

|                             |    |                           |
|-----------------------------|----|---------------------------|
| IN RE: ALL ASBESTOS-RELATED | \$ | IN THE DISTRICT COURTS OF |
| PERSONAL INJURY AND         | \$ |                           |
| WRONGFUL DEATH CASES        | \$ | DALLAS COUNTY, TEXAS      |
| PENDING IN DALLAS COUNTY    | \$ |                           |
| DISTRICT COURTS             | \$ | 191ST JUDICIAL DISTRICT   |

**DEFENDANT OWENS-ILLINOIS, INC.'S  
SUPPLEMENTATION TO ANSWERS TO INTERROGATORIES  
AND RESPONSES TO REQUESTS FOR ADMISSIONS  
AND FOR PRODUCTION OF DOCUMENTS**

Owens-Illinois, Inc., hereby supplements all existing Interrogatory Answers, Responses to Requests for Admissions and Responses to Requests to Produce Documents previously served in the Dallas County Asbestos Litigation to the extent that any such interrogatory, request for admission or documents request seeks to elicit information or admissions of the following nature or documents related thereto:

Owens-Illinois, Inc. recently discovered certain documents concerning the Kimax line of glass pipe that contain information that may be responsive to previously filed discovery requests. It has commenced an investigation concerning this information. The investigation is continuing. Its investigation has thus far disclosed the following:

From approximately 1959 through 1977, the Kimble Glass Company, a unit of Owens-Illinois, Inc., manufactured and sold the Kimax line of glass pipe intended for use by various industries including chemical, food, dairy products, pharmaceutical, textiles, paper and pulp as well as photo engravers, aeronautical researchers and atomic energy plants. From 1959 to 1966 the glass pipe was a conical end glass process pipe. From 1966 to 1977 a beaded glass process pipe was added to the product line. The glass pipe did not contain asbestos as one of its ingredients.

Gaskets, inserts and spacers were utilized as accessory parts of the conical end glass process piping system. The gaskets, inserts and spacers were not manufactured by Kimble. The accessory parts were not utilized by the dairy industry as that industry used a different coupling and associated accessories. Records made available to and reviewed by Owens-Illinois indicate



that, during the last quarter of 1963, Kimble Glass Company began to offer for sale these accessory parts in conjunction with the sale or use of Kimax glass pipe. Other records made available to and reviewed by Owens-Illinois indicate that these accessory materials were manufactured or supplied by Garlock, Inc., Chicago Gasket Company, Micromold Products Corp., Fischer & Porter, Sullivan Asbestos Corp., Amsco Sales Corp., and Johns-Manville. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that the total dollar amount of sales of these accessory parts which contained asbestos as one of its ingredients was approximately \$28,000 in 1974, \$41,500 in 1976 and \$39,950 in 1977.

Gaskets were intended to be used as an interface between the pipe ends to prevent glass to glass contact. Inserts were intended to be used for cushioning pipe ends from metal flanges. Spacers were intended to be used to join glass pipe to glass lined steel pipe. The gaskets, inserts and spacers were small, being used with glass pipe ranging in diameters from one inch to six inches. The thickness of the gaskets was approximately 1/8 of an inch and the thickness of the spacers ranged from approximately 1/4 of an inch to 3/8 of an inch. Some of the gaskets included asbestos as one of their ingredients, including the use of asbestos described in the product catalogue as blue african asbestos when resilience and corrosion resistance were required. Many gaskets were sold which contained neoprene or Teflon as one of their ingredients and no asbestos. The spacers and inserts also included asbestos as one of their ingredients. Due to the small size of these accessory parts, the amount of asbestos would have been limited. The accessory parts were used in conjunction with low heat applications where the normal operating temperature was 250°F or less and the maximum operating temperature was 450°F.

The spacers were substantially encapsulated with Teflon which covered all of the spacer except for the outer rim. A portion of the gaskets were also encapsulated with a Teflon covering. The inserts contained asbestos impregnated into a black neoprene material. It was a hard pressed material.

The gaskets, inserts and spacers were made to fit and did not require cutting for use with the glass piping systems.

In approximately 1966 a new Kimax glass pipe known as the Kimax beaded process pipe was first made available for sale. The beaded pipe allowed on site fabrication,

including the creation of a new bead for the coupling to sit on. This made the product more versatile than the conical end pipe which, however, remained available for sale. Use of the beaded glass process pipe did not involve the use of asbestos containing accessory products except for gaskets where the beaded glass process pipe connected to existing conical end glass process pipe. A field beading kit was available for use in connection with field fabrication of the beaded glass pipe. The kit included a small plate approximately 10"-12" in width and length for fire protection purposes and a covering over each of two small hoses included in the kit. The plate and hose coverings may possibly have contained asbestos, but Owens-Illinois cannot yet confirm the ingredients of these materials based upon its business records presently reviewed in connection with this investigation. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that 22 beading kits were sold in 1974 for a total annual dollar sales volume of \$7,320, that 25 beading kits were sold in 1976 for a total annual dollar sales volume of \$10,374 and that 19 beading kits were sold in 1977 for a total annual sales volume of \$8,151.

Kimble also sold Glass-Lined Reactors manufactured by Schwelm for a period of time presently unknown. The reactors ranged in capacities from 300 gallons to 5000 gallons. The reactor vessels contained gaskets, not manufactured by Kimble, which were encapsulated with Teflon and included asbestos as one of their ingredients.

Kontes Glass Company, which was a subsidiary of Owens-Illinois during 1982-1985, purchased certain asbestos containing materials from other manufacturers and incorporated those materials into four of its products during the period 1982 through 1985. Kontes Glass Company is primarily a manufacturer of laboratory glass products. During 1982 and 1983, Kontes Glass Company incorporated an asbestos containing gasket into a flask clamp. A total of 496 were sold during the two year period and nine replacement gaskets were sold during the same period of time. During 1982 and 1983, Kontes Glass sold two vacuum pumps which contained a small amount of asbestos tape wrapped around a vapor tube. During 1983 Kontes Glass sold three Sweep Co-Distillation Apparatuses which included asbestos containing plates inside the heater portion of the apparatus. From 1982 through 1985, Kontes Glass also sold a Kjeldahl Digestion-Distillation Apparatus which included an asbestos containing cover and an asbestos containing mounting plate for the heater which was inside the apparatus. Eighty-three (83) of these apparatuses were sold during the entire four year period. In addition,

223 replacement heaters with the mounting plate and 12 of the covers were sold during the same four year period. As stated above, the asbestos containing parts were not manufactured by Kontes Glass, but were purchased from other manufacturers and incorporated into the products by Kontes Glass.

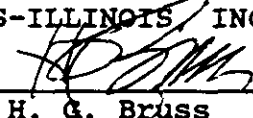
On or about December 30, 1977, Owens-Illinois transferred certain assets to OI/Schott Process Systems, Inc., including the Kimax Process Pipe Production facility and other property related to the Kimax Process Pipe product line in exchange for 50% of the stock of OI/Schott Process Systems, Inc. In addition the right to sell Schwelm Reactor vessels was included in OI/Schott's product line. After the transfer of the Kimax Process Pipe assets to OI/Schott Process Systems, Inc., Owens-Illinois did not thereafter sell any of the process pipe or the accessory products described above. Pursuant to a Sales Agreement dated May 24, 1990, Owens-Illinois sold its 50% interest in OI/Schott Process Systems, Inc. to Schott Corporation.

Owens-Illinois will make all of the documents related to the foregoing matters, which have been recently discovered, available for inspection and copying at the offices of its counsel, Bernstein, Shur, Sawyer & Nelson in Portland, Maine upon request.

Owens-Illinois is presently continuing its investigation and will further supplement its discovery responses in the future if it becomes necessary.

Dated: September 22, 1993.

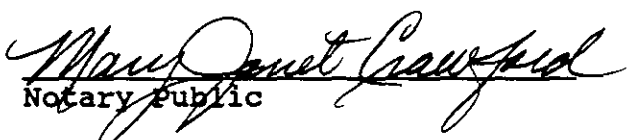
OWENS-ILLINOIS INC.

By:   
H. G. Bruss

September 22, 1993

Then personally appeared the above named H. G. Bruss, in his capacity as Assistant Secretary of Owens-Illinois, Inc. and made oath that the foregoing supplementation to Answers to Interrogatories, Responses to Requests for Admissions and for Production of Documents is true to the best of his knowledge, information and belief.

Before me,

  
Notary Public

MARY JANET CRAWFORD  
Notary Public, State of Ohio  
My Commission Expires 1-4-96



Respectfully submitted,

Peter A. Moir BAB

Larry D. Carlson  
State Bar No. 03814500  
Peter A. Moir  
State Bar No. 14254500  
Robert W. Teeter  
State Bar No. 19761625  
BAKER & BOTTS, L.L.P.  
800 Trammell Crow Center  
2001 Ross Avenue  
Dallas, Texas 75201  
(214) 953-6500

ATTORNEYS FOR DEFENDANT  
OWENS-ILLINOIS, INC.

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the foregoing Supplementation to Answers to Interrogatories and Responses to Requests for Admissions and for Production of Documents has been forwarded by certified mail, return receipt requested, to counsel for plaintiffs, and to all known defense counsel by U.S. Mail on this 29<sup>th</sup> day of September, 1993.

Peter A. Moir BAB  
PETER A. MOIR

RECEIVED

OCT 15 1993

IN THE CIRCUIT COURT OF THE CITY OF ST. LOUIS  
STATE OF MISSOURI

|                      |   |           |
|----------------------|---|-----------|
| LOUISE C. BENNETT    | ) | 842-04784 |
| ROSOLINO GILBERTI    | ) | 822-01476 |
| MARILYN NUGENT       | ) | 892-02090 |
| RAYMOND BURBACH      | ) | 912-00687 |
| THOMAS DURHAM        | ) | 922-00947 |
| CLIFFORD CURTIN      | ) | 922-08897 |
| DONALD BLASINGAME    | ) | 882-06653 |
| MICHAEL MARTIN       | ) | 882-06989 |
| WILBERN WARD         | ) | 882-06984 |
|                      | ) |           |
| Plaintiffs.          | ) |           |
|                      | ) |           |
| v.                   | ) |           |
|                      | ) |           |
| OWENS-ILLINOIS, INC. | ) |           |
|                      | ) |           |
| Defendant.           | ) |           |

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AND RESPONSES TO REQUESTS FOR ADMISSIONS  
AND FOR PRODUCTION OF DOCUMENTS**

Owens-Illinois hereby supplements all existing Interrogatory Answers, Responses to Requests for Admissions and Responses to Requests to Produce Documents previously served in the above-referenced Asbestos Litigation to the extent that any such interrogatory, request for admission or document request seeks to elicit information or admissions of the following nature or documents related thereto:

Owens-Illinois recently discovered certain documents concerning the Kimax line of glass pipe that contain information that may be responsive to previously filed discovery requests. It has commenced an investigation concerning this information. The investigation is continuing. Its investigation has thus far disclosed the following:

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Gaskets, inserts and spacers were utilized as accessory parts of the conical end glass process piping system. The gaskets, inserts and spacers were not manufactured by Kimble. The accessory parts were not utilized by the dairy industry as that industry used a different coupling and associated accessories. Records made available to and reviewed by Owens-Illinois indicate

that, during the last quarter of 1963, Kimble Glass Company began to offer for sale these accessory parts in conjunction with the sale or use of Kimax glass pipe. Other records made available to and reviewed by Owens-Illinois indicate that these accessory materials were manufactured or supplied by Garlock, Inc., Chicago Gasket Company, Micromold Products Corp., Fischer & Porter, Sullivan Asbestos Corp., Amsco Sales Corp., and Johns-Manville. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that the total dollar amount of sales of these accessory parts which contained asbestos as one of its ingredients was approximately \$28,000 in 1974, \$41,500 in 1976 and \$39,950 in 1977.

Gaskets were intended to be used as an interface between the pipe ends to prevent glass to glass contact. Inserts were intended to be used for cushioning pipe ends from metal flanges. Spacers were intended to be used to join glass pipe to glass lined steel pipe. The gaskets, inserts and spacers were small, being used with glass pipe ranging in diameters from one inch to six inches. The thickness of the gaskets was approximately 1/8 of an inch and the thickness of the spacers ranged from approximately 1/4 of an inch to 3/8 of an inch. Some of the gaskets included asbestos as one of their ingredients, including the use of asbestos described in the product catalogue as blue african asbestos when resilience and corrosion resistance were required. Many gaskets were sold which contained neoprene or Teflon as one of their ingredients and no asbestos. The spacers and inserts also included asbestos as one of their ingredients. Due to the small size of these accessory parts, the amount of asbestos would have been limited. The accessory parts were used in conjunction with low heat applications where the normal operating temperature was 250°F or less and the maximum operating temperature was 450°F.

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including the creation of a new bead for the coupling to sit on. This made the product more versatile than the conical end pipe which, however, remained available for sale. Use of the beaded glass process pipe did not involve the use of asbestos containing accessory products except for gaskets where the beaded glass process pipe connected to existing conical end glass process pipe. A field beading kit was available for use in connection with field fabrication of the beaded glass pipe. The kit included a small plate approximately 10"-12" in width and length for fire protection purposes and a covering over each of two small hoses included in the kit. The plate and hose coverings may possibly have contained asbestos, but Owens-Illinois cannot yet confirm the ingredients of these materials based upon its business records presently reviewed in connection with this investigation. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that 22 beading kits were sold in 1974 for a total annual dollar sales volume of \$7,320, that 25 beading kits were sold in 1976 for a total annual dollar sales volume of \$10,374 and that 19 beading kits were sold in 1977 for a total annual sales volume of \$8,151.

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Kontes Glass Company, which was a subsidiary of Owens-Illinois during 1982-1985, purchased certain asbestos containing materials from other manufacturers and incorporated those materials into four of its products during the period 1982 through 1985. Kontes Glass Company is primarily a manufacturer of laboratory glass products. During 1982 and 1983, Kontes Glass Company incorporated an asbestos containing gasket into a flask clamp. A total of 496 were sold during the two year period and nine replacement gaskets were sold during the same period of time. During 1982 and 1983, Kontes Glass sold two vacuum pumps which contained a small amount of asbestos tape wrapped around a vapor tube. During 1983 Kontes Glass sold three Sweep Co-Distillation Apparatuses which included asbestos containing plates inside the heater portion of the apparatus. From 1982 through 1985, Kontes Glass also sold a Kjeldahl Digestion-Distillation Apparatus which included an asbestos containing cover and an asbestos containing mounting plate for the heater which was inside the apparatus. Eighty-three (83) of these apparatuses were sold during the entire four year period. In addition,

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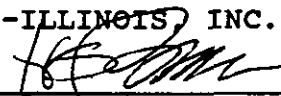
On or about December 30, 1977, Owens-Illinois transferred certain assets to OI/Schott Process Systems, Inc., including the Kimax Process Pipe Production facility and other property related to the Kimax Process Pipe product line in exchange for 50% of the stock of OI/Schott Process Systems, Inc. In addition the right to sell Schwelm Reactor vessels was included in OI/Schott's product line. After the transfer of the Kimax Process Pipe assets to OI/Schott Process Systems, Inc., Owens-Illinois did not thereafter sell any of the process pipe or the accessory products described above. Pursuant to a Sales Agreement dated May 24, 1990, Owens-Illinois sold its 50% interest in OI/Schott Process Systems, Inc. to Schott Corporation.

Owens-Illinois will make all of the documents related to the foregoing matters, which have been recently discovered, available for inspection and copying at the offices of its counsel, Bernstein, Shur, Sawyer & Nelson in Portland, Maine upon request.

Owens-Illinois is presently continuing its investigation and will further supplement its discovery responses in the future if it becomes necessary.

Dated: September 22, 1993.

OWENS-ILLINOIS, INC.

By: 

H. G. Bruss

September 22, 1993

Then personally appeared the above named H. G. Bruss, in his capacity as Assistant Secretary of Owens-Illinois, Inc. and made oath that the foregoing supplementation to Answers to Interrogatories, Responses to Requests for Admissions and for Production of Documents is true to the best of his knowledge, information and belief.

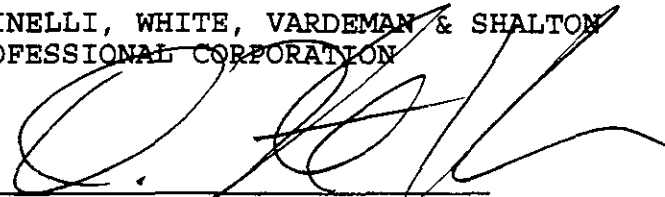
Before me,

  
Notary Public

MARY JANET CRAWFORD  
Notary Public, State of Ohio  
My Commission Expires 1-4-96

Respectfully submitted,

POLSINELLI, WHITE, VARDEMAN & SHALTON  
A PROFESSIONAL CORPORATION

By: 

D. KEITH HENSON (#31988)  
JOEL A. POOLE (#32070)  
One Metropolitan Square  
211 North Broadway, Suite 1440  
St. Louis, Missouri 63102  
(314) 231-1950  
Telecopier No. (314) 231-1776

ATTORNEYS FOR DEFENDANT  
OWENS-ILLINOIS, INC.

**CERTIFICATE OF SERVICE**

I hereby certify that a copy of the above and foregoing was mailed via U.S. Mail this 13<sup>th</sup> day of October, 1993 to:

Mark Bronson  
Newman & Bronson  
1015 Locust, Suite 1024  
St. Louis, MO 63101

Walter Floyd  
Walter L. Floyd, Inc.  
230 S. Bemiston, Suite 900  
Clayton, MO 63105

Brian Weinstein  
Baron & Budd  
The Centrum  
Suite 1100  
3102 Oak Lawn Avenue  
Dallas, TX 75219

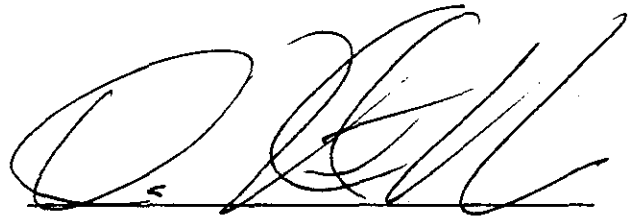
Alan E. Dewoskin  
225 S. Meramec Avenue  
Suite 426  
St. Louis, MO 63105

Allard Allston, III  
Ness, Motley, Loadholt,  
Richardson & Poole  
P. O. Box 365  
Bamwell, SC 29812

Donald H. Blasingame  
202 Starling Community  
Arnold, MO 63010

Michael P. Martin  
P. O. Box 147  
Bourbon, MO 65441

Wilbern M. Ward  
General Delivery  
Labadie, MO 63055

A large, stylized handwritten signature in black ink, appearing to be 'D. H. Blasingame', is written over a horizontal line.

09605/09774  
PWS-PL: Y:\POCUR\PLDG.OCT\148157.1



In Re: Georgia Asbestos Litigation )  
in State and Federal Courts )

SUPPLEMENTATION TO ANSWERS TO INTERROGATORIES  
AND RESPONSES TO REQUESTS FOR ADMISSIONS AND FOR  
PRODUCTION OF DOCUMENTS ON BEHALF OF OWENS-ILLINOIS, INC.

TO: BRIAN D. WEINSTEIN, ESQUIRE, ATTORNEY FOR PLAINTIFFS:

The defendant, Owens-Illinois, Inc. herein provides supplemental responses to the plaintiff's Interrogatories, Requests for Admissions, and Requests for Production of Documents. These responses are herein attached.

NELSON MULLINS RILEY & SCARBOROUGH

By: W. Thomas Causby  
W. Thomas Causby  
1330 Lady Street, Third Floor  
Post Office Box 11070  
Columbia, SC 29211  
(803) 799-2000

MOZLEY FINLAYSON & LOGGINS

By: D. Keith Calhoun  
Sewell K. Loggins  
D. Keith Calhoun  
One Premier Plaza, Suite 900  
5605 Glenridge Drive  
Atlanta, GA 30342  
(404) 256-0700

Attorneys for Defendant Owens-  
Illinois, Inc.

September 29, 1993

IN THE CIRCUIT COURT OF JACKSON COUNTY, MISSISSIPPI

PAUL ALLEN, ET AL.

PLAINTIFFS

VS.

NO. 92-5299(3)

FIBREBOARD CORPORATION, ET AL.

DEFENDANTS

GLENN BRITT, ET AL.

PLAINTIFFS

VS.

NO. 92-5300(1)

KEENE CORPORATION, ET AL.

DEFENDANTS

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AND RESPONSES TO REQUESTS FOR ADMISSIONS  
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Dated: September 22, 1993.

OWENS-ILLINOIS, INC.

By: H. G. Bruss  
H. G. Bruss

September 22, 1993

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Before me,

Mary Janet Crawford  
Notary Public

MARY JANET CRAWFORD  
Notary Public, State of Ohio  
My Commission Expires 1-4-96

Respectfully submitted,



RICHARD L. FORMAN

WALTER G. WATKINS, JR.

JOHN D. COSMICH

ATTORNEYS FOR DEFENDANT  
OWENS-ILLINOIS, INC.

OF COUNSEL:

FORMAN, PERRY, WATKINS & KRUTZ

A Professional Association

Suite 1200, One Jackson Place

188 E. Capitol Street

Post Office Box 22608

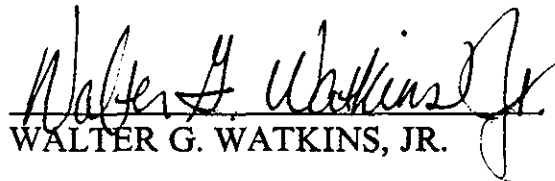
Jackson, Mississippi 39225-2608

(601) 960-8600

CERTIFICATE OF SERVICE

I, the undersigned attorney, certify that I have this day caused a copy of the above to be placed in the United States mail, postage fully prepaid, addressed to plaintiffs' counsel in this matter.

THIS, the 29th day of September, 1993.



WALTER G. WATKINS, JR.

CAUSE NO. 87-G-3066

|                                   |    |                          |
|-----------------------------------|----|--------------------------|
| MARY S. MORROW, AS REPRESENTATIVE | \$ | IN THE DISTRICT COURT OF |
| OF ESTATE OF STANLEY JOSEPH       | \$ |                          |
| MORROW, DECEASED (AND ALL OTHER   | \$ |                          |
| FRED BARON CASES PENDING IN THIS  | \$ |                          |
| COURT)                            | \$ |                          |
|                                   | \$ |                          |
| VS.                               | \$ | BRAZORIA COUNTY, TEXAS   |
|                                   | \$ |                          |
| ARMSTRONG WORLD INDUSTRIES, INC.  | \$ |                          |
| ET AL                             | \$ | 239TH JUDICIAL DISTRICT  |

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
TO INTERROGATORIES AND RESPONSES TO REQUESTS FOR  
ADMISSIONS AND FOR PRODUCTION OF DOCUMENTS

TO THE HONORABLE JUDGE OF SAID COURT:

Now comes OWENS-ILLINOIS, INC., one of the Defendants in the  
above styled and numbered cause, and files this its  
Supplementation to Answers to Interrogatories and Responses to  
Requests for Admissions and for Production of Documents herein.

Respectfully submitted,

STRONG, PIPKIN, NELSON & BISSELL, L.L.P.  
14th Floor, San Jacinto Bldg.  
595 Orleans  
Beaumont, Texas 77701-3255  
(409) 835-4581  
Fax (409) 835-0914

By 

John G. Bissell  
State Bar No. 02356000

David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.



CERTIFICATE OF SERVICE

This will certify that on the 29th day of September, 1993, I forwarded by certified mail, return receipt requested, to counsel for Plaintiff, a true and correct copy of the above and foregoing Supplementation to Answers to Interrogatories and Responses to Requests for Admissions and for Production of Documents.

  
\_\_\_\_\_  
Debbie Self

CAUSE NO. 87-R-3384

|                                    |   |                         |
|------------------------------------|---|-------------------------|
| OLA MAE BELL AS THE REPRESENTATIVE | § | IN THE DISTRICT COURT   |
| OF THE ESTATE OF OTIS BELL,        | § |                         |
| DECEASED (AND ALL OTHER FRED BARON | § |                         |
| CASES PENDING IN THIS COURT)       | § |                         |
|                                    | § | BRAZORIA COUNTY, TEXAS  |
|                                    | § |                         |
| VS.                                | § |                         |
|                                    | § |                         |
| THE CELOTEX CORP., ET AL           | § | 149TH JUDICIAL DISTRICT |

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
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14th Floor, San Jacinto Bldg.  
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Beaumont, Texas 77701-3255  
(409) 835-4581  
Fax (409) 835-0914

By 

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State Bar No. 02356000

David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self  
Debbie Self

CAUSE NO. 91-4542-C

|                                   |   |                        |
|-----------------------------------|---|------------------------|
| ROBERT AND LEONA TINER            | § | IN THE DISTRICT COURT  |
| (AND ALL OTHER RUSSELL BUDD       | § |                        |
| CASES PENDING IN THIS             | § |                        |
| COURT)                            | § | NUECES COUNTY, TEXAS   |
|                                   | § |                        |
| VS.                               | § |                        |
|                                   | § |                        |
| ARMSTRONG WORLD INDUSTRIES, ET AL | § | 94TH JUDICIAL DISTRICT |

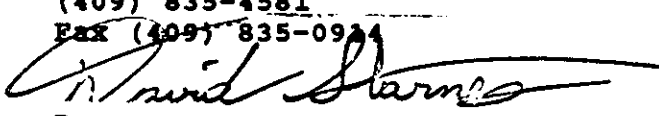
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(409) 835-4581  
Fax (409) 835-0944

By 

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State Bar No. 02356000

David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
BEAUMONT DIVISION

MASTER ASBESTOS DOCKET

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
TO INTERROGATORIES AND RESPONSES TO REQUESTS FOR  
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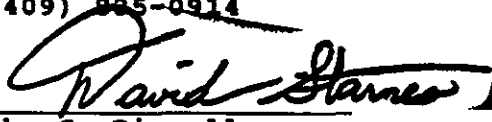
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14th Floor, San Jacinto Bldg.  
595 Orleans  
Beaumont, Texas 77701-3255  
(409) 835-4581  
Fax (409) 835-0914

By

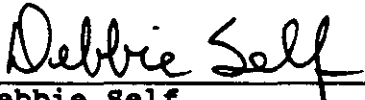
  
John G. Bissell  
State Bar No. 02356000

David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
BROWNSVILLE DIVISION

MASTER ASBESTOS DOCKET

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
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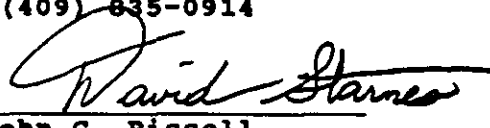
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Beaumont, Texas 77701-3255  
(409) 835-4581  
Fax (409) 835-0914

By

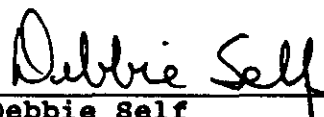
  
John G. Bissell  
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David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
CORPUS CHRISTI DIVISION

MASTER ASBESTOS DOCKET

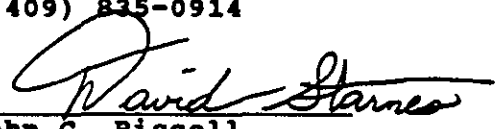
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Beaumont, Texas 77701-3255  
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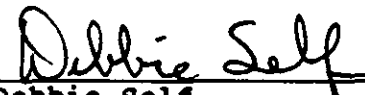
By   
John G. Bissell  
State Bar No. 02356000

David W. Starnes  
State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self



IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
GALVESTON DIVISION

MASTER ASBESTOS DOCKET

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
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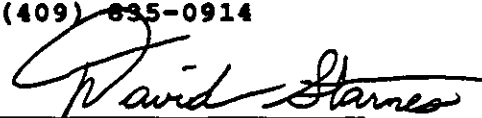
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Fax (409) 835-0914

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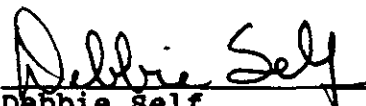
  
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Owens-Illinois, Inc.

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Debbie Self

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
HOUSTON DIVISION

MASTER ASBESTOS DOCKET

DEFENDANT, OWENS-ILLINOIS, INC.'S SUPPLEMENTATION TO ANSWERS  
TO INTERROGATORIES AND RESPONSES TO REQUESTS FOR  
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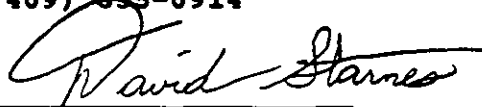
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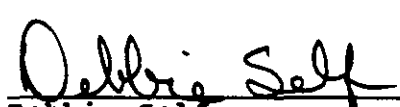
  
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Owens-Illinois, Inc.

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Debbie Self

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF TEXAS  
VICTORIA DIVISION

MASTER ASBESTOS DOCKET

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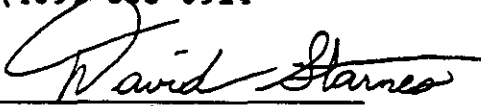
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Beaumont, Texas 77701-3255  
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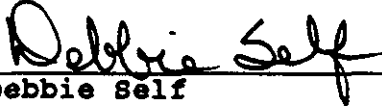
  
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State Bar No. 19072700

Attorneys for Defendant  
Owens-Illinois, Inc.

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Debbie Self

**SUPPLEMENTATION TO ANSWERS TO INTERROGATORIES  
AND RESPONSES TO REQUESTS FOR ADMISSIONS  
AND FOR PRODUCTION OF DOCUMENTS**

Owens-Illinois hereby supplements all existing Interrogatory Answers, Responses to Requests for Admissions and Responses to Requests to Produce Documents previously served in the Texas Asbestos Litigation to the extent that any such interrogatory, request for admission or document request seeks to elicit information or admissions of the following nature or documents related thereto:

Owens-Illinois recently discovered certain documents concerning the Kimax line of glass pipe that contain information that may be responsive to previously filed discovery requests. It has commenced an investigation concerning this information. The investigation is continuing. Its investigation has thus far disclosed the following:

From approximately 1959 through 1977, the Kimble Glass Company, a unit of Owens-Illinois, Inc., manufactured and sold the Kimax line of glass pipe intended for use by various industries including chemical, food, dairy products, pharmaceutical, textiles, paper and pulp as well as photo engravers, aeronautical researchers and atomic energy plants. From 1959 to 1966 the glass pipe was a conical end glass process pipe. From 1966 to 1977 a beaded glass process pipe was added to the product line. The glass pipe did not contain asbestos as one of its ingredients.

Gaskets, inserts and spacers were utilized as accessory parts of the conical end glass process piping system. The gaskets, inserts and spacers were not manufactured by Kimble. The accessory parts were not utilized by the dairy industry as that industry used a different coupling and associated accessories. Records made available to and reviewed by Owens-Illinois indicate

that, during the last quarter of 1963, Kimble Glass Company began to offer for sale these accessory parts in conjunction with the sale or use of Kimax glass pipe. Other records made available to and reviewed by Owens-Illinois indicate that these accessory materials were manufactured or supplied by Garlock, Inc., Chicago Gasket Company, Micromold Products Corp., Fischer & Porter, Sullivan Asbestos Corp., Amsco Sales Corp., and Johns-Manville. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that the total dollar amount of sales of these accessory parts which contained asbestos as one of its ingredients was approximately \$28,000 in 1974, \$41,500 in 1976 and \$39,950 in 1977.

Gaskets were intended to be used as an interface between the pipe ends to prevent glass to glass contact. Inserts were intended to be used for cushioning pipe ends from metal flanges. Spacers were intended to be used to join glass pipe to glass lined steel pipe. The gaskets, inserts and spacers were small, being used with glass pipe ranging in diameters from one inch to six inches. The thickness of the gaskets was approximately 1/8 of an inch and the thickness of the spacers ranged from approximately 1/4 of an inch to 3/8 of an inch. Some of the gaskets included asbestos as one of their ingredients, including the use of asbestos described in the product catalogue as blue african asbestos when resilience and corrosion resistance were required. Many gaskets were sold which contained neoprene or Teflon as one of their ingredients and no asbestos. The spacers and inserts also included asbestos as one of their ingredients. Due to the small size of these accessory parts, the amount of asbestos would have been limited. The accessory parts were used in conjunction with low heat applications where the normal operating temperature was 250°F or less and the maximum operating temperature was 450°F.

The spacers were substantially encapsulated with Teflon which covered all of the spacer except for the outer rim. A portion of the gaskets were also encapsulated with a Teflon covering. The inserts contained asbestos impregnated into a black neoprene material. It was a hard pressed material.

The gaskets, inserts and spacers were made to fit and did not require cutting for use with the glass piping systems.

In approximately 1966 a new Kimax glass pipe known as the Kimax beaded process pipe was first made available for sale. The beaded pipe allowed on site fabrication,

including the creation of a new bead for the coupling to sit on. This made the product more versatile than the conical end pipe which, however, remained available for sale. Use of the beaded glass process pipe did not involve the use of asbestos containing accessory products except for gaskets where the beaded glass process pipe connected to existing conical end glass process pipe. A field beading kit was available for use in connection with field fabrication of the beaded glass pipe. The kit included a small plate approximately 10"-12" in width and length for fire protection purposes and a covering over each of two small hoses included in the kit. The plate and hose coverings may possibly have contained asbestos, but Owens-Illinois cannot yet confirm the ingredients of these materials based upon its business records presently reviewed in connection with this investigation. While the investigation to date has not disclosed all of the sales on an annual basis, records made available to Owens-Illinois indicate that 22 beading kits were sold in 1974 for a total annual dollar sales volume of \$7,320, that 25 beading kits were sold in 1976 for a total annual dollar sales volume of \$10,374 and that 19 beading kits were sold in 1977 for a total annual sales volume of \$8,151.

Kimble also sold Glass-Lined Reactors manufactured by Schwelm for a period of time presently unknown. The reactors ranged in capacities from 300 gallons to 5000 gallons. The reactor vessels contained gaskets, not manufactured by Kimble, which were encapsulated with Teflon and included asbestos as one of their ingredients.

Kontes Glass Company, which was a subsidiary of Owens-Illinois during 1982-1985, purchased certain asbestos containing materials from other manufacturers and incorporated those materials into four of its products during the period 1982 through 1985. Kontes Glass Company is primarily a manufacturer of laboratory glass products. During 1982 and 1983, Kontes Glass Company incorporated an asbestos containing gasket into a flask clamp. A total of 496 were sold during the two year period and nine replacement gaskets were sold during the same period of time. During 1982 and 1983, Kontes Glass sold two vacuum pumps which contained a small amount of asbestos tape wrapped around a vapor tube. During 1983 Kontes Glass sold three Sweep Co-Distillation Apparatuses which included asbestos containing plates inside the heater portion of the apparatus. From 1982 through 1985, Kontes Glass also sold a Kjeldahl Digestion-Distillation Apparatus which included an asbestos containing cover and an asbestos containing mounting plate for the heater which was inside the apparatus. Eighty-three (83) of these apparatuses were sold during the entire four year period. In addition,

223 replacement heaters with the mounting plate and 12 of the covers were sold during the same four year period. As stated above, the asbestos containing parts were not manufactured by Kontes Glass, but were purchased from other manufacturers and incorporated into the products by Kontes Glass.

On or about December 30, 1977, Owens-Illinois transferred certain assets to OI/Schott Process Systems, Inc., including the Kimax Process Pipe Production facility and other property related to the Kimax Process Pipe product line in exchange for 50% of the stock of OI/Schott Process Systems, Inc. In addition the right to sell Schwelm Reactor vessels was included in OI/Schott's product line. After the transfer of the Kimax Process Pipe assets to OI/Schott Process Systems, Inc., Owens-Illinois did not thereafter sell any of the process pipe or the accessory products described above. Pursuant to a Sales Agreement dated May 24, 1990, Owens-Illinois sold its 50% interest in OI/Schott Process Systems, Inc. to Schott Corporation.

Owens-Illinois will make all of the documents related to the foregoing matters, which have been recently discovered, available for inspection and copying at the offices of its counsel, Bernstein, Shur, Sawyer & Nelson in Portland, Maine upon request.

Owens-Illinois is presently continuing its investigation and will further supplement its discovery responses in the future if it becomes necessary.

Dated: September 22, 1993.

OWENS-ILLINOIS, INC.

By:   
H. G. Bruss

September 22, 1993

Then personally appeared the above named H. G. Bruss, in his capacity as Assistant Secretary of Owens-Illinois, Inc. and made oath that the foregoing supplementation to Answers to Interrogatories, Responses to Requests for Admissions and for Production of Documents is true to the best of his knowledge, information and belief.

Before me,

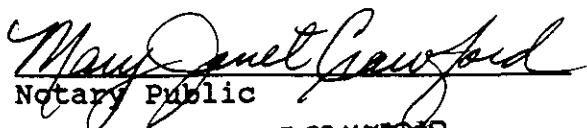
  
Notary Public  
MARY JANET CRAWFORD  
Notary Public, State of Ohio  
My Commission Expires 1-4-96

EXHIBIT I

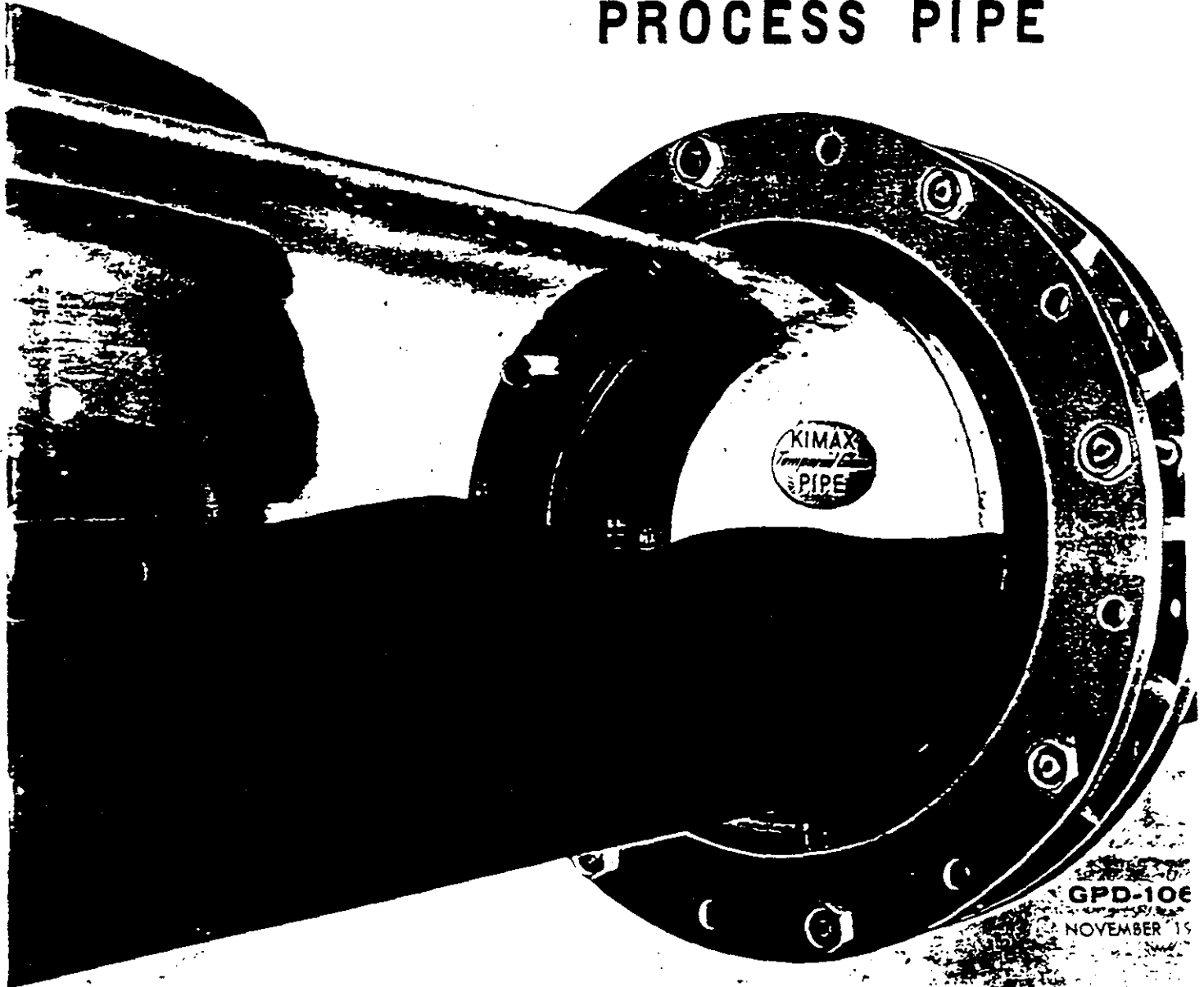


**OWENS-ILLINOIS**

**KIMAX<sup>®</sup>**

**tempered glass**

**PROCESS PIPE**



**GPD-106**

**NOVEMBER '15**



# OWENS-ILLINOIS

GENERAL OFFICES • TOLEDO, OHIO 43601

## OWENS-ILLINOIS SALES OFFICES

Atlanta, Ga. 30341  
1561 Bishop Hollow Run  
AC/404 457-0623

Downers Grove, Illinois 60515  
3685 Duchess Court  
AC/312 964-2144

Houston, Texas 77055  
2315 Moss Hill  
AC/713 465-4789

La Mirada, Calif. 90638  
15052 Rosecrans Ave.  
Suite 209  
AC/213 941-0276  
AC/714 521-2271

Vineland, N. J. 08360  
Crystal & Fowler Ave.  
AC/609 692-3600

Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

Owens-Illinois  
International Division  
Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

KIMAX Tempered Glass Pipe is manufactured and sold by the Consumer and Technical Products Division.

TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

# KIMAX<sup>®</sup>

## *Tempered Glass*

# PIPE

This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from such causes, Owens-Illinois will, in full discharge of this warranty, replace such pipe at no charge.

### GENERAL INFORMATION

|                               |      |
|-------------------------------|------|
| Advantages                    | 2, 3 |
| Manufacturing Characteristics | 2    |
| Non-standard Items            | 3    |
| Ordering                      | 3    |
| Physical Properties           | 3    |
| Uses                          | 2    |

### KIMAX GLASS PIPE AND FITTINGS

|                   |         |
|-------------------|---------|
| Adjustable Joint  | 4, 9    |
| Caps              | 9       |
| Crosses           | 8       |
| Elbows            | 7       |
| Laterals          | 5, 6    |
| Reducers          | 8       |
| Spacers           | 5, 6, 7 |
| Straight Lengths  | 9       |
| Tees              | 4       |
| Thermometer Wells | 6, 7    |
| U Bends           | 8       |
|                   | 7       |

### FLANGES, GASKETS AND ACCESSORIES

|                  |       |
|------------------|-------|
| Adapter Button   | 10-13 |
| Donut Spacer     | 12    |
| Ferrule          | 12    |
| Flange, adapter  | 10    |
| Flange, A.S.M.E. | 12    |
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## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors, textiles, paper and pulp, photo engravers, aeronautical researchers and atomic energy plants.

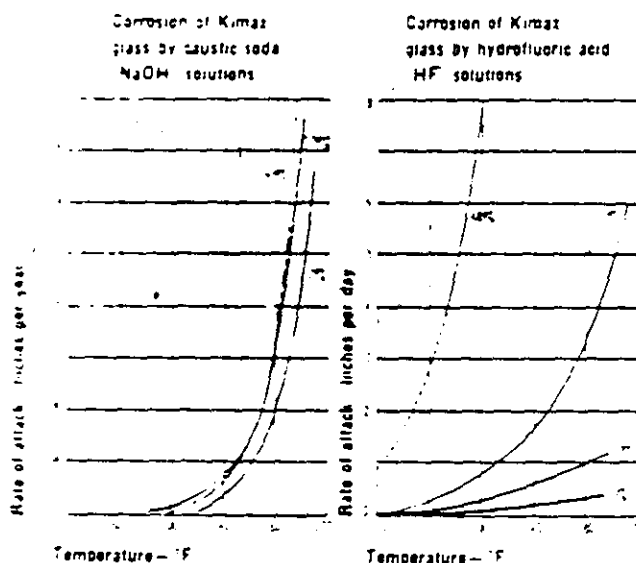
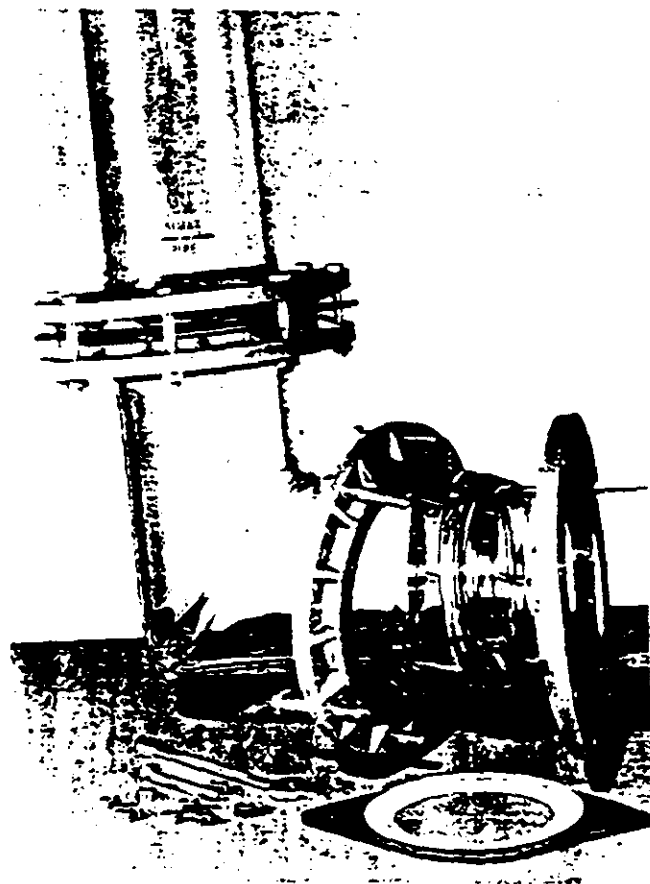
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight-flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels, boiling units, reaction chambers, and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials, including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from H-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals, including mineral and organic acids; SO<sub>2</sub> vapor; chlorinated hydrocarbon organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

**Economy** is inherent in KIMAX glass pipe systems. Material competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long lived.

**Lightweight.** KIMAX glass pipe weighs 1/3 to 1/6 less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of pipe lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

#### Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine drawn, heavy-wall tubing. Length dimensions are held to ±1/16".

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—triples the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as caps, U-bends, thermometer wells, and some traps are annealed only due to their shape. These annealed fittings are clearly identified.

#### Physical Properties

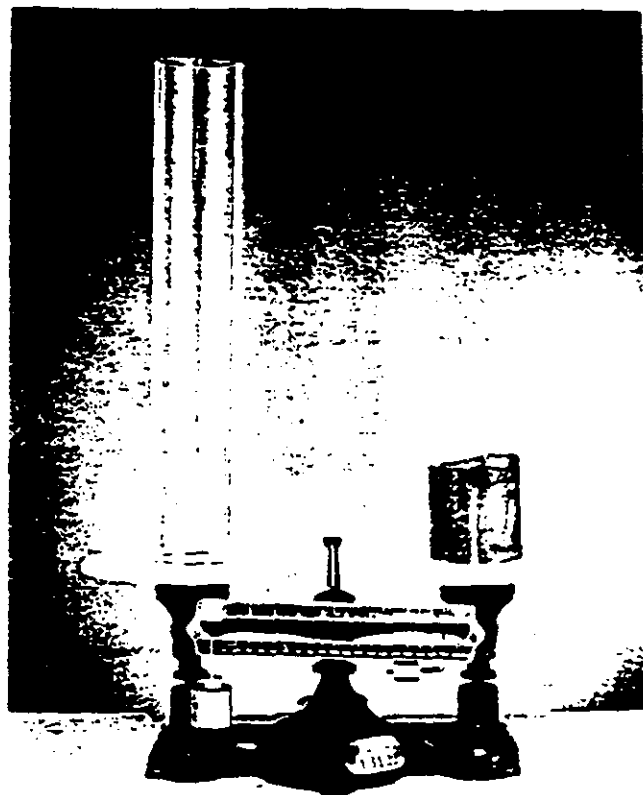
KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products.

Operating temperatures extend up to 350° F. under normal conditions. They may go up to 450° F. if insulating protection is provided.

Thermal conductivity: 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F.

Thermal expansion of KIMAX pipe is 0.22 inches per 100 feet per 100° F. temperature change.

Thermal shock differential ranges from 160° F. to 210° F. depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



#### Ordering

When ordering a standard item please refer to KIMAX glass pipe distributors' price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

#### Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

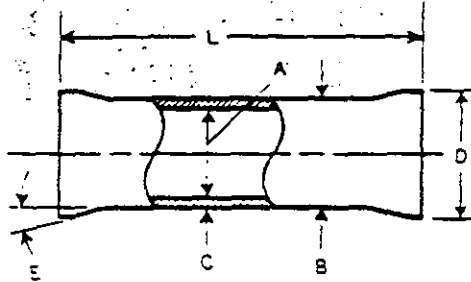
Non-stock items such as reducing tees and crosses with 3 and 4-way reductions; traps; U-returns and drainline Y's can be supplied by your KIMAX pipe distributor on special order.

# KIMAX GLASS PIPE AND FITTING

## STRAIGHT LENGTHS 6100

Standard lengths in all diameters are 6", 12", 18", 24", 30", 48", 60", 84", 96", 108", and 120".

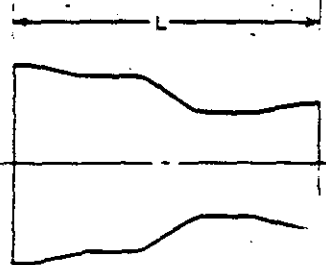
Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied special order.



| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs. Ft. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | 156"      | 1 1/4"              | 12°                  | 3"                  | 30                 | 33                        |
| 1 1/2"                        | 1.844"            | 172"      | 2 1/4"              | 12°                  | 3 1/2"              | 40                 | 33                        |
| 2"                            | 2.344"            | 172"      | 2 3/4"              | 12°                  | 4"                  | 50                 | 33                        |
| 3"                            | 3.406"            | 203"      | 3 7/8"              | 12°                  | 5"                  | 70                 | 33                        |
| 4"                            | 4.530"            | 255"      | 5 1/2"              | 12°                  | 6"                  | 90                 | 33                        |
| 6"                            | 6.656"            | 328"      | 7 1/2"              | 12°                  | 8"                  | 120                | 33                        |

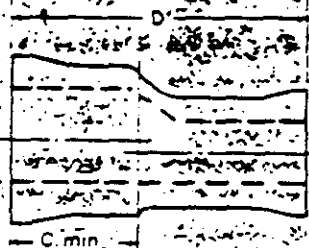
When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



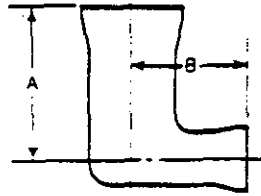
| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2 or 1          | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 7             |
| 6                     | 4, 3, 2, 1 1/2 or 1    | 9             |

## ECCENTRIC REDUCERS 6240



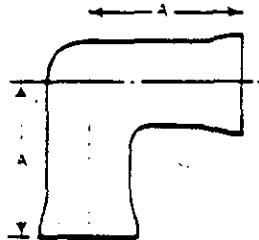
| Pipe Size<br>(inches) | Reduced To<br>(inches) | C<br>Minimum<br>(inches) | D<br>(inches) |
|-----------------------|------------------------|--------------------------|---------------|
| 1 1/2                 | 1                      | 1 1/4                    | 4             |
| 2                     | 1 1/2 or 1             | 1 1/4                    | 4             |
| 3                     | 2, 1 1/2 or 1          | 2 1/4                    | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 3                        | 7             |
| 6                     | 4, 3, or 2             | 3                        | 9             |

## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1 1/2                 | 1                      | 2 1/4         | 3             |
| 2                     | 1                      | 3             | 3             |
| 2                     | 1 1/4                  | 4             | 3 1/4         |
| 3                     | 1                      | 5             | 3 1/4         |
| 3                     | 1 1/4                  | 5             | 4             |
| 3                     | 2                      | 5             | 4 1/2         |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1 1/4                  | 7             | 4 1/4         |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5 1/4         |
| 5                     | 1                      | 9             | 5             |
| 5                     | 1 1/4                  | 9             | 5 1/4         |
| 5                     | 2                      | 9             | 5 1/2         |
| 5                     | 3                      | 9             | 5 3/4         |
| 6                     | 4                      | 9             | 6             |

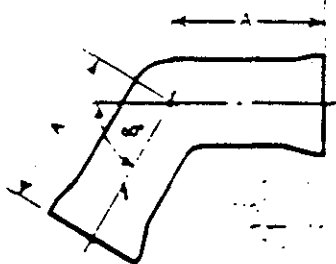
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2 1/4         |
| 1 1/2                 | 3 1/4         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

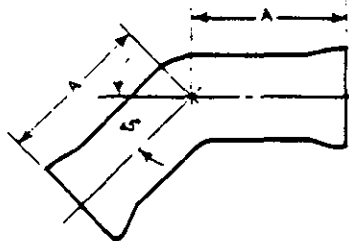
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2 1/4         |
| 1 1/2                 | 3 1/4         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

## 45° ELBOWS 6201

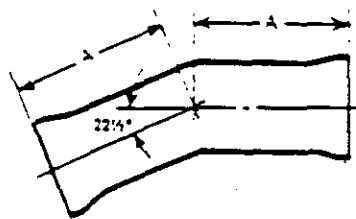


| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2 1/4         |
| 1 1/2                 | 3 1/4         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

# 22½° ELBOWS 6201

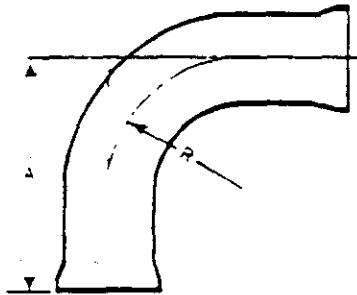
# KIMAX GLASS PIPE AND FITTING



When ordering, specify degree of angle.

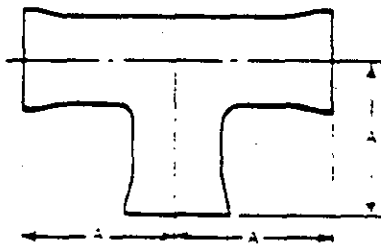
| Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|---------------|---------------|
| 1                     | 2½            | 1             |
| 1½                    | 3             | 1½            |
| 2                     | 4             | 2             |
| 3                     | 5             | 3             |
| 4                     | 6             | 4             |
| 5                     | 7             | 5             |

# SWEEP ELBOWS 6239



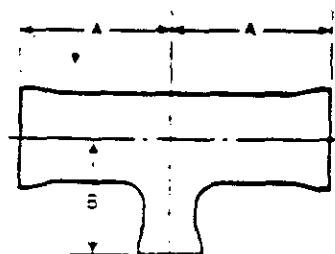
| Pipe Size<br>(inches) | A<br>(inches) | R<br>(inches) |
|-----------------------|---------------|---------------|
| 1                     | 2½            | 1             |
| 1½                    | 3             | 1½            |
| 2                     | 4             | 2             |
| 3                     | 5             | 3             |
| 4                     | 6             | 4             |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|---------------|---------------|
| 1                     | 2½            | 1             |
| 1½                    | 3             | 1½            |
| 2                     | 4             | 2             |
| 3                     | 5             | 3             |
| 4                     | 6             | 4             |

# REDUCING TEES 6211



When ordering, specify pipe ID and bottom leg ID.

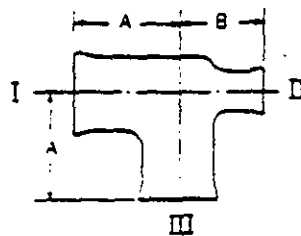
| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1½                    | 1                      | 3½            | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1½                     | 4             | 3½            |
| 3                     | 1                      | 5             | 3½            |
| 3                     | 1½                     | 5             | 4             |
| 3                     | 2                      | 5             | 4½            |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1½                     | 7             | 4½            |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5½            |
| 5                     | 1                      | 9             | 5             |
| 5                     | 1½                     | 9             | 5½            |
| 5                     | 2                      | 9             | 6             |
| 5                     | 3                      | 9             | 6½            |
| 5                     | 4                      | 9             | 7             |

Other reduction combinations are available on special order to customer's specifications.



# KIMAX GLASS PIPE AND FITTING

## REDUCER TEES 6212

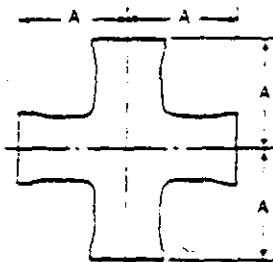


When ordering, specify pipe I D. in this order: I II and III

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|----------------------------|-----------------------------|------------------------------|---------------|---------------|
| 1 1/2                      | 1                           | 1 1/2                        | 3 1/2         | 3             |
| 2                          | 1                           | 2                            | 4             | 3             |
| 2                          | 1 1/2                       | 2                            | 4             | 3 1/2         |
| 3                          | 1                           | 3                            | 5             | 3 1/2         |
| 3                          | 1 1/2                       | 3                            | 5             | 4             |
| 3                          | 2                           | 3                            | 5             | 4 1/2         |
| 4                          | 1                           | 4                            | 7             | 4             |
| 4                          | 1 1/2                       | 4                            | 7             | 4 1/2         |
| 4                          | 2                           | 4                            | 7             | 5             |
| 4                          | 3                           | 4                            | 7             | 5 1/2         |
| 5                          | 1                           | 5                            | 9             | 5             |
| 5                          | 1 1/2                       | 5                            | 9             | 5 1/2         |
| 5                          | 2                           | 5                            | 9             | 6             |
| 5                          | 3                           | 5                            | 9             | 6 1/2         |
| 6                          | 4                           | 5                            | 9             | 7             |

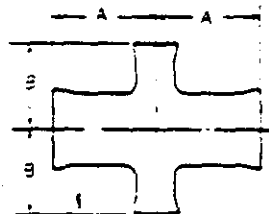
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 3 1/2         |
| 1 1/2                 | 3 1/2         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

## REDUCER CROSSES 6250

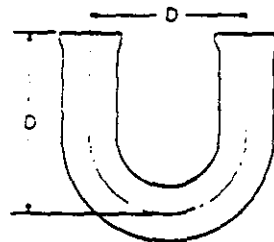


When ordering, specify I D of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|
| 1 1/2                 | 1                       | 3 1/2         | 3             |
| 2                     | 1                       | 4             | 3             |
| 2                     | 1 1/2                   | 4             | 3 1/2         |
| 3                     | 1                       | 5             | 3 1/2         |
| 3                     | 1 1/2                   | 5             | 4             |
| 3                     | 2                       | 5             | 4 1/2         |
| 4                     | 1                       | 7             | 4             |
| 4                     | 1 1/2                   | 7             | 4 1/2         |
| 4                     | 2                       | 7             | 5             |
| 4                     | 3                       | 7             | 5 1/2         |
| 6                     | 1                       | 9             | 5             |
| 6                     | 1 1/2                   | 9             | 5 1/2         |
| 6                     | 2                       | 9             | 6             |
| 6                     | 3                       | 9             | 6 1/2         |
| 6                     | 4                       | 9             | 8             |

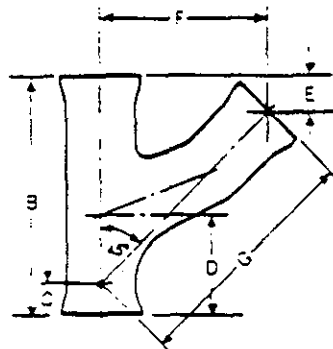
Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265



Use soft strip asbestos inserts (7202) only, with this fitting.

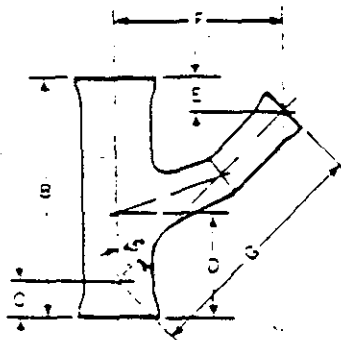
| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 5 1/2         |
| 1 1/2                 | 7             |
| 2                     | 7             |
| 3                     | 9             |
| 4                     | 12            |



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1                     | 5 1/2         | 1 1/2         | 2 1/2         | 1 1/2         | 2 1/2         | 2 1/2         |
| 1 1/2                 | 6             | 1 1/2         | 2 1/2         | 1 1/2         | 2 1/2         | 2 1/2         |
| 2                     | 7             | 1 1/2         | 2 1/2         | 1 1/2         | 2 1/2         | 2 1/2         |
| 3                     | 10            | 1 1/2         | 2 1/2         | 1 1/2         | 2 1/2         | 2 1/2         |
| 4                     | 14            | 2 1/2         | 2 1/2         | 2 1/2         | 2 1/2         | 2 1/2         |
| 6                     | 18            | 3 1/2         | 2 1/2         | 2 1/2         | 2 1/2         | 2 1/2         |

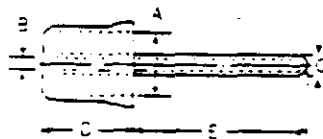
## LATERAL "Y" REDUCERS 6231



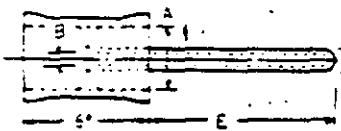
When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 8             | 1 1/4         | 3 1/2         | 1 1/4         | 5 1/4         | 1 1/4         |
| 2                     | 1 1/2                   | 8             | 1 1/4         | 3 1/2         | 1 1/4         | 5 1/4         | 1 1/4         |
| 3                     | 1 1/2                   | 10            | 1 1/4         | 3 1/2         | 1 1/4         | 5 1/4         | 1 1/4         |
| 3                     | 2                       | 10            | 1 1/4         | 3 1/2         | 1 1/4         | 5 1/4         | 1 1/4         |
| 4                     | 1 1/2                   | 14            | 2 1/4         | 4 1/2         | 2 1/4         | 9 1/4         | 2 1/4         |
| 4                     | 2                       | 14            | 2 1/4         | 4 1/2         | 2 1/4         | 9 1/4         | 2 1/4         |
| 4                     | 3                       | 14            | 2 1/4         | 4 1/2         | 2 1/4         | 9 1/4         | 2 1/4         |
| 6                     | 3                       | 18            | 3 1/4         | 5 1/2         | 3 1/4         | 11 1/4        | 3 1/4         |

## THERMOMETER WELLS (Annealed)



6292 SINGLE END



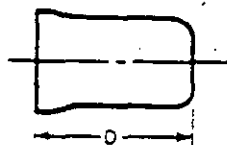
6295 DOUBLE END

When ordering, specify pipe I.D., bulb size, and tube length.

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.

| A<br>Pipe Size<br>(inches) | B<br>For Ther-<br>mometer<br>Bulb Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches) |
|----------------------------|----------------------------------------------------|----------------------------|---------------|
| 1 1/2                      | 1/2                                                | 1/2                        | 2 1/4         |
| 1 1/2                      | 1/2                                                | 1/2                        | 2 1/4         |
| 1 1/2                      | 1/2                                                | 1                          | 2 1/4         |
| 2                          | 1/2                                                | 1/2                        | 2 1/4         |
| 2                          | 1/2                                                | 1/2                        | 2 1/4         |
| 2                          | 1/2                                                | 1                          | 2 1/4         |
| 3                          | 1/2                                                | 1/2                        | 3 1/2         |
| 3                          | 1/2                                                | 1/2                        | 3 1/2         |
| 3                          | 1/2                                                | 1                          | 3 1/2         |

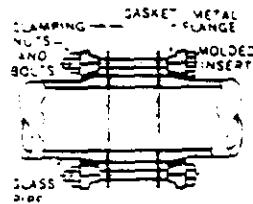
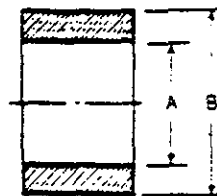
## CAPS (Annealed) 6236



Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 2             |
| 1 1/2                 | 3             |
| 2                     | 4             |
| 3                     | 4 1/2         |
| 4                     | 6             |
| 6                     | 7             |

## STRAIGHT SPACERS 6260

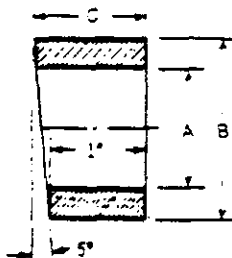


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware gaskets must be ordered separately. Standard lengths are 1 1/2", 2", 2 1/4", 3", 4", and 5". Other lengths available on special order. Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/8                 |
| 1 1/2                      | 1 3/4                 |
| 2                          | 2 1/4                 |
| 3                          | 2 3/4                 |
| 4                          | 3 1/4                 |
| 5                          | 3 3/4                 |

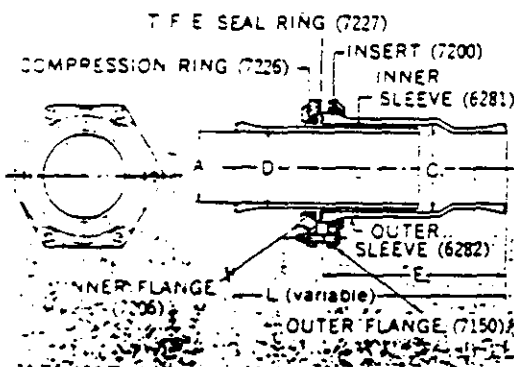
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on special order.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches) |
|----------------------------|-----------------------|---------------|
| 1                          | 1 1/8                 | 1 1/8         |
| 1 1/2                      | 1 3/4                 | 1 3/4         |
| 2                          | 2 1/4                 | 2 1/4         |
| 3                          | 2 3/4                 | 2 3/4         |
| 4                          | 3 1/4                 | 3 1/4         |

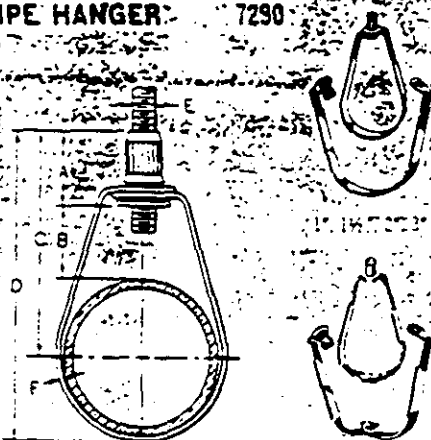
## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments to 2 1/4". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1", 1 1/2", 2") and p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281), outer sleeve (6282), inner flange (7206), outer flange (7150), insert (7200), T F E seal ring (7227), compression ring (7226), bolts (7180). All metal parts are aluminum. Three bolts (hex head 5/16 x 1 1/4) required for 1", 1 1/2", and 2" sizes. Six bolts required for 3" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | L<br>(Inches) | Max.   |
|----------------------------|---------------|---------------|---------------|---------------|--------|
| 1                          | 1 1/4         | 1 1/8         | 5 1/2         | 8 3/4         | 10 1/4 |
| 1 1/2                      | 2             | 1 3/4         | 6             | 9 1/4         | 11 1/4 |
| 2                          | 2 1/4         | 2 1/8         | 6 1/2         | 10            | 12 1/4 |
| 3                          | 3 1/4         | 3 1/8         | 8             | 11 1/4        | 14     |
| 4                          | 4 1/4         | 4 1/8         | 9             | 13 1/4        | 15 1/4 |

## PIPE HANGER 7290



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. Simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is released by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A     | B     | C     | D     | E   | F     |
|-----------------------|-------|-------|-------|-------|-----|-------|
| 1                     | 1 1/8 | 1     | 2 3/4 | 3 1/4 | 1/2 | 1 1/2 |
| 1 1/2                 | 1 3/8 | 1 1/4 | 3 1/4 | 4 1/4 | 1/2 | 1 3/4 |
| 2                     | 1 5/8 | 1 1/2 | 3 3/4 | 4 3/4 | 1/2 | 2     |
| 3                     | 1 7/8 | 1 3/4 | 4 1/4 | 5 1/4 | 1/2 | 2 1/4 |
| 4                     | 2     | 1 7/8 | 4 3/4 | 5 3/4 | 1/2 | 2 1/2 |
| 5                     | 2 1/8 | 2     | 5 1/4 | 6 1/4 | 1/2 | 2 3/4 |

## FLANGES, GASKETS AND ACCESSORIES

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

### FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME bolt circle flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel.

### GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, fluoroseal and T.F.E. lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a liner of soft asbestos (Blue African asbestos with a machined T.F.E. liner) are recommended. Other types of liner material may be used with T.F.E. lined gaskets. Consult your distributor for details of performance and prices.

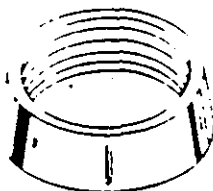
### INSERTS

Inserts are used to join pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings throughout the diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all tempered fittings such as U-bends, thermometer wells, etc.

Inserts are permitted into inner rings of all Style I and II 4" and 6" flanges.

See page 13 for more information regarding gaskets.

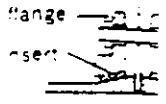
### FERRULE 7245



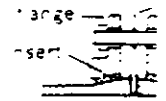
Stainless steel. To be welded, brazed or soldered to metal tubing in 1", 1½", 2", 3" and 4" diameters.

### FLANGE SET 7100 STYLE I

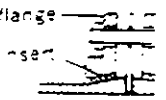
SIZES  
1", 1½", 2"



SIZE  
3"

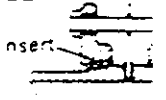


SIZES  
4", 6"

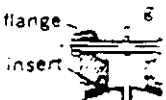


### FLANGE SET 7105 STYLE II

SIZES  
1", 1½", 2", 3"



SIZES  
4", 6"



### ASME ADAPTER FLANGES 7160

SIZES  
1", 1½", 2", 3"



To adapt 4" and 6" glass pipe to an ASME flange, use the STYLE I Aluminum—No. 7150, 1—7151 outer flange, 1—7152 STYLE II Cast Iron—No. 7155, 1—7156 outer flange, 1—7157

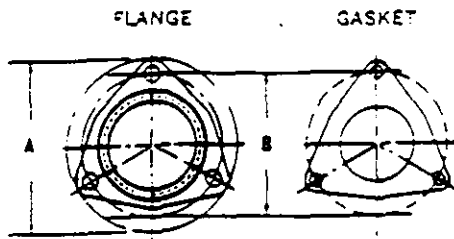
# FLANGES, GASKETS AND ACCESSORI

## FLANGE SET NO. 7100, 1", 1½", 2" I.D.

STYLE I Aluminum Set contain the following components

- 2-7150 Aluminum Flanges
- 2-7200 Neoprene Asbestos Inserts
- 3-7180 Aluminum Bolts and Nuts

| Pipe Size | A      | B      | Bolt Size      |
|-----------|--------|--------|----------------|
| 1"        | 3 1/4" | 3 1/4" | 1/4"-18x2 1/2" |
| 1 1/2"    | 4 1/4" | 4 1/4" | 1/2"-16x2 1/2" |
| 2"        | 4 3/4" | 4 3/4" | 1/2"-16x2 1/2" |

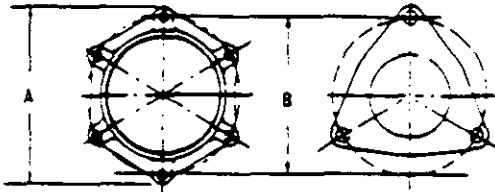


## FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components

- 2-7150 Aluminum Flanges
- 2-7200 Neoprene Asbestos Inserts
- 3-7180 Aluminum Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size      |
|-----------|----|----|----------------|
| 3"        | 5" | 5" | 1/2"-18x2 1/2" |



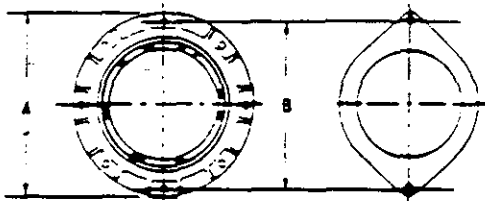
## FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components

- 2-7151 Aluminum Outer Flanges\*
- 2-7153 Aluminum Inner Rings with 7202 insert cemented in place
- 3-7180 Aluminum Bolts and Nuts

| Pipe Size | A       | B      | Bolt Size      |
|-----------|---------|--------|----------------|
| 4"        | 8 1/4"  | 7 1/4" | 1/2"-18x2 1/2" |
| 6"        | 10 1/4" | 9 1/4" | 1/2"-16x2 1/2" |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.

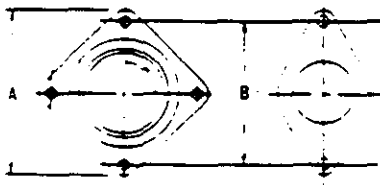


## FLANGE SET NO. 7105, 1", 1½", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components

- 2-7155 Cast Iron Flanges
- 2-7200 Neoprene Asbestos Inserts
- 4-7190 Steel Bolts and Nuts

| Pipe Size | A      | B      | Bolt Size      |
|-----------|--------|--------|----------------|
| 1"        | 3 1/4" | 3 1/4" | 1/4"-18x2 1/2" |
| 1 1/2"    | 4 1/4" | 4 1/4" | 1/2"-16x2 1/2" |
| 2"        | 4 3/4" | 4 3/4" | 1/2"-16x2 1/2" |
| 3"        | 5 3/4" | 5"     | 1/2"-18x2 1/2" |



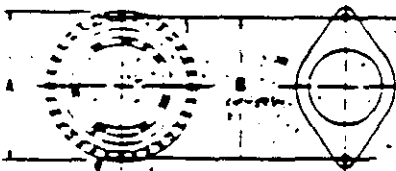
## FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components

- 2-7156 Cast Iron Outer Flange\*
- 2-7158 Cast Iron Inner Ring with 7202 Inserts cemented in place\*
- 4-7190 Steel Bolts and Nuts

| Pipe Size | A       | B      | Bolt Size      |
|-----------|---------|--------|----------------|
| 4"        | 8 1/4"  | 7 1/4" | 1/2"-18x2 1/2" |
| 6"        | 10 1/4" | 9 1/4" | 1/2"-16x2 1/2" |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring

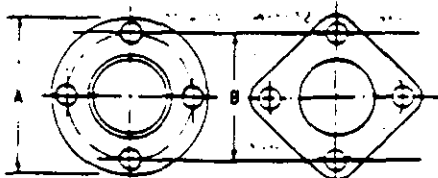


## ASME ADAPTER FLANGE NO. 7160, 1", 1½", 2", 3" I.D.

ASME Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

- 7200 for Conical End Tempered Glass
- 7202 Strip insert for Conical End Annealed Glass
- 7203 Molded Adapter Insert for Beaded End Glass

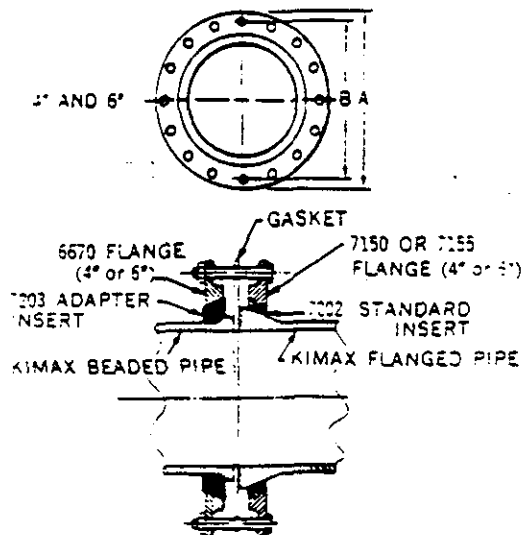
| Pipe Size | A      | B      | Bolt Size      |
|-----------|--------|--------|----------------|
| 1"        | 4 1/4" | 3 1/4" | 1/4"-18x2 1/2" |
| 1 1/2"    | 5"     | 3 3/4" | 1/2"-18x2 1/2" |
| 2"        | 6"     | 4 1/4" | 1/2"-18x2 1/2" |
| 3"        | 7 1/4" | 5"     | 1/2"-18x2 1/2" |



# ADAPTER FLANGE

6670

# FLANGES, GASKETS AND ACCESSORIES

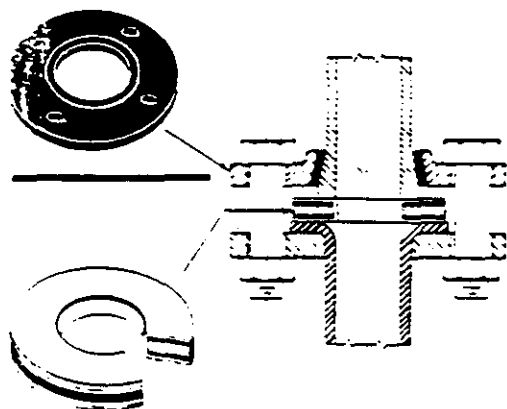


Used with Style I or Style II flanges to join field beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(inches) |
| 4                     | 3 1/4  | 7 1/2            | 8                  | 1/2 x 3 x 1 1/4  |
| 6                     | 10 1/4 | 9 1/4            | 8                  | 5/8 x 3 1/4      |

For 1" through 3" beaded pipe, use Style II flange (7155) with adapter insert (7203).

# A.S.M.E. ADAPTER FLANGE 7160



Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel in 1", 1 1/2", 2" and 3" sizes.

Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined T.F.E. envelope.

Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(inches) | Thickness<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 1/4                   |
| 4                     | 1/4                   |
| 6                     | 1/2                   |

# DONUT SPACER 7240

# ADAPTER BUTTON 7230



Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(inches) | O.D.<br>(inches) | Height<br>(inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 1/4                |

# SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(inches) | I.D.<br>(inches) | Length<br>(inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1" thru 4"            | 5/16 min.        | 11 3/32            | .56                 |
| 6"                    | 3/8 min.         | 11 3/32            | .56                 |

## INSERTS



**7200** for 1" through 3" tempered fittings.



**7202** for 4" and 6" tempered fittings  
for 1" through 6" annealed fittings.

**7203** adapter insert for beaded ends  
(similar to 7200)

## FLANGES, GASKETS AND ACCESSORIES

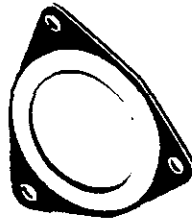
Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1 1/2", 2", 2 1/2", 3", 3 1/2", and 5" diameters. The 1", 1 1/2", 2", and 3" sizes are used with standard tempered glass pipe and fittings. Other sizes are used with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

Adapter insert 7203 is a molded insert designed for use on field beaded pipe, with Style I and Style II flanges in 1" through 6" diameters, or with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

STYLE I (1", 1 1/2", 2", 2 1/2", 3" sizes only)



Since the gasket is the only part of the joint assembly to come in contact with conveyed liquids, choice of gasket material is extremely important.

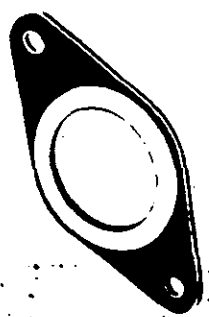
Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below. When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of T F E are recommended.

The T F E machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

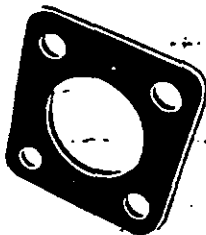
Standard filler for T F E machined envelope gasket is Blue African asbestos.

Other filler materials for T F E machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of T F E envelope gaskets are the same as that of the filler material.

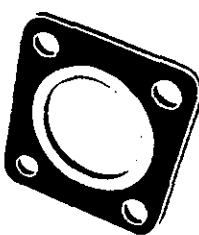
STYLE II (all sizes - also used for 4" and 6" Style I)



A.S.M.E. (1", 1 1/2", 2", 3" sizes only)



Standard



Teflon  
machined envelope

| Catalog Number |          |          | Material                                               | Service                                                        | Maximum Working Temp., °F |
|----------------|----------|----------|--------------------------------------------------------|----------------------------------------------------------------|---------------------------|
| Style I        | Style II | A.S.M.E. |                                                        |                                                                |                           |
| 7250           | 7251     | —        | Asbestos                                               | Organic and mineral acids, solvents and chlorinated compounds. | 450                       |
| 7250           | 7251     | —        | Neoprene                                               | Distilled water and mineral acids except HNO <sub>3</sub>      | 200                       |
| 7275           | 7276     | 7277     | T F E Machined Envelope (Blue African Asbestos Filler) | All                                                            | 450                       |

# ENGINEERING

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft., 2" dia.) |
|-------------------------------|-------------------------------------------|
| KIMAX Tempered Glass          | 1.10-1.20                                 |
| PVC—Jones 80                  |                                           |
| Normal and High Impact        | 1.33                                      |
| Hard Rubber                   | 1.33                                      |
| Graphite (Impervious)         | 1.70                                      |
| Resin-Bonded Asbestos         | 1.33                                      |
| Stainless Steel (Schedule 40) | 1.33                                      |
| Lead (Eight)                  | 1.30                                      |
| Porcelain                     | 1.33                                      |
| High Silicon Iron             | 1.70                                      |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING    | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |     |     |     |      |      |
|------------|----------------------------------------|-----|-----|-----|------|------|
|            | 1"                                     | 1½" | 2"  | 3"  | 4"   | 6"   |
| 90° Elbow  | 1.5                                    | 2.5 | 3.5 | 5.5 | 8.0  | 12.0 |
| 45° Elbow  | 1.0                                    | 1.5 | 2.0 | 3.0 | 4.5  | 7.0  |
| Tee        | 2.0                                    | 3.0 | 4.0 | 6.0 | 8.5  | 12.5 |
| Cross      | 3.0                                    | 4.5 | 6.0 | 9.0 | 12.5 | 18.0 |
| Flange     | 1.0                                    | 1.5 | 2.0 | 3.0 | 4.5  | 7.0  |
| Gate Valve | 1.0                                    | 1.5 | 2.0 | 3.0 | 4.5  | 7.0  |
| Plug Valve | 1.0                                    | 1.5 | 2.0 | 3.0 | 4.5  | 7.0  |
| Ball Valve | 1.0                                    | 1.5 | 2.0 | 3.0 | 4.5  | 7.0  |

## Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 350°F under normal conditions. Where operating temperatures exceed 350°F up to 450°F, it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Fibre Products, Glass Pipe Market Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table.

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 30         | 35   | 40   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 150  |

\*Freezing point of conveyed material should be taken into consideration.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, note thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of 0.001 in./ft. 100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                     |
|-----------------------|----------------------------------------|
| KIMAX Tempered Glass  | 1.00                                   |
| Porcelain             | 1.30                                   |
| Graphite (Impervious) | 1.30                                   |
| Steel                 | 1.50                                   |
| High Silicon Iron     | 1.90                                   |
| Stainless Steel       | 1.20                                   |
| Resin-bonded Asbestos | 1.30                                   |
| PVC, Sched. 80        | Normal Impact 1.30<br>High Impact 1.40 |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials. In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gasket and T.F.E. covered donut spacers.

## GASKET AND DONUT SPACER THICKNESS

| Material                                 | Pipe Diameter |      |      |      |      |      |
|------------------------------------------|---------------|------|------|------|------|------|
|                                          | 1"            | 1½"  | 2"   | 3"   | 4"   | 6"   |
| Asbestos, Neoprene, Koroseal, Gum Rubber | 1/8"          | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" |
| T.F.E. Envelope                          | 1/8"          | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" |
| Solid Beaded Teflon                      | 1/8"          | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" |
| Donut Spacer                             | 1/8"          | 1/8" | 1/8" | 1/8" | 1/8" | 1/8" |



## Layout (continued)

Consideration should be given to anchor point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

Typical Area Sketch

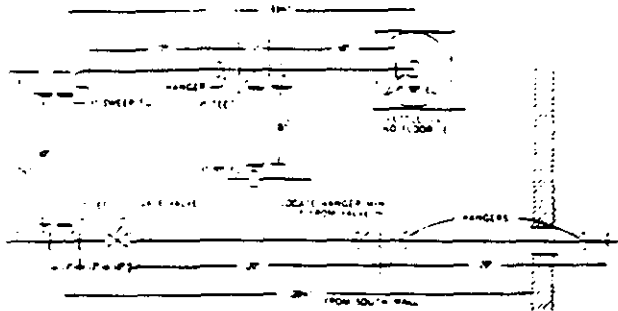


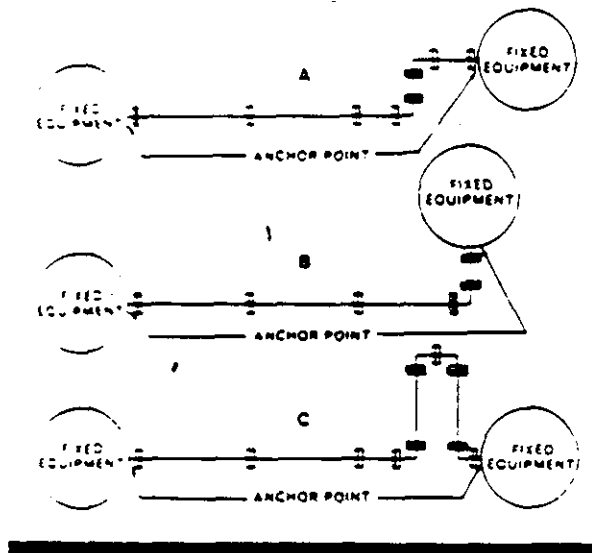
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

A,B,C—Recommended Means



D—Not Recommended

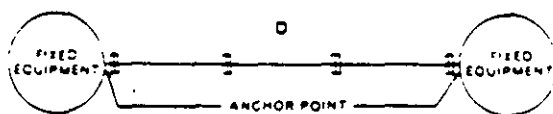


Figure 2

All valves, strainers, meters, or any heavy equipment nests in the line must be independently supported. This support prevents transmission of dead weight to the line and to prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported by two hangers, located about 1 foot from each end. See discussion of horizontal line support at top of Figure 5, page 17.

Glass pipeline at floor level, ground level, or below grade level when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel iron, etc. The pipe should be supported by padded pipe hangers, padded blocks, loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by concrete. It should be supported in a similar manner as horizontal run for flexibility. See figure 3.

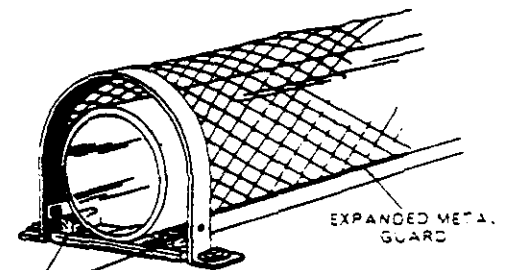
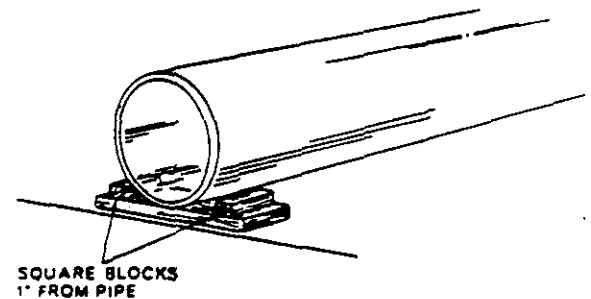
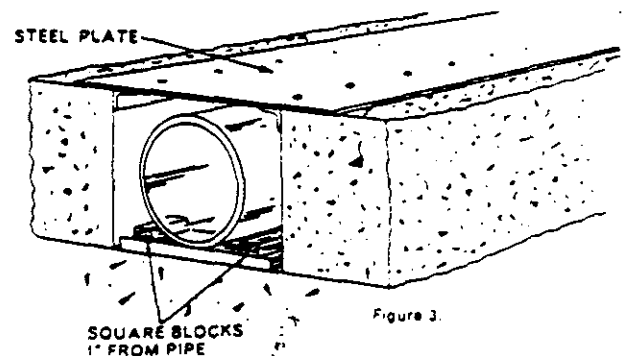
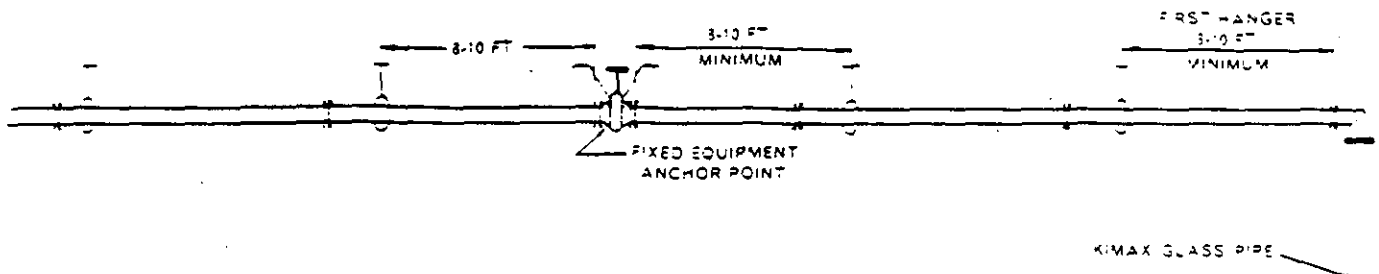
SQUARE BLOCKS  
1" FROM PIPESQUARE BLOCKS  
1" FROM PIPESQUARE BLOCKS  
1" FROM PIPE

Figure 3

# ENGINEERING



## Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

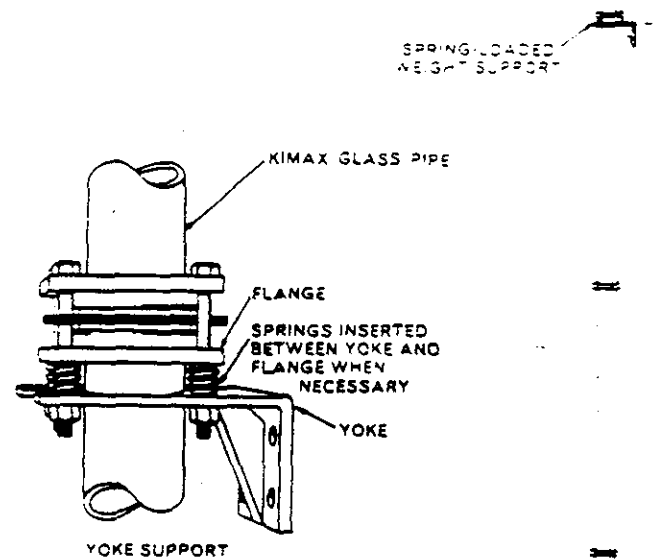
The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.



## Pipe Pitch

Normal pipe pitch of 1/8" per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

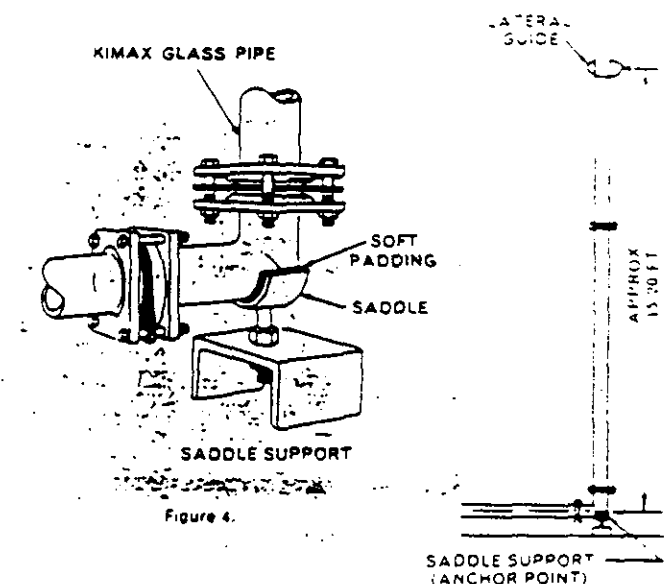


Figure 4.

Figure 5.

## Recommended Vertical Line Support

## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

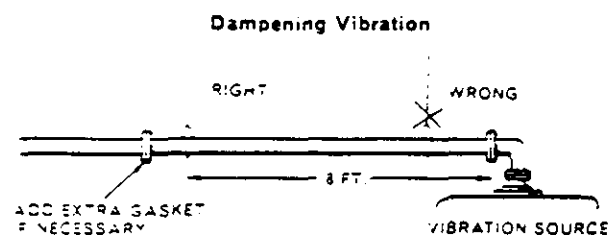


Figure 6

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 6" pipe. See Figure 7.

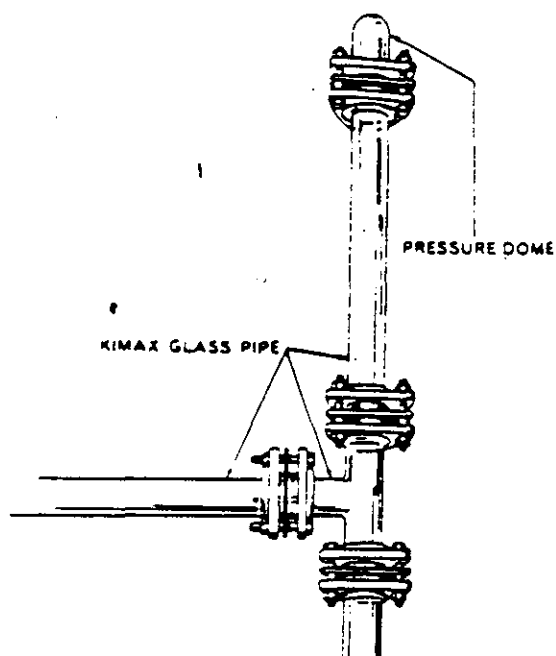


Figure 7

## Thermometer Wells

Thermometer wells are used with corrosive liquid media to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe, using Style I or Style II flanges. See Figure 8.

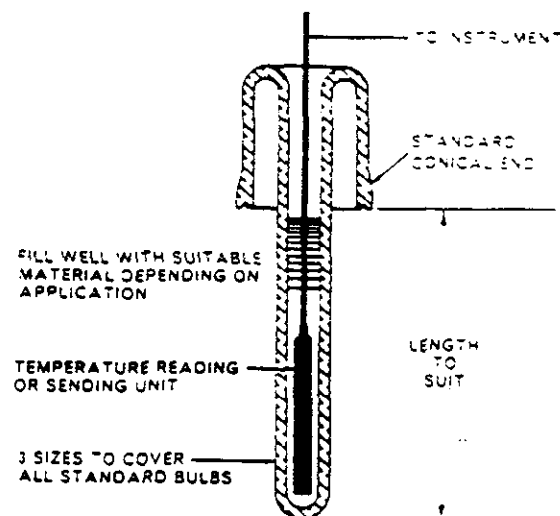


Figure 8

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in the lines as a sight flow indicator.

The glass should be inserted between the two metal flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

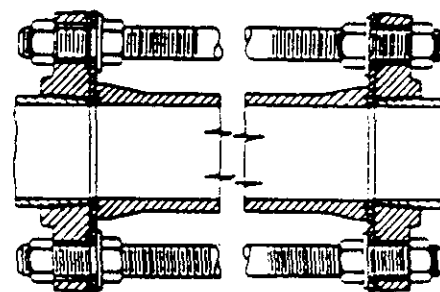


Figure 9

# ENGINEERING

## Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1", 1½", 2", 3", 4" and 6".

Standard lengths of KIMAX straight lengths vary from 5 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipeline design.

## Special Lengths

It may be necessary to order non standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

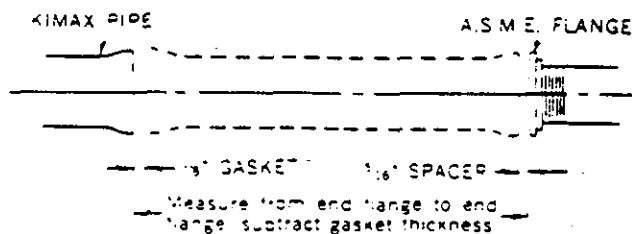


Figure 10

## Special Apparatus

The corrosion resistance and transparency of glass, workability, make it ideal for fabricating into special apparatus.

Such apparatus may be adapted from existing standards and fittings (tubulated or perforated straight lengths, stands); custom fabricated by modifying existing glass equipment (receiver vessels, separation units, etc.); or minor adapting of stock laboratory or industrial glass (boiling flasks; distillation apparatus; offset columns, etc.).

Typical apparatus adapted for special uses are illustrated. Owens-Illinois and KIMAX Glass Pipe distributors will assist you in the development of specially fabricated glass apparatus for your particular requirements.

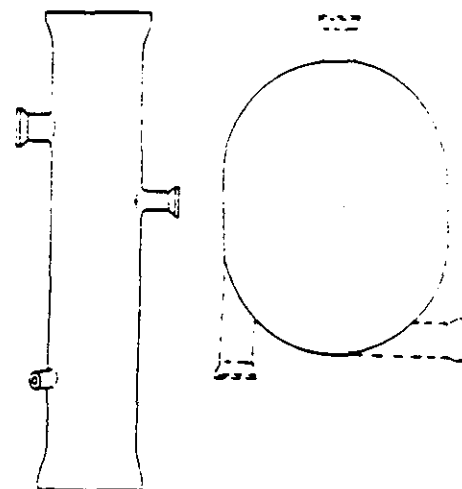


Figure 11

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or sliding movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive lateral motion can be corrected by an occasional support.

It is recommended that each 10 foot length of KIMAX glass pipe be supported with a hanger approximately every four feet. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

MAXIMUM RECOMMENDED SPAN-FEET

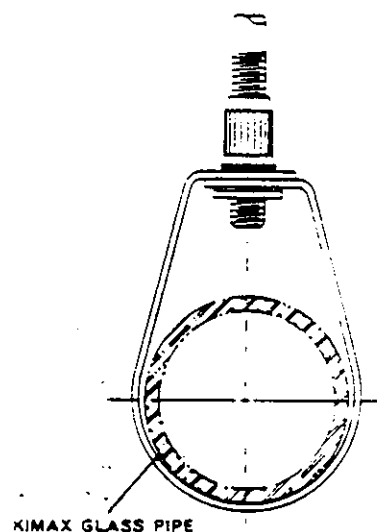
| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | 7                                |
| 1 1/2"    | 9             | 9                              | 7                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 5"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for structural material to which it is to be attached. There are many types for a specific material such as concrete, insert, flange, swivel hanger flange, wood beam attachment, tie clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact and a self-locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers used to prevent sideways of pipe when hanger rod and nut runs are extra long.

Pipe Hanger



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from fixed point such as pump or tank. When connecting to bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting support.
4. Tighten flange bolts to proper torque. Check pipe support for proper alignment.

# INSTALLATION

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

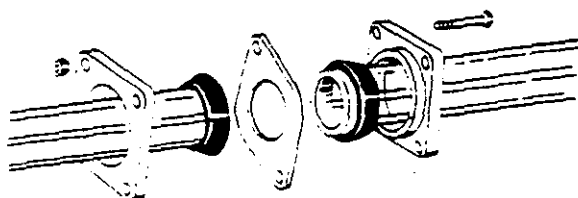
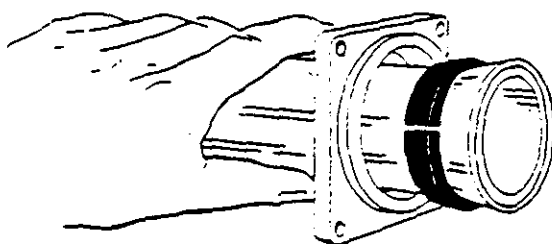
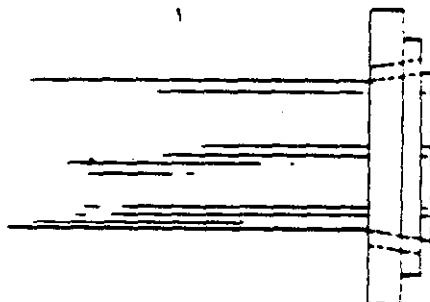


Figure 13.

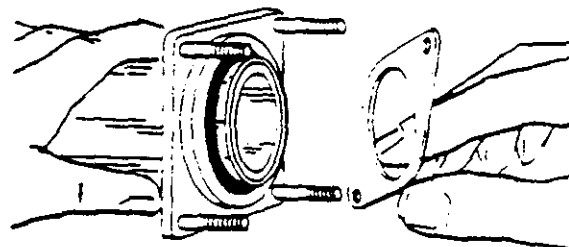
## Steps for Joint Assembly



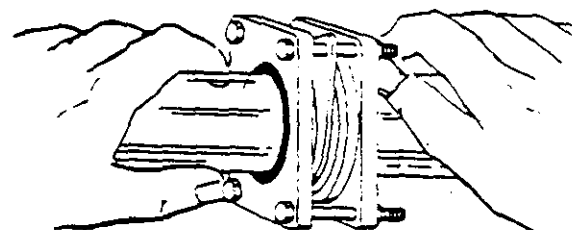
Step 1. Place the metal flange—small opening first—and the insert over the flared end of the pipe before the pipe is hung. For 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on it. Keep gaskets dry to avoid gaskets slipping out between joints under line pressure.



Step 4. Align gasket opening precisely with pipe opening, avoid obstructions to line flow (especially important in oil and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may pull interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than the recommended in the table below, are required to stop a leak the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB. FT.

| Pipe Size | Regular Gasket | Solid T.F.E. Gasket |
|-----------|----------------|---------------------|
| 1"        | 2              | 2.5                 |
| 1 1/2"    | 3-3.5          | 3.4                 |
| 2"        | 3.4            | 4.5                 |
| 3"        | 3.4            | 4.5                 |
| 4"        | 3.4            | 5.7                 |
| 6"        | 5.6            | 7.10                |

Occasionally, a line will leak after it has been in service for short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

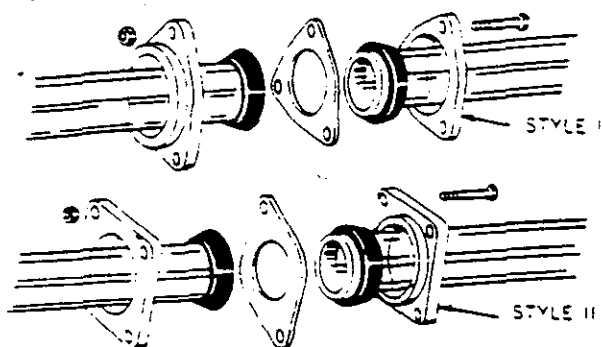
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

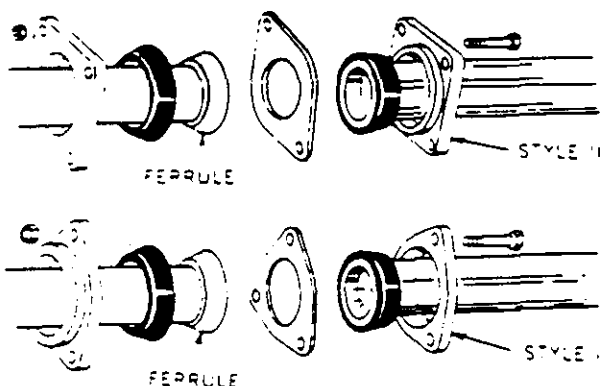
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe, and Style I flange and standard insert on flanged pipe.

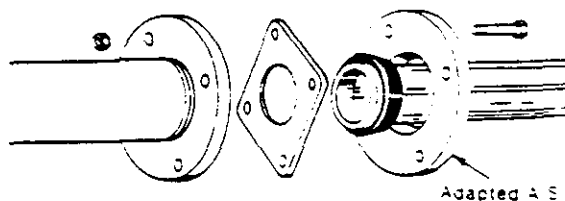
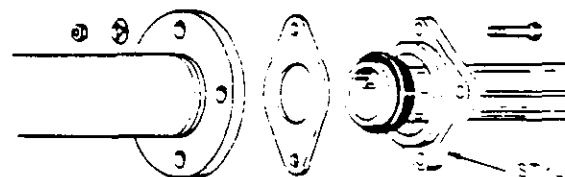
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule (#7245) to the tubing end.



### Glass to A.S.M.E. Flange

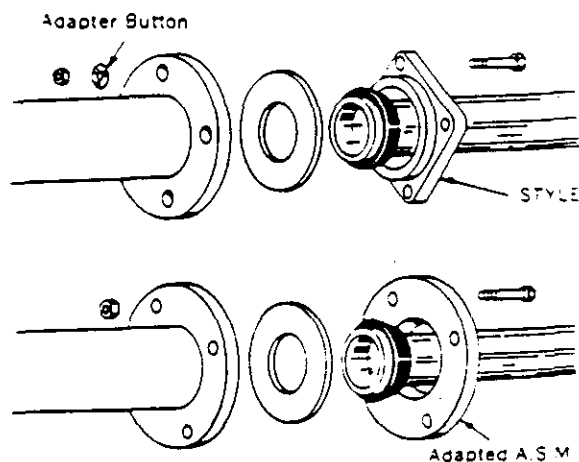
Glass can be mated to A.S.M.E. flanges by means of a cast iron flange (all sizes have A.S.M.E. Bolt Circles), an adapted A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters) or a 4" or 6" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on smaller diameter Style I or II bolt, for centering bolt in a A.S.M.E. flange bolt holes. Raised part of button goes in hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1", 2", 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A T F E covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring cover with a machined T F E envelope.

# INSTALLATION

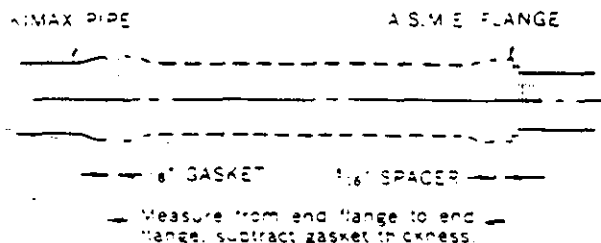
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



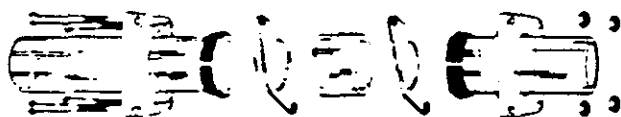
2. **Spacers.** Standard straight and 5° beveled spacers, made from heavy wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 1" diameters, available in 1/2" to 2" lengths.

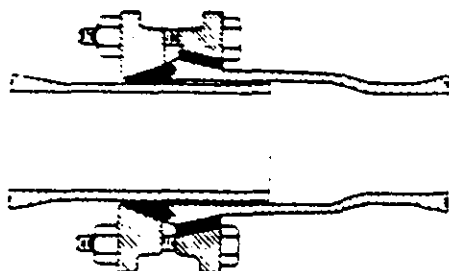
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When ordering spacers, square spacer and gasket, and check alignment with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Adjustable Joints.** Permit linear variations up to 2 1/4". Also used to correct misalignment.



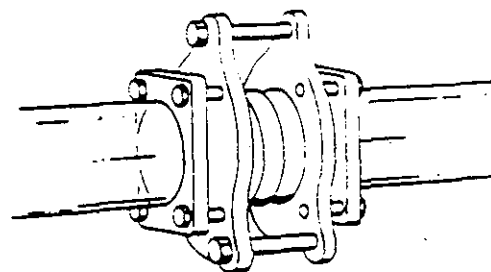
Long cut section of straight pipe may be used for inner sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTINGS section.

4. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibratory reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. **Field Fabrication—KIMAX pipe may be cut and beaded means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.**

Since the bead is designed to fit the grooved end of flange pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Bead Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) beaded ends to mate with Style I or Style II flange with standard insert or flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

6. **Adjust Equipment.** It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment devices.



# TESTING AND MAINTENANCE

## Initial Tests

After installation is completed, but before the line is put into service, inspect for stress points as follows:

- Shake the line. If the line moves from side to side, it is probably free from bending loads.
- Open a flanged joint. If the flange does not move when the bolts are removed, the pipe is not restrained.

## Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at 1½ times standard operation pressure. Do not exceed 1½ times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

## Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. Inadequate bolt tightening: Do not hesitate to "snug" bolts sufficiently.
2. Misalignment: Flange not square with line, gasket out of alignment with pipe opening, or hangers not adjusted properly.
3. Temperature cycling: Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

## Cleaning

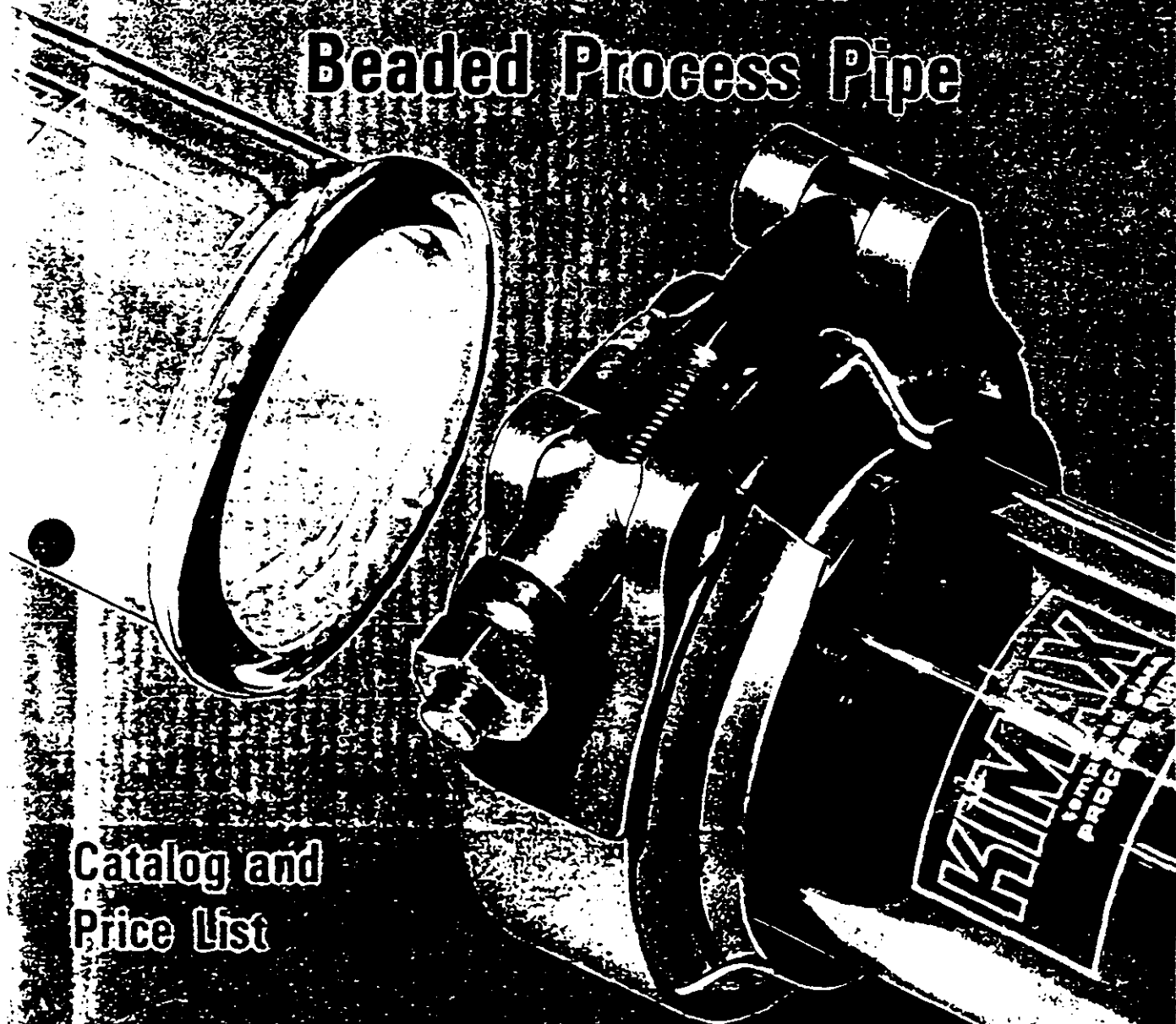
Purge lines with water, cleaning liquids, or steam when closed. Caution: Do not use hot caustic solutions, caustic metallic tube cleaners or hydrofluoric acid.

## SPECIAL ENGINEERING NOTES

# KIMAX

CPD-1054  
July 1971

## Beaded Process Pipe



Catalog and  
Price List

## Fluid Process Systems

OWENS ILLINOIS

Circle 10

# KIMAX BEADED PROCESS PIPE

Recommended for use in chemical, pharmaceutical, textile, food, dairy and other processing where highly corrosive, sensitive, high purity products are conveyed.

## ➤ Unequaled — corrosion resistance —

can handle the widest range of corrosives and reagents.

All pipe and fittings are made of the same chemically inert Owens-Illinois (KG-33) borosilicate glass used in the manufacture of KIMAX glass laboratory ware and KIMAX glass drainline. Compression couplings seal glass to TFE gaskets in a manner that the flow comes in contact only with glass or TEFLON.

## ➤ 450°F. to freezing point temperature capability.

7123 couplings with VITON liners and TFE seals offer continuous service from 450°F. to freezing point.

7126 couplings with HYDRIN liners and TFE seals offer continuous service from 300°F. to freezing point.

## ➤ 100 to 30 PSI operating pressure — depending on pipe I.D. See page 3.

## ➤ Stainless steel couplings (300 series SS) — all glass beaded joints are made with single bolt, stainless steel band couplings containing a VITON or HYDRIN compression liner and TFE seal for maximum external and internal corrosion resistance.

## ➤ Built-in-ruggedness —

beaded pipe and fittings are manufactured from heavy schedule tubing, and tempered for extra strength.

## ➤ Easy and low cost to install.

a. Joints are made in seconds with one bolt, snap couplings which seal even with line deflections and misalignment up to 4°.

b. Pipe can be easily and quickly field cut and beaded where required without effecting pressure rating.

## ➤ Safety — added: 1

Translucent armoring of glass fiber cloth impregnated with polyester resin provides that extra protection in case of accidental rupture. See page 4 and GPD 1050 for details.

## ➤ Assured Product Purity —

All wetted parts of system are chemically inert borosilicate glass or TFE. Parts per million pick up for distilled water . . . SiO<sub>2</sub> (less than .08 ppm), Boron (less than .01 ppm), Na (less than .01 ppm).

## ● System Versatility —

Adaptable to other piping systems; can easily be disassembled and reassembled to meet future requirements.

## ● Maintenance Free —

Smooth inner walls prevent scale build-up and line stoppages.

## ● Service —

National network of stocking distributors; field engineering staff for start up service.

## GUIDE SPECIFICATIONS

### I. General

A. Contractor shall furnish and install a complete piping system as indicated. This system shall be made of borosilicate glass (Type 1), conforming to Federal Specification DD-G-5418 and as manufactured by Owens-Illinois under the trade name "KIMAX."

B. This system shall include all glass piping and fittings in size 1/2, 3/4, 1, 1 1/2, 2, 3, 4 and 6" O.D. as shown on the drawing along with the required couplings and padded supports.

C. Coupling device shall be capable of maintaining a Teflon-to-glass seal with line deflections of at least 1/4" per foot of pipe length.

D. The entire piping system shall be capable of withstanding working pressures as listed in GPD-1054 R.

### II. Installation

A. The system shall be installed free of stress according to the manufacturer's recommended installation procedures.

B. Padded pipe hangers shall be used on horizontal runs every 8 to 10 feet of pipe length, or more frequently when good piping practices indicate. The hanger should be located adjacent to a coupling wherever possible.

C. Padded riser clamps shall be used to support vertical risers. Locate riser clamps at each floor, or at center distance not to exceed 12'.

D. Connection to valves and faucets shall be made with KIMAX adapters or according to recommendation by Owens-Illinois.

E. All valves, meters, pumps, faucets, and other heavy equipment must be supported independently.

F. To keep contamination to a minimum, all pipe, fittings and couplings should remain in their sealed cartons until just prior to their use.

G. After installation, all remaining openings shall be sealed close to avoid contamination of the line.

### III. Protection of Pipe

A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum of 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with Fiberglass, glass wool and/or with a non-hardening caulking material.

B. Glass Pipe shall not be installed in direct contact with concrete or metal.

C. Glass pipe shall be protected against all weld splatter.

### IV. Test\*

Test in accordance with manufacturer's recommendations. See Testing and Cleaning in GPD-1054 R.

\*Compressed air test method not recommended . . . consult manufacturer.

KIMAX—Registered trademark of Owens-Illinois.  
TEFLON—Registered trademark of E. I. DuPont.

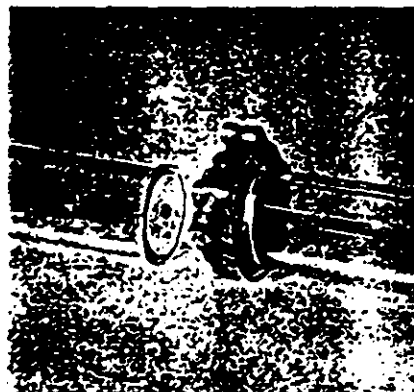
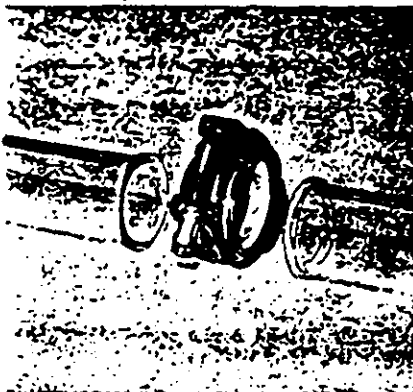
# PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPING SYSTEM

| SYSTEM                                  | KIMAX BEADED<br>PROCESS PIPE<br>1/2" thru 6"                  | KIMAX CONICAL END<br>PROCESS PIPE<br>1" thru 6"         | KIMAX DRAINLINE<br>1" thru 6"                          |
|-----------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------|
| <b>PHYSICAL PROPERTIES:</b>             |                                                               |                                                         |                                                        |
| Working Pressure *                      | 1/2"-1" 100 PSI<br>1 1/2"-2" 75 PSI<br>4" 50 PSI<br>6" 30 PSI | 1"-3" 50 PSI<br>4" 35 PSI<br>6" 20 PSI                  | Gravity Flow                                           |
| Test Pressure *                         | 1 1/2 Times Working Pressure                                  | 1 1/2 Times Working Pressure                            | 22 1/2 PSI                                             |
| Operating Temperature<br>(Maximum)      | Freezing Point to<br>450° F or 300° F                         | Freezing Point to<br>450° F                             | Freezing Point or<br>Waste to 212° F                   |
| Glass Therm. Expansion                  | $32 \times 10^{-7}$                                           | $32 \times 10^{-7}$                                     | $32 \times 10^{-7}$                                    |
| Glass Therm. Conductivity               | 0.73 BTU/hr. / Ft. <sup>2</sup> /F°/Ft.<br>at 212° F          | 0.73 BTU/hr. / Ft. <sup>2</sup> /F°/Ft.<br>at 212° F    | 0.73 BTU/hr. / Ft. <sup>2</sup> /F°/Ft.<br>at 212° F   |
| Glass Therm. Shock Diff.                | 1/2"-3" 200° F<br>4" 175° F<br>6" 160° F                      | 1"-3" 200° F<br>4" 175° F<br>6" 160° F                  | 1"-3" 200° F<br>4" 175° F<br>6" 160° F                 |
| Vacuum                                  | Full                                                          | Full                                                    | Full                                                   |
| <b>CHEMICAL PROPERTIES:</b>             |                                                               |                                                         |                                                        |
| Corrosivity Acids                       | All Except Hydrofluoric or<br>Phosphoric with Fluorides       | All Except Hydrofluoric or<br>Phosphoric with Fluorides | All Except Hydrofluoric or<br>Phosphoric with Fluoride |
| Corrosivity Alkalies                    | Some attack<br>above 120° F                                   | Some attack<br>above 120° F                             | Some attack<br>above 120° F                            |
| Coupling Outer Band                     | 1 bolt stainless<br>steel 1/2"-6"                             | Style I, II and<br>ASA Flange                           | Bolted stainless<br>steel                              |
| Coupling Compression<br>Inner Seal Ring | Hydric / TFE Seal 300° F<br>Viton / TFE Seal 450° F           | Customer Selection                                      | Buna-N / TFE Seal                                      |
| <b>SYSTEM IDENTIFICATION:</b>           |                                                               |                                                         |                                                        |
|                                         | KIMAX<br>Yellow Label                                         | KIMAX<br>Yellow Label                                   | KIMAX<br>Green Label                                   |

\*Note: Gas pressure recommendations. It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when gas pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## MAKING JOINTS WITH KIMAX PROCESS PIPE COUPLINGS

1. Dip coupling in water or wipe beaded ends of glass with damp cloth.
2. Snap coupling over one end of pipe making certain TFE liner is behind bead ... then stab other section of pipe into opposite side of coupling.
3. Tighten coupling bolt with 6" ratchet wrench until the gap between segments is approximately 3/16".

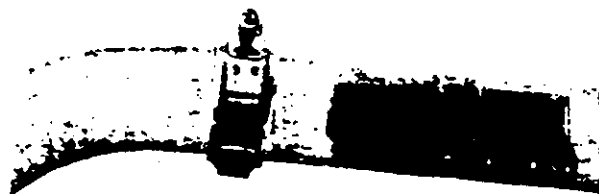


# KIMAX ARMORED BEADED GLASS PROCESS PIPE

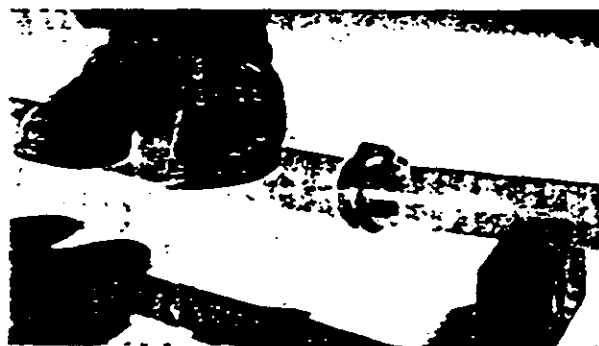
For transportation of valuable or corrosive fluids where accidental rupture may expose personnel and facilities to injury, damage or loss of product.

## ADVANTAGES

1. Armoring contains fluids—allows orderly shutdown. See chemical resistance below
2. Keeps glass intact for safe removal from system
3. Retains basic advantage of a KIMAX Glass Pipe System
4. Translucency allows detection of stoppages or damage
5. Pipe can be field cut, beaded, and re-armored
6. Economical one bolt pressure rated coupling permits easy installation, removal, and modification of systems



Translucency allows detection of stoppages or damage



KIMAX coupling design allows up to 4° deflection or misalignment



Easy-to-use one-bolt couplings make field installation or removal simple.

## ARMORING CHEMICAL RESISTANCE

3-month direct exposure samples checked daily

|                             |                 |
|-----------------------------|-----------------|
| 1. H <sub>2</sub> O         | No effect       |
| 2. N-Amyl Alcohol           | No effect       |
| 3. Methyl Alcohol           | No effect       |
| 4. Ammonium Hydroxide       | Attacked—3 days |
| 5. Sodium Hydroxide         | Attacked—1 week |
| 6. N-Octane                 | No effect       |
| 7. Benzene                  | No effect       |
| 8. Toluene                  | No effect       |
| 9. JP-4 Fuel                | No effect       |
| 10. Acetone                 | Attack—2 days   |
| 11. Methyl Ethyl Ketone     | Attack—2 days   |
| 12. Hydrogen Peroxide       | No effect       |
| 13. N-Butyric Acid (100%)   | No effect       |
| 14. Nitric Acid (70%)       | Attack—4 hours  |
| 15. Hydrochloric Acid (38%) | Attack—2 weeks  |
| 16. Sulphuric Acid (98%)    | Attack—6 hours  |
| 17. Acetic Acid (100%)      | Attack—2 days   |
| 18. Phosphoric Acid         | Attack—2 months |
| 19. Nitrobenzene            | Attack—2 weeks  |
| 20. Benzaldehyde            | Attack—5 days   |
| 21. Carbon Disulfide        | No effect       |
| 22. Carbon Tetrachloride    | No effect       |
| 23. Chloroform              | Attack—5 days   |
| 24. Methylene Chloride      | Attack—2 days   |

## PHYSICAL PROPERTIES

(Armoring—"3M" Brand "SUNSET" Material)

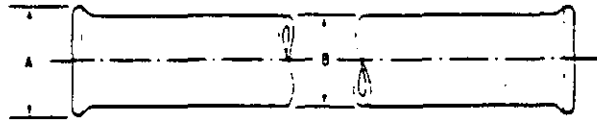
1. Color—translucent (light green tint)
2. Glass fiber cloth impregnated with polyester resin. Non toxic and contact not harmful
3. Can endure a 10 ft./lb. impact without catastrophic failure
4. Coverage—double wrap, total thickness .020
5. Cured Properties—Environmental
  - a. Temperature Capability
    - 300°F. continuous, 350°F. intermittent operation
  - b. Weathering Resistance
    - 1. Weather-O-Meter 2500 hours. No adverse effects
    - 2. Outdoor Aging (Minnesota-Florida-Colorado). No adverse effects—2 years.
    - 3. Not adversely affected by sunlight.
  - c. Salt Spray: 20% salt spray, 95°F
    - 1000 hours—No adverse effects.
  - d. UV Exposure: (Ford S-I Oven)
    - 160°F., 3 months. Slight yellowing.
  - e. Extended Cold Aging (—28°F):
    - No adverse effects. No loss of adhesion upon shock test.
6. Heat Resistance

| Time-Minutes | Temperature | Change in Sample           |
|--------------|-------------|----------------------------|
| 10           | 300°F       | No change                  |
| 10           | 400°F       | Discoloration              |
| 10           | 520°F       | Discoloration—some smolder |

CONTACT YOUR NEAREST KIMAX REPRESENTATIVE FOR ADDITIONAL INFORMATION AND PRICES.

# PROCESS PIPE AND FITTINGS

## 6300 BEADED PIPE



All pipe is available from stock in lengths shown.

### SPECIAL LENGTHS:

KIMAX Beaded Process Pipe is designed for "on the job" cutting and beading. Pipe is easily cut and beaded with a KIMAX 7310-56802 or 7310-56803 Portable cutter and 7310-56801 Beading Kit.

Your KIMAX distributor or manufacturer will also provide special lengths at a slightly higher cost per foot.

### NOTE:

Field fabrication does not reduce pressure or temperature capability.

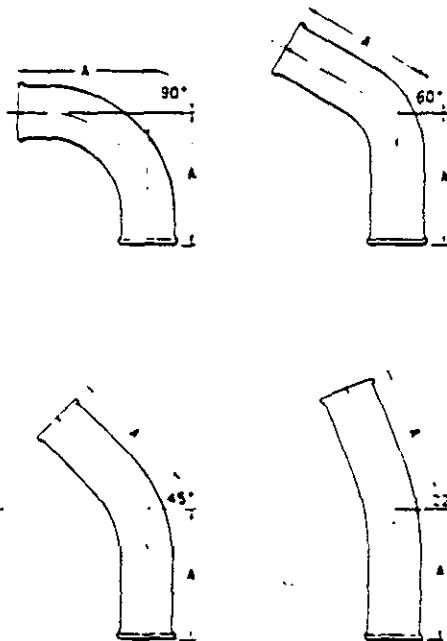
KIMAX Armored pipe can also be field fabricated.

| 1/2" I.D. |            |         | 3/4" I.D. |            |         | 1" I.D. |            |         | 1 1/2" I.D. |            |       |
|-----------|------------|---------|-----------|------------|---------|---------|------------|---------|-------------|------------|-------|
| Length    | Article    | Price   | Length    | Article    | Price   | Length  | Article    | Price   | Length      | Article    | Price |
| 1"        | 5300-48003 | \$ 2.15 | 1"        | 5300-58003 | \$ 3.50 | 3"      | 5300-10003 | \$ 5.40 | —           | —          | —     |
| 2"        | 48004      | 2.15    | 2"        | 58004      | 3.50    | 4"      | 10004      | 5.40    | 4"          | 5300-15004 | 5.40  |
| 3"        | 48005      | 2.15    | 3"        | 58005      | 3.50    | 5"      | 10005      | 5.40    | 5"          | 15005      | 5.40  |
| 4"        | 48006      | 3.00    | 4"        | 58006      | 3.85    | 6"      | 10006      | 5.90    | 6"          | 15006      | 5.90  |
| 5"        | 48007      | 3.20    | 5"        | 58007      | 4.10    | 8"      | 10008      | 5.45    | 8"          | 15008      | 5.45  |
| 6"        | 48008      | 3.40    | 6"        | 58008      | 4.35    | 10"     | 10010      | 5.95    | 10"         | 15010      | 5.95  |
| 8"        | 48009      | 3.65    | 8"        | 58009      | 4.60    | 12"     | 10012      | 7.50    | 12"         | 15012      | 7.50  |
| 10"       | 48010      | 3.85    | 10"       | 58010      | 4.85    | 16"     | 10016      | 9.00    | 16"         | 15016      | 9.00  |
| 12"       | 48011      | 4.05    | 12"       | 58011      | 5.05    | 20"     | 10020      | 9.35    | 20"         | 15020      | 9.35  |
| 14"       | 48012      | 4.10    | 14"       | 58012      | 5.35    | 24"     | 10024      | 10.10   | 24"         | 15024      | 10.10 |
| 16"       | 48013      | 5.11    | 16"       | 58013      | 5.35    | 30"     | 10030      | 11.15   | 30"         | 15030      | 11.15 |
| 18"       | 48014      | 5.35    | 18"       | 58014      | 5.35    | 36"     | 10036      | 12.20   | 36"         | 15036      | 12.20 |
| 20"       | 48015      | 5.35    | 20"       | 58015      | 7.25    | 48"     | 10048      | 13.25   | 48"         | 15048      | 13.25 |
|           |            |         |           |            |         | 60"     | 10060      | 14.50   | 60"         | 15060      | 14.50 |
|           |            |         |           |            |         | 72"     | 10072      | 15.35   | 72"         | 15072      | 15.35 |
|           |            |         |           |            |         | 84"     | 10084      |         | 84"         | 15084      |       |
|           |            |         |           |            |         | 96"     | 10096      |         | 96"         | 15096      |       |
|           |            |         |           |            |         | 108"    | 10108      |         | 108"        | 15108      |       |
|           |            |         |           |            |         | 120"    | 10120      |         | 120"        | 15120      |       |

| 2" I.D. |            |         | 3" I.D. |            |         | 4" I.D. |            |       | 6" I.D. |            |       |
|---------|------------|---------|---------|------------|---------|---------|------------|-------|---------|------------|-------|
| Length  | Article    | Price   | Length  | Article    | Price   | Length  | Article    | Price | Length  | Article    | Price |
| 4"      | 5300-20004 | \$10.30 | 4"      | 5300-30004 | \$16.30 | —       | —          | \$ —  | —       | —          | —     |
| 6"      | 20006      | 10.30   | 6"      | 30006      | 16.30   | 6"      | 6300-40006 | 23.25 | 6"      | 5300-60006 | 23.25 |
| 8"      | 20008      | 11.00   | 8"      | 30008      | 17.10   | 8"      | 40008      | 24.25 | 8"      | 60008      | 24.25 |
| 10"     | 20010      | 12.10   | 10"     | 30010      | 17.90   | 10"     | 40010      | 25.25 | 10"     | 60010      | 25.25 |
| 12"     | 20012      | 13.00   | 12"     | 30012      | 18.70   | 12"     | 40012      | 26.25 | 12"     | 60012      | 26.25 |
| 14"     | 20014      | 13.90   | 14"     | 30014      | 19.50   | 14"     | 40014      | 27.25 | 14"     | 60014      | 27.25 |
| 16"     | 20016      | 14.80   | 16"     | 30016      | 20.30   | 16"     | 40016      | 28.25 | 16"     | 60016      | 28.25 |
| 18"     | 20018      | 15.70   | 18"     | 30018      | 21.10   | 18"     | 40018      | 29.25 | 18"     | 60018      | 29.25 |
| 20"     | 20020      | 16.50   | 20"     | 30020      | 22.00   | 20"     | 40020      | 30.25 | 20"     | 60020      | 30.25 |
| 24"     | 20024      | 19.30   | 24"     | 30024      | 25.40   | 24"     | 40024      | 36.25 | 24"     | 60024      | 36.25 |
| 30"     | 20030      | 23.10   | 30"     | 30030      | 30.30   | 30"     | 40030      | 42.25 | 30"     | 60030      | 42.25 |
| 36"     | 20036      | 25.40   | 36"     | 30036      | 35.20   | 36"     | 40036      | 48.25 | 36"     | 60036      | 48.25 |
| 48"     | 20048      | 29.70   | 48"     | 30048      | 39.60   | 48"     | 40048      | 54.25 | 48"     | 60048      | 54.25 |
| 60"     | 20060      | 33.00   | 60"     | 30060      | 44.00   | 60"     | 40060      | 60.50 | 60"     | 60060      | 60.50 |
| 72"     | 20072      |         | 72"     | 30072      |         | 72"     | 40072      |       | 72"     | 60072      |       |
| 84"     | 20084      |         | 84"     | 30084      |         | 84"     | 40084      |       | 84"     | 60084      |       |
| 96"     | 20096      |         | 96"     | 30096      |         | 96"     | 40096      |       | 96"     | 60096      |       |
| 108"    | 20108      |         | 108"    | 30108      |         | 108"    | 40108      |       | 108"    | 60108      |       |
| 120"    | 20120      |         | 120"    | 30120      |         | 120"    | 40120      |       | 120"    | 60120      |       |

# PROCESS PIPE AND FITTINGS

## 6301 SWEEP ELBOW



90°

45°

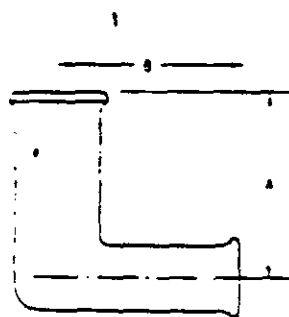
| Size       | A"    | Article   | Price   | Size       | A"    | Article   | Price   |
|------------|-------|-----------|---------|------------|-------|-----------|---------|
| 1/2" 90°   | 2 1/4 | 6301-4890 | \$ 4.20 | 1/2" 45°   | 2 1/4 | 6301-4845 | \$ 4.20 |
| 3/4" 90°   | 2 1/4 | 6890      | 4.30    | 1" 45°     | 2 1/4 | 6345      | 4.30    |
| 1" 90°     | 2 1/4 | 1090      | 7.15    | 1 1/2" 45° | 2 1/4 | 1045      | 7.15    |
| 1 1/2" 90° | 5     | 1590      | 7.50    | 2" 45°     | 3     | 1545      | 7.50    |
| 2" 90°     | 6     | 2090      | 9.65    | 2 1/2" 45° | 4     | 2045      | 9.65    |
| 3" 90°     | 7     | 3090      | 15.65   | 3" 45°     | 5     | 3045      | 15.65   |
| 4" 90°     | 10    | 4090      | 20.65   | 4" 45°     | 7     | 4045      | 20.65   |
| 6" 90°     | 12    | 6090      | 50.00   | 6" 45°     | 9     | 6045      | 50.00   |

60°

22 1/2°

| Size       | A"    | Article   | Price   | Size           | A"    | Article   | Price   |
|------------|-------|-----------|---------|----------------|-------|-----------|---------|
| 1/2" 60°   | 2 1/4 | 6301-4860 | \$ 4.20 | 1/2" 22 1/2°   | 2 1/4 | 6301-4822 | \$ 4.20 |
| 3/4" 60°   | 2 1/4 | 6860      | 4.30    | 1" 22 1/2°     | 2 1/4 | 6822      | 4.30    |
| 1" 60°     | 2 1/4 | 1060      | 7.15    | 1 1/2" 22 1/2° | 2 1/4 | 1022      | 7.15    |
| 1 1/2" 60° | 3 1/4 | 1560      | 7.50    | 2" 22 1/2°     | 3 1/4 | 1522      | 7.50    |
| 2" 60°     | 4     | 2060      | 9.65    | 2 1/2" 22 1/2° | 4     | 2022      | 9.65    |
| 3" 60°     | 5     | 3060      | 15.65   | 3" 22 1/2°     | 5     | 3022      | 15.65   |
| 4" 60°     | 7     | 4060      | 20.65   | 4" 22 1/2°     | 7     | 4022      | 20.65   |
| 6" 60°     | 9     | 6060      | 50.00   | 6" 22 1/2°     | 9     | 6022      | 50.00   |

## 6302 REDUCER ELBOW

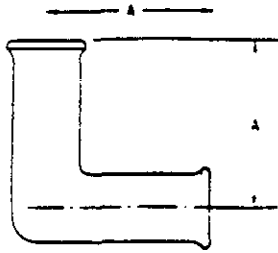


| Size          | A"    | B"    | Article   | Price   |
|---------------|-------|-------|-----------|---------|
| 1/2" x 1/2"   | 2 1/4 | 2 1/4 | 6302-6848 | \$ 7.30 |
| 1" x 1/2"     | 2 1/4 | 2 1/4 | 1048      | 9.60    |
| 1 1/2" x 1/2" | 2 1/4 | 2 1/4 | 1068      | 9.60    |
| 2" x 1/2"     | 3 1/4 | 3     | 1548      | 10.30   |
| 3" x 1/2"     | 3 1/4 | 3     | 1568      | 10.30   |
| 4" x 1/2"     | 3 1/4 | 3     | 1510      | 10.30   |
| 2" x 3/4"     | 4     | 3     | 2048      | 13.80   |
| 3" x 3/4"     | 4     | 3     | 2068      | 13.80   |
| 4" x 3/4"     | 4     | 3     | 2010      | 13.80   |
| 2" x 1"       | 4     | 3 1/2 | 2015      | 13.80   |
| 3" x 1"       | 5     | 3 1/2 | 3010      | 21.65   |
| 4" x 1"       | 5     | 4     | 3015      | 21.65   |
| 3" x 1 1/2"   | 5     | 4 1/2 | 3020      | 21.65   |
| 4" x 1 1/2"   | 7     | 4 1/2 | 4010      | 30.90   |
| 4" x 2"       | 7     | 5     | 4015      | 30.90   |
| 4" x 3"       | 7     | 5 1/2 | 4020      | 30.90   |
| 5" x 1 1/2"   | 9     | 5 1/2 | 4030      | 30.90   |
| 6" x 1 1/2"   | 9     | 5 1/2 | 6015      | 58.70   |
| 6" x 2"       | 9     | 6     | 6020      | 58.70   |
| 6" x 3"       | 9     | 6 1/2 | 6030      | 58.70   |
| 6" x 4"       | 9     | 8     | 6040      | 58.70   |

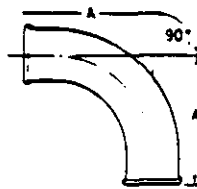


## PROCESS PIPE AND FITTINGS

**6303 90°  
MITERED ELBOW**



**6304 90° SHORT  
RADIUS ELBOW**

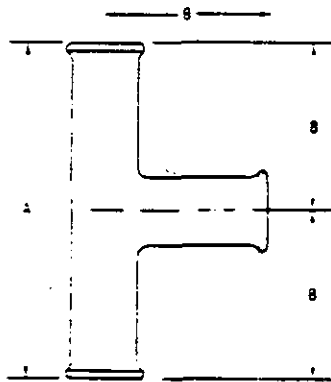


**6303**

**6304**

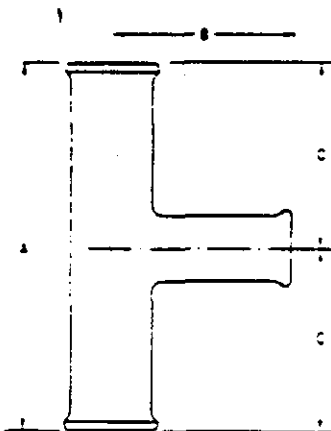
| Size       | A"    | Article   | Price   | Size                          | A"    | Article   | Price   |
|------------|-------|-----------|---------|-------------------------------|-------|-----------|---------|
| 1 1/2" 90° | 3 1/2 | 6303-1590 | \$10.30 | 1 1/2" 90°                    | 3 1/2 | 6304-1590 | \$10.30 |
| 2" 90°     | 4     | 2090      | 12.30   | 2" 90°                        | 4     | 3090      | 12.30   |
| 2" 90°     | 5     | 3090      | 21.65   | 2" 90°                        | 5     | 4090      | 21.65   |
| 4" 90°     | 7     | 4090      | 30.90   | 4" 90°                        | 7     | 5090      | 30.90   |
| 5" 90°     | 9     | 5090      | 58.70   | Interchangeable with 6310-TEE |       |           |         |

**6310 STRAIGHT T**



| Size   | A"    | B"    | Article   | Price   |
|--------|-------|-------|-----------|---------|
| 1/2"   | 3 1/4 | 2 1/4 | 6310-4848 | \$ 4.20 |
| 3/4"   | 5     | 2 1/4 | 5868      | 5.40    |
| 1"     | 5 1/2 | 2 1/4 | 1010      | 6.70    |
| 1 1/2" | 7     | 3 1/4 | 1515      | 12.30   |
| 2"     | 8     | 4     | 2020      | 15.00   |
| 3"     | 10    | 5     | 3030      | 20.00   |
| 4"     | 14    | 7     | 4040      | 33.75   |
| 5"     | 18    | 9     | 5060      | 50.00   |

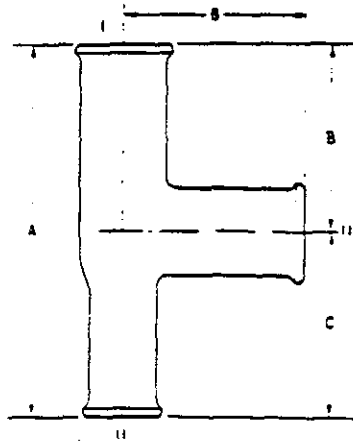
**6311 REDUCING T (BRANCH)**



| Size<br>Run x Branch | A"    | B"    | C"    | Article   | Price   |
|----------------------|-------|-------|-------|-----------|---------|
| 1/2" x 1/2"          | 5     | 2 1/4 | 2 1/4 | 6311-6848 | \$ 7.30 |
| 1" x 1/2"            | 5 1/2 | 2 1/4 | 2 1/4 | 1048      | 9.60    |
| 1" x 3/4"            | 5 1/2 | 2 1/4 | 2 1/4 | 1068      | 9.60    |
| 1 1/2" x 1/2"        | 7     | 3     | 3 1/4 | 1548      | 12.30   |
| 1 1/2" x 3/4"        | 7     | 3     | 3 1/4 | 1568      | 12.30   |
| 1 1/2" x 1"          | 7     | 3     | 3 1/4 | 1510      | 12.30   |
| 2" x 1/2"            | 8     | 3     | 4     | 2048      | 15.00   |
| 2" x 3/4"            | 8     | 3     | 4     | 2068      | 15.00   |
| 2" x 1"              | 8     | 3     | 4     | 2010      | 15.00   |
| 2" x 1 1/4"          | 8     | 3 1/4 | 4     | 2015      | 15.00   |
| 3" x 1"              | 10    | 3 1/4 | 5     | 3010      | 20.00   |
| 3" x 1 1/2"          | 10    | 4     | 5     | 3015      | 20.00   |
| 3" x 2"              | 10    | 4 1/2 | 5     | 3020      | 20.00   |
| 4" x 1"              | 14    | 4     | 7     | 4010      | 33.75   |
| 4" x 1 1/2"          | 14    | 4 1/2 | 7     | 4015      | 33.75   |
| 4" x 2"              | 14    | 5     | 7     | 4020      | 33.75   |
| 4" x 3"              | 14    | 5 1/2 | 7     | 4030      | 33.75   |
| 6" x 1 1/2"          | 18    | 5 1/2 | 9     | 6015      | 50.00   |
| 6" x 2"              | 18    | 6     | 9     | 6020      | 50.00   |
| 6" x 3"              | 18    | 6 1/2 | 9     | 6030      | 50.00   |
| 6" x 4"              | 18    | 8     | 9     | 6040      | 50.00   |

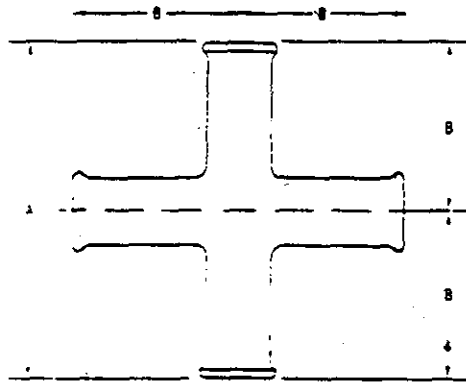
## PROCESS PIPE AND FITTINGS

### 6312 REDUCING T (RUN)



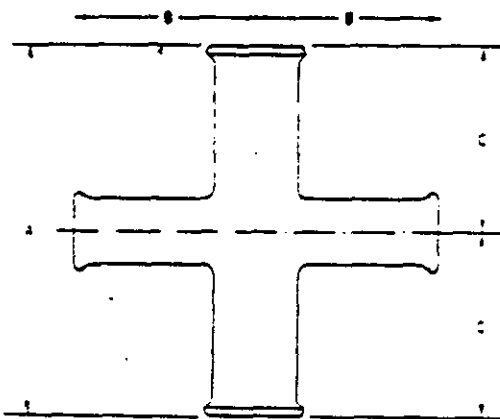
| Size                   |    |     | A"     | B"    | C"    | Article   | Price   |
|------------------------|----|-----|--------|-------|-------|-----------|---------|
| I                      | II | III |        |       |       |           |         |
| 1/2" x 1/2" x 1/2"     |    |     | 5      | 2 1/2 | 2 1/2 | 6312-6848 | \$ 7.30 |
| 1" x 1/2" x 1"         |    |     | 5 1/2  | 2 1/2 | 2 1/2 | 6312-6848 | 7.60    |
| 1" x 1/2" x 1"         |    |     | 5 1/2  | 2 1/2 | 2 1/2 | 6312-6848 | 7.60    |
| 1 1/4" x 1/2" x 1 1/4" |    |     | 6 1/2  | 3 1/2 | 3     | 6312-6848 | 12.60   |
| 1 1/4" x 1/2" x 1 1/4" |    |     | 6 1/2  | 3 1/2 | 3     | 6312-6848 | 12.60   |
| 1 1/2" x 1" x 1 1/2"   |    |     | 6 1/2  | 3 1/2 | 3     | 6312-6848 | 12.60   |
| 2" x 1 1/2" x 2"       |    |     | 7      | 4     | 3     | 6312-6848 | 15.00   |
| 2" x 1 1/2" x 2"       |    |     | 7      | 4     | 3     | 6312-6848 | 15.00   |
| 2" x 1" x 2"           |    |     | 7      | 4     | 3     | 6312-6848 | 15.00   |
| 2" x 1 1/4" x 2"       |    |     | 7 1/2  | 4     | 3 1/4 | 6312-6848 | 15.00   |
| 3" x 1" x 3"           |    |     | 9 1/2  | 5     | 3 1/2 | 6312-6848 | 15.00   |
| 3" x 1 1/4" x 3"       |    |     | 9      | 5     | 4     | 6312-6848 | 15.00   |
| 3" x 2" x 3"           |    |     | 9 1/2  | 5     | 4 1/2 | 6312-6848 | 15.00   |
| 4" x 1" x 4"           |    |     | 11     | 7     | 5     | 6312-6848 | 15.00   |
| 4" x 1 1/2" x 4"       |    |     | 11 1/2 | 7     | 5 1/2 | 6312-6848 | 15.00   |
| 4" x 2" x 4"           |    |     | 12     | 7     | 5     | 6312-6848 | 15.00   |
| 4" x 3" x 4"           |    |     | 12 1/2 | 7     | 5 1/2 | 6312-6848 | 15.00   |
| 5" x 1" x 5"           |    |     | 14     | 9     | 5     | 6312-6848 | 15.00   |
| 5" x 1 1/2" x 5"       |    |     | 14 1/2 | 9     | 5 1/2 | 6312-6848 | 15.00   |
| 5" x 2" x 5"           |    |     | 15     | 9     | 5     | 6312-6848 | 15.00   |
| 5" x 3" x 5"           |    |     | 15 1/2 | 9     | 5 1/2 | 6312-6848 | 15.00   |
| 5" x 4" x 5"           |    |     | 17     | 9     | 5     | 6312-6848 | 15.00   |

### 6320 STRAIGHT CROSS



| Size            | A"    | B"    | Article   | Price   |
|-----------------|-------|-------|-----------|---------|
| 1/2" x 1/2"     | 4 1/2 | 2 1/2 | 6320-4848 | \$ 5.10 |
| 1/2" x 1/2"     | 5     | 2 1/2 | 6320-4848 | 5.90    |
| 1" x 1"         | 5 1/2 | 2 1/2 | 6320-4848 | 10.10   |
| 1 1/2" x 1 1/2" | 7     | 3 1/2 | 6320-4848 | 16.00   |
| 2" x 2"         | 9     | 4     | 6320-4848 | 21.40   |
| 3" x 3"         | 10    | 5     | 6320-4848 | 23.60   |
| 4" x 4"         | 14    | 7     | 6320-4848 | 48.00   |
| 5" x 5"         | 18    | 9     | 6320-4848 | 54.60   |

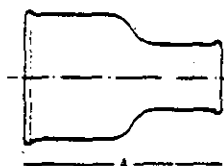
### 6350 REDUCER CROSS



| Size          | A"    | B"    | C"    | Article   | Price   |
|---------------|-------|-------|-------|-----------|---------|
| 1/2" x 1/2"   | 5     | 2 1/2 | 2 1/2 | 6350-6848 | \$ 9.60 |
| 1" x 1/2"     | 5 1/2 | 2 1/2 | 2 1/2 | 6350-6848 | 13.10   |
| 1" x 1/2"     | 5 1/2 | 2 1/2 | 2 1/2 | 6350-6848 | 13.10   |
| 1 1/4" x 1/2" | 6     | 3     | 3 1/2 | 6350-6848 | 15.00   |
| 1 1/4" x 1/2" | 6     | 3     | 3 1/2 | 6350-6848 | 15.00   |
| 1 1/2" x 1"   | 6     | 3     | 3 1/2 | 6350-6848 | 15.00   |
| 2" x 1 1/2"   | 7     | 3     | 4     | 6350-6848 | 21.40   |
| 2" x 1 1/2"   | 8     | 3     | 4     | 6350-6848 | 21.40   |
| 2" x 1 1/2"   | 8     | 3     | 4     | 6350-6848 | 21.40   |
| 2" x 1 1/4"   | 8     | 3 1/2 | 4     | 6350-6848 | 21.40   |
| 2" x 1"       | 10    | 3 1/2 | 5     | 6350-6848 | 23.60   |
| 2" x 1"       | 10    | 4     | 5     | 6350-6848 | 23.60   |
| 2" x 2"       | 10    | 4 1/2 | 5     | 6350-6848 | 23.60   |
| 3" x 1 1/2"   | 14    | 4     | 7     | 6350-6848 | 48.00   |
| 3" x 1 1/2"   | 14    | 4 1/2 | 7     | 6350-6848 | 48.00   |
| 3" x 2"       | 14    | 5     | 7     | 6350-6848 | 48.00   |
| 3" x 3"       | 18    | 5     | 9     | 6350-6848 | 52.10   |
| 3" x 1 1/2"   | 18    | 5 1/2 | 9     | 6350-6848 | 52.10   |
| 3" x 2"       | 18    | 6     | 9     | 6350-6848 | 52.10   |
| 3" x 3"       | 18    | 6 1/2 | 9     | 6350-6848 | 52.10   |
| 3" x 4"       | 19    | 8     | 9     | 6350-6848 | 52.10   |

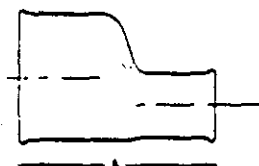
## PROCESS PIPE AND FITTINGS

### 6315 REDUCER (Straight)



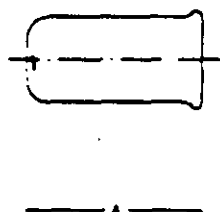
| Size          | A" | Article   | Price   | Size        | A" | Article   |
|---------------|----|-----------|---------|-------------|----|-----------|
| 1/2" x 1/2"   | 4  | 6315-6848 | \$ 3.90 | 3" x 1 1/2" | 5  | 6315-3015 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3000      |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      |
| 1 1/4" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      |
| 1 1/4" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 5" x 1"     | 9  | 5010      |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 5" x 1 1/2" | 9  | 5015      |
| 2" x 1"       | 4  | 2010      | 6.90    | 5" x 2"     | 9  | 5020      |
| 2" x 1 1/4"   | 4  | 2015      | 6.90    | 5" x 3"     | 9  | 5030      |
| 3" x 1"       | 5  | 3010      | 9.40    | 5" x 4"     | 9  | 5040      |

### 6340 REDUCER (Eccentric)



| Size          | A" | Article   | Price   | Size        | A" | Article   |
|---------------|----|-----------|---------|-------------|----|-----------|
| 1/2" x 1/2"   | 4  | 6340-6848 | \$ 3.90 | 3" x 1 1/2" | 5  | 6340-3015 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3000      |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      |
| 1 1/4" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      |
| 1 1/4" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 5" x 1"     | 9  | 5010      |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 5" x 1 1/2" | 9  | 5015      |
| 2" x 1"       | 4  | 2010      | 6.90    | 5" x 2"     | 9  | 5020      |
| 2" x 1 1/4"   | 4  | 2015      | 6.90    | 5" x 3"     | 9  | 5030      |
| 3" x 1"       | 5  | 3010      | 9.40    | 5" x 4"     | 9  | 5040      |

### 6336 END CAP



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2     | 6336-4800 | \$ 2.20 |
| 1/2"   | 2     | 6800      | 2.35    |
| 1"     | 2     | 1000      | 2.45    |
| 1 1/2" | 3     | 1500      | 3.50    |
| 2"     | 4     | 2000      | 4.70    |
| 3"     | 4 1/2 | 3000      | 7.35    |
| 4"     | 6     | 4000      | 10.50   |
| 6"     | 7     | 6000      | 14.00   |

### 6344 END PLUG

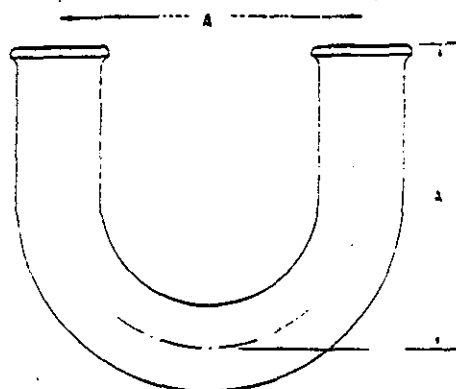


| Size   | A"    | Article   | Price  |
|--------|-------|-----------|--------|
| 1 1/2" | 1 1/2 | 6344-1500 | \$1.90 |
| 2"     | 1     | 2000      | 2.35   |
| 3"     | 1 1/2 | 3000      | 3.35   |
| 4"     | 1 1/2 | 4000      | 5.35   |
| 6"     | 1 1/2 | 6000      | 7.90   |

Use catalog dimensions for piping layout as gasket thickness allowance is included

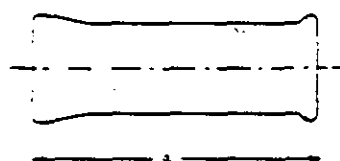
## PROCESS PIPE AND FITTINGS

### 6365 U BEND (Annealed)



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/4"   | 2 1/4 | 6365-4800 | \$ 5.00 |
| 1/2"   | 2 1/4 | 6800      | 7.55    |
| 1"     | 5 1/2 | 1000      | 11.30   |
| 1 1/2" | 7     | 1500      | 17.20   |
| 2"     | 7     | 2000      | 22.30   |
| 3"     | 9     | 3000      | 35.75   |
| 4"     | 12    | 4000      | 51.00   |

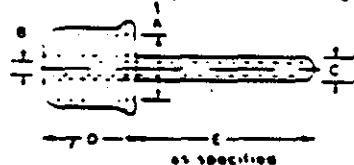
### 6366 ADAPTER Straight or Reducer (Conical to Beaded End Pipe)



| Size<br>Conical<br>x Bead | A" | Article   | Price  | Size<br>Conical<br>x Bead | A" | Article   | Price |
|---------------------------|----|-----------|--------|---------------------------|----|-----------|-------|
| 1/2" x 1/2"               | 4  | 6366-4848 | \$2.75 | 2" x 1 1/2"               | 4  | 6366-2015 | \$    |
| 1/2" x 3/4"               | 4  | 5848      | 4.90   | 2" x 2"                   | 4  | 2020      |       |
| 1/2" x 1"                 | 4  | 5858      | 3.25   | 3" x 1 1/2"               | 5  | 3010      |       |
| 1" x 1/2"                 | 4  | 1048      | 5.70   | 3" x 2"                   | 5  | 3015      |       |
| 1" x 3/4"                 | 4  | 1068      | 5.70   | 3" x 3"                   | 5  | 3020      |       |
| 1" x 1"                   | 4  | 1010      | 5.00   | 3" x 3"                   | 5  | 3030      |       |
| 1 1/2" x 1/2"             | 4  | 1548      | 6.20   | 4" x 1 1/2"               | 7  | 4010      |       |
| 1 1/2" x 3/4"             | 4  | 1558      | 6.20   | 4" x 2"                   | 7  | 4015      |       |
| 1 1/2" x 1"               | 4  | 1510      | 6.20   | 4" x 3"                   | 7  | 4020      |       |
| 2" x 1 1/2"               | 4  | 1515      | 5.95   | 4" x 3"                   | 7  | 4030      |       |
| 2" x 1"                   | 4  | 2048      | 7.90   | 4" x 4"                   | 7  | 4040      |       |
| 2" x 3/4"                 | 4  | 2068      | 7.90   | 5" x 4"                   | 9  | 5040      |       |
| 2" x 1"                   | 4  | 2010      | 7.90   | 5" x 5"                   | 9  | 5060      |       |

### THERMOMETER WELLS—Made to Order 6392 Single End

Length E must be specified (from min. 6" to max. 36")

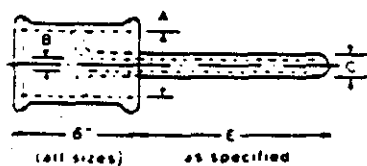


NOTE: All thermometer wells are annealed.

| A"<br>Pipe<br>Size | Well<br>I.D.<br>B" | C"  | D"    | Article   | Price   |
|--------------------|--------------------|-----|-------|-----------|---------|
| 1/2"               | 1/4                | 1/4 | 2 1/4 | 6392-1538 | \$15.55 |
| 1/2"               | 1/4                | 1/4 | 2 1/4 | 1550      | 15.30   |
| 1/2"               | 1/4                | 1   | 2 1/4 | 1558      | 15.50   |
| 1"                 | 1/4                | 1/4 | 2 1/4 | 2038      | 16.35   |
| 1"                 | 1/4                | 1/4 | 2 1/4 | 2050      | 17.10   |
| 1"                 | 1/4                | 1   | 2 1/4 | 2058      | 17.90   |
| 1"                 | 1/4                | 1/4 | 3 1/4 | 3038      | 19.30   |
| 1"                 | 1/4                | 1/4 | 3 1/4 | 3050      | 19.55   |
| 1"                 | 1/4                | 1   | 3 1/4 | 3058      | 20.25   |

### 6395 Double End

Length E must be specified (from min. 6" to max. 36")



NOTE: All thermometer wells are annealed.

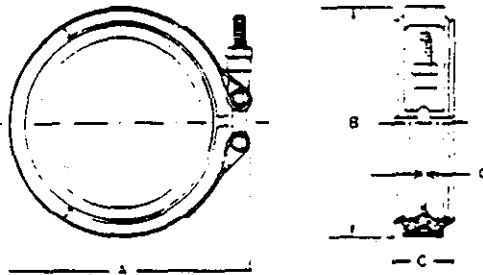
| A"<br>Pipe<br>Size | Well<br>I.D.<br>B" | C"  | D" | Article   | Price   |
|--------------------|--------------------|-----|----|-----------|---------|
| 1/2"               | 1/4                | 1/4 | 6  | 6395-1538 | \$20.35 |
| 1/2"               | 1/4                | 1/4 | 6  | 1550      | 20.60   |
| 1/2"               | 1/4                | 1   | 6  | 1558      | 21.30   |
| 1"                 | 1/4                | 1/4 | 6  | 2038      | 23.30   |
| 1"                 | 1/4                | 1/4 | 6  | 2050      | 23.45   |
| 1"                 | 1/4                | 1   | 6  | 2058      | 24.75   |
| 1"                 | 1/4                | 1/4 | 6  | 3038      | 28.80   |
| 1"                 | 1/4                | 1/4 | 6  | 3050      | 29.05   |
| 1"                 | 1/4                | 1   | 6  | 3058      | 29.75   |

## ACCESSORIES AND HARDWARE

### PROCESS PIPE COUPLINGS (Bead to Bead)

Coupling assemblies consists of a 300 series stainless steel outer band with T. bolt and hex nut; either Viton or Hydrin liner and a TFE seal ring.

No. 7123 coupling is designed for temperature service up to 450° F. No. 7126 coupling for service up to 300° F.



### 7123 High Temp. — Viton Liner (450°) (C)

| Size   | A"    | B"    | C"    | D"  | Article   |
|--------|-------|-------|-------|-----|-----------|
| 1/2"   | 1 3/4 | 1 3/4 | 1/2   | 1/2 | 7123-4800 |
| 3/4"   | 1 3/4 | 1 3/4 | 1/2   | 1/2 | 6800      |
| 1"     | 2 1/4 | 1 3/4 | 1     | 1/2 | 1000      |
| 1 1/2" | 3     | 2 1/4 | 1 1/2 | 1/2 | 1500      |
| 2"     | 3 3/4 | 3 1/4 | 2 1/2 | 1/2 | 2000      |
| 3"     | 4 3/4 | 4 1/4 | 3 1/2 | 1/2 | 3000      |
| 4"     | 5     | 5 1/2 | 4 1/2 | 1/2 | 4000      |
| 5"     | 5 3/4 | 5     | 5 1/2 | 1/2 | 5000      |

### 7126 Med. Temp. — Hydrin Liner (300°)(B)

| Size   | A"    | B"    | C"    | D"  | Article   |
|--------|-------|-------|-------|-----|-----------|
| 1/2"   | 1 3/4 | 1 3/4 | 1/2   | 1/2 | 7126-4800 |
| 3/4"   | 1 3/4 | 1 3/4 | 1/2   | 1/2 | 6800      |
| 1"     | 2 1/4 | 1 3/4 | 1     | 1/2 | 1000      |
| 1 1/2" | 3     | 2 1/4 | 1 1/2 | 1/2 | 1500      |
| 2"     | 3 3/4 | 3 1/4 | 2 1/2 | 1/2 | 2000      |
| 3"     | 4 3/4 | 4 1/4 | 3 1/2 | 1/2 | 3000      |
| 4"     | 5     | 5 1/2 | 4 1/2 | 1/2 | 4000      |
| 5"     | 5 3/4 | 5     | 5 1/2 | 1/2 | 5000      |

### 7123-7126 COUPLING COMPONENTS

#### 7125 S.S. Band and Nut

#### 7124 T.F.E. Seal and Viton Liner

#### 7127 T.F.E. and Hydrin

Consists of . . .

| Coupling No. | Liner Material | Max. Temp. | Band No. | Nut No. | Liner with Seal Ring |
|--------------|----------------|------------|----------|---------|----------------------|
| 7123         | Viton          | 450°       | 7125     | 5664    | 7124                 |
| 7126         | Hydrin         | 300°       | 7125     | 5664    | 7127                 |

| Size   | Article   | Price  | Size   | Article   | Price   | Size   | Article   |
|--------|-----------|--------|--------|-----------|---------|--------|-----------|
| 1/2"   | 7125-4800 | \$1.90 | 1/2"   | 7124-4800 | \$ 5.75 | 1/2"   | 7127-4800 |
| 3/4"   | 6800      | 1.90   | 3/4"   | 6800      | 6.25    | 3/4"   | 6800      |
| 1"     | 1000      | 1.95   | 1"     | 1000      | 6.35    | 1"     | 1000      |
| 1 1/2" | 1500      | 2.30   | 1 1/2" | 1500      | 7.20    | 1 1/2" | 1500      |
| 2"     | 2000      | 2.30   | 2"     | 2000      | 8.30    | 2"     | 2000      |
| 3"     | 3000      | 4.30   | 3"     | 3000      | 12.30   | 3"     | 3000      |
| 4"     | 4000      | 5.50   | 4"     | 4000      | 18.10   | 4"     | 4000      |
| 5"     | 5000      | 8.30   | 5"     | 5000      | 25.30   | 5"     | 5000      |

### 7290 PADDED PIPE HANGER



All hangers are zinc coated and have a factory applied plastic sleeve to prevent glass to metal contact. Use one hanger every 3 to 10 feet. Support all valves and meters individually.

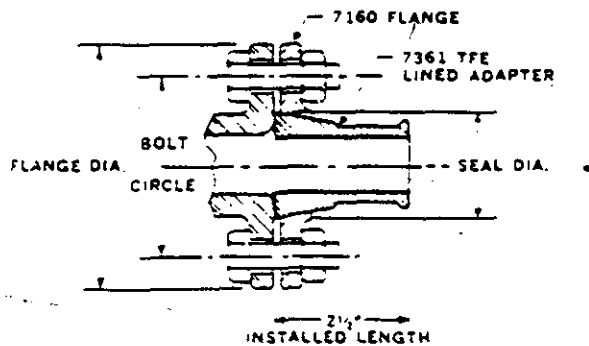
| Size   | Article   | Price |
|--------|-----------|-------|
| 1/2"   | 7290-4800 | \$ 45 |
| 3/4"   | 6800      | 45    |
| 1"     | 1000      | 50    |
| 1 1/2" | 1500      | 50    |
| 2"     | 2000      | 50    |
| 3"     | 3000      | 1.00  |
| 4"     | 4000      | 1.20  |
| 5"     | 5000      | 1.20  |

## ACCESSORIES AND HARDWARE

### 7360 COUPLING KIT

(125 lb. A.S.A. Flange to Beaded Pipe)

For maximum temperature and pressure applications.



Bolts and Nuts not included.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$10.00 |
| 1 1/2" | 1500      | 15.00   |
| 2"     | 2000      | 20.00   |
| 3"     | 3000      | 30.00   |
| 4"     | 4000      | 40.00   |
| 6"     | 6000      | 50.00   |

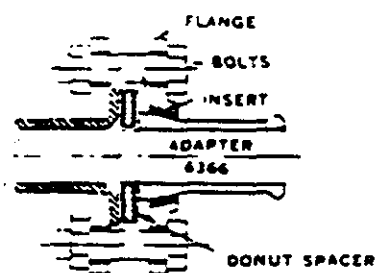
Assembly Consists of . . .

| Size   | Flange    | T.F.E. Lined Adapter | A Dia. | B Bolt G.D. | C Diameter | Bolt Qty. & Size |
|--------|-----------|----------------------|--------|-------------|------------|------------------|
| 1"     | 7160-1000 | 7361-1000            | 4 1/2" | 3/8"        | 1 1/2"     | 40 1/2 x 1/2     |
| 1 1/2" | 1500      | 1500                 | 5"     | 3/8"        | 2 1/2"     | 40 1/2 x 1/2     |
| 2"     | 2000      | 2000                 | 6"     | 4 1/4"      | 3"         | 40 1/2 x 1/2     |
| 3"     | 3000      | 3000                 | 7 1/2" | 5"          | 4 1/2"     | 40 1/2 x 1/2     |
| 4"     | 4000      | 4000                 | 9"     | 7 1/2"      | 5 1/2"     | 50 1/2 x 1/2     |
| 6"     | 6000      | 6000                 | 11"    | 9 1/2"      | 7 1/2"     | (3) 1/2 x 1/2    |

### 7121 COUPLING

(ASA Flanged Metal to Beaded End Pipe)

To join beaded glass pipe to inside coated metal pipe.



Adapter 6366 not included

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7121-4800 | \$ 8.50 |
| 1 1/2" | 5800      | 7.50    |
| 2"     | 1000      | 9.75    |
| 2 1/2" | 1500      | 11.75   |
| 3"     | 2000      | 12.95   |
| 3 1/2" | 3000      | 17.25   |
| 4"     | 4000      | 25.95   |
| 6"     | 6000      | 45.00   |

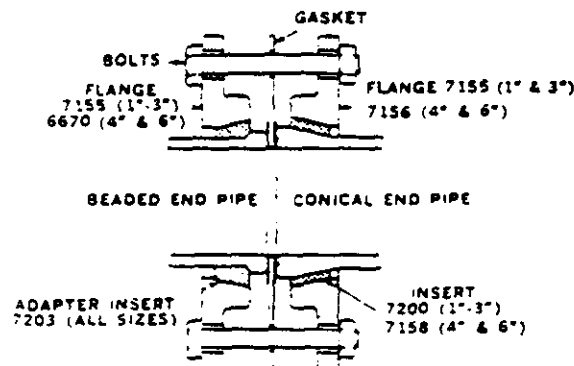
Assembly Consists of . . .

| Size   | Flange    | Insert    | Donut Spacer | Adapter Butters | 7190 Nuts & Bolts | Qty |
|--------|-----------|-----------|--------------|-----------------|-------------------|-----|
| 1"     | 7150-4800 | 7202-4800 | 7240-4800    | —               | 1/2" — 12 x 2     | 4   |
| 1 1/2" | 5800      | 6800      | 6800         | —               | 1/2" — 12 x 2     | 4   |
| 2"     | 1000      | 7200-1000 | 1000         | —               | 1/2" — 12 x 2     | 4   |
| 2 1/2" | 1500      | 1500      | 1500         | —               | 1/2" — 12 x 2     | 4   |
| 3"     | 2000      | 2000      | 2000         | —               | 1/2" — 12 x 2     | 4   |
| 3 1/2" | 3000      | 3000      | 3000         | —               | 1/2" — 12 x 3     | 4   |
| 4"     | 7156-4000 | 7158-4000 | 4000         | 7230-99         | 1/2" — 18 x 3     | 8   |
| 6"     | 6000      | 6000      | 6000         | 7230-99         | 1/2" — 16 x 3     | 8   |

## ACCESSORIES AND HARDWARE

### \*7110 COUPLING ASSEMBLY (Beaded to Conical End Pipe)

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



\*Pressure rating limited to that of Conical Pipe System.  
Not to be used with Beaded Armored Pipe.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7110-1000 | \$ 4.00 |
| 1 1/2" | 1500      | 4.50    |
| 2"     | 2000      | 5.50    |
| 3"     | 3000      | 11.25   |
| 4"     | 4000      | 24.00   |
| 6"     | 6000      | 51.00   |

### Assembly Consists of . . .

| Size   | Flange                 | Insert                 | Gasket    | *190 Nuts & Bolts - |
|--------|------------------------|------------------------|-----------|---------------------|
| 1"     | 7155-1000              | 7200-1000<br>7203-1000 | 7075-1000 | 1/4" - 18 x 1 1/2"  |
| 1 1/2" | 1500                   | 7200-1500<br>7203-1500 | 1500      | 1/4" - 18 x 2 1/4"  |
| 2"     | 2000                   | 7200-2000<br>7203-2000 | 2000      | 1/4" - 18 x 2 1/2"  |
| 3"     | 3000                   | 7200-3000<br>7203-3000 | 3000      | 1/4" - 18 x 3"      |
| 4"     | 7156-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | 1/4" - 18 x 3"      |
| 6"     | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | 1/4" - 18 x 3"      |

### 7360, 7121, 7110 COUPLING KIT COMPONENTS

| Flange for 7360  |           |         | Insert for 7121                |           |         | Flange for 7110 (Need 2)    |           |             |
|------------------|-----------|---------|--------------------------------|-----------|---------|-----------------------------|-----------|-------------|
| 1"               | 7150-1000 | \$ 3.00 | 1"                             | 7202-4800 | \$ .30  | 1"                          | 7155-1000 | \$ 1.00 ea. |
| 1 1/2"           | 1500      | 4.00    | 1 1/2"                         | 5800      | .30     | 1 1/2"                      | 1500      | 1.50 ea.    |
| 2"               | 2000      | 4.50    | 2"                             | 7200-1000 | .50     | 2"                          | 2000      | 2.00 ea.    |
| 3"               | 3000      | 5.00    | 3"                             | 1500      | .70     | 3"                          | 3000      | 3.00 ea.    |
| 4"               | 4000      | 10.15   | 4"                             | 2000      | .90     | 4"                          | 7156-4000 | 5.20 ea.    |
| 6"               | 6000      | 11.50   | 6"                             | 3000      | 1.25    | 6"                          | 6670-4000 | 6.90 ea.    |
| Adapter for 7360 |           |         | 4"                             | 7158-4000 | 5.05    | 6"                          | 7156-6000 | 10.60 ea.   |
| 1"               | 1000      | \$ 1.50 | 6"                             | 5000      | 10.70   | 6"                          | 6670-6000 | 8.60 ea.    |
| 1 1/2"           | 1500      | 1.50    | Donut Spacer for 7121          |           |         | Inserts for 7110 (one each) |           |             |
| 2"               | 2000      | 1.50    | 1"                             | 7240-4800 | \$ 4.00 | 1"                          | 7200-1000 | \$ .60 ea.  |
| 3"               | 3000      | 2.50    | 1 1/2"                         | 5800      | 4.50    | 1 1/2"                      | 7203-1000 | 1.35 ea.    |
| 4"               | 4000      | 10.00   | 2"                             | 1000      | 5.50    | 2"                          | 7200-1500 | .70 ea.     |
| 6"               | 6000      | 10.00   | 3"                             | 1500      | 6.50    | 3"                          | 7203-1500 | 1.45 ea.    |
| Flange for 7121  |           |         | 4"                             | 2000      | 7.15    | 4"                          | 7200-2000 | .90 ea.     |
| 1"               | 7150-4800 | \$ 1.55 | 6"                             | 3000      | 10.00   | 6"                          | 7203-2000 | 1.55 ea.    |
| 1 1/2"           | 5800      | 2.00    | 4"                             | 4000      | 16.00   | 4"                          | 7200-3000 | 1.35 ea.    |
| 2"               | 1000      | 3.00    | 6"                             | 5000      | 24.00   | 6"                          | 7203-3000 | 2.20 ea.    |
| 3"               | 1500      | 4.00    | Adapter Button for 7121 (4-6") |           |         | 4"                          | 7158-4000 | 5.05 ea.    |
| 4"               | 2000      | 4.50    | 4"-6"                          | 7230-39   | \$ .10  | 6"                          | 7203-4000 | 3.50 ea.    |
| 6"               | 3000      | 5.50    |                                |           |         | 5"                          | 7158-6000 | 10.70 ea.   |
| 4"               | 7156-4000 | 5.20    |                                |           |         | 6"                          | 7203-6000 | 5.20 ea.    |
| 6"               | 5000      | 10.50   |                                |           |         |                             |           |             |

### 7190 Bolts & Nuts

For all Coupling Kits & Assemblies

| Description        | Qty. | Article   | P  |
|--------------------|------|-----------|----|
| 1/4" - 18 x 2 1/4" | 4    | 7190-1800 | \$ |
| 1/4" - 18 x 2 1/2" | 4    | 1824      |    |
| 1/4" - 18 x 3"     | 4    | 1800      |    |
| 1/4" - 16 x 3"     | 3    | 1600      |    |
| 1/4" - 13 x 2"     | 4    | 1300      |    |
| 1/4" - 13 x 2 1/4" | 4    | 1302      |    |
| 1/4" - 13 x 2 1/2" | 4    | 1324      |    |
| 1/4" - 11 x 2 1/4" | 4    | 1104      |    |
| 1/4" - 11 x 3"     | 4    | 1100      |    |
| 1/4" - 11 x 3 1/2" | 4    | 1124      |    |
| 1/4" - 10 x 3 1/2" | 4    | 1024      |    |

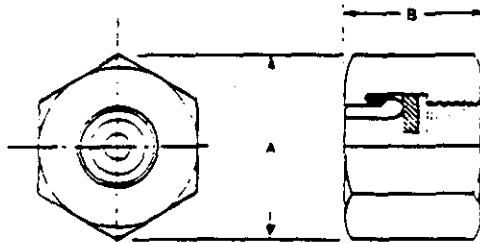
### Gasket for 7110

T.F.E. Machined (Full Flow) Gasket  
(Blue African Asbestos Filler)

| Description | Size   | Article   | P  |
|-------------|--------|-----------|----|
| Style 11    | 1"     | 7276-1000 | \$ |
| "           | 1 1/2" | 1500      |    |
| "           | 2"     | 2000      |    |
| "           | 3"     | 3000      |    |
| "           | 4"     | 4000      |    |
| "           | 6"     | 6000      |    |

## ACCESSORIES AND HARDWARE

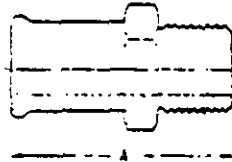
### 7340 FAUCET UNION—ALUMINUM (Beaded to 1/2" Metal IPS Straight Pipe Thread)



Replacement parts for No. 7340 assembly include No. 7343 gasket and No. 7344 cushion ring.

| Size               | A"    | B"    | Article   | Price  |
|--------------------|-------|-------|-----------|--------|
| 1/2" Assembly      | 1 1/4 | 1 1/4 | 7340-4800 | \$2.00 |
| 1/2" Gasket (TFE)  | —     | —     | 7343-4800 | .50    |
| 1/2" Cushion (TFE) | —     | —     | 7344-4800 | .50    |

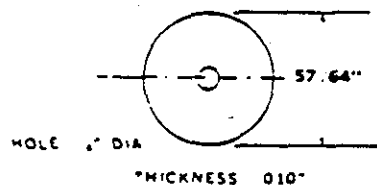
### 7350 Male Threaded ADAPTER (316 Stainless Steel)



Used to join threaded female fittings, valves and flanges to beaded pipe.

| Size   | A"    | Article   | Price            |
|--------|-------|-----------|------------------|
| 1/2"   | 2 1/4 | 7350-4800 | \$12.00          |
| 3/4"   | 2 1/4 | 5300      | 12.05            |
| 1"     | 2 1/4 | 1000      | 14.35            |
| 1 1/2" | 2 1/4 | 1500      | 19.60            |
| 2"     | 2 1/4 | 2000      | Price on Request |
| 3"     | 2 1/4 | 3000      |                  |
| 4"     | 2 1/4 | 4000      |                  |

### 7348 Gasket — Flow Control (TFE)

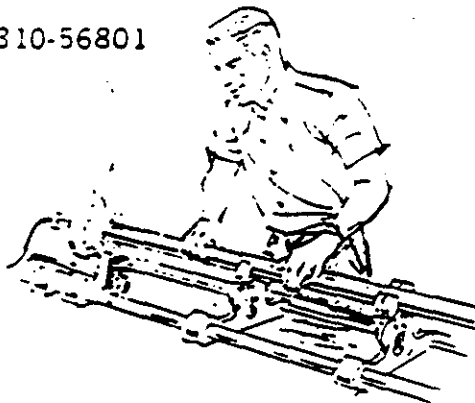


Place 7348 Flow Control Gasket into 7125 coupling — place at first horizontal joint from faucet.

| Size | Article   | Price | Description |
|------|-----------|-------|-------------|
| 1/2" | 7348-4800 | \$50  | TFE         |

Used to reduce surge and water hammer in distilled water systems.

7310-56801



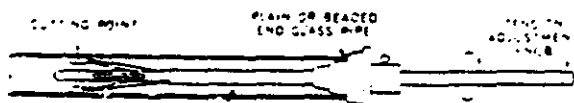
### BK-5 PORTABLE BEADING KIT

For fast, simplified field beading of glass pipe. Kit is designed so that operator can form a bead on 1/2" through 6" pipe that has same compatibility in coupling as factory beaded pipe. For operational details, consult KIMAX Cutting and Beading Manual GPD-1066.

PRICE ON REQUEST

7310-56802 Cutting 1 1/2", 2", 3", 4", 6" Pipe

7310-56803 Cutting 1/2", 3/4", 1" Pipe



### PORTABLE GLASS CUTTERS

For on-the-job scoring and cutting of special lengths of glass pipe. For operational details consult KIMAX Cutting and Beading Manual GPD-1066.

PRICE ON REQUEST



# ENGINEERING DATA

## COMPARATIVE WEIGHT

The following table indicates approximate weight of 2" diameter KIMAX Glass Pipe compared to the weight of other pipe material of the same diameter.

| Material                      | Approximate Weight (lbs./ft./2" dia.) |
|-------------------------------|---------------------------------------|
| KIMAX Glass Pipe              | 1.10-1.20                             |
| PVC Schedule 80               | 1.33                                  |
| Normal Impact                 | 1.33                                  |
| High Impact                   | 1.33                                  |
| Hard Rubber                   | 1.33                                  |
| Dracite (Imperious)           | 1.10                                  |
| Resin-Bonded Asbestos         | 1.33                                  |
| Stainless Steel (Schedule 40) | 1.55                                  |
| Lead Ex. Light                | 4.20                                  |
| Porcelain                     | 1.25                                  |
| High Silicon Iron             | 1.10                                  |

## OPERATING TEMPERATURES AND PRESSURES

KIMAX Glass Pipe will operate at temperatures up to 450° F. under normal conditions. Where operating temperatures exceed 250° F. up to 450° F., protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois, Fluid Process Systems, C & TP Div., Cincinnati, N. J. 45360.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table.

| Maximum Operating Limits |     |     |     |     |     |
|--------------------------|-----|-----|-----|-----|-----|
| Pipe Size                | 1"  | 1½" | 2"  | 3"  | 4"  |
| Pressure (PSI)           | 100 | 75  | 50  | 30  | 20  |
| Max. Temperature (°F)    | 450 | 450 | 450 | 450 | 450 |
| Min. Temperature (°F)    | -50 | -50 | -50 | -50 | -50 |
| Thermal Expansion        |     |     |     |     |     |
| Differential             | 100 | 100 | 75  | 50  | 30  |

Working point of relieved material should be taken into consideration.

Note: Gas pressure recommendations.

It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under high pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## THERMAL EXPANSION

When using KIMAX Glass Pipe to other materials, rate of thermal expansion must be taken into consideration and allow inches/inch for the variation.

KIMAX Glass Pipe has a thermal expansion of .001100 in./in./°F. With this factor as 1.00, relative expansion of other materials is:

| Material              | Relative Expansion |
|-----------------------|--------------------|
| KIMAX Glass Pipe      | 1.00               |
| Porcelain             | 1.00               |
| Dracite (Imperious)   | 1.00               |
| Steel                 | 1.50               |
| High Silicon Iron     | 1.50               |
| Stainless Steel       | 1.50               |
| Resin-Bonded Asbestos | 1.00               |
| PVC Schedule 80       | 1.00               |
| Normal Impact         | 1.00               |
| High Impact           | 1.00               |

## FLOW CHARACTERISTICS — PRESSURE DROP

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction KIMAX pipe is approximately 10 to 20% less than that of steel. The percentage of difference increases as the pipe becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per inch increases. The chart below states the equivalent length for various fittings, based on water at 70° F.

| Fitting     | Equivalent Lengths (Feet) By Pipe Size |      |      |       |       |
|-------------|----------------------------------------|------|------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    |
| 22½° L      | .05                                    | .05  | .10  | .15   | .20   |
| 45° L       | .10                                    | .10  | .20  | .30   | .40   |
| 90° L       | .20                                    | .20  | .40  | .60   | .80   |
| 180° L      | .40                                    | .40  | .80  | 1.20  | 1.60  |
| Sweep L     | .10                                    | .10  | .20  | .30   | .40   |
| Ref. Bend   | .40                                    | .40  | .80  | 1.20  | 1.60  |
| T (Run)     | .10                                    | .10  | .20  | .30   | .40   |
| T (S.O.)    | .50                                    | .50  | 1.00 | 1.50  | 2.00  |
| T (S.I.)    | .50                                    | .50  | 1.00 | 1.50  | 2.00  |
| Gate Valve  | 1.5                                    | 2.0  | 3.0  | 4.5   | 6.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   |
| Globe Valve | 16.00                                  | 54.0 | 70.0 | 108.0 | 144.0 |

| Flow Rate (Gals./Min.) |       | Pressure Drop (PSI) Per 100 Ft. By Pipe Size |      |      |      |    |
|------------------------|-------|----------------------------------------------|------|------|------|----|
|                        |       | 1"                                           | 1½"  | 2"   | 3"   | 4" |
| 5                      | Glass | 2.5                                          | —    | —    | —    | —  |
| 5                      | Steel | 4.0                                          | —    | —    | —    | —  |
| 10                     | Glass | 5.5                                          | —    | —    | —    | —  |
| 10                     | Steel | 7.0                                          | —    | —    | —    | —  |
| 15                     | Glass | 8.4                                          | —    | —    | —    | —  |
| 15                     | Steel | 11.0                                         | —    | —    | —    | —  |
| 20                     | Glass | 10.3                                         | —    | —    | —    | —  |
| 20                     | Steel | 15.5                                         | —    | —    | —    | —  |
| 25                     | Glass | 14.0                                         | 3    | 9    | —    | —  |
| 25                     | Steel | 19.5                                         | 4    | 10   | —    | —  |
| 50                     | Glass | —                                            | 8.0  | 2.3  | 3    | —  |
| 50                     | Steel | —                                            | 9.0  | 2.9  | 5    | —  |
| 75                     | Glass | —                                            | 14.0 | 4.1  | 5    | —  |
| 75                     | Steel | —                                            | 16.2 | 5.0  | 9    | —  |
| 100                    | Glass | —                                            | —    | 6.2  | 1.0  | 4  |
| 100                    | Steel | —                                            | —    | 8.0  | 1.2  | 5  |
| 150                    | Glass | —                                            | —    | 14.5 | 2.0  | 9  |
| 150                    | Steel | —                                            | —    | —    | 2.7  | 10 |
| 200                    | Glass | —                                            | —    | —    | 3.5  | 10 |
| 200                    | Steel | —                                            | —    | —    | 4.3  | 11 |
| 300                    | Glass | —                                            | —    | —    | 5.7  | 20 |
| 300                    | Steel | —                                            | —    | —    | 9.7  | 20 |
| 400                    | Glass | —                                            | —    | —    | 12.7 | 30 |
| 400                    | Steel | —                                            | —    | —    | —    | 40 |

NOTE: Above pressure drops are only approximate. For more detailed data refer to equations for friction factors by Darcy, Hagen, and McAdams, Trans. Am. Inst. Chem. Engs. 26: 56 (1932) and Wilson, McAdams and Seitzer, Ind. Eng. Chem. 14: 40 (1922).

# ENGINEERING DATA

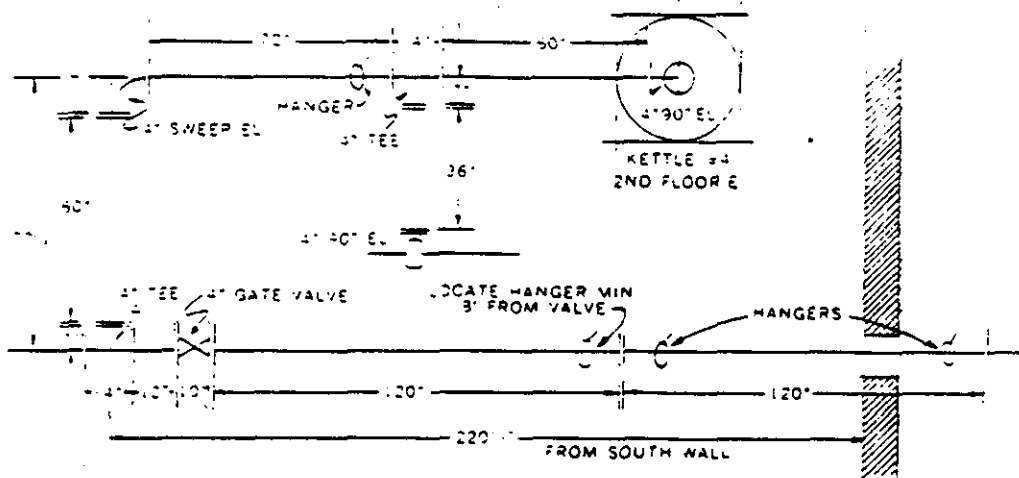
## LAYOUT

Layout of KIMAX Glass Pipe is similar to that of other materials. In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Consideration should be given to anchor point locations and line flexibility. Line flexibility can be achieved by use of right angle bends and elbows.

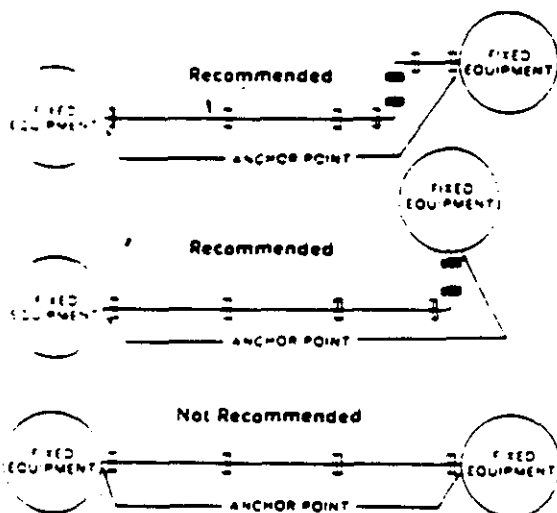
Typical Area Sketch



## ANCHOR POINTS

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks and pumps.

There should be only one anchor point in any straight run of pipe. Diagrams below show both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.



All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

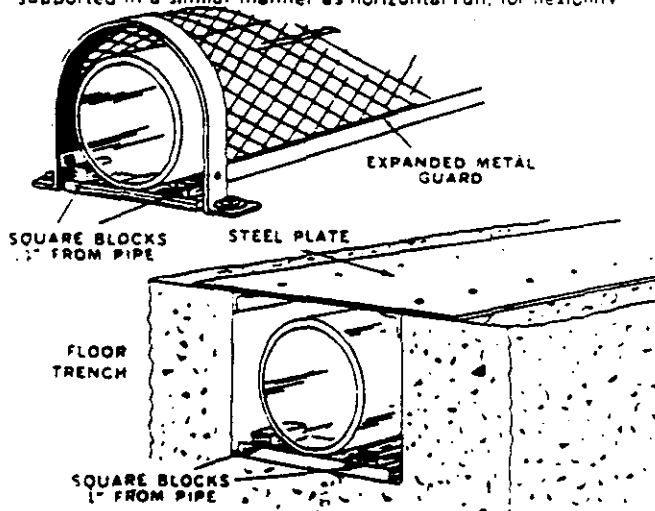
## HORIZONTAL LINE SUPPORT

Each 10-foot length of KIMAX pipe should be supported with at least one hanger located about 1 foot from each end. See illustration of horizontal line support, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

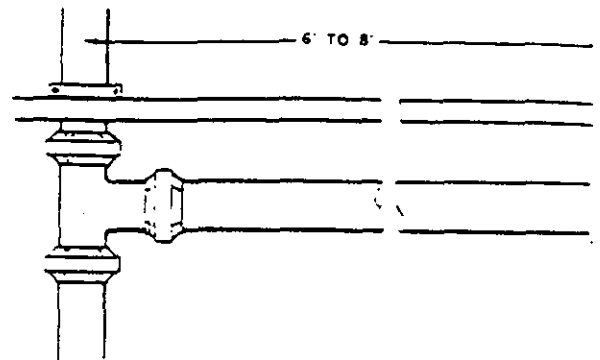
Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways in order to prevent bending movements in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility.

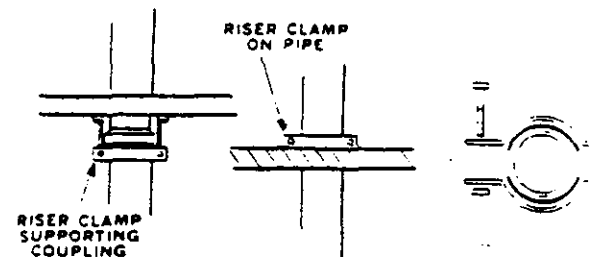


## INSTALLATION DATA

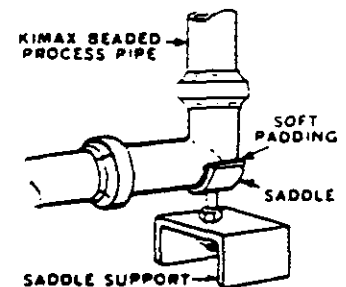
- Do not support vertical runs with horizontal lines. First hanger should be placed from 6 feet to 8 feet from column.



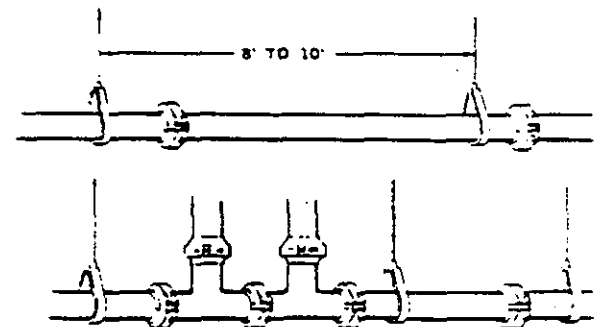
- Use KIMAX compression coupling without seal ring around O.D. of pipe and support to structure with a riser clamp or support ring.
- Clamps should be below coupling on riser where possible.
- Support need not be at joint.
- OR
- Use riser clamp lined with 1/4" thick neoprene.
- Locate riser clamps at each floor or at center distance not to exceed 12 feet.



- The padded saddle is used beneath 90 degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

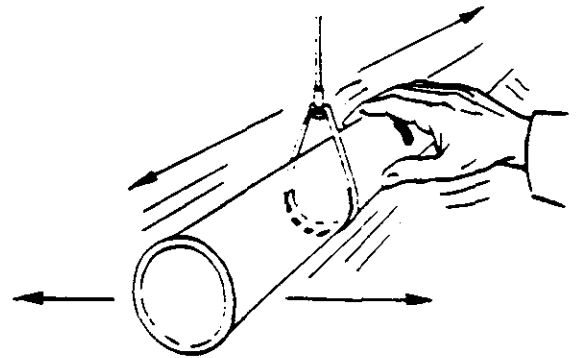


- Use padded hangers to prevent glass to metal contact. Space hangers to support lines every 8 feet to 10 feet.
- Use extra hanger when two or more couplings fall within hanger span.
- Independently support all valves, meters or any heavy equipment installed in line.



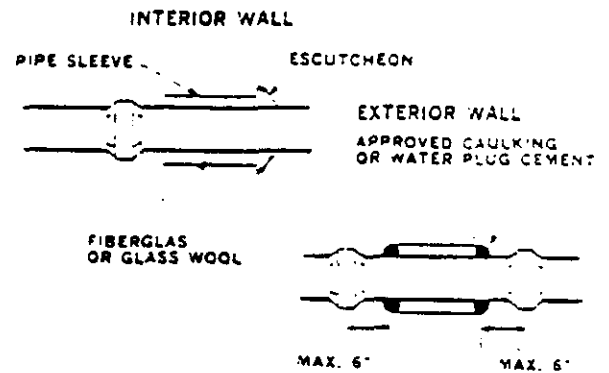
## INSTALLATION DATA

- Keep lines loose . . . when horizontal lines are hung they should be free to move sideways.
- Axial movement should be limited, but by no more than one (1) anchor point per 50' in any direction.



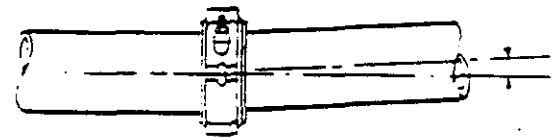
- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 6" on either side of wall.



- To attach a line, snug coupling, lock joint to pitch required and tighten coupling.
- Pitch should not exceed 4°

Note: For maximum efficiency at extreme operating conditions, joints should be retightened every 24 hours.



### Vibration

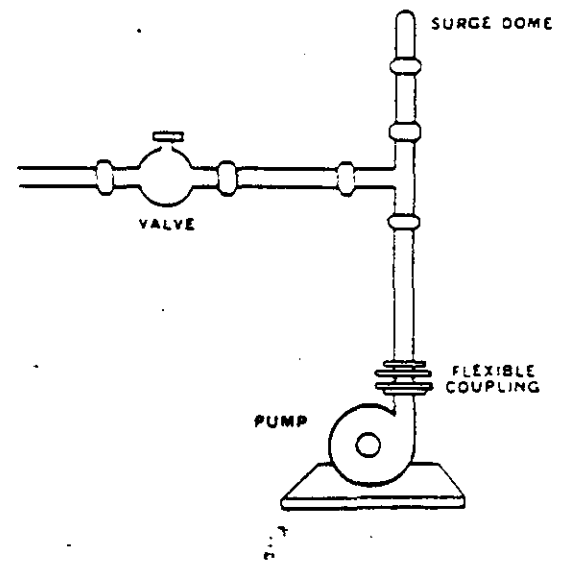
Connection to a pump or vibrating equipment is accomplished by using a flexible connection — either expansion joints or flexible couplings. The fluid properties, temperature and pressure of the transmitted material determine the type.

Vibration may also be dampened by use of a swing hanger or by moving the pipe hanger away from the source of vibration.

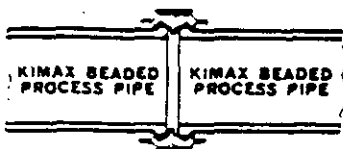
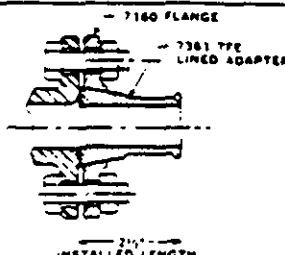
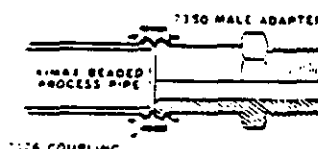
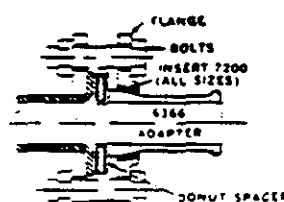
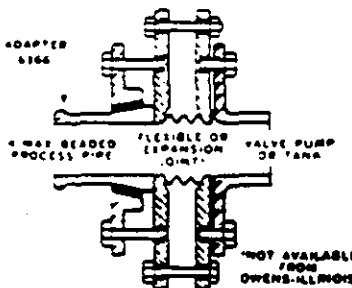
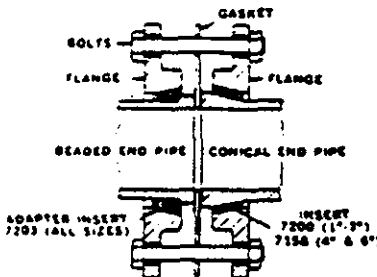
### Pressure Surges Must Be Controlled To Prevent Excessive Pipe Movement

To reduce pressure surges, install a pressure dome on the discharge side of a pump next to the valve, or at the top of the vertical rise of a discharge line.

For distilled water systems eliminate self-closing "quick shut off" faucets or install No. 7248 flow restrictors.



## TYPICAL JOINT REFERENCE CHART

| KIMAX Beaded Process Pipe                                                                                                                               | Type of Joint                                                                        | Material Needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|------------|---------------|----------------|----------------|---------------|---------------|---------------|---------------|-----------------|-----------------|------|-----------|----|-----------|--------|-----------|----|-----------|----|-----------|----|-----------|--|-----------|--|--|--------|-----------|----|-----------|--|-----------|--|--|
| To:<br>KIMAX Beaded Process Pipe<br>(Factory or Field Beaded)                                                                                           |    | <b>KIMAX 7126 Process Pipe Coupling</b> <table><tr><th>Pipe Size</th><th>Coupling Code</th><th>Pipe Size</th><th>Coupling Code</th></tr><tr><td>1/2"</td><td>7126-4800</td><td>2"</td><td>7126-2000</td></tr><tr><td>3/4"</td><td>7126-6800</td><td>3"</td><td>7126-3000</td></tr><tr><td>1"</td><td>7126-1000</td><td>4"</td><td>7126-4000</td></tr><tr><td>1 1/2"</td><td>7126-1500</td><td>6"</td><td>7126-6000</td></tr></table> See Page 11. GPD-1054R                                                                                                                                                                               | Pipe Size     | Coupling Code | Pipe Size  | Coupling Code | 1/2"           | 7126-4800      | 2"            | 7126-2000     | 3/4"          | 7126-6800     | 3"              | 7126-3000       | 1"   | 7126-1000 | 4" | 7126-4000 | 1 1/2" | 7126-1500 | 6" | 7126-6000 |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| Pipe Size                                                                                                                                               | Coupling Code                                                                        | Pipe Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Coupling Code |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1/2"                                                                                                                                                    | 7126-4800                                                                            | 2"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7126-2000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 3/4"                                                                                                                                                    | 7126-6800                                                                            | 3"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7126-3000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1"                                                                                                                                                      | 7126-1000                                                                            | 4"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7126-4000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1 1/2"                                                                                                                                                  | 7126-1500                                                                            | 6"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7126-6000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| To:<br>1", 1 1/2", 2", 3", 4" or 6"<br>Beaded Pipe to A.S.A.<br>Flanged Valves                                                                          |    | <b>KIMAX 7360 Coupling Assembly</b> <table><tr><th>Pipe Size</th><th>Coupling Code</th></tr><tr><td>1"</td><td>7360-1000</td></tr><tr><td>1 1/2"</td><td>7360-1500</td></tr><tr><td>2"</td><td>7360-2000</td></tr><tr><td>3"</td><td>7360-3000</td></tr><tr><td>4"</td><td>7360-4000</td></tr><tr><td>6"</td><td>7360-6000</td></tr></table> See Page 12. GPD-1054R                                                                                                                                                                                                                                                                       | Pipe Size     | Coupling Code | 1"         | 7360-1000     | 1 1/2"         | 7360-1500      | 2"            | 7360-2000     | 3"            | 7360-3000     | 4"              | 7360-4000       | 6"   | 7360-6000 |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| Pipe Size                                                                                                                                               | Coupling Code                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1"                                                                                                                                                      | 7360-1000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1 1/2"                                                                                                                                                  | 7360-1500                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 2"                                                                                                                                                      | 7360-2000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 3"                                                                                                                                                      | 7360-3000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 4"                                                                                                                                                      | 7360-4000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 6"                                                                                                                                                      | 7360-6000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| To:<br>1/2" thru 4"<br>IPS (female)<br>Threaded Pipe<br>7350 S.S. (316)                                                                                 |    | <b>KIMAX 7350 Adapter</b> <table><tr><th>Pipe Size</th><th>Codes</th><th>Pipe Size</th><th>Code</th></tr><tr><td>1/2"</td><td>7350-4800</td><td></td><td></td></tr><tr><td></td><td>7126-4800</td><td></td><td></td></tr><tr><td>3/4"</td><td>7350-6800</td><td>2"</td><td>7350-2000</td></tr><tr><td></td><td>7126-6800</td><td></td><td></td></tr><tr><td>1"</td><td>7350-1000</td><td>3"</td><td>7350-3000</td></tr><tr><td></td><td>7126-1000</td><td></td><td></td></tr><tr><td>1 1/2"</td><td>7350-1500</td><td>4"</td><td>7350-4000</td></tr><tr><td></td><td>7126-1500</td><td></td><td></td></tr></table> See Page 14. GPD-1054R | Pipe Size     | Codes         | Pipe Size  | Code          | 1/2"           | 7350-4800      |               |               |               | 7126-4800     |                 |                 | 3/4" | 7350-6800 | 2" | 7350-2000 |        | 7126-6800 |    |           | 1" | 7350-1000 | 3" | 7350-3000 |  | 7126-1000 |  |  | 1 1/2" | 7350-1500 | 4" | 7350-4000 |  | 7126-1500 |  |  |
| Pipe Size                                                                                                                                               | Codes                                                                                | Pipe Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Code          |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1/2"                                                                                                                                                    | 7350-4800                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
|                                                                                                                                                         | 7126-4800                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 3/4"                                                                                                                                                    | 7350-6800                                                                            | 2"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7350-2000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
|                                                                                                                                                         | 7126-6800                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1"                                                                                                                                                      | 7350-1000                                                                            | 3"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7350-3000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
|                                                                                                                                                         | 7126-1000                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1 1/2"                                                                                                                                                  | 7350-1500                                                                            | 4"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7350-4000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
|                                                                                                                                                         | 7126-1500                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| To:<br>ASA Flanged Metal<br>(glass, rubber or plastic lined) Pipe, Tanks or Valves                                                                      |  | <b>KIMAX 7121 Coupling Assembly</b> <table><tr><th>Pipe Size</th><th>Coupling Code</th><th>Pipe Size</th><th>Coupling Code</th></tr><tr><td>1/2"</td><td>7121-4800</td><td></td><td></td></tr><tr><td>3/4"</td><td>7121-6800</td><td></td><td></td></tr><tr><td>1"</td><td>7121-1000</td><td>3"</td><td>7121-3000</td></tr><tr><td>1 1/2"</td><td>7121-1500</td><td>4"</td><td>7121-4000</td></tr><tr><td>2"</td><td>7121-2000</td><td>6"</td><td>7121-6000</td></tr></table> See Page 12. GPD-1054R                                                                                                                                      | Pipe Size     | Coupling Code | Pipe Size  | Coupling Code | 1/2"           | 7121-4800      |               |               | 3/4"          | 7121-6800     |                 |                 | 1"   | 7121-1000 | 3" | 7121-3000 | 1 1/2" | 7121-1500 | 4" | 7121-4000 | 2" | 7121-2000 | 6" | 7121-6000 |  |           |  |  |        |           |    |           |  |           |  |  |
| Pipe Size                                                                                                                                               | Coupling Code                                                                        | Pipe Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Coupling Code |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1/2"                                                                                                                                                    | 7121-4800                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 3/4"                                                                                                                                                    | 7121-6800                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1"                                                                                                                                                      | 7121-1000                                                                            | 3"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7121-3000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1 1/2"                                                                                                                                                  | 7121-1500                                                                            | 4"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7121-4000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 2"                                                                                                                                                      | 7121-2000                                                                            | 6"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7121-6000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| To:<br>Valves, Pumps or Tanks<br>(when contraction or expansion is a factor)                                                                            |  | <table><tr><th colspan="2">Connect to</th></tr><tr><th>1" 3" Pipe</th><th>4" 6" Pipe</th></tr><tr><td>1-6366 Adapter</td><td>1-6366 Adapter</td></tr><tr><td>1-7155 Flange</td><td>1-7156 Flange</td></tr><tr><td>1-7200 Insert</td><td>1-7158 Insert</td></tr><tr><td>4-Bolts &amp; Nuts*</td><td>8-Bolts &amp; Nuts*</td></tr></table> *Contractor supply 3/4" bolts to length<br>See Page 13. GPD-1054R                                                                                                                                                                                                                                | Connect to    |               | 1" 3" Pipe | 4" 6" Pipe    | 1-6366 Adapter | 1-6366 Adapter | 1-7155 Flange | 1-7156 Flange | 1-7200 Insert | 1-7158 Insert | 4-Bolts & Nuts* | 8-Bolts & Nuts* |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| Connect to                                                                                                                                              |                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1" 3" Pipe                                                                                                                                              | 4" 6" Pipe                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1-6366 Adapter                                                                                                                                          | 1-6366 Adapter                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1-7155 Flange                                                                                                                                           | 1-7156 Flange                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1-7200 Insert                                                                                                                                           | 1-7158 Insert                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 4-Bolts & Nuts*                                                                                                                                         | 8-Bolts & Nuts*                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| To:<br>KIMAX Conical End Process Pipe<br><b>LIMITED TO CONICAL PIPE PRESSURES &amp; TEMPERATURES</b><br><b>NOT TO BE USED WITH BEADED ARMORED PIPE.</b> |  | <b>KIMAX 7110 Coupling Assembly</b> <table><tr><th>Pipe Size</th><th>Coupling Code</th><th>Pipe Size</th><th>Coupling Code</th></tr><tr><td>1"</td><td>7110-1000</td><td>3"</td><td>7110-3000</td></tr><tr><td>1 1/2"</td><td>7110-1500</td><td>4"</td><td>7110-4000</td></tr><tr><td>2"</td><td>7110-2000</td><td>6"</td><td>7110-6000</td></tr></table> See Page 13. GPD-1054R                                                                                                                                                                                                                                                          | Pipe Size     | Coupling Code | Pipe Size  | Coupling Code | 1"             | 7110-1000      | 3"            | 7110-3000     | 1 1/2"        | 7110-1500     | 4"              | 7110-4000       | 2"   | 7110-2000 | 6" | 7110-6000 |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| Pipe Size                                                                                                                                               | Coupling Code                                                                        | Pipe Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Coupling Code |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1"                                                                                                                                                      | 7110-1000                                                                            | 3"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7110-3000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 1 1/2"                                                                                                                                                  | 7110-1500                                                                            | 4"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7110-4000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |
| 2"                                                                                                                                                      | 7110-2000                                                                            | 6"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 7110-6000     |               |            |               |                |                |               |               |               |               |                 |                 |      |           |    |           |        |           |    |           |    |           |    |           |  |           |  |  |        |           |    |           |  |           |  |  |

## TESTING AND CLEANING

In recognition of cold flow characteristics of plastics and elastomers, we recommend the following procedures:

- Tighten bolts on all couplings and flanges at time of installation.
- For maximum efficiency at extreme operating conditions, joints should be retightened after 24 hours.
- Gently shake lines to make certain pipe is free of strain. There should be some limited movement in lines.
- Pressure test system with water at  $1\frac{1}{2}$  times specified working pressure. Do not test with air or gas.

If leaking occurs:

- Recheck couplings for loosened bolts.
- If leaking persists, remove coupling and check condition and positioning of compression liner and seal ring.

To clean system, flush lines with water, other cleaning fluids or atmospheric pressure steam (open drain). Do not use hydrofluoric acid, hot caustic solutions, abrasives or metallic tube cleaners.

# KIMAX Beaded Process Pipe

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AC 714 521 2271

Vineland, N.J. 08360  
Crystal & Fowler Ave.  
AC 609 692 4606  
AC 609 692 6299

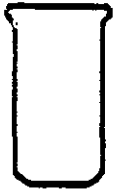
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## TEMPERED GLASS PRODUCTS



**KIMAX TEMPERED GLASS  
DRAINLINE**

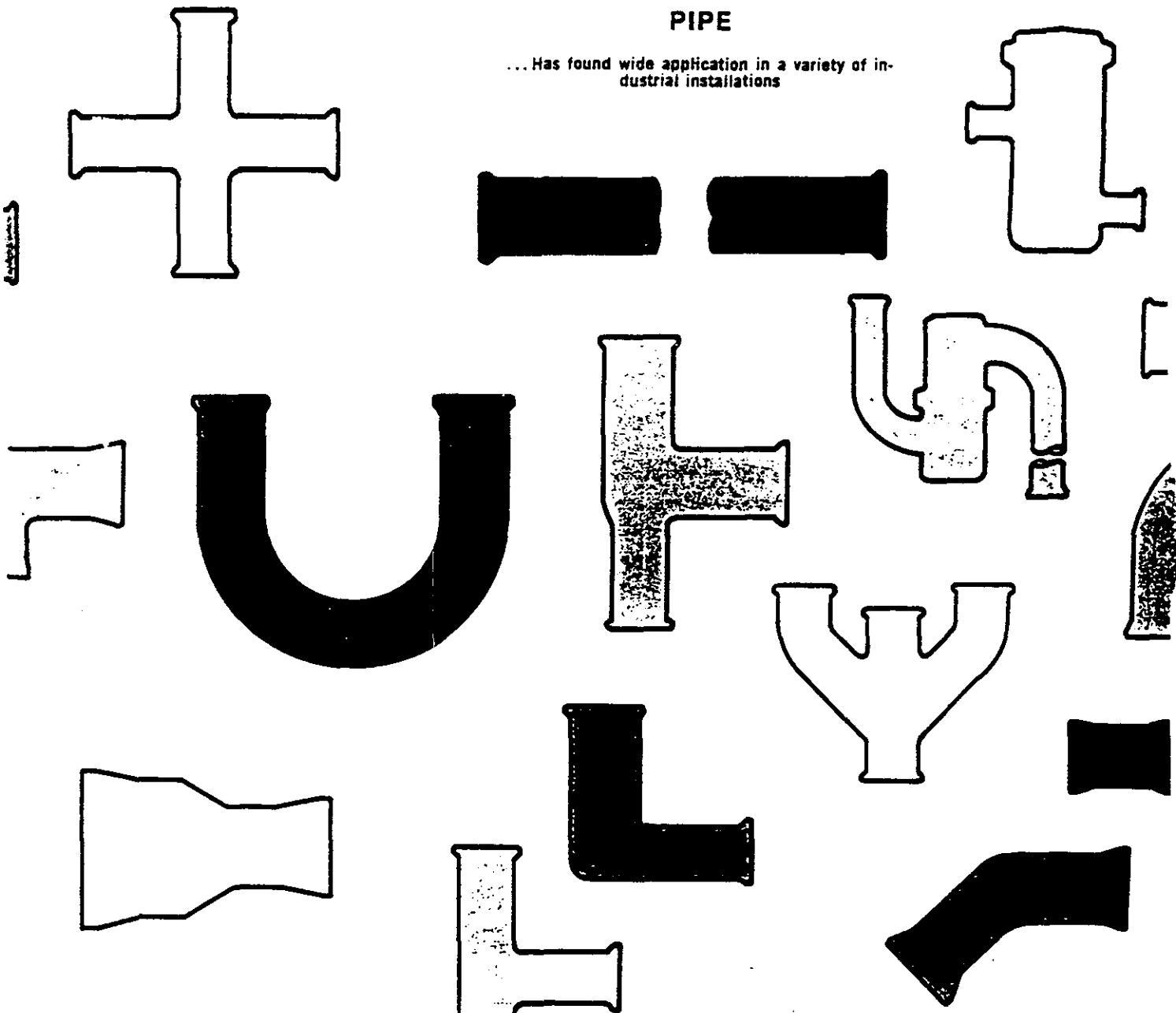
... Assured maximum corrosion resistance for  
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PIPE**

... For distilled water, dairy, chemical and food  
processing, and other industrial installations

**KIMAX PROCESS GLASS  
PIPE**

... Has found wide application in a variety of in-  
dustrial installations



## PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPE

| SYSTEM                      | KIMAX DRAINLINE<br>1½" thru 8"                       | KIMAX BEADED PIPE<br>½" thru 4"                      | KIMAX PROCESS CONICAL<br>END PIPE 1" thru 8"               |
|-----------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------|
| <b>PHYSICAL PROPERTIES:</b> |                                                      |                                                      |                                                            |
| Working Pressure            | Gravity Flow                                         | ½"-¾"-1" 100 PSI<br>1½"-2"-3" 75 PSI<br>4" 50 PSI    | 1"-3" 50 PSI<br>4" 35 PSI<br>6" 20 PSI                     |
| Test Pressure <b>[MAX]</b>  | 22½ PSI                                              | Twice Working Pressure <b>(MAX)</b>                  | Twice Working Pressure                                     |
| Operating Temp.             | Freezing Point of Waste to 212° F                    | Freezing Point to 350° F                             | Freezing Point to 450° F                                   |
| Glass Therm. Exp.           | 32 x 10 <sup>-7</sup>                                | 32 x 10 <sup>-7</sup>                                | 32 x 10 <sup>-7</sup>                                      |
| Glass Therm. Conductivity   | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/FT at 212° F       | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/FT at 212° F       | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/FT at 212° F             |
| Glass Therm. Shock Diff.    | 1½"-3" 200° F<br>4" 175° F<br>6" 160° F              | ½"-3" 200° F<br>4" 175° F                            | 1"-3" 200° F<br>4" 175° F<br>6" 160° F                     |
| Vacuum                      | Full                                                 | Full                                                 | Full                                                       |
| <b>CHEMICAL PROPERTIES</b>  |                                                      |                                                      |                                                            |
| Durability<br>Acids         | All Except Hydrofluoric<br>Phosphoric with Fluorides | All Except Hydrofluoric<br>Phosphoric with Fluorides | All Except Hydrofluoric<br>Phosphoric with Fluorides       |
| Alkalies                    | Some attack<br>above 150° F                          | Some attack<br>above 150° F                          | Some attack<br>above 150° F                                |
| Coupling                    | 1 bolt stainless steel                               | 1 bolt stainless steel 1"-4"<br>Plastic ½" + ¾"      | Style I, II and ASME Flange<br><i>Expanded information</i> |
| Coupling Gasket             | Buna-N/TFE Seal                                      | *Viton/TFE Seal 450° F<br>Hydrin/TFE Seal 350° F     | Customer Selection                                         |
| Identification              | KIMAX<br>Green Label                                 | KIMAX<br>Yellow Label                                | KIMAX<br>Yellow Label                                      |

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KIMAX is a registered trademark of Owens-Illinois, Inc.

\*See Gasket Selection Chart



Owens-Illinois has developed a complete line of KIMAX tempered glass products that specifically answer the requirements of widely diversified piping systems. Made from durable, Type I borosilicate glass which features maximum chemical durability, corrosion resistance, heat and shock resistance, low maintenance cost, and transparency. Owens-Illinois has also developed and patented couplings and other hardware accessories that provide a piping system that is easily installed; easily maintained, and assures long, trouble-free service life. KIMAX Piping Systems have three styles to best serve your needs.

- KIMAX Drainline for waste disposal

- KIMAX Beaded Process Pipe for pressure service
- KIMAX Conical End Process Pipe for pressure service

#### Important features to:

#### BUILDING OWNER

- Low installation cost
- Maximum corrosion resistance
- Heat resistance
- Fire proof
- Transparency for simple inspection
- System easily altered to meet new layout conditions



# KIMAX<sup>®</sup> TEMPERED GLASS PRODUCTS

#### SPECIFIER

Architects and specifying engineers are constantly in search of materials which will give new freedom in design, confidence in performance, and reasonable installation costs. All KIMAX glass piping system products offer these provisions because;

- All KIMAX pipe may be installed behind walls, over-head against ceilings, or underground with confidence.
- Light weight of KIMAX glass piping system
- requires only  $\frac{1}{2}$  to  $\frac{1}{3}$  as many hangers as other conventional systems.
- All wetted parts are borosilicate glass or TFE\*; thus, the total system is highly chemical resistant.
- Glass does not sag when exposed to boiling water. Hangers may be placed up to 10' apart.
- Low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.

# **① KIMAX TEMPERED GLASS DRAINLINE**

## **RECOMMENDED USES**

KIMAX Drainline is recommended for corrosive waste disposal from laboratory and industrial process areas. Because of the excellent corrosion resistance KIMAX Glass Drainline can be recommended for all corrosive service except where large quantities of HF Acid are used. KIMAX Drainline is recommended for service where temperatures range from freezing point of the waste to 212°F continuous and even up to 250°F for short periods of time.

## **INSTALLATION**

KIMAX Glass Drainline installation techniques are similar to other drainline materials designed for the same type service. However, with the KIMAX Bead to Bead Coupling and the new KIMAX Bead to Plain End Coupling, joining of the pipe and fitting is now very simple.

Suggested installation practices are found in the KIMAX Drainline Installation Manual. Owens-Illinois sales and field engineering representatives are also available for on-the-job service and training.

### **... Easily Assembled**

The patented KIMAX coupling assemblies described below makes installation simple and time-saving. The coupling bolts are to be firmly tightened. We recommend the use of a ratchet wrench with a 4"

to 6" handle. Coupling design permits the joint to be deflected up to 4°.

### **... Field Fabrication**

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site by the use of a KIMAX field "beading kit" or by using the new B/P (bead to plain end) coupling system.

### **... Below Ground**

KIMAX Glass Drainline may be safely specified for underground installations.

### **... Adaptation to Other Materials**

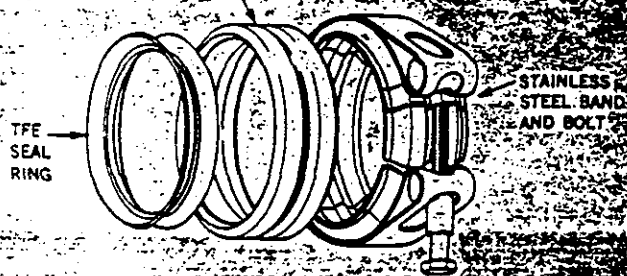
KIMAX Glass Drainline can be readily joined to other drainline materials.

### **... Easily Handled**

Because KIMAX Glass Drainline is about  $\frac{1}{4}$  the weight of conventional iron pipe, straight lengths and fittings are easily transported to point of installation. All fittings and straight lengths are packaged in corrugated cartons for shipment and storage. For a condensed listing of KIMAX Drainline pipe, fittings, and accessories, see Pages 6 thru 11 of this catalog, or write for complete KIMAX Tempered Glass Drainline Catalog (TR862R) and Installation Manual to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P.O. Box 1035, Toledo, Ohio 43601.

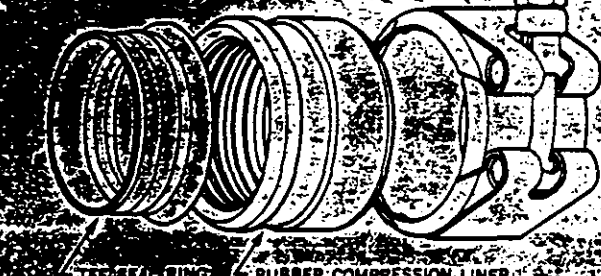
### **BEAD TO BEAD COUPLING**

RUBBER COMPRESSION LINER



### **BEADED TO PLAIN END COUPLING**

STAINLESS STEEL BAND AND BOLT



### **... Quick Positive Seal Joint**

One of the most important components of a leak-free drainline system is the joint mechanism. The KIMAX drainline coupling Article No. 6650, (beaded to beaded pipe) and the new B/P (beaded to plain end) coupling No. 6661 illustrated above, will assure the proper joint seal ... with ease of assembly and disassembly. All coupling joints are protected with

TFE seal rings, therefore providing a complete drainline system with all wetted surfaces of either KIMAX borosilicate glass or TFE\* plastic.

\*TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

# SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed Borosilicate glass (Type I), conforming to Federal Specification DD-G-541A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B. This system shall include all glass straight lengths, fittings, traps, compression type fluoro-carbon lined couplings and padded hanger supports. It shall also include factory protected heavy schedule pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.
- C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A. Glass-to-glass connections shall be made with KIMAX one-bolt compression type couplings fabricated from 300 series stainless steel consisting of three (3) contoured 120° segments fastened to an outer band with integral barrel nut and trunion; contoured Buna N resilient compression ring and a wide angle 30° fluoro-carbon inner seal ring. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.
- B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

### III. Protection of Pipe

- A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiberglass, glass wool and/or with a non-hardening approved caulking material.
- B. Glass pipe shall not be installed in direct contact with concrete. Fiberglass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C. Glass pipe shall be protected against all weld splatter.

### IV. Tests

Test in accordance to manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A. **Excavation**—shall conform to National Plumbing Code A 40.8 Section 2.7.
  1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
  2. At least 4" of properly compacted sand shall be used directly under the pipe.
- B. **Buried Pipe**
  1. Straight lengths shall be heavy schedule 5' lengths and shall include a factory-applied protective coating.
  2. Fittings and couplings shall receive a field-applied protective coating prior to back-filling. This coating may be Behr Manning Undercoat, Scotch Wrap, J. M. Trans-Tex, 3M EC-1221, or approved equal.
- C. **Backfill**

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: \_\_\_\_\_

### Specification for KIMAX Acid Waste Drainline and Vent System

This system shall be made of KIMAX tempered and annealed Borosilicate glass conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX one-bolt compression type stainless steel couplings with a fluoro-carbon inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

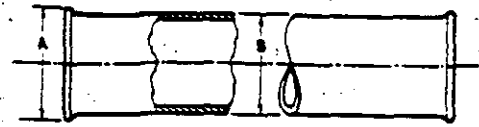
Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX heavy schedule factory protected pipe, 5' lengths, and either wrapped or coated fittings and couplings shall be installed in sand base and back fill in accordance with the manufacturer's instructions and governing plumbing code.

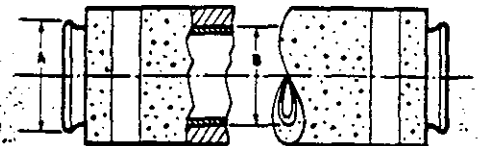
# KIMAX TEMPERED GLASS PRODUCTS

## Drainline PIPE AND FITTINGS

**STRAIGHT LENGTHS PIPE**  
 6500 5-ft. lengths  
 6501 10-ft. lengths  
 6504 Nipple Stock (beaded one end only)



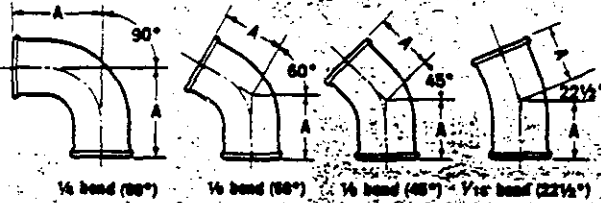
**6502 EPS\* Covered 5-ft. lengths Heavy Schedule**



\*Expanded Polystyrene

| Size | Regular Schedule<br>(6500, 6501) |          | Heavy Schedule<br>(6502) |                      |
|------|----------------------------------|----------|--------------------------|----------------------|
|      | A                                | B (O.D.) | Weight<br>lbs. / ft.     | Weight<br>lbs. / ft. |
| 1½   | 2.06                             | 1.84     | 0.64                     | 0.87                 |
| 2    | 2.58                             | 2.34     | 0.94                     | 1.1                  |
| 3    | 3.69                             | 3.41     | 1.6                      | 2.0                  |
| 4    | 4.84                             | 4.53     | 2.6                      | 3.4                  |
| 6    | 7.12                             | 6.66     | 4.7                      | 6.3                  |

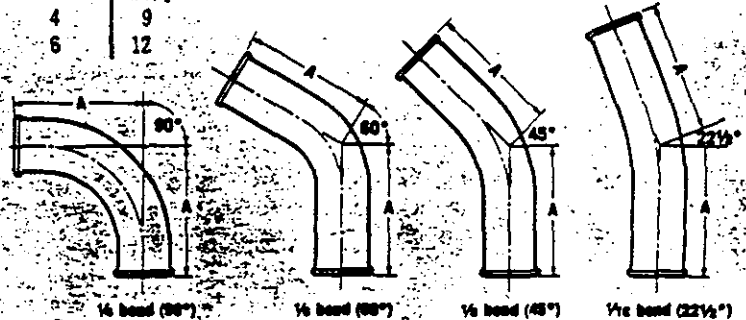
### 6513 BENDS



| Size | 90° | 60° | 45° | 22½° |
|------|-----|-----|-----|------|
| 1½   | 3   | 2½  | 2   | 2    |
| 2    | 3½  | 2¾  | 2¼  | 2¼   |
| 3    | 5   | 3½  | 2¾  | 2¾   |
| 4    | 7   | 4½  | 3¾  | 3¾   |

### 6511 SWEEPS

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |



### SPECIAL PURPOSE BENDS

6512

6512P (ANNEALED)\*

6514

6514P (ANNEALED)\*

6512

6512P

6514

6514P



| Size | A  | B  | A  | B  | A  | B  | A  | B  |
|------|----|----|----|----|----|----|----|----|
| 1½   | 3¾ | 6  | 3¾ | 12 | 2½ | 3  | 2½ | 12 |
| 2    | 3¾ | 7½ | 3¾ | 12 | 3  | 3¾ | 3  | 12 |

\*Can be field cut.

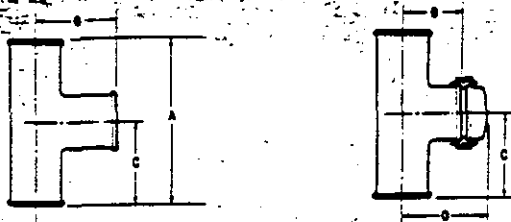
### 6513 BEND OFFSETS

| Size | L  | ¼  | O  | L   | ¼  | O  | L   | ¼  | O  | L   | ¼  | O  |
|------|----|----|----|-----|----|----|-----|----|----|-----|----|----|
| 1½   | 8  | 6½ | 6  | 7½  | 4¾ | 8¾ | 7½  | 4¾ | 8¾ | 7½  | 4¾ | 8¾ |
| 2    | 10 | 8  | 8  | 10½ | 6  | 10 | 10½ | 6  | 10 | 10½ | 6  | 10 |
| 3    | 14 | 10 | 10 | 13½ | 8  | 13 | 13½ | 8  | 13 | 13½ | 8  | 13 |
| 4    |    |    |    |     |    |    |     |    |    |     |    |    |

### 6511 SWEEP OFFSETS

| Size | L  | ¼  | O  | L   | ¼   | O   | L   | ¼   | O   | L   | ¼   | O   |
|------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1½   | 8  | 6½ | 6  | 13½ | 7½  | 15½ | 13½ | 7½  | 15½ | 13½ | 7½  | 15½ |
| 2    | 10 | 8  | 8  | 15  | 8   | 17  | 17  | 8   | 19½ | 17  | 8   | 19½ |
| 3    | 14 | 10 | 10 | 19½ | 11½ | 22½ | 22½ | 11½ | 25  | 25  | 11½ | 25  |
| 4    | 18 | 12 | 12 | 27  | 15  | 30  | 30  | 15  | 34½ | 34½ | 15  | 34½ |
| 6    | 24 | 16 | 16 | 36  | 20  | 41  | 41  | 20  | 48½ | 48½ | 20  | 48½ |

# 6523 STRAIGHT T 6524 TEST T WITH CLEANOUT



STRAIGHT T

| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 2   | 12 | 4½ | 6  |
| 3 x 3   | 12 | 6  | 6  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7¾ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

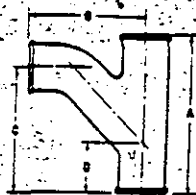
TEST T WITH CLEANOUT

| Size    | A  | B  | C | D  |
|---------|----|----|---|----|
| 1½ x 1½ | 6  | 2¾ | 3 | 3¾ |
| 2 x 2   | 8  | 2½ | 4 | 3¾ |
| 3 x 3   | 12 | 3¾ | 6 | 4¾ |
| 4 x 4   | 14 | 4½ | 7 | 5¾ |

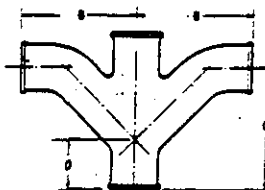
Test Tee and cleanout comes as complete assembly including cap and coupling.

# COMBINATION Y AND ½ BEND

6528 SINGLE

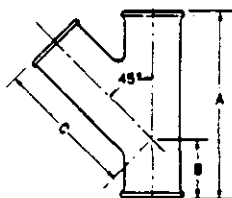


6529 DOUBLE



| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 4½ | 4½  | 1½ |
| 2 x 1½  | 8  | 4¾ | 5½  | 2½ |
| 2 x 2   | 8  | 6  | 6½  | 2½ |
| 3 x 1½  | 12 | 5¾ | 7½  | 3½ |
| 3 x 2   | 12 | 6½ | 8   | 3½ |
| 3 x 3   | 12 | 8½ | 9   | 3½ |
| 4 x 1½  | 14 | 6  | 8½  | 4½ |
| 4 x 2   | 14 | 7  | 9½  | 4½ |
| 4 x 3   | 14 | 9  | 10½ | 4½ |
| 4 x 4   | 14 | 11 | 11½ | 4½ |
| 6 x 2   | 20 | 8½ | 11½ | 5½ |
| 6 x 3   | 20 | 10 | 12½ | 5½ |
| 6 x 4   | 20 | 12 | 13½ | 5½ |
| 6 x 6   | 20 | 15 | 14½ | 5½ |

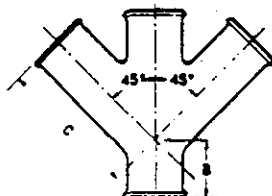
6526 SINGLE



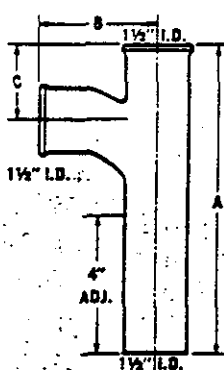
DRAINLINE Y

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 1¾ | 4½  |
| 2 x 1½  | 8  | 2½ | 4¾  |
| 2 x 2   | 8  | 2½ | 6   |
| 3 x 1½  | 12 | 3¾ | 5½  |
| 3 x 2   | 12 | 3¾ | 6¾  |
| 3 x 3   | 12 | 3¾ | 8   |
| 4 x 1½  | 14 | 4½ | 6¾  |
| 4 x 2   | 14 | 4½ | 7½  |
| 4 x 3   | 14 | 4½ | 8¾  |
| 4 x 4   | 14 | 4½ | 10  |
| 6 x 2   | 20 | 5¾ | 9   |
| 6 x 3   | 20 | 5¾ | 10¾ |
| 6 x 4   | 20 | 5¾ | 11½ |
| 6 x 6   | 20 | 5¾ | 14  |

6527 DOUBLE



6525 and 6525R\* (ANNEALED)†



Adjustable Sanitary T  
(PLAIN END OUTLET)

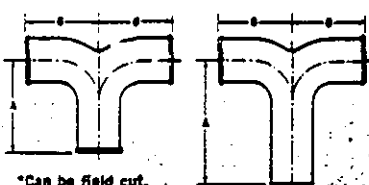
|       | Size         | A  | B  | C  |
|-------|--------------|----|----|----|
| 6525  | 1½ x 1½ x 1½ | 8¾ | 3½ | 2½ |
| 6525R | 1½ x 1½ x 1½ | 8¾ | 3½ | 3¾ |

\*No. 6525R differs from No. 6525 in length of "C" dimensions only.

†Can be field cut.

DOUBLE QUARTER BEND

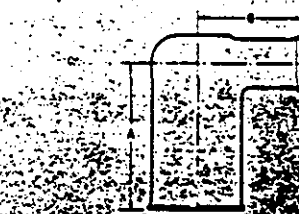
6533 6533P (ANNEALED)\*



\*Can be field cut.

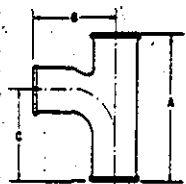
|      | 6533 | 6533P |
|------|------|-------|
| Size | A    | B     |
| 1½   | 3¾   | 3¾    |
| 2    | 5    | 10    |
| 3    | 7¾   | 10    |
| 4    | 8¾   | 4½    |
| 6    | 12¾  | 12    |

6518 QUARTER BEND REDUCER



| Size   | A  | B  |
|--------|----|----|
| 2 x 1½ | 4  | 3¾ |
| 3 x 1½ | 5  | 4  |
| 3 x 2  | 5½ | 4½ |
| 4 x 1½ | 7  | 4½ |
| 4 x 2  | 7  | 5  |
| 4 x 3  | 7  | 5½ |
| 6 x 1½ | 9  | 5½ |
| 6 x 2  | 9  | 6  |
| 6 x 3  | 9  | 6½ |
| 6 x 4  | 9  | 8  |

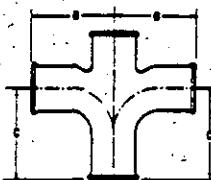
6521 SINGLE



SANITARY T

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 3½ | 3¾  |
| 2 x 1½  | 8  | 3¾ | 5   |
| 2 x 2   | 8  | 4½ | 5   |
| 3 x 1½  | 12 | 4½ | 7¾  |
| 3 x 2   | 12 | 5  | 7¾  |
| 3 x 3   | 12 | 6¾ | 7¾  |
| 4 x 1½  | 14 | 4½ | 8¾  |
| 4 x 2   | 14 | 5¾ | 8¾  |
| 4 x 3   | 14 | 7  | 8¾  |
| 4 x 4   | 14 | 8½ | 8¾  |
| 6 x 2   | 20 | 6¾ | 12¾ |
| 6 x 3   | 20 | 8  | 12¾ |
| 6 x 4   | 20 | 9¾ | 12¾ |
| 6 x 6   | 20 | 12 | 12¾ |

6522 DOUBLE

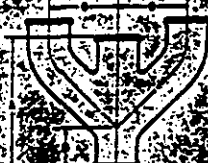


UPRIGHT Y OR H (van branch)

6532 SINGLE



6534 DOUBLE



| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 3¾ | 6¾  | 1½ |
| 2 x 1½  | 8  | 3¾ | 7¾  | 2½ |
| 2 x 2   | 8  | 4½ | 8¾  | 2½ |
| 3 x 1½  | 12 | 3¾ | 9¾  | 3½ |
| 3 x 2   | 12 | 4½ | 10¾ | 3½ |
| 3 x 3   | 12 | 6¾ | 11¾ | 3½ |
| 4 x 1½  | 14 | 4½ | 10¾ | 4½ |
| 4 x 2   | 14 | 5¾ | 11¾ | 4½ |
| 4 x 3   | 14 | 7  | 12¾ | 4½ |
| 4 x 4   | 14 | 8½ | 13¾ | 4½ |
| 6 x 2   | 20 | 6¾ | 16¾ | 5½ |
| 6 x 3   | 20 | 8  | 17¾ | 5½ |
| 6 x 4   | 20 | 9¾ | 18¾ | 5½ |
| 6 x 6   | 20 | 12 | 20¾ | 5½ |

\*Double, available in these sizes only.

\*\*\* dimension may be longer or shorter than A.

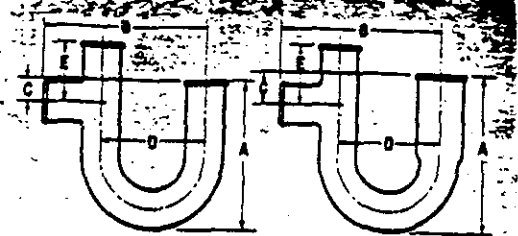
OWENS-ILLINOIS

Use catalog dimensions for piping layout as gasket thickness allowance is included.

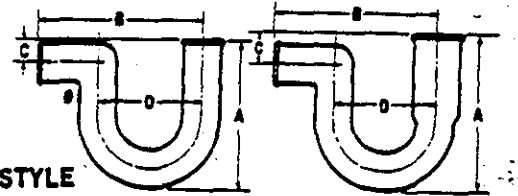
# KIMAX TEMPERED GLASS PRODUCTS

## Drainline PIPE AND FITTINGS

6713 (Vented)



6718

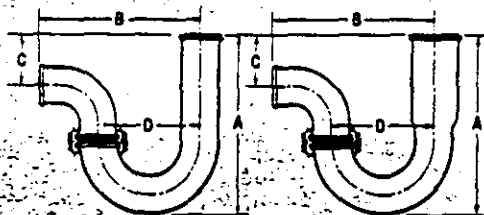


TRAP—P STYLE

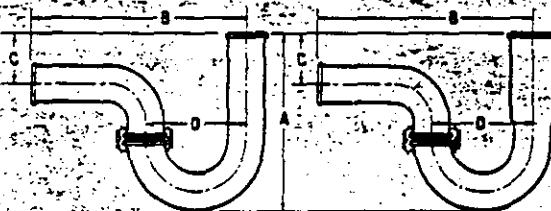
| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Seal<br>Depth |
|------------------------|--------------|-----|-----|----|----|----|---------------|
| 1½ x 1½                | 1½           | 7   | 8   | 1  | 5  | 3  | 3½            |
| 2 x 1½                 | 1½           | 7½  | 8   | 1½ | 5  | 3  | 3½            |
| 2 x 2                  | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | 3½            |
| 3 x 3                  | 3            | 10½ | 10½ | 2  | 6½ | 4  | 3½            |
| 4 x 4                  | 4            | 12½ | 12½ | 2½ | 7½ | 5  | 3½            |
| 6 x 6                  | 4            | 16¾ | 17  | 3½ | 10 | 7  | 3½            |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 11.

6700



6701



### Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 8  | 2½ | 5  | 3¾            |
| 2 x 1½                 | 8¾ | 8  | 2½ | 5  | 3¾            |
| 2 x 2                  | 9¼ | 8¾ | 1¾ | 5½ | 4¾            |

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 11 | 1¾ | 5  | 4¾            |
| 2 x 1½                 | 8¾ | 11 | 1¾ | 5  | 4¾            |
| 2 x 2                  | 9¼ | 13 | 1¾ | 5½ | 5¼            |

6704 (Plain End Outlet\*)

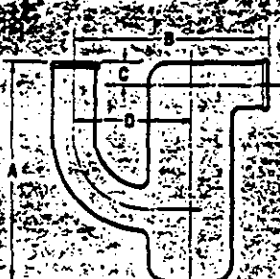


No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B   | C  | D  | Seal<br>Depth |
|------------------------|----|-----|----|----|---------------|
| 1½ x 1½                | 8¾ | 17  | 2½ | 5  | 3¾            |
| 2 x 1½                 | 8¾ | 17  | 2½ | 5  | 3¾            |
| 2 x 2                  | 9¼ | 17½ | 1¾ | 5½ | 4¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 11.  
\*Annoyed outlet, can be field cut.

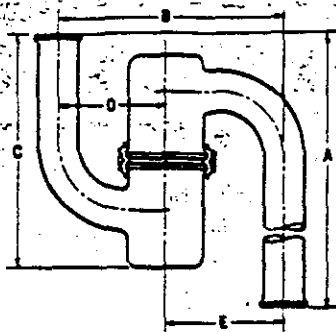
6707 DRUM TRAP—P STYLE



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. | Seal<br>Depth |
|------------------------|----|----|----|----|--------------|---------------|
| 1½ x 1½                | 9  | 8  | 1  | 4¾ | 3            | 3¾            |
| 2 x 1½                 | 9  | 8  | 1½ | 4¾ | 3            | 3¾            |
| 2 x 2                  | 9¾ | 9¾ | 2  | 5½ | 4            | 3¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts.

# 6712 SWIVEL DRUM TRAP—S STYLE



No. 6712 Swivel Drum Trap assembly consists of one No. 6715 inlet and one No. 6717 outlet with a No. 6650 KIMAX coupling at the swivel joint.

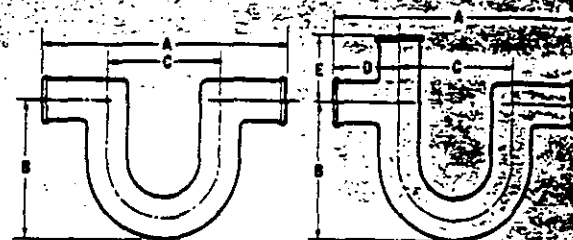
| Size<br>Inlet x Outlet | A   | B   | C   | D  | E  | Body<br>I.D. | Seal<br>Depth |
|------------------------|-----|-----|-----|----|----|--------------|---------------|
| 1½ x 1½                | 20¾ | 10  | 10¼ | 4¾ | 5¼ | 3            | 3¾            |
| 2 x 1½                 | 20¾ | 10  | 10¼ | 4¾ | 5¼ | 3            | 3¾            |
| 2 x 2                  | 20¾ | 11¼ | 11  | 5¼ | 5¾ | 4            | 3¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts.  
Annealed outlet, can be field cut.

# RUNNING TRAP

6770

6771 (Vented)

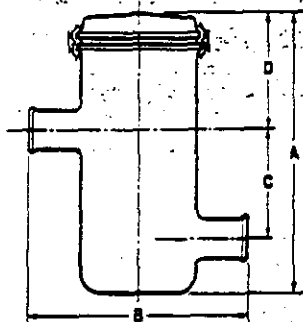


| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Seal<br>Depth |
|------------------------|--------------|-----|-----|----|----|----|---------------|
| 1½ x 1½                | 1½           | 11  | 6   | 5  | 3  | 3  | 3¾            |
| 2 x 2                  | 2            | 12  | 6¾  | 5½ | 3¾ | 3½ | 3¾            |
| 3 x 3                  | 3            | 14½ | 8¾  | 6¾ | 4  | 4  | 3¾            |
| 4 x 4                  | 4            | 17½ | 9¾  | 7¾ | 5  | 5  | 3¾            |
| *6 x 6                 | 4            | 24  | 12¾ | 10 | 7  | 7  | 3¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts.

# DRUM TRAP (top cleanout)

6576



TYPE A

TYPE B

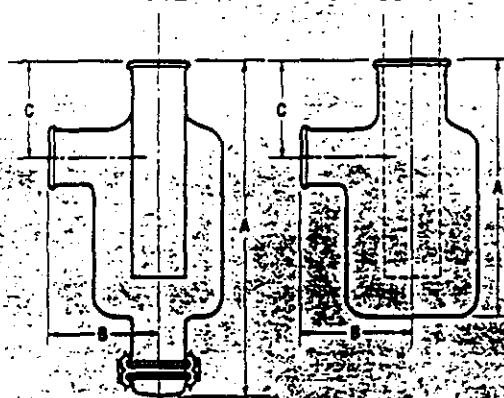
| Size<br>Inlet x Outlet | A   | B   | C  | D  | Body<br>I.D. | Seal<br>Depth |
|------------------------|-----|-----|----|----|--------------|---------------|
| *1½ x 1½               | 13¾ | 10¼ | 4¾ | 5¼ | 6            | 3             |

\*Special order

# PARTITION TRAP

6612

6614



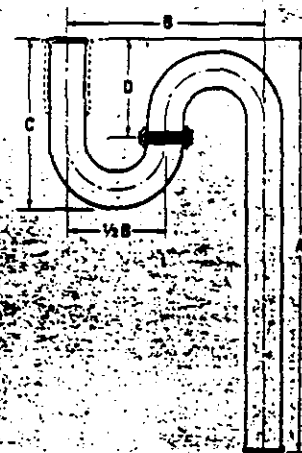
| Size<br>Inlet x Outlet | A   | B  | C  | Seal<br>Depth |
|------------------------|-----|----|----|---------------|
| 1½ x 1½                | 11¼ | 3¾ | 3¾ | 3¾            |
| 2 x 2                  | 12¼ | 5¼ | 4¼ | 3¾            |

| Size<br>Inlet x Outlet | A  | B  | C  |
|------------------------|----|----|----|
| 2 x 1½                 | 8¾ | 3¾ | 3¾ |

Both traps are non-siphoning with partition always visible.

# SWIVEL TRAP—S STYLE

6703



| Size<br>Inlet x Outlet | A   | B  | C  | D  | Seal<br>Depth |
|------------------------|-----|----|----|----|---------------|
| 1½ x 1½                | 20¾ | 10 | 8¾ | 5¾ | 4¾            |
| 2 x 1½                 | 20¾ | 10 | 8¾ | 5¾ | 4¾            |
| 2 x 2                  | 20¾ | 11 | 9¼ | 4¾ | 5¾            |

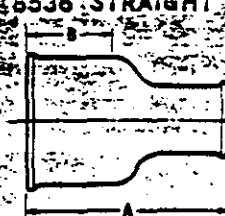
Traps available with either A or B type cleanout. See Standard Cleanouts.  
Annealed outlet, can be field cut.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

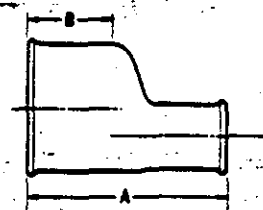
OWENS-ILLINOIS

# KIMAX TEMPERED GLASS PRODUCTS

## Drainline PIPE AND FITTINGS



6537 ECCENTRIC



6550 U BEND (vent loop)

### REDUCERS OR INCREASERS

| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1½       |
| 3 x 1½ | 5 | 2½       |
| 3 x 2  | 5 | 2½       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

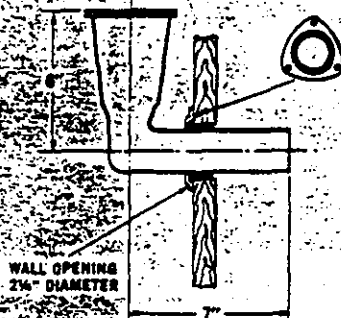
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

Notes: U bends (annealed only) are often used for vent loops. No. 6562 outlets on Swivel "S" Traps are also used as vent loops.

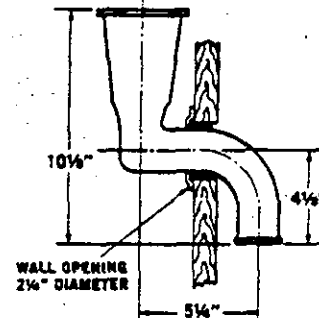
### CUP SINKS

Outside surface of cupsink bodies has an opaque white surface. No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length, (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1½) on outlet to connect to 2" expanded end traps or fittings.

### 6627 3" x 6" OVAL HORIZONTAL, 1½" PLAIN END OUTLET



### 6628 3" x 6" OVAL VERTICAL, 1½" OUTLET



### WALL MOUNTED CUP SINK

Horizontal Outlet  
No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7158 2" flange  
No. 7204 insert (2 x 1½)

Vertical Outlet  
No. 6628 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7158 2" flange  
No. 7204 insert (2 x 1½)

### 6617 BEADED OUTLET

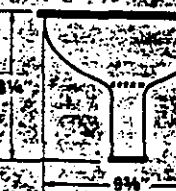


### 6617P PLAIN END OUTLET



### 6" HEMISPHERICAL

### 6618 BEADED OUTLET



### 6618P PLAIN END OUTLET



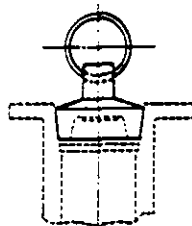
### 3" x 8" OVAL





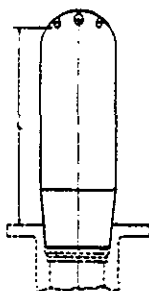
| Size | A  | B | C  | D  |
|------|----|---|----|----|
| 1½   | 3¾ | ¼ | 2¾ | 2  |
| 2    | 3¾ | ¼ | 3  | 2¾ |
| 3    | 4¾ | ½ | 3  | 3¾ |

## 6726 SINK STOPPER



No. 6726 Sink Stopper is available in 1½" and 2" size in lead; 3" size only in black fluorocarbon.

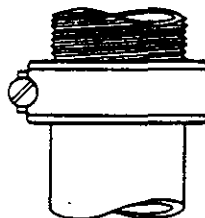
## 6727 SINK OVERFLOW (Beehive and Open Type)



Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" and 3" sink outlets only... 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length | Open Type Length |
|------------------|---------------------|------------------|
| 1½               | 4" 6" 8"            | — — —            |
| 2                | — — —               | 4" 6" 8"         |
| 3                | — — —               | 4" 6" 8"         |

## 6735 1½" SPLIT COUPLING (Threaded to Beaded Pipe)

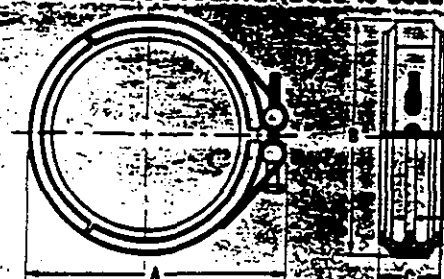


No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" metal pipe.

The assembly consists of:

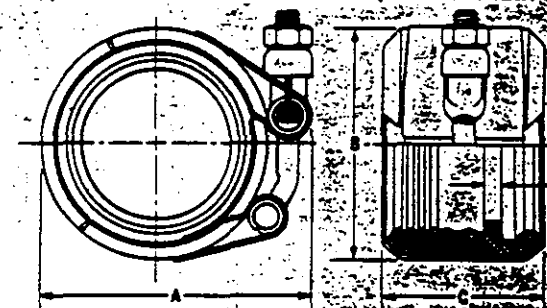
- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

To install... remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼—28 x 2½ |
| 2    | 3¾ | 3¾ | 1¾ | ¾ | ¼—28 x 2½ |
| 3    | 4¾ | 4¾ | 1¾ | ¾ | ¼—28 x 2½ |
| 4    | 6  | 5¾ | 1¾ | ¾ | ¼—28 x 3¾ |
| 6    | 8¾ | 7¾ | 1¾ | ¾ | ¼—28 x 6  |

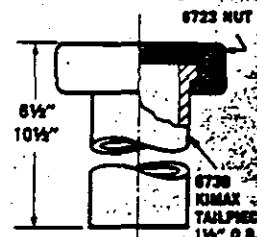
## 6661 B/P\* DRAINLINE COUPLING (Bead to Plain End)



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼—28      |
| 2    | 3¾ | 3¾ | 1¾ | ¾ | ¼—28      |
| 3    | 4¾ | 4¾ | 2  | ¾ | ¼—28      |

\*Patent Pending

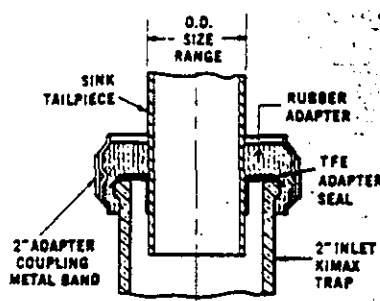
## 6728 1½" TAILPIECE ASSEMBLY



KIMAX tailpiece is available in 5¼" and 10¾" lengths. Specify length when ordering. This is annealed and can be field cut to exact length. Assembly No. 6728 consists of No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used with plastic or metal sink drains. Sink drains must be threaded. For a metal sink drain, use a metal gasket. No. 6738 between sink drain and gasket. Hand tighten coupling and tighten with wrench.

## 6655 ADAPTER COUPLING Patent Pending



No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to sink end sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt, ¼—28 x 2½

| Size   | Tailpiece Style                                                                                                                                                    | Notes       |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                              | 1/2" x 1/2" |
| 2 x 1¾ | Lead, Class D or XL tailpiece; PYREX tailpiece and cup sink                                                                                                        | 1/2" x 1/2" |
| 2 x 1¾ | Plain end KIMAX Regular, Schedule 40 or Heavy Schedule 1½ glass pipe or fittings; Duriron #SO-2 Duriron #11713 Lead—Class C or L, B or M Plastic or Steel (1½ IPS) | 1/2" x 1/2" |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

OWENS-ILLINOIS

# **KIMAX** BEADED GLASS PROCESS PIPE

Owens-Illinois has developed KIMAX Beaded Glass Pipe to specifically answer the need for a process piping system that will contribute a minimum of contamination to the product conveyed. KIMAX Beaded Process Pipe is made of durable Type 1 borosilicate glass.

## **RECOMMENDED USES**

KIMAX Beaded Glass Pipe is specially recommended for use in piping system applications for the transportation of materials such as distilled water, milk, or corrosive liquids in the food or chemical processing industries. It is specifically designed for use wherever the transfer of fluids demands a sanitary corrosion resistant or visually inspected system.

## **ADVANTAGES**

- Corrosion Resistant
- Transparent
- Can be field fabricated
- Lightweight
- Pressure and high temperature rated
- Economical . . . easily installed and modified

## **INSTALLATION**

**LAYOUT . . .** of KIMAX Beaded Glass Pipe is similar to that of any other piping material. No allowance for expansion is necessary.

**PIPE HANGING . . .** is similar to other glass pipe with hanger spacing every 8 or 10 feet.

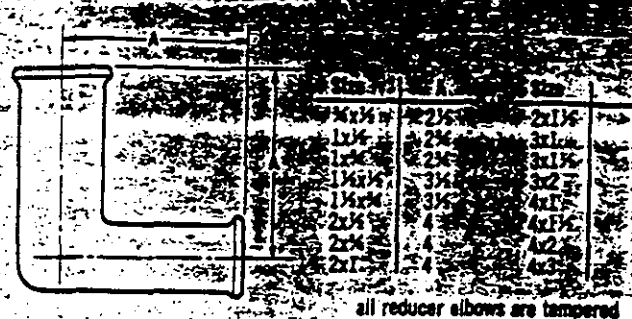
**NEW KIMAX COUPLINGS . . .** assures quick, simplified installation . . . positive seal joints. Developed specially for KIMAX Beaded Pipe which provides a positive compression, leak-proof seal.

For condensed listing of pipe, fittings, and accessories, turn to Page 13 and 14. For complete information, write for catalog on KIMAX Beaded Glass Pipe to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P. O. Box 1035, Toledo, Ohio 43601.

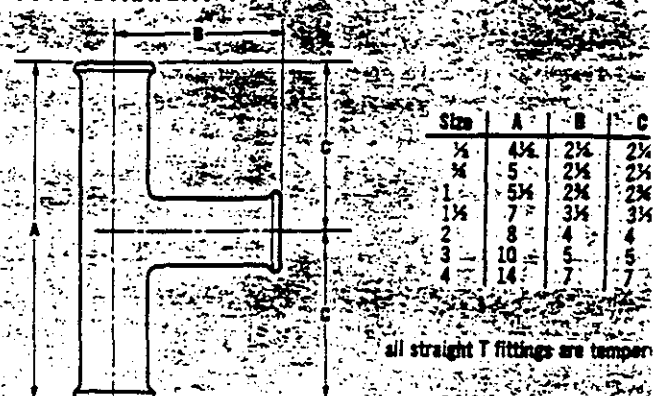
# I KIMAX TEMPERED GLASS PRODUCTS

**Beaded Glass  
Process Pipe  
PIPE AND FITTINGS**

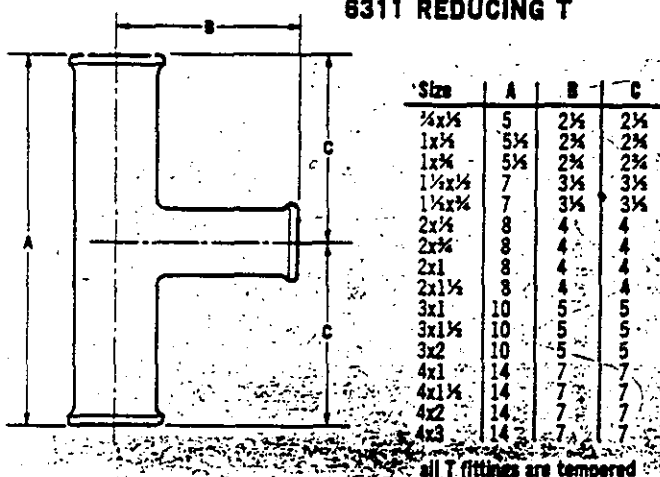
## 6302 REDUCER, ELBOW



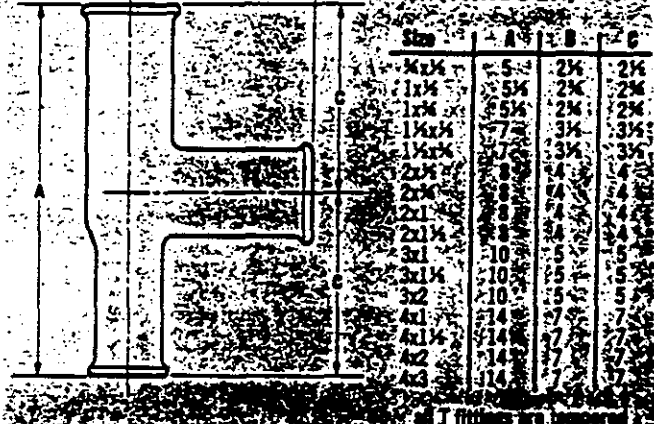
## 6310 STRAIGHT T



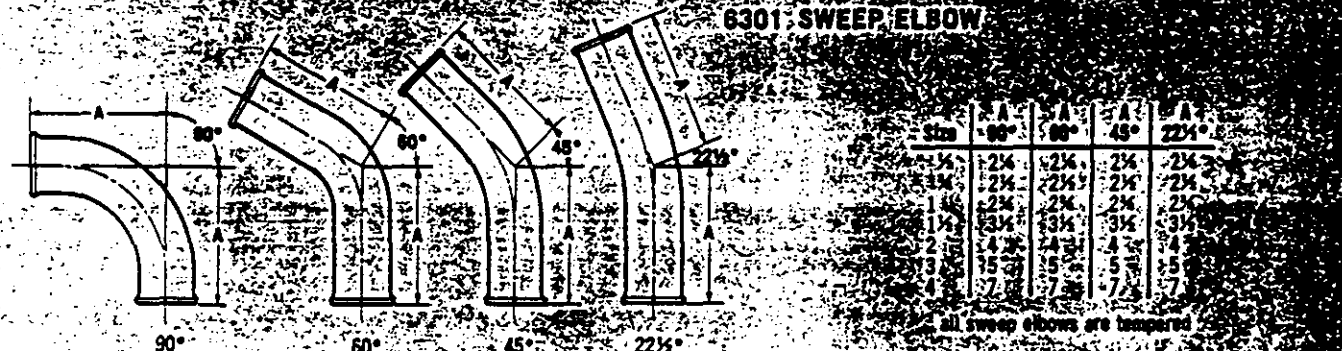
## 6311 REDUCING T



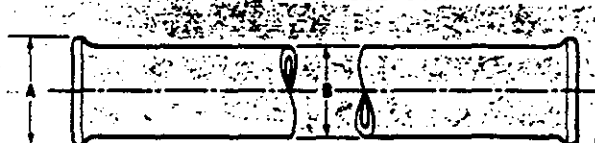
## 6312 REDUCING T (THROUGH)



## 6301 SWEEP ELBOW



## 6300 STRAIGHT LENGTHS



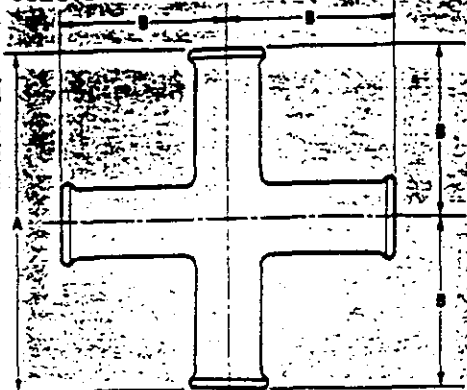
| Size  | A     | B     | C     |
|-------|-------|-------|-------|
| 1/4   | 2 1/4 | 2 1/4 | 2 1/4 |
| 1/2   | 2 1/4 | 2 1/4 | 2 1/4 |
| 3/4   | 2 1/4 | 2 1/4 | 2 1/4 |
| 1     | 2 1/4 | 2 1/4 | 2 1/4 |
| 1 1/4 | 2 1/4 | 2 1/4 | 2 1/4 |
| 1 1/2 | 2 1/4 | 2 1/4 | 2 1/4 |
| 2     | 2 1/4 | 2 1/4 | 2 1/4 |
| 2 1/2 | 2 1/4 | 2 1/4 | 2 1/4 |
| 3     | 2 1/4 | 2 1/4 | 2 1/4 |
| 3 1/2 | 2 1/4 | 2 1/4 | 2 1/4 |
| 4     | 2 1/4 | 2 1/4 | 2 1/4 |
| 4 1/2 | 2 1/4 | 2 1/4 | 2 1/4 |
| 5     | 2 1/4 | 2 1/4 | 2 1/4 |
| 5 1/2 | 2 1/4 | 2 1/4 | 2 1/4 |
| 6     | 2 1/4 | 2 1/4 | 2 1/4 |

Straight lengths are tempered on ends only and available from stock in lengths shown. Special straight lengths, factory beaded, available on order at slightly higher cost per foot of pipe. For 1 1/4" and larger pipe see KIMAX Process Pipe Catalog No. TR-99.

Special lengths are normally cut and beaded on the job by using a KIMAX BK-4 Beading Kit.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

# 6320 STRAIGHT CROSS



| Size  | A     | B     |
|-------|-------|-------|
| 1/4   | 4 1/2 | 2 1/2 |
| 1/2   | 5 1/2 | 2 1/2 |
| 3/4   | 5 1/2 | 2 1/2 |
| 1     | 7 1/2 | 3 1/2 |
| 1 1/4 | 8     | 4     |
| 2     | 10    | 5 1/2 |
| 3     | 14    | 7     |

all cross fittings are tempered

# STRAIGHT REDUCER ADAPTER

6315

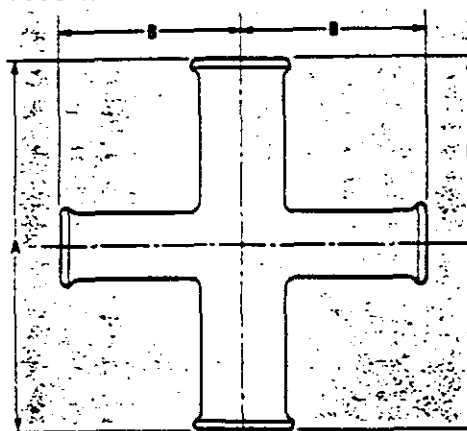
6368



| Size    | A |
|---------|---|
| 1/4-1/2 | 4 |
| 1/2-3/4 | 4 |
| 3/4-1   | 4 |
| 1-1 1/4 | 4 |
| 1 1/4-2 | 4 |
| 2-3     | 5 |
| 3-4     | 7 |

all reducer fittings are tempered

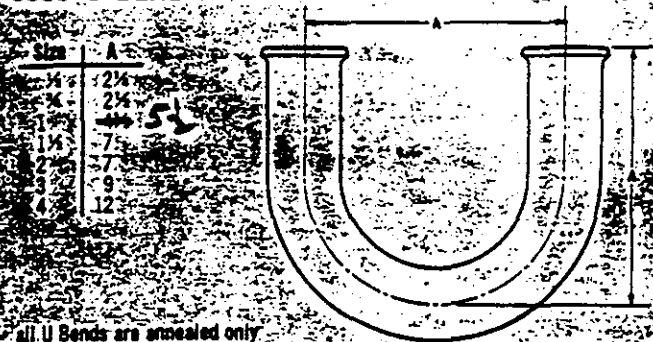
# 6350 REDUCER CROSS



| Size    | A     | B     |
|---------|-------|-------|
| 1/4-1/2 | 5 1/2 | 2 1/2 |
| 1/2-3/4 | 5 1/2 | 2 1/2 |
| 3/4-1   | 5 1/2 | 2 1/2 |
| 1-1 1/4 | 7 1/2 | 3 1/2 |
| 1 1/4-2 | 8     | 4     |
| 2-3     | 10    | 5 1/2 |
| 3-4     | 14    | 7     |

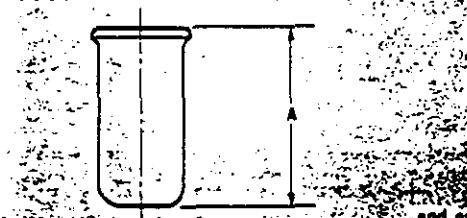
all cross fittings are tempered

# 6385 U BEND



all U Bends are annealed only

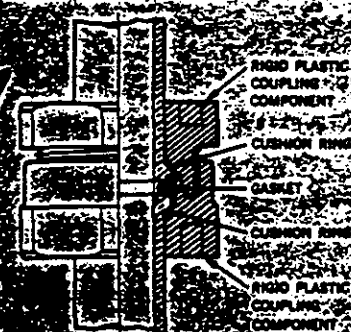
# 6336 END CAP



| Size  | A |
|-------|---|
| 1/4   | 2 |
| 1/2   | 2 |
| 3/4   | 2 |
| 1     | 2 |
| 1 1/4 | 2 |
| 2     | 2 |
| 3     | 2 |
| 4     | 2 |

end caps annealed only

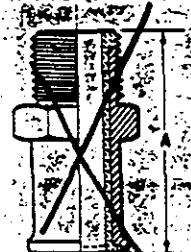
# 7300 COUPLING (For Pipe Sizes 1/2, 3/4, 1)



Of split nut design, the KIMAX all plastic coupling (patent applied for) assembly is complete with TFE gasket and moulded inserts. The coupling is rated at 100 PSI continuous service at 250°F.

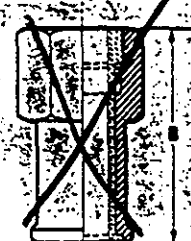
# ADAPTERS

## 7345 (Male Threaded)



Glass pipe to standard pipe thread adapter. This fitting is used to convert standard pipe thread to a glass bead. Available in male or female pipe thread style. Fittings are made of aluminum with TFE linings.

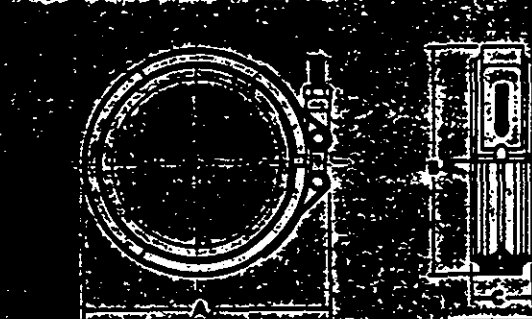
## 7346 (Female Threaded)



| Size | A     | B     |
|------|-------|-------|
| 1/4  | 2 1/2 | 2 1/2 |
| 1/2  | 2 1/2 | 2 1/2 |

all conical end adapters are tempered

# 7120 COUPLING (Banded)



For use in KIMAX 1/2, 3/4, 1, 1 1/4, 2, 3, and 4" KIMAX beaded pipe. Assembly consists of:  
 (7120) stainless steel band  
 with TFE (fluoropolymer) lining  
 (7121) hydrofluorocarbon elastomer pressure ring  
 O-Ring

| Size  | A     | B     | C     |
|-------|-------|-------|-------|
| 1/2   | 2 1/2 | 2 1/2 | 1 1/2 |
| 3/4   | 2 1/2 | 2 1/2 | 1 1/2 |
| 1     | 3 1/2 | 3 1/2 | 2 1/2 |
| 1 1/4 | 4 1/2 | 4 1/2 | 3 1/2 |
| 2     | 5 1/2 | 5 1/2 | 4 1/2 |

See KIMAX Process Pipe Catalog No. TR-99 for flanges to connect conical ends to standard KIMAX Process Pipe.

Contact your KIMAX Distributor for availability of 1/2" and 3/4" and couplings. Use catalog dimensions for piping layout as gasket thickness allowance is included.

# KIMAX TEMPERED GLASS CONICAL END PROCESS PIPE

## RECOMMENDED USES

KIMAX Glass Conical End Process Pipe has found wide application in a variety of industries. Some of the current users are chemical, food, dairy products, and pharmaceutical processors; textile, paper and pulp mills; photoengravers; aeronautical researchers and atomic energy plants.

## ADVANTAGES

**ADAPTABILITY** . . . readily joined to other materials including threaded pipe, straight tubing, beaded glass pipe, and glass lined steel.

**CORROSION RESISTANCE** . . . made of durable Type I borosilicate glass for maximum resistance to corrosion and scale build-up.

**DURABILITY** . . . all pipe ends and most fittings are tempered for maximum strength. Because of their shape, certain fittings cannot be tempered. Non-tempered items are stress relieved and are prominently marked so the installer may select the proper soft insert.

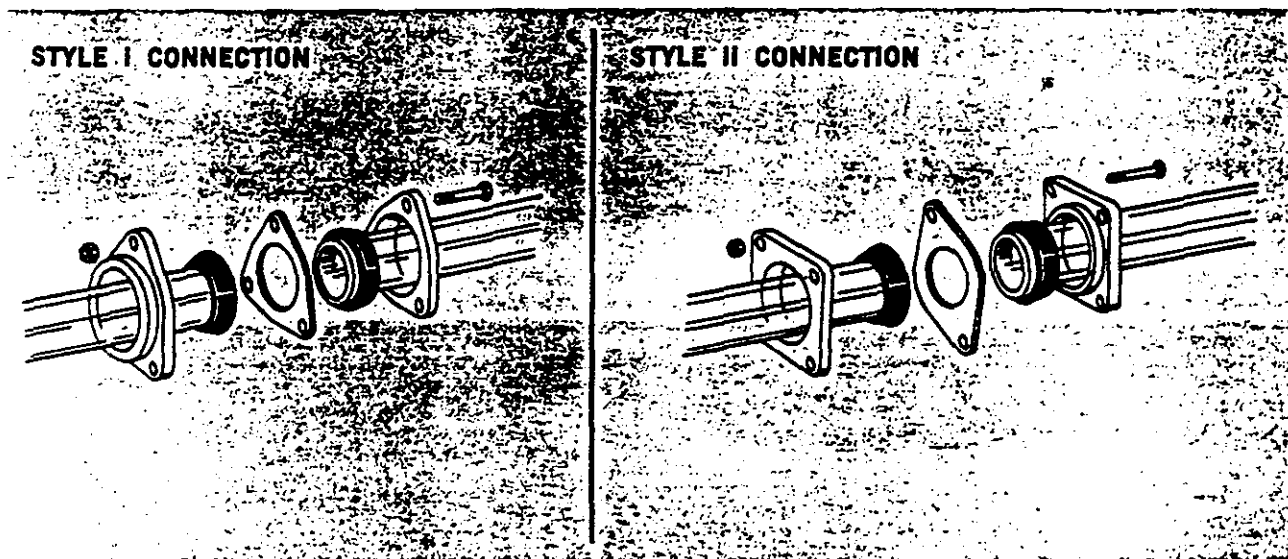
**ECONOMY** . . . Material is competitively priced . . . installation costs are low . . . maintenance costs negligible, and long service life of the total glass pipe system assured.

**LIGHTWEIGHT** . . . KIMAX Glass Process Pipe weighs less than other materials performing comparable functions. It requires fewer hangers; is easier to install.

**TRANSPARENCY** . . . is an aid in many processes such as inspection of dye lines and food lines, or wherever visual inspection is vital to product production or to the flow of liquids.

**PHYSICAL PROPERTIES** . . . See Physical and Chemical Properties Chart, Page 2.

For condensed listings of pipe, fittings and accessories, see Pages 16 thru 19. For complete KIMAX Process Pipe Catalog and/or Process Pipe Installation Manual, request same by writing to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P. O. Box 1035, Toledo, Ohio 43601.

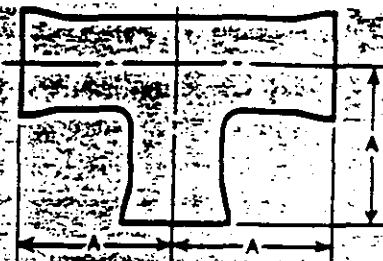




# KIMAX TEMPERED GLASS PRODUCTS

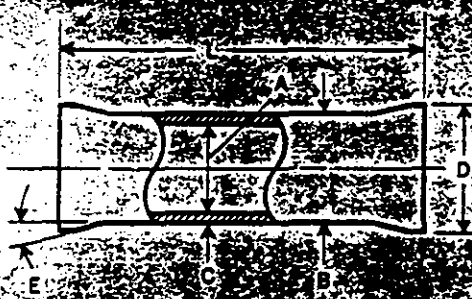
## Process Pipe PIPE AND FITTINGS

### 6210 TEES



| Pipe Size<br>(Inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 1/4            |
| 1 1/4                 | 3 1/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

### 6100 STRAIGHT LENGTHS

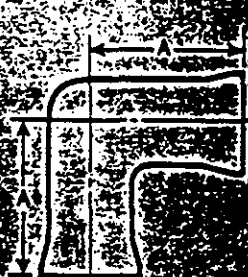


Standard lengths in all diameters are 6", 12", 18", 24", 30", 48", 60", 72", 84", 96", 108", and 120". Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is ± 1/8".

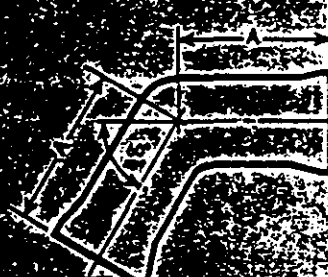
| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall<br>Thickness | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs./Ft. | Ps<br>Eccom.<br>Pressure |
|-------------------------------|-------------------|------------------------|---------------------|----------------------|---------------------|--------------------|--------------------------|
| 1"                            | 1.313"            | .156"                  | 2 1/4"              | 12°                  | 3"                  | .60                | 55                       |
| 1 1/4"                        | 1.844"            | .172"                  | 3 1/4"              | 12°                  | 3 1/4"              | 1.0                | 55                       |
| 2"                            | 2.344"            | .172"                  | 4 1/4"              | 12°                  | 4"                  | 1.13               | 55                       |
| 3"                            | 3.408"            | .203"                  | 6 1/4"              | 12°                  | 5 1/2"              | 2.0                | 55                       |
| 4"                            | 4.530"            | .263"                  | 8 1/4"              | 21°                  | 6"                  | 3.4                | 35                       |
| 6"                            | 6.656"            | .328"                  | 12 1/4"             | 21°                  | 6"                  | 5.3                | 20                       |

When ordering, specify pipe I.D. and length in inches.

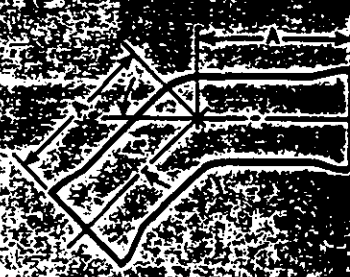
### 6201 ELBOWS



90° ELBOWS



60° ELBOWS

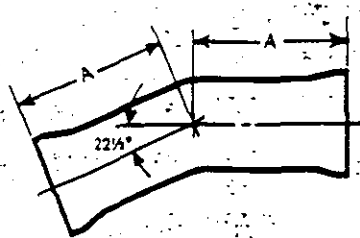


45° ELBOWS

| Pipe Size<br>(Inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 1/4            |
| 1 1/4                 | 3 1/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

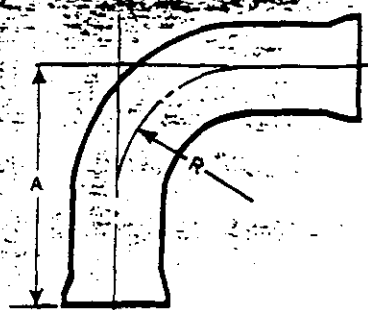
When ordering, specify degree of angle.





### 6201 22 1/2° ELBOWS

| Pipe Size<br>(inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 3/4            |
| 1 1/2                 | 3 3/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

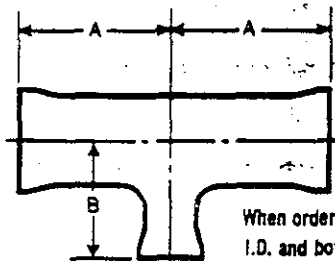


### 6239 SWEEP ELBOWS

| Pipe Size<br>(inches) | A<br>(± 1/8 in.) | R<br>(± 1/4 in.) |
|-----------------------|------------------|------------------|
| 1                     | 4 3/4            | 2 3/4            |
| 1 1/2                 | 5                | 3 3/4            |
| 2                     | 6                | 3 3/4            |
| 3                     | 7                | 4 1/4            |
| 4                     | 10               | 6                |

When ordering, specify degree of angle.

### 6211 REDUCING TEES

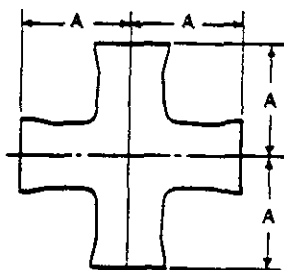


When ordering, specify pipe I.D. and bottom leg I.D.

| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|-----------------------|------------------------|------------------|------------------|
| 1 1/2                 | 1                      | 3 3/4            | 3                |
| 2                     | 1                      | 4                | 3                |
| 2                     | 1 1/2                  | 4                | 3 3/4            |
| 3                     | 1                      | 5                | 3 3/4            |
| 3                     | 1 1/2                  | 5                | 4                |
| 3                     | 2                      | 5                | 4 1/4            |
| 4                     | 1                      | 7                | 4                |
| 4                     | 1 1/2                  | 7                | 4 1/4            |
| 4                     | 2                      | 7                | 5                |
| 4                     | 3                      | 7                | 5 1/4            |
| 6                     | 1                      | 9                | 5                |
| 6                     | 1 1/2                  | 9                | 5 1/4            |
| 6                     | 2                      | 9                | 6                |
| 6                     | 3                      | 9                | 6 1/4            |
| 6                     | 4                      | 9                | 8                |

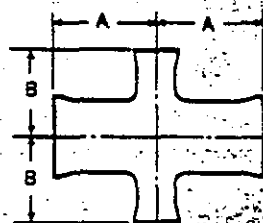
Other reduction combinations are available on special order to customer's specifications.

### 6220 CROSSES



| Pipe Size<br>(inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 3/4            |
| 1 1/2                 | 3 3/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

### 6250 REDUCER CROSSES



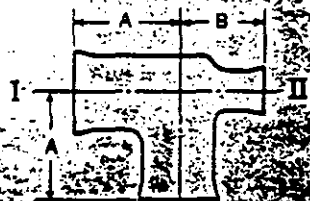
| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|-----------------------|-------------------------|------------------|------------------|
| 1 1/2                 | 1                       | 3 3/4            | 3                |
| 2                     | 1                       | 4                | 3                |
| 2                     | 1 1/2                   | 4                | 3 3/4            |
| 3                     | 1                       | 5                | 3 3/4            |
| 3                     | 1 1/2                   | 5                | 4                |
| 3                     | 2                       | 5                | 4 1/4            |
| 4                     | 1                       | 7                | 4                |
| 4                     | 1 1/2                   | 7                | 4 1/4            |
| 4                     | 2                       | 7                | 5                |
| 4                     | 3                       | 7                | 5 1/4            |
| 6                     | 1                       | 9                | 5                |
| 6                     | 1 1/2                   | 9                | 5 1/4            |
| 6                     | 2                       | 9                | 6                |
| 6                     | 3                       | 9                | 6 1/4            |
| 6                     | 4                       | 9                | 8                |

Other reduction combinations are available on special order to customer's specifications.

When ordering, specify I.D. of pipe and branch.

### 6212 REDUCER TEES

When ordering, specify pipe I.D. in this order; I, II, and III.



| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|----------------------------|-----------------------------|------------------------------|------------------|------------------|
| 1 1/2                      | 1                           | 1 1/2                        | 3 3/4            | 3                |
| 2                          | 1                           | 2                            | 4                | 3                |
| 2                          | 1 1/2                       | 2                            | 4                | 3 3/4            |
| 3                          | 1                           | 3                            | 5                | 3 3/4            |
| 3                          | 1 1/2                       | 3                            | 5                | 4                |
| 3                          | 2                           | 3                            | 5                | 4 1/4            |
| 4                          | 1                           | 4                            | 7                | 4                |
| 4                          | 1 1/2                       | 4                            | 7                | 4 1/4            |
| 4                          | 2                           | 4                            | 7                | 5                |
| 4                          | 3                           | 4                            | 7                | 5 1/4            |
| 6                          | 1                           | 6                            | 9                | 5                |
| 6                          | 1 1/2                       | 6                            | 9                | 5 1/4            |
| 6                          | 2                           | 6                            | 9                | 6                |
| 6                          | 3                           | 6                            | 9                | 6 1/4            |
| 6                          | 4                           | 6                            | 9                | 8                |

Other reduction combinations are available on special order to customer's specifications.

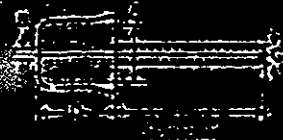
Use catalog dimensions for pipe layout as gasket thickness allowance is included



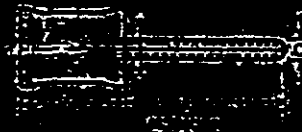
# KIMAX TEMPERED GLASS PRODUCTS

## Process Pipe PIPE AND FITTINGS

### THERMOMETER WELLS (Annealed)



**6292  
SINGLE BEND**



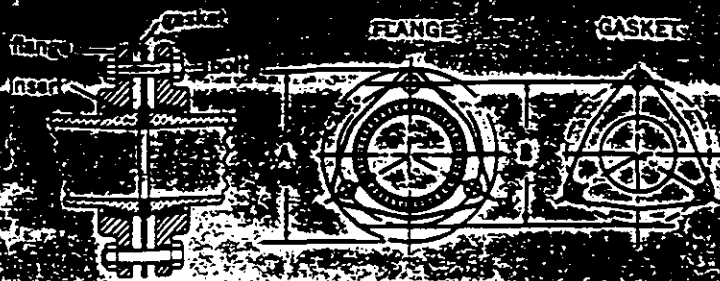
**6295  
DOUBLE BEND**

Use soft strip asbestos inserts (7202) only, with this fitting.

Standard lengths are 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, 156, 162, 168, 174, 180, 186, 192, 198, 204, 210, 216, 222, 228, 234, 240, 246, 252, 258, 264, 270, 276, 282, 288, 294, 300, 306, 312, 318, 324, 330, 336, 342, 348, 354, 360, 366, 372, 378, 384, 390, 396, 402, 408, 414, 420, 426, 432, 438, 444, 450, 456, 462, 468, 474, 480, 486, 492, 498, 504, 510, 516, 522, 528, 534, 540, 546, 552, 558, 564, 570, 576, 582, 588, 594, 600, 606, 612, 618, 624, 630, 636, 642, 648, 654, 660, 666, 672, 678, 684, 690, 696, 702, 708, 714, 720, 726, 732, 738, 744, 750, 756, 762, 768, 774, 780, 786, 792, 798, 804, 810, 816, 822, 828, 834, 840, 846, 852, 858, 864, 870, 876, 882, 888, 894, 900, 906, 912, 918, 924, 930, 936, 942, 948, 954, 960, 966, 972, 978, 984, 990, 996, 1002, 1008, 1014, 1020, 1026, 1032, 1038, 1044, 1050, 1056, 1062, 1068, 1074, 1080, 1086, 1092, 1098, 1104, 1110, 1116, 1122, 1128, 1134, 1140, 1146, 1152, 1158, 1164, 1170, 1176, 1182, 1188, 1194, 1200, 1206, 1212, 1218, 1224, 1230, 1236, 1242, 1248, 1254, 1260, 1266, 1272, 1278, 1284, 1290, 1296, 1302, 1308, 1314, 1320, 1326, 1332, 1338, 1344, 1350, 1356, 1362, 1368, 1374, 1380, 1386, 1392, 1398, 1404, 1410, 1416, 1422, 1428, 1434, 1440, 1446, 1452, 1458, 1464, 1470, 1476, 1482, 1488, 1494, 1500, 1506, 1512, 1518, 1524, 1530, 1536, 1542, 1548, 1554, 1560, 1566, 1572, 1578, 1584, 1590, 1596, 1602, 1608, 1614, 1620, 1626, 1632, 1638, 1644, 1650, 1656, 1662, 1668, 1674, 1680, 1686, 1692, 1698, 1704, 1710, 1716, 1722, 1728, 1734, 1740, 1746, 1752, 1758, 1764, 1770, 1776, 1782, 1788, 1794, 1800, 1806, 1812, 1818, 1824, 1830, 1836, 1842, 1848, 1854, 1860, 1866, 1872, 1878, 1884, 1890, 1896, 1902, 1908, 1914, 1920, 1926, 1932, 1938, 1944, 1950, 1956, 1962, 1968, 1974, 1980, 1986, 1992, 1998, 2004, 2010, 2016, 2022, 2028, 2034, 2040, 2046, 2052, 2058, 2064, 2070, 2076, 2082, 2088, 2094, 2100, 2106, 2112, 2118, 2124, 2130, 2136, 2142, 2148, 2154, 2160, 2166, 2172, 2178, 2184, 2190, 2196, 2202, 2208, 2214, 2220, 2226, 2232, 2238, 2244, 2250, 2256, 2262, 2268, 2274, 2280, 2286, 2292, 2298, 2304, 2310, 2316, 2322, 2328, 2334, 2340, 2346, 2352, 2358, 2364, 2370, 2376, 2382, 2388, 2394, 2400, 2406, 2412, 2418, 2424, 2430, 2436, 2442, 2448, 2454, 2460, 2466, 2472, 2478, 2484, 2490, 2496, 2502, 2508, 2514, 2520, 2526, 2532, 2538, 2544, 2550, 2556, 2562, 2568, 2574, 2580, 2586, 2592, 2598, 2604, 2610, 2616, 2622, 2628, 2634, 2640, 2646, 2652, 2658, 2664, 2670, 2676, 2682, 2688, 2694, 2700, 2706, 2712, 2718, 2724, 2730, 2736, 2742, 2748, 2754, 2760, 2766, 2772, 2778, 2784, 2790, 2796, 2802, 2808, 2814, 2820, 2826, 2832, 2838, 2844, 2850, 2856, 2862, 2868, 2874, 2880, 2886, 2892, 2898, 2904, 2910, 2916, 2922, 2928, 2934, 2940, 2946, 2952, 2958, 2964, 2970, 2976, 2982, 2988, 2994, 3000, 3006, 3012, 3018, 3024, 3030, 3036, 3042, 3048, 3054, 3060, 3066, 3072, 3078, 3084, 3090, 3096, 3102, 3108, 3114, 3120, 3126, 3132, 3138, 3144, 3150, 3156, 3162, 3168, 3174, 3180, 3186, 3192, 3198, 3204, 3210, 3216, 3222, 3228, 3234, 3240, 3246, 3252, 3258, 3264, 3270, 3276, 3282, 3288, 3294, 3300, 3306, 3312, 3318, 3324, 3330, 3336, 3342, 3348, 3354, 3360, 3366, 3372, 3378, 3384, 3390, 3396, 3402, 3408, 3414, 3420, 3426, 3432, 3438, 3444, 3450, 3456, 3462, 3468, 3474, 3480, 3486, 3492, 3498, 3504, 3510, 3516, 3522, 3528, 3534, 3540, 3546, 3552, 3558, 3564, 3570, 3576, 3582, 3588, 3594, 3600, 3606, 3612, 3618, 3624, 3630, 3636, 3642, 3648, 3654, 3660, 3666, 3672, 3678, 3684, 3690, 3696, 3702, 3708, 3714, 3720, 3726, 3732, 3738, 3744, 3750, 3756, 3762, 3768, 3774, 3780, 3786, 3792, 3798, 3804, 3810, 3816, 3822, 3828, 3834, 3840, 3846, 3852, 3858, 3864, 3870, 3876, 3882, 3888, 3894, 3900, 3906, 3912, 3918, 3924, 3930, 3936, 3942, 3948, 3954, 3960, 3966, 3972, 3978, 3984, 3990, 3996, 4002, 4008, 4014, 4020, 4026, 4032, 4038, 4044, 4050, 4056, 4062, 4068, 4074, 4080, 4086, 4092, 4098, 4104, 4110, 4116, 4122, 4128, 4134, 4140, 4146, 4152, 4158, 4164, 4170, 4176, 4182, 4188, 4194, 4200, 4206, 4212, 4218, 4224, 4230, 4236, 4242, 4248, 4254, 4260, 4266, 4272, 4278, 4284, 4290, 4296, 4302, 4308, 4314, 4320, 4326, 4332, 4338, 4344, 4350, 4356, 4362, 4368, 4374, 4380, 4386, 4392, 4398, 4404, 4410, 4416, 4422, 4428, 4434, 4440, 4446, 4452, 4458, 4464, 4470, 4476, 4482, 4488, 4494, 4500, 4506, 4512, 4518, 4524, 4530, 4536, 4542, 4548, 4554, 4560, 4566, 4572, 4578, 4584, 4590, 4596, 4602, 4608, 4614, 4620, 4626, 4632, 4638, 4644, 4650, 4656, 4662, 4668, 4674, 4680, 4686, 4692, 4698, 4704, 4710, 4716, 4722, 4728, 4734, 4740, 4746, 4752, 4758, 4764, 4770, 4776, 4782, 4788, 4794, 4800, 4806, 4812, 4818, 4824, 4830, 4836, 4842, 4848, 4854, 4860, 4866, 4872, 4878, 4884, 4890, 4896, 4902, 4908, 4914, 4920, 4926, 4932, 4938, 4944, 4950, 4956, 4962, 4968, 4974, 4980, 4986, 4992, 4998, 5004, 5010, 5016, 5022, 5028, 5034, 5040, 5046, 5052, 5058, 5064, 5070, 5076, 5082, 5088, 5094, 5100, 5106, 5112, 5118, 5124, 5130, 5136, 5142, 5148, 5154, 5160, 5166, 5172, 5178, 5184, 5190, 5196, 5202, 5208, 5214, 5220, 5226, 5232, 5238, 5244, 5250, 5256, 5262, 5268, 5274, 5280, 5286, 5292, 5298, 5304, 5310, 5316, 5322, 5328, 5334, 5340, 5346, 5352, 5358, 5364, 5370, 5376, 5382, 5388, 5394, 5400, 5406, 5412, 5418, 5424, 5430, 5436, 5442, 5448, 5454, 5460, 5466, 5472, 5478, 5484, 5490, 5496, 5502, 5508, 5514, 5520, 5526, 5532, 5538, 5544, 5550, 5556, 5562, 5568, 5574, 5580, 5586, 5592, 5598, 5604, 5610, 5616, 5622, 5628, 5634, 5640, 5646, 5652, 5658, 5664, 5670, 5676, 5682, 5688, 5694, 5700, 5706, 5712, 5718, 5724, 5730, 5736, 5742, 5748, 5754, 5760, 5766, 5772, 5778, 5784, 5790, 5796, 5802, 5808, 5814, 5820, 5826, 5832, 5838, 5844, 5850, 5856, 5862, 5868, 5874, 5880, 5886, 5892, 5898, 5904, 5910, 5916, 5922, 5928, 5934, 5940, 5946, 5952, 5958, 5964, 5970, 5976, 5982, 5988, 5994, 6000, 6006, 6012, 6018, 6024, 6030, 6036, 6042, 6048, 6054, 6060, 6066, 6072, 6078, 6084, 6090, 6096, 6102, 6108, 6114, 6120, 6126, 6132, 6138, 6144, 6150, 6156, 6162, 6168, 6174, 6180, 6186, 6192, 6198, 6204, 6210, 6216, 6222, 6228, 6234, 6240, 6246, 6252, 6258, 6264, 6270, 6276, 6282, 6288, 6294, 6300, 6306, 6312, 6318, 6324, 6330, 6336, 6342, 6348, 6354, 6360, 6366, 6372, 6378, 6384, 6390, 6396, 6402, 6408, 6414, 6420, 6426, 6432, 6438, 6444, 6450, 6456, 6462, 6468, 6474, 6480, 6486, 6492, 6498, 6504, 6510, 6516, 6522, 6528, 6534, 6540, 6546, 6552, 6558, 6564, 6570, 6576, 6582, 6588, 6594, 6600, 6606, 6612, 6618, 6624, 6630, 6636, 6642, 6648, 6654, 6660, 6666, 6672, 6678, 6684, 6690, 6696, 6702, 6708, 6714, 6720, 6726, 6732, 6738, 6744, 6750, 6756, 6762, 6768, 6774, 6780, 6786, 6792, 6798, 6804, 6810, 6816, 6822, 6828, 6834, 6840, 6846, 6852, 6858, 6864, 6870, 6876, 6882, 6888, 6894, 6900, 6906, 6912, 6918, 6924, 6930, 6936, 6942, 6948, 6954, 6960, 6966, 6972, 6978, 6984, 6990, 6996, 7002, 7008, 7014, 7020, 7026, 7032, 7038, 7044, 7050, 7056, 7062, 7068, 7074, 7080, 7086, 7092, 7098, 7104, 7110, 7116, 7122, 7128, 7134, 7140, 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# FLANGES, GASKETS AND ACCESSORIES

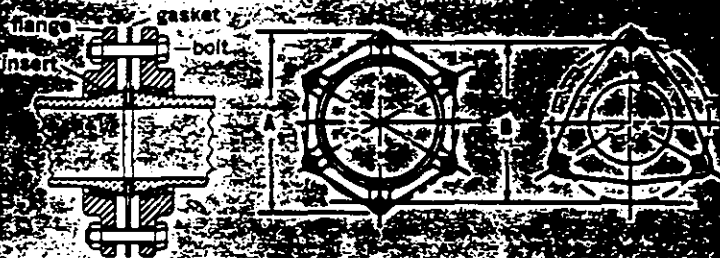


FLANGE SET NO. 7100, 1 1/2\"/>

STYLE I Aluminum Set contains the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 3—7180 Aluminum Bolts and Nuts

| Pipe Size | A     | B     | C     |
|-----------|-------|-------|-------|
| 1 1/2     | 3 1/2 | 2 1/2 | 1 1/2 |
| 2         | 4 1/2 | 3 1/2 | 2 1/2 |

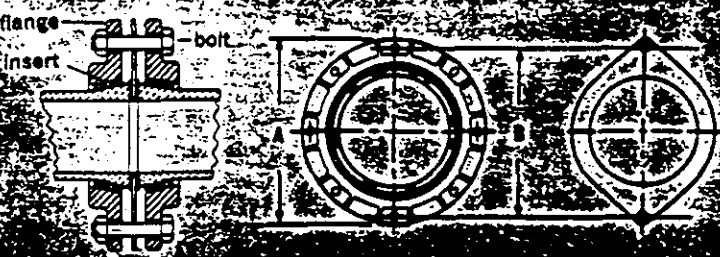


FLANGE SET NO. 7100, 2\"/>

STYLE I Aluminum Set contains the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 6—7180 Aluminum Bolts and Nuts

| Pipe Size | A | B     | C     |
|-----------|---|-------|-------|
| 2         | 6 | 5 1/2 | 3 1/2 |



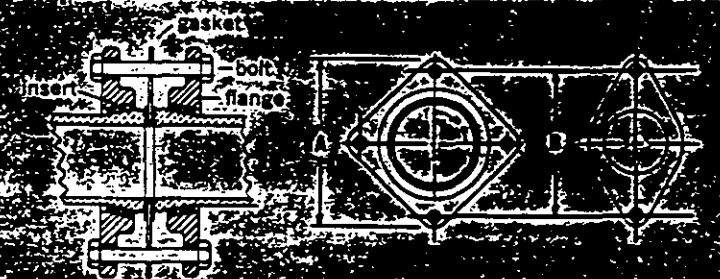
FLANGE SET NO. 7100, 4\"/>

STYLE I Aluminum Set contains the following components:

- 2—7151 Aluminum Outer Flanges
- 2—7153 Aluminum Inner Rings with 7202 Insert concentrically placed
- 8—7180 Aluminum Bolts and Nuts

| Pipe Size | A      | B     | C     |
|-----------|--------|-------|-------|
| 4         | 10 1/2 | 7 1/2 | 5 1/2 |
| 6         | 10 1/2 | 7 1/2 | 5 1/2 |

May be ordered separately: 7151 Outer Flange and 7153 Inner Ring.

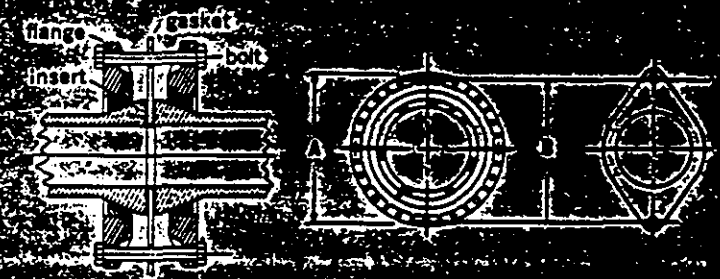


FLANGE SET NO. 7100, 1 1/2\"/>

STYLE II Cast Iron Flange and Centering Bolt Gasket

- 2—7155 Cast Iron Flanges
- 2—7200 Neoprene Asbestos Inserts
- 4—7190 Steel Bolts and Nuts

| Pipe Size | A     | B     | C     |
|-----------|-------|-------|-------|
| 1 1/2     | 3 1/2 | 2 1/2 | 1 1/2 |
| 2         | 4 1/2 | 3 1/2 | 2 1/2 |



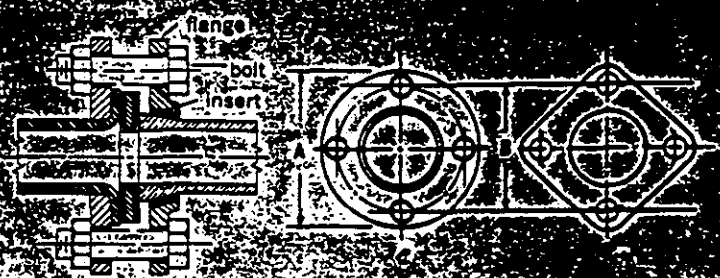
FLANGE SET NO. 7100, 2\"/>

STYLE II Cast Iron Flange and Centering Bolt Gasket

- 2—7155 Cast Iron Flanges
- 2—7200 Neoprene Asbestos Inserts
- 4—7190 Steel Bolts and Nuts

| Pipe Size | A | B     | C     |
|-----------|---|-------|-------|
| 2         | 6 | 5 1/2 | 3 1/2 |

May be ordered separately: 7155 Outer Flange and 7190 Inner Ring.

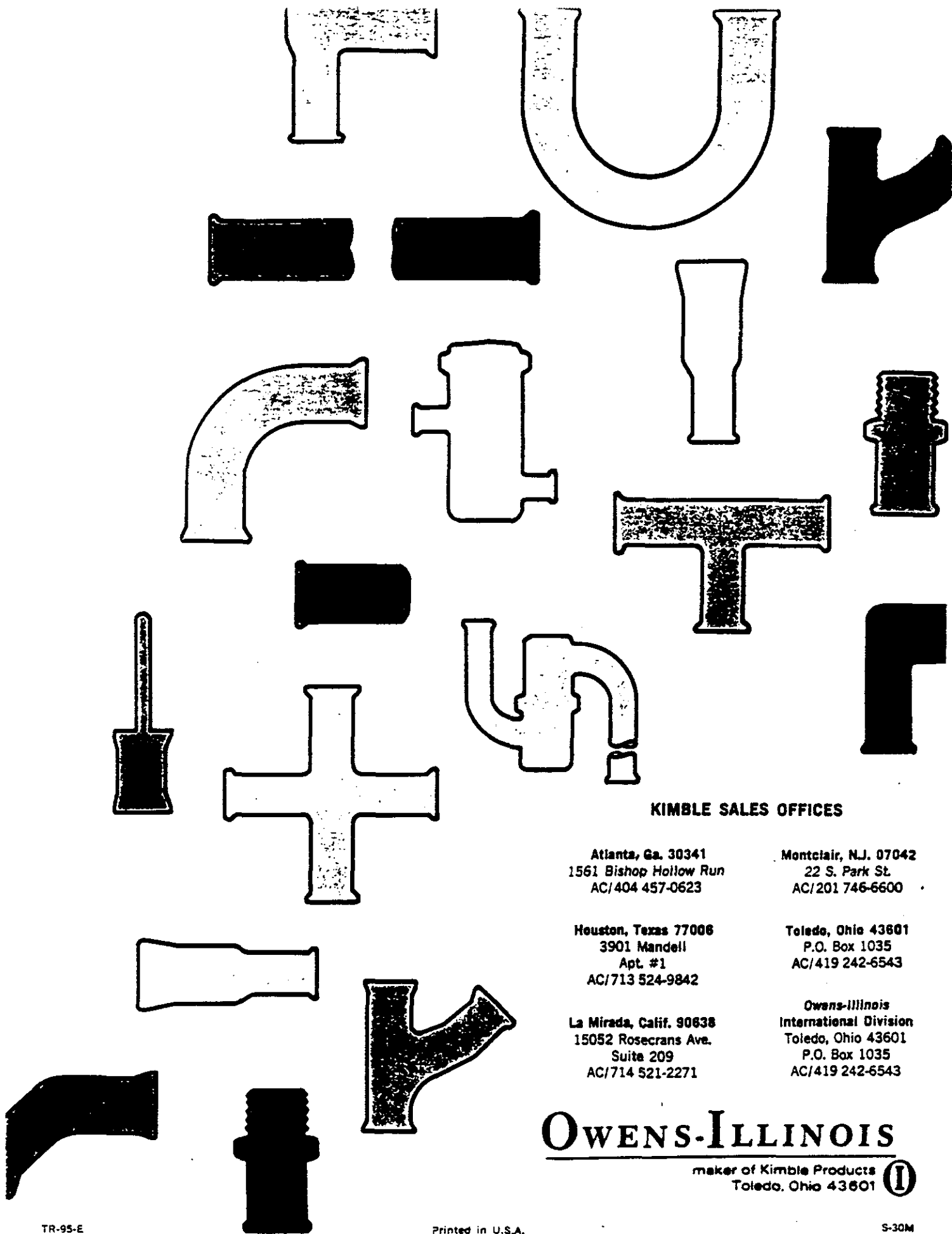


ASME ADAPTER FLANGE NO. 7110, 1 1/2\"/>

ASME Flange and Centering Bolt Gasket

- 2—7202 Stripped Centering Bolt Gaskets
- 2—7203 Milled Centering Bolt Gaskets

| Pipe Size | A     | B     | C     |
|-----------|-------|-------|-------|
| 1 1/2     | 3 1/2 | 2 1/2 | 1 1/2 |
| 2         | 4 1/2 | 3 1/2 | 2 1/2 |



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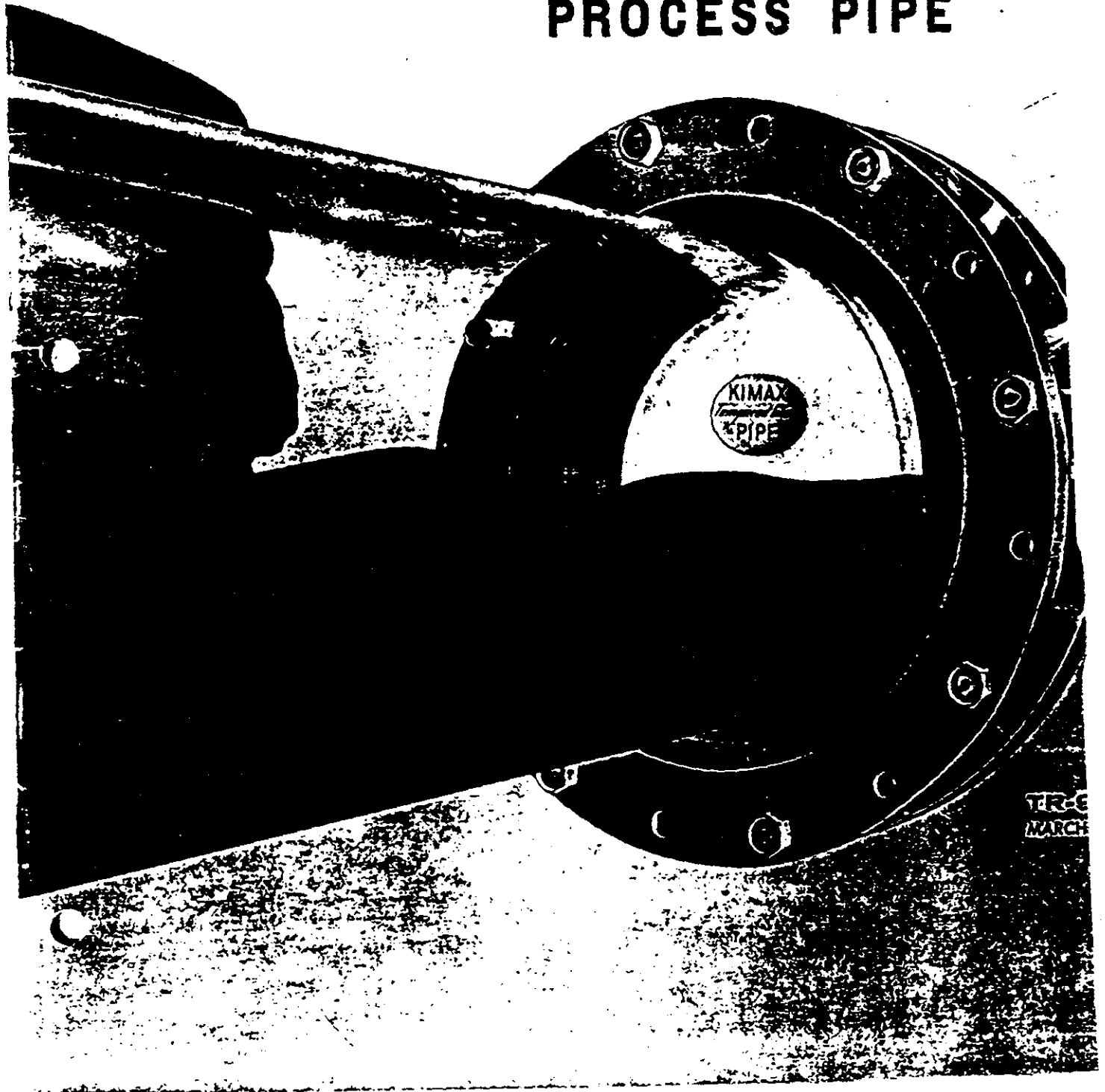
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**OWENS-ILLINOIS**

**KIMAX<sup>®</sup>**

**tempered glass**

**PROCESS PIPE**





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KIMAX Tempered Glass Pipe is manufactured and  
sold by the Consumer and Technical Products Division.

# KIMAX<sup>®</sup> *Tempered Glass* PIPE

This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from other causes, Owens-Illinois will, in full discharge of its warranty, replace such pipe at no charge.

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## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

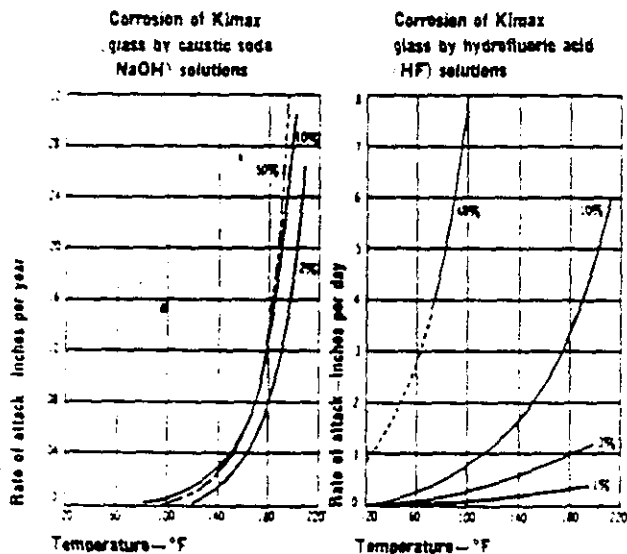
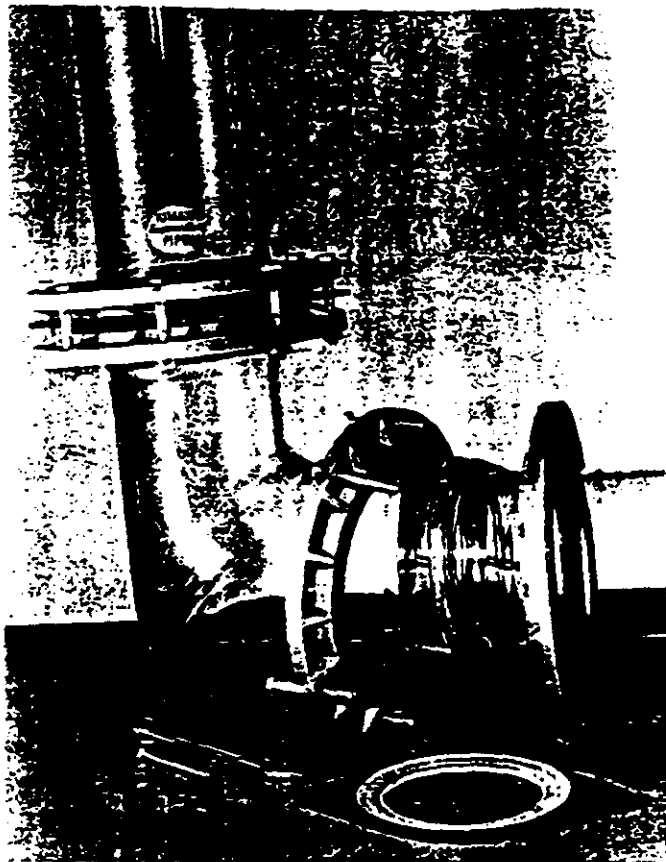
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids; SO<sub>2</sub> vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

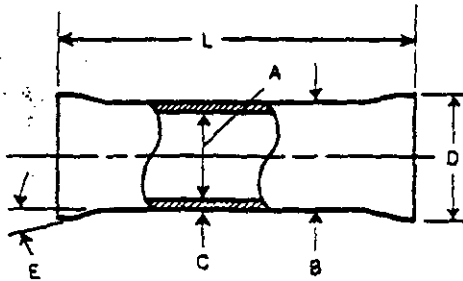
**Economy** is inherent in KIMAX glass pipe systems. Material is competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.

# KIMAX GLASS PIPE AND FITTINGS

## STRAIGHT LENGTHS 6100

Standard lengths in all diameters are 6": 12": 18": 24": 30": 48": 60": 72": 84": 96": 108": and 120".

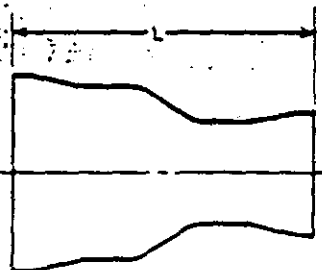
Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is  $\pm \frac{1}{32}$ ".



| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs./Ft. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | .156"     | 1 1/8"              | 12°                  | 3"                  | .60                | 55                        |
| 1 1/2"                        | 1.844"            | .172"     | 2 1/4"              | 12°                  | 3 1/2"              | 1.0                | 55                        |
| 2"                            | 2.344"            | .172"     | 2 3/4"              | 12°                  | 4"                  | 1.13               | 55                        |
| 3"                            | 3.406"            | .203"     | 3 7/8"              | 12°                  | 5"                  | 2.0                | 55                        |
| 4"                            | 4.530"            | .255"     | 5 1/2"              | 21°                  | 6"                  | 3.4                | 35                        |
| 6"                            | 6.656"            | .328"     | 7 1/2"              | 21°                  | 6"                  | 6.3                | 30                        |

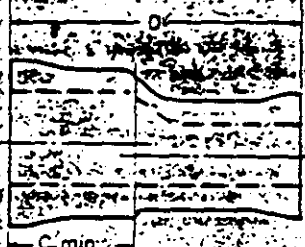
When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | L<br>( $\pm \frac{1}{16}$ in.) |
|-----------------------|------------------------|--------------------------------|
| 1 1/2"                | 1"                     | 4                              |
| 2"                    | 1 1/2" or 1"           | 4                              |
| 3"                    | 2, 1 1/2" or 1"        | 5                              |
| 4"                    | 3, 2, 1 1/2" or 1"     | 7                              |
| 6"                    | 4, 3, 2, 1 1/2" or 1"  | 9                              |

## ECCENTRIC REDUCERS 6240



| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | C<br>Minimum<br>(Inches) | D<br>( $\pm \frac{1}{16}$ in.) |
|-----------------------|------------------------|--------------------------|--------------------------------|
| 1 1/2"                | 1"                     | 1 1/4"                   | 4                              |
| 2"                    | 1 1/2" or 1"           | 1 1/4"                   | 4                              |
| 3"                    | 2, 1 1/2" or 1"        | 2 1/4"                   | 5                              |
| 4"                    | 3, 2, 1 1/2" or 1"     | 3"                       | 7                              |
| 6"                    | 4, 3, or 2"            | 3"                       | 9                              |

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{2}$  to  $\frac{1}{3}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

## Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing. Length dimensions are held to  $\pm \frac{1}{32}$ ".

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—triples the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as caps, U-bends, thermometer wells, and some traps are annealed only due to their shape. These annealed fittings are clearly identified.

## Physical Properties

KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

**Operating temperatures** extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

**Thermal conductivity:** 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F.

**Thermal expansion** of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

**Thermal shock differential** ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



## Ordering

When ordering a standard item please refer to KIMAX pipe distributors' price catalog number. Specify item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price lists contain carton quantities and shipping weights.

Rough sketches of proposed piping showing center-to-face dimensions are helpful when requesting a quotation. Your distributor will assist you to lay out piping at lowest cost and provide technical assistance and installation counsel.

## Non-Standard Items

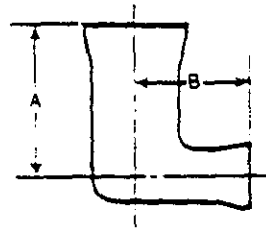
KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to meet special requirements.

Non-stock items such as reducing and crosses with 3 and 4-way reductions; traps; U-reducers; drainline Y's can be supplied by your KIMAX pipe distributor on special order.



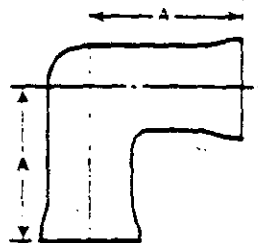
# KIMAX GLASS PIPE AND FITTINGS

## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                      | 3½                             | 3                              |
| 2                     | 1                      | 4                              | 3                              |
| 2                     | 1½                     | 4                              | 3½                             |
| 3                     | 1                      | 5                              | 3½                             |
| 3                     | 1½                     | 5                              | 4                              |
| 3                     | 2                      | 5                              | 4½                             |
| 4                     | 1                      | 7                              | 4                              |
| 4                     | 1½                     | 7                              | 4½                             |
| 4                     | 2                      | 7                              | 5                              |
| 4                     | 3                      | 7                              | 5½                             |
| 5                     | 1                      | 9                              | 5                              |
| 5                     | 1½                     | 9                              | 5½                             |
| 5                     | 2                      | 9                              | 5                              |
| 5                     | 3                      | 9                              | 5½                             |
| 6                     | 4                      | 9                              | 8                              |

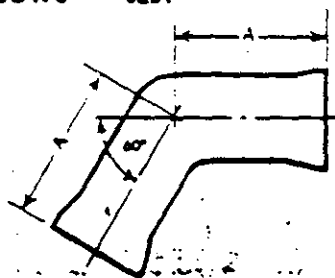
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

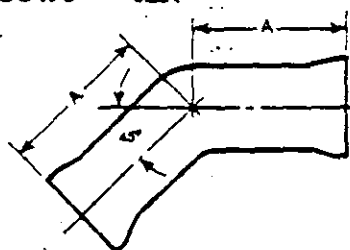
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

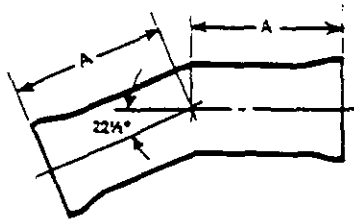
## 45° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

# 22½° ELBOWS 6201

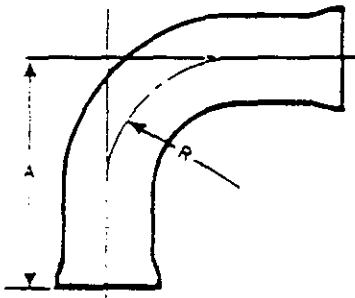


When ordering, specify degree of angle.

# KIMAX GLASS PIPE AND FITTINGS

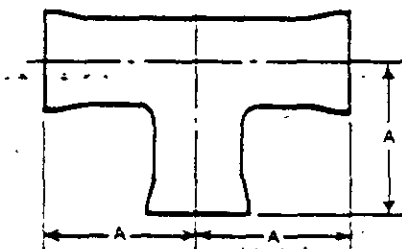
| Pipe Size<br>(inches) | A<br>(± ½ in.) |
|-----------------------|----------------|
| 1                     | 2½             |
| 1½                    | 3½             |
| 2                     | 4              |
| 3                     | 5              |
| 4                     | 7              |
| 5                     | 9              |

# SWEEP ELBOWS 6239



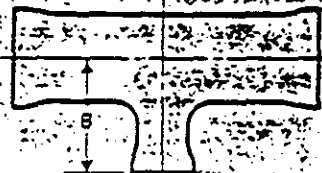
| Pipe Size<br>(inches) | A<br>(± ½ in.) | R<br>(± ½ in.) |
|-----------------------|----------------|----------------|
| 1                     | 4½             | 2½             |
| 1½                    | 5              | 3½             |
| 2                     | 5              | 3½             |
| 3                     | 7              | 4½             |
| 4                     | 10             | 5              |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(± ½ in.) |
|-----------------------|----------------|
| 1                     | 2½             |
| 1½                    | 3½             |
| 2                     | 4              |
| 3                     | 5              |
| 4                     | 7              |
| 6                     | 9              |

# REDUCING TEES 6211



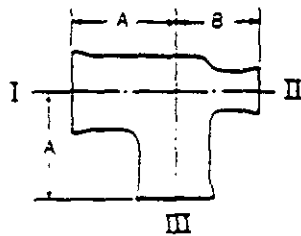
When ordering, specify pipe I.D. and bottom leg I.D.

| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(± ½ in.) | B<br>(± ½ in.) |
|-----------------------|------------------------|----------------|----------------|
| 1½                    | 1                      | 3½             | 3              |
| 2                     | 1                      | 4              | 3              |
| 2                     | 1½                     | 4              | 3½             |
| 3                     | 1                      | 5              | 3½             |
| 3                     | 1½                     | 5              | 4              |
| 3                     | 2                      | 5              | 4½             |
| 4                     | 1                      | 7              | 4              |
| 4                     | 1½                     | 7              | 4½             |
| 4                     | 2                      | 7              | 5              |
| 4                     | 3                      | 7              | 5½             |
| 6                     | 1                      | 9              | 5              |
| 6                     | 1½                     | 9              | 5½             |
| 6                     | 2                      | 9              | 6              |
| 6                     | 3                      | 9              | 6½             |
| 6                     | 4                      | 9              | 8              |

Other reduction combinations are available on special order to customer's specifications.

# KIMAX GLASS PIPE AND FITTINGS

## REDUCER TEES 6212

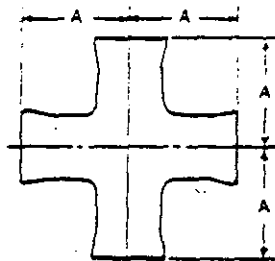


When ordering, specify pipe I.D. in this order: I, II, and III.

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|----------------------------|-----------------------------|------------------------------|--------------------------------|--------------------------------|
| 1½                         | 1                           | ½                            | 3½                             | 3                              |
| 2                          | 1                           | ½                            | 4                              | 3                              |
| 2                          | 1½                          | ½                            | 4                              | 3½                             |
| 3                          | 1                           | ½                            | 5                              | 3½                             |
| 3                          | 1½                          | ½                            | 5                              | 4                              |
| 3                          | 2                           | ½                            | 5                              | 4½                             |
| 4                          | 1                           | ½                            | 7                              | 4                              |
| 4                          | 1½                          | ½                            | 7                              | 4½                             |
| 4                          | 2                           | ½                            | 7                              | 5                              |
| 4                          | 3                           | ½                            | 7                              | 5½                             |
| 6                          | 1                           | ½                            | 9                              | 5                              |
| 6                          | 1½                          | ½                            | 9                              | 5½                             |
| 6                          | 2                           | ½                            | 9                              | 6                              |
| 6                          | 3                           | ½                            | 9                              | 6½                             |
| 6                          | 4                           | ½                            | 9                              | 8                              |

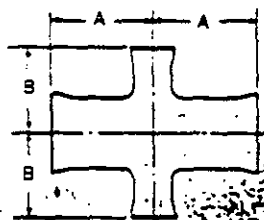
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2½                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

## REDUCER CROSSES 6250

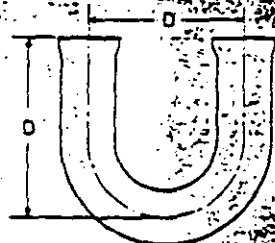


When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|-------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                       | 3½                             | 3                              |
| 2                     | 1                       | 4                              | 3                              |
| 2                     | 1½                      | 4                              | 3½                             |
| 3                     | 1                       | 5                              | 3½                             |
| 3                     | 1½                      | 5                              | 4                              |
| 3                     | 2                       | 5                              | 4½                             |
| 4                     | 1                       | 7                              | 4                              |
| 4                     | 1½                      | 7                              | 4½                             |
| 4                     | 2                       | 7                              | 5                              |
| 4                     | 3                       | 7                              | 5½                             |
| 6                     | 1                       | 9                              | 5                              |
| 6                     | 1½                      | 9                              | 5½                             |
| 6                     | 2                       | 9                              | 6                              |
| 6                     | 3                       | 9                              | 6½                             |
| 6                     | 4                       | 9                              | 8                              |

Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265

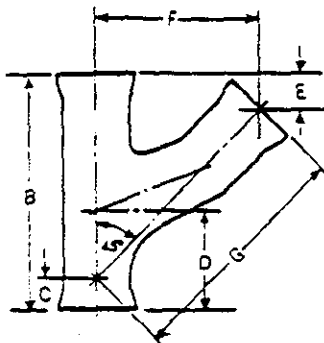


Use soft strip asbestos inserts (7202) only, with fitting.

| Pipe Size<br>(inches) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 5½                             |
| 1½                    | 7                              |
| 2                     | 7                              |
| 3                     | 9                              |
| 4                     | 12                             |

# LATERAL "Y" 6230

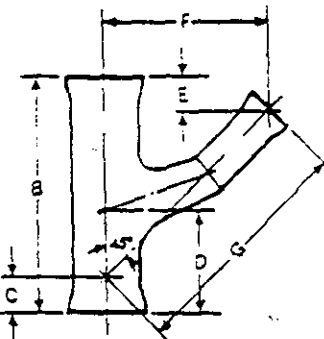
# KIMAX GLASS PIPE AND FITTINGS



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(= 1/2 in.) | C<br>(inches) | D<br>(= 1/2 in.) | E<br>(= 1/2 in.) | F<br>(= 1/2 in.) | G<br>(inches) |
|-----------------------|------------------|---------------|------------------|------------------|------------------|---------------|
| 1                     | 5/8              | 3/8           | 1 1/2            | 1                | 3 1/2            | 3 1/4         |
| 1 1/2                 | 7                | 1             | 2 1/8            | 1 1/8            | 5 1/8            | 4 1/2         |
| 2                     | 8                | 1 1/8         | 3 1/8            | 1 1/4            | 6 1/4            | 5 1/4         |
| 3                     | 10               | 1 3/8         | 3 7/8            | 1 3/8            | 7 3/8            | 6 1/4         |
| 4                     | 14               | 2 1/4         | 4 1/8            | 2 1/8            | 9 1/8            | 8             |
| 5                     | 18               | 3 1/4         | 5 1/8 = 5 1/8    | 2 3/8            | 11 3/8           | 10 1/4        |

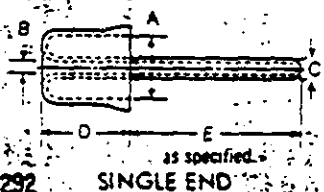
## LATERAL "Y" REDUCERS 6231



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(= 1/2 in.) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|------------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 8                | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 4 1/4         |
| 2                     | 1 1/2                   | 8                | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 4 1/4         |
| 3                     | 1 1/2                   | 10               | 1 3/8         | 3 7/8         | 1 3/8         | 6 1/8         | 5 1/4         |
| 3                     | 2                       | 10               | 1 3/8         | 3 7/8         | 1 3/8         | 6 1/8         | 5 1/4         |
| 4                     | 1 1/2                   | 14               | 2 1/4         | 4 1/8         | 2 1/8         | 8 1/8         | 7             |
| 4                     | 2                       | 14               | 2 1/4         | 4 1/8         | 2 1/8         | 8 1/8         | 7             |
| 4                     | 3                       | 14               | 2 1/4         | 4 1/8         | 2 1/8         | 8 1/8         | 7             |
| 5                     | 3                       | 18               | 3 1/4         | 5 1/8         | 2 3/8         | 11 3/8        | 10 1/4        |

## THERMOMETER WELLS (Annealed)



as specified

6292 SINGLE END



as specified

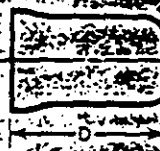
6295 DOUBLE END

When ordering, specify pipe I.D., well size, and tube length.

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.

| A<br>Pipe Size<br>(inches) | B<br>For Ther-<br>mometer<br>Well Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches) |
|----------------------------|----------------------------------------------------|----------------------------|---------------|
| 1 1/2                      | 3/8                                                | 3/8                        | 2 1/4         |
| 1 1/2                      | 3/8                                                | 3/8                        | 2 1/4         |
| 1 1/2                      | 3/8                                                | 1                          | 2 1/4         |
| 2                          | 3/8                                                | 3/8                        | 2 1/4         |
| 2                          | 3/8                                                | 3/8                        | 2 1/4         |
| 2                          | 3/8                                                | 1                          | 2 1/4         |
| 3                          | 3/8                                                | 3/8                        | 3 1/4         |
| 3                          | 3/8                                                | 3/8                        | 3 1/4         |
| 3                          | 3/8                                                | 1                          | 3 1/4         |

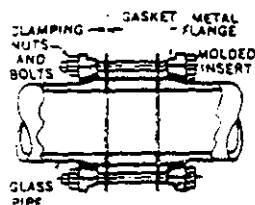
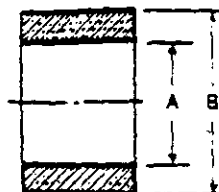
## CAPS (Annealed) 6235



Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(inches) | D<br>(± 1/2 in.) |
|-----------------------|------------------|
| 1                     | 2                |
| 1 1/2                 | 3                |
| 2                     | 4                |
| 3                     | 4 1/2            |
| 4                     | 6                |
| 6                     | 7                |

## STRAIGHT SPACERS 6260

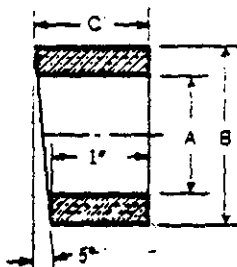


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware gaskets must be ordered separately. Standard lengths are 1/2", 3/4", 1 1/4", 2", 2 1/2", 3", 4", and 5". Other lengths available on special or Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 3/4                 |
|                            | 2 1/2                 |
|                            | 2 3/4                 |
|                            | 3 1/2                 |
|                            | 4 1/2                 |
| 3                          | 7 1/2                 |

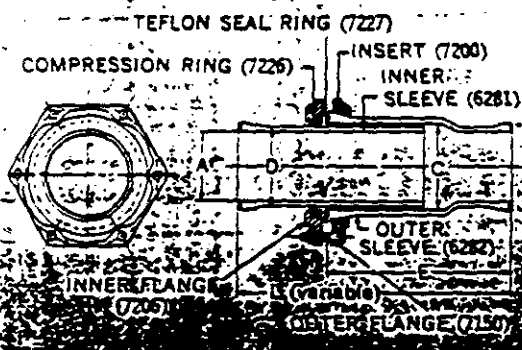
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on spec order.

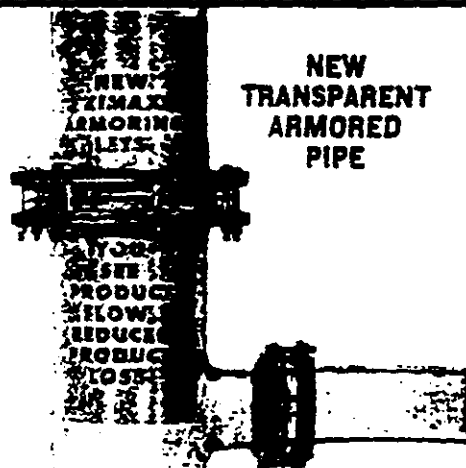
| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches) |
|----------------------------|-----------------------|---------------|
| 1                          | 1 3/4                 | 1 3/4         |
| 1 1/2                      | 2 1/2                 | 1 3/4         |
| 2                          | 2 3/4                 | 1 3/4         |
| 3                          | 3 1/2                 | 1 3/4         |
| 4                          | 4 1/2                 | 1 3/4         |

## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments up to 2 1/4". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1", 1 1/2", 2") and 15 p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281); outer sleeve (6282); inner flange (7206); outer flange (7150); insert (7200); Teflon seal ring (7227); compression ring (7226); bolts (7180). All metal parts are aluminum. Three bolts (hex head 3/8-18 x 1 1/4) required for 1 1/2", 2", and 3" sizes. Six bolts required for 4" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | L<br>(inches)<br>Min. Max. |
|----------------------------|---------------|---------------|---------------|----------------------------|
| 1                          | 1 1/2         | 1 3/4         | 5 1/2         | 8 3/4 10 3/4               |
| 1 1/2                      | 2             | 2 1/2         | 6             | 9 3/4 11 3/4               |
| 2                          | 2 1/2         | 2 3/4         | 6 1/2         | 10 11 1/2                  |
| 3                          | 3 1/2         | 3 3/4         | 8             | 11 3/4 14                  |
| 4                          | 4 1/2         | 4 3/4         | 9             | 13 1/2 15 1/2              |



## NEW TRANSPARENT ARMORED PIPE

A new armoring process developed by Owens-Illinois Technical Center engineers provides excellent visibility for constant inspection of process.

Armoring consists of coating exterior of straight pipe and fittings with layers of polyester resin and glass particles. This coating imparts exceptionally high resistance to mechanical shock and abrasion, greatly reducing the possibility of breakage. Should breakage occur, the polyester coating will retain glass fragments, reducing product loss at the point of breakage and preventing contamination of products flowing through the line.

KIMAX Glass Pipe, armored by the new process, operates at temperatures up to 250° F. Chemical resistance is the same as that of unarmored pipe.

For more information about KIMAX armored pipe, consult your KIMAX Glass Pipe distributor or write to: Glass Pipe Market Development, Consumer and Technical Products Division, Owens-Illinois, Toledo 1, Ohio.

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

## FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME bolt circle flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally

for joining KIMAX glass pipe to glass lined steel.

See pages 11 and 12 for details of flange assemblies and components.

Other materials and special coatings available from your distributor.

## GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, Koroseal, and Teflon®-lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler

of soft asbestos (Blue African asbestos with a machined Teflon liner, are recommended. Other types of filler material may be used with Teflon lined gaskets. Consult your distributor for details of performance and prices.

## INSERTS

Used for cushioning pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all annealed fittings such as U-bends, thermometer wells, and caps.

Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 13 for more information.

\*DuPont T.M.

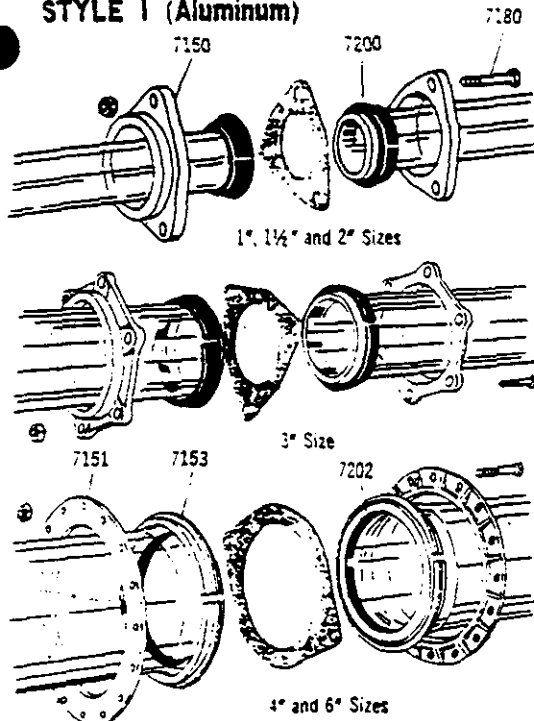
| Pipe Size | STYLE I         |         | STYLE II (A.S.M.E. Bolt Circle) |         | A.S.M.E.                                                                                                                                                                                                                                                |         | Pi |
|-----------|-----------------|---------|---------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----|
|           | Aluminum Flange | Gaskets | Cast Iron Flange                | Gaskets | Adapter Flanges                                                                                                                                                                                                                                         | Gaskets |    |
| 1"        |                 |         |                                 |         |                                                                                                                                                                                                                                                         |         |    |
| 1 1/2"    |                 |         |                                 |         |                                                                                                                                                                                                                                                         |         |    |
| 2"        |                 |         |                                 |         |                                                                                                                                                                                                                                                         |         |    |
| 3"        |                 |         |                                 |         |                                                                                                                                                                                                                                                         |         |    |
| 4"        |                 |         |                                 |         | <div style="border: 1px solid black; padding: 5px; text-align: center;">                     Use STYLE I or II<br/>                     flanges for<br/>                     4 inch and 6 inch<br/>                     A.S.M.E.                 </div> |         |    |
| 6"        |                 |         |                                 |         |                                                                                                                                                                                                                                                         |         |    |

## FLANGES, GASKETS AND ACCESSORIES

### FLANGE SET

7100

#### STYLE I (Aluminum)



Style I Flange Set Assembly (7100) in 1", 1 1/2", 2", 3" and 4" and 6" diameters consists of the following individual components:

- 2 aluminum flanges (7150)
- 2 molded neoprene asbestos inserts (7200)
- 3 aluminum bolts with nuts (7180) for 1", 1 1/2" and 2"; 8 bolts for 3" size

In 4" and 6" diameters, assembly (7100) consists of:

- 2 aluminum flanges (7150) consisting of outer flanges (7151) and inner rings (7153) complete with inserts (7202) cemented in.
- 8 aluminum bolts with nuts (7180)

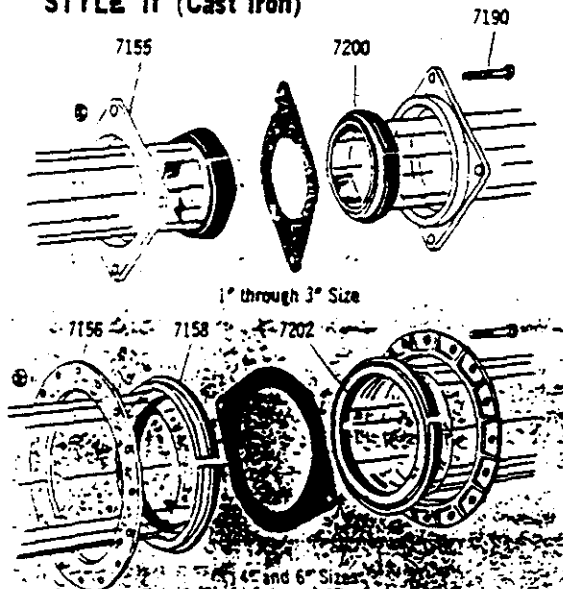
Inner rings of 4" and 6" diameter flanges snap into outer flanges. The 4" and 6" flanges have A.S.M.E. bolt circles.

Interface gaskets must be ordered separately. See page 13.

### FLANGE SET

7105

#### STYLE II (Cast Iron)



Style II flanges are coated with corrosion-resistant paint.

In the 1", 1 1/2", 2", and 3" diameters, flange set assembly (7105) consists of the following individual components:

- 2 cast iron flanges (7155)
- 2 molded neoprene asbestos inserts (7200)
- 4 steel bolts with nuts (7190)

In the 4" and 6" diameters, assembly (7105) includes:

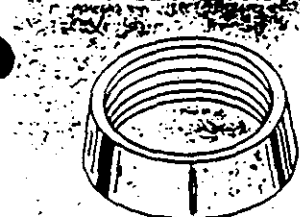
- 2 cast iron flanges (7155) consisting of outer flanges (7156) and inner rings (7158) complete with inserts (7202) cemented in.
- 3 steel bolts with nuts (7190)

All sizes of Style II flanges have A.S.M.E. bolt circles. Inner rings of the 4" and 6" sizes, snap into outer flanges.

Interface gaskets must be ordered separately. See page 13.

### FERRULE

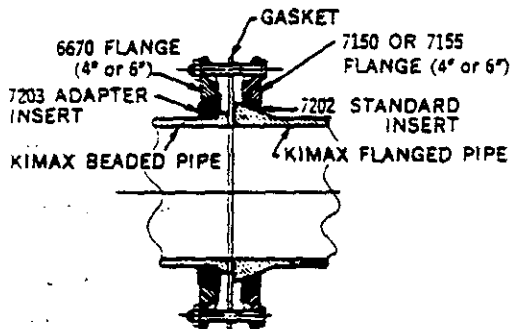
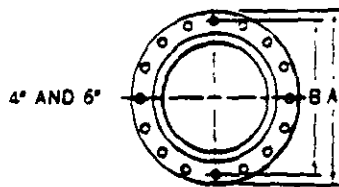
7245



Stainless steel. To be welded, brazed or soldered to metal tubing. In 1", 1 1/2", 2", 3", and 4" diameters.

## ADAPTER FLANGE

6670

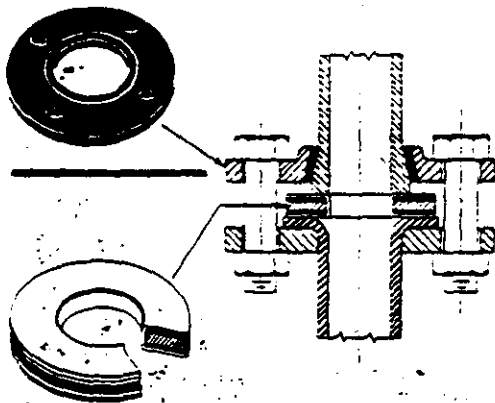


Used with Style I or Style II flanges to join field-beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(Inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(Inches) |
| 4                     | 8 1/4  | 7 1/2            | 8                  | 5/16-18 x 2 1/4  |
| 6                     | 10 1/4 | 9 1/4            | 8                  | 5/16-16 x 2 1/4  |

For 1\" through 3\" beaded pipe, use Style II flange (7155) with adapter insert (7203).

## A.S.M.E. ADAPTER FLANGE 7160



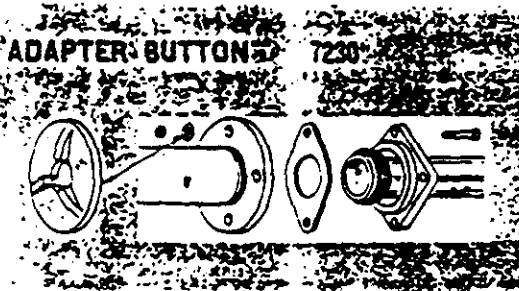
Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel. In 1\", 1 1/2\", 2\", and 3\" sizes.

Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.

Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(Inches) | Thickness<br>(Inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 3/8                   |
| 4                     | 1/2                   |
| 6                     | 3/4                   |

## DONUT SPACER 7240



Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(Inches) | O.D.<br>(Inches) | Height<br>(Inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 1/4                |

## SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1\" through 4\" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(Inches) | I.D.<br>(Inches) | Length<br>(Inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1\" thru 4\"          | 3/16 min.        | 11 1/2             | .156                |
| 6"                    | 1/4 min.         | 11 1/2             | .156                |



## INSERTS



**7200** for 1" through 3" tempered fittings.



**7202.** for 4" and 6" tempered fittings  
for 1" through 6" annealed fittings.

**7203** adapter insert for beaded ends  
(similar to 7200)

## FLANGES, GASKETS AND ACCESSOR

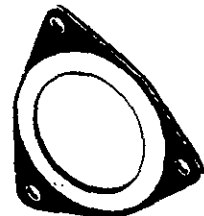
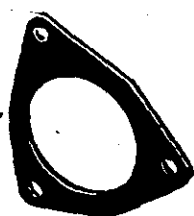
Insert 7200 is molded neoprene asbestos construction. It is available 1": 1½": 2": 2½": 3": 3½": and 5" diameters. The 1": 1½": 2": and 3" sizes used with standard tempered glass pipe and fittings. Other sizes are use with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

Adapter insert 7203 is a molded insert designed use on field-bead pipe, with Style I and Style II flanges in 1" through 3" diameters; a with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

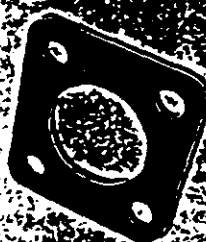
**STYLE I** (1": 1½": 2": 2½": 3" sizes only)



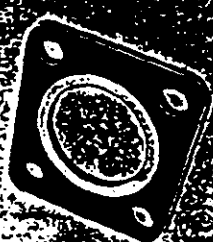
**STYLE II** (all sizes-also used for 4" and 6" Style I)



**Standard**  
A.S.M.E. (1": 1½": 2": 2½": 3" sizes only)



Standard



Teflon machined envelope

Since the gasket is the only part of the joint assembly to come in contact with conveyed liquids, choice of gasket material is extreme important.

Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below.

When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of Teflon are recommended.

The Teflon machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

Standard filler for Teflon machined envelope gasket is Blue Africa asbestos.

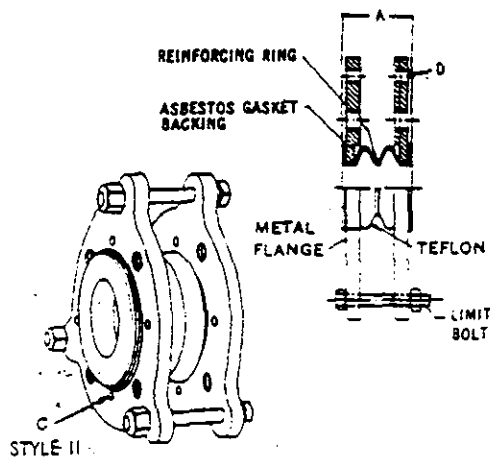
Other filler materials for Teflon machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of Teflon envelope gaskets are the same as that of the filler material.

| Catalog Number |                   | Material                                                | Service                                                               | Maximum Working Temp., °F |
|----------------|-------------------|---------------------------------------------------------|-----------------------------------------------------------------------|---------------------------|
| Style I        | Style II A.S.M.E. |                                                         |                                                                       |                           |
| 7250           | 51                | Asbestos                                                | Organic and mineral acids, solvents and chlorinated compounds.        | 400                       |
| 7255           | 7256              | Gum Rubber                                              | Food products, mineral acids, except HNO <sub>3</sub> .               | 200                       |
| 7260           | 7261              | Neoprene                                                | Distilled water and mineral acids, except HNO <sub>3</sub> .          | 220                       |
| 7265           | 7266 7267         | Koroseal                                                | Mineral acids including HNO <sub>3</sub> , and chlorinated compounds. | 150                       |
| 7270           | 7271              | Silicone Rubber                                         | All                                                                   | 450                       |
| 7275           | 7276 7277         | Teflon Machined Envelope (Blue African Asbestos Filler) | All                                                                   | 450                       |

| Material                                 | Pipe Size |          |         |         |         |         |
|------------------------------------------|-----------|----------|---------|---------|---------|---------|
|                                          | 1" Dia.   | 1½" Dia. | 2" Dia. | 3" Dia. | 4" Dia. | 6" Dia. |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"        | ¼"       | ¼"      | ¼"      | ¼"      | ¼"      |
| Teflon Envelope                          | ⅛"        | ⅛"       | ⅛"      | ⅛"      | ⅛"      | ⅛"      |

# **FLEXIBLE JOINT 7280**

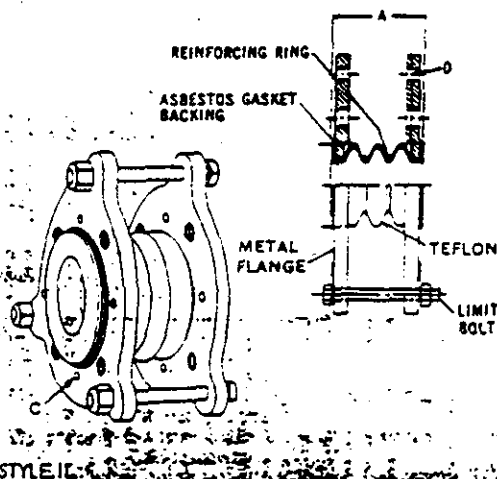
# **FLANGES, GASKETS AND ACCESSORIES**



High density Teflon bellows (2 convolutions) have rounded contours and are stress relieved for extra strength under load. Flanges are double drilled and tapped with ASME bolt circles for use with Style II, ASME, or ASA Series 15 flanges. Will connect to glass, glass lined steel, and iron flanges. Complete with 3 limit bolts but without flange bolts.

| Pipe Size (inches) | Nom. Length | A Max. Travel | Normal Travel | No. Holes | C Thread | Bolt Circle | D Bolt Dia. | Bolt Circle |
|--------------------|-------------|---------------|---------------|-----------|----------|-------------|-------------|-------------|
| 1                  | 1 3/4       | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 3 1/2       | 1/2         | 5 1/2       |
| 1 1/2              | 1 3/4       | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 3 1/2       | 1/2         | 5 1/2       |
| 2                  | 1 3/4       | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 4 1/2       | 1/2         | 6 1/2       |
| 3                  | 2 1/4       | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 6           | 1/2         | 8 1/2       |
| 4                  | 2 3/4       | ± 1/4         | ± 1/4         | 8         | 1/4-18   | 7 1/2       | 1/2         | 9 1/2       |
| 6                  | 2 3/4       | ± 1/4         | ± 1/4         | 8         | 1/4-16   | 9 1/2       | 1/2         | 12 1/2      |

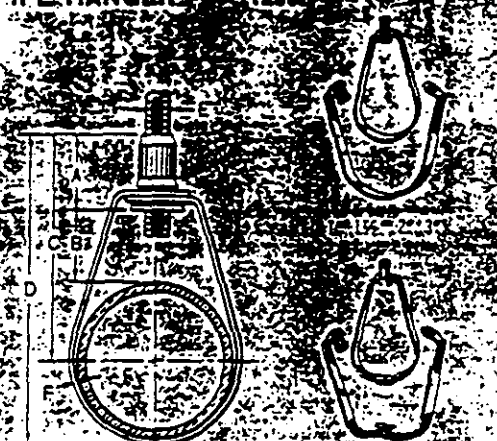
# **EXPANSION JOINT 7285**



Similar to Flexible Joint (7280) but with additional convolutions to permit more face-face adjustment.

| Pipe Size (inches) | Nom. Length | A Max. Travel | Normal Travel | No. Holes | C Thread | Bolt Circle | D Bolt Dia. | Bolt Circle |
|--------------------|-------------|---------------|---------------|-----------|----------|-------------|-------------|-------------|
| 1                  | 1 11/16     | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 3 1/2       | 1/2         | 5 1/2       |
| 1 1/2              | 1 11/16     | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 3 1/2       | 1/2         | 5 1/2       |
| 2                  | 2 3/4       | ± 1/4         | ± 1/4         | 4         | 1/4-18   | 4 1/2       | 1/2         | 6 1/2       |
| 3                  | 3 3/4       | ± 1           | ± 1/4         | 4         | 1/4-18   | 6           | 1/2         | 8 1/2       |
| 4                  | 3 3/4       | ± 1           | ± 1/4         | 8         | 1/4-18   | 7 1/2       | 1/2         | 9 1/2       |
| 6                  | 3 11/16     | ± 1 1/4       | ± 1/4         | 8         | 1/4-16   | 9 1/2       | 1/2         | 12 1/2      |

# **PIPE HANGER 7290**



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is reseated by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size (inches) | A     | B     | C     | D      | E   | F         |
|--------------------|-------|-------|-------|--------|-----|-----------|
| 1                  | 1 1/8 | 1     | 2 3/4 | 3 1/8  | 3/4 | 1/4 x 1/4 |
| 1 1/2              | 1 1/8 | 1 1/4 | 3 1/4 | 4 1/8  | 3/4 | 1/4 x 1/4 |
| 2                  | 1 1/8 | 1 1/4 | 3 1/4 | 4 1/8  | 3/4 | 1/4 x 1/4 |
| 3                  | 1 3/4 | 1 3/4 | 4 1/4 | 6 1/4  | 1   | 1/2 x 1/2 |
| 4                  | 1 3/4 | 1 3/4 | 5 1/4 | 7 1/4  | 1   | 1/2 x 1   |
| 6                  | 1 3/4 | 2 1/4 | 7 1/4 | 10 1/4 | 1   | 1/2 x 1   |

### Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Tempered Glass          | 1.10—1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.58                                     |
| Graphite (impervious)         | 1.70                                     |
| Resin-Bonded Asbestos         | 2.38                                     |
| Stainless Steel (Schedule 40) | 3.55                                     |
| Lead, Ex. Light               | 4.80                                     |
| Porcelain                     | 7.35                                     |
| High Silicon Iron             | 7.70                                     |

### Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 22½° L      | 0.5                                    | .75  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° L       | 1.3                                    | 1.9  | 2.5  | 3.8   | 5.0   | 7.5   |
| 50° L       | 2.1                                    | 3.0  | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° L       | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Sweep L     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.2                                    | 6.3  | 8.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| T (S.O.)    | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| T (S.I.)    | 6.0                                    | 9.0  | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2  | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 36.0                                   | 54.0 | 72.0 | 108.0 | 144.0 | 216.0 |

### Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Kimble Products, Glass Pipe Marketing Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

### MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   |            | 35   | 20   |
| MAX. TEMPERATURE (°F)            |            | 450  | 450  |
| MIN. TEMPERATURE (°F)            |            | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) |            | 175  | 160  |

\*Freezing point of conveyed material should be taken into consideration

### Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of .0022" ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Tempered Glass  | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (impervious) | 1.30                                     |
| Steel                 | 3.60                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 6.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 16.00<br>High Impact 44.00 |

### Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and Teflon-covered donut spacer.

### GASKET AND DONUT SPACER THICKNESS

| Material                                 | 1" |     | Diameter |    |    |
|------------------------------------------|----|-----|----------|----|----|
|                                          | 1" | 1½" | 3"       | 4" | 6" |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼" | ¼"  | ¼"       | ¼" | ¼" |
| Teflon Envelope                          | ¼" | ¼"  | ¼"       | ¼" | ¼" |
|                                          | ¼" | ¼"  | ¼"       | ¼" | ¼" |
| Solid Beaded Teflon                      | ¼" | ¼"  | ¼"       | ¼" | ¼" |
| Donut Spacer                             | ¼" | ¼"  | ¼"       | ¼" | ¼" |

# ENGINEERING

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

Typical Area Sketch

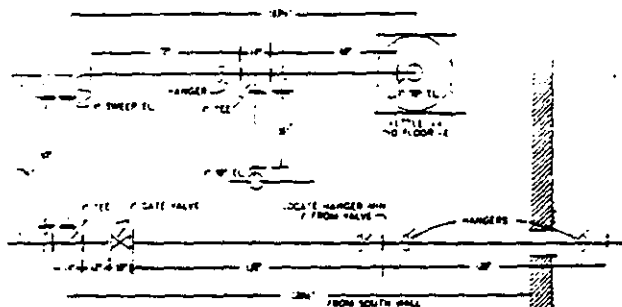


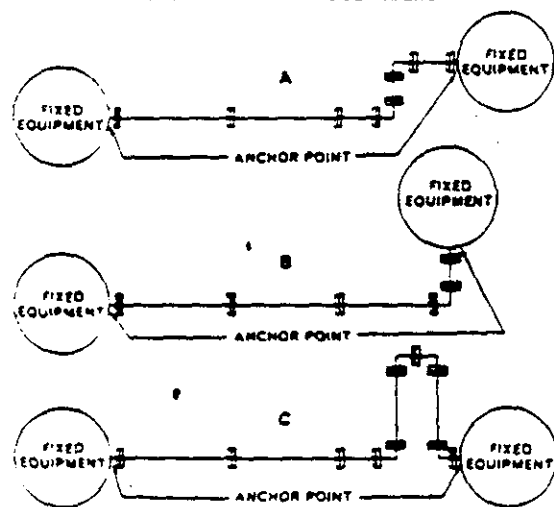
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

A,B,C—Recommended Means



D—Not Recommended



Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 5, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

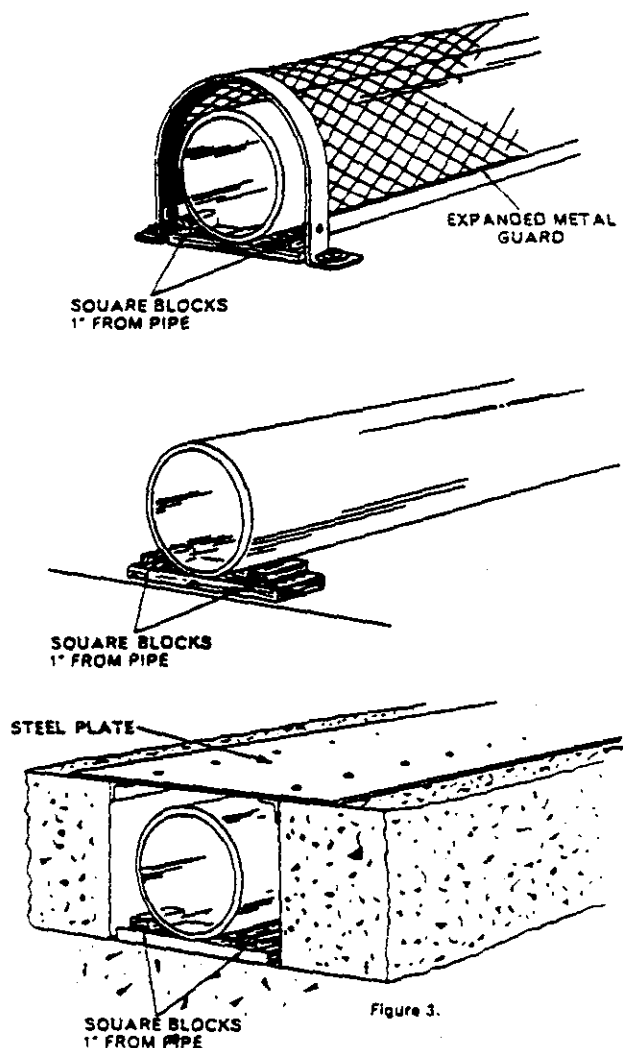
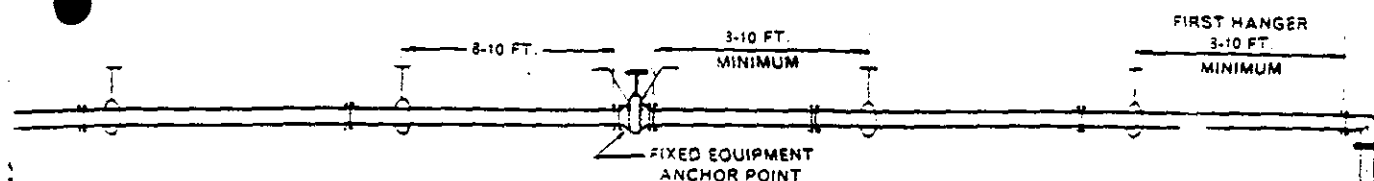


Figure 3.



### Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.

### Pipe Pitch

Normally, a pitch of  $\frac{1}{2}$ " per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

### Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high-traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

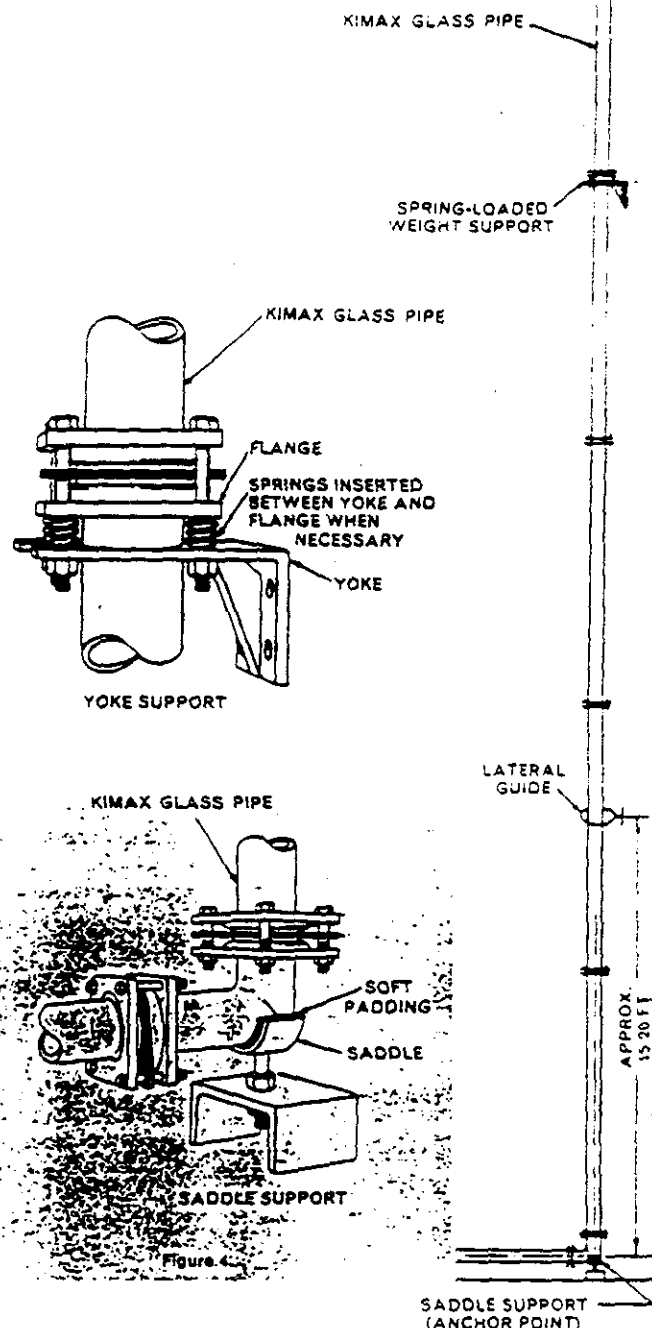


Figure 4

Figure 5

Recommended Vertical Line Supports

# ENGINEERING

## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

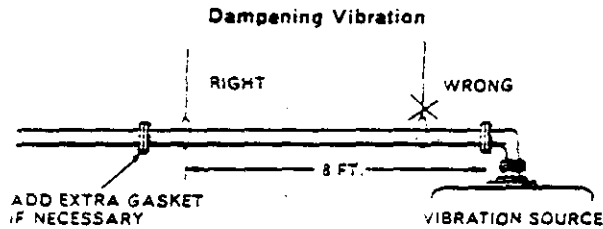


Figure 6.

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 6" pipe. See Figure 7.

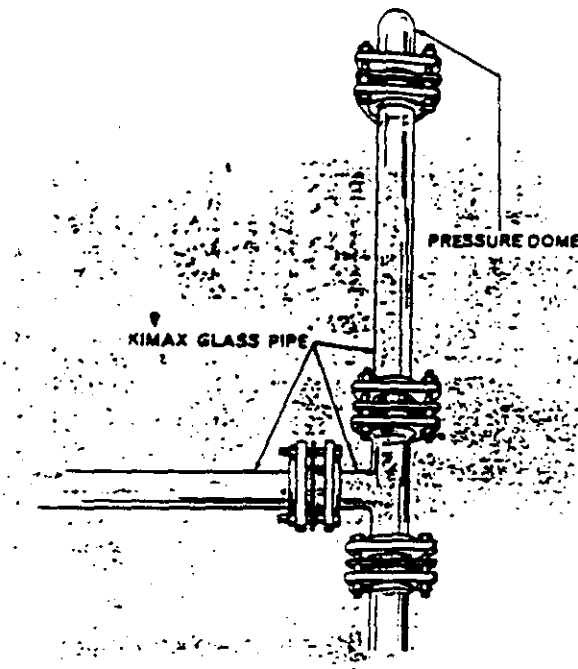


Figure 7.

## Thermometer Wells

Thermometer wells are used with corrosive liquid operation to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer well are installed in the same manner as KIMAX glass pipe fittings using Style I or Style II flanges. See Figure 8.

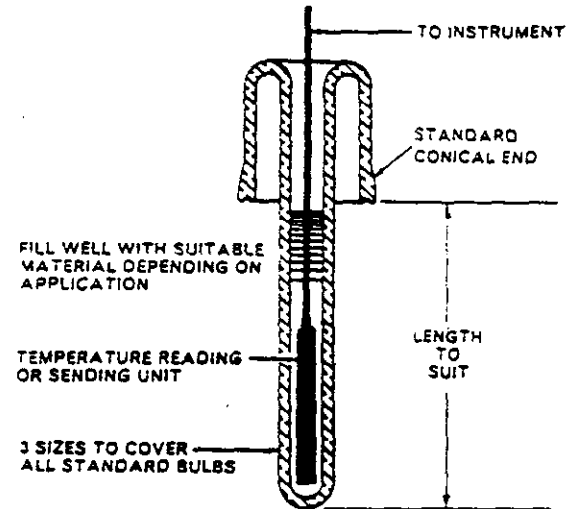


Figure 8.

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

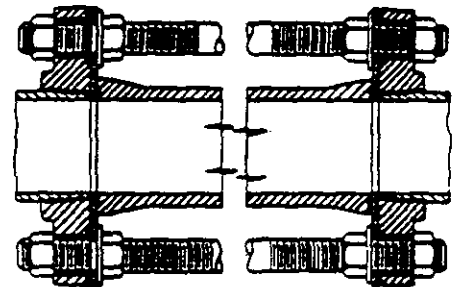


Figure 9.

### Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1", 1½", 2", 3", 4" and 6".

Standard lengths of KIMAX straight lengths vary from 6 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipe-line design.

### Special Lengths

It may be necessary to order non-standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

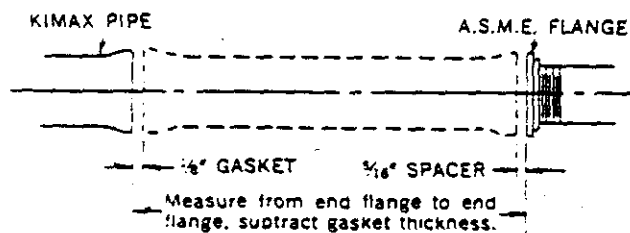


Figure 10.

### Special Apparatus

The corrosion resistance and transparency of glass, workability, make it ideal for fabricating into special apparatus.

Such apparatus may be adapted from existing standard and fittings (tubulated or perforated straight lengths, stance); custom fabricated by modifying existing glass-f equipment (receiver vessels, section units, etc.); a minor adapting of stock laboratory industrial glass (boiling flasks; distillation apparatus; offset columns, etc).

Typical apparatus adapted for special uses are illustrated t

Owens-Illinois and KIMAX Glass Pipe distributors will you in the development of specially fabricated glass appa for your particular requirements.

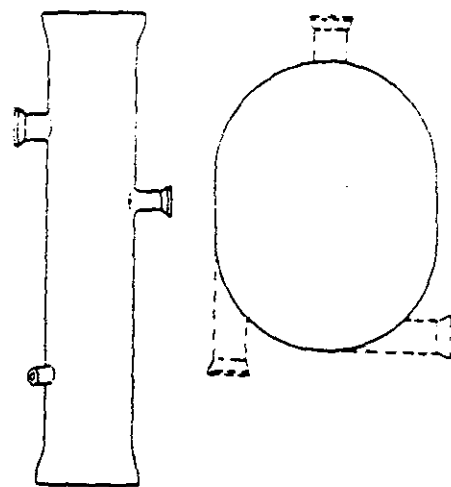


Figure 11.

# INSTALLATION

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

**MAXIMUM RECOMMENDED SPAN-FEET**

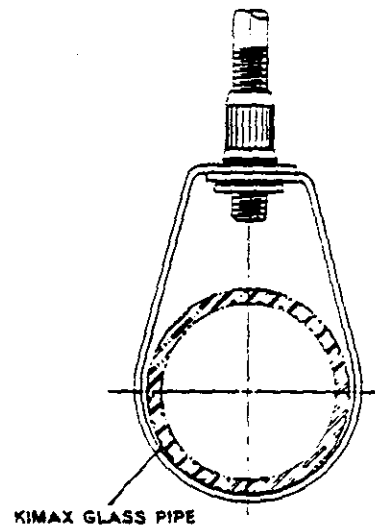
| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | 7                                |
| 1 1/4"    | 9             | 9                              | 7                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 6"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, I-beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.

**Pipe Hanger**



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.



# INSTALLAT

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

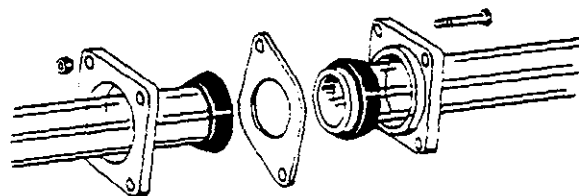
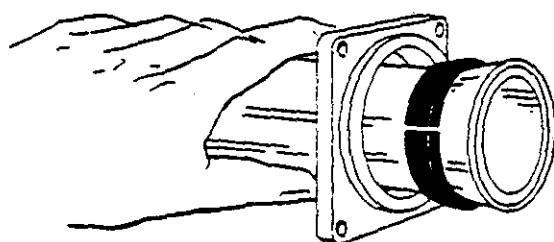
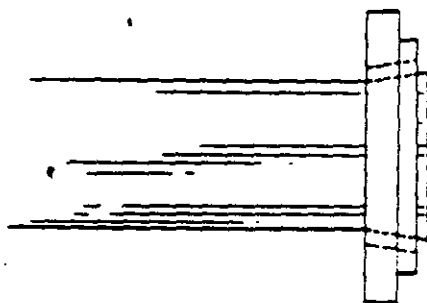


Figure 13.

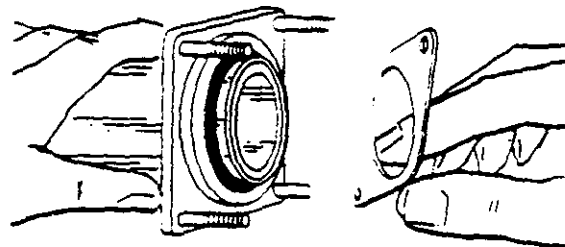
## Steps for Joint Assembly



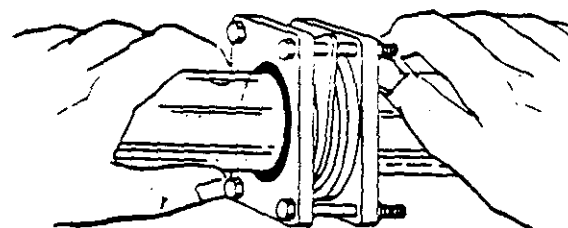
Step 1. Place the metal flange—small opening first—and the insert over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on it. Keep gaskets dry to avoid gaskets slipping out between flange under line pressure.



Step 4. Align gasket opening precisely with pipe opening, avoid obstructions to line flow (especially important in oil and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB./FT.

| Pipe Size | Regular Gasket | Solid Teflon Gasket |
|-----------|----------------|---------------------|
| 1"        | 2              | 2-3                 |
| 1½"       | 3-3.5          | 3-4                 |
| 2"        | 3-4            | 4-5                 |
| 3"        | 3-4            | 4-5                 |
| 4"        | 3-4            | 5-7                 |
| 6"        | 5-6            | 7-10                |

Occasionally, a line will leak after it has been in service for short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

# INSTALLATION

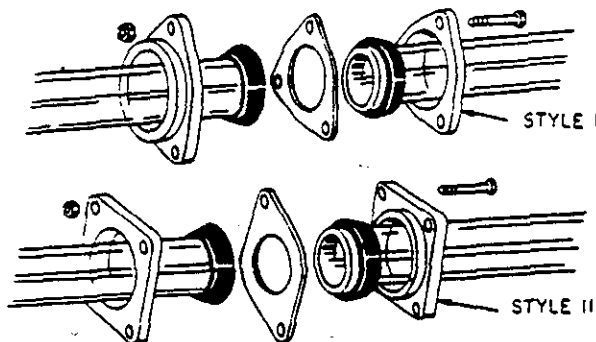
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

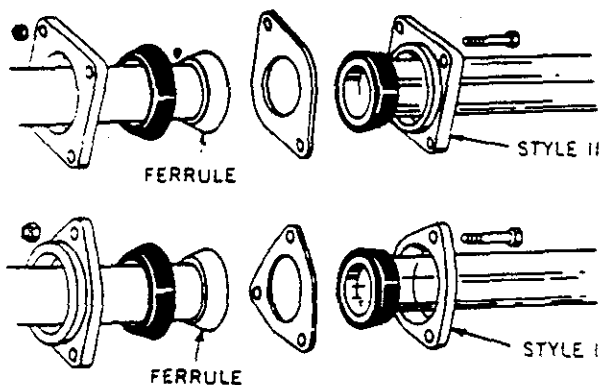
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#5670) and adapter insert (#7203) on beaded pipe; and Style II flange and standard insert on flanged pipe.

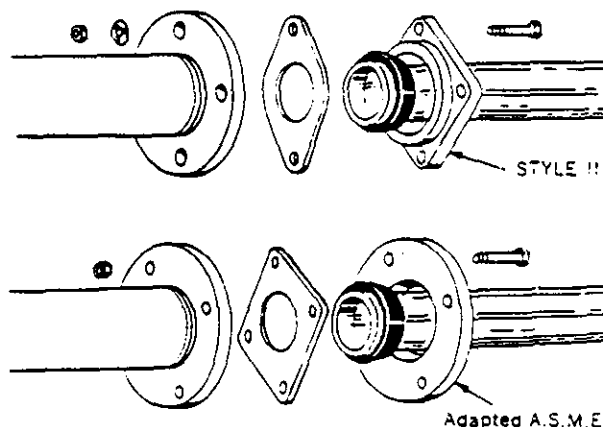
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule (#7245) to the tubing end.



### Glass to A.S.M.E. Flange

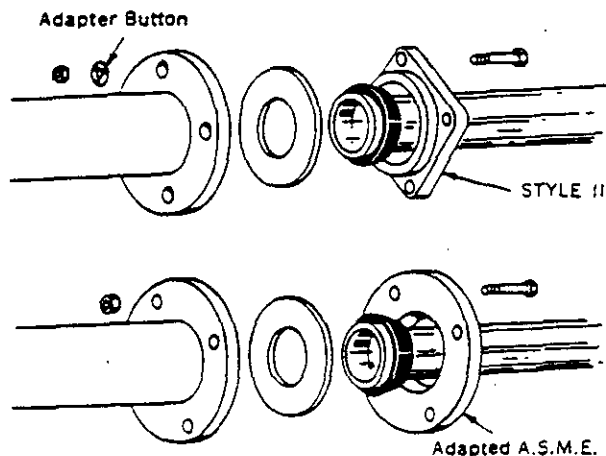
Glass can be mated to A.S.M.E. flanges by means of a Style I cast iron flange (all sizes have A.S.M.E. Bolt Circles); an adapter A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters only); or 4" or 6" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.M.E. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A Teflon-covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined Teflon envelope.

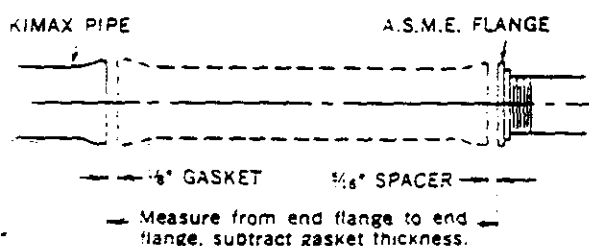
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. **Spacers.** Standard straight and 5° beveled spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 6" diameters, available in 1/2" to 2" lengths.

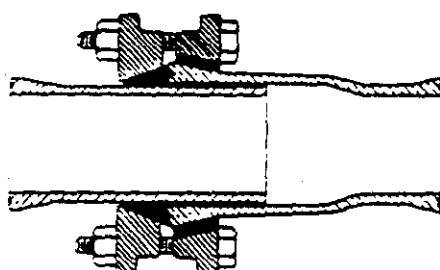
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Adjustable Joints.** Permit linear variations up to 2 1/4". Also used to correct misalignment.



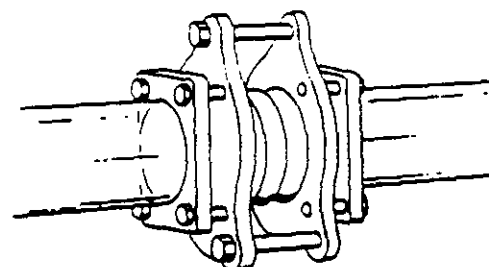
Long cut section of straight pipe may be used for inner sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTINGS section.

4. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when pipes are connected to pumps, vial reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. **Field Fabrication.**—KIMAX pipe may be cut and beaded means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flange pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) on beaded ends to mate with Style I or Style II flange with standard insert on flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

6. **Adjust Equipment.** It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment device.

## TESTING AND MAINTENANCE

### Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- Shake the line. If the line moves from side to side, it is probably free from bending loads.
- Open a flanged joint. If the flange does not move when bolts are removed, the pipe is not restrained.

### Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

### Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. Inadequate bolt tightening: Do not hesitate to "snug" bolts sufficiently.
2. Misalignment: Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. Temperature cycling: Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

### Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution. Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.

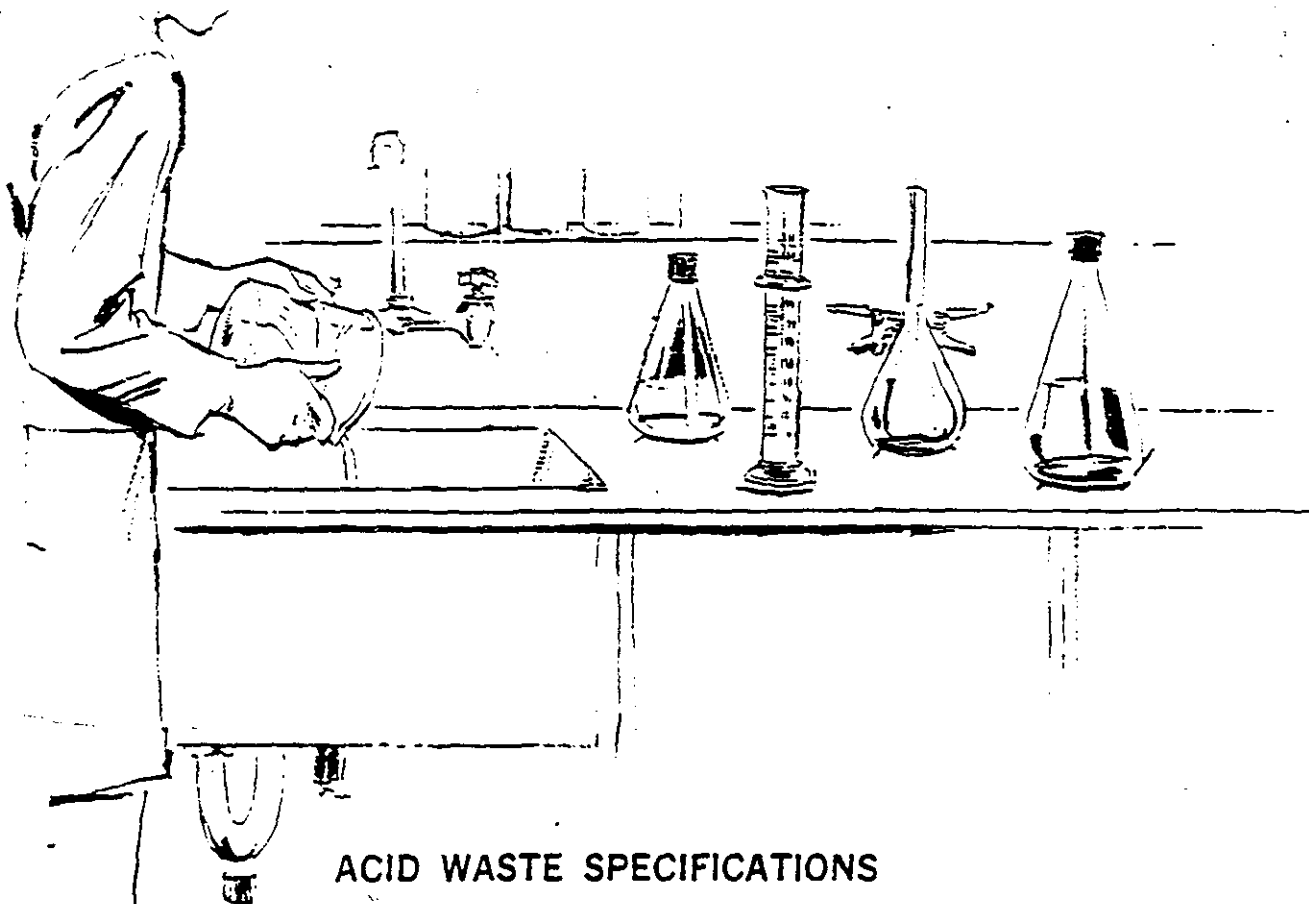
AT THE  
TOP OF THE  
WORLD

OWENS-ILLINOIS

KIMAX<sup>®</sup>  
Tempered Glass  
DRAINLINE

TF-23  
September 1960





## ACID WASTE SPECIFICATIONS

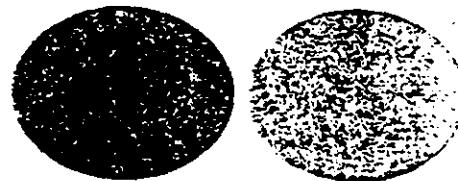
1. All drainlines which carry acid or corrosive wastes shall be "Kimax" brand low expansion, tempered, chemically durable borosilicate Type I Class A glass as manufactured by Owens-Illinois Glass Company.
2. All vents carrying corrosive fumes shall be of Kimax tempered drainline.
3. Underground drainlines shall be heavy schedule Kimax tempered drainline with regular schedule fittings and standard Kimax one bolt couplings. Maximum lengths of straight pipe shall be 5 ft. All pipe, fittings and couplings shall be liberally coated with not less than 1/16" mastic before back-filling. Backfill of not less than 4" of rock-free sand should surround pipe.
4. All glass-to-glass joints shall be made with the Kimax one bolt compression coupling. This coupling shall consist of a 360 segmented stainless steel outer band, Buna N rubber compression ring, and Teflon seal ring. Each coupling is to be installed and tightened in accordance with the manufacturer's recommendations.
5. All Kimax drainlines and vents shall be installed free of strain. Vertical runs shall be supported by padded Riser clamps. 1 1/2" and 2" should be supported at every other floor, 3", 4" and 6" at every floor. Horizontal runs shall be supported by padded clevis or trapeze hangers every 8 to 10 ft. Set pitch at joint maximum 1/4" per ft. for 1 1/2" and 2" pipe and 3/16" per ft. for 3", 4" and 6" pipe. Tighten coupling bolt before going on to the next section. Test all vertical and horizontal lines for strain by shaking.

**Layout practice:** Layout practice and all fittings shall conform to plumbing codes governing the project.

**Installation:** This installation shall be in accordance with the manufacturer's recommendation unless otherwise noted and commensurable with good drainage piping practice.

# OWENS-ILLINOIS

**KIMAX®**  
Tempered Glass  
DRAINLINE



## ADVANTAGES

Resistant to more corrosive wastes than any other piping and venting material.

Complete flexibility — can be easily installed, disassembled and reinstalled to meet new layout demands.

Transparency makes visual inspection possible.

Ultra-smooth walls discourage scale build up.

Kimax borosilicate glass is extremely resistant to thermal shock.

Low expansion KIMAX glass eliminates need for expansion joints or loops.

Supported weight is 1/7 that of high silicon iron materials and requires only 1/2 to 1/3 as many hanger supports.

Kimax glass is rodent and fireproof.

Glass drainline can be field-fabricated, and is salvageable.

KIMAX glass drainline can be readily dismantled and re-used.

## GENERAL INFORMATION

KIMAX Tempered Glass Drainline is the most universally corrosion-resistant system for disposal of chemical wastes.

### Glass Components

KIMAX Drainline straight lengths and fittings are made from KG-33 Type I borosilicate glass long used in the manufacture of laboratory apparatus. It will resist destructive action of all corrosive wastes except concentrated hydrofluoric acid; phosphoric acid with fluorides; and hot, concentrated sodium and potassium hydroxides.

Most fittings and ends of all straight lengths 5' and 10' are tempered for extra strength. A few fittings and short nipple stock are annealed only. These are clearly identified.

### Kimax Coupling

Glass lengths and fittings are joined to each other and to other materials simply and quickly by means of one-bolt, pre-assembled compression coupling. The seal ring, which is the only coupling part which comes in contact with corrosive waste, is made of Teflon®.

### Accessories

The KIMAX Drainline system contains all accessories needed for complete installation from sink to sewer, and for connection to other materials.

Accessories range from sink tailpiece assemblies to threaded bead and flange adapters.

\*DuPont Trademark—FEP 110

## KIMAX COUPLING ASSURES QUICK, POSITIVE SEAL JOINTS

KIMAX drainline couplings are engineered to assure leak-free compression joints, under severe corrosion conditions.

The pre-assembled unit consists of (1) an outer shell of stainless steel, segmented for easy disassembly, (2) Buna N rubber compression ring to cushion glass beaded ends and (3) Teflon seal ring.

The Stainless Steel Outer Shell encloses the rubber compression ring completely, eliminating the possibility of the ring bulging up when the coupling is tightened. A few turns of the lubricated bolt locks the shell in position.

The Compression Ring is made of Buna N rubber assuring user of many years of trouble-free service.

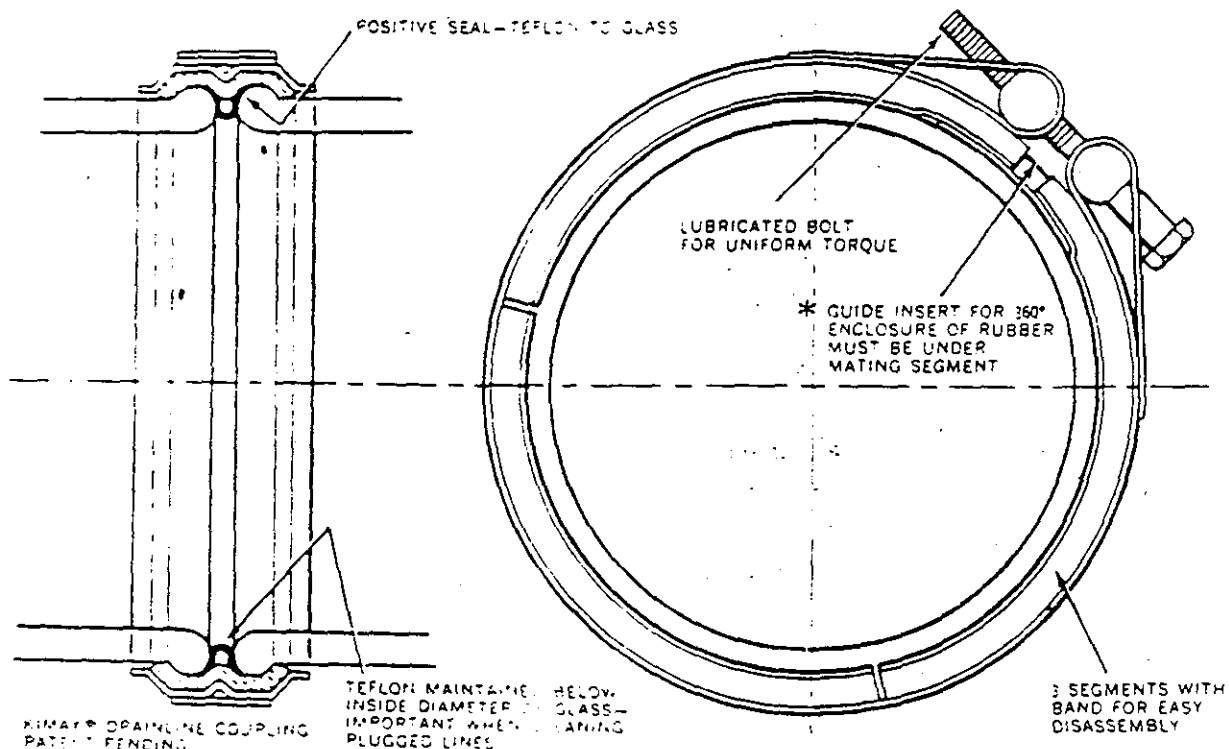
The Teflon Seal Ring is maintained below the inside diameter of the glass to prevent damage when routing out a line with a plastic-covered snake or a wooden rod.

### Making the Joint

Assembling a joint is fast and simple with the KIMAX drainline coupling:

1. Wet the coupling.
2. Push both pipe ends into the coupling firmly but gently.
3. Make sure that the guide insert slides *under* the matching segment of the stainless steel outer shell.\*
4. When the glass is in its final position, tighten the lubricated bolt with a wrench to the following torques:

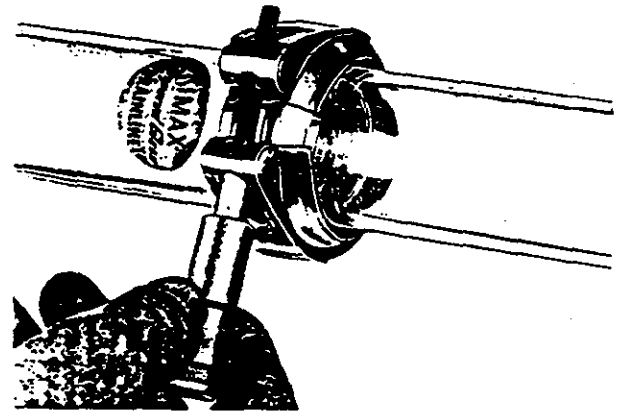
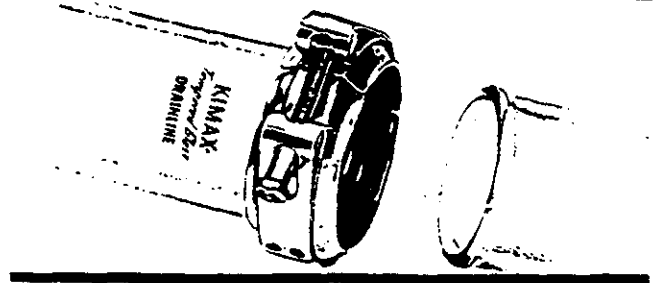
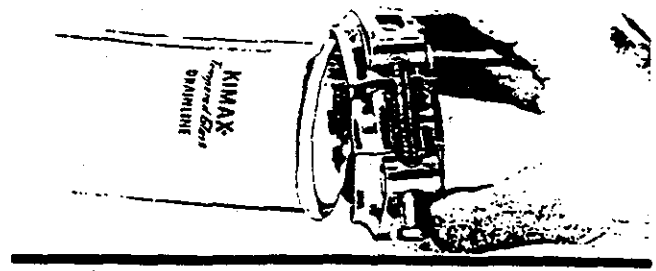
| Pipe Size              | Minimum Recommended Torque<br>(Pound Inches) |
|------------------------|----------------------------------------------|
| 1 1/2", 2", 2 1/2", 4" | 50                                           |
| 5"                     | 30                                           |



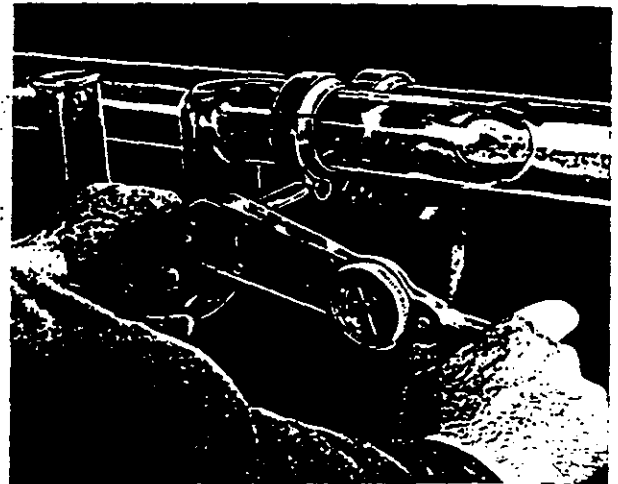
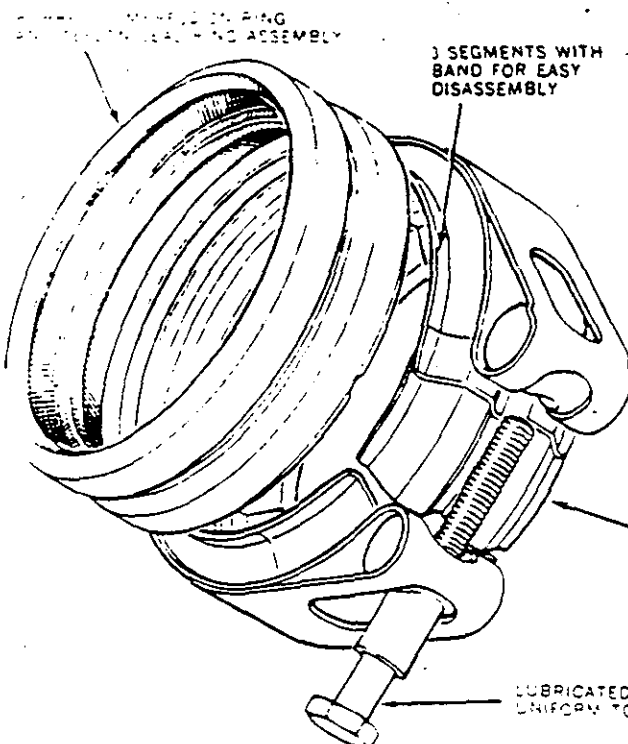


## SERVICE RECOMMENDATIONS

1. Maximum continuous operating temperature—212°F. May be subjected to 250°F for short periods.
2. Minimum testing pressure: 5 psi
3. Maximum testing pressure: 15 psi
4. Retighten all couplings to recommended torque, 24 hours or more after installation to compensate for initial set of Teflon seal.
5. Couplings disassembled and reinstalled should be tested for leakage. Rubber compression ring and Teflon seal may require replacement to correct leakage.

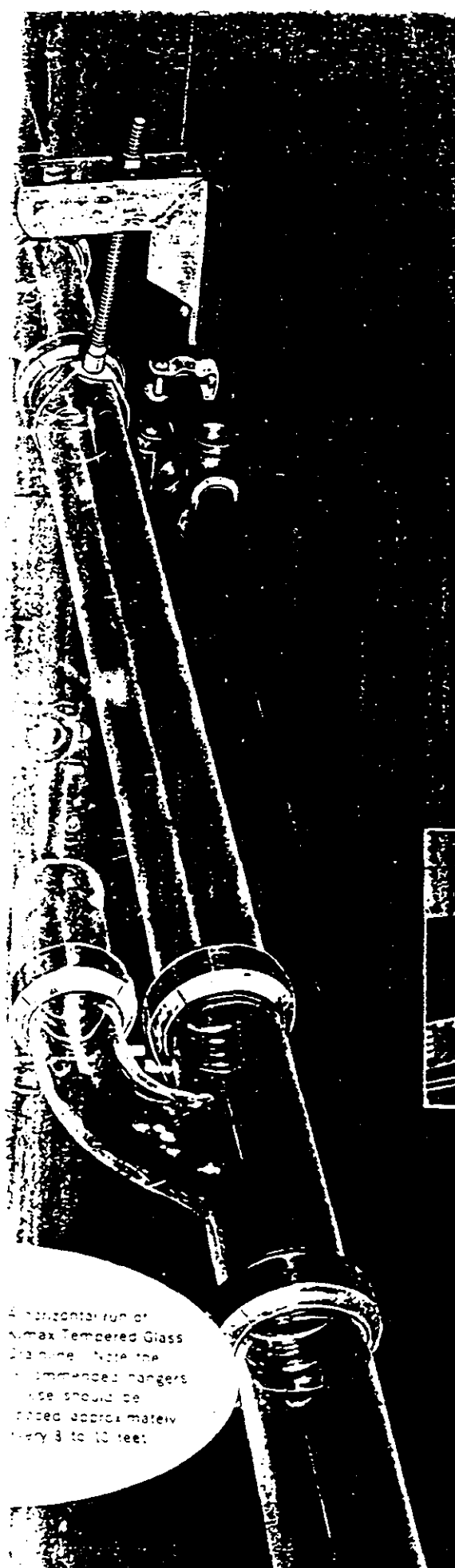


A positive-seal joint is made quickly by pushing both pipe ends into the wetted coupling insert, then tighten the single lubricated bolt after glass is in final position.



When the line is in its final position, the coupling bolt is tightened to 50 inch-pounds of torque for 1½", 2", 3" and 4" diameter pipe; 80 inch-pounds for 6" pipe.

ALL METAL PARTS  
ARE STAINLESS STEEL



A horizontal run of KIMAX Tempered Glass Drainline. Note the recommended hangers. These should be spaced approximately every 3 to 10 feet.

## SYSTEM DESIGN

Layout of a KIMAX drainline system is substantially the same as that of any well-designed waste system.

Dimensions of all glass parts listed on pages 8 to 16 are nominal and include allowance for coupling liner thickness.

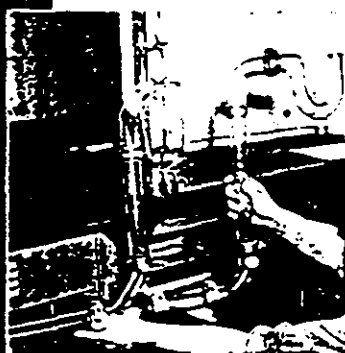
Expansion rate is only .22 inch per 100°F. per 100 feet, thus expansion joints are not necessary.

It is not necessary to install inverted traps at the end of a horizontal run to keep the line full when hot wastes are conveyed.

Length of vertical or horizontal runs of KIMAX drainline systems is unlimited. Lines can be buried to any depth.

## INSTALLATION

Installation techniques for KIMAX Tempered Glass Drainline are simple and fast. Glass to glass joints are made by stabbing beaded ends into a wetted coupling and tightening the single coupling bolt to required torque (see pages 2-3).



Each joint should be finger-tightened until glass section is in final position. Then, all coupling bolts must be tightened to proper torque. Layouts for hard-to-reach places can be made up and installed as a unit (see photo).

KIMAX drainline, like any pipe, should not be forced into place. Horizontal line hangers should allow lateral movement and should be adjusted to pipe, not pipe to hangers.

Odd lengths can be made on the job with the KIMAX Beading Kit. Field Beading Manual TR-244 contains detailed instructions. Short nipple stock is available for most economical fabrication of short pieces.

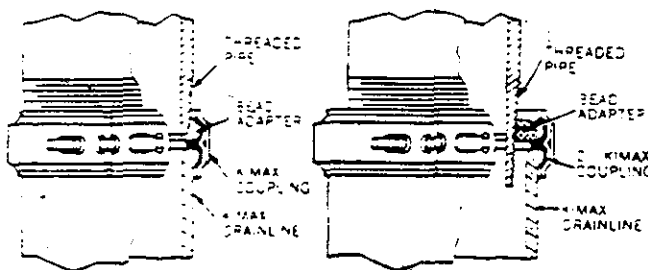
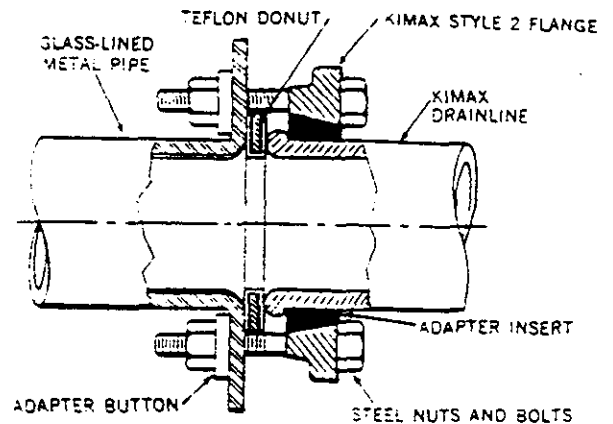
## Handling Procedures

During installation, it is advisable to unpack only those sections needed for immediate installation. Unpacked pieces should be placed on cardboard, paper or wood. Do not place glass parts on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter and other surface damage. Pieces so damaged should be replaced.

## To Glass-Lined Metal Pipe

Use KIMAX Style II flange #7155 for 1½" through 3" sizes, and adapter flange #6670 for 4" and 6" with adapter insert #7203 on beaded glass drainline. Adapter buttons #7230 must be used as shown in ASME flange to center smaller diameter bolts.

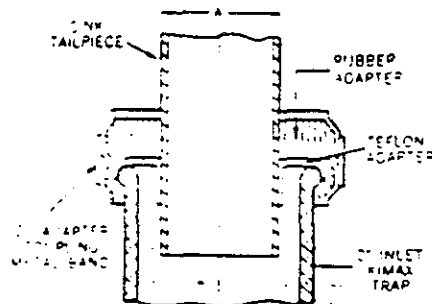


## To Threaded Pipe

To join KIMAX drainline to threaded sink tailpieces or threaded vent stacks of the same diameter, use Teflon bead adapter #6680 and drainline coupling #6650.

To join 1½" threaded sink tailpieces to KIMAX traps with expanded inlets 2" x 1½", use adjustable bead adapter #6685 and KIMAX coupling #6650.

Brush acid-proof cement on pipe threads before applying bead adapters.



## To Unthreaded Sink Tailpieces

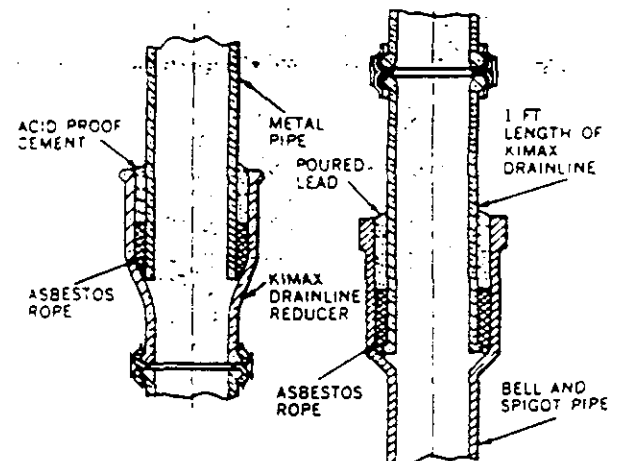
Adapter coupling #6655 is designed to join standard 1½", 2", and 1½" sink tailpieces to KIMAX glass traps with expanded inlets 2" x 1½". Coupling #6655 is designed to permit height adjustment without the need to cut sink tailpieces to exact length.

## To Bell and Spigot

All joints should be vertical or 45° from vertical rather than horizontal to avoid accumulation of corrosive wastes.

1. Clean all surfaces thoroughly.
2. Place layer of asbestos rope or 1/8" asbestos gasket between glass and metal.
3. Insert male pipe end making sure that glass does not contact metal.
4. Pack hub halfway up with asbestos rope; do not use impregnated rope which inhibits sealing.
5. Seal joint with acid-proof cement, sealing cement or expanding iron hydraulic seal cement.

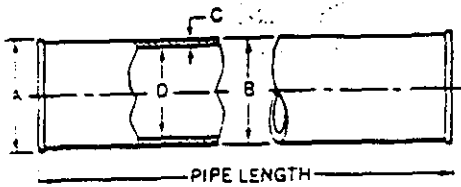
When KIMAX male end is to be sealed into metal bell, preheat glass and metal bell uniformly to 200° F. Seal with molten lead at lowest pouring point. Caulk lightly after cooling.



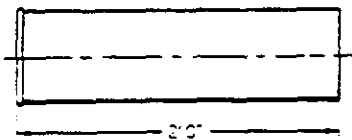
6500—regular schedule, 5-ft. lengths

6501—regular schedule, 10-ft. lengths

6502—heavy schedule, 5-ft. lengths\*



6503—NIPPLE STOCK, 2-ft. lengths\*\*



## STRAIGHT LENGTHS

Standard lengths of regular drainline are 5 and 10 feet. Special lengths up to 15 feet may be ordered as special items and these items are priced on a per-foot basis to the next nearest foot, plus 10% for special handling.

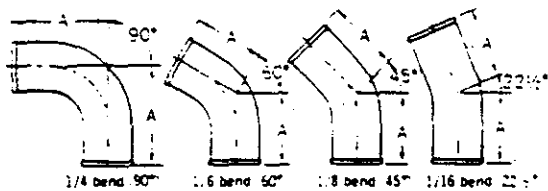
| Size  | Regular Schedule<br>6500, 6501, 6503 |        |          |        | Heavy Schedule<br>6502   |                   |
|-------|--------------------------------------|--------|----------|--------|--------------------------|-------------------|
|       | A                                    | B (OD) | C (wall) | D (ID) | weight<br>lbs/ft. C wall | weight<br>lbs/ft. |
| 1 1/2 | 2.05                                 | 1.84   | 0.12     | 1.60   | 0.64                     | 0.37              |
| 2     | 2.58                                 | 2.34   | 0.14     | 2.06   | 0.94                     | 0.51              |
| 3     | 3.69                                 | 3.41   | 0.17     | 3.07   | 1.3                      | 0.74              |
| 4     | 4.84                                 | 4.53   | 0.20     | 4.13   | 2.6                      | 1.4               |
| 6     | 7.12                                 | 6.66   | 0.24     | 6.18   | 4.7                      | 2.6               |

\*KIMAX heavy schedule drainline (marked "H-S") is designed for burying underground or under concrete. Maximum length recommended for burial is 5 feet.

\*\*Nipple stock is annealed only, beaded on one end and available in 2-foot lengths. regular schedule weight. Most economical way to make up short lengths.

6511

## BENDS

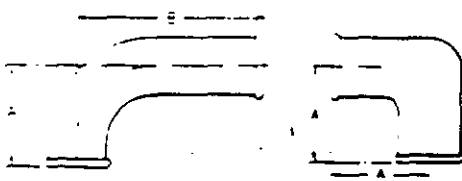


| Size  | A     |
|-------|-------|
| 1 1/2 | 4 1/2 |
| 2     | 5     |
| 3     | 6 1/2 |
| 4     | 9     |
| 6     | 12    |

6512

6513

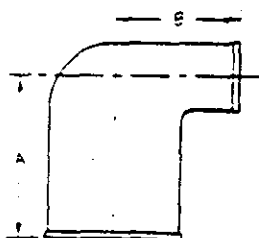
## SHORT RADIUS QUARTER BENDS



| Size  | 6512  |       | 6513 |
|-------|-------|-------|------|
|       | A     | B     | A    |
| 1 1/2 | 3 1/2 | 6     | 5    |
| 2     | 3 3/4 | 7 1/2 |      |

6518

## QUARTER BEND REDUCER



| Size          | A | B     |
|---------------|---|-------|
| 1 x 1 1/2     | 4 | 3 1/2 |
| 1 1/2 x 1 1/2 | 5 | 4     |
| 2 x 2         | 5 | 4 1/2 |
| 4 x 1 1/2     | 7 | 4 1/2 |
| 4 x 2         | 7 | 5     |
| 4 x 3         | 7 | 5 1/2 |
| 6 x 1 1/2     | 9 | 5 1/2 |
| 6 x 2         | 9 | 6     |
| 6 x 3         | 9 | 6 1/2 |
| 6 x 4         | 9 | 7     |

## Lines Below Ground

KIMAX glass drainline may be buried underground to any depth. Standard straight lengths and couplings may be encased in protective sieves or placed in covered troughs.

When burying glass drainline without protective sieves or troughs, use heavy-schedule straight lengths, 5' long, and regular fittings.

Coat unprotected, buried pipe and fittings with at least 1/16" mastic. Backfill carefully with rock-free sand, placing 4" sand under pipe and 4 to 12 inches of rock-free sand on top.

## Horizontal Runs

Support horizontal runs every 8 to 10 feet, never closer unless there are more than two joints in an 8 - 10 foot section. Use padded hangers, either clevis or trapeze type.

To pitch a line, couple first straight length loosely. Adjust hanger to proper pitch. Tighten coupling to recommended torque.

Maximum allowable pitch per joint is:

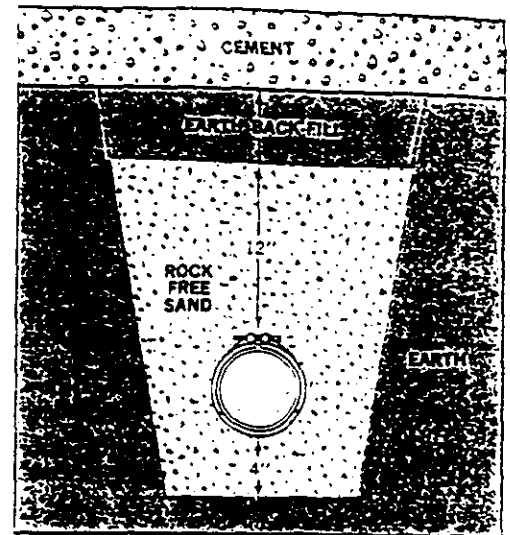
| Pipe Diameter      | Maximum Pitch |
|--------------------|---------------|
| 1 1/2", 2"         | 1/4" per foot |
| 2 1/2", 3", 4", 5" | 1/8" per foot |

When horizontal runs rest on flat surface, wall brackets, snelves, floors, place square guide blocks or pins on either side of each run to allow approximately 1/2 inch lateral movement, see center illustrations, page 6.

## Vertical Runs

All vertical runs must be independently supported. Use padded riser clamps under the bottom coupling of vertical stack, see diagram below. Support 3", 4" and 6" diameter vertical runs with riser clamps at each floor. Support 1 1/2" and 2" runs at every other floor.

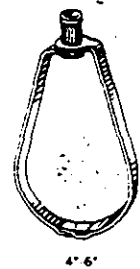
Do not use horizontal lines to support vertical runs. Place first horizontal hanger at least 7 feet away from vertical stack.



**Burial Underground or Underneath Concrete.** Use heavy schedule straight lengths and regular fittings, maximum length 5 feet. Coat heavily with at least 1/16" of mastic. Backfill carefully, top and bottom, with rock-free fill dirt.



1 1/2" 3"



4" 6"



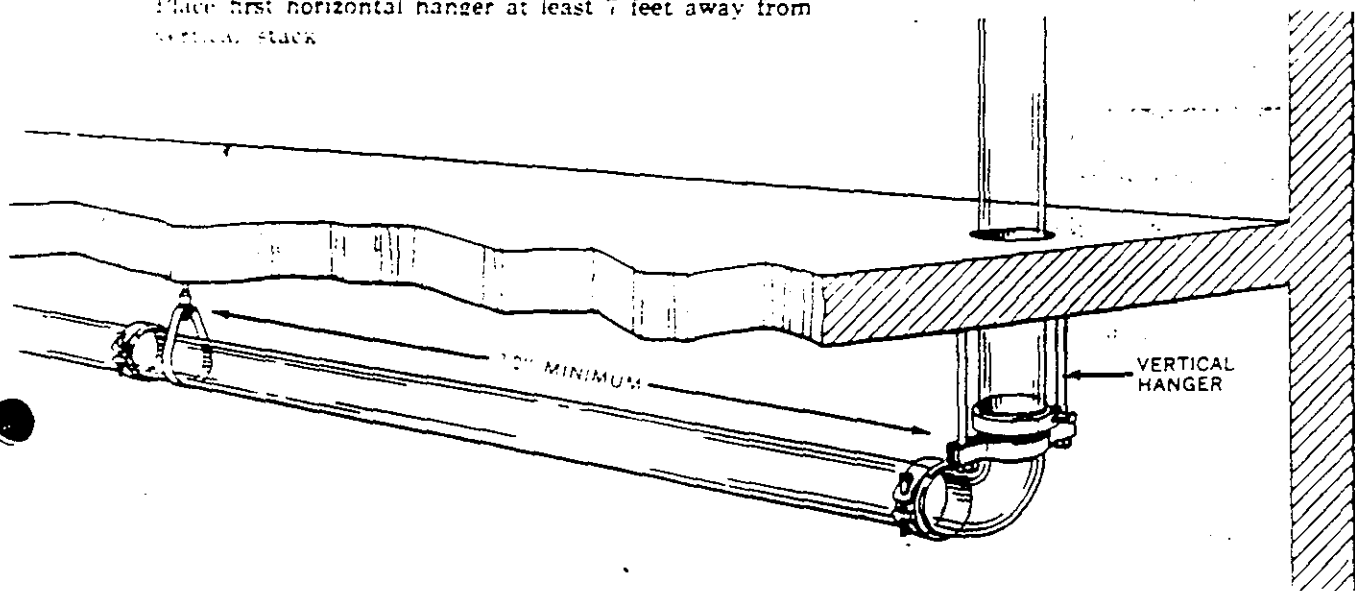
squeeze together  
insert drops out



spread and slip  
over drainline



squeeze  
replace insert



## INSTALLATION (Continued)

### Pipe Protection

When exposed to traffic, glass lines at floor level, ground level or below grade, should be protected by expanded metal or similar guards.

### Causes of Initial Leakage

If leakage occurs during initial water tests, it may be due to one of the following reasons:

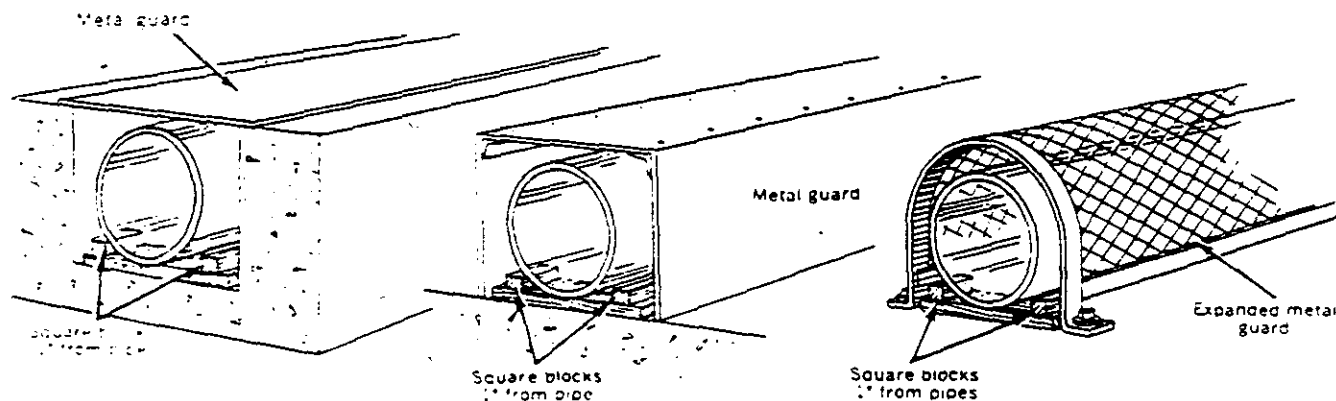
1. Coupling bolt not tightened to proper torque.
2. Dirt or foreign particles may be lodged on coupling liner or glass beaded ends.
3. Glass beads may be cracked, chipped or under size. Replace glass section, if necessary.

4. Glass beads are not properly seated in coupling.
5. Glass pipe is not properly aligned resulting in a poorly sealed joint.
6. Coupling parts may be incorrectly assembled or defective. Replace, if necessary.

### Removing Obstructions

Obstructions may be removed in one of three ways:

1. Dissolve the obstruction with chemicals except concentrated hydrofluoric acid.
2. Remove plugged section and rod out with wood pole.
3. Use plastic-covered snake.



## JOINING KIMAX GLASS DRAINLINE TO OTHER MATERIALS

### To KIMAX Process Pipe

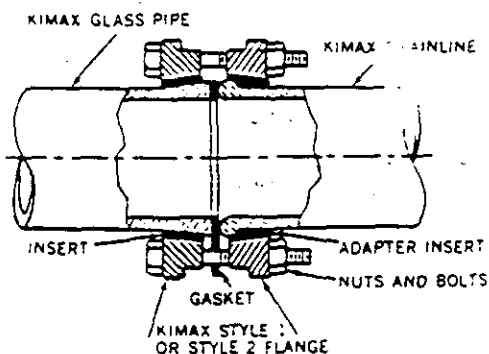
To adapt drainline to KIMAX process pipe, use the following assemblies depending on pipe size:

#### 1 1/2", 2" and 3" diameters

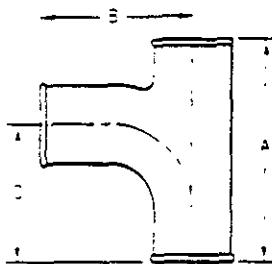
- Style II metal flange #7155
- standard insert #7200
- adapter insert #7203
- Teflon machined envelope gasket #7276
- steel bolts and nuts #7190

#### 4" and 6" diameters

- Style II metal flange #7155
- adapter metal flange #6670
- adapter insert #7203
- Teflon machined envelope gasket #7276
- steel nuts and bolts #7190

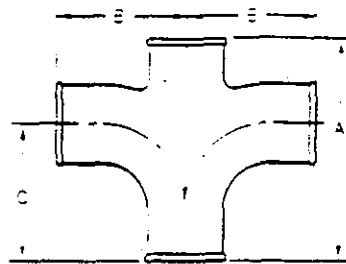


6521



drainline T branch

6522

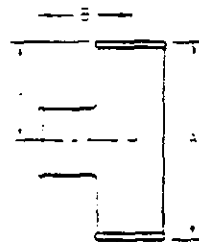


double branch drainline T

## T BRANCHES

| Size        | A | B     | C     |
|-------------|---|-------|-------|
| 1/2 x 1/2   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3/4   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/4 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 6     | 1 | 1 1/2 | 1 1/2 |

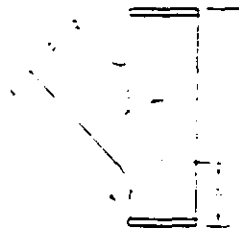
6523



## STRAIGHT TEE

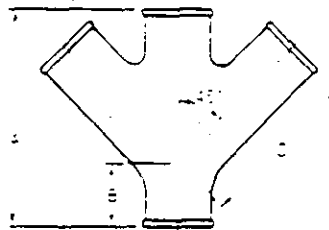
| Size        | A | B     | C     |
|-------------|---|-------|-------|
| 1/2 x 1/2   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3/4   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/4 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 6     | 1 | 1 1/2 | 1 1/2 |

6526



drainline Y branch

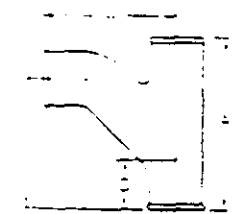
6527

double branch  
drainline Y

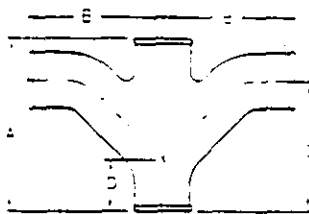
## Y BRANCHES

| Size        | A | B     | C     |
|-------------|---|-------|-------|
| 1/2 x 1/2   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3/4   | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/4 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 2 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 3 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 4 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5     | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 5 1/2 | 1 | 1 1/2 | 1 1/2 |
| 1/2 x 6     | 1 | 1 1/2 | 1 1/2 |

6528

drainline combination  
Y and 1/8 bend

6529

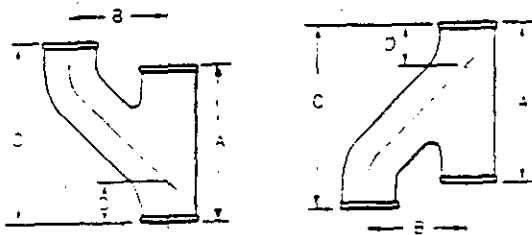
double branch  
drainline combination  
Y and 1/8 bend

## COMBINATION Y AND 1/8 BEND

| Size        | A | B     | C     | D     |
|-------------|---|-------|-------|-------|
| 1/2 x 1/2   | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 3/4   | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 1     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/4 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 1 1/2 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 2     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 2 1/2 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 3     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 3 1/2 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 4     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 4 1/2 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 5     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 5 1/2 | 1 | 1 1/2 | 1 1/2 | 1 1/2 |
| 1/2 x 6     | 1 | 1 1/2 | 1 1/2 | 1 1/2 |

6532

# UPRIGHT Y OR H FITTING (and vent branch)



upright Y or H fitting

vent branch

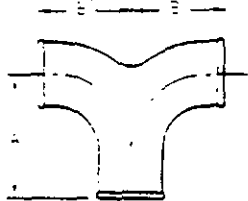
Note: above fittings identical

| Size        | A  | B     | C     | C*    |
|-------------|----|-------|-------|-------|
| 1/2 x 1/2   | 3  | 1     | 1 1/4 | 3 1/4 |
| 1/2 x 3/4   | 3  | 3/4   | 1 1/4 | 3 1/4 |
| 1/2 x 1     | 3  | 1     | 1 1/4 | 3 1/4 |
| 1 x 1/2     | 10 | 3/4   | 1 1/4 | 3 1/4 |
| 1 x 3/4     | 10 | 1     | 1 1/4 | 3 1/4 |
| 1 x 1       | 10 | 1     | 1 1/4 | 3 1/4 |
| 1 1/2 x 1/2 | 14 | 1 1/4 | 1 1/4 | 4 1/4 |
| 1 1/2 x 1   | 14 | 1     | 1 1/4 | 4 1/4 |
| 1 1/2 x 3/4 | 14 | 3/4   | 1 1/4 | 4 1/4 |
| 1 1/2 x 1/2 | 14 | 1     | 1 1/4 | 4 1/4 |
| 2 x 1/2     | 20 | 1 1/4 | 1 1/4 | 5 1/4 |
| 2 x 1       | 20 | 1     | 1 1/4 | 5 1/4 |
| 2 x 3/4     | 20 | 3/4   | 1 1/4 | 5 1/4 |
| 2 x 1/2     | 20 | 1     | 1 1/4 | 5 1/4 |

\*Offset dimension may be higher or lower than "A"

6533

# DOUBLE QUARTER BEND

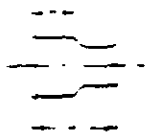


| Size  | A      | B     |
|-------|--------|-------|
| 1/2   | 3 1/4  | 1 1/4 |
| 3/4   | 3 1/4  | 1 1/4 |
| 1     | 3 1/4  | 1 1/4 |
| 1 1/2 | 3 1/4  | 1 1/4 |
| 2     | 10 1/4 | 1 1/4 |

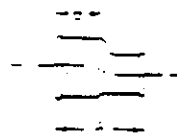
6536

6537

# REDUCERS



reducer and increaser



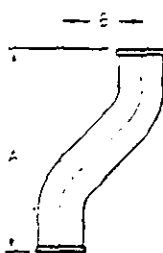
reducer eccentric

| Size        | A | B min |
|-------------|---|-------|
| 1/2 x 1/2   | 4 | 1 1/4 |
| 1/2 x 3/4   | 5 | 1 1/4 |
| 3/4 x 3/4   | 5 | 1 1/4 |
| 3/4 x 1     | 5 | 1 1/4 |
| 1 x 1       | 5 | 1 1/4 |
| 1 x 3/4     | 7 | 1 1/4 |
| 1 x 1/2     | 7 | 1 1/4 |
| 1 x 1       | 7 | 1 1/4 |
| 1 1/2 x 1/2 | 9 | 1 1/4 |
| 1 1/2 x 1   | 9 | 1 1/4 |
| 1 1/2 x 3/4 | 9 | 1 1/4 |
| 1 1/2 x 1/2 | 9 | 1 1/4 |
| 2 x 1/2     | 9 | 1 1/4 |
| 2 x 1       | 9 | 1 1/4 |
| 2 x 3/4     | 9 | 1 1/4 |
| 2 x 1/2     | 9 | 1 1/4 |

\*Used with adjustable join

6540

# OFFSET



| Size | A  | B Offset | Size |
|------|----|----------|------|
| 1/2  | 12 | 1        | 3    |
| 1/2  | 12 | 3        | 3    |
| 1/2  | 12 | 4        | 3    |
| 1/2  | 12 | 5        | 3    |
| 1/2  | 12 | 8        | 4    |
| 1/2  | 12 | 10       | 4    |
| 1/2  | 12 | 12       | 4    |
| 1/2  | 12 | 14       | 4    |
| 1/2  | 12 | 16       | 4    |
| 1/2  | 12 | 18       | 4    |
| 1/2  | 12 | 20       | 4    |
| 1/2  | 12 | 22       | 4    |
| 1/2  | 12 | 24       | 4    |
| 1/2  | 12 | 26       | 4    |
| 1/2  | 12 | 28       | 4    |
| 1/2  | 12 | 30       | 4    |
| 1/2  | 12 | 32       | 4    |
| 1/2  | 12 | 34       | 4    |
| 1/2  | 12 | 36       | 4    |
| 1/2  | 12 | 38       | 4    |
| 1/2  | 12 | 40       | 4    |
| 1/2  | 12 | 42       | 4    |
| 1/2  | 12 | 44       | 4    |
| 1/2  | 12 | 46       | 4    |
| 1/2  | 12 | 48       | 4    |
| 1/2  | 12 | 50       | 4    |
| 1/2  | 12 | 52       | 4    |
| 1/2  | 12 | 54       | 4    |
| 1/2  | 12 | 56       | 4    |
| 1/2  | 12 | 58       | 4    |
| 1/2  | 12 | 60       | 4    |
| 1/2  | 12 | 62       | 4    |
| 1/2  | 12 | 64       | 4    |
| 1/2  | 12 | 66       | 4    |
| 1/2  | 12 | 68       | 4    |
| 1/2  | 12 | 70       | 4    |
| 1/2  | 12 | 72       | 4    |
| 1/2  | 12 | 74       | 4    |
| 1/2  | 12 | 76       | 4    |
| 1/2  | 12 | 78       | 4    |
| 1/2  | 12 | 80       | 4    |
| 1/2  | 12 | 82       | 4    |
| 1/2  | 12 | 84       | 4    |
| 1/2  | 12 | 86       | 4    |
| 1/2  | 12 | 88       | 4    |
| 1/2  | 12 | 90       | 4    |
| 1/2  | 12 | 92       | 4    |
| 1/2  | 12 | 94       | 4    |
| 1/2  | 12 | 96       | 4    |
| 1/2  | 12 | 98       | 4    |
| 1/2  | 12 | 100      | 4    |
| 1/2  | 12 | 102      | 4    |
| 1/2  | 12 | 104      | 4    |
| 1/2  | 12 | 106      | 4    |
| 1/2  | 12 | 108      | 4    |
| 1/2  | 12 | 110      | 4    |
| 1/2  | 12 | 112      | 4    |
| 1/2  | 12 | 114      | 4    |
| 1/2  | 12 | 116      | 4    |
| 1/2  | 12 | 118      | 4    |
| 1/2  | 12 | 120      | 4    |
| 1/2  | 12 | 122      | 4    |
| 1/2  | 12 | 124      | 4    |
| 1/2  | 12 | 126      | 4    |
| 1/2  | 12 | 128      | 4    |
| 1/2  | 12 | 130      | 4    |
| 1/2  | 12 | 132      | 4    |
| 1/2  | 12 | 134      | 4    |
| 1/2  | 12 | 136      | 4    |
| 1/2  | 12 | 138      | 4    |
| 1/2  | 12 | 140      | 4    |
| 1/2  | 12 | 142      | 4    |
| 1/2  | 12 | 144      | 4    |
| 1/2  | 12 | 146      | 4    |
| 1/2  | 12 | 148      | 4    |
| 1/2  | 12 | 150      | 4    |
| 1/2  | 12 | 152      | 4    |
| 1/2  | 12 | 154      | 4    |
| 1/2  | 12 | 156      | 4    |
| 1/2  | 12 | 158      | 4    |
| 1/2  | 12 | 160      | 4    |
| 1/2  | 12 | 162      | 4    |
| 1/2  | 12 | 164      | 4    |
| 1/2  | 12 | 166      | 4    |
| 1/2  | 12 | 168      | 4    |
| 1/2  | 12 | 170      | 4    |
| 1/2  | 12 | 172      | 4    |
| 1/2  | 12 | 174      | 4    |
| 1/2  | 12 | 176      | 4    |
| 1/2  | 12 | 178      | 4    |
| 1/2  | 12 | 180      | 4    |
| 1/2  | 12 | 182      | 4    |
| 1/2  | 12 | 184      | 4    |
| 1/2  | 12 | 186      | 4    |
| 1/2  | 12 | 188      | 4    |
| 1/2  | 12 | 190      | 4    |
| 1/2  | 12 | 192      | 4    |
| 1/2  | 12 | 194      | 4    |
| 1/2  | 12 | 196      | 4    |
| 1/2  | 12 | 198      | 4    |
| 1/2  | 12 | 200      | 4    |
| 1/2  | 12 | 202      | 4    |
| 1/2  | 12 | 204      | 4    |
| 1/2  | 12 | 206      | 4    |
| 1/2  | 12 | 208      | 4    |
| 1/2  | 12 | 210      | 4    |
| 1/2  | 12 | 212      | 4    |
| 1/2  | 12 | 214      | 4    |
| 1/2  | 12 | 216      | 4    |
| 1/2  | 12 | 218      | 4    |
| 1/2  | 12 | 220      | 4    |
| 1/2  | 12 | 222      | 4    |
| 1/2  | 12 | 224      | 4    |
| 1/2  | 12 | 226      | 4    |
| 1/2  | 12 | 228      | 4    |
| 1/2  | 12 | 230      | 4    |
| 1/2  | 12 | 232      | 4    |
| 1/2  | 12 | 234      | 4    |
| 1/2  | 12 | 236      | 4    |
| 1/2  | 12 | 238      | 4    |
| 1/2  | 12 | 240      | 4    |
| 1/2  | 12 | 242      | 4    |
| 1/2  | 12 | 244      | 4    |
| 1/2  | 12 | 246      | 4    |
| 1/2  | 12 | 248      | 4    |
| 1/2  | 12 | 250      | 4    |
| 1/2  | 12 | 252      | 4    |
| 1/2  | 12 | 254      | 4    |
| 1/2  | 12 | 256      | 4    |
| 1/2  | 12 | 258      | 4    |
| 1/2  | 12 | 260      | 4    |
| 1/2  | 12 | 262      | 4    |
| 1/2  | 12 | 264      | 4    |
| 1/2  | 12 | 266      | 4    |
| 1/2  | 12 | 268      | 4    |
| 1/2  | 12 | 270      | 4    |
| 1/2  | 12 | 272      | 4    |
| 1/2  | 12 | 274      | 4    |
| 1/2  | 12 | 276      | 4    |
| 1/2  | 12 | 278      | 4    |
| 1/2  | 12 | 280      | 4    |
| 1/2  | 12 | 282      | 4    |
| 1/2  | 12 | 284      | 4    |
| 1/2  | 12 | 286      | 4    |
| 1/2  | 12 | 288      | 4    |
| 1/2  | 12 | 290      | 4    |
| 1/2  | 12 | 292      | 4    |
| 1/2  | 12 | 294      | 4    |
| 1/2  | 12 | 296      | 4    |
| 1/2  | 12 | 298      | 4    |
| 1/2  | 12 | 300      | 4    |
| 1/2  | 12 | 302      | 4    |
| 1/2  | 12 | 304      | 4    |
| 1/2  | 12 | 306      | 4    |
| 1/2  | 12 | 308      | 4    |
| 1/2  | 12 | 310      | 4    |
| 1/2  | 12 | 312      | 4    |
| 1/2  | 12 | 314      | 4    |
| 1/2  | 12 | 316      | 4    |
| 1/2  | 12 | 318      | 4    |
| 1/2  | 12 | 320      | 4    |
| 1/2  | 12 | 322      | 4    |
| 1/2  | 12 | 324      | 4    |
| 1/2  | 12 | 326      | 4    |
| 1/2  | 12 | 328      | 4    |
| 1/2  | 12 | 330      | 4    |
| 1/2  | 12 | 332      | 4    |
| 1/2  | 12 | 334      | 4    |
| 1/2  | 12 | 336      | 4    |
| 1/2  | 12 | 338      | 4    |
| 1/2  | 12 | 340      | 4    |
| 1/2  | 12 | 342      | 4    |
| 1/2  | 12 | 344      | 4    |
| 1/2  | 12 | 346      | 4    |
| 1/2  | 12 | 348      | 4    |
| 1/2  | 12 | 350      | 4    |
| 1/2  | 12 | 352      | 4    |
| 1/2  | 12 | 354      | 4    |
| 1/2  | 12 | 356      | 4    |
| 1/2  | 12 | 358      | 4    |
| 1/2  | 12 | 360      | 4    |
| 1/2  | 12 | 362      | 4    |
| 1/2  | 12 | 364      | 4    |
| 1/2  | 12 | 366      | 4    |
| 1/2  | 12 | 368      | 4    |
| 1/2  | 12 | 370      | 4    |
| 1/2  | 12 | 372      | 4    |
| 1/2  | 12 | 374      | 4    |
| 1/2  | 12 | 376      | 4    |
| 1/2  | 12 | 378      | 4    |
| 1/2  | 12 | 380      | 4    |
| 1/2  | 12 | 382      | 4    |
| 1/2  | 12 | 384      | 4    |
| 1/2  | 12 | 386      | 4    |
| 1/2  | 12 | 388      | 4    |
| 1/2  | 12 | 390      | 4    |
| 1/2  | 12 | 392      | 4    |
| 1/2  | 12 | 394      | 4    |
| 1/2  | 12 | 396      | 4    |
| 1/2  | 12 | 398      | 4    |
| 1/2  | 12 | 400      | 4    |
| 1/2  | 12 | 402      | 4    |
| 1/2  | 12 | 404      | 4    |
| 1/2  | 12 | 406      | 4    |
| 1/2  | 12 | 408      | 4    |
| 1/2  | 12 | 410      | 4    |
| 1/2  | 12 | 412      | 4    |
| 1/2  | 12 | 414      | 4    |
| 1/2  | 12 | 416      | 4    |
| 1/2  | 12 | 418      | 4    |
| 1/2  | 12 | 420      | 4    |
| 1/2  | 12 | 422      | 4    |
| 1/2  | 12 | 424      | 4    |
| 1/2  | 12 | 426      | 4    |
| 1/2  | 12 | 428      | 4    |
| 1/2  | 12 | 430      | 4    |
| 1/2  | 12 | 432      | 4    |
| 1/2  | 12 | 434      | 4    |
| 1/2  | 12 | 436      | 4    |
| 1/2  | 12 | 438      | 4    |
| 1/2  | 12 | 440      | 4    |
| 1/2  | 12 | 442      | 4    |
| 1/2  | 12 | 444      | 4    |
| 1/2  | 12 | 446      | 4    |
| 1/2  | 12 | 448      | 4    |
| 1/2  | 12 | 450      | 4    |
| 1/2  | 12 | 452      | 4    |
| 1/2  | 12 | 454      | 4    |
| 1/2  | 12 | 456      | 4    |
| 1/2  | 12 | 458      | 4    |
| 1/2  | 12 | 460      | 4    |
| 1/2  | 12 | 462      | 4    |
| 1/2  | 12 | 464      | 4    |
| 1/2  | 12 | 466      | 4    |
| 1/2  | 12 | 468      | 4    |
| 1/2  | 12 | 470      | 4    |
| 1/2  | 12 | 472      | 4    |
| 1/2  | 12 | 474      | 4    |
| 1/2  | 12 | 476      | 4    |
| 1/2  | 12 | 478      | 4    |
| 1/2  | 12 | 480      | 4    |
| 1/2  | 12 | 482      | 4    |
| 1/2  | 12 | 484      | 4    |
| 1/2  | 12 | 486      | 4    |
| 1/2  | 12 | 488      | 4    |
| 1/2  | 12 | 490      | 4    |
| 1/2  | 12 | 492      | 4    |
| 1/2  | 12 | 494      | 4    |
| 1/2  | 12 | 496      | 4    |
| 1/2  | 12 | 498      | 4    |
| 1/2  | 12 | 500      | 4    |
| 1/2  | 12 | 502      | 4    |
| 1/2  | 12 | 504      | 4    |
| 1/2  | 12 | 506      | 4    |
| 1/2  | 12 | 508      | 4    |
| 1/2  | 12 | 510      | 4    |
| 1/2  | 12 | 512      | 4    |
| 1/2  | 12 | 514      | 4    |
| 1/2  | 12 | 516      | 4    |
| 1/2  | 12 | 518      | 4    |
| 1/2  | 12 | 520      | 4    |
| 1/2  | 12 | 522      | 4    |
| 1/2  | 12 | 524      | 4    |
| 1/2  | 12 | 526      | 4    |
| 1/2  | 12 | 528      | 4    |
| 1/2  | 12 | 530      | 4    |
| 1/2  | 12 | 532      | 4    |
| 1/2  | 12 | 534      | 4    |
| 1/2  | 12 | 536      | 4    |
| 1/2  | 12 | 538      | 4    |
| 1/2  | 12 | 540      | 4    |
| 1/2  | 12 | 542      | 4    |
| 1/2  | 12 | 544      | 4    |
| 1/2  | 12 | 546      | 4    |
| 1/2  | 12 | 548      | 4    |
| 1/2  | 12 | 550      | 4    |
| 1/2  | 12 | 552      | 4    |
| 1/2  | 12 | 554      | 4    |
| 1/2  | 12 | 556      | 4    |
| 1/2  | 12 | 558      | 4    |
| 1/2  | 12 | 560      | 4    |
| 1/2  | 12 | 562      | 4    |



6544



Short cleanout plug

6545 (annealed)

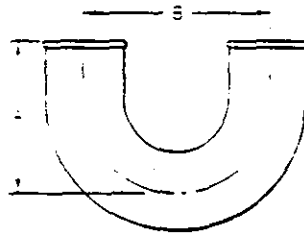


Long cleanout plug

## CLEANOUT PLUGS

| Size  | A     | B     |
|-------|-------|-------|
| 1 1/2 | 4     | 5 1/2 |
| 2     | 4 1/2 | 5 3/4 |
| 3     | 5     | 6 1/4 |
| 4     | 5 1/2 | 6 3/4 |
| 6     | 7 1/2 | 8 1/2 |

6550



## U BEND (Vent Loop)

| Size  | A     | B     |
|-------|-------|-------|
| 1 1/2 | 4     | 5     |
| 2     | 4 1/2 | 5 1/2 |
| 3     | 5     | 6     |
| 4     | 5 1/2 | 6 1/2 |
| 6     | 7 1/2 | 8 1/2 |

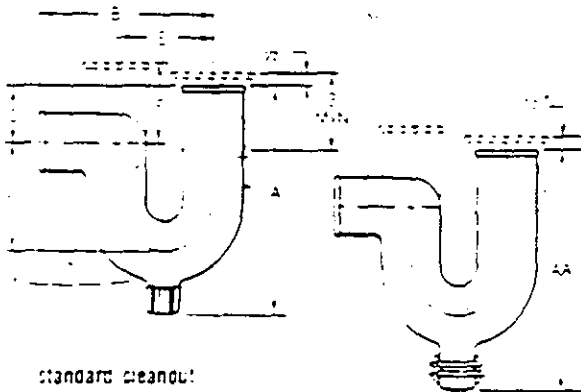
NOTE: U bends (annealed only) are often used for vent loops. Bottom sections of long S traps (#6562) are also used as vent loops.

6554—without vent

6554-A—without vent

6555—with vent

6555-A—with vent



standard cleanout

large cleanout

## P TRAP

Available in two cleanout styles. Standard cleanouts supplied with phenolic screw caps (#6675) with Teflon liners.

Large cleanout traps supplied with 1 1/2" KIMAX coupling #6650 and 1 1/2" short cleanout plug #6544.

Traps without cleanouts (annealed only) are available on special order. Cleanouts are recommended for all traps.

Expanded inlets of reducer traps have 3" minimum depth to permit height adjustments.

| Size  | vent size | seal depth | A     | B     | C     | D     | E     | F     | AA     |
|-------|-----------|------------|-------|-------|-------|-------|-------|-------|--------|
| 1 1/2 | 1 1/2     | 1 1/4      | 3 1/2 | 3     | 1     | 3 1/2 | 5     | 1     | 5 1/2  |
| 2     | 2         | 1 1/4      | 3 1/2 | 3     | 1     | 3 1/2 | 5 1/2 | 1     | 5 3/4  |
| 3     | 3         | 1 3/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 6 1/4  |
| 4     | 4         | 1 3/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 6 3/4  |
| 6     | 6         | 2          | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 8 1/2  |
| 8     | 8         | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 10 1/2 |
| 10    | 10        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 12 1/2 |
| 12    | 12        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 14 1/2 |
| 14    | 14        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 16 1/2 |
| 16    | 16        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 1 1/2 | 18 1/2 |

\*Use adapter coupling (#6655) for top joint.

\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.

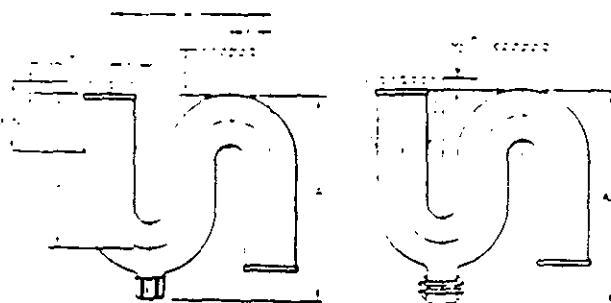
\*\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.

6556—without vent

6556-A—without vent

6557—with vent

6557-A—with vent



standard cleanout

large cleanout

## S TRAP

In two cleanout styles. Traps without cleanouts (annealed only) available on special order. Cleanouts recommended for all traps.

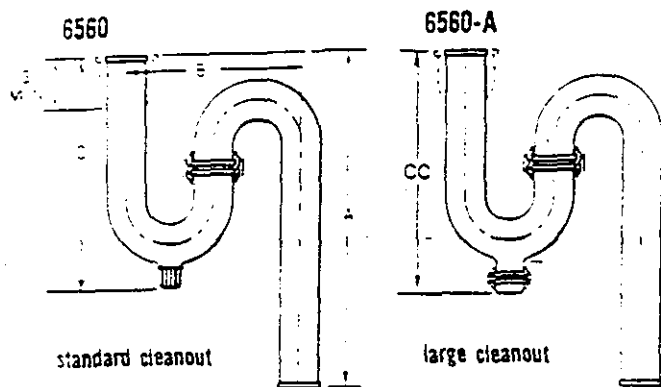
Large cleanout traps supplied with 1 1/2" KIMAX coupling #6650 and 1 1/2" short cleanout plug #6544.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

| Size  | vent size | seal depth | A     | B     | C     | E     | F     | AA     |
|-------|-----------|------------|-------|-------|-------|-------|-------|--------|
| 1 1/2 | 1 1/2     | 1 1/4      | 3 1/2 | 3     | 1     | 3 1/2 | 5     | 5 1/2  |
| 2     | 2         | 1 1/4      | 3 1/2 | 3     | 1     | 3 1/2 | 5 1/2 | 5 3/4  |
| 3     | 3         | 1 3/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 6 1/4  |
| 4     | 4         | 1 3/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 6 3/4  |
| 6     | 6         | 2          | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 8 1/2  |
| 8     | 8         | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 10 1/2 |
| 10    | 10        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 12 1/2 |
| 12    | 12        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 14 1/2 |
| 14    | 14        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 16 1/2 |
| 16    | 16        | 2 1/4      | 3 1/2 | 3 1/4 | 1 1/2 | 3 1/2 | 5 1/2 | 18 1/2 |

\*Use adapter coupling (#6655) for top joint.

\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.



## LONG S TRAP

Trap #6560 consists of top section #6561, bottom section #6562 (annealed only), and KIMAX coupling #6650.

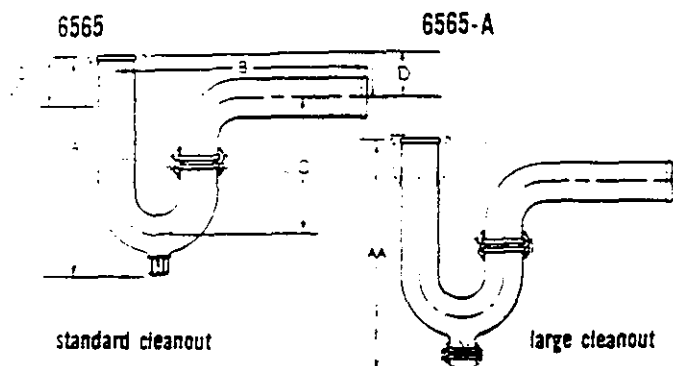
Trap #6560-A consists of top section #6561-A (with 1/2" KIMAX coupling #6650 and short plug #6544), bottom section #6562 (annealed only) and KIMAX coupling #6650.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

| Size          | seal depth | A      | Max. B | C     | CC     |
|---------------|------------|--------|--------|-------|--------|
| 1 1/2 x 1 1/2 | 5 1/4      | 16 1/4 | 10     | 8 1/4 | 11 1/4 |
| 1 1/2 x 1 1/2 | 5 1/4      | 20 1/4 | 10     | 8 1/4 | 11 1/4 |
| 2 x 1 1/2     | 5 1/4      | 16 1/4 | 10     | 8 1/4 | 11 1/4 |
| 2 x 1 1/2     | 5 1/4      | 20 1/4 | 10     | 8 1/4 | 11 1/4 |
| 2 x 2         | 5 1/4      | 20 1/4 | 10     | 8 1/4 | 11 1/4 |
| 2 1/2 x 2     | 5 1/4      | 20 1/4 | 10     | 8 1/4 | 11 1/4 |

\*Use adapter coupling (#6655) for top joint.

\*\*Use adjustable joint (#6660) for top joint.



## LONG P TRAP

Long P trap assembly #6565 (standard cleanout) consists of top section #6561, horizontal section #6512, and KIMAX coupling #6650.

Assembly #6565-A (large cleanout) consists of top section #6561-A (with 1/2" KIMAX coupling #6650 and short plug #6544), horizontal section #6512, and KIMAX coupling #6650.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

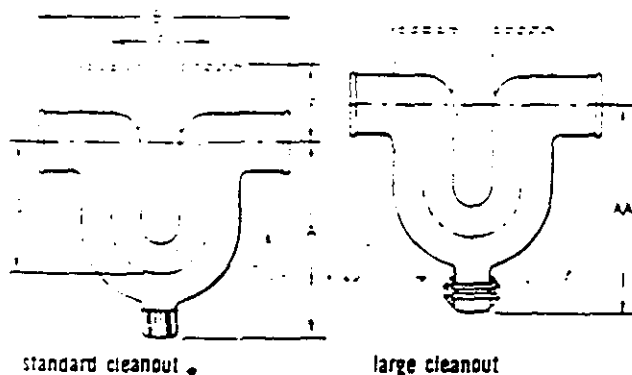
| Size          | seal depth | A      | B  | C     | D      | AA     |
|---------------|------------|--------|----|-------|--------|--------|
| 1 1/2 x 1 1/2 | 5 1/4      | 10 1/4 | 11 | 8 1/4 | 10 1/4 | 10 1/4 |
| 2 x 1 1/2     | 5 1/4      | 10 1/4 | 11 | 8 1/4 | 10 1/4 | 10 1/4 |
| 2 x 2         | 5 1/4      | 10 1/4 | 11 | 8 1/4 | 10 1/4 | 10 1/4 |
| 2 1/2 x 2     | 5 1/4      | 10 1/4 | 11 | 8 1/4 | 10 1/4 | 10 1/4 |

\*Use adapter coupling (#6655) for top joint.

\*\*Use adjustable joint (#6660) for top joint.

6570 —without vents  
6571 —with 1 vent  
6572 —with 2 vents

6570-A —without vents  
6571-A —with 1 vent  
6572-A —with 2 vents



## RUNNING TRAP

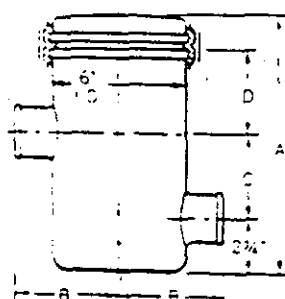
In two cleanout styles and with 3 vent options.

Running traps with large cleanouts supplied with 1/2" KIMAX coupling #6650 and short cleanout plug #6544.

Traps without cleanouts supplied on special order, annealed only. Cleanouts recommended for all traps.

| Size          | vent size | seal depth | A      | B      | C     | E     | F     | AA     |
|---------------|-----------|------------|--------|--------|-------|-------|-------|--------|
| 1 1/2 x 1 1/2 | 1 1/2     | 3 1/4      | 20 1/4 | 11     | 5     | 5     | 3     | 30 1/4 |
| 1 1/2 x 1 1/2 | 1 1/2     | 3 1/4      | 8 1/4  | 10     | 5 1/4 | 5 1/4 | 3 1/4 | 9 1/4  |
| 2 x 2         | 2         | 3 1/4      | 10     | 14 1/4 | 6 1/4 | 6 1/4 | 4     | 10 1/4 |
| 2 x 2         | 2         | 3 1/4      | 11 1/4 | 17 1/4 | 7 1/4 | 7 1/4 | 5     | 12 1/4 |
| 2 1/2 x 2 1/2 | 2 1/2     | 3 1/4      | 14 1/4 | 24     | 8 1/4 | 10    | 7     | 15 1/4 |

6576



## DRUM TRAP (top cleanout)

Assembly #6576 consists of following components:

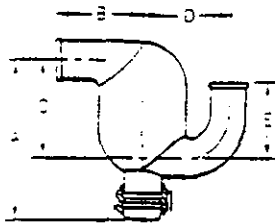
6" glass body #6577

5" short cleanout plug #6544

5" drainline coupling #6650

| Size  | seal depth | A      | B     | C     | D     |
|-------|------------|--------|-------|-------|-------|
| 1 1/2 | 2 1/4      | 13 1/4 | 5 1/4 | 4 1/2 | 4 1/2 |
| 2     | 2 1/4      | 13 1/4 | 5 1/4 | 4 1/2 | 4 1/2 |
| 2 1/2 | 2 1/4      | 14 1/4 | 5 1/4 | 5 1/2 | 4 1/2 |

6585

**DRUM TRAP (bottom cleanout)**

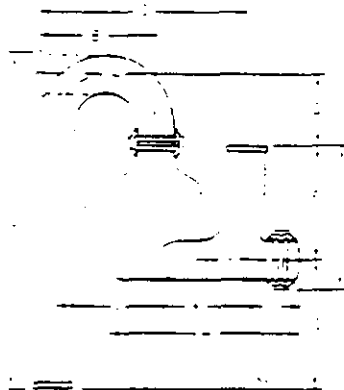
Assembly #6585 consists of following components:

- glass body #6586
- short cleanout plug #6544
- drainline coupling #6650

| Size | seal depth | A      | B      | C      | D      | E      |
|------|------------|--------|--------|--------|--------|--------|
| 1/2" | 1 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |
| 3/4" | 1 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |

6590—vertical outlet.

6591—horizontal outlet.

**CENTRIFUGAL DRUM TRAP (side cleanout)**

Assembly #6590 consists of following components:

- glass body #6590
- vertical outlet #6562\*
- short cleanout plug #6544
- drainline couplings #6650

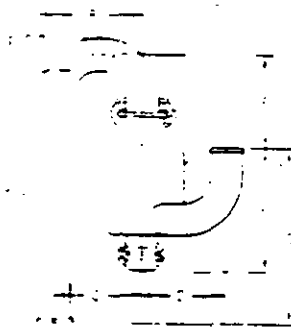
Assembly #6591 is same as #6590 except that horizontal outlet #6510 is used in place of vertical outlet #6562.

| Size | seal depth | A       | B      | C       | D       | E       | F       | G       | H       | I       | J       | K       | L       | M       | N       | O       | P       | Q       | R       | S       | T       | U       | V       | W       | X       | Y       | Z       |
|------|------------|---------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1/2" | 1 1/4"     | 16 1/2" | 8 1/4" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" |
| 3/4" | 1 1/4"     | 16 1/2" | 8 1/4" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" |

\*Same as bottom section of long S trap (#6560). Annealed only.

6600—vertical outlet.

6601—horizontal outlet.

**CENTRIFUGAL DRUM TRAP (bottom cleanout)**

The adjustable connection at the top of the body permits approximately 21° variation in the depth of seal.

Vertical outlet assembly #6600 consists of:

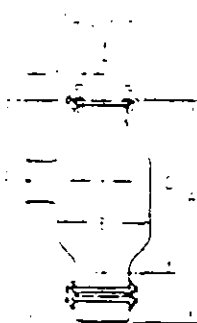
- glass body #6600
- vertical outlet #6603 (annealed only)
- short cleanout plug #6544
- drainline coupling #6650
- adapter coupling #6604 for 1/2" size or adjustable joint #6611 for 3/4" size

Horizontal outlet assembly #6601 is same as #6600 except that horizontal outlet #6604 is used in place of vertical outlet.

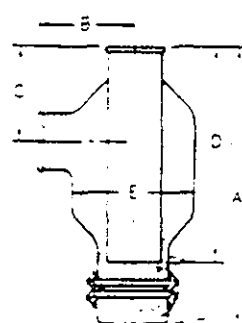
| Size | seal depth | A       | B      | C       | D       | E       | F       | G       |
|------|------------|---------|--------|---------|---------|---------|---------|---------|
| 1/2" | 1 1/4"     | 16 1/2" | 8 1/4" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" |
| 3/4" | 1 1/4"     | 16 1/2" | 8 1/4" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" | 12 1/2" |

6610

6612



without partition



with sealed-in partition

**PARTITION TRAPS**

Assembly #6610 consists of:

- glass body #6610 (without partition)
- drainline coupling #6650
- short cleanout plug #6544

Partition trap assembly #6610 to threaded sink tailpiece, thread bead adapter #6630 on top of body, 3/4" to beaded end of straight length cut to desired length using coupling #6650. Beaded end of straight length into trap inlet through adjustable connection (adapter coupling #6630 for 1/2" size, adjustable joint #6660 for 3/4" and 1" sizes).

Partition trap assembly #6612 consists of glass body #6612 with sealed-in partition (annealed only), 3/4" coupling #6650 and 3/4" short cleanout plug #6544.

Both traps are non-siphoning with the partition always visible.

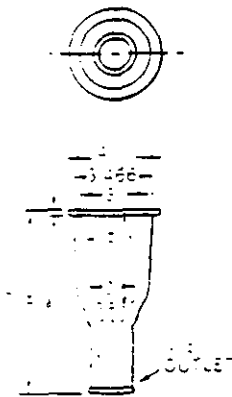
| Size   | seal depth | A      | B      | C      | D      | E      |
|--------|------------|--------|--------|--------|--------|--------|
| 1/2"   | 3 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |
| 3/4"   | 3 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |
| 1"     | 3 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |
| 1 1/2" | 3 1/4"     | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" | 3 1/4" |

\*Available only without partition.

## CUP SINKS

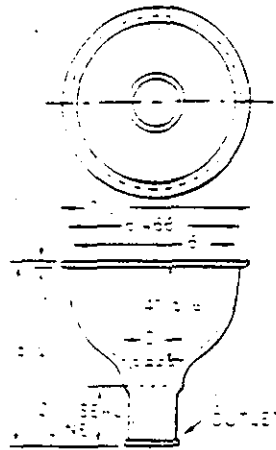
6616

3" hemispherical cup sink



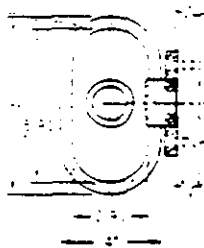
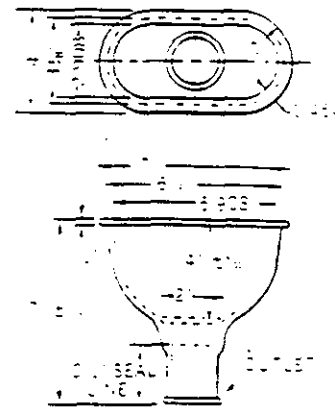
6617

5" hemispherical cup sink



6619

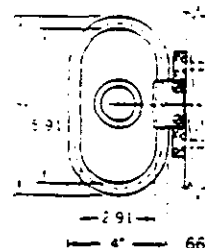
3" x 6" oval cup sink - straight sides



6620

3" x 6" oval cup sink,  
oval, straight sides

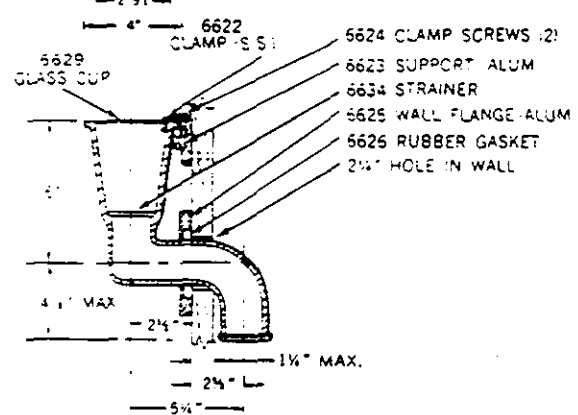
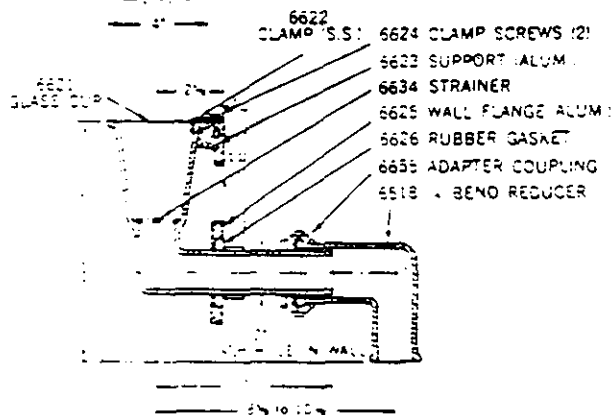
6627 MOUNTING BOLTS 4



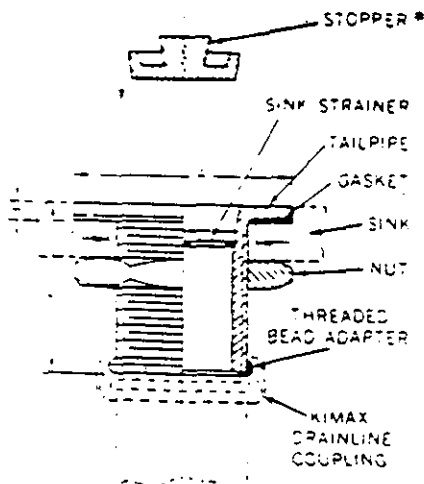
6628

3" x 5" Cup Sink, Offset  
Vertical Outlet, Straight Sides

6627 MOUNTING BOLTS 4



6630



### 5 PIECE SINK TAILPIECE ASSEMBLY

Assembly #6630 includes Teflon tailpipe #6631; tailpipe locknut #6632; one Teflon strainer #6634; rubber gasket #6635; and Teflon bead adapter #6633. Teflon stopper #6637 must be ordered separately.

The tailpiece is tightened with a single nut. Teflon bead adapter #6633 is threaded to the tailpipe and joined to KIMAX drainline traps by means of K coupling #6650.

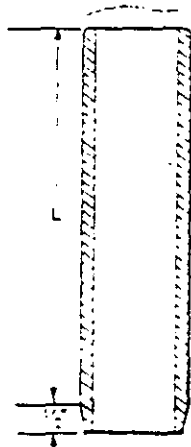
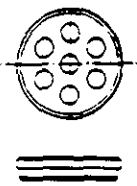
Three-inch lengths are standard. Longer tailpipes available on special order at extra cost.

| Size | Recommended sink opening dimensions |        |    |
|------|-------------------------------------|--------|----|
|      | A                                   | B      | C  |
| 3"   | 3 1/2"                              | 4 1/2" | 5" |
| 4"   | 4 1/2"                              | 5 1/2" | 6" |
| 5"   | 5 1/2"                              | 6 1/2" | 7" |

NOTE: Tailpipe #6631, strainer #6634 & stopper #6637 are made of a filled Teflon material.

6638

BEEHIVE CAP



## STANDING OVERFLOW

Made from corrosion resistant filled Teflon available in three standard lengths. Precision tapered at lower end to fit tightly into mating taper or tailpipe. Beehive cap (#6639) must be ordered separately.

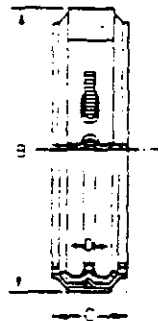
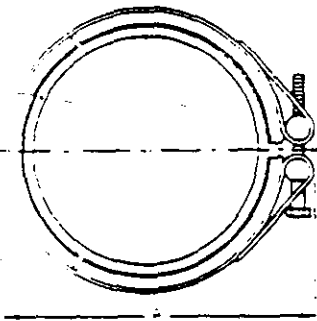
STANDING OVERFLOW #6638

BEEHIVE CAP #6639

| Size      | L (length) |
|-----------|------------|
| 1 1/2 x 4 | 4          |
| 2 x 5     | 5          |
| 2 1/2 x 6 | 6          |
| 3 x 8     | 8          |
| 4 x 10    | 10         |
| 5 x 12    | 12         |
| 6 x 14    | 14         |
| 8 x 18    | 18         |

| Size  |
|-------|
| 1 1/2 |
| 2     |
| 2 1/2 |
| 3     |
| 4     |
| 5     |
| 6     |
| 8     |

6650



## DRAINLINE COUPLING \*

Positive-seal compression coupling #6650 consists of following components:  
Segmented stainless steel outer band #6651.

Buna N rubber compression ring with Teflon-B liner #6652.

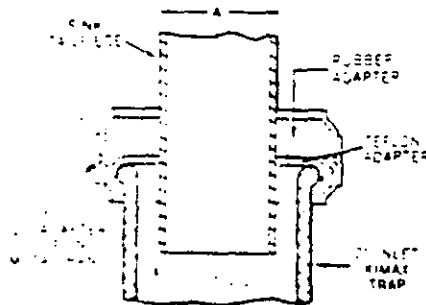
Stainless steel bolt #6653.

For details of construction, see pages 4-5.

| Size  | A     | B     | C     | D     |
|-------|-------|-------|-------|-------|
| 1 1/2 | 1 1/2 | 2 1/4 | 1 1/4 | 1 1/4 |
| 2     | 2 1/2 | 3 1/4 | 1 1/4 | 1 1/4 |
| 3     | 3 1/2 | 4 1/4 | 1 1/4 | 1 1/4 |
| 4     | 4 1/2 | 5 1/4 | 1 1/4 | 1 1/4 |
| 5     | 5 1/2 | 6 1/4 | 1 1/4 | 1 1/4 |

\*Patent Pending

6655



## ADAPTER COUPLING (assembly)

Assembly #6655 is used to join KIMAX drainline to unthreaded sink tailpieces. Assembly consists of:

Segmented stainless steel outer band #6651

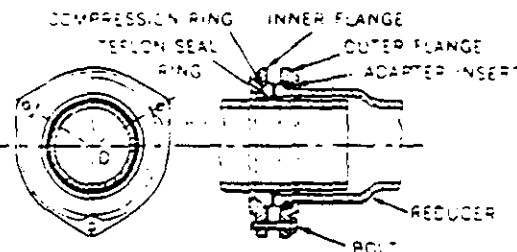
Buna N rubber adapter #6657

Teflon adapter #6656

Stainless steel bolt #6653

| Size  | Type of 1 1/2" Sink Strainer                                                                                  | Sink Strainer O.D. |
|-------|---------------------------------------------------------------------------------------------------------------|--------------------|
| 1 1/2 | Metal tubing and lead                                                                                         | 1.48" - 1.53"      |
| 2     | Lead, class "D" or "XL"                                                                                       | 1.70" - 1.72"      |
| 2 1/2 | Corrosiron #14646; Durcon #50-2                                                                               | 1.82" - 1.90"      |
| 3     | Duriron #11713; Lead, class "B"; "C", "D" or "M"; Plastic or steel (1 1/2" I.P.S.); Vulcathene #505 and glass |                    |

6660



## ADJUSTABLE JOINT (hardware only)

Adjustable joint permits space adjustment from 1 1/4" to 5" depending on size. Assembly #6660 consists of:

● aluminum inner flange #7206.

● aluminum outer flange #7150.

● Teflon seal ring (hat gasket) #7227.

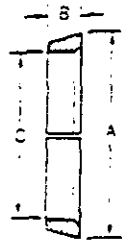
● adapter insert (molded neoprene asbestos) #7203.

● rubber compression ring #7226.

● 3 aluminum (hex head 1/4" - 18 x 1 1/4") bolts #7190 for 1 1/2", 2" and 3" sizes or 6 (hex head 1/4" - 18 x 1 1/4") aluminum bolts #7190 for 4" size.

| Size  | D     | adjustment |
|-------|-------|------------|
| 1 1/2 | 4 1/4 | 1 1/4      |
| 2     | 5 1/4 | 2 1/4      |
| 3     | 6 1/4 | 3 1/4      |
| 4     | 8 1/4 | 5          |

7203

**ADAPTER INSERT (Molded)**

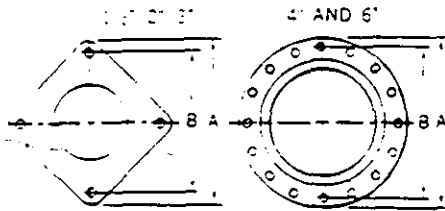
Neoprene molded insert is used when joining KIMAX drainline to other piping materials. These inserts will work with either Style II & Style II flanges for glass pipe. The 2 1/2", 3 1/2" and 5" sizes are used only with adjustable joints.

| Size   | A      | B      | C    |
|--------|--------|--------|------|
| 2 1/2" | 2 1/4" | 3/4"   | 1.91 |
| 3 1/2" | 2 3/4" | 3/4"   | 2.43 |
| 5"     | 3 1/4" | 3/4"   | 3.10 |
| 6"     | 4 1/4" | 3/4"   | 3.60 |
| 8"     | 5"     | 1"     | 4.25 |
| 10"    | 6"     | 1 1/4" | 4.62 |
| 12"    | 6 1/4" | 1 1/2" | 5.50 |
| 14"    | 8 1/4" | 1 3/4" | 6.85 |

\*Use #6670 metal flange only.

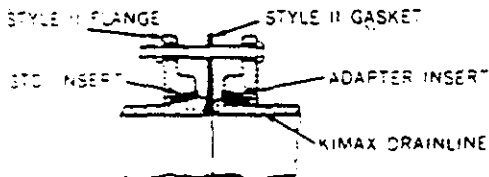
7155

6670

**METAL FLANGES**

Style II cast iron  
2 1/2", 3", 4", 6"

Metal flange cast iron  
4" and 6"



Cast-iron flanges are used to join KIMAX drainline to KIMAX process pipe or to glass-lined metal pipe. They are commonly used to join KIMAX process pipe to itself.

Flange #7155 is used on 2 1/2", 3", 4" and 6" drainline ends and adapter flange #6670 on 4" and 6" sizes. Adapter insert #7203 must be used between flange and drainline.

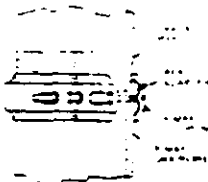
Flange #7155 is used with standard insert #7200 or #7201 for all sizes of process pipe. The 4" and 6" sizes are similar in shape to flange #6670 but have inner snap-rings with cemented inserts.

All sizes of both flanges have A.S.M.E. bolt circles.

For bolt sizes and number required, see table below.

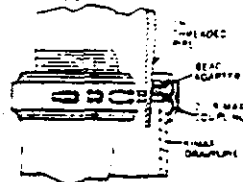
| Size   | A       | B<br>Bolt Circle | No. Bolts | Bolt Size        |
|--------|---------|------------------|-----------|------------------|
| 2 1/2" | 4 1/4"  | 3 1/2"           | 4         | 3/16-18 x 2 1/2" |
| 3"     | 5 1/4"  | 4 1/4"           | 4         | 3/16-18 x 2 1/2" |
| 4"     | 6 1/4"  | 6"               | 4         | 3/16-18 x 3"     |
| 6"     | 8 1/4"  | 7 1/4"           | 8         | 3/16-18 x 2 1/2" |
| 8"     | 10 1/4" | 9 1/4"           | 8         | 3/16-16 x 2 1/2" |

6660



standard

6685



adjustable

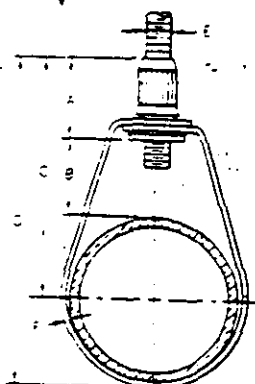
**BEAD ADAPTERS (threaded)**

Threaded bead adapters are used to provide beaded mating surface on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling #6650. All Kichen construction.

Adapter #6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1 1/2" metal to 1 1/2" glass). Ideal for floor drain connections. In 1 1/2", 2", 3", 4" and 6" sizes.

Adapter #6685 is designed to mate 1 1/2" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on trap piece for space adjustments.

7290

**"AUTO-GRIP"® HANGER**

Recommended for horizontal runs. Hangers contain interior A.S.M.E. type U.S. Zinc coating. See page 8 for operation.

Options: Standard finish on band connections.

| Size   | A      | B      | C      | D       | E      | F             |
|--------|--------|--------|--------|---------|--------|---------------|
| 2 1/2" | 1 1/4" | 1 1/4" | 3 1/4" | 4 1/4"  | 1 1/4" | 1/2" x 1 1/4" |
| 3"     | 1 1/4" | 1 1/4" | 3 1/4" | 4 1/4"  | 1 1/4" | 1/2" x 1 1/4" |
| 4"     | 1 1/4" | 1 1/4" | 4 1/4" | 6 1/4"  | 1 1/4" | 1/2" x 1 1/4" |
| 6"     | 1 1/2" | 1 1/4" | 5 1/4" | 7 1/4"  | 1 1/4" | 1/2" x 1 1/4" |
| 8"     | 1 1/2" | 2 1/4" | 7 1/4" | 10 1/4" | 1 1/4" | 1/2" x 1 1/4" |

7200



7202



### INSERTS

For use with glass process pipe and fittings to cushion glass from metal flange.

Insert #7200 is molded neoprene asbestos. The 1, 1½, 2, and 3" sizes are used with standard tempered pipe and fittings.

Insert #7202 is a neoprene asbestos strip insert used for 1" through 6" annealed fittings and for use as replacement parts for 4" and 6" tempered pipe and fittings.

7276



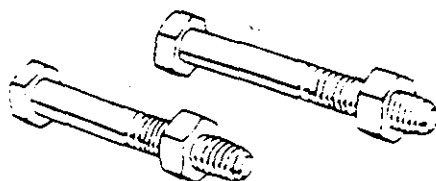
### INTERFACE GASKET

Used when joining KIMAX tempered glass drainline to KIMAX process pipe and KIMAX process pipe to itself.

Teflon machined envelope is a one-piece liner. Inner diameter is same as glass to prevent constriction of flow at the joint. Standard filler is Blue African asbestos.

Maximum working temperature of gasket is 450° F. Gasket thickness is 1/16" in 1, 1½, 2, and 3 sizes; ¼" in 4" and 6" sizes.

7190

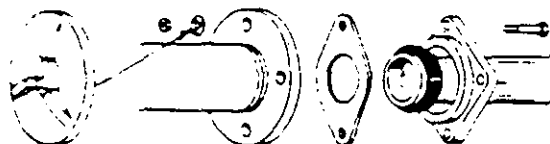


### BOLTS & NUTS

Steel bolts and nuts #7190 are required to fasten metal flanges when joining KIMAX drainline to process pipe or to glass-lined metal pipe.

Four bolts needed for 1½, 2, and 3" sizes; eight bolts needed for 4" and 6" sizes.

7230

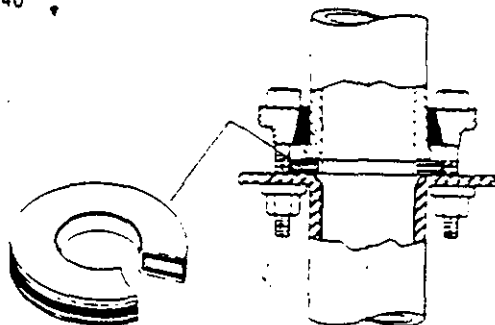


### ADAPTER BUTTON

Used to center smaller diameter Style II steel bolts in larger holes of A.S.M.E. flange when adapting KIMAX glass drainline to glass-lined metal pipe. One size of button is used for all sizes of flanges.

| I.D. | O.D.   | Height |
|------|--------|--------|
| 3/8" | 1 1/4" | 1"     |

7240



### DONUT SPACER

Teflon-covered donut spacer must be interposed between KIMAX drainline and glass-lined metal pipe.

Spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.

| PIPE SIZE<br>(inches) | THICKNESS<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 1/4"                  |
| 1 1/2                 | 1/4"                  |
| 2                     | 1/4"                  |
| 3                     | 1/4"                  |
| 4                     | 1/4"                  |
| 6                     | 1/4"                  |



KIMBLE GENERAL  
BRANCH SALES OFFICES

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Phone: 746-6600

Toledo 1, Ohio  
P. O. Box 1035  
Phone: 242-6543

**OWENS-ILLINOIS**

Maker of Kimble Products  
Toledo 1, Ohio



KIMAX Tempered Drainline is manufactured and sold by the Consumer and Technical Products Division



TR-2

*Installing* **KIMAX**  
**TEMPERED**  
**GLASS**  
**DRAINLINE**



**OWENS-ILLINOIS GLASS COMPANY**  
CONSUMER AND TECHNICAL PRODUCTS DIVISION

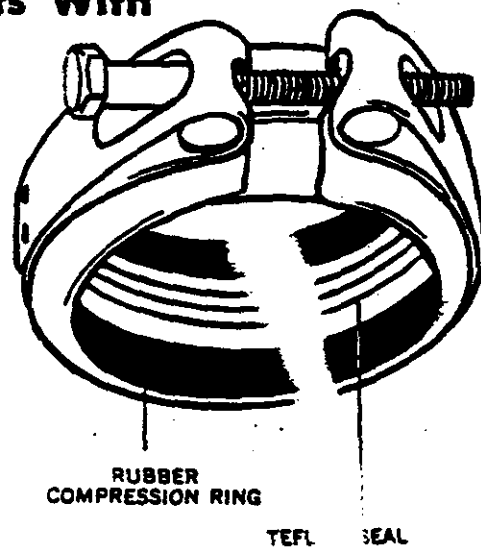
## Kimax\* Tempered Glass Drainline

### IS EASY TO INSTALL BECAUSE . . .

- Kimax Glass Drainline weighs just a fraction of conventional drainline materials.
- Longer lengths are available. Therefore fewer joints are required.
- Expansion is negligible; therefore expansion joints are not needed or recommended.
- Joints can be made faster. They're easier to handle and require fewer hangers because hangers are placed farther apart.
- Kimax glass possesses good mechanical strength. You don't have to handle it with kid gloves.
- There is no limit to the length or height to which Kimax glass drainline can be installed. It can be encased inside a wall, accessible or not. It can be buried in the ground, underneath concrete, or inside any trough or sleeve.

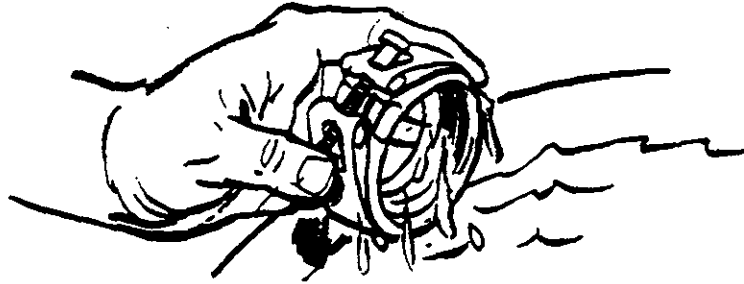
### Making Corrosion Resistant Joints With The Kimax Coupling

- All the metal parts are stainless steel. Inside, the coupling has a rubber compression ring and a Teflon seal ring.
- The coupling works like this: When tightened the metal band causes the Teflon seal ring and the glass beads to exert pressure on one another.

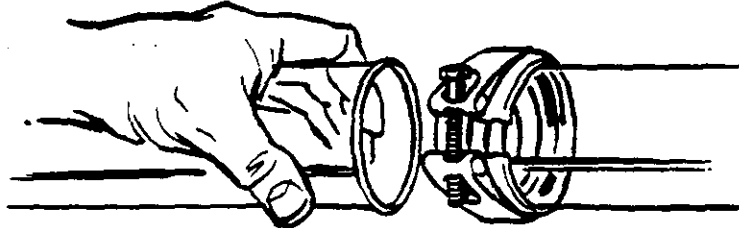


- Kimax is a registered trademark of Owens-Illinois, Toledo 1, Ohio
- While all instructions in this manual have been tried and tested in actual installations, the actual installation procedures used are at the discretion and responsibility of the contractor or installer.

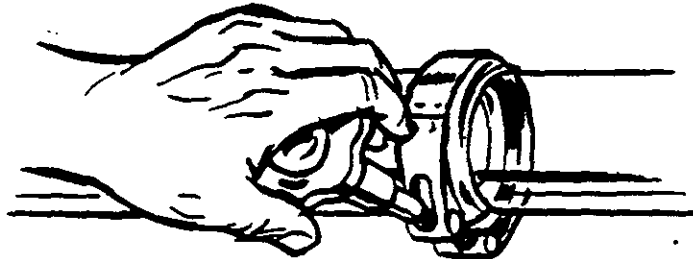
## How To Use The Kimax Coupling



1. Dip the coupling into a bucket of water or wet the inside with a damp sponge or cloth.



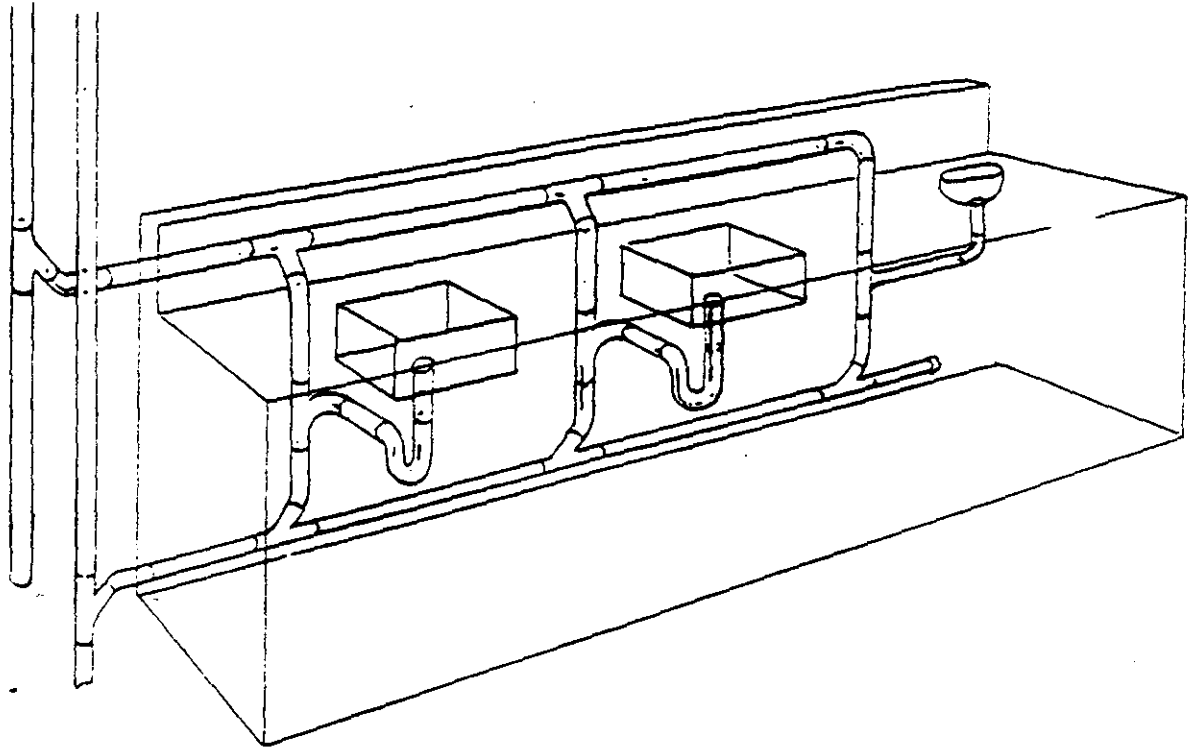
2. Push the coupling over one drainline section and then push the other section into the coupling.



3. Once the beads are seated properly you should be able to rotate the coupling on the glass. Tighten the bolt with a palm ratchet wrench until coupling firmly grips the glass.

### FOUR THINGS TO REMEMBER ABOUT THE KIMAX COUPLING

- The nut is assembled in the coupling so you won't have to hunt for it. However, it can easily be removed and replaced if necessary.
- A more positive Teflon to glass seal is obtained if all couplings are retightened to recommended torque 24 hours after being installed. This compensates for the cold flow in the Teflon seal ring.
- When dismantling the coupling it is recommended that any rubber and Teflon parts be checked for damage before being reinstalled. They may need replacing.
- Maximum continuous operating temperature is 212°F. (May be subjected to 250°F for short periods.)



## **Kimax Layouts Are Simple**

**THEY'RE SIMILAR TO DRAINLINE JOBS WITH OTHER MATERIALS**

### **REMEMBER THIS**

- Catalog dimensions for each length of drainline or fitting are given to the center of the gasket inside each drainline coupling. This means you forget about gasket thickness for layout purposes.
- In planning a Kimax drainline system, use catalog dimensions for straight lengths and fittings, since gasket thicknesses have been allowed for.
- Installation layout is simple because of the Owens-Illinois Kimax coupling assembly. With this one-piece coupling you tighten only one bolt for each joint. (It is available with a built-in positive seal detector upon request.)

## Burying Kimax Drainline

### PREPARING THE TRENCH

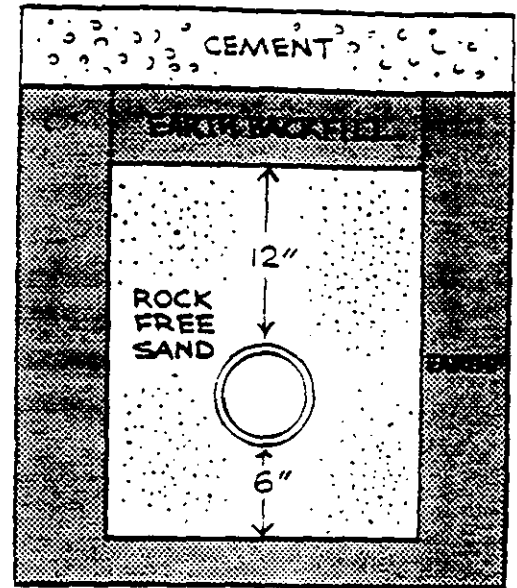
1. Dig trench to workable width and necessary depth dimensions as shown in illustration.
2. Partially refill the trench with 6 inches of rock-free sand.
3. Tamp the grade to assure a firm foundation for laying the drainline.

### LAYING THE DRAINLINE

4. Use 5-foot lengths of heavy schedule drainline with regular fittings. No expansion joints are needed since there's little or no expansion.
5. The line should be wrapped to prevent serious scratching of the glass. The recommended procedure is wrapping the line from bead to bead with JM E20 polyethylene tape or its equivalent. Or the line can be coated with at least 1/16" of ordinary automotive undercoating or other suitable mastic.
6. Lay the drainline in the trench with normal pitch ( $\frac{1}{4}$  inch per foot up to 3 inches,  $\frac{1}{8}$  inch per foot above 3 inches). You can assemble it above the ground, or in the trench, depending on job conditions.
7. Check all joints for tightness. If fittings in pre-assembled section are to be adjusted for position when laid in the trench, tighten coupling only half way so fittings can be rotated.
8. Test the line to make sure there are no leaks. If there is a leak, tighten leaking joint. If it still leaks make sure rubber compression ring and Teflon seal are dirt free. Be sure coupling and beads are not defective. Make sure beads are seated properly in the coupling. Check to see that the drainline alignment is satisfactory.

### BACKFILLING THE TRENCH

9. Backfill the trench with thin layers of rock free sand to 12 inches above the top of the drainline.
10. Tamp sand down firmly or spray it with water to make sure it's firm.
11. Fill the rest of the trench and complete floor or slab.



## Hanging Kimax Drainline

### HORIZONTAL RUNS

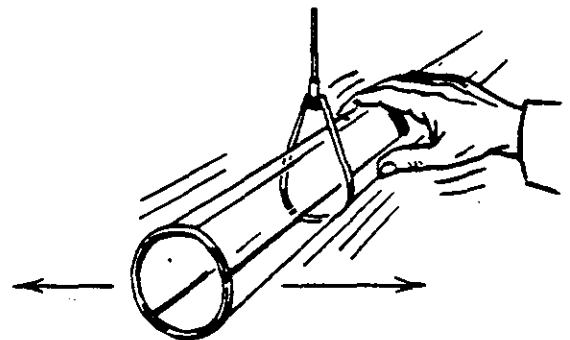
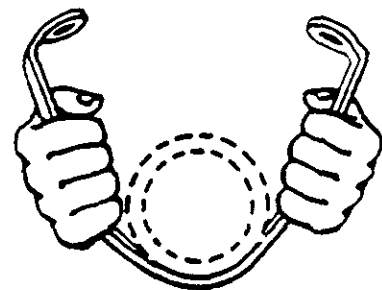
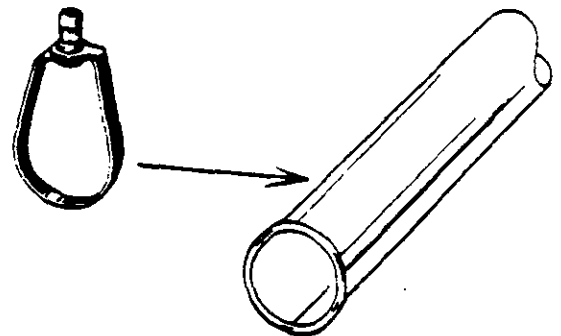
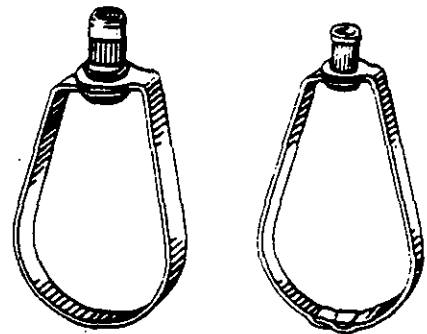
Use these "Auto-Grip"\* hangers or an equivalent to support the line every eight to ten feet. Notice: they are padded to prevent metal to glass contact.

1. Fit the hangers to the drainline, not the drainline to the hangers.

2. Spread the hanger and slip over drainline.

3. Tighten each coupling as you make it and never pull or spring the drainline into place.

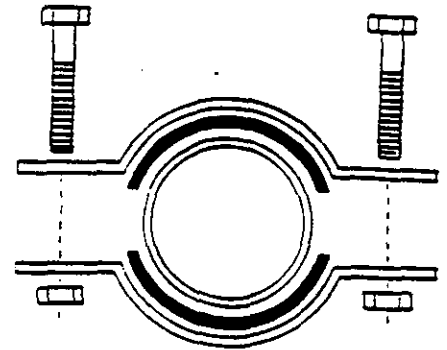
4. When the drainline is hung it should be free to move sideways.



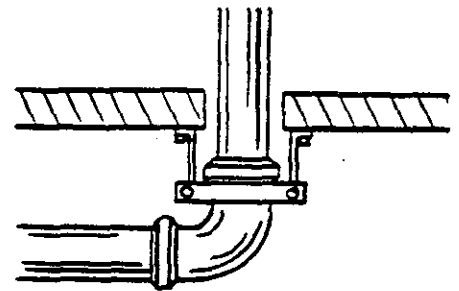
\* "Auto-Grip" is a registered trademark of the Automatic Sprinkler Corp. of America, Youngstown, Ohio.

## VERTICAL RUNS

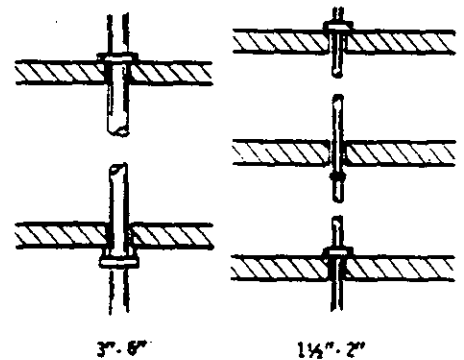
1. Riser clamp lined with  $\frac{1}{4}$ " thick neoprene should be installed under a coupling every third floor whenever possible.



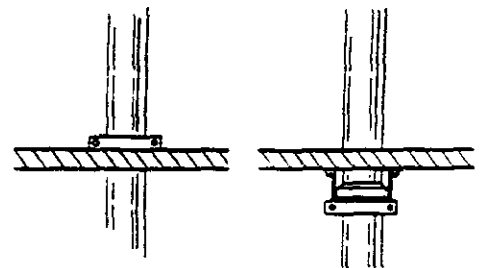
2. Use a ring support under bottom coupling.



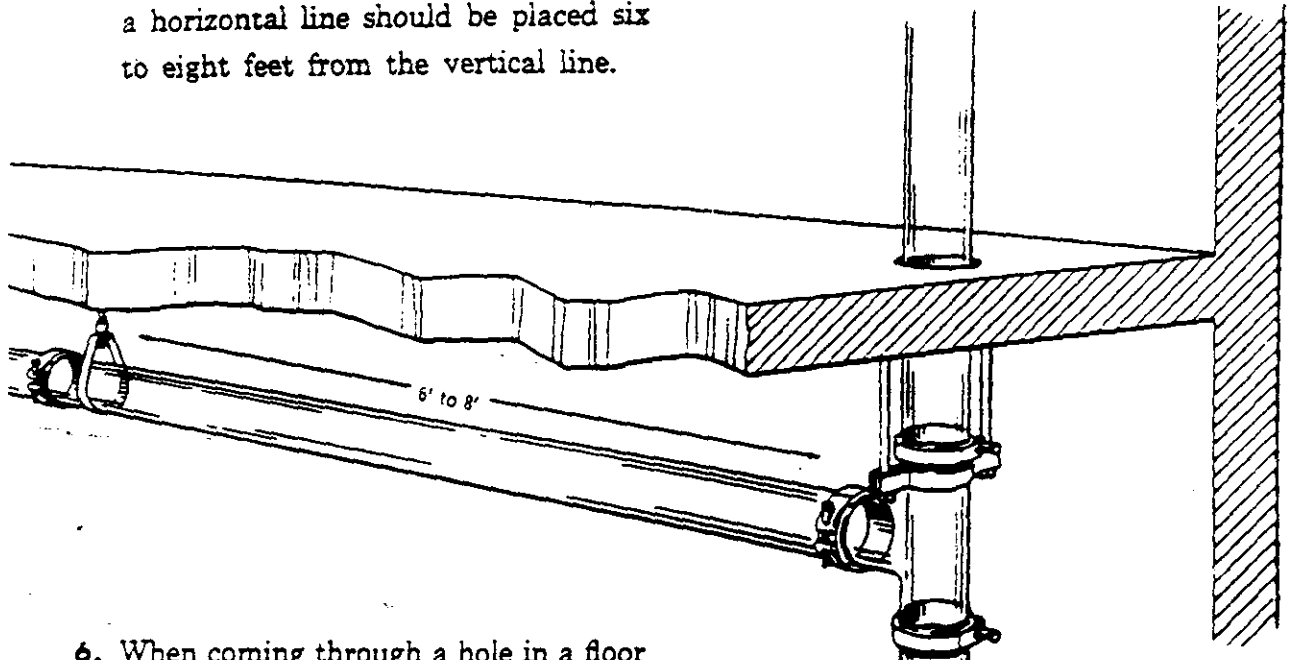
3. Support 3", 4" and 6" stacks at every floor. Support 1½" and 2" stacks every other floor.



4. Place riser clamps either above the floor or below it as indicated. Whenever practical every third support in a vertical run should be positioned directly below a coupling.

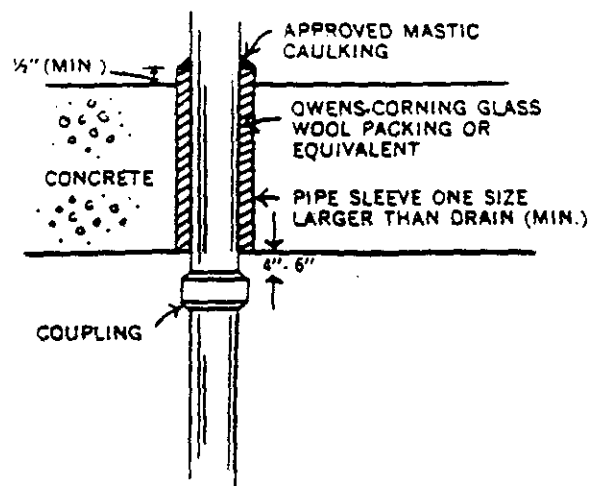


5. Do not support vertical runs with horizontal drainlines. The first hanger on a horizontal line should be placed six to eight feet from the vertical line.



6. When coming through a hole in a floor make sure drainline is not touching the floor.

7. To bring a drainline through a concrete floor, insert a pipe sleeve one size larger than drain into floor. Insert drainline and pack Owens-Corning glass wool or an equivalent insulation around it in sleeve. Seal above with an approved mastic caulking. Secure drainline with a coupling four to six inches below concrete slab for added flexibility.



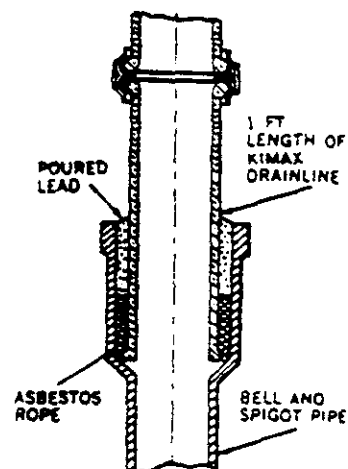


## Making Joints With Kimax Drainline

### JOINING KIMAX DRAINLINE TO METAL BELL AND SPIGOT PIPE

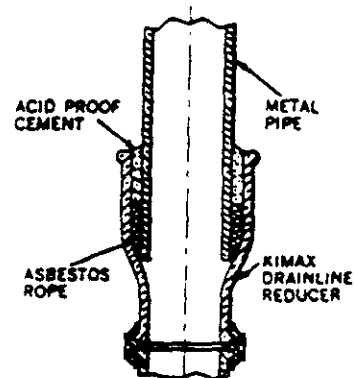
1. Pack the joint well with asbestos rope.
2. Pre-heat both pipes to the point where a drop of water sizzles.
3. Pour in hot lead and caulk.

**NOTE:** It is important to leave a space of several inches from top of joint to first coupling.



### JOINING METAL PIPE TO A KIMAX REDUCER

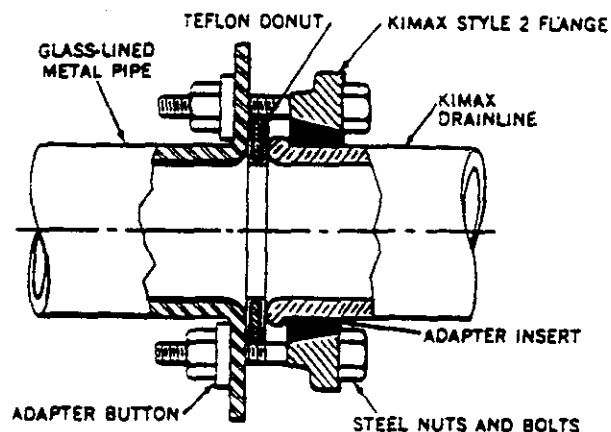
1. Make sure inside surface of drainline is clean.
2. Pack with asbestos rope.
3. Pack the joint with acid-proof cement.



**NOTE:** Whenever possible join glass to metal in a vertical position. Horizontal lines have a pocket where corrosive wastes collect and attack the packing.

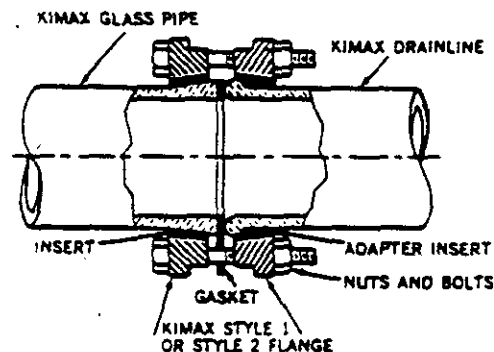
## JOINING KIMAX DRAINLINE TO GLASS LINED METAL PIPE

1. Use a Kimax flange that fits with an ASME bolt circle, an adapter insert, a set of adapter buttons and a Teflon donut gasket.
2. Insert the adapter insert next to the flanged metal pipe. Hold the Kimax drainline in place and insert the Teflon donut gasket as shown. Insert the bolt through a Kimax flange and through the metal flange. Set with an adapter button as shown and secure with a nut. Connection is now complete and secure with the Teflon donut protecting both the glass drainline and the glass lined metal pipe.



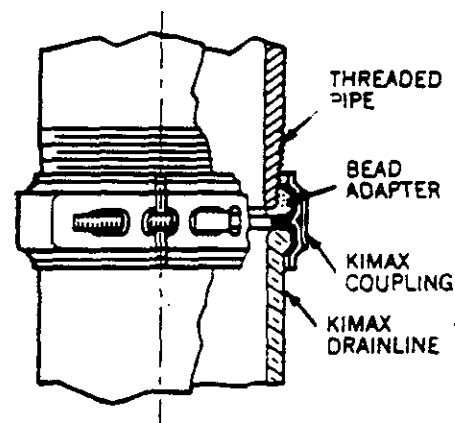
## JOINING KIMAX DRAINLINE TO KIMAX PROCESS PIPE

In this application two Kimax metal flanges are used as indicated. After inserting adapter inserts and Teflon interface gasket, bolt the two flanges together and secure with nuts.



## JOINING KIMAX DRAINLINE TO THREADED METAL OR PLASTIC PIPE

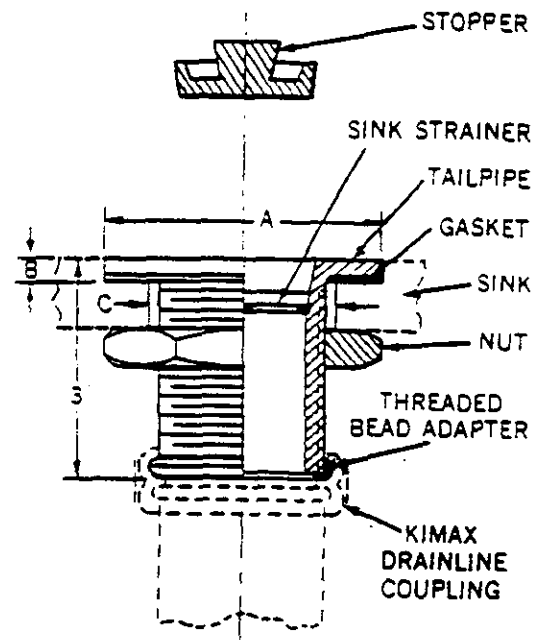
1. When joining Kimax drainline to threaded metal or plastic pipe use a threaded bead adapter. Just turn it snugly on the end of the tail piece or pipe for a ready made bead.
2. When using the bead adapter on metal, coat the metal threads with acid proof cement before you screw the adapter on.
3. Then use a standard Kimax coupling.



## Making Sink Connections With Kimax Drainline

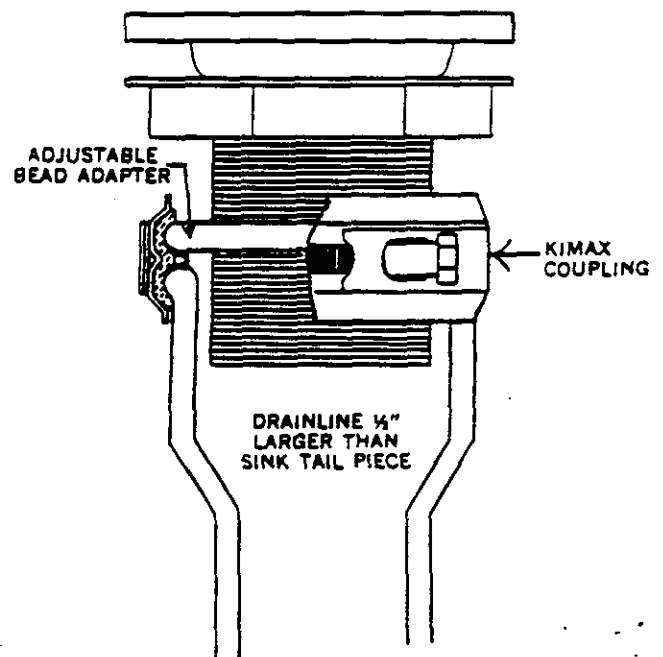
### USE THIS THREADED BEAD ADAPTER TO JOIN DRAINLINE TO THREADED SINK TAIL PIECE

Screw bead adapter onto sink tail piece. Push Kimax coupling over bead adapter and then push drainline into the coupling. Tighten bolt.



### USE THIS ADJUSTABLE BEAD ADAPTER WHEN HEIGHT ADJUSTMENT IS DESIRED

Screw adjustable bead adapter onto tail piece to desired height. Push coupling over bead adapter. Position drainline end over tail piece and push it into the coupling. Tighten bolt. Adjustable bead adapter is readily available in 2" x 1½" size. Contact an Owens-Illinois representative for other special sizes.



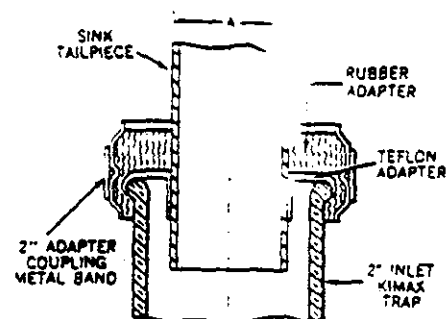
## USE THIS ADAPTER COUPLING TO JOIN KIMAX DRAINLINE TO

SMOOTH TAIL PIECES

PARTITION TRAPS WITHOUT SEALED  
IN PARTITIONS

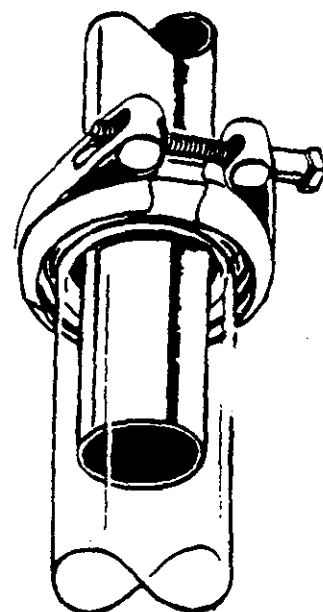
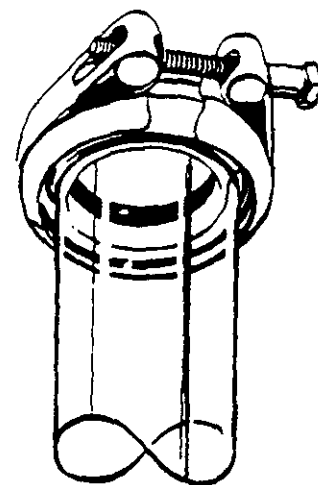
DRAIN TRAPS AND END CUP SINKS

3 I.D. SIZES —  $1\frac{1}{2}$ ",  $1\frac{3}{4}$ " AND  $1\frac{7}{8}$ "



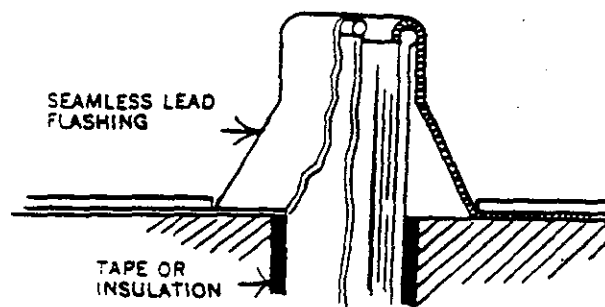
### FOLLOW THESE STEPS

1. Wet the adapter coupling.
2. Slip it over the bead on the outgoing drainline, trap or drainline reducer.
3. Slide the incoming tail piece or pipe through the coupling.
4. When everything is in position tighten the bolt to recommended torque.



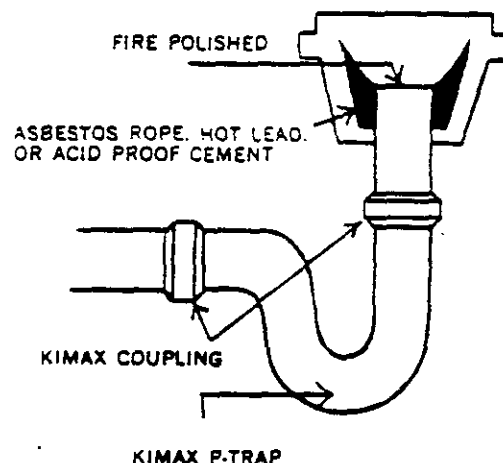
### Flashing For Kimax Drainline

When installing through a slab roof or metal deck use seamless lead flashing as shown.



### Connecting Kimax Drainline To A Floor Drain

Drawing shows how to attach a Kimax drainline to a floor drain with a Kimax coupling and a Kimax P trap. Use a drainline of the proper diameter and length which is beaded at one end and fire polished\* at the other. Insert the fire polished end into outlet or floor drain. Make sure glass is flush with bottom of drain. Seal joint by packing with asbestos rope, hot lead or acid proof cement. Attach beaded end of the drainline to standard Kimax P trap with standard Kimax coupling. Be sure to lay underground glass pipe and fittings on a minimum of 6" of sand and follow procedure for underground installations.

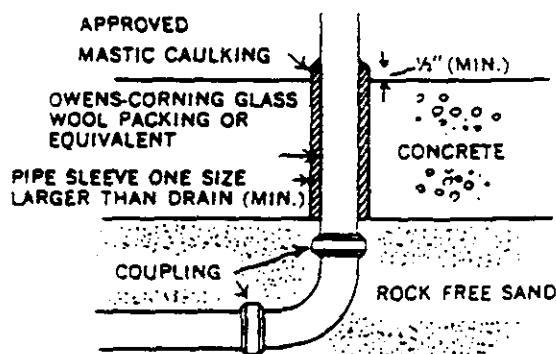


### Connecting Kimax Drainline To A Threaded Floor Drain

When connecting Kimax drainline to a threaded floor drain use a threaded bead adapter and a standard Kimax coupling. Turn the bead adapter on the end of the floor drain and secure the joint with a standard Kimax coupling.

### Bringing Kimax Drainline Through A Concrete Slab

To bring a drainline through a concrete slab from underground insert a pipe sleeve one size larger than the drain into slab. Insert drainline and pack Owens-Corning glass wool or an equivalent insulation around it in sleeve. Seal top with an approved mastic caulking. Under the slab the drainline must be completely cushioned with rock free sand.



\* Kimax Drainline can be fire polished with the Kimax Beading Kit. Fire polishing smooths the edges of glass that have been cut. Slowly rotate cut end of glass in flame until surface begins to glow. Remove glass from flame.

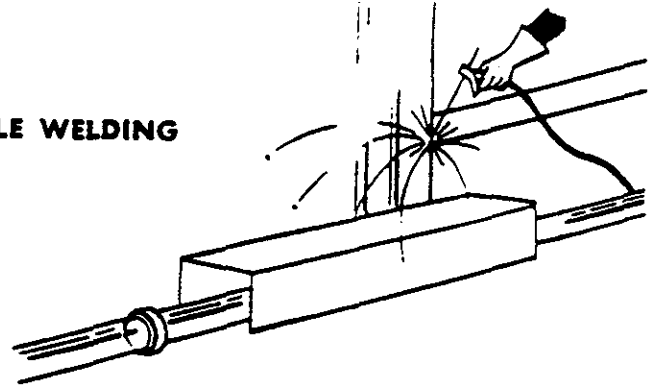
## Protecting Kimax Drainline

### AVOID SCRATCHING GLASS

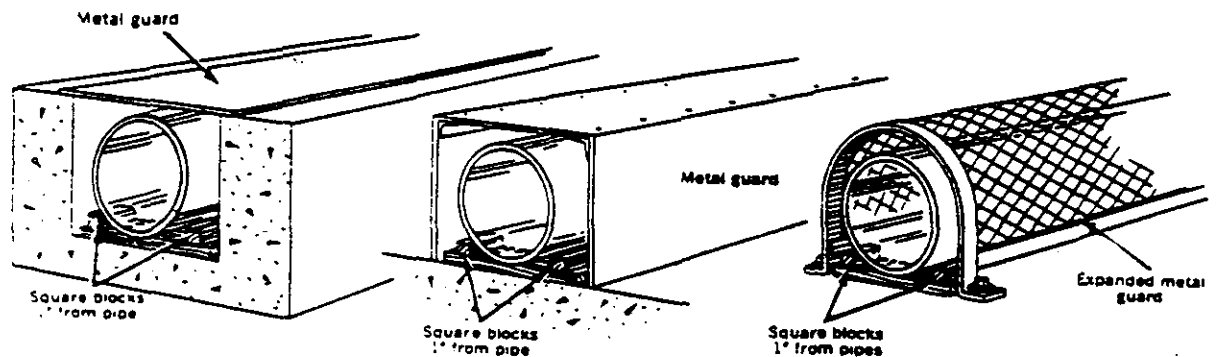
Keep drainline in shipping carton until ready for use.

### AVOID SPATTERING GLASS WHILE WELDING

Protect the drainline by covering it with a carton or cardboard.



### WHEN EXPOSED TO HEAVY TRAFFIC



Drainline should be protected by expanded metal, plywood enclosure, channel iron, etc. It should be supported by rubberized pipe, rollers, padded blocks with loose fitting side wedges or other

loose lateral guides. The drainline must be free to move sideways to prevent bending moments in other sections of the system.

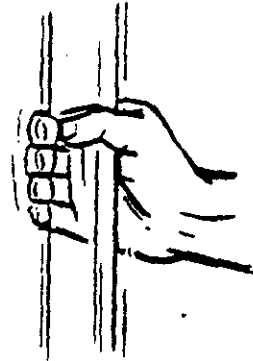
### CLEANING PROCEDURES

To clean drainline system rod out section of plugged drainline with rod and pole, or add chemicals to the system which will dissolve the stoppage, or use a plastic-covered snake.

## Testing Kimax Drainline

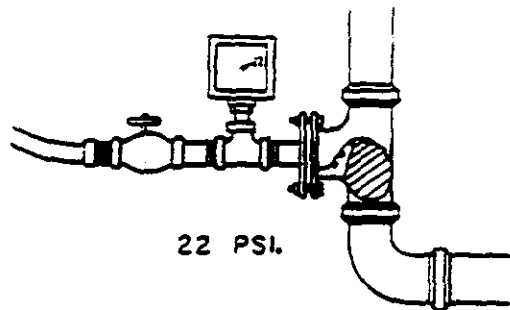
**SHAKE THE LINE TO MAKE SURE THERE IS NO STRAIN**

Be sure drainline is loose. If not, make necessary adjustments.



### **BE SURE THERE ARE NO LEAKS**

- Test the line in accordance with local codes.
- Use water pressure of 5 to 22 psi for 15 minutes.
- Check to see that all couplings are tight and leak-free.



### **IN CASE OF A LEAK FOLLOW THIS PROCEDURE**

1. Tighten leaking joint.
2. If it still leaks remove the coupling and make sure rubber compression ring and Teflon seal are free from dirt or other obstructions.
3. Make sure coupling and beads are not defective. Replace coupling or drainline when necessary.
4. Make sure drainline alignment is good.
5. Make sure beads are properly seated in coupling.



**KIMBLE GENERAL  
BRANCH SALES OFFICES**

Los Angeles 5, Calif.  
3461 W. 8th St.  
Phone: 385-3471

Montclair, N. J.  
22 S. Park St.  
Phone: 746-6600

Toledo 1, Ohio  
P. O. Box 1035  
Phone: 242-6543

**OWENS-ILLINOIS**  
maker of Kimble Products  
Toledo 1, Ohio 

KIMAX Tempered Drainline is manufactured and sold by the Consumer and Technical Products Division

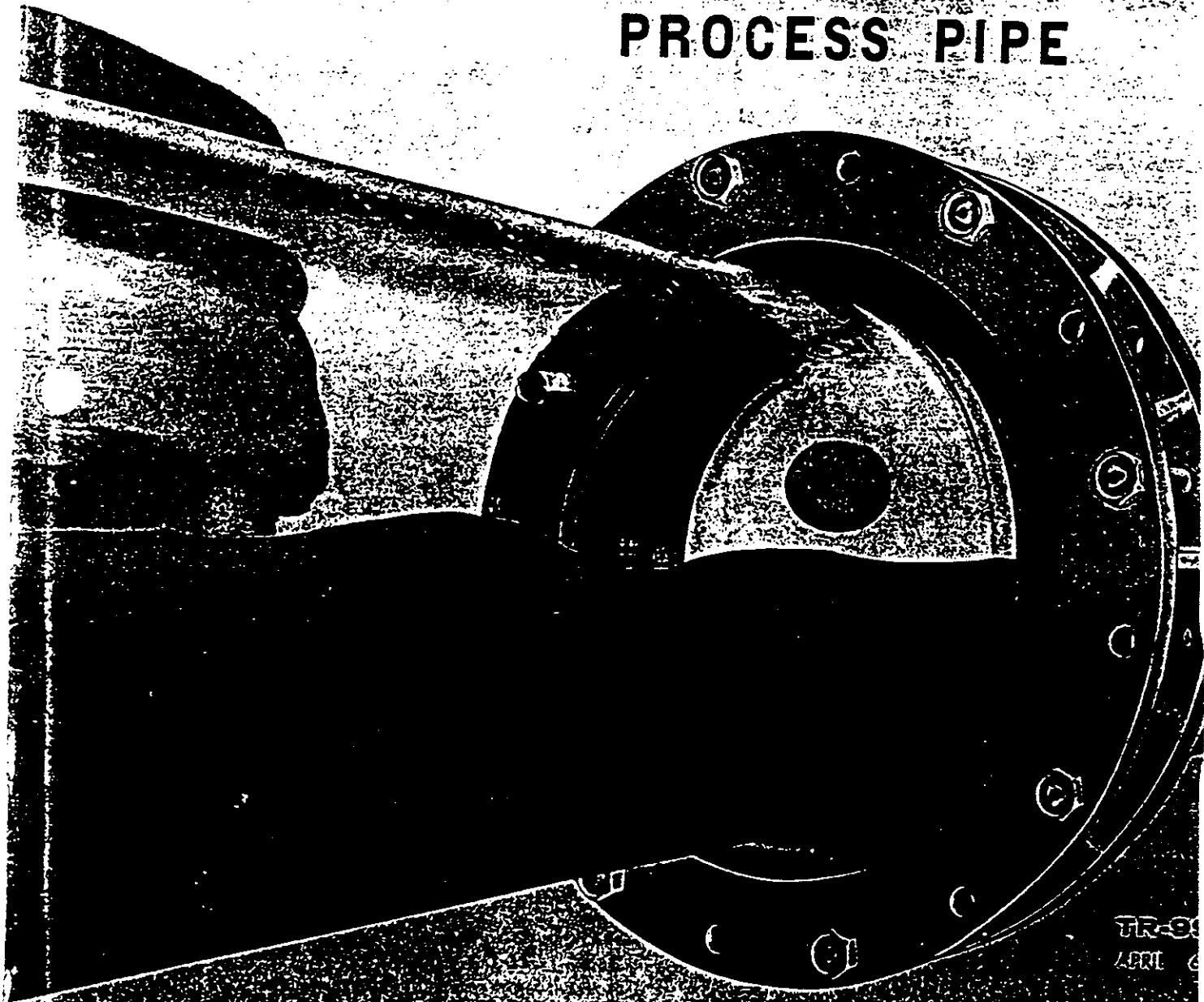


**OWENS-ILLINOIS**

**KIMAX<sup>®</sup>**

tempered glass

**PROCESS PIPE**



TR-9  
APRIL 6



# OWENS-ILLINOIS

GENERAL OFFICES • TOLEDO 1, OHIO

## BRANCH SALES OFFICES

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15052 Rosecrans Ave.  
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Toledo, Ohio 43601  
P. O. Box 1035  
Phone: 242-6543

KIMAX Tempered Glass Pipe is manufactured and sold by the Consumer and Technical Products Division.

TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

## KIMAX<sup>®</sup> *Tempered Glass* PIPE

This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from such causes, Owens-Illinois will, in full discharge of this warranty, replace such pipe at no charge.

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## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

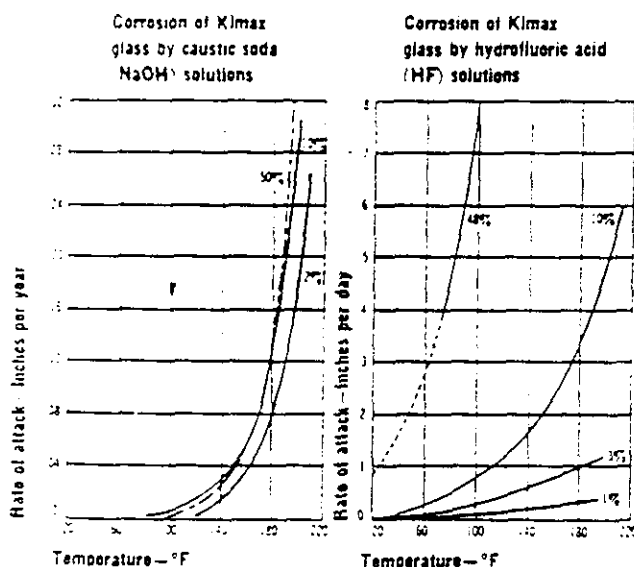
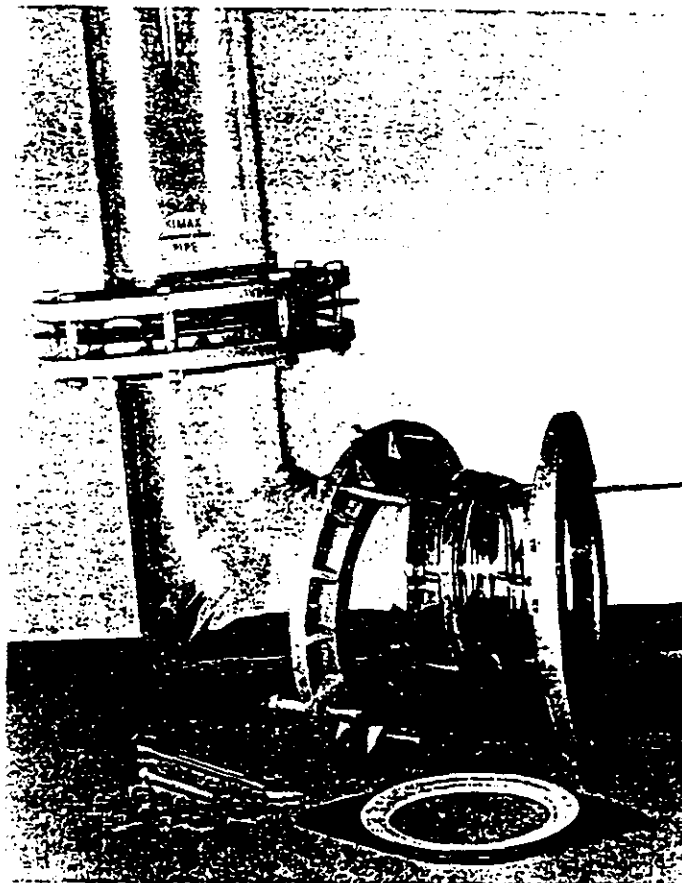
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

**Economy** is inherent in KIMAX glass pipe systems. Material is competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{3}$  to  $\frac{1}{4}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

## Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing. Length dimensions are held to  $\pm 1/32"$ .

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—improves the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as caps, U-bends, thermometer wells, and some traps are annealed only due to their shape. These annealed fittings are clearly identified.

## Physical Properties

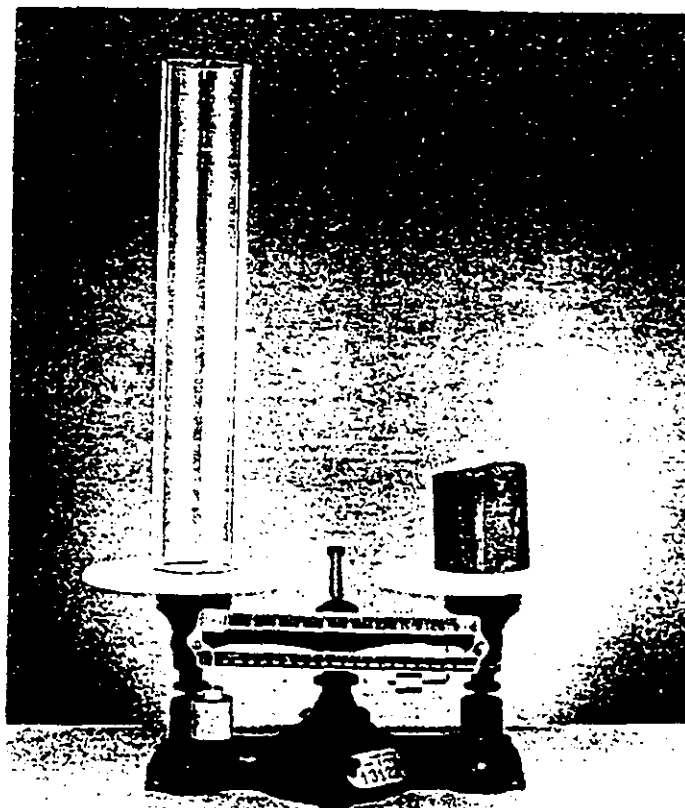
KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

**Operating temperatures** extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

**Thermal conductivity:** 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F

**Thermal expansion** of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

**Thermal shock differential** ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



## Ordering

When ordering a standard item please refer to KIMAX glass pipe distributors' price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

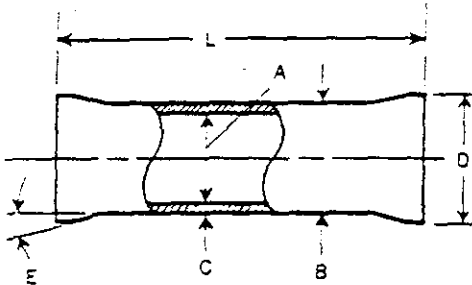
## Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

Non-stock items such as reducing tees and crosses with 3 and 4-way reductions; traps; U-returns and drainline Y's can be supplied by your KIMAX pipe distributor on special order.

# KIMAX GLASS PIPE AND FITTINGS

## STRAIGHT LENGTHS 6100



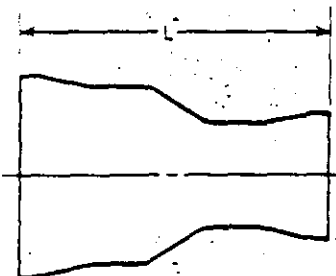
Standard lengths in all diameters are 6": 12": 18": 24": 30": 48": 60": 72": 84": 96": 108": and 120".

Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is  $\pm \frac{1}{32}$ ".

| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs./Ft. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | .156"     | 1 1/4"              | 12°                  | 3"                  | .60                | 55                        |
| 1 1/2"                        | 1.844"            | .172"     | 2 1/4"              | 12°                  | 3 1/2"              | 1.0                | 55                        |
| 2"                            | 2.344"            | .172"     | 2 3/4"              | 12°                  | 4"                  | 1.13               | 55                        |
| 3"                            | 3.406"            | .203"     | 3 15/32"            | 12°                  | 5"                  | 2.0                | 55                        |
| 4"                            | 4.530"            | .265"     | 5 11/32"            | 21°                  | 6"                  | 3.4                | 35                        |
| 6"                            | 6.656"            | .328"     | 7 11/32"            | 21°                  | 6"                  | 6.3                | 20                        |

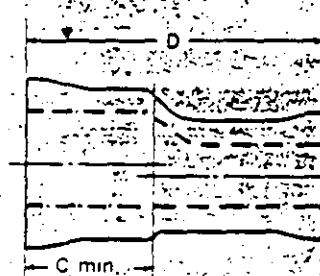
When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



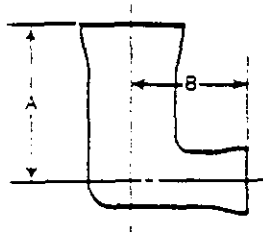
| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|
| 1 1/2                 | 1                      | 4                              |
| 2                     | 1 1/2 or 1             | 4                              |
| 3                     | 2, 1 1/2 or 1          | 5                              |
| 4                     | 3, 2, 1 1/2 or 1       | 7                              |
| 6                     | 4, 3, 2, 1 1/2 or 1    | 9                              |

## ECCENTRIC REDUCERS 6240



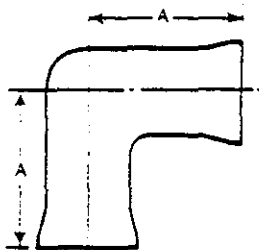
| Pipe Size<br>(inches) | Reduced To<br>(inches) | C<br>Minimum<br>(inches) | D<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------|--------------------------------|
| 1 1/2                 | 1                      | 1 1/4                    | 4                              |
| 2                     | 1 1/2 or 1             | 1 1/4                    | 4                              |
| 3                     | 2, 1 1/2, or 1         | 2 1/4                    | 5                              |
| 4                     | 3, 2, 1 1/2, or 1      | 3                        | 7                              |
| 6                     | 4, 3, or 2             | 3                        | 9                              |

## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|--------------------------------|
| 1 1/2                 | 1                      | 2 1/2                          | 3                              |
| 2                     | 1 1/2                  | 3                              | 3 1/2                          |
| 2 1/2                 | 2                      | 4                              | 4                              |
| 3                     | 2 1/2                  | 5                              | 4 1/2                          |
| 3 1/2                 | 3                      | 6                              | 5                              |
| 4                     | 3 1/2                  | 7                              | 5 1/2                          |
| 4 1/2                 | 4                      | 8                              | 6                              |
| 5                     | 4 1/2                  | 9                              | 6 1/2                          |
| 5 1/2                 | 5                      | 10                             | 7                              |
| 6                     | 5 1/2                  | 11                             | 7 1/2                          |
| 6 1/2                 | 6                      | 12                             | 8                              |
| 7                     | 6 1/2                  | 13                             | 8 1/2                          |
| 7 1/2                 | 7                      | 14                             | 9                              |
| 8                     | 7 1/2                  | 15                             | 9 1/2                          |
| 8 1/2                 | 8                      | 16                             | 10                             |
| 9                     | 8 1/2                  | 17                             | 10 1/2                         |
| 9 1/2                 | 9                      | 18                             | 11                             |
| 10                    | 9 1/2                  | 19                             | 11 1/2                         |
| 10 1/2                | 10                     | 20                             | 12                             |
| 11                    | 10 1/2                 | 21                             | 12 1/2                         |
| 11 1/2                | 11                     | 22                             | 13                             |
| 12                    | 11 1/2                 | 23                             | 13 1/2                         |
| 12 1/2                | 12                     | 24                             | 14                             |
| 13                    | 12 1/2                 | 25                             | 14 1/2                         |
| 13 1/2                | 13                     | 26                             | 15                             |
| 14                    | 13 1/2                 | 27                             | 15 1/2                         |
| 14 1/2                | 14                     | 28                             | 16                             |
| 15                    | 14 1/2                 | 29                             | 16 1/2                         |
| 15 1/2                | 15                     | 30                             | 17                             |
| 16                    | 15 1/2                 | 31                             | 17 1/2                         |
| 16 1/2                | 16                     | 32                             | 18                             |
| 17                    | 16 1/2                 | 33                             | 18 1/2                         |
| 17 1/2                | 17                     | 34                             | 19                             |
| 18                    | 17 1/2                 | 35                             | 19 1/2                         |
| 18 1/2                | 18                     | 36                             | 20                             |
| 19                    | 18 1/2                 | 37                             | 20 1/2                         |
| 19 1/2                | 19                     | 38                             | 21                             |
| 20                    | 19 1/2                 | 39                             | 21 1/2                         |
| 20 1/2                | 20                     | 40                             | 22                             |
| 21                    | 20 1/2                 | 41                             | 22 1/2                         |
| 21 1/2                | 21                     | 42                             | 23                             |
| 22                    | 21 1/2                 | 43                             | 23 1/2                         |
| 22 1/2                | 22                     | 44                             | 24                             |
| 23                    | 22 1/2                 | 45                             | 24 1/2                         |
| 23 1/2                | 23                     | 46                             | 25                             |
| 24                    | 23 1/2                 | 47                             | 25 1/2                         |
| 24 1/2                | 24                     | 48                             | 26                             |
| 25                    | 24 1/2                 | 49                             | 26 1/2                         |
| 25 1/2                | 25                     | 50                             | 27                             |
| 26                    | 25 1/2                 | 51                             | 27 1/2                         |
| 26 1/2                | 26                     | 52                             | 28                             |
| 27                    | 26 1/2                 | 53                             | 28 1/2                         |
| 27 1/2                | 27                     | 54                             | 29                             |
| 28                    | 27 1/2                 | 55                             | 29 1/2                         |
| 28 1/2                | 28                     | 56                             | 30                             |
| 29                    | 28 1/2                 | 57                             | 30 1/2                         |
| 29 1/2                | 29                     | 58                             | 31                             |
| 30                    | 29 1/2                 | 59                             | 31 1/2                         |
| 30 1/2                | 30                     | 60                             | 32                             |
| 31                    | 30 1/2                 | 61                             | 32 1/2                         |
| 31 1/2                | 31                     | 62                             | 33                             |
| 32                    | 31 1/2                 | 63                             | 33 1/2                         |
| 32 1/2                | 32                     | 64                             | 34                             |
| 33                    | 32 1/2                 | 65                             | 34 1/2                         |
| 33 1/2                | 33                     | 66                             | 35                             |
| 34                    | 33 1/2                 | 67                             | 35 1/2                         |
| 34 1/2                | 34                     | 68                             | 36                             |
| 35                    | 34 1/2                 | 69                             | 36 1/2                         |
| 35 1/2                | 35                     | 70                             | 37                             |
| 36                    | 35 1/2                 | 71                             | 37 1/2                         |
| 36 1/2                | 36                     | 72                             | 38                             |
| 37                    | 36 1/2                 | 73                             | 38 1/2                         |
| 37 1/2                | 37                     | 74                             | 39                             |
| 38                    | 37 1/2                 | 75                             | 39 1/2                         |
| 38 1/2                | 38                     | 76                             | 40                             |
| 39                    | 38 1/2                 | 77                             | 40 1/2                         |
| 39 1/2                | 39                     | 78                             | 41                             |
| 40                    | 39 1/2                 | 79                             | 41 1/2                         |
| 40 1/2                | 40                     | 80                             | 42                             |
| 41                    | 40 1/2                 | 81                             | 42 1/2                         |
| 41 1/2                | 41                     | 82                             | 43                             |
| 42                    | 41 1/2                 | 83                             | 43 1/2                         |
| 42 1/2                | 42                     | 84                             | 44                             |
| 43                    | 42 1/2                 | 85                             | 44 1/2                         |
| 43 1/2                | 43                     | 86                             | 45                             |
| 44                    | 43 1/2                 | 87                             | 45 1/2                         |
| 44 1/2                | 44                     | 88                             | 46                             |
| 45                    | 44 1/2                 | 89                             | 46 1/2                         |
| 45 1/2                | 45                     | 90                             | 47                             |
| 46                    | 45 1/2                 | 91                             | 47 1/2                         |
| 46 1/2                | 46                     | 92                             | 48                             |
| 47                    | 46 1/2                 | 93                             | 48 1/2                         |
| 47 1/2                | 47                     | 94                             | 49                             |
| 48                    | 47 1/2                 | 95                             | 49 1/2                         |
| 48 1/2                | 48                     | 96                             | 50                             |
| 49                    | 48 1/2                 | 97                             | 50 1/2                         |
| 49 1/2                | 49                     | 98                             | 51                             |
| 50                    | 49 1/2                 | 99                             | 51 1/2                         |
| 50 1/2                | 50                     | 100                            | 52                             |

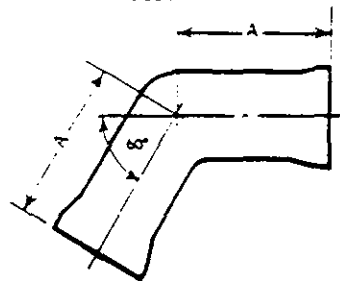
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2 1/4                          |
| 1 1/2                 | 3 1/4                          |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

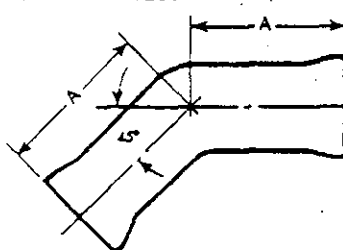
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2 1/4                          |
| 1 1/2                 | 3 1/4                          |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

## 45° ELBOWS 6201

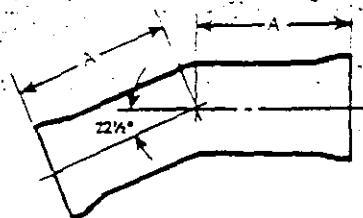


| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2 1/4                          |
| 1 1/2                 | 3 1/4                          |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

# 22½° ELBOWS 6201

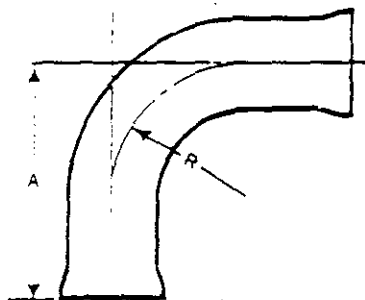
# KIMAX GLASS PIPE AND FITTINGS



When ordering, specify degree of angle.

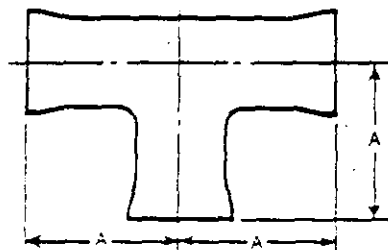
| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¼                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

# SWEEP ELBOWS 6239



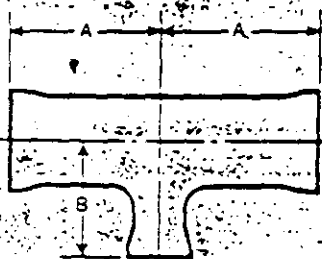
| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | R<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|--------------------------------|
| 1                     | 4¼                             | 2¼                             |
| 1½                    | 5                              | 3½                             |
| 2                     | 6                              | 3½                             |
| 3                     | 7                              | 4¼                             |
| 4                     | 10                             | 5                              |

# TEES 6210



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¼                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

# REDUCING TEES 6211



When ordering, specify pipe I.D. and bottom leg I.D.

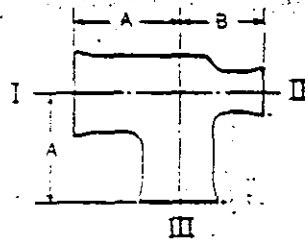
| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                      | 3½                             | 3                              |
| 2                     | 1                      | 4                              | 3                              |
| 2                     | 1½                     | 4                              | 3½                             |
| 3                     | 1                      | 5                              | 3½                             |
| 3                     | 1½                     | 5                              | 4                              |
| 3                     | 2                      | 5                              | 4½                             |
| 4                     | 1                      | 7                              | 4                              |
| 4                     | 1½                     | 7                              | 4½                             |
| 4                     | 2                      | 7                              | 5                              |
| 4                     | 3                      | 7                              | 5½                             |
| 6                     | 1                      | 9                              | 5                              |
| 6                     | 1½                     | 9                              | 5½                             |
| 6                     | 2                      | 9                              | 6                              |
| 6                     | 3                      | 9                              | 6½                             |
| 6                     | 4                      | 9                              | 8                              |

Other reduction combinations are available on special order to customer's specifications.



# KIMAX GLASS PIPE AND FITTINGS

## REDUCER TEES 6212

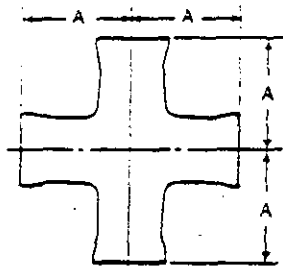


When ordering, specify pipe I.D. in this order: I, II, and III.

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(= 1/32 in.) | B<br>(= 1/32 in.) |
|----------------------------|-----------------------------|------------------------------|-------------------|-------------------|
| 1 1/2                      | 1                           | 1 1/2                        | 3 1/2             | 3                 |
| 2                          | 1                           | 2                            | 4                 | 3                 |
| 2                          | 1 1/2                       | 2                            | 4                 | 3 1/2             |
| 3                          | 1                           | 3                            | 5                 | 3 1/2             |
| 3                          | 1 1/2                       | 3                            | 5                 | 4                 |
| 3                          | 2                           | 3                            | 5                 | 4 1/2             |
| 4                          | 1                           | 4                            | 7                 | 4                 |
| 4                          | 1 1/2                       | 4                            | 7                 | 4 1/2             |
| 4                          | 2                           | 4                            | 7                 | 5                 |
| 4                          | 3                           | 4                            | 7                 | 5 1/2             |
| 6                          | 1                           | 6                            | 9                 | 5                 |
| 6                          | 1 1/2                       | 6                            | 9                 | 5 1/2             |
| 6                          | 2                           | 6                            | 9                 | 6                 |
| 6                          | 3                           | 6                            | 9                 | 6 1/2             |
| 6                          | 4                           | 6                            | 9                 | 8                 |

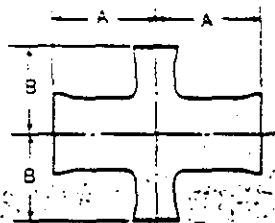
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(inches) | A<br>(= 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 3 1/2             |
| 1 1/2                 | 3 1/2             |
| 2                     | 4                 |
| 3                     | 5                 |
| 4                     | 7                 |
| 6                     | 9                 |

## REDUCER CROSSES 6250

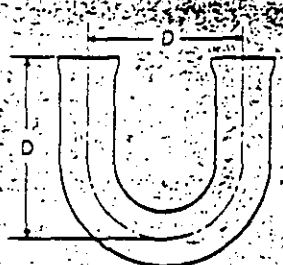


When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>(= 1/32 in.) | B<br>(= 1/32 in.) |
|-----------------------|-------------------------|-------------------|-------------------|
| 1 1/2                 | 1                       | 3 1/2             | 3                 |
| 2                     | 1                       | 4                 | 3                 |
| 2                     | 1 1/2                   | 4                 | 3 1/2             |
| 3                     | 1                       | 5                 | 3 1/2             |
| 3                     | 1 1/2                   | 5                 | 4                 |
| 3                     | 2                       | 5                 | 4 1/2             |
| 4                     | 1                       | 7                 | 4                 |
| 4                     | 1 1/2                   | 7                 | 4 1/2             |
| 4                     | 2                       | 7                 | 5                 |
| 4                     | 3                       | 7                 | 5 1/2             |
| 6                     | 1                       | 9                 | 5                 |
| 6                     | 1 1/2                   | 9                 | 5 1/2             |
| 6                     | 2                       | 9                 | 6                 |
| 6                     | 3                       | 9                 | 6 1/2             |
| 6                     | 4                       | 9                 | 8                 |

Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265

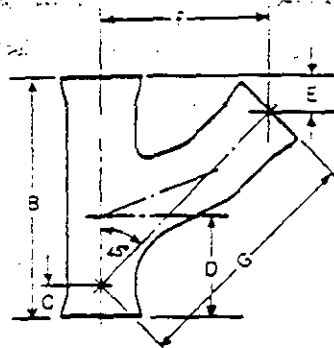


Use soft strip asbestos inserts (7202) only, with this fitting.

| Pipe Size<br>(inches) | B<br>(= 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 5 1/2             |
| 1 1/2                 | 7                 |
| 2                     | 7                 |
| 3                     | 9                 |
| 4                     | 12                |

# KIMAX GLASS PIPE AND FITTINGS

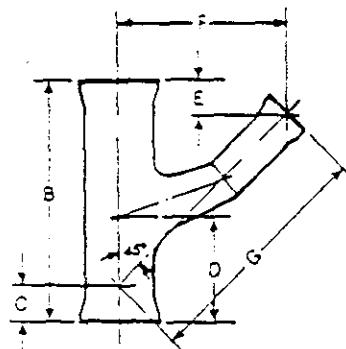
## LATERAL "Y" 6230



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(= 1/2 in.) | C<br>(inches) | D<br>(= 1/2 in.) | E<br>(= 1/2 in.) | F<br>(= 1/2 in.) | G<br>(inches) |
|-----------------------|------------------|---------------|------------------|------------------|------------------|---------------|
| 1                     | 5 1/4            | 1 1/4         | 1 1/2            | 1 1/4            | 3 1/4            | 5 1/4         |
| 1 1/4                 | 7                | 1 1/4         | 2 1/4            | 1 1/4            | 5 1/4            | 7 1/4         |
| 2                     | 8                | 1 1/4         | 3 1/4            | 1 1/4            | 5 1/4            | 7 1/4         |
| 3                     | 10               | 1 1/4         | 3 1/2            | 1 1/4            | 7 1/4            | 9 1/4         |
| 4                     | 14               | 2 1/4         | 4 1/4            | 2 1/4            | 9 1/4            | 13            |
| 6                     | 18               | 3 1/4         | 7 1/4            | 2 1/2            | 11 1/4           | 16 1/4        |

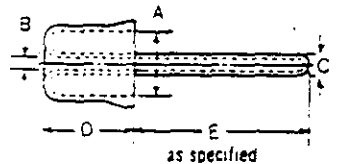
## LATERAL "Y" REDUCERS 6231



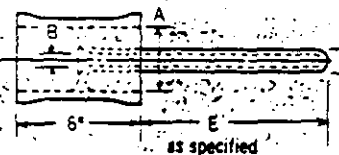
When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(= 1/2 in.) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|------------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 3                | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 7 1/4         |
| 2                     | 1 1/4                   | 3                | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 7 1/4         |
| 3                     | 1 1/2                   | 10               | 1 1/4         | 3 1/2         | 1 1/4         | 7 1/4         | 9 1/4         |
| 3                     | 2                       | 10               | 1 1/4         | 3 1/4         | 1 1/4         | 7 1/4         | 9 1/4         |
| 4                     | 1 1/2                   | 14               | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 13            |
| 4                     | 2                       | 14               | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 13            |
| 4                     | 3                       | 14               | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 13            |
| 6                     | 3                       | 18               | 3 1/4         | 7 1/4         | 2 1/2         | 11 1/4        | 16 1/4        |

## THERMOMETER WELLS (Annealed)



6292 SINGLE END



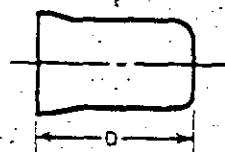
6295 DOUBLE END

When ordering, specify pipe I.D.; bulb size; and tube length.

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.

| A<br>Pipe Size<br>(inches) | B<br>For Ther-<br>mometer<br>Bulb Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches) |
|----------------------------|----------------------------------------------------|----------------------------|---------------|
| 1 1/2                      | 1/4                                                | 1/4                        | 2 1/4         |
| 1 1/4                      | 1/4                                                | 1/4                        | 2 1/4         |
| 1 1/2                      | 1/4                                                | 1                          | 2 1/4         |
| 2                          | 1/4                                                | 1/4                        | 2 1/4         |
| 2                          | 1/4                                                | 1/4                        | 2 1/4         |
| 2                          | 1/4                                                | 1                          | 2 1/4         |
| 3                          | 1/4                                                | 1/4                        | 3 1/4         |
| 3                          | 1/4                                                | 1/4                        | 3 1/4         |
| 3                          | 1/4                                                | 1                          | 3 1/4         |

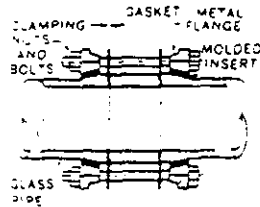
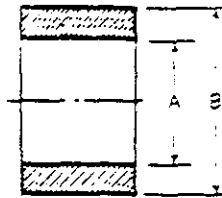
## CAPS (Annealed) 6236



Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(inches) | D<br>(= 1/2 in.) |
|-----------------------|------------------|
| 1                     | 2                |
| 1 1/2                 | 3                |
| 2                     | 4                |
| 3                     | 4 1/4            |
| 4                     | 5                |
| 6                     | 7                |

## STRAIGHT SPACERS 6260

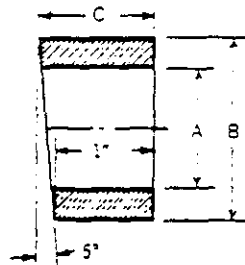


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are 1", 1½", 2", 2½", 3", 4", and 5". Other lengths available on special order. Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/4                 |
| 1 1/2                      | 2 1/2                 |
| 2                          | 2 3/4                 |
| 2 1/2                      | 3 1/2                 |
| 3                          | 3 3/4                 |
| 4                          | 4 1/2                 |
| 5                          | 5 1/4                 |

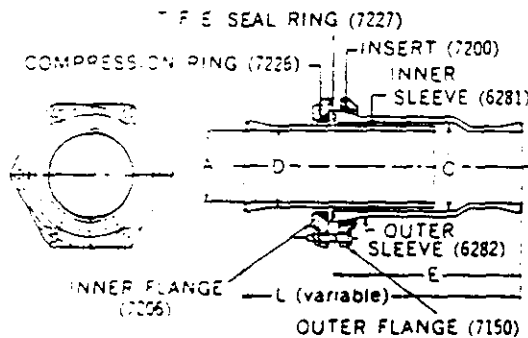
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on special order.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches) |
|----------------------------|-----------------------|---------------|
| 1                          | 1 1/4                 | 1 1/4         |
| 1 1/2                      | 2 1/2                 | 2 1/4         |
| 2                          | 2 3/4                 | 2 3/4         |
| 2 1/2                      | 3 1/2                 | 3 1/4         |
| 3                          | 3 3/4                 | 3 3/4         |
| 4                          | 4 1/2                 | 4 1/2         |

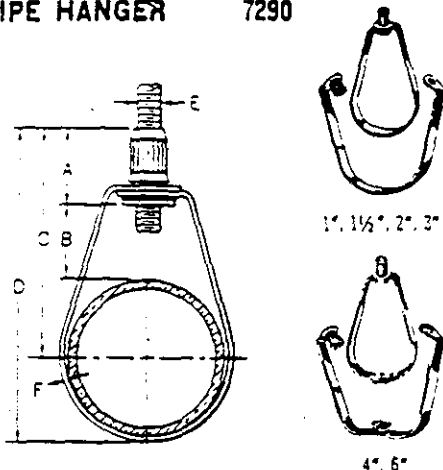
## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments up to 2¼". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1", 1½", 2") and 15 p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281); outer sleeve (6282); inner flange (7206); outer flange (7150); insert (7200); T F E seal ring (7227); compression ring (7226); bolts (7180). All metal parts are aluminum. Three bolts (hex head 5/16-18 x 1¼) required for 1½", 2", and 3" sizes. Six bolts required for 4" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | L<br>(inches) |        |
|----------------------------|---------------|---------------|---------------|---------------|--------|
|                            |               |               |               | Min.          | Max.   |
| 1                          | 1 1/2         | 1 1/4         | 5 1/2         | 8 1/4         | 10 1/4 |
| 1 1/2                      | 2             | 1 3/4         | 6             | 9 1/4         | 11 1/4 |
| 2                          | 2 1/2         | 2 1/2         | 6 1/2         | 10            | 11 1/2 |
| 3                          | 3 1/2         | 3 1/2         | 8             | 11 1/4        | 14     |
| 4                          | 4 1/2         | 4 1/2         | 9             | 13 1/2        | 15 1/2 |

## PIPE HANGER 7290



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is reseated by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A     | B     | C     | D      | E   | F         |
|-----------------------|-------|-------|-------|--------|-----|-----------|
| 1                     | 1 1/4 | 1     | 2 1/4 | 3 1/4  | 1/2 | 1/4 x 1/4 |
| 1 1/2                 | 1 1/4 | 1 1/4 | 3 1/4 | 4 1/4  | 1/2 | 1/4 x 1/4 |
| 2                     | 1 1/4 | 1 1/4 | 3 1/4 | 4 1/4  | 1/2 | 1/4 x 1/4 |
| 3                     | 1 1/4 | 1 1/4 | 4 1/4 | 6 1/4  | 1/2 | 1/2 x 1/4 |
| 4                     | 1 1/4 | 1 1/4 | 5 1/4 | 7 1/4  | 1/2 | 1/2 x 1   |
| 5                     | 1 1/2 | 2 1/4 | 7 1/4 | 10 1/4 | 1/2 | 1/2 x 1   |

## FLANGES, GASKETS AND ACCESSORIES

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

### FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel.

### GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, Koroseal, and T F E lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler of soft asbestos (Blue African asbestos) with a machined T F E liner, are recommended. Other types of filler material may be used with T F E lined gaskets. Consult your distributor for details of performance and prices.

### INSERTS

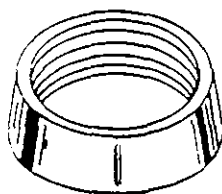
Used for cushioning pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all annealed fittings such as U-bends, thermometer wells, and caps.

Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 13 for more information.

\*DuPont T M

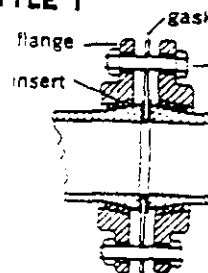
### FERRULE 7245



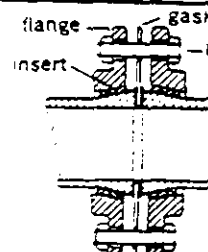
Stainless steel. To be welded, brazed or soldered to metal tubing. In 1", 1½", 2", 3", and 4" diameters.

### FLANGE SET 7100 STYLE I

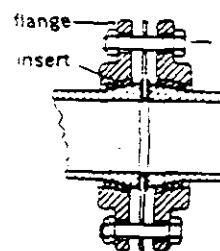
SIZES  
1", 1½", 2"



SIZE  
3"

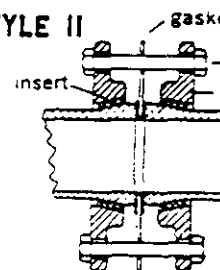


SIZES  
4", 6"

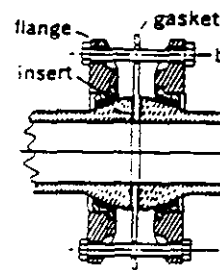


### FLANGE SET 7105 STYLE II

SIZES  
1", 1½", 2", 3"

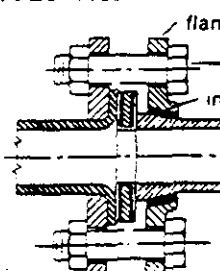


SIZES  
4", 6"



### ASME ADAPTER FLANGES 7160

SIZES  
1", 1½", 2", 3"



To adapt 4" and 6" glass pipe to an ASME Flange, use the following:  
STYLE I Aluminum—No. 7150, 1—7151 outer flange, 1—7153 inner  
STYLE II Cast Iron—No. 7155, 1—7156 outer flange, 1—7158 inner

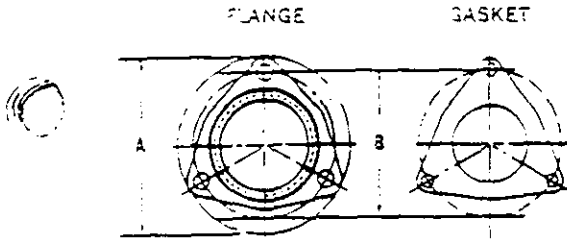
# FLANGES, GASKETS AND ACCESSORIES

## FLANGE SET NO. 7100, 1", 1½", 2" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 3—7180 Aluminum Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¼ | 2¼ | ½-18x2    |
| 1½        | 4¼ | 2½ | ¾-18x1½   |
| 2         | 4¾ | 2¾ | ¾-18x2    |

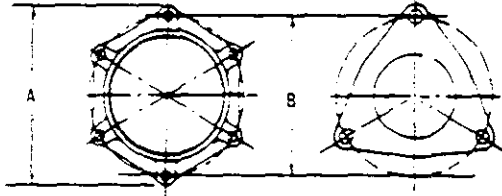


## FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 6—7180 Aluminum Bolts and Nuts

| Pipe Size | A | B  | Bolt Size |
|-----------|---|----|-----------|
| 3         | 5 | 5¼ | ¾-18x2¼   |



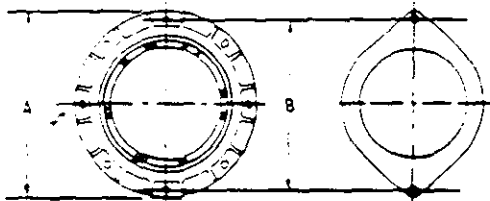
## FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7151 Aluminum Outer Flanges\*
- 2—7153 Aluminum Inner Rings with 7202 Insert cemented in place.\*
- 8—7180 Aluminum Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¼  | 7¼ | ¾-18x2½   |
| 6         | 10¼ | 9½ | ¾-18x3    |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.

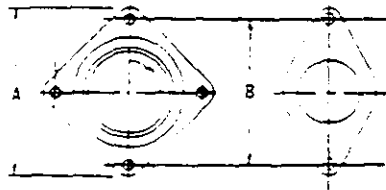


## FLANGE SET NO. 7105, 1", 1½", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7155 Cast Iron Flanges
- 2—7200 Neoprene Asbestos Inserts
- 4—7190 Steel Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¼ | 2¼ | ½-18x2¼   |
| 1½        | 4¼ | 2½ | ¾-18x2¼   |
| 2         | 5¼ | 3¼ | ¾-18x2½   |
| 3         | 6¾ | 5  | ¾-18x3    |



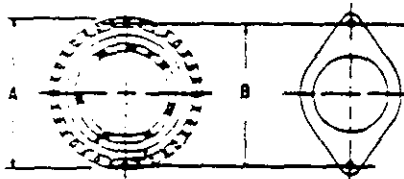
## FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7156 Cast Iron Outer Flange\*
- 2—7158 Cast Iron Inner Ring with 7202 Inserts cemented in place.\*
- 8—7190 Steel Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¼  | 7¼ | ¾-18x2½   |
| 6         | 10¼ | 9½ | ¾-18x2½   |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring.

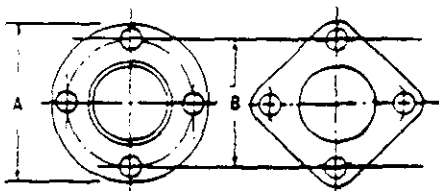


## ASME ADAPTER FLANGE NO. 7160, 1", 1½", 2", 3" I.D.

ASME Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

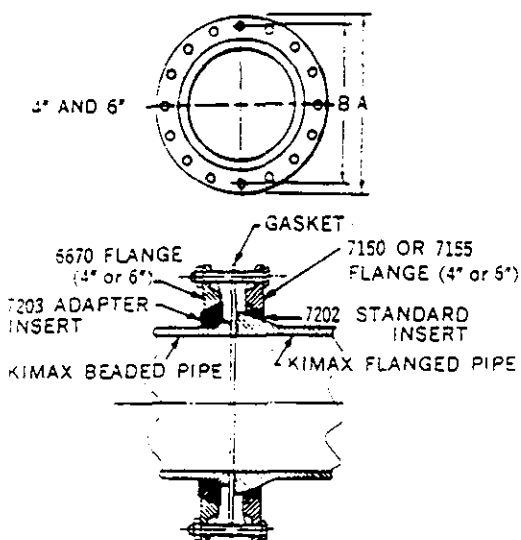
- 7200 for Conical End Tempered Glass
- 7202 Strip Insert for Conical End Annealed Glass
- 7203 Molded Adapter Insert for Beaded End Glass

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 4¼ | 3¼ | ¾-18x2    |
| 1½        | 5  | 3¾ | ¾-18x2¼   |
| 2         | 6  | 4¼ | ¾-18x2½   |
| 3         | 7½ | 6  | ¾-18x3    |



## ADAPTER FLANGE

6670



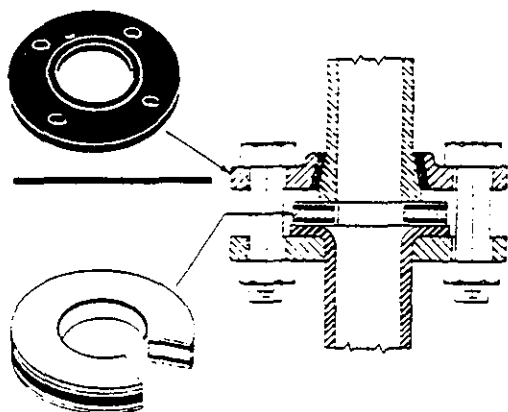
## FLANGES, GASKETS AND ACCESSORIES

Used with Style I or Style II flanges to join field-beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(inches) |
| 4                     | 3 1/4  | 7 1/2            | 8                  | 5/16-18 x 2 1/4  |
| 5                     | 10 1/4 | 9 1/2            | 8                  | 5/8-16 x 2 1/4   |

For 1" through 3" beaded pipe, use Style II flange (7155) with adapter insert (7203).

## A.S.M.E. ADAPTER FLANGE 7160



Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel. In 1", 1 1/2", 2", and 3" sizes.

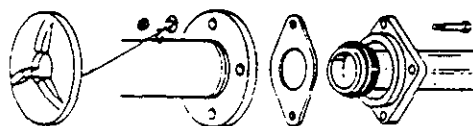
Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined T F E envelope.

Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(inches) | Thickness<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 1/4                   |
| 4                     | 1/4                   |
| 6                     | 1/4                   |

## DONUT SPACER 7240

## ADAPTER BUTTON 7230



Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(inches) | O.D.<br>(inches) | Height<br>(inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 1/4                |

## SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(inches) | I.D.<br>(inches) | Length<br>(inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1" thru 4"            | 3/16 min.        | 11 1/2             | .156                |
| 5"                    | 3/8 min.         | 11 1/2             | .156                |

## INSERTS



**7200** for 1" through 3" tempered fittings.



**7202** for 4" and 6" tempered fittings  
for 1" through 6" annealed fittings.

**7203** adapter insert for beaded ends  
(similar to 7200)

## FLANGES, GASKETS AND ACCESSORIES

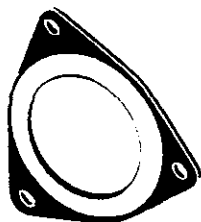
Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1½", 2", 2½", 3", 3½", and 5" diameters. The 1", 1½", 2", and 3" sizes are used with standard tempered glass pipe and fittings. Other sizes are for use with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters; and with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

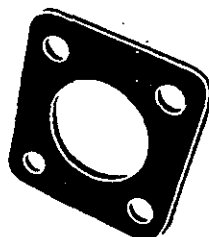
STYLE I (1", 1½", 2", 2½", 3" sizes only)



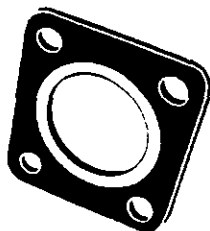
STYLE II (all sizes - also used for 4" and 6" Style I)



A.S.M.E. (1", 1½", 2", 3" sizes only)



Standard



Teflon  
machined envelope

Since the gasket is the only part of the joint assembly to come into contact with conveyed liquids, choice of gasket material is extremely important.

Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below.

When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of TFE are recommended.

The TFE machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

Standard filler for TFE machined envelope gasket is Blue African asbestos.

Other filler materials for TFE machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of TFE envelope gaskets are the same as that of the filler material.

| Catalog Number |          |          | Material                                             | Service                                                               | Maximum Working Temp., °F. |
|----------------|----------|----------|------------------------------------------------------|-----------------------------------------------------------------------|----------------------------|
| Style I        | Style II | A.S.M.E. |                                                      |                                                                       |                            |
| 7250           | 7251     | —        | Asbestos                                             | Organic and mineral acids, solvents and chlorinated compounds.        | 400                        |
| 7255           | 7256     | —        | Gum Rubber                                           | Food products, mineral acids, except HNO <sub>3</sub> .               | 200                        |
| 7260           | 7261     | —        | Neoprene                                             | Distilled water and mineral acids, except HNO <sub>3</sub> .          | 220                        |
| 7265           | 7266     | 7267     | Koroseal                                             | Mineral acids including HNO <sub>3</sub> , and chlorinated compounds. | 150                        |
| 7270           | 7271     | —        | Silicone Rubber                                      | All                                                                   | 450                        |
| 7275           | 7276     | 7277     | TFE Machined Envelope (Blue African Asbestos Filler) | All                                                                   | 450                        |

| Material                                 | Pipe Size |          |         |         |         |         |
|------------------------------------------|-----------|----------|---------|---------|---------|---------|
|                                          | 1" Dia.   | 1½" Dia. | 2" Dia. | 3" Dia. | 4" Dia. | 6" Dia. |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"        | ¼"       | ¼"      | ¼"      | ¼"      | ¼"      |
| TFE Envelope                             | ¼"        | ¼"       | ¼"      | ¼"      | ¼"      | ¼"      |

# ENGINEERING

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Tempered Glass          | 1.10-1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.53                                     |
| Graphite (impervious)         | 1.70                                     |
| Resin-Bonded Asbestos         | 0.38                                     |
| Stainless Steel (Schedule 40) | 3.65                                     |
| Lead, Ex. Light               | 4.80                                     |
| Porcelain                     | 2.35                                     |
| High Silicon Iron             | 7.70                                     |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 20° El      | 0.5                                    | .75  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° El      | 1.0                                    | 1.3  | 2.5  | 3.8   | 5.0   | 7.5   |
| 60° El      | 1.1                                    | 1.0  | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° El      | 1.2                                    | 1.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Quick L     | 1.1                                    | 1.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.0                                    | 6.0  | 8.3  | 12.5  | 16.7  | 25.0  |
| Tee Run     | 1.1                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| Tee C       | 3.0                                    | 1.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Tee T       | 3.0                                    | 9.0  | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.0  | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 35.0                                   | 54.0 | 72.0 | 108.0 | 144.0 | 215.0 |

## Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Kimble Products, Glass Pipe Market Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table.

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 35   | 20   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 160  |

\*Freezing point of conveyed material should be taken into consideration.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of .0022" ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Tempered Glass  | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (impervious) | 1.30                                     |
| Steel                 | 3.60                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 5.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 16.00<br>High Impact 44.00 |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and T F E-covered donut spacers:

## GASKET AND DONUT SPACER THICKNESS

| Material                                 | Pipe Diameter |     |    |    |      |      |
|------------------------------------------|---------------|-----|----|----|------|------|
|                                          | 1"            | 1½" | 2" | 3" | 4"   | 6"   |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"            | ⅜"  | ½" | ⅝" | ¾"   | ¾"   |
| T F E Envelope                           | ⅜"            | ⅝"  | ⅞" | 1" | 1 ⅛" | 1 ⅛" |
| Solid Beaded Teflon                      | ⅜"            | ⅝"  | ⅞" | 1" | 1 ⅛" | 1 ⅛" |
| Donut Spacer                             | ¼"            | ⅜"  | ½" | ⅝" | ¾"   | ¾"   |



## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

Typical Area Sketch

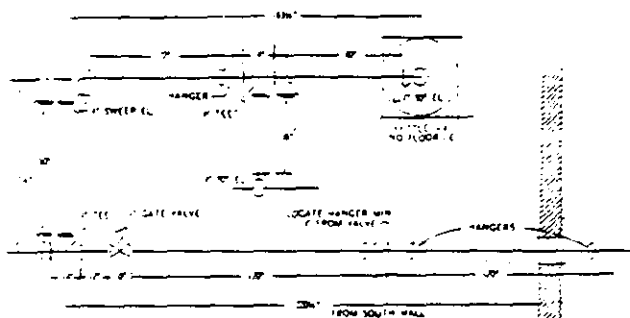


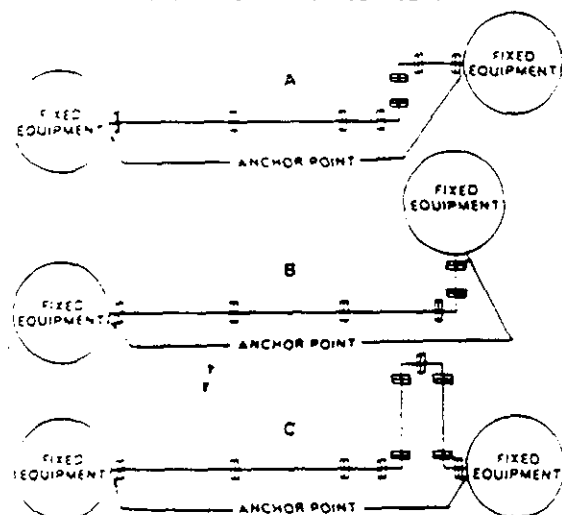
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

A, B, C—Recommended Means



D—Not Recommended



Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 5, page 17.

Glass or line at floor level, ground level or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

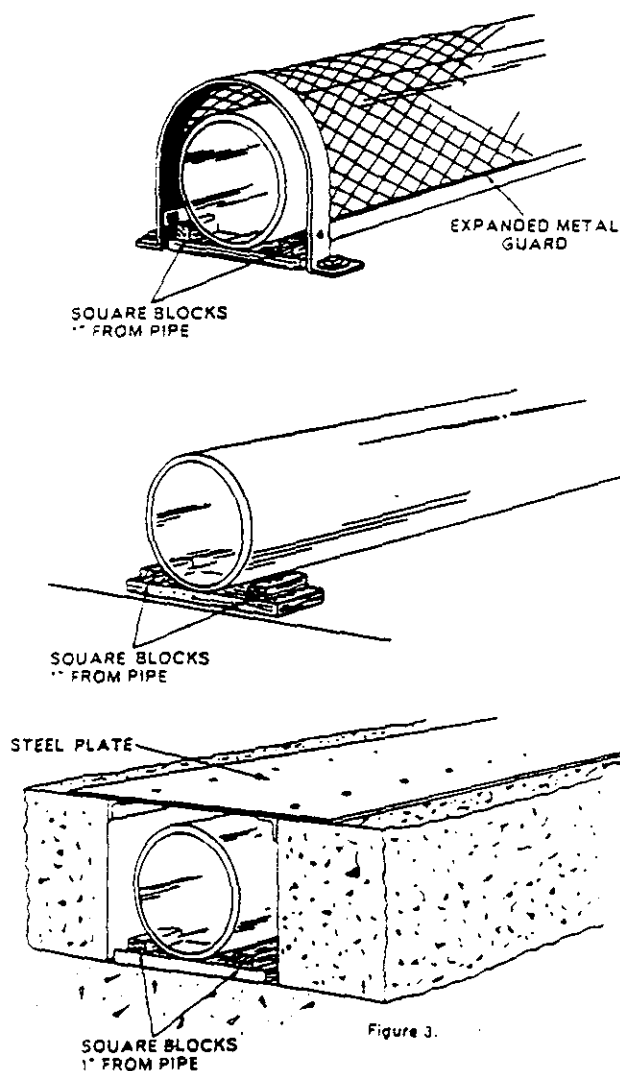
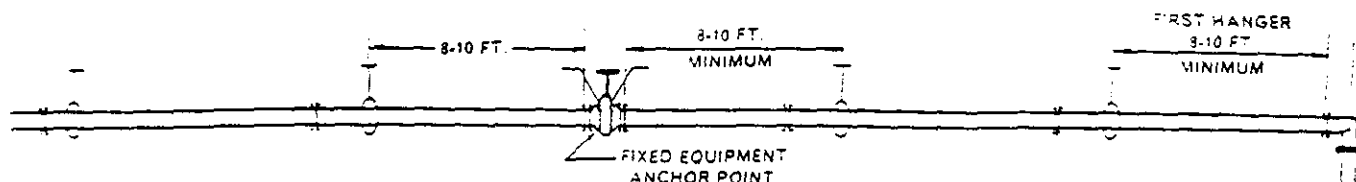


Figure 3.



## Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.

## Pipe Pitch

Normally, a pitch of  $\frac{1}{4}$ " per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

## Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

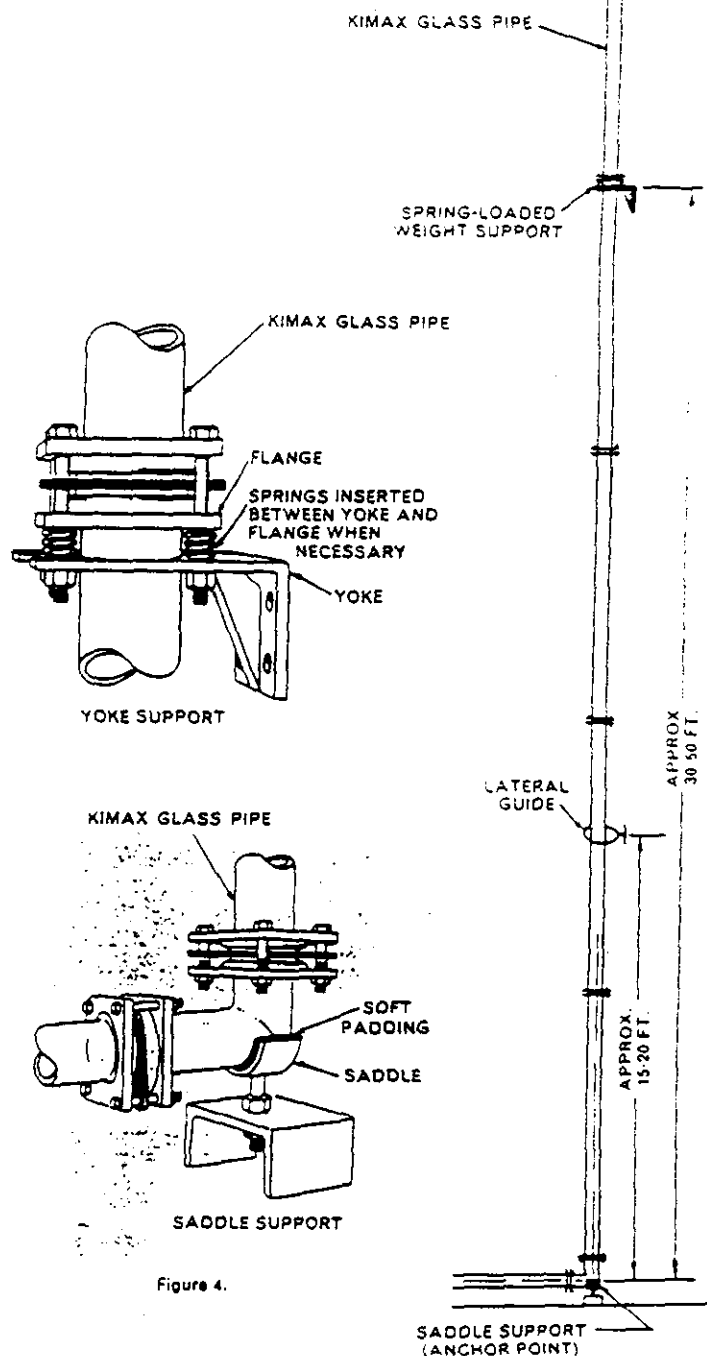


Figure 4.

Figure 5.

Recommended Vertical Line Supports

### Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

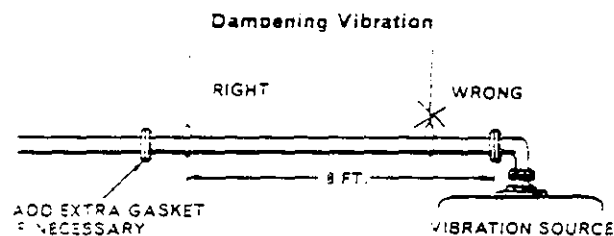


Figure 6.

### Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 6" pipe. See Figure 7.

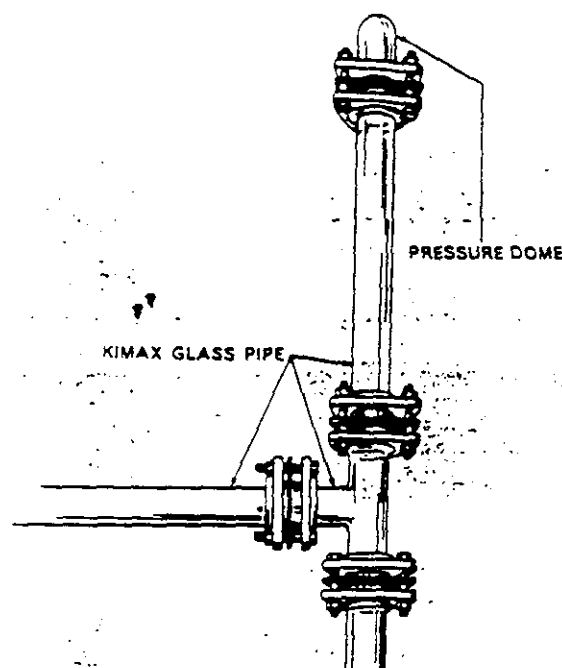


Figure 7.

### Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings, using Style I or Style II flanges. See Figure 8.

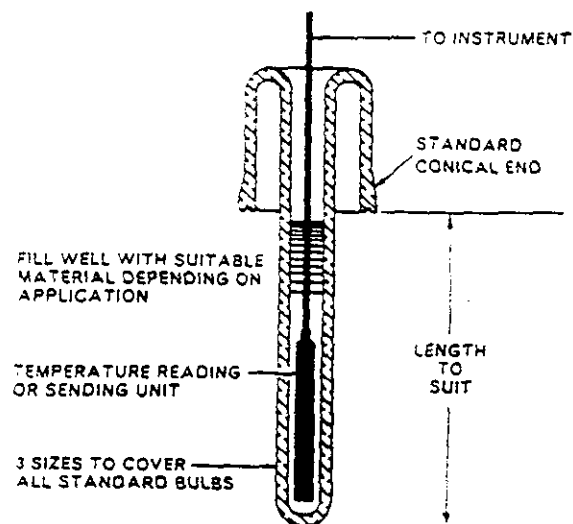


Figure 8.

### Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

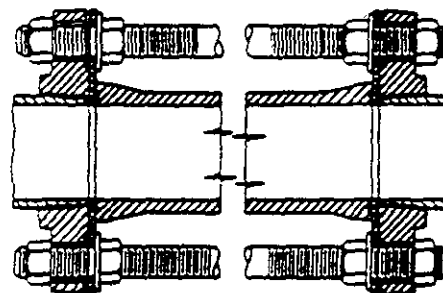


Figure 9.

# ENGINEERING

## Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1", 1½", 2", 3", 4" and 6".

Standard lengths of KIMAX straight lengths vary from 6 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipeline design.

## Special Lengths

It may be necessary to order non-standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

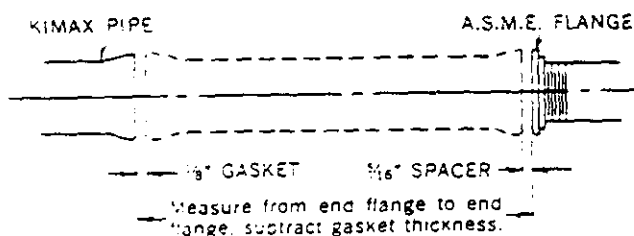


Figure 10.

## Special Apparatus

The corrosion resistance and transparency of glass, and its workability, make it ideal for fabricating into special shapes.

Such apparatus may be adapted from existing standard pipe and fittings (tubulated or perforated straight lengths, for instance); custom fabricated by modifying existing glass-forming equipment (receiver vessels, separation units, etc.); and by minor adapting of stock laboratory or industrial glass piece (boiling flasks; distillation apparatus; offset columns, etc.)

Typical apparatus adapted for special uses are illustrated below.

Owens-Illinois and KIMAX Glass Pipe distributors will assist you in the development of specially fabricated glass apparatus for your particular requirements.

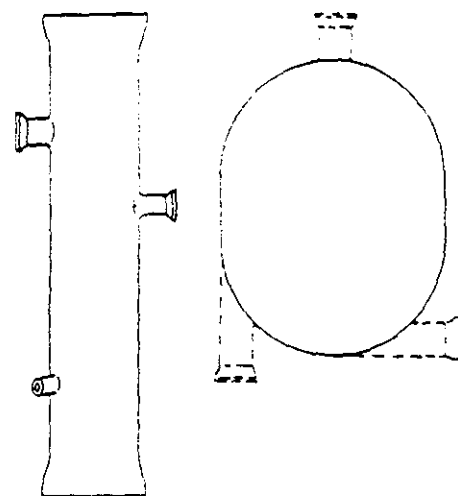


Figure 11.

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or bending movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

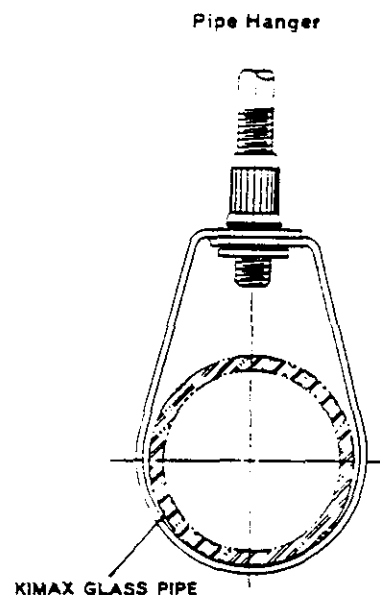
**MAXIMUM RECOMMENDED SPAN-FEET**

| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | 7                                |
| 1 1/4"    | 9             | 9                              | 7                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 6"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, I-beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed point loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.

# INSTALLATION

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

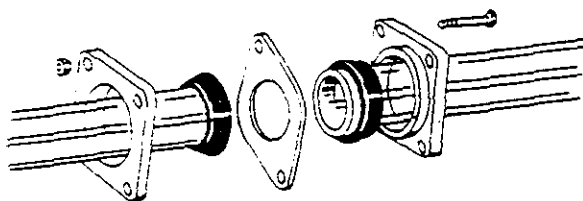
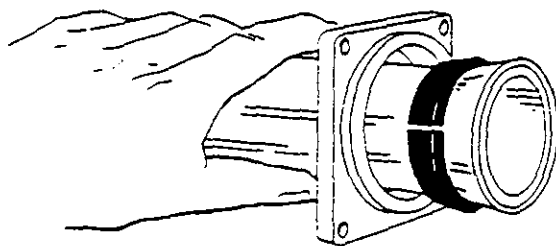
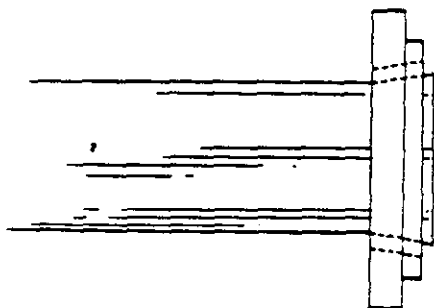


Figure 13.

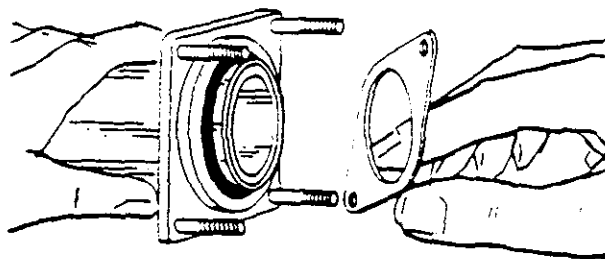
## Steps for Joint Assembly



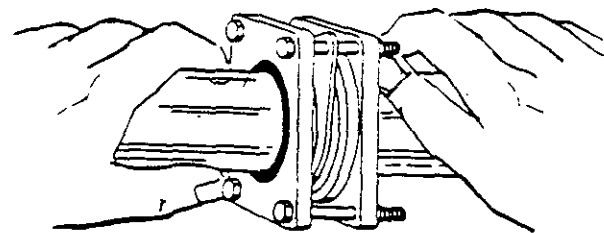
Step 1. Place the metal flange—small opening first—and the insert, over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on bolts. Keep gaskets dry to avoid gaskets slipping out between flange under line pressure.



Step 4. Align gasket opening precisely with pipe opening to avoid obstructions to line flow (especially important in milk and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB./FT.

| Pipe Size | Regular Gasket | Solid T F E Gasket |
|-----------|----------------|--------------------|
| 1"        | 2              | 2-3                |
| 1 1/4"    | 3-3.5          | 3-4                |
| 2"        | 3-4            | 4-5                |
| 3"        | 3-4            | 4-5                |
| 4"        | 3-4            | 5-7                |
| 6"        | 5-6            | 7-10               |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

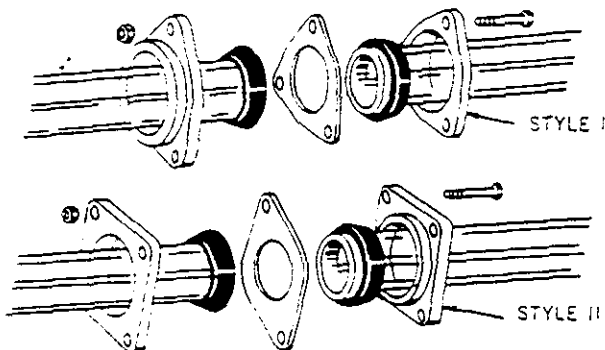
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

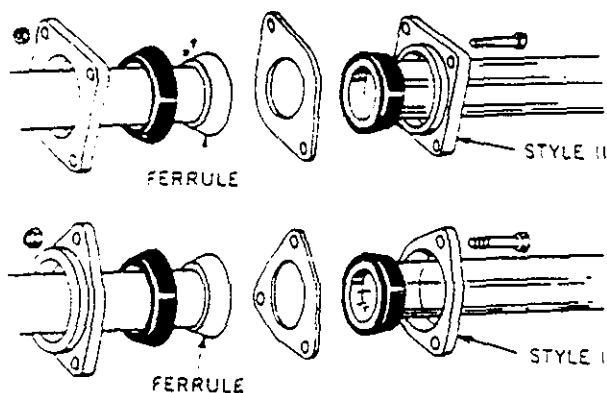
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe and Style I flange and standard insert on flanged pipe.

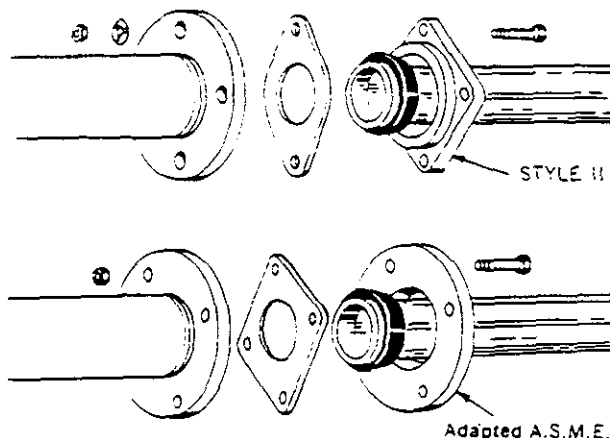
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule (#7245) to the tubing end.



### Glass to A.S.M.E. Flange

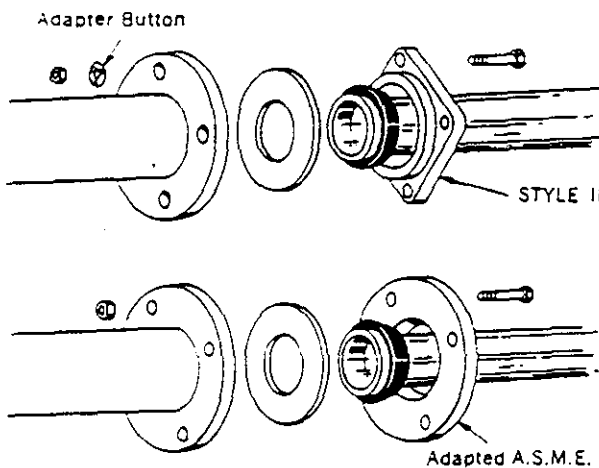
Glass can be mated to A.S.M.E. flanges by means of a Style I cast iron flange (all sizes have A.S.M.E. Bolt Circles); an adapter A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters only); or a 4" or 5" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.M.E. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A T F E covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined T F E envelope.

# INSTALLATION

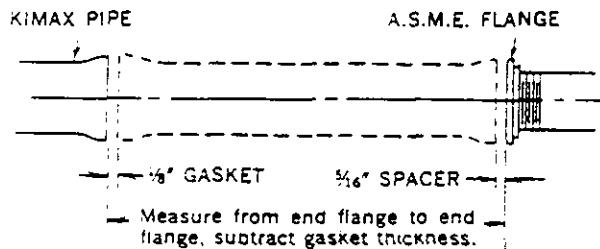
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. **Spacers.** Standard straight and 5° beveled spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 6" diameters, available in 1/2" to 2" lengths.

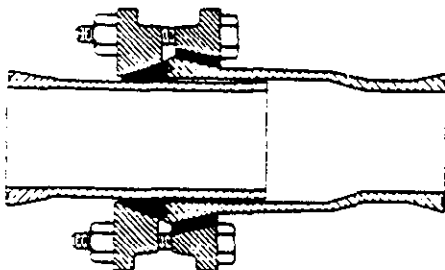
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Adjustable Joints.** Permit linear variations up to 2 1/4". Also used to correct misalignment.



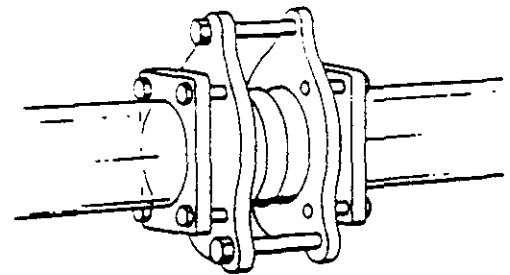
Long cut section of straight pipe may be used for inner glass sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTINGS section.

4. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. **Field Fabrication**—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) on beaded ends to mate with Style I or Style II flange with standard insert on flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

6. **Adjust Equipment.** It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment devices.



# TESTING AND MAINTENANCE

## Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- **Shake the line.** If the line moves from side to side, it is probably free from bending loads.
- **Open a flanged joint.** If the flange does not move when bolts are removed, the pipe is not restrained.

## Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

## Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. Inadequate bolt tightening: Do not hesitate to "snug" bolts sufficiently.
2. Misalignment: Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. Temperature cycling: Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

## Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.



## PRICE LIST TR-264-A

September, 1963

Owens-Illinois KIMAX®

### Tempered Glass DRAINLINE and Fittings

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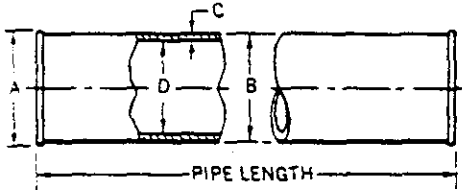
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The prices set forth herein are considered by Owens-Illinois as fair and reasonable, and are suggested for all sales except in Missouri, Vermont, Texas and the District of Columbia. Actual prices are within the sole discretion of the distributor.

## STRAIGHT LENGTHS

Standard lengths of regular drainline are 5 and 10 feet. Special lengths, up to 15 feet may be ordered as special items and are priced on a per-foot basis to the next nearest foot, plus 10% for special handling.



\*KIMAX heavy schedule drainline (marked "H-S") is designed for burying underground or under concrete. Maximum length recommended for burial is 5 feet.

## KIMAX DRAINLINE PIPE AND FITTINGS

### 6500—regular schedule, 5-ft. lengths

| Size     | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 5' | 2.06 | 1.84   | 0.12     | 1.60   | 4 pcs.        | 18 lbs.                          | \$10.00                |
| 2        | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 25                               | 13.50                  |
| 3        | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 23                               | 20.00                  |
| 4        | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 20                               | 27.50                  |
| 6        | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 33                               | 44.00                  |

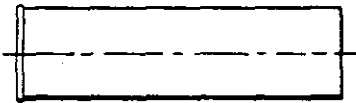
### 6501—regular schedule, 10-ft. lengths

| Size      | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|-----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 10' | 2.06 | 1.84   | 0.12     | 1.60   | 4             | 35 lbs.                          | 20.00                  |
| 2         | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 48                               | 27.00                  |
| 3         | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 45                               | 40.00                  |
| 4         | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 40                               | 55.00                  |
| 6         | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 60                               | 88.00                  |

### 6502—heavy schedule, 5-ft. lengths\*

| Size     | C (wall) | D (ID) | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|----------|----------|--------|---------------|--------------------------------------|------------------------|
| 1½" x 5' | 0.17     | 1½"    | 4 pcs.        | 24 lbs.                              | \$11.00                |
| 2        | 0.17     | 2      | 4             | 29                                   | 15.00                  |
| 3        | 0.20     | 3      | 2             | 25                                   | 22.50                  |
| 4        | 0.26     | 4      | 1             | 24                                   | 30.00                  |
| 6        | 0.33     | 6      | 1             | 35                                   | 49.00                  |

## STRAIGHT LENGTHS

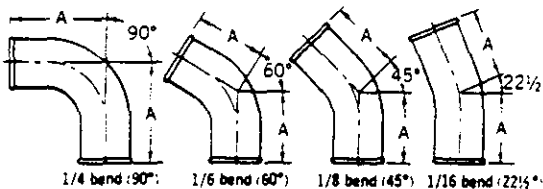


\*\*Nipple stock is annealed only, beaded on one end and available in 2-foot lengths, regular schedule weight. Most economical way to make up short lengths.

### 6503—NIPPLE STOCK, 2-ft. lengths\*\*

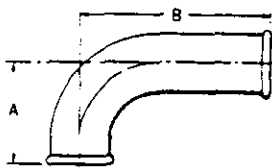
| Size     | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 2' | 2.06 | 1.84   | 0.12     | 1.60   | 4 pcs.        | 8 lbs.                           | \$ 4.00                |
| 2        | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 10                               | 5.40                   |
| 3        | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 9                                | 8.00                   |
| 4        | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 8                                | 11.00                  |
| 6        | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 12                               | 17.50                  |

## BENDS 6511



| Size | A  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|---------------|--------------------------------------|------------------------|
| 1½"  | 4½ | 4 pcs.        | 5 lbs.                               | \$ 5.50                |
| 2    | 5  | 4             | 6                                    | 7.00                   |
| 3    | 6½ | 1             | 3                                    | 12.50                  |
| 4    | 9  | 1             | 8                                    | 16.50                  |
| 6    | 12 | 1             | 14                                   | 35.00                  |

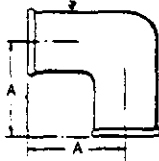
## SHORT RADIUS QUARTER BENDS



### 6512

| Size | A  | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 3½ | 6  | 4 pcs.        | 5 lbs.                               | \$7.50                 |
| 2    | 3½ | 7½ | 4             | 6                                    | 9.00                   |

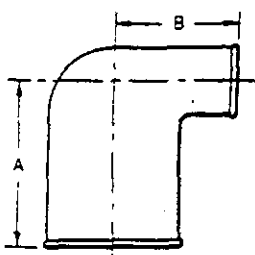
## SHORT RADIUS QUARTER BENDS



### 6513

| Size | A | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|---|---------------|--------------------------------------|------------------------|
| 1½"  | 3 | 4 pcs.        | 5 lbs.                               | \$7.50                 |

## QUARTER BEND REDUCER



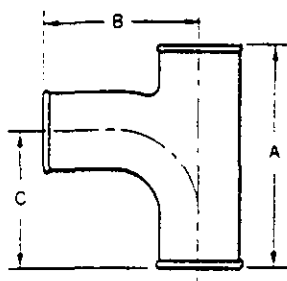
### 6518

| Size     | A | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|----------|---|----|---------------|--------------------------------------|------------------------|
| 2" x 1½" | 4 | 3½ | 4 pcs.        | 5 lbs.                               | \$ 8.00                |
| 3 x 1½   | 5 | 4  | 1             | 2                                    | 10.00                  |
| 3 x 2    | 5 | 4½ | 1             | 2                                    | 11.00                  |
| 4 x 1½   | 7 | 4½ | 1             | 3                                    | 11.50                  |
| 4 x 2    | 7 | 5  | 1             | 3                                    | 12.50                  |
| 4 x 3    | 7 | 5½ | 1             | 3                                    | 14.00                  |
| 6 x 1½   | 9 | 5½ | 1             | 8                                    | 27.00                  |
| 6 x 2    | 9 | 6  | 1             | 8                                    | 28.50                  |
| 6 x 3    | 9 | 6½ | 1             | 9                                    | 30.00                  |
| 6 x 4    | 9 | 8  | 1             | 9                                    | 32.00                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

## T BRANCHES

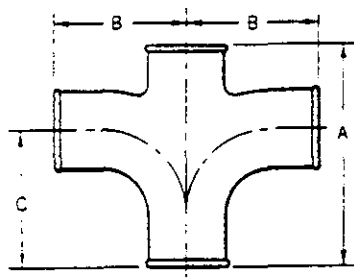
### 6521—drainline T branch



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3½ | 3¾  | 4 pcs.        | 5 lbs.                               | \$ 7.25                |
| 2 x 1½"   | 8  | 3¾ | 5   | 4             | 7                                    | 8.75                   |
| 2 x 2     | 8  | 4½ | 5   | 4             | 8                                    | 9.75                   |
| 3 x 1½"   | 12 | 4¼ | 7½  | 1             | 3                                    | 10.75                  |
| 3 x 2     | 12 | 5  | 7½  | 1             | 4                                    | 13.25                  |
| 3 x 3     | 12 | 6¾ | 7½  | 1             | 5                                    | 13.50                  |
| 4 x 1½"   | 14 | 4¾ | 8¾  | 1             | 6                                    | 17.50                  |
| 4 x 2     | 14 | 5¾ | 8¾  | 1             | 7                                    | 19.00                  |
| 4 x 3     | 14 | 7  | 8¾  | 1             | 7                                    | 21.25                  |
| 4 x 4     | 14 | 8¾ | 8¾  | 1             | 13                                   | 25.00                  |
| 6 x 2     | 20 | 6¾ | 12¾ | 1             | 14                                   | 33.00                  |
| 6 x 3     | 20 | 8  | 12¾ | 1             | 15                                   | 34.00                  |
| 6 x 4     | 20 | 9¾ | 12¾ | 1             | 18                                   | 37.00                  |
| 6 x 6     | 20 | 12 | 12¾ | 1             | 20                                   | 41.00                  |

## T BRANCHES

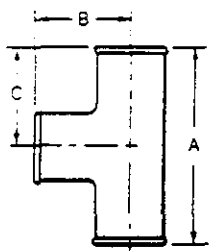
### 6522—double branch drainline T



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3½ | 3¾  | 4 pcs.        | 7 lbs.                               | \$11.25                |
| 2 x 1½"   | 8  | 3¾ | 5   | 4             | 10                                   | 12.50                  |
| 2 x 2     | 8  | 4½ | 5   | 4             | 10                                   | 14.50                  |
| 3 x 1½"   | 12 | 4¼ | 7½  | 1             | 4                                    | 15.00                  |
| 3 x 2     | 12 | 5  | 7½  | 1             | 5                                    | 20.50                  |
| 3 x 3     | 12 | 6¾ | 7½  | 1             | 7                                    | 22.00                  |
| 4 x 1½"   | 14 | 4¾ | 8¾  | 1             | 10                                   | 24.00                  |
| 4 x 2     | 14 | 5¾ | 8¾  | 1             | 11                                   | 28.00                  |
| 4 x 3     | 14 | 7  | 8¾  | 1             | 12                                   | 32.00                  |
| 4 x 4     | 14 | 8¾ | 8¾  | 1             | 14                                   | 39.00                  |
| 6 x 2     | 20 | 6¾ | 12¾ | 1             | 15                                   | 43.00                  |
| 6 x 3     | 20 | 8  | 12¾ | 1             | 17                                   | 44.00                  |
| 6 x 4     | 20 | 9¾ | 12¾ | 1             | 20                                   | 52.00                  |
| 6 x 6     | 20 | 12 | 12¾ | 1             | 22                                   | 62.00                  |

## STRAIGHT TEE

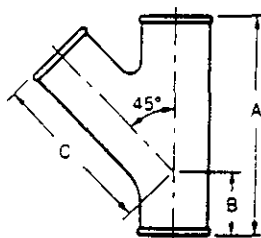
### 6523



| Size      | A  | B  | C  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3  | 3  | 4 pcs.        | 5 lbs.                               | \$10.25                |
| 2 x 1½"   | 8  | 3¾ | 4  | 4             | 7                                    | 11.00                  |
| 2 x 2     | 8  | 4  | 4  | 4             | 8                                    | 12.00                  |
| 3 x 2     | 12 | 4½ | 6  | 1             | 4                                    | 15.75                  |
| 3 x 3     | 12 | 6  | 6  | 1             | 5                                    | 16.00                  |
| 4 x 2     | 14 | 5  | 7  | 1             | 8                                    | 19.00                  |
| 4 x 3     | 14 | 6½ | 7  | 1             | 11                                   | 23.50                  |
| 4 x 4     | 14 | 8  | 7  | 1             | 11                                   | 24.00                  |
| 6 x 3     | 20 | 7¾ | 10 | 1             | 15                                   | 52.00                  |
| 6 x 4     | 20 | 9  | 10 | 1             | 18                                   | 53.50                  |
| 6 x 6     | 20 | 10 | 10 | 1             | 20                                   | 56.00                  |

## Y BRANCHES

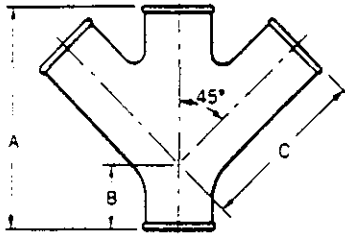
### 6526—drainline Y branch



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 1¾ | 4½  | 4 pcs.        | 5 lbs.                               | \$ 8.50                |
| 2 x 1½"   | 8  | 2½ | 4¾  | 4             | 8                                    | 9.00                   |
| 2 x 2     | 8  | 2½ | 6   | 4             | 9                                    | 10.00                  |
| 3 x 1½"   | 12 | 3¾ | 5½  | 1             | 4                                    | 12.50                  |
| 3 x 2     | 12 | 3¾ | 6½  | 1             | 4                                    | 13.00                  |
| 3 x 3     | 12 | 3¾ | 8   | 1             | 4                                    | 15.00                  |
| 4 x 1½"   | 14 | 4½ | 6¾  | 1             | 7                                    | 16.00                  |
| 4 x 2     | 14 | 4½ | 7½  | 1             | 8                                    | 17.00                  |
| 4 x 3     | 14 | 4½ | 8¾  | 1             | 8                                    | 23.00                  |
| 4 x 4     | 14 | 4½ | 10  | 1             | 13                                   | 25.00                  |
| 6 x 2     | 20 | 5¾ | 9   | 1             | 14                                   | 34.50                  |
| 6 x 3     | 20 | 5¾ | 10¾ | 1             | 15                                   | 44.00                  |
| 6 x 4     | 20 | 5¾ | 11½ | 1             | 18                                   | 45.50                  |
| 6 x 6     | 20 | 5¾ | 14  | 1             | 20                                   | 50.50                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

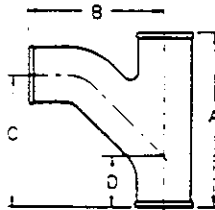
## Y BRANCHES



### 6527—double branch drainline Y

| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 1½ | 4½  | 4 pcs.        | 7 lbs.                               | \$12.50                |
| 2 x 1½    | 8  | 2½ | 4½  | 4             | 10                                   | 13.50                  |
| 2 x 2     | 8  | 2½ | 6   | 4             | 10                                   | 14.50                  |
| 3 x 1½    | 12 | 3½ | 5½  | 1             | 4                                    | 17.00                  |
| 3 x 2     | 12 | 3½ | 6½  | 1             | 7                                    | 19.00                  |
| 3 x 3     | 12 | 3½ | 8   | 1             | 8                                    | 23.00                  |
| 4 x 1½    | 14 | 4½ | 6½  | 1             | 13                                   | 25.00                  |
| 4 x 2     | 14 | 4½ | 7½  | 1             | 13                                   | 26.50                  |
| 4 x 3     | 14 | 4½ | 8½  | 1             | 14                                   | 34.00                  |
| 4 x 4     | 14 | 4½ | 10  | 1             | 14                                   | 48.00                  |
| 6 x 2     | 20 | 5½ | 9   | 1             | 15                                   | 60.00                  |
| 6 x 3     | 20 | 5½ | 10½ | 1             | 17                                   | 63.00                  |
| 6 x 4     | 20 | 5½ | 11½ | 1             | 20                                   | 66.50                  |
| 6 x 6     | 20 | 5½ | 14  | 1             | 22                                   | 88.00                  |

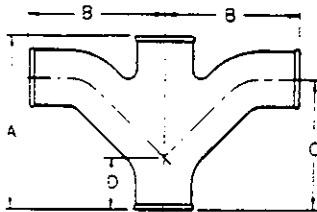
## COMBINATION Y AND 1/8 BEND



### 6528—drainline combination Y and 1/8 bend

| Size      | A  | B  | C   | D  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 4½ | 4½  | 1½ | 4 pcs.        | 6 lbs.                               | \$ 9.00                |
| 2 x 1½    | 8  | 4½ | 5½  | 2½ | 4             | 8                                    | 9.50                   |
| 2 x 2     | 8  | 6  | 6½  | 2½ | 4             | 10                                   | 12.75                  |
| 3 x 1½    | 12 | 5½ | 7½  | 3½ | 1             | 4                                    | 11.50                  |
| 3 x 2     | 12 | 6½ | 8   | 3½ | 1             | 4                                    | 13.50                  |
| 3 x 3     | 12 | 8½ | 9   | 3½ | 1             | 5                                    | 16.50                  |
| 4 x 1½    | 14 | 6  | 8½  | 4½ | 1             | 8                                    | 14.75                  |
| 4 x 2     | 14 | 7  | 9½  | 4½ | 1             | 8                                    | 18.00                  |
| 4 x 3     | 14 | 9  | 10½ | 4½ | 1             | 9                                    | 21.75                  |
| 4 x 4     | 14 | 11 | 11  | 4½ | 1             | 12                                   | 27.00                  |
| 6 x 2     | 20 | 8½ | 11½ | 5½ | 1             | 15                                   | 31.00                  |
| 6 x 3     | 20 | 10 | 12½ | 5½ | 1             | 17                                   | 39.00                  |
| 6 x 4     | 20 | 12 | 13½ | 5½ | 1             | 21                                   | 41.50                  |
| 6 x 6     | 20 | 15 | 14½ | 5½ | 1             | 23                                   | 46.50                  |

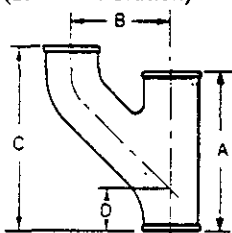
## COMBINATION Y AND 1/8 BEND



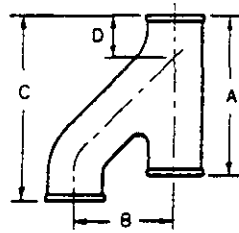
### 6529—double branch drainline combination Y and 1/8 bend

| Size      | A  | B  | C   | D  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 4½ | 4½  | 1½ | 4 pcs.        | 8 lbs.                               | \$14.75                |
| 2 x 1½    | 8  | 4½ | 5½  | 2½ | 4             | 11                                   | 15.75                  |
| 2 x 2     | 8  | 6  | 6½  | 2½ | 4             | 13                                   | 18.50                  |
| 3 x 1½    | 12 | 5½ | 7½  | 3½ | 1             | 4                                    | 22.00                  |
| 3 x 2     | 12 | 6½ | 8   | 3½ | 1             | 6                                    | 22.75                  |
| 3 x 3     | 12 | 8½ | 9   | 3½ | 1             | 11                                   | 30.00                  |
| 4 x 1½    | 14 | 6  | 8½  | 4½ | 1             | 11                                   | 25.00                  |
| 4 x 2     | 14 | 7  | 9½  | 4½ | 1             | 12                                   | 26.50                  |
| 4 x 3     | 14 | 9  | 10½ | 4½ | 1             | 14                                   | 31.25                  |
| 4 x 4     | 14 | 11 | 11  | 4½ | 1             | 18                                   | 46.50                  |
| 6 x 2     | 20 | 8½ | 11½ | 5½ | 1             | 18                                   | 49.50                  |
| 6 x 3     | 20 | 10 | 12½ | 5½ | 1             | 19                                   | 52.00                  |
| 6 x 4     | 20 | 12 | 13½ | 5½ | 1             | 20                                   | 65.00                  |
| 6 x 6     | 20 | 15 | 14½ | 5½ | 1             | 22                                   | 78.00                  |

## UPRIGHT Y OR H FITTING (and vent branch)



upright Y or H fitting



vent branch

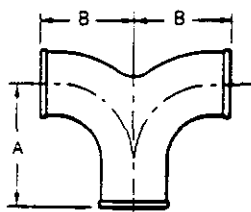
Note: above fittings identical

### 6532

| Size      | A  | B  | D  | C*  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3  | 1½ | 6½  | 4 pcs.        | 7 lbs.                               | \$20.00                |
| 2 x 1½    | 8  | 3½ | 2½ | 7½  | 4             | 8                                    | 20.00                  |
| 2 x 2     | 8  | 4  | 2½ | 8½  | 4             | 10                                   | 22.50                  |
| 3 x 1½    | 12 | 3½ | 3½ | 9½  | 1             | 4                                    | 22.00                  |
| 3 x 2     | 12 | 4½ | 3½ | 10½ | 1             | 4                                    | 24.00                  |
| 3 x 3     | 12 | 6  | 3½ | 13  | 1             | 4                                    | 28.00                  |
| 4 x 1½    | 14 | 4½ | 4½ | 10½ | 1             | 10                                   | 30.00                  |
| 4 x 2     | 14 | 5  | 4½ | 12  | 1             | 11                                   | 32.00                  |
| 4 x 3     | 14 | 6½ | 4½ | 14½ | 1             | 12                                   | 36.00                  |
| 4 x 4     | 14 | 8  | 4½ | 16½ | 1             | 14                                   | 41.00                  |
| 6 x 3     | 20 | 7½ | 5½ | 16½ | 1             | 17                                   | 58.00                  |
| 6 x 4     | 20 | 9  | 5½ | 19  | 1             | 20                                   | 62.50                  |
| 6 x 6     | 20 | 12 | 5½ | 24  | 1             | 22                                   | 72.00                  |

\*"C" dimension may be higher or lower than "A."

## DOUBLE QUARTER BEND



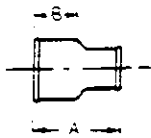
### 6533

| Size | A   | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|-----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 3½  | 3½ | 4 pcs.        | 6 lbs.                               | \$ 9.00                |
| 2    | 5   | 4½ | 4             | 10                                   | 12.00                  |
| 3    | 7½  | 6½ | 1             | 5                                    | 20.00                  |
| 4    | 8½  | 8½ | 1             | 18                                   | 31.00                  |
| 6    | 12½ | 12 | 1             | 25                                   | 60.00                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

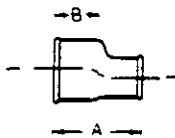
## REDUCERS

6536



reducer and increaser

6537

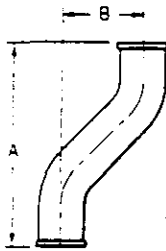


reducer eccentric

| Size        | A | B (min.) | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price 6536 | Suggested Resale Price 6537 |
|-------------|---|----------|---------------|--------------------------------------|-----------------------------|-----------------------------|
| 2" x 1 1/2" | 4 | 1 1/4    | 4 pcs.        | 3 lbs.                               | \$ 4.50                     | \$ 4.50                     |
| *2 1/2 x 2  | 5 | 3        | 4             | 4                                    | 6.00                        | 6.50                        |
| 3 x 1 1/2   | 5 | 2 1/4    | 1             | 1                                    | 6.50                        | 6.50                        |
| 3 x 2       | 5 | 2 1/4    | 1             | 2                                    | 8.00                        | 8.00                        |
| *3 1/2 x 3  | 7 | 4        | 1             | 2                                    | 8.50                        | 8.50                        |
| 4 x 1 1/2   | 7 | 3        | 1             | 3                                    | 8.00                        | 8.00                        |
| 4 x 2       | 7 | 3        | 1             | 3                                    | 8.50                        | 8.50                        |
| 4 x 3       | 7 | 3        | 1             | 3                                    | 10.00                       | 10.00                       |
| *5 x 4      | 9 | 5 1/2    | 1             | 4                                    | 15.00                       | 18.50                       |
| 6 x 1 1/2   | 9 | 4        | 1             | 4                                    | 12.50                       | 12.50                       |
| 6 x 2       | 9 | 4        | 1             | 5                                    | 13.50                       | 13.50                       |
| 6 x 3       | 9 | 4        | 1             | 5                                    | 15.50                       | 15.50                       |
| 6 x 4       | 9 | 4        | 1             | 5                                    | 17.00                       | 17.00                       |

\*Used with adjustable joint (=6660)

## OFFSETS



6540

| Offset B Dimension          | Suggested Resale Prices |         |         |         |          |
|-----------------------------|-------------------------|---------|---------|---------|----------|
|                             | Pipe Sizes              |         |         |         |          |
|                             | 1 1/2"                  | 2"      | 3"      | 4"      | 6"       |
| 2"                          | \$15.00                 | \$16.00 | \$20.50 | \$26.50 | —        |
| 3                           | 16.00                   | —       | —       | —       | —        |
| 4                           | 16.50                   | 16.50   | 22.00   | 31.50   | \$ 74.00 |
| 6                           | 19.00                   | 20.50   | 23.50   | 53.50   | 84.00    |
| 8                           | 19.50                   | 22.00   | 25.00   | 63.00   | 93.00    |
| 10                          | 35.00                   | 31.50   | 47.50   | 71.00   | 100.00   |
| 12                          | 38.00                   | 33.00   | 53.50   | 84.00   | 110.00   |
| Approximate Shipping Weight | 3 lbs.                  | 3 lbs.  | 5 lbs.  | 8 lbs.  | 20 lbs.  |
| A Dimension                 | 12                      | 12      | 15      | 20      | 25       |

When ordering Drainline Offset specify pipe size and desired offset. All sizes of offsets are packaged 1 Per Shipper Carton.

## CLEANOUT PLUGS



Short cleanout plug

6544

| Size   | A     | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|--------|-------|---------------|--------------------------------------|------------------------|
| 1 1/2" | 3/4   | 4 pcs.        | 1 lb.                                | \$2.00                 |
| 2      | 1     | 4             | 1                                    | 2.50                   |
| 3      | 1 1/4 | 1             | 1                                    | 4.00                   |
| 4      | 1 1/4 | 1             | 1                                    | 7.00                   |
| 6      | 1 1/2 | 1             | 1                                    | 9.50                   |

## CLEANOUT PLUGS



Long cleanout plug

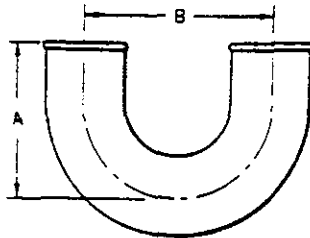
6545 (annealed)

| Size   | B     | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|--------|-------|---------------|--------------------------------------|------------------------|
| 1 1/2" | 3 1/4 | 4 pcs.        | 2 lbs.                               | \$ 3.00                |
| 2      | 3 3/4 | 4             | 3                                    | 3.50                   |
| 3      | 4 1/4 | 1             | 1                                    | 5.00                   |
| 4      | 5 1/4 | 1             | 3                                    | 11.50                  |
| 6      | 6 1/2 | 1             | 4                                    | 17.50                  |

# KIMAX DRAINLINE PIPE AND FITTINGS



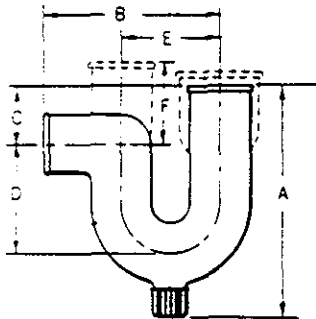
U BEND (Vent Loop)



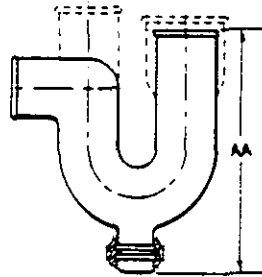
6550

| Size | A  | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 4  | 5  | 4 pcs.        | 5 lbs.                               | \$ 9.50                |
| 2    | 4½ | 5½ | 4             | 5                                    | 12.00                  |
| 3    | 5½ | 6½ | 1             | 8                                    | 24.00                  |
| 4    | 6½ | 7½ | 1             | 11                                   | 32.00                  |
| 6    | 8½ | 10 | 1             | 20                                   | 90.00                  |

P TRAP



standard cleanout



large cleanout

6554—without vent

6554-A—without vent

6555—with vent

6555-A—with vent

| Size      | Vent Size | Seal Depth | A    | B    | C   | D   | E   | F   | AA   | Case Quantity |
|-----------|-----------|------------|------|------|-----|-----|-----|-----|------|---------------|
| 1½" x 1½" | 1½"       | 3¾"        | 8½"  | 8    | 1   | 5   | 5   | 3   | 9½"  | 1 pc.         |
| *2 x 1½"  | 1½"       | 3¾"        | 8½"  | 8    | 1   | 5   | 5   | 3   | 9½"  | 1             |
| 2 x 2     | 2         | 3¾"        | 9½"  | 8½"  | 1½" | 5½" | 5½" | 3½" | 10½" | 1             |
| 2½ x 1½"  | 1½"       | 3¾"        | 8½"  | 8    | 1   | 5   | 5   | 3   | 9½"  | 1             |
| **2½ x 2  | 2         | 3¾"        | 9½"  | 8½"  | 1½" | 5½" | 5½" | 3½" | 10½" | 1             |
| 3 x 3     | 3         | 3¾"        | 12   | 10½" | 2   | 6½" | 6½" | 4   | 12½" | 1             |
| ***3½ x 3 | 3         | 3¾"        | 12   | 10½" | 2   | 6½" | 6½" | 4   | 12½" | 1             |
| 4 x 4     | 4         | 3¾"        | 14   | 12½" | 2½" | 7½" | 7½" | 5   | 14½" | 1             |
| 6 x 6     | 4         | 3¾"        | 18½" | 17   | 3½" | 9½" | 10  | 7   | 18½" | 1             |

## Suggested Resale Prices

| Size      | Shipping Weight Per Case | Assembly Without Vent 6554 | Assembly With Vent 6554A | Assembly Without Vent 6555 | Assembly With Vent 6555A | Body Only 6553 W/O Vent | Body Only 6553A With Vent |
|-----------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|-------------------------|---------------------------|
| 1½" x 1½" | 3 lbs.                   | \$13.50                    | \$18.00                  | \$16.00                    | \$20.50                  | \$13.50                 | \$18.00                   |
| *2 x 1½"  | 4                        | 14.00                      | 18.50                    | 16.50                      | 21.00                    | 14.00                   | 18.50                     |
| 2 x 2     | 4                        | 20.00                      | 24.50                    | 31.00                      | 35.50                    | 20.00                   | 31.00                     |
| 2½ x 1½"  | 4                        | 22.00                      | 26.50                    | 25.00                      | 29.50                    | 22.00                   | 26.50                     |
| **2½ x 2  | 4                        | 35.00                      | 39.50                    | 39.50                      | 44.00                    | 35.00                   | 39.50                     |
| 3 x 3     | 7                        | 42.50                      | 47.00                    | 49.00                      | 53.50                    | 42.50                   | 49.00                     |
| ***3½ x 3 | 7                        | 50.00                      | 54.50                    | 56.00                      | 60.50                    | 50.00                   | 56.00                     |
| 4 x 4     | 10                       | 52.00                      | 56.50                    | 58.00                      | 62.50                    | 52.00                   | 58.00                     |
| 6 x 6     | 15                       | 170.00                     | 174.50                   | 180.00                     | 184.50                   | 170.00                  | 180.00                    |

6675 Extra Phenolic Caps — for 6554 or 6555.....\$ .35 each

6544 Short Clean-Out Plugs — (1½") for 6554A and 6555A.....\$2.00 each

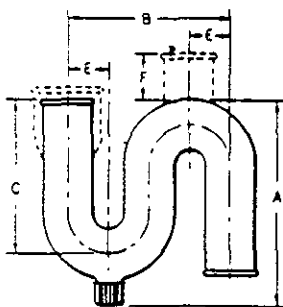
6650 Extra Drainline Coupling for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.

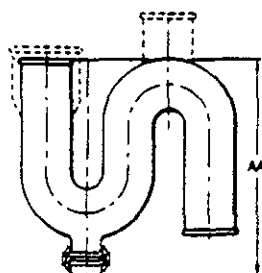
\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.

\*\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.

S TRAP



standard cleanout



large cleanout

6556—without vent

6556-A—without vent

6557—with vent

6557-A—with vent

| Size      | Vent Size | Seal Depth | A    | B  | C   | E   | F   | AA   | Case Quantity |
|-----------|-----------|------------|------|----|-----|-----|-----|------|---------------|
| 1½" x 1½" | 1½"       | 3¾"        | 8½"  | 10 | 6   | 2½" | 2½" | 9½"  | 1 pc.         |
| *2 x 1½"  | 1½"       | 3¾"        | 8½"  | 10 | 6   | 2½" | 2½" | 9½"  | 1             |
| 2 x 2     | 2         | 3¾"        | 9½"  | 11 | 7   | 2½" | 2½" | 10½" | 1             |
| **2½ x 2  | 2         | 3¾"        | 9½"  | 11 | 7   | 2½" | 2½" | 10½" | 1             |
| 3 x 3     | 3         | 3¾"        | 12   | 13 | 8½" | 3½" | 3½" | 12½" | 1             |
| 4 x 4     | 4         | 3¾"        | 14   | 15 | 10  | 3½" | 3½" | 14½" | 1             |
| 6 x 6     | 4         | 3¾"        | 18½" | 20 | 13  | 5   | 3½" | 18½" | 1             |

## Suggested Resale Prices

| Size      | Shipping Weight Per Case | Assembly Without Vent 6556 | Assembly With Vent 6556A | Assembly Without Vent 6557 | Assembly With Vent 6557A | Body Only 6558 W/O Vent | Body Only 6558A With Vent |
|-----------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|-------------------------|---------------------------|
| 1½" x 1½" | 4 lbs.                   | \$18.00                    | \$20.50                  | \$19.50                    | \$25.00                  | \$18.00                 | \$20.50                   |
| *2 x 1½"  | 5                        | 16.50                      | 21.00                    | 20.00                      | 24.50                    | 16.50                   | 21.00                     |
| 2 x 2     | 5                        | 18.50                      | 23.00                    | 22.50                      | 27.00                    | 18.50                   | 23.00                     |
| **2½ x 2  | 6                        | 19.50                      | 24.00                    | 23.00                      | 28.00                    | 19.50                   | 24.00                     |
| 3 x 3     | 9                        | 45.00                      | 49.50                    | 50.00                      | 55.00                    | 45.00                   | 50.00                     |
| 4 x 4     | 14                       | 66.00                      | 70.50                    | 72.50                      | 77.00                    | 66.00                   | 72.50                     |
| 6 x 6     | 19                       | 140.00                     | 144.50                   | 160.00                     | 164.50                   | 140.00                  | 160.00                    |

6675 Extra Phenolic Caps for 6556 and 6557.....\$ .35 each

6544 Short Clean-Out Plugs (1½") for 6556A and 6557A.....\$2.00 each

6650 Extra Drainline Coupling for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.

\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.

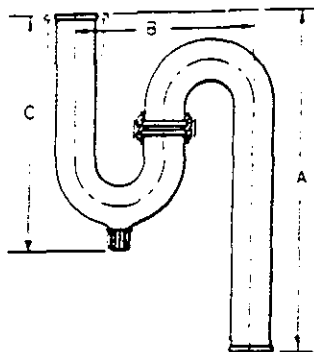


# KIMAX DRAINLINE PIPE AND FITTINGS

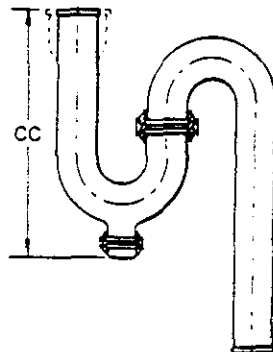
## LONG S TRAP

6560

6560-A



standard cleanout



large cleanout

| Size              | Seal Depth | A    | B   | Maximum C | CC   | Case Quantity | Shpg. Wt. Per Case |
|-------------------|------------|------|-----|-----------|------|---------------|--------------------|
| 1½" x 1½" x 16½"  | 5¼"        | 16½" | 10" | 8½½"      | 11½" | 1 pc.         | 6 lbs.             |
| 1½" x 1½" x 20½"  | 5¼"        | 20½" | 10" | 8½½"      | 11½" | 1             | 7                  |
| *2 x 1½" x 16½"   | 5¼"        | 16½" | 10" | 8½½"      | 11½" | 1             | 7                  |
| 2 x 1½" x 20½"    | 5¼"        | 20½" | 10" | 8½½"      | 11½" | 1             | 8                  |
| 2 x 2" x 20½"     | 5¼"        | 20½" | 11" | 9½½"      | 12½" | 1             | 9                  |
| **2½" x 2" x 20½" | 5¼"        | 20½" | 11" | 9½½"      | 12½" | 1             | 9                  |

### Suggested Resale Prices

| Size              | Complete 6560 | Inlet Pipe 6560A | Outlet Pipe 6561 | Coupling 6565 |
|-------------------|---------------|------------------|------------------|---------------|
| 1½" x 1½" x 16½"  | \$23.00       | \$27.50          | \$12.50          | \$17.00       |
| 1½" x 1½" x 20½"  | 23.50         | 28.00            | 12.50            | 17.00         |
| *2 x 1½" x 16½"   | 24.00         | 28.50            | 13.50            | 18.00         |
| 2 x 1½" x 20½"    | 24.50         | 29.00            | 13.50            | 18.00         |
| 2 x 2" x 20½"     | 29.00         | 33.50            | 15.00            | 19.50         |
| **2½" x 2" x 20½" | 31.00         | 35.50            | 17.00            | 21.50         |

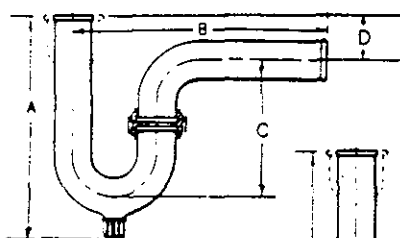
6675 Extra Phenolic Caps for 6560 and 6561.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6560A and 6561A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.  
 \*\*Use adjustable joint (#6660) for top joint.

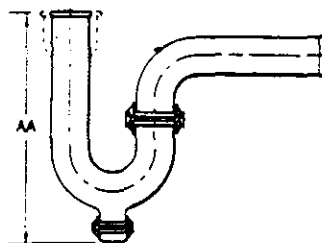
## LONG P TRAP

6565

6565-A



standard cleanout



large cleanout

| Size       | Seal Depth | A     | B   | C   | D   | AA    | Case Quantity | Shpg. Wt. Per Case |
|------------|------------|-------|-----|-----|-----|-------|---------------|--------------------|
| 1½" x 1½"  | 5¼"        | 10½½" | 11" | 6½" | 1½" | 11½"  | 1 pc.         | 1 lbs.             |
| *2 x 1½"   | 5¼"        | 10½½" | 11" | 6½" | 1½" | 11½"  | 1             | -                  |
| 2 x 2"     | 5¼"        | 11½½" | 13" | 7½" | 1½" | 12½½" | 1             | -                  |
| **2½" x 2" | 5¼"        | 11½½" | 13" | 7½" | 1½" | 12½½" | -             | -                  |

### Suggested Resale Prices

| Size       | Complete 6565 | Inlet Pipe 6565A | Outlet Pipe 6561 | Coupling 6565 |
|------------|---------------|------------------|------------------|---------------|
| 1½" x 1½"  | \$22.50       | \$27.00          | \$12.50          | \$17.00       |
| *2 x 1½"   | 23.50         | 28.00            | 13.50            | 18.00         |
| 2 x 2"     | 27.30         | 31.80            | 15.00            | 19.50         |
| **2½" x 2" | -             | -                | -                | -             |

6675 Extra Phenolic Caps for 6565 and 6561.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6565A and 6561A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.  
 \*\*Use adjustable joint (#6660) for top joint.

## RUNNING TRAP

6570

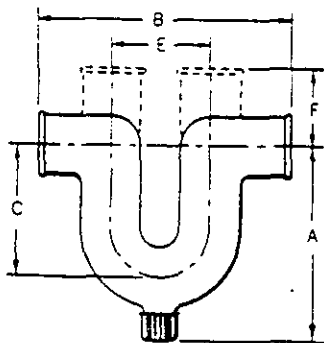
6571

6572

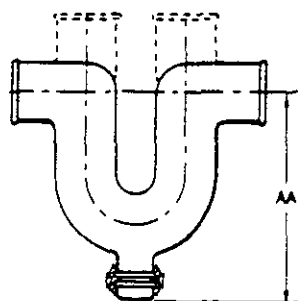
6570-A

6571-A

6572-A



standard cleanout



large cleanout

| Size      | Vent Size | Seal Depth | A     | B    | C   | E   | F   | AA    | Case Quantity | Shpg. Wt. Per Case |
|-----------|-----------|------------|-------|------|-----|-----|-----|-------|---------------|--------------------|
| 1½" x 1½" | 1½"       | 3¼"        | 7½½"  | 11"  | 5"  | 5"  | 3"  | 8½½"  | 1 pc.         | 3 lbs.             |
| 2 x 2"    | 2"        | 3¼"        | 8½½"  | 12"  | 5½" | 5½" | 3½" | 9½"   | 1             | 4                  |
| 3 x 3"    | 3"        | 3¼"        | 10"   | 14½" | 6½" | 6½" | 4"  | 10½½" | 1             | 5                  |
| 4 x 4"    | 4"        | 3¼"        | 11½"  | 17½" | 7½" | 7½" | 5"  | 12½"  | 1             | 7                  |
| 6 x 6"    | 4"        | 3¼"        | 14½½" | 24"  | 9½" | 10" | 7"  | 15½½" | 1             | 15                 |

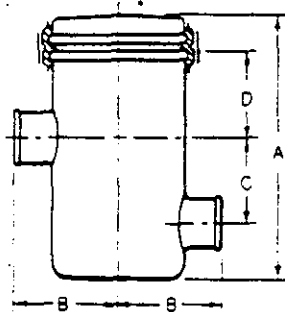
### Suggested Resale Prices

| Size      | Complete Without Vent 6570 | Complete With 1 Vent 6571 | Complete With 2 Vents 6572 |
|-----------|----------------------------|---------------------------|----------------------------|
| 1½" x 1½" | \$20.00                    | \$24.50                   | \$23.00                    |
| 2 x 2"    | 30.00                      | 34.50                     | 35.00                      |
| 3 x 3"    | 50.00                      | 54.50                     | 57.00                      |
| 4 x 4"    | 83.50                      | 88.00                     | 89.50                      |
| 6 x 6"    | 170.00                     | 174.50                    | 180.00                     |

6675 Extra Phenolic Caps for 6570, 6571 or 6572.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6570A, 6571A and 6572A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

# KIMAX DRAINLINE PIPE AND FITTINGS

## DRUM TRAP (top cleanout)



6576

Assembly #6576 consists of following components:

- 6" glass body #6577
- 6" short cleanout plug #6544
- 6" drainline coupling #6650

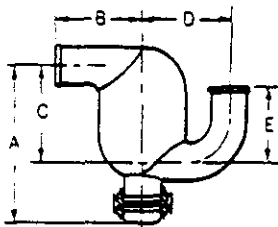
| Size | Seal Depth | A    | B   | C   | D   | Case Quantity |
|------|------------|------|-----|-----|-----|---------------|
| 1½"  | 2½"        | 13¾" | 5¼" | 4½" | 4¼" | 1 pc.         |
| 2"   | 2½"        | 13¾" | 5¼" | 4½" | 4¼" | 1             |
| 3"   | 2½"        | 14¾" | 6¼" | 5½" | 4¼" | 1             |

### Suggested Resale Prices

| Size | 6576 or 6577 Case Quantity | 6576 Shpg. Wt. | 6576 Complete | 6577 Shpg. Wt. | 6577 Body Only |
|------|----------------------------|----------------|---------------|----------------|----------------|
| 1½"  | 1 pc.                      | 9 lbs.         | \$70.00       | 7 lbs.         | \$45.50        |
| 2"   | 1                          | 9              | 78.00         | 7              | 53.50          |
| 3"   | 1                          | 11             | 88.00         | 9              | 63.50          |

6544 Extra 6" Clean-Out Plugs for 6544.....\$ 9.50 each  
6650 Extra 6" Couplings for 6650.....\$14.00 each

## DRUM TRAP (bottom cleanout)



6585

Assembly #6585 consists of following components:

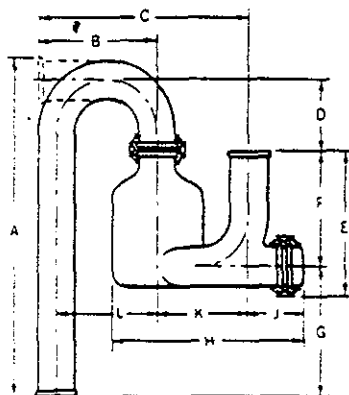
- glass body #6586
- short cleanout plug #6544
- drainline coupling #6650

| Size | Seal Depth | A   | B   | C   | D   | E   | Case Quantity | Shpg. Wt. Per Case |
|------|------------|-----|-----|-----|-----|-----|---------------|--------------------|
| 1½"  | 3"         | 8¾" | 4½" | 4¼" | 4½" | 3¾" | 1 pc.         | 7 lbs.             |
| 2"   | 3¼"        | 9¾" | 5"  | 5¼" | 5½" | 4¼" | 1             | 8                  |

### Suggested Resale Prices

| Size | Complete 6585 | Body Only 6586 | Case Quantity | Shpg. Wt. Per Case | Plug 6544 | Coupling 6650 |
|------|---------------|----------------|---------------|--------------------|-----------|---------------|
| 1½"  | \$19.00       | \$14.50        | 1 pc.         | 6 lbs.             | \$2.00    | \$2.50        |
| 2"   | 21.00         | 15.20          | 1             | 7                  | 2.50      | 3.30          |

## CENTRIFUGAL DRUM TRAP (side cleanout)



6590—vertical outlet

6591—horizontal outlet

Assembly #6590 consists of following components:

- glass body #6592
- vertical outlet #6562\*
- short cleanout plug #6544
- 2 drainline couplings #6650

Assembly #6591 is same as #6590 except that horizontal outlet #6512 is used in place of vertical outlet #6562.

| Size | Seal Depth | A    | B   | C    | D   | E   | F   | G   | H    | J   | K   | L   |
|------|------------|------|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| 1½"  | 7½"        | 16½" | 6"  | 10½" | 3¾" | 7"  | 5½" | 6¾" | 10½" | 3¾" | 4½" | 5"  |
| 2"   | 7¾"        | 20¾" | 7¼" | 13"  | 3¾" | 7¾" | 6"  | 9½" | 12¾" | 4"  | 5½" | 5½" |

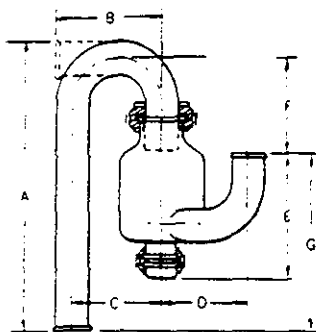
### Suggested Resale Prices

| Size | Case Quantity | Shpg. Wt. Per Case | Vertical Complete 6590 | Horizontal Complete 6591 | Body Only 6592 | Vertical Outlet Only 6562 | Horizontal Outlet Only 6512 | Plug 6544 | Coupling 6650 |
|------|---------------|--------------------|------------------------|--------------------------|----------------|---------------------------|-----------------------------|-----------|---------------|
| 1½"  | 1 pc.         | 28 lbs.            | \$45.00                | \$42.00                  | \$32.50        | \$ 8.00                   | \$7.50                      | \$2.00    | \$2.50        |
| 2"   | 1             | 22                 | 58.00                  | 54.30                    | 39.50          | 10.70                     | 9.00                        | 2.50      | 3.30          |

\*Same as bottom section of long S trap (#6560). Annealed only.

# KIMAX DRAINLINE PIPE AND FITTINGS

## CENTRIFUGAL DRUM TRAP (bottom cleanout)



6600—vertical outlet

6601—horizontal outlet

The adjustable connection at the top of the body permits approximately 2½" variation in the depth of seal.

Vertical outlet assembly #6600 consists of:

- glass body #6602
- vertical outlet #6603 (annealed only)
- short cleanout plug #6544
- drainline coupling #6650
- \*adapter coupling #6655 for 1½" size or
- \*adjustable joint #6660 for 2" size

Horizontal outlet assembly #6601 is same as #6600 except that horizontal outlet #6604 is used in place of vertical outlet.

| Size | Seal Depth | A    | B   | C   | D   | E   | F   | G    | Case Quantity | Shpg. Wt. Per Case |
|------|------------|------|-----|-----|-----|-----|-----|------|---------------|--------------------|
| 1½"  | 7¾"        | 16½" | 6"  | 5"  | 4½" | 7¾" | 5½" | 10"  | 1 pc.         | 20 lbs.            |
| 2"   | 7¾"        | 20¾" | 7½" | 5½" | 5½" | 9"  | 4½" | 14½" | 1             | 22                 |

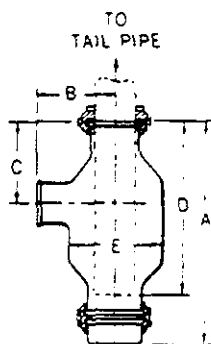
### Suggested Resale Prices

| Size | Vertical Complete 6600 | Horizontal Complete 6601 | Body Only 6602 | Vertical Outlet Only 6603 | Horizontal Outlet Only 6604 | *6655 or *6660 | Plug 6544 | Coupling 6650 |
|------|------------------------|--------------------------|----------------|---------------------------|-----------------------------|----------------|-----------|---------------|
| 1½"  | \$42.00                | \$40.00                  | \$24.50        | \$ 7.00                   | \$5.00                      | \$6.00         | \$2.00    | \$2.50        |
| 2"   | \$4.00                 | \$2.00                   | 28.70          | 10.00                     | 8.00                        | 9.50           | 2.50      | 3.30          |

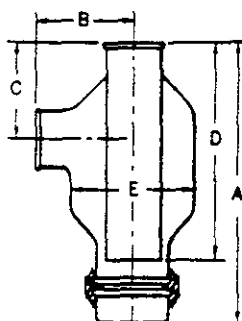
## PARTITION TRAPS

6610

6612



without partition



with sealed-in partition

Assembly #6610 consists of:

- glass body #6611 (without partition)
- 3" drainline coupling #6650
- 3" short cleanout plug #6544

To connect trap assembly #6610 to threaded sink tailpiece, thread bead adapter #6680 on tailpiece. Join to beaded end of straight length cut to desired length, using coupling #6650. Slip cut end of straight length into trap inlet through adjustable connection (adapter coupling #6655 for 1½" size; adjustable joint #6660 for 2" and 3" sizes).

Drainline partition trap assembly #6612 consists of glass body #6613, with sealed-in partition (annealed only), 3" coupling #6650 and 3" short cleanout plug #6544.

Both traps are non-siphoning with the partition always visible.

| Size      | Seal Depth | A    | B   | C   | D    | E  | Case Quantity | Shipping Weight Per Case | Without Partition 6610 |
|-----------|------------|------|-----|-----|------|----|---------------|--------------------------|------------------------|
| 1½" x 3¾" | 3¾"        | 8½"  | 3¾" | 3¾" | 7¾"  | 3" | 1 pc.         | 2 lbs.                   | \$20.00                |
| 2 x 5¼"   | 3¾"        | 11½" | 5¼" | 4¼" | 9"   | 5" | 1             | 4                        | 35.00                  |
| *2 x 4¼"  | 3¾"        | 11¼" | 4¼" | 4¼" | 9"   | 5" | 1             | 4                        | 40.00                  |
| 3 x 6½"   | 4"         | 16¾" | 6½" | 5"  | 10½" | 6" | 1             | 7                        | 52.00                  |

### Suggested Resale Prices

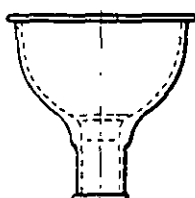
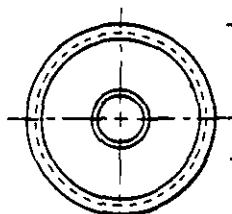
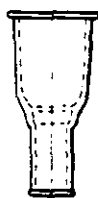
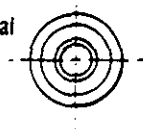
| Size      | Body Only for 6610 6611 | With Partition 6612 | Shipping Weight Per Case | Body Only for 6612 6613 | Plug 3" 6544 | Coupling 3" 6650 |
|-----------|-------------------------|---------------------|--------------------------|-------------------------|--------------|------------------|
| 1½" x 3¾" | \$11.00                 | \$28.00             | 5 lbs.                   | \$19.00                 | \$4.00       | \$5.00           |
| 2 x 5¼"   | 28.00                   | 38.00               | 6                        | 29.00                   | 4.00         | 5.00             |
| *2 x 4¼"  | 31.00                   | —                   | —                        | —                       | 4.00         | 5.00             |
| 3 x 6½"   | 43.00                   | 66.00               | 9                        | 46.00                   | 4.00         | 5.00             |

\*Available only without partition.

## CUP SINKS

6616

3" hemispherical cup sink



6617

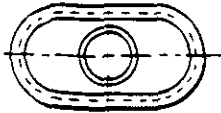
6" hemispherical cup sink

| Size | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|------|---------------|--------------------------|------------------------|
| 3"   | 1 pc.         | 3 lbs.                   | \$12.00                |

| Size | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|------|---------------|--------------------------|------------------------|
| 6"   | 1 pc.         | 9 lbs.                   | \$12.00                |

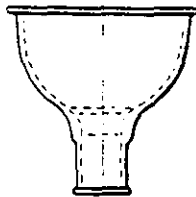
# KIMAX DRAINLINE PIPE AND FITTINGS

## CUP SINKS

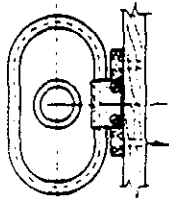


6619—3' x 6' oval cup sink (straight sides)

| Size    | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|---------|---------------|--------------------------|------------------------|
| 3' x 6' | 1 pc.         | 4 lbs.                   | \$10.00                |



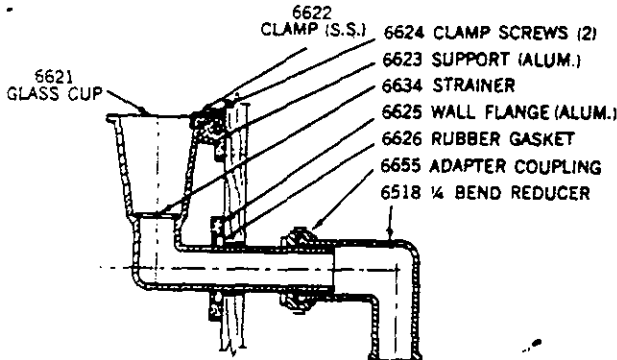
## CUP SINK



6620—1½" Outlet  
3' x 6' end cup sink,  
oval, straight sides

6627 MOUNTING BOLTS (4)

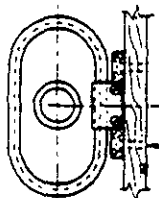
| Size    | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|---------|---------------|--------------------------|------------------------|
| 3' x 6' | 1 pc.         | 18 lbs.                  | \$35.75                |



### Assembly Component Parts

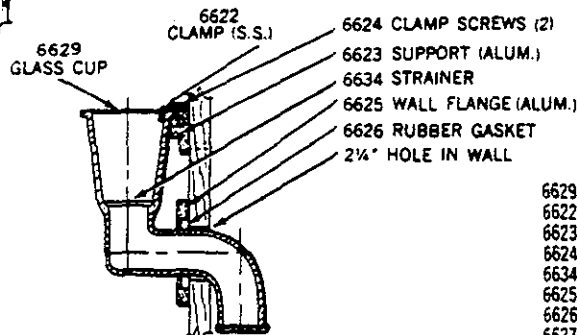
|                                               |         |
|-----------------------------------------------|---------|
| 6621 End Cup Sink, Glass Only.....            | \$14.50 |
| 6622 Clamp (S.S.).....                        | 1.50    |
| 6623 Sink Support (Aluminum).....             | 2.00    |
| 6624 Clamp Screws, Round Head, ¼" x 1¼".....  | .10     |
| 6634 Ebon Sink Strainer, 2".....              | 1.00    |
| 6625 Wall Flange (Aluminum), 4¼" x 3¼".....   | 1.75    |
| 6626 Wall Flange Gasket (Rubber).....         | .60     |
| 6627 Flat Head Mounting Screws, ¼" x 1¼"..... | .10     |
| 6655 Adapter Coupling Assembly, 1½".....      | 6.00    |
| 6518 Quarter Bend Reducer, 2" x 1½".....      | 8.00    |

## CUP SINKS



6628—1½" Outlet  
3' x 6' Cup Sink, Offset  
Vertical Outlet, Straight Sides

6627 MOUNTING BOLTS (4)



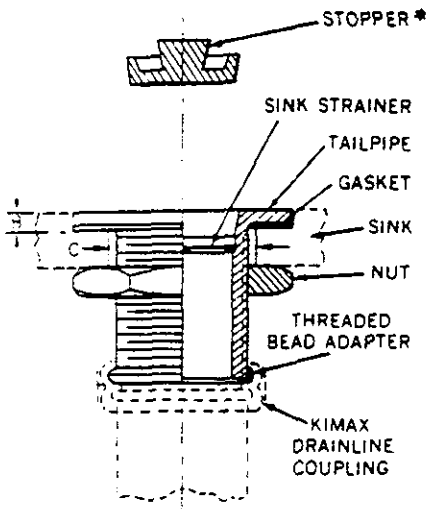
| Size    | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|---------|---------------|--------------------------|------------------------|
| 3' x 6' | 1 pc.         | 18 lbs.                  | \$27.25 each           |

### Assembly Component Parts

|                                               |         |
|-----------------------------------------------|---------|
| 6629 End Cup Sink (Glass Only).....           | \$20.00 |
| 6622 Clamp (S.S.).....                        | 1.50    |
| 6623 Sink Support (Aluminum).....             | 2.00    |
| 6624 Clamp Screws, Round Head, ¼" x 1¼".....  | .10     |
| 6634 Ebon Sink Strainer, 2".....              | 1.00    |
| 6625 Wall Flange (Aluminum), 4¼" x 3¼".....   | 1.75    |
| 6626 Wall Flange Gasket (Rubber).....         | .60     |
| 6627 Flat Head Mounting Screws, ¼" x 1¼"..... | .10     |

# KIMAX DRAINLINE PIPE AND FITTINGS

## 5 PIECE SINK TAILPIECE ASSEMBLY



### 6630

Assembly #6630 includes Teflon tailpipe #6631; tailpipe locknut #6632; one Teflon strainer #6634; rubber gasket #6635; and Teflon bead adapter #6680.

\*Ebolon stopper #6637 must be ordered separately. 1½" \$2.90, 2" \$5.00, 3" \$8.00.

The tailpiece is tightened with a single nut. Teflon bead adapter #6680 is threaded to the tailpipe and joined to KIMAX drainline traps by means of KIMAX coupling #6650.

Three-inch lengths are standard. Longer tailpipes available on special order at extra cost.

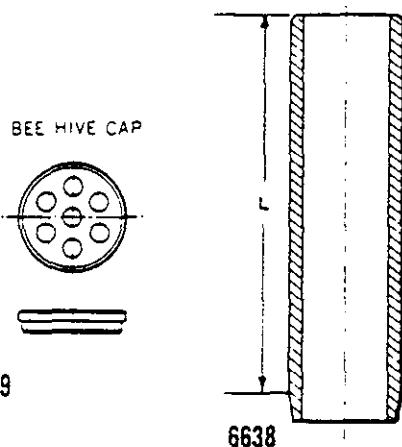
| Size | Recommended sink opening dimensions |      |    | Case Quantity | Shpg. Wt. Per Case | Complete 6630 |
|------|-------------------------------------|------|----|---------------|--------------------|---------------|
|      | A                                   | B    | C  |               |                    |               |
| 1½"  | 3½/32                               | ½/32 | 2  | 1 pc.         | 2 lbs.             | \$18.50       |
| 2"   | 4                                   | ½/16 | 2½ | 1             | 2                  | 31.50         |
| 3"   | 5                                   | ½/16 | 3¾ | 1             | 3                  | 48.00         |

### Suggested Resale Prices

| Size | Tailpiece 6631 | Lock Nut 6632 | Strainer 6634 | Gasket 6635 | Adapter 6680 |
|------|----------------|---------------|---------------|-------------|--------------|
| 1½"  | \$13.85        | \$1.25        | \$ .75        | \$ .15      | \$2.65       |
| 2"   | 25.00          | 2.00          | 1.00          | .20         | 4.20         |
| 3"   | 38.00          | 3.00          | 2.00          | .35         | 5.60         |

NOTE: Tailpipe #6631, strainer #6634 & stopper #6637 are made of a filled Teflon material.

## STANDING OVERFLOW

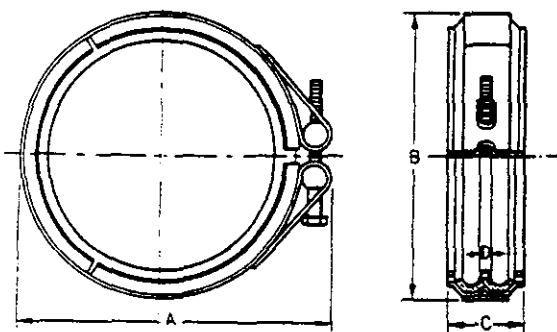


### 6638

Made from corrosion resistant filled Teflon available in three standard lengths. Precision tapered at lower end to fit tightly into mating taper of tailpipe. Beehive cap (#6639) must be ordered separately.

| 6638 Size | L (length) | Suggested Resale Price | 6639 Size | Suggested Resale Price |
|-----------|------------|------------------------|-----------|------------------------|
| 1½" x 4"  | 4"         | \$ 3.30 each           | 1½"       | \$2.40 each            |
| 1½" x 6"  | 6"         | 5.00 each              | 2"        | 3.00 each              |
| 1½" x 8"  | 8"         | 6.00 each              | 3"        | 5.00 each              |
| 2 x 4"    | 4"         | 9.00 each              |           |                        |
| 2 x 6"    | 6"         | 11.00 each             |           |                        |
| 2 x 8"    | 8"         | 13.00 each             |           |                        |
| 3 x 4"    | 4"         | 10.00 each             |           |                        |
| 3 x 6"    | 6"         | 12.00 each             |           |                        |
| 3 x 8"    | 8"         | 14.00 each             |           |                        |

## DRAINLINE COUPLING\*



### 6650

Positive-seal compression coupling #6650 consists of following components:

Segmented stainless steel outer band #6651.

Buna N rubber compression ring with Teflon® liner #6652.

Stainless steel bolt #6653.

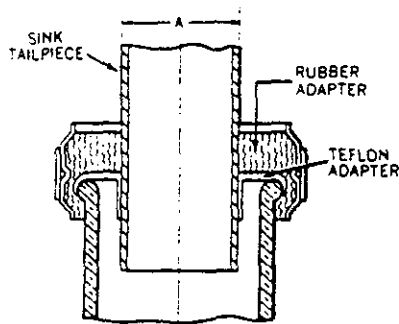
| Size | Case Quantity | Shipping Weight Per Case | 6650 Complete Assembly | Suggested Resale Price |                               |           |
|------|---------------|--------------------------|------------------------|------------------------|-------------------------------|-----------|
|      |               |                          |                        | 6651 Metal Band        | 6652 Rubber Sleeve With Liner | 6653 Bolt |
| 1½"  | 10 pcs.       | 4 lbs.                   | \$2.50                 | \$1.10                 | \$1.80                        | \$ .20    |
| 2"   | 10            | 5                        | 3.30                   | 1.40                   | 2.50                          | .20       |
| 3"   | 10            | 7                        | 5.00                   | 2.20                   | 3.65                          | .20       |
| 4"   | 10            | 10                       | 6.60                   | 2.80                   | 5.00                          | .30       |
| 6"   | 10            | 13                       | 14.00                  | 5.00                   | 8.70                          | .30       |

\*Patent pending

# KIMAX DRAINLINE PIPE AND FITTINGS

## ADAPTER COUPLING (assembly)

6655



### Suggested Resale Prices

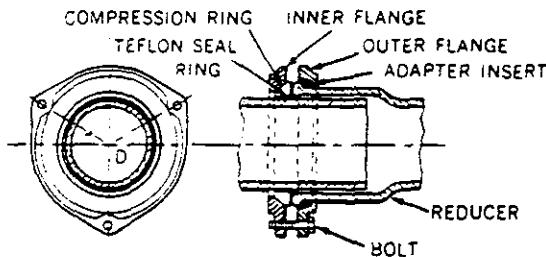
| Size        | 6655 Complete | 6656 Teflon Adapter | 6667 Buna-N Adapter | 6651 Metal Band 2" Size | 6653 Bolt 2" Size |
|-------------|---------------|---------------------|---------------------|-------------------------|-------------------|
| 2" x 1 1/2" | \$6.00 each   | \$3.60 each         | \$ .80 each         | \$1.40 each             | \$ .20 each       |
| 2 x 1 1/4"  | 6.00 each     | 3.60 each           | .80 each            | 1.40 each               | .20 each          |
| 2 x 1"      | 6.00 each     | 3.60 each           | .80 each            | 1.40 each               | .20 each          |

Assembly #6655 is used to join KIMAX drainline to unthreaded sink tailpieces. Assembly consists of:

|                                            |                        |             |
|--------------------------------------------|------------------------|-------------|
| Segmented stainless steel outer band #6651 | Size 2" .....          | \$1.40 each |
| Buna N rubber adapter #6657                | All Listed Sizes ..... | .80 each    |
| Teflon adapter #6656                       | All Listed Sizes ..... | 3.60 each   |
| Stainless steel bolt #6653                 | All Listed Sizes ..... | .20 each    |

## ADJUSTABLE JOINT (hardware only)

6660



Adjustable joint permits space adjustment from 1 1/4" to 5" depending on size. Assembly #6660 consists of:

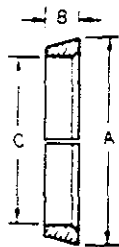
- aluminum inner flange #7206.
- aluminum outer flange #7150.
- Teflon seal ring (hat gasket) #7227.
- adapter insert (molded neoprene asbestos) #7203.
- rubber compression ring #7225.
- 3 aluminum (hex head 3/16" - 18 x 1 1/4") bolts #7180 for 1 1/2", 2" and 3" sizes or 6 (hex head 1/4" - 18 x 1 1/2") aluminum bolts #7180 for 4" size.

### Suggested Resale Prices

| Size   | D      | Adjustment | Case Quantity | Complete 6660 | Inner Flange 7206 | Outer Flange 7150 | Teflon Seal Ring 7227 | Adapter Insert 7203 | Comp. Ring 7225 | Alum. Bolts 7180 |
|--------|--------|------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-----------------|------------------|
| 1 1/2" | 4 1/2" | 1 1/4"     | 1 pc.         | \$ 7.00       | \$1.00            | \$ .70            | \$ 3.50               | \$1.00              | \$ .40          | \$ .85           |
| 2      | 5 1/4" | 2 1/4"     | 1             | 9.50          | 1.20              | 1.30              | 4.50                  | 1.20                | .80             | .85              |
| 3      | 6 1/4" | 3 1/4"     | 1             | 13.00         | 2.20              | 1.75              | 6.75                  | 1.90                | 1.00            | .85              |
| 4      | 8 1/4" | 5"         | 1             | 21.00         | 2.75              | 2.80              | 10.15                 | 2.60                | 2.00            | .85              |

## ADAPTER INSERT (Molded)

K-7203



Neoprene molded insert is used when joining KIMAX drainline to other piping materials. These inserts will work with either Style I & Style II flanges for glass pipe. The 2 1/2", 3 1/2" and 5" sizes are used only with adjustable joints.

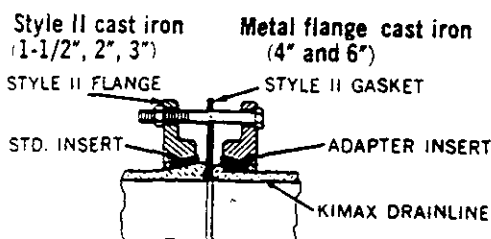
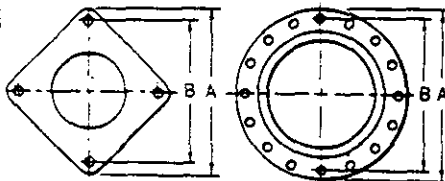
| Size   | A        | B       | C    | Suggested Resale Price |
|--------|----------|---------|------|------------------------|
| 1 1/2" | 2 7/16"  | 3/16"   | 1.91 | \$1.00 each            |
| 2      | 2 13/16" | 3/16"   | 2.43 | 1.20 each              |
| 2 1/2" | 3 3/8"   | 3/8"    | 3.00 | 1.40 each              |
| 3      | 4 1/4"   | 3/8"    | 3.53 | 1.90 each              |
| 3 1/2" | 5"       | 3/8"    | 4.28 | 2.10 each              |
| *4     | 6"       | 1 1/16" | 4.62 | 2.60 each              |
| 5      | 6 3/4"   | 3/4"    | 5.63 | 3.70 each              |
| *6     | 8 1/4"   | 3/4"    | 6.85 | 5.50 each              |

\*Use #6670 metal flange only.

## METAL FLANGES

6670

7155



Cast-iron flanges are used to join KIMAX drainline to KIMAX process pipe or to glass-lined metal pipe. They are commonly used to join KIMAX process pipe to itself.

Flange #7155 is used on 1 1/2", 2" and 3" drainline ends and adapter flange #6670 on 4" and 6" sizes. Adapter insert #7203 must be used between flange and drainline.

Flange #7155 is used with standard insert #7200 or #7202 for all sizes of process pipe. The 4" and 6" sizes are similar in shape to Flange #6670 but have inner snap-rings with cemented inserts.

All sizes of both flanges have A.S.M.E. bolt circles.

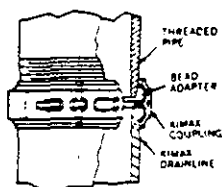
For bolt sizes and number required, see table below.

| Catalog Number | Size   | A       | B Bolt Circle | No. Bolts | Bolt Size           | Suggested Resale Price |
|----------------|--------|---------|---------------|-----------|---------------------|------------------------|
| 7155           | 1 1/2" | 4 3/8"  | 3 3/8"        | 4         | 3/16" - 18 x 2 1/4" | \$1.05 each            |
| 7155           | 2      | 5 1/16" | 4 3/8"        | 4         | 3/16" - 18 x 2 1/4" | 1.55 each              |
| 7155           | 3      | 6 3/8"  | 6"            | 4         | 3/16" - 18 x 3"     | 1.85 each              |
| 6670           | 4      | 8 3/4"  | 7 1/2"        | 8         | 3/16" - 18 x 2 1/4" | 5.00 each              |
| 6670           | 6      | 10 1/4" | 9 1/2"        | 8         | 3/16" - 16 x 2 1/4" | 7.00 each              |

# KIMAX DRAINLINE PIPE AND FITTINGS

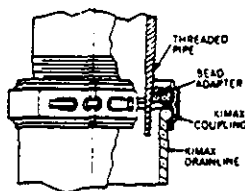
## BEAD ADAPTERS (threaded)

6680



standard

6685



adjustable

Threaded bead adapters are used to provide beaded mating surface on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling #6650. All-Teflon construction.

Adapter #6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4" and 6" sizes.

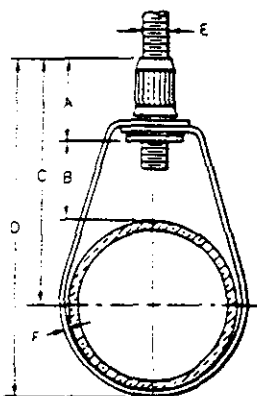
Adapter #6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments.

| 6680 | Size | Suggested Resale Price |
|------|------|------------------------|
|      | 1½"  | \$ 2.55 each           |
|      | 2    | 4.20 each              |
|      | 3    | 5.60 each              |
|      | 4    | 8.80 each              |
|      | 6    | 14.50 each             |

| 6685 | Size     | Suggested Resale Price |
|------|----------|------------------------|
|      | 2" x 1½" | \$ 4.20 each           |

## "AUTO-GRIP"® HANGER



7290

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating. See page 8 for operating instructions.

| Size | A  | B  | C  | D   | E | F     | Suggested Resale Price |
|------|----|----|----|-----|---|-------|------------------------|
| 1½"  | 1⅞ | 1½ | 3¼ | 4⅜  | ¾ | ⅞ x ¾ | \$ .45                 |
| 2    | 1⅞ | 1¼ | 3½ | 4⅜  | ¾ | ⅞ x ¾ | .48                    |
| 3    | 1¾ | 1¾ | 4¾ | 6¾  | ¾ | ⅞ x ¾ | .78                    |
| 4    | 1½ | 1¾ | 5⅞ | 7⅞  | ¾ | ⅞ x 1 | 1.60                   |
| 6    | 1½ | 2¾ | 7⅞ | 10¾ | ¾ | ⅞ x 1 | 2.35                   |

® TM of Automatic Sprinkler Corporation of America.

## INSERTS

7200



7202



For use with glass process pipe and fittings to cushion glass from metal flange.

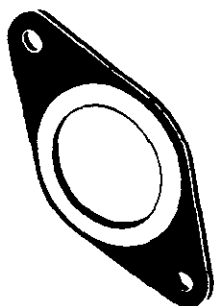
Insert #7200 is molded neoprene asbestos. The 1½", 2", and 3" sizes are used with standard tempered pipe and fittings; 1½", 2", 2½", 3½", and 5" are used with adjustable joint.

Insert #7202 is a neoprene asbestos strip insert used for 1½" through 6" annealed fittings and for use as replacement parts for 4" and 6" tempered pipe and fittings.

| 7200 Size | Suggested Resale Price | 7202 Size | Suggested Resale Price |
|-----------|------------------------|-----------|------------------------|
| 1½"       | \$ .45                 | 1½"       | \$ .45                 |
| 2         | .50                    | 2         | .50                    |
| 2½        | .75                    | 3         | .75                    |
| 3         | .75                    | 4         | .75                    |
| 3½        | .90                    | 6         | 1.45                   |
| 5         | 1.10                   |           |                        |

## INTERFACE GASKET

7276



Used when joining KIMAX tempered glass drainline to KIMAX process pipe and KIMAX process pipe to itself.

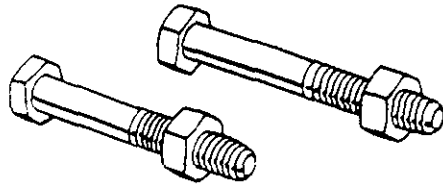
Teflon machined envelope is a one-piece liner. Inner diameter is same as glass to prevent constriction of flow at the joint. Standard filler is Blue African asbestos.

Maximum working temperature of gasket is 450° F. Gasket thickness is ⅞" in 1½", 2" and 3" sizes; ¾" in 4" and 6" sizes.

| Size | Suggested Resale Price |
|------|------------------------|
| 1½"  | \$ .85                 |
| 2    | .75                    |
| 3    | 1.50                   |
| 4    | 2.50                   |
| 6    | 3.75                   |

# KIMAX DRAINLINE PIPE AND FITTINGS

## BOLTS & NUTS



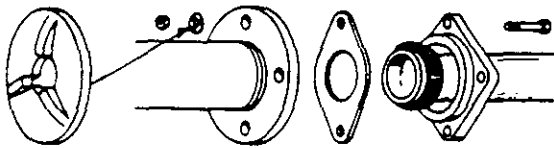
7190

Steel bolts and nuts #7190 are required to fasten metal flanges when joining KIMAX drainline to process pipe or to glass-lined metal pipe.

Four bolts needed for 1½", 2", and 3" sizes; eight bolts needed for 4" and 6" sizes.

| Size        | Suggested Resale Price |
|-------------|------------------------|
| ½"-18 x 1½" | \$ .03                 |
| ½"-18 x 2   | .03                    |
| ½"-18 x 2½  | .03                    |
| ½"-18 x 2½  | .03                    |
| ½"-18 x 3   | .03                    |
| ¾"-16 x 2½  | .03                    |

## ADAPTER BUTTON

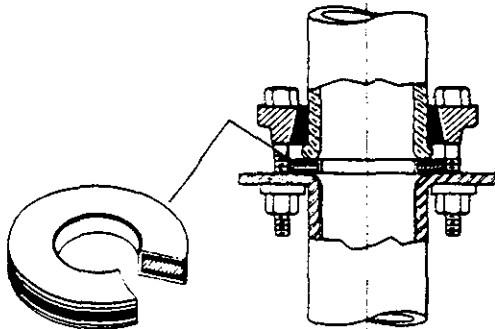


7230

Used to center smaller diameter Style II steel bolts in larger holes of A.S.M.E. flange when adapting KIMAX glass drainline to glass-lined metal pipe. One size of button is used for all sizes of flanges.

| I.D.  | O.D. | Height | Suggested Resale Price |
|-------|------|--------|------------------------|
| .390" | 1¼"  | ¼"     | \$ .05                 |

## DONUT SPACER



7240

Teflon-covered donut spacer must be interposed between KIMAX drainline and glass-lined metal pipe.

Spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.

| Size | Thickness | Suggested Resale Price |
|------|-----------|------------------------|
| 1½   | ¼         | \$ 6.00                |
| 2    | ¼         | 9.80                   |
| 3    | ¾         | 13.40                  |
| 4    | ¾         | 15.50                  |
| 6    | ¾         | 24.00                  |



C

1

2

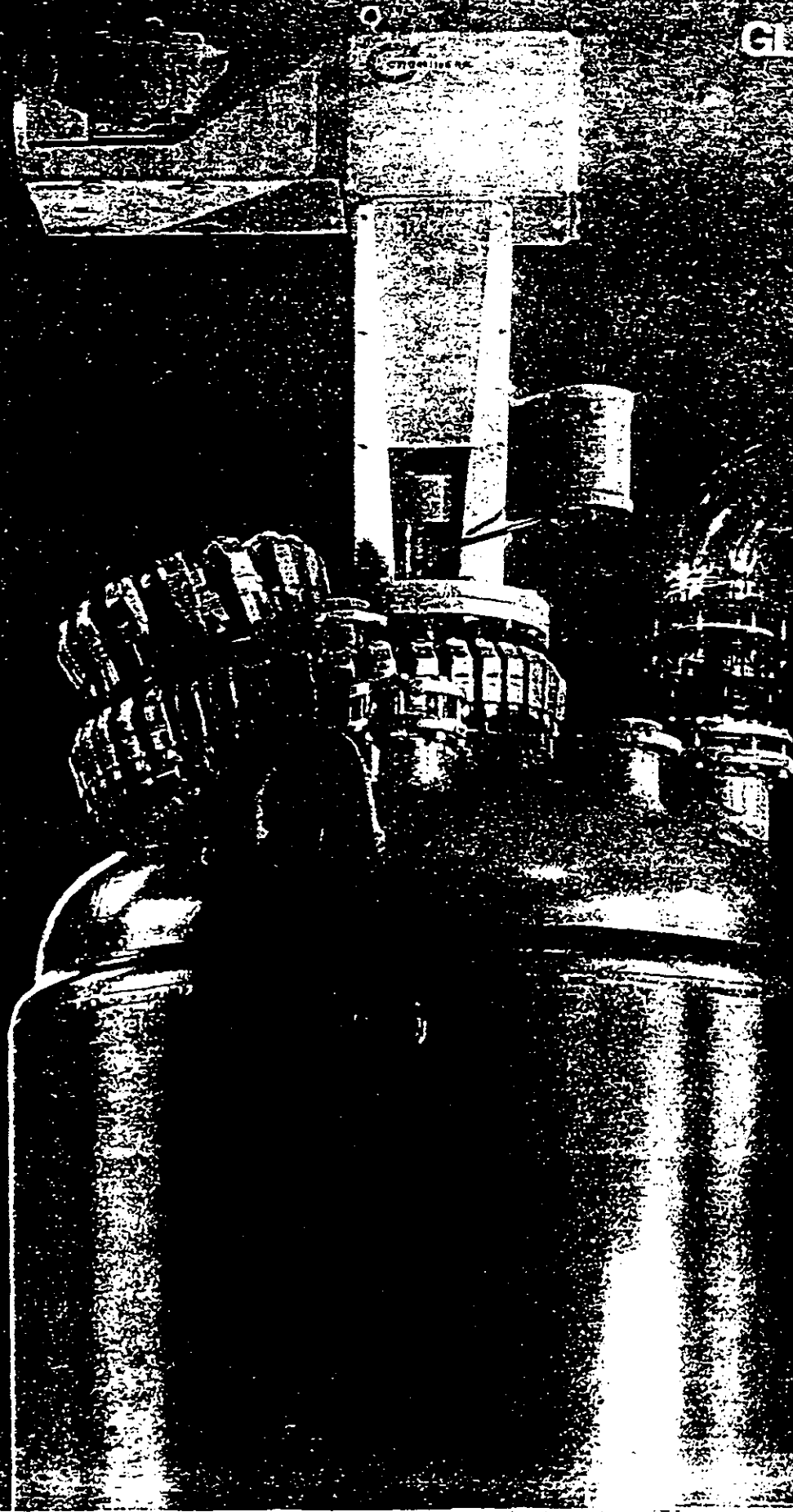
3

**SCHWELM** 

**Owens-Illinois**

**STANDARD  
GLASS-LINED  
REACTORS**

**The Alternative  
Glass-Lined  
Reactor**



9 standard sizes,  
from 300 to 5,000  
gallons. Other sizes  
available.

Chemneer drive, type  
HTN, with dry well  
output - tight seal to  
prevent oil leakage.

Backed up by  
Schweim's 70 years  
of experience in glass-  
lined steel vessels.

Top and bottom  
lifting lugs

Type CRT gaskets  
used throughout.

Exclusive Schweim  
583-A green glass,  
high acid/alkali resis-  
tant tested at  
20,000 volts

Seal cartridge can be  
removed and seal  
changed without dis-  
turbing the drive or  
entering the vessel.  
Can be bench tested  
before installation.

Manufactured to  
ASME standards

One piece all-  
welded construction



Two 150 lb. rated  
sight glass units

Entire unit fully  
interchangeable  
with existing  
equipment now  
available in regard  
to nozzle orientation

Complete with 3-blade  
retreat impeller and  
adjustable finger  
baffle

Restricted tantalum  
thermowell tips avail-  
able for baffles or  
bottom outlet valve

Offset bottom outlet  
for easy cleaning

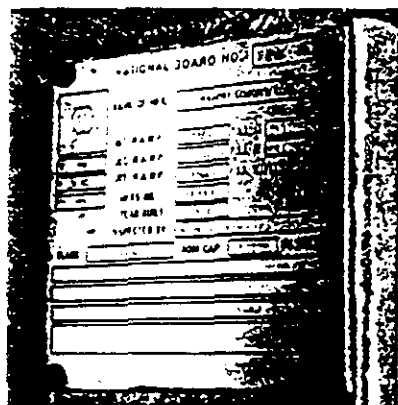
Adjustable leg support  
(side lug support or  
side skirt support  
available)



# The best of two countries, joined to bring you the alternative glass-lined reactor.

The proven Schwelm reactor. Designed and manufactured to the most exacting West German standards. Tested and retested to make sure it surpasses all ASME and American standards. And proven in use all over the world.

Now Schwelm reactors are brought to the American market by Owens-Illinois to give the chemical and pharmaceutical industries an alternative source for glass-lined reactors. It is an alternative source with all the resources of Owens-Illinois behind it, combining the technical service and marketing facilities of OI with the reactor expertise and experience of Schwelm.



The result is what we believe to be a better glass-lined reactor. The engineers and technicians of Schwelm and OI worked for over three years to prepare for the American market, and draws heavily on every one of

Schwelm's 70 years of experience in manufacturing glass-lined steel vessels.

Each vessel is built to ASME and A.S.I. specifications and can be code

stamped. And each brings you the superior design features and performance characteristics described in detail in the following pages.

## Why a glass-lined reactor?

For many years glass has been used for chemical processes because of its high degree of chemical resistivity. Glass is an ideal choice when you need a high degree of acid or alkali resistivity, absolute product purity, ease of cleaning, minimum product adherence, or when you want to change processes frequently over a varying range of corrosive conditions.

However, the use of glass is restricted in terms of the size of the vessels, and in terms of pressure and thermal shock.

So glass-lined steel was born. Vessels of all-welded tough carbon steel to which has been fused a smooth corrosion-resistant, chemically inert glassed interior. The glass provides resistance to chemical attack by acids or alkalis, but unlike glass alone it has sufficient flexibility to follow every movement of the steel, to expand or contract as the steel does. This is because of the high compressive stress of the glass lining at room temperature, and today glass-lined steel equipment is used wherever aggressive media are used or stored, where purity is essential, and for polymerization processes in chemical, pharmaceutical, and food and

beverage industries.

During a temperature rise, compressive stress will decrease and precautions must be taken to avoid creating tension stress. Tension stress in the glass lining can be caused by filling a hot empty vessel with a cold liquid, or by firing a cold vessel by introducing a heating medium into the jacket. Table I below shows the allowable  $\Delta T$  to prevent excess tension stress.

In the past, the greatest value of a glass-lined vessel was its acid resistivity, but today just as much or more value is placed on its equally important resistivity to alkali attack. Extensive work in the Schwelm laboratory for glass-lining research led to improving the alkali resistivity of our glass lining with the use of exclusive additives, and today our lining shows far better test results than in the past. In addition resistivity to thermal shocks, and anti-stick characteristics have been improved.

The very low corrosion rate per time unit in the case of chemical attack guarantees a long service life for Schwelm glass-lined equipment, and those corrosion rates are more specifically detailed in Table II below.

TABLE I Allowable  $\Delta T$  for standard reactors with Schwelm 583-A glass lining

| Filling a hot empty vessel with a cold liquid |     |                      |     | Firing a cold vessel by introducing heating medium into jacket |     |                              |     |
|-----------------------------------------------|-----|----------------------|-----|----------------------------------------------------------------|-----|------------------------------|-----|
| Glass lining temperature                      |     | Min. temp. of liquid |     | Glass lining temperature                                       |     | Max. temp. of heating medium |     |
| °C                                            | °F  | °C                   | °F  | °C                                                             | °F  | °C                           | °F  |
| 80                                            | 176 | -40                  | -40 | 10                                                             | 32  | 150                          | 302 |
| 100                                           | 212 | -40                  | -40 | 20                                                             | 68  | 165                          | 329 |
| 120                                           | 248 | -20                  | -4  | 40                                                             | 104 | 180                          | 356 |
| 140                                           | 284 | 0                    | 32  | 60                                                             | 140 | 195                          | 383 |
| 160                                           | 320 | +20                  | 68  | 80                                                             | 176 | 210                          | 410 |
| 180                                           | 356 | 40                   | 104 | 100                                                            | 212 | 220                          | 428 |
| 200                                           | 392 | 80                   | 176 | 120                                                            | 248 | 235                          | 455 |
| 220                                           | 428 | 100                  | 212 | 140                                                            | 284 | 250                          | 482 |
| 240                                           | 464 | 140                  | 284 | 160                                                            | 320 | 265                          | 509 |
|                                               |     |                      |     | 180                                                            | 356 | 275                          | 527 |
|                                               |     |                      |     | 200                                                            | 392 | 280                          | 536 |

TABLE II Alkalies & Acid Resistance (g/sq. m. per day)

| TESTING AGENT             | 5%   |      |      |      |      |      |       |      | Concentrated |             |              |             |
|---------------------------|------|------|------|------|------|------|-------|------|--------------|-------------|--------------|-------------|
|                           | 40°C | 50°C | 60°C | 70°C | 80°C | 90°C | 100°C |      | LIQUID PHASE | VAPOR PHASE | LIQUID PHASE | VAPOR PHASE |
| Phosphoric Acid $H_3PO_4$ | 0.09 | 0.09 | 0.12 | 0.15 | 0.19 | 0.12 | 0.34  | 0.77 | —            | —           | —            | —           |
| Acetic Acid $CH_3COOH$    | 0.23 | 0.33 | 0.08 | 0.10 | 0.17 | 0.23 | 0.22  | 0.25 | —            | —           | —            | —           |
| Nitric Acid $HNO_3$       | 0.14 | 0.14 | 0.10 | 0.12 | 0.05 | 0.25 | 0.00  | 0.30 | —            | —           | —            | —           |
| Sulfuric Acid $H_2SO_4$   | 0.21 | 0.18 | 0.18 | 0.16 | 0.32 | 0.34 | —     | —    | —            | —           | —            | —           |
| Hydrochloric Acid $HCl$   | —    | —    | —    | —    | —    | —    | —     | —    | —            | —           | 0.14         | 0.27        |

# Six specific reasons why the Schwelm glass-lined reactor is the better glass-lined reactor.

A better product doesn't just happen — it is the result of specific improvements that step-by-step could better results for you. Specific improvements like these:

## 1 The exclusive Schwelm 583-A green glass lining.

The Schwelm 583-A green glass lining that is standard in Schwelm reactors is the result of years of research and experience, and there is no other glass lining exactly like it in the world today. It offers you three key benefits: (1) excellent corrosion resistance that can handle acids and alkalis under severe thermal conditions; (2) unique anti-sticking properties that make it well-suited for polymerization; and (3) better thermal shock qualities, verified by laboratory tests.

Other glass linings can give you one or two of these key benefits, but only a Schwelm 583-A glass lining can give you all three benefits in one lining.

## 2 Our new computer controlled firing furnace.

One of the reasons Schwelm quality controls is unusually effective is our new micro-processor computer controlled furnace. Every glass ground and finish coat means another trip into the furnace to fuse the glass lining to the steel. Our new furnace controls the heat more accurately because it's computer controlled, gives cleaner heat because it's electric, and gives you a better lining because the cleaner heat means fewer pinhole impurities to cause imperfections.

## 3 An outside coat of glass, too?

Yes, believe it or not, it doesn't show, it doesn't give you a glass-lined exterior, it just gives you a

better product. By putting an outside coat of glass on the vessel before it is put into the furnace for its first firing, we significantly reduce the scaling of the steel and the number of particles of fly-ash that normally take off during the firing process. Why is that important to you? Because it's those particles of fly-ash that are a major cause of pinhole imperfections in the interior glass lining. Fewer particles, fewer imperfections. More Schwelm.

## 4 Why our round holes stay round:

Before the steel vessel goes into the furnace for firing, a heavy rein-

forcing ring is welded onto the man-port where the drive will be fitted. This makes sure our round holes stay round and don't sag during the red-hot firing process. More importantly to you, this results in less warpage and means that the gasket will usually fit without snuggling or with a minimum of snuggling.

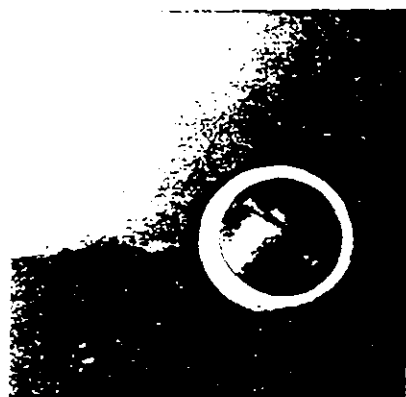
## 5 Nobody's perfect, but we're a little closer.

As you can imagine, the fusing of a glass lining to an all-steel vessel is a complicated and delicate operation. The Schwelm glass lining process has been developed and



Glass is sprayed on the outside of the vessel, too, before its first firing.

perfected through years of experience and glass linings to exacting specifications and characteristics. The application of glass linings is free of major imperfections.



Plugged lining to correct imperfections.

occasionally develop and are corrected with plugs. Schweim quality control is unusually demanding and incorporates several unusual steps in the manufacturing process. The result is that a high percentage of our vessels are plug-free. We meet and usually exceed all specifications in this area.

As we said, nobody's perfect but we're a little closer.

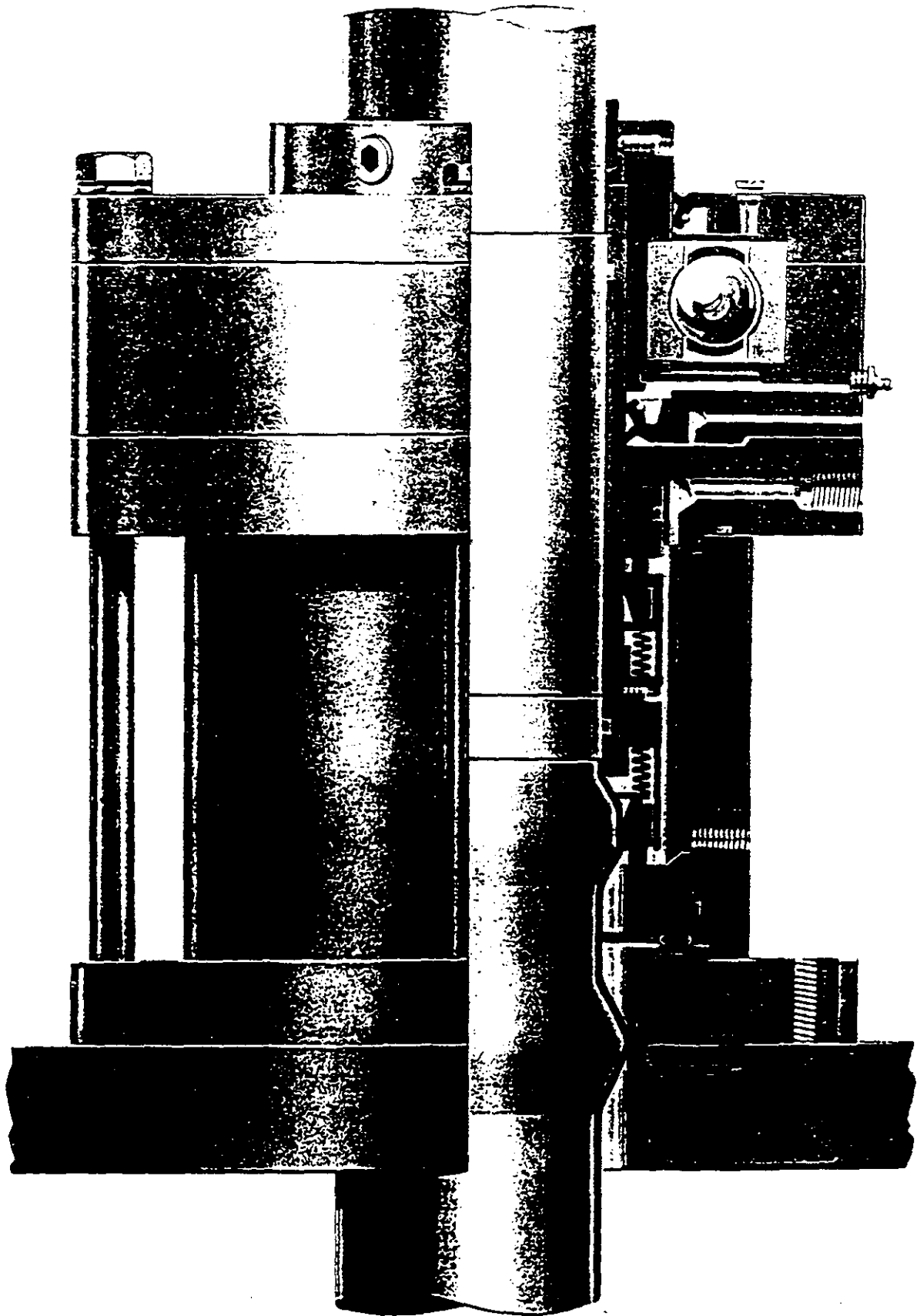
## 6 When bigger means better:

Bigger doesn't always mean better but here are three specific cases when it does: (a) Bigger pipe-leg couplings. We use four-inch pipe

leg couplings instead of three-inch. That means they're 33% bigger. Sturdier, safer, more durable. (b) Bigger clamps. Even the clamps we use for manways and assembly covers is bigger. They not only are easier to handle but bigger test limits. As a regular standard, we hydro-test a unit in our plant at limits 35% greater than those called for by ASME Section 8 code. (c) Bigger test limits.

In each of these cases, bigger means better. It takes us longer and costs us more, but it gives you a better product. More strength, more dependability, more Schweim. And, for other or those specific reasons the alternative glass-lined reactor may be the better glass-lined reactor.

And reason #7: the dependable  
Chemineer HTN drive.



A better reactor should have a better drive unit, so we're using the one we think is the best available, the Chemineer-TN drive.

#### Closed tank agitators.

Chemineer-TN mechanical seal agitators provide reliable sealing for high pressures. All units are supplied with a removable cartridge coupler mechanical seal assembly (shown on facing page) for seal change simplicity. This seal cartridge can be bench tested prior to installation. No additional headroom over the drive is required for seal change, and no special tools or hoists are usually needed. The seal cartridge can be replaced without disturbing the drive or entering the vessel. The seal housing is supplied with a cooling jacket.

#### Low profile angle drive.

The low profile right angle configuration is ideal for low headroom applications, and allows complete access to change gears without disturbing the motor or drive bearings. Single drive configuration for all requirements eliminates design problems, extra service parts and delivery delays because no modifications are required.

#### Change gears.

Easy access change gears are spline or taper hub mounted for rapid change in field. No special tools or hoists are needed. Motor is not disturbed, and no internal drive parts need be changed. Access to change gears requires only the removal of the change gear plate.

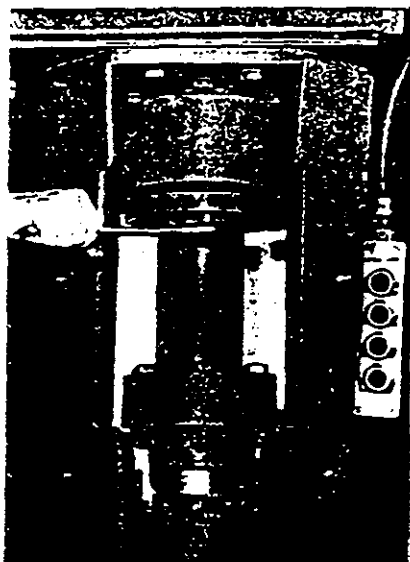
#### Dry well output shaft seal.

All sizes are provided with a dry well output shaft seal to preclude the possibility of oil leakage.

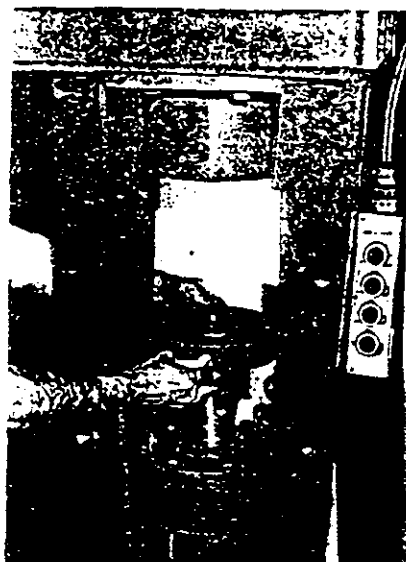
#### TIMKEN bearings throughout.

All drive bearings in all sizes are TIMKEN tapered roller bearings, another industry first for Chemineer. The large load carrying capacity of this design is unmatched, with 30,000-hour B-10 minimum bearing life. TIMKEN's most popular sizes are used and bearings will normally be available from a local distributor.

## Here's how easy Chemineer seal maintenance is:



**1.** Cartridge mechanical seals, good to 5,000 psi, are easily removed. No extra headroom required. Agitator shaft drops less than 1/4" into a catcher bracket in the mounting flange when the shaft spacer is unbolting.



**3.** Tapered coupling easily removed from agitator shaft. All disassembly operations done within pedestal opening. All shaft components taper or tenon fit and match marked to restore factory alignment on reassembly.



**2.** Shaft spacer easily removed. No special tools required for this or any maintenance operations. No blocking of the agitator shaft and impeller required.



**4.** Cartridge seal lifted off. Easily accessible components. Cartridge uses standard John Crane seals—available locally. Bench pressure test both statically and in rotation before assembly.



### 300 Gallon Jacketed Glass-Lined Reactor

## MATERIALS OF CONSTRUCTION

|                  |       |    |      |
|------------------|-------|----|------|
| Shells           | 24-28 | Gr | 1.00 |
| Jackets          | 24-28 | Gr | 1.00 |
| Heads            | 24-28 | Gr | 1.00 |
| Chances          | 24-28 | Gr | 1.00 |
| Big Type Nozzles | 24-28 | Gr | 1.00 |
| Nozzles          | 24-28 | Gr | 1.00 |
| Split Loose      | 24-28 | Gr | 1.00 |
| Changes          | 24-28 | Gr | 1.00 |

## SPECIFICATIONS

|                         |                        |         |
|-------------------------|------------------------|---------|
| Design                  | Jacket                 | Shear   |
| Working Pressure        |                        |         |
| OSI                     | 1000W PSI              | 1000PSI |
| Test Pressure           |                        |         |
| OSI                     | 150                    | 150     |
| Design Temperature (°F) |                        |         |
|                         | 400                    | 400     |
| Capacity (gals)         | ± 73                   | ± 683   |
| Joint Efficiency        | 0.85                   | 0.85    |
| Welds                   | Partially radiographed |         |

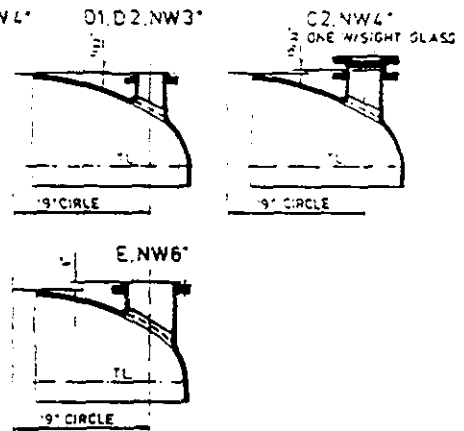
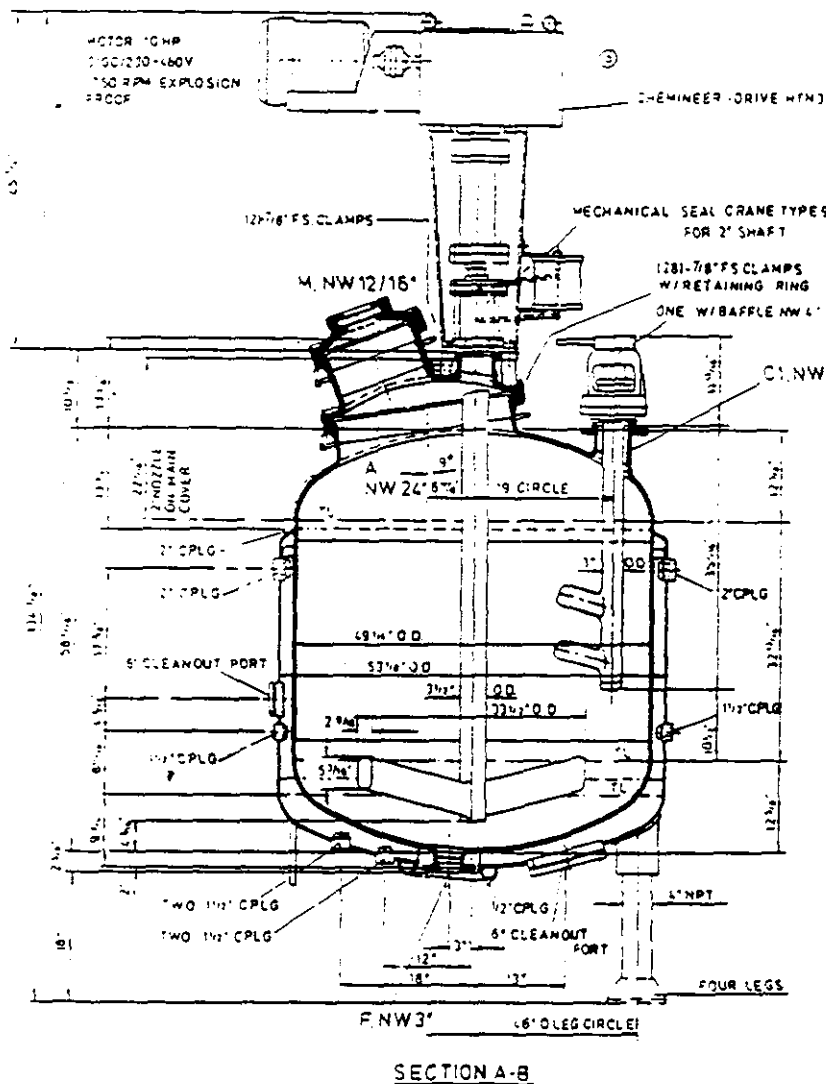
Execution of welds acc. to  
Work Standard

## STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 5,8"   |
| Bottom Head  | 5,8"   |
| Inner Shell  | 5,8"   |
| Jacket Head  | 15/32" |
| Jacket Shell | 25/64" |

## WEIGHT (pounds)

|                               |         |
|-------------------------------|---------|
| Base body, no accessories     | = 3.900 |
| Complete with drive system    | = 5.000 |
| Jacket & shell filled w/water | = 8.800 |



### GENERAL NOTES

1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII Div 1 current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schweiß glass 583-A, highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing

# RTG-500

## 500 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                     |              |
|---------------------|--------------|
| Shell               | SA-285 Gr. B |
| Jacket              | SA-285 Gr. B |
| Heads               | SA-285 Gr. B |
| Clamos              | SA-193 Gr. B |
| Pad Type Nozzles    | SA-350 Gr. B |
| Nozzles             | SA-350 Gr. B |
| Split Loose Flanges | SA-350 Gr. B |

### SPECIFICATIONS

| Design             | Jacket                                          | Shell   |
|--------------------|-------------------------------------------------|---------|
| Working Pressure   | 30 w. Fy                                        | 1003 Fy |
| Test Pressure      | 135                                             | 150     |
| Design Temperature | 400                                             | 400     |
| Capacity (gals)    | 500                                             | 580     |
| Joint Efficiency   | 0.85                                            | 0.85    |
| Welds              | Partially radiographed and dye penetrant tested |         |

Execution of welds acc. to Work Standard W N 211 Q2 0001

### STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 5/8"   |
| Bottom Head  | 5/8"   |
| Inner Shell  | 5/8"   |
| Jacket Head  | 15/32" |
| Jacket Shell | 25/64" |

### WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 5 000  |
| Complete with drive system    | 6 100  |
| Jacket & shell filled w/water | 11 800 |

### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweim glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature lining

## MATERIALS OF CONSTRUCTION

|                  |        |   |   |      |
|------------------|--------|---|---|------|
| Shell            | QX-285 | Q | 1 | 0.00 |
| Jacker           | QX-285 | Q | 1 | 0.00 |
| Heads            | QX-285 | Q | 1 | 0.00 |
| Clamos           | QX-285 | Q | 1 | 0.00 |
| Pad Type Nozzles | QX-350 | Q | 1 | 0.00 |
| Nozzles          | QX-350 | Q | 1 | 0.00 |
| Split Loose      |        |   |   |      |
| Flanges          | QX-350 | Q | 1 | 0.00 |

## SPECIFICATIONS

|                    |                                                 |            |
|--------------------|-------------------------------------------------|------------|
| Design             | Jacket                                          | Shell      |
| Working Pressure   |                                                 |            |
| psi                | 30 w. F.V.                                      | 100 & F.V. |
| Test Pressure      |                                                 |            |
| psi                | 135                                             | 150        |
| Design Temperature |                                                 |            |
| °C                 | 400                                             | 400        |
| Capacity (gals)    | 100                                             | 580        |
| Joint Efficiency   | 0.85                                            | 0.85       |
| Welds              | Partially radiographed and dye penetrant tested |            |

Execution of welds acc. to  
Work Standard WN 211 02 0001

## STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 5/8"   |
| Bottom Head  | 5/8"   |
| Inner Shell  | 5/8"   |
| Jacket Head  | 15/32" |
| Jacket Shell | 25/64" |

## WEIGHT (pounds)

|                               |          |
|-------------------------------|----------|
| Base body, no accessories     | = 5 000  |
| Complete with drive system    | = 6 100  |
| Jacket & shell filled w/water | = 11 800 |

### GENERAL NOTES

1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schweilf glass 583-A: highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing

# RTG-750

## 750 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |               |
|------------------------|---------------|
| Shell                  | SA-285 Gr B   |
| Jacket                 | SA-285 Gr B   |
| Heads                  | SA-285 Gr B   |
| Clamps                 | SA-193 B7     |
| Pad Type Nozzles       | SA-350 Gr LF1 |
| Nozzles                | SA-350 Gr LF1 |
| Split Loose<br>Flanges | SA-350 Gr LF1 |

### SPECIFICATIONS

| Design                     | Jacket                                             | Shell    |
|----------------------------|----------------------------------------------------|----------|
| Working Pressure<br>(PSI)  | 30 W/F                                             | 100 & FV |
| Test Pressure<br>(PSI)     | 135                                                | 150      |
| Design Temperature<br>(°F) | 400                                                | 400      |
| Capacity (gals)            | ±121                                               | ±925     |
| Joint Efficiency           | 0.85                                               | 0.85     |
| Welds                      | Partially radiographed<br>and dye penetrant tested |          |

Execution of welds acc. to  
Work Standard AWS 211.02.0001

### STEEL THICKNESS (inches)

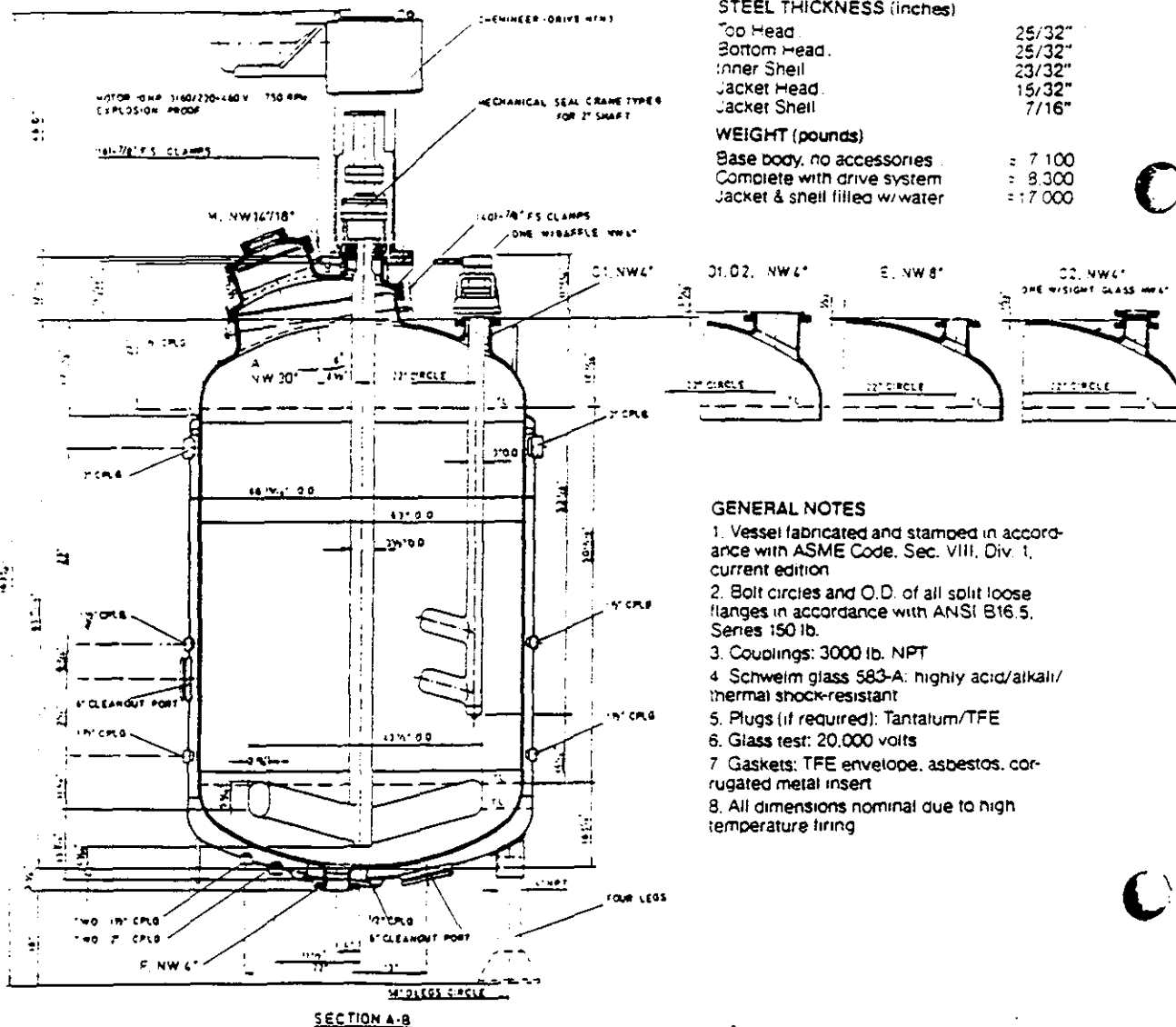
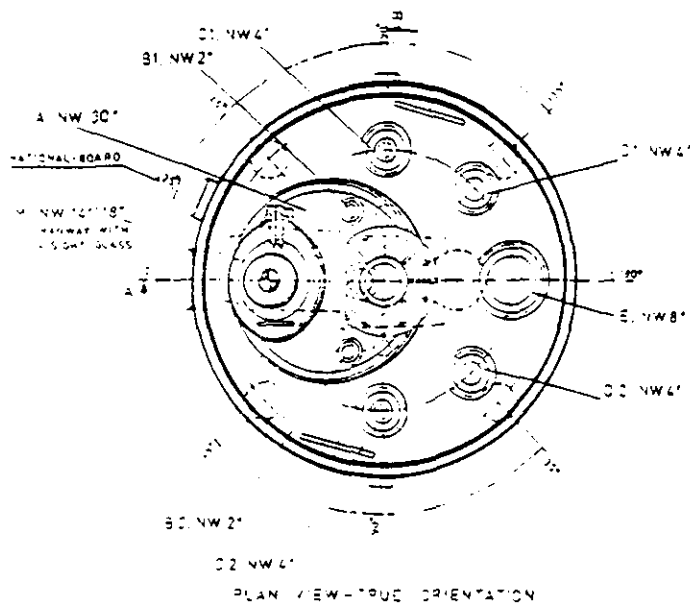
|              |        |
|--------------|--------|
| Top Head     | 25/32" |
| Bottom Head  | 25/32" |
| Inner Shell  | 23/32" |
| Jacket Head  | 15/32" |
| Jacket Shell | 7/16"  |

### WEIGHT (pounds)

|                               |          |
|-------------------------------|----------|
| Base body, no accessories     | ± 7,100  |
| Complete with drive system    | ± 8,300  |
| Jacket & shell filled w/water | ± 17,000 |

### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweim glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing



# RTG-1000

## 1000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |              |
|------------------------|--------------|
| Shell                  | SA-285 Gr. B |
| Jacket                 | SA-285 Gr. B |
| Heads                  | SA-285 Gr. B |
| Clamps                 | SA-193 B7    |
| Pad Type Nozzles       | SA-350 Gr. B |
| Nozzles                | SA-350 Gr. B |
| Split Loose<br>Flanges | SA-350 Gr. B |

### SPECIFICATIONS

| Design                     | Jacket                                             | Shell    |
|----------------------------|----------------------------------------------------|----------|
| Working Pressure<br>(psi)  | 90 w/ FV                                           | 100 & FV |
| Test Pressure<br>(psi)     | 135                                                | 150      |
| Design Temperature<br>(°F) | 400                                                | 400      |
| Capacity (gals)            | ±140                                               | ±160     |
| Joint Efficiency           | 0.85                                               | 0.85     |
| Welds                      | Partially radiographed<br>and dye penetrant tested |          |

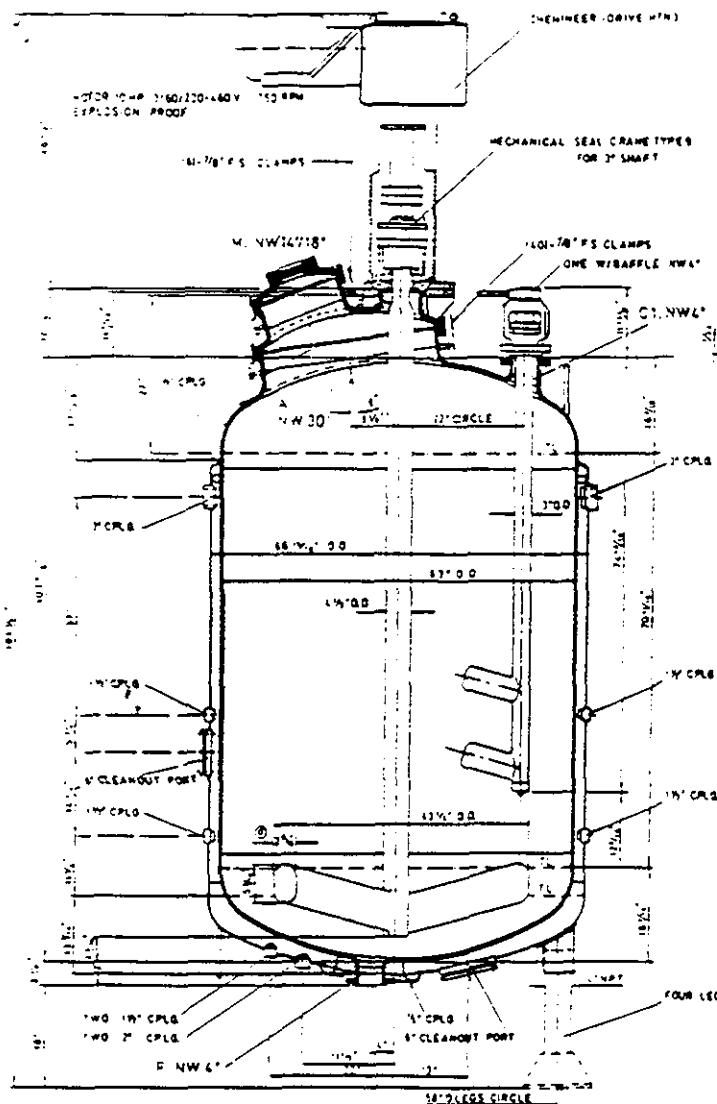
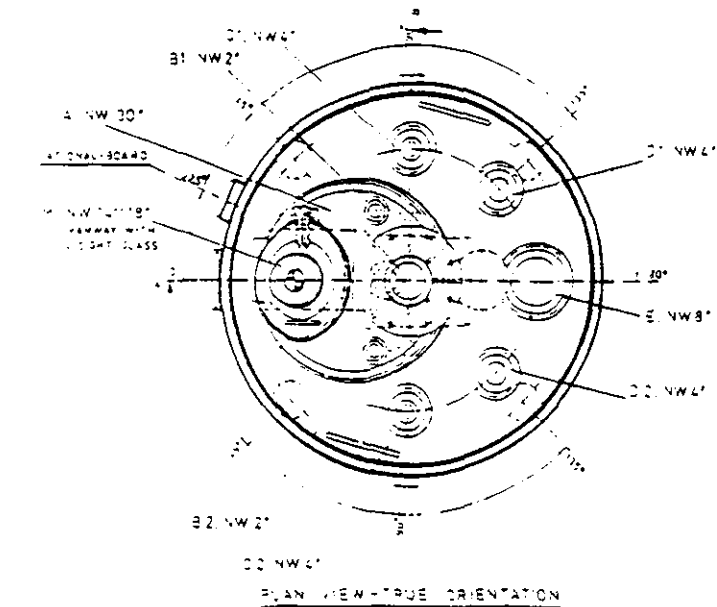
Execution of welds acc. to  
Work Standard AWS D11.02:2001

### STEEL THICKNESS (inches)

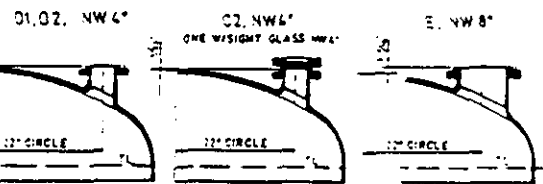
|              |        |
|--------------|--------|
| Top Head     | 25/32" |
| Bottom Head  | 25/32" |
| Inner Shell  | 23/32" |
| Jacket Head  | 15/32" |
| Jacket Shell | 7/16"  |

### WEIGHT (pounds)

|                               |          |
|-------------------------------|----------|
| Base body, no accessories     | = 8,300  |
| Complete with drive system    | = 9,900  |
| Jacket & shell filled w/water | = 21,100 |



SECTION A-A



### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweim glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-1500

1500 Gallon Jacketed  
Glass-Lined Reactor

## MATERIALS OF CONSTRUCTION

|                        |              |
|------------------------|--------------|
| Shell                  | SA-285 Gr. B |
| Jacket                 | SA-285 Gr. B |
| Heads                  | SA-285 Gr. B |
| Clamps                 | SA-285 Gr. B |
| Pad Type Nozzles       | SA-285 Gr. B |
| Nozzles                | SA-285 Gr. B |
| Split Loose<br>Flanges | SA-285 Gr. B |

## SPECIFICATIONS

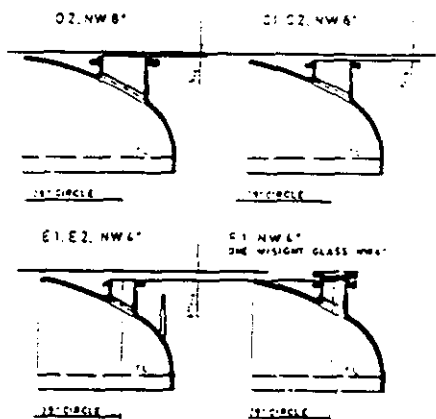
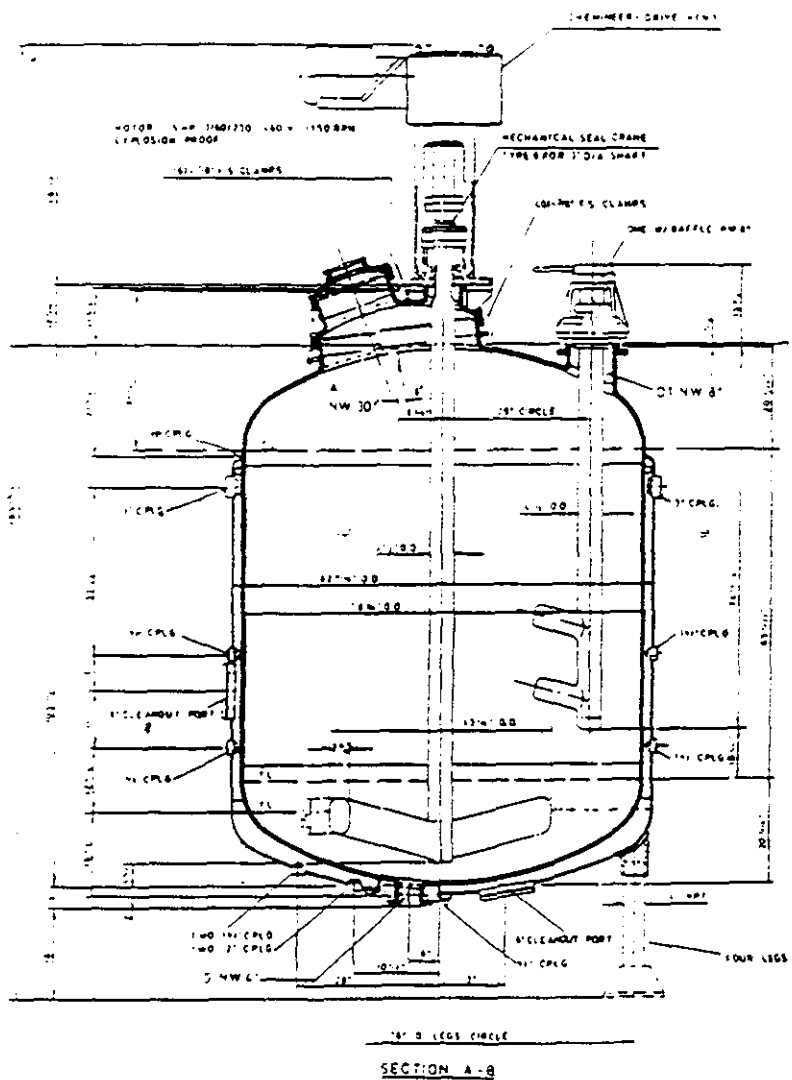
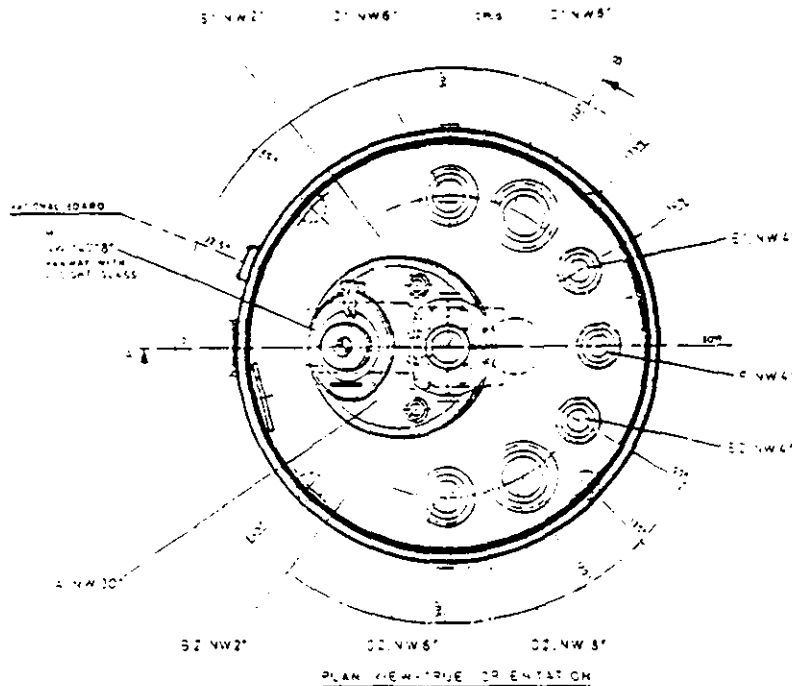
|                            |                                                    |            |
|----------------------------|----------------------------------------------------|------------|
| Design                     | Jacket                                             | Shell      |
| Working Pressure           | 30 W.P.                                            | 100 P.S.I. |
| Test Pressure              | 105                                                | 150        |
| Design Temperature         | 400                                                | 400        |
| Capacity (gals)            | 1206                                               | 1810       |
| Joint Efficiency           | 0.85                                               | 0.85       |
| Welds                      | Partially radiographed<br>and dye penetrant tested |            |
| Execution of welds acc. to | Work Standard                                      |            |
|                            | AWS D11.02:2001                                    |            |

## STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 15/16" |
| Bottom Head  | 15/16" |
| Inner Shell  | 55/64" |
| Jacket Head  | 19/32" |
| Jacket Shell | 33/64" |

## WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 12,500 |
| Complete with drive system    | 14,200 |
| Jacket & shell filled w/water | 31,000 |



## GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-2000

## 2000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |                 |
|------------------------|-----------------|
| Shell                  | SA-285 Gr. B    |
| Jacket                 | SA-285 Gr. B    |
| Heads                  | SA-285 Gr. B    |
| Clamps                 | SA-193 Gr. 7    |
| Pad Type Nozzles       | SA-350 Gr. LF-1 |
| Nozzles                | SA-350 Gr. LF-1 |
| Split Loose<br>Flanges | SA-350 Gr. LF-1 |

### SPECIFICATIONS

|                    |                                                    |           |
|--------------------|----------------------------------------------------|-----------|
| Design             | Jacket                                             | Shell     |
| Working Pressure   | 90w.F.V.                                           | 1003.F.V. |
| Test Pressure      | psi                                                | psi       |
| Design Temperature | 400                                                | 400       |
| Capacity (gals)    | 220                                                | 2170      |
| Joint Efficiency   | 0.85                                               | 0.85      |
| Welds              | Partially radiographed<br>and dye penetrant tested |           |

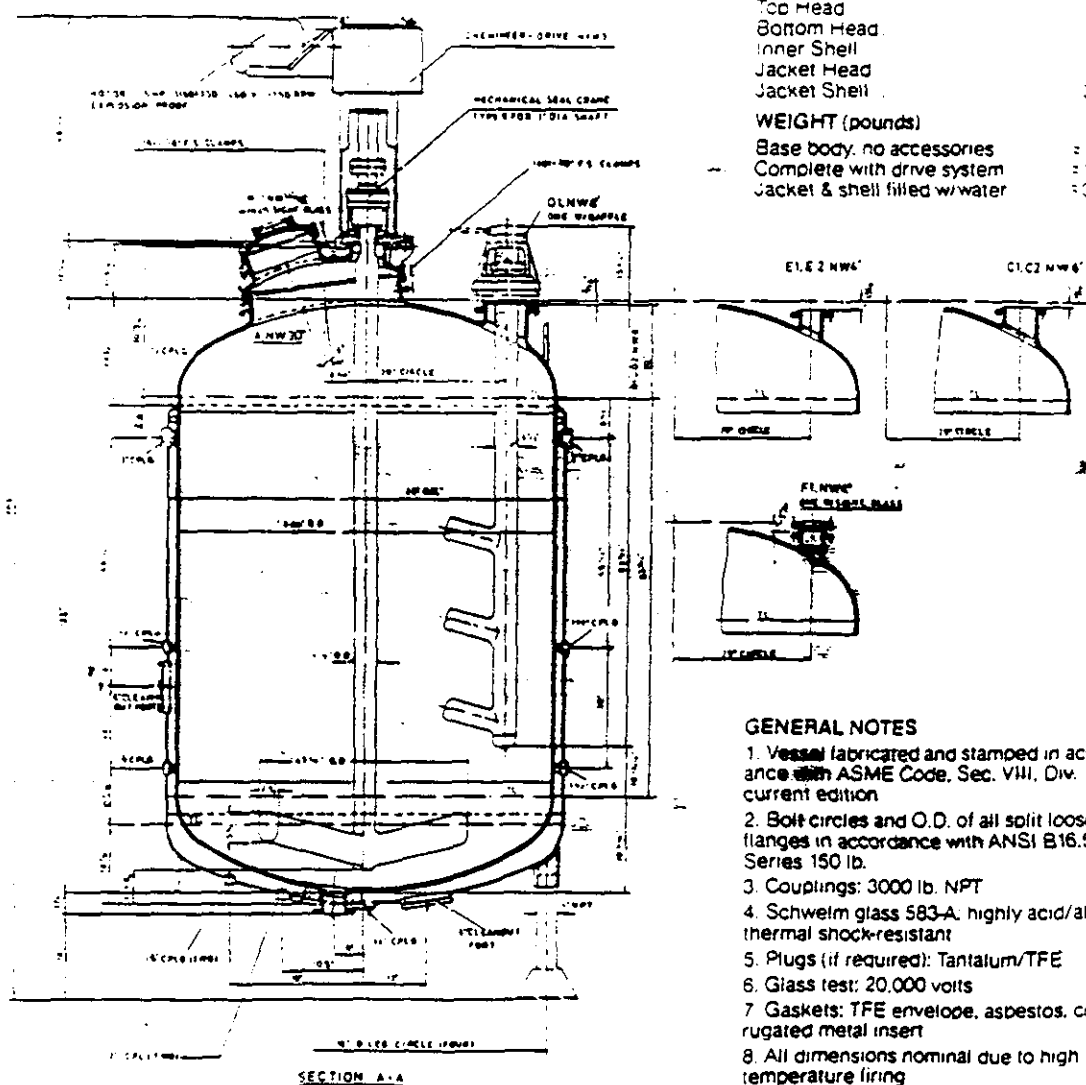
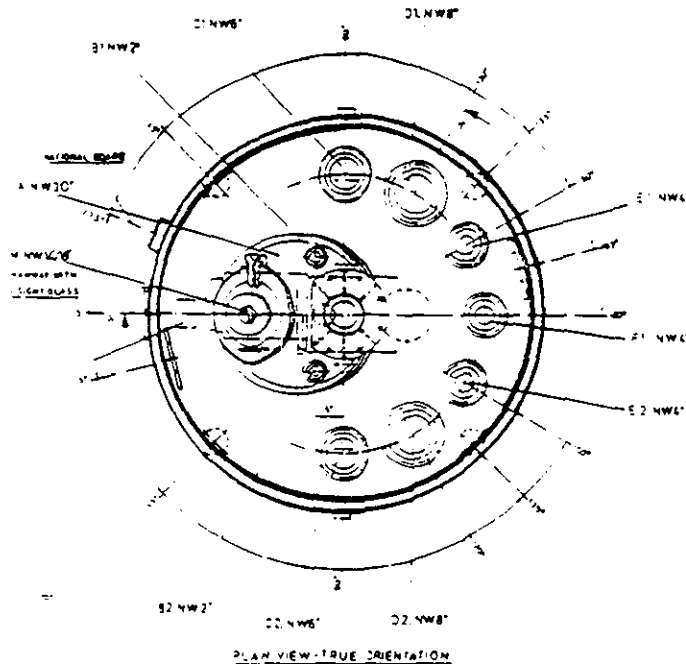
Execution of welds acc. to  
Work Standard: VN 211 02.0001

### STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 15/16" |
| Bottom Head  | 15/16" |
| Inner Shell  | 55/64" |
| Jacket Head  | 19/32" |
| Jacket Shell | 33/64" |

### WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 14,350 |
| Complete with drive system    | 15,050 |
| Jacket & shell filled w/water | 16,150 |



### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition.
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A, highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-3000

## 3000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |              |
|------------------------|--------------|
| Shell                  | SA-285 Gr. B |
| Jacket                 | SA-285 Gr. B |
| Heads                  | SA-285 Gr. B |
| Clamps                 | SA-193 Gr. B |
| Pad Type Nozzles       | SA-350 Gr. B |
| Nozzle                 | SA-350 Gr. B |
| Split Loose<br>Flanges | SA-350 Gr. B |

### SPECIFICATIONS

|                    |                                                 |             |
|--------------------|-------------------------------------------------|-------------|
| Design             | Jacket                                          | Shell       |
| Working Pressure   | 30 W.P.                                         | 1003 P.S.I. |
| Test Pressure      | 105                                             | 150         |
| Design Temperature | 400                                             | 400         |
| Capacity (gals.)   | 255                                             | 3450        |
| Joint Efficiency   | 0.85                                            | 0.85        |
| Welds              | Partially radiographed and dye penetrant tested |             |

Execution of welds acc. to  
Work Standard. WN 211 02 0001

### STEEL THICKNESS (inches)

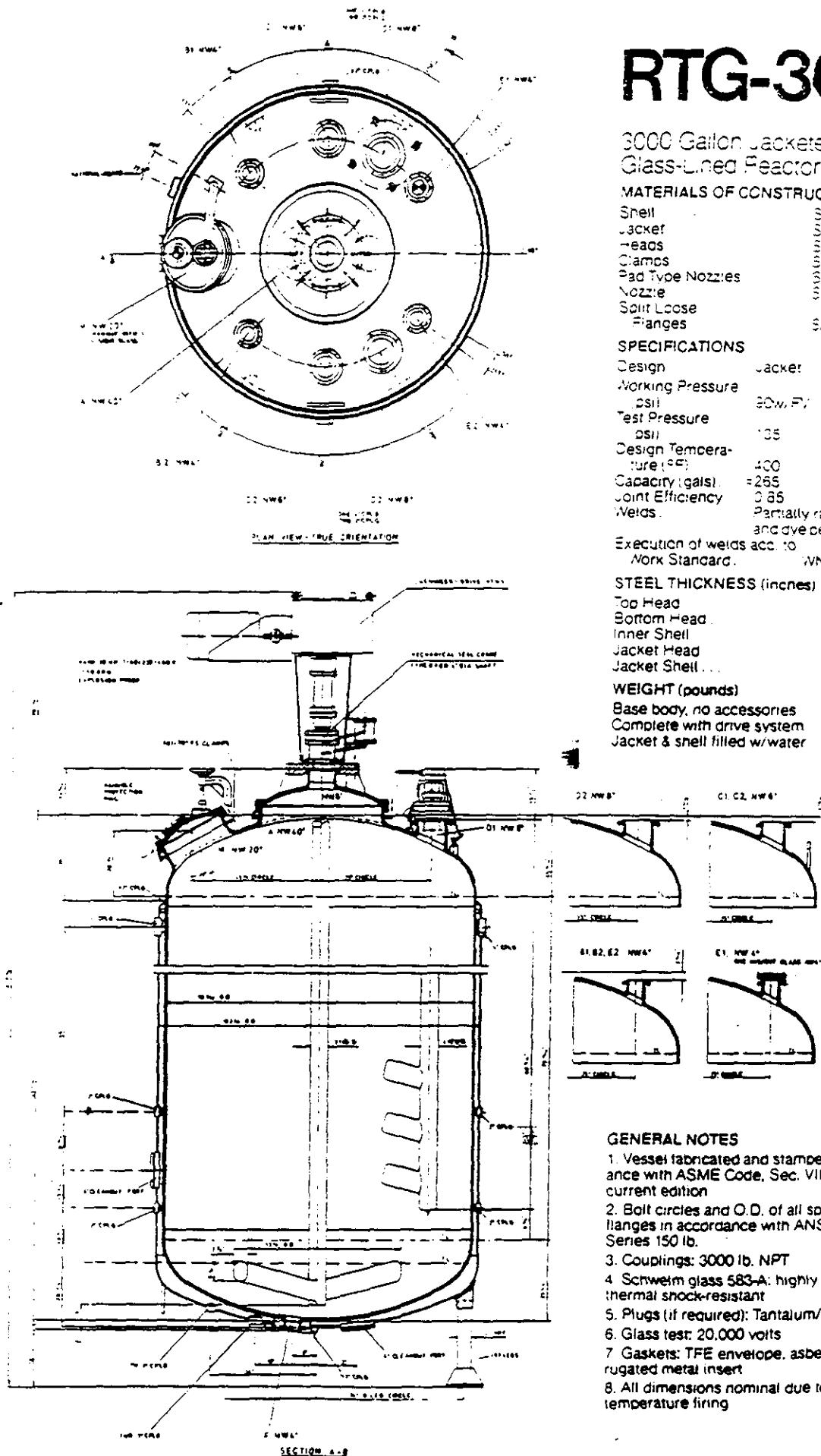
|              |         |
|--------------|---------|
| Top Head     | 1-1/64" |
| Bottom Head  | 1-1/64" |
| Inner Shell  | 1-1/64" |
| Jacket Head  | 5/8"    |
| Jacket Shell | 35/64"  |

### WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 23,350 |
| Complete with drive system    | 25,750 |
| Jacket & shell filled w/water | 56,700 |

### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing



# RTG-4000

4000 Gallon Jacketed  
Glass-Lined Reactor

## MATERIALS OF CONSTRUCTION

|                        |              |
|------------------------|--------------|
| Shell                  | SA-285 Gr B  |
| Jacket                 | SA-285 Gr B  |
| Heads                  | SA-285 Gr B  |
| Gaskets                | SA-193 B7    |
| Pad Type Nozzles       | SA-350 Gr LF |
| Nozzles                | SA-350 Gr LF |
| Split Loose<br>Flanges | SA-350 Gr LF |

## SPECIFICATIONS

|                         |                                                    |         |
|-------------------------|----------------------------------------------------|---------|
| Design                  | Jacket                                             | Shell   |
| Working Pressure        | 30W/FV                                             | 1003/FV |
| Test Pressure           | 135                                                | 150     |
| Design Temperature (°F) | 400                                                | 400     |
| Capacity (gals)         | 3325                                               | 3465    |
| Joint Efficiency        | 0.85                                               | 0.85    |
| Welds                   | Partially radiographed<br>and dye penetrant tested |         |

Execution of welds acc. to  
Work Standard AWS D11.02.0001

## STEEL THICKNESS (inches)

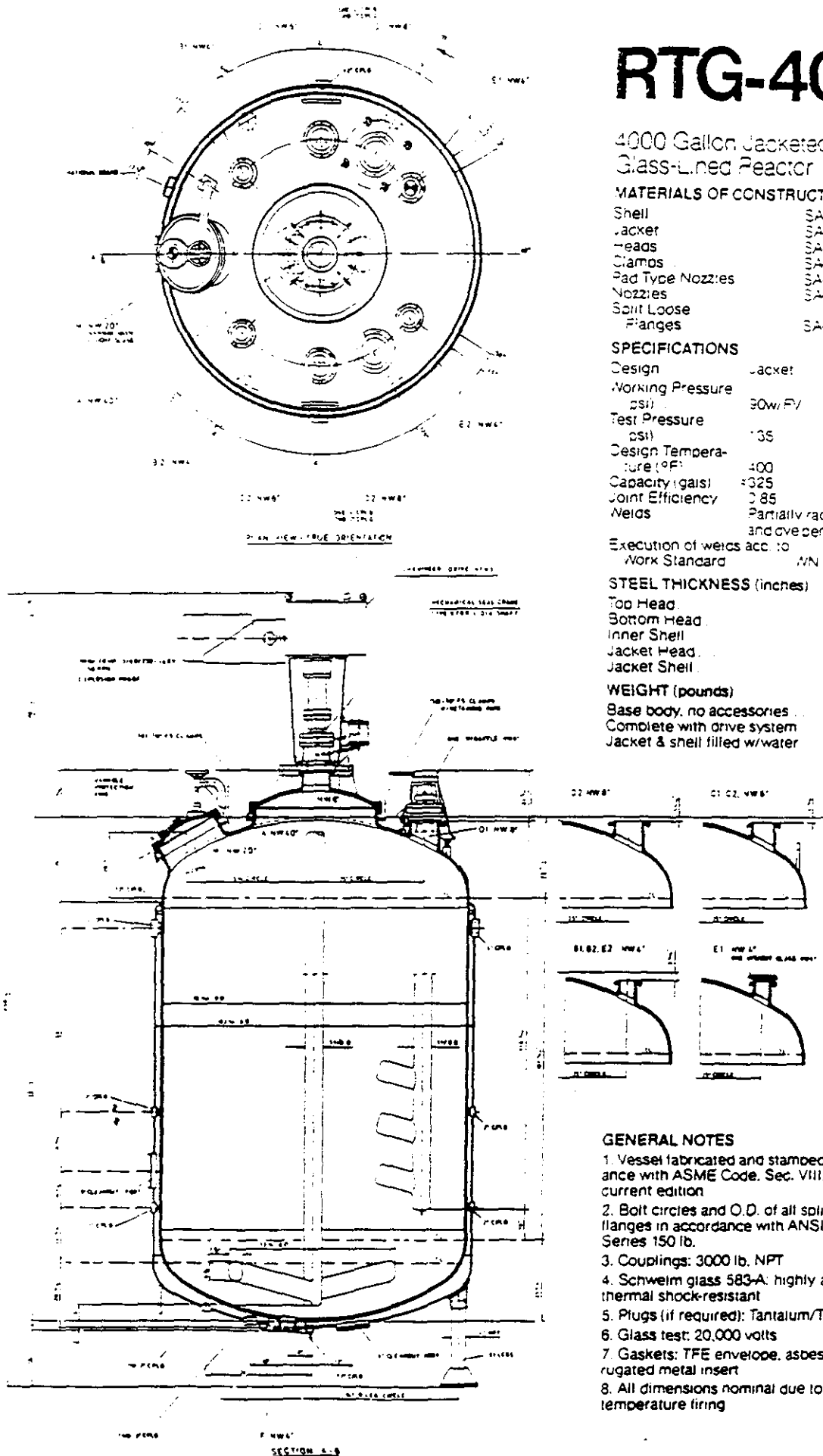
|              |         |
|--------------|---------|
| Top Head     | 1-1/64" |
| Bottom Head  | 1-1/64" |
| Inner Shell  | 1-1/64" |
| Jacket Head  | 5/8"    |
| Jacket Shell | 35/64"  |

## WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 28,100 |
| Complete with drive system    | 31,050 |
| Jacket & shell filled w/water | 71,000 |

## GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing





# RTG-5000

5000 Gallon Jacketed  
Glass-Lined Reactor

## MATERIALS OF CONSTRUCTION

|                        |              |
|------------------------|--------------|
| Shell                  | SA-285 Gr. B |
| Jacket                 | SA-285 Gr. B |
| Heads                  | SA-285 Gr. B |
| Clamps                 | SA-193 B7    |
| Pad Type Nozzles       | SA-350 Gr. L |
| Nozzles                | SA-350 Gr. L |
| Split Loose<br>Flanges | SA-350 Gr. L |

## SPECIFICATIONS

|                    |                                                 |       |
|--------------------|-------------------------------------------------|-------|
| Design             | Jacket                                          | Shell |
| Working Pressure   | psi                                             | psi   |
| Test Pressure      | psi                                             | psi   |
| Design Temperature | °F                                              | °F    |
| Capacity (gals)    | 4300                                            | 5690  |
| Joint Efficiency   | 0.85                                            | 0.85  |
| Welds              | Partially radiographed and dye penetrant tested |       |

Execution of welds acc. to  
Work Standard AWS D11.2:2001

## STEEL THICKNESS (inches)

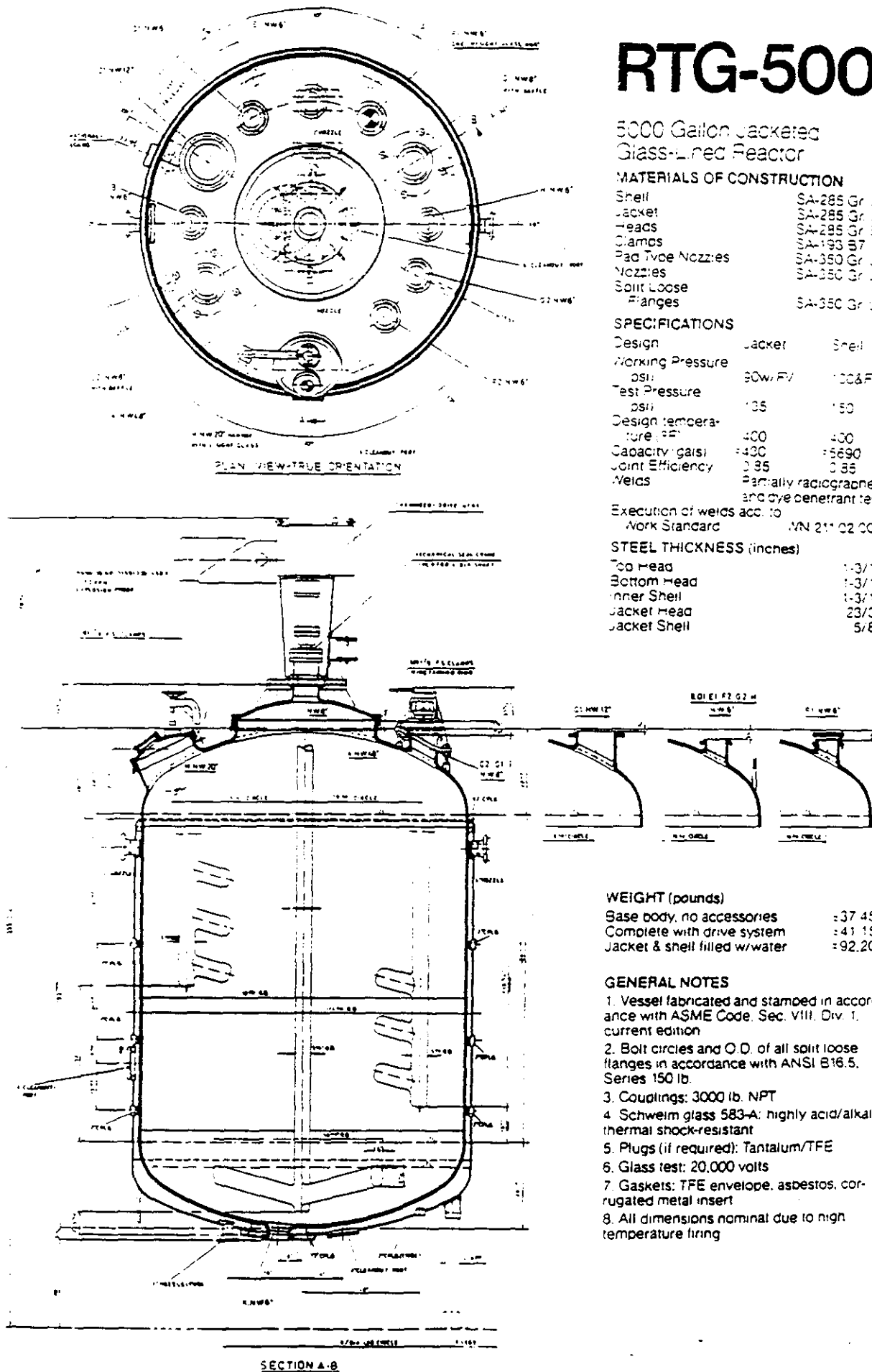
|              |         |
|--------------|---------|
| Top Head     | 1-3/16" |
| Bottom Head  | 1-3/16" |
| Inner Shell  | 1-3/16" |
| Jacket Head  | 23/32"  |
| Jacket Shell | 5/8"    |

## WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 37,450 |
| Complete with drive system    | 41,150 |
| Jacket & shell filled w/water | 92,200 |

## GENERAL NOTES

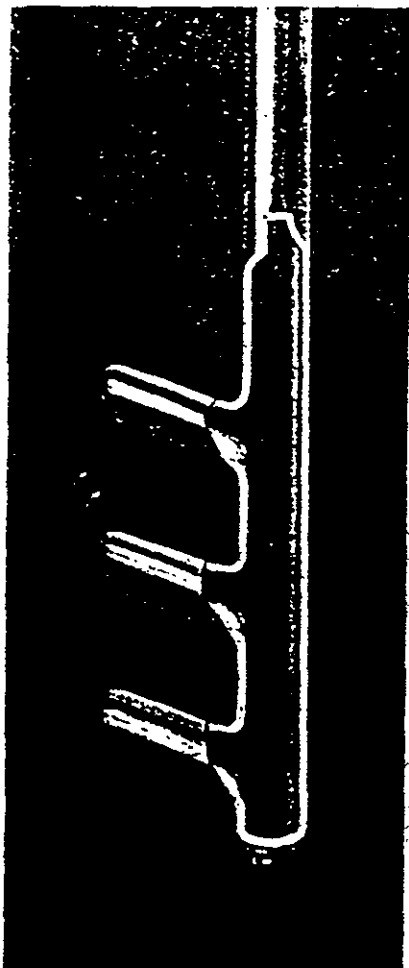
- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweim glass 583-A; highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing



# Accessories

## Bottom Flush Valves

Glass-lined and either manual or pneumatic actuated.



## Temperature Sensing

Tantalum tips available in the baffle or on the bottom flush valves.

## Jacket Agitator Nozzles

Assure uniform heating or cooling of the vessel.

## Baffles

Standard finger type baffles or "beaver-tail" available on special order. All baffles adjustable.



## Agitators

Standard 3-blade retreat curve agitators

## 6" Jacket Cleanout Ports

Available on standard jacketed reactors.



## Manhole Protection Rings

Glass-lined steel protection rings furnished as standard.

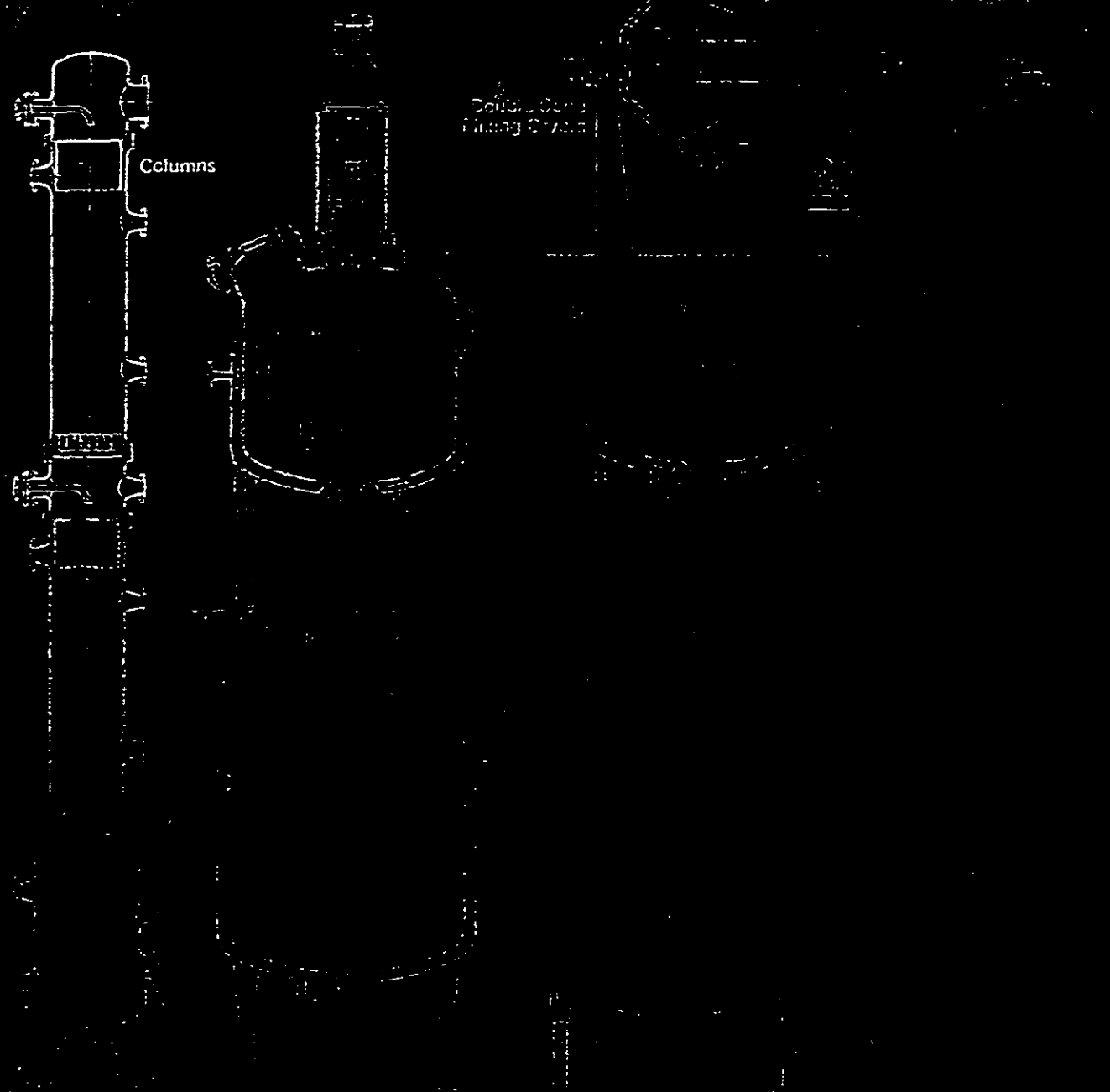
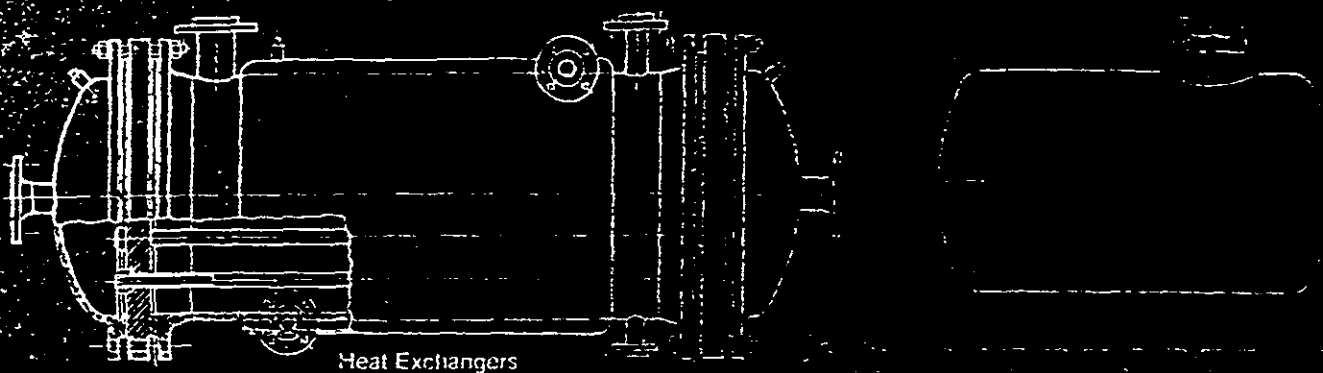
## Blue or White Glass

Schweini 583-A green glass is furnished as standard due to its excellent acid and alkali resistance and to its unsurpassed anti-stick properties. If desired, Cobalt blue or white glass is also available.

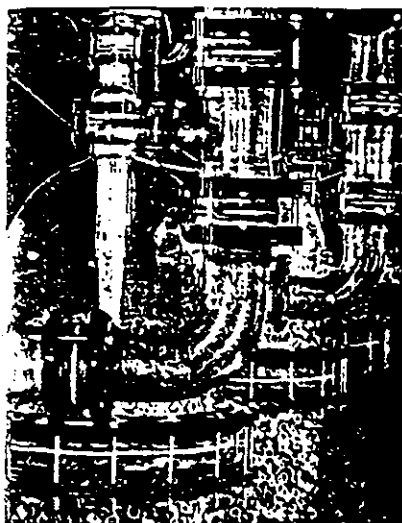
## Continuous Fault Detector

Serves as an immediate alarm system in case of any lining failure, which avoids serious damage and corresponding expensive repairs.

# Other glass-lined steel equipment available from Schwelm/Owens-Illinois:



# Now one source can supply the entire system: Owens-Illinois.



## 1. The well-known Schott process pipe and systems.

Schott chemical process systems have over 100 years of experience behind them, are performing all over the world, and are backed up by the marketing and service capabilities of Owens-Illinois.

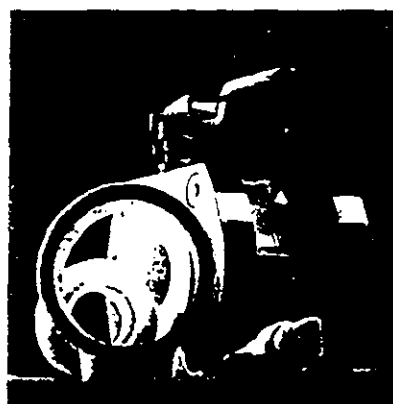
All Schott systems and components are made of DURAN® 50 borosilicate glass for corrosion resistance, durability, transparency and the maintenance of product purity. It has the lowest coefficient of expansion of any corrosion-resistant glass, offers exceptional resistance to thermal shock, and withstands maximum operating temperatures at 200°C.

Technical assistance is available from design concept through installation and maintenance.

## 2. Our exclusive CER-VIT® Ball Valves.

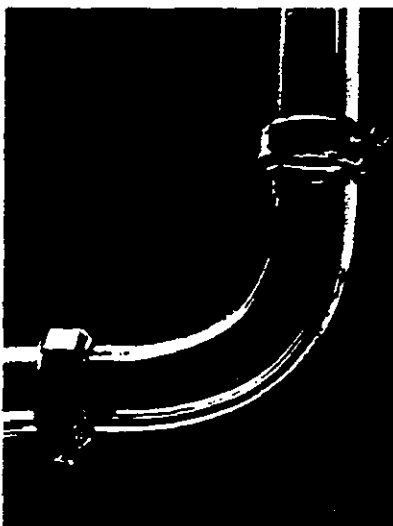
CER-VIT is the exclusive O-I glass ceramic that resists most acids, has a near zero coefficient of expansion, and provides excellent shock resistance. It also handles

alkali solutions in moderate concentrations and temperatures, as well as most other organic and inorganic solvents. These valves give you worry-free operation under normal vibration, pressure and temperature fluctuations, and are easy to handle during installation and maintenance.



## 3. Our tested KIMAX® glass pipe.

KIMAX is tough, corrosion-resistant piping made of our KG-33 borosilicate glass, and resists a wide range of corrosives and reagents. It can withstand operating pressures



to 100 psi up to 300°F according to pipe ID. It adapts well with existing systems and can be modified as your needs change.

## 4. And of course, the proven Schweim reactors.

We hope this catalog has been helpful in telling you some of the specific details that make the Schweim glass-lined reactor truly the alternative reactor you should consider. However, we also realize that there is much more you'll want to know before making your final decision.



For more information—about the Schweim reactor or any other part of the system—call or write today. Contact your nearest Fluid Process Systems sales office and they'll be happy to answer your questions promptly.

**The systems source.**



## The Alternative Glass-Lined Reactor

### Manufacturing Engineering

Vineland, New Jersey 08360  
P.O. Box 2187  
(609) 692-4606  
(609) 692-3600 Ext. 457

### Sales Offices

Atlanta, Georgia 30341  
1551 Bishop Hollow Run  
(404) 457-0623

Fullerton, California 92631  
1600 East Nutwood Ave.  
Suite 650  
(714) 879-7330

Hanover, Illinois 60103  
5837 Franklin Court  
(312) 837-3664

Houston, Texas 77056  
1770 St. James Place  
Suite 407  
(713) 621-8530

Vineland, New Jersey 08360  
P.O. Box 2187  
(609) 692-6239

**The systems source.**

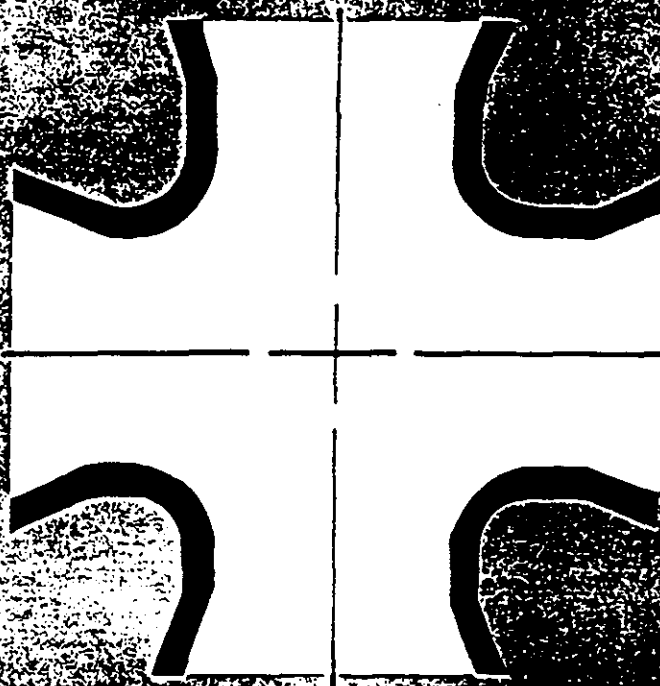
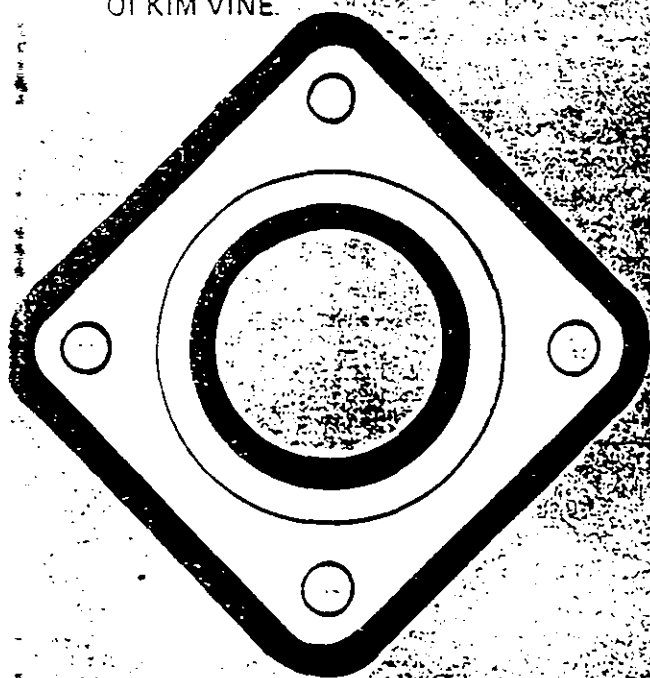


Vineland, New Jersey 08360

1640 South West Boulevard  
P. O. Box T  
Vineland, New Jersey 08360-0136

Phone (609) 692-4700  
TWX 510-687-8913  
OI KIM VINE

Conical End Process Pipe  
FPS-61-3



# KIMAX conical end GLASS PROCESS PIPE

## Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

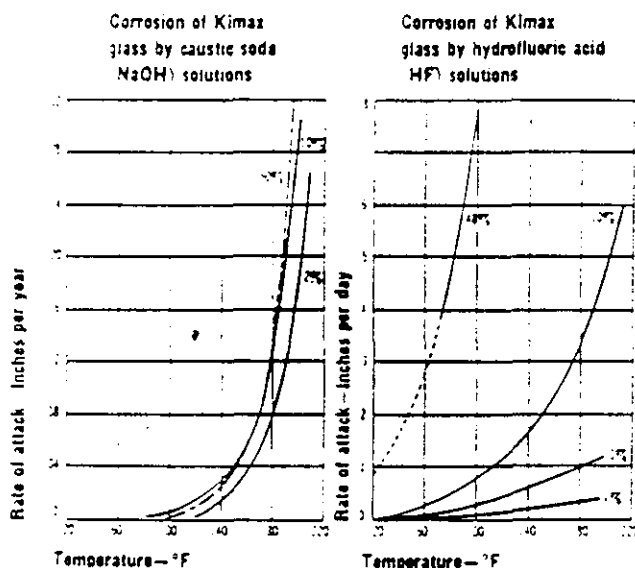
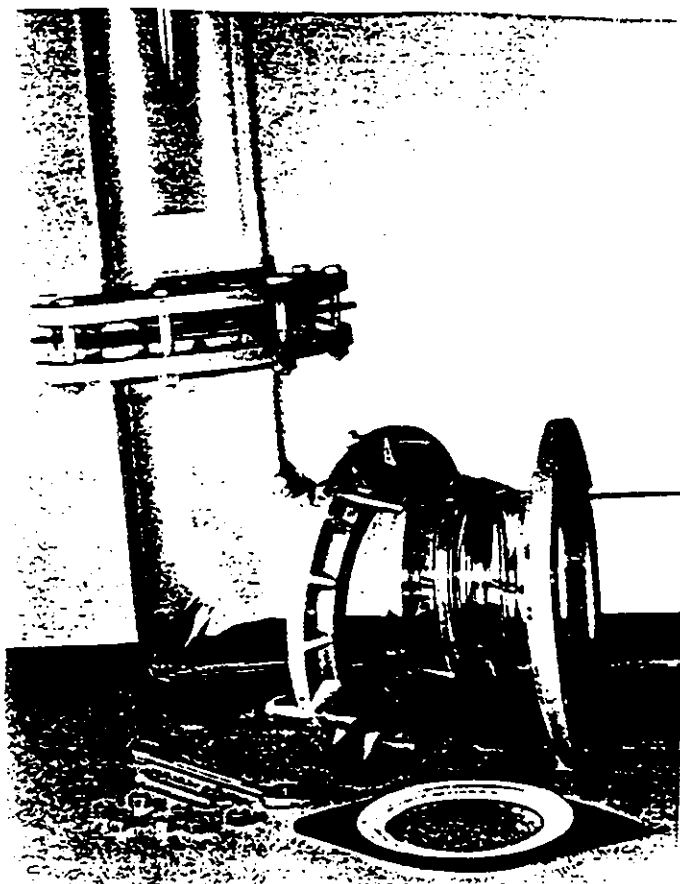
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

## Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials, including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, BASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

Economy is inherent in KIMAX glass pipe systems. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{2}$  to  $\frac{3}{8}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of overlines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

### Manufacturing Characteristics

KIMAX Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing.

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

### Physical Properties

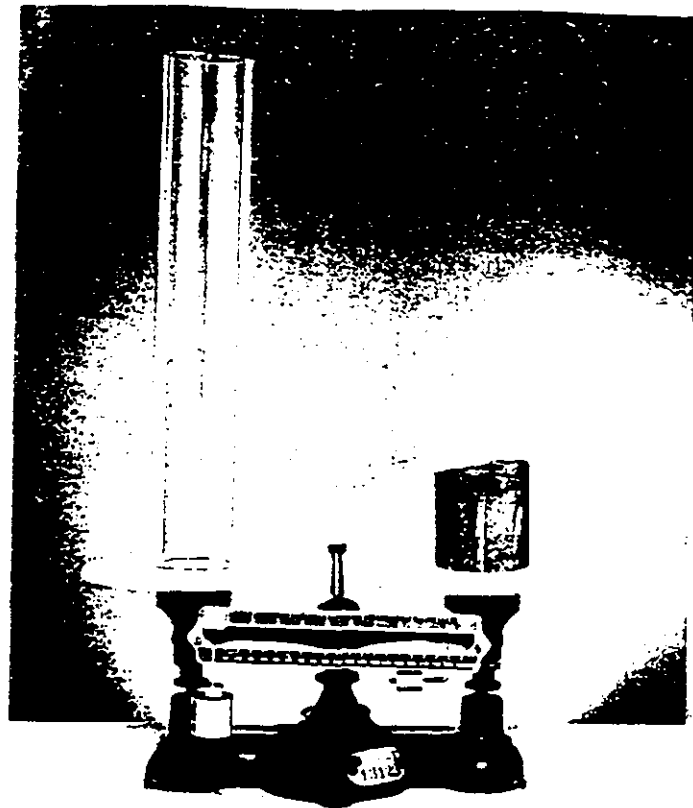
KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

Operating temperatures extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

Thermal conductivity: 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F

Thermal expansion of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

Thermal shock differential ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



### Ordering

When ordering a standard item please refer to KIMAX glass pipe price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

### Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

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TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

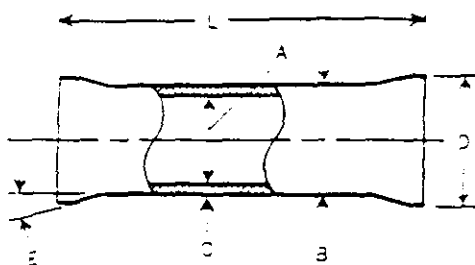
KIMAX is a registered trademark of Owens-Illinois, Inc.



# STRAIGHT LENGTHS 6100

Standard lengths in all diameters are 6", 10", 13", 14", 16", 18", 19", 20", 22", 24", 26", 28", 30", 32", 34", 36", 38", 40", 42", 44", 46", 48", 50", 52", 54", 56", 58", 60", 62", 64", 66", 68", 70", 72", 74", 76", 78", 80", 82", 84", 86", 88", 90", 92", 94", 96", 98", 100", 102", 104", 106", 108", 110", 112", 114", 116", 118", 120", 122", 124", 126", 128", 130", 132", 134", 136", 138", 140", 142", 144", 146", 148", 150", 152", 154", 156", 158", 160", 162", 164", 166", 168", 170", 172", 174", 176", 178", 180", 182", 184", 186", 188", 190", 192", 194", 196", 198", 200", 202", 204", 206", 208", 210", 212", 214", 216", 218", 220", 222", 224", 226", 228", 230", 232", 234", 236", 238", 240", 242", 244", 246", 248", 250", 252", 254", 256", 258", 260", 262", 264", 266", 268", 270", 272", 274", 276", 278", 280", 282", 284", 286", 288", 290", 292", 294", 296", 298", 300", 302", 304", 306", 308", 310", 312", 314", 316", 318", 320", 322", 324", 326", 328", 330", 332", 334", 336", 338", 340", 342", 344", 346", 348", 350", 352", 354", 356", 358", 360", 362", 364", 366", 368", 370", 372", 374", 376", 378", 380", 382", 384", 386", 388", 390", 392", 394", 396", 398", 400", 402", 404", 406", 408", 410", 412", 414", 416", 418", 420", 422", 424", 426", 428", 430", 432", 434", 436", 438", 440", 442", 444", 446", 448", 450", 452", 454", 456", 458", 460", 462", 464", 466", 468", 470", 472", 474", 476", 478", 480", 482", 484", 486", 488", 490", 492", 494", 496", 498", 500", 502", 504", 506", 508", 510", 512", 514", 516", 518", 520", 522", 524", 526", 528", 530", 532", 534", 536", 538", 540", 542", 544", 546", 548", 550", 552", 554", 556", 558", 560", 562", 564", 566", 568", 570", 572", 574", 576", 578", 580", 582", 584", 586", 588", 590", 592", 594", 596", 598", 600", 602", 604", 606", 608", 610", 612", 614", 616", 618", 620", 622", 624", 626", 628", 630", 632", 634", 636", 638", 640", 642", 644", 646", 648", 650", 652", 654", 656", 658", 660", 662", 664", 666", 668", 670", 672", 674", 676", 678", 680", 682", 684", 686", 688", 690", 692", 694", 696", 698", 700", 702", 704", 706", 708", 710", 712", 714", 716", 718", 720", 722", 724", 726", 728", 730", 732", 734", 736", 738", 740", 742", 744", 746", 748", 750", 752", 754", 756", 758", 760", 762", 764", 766", 768", 770", 772", 774", 776", 778", 780", 782", 784", 786", 788", 790", 792", 794", 796", 798", 800", 802", 804", 806", 808", 810", 812", 814", 816", 818", 820", 822", 824", 826", 828", 830", 832", 834", 836", 838", 840", 842", 844", 846", 848", 850", 852", 854", 856", 858", 860", 862", 864", 866", 868", 870", 872", 874", 876", 878", 880", 882", 884", 886", 888", 890", 892", 894", 896", 898", 900", 902", 904", 906", 908", 910", 912", 914", 916", 918", 920", 922", 924", 926", 928", 930", 932", 934", 936", 938", 940", 942", 944", 946", 948", 950", 952", 954", 956", 958", 960", 962", 964", 966", 968", 970", 972", 974", 976", 978", 980", 982", 984", 986", 988", 990", 992", 994", 996", 998, 1000", 1002", 1004", 1006", 1008", 1010", 1012", 1014", 1016", 1018", 1020", 1022", 1024", 1026", 1028", 1030", 1032", 1034", 1036", 1038", 1040", 1042", 1044", 1046", 1048", 1050", 1052", 1054", 1056", 1058, 1060".

Intermediate odd lengths are available on special order. Special lengths up to 15 feet supplied on special order.

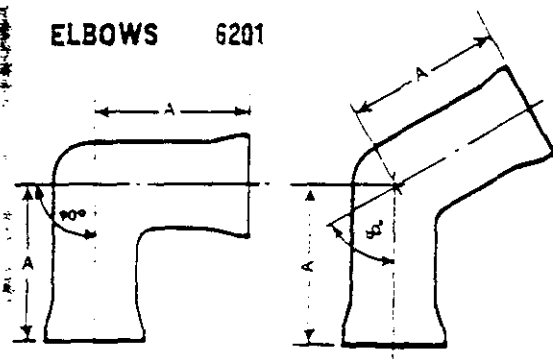


| A         | B     | C    | D      | E      | L      | Weight   | Psi      |
|-----------|-------|------|--------|--------|--------|----------|----------|
| Pipe Size | Pipe  | Wall | Flange | Flange | Min.   | Lbs. Ft. | Recom.   |
| Nom. I.D. | O.D.  |      | O.D.   | Angle  | Length |          | Pressure |
| 1"        | 1.315 | .083 | 2.315  | 10°    | 3"     | 1.0      | 10       |
| 1 1/2"    | 1.900 | .083 | 2.900  | 10°    | 3"     | 1.5      | 10       |
| 2"        | 2.375 | .083 | 3.375  | 10°    | 3"     | 2.0      | 10       |
| 2 1/2"    | 2.875 | .083 | 3.875  | 10°    | 3"     | 2.5      | 10       |
| 3"        | 3.375 | .083 | 4.375  | 10°    | 3"     | 3.0      | 10       |
| 3 1/2"    | 3.875 | .083 | 4.875  | 10°    | 3"     | 3.5      | 10       |
| 4"        | 4.375 | .083 | 5.375  | 10°    | 3"     | 4.0      | 10       |
| 5"        | 5.312 | .083 | 6.312  | 10°    | 3"     | 5.0      | 10       |

When ordering, specify pipe I.D. and length in inches.

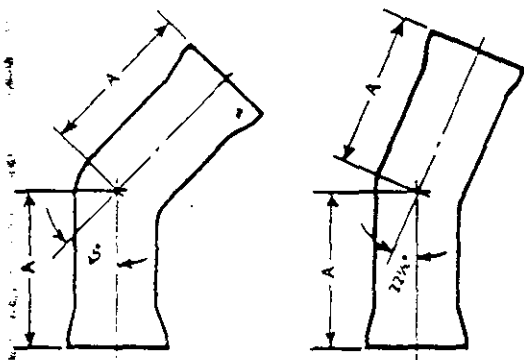
SEE CURRENT PRICE LIST FOR ARTICLE NUMBERS

## ELBOWS 6201

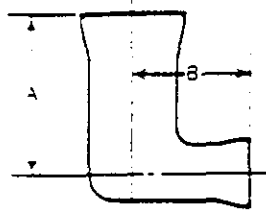


| Pipe Size | A        |
|-----------|----------|
| (inches)  | (inches) |
| 1         | 2 1/4    |
| 1 1/2     | 3 1/4    |
| 2         | 4        |
| 3         | 5        |
| 4         | 7        |
| 5         | 9        |

When ordering, specify degree of angle.

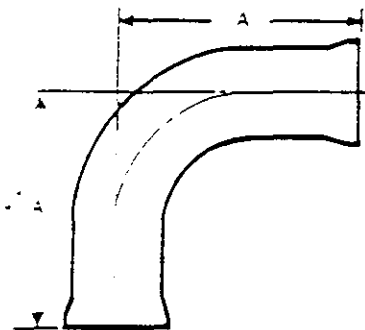


# REDUCER ELBOWS 6202



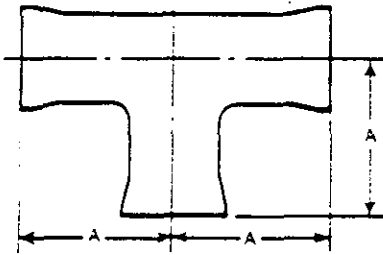
| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1 1/2                 | 1                      | 3 1/2         | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1 1/2                  | 4             | 3 1/2         |
| 3                     | 1                      | 5             | 3 1/2         |
| 3                     | 1 1/2                  | 5             | 4             |
| 3                     | 2                      | 5             | 4 1/2         |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1 1/2                  | 7             | 4 1/2         |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5 1/2         |
| 5                     | 1                      | 9             | 5             |
| 5                     | 1 1/2                  | 9             | 5 1/2         |
| 5                     | 2                      | 9             | 6             |
| 5                     | 3                      | 9             | 6 1/2         |
| 5                     | 4                      | 9             | 7             |

# SWEEP ELBOWS 6239



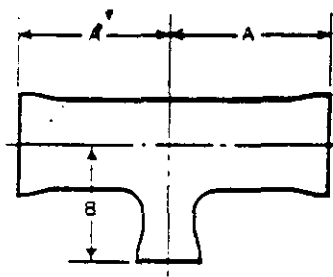
| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 4 1/2         |
| 1 1/2                 | 5             |
| 2                     | 5             |
| 3                     | 7             |
| 4                     | 10            |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2 1/2         |
| 1 1/2                 | 3 1/2         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

# REDUCING TEES 6211

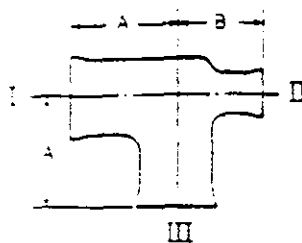


| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1 1/2                 | 1                      | 3 1/2         | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1 1/2                  | 4             | 3 1/2         |
| 3                     | 1                      | 5             | 3 1/2         |
| 3                     | 1 1/2                  | 5             | 4             |
| 3                     | 2                      | 5             | 4 1/2         |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1 1/2                  | 7             | 4 1/2         |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5 1/2         |
| 5                     | 1                      | 9             | 5             |
| 5                     | 1 1/2                  | 9             | 5 1/2         |
| 5                     | 2                      | 9             | 6             |
| 5                     | 3                      | 9             | 6 1/2         |
| 5                     | 4                      | 9             | 7             |

When ordering, specify pipe run I.D. and branch I.D.

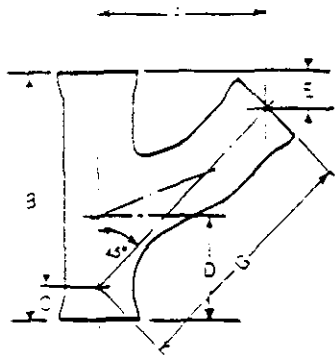
Other reduction combinations are available on special order to customer's specifications.

# REDUCER TEES 6212



When ordering, specify pipe size in this order: I, II, and III

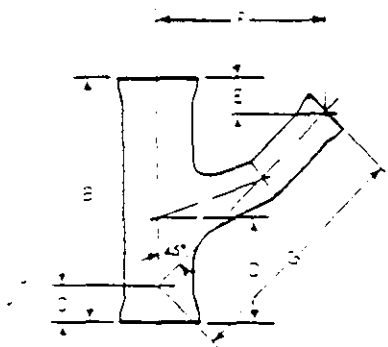
| Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|-----------------------------|------------------------------|---------------|---------------|
| 1                     | 1                           | 1                            | 1             | 1             |
| 1                     | 1 1/2                       | 1                            | 1             | 1 1/2         |
| 1                     | 2                           | 1                            | 1             | 2             |
| 1                     | 2 1/2                       | 1                            | 1             | 2 1/2         |
| 1                     | 3                           | 1                            | 1             | 3             |
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| 1                     | 7                           | 1                            | 1             | 7             |
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| 1                     | 9                           | 1                            | 1             | 9             |
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| 1                     | 10                          | 1                            | 1             | 10            |
| 1                     | 10 1/2                      | 1                            | 1             | 10 1/2        |
| 1                     | 11                          | 1                            | 1             | 11            |
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| 1                     | 12                          | 1                            | 1             | 12            |
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| 1                     | 13                          | 1                            | 1             | 13            |
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| 1                     | 16                          | 1                            | 1             | 16            |
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| 1                     | 21                          | 1                            | 1             | 21            |
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| 1                     | 26                          | 1                            | 1             | 26            |
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| 1                     | 28                          | 1                            | 1             | 28            |
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| 1                     | 29                          | 1                            | 1             | 29            |
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| 1                     | 37                          | 1                            | 1             | 37            |
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| 1                     | 40                          | 1                            | 1             | 40            |
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| 1                     | 42                          | 1                            | 1             | 42            |
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| 1                     | 44                          | 1                            | 1             | 44            |
| 1                     | 44 1/2                      | 1                            | 1             | 44 1/2        |
| 1                     | 45                          | 1                            | 1             | 45            |
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| 1                     | 46 1/2                      | 1                            | 1             | 46 1/2        |
| 1                     | 47                          | 1                            | 1             | 47            |
| 1                     | 47 1/2                      | 1                            | 1             | 47 1/2        |
| 1                     | 48                          | 1                            | 1             | 48            |
| 1                     | 48 1/2                      | 1                            | 1             | 48 1/2        |
| 1                     | 49                          | 1                            | 1             | 49            |
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| 1                     | 50                          | 1                            | 1             | 50            |
| 1                     | 50 1/2                      | 1                            | 1             | 50 1/2        |
| 1                     | 51                          | 1                            | 1             | 51            |
| 1                     | 51 1/2                      | 1                            | 1             | 51 1/2        |
| 1                     | 52                          | 1                            | 1             | 52            |
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| 1                     | 53                          | 1                            | 1             | 53            |
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| 1                     | 54                          | 1                            | 1             | 54            |
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| 1                     | 55                          | 1                            | 1             | 55            |
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| 1                     | 56                          | 1                            | 1             | 56            |
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| 1                     | 57                          | 1                            | 1             | 57            |
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| 1                     | 61                          | 1                            | 1             | 61            |
| 1                     | 61 1/2                      | 1                            | 1             | 61 1/2        |
| 1                     | 62                          | 1                            | 1             | 62            |
| 1                     | 62 1/2                      | 1                            | 1             | 62 1/2        |
| 1                     | 63                          | 1                            | 1             | 63            |
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| 1                     | 64                          | 1                            | 1             | 64            |
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| 1                     | 65                          | 1                            | 1             | 65            |
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| 1                     | 66                          | 1                            | 1             | 66            |
| 1                     | 66 1/2                      | 1                            | 1             | 66 1/2        |
| 1                     | 67                          | 1                            | 1             | 67            |
| 1                     | 67 1/2                      | 1                            | 1             | 67 1/2        |
| 1                     | 68                          | 1                            | 1             | 68            |
| 1                     | 68 1/2                      | 1                            | 1             | 68 1/2        |
| 1                     | 69                          | 1                            | 1             | 69            |
| 1                     | 69 1/2                      | 1                            | 1             | 69 1/2        |
| 1                     | 70                          | 1                            | 1             | 70            |
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| 1                     | 71                          | 1                            | 1             | 71            |
| 1                     | 71 1/2                      | 1                            | 1             | 71 1/2        |
| 1                     | 72                          | 1                            | 1             | 72            |
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| 1                     | 73                          | 1                            | 1             | 73            |
| 1                     | 73 1/2                      | 1                            | 1             | 73 1/2        |
| 1                     | 74                          | 1                            | 1             | 74            |
| 1                     | 74 1/2                      | 1                            | 1             | 74 1/2        |
| 1                     | 75                          | 1                            | 1             | 75            |
| 1                     | 75 1/2                      | 1                            | 1             | 75 1/2        |
| 1                     | 76                          | 1                            | 1             | 76            |
| 1                     | 76 1/2                      | 1                            | 1             | 76 1/2        |
| 1                     | 77                          | 1                            | 1             | 77            |
| 1                     | 77 1/2                      | 1                            | 1             | 77 1/2        |
| 1                     | 78                          | 1                            | 1             | 78            |
| 1                     | 78 1/2                      | 1                            | 1             | 78 1/2        |
| 1                     | 79                          | 1                            | 1             | 79            |
| 1                     | 79 1/2                      | 1                            | 1             | 79 1/2        |
| 1                     | 80                          | 1                            | 1             | 80            |
| 1                     | 80 1/2                      | 1                            | 1             | 80 1/2        |
| 1                     | 81                          | 1                            | 1             | 81            |
| 1                     | 81 1/2                      | 1                            | 1             | 81 1/2        |
| 1                     | 82                          | 1                            | 1             | 82            |
| 1                     | 82 1/2                      | 1                            | 1             | 82 1/2        |
| 1                     | 83                          | 1                            | 1             | 83            |
| 1                     | 83 1/2                      | 1                            | 1             | 83 1/2        |
| 1                     | 84                          | 1                            | 1             | 84            |
| 1                     | 84 1/2                      | 1                            | 1             | 84 1/2        |
| 1                     | 85                          | 1                            | 1             | 85            |
| 1                     | 85 1/2                      | 1                            | 1             | 85 1/2        |
| 1                     | 86                          | 1                            | 1             | 86            |
| 1                     | 86 1/2                      | 1                            | 1             | 86 1/2        |
| 1                     | 87                          | 1                            | 1             | 87            |
| 1                     | 87 1/2                      | 1                            | 1             | 87 1/2        |
| 1                     | 88                          | 1                            | 1             | 88            |
| 1                     | 88 1/2                      | 1                            | 1             | 88 1/2        |
| 1                     | 89                          | 1                            | 1             | 89            |
| 1                     | 89 1/2                      | 1                            | 1             | 89 1/2        |
| 1                     | 90                          | 1                            | 1             | 90            |
| 1                     | 90 1/2                      | 1                            | 1             | 90 1/2        |
| 1                     | 91                          | 1                            | 1             | 91            |
| 1                     | 91 1/2                      | 1                            | 1             | 91 1/2        |
| 1                     | 92                          | 1                            | 1             | 92            |
| 1                     | 92 1/2                      | 1                            | 1             | 92 1/2        |
| 1                     | 93                          | 1                            | 1             | 93            |
| 1                     | 93 1/2                      | 1                            | 1             | 93 1/2        |
| 1                     | 94                          | 1                            | 1             | 94            |
| 1                     | 94 1/2                      | 1                            | 1             | 94 1/2        |
| 1                     | 95                          | 1                            | 1             | 95            |
| 1                     | 95 1/2                      | 1                            | 1             | 95 1/2        |
| 1                     | 96                          | 1                            | 1             | 96            |
| 1                     | 96 1/2                      | 1                            | 1             | 96 1/2        |
| 1                     | 97                          | 1                            | 1             | 97            |
| 1                     | 97 1/2                      | 1                            | 1             | 97 1/2        |
| 1                     | 98                          | 1                            | 1             | 98            |
| 1                     | 98 1/2                      | 1                            | 1             | 98 1/2        |
| 1                     | 99                          | 1                            | 1             | 99            |
| 1                     | 99 1/2                      | 1                            | 1             | 99 1/2        |
| 1                     | 100                         | 1                            | 1             | 100           |
| 1                     | 100 1/2                     | 1                            | 1             | 100 1/2       |
| 1                     | 101                         | 1                            | 1             | 101           |
| 1                     | 101 1/2                     | 1                            | 1             | 101 1/2       |
| 1                     | 102                         | 1                            | 1             | 102           |
| 1                     | 102 1/2                     | 1                            | 1             | 102 1/2       |
| 1                     | 103                         | 1                            | 1             | 103           |
| 1                     | 103 1/2                     | 1                            | 1             | 103 1/2       |
| 1                     | 104                         | 1                            | 1             | 104           |
| 1                     | 104 1/2                     | 1                            | 1             | 104 1/2       |
| 1                     | 105                         | 1                            | 1             | 105           |
| 1                     | 105 1/2                     | 1                            | 1             | 105 1/2       |
| 1                     | 106                         | 1                            | 1             | 106           |
| 1                     | 106 1/2                     | 1                            | 1             | 106 1/2       |
| 1                     | 107                         | 1                            | 1             | 107           |
| 1                     | 107 1/2                     | 1                            | 1             | 107 1/2       |
| 1                     | 108                         | 1                            | 1             | 108           |
| 1                     | 108 1/2                     | 1                            | 1             | 108 1/2       |
| 1                     | 109                         | 1                            | 1             | 109           |
| 1                     | 109 1/2                     | 1                            | 1             | 109 1/2       |
| 1                     | 110                         | 1                            | 1             | 110           |
| 1                     | 110 1/2                     | 1                            | 1             | 110 1/2       |
| 1                     | 111                         | 1                            | 1             | 111           |
| 1                     | 111 1/2                     | 1                            | 1             | 111 1/2       |
| 1                     | 112                         | 1                            | 1             | 112           |
| 1                     | 112 1/2                     | 1                            | 1             | 112 1/2       |
| 1                     | 113                         | 1                            | 1             | 113           |
| 1                     | 113 1/2                     | 1                            | 1             | 113 1/2       |
| 1                     | 114                         | 1                            | 1             | 114           |
| 1                     | 114 1/2                     | 1                            | 1             | 114 1/2       |
| 1                     | 115                         | 1                            | 1             | 115           |
| 1                     | 115 1/2                     | 1                            | 1             | 115 1/2       |
| 1                     | 116                         | 1                            | 1             | 116           |
| 1                     | 116 1/2                     | 1                            | 1             | 116 1/2       |
| 1                     | 117                         | 1                            | 1             | 117           |
| 1                     | 117 1/2                     | 1                            | 1             | 117 1/2       |
| 1                     | 118                         | 1                            | 1             | 118           |
| 1                     | 118 1/2                     | 1                            | 1             | 118 1/2       |
| 1                     | 119                         | 1                            | 1             | 119           |
| 1                     | 119 1/2                     | 1                            | 1             | 119 1/2       |
| 1                     | 120                         | 1                            | 1             | 120           |
| 1                     | 120 1/2                     | 1                            | 1             | 120 1/2       |
| 1                     | 121                         | 1                            | 1             | 121           |
| 1                     | 121 1/2                     | 1                            | 1             | 121 1/2       |
| 1                     | 122                         | 1                            | 1             | 122           |
| 1                     | 122 1/2                     | 1                            | 1             | 122 1/2       |
| 1                     | 123                         | 1                            | 1             | 123           |
| 1                     | 123 1/2                     | 1                            | 1             | 123 1/2       |
| 1                     | 124                         | 1                            | 1             | 124           |
| 1                     | 124 1/2                     | 1                            | 1             | 124 1/2       |
| 1                     | 125                         | 1                            | 1             | 125           |
| 1                     | 125 1/2                     | 1                            | 1             | 125 1/2       |
| 1                     | 126                         | 1                            | 1             | 126           |
| 1                     | 126 1/2                     | 1                            | 1             | 126 1/2       |
| 1                     | 127                         | 1                            | 1             | 127           |
| 1                     | 127 1/2                     | 1                            | 1             | 127 1/2       |
| 1                     | 128                         | 1                            | 1             | 128           |
| 1                     | 128 1/2                     | 1                            | 1             | 128 1/2       |
| 1                     | 129                         | 1                            | 1             | 129           |
| 1                     | 129 1/2                     | 1                            | 1             | 129 1/2       |
| 1                     | 130                         | 1                            | 1             | 130           |
| 1                     | 130 1/2                     | 1                            | 1             | 130 1/2       |
| 1                     | 131                         | 1                            | 1             | 131           |
| 1                     | 131 1/2                     | 1                            | 1             | 131 1/2       |
| 1                     | 132                         | 1                            | 1             | 132           |
| 1                     | 132 1/2                     | 1                            | 1             | 132 1/2       |
| 1                     | 133                         | 1                            | 1             | 133           |
| 1                     | 133 1/2                     | 1                            | 1             | 133 1/2       |
| 1                     | 134                         | 1                            | 1             | 134           |
| 1                     | 134 1/2                     | 1                            | 1             | 134 1/2       |
| 1                     | 135                         | 1                            | 1             | 135           |
| 1                     | 135 1/2                     | 1                            | 1             | 135 1/2       |
| 1                     | 136                         | 1                            | 1             | 136           |
| 1                     | 136 1/2                     | 1                            | 1             | 136 1/2       |
| 1                     | 137                         | 1                            | 1             | 137           |
| 1                     | 137 1/2                     | 1                            | 1             | 137 1/2       |
| 1                     | 138                         | 1                            | 1             | 138           |
| 1                     | 138 1/2                     | 1                            | 1             | 138 1/2       |
| 1                     | 139                         | 1                            | 1             | 139           |
| 1                     | 139 1/2                     | 1                            | 1             | 139 1/2       |
| 1                     | 140                         | 1                            | 1             | 140           |
| 1                     | 140 1/2                     | 1                            | 1             | 140 1/2       |
| 1                     | 141                         | 1                            | 1             | 141           |
| 1                     | 141 1/2                     | 1                            | 1             | 141 1/2       |
| 1                     | 142                         | 1                            | 1             | 142           |
| 1                     | 142 1/2                     | 1                            | 1             | 142 1/2       |
| 1                     | 143                         | 1                            | 1             | 143           |
| 1                     | 143 1/2                     | 1                            | 1             | 143 1/2       |
| 1                     | 144                         | 1                            | 1             | 144           |
| 1                     | 144 1/2                     | 1                            | 1             | 144 1/2       |
| 1                     | 145                         | 1                            | 1             | 145           |
| 1                     | 145 1/2                     | 1                            | 1             | 145 1/2       |
| 1                     | 146                         |                              |               |               |



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1                     | 3/4           | 1             | 2 1/2         | 1             | 2 1/2         | 2 1/2         |
| 1 1/2                 | 1             | 1 1/4         | 3 1/2         | 1 1/4         | 3 1/2         | 3 1/2         |
| 2                     | 1 1/4         | 1 3/4         | 4 1/2         | 1 3/4         | 4 1/2         | 4 1/2         |
| 2 1/2                 | 1 3/4         | 2             | 5 1/2         | 2             | 5 1/2         | 5 1/2         |
| 3                     | 2             | 2 1/4         | 6 1/2         | 2 1/4         | 6 1/2         | 6 1/2         |
| 3 1/2                 | 2 1/4         | 2 3/4         | 7 1/2         | 2 3/4         | 7 1/2         | 7 1/2         |
| 4                     | 2 3/4         | 3             | 8 1/2         | 3             | 8 1/2         | 8 1/2         |
| 4 1/2                 | 3             | 3 1/4         | 9 1/2         | 3 1/4         | 9 1/2         | 9 1/2         |
| 5                     | 3 1/4         | 3 1/2         | 10 1/2        | 3 1/2         | 10 1/2        | 10 1/2        |

## LATERAL "Y" REDUCERS 6231

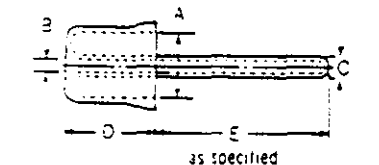


When ordering, specify I.D. of pipe and branch.

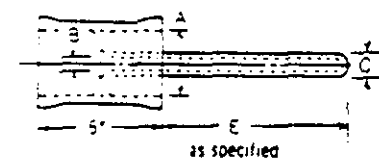
| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 3             | 2 1/4         | 3 1/2         | 1 1/4         | 3 1/2         | 2 1/2         |
| 2 1/2                 | 1 1/4                   | 3 1/4         | 2 3/4         | 4 1/2         | 1 3/4         | 4 1/2         | 3 1/2         |
| 3                     | 1 3/4                   | 3 1/2         | 3 1/4         | 5 1/2         | 2 1/4         | 5 1/2         | 4 1/2         |
| 3 1/2                 | 2                       | 3 3/4         | 3 3/4         | 6 1/2         | 2 3/4         | 6 1/2         | 5 1/2         |
| 4                     | 2 1/4                   | 4             | 4 1/4         | 7 1/2         | 3 1/4         | 7 1/2         | 6 1/2         |
| 4 1/2                 | 2 3/4                   | 4 1/4         | 4 3/4         | 8 1/2         | 3 3/4         | 8 1/2         | 7 1/2         |
| 5                     | 3                       | 4 1/2         | 5 1/4         | 9 1/2         | 4 1/4         | 9 1/2         | 8 1/2         |
| 5 1/2                 | 3 1/4                   | 4 3/4         | 5 3/4         | 10 1/2        | 4 3/4         | 10 1/2        | 9 1/2         |
| 6                     | 3 1/2                   | 5             | 6 1/4         | 11 1/2        | 5 1/4         | 11 1/2        | 10 1/2        |

## THERMOMETER WELLS

Thermometer wells protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified. Use soft strip asbestos insert (7202) with thermometer wells.



6292 SINGLE END



6295 DOUBLE END

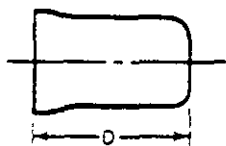
When ordering, specify pipe I.D., well I.D., and tube length.

| A<br>Pipe Size<br>(inches) | B<br>Min.<br>Well<br>I.D.<br>(inches) | C<br>Tube Size<br>(inches)<br>I.D. | D<br>(inches) |
|----------------------------|---------------------------------------|------------------------------------|---------------|
| 1                          | 3/4                                   | 1/2                                | 2 1/4         |
| 1 1/2                      | 1                                     | 3/4                                | 3 1/4         |
| 2                          | 1 1/4                                 | 1 1/8                              | 4 1/4         |
| 2 1/2                      | 1 3/4                                 | 1 3/8                              | 5 1/4         |
| 3                          | 2                                     | 2                                  | 6 1/4         |
| 3 1/2                      | 2 1/4                                 | 2 1/8                              | 7 1/4         |
| 4                          | 2 3/4                                 | 2 3/8                              | 8 1/4         |
| 4 1/2                      | 3                                     | 3                                  | 9 1/4         |
| 5                          | 3 1/4                                 | 3 1/8                              | 10 1/4        |
| 5 1/2                      | 3 1/2                                 | 3 3/8                              | 11 1/4        |
| 6                          | 3 3/4                                 | 4                                  | 12 1/4        |

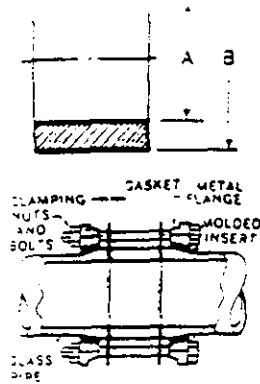
## CAPS

6236

Use soft strip asbestos inserts (7202) with this fitting.



| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 2             |
| 1 1/2                 | 3             |
| 2                     | 4             |
| 3                     | 4 1/2         |
| 4                     | 6             |
| 5                     | 7             |

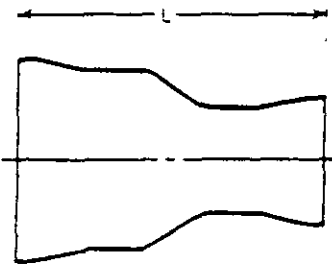


Typical Spacer Assembly

Straight spacers offers more way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are 1", 1 1/2", 2", 3", 4", and 5". Other lengths available on special order.

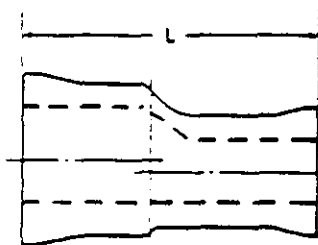
| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/4                 |
| 1 1/2                      | 2 1/4                 |
| 2                          | 2 3/4                 |
| 3                          | 3 3/4                 |
| 4                          | 4 3/4                 |
| 5                          | 5 3/4                 |

## STRAIGHT REDUCERS 6215



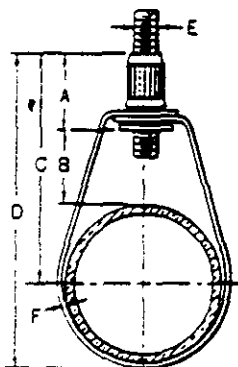
| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2 or 1          | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 7             |
| 5                     | 4, 3, 2, 1 1/2 or 1    | 9             |

## ECCENTRIC REDUCERS 6240



| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2, or 1         | 5             |
| 4                     | 3, 2, 1 1/2, or 1      | 7             |
| 5                     | 4, 3, 2, or 1 1/2      | 9             |

## PIPE HANGER 7290

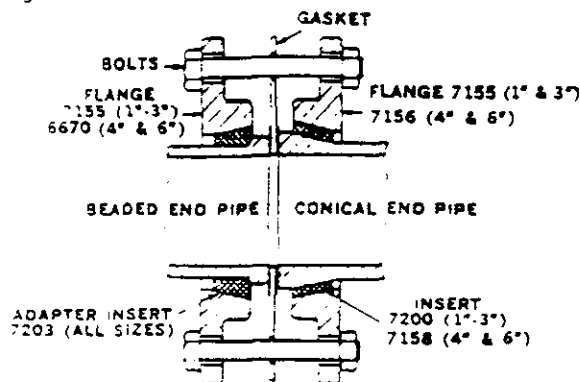


Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is reseated by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A     | B     | C     | D       | E   | F         |
|-----------------------|-------|-------|-------|---------|-----|-----------|
| 1                     | 1 1/4 | 1     | 2 3/4 | 3 1/4   | 1/2 | 1/4 x 1/4 |
| 1 1/2                 | 1 1/4 | 1 1/4 | 3 3/4 | 4 1/4   | 1/2 | 1/4 x 1/2 |
| 2                     | 1 1/4 | 1 1/4 | 3 3/4 | 4 11/16 | 1/2 | 1/4 x 1/2 |
| 3                     | 1 1/2 | 1 1/2 | 4 1/4 | 6 1/4   | 1/2 | 1/2 x 1/2 |
| 4                     | 1 1/2 | 1 1/2 | 5 1/2 | 7 11/16 | 1/2 | 1/2 x 1   |
| 5                     | 1 1/2 | 2 1/4 | 7 1/4 | 10 1/4  | 1/2 | 1/2 x 1   |

## (Beaded to Conical End Pipe)

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



\*Pressure rating limited to that of Conical Pipe System.  
Not to be used with Beaded Armored Pipe.

| Size   | Armure    | Size   | Armure    |
|--------|-----------|--------|-----------|
| 1"     | 7155-1000 | 1"     | 7155-1000 |
| 1 1/2" | 1500      | 1 1/2" | 1500      |
| 2"     | 2000      | 2"     | 2000      |

## Assembly Consists of . . .

| Size   | Flange                 | Insert                 | Gasket    | Nuts & Bolts — Qty.  |
|--------|------------------------|------------------------|-----------|----------------------|
| 1"     | 7155-1000              | 7200-1000<br>7203-1000 | 7156-1000 | 1/4" — 13 x 2 1/2" 4 |
| 1 1/2" | 1500                   | 7200-1500<br>7203-1500 | 1500      | 1/4" — 13 x 2 1/2" 4 |
| 2"     | 2000                   | 7200-2000<br>7203-2000 | 2000      | 1/4" — 13 x 2 1/2" 4 |
| 3"     | 3000                   | 7200-3000<br>7203-3000 | 3000      | 1/4" — 13 x 3 1/2" 4 |
| 4"     | 7155-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | 1/4" — 13 x 3 1/2" 3 |
| 6"     | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | 1/4" — 13 x 3 1/2" 3 |

## INSERTS



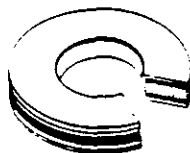
- 7200 for 1" through 3"
- 7202 for 4" and 5"  
Also available for 1" through 6"  
for certain fittings
- 7203 adapter insert for beaded ends (similar to 7200)

Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1 1/2", 2", and 3" diameters. The 1", 1 1/2", 2", and 3" sizes are used with standard glass pipe and fittings.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" pipe and fittings and for 1" through 6" as specified on certain fittings.

Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters; and with Adapter Flange (6670) in 4" and 6" diameters.

## DONUT SPACER 7240

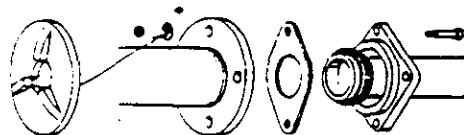


Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined TFE envelope.

Required for joining glass pipe to glass-lined steel using A.S.A. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(inches) | Thickness<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 1/4                   |
| 4                     | 1/4                   |
| 6                     | 1/4                   |

## ADAPTER BUTTON 7230



Used to center smaller diameter Style II bolts in larger holes of A.S.A. flange when adapting glass pipe to A.S.A. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(Inches) | O.D.<br>(Inches) | Height<br>(Inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 1/4                |

## SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(Inches) | I.D.<br>(Inches) | Length<br>(Inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1" thru 4"            | 1/4 min.         | 1 1/2              | .156                |
| 6"                    | 3/4 min.         | 1 1/2              | .156                |

# FLANGES, GASKETS AND ACCESSORIES

KIMAX Glass Pipe and fittings are joined by means of metal flanges, cushioned from the glass by molded or strip inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

## FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. The 4" and 6" sizes have ASA bolt circles and can mate with an ASA flange. Bolts and nuts for Style I flanges are aluminum.

Style I flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASA bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe flanges with an ASA bolt circle.

ASA Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel pipe.

## GASKETS

Gasket thickness and temperature ranges for all standard gasket materials are listed on page 16. Common materials include neoprene, asbestos and TFE machined envelope gaskets.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler of soft asbestos (Blue African asbestos) with a machined TFE liner, are recommended. Other types of filler material may be used with TFE lined gaskets. Consult your distributor for details of performance and prices.

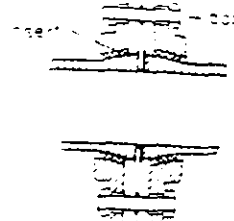
## INSERTS

Used for cushioning pipe ends from metal flanges. Molded inserts are used for standard pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of standard pipe and fittings and for certain fittings, such as U-bends; thermometer wells; and caps.

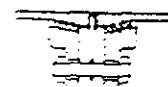
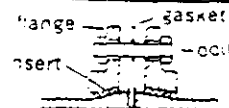
Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 9 for more information.

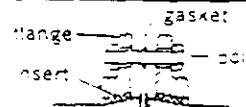
SIZES  
1", 1½", 2"



SIZE  
3"



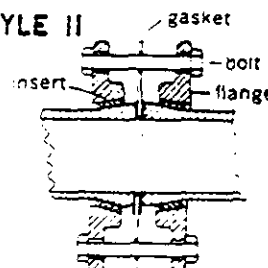
SIZES  
4", 6"



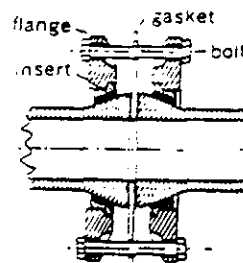
## FLANGE SET 7105 STYLE II

(Cast Iron)

SIZES  
1", 1½", 2", 3"



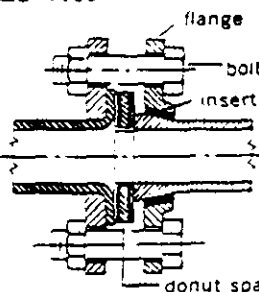
SIZES  
4", 6"



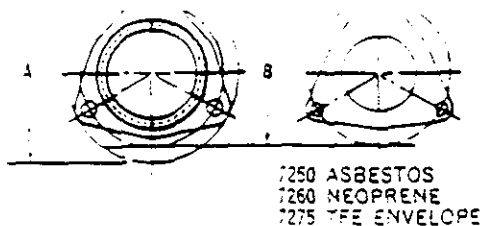
## ASA ADAPTER FLANGES 7160

(Cast Iron)

SIZES  
1", 1½", 2", 3"



To adapt 4" and 6" glass pipe to an ASA Flange, use the following:  
STYLE I Aluminum—No. 7150. 1—7151 outer flange, 1—7153 inner ring  
STYLE II Cast Iron—No. 7155. 1—7156 outer flange, 1—7158 inner ring



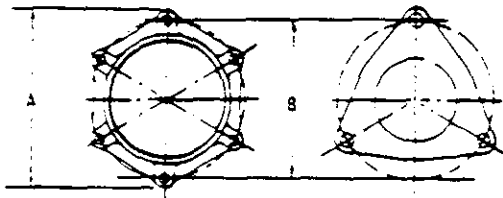
| Pipe Size | A     | B     | Bolt Size    |
|-----------|-------|-------|--------------|
| 1         | 3 1/4 | 3 1/4 | 1/4-13x2     |
| 1 1/2     | 4 1/4 | 3 3/4 | 1/4-13x1 1/2 |
| 2         | 5 1/4 | 4 1/4 | 1/4-13x2     |

#### FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components

- 2-7150 Aluminum Flanges
- 2-7200 Neoprene Asbestos Inserts
- 8-7180 Aluminum Bolts and Nuts

| Pipe Size | A | B     | Bolt Size |
|-----------|---|-------|-----------|
| 1         | 5 | 5 1/4 | 1/4-13x2  |



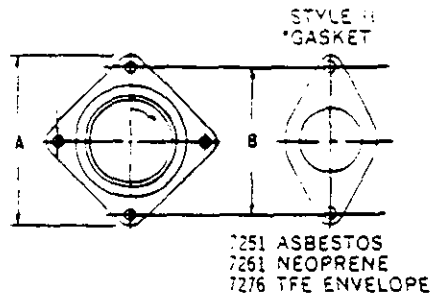
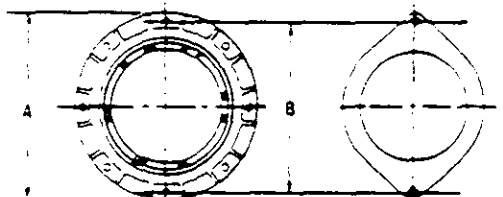
#### FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components

- 2-7151 Aluminum Outer Flanges\*
- 2-7153 Aluminum Inner Rings with 7202 Insert cemented in place\*
- 8-7180 Aluminum Bolts and Nuts

| Pipe Size | A      | B     | Bolt Size    |
|-----------|--------|-------|--------------|
| 4         | 8 1/4  | 7 1/4 | 1/4-13x2 1/4 |
| 6         | 10 1/4 | 9 1/4 | 1/4-16x3     |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.



#### FLANGE SET NO. 7105, 1", 1 1/2", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2-7155 Cast Iron Flanges
- 2-7200 Neoprene Asbestos Inserts
- 4-7190 Steel Bolts and Nuts

| Pipe Size | A     | B     | Bolt Size    |
|-----------|-------|-------|--------------|
| 1         | 3 1/4 | 3 1/4 | 1/4-18x2 1/4 |
| 1 1/2     | 4 1/4 | 3 3/4 | 1/4-18x2 1/4 |
| 2         | 5 1/4 | 4 1/4 | 1/4-18x2 1/4 |
| 3         | 6 1/4 | 5     | 1/4-18x3     |

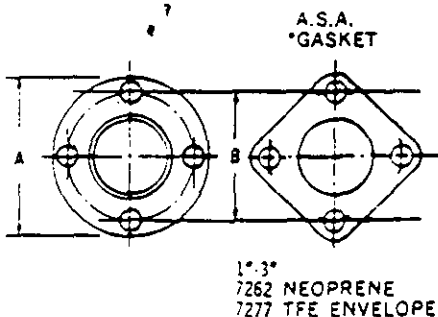
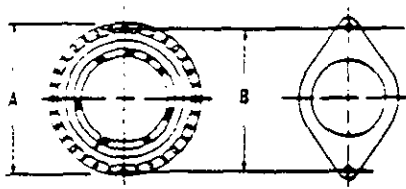
#### FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components

- 2-7156 Cast Iron Outer Flange\*
- 2-7158 Cast Iron Inner Ring with 7202 Inserts cemented in place.\*
- 8-7190 Steel Bolts and Nuts.

| Pipe Size | A      | B     | Bolt Size    |
|-----------|--------|-------|--------------|
| 4         | 8 1/4  | 7 1/4 | 1/4-18x2 1/4 |
| 6         | 10 1/4 | 9 1/4 | 1/4-16x2 1/4 |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring.



#### ASA ADAPTER FLANGE NO. 7160, 1", 1 1/2", 2", 3" I.D.

ASA Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

- 7200 for Conical End Glass
- 7202 Strip Insert for Conical End fittings as specified.
- 7203 Molded Adapter Insert for Beaded End Glass

| Pipe Size | A     | B     | Bolt Size**  |
|-----------|-------|-------|--------------|
| 1         | 4 1/4 | 3 1/4 | 1/4-13x2     |
| 1 1/2     | 5     | 3 3/4 | 1/4-13x2 1/4 |
| 2         | 6     | 4 1/4 | 1/4-13x2 1/4 |
| 3         | 7 1/4 | 6     | 1/4-11x3     |

\*SEE PAGE 16 FOR GASKET THICKNESS.

\*\*4 bolts required for each flange.



## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

## MAXIMUM RECOMMENDED SPAN-FEET

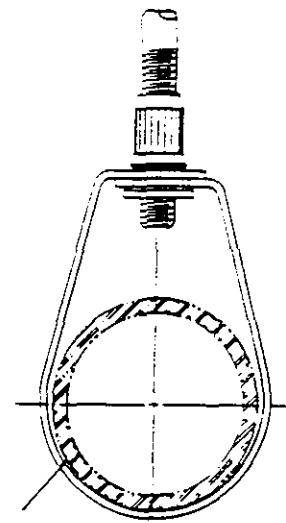
| Pipe Size | Gas | Fluid in Pipe                  |                                  |
|-----------|-----|--------------------------------|----------------------------------|
|           |     | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8   | 8                              | 7                                |
| 1½"       | 9   | 9                              | 7                                |
| 2"        | 9   | 9                              | 8                                |
| 3"        | 9   | 9                              | 8                                |
| 4"        | 10  | 10                             | 8                                |
| 6"        | 10  | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.

Pipe Hanger



## Assembling The Line

Installation of KIMAX Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.

## Joint Assembly

The ends of KIMAX Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

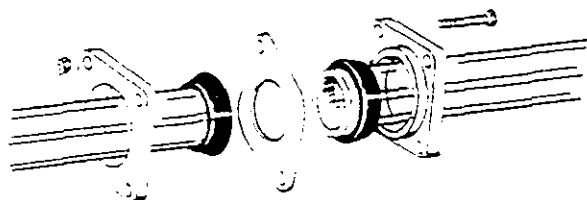
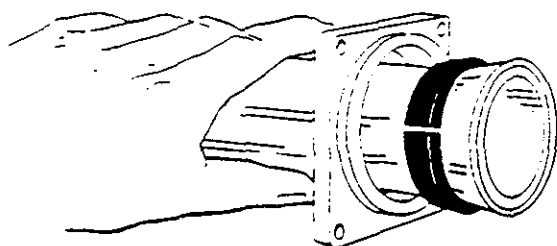
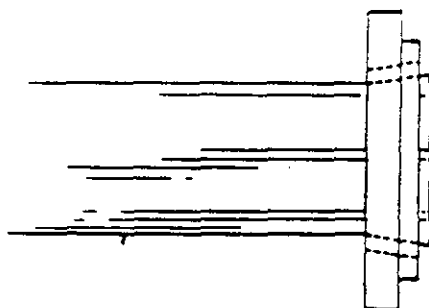


Figure 13.

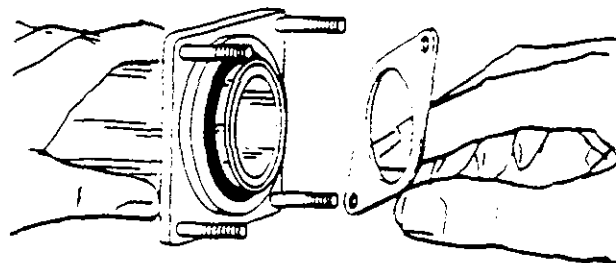
## Steps for Joint Assembly



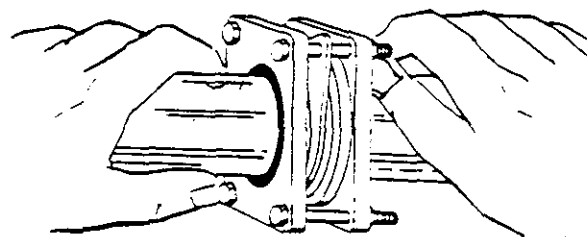
Step 1. Place the metal flange—small opening first—and the insert over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on bolts. Keep gaskets dry to avoid gaskets slipping out between flanges under line pressure.



Step 4. Align gasket opening precisely with pipe opening to avoid obstructions to line flow (especially important in milk and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB., FT.

| Pipe Size | Regular Gasket | Solid T F E Gasket |
|-----------|----------------|--------------------|
| 1"        | 2              | 2-3                |
| 1 1/4"    | 3-3.5          | 3-4                |
| 2"        | 3-4            | 4-5                |
| 3"        | 3-4            | 4-5                |
| 4"        | 3-4            | 5-7                |
| 6"        | 5-6            | 7-10               |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

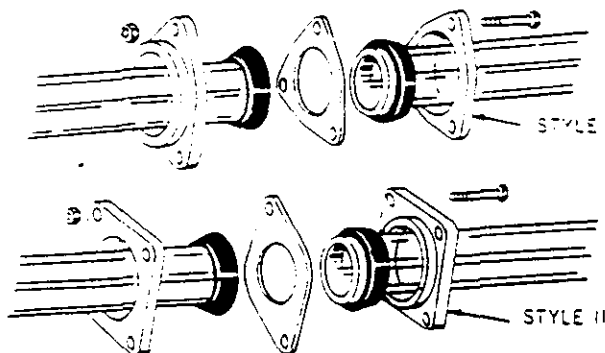
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

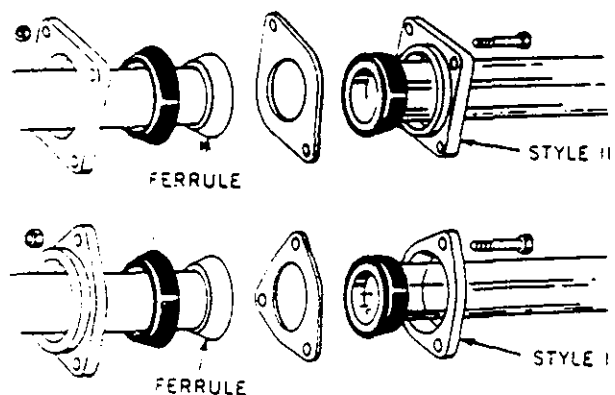
When joining KIMAX Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe, and Style II flange and standard insert on flanged pipe.

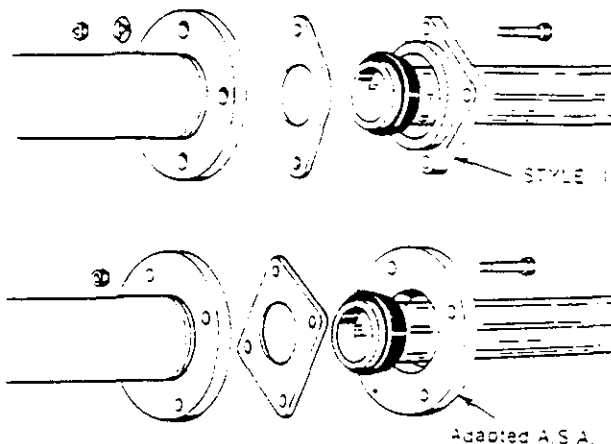
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule to the tubing end.



### Glass to A.S.A. Flange

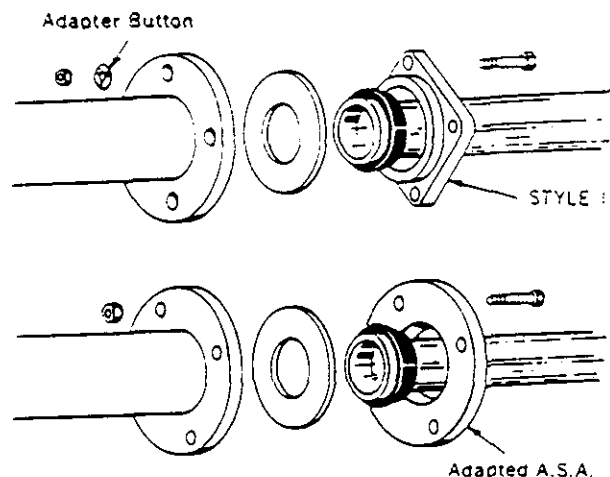
Glass can be mated to A.S.A. flanges by means of a Style I cast iron flange (all sizes have A.S.A. Bolt Circles), an adapted A.S.A. flange #7160 (1", 1 1/2", 2" and 3" diameters only), or a 4" or 6" diameter Style I aluminum flange which has A.S.A. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.A. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.A. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A TFE covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined TFE envelope.

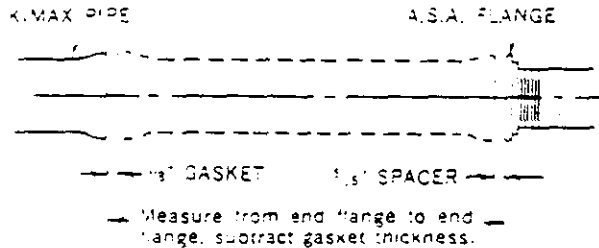
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since KIMAX Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.

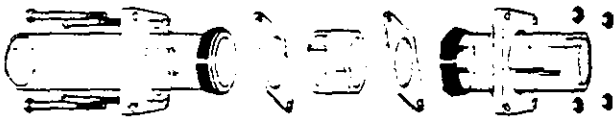


2. **Spacers.** Standard straight spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from  $\frac{1}{2}$ " to 5" except for 6" diameters, available in  $\frac{1}{2}$ " to 2" lengths.

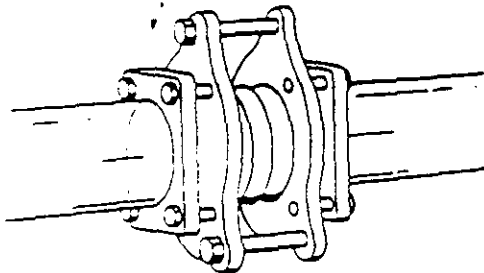
When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.



4. **Field Fabrication**—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—GPD-1066.

## TESTING AND MAINTENANCE

### Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- Shake the line. If the line moves from side to side, it is probably free from bending loads.
- Open a flanged joint. If the flange does not move when bolts are removed, the pipe is not restrained.

### Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

### Causes of Leakage

Persistent leakage is usually due to one of these causes.

1. **Inadequate bolt tightening:** Do not hesitate to "snug" bolts sufficiently.
2. **Misalignment:** Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. **Temperature cycling:** Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

### Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft., 2" dia.) |
|-------------------------------|-------------------------------------------|
| KIMAX Glass                   | 1.10-1.20                                 |
| PVC—Sched. 80                 |                                           |
| Normal and High Impact        | 1.33                                      |
| Hard Rubber                   | 1.33                                      |
| Graphite (impervious)         | 1.10                                      |
| Resin-Bonded Asbestos         | 1.33                                      |
| Stainless Steel (Schedule 40) | 1.33                                      |
| Lead, Extra Light             | 1.30                                      |
| Porcelain                     | 1.15                                      |
| High Silicon Iron             | 1.10                                      |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 22½" L      | 0.5                                    | 0.5  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45" L       | 1.3                                    | 1.3  | 2.5  | 3.8   | 5.0   | 7.5   |
| 60" L       | 2.1                                    | 2.0  | 4.1  | 5.3   | 8.3   | 12.5  |
| 90" L       | 3.0                                    | 2.5  | 5.0  | 7.5   | 10.0  | 15.0  |
| Sweep L     | 1.1                                    | 0.5  | 1.3  | 5.0   | 5.7   | 10.0  |
| Ret. Bend   | 4.0                                    | 5.0  | 3.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.1                                    | 0.5  | 0.3  | 5.0   | 5.7   | 10.0  |
| T (S.O.)    | 5.0                                    | 2.5  | 1.0  | 15.0  | 20.0  | 30.0  |
| T (S.I.)    | 5.0                                    | 3.0  | 1.0  | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2  | 3.0  | 4.5   | 5.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 35.0                                   | 54.0 | 72.0 | 108.0 | 144.0 | 215.0 |

## Operating Temperatures and Pressurest

KIMAX Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult O-I/SCHOTT Process Systems, Inc., Vineland, N.J. 08360.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 25   | 10   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 100        | 75   | 50   |

\*Freezing point of conveyed material should be taken into consideration.

\*NOTE: Gas pressure recommendations: It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Glass Pipe has a thermal expansion of .0022" to 100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Glass           | 1.00                                     |
| Porcelain             | 1.00                                     |
| Graphite (impervious) | 1.00                                     |
| Steel                 | 3.50                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 5.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 15.00<br>High Impact 24.00 |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and T F E covered donut spacers:

## GASKET AND DONUT SPACER THICKNESS

| Material            | Maximum Working Temp., °F. | Pipe Diameter |     |    |    |    |    |
|---------------------|----------------------------|---------------|-----|----|----|----|----|
|                     |                            | 1"            | 1½" | 2" | 3" | 4" | 6" |
| Asbestos, Neoprene  | 400/220                    | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| TFE Envelope        | 450                        | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| Solid Beaded Teflon | 450                        | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| Donut Spacer        | 450                        | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

Typical Area Sketch

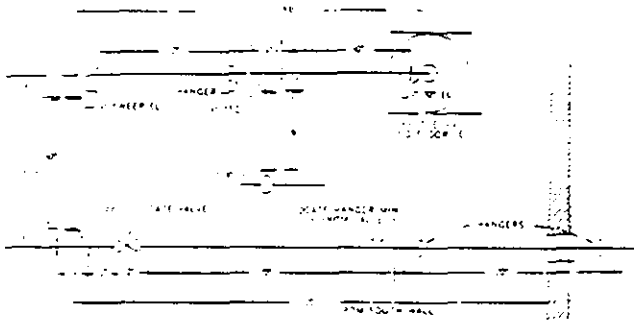


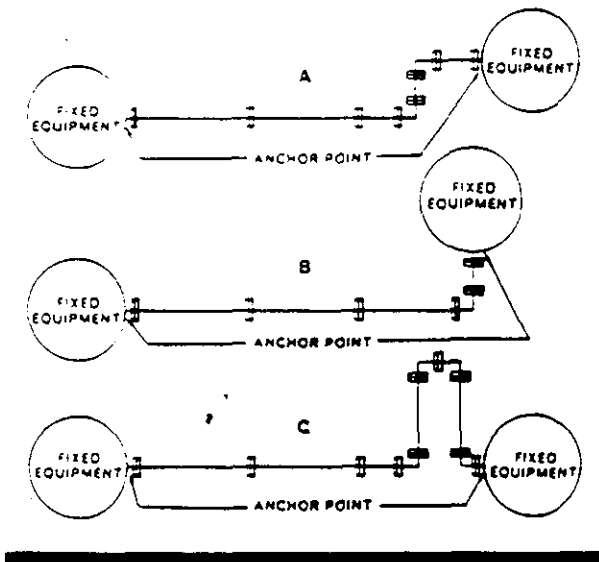
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

A,B,C—Recommended Means



D—Not Recommended

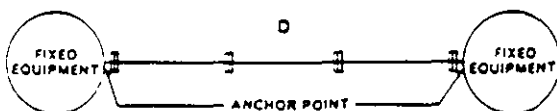


Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 3, page 13.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

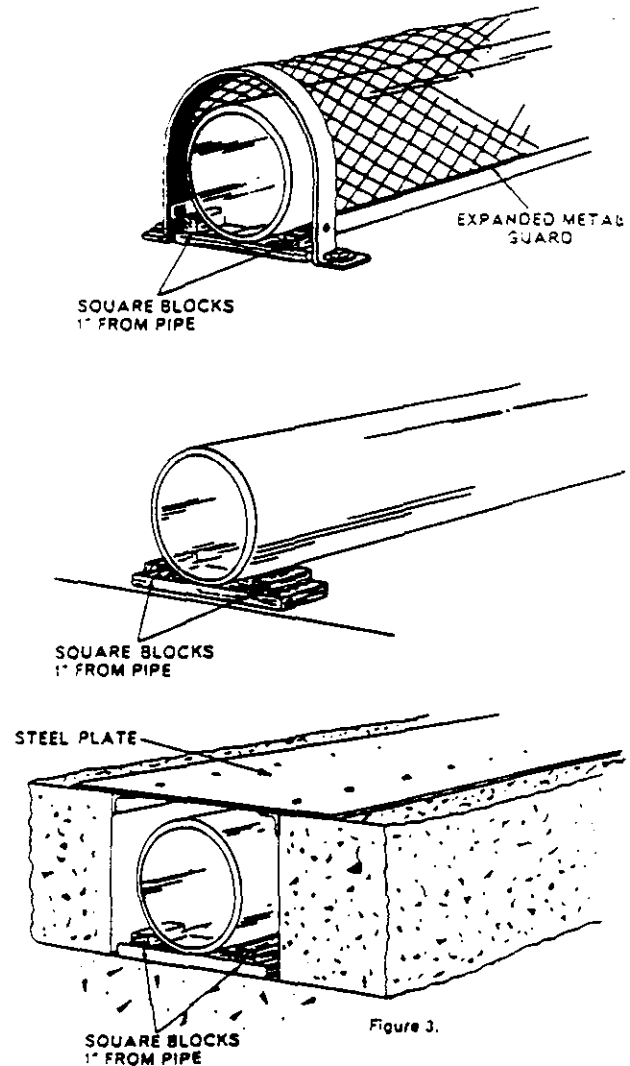
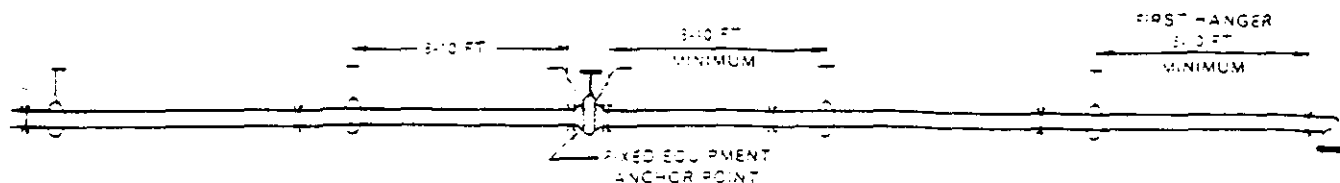


Figure 3.



### Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90 degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 3 feet away from the riser. See Figure 5.

### Pipe Pitch

Normally a pitch of 1/8" per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the fluid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

### Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high-traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

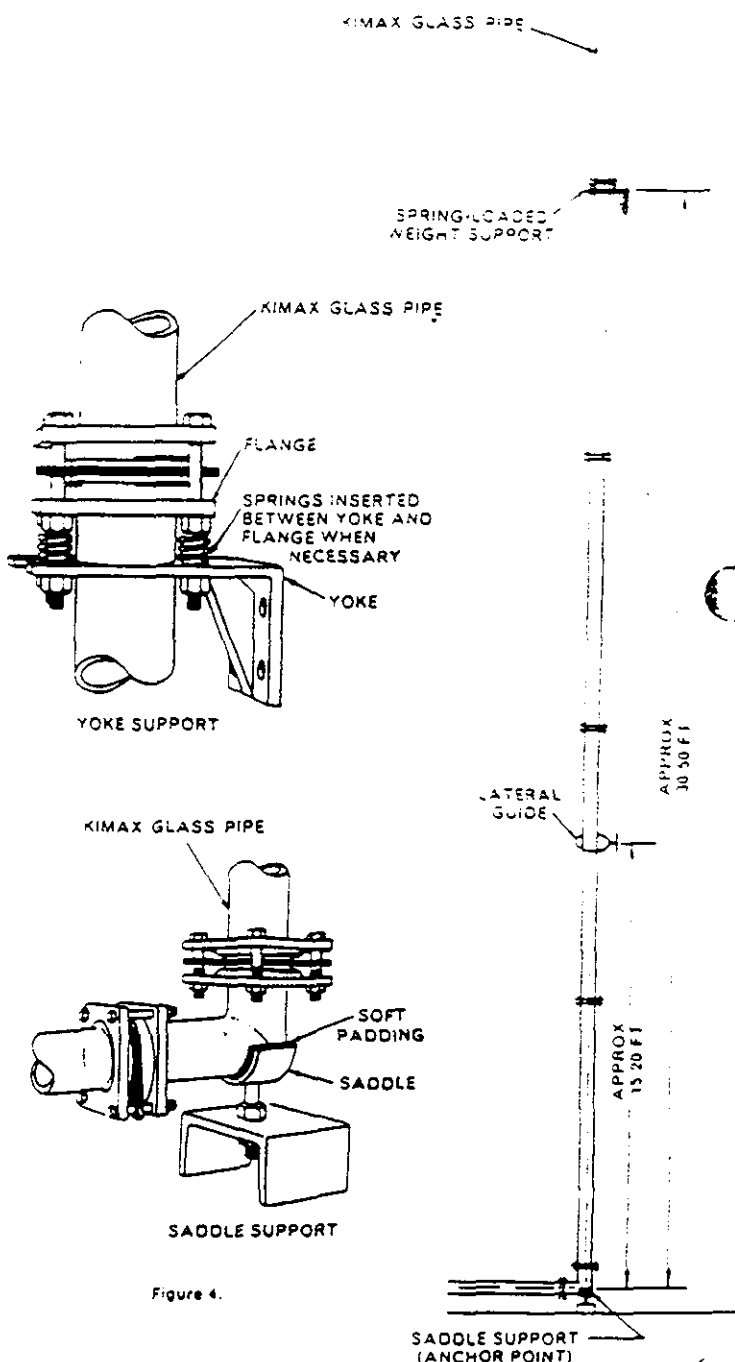


Figure 4.

Figure 5.

Recommended Vertical Line Supports

## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

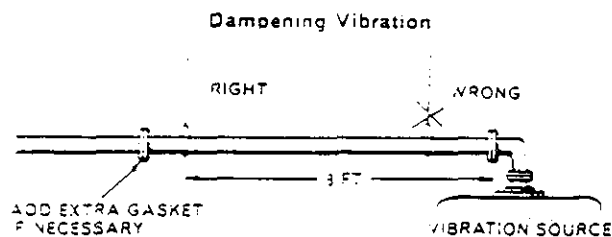


Figure 6.

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1 1/4" pipe; two feet for 2" to 6" pipe. See Figure 7.

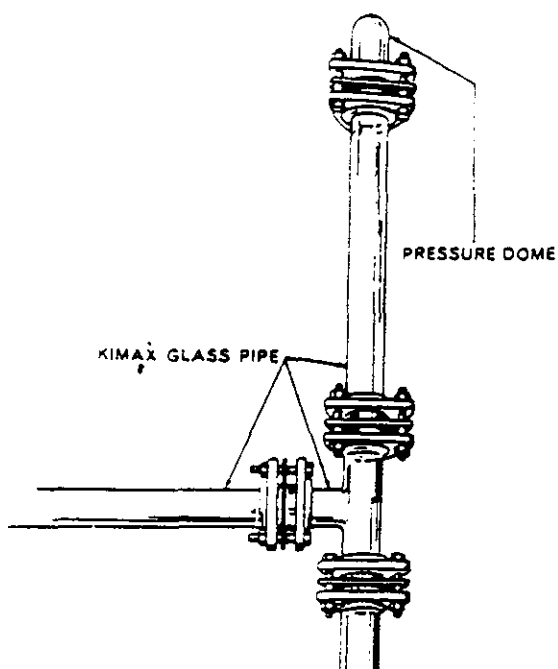


Figure 7.

## Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings, using Style I or Style II flanges. See Figure 8.

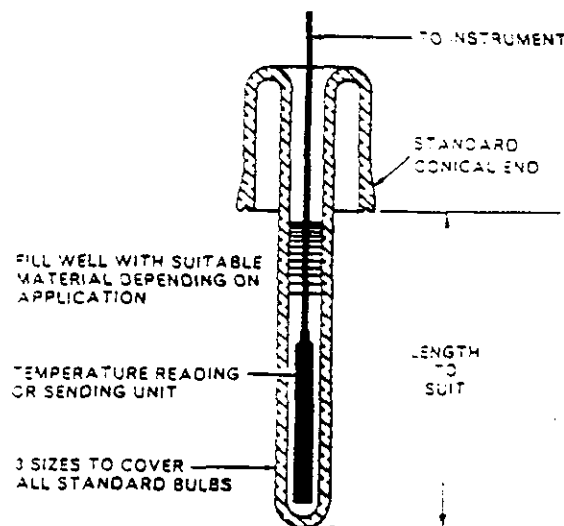


Figure 8.

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.A. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

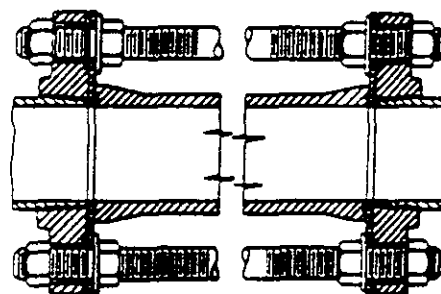


Figure 9.



## Other Products by O-I SCHOTT Process Systems, Inc.

1. Beaded Glass Pipe
2. Beaded Glass Armored Pipe
3. Cer-Vit Ball Valves
4. Complete Pre-Engineered Glass Plants by Schott
5. KIMAX Heat Exchangers and Pilot Plants
6. Glass Draftline

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Manufactured by

**O-I / SCHOTT**

Process Systems, Inc.

1640 South West Boulevard

P.O. Box T

Vineland, New Jersey 08360-0136

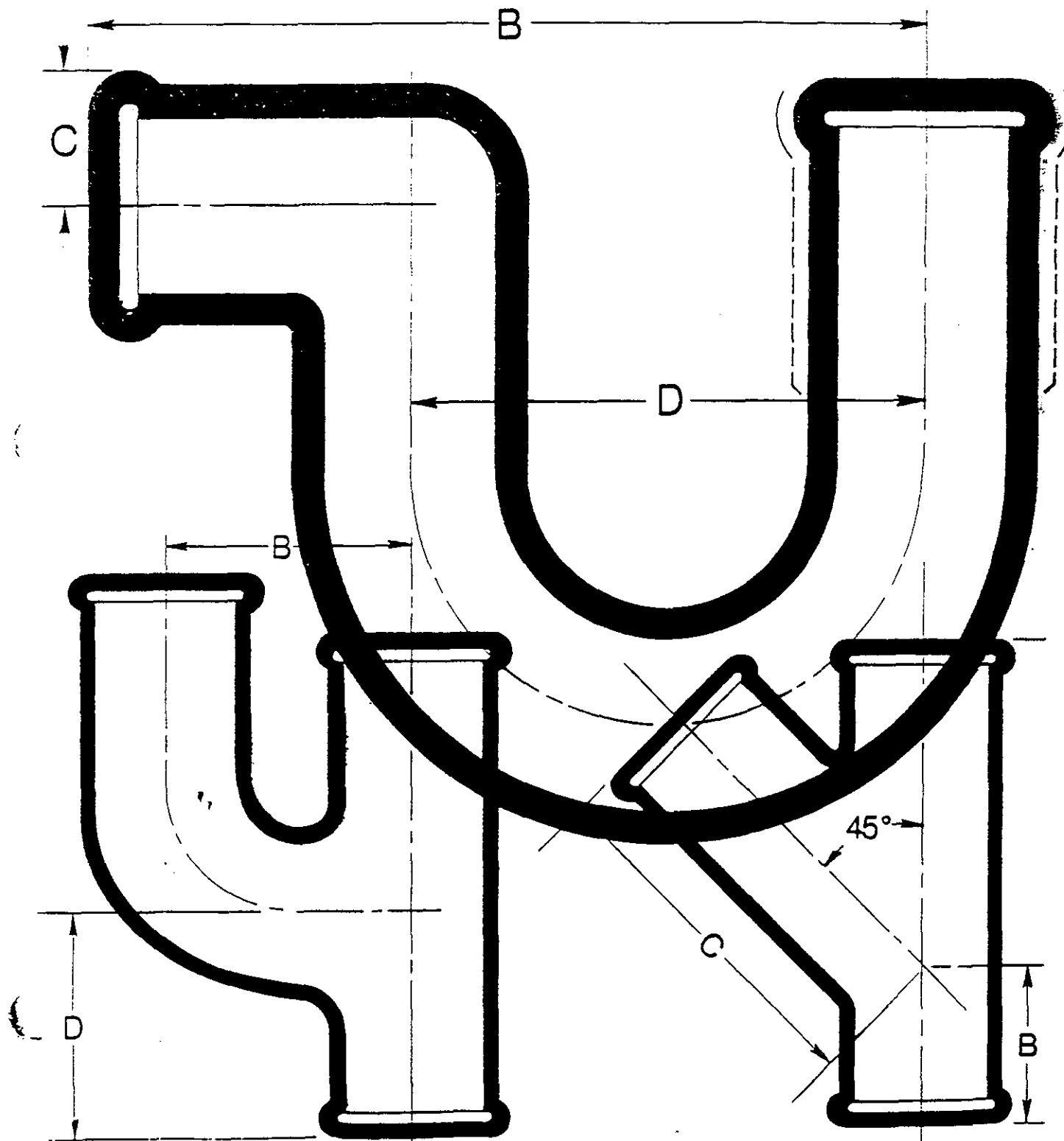
Phone (609) 692-4700

TWX 510-687-8913

OI KIM VINE

## Glass Drainline

CATALOG: C-65-5



## assured maximum corrosion resistance for chemical waste disposal systems

### KIMAX, the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, O-I/Schott has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\* at atmospheric pressure.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manufactured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

**Building Owners:** KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- ☐ KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- ☐ Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- ☐ When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- ☐ All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- ☐ Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- ☐ All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\*For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetrafluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

**Specifier:** Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX glass drainline offers this freedom, confidence and reasonable cost because:

- ☐ All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- ☐ The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- ☐ The light weight of the KIMAX systems requires only 1/2 to 1/3 as many hangers as conventional high silicon iron pipe.
- ☐ Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- ☐ Straight lengths of KIMAX pipe can be field cut to exact length.
- ☐ KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

### Installation advantages:

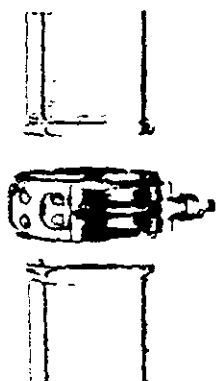
Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual FPS-650-1. O-I/Schott sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installation. KIMAX Drainline systems do provide certain installation advantages which are:

**Leak-Free Joint Assembly:** The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos). The coupling permits the joint to be deflected up to 4°.

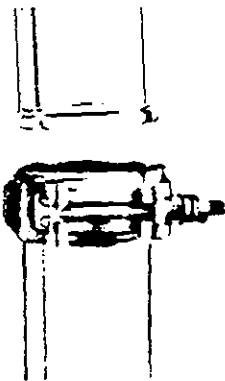
**Field Fabrication:** KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the B/P (bead to plain end) coupling system.

**Minimum Number of Hangers:** KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.

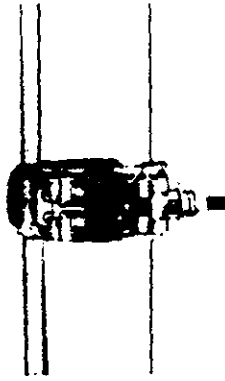
**NOTE:** Gas pressure recommendations: It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.



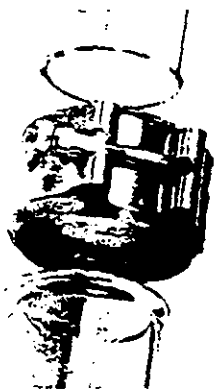
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3



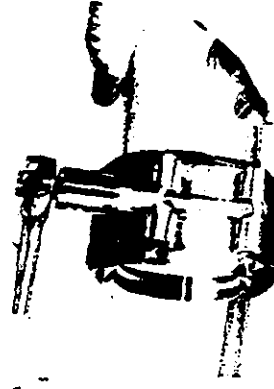
KIMAX  
Bead to Bead  
Drainline  
Coupling



2



3



KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling

# Other Kimax installation advantages include:

**Below Ground Burial:** KIMAX Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a protective casing of thick expanded polystyrene. For recommended installation procedures of KIMAX Drainline see Installation Manual FPS-650-1. Shown here is an example of KIMAX Drainline as installed underground.



**Adaptation to Other Materials:** KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 25.

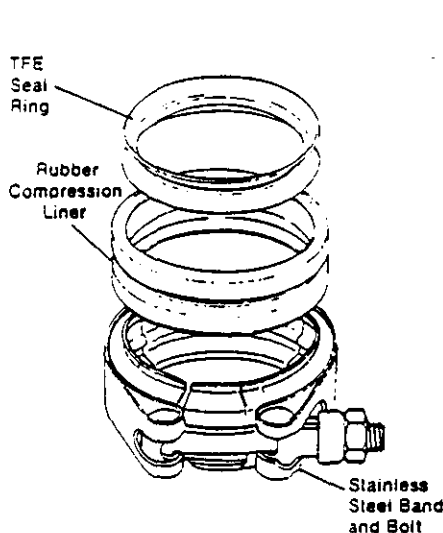
**Easily Handled:** KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

KIMAX Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem.

It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and bio-chemistry laboratories; veterinary and medical colleges, research, and other institutional laboratories.

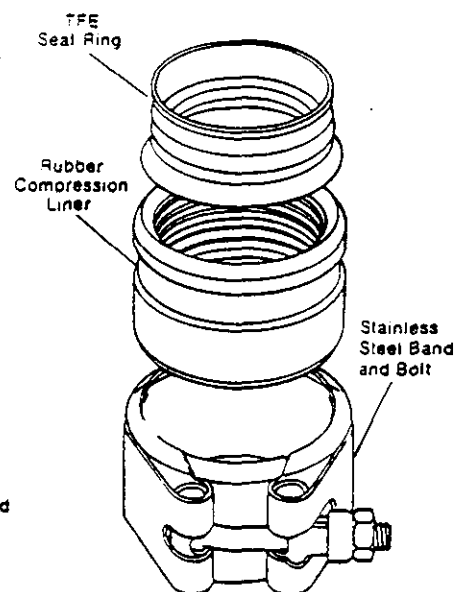
KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants... wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints



### KIMAX Drainline Coupling (Bead to Bead):

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoro-ethylene provide the required joint seal. Assembly of joint is simple... place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.



### KIMAX B/P Drainline Coupling (Beaded to Plain End):

The KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of KIMAX glass drainline straight lengths.

# Guide Specifications

## Long form:

### ACID WASTE DRAINLINE

#### I. General

A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of borosilicate glass conforming to Federal Specification DD-G-541B and Military Specification MIL-P-22561B (YD) as manufactured under the trade name "KIMAX" by O-I/Schott.

B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include protected pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.

C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

#### II. Connections

A. Glass-to-glass connections shall be made with KIMAX compression type couplings, Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Seal ring gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.

B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

#### III. Protection of Pipe

A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.

B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.

C. Glass pipe shall be protected against all weld spatter.

#### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

#### V. Underground Pipe

A. Excavation—shall conform to National Plumbing Code A 40.8 Section 2.7.

1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
2. At least 4" of properly compacted sand or rock free soil shall be used directly under the pipe.

#### B. Buried Pipe

1. Straight lengths shall be protected in expanded polystyrene casing.
2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.

#### C. Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

#### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## Short form:

### ACID WASTE DRAINLINE

This system shall be made of KIMAX borosilicate glass and conforming to Federal Specification DD-G-541-B and Military Specification MIL-P-22561-B (YD) as manufactured by O-I/Schott. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetra-fluoroethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

Note: Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of rock-free sand or soil compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendations.

KIMAX protected pipe, and wrapped fittings shall be installed and back filled in accordance with the manufacturer's instructions and governing plumbing code.

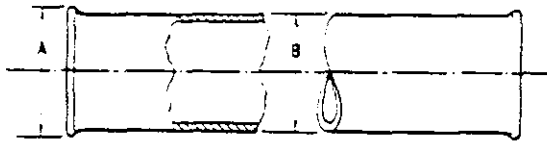
# pipe and fittings

## Straight Lengths—Pipe

Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

6500 5-ft. lengths

6501 10-ft. lengths

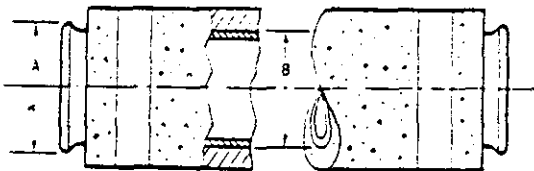


| Size | Weight<br>lb./ft. | A    | B (O.D.) | 5 ft. lengths<br>Art. No. | 10 ft. lengths<br>Art. No. |
|------|-------------------|------|----------|---------------------------|----------------------------|
| 1½   | 0.87              | 2.06 | 1.34     | 6500- 1500                | 6501- 1500                 |
| 2    | 1.1               | 2.58 | 2.34     | 2000                      | 2000                       |
| 3    | 2.0               | 3.69 | 3.41     | 3000                      | 3000                       |
| 4    | 3.4               | 4.84 | 4.53     | 4000                      | 4000                       |
| 6    | 6.3               | 7.12 | 6.66     | 6000                      | 6000                       |

## 6502—EPS\* Covered

5-ft. lengths (for underground use)

6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.



\*Expanded Polystyrene

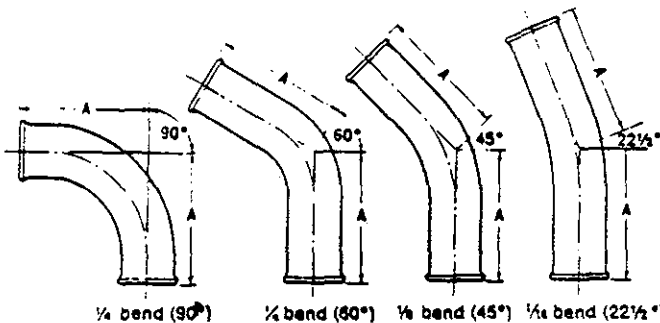
EPS Covered Art. No.      Beaded one end only Art. No.

|            |             |
|------------|-------------|
| 6502- 1500 | 6504- 1500† |
| 2000       | 2000†       |
| 3000       | 3000†       |
| 4000       | 4000†       |
| 6000       | 6000†       |

## 6504—Beaded one end only

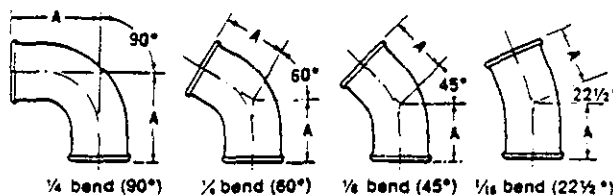
6504 pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 8" of bead.

## 6511—Sweeps



| Size | A  | 90°<br>Art. No. | 60°<br>Art. No. | 45°<br>Art. No. | 22½°<br>Art. No. |
|------|----|-----------------|-----------------|-----------------|------------------|
| 1½   | 4½ | 6511- 1590      | 6511- 1560      | 6511- 1545      | 6511- 1522       |
| 2    | 5  | 2090            | 2060            | 2045            | 2022†            |
| 3    | 6½ | 3090            | 3060†           | 3045            | 3022†            |
| 4    | 9  | 4090            | 4060†           | 4045            | 4022†            |
| 6    | 12 | 6090            | 6060†           | 6045            | 6022†            |

## 6513—Bends



| Size            | A<br>90° | A<br>60°         | A<br>45° | A<br>22½° | 90°<br>Art. No. | 60°<br>Art. No. |
|-----------------|----------|------------------|----------|-----------|-----------------|-----------------|
| 1½              | 3        | 2½               | 2        | 2         | 6513- 1590      | 6513- 1560      |
| 2               | 3½       | 2½               | 2½       | 2½        | 2090            | 2060            |
| 3               | 5        | 3½               | 2½       | 2½        | 3090            | 3060†           |
| 4               | 7        | 4½               | 3½       | 3½        | 4090            | 4060†           |
| 6               | —        | —                | 7        | —         |                 |                 |
| 45°<br>Art. No. |          | 22½°<br>Art. No. |          |           |                 |                 |
| 6513- 1545      |          | 6513- 1522       |          |           |                 |                 |
| 2045            |          | 2022             |          |           |                 |                 |
| 3045            |          | 3022†            |          |           |                 |                 |
| 4045            |          | 4022†            |          |           |                 |                 |
| 6045            |          |                  |          |           |                 |                 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

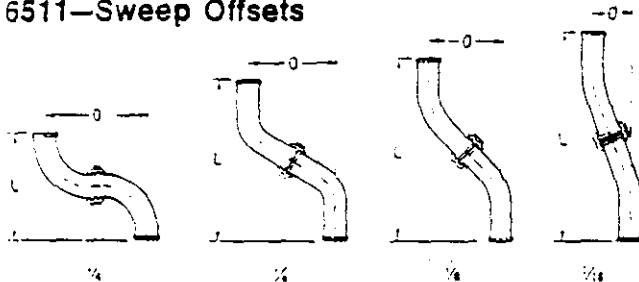
†Manufactured per order. Not returnable.

# pipe and fittings

## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

### 6511—Sweep Offsets



| Size  | 1/4 |    | 1/2    |        | 3/4    |        | 1 1/4  |       |
|-------|-----|----|--------|--------|--------|--------|--------|-------|
|       | L   | O  | L      | O      | L      | O      | L      | O     |
| 1 1/2 | 9   | 9  | 13 1/2 | 7 3/8  | 15 3/4 | 5 1/2  | 17 3/4 | 3 3/8 |
| 2     | 10  | 10 | 15     | 8 3/4  | 17 1/2 | 7 1/2  | 19 1/4 | 3 3/8 |
| 3     | 13  | 13 | 19 1/2 | 11 1/4 | 22 1/4 | 9 1/4  | 25     | 5     |
| 4     | 18  | 18 | 27     | 15 3/8 | 30 3/4 | 12 1/2 | 34 1/8 | 6 3/8 |
| 6     | 24  | 24 | 36     | 20 3/4 | 41     | 17     | 46 1/4 | 9 1/4 |

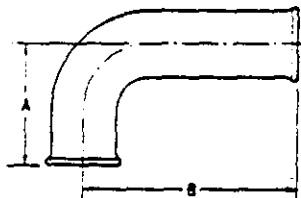
### 6513—Bend Offsets



| Size  | 1/4   |       | 1/2    |       | 3/4    |       | 1 1/4  |       |
|-------|-------|-------|--------|-------|--------|-------|--------|-------|
|       | L     | O     | L      | O     | L      | O     | L      | O     |
| 1 1/2 | 6     | 6     | 7 1/2  | 4 1/8 | 8 3/4  | 2 7/8 | 7 3/4  | 1 1/2 |
| 2     | 6 1/2 | 6 1/2 | 8 3/4  | 4 3/4 | 7 3/4  | 3 1/4 | 8 3/4  | 1 3/4 |
| 3     | 10    | 10    | 10 1/2 | 6 1/4 | 9 3/4  | 3 3/8 | 10 1/2 | 2 1/8 |
| 4     | 14    | 14    | 13 1/2 | 7 3/8 | 11 1/4 | 4 3/8 | 10 3/4 | 2 1/2 |

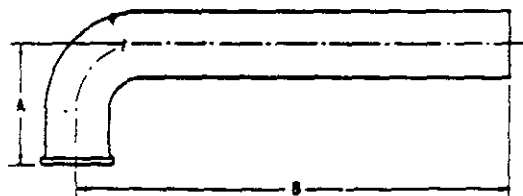
## Special Purpose Bends

### 6512 Long 90°



| 6512      |       |       | Art. No.           |
|-----------|-------|-------|--------------------|
| Size      | A     | B     |                    |
| 1 1/2-90° | 3 3/8 | 6     | 6512- 1590<br>2090 |
| 2-90°     | 3 3/8 | 7 1/2 |                    |

### 6512P\* (Annealed) Plain End

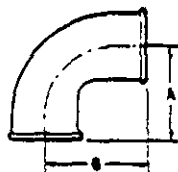


\*Can be field cut.

| 6512P*    |       |    | Art. No.            |
|-----------|-------|----|---------------------|
| Size      | A     | B  |                     |
| 1 1/2-90° | 3 3/8 | 12 | 6512P- 1590<br>2090 |
| 2-90°     | 3 3/8 | 12 |                     |

\*Can be field cut.

### 6514 Short 90°



| 6514      |       |   | Art. No.   |
|-----------|-------|---|------------|
| Size      | A     | B |            |
| 1 1/2-90° | 2 1/2 | 3 | 6514- 1590 |

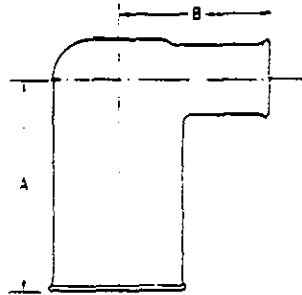
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.



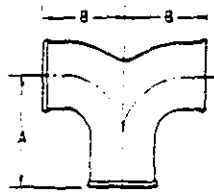
# pipe and fittings

## 6518—Quarter Bend Reducer



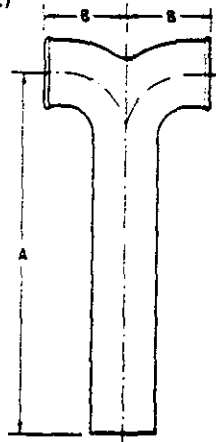
| Size   | A | B  | Art. No.  |
|--------|---|----|-----------|
| 2 x 1½ | 4 | 3½ | 6518-2015 |
| 3 x 1½ | 5 | 4  | 3015      |
| 3 x 2  | 5 | 4½ | 3020      |
| 4 x 1½ | 7 | 4½ | 4015 †    |
| 4 x 2  | 7 | 5  | 4020 †    |
| 4 x 3  | 7 | 5½ | 4030 †    |
| 6 x 1½ | 9 | 5½ | 6015 †    |
| 6 x 2  | 9 | 6  | 6020 †    |
| 6 x 3  | 9 | 6½ | 6030 †    |
| 6 x 4  | 9 | 8  | 6040 †    |

## 6519—Double Quarter Bend



| Size         | A  | B  | Art. No.  |
|--------------|----|----|-----------|
| 1½           | 3  | 2½ | 6519-1500 |
| **2 x 2 x 1½ | 3¼ | 2¼ | **2015 †  |
| 2            | 3½ | 2¼ | 2020      |
| 3            | 5  | 4½ | 3000      |
| 4            | 6½ | 5¾ | 4000 †    |
| 6            | 8½ | 7  | 6000 †    |

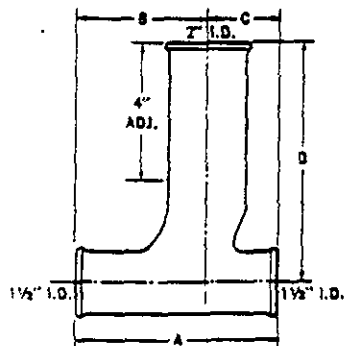
## 6519P—Double Quarter Bend (Plain End Outlet)\*



| Size         | A  | B  | Art. No.   |
|--------------|----|----|------------|
| 1½           | 10 | 2¼ | 6519P-1500 |
| **2 x 2 x 1½ | 10 | 2¼ | **2015 †   |
| 2            | 10 | 2¼ | 2020 †     |
| 3            |    |    |            |
| 4            |    |    |            |
| 6            |    |    |            |

\* Can be field cut.  
\*\* Branch is 1½".

## 6520—Adjustable Sanitary T (One Adjustable Inlet)



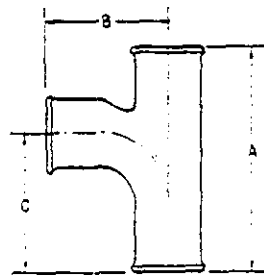
| Size        | A | B     | C     | D | Art. No.  |
|-------------|---|-------|-------|---|-----------|
| 1½ x 1½ x 2 | 6 | 3-7/8 | 2-1/8 | 7 | 6520-1520 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

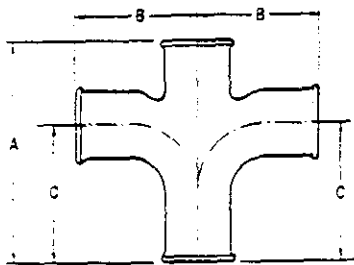
† Manufactured per order. Not returnable.

# pipe and fittings

6521—Single Sanitary T

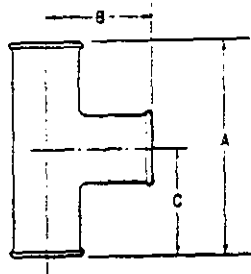


6522—Double



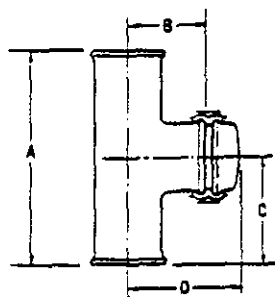
| Size    | A  | B  | C   | Single<br>Art. No. | Double<br>Art. No. |
|---------|----|----|-----|--------------------|--------------------|
| 1½ x 1½ | 6  | 3½ | 3½  | 6521-1515          | 6522-1515          |
| 2 x 1½  | 8  | 3½ | 5   | 2015               | 2015               |
| 2 x 2   | 8  | 4½ | 5   | 2020               | 2020               |
| 3 x 1½  | 12 | 4½ | 7½  | 3015               | 3015†              |
| 3 x 2   | 12 | 5  | 7½  | 3020               | 3020               |
| 3 x 3   | 12 | 6½ | 7½  | 3030               | 3030               |
| 4 x 1½  | 14 | 4½ | 8½  | 4015               | 4015†              |
| 4 x 2   | 14 | 5½ | 8½  | 4020               | 4020               |
| 4 x 3   | 14 | 7  | 8½  | 4030               | 4030†              |
| 4 x 4   | 14 | 8½ | 9½  | 4040               | 4040               |
| 6 x 2   | 20 | 6½ | 12½ | 6020†              | 6020†              |
| 6 x 3   | 20 | 8  | 12½ | 6030†              | 6030†              |
| 6 x 4   | 20 | 9½ | 12½ | 6040               | 6040†              |
| 6 x 6   | 20 | 12 | 12½ | 6060               | 6060†              |

6523—Straight T



| Size    | A  | B  | C  | Art. No.  |
|---------|----|----|----|-----------|
| 1½ x 1½ | 6  | 3  | 3  | 6523-1515 |
| 2 x 1½  | 8  | 3½ | 4  | 2015      |
| 2 x 2   | 8  | 4  | 4  | 2020      |
| 3 x 1½  | 12 | 4½ | 6  | 3015      |
| 3 x 2   | 12 | 4½ | 6  | 3020      |
| 3 x 3   | 12 | 6  | 6  | 3030      |
| 4 x 1½  | 14 | 5  | 7  | 4015†     |
| 4 x 2   | 14 | 5  | 7  | 4020      |
| 4 x 3   | 14 | 6½ | 7  | 4030†     |
| 4 x 4   | 14 | 8  | 7  | 4040      |
| 6 x 3   | 20 | 7½ | 10 | 6030†     |
| 6 x 4   | 20 | 9  | 10 | 6040†     |
| 6 x 6   | 20 | 10 | 10 | 6060      |

6524—Test T with cleanout



| Size    | A  | B  | C | D  | Art. No.  |
|---------|----|----|---|----|-----------|
| 1½ x 1½ | 6  | 2½ | 3 | 3½ | 6524-1515 |
| 2 x 2   | 8  | 2½ | 4 | 3½ | 2020      |
| 3 x 3   | 12 | 3½ | 6 | 4½ | 3030      |
| 4 x 4   | 14 | 4½ | 7 | 5½ | 4040      |

Test Tee and cleanout comes as complete assembly including cap and coupling.

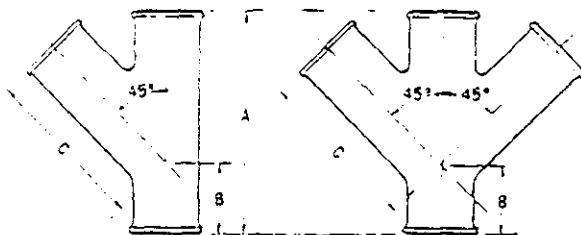
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

Drainline Y  
6526—Single

6527—Double

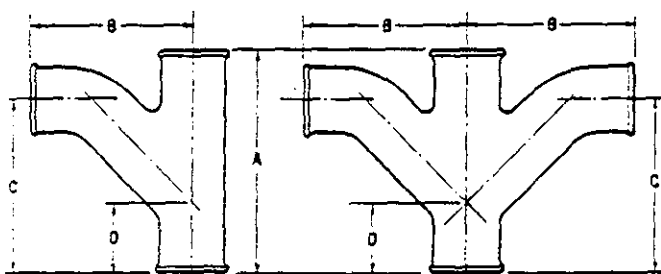


| Size          | A  | B     | C      | Single Y<br>Art. No. | Double Y<br>Art. No. |
|---------------|----|-------|--------|----------------------|----------------------|
| 1 1/2 x 1 1/2 | 6  | 1 3/4 | 4 1/2  | 6526-1515            | 6527-1515            |
| 2 x 1 1/2     | 8  | 2 1/2 | 5 1/2  | -2015                | -2015†               |
| 2 x 2         | 8  | 2 1/2 | 6      | -2020                | -2020                |
| 3 x 1 1/2     | 12 | 3 3/4 | 5 1/2  | -3015                | -3015†               |
| 3 x 2         | 12 | 3 3/4 | 6 3/4  | -3020                | -3020                |
| 3 x 3         | 12 | 3 3/4 | 8      | -3030                | -3030                |
| 4 x 1 1/2     | 14 | 4 1/2 | 5 3/4  | -4015                | -4015†               |
| 4 x 2         | 14 | 4 1/2 | 7 1/2  | -4020                | -4020†               |
| 4 x 3         | 14 | 4 1/2 | 8 3/4  | -4030                | -4030                |
| 4 x 4         | 14 | 4 1/2 | 10     | -4040                | -4040                |
| 6 x 2         | 20 | 5 3/4 | 9      | -6020†               | -6020†               |
| 6 x 3         | 20 | 5 3/4 | 10 3/4 | -6030                | -6030†               |
| 6 x 4         | 20 | 5 3/4 | 11 1/2 | -6040                | -6040†               |
| 6 x 6         | 20 | 5 3/4 | 14     | -6060                | -6060†               |

Combination Y and 1/8 Bend

6528—Single

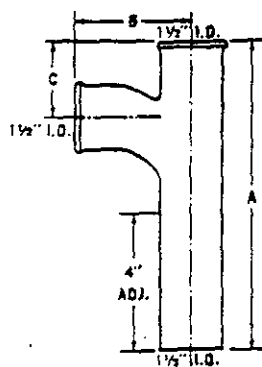
6529—Double



| Size          | A  | B     | C      | D     | Single<br>Art. No. | Double<br>Art. No. |
|---------------|----|-------|--------|-------|--------------------|--------------------|
| 1 1/2 x 1 1/2 | 6  | 4 1/2 | 4 3/4  | 1 3/8 | 6528-1515          | 6529-1515          |
| 2 x 1 1/2     | 8  | 4 3/4 | 5 1/2  | 2 1/2 | -2015              | -2015              |
| 2 x 2         | 8  | 6     | 6 1/4  | 2 1/2 | -2020              | -2020              |
| 3 x 1 1/2     | 12 | 5 3/4 | 7 1/4  | 3 3/4 | -3015              | -3015              |
| 3 x 2         | 12 | 6 1/2 | 8      | 3 3/4 | -3020              | -3020              |
| 3 x 3         | 12 | 8 1/2 | 9      | 3 3/4 | -3030              | -3030              |
| 4 x 1 1/2     | 14 | 6     | 8 1/2  | 4 1/2 | -4015              | -4015†             |
| 4 x 2         | 14 | 7     | 9 1/4  | 4 1/2 | -4020              | -4020              |
| 4 x 3         | 14 | 9     | 10 1/4 | 4 1/2 | -4030              | -4030              |
| 4 x 4         | 14 | 11    | 11     | 4 1/2 | -4040              | -4040              |
| 6 x 2         | 20 | 8 3/4 | 11 3/4 | 5 3/4 | -6020†             | -6020†             |
| 6 x 3         | 20 | 10    | 12 1/2 | 5 3/4 | -6030              | -6030†             |
| 6 x 4         | 20 | 12    | 13 1/2 | 5 3/4 | -6040              | -6040†             |
| 6 x 6         | 20 | 15    | 14 1/2 | 5 3/4 | -6060              | -6060†             |

6530 Adjustable Sanitary T

(Plain End Outlet) \*



| Size                  | A     | B     | C     | Art. No.  |
|-----------------------|-------|-------|-------|-----------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 3/4 | 3 1/2 | 3 1/2 | 6530-1515 |

\* Can be field cut.

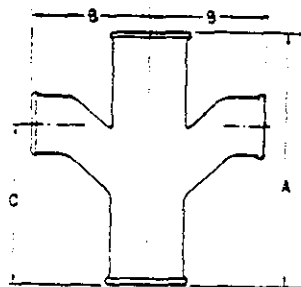
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

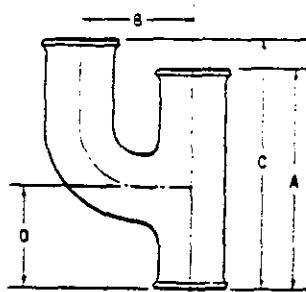
## 6531 Partition Cross (Compact)

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.



| Size             | A | B  | C | Art. No.   |
|------------------|---|----|---|------------|
| 2 x 1½           | 8 | 3½ | 5 | 6531-2015† |
| 3 x 2            | 8 | 4½ | 5 | -2020†     |
| 2 x 1½ x 1½ x 1½ | 8 | 3½ | 5 | -2151      |

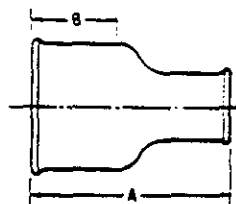
## 6532—Single Upright Y or H (vent branch)



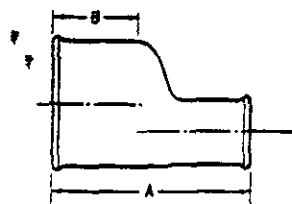
| Size    | A  | B  | C*  | D  | Art. No.   |
|---------|----|----|-----|----|------------|
| 1½ x 1½ | 6  | 3  | 6½  | 2½ | 6532-1515† |
| 2 x 1½  | 8  | 3½ | 7½  | 3½ | -2015      |
| 3 x 2   | 8  | 4  | 8½  | 3½ | -2020†     |
| 3 x 1½  | 12 | 3½ | 9½  | 4½ | -3015†     |
| 3 x 2   | 12 | 4½ | 10½ | 4½ | -3020†     |
| 3 x 3   | 12 | 6  | 13  | 5½ | -3030†     |
| 4 x 1½  | 14 | 4½ | 10½ | 5½ | -4015†     |
| 4 x 2   | 14 | 5  | 12  | 5½ | -4020†     |
| 4 x 3   | 14 | 6½ | 14½ | 6½ | -4030†     |
| 4 x 4   | 14 | 8  | 16½ | 6½ | -4040†     |
| 6 x 3   | 20 | 7½ | 16½ | 7½ | -6030†     |
| 6 x 4   | 20 | 9  | 19  | 8  | -6040†     |
| 6 x 6   | 20 | 12 | 24  | 12 | -6060†     |

\*"C" dimension may be longer or shorter than "A"

## 6536—Straight Reducers or Increases

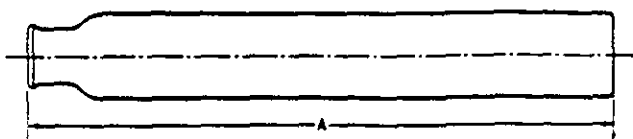


## 6537—Eccentric Reducers or Increases



| Size   | A | B (min.) | Straight Art. No. | Eccentric Art. No. |
|--------|---|----------|-------------------|--------------------|
| 2 x 1½ | 4 | 1¾       | 6536-2015         | 6537-2015          |
| 3 x 1½ | 5 | 2¾       | -3015             | -3015              |
| 3 x 2  | 5 | 2¾       | -3020             | -3020              |
| 4 x 1½ | 7 | 3        | -4015             | -4015†             |
| 4 x 2  | 7 | 3        | -4020             | -4020†             |
| 4 x 3  | 7 | 3        | -4030             | -4030†             |
| 6 x 1½ | 9 | 4        | -6015†            | -6015†             |
| 6 x 2  | 9 | 4        | -6020†            | -6020†             |
| 6 x 3  | 9 | 4        | -6030             | -6030†             |
| 6 x 4  | 9 | 4        | -6040             | -6040†             |

## 6540 Vent Increases



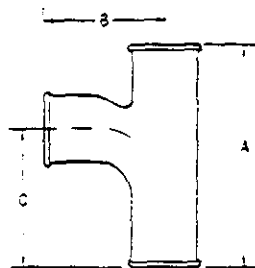
| Size   | A  | Art. No.   |
|--------|----|------------|
| 1½ x 3 | 22 | 6540-1530† |
| 2 x 3  | 22 | -2030      |
| 3 x 4  | 22 | -3040†     |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

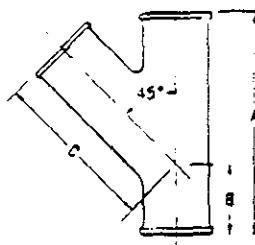
# pipe and fittings compact fittings

## 6541 Single Sanitary T



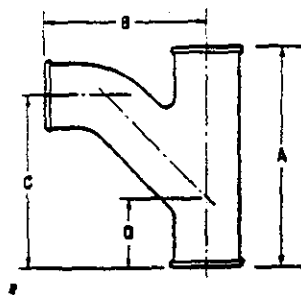
| Size    | A  | B  | C  | Art. No.   |
|---------|----|----|----|------------|
| 1½ x 1½ | 4½ | 2½ | 2½ | 6541- 1515 |
| 2 x 1½  | 4¾ | 2¾ | 2¾ | 2015       |
| 2 x 2   | 5½ | 3½ | 3½ | 2020       |
| 3 x 2   | 9  | 4½ | 5½ | 3020       |
| 3 x 3   | 9  | 4½ | 5½ | 3030       |
| 4 x 1½  | 10 | 4½ | 6½ | 4015†      |
| 4 x 2   | 10 | 4½ | 6½ | 4020†      |
| 4 x 3   | 10 | 5½ | 6½ | 4030       |
| 4 x 4   | 10 | 5½ | 6½ | 4040       |
| 6 x 2   | 16 | 5½ | 9½ | 6020†      |
| 6 x 3   | 16 | 6½ | 9½ | 6030†      |
| 6 x 4   | 16 | 7½ | 9½ | 6040†      |
| 6 x 6   | 16 | 9½ | 9½ | 6060†      |

## 6546 Single Drainline Y



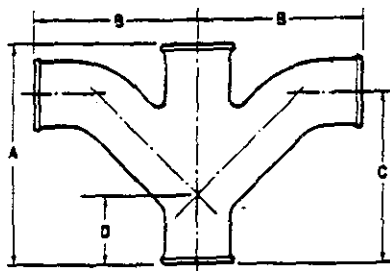
| Size    | A  | B  | C   | Art. No.   |
|---------|----|----|-----|------------|
| 1½ x 1½ | 5½ | 1½ | 4   | 6546- 1515 |
| 2 x 2   | 5¾ | 1½ | 4½  | 2020       |
| 3 x 2   | 9  | 2½ | 6½  | 3020       |
| 3 x 3   | 9  | 2½ | 7½  | 3030       |
| 4 x 1½  | 10 | 3½ | 6½  | 4015†      |
| 4 x 2   | 10 | 2½ | 7½  | 4020       |
| 4 x 3   | 10 | 2  | 8½  | 4030†      |
| 4 x 4   | 10 | 2  | 8½  | 4040       |
| 6 x 2   | 16 | 4½ | 9½  | 6020†      |
| 6 x 3   | 16 | 5½ | 10½ | 6030†      |
| 6 x 4   | 16 | 4½ | 11½ | 6040†      |
| 6 x 6   | 16 | 4½ | 12½ | 6060†      |

## 6548 Combination Y and ½ Bend



| Size   | A  | B   | C   | D  |
|--------|----|-----|-----|----|
| 2 x 1½ | 5½ | 3¾  | 3¾  | 1¾ |
| 2 x 2  | 6  | 4¾  | 4¾  | 1½ |
| 3 x 2  | 9  | 6½  | 6½  | 2¾ |
| 3 x 3  | 9  | 6½  | 6½  | 2½ |
| 4 x 1½ | 10 | 5½  | 6½  | 2¾ |
| 4 x 2  | 10 | 5½  | 6½  | 2¾ |
| 4 x 3  | 10 | 6½  | 7½  | 3½ |
| 4 x 4  | 10 | 6½  | 7½  | 2¾ |
| 6 x 2  | 16 | 7½  | 9½  | 4½ |
| 6 x 3  | 16 | 8½  | 9½  | 4¾ |
| 6 x 4  | 16 | 9½  | 10½ | 4¾ |
| 6 x 6  | 16 | 11½ | 10½ | 3½ |

## 6549 Double Combination Y and ½ Bend



| Single<br>6548<br>Art. No. | Double<br>6549<br>Art. No. |
|----------------------------|----------------------------|
| 6548- 2015                 | 6549- 4015†                |
| 2020                       | 4020                       |
| 3020                       | 4030                       |
| 3030                       | 4040                       |
| 4015†                      | 6020†                      |
| 4020                       | 6030†                      |
| 4030                       | 6040†                      |
| 4040                       | 6060†                      |
| 6020†                      |                            |
| 6030†                      |                            |
| 6040†                      |                            |
| 6060†                      |                            |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

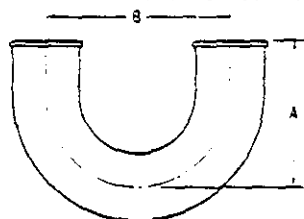
## 6544 Cleanout Plug



| Size  | A     | Art. No.  |
|-------|-------|-----------|
| 1 1/2 | 1     | 5544-1500 |
| 2     | 1     | -2000     |
| 3     | 1 1/8 | -3000     |
| 4     | 1 1/4 | -4000     |
| 5     | 1 1/2 | -6000     |

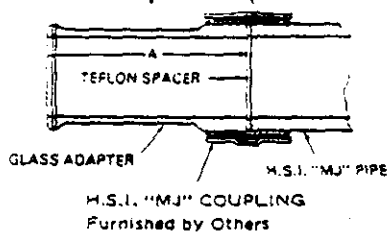
## 6550 U Bend (vent loop)

Note: U bends are often used for vent loops.  
No. 6705 outlets on Swivel "S" Traps are also used as vent loops.



| Size  | A     | B     | Art. No.  |
|-------|-------|-------|-----------|
| 1 1/2 | 4     | 5     | 5550-1500 |
| 2     | 4 1/2 | 5 1/2 | -2000     |
| 3     | 5 1/2 | 6 1/2 | -3000     |
| 4     | 6 1/2 | 7 1/2 | -4000 T   |

## 6566 - "MJ" Pipe Adapter\*



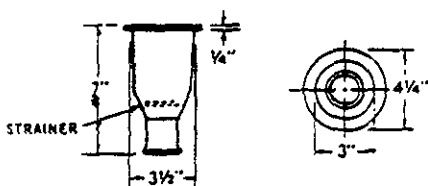
\*6566 "MJ" Pipe Adapter consists of glass adapter and teflon spacer.

### Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | A     | Art. No.  |
|-----------|-------|-----------|
| 1 1/2     | 3 1/2 | 6566-1500 |
| 2         | 4     | -2000     |
| 3         | 5     | -3000     |
| 4         | 6     | -4000     |

# cup sinks

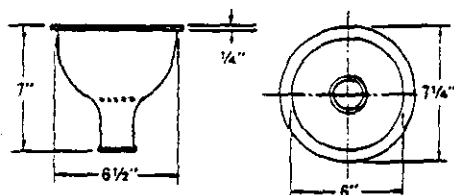
## 6616 Beaded Outlet 3" Hemispherical



No. 6724, 2" sink strainer furnished with all cup sinks. Use No. 6655 adapter coupling (2 x 1-7/8) on plain end outlets to connect to 2" expanded end traps or fittings, or No. 6661 coupling to connect to 1 1/2" beaded end pipe or fitting.

Art. No.  
6616-3000

## 6617 Beaded Outlet 6" Hemispherical



Art. No.  
6617-6000

Use catalog dimensions for piping layout as gasket thickness allowance is included.

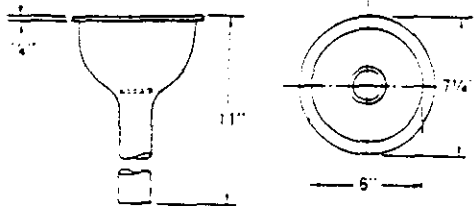
\*Manufactured per order. Not returnable.

# cup sinks

**6617P Plain End Outlet 6" Hemispherical**

Art. No.

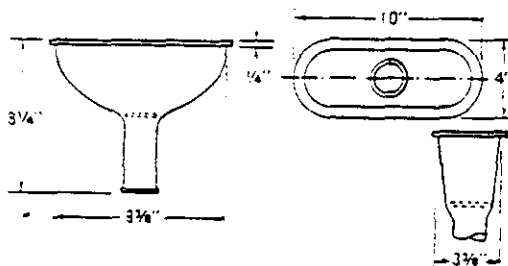
6617P-6011



**6618 Beaded Outlet 3" x 9" Oval**

Art. No.

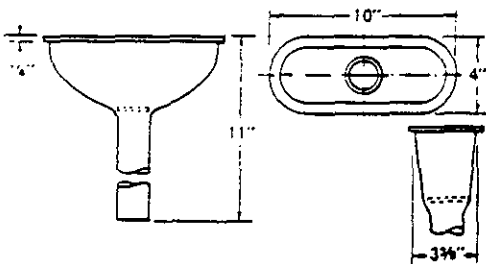
6618-3900



**6618P Plain End Outlet 3" x 9" Oval**

Art. No.

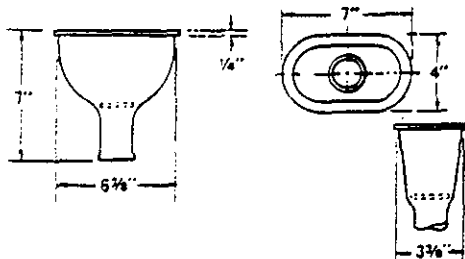
6618P-3911



**6619 Beaded Outlet 3" x 6" Oval**

Art. No.

6619-3600

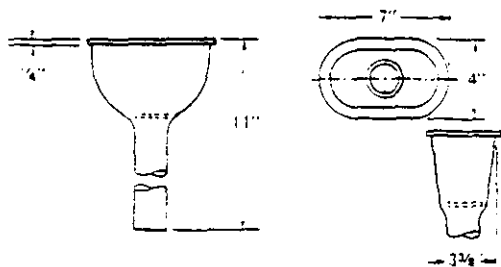


Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

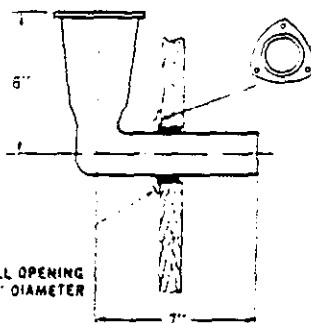
# cup sinks

## 6619P Plain End Outlet 3" x 6" Oval



Art. No.  
6619P-3611

## 6627 3" x 6" Oval Horizontal, Wall Mounted Cup Sink 1 1/2" Plain End Outlet



### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

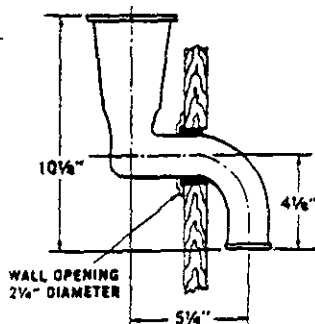
Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet.

Art. No.  
6627-3600

### Components

Art No.  
6621-3600  
6724-2000  
7150-2000  
7204-2015

## 6628 3" x 6" Oval Vertical, 1 1/2" Outlet Wall Mounted Cup Sink



### Vertical Outlet

No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

Mounting bolts or screws to be furnished by installer. For No. 6628 assembly use No. 6650 1 1/2" size KIMAX coupling on outlet.

Art. No.  
6628-3600†

### Components

Art No.  
6629-3600†  
6724-2000  
7150-2000  
7204-2015

## 6724 Sink Strainer (All Cup Sinks)

Size Art No.  
2 6724-2000

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable



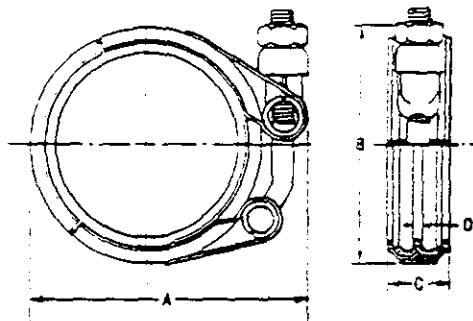
# couplings

## 6650—Drainline Coupling (Bead to Bead)

No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4", and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna-N rubber compression liner with TFE seal ring
- No. 6653 stainless steel bolt
- No. 6664 Silver plated stainless steel hex nut

Patented



| Size | A  | B  | C  | D    | Bolt Size    | Art. No.   |
|------|----|----|----|------|--------------|------------|
| 1½   | 3  | 2½ | 1½ | 3/16 | 1/4 -28 x 2½ | 6650- 1500 |
| 2    | 3½ | 3  | 1½ | 3/16 | 1/4 -28 x 2½ | 2000       |
| 3    | 4½ | 4¼ | 1½ | 3/16 | 1/4 -28 x 2½ | 3000       |
| 4    | 6  | 5¼ | 1½ | 3/16 | 1/4 -28 x 3¼ | 4000       |
| 6    | 8½ | 7¾ | 1½ | 1/4  | 5/16 -24 x 4 | 6000       |

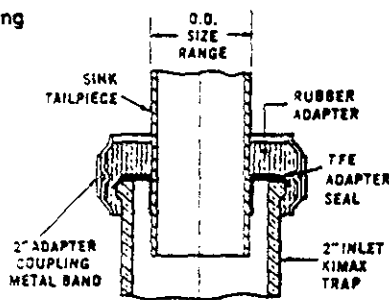
## 6655—Adapter Coupling

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt, ¼ -28 x 2½
- No. 6664 Silver plated stainless steel hex nut

Patent Pending



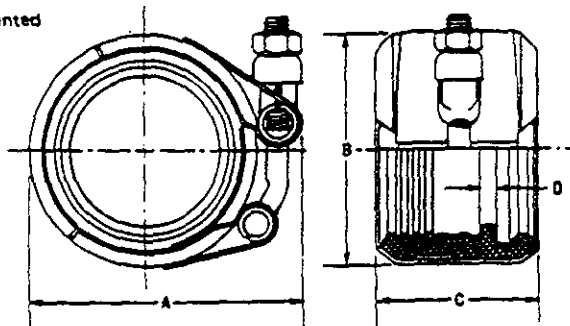
| Size      | Tailpiece Style                                                                                                                                                            | O.D. Size Range | Art. No.   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|
| 2 x 1½    | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                      | 1.48 to 1.53    | 6655- 2015 |
| 2 x 1½    | Lead, Class D or XL tailpiece PYREX tailpiece and cup sink                                                                                                                 | 1.70 to 1.78    | 2017       |
| 2 x 1-7/8 | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Durcon = SO-2<br>Duriron = 11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 1.82 to 1.90    | 2018       |

## 6661—B/P Drainline Coupling (Bead to Plain End)

No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3", 4" or 6" KIMAX beaded glass drainline to plain end (cut) glass pipe; lead, I.P.S. metal, or plastic pipe. This exclusively designed KIMAX drainline coupling consists of the following components:

- No. 6662 stainless steel band with bolt
- No. 6663 Buna-N rubber compression liner with TFE seal ring
- No. 6664 silver plated stainless steel hex nut

Patented



| Size | A  | B  | C  | D    | Bolt Size   | Art. No.   |
|------|----|----|----|------|-------------|------------|
| 1½   | 3  | 2½ | 1½ | 3/16 | 1/4-28      | 6661- 1500 |
| 2    | 3½ | 3  | 1½ | 3/16 | 1/4-28      | 2000       |
| 3    | 4½ | 4¼ | 2½ | 3/16 | 5/16-24     | 3000       |
| 4    | 6  | 5½ | 2½ | 3/16 | 5/16-24 (2) | 4000       |
| 6    | 8½ | 7¾ | 4  | 1/4  | 5/16-24 (2) | 6000       |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

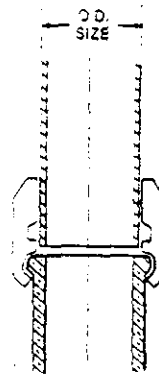
†Manufactured per order. Not returnable.

# couplings

## 6665—Adapter Coupling

Used to join 1½" beaded KIMAX drainline pipe to 1¼" or 1½" O.D. tubing.

Note: Rubber seal only - not recommended where solvents will come in contact with the coupling seal.



| Size    | Tailpiece Style | Art. No.            |
|---------|-----------------|---------------------|
| 1½ x 1¼ | 1¼" O.D. tubing | 6665- 1512†<br>1515 |
| 1½ x 1½ | 1½" O.D. tubing |                     |

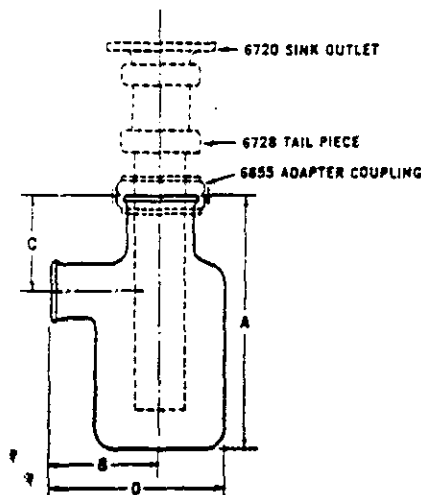
## drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

### 6614—Partition Trap (Consists of Trap Body Only)

Available with 2" inlet only. 1½" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

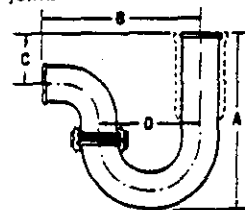
Traps are non-siphoning with partition always visible.  
Traps available with B type cleanout. See Standard Cleanout, Page 21.



| Size<br>Inlet x Outlet | A  | B  | C  | D | Art. No.  |
|------------------------|----|----|----|---|-----------|
| 2 x 1½                 | 8½ | 3¾ | 3¾ | 6 | 6614-2015 |
| 2 x 2                  | 8½ | 3¾ | 4¾ | 6 | -2020     |

### 6700—Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  |
|------------------------|----|----|----|----|-----------|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  | 6700-1515 |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  | -2015     |
| 2 x 2                  | 9½ | 8¾ | 1¾ | 5½ | -2020     |

See Standard Cleanout, Page 21.

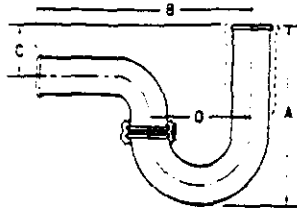
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable

# drainline traps Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6701—Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

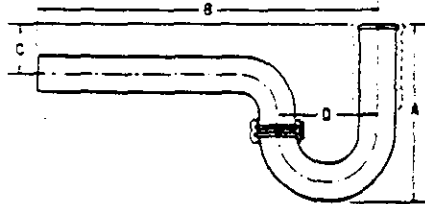


| Size<br>Inlet x Outlet | A     | B  | C     | D     | Art. No.  |
|------------------------|-------|----|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 9 1/4 | 11 | 1 5/8 | 5     | 6701-1515 |
| 2 x 1 1/2              | 8 3/4 | 11 | 1 5/8 | 5     | -2015     |
| 2 x 2                  | 8 3/4 | 13 | 1 1/4 | 5 1/2 | -2020     |

See Standard Cleanout, Page 21.

## 6704—Swivel Trap—P Style (Plain End Outlet\*)

No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

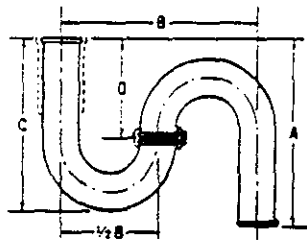


| Size<br>Inlet x Outlet | A     | B      | C     | D     | Art. No.  |
|------------------------|-------|--------|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 8 3/4 | 17     | 1 5/8 | 5     | 6704-1515 |
| 2 x 1 1/2              | 8 3/4 | 17     | 1 5/8 | 5     | -2015     |
| 2 x 2                  | 9 1/4 | 17 1/2 | 1 1/4 | 5 1/2 | -2020     |

\*Plain end outlet, can be field cut.

## 6706—Swivel Trap—S Style

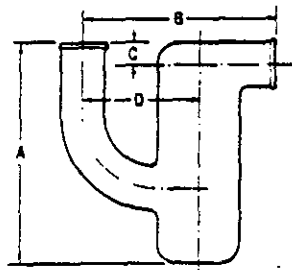
No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A     | B  | C     | D     | Art. No.  |
|------------------------|-------|----|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 10    | 10 | 8 3/4 | 5     | 6706-1515 |
| 2 x 1 1/2              | 10    | 10 | 8 3/4 | 5     | -2015     |
| 2 x 2                  | 9 3/4 | 11 | 9 1/4 | 4 3/8 | -2020     |

## 6707—Drum Trap—P Style

Traps available with S type cleanout. See Standard Cleanout, Page 21.

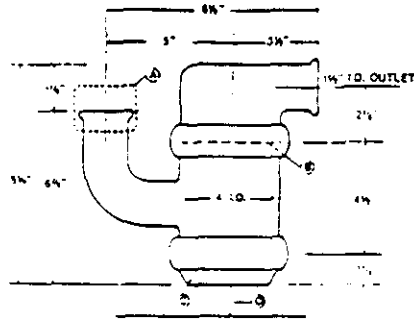


| Size<br>Inlet x Outlet | A     | B     | C     | D     | Body<br>I.D. | Art. No.  |
|------------------------|-------|-------|-------|-------|--------------|-----------|
| 1 1/2 x 1 1/2          | 9     | 8     | 1     | 4 3/4 | 3            | 6707-1515 |
| 2 x 1 1/2              | 9     | 8     | 1 1/2 | 4 3/4 | 3            | -2015     |
| 2 x 2                  | 9 3/4 | 9 3/4 | 2     | 5 1/2 | 4            | -2020     |

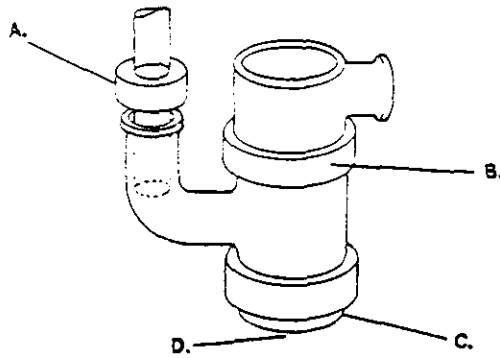
# drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6708—Interceptor Trap



- A. Adapter Coupling #6665-1512 (to connect to 1 1/4" O.D. tubing)  
(Rubber Seal) #6665-1515 (to connect to 1 1/2" O.D. tubing)
- B. Perforated S.S. Screen 1/16" dia. holes 6 sq. in. free area opg.
- C. Removable coupling/end cap for cleanout.
- D. Min. 3" clearance required under trap for removal of end cap.



| Size              | Description      | Art. No.   |
|-------------------|------------------|------------|
| 1 1/2" x 1 1/2"   | Interceptor Trap | 6708- 4015 |
| 1 1/4" O.D. Inlet | Adapter Coupling | 6665- 1512 |
| 1 1/2" O.D. Inlet | Adapter Coupling | 6665- 1515 |

### Specifications

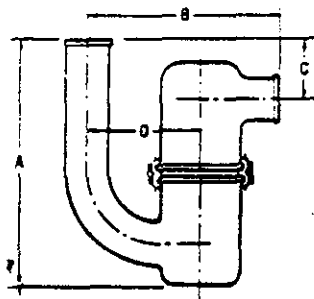
KIMAX Borosilicate Glass Interceptor Trap with 1 1/2" I.D. inlet, 1 1/2" I.D. outlet and 4" I.D. body. Perforated S.S. Screen Interceptor 4" dia. with 1/16" holes and effective 6 sq. in. free area opening. Bottom C.O. Coupling with end cap for cleaning.

### Connections

- For DWV Service use KIMAX Adapter Coupling 6665-1515 for 1 1/2" OD. tubing or 6665-1512 for 1 1/4" O.D. tubing. RUBBER SEAL ONLY.
- To connect to 1 1/2" IPS metal or rigid plastic plain end pipe, use KIMAX B/P Coupling 6661-1500.
- To connect to 1 1/2" I.D. glass drainline, use KIMAX Couplings 6650-1500 or 6661-1500.

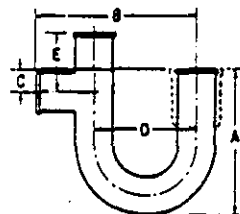
## 6710—Swivel Drum Trap—P Style

No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 Inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A      | B     | C     | D     | Body<br>I.D. | Art. No.  |
|------------------------|--------|-------|-------|-------|--------------|-----------|
| 1 1/2 x 1 1/2          | 10 1/4 | 8     | 2 1/2 | 4 1/4 | 3            | 6710-1515 |
| 2 x 1 1/2              | 10 1/4 | 8     | 2 1/2 | 4 1/4 | 3            | 2015      |
| 2 x 2                  | 11     | 9 1/4 | 3     | 5 1/2 | 4            | 2020      |

## 6713—Trap—P Style (Vented)†



| Size<br>Inlet x<br>Outlet | Vent<br>Size | A      | B      | C     | D     | E     | Art. No.    |
|---------------------------|--------------|--------|--------|-------|-------|-------|-------------|
| 1 1/2 x 1 1/2             | 1 1/2        | 7      | 8      | 1     | 5     | 3     | 6713- 1515† |
| 2 x 1 1/2                 | 1 1/2        | 7 1/2  | 8      | 1 1/2 | 5     | 3     | *2015†      |
| 2 x 2                     | 2            | 8 1/4  | 8 3/4  | 1 1/2 | 5 1/2 | 3 1/2 | 2020†       |
| 3 x 3                     | 3            | 10 1/4 | 10 1/2 | 2     | 6 1/2 | 4     | 3030†       |
| 4 x 4                     | 4            | 12 1/4 | 12 1/2 | 2 1/2 | 7 1/2 | 5     | 4040†       |
| 6 x 6                     | 4            | 16 3/4 | 31     | 2 1/2 | 24    | 7     | **6060†     |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
\*\*No cleanouts on 6 x 6 traps.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

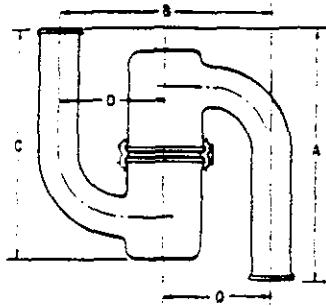
†Manufactured per order. Not returnable.

# drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6714—Swivel Drum Trap—S Style

No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.

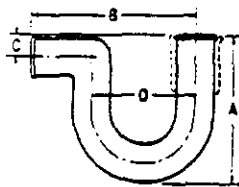


| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>D. | Art. No.  |
|------------------------|-----|----|-----|----|------------|-----------|
| 1½ x 1½                | 11¼ | 9½ | 10¼ | 4¾ | 3          | 6714-1515 |
| 2 x 1½                 | 11¼ | 9½ | 10¼ | 4¾ | 3          | 2015      |
| 2 x 2                  | 11¼ | 11 | 11  | 5½ | 4          | 2020      |

Traps available with B type cleanout. See Standard Cleanout, Page 21.

## 6718 Trap—P Style

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with B type cleanout. See Standard Cleanout, Page 21.

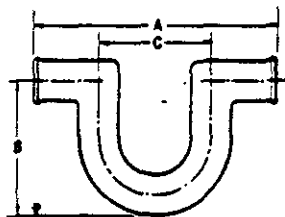


| Size<br>Inlet x<br>Outlet | A   | B   | C  | D  | E  | Art. No.  |
|---------------------------|-----|-----|----|----|----|-----------|
| 1½ x 1½                   | 7   | 8   | 1  | 5  | 3  | 6718-1515 |
| *2 x 1½                   | 7½  | 8   | 1½ | 5  | 3  | 2015      |
| 2 x 2                     | 8¾  | 8¾  | 1½ | 5½ | 3½ | 2020      |
| 3 x 3                     | 10¼ | 10¼ | 2  | 6½ | 4  | 3030      |
| 4 x 4                     | 12¼ | 12¼ | 2½ | 7½ | 5  | 4040      |
| 6 x 6                     | 18½ | 31  | 3¾ | 24 | 7  | **6060†   |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
\*\*No cleanouts on 6 x 6 traps.

## 6770 Running Trap

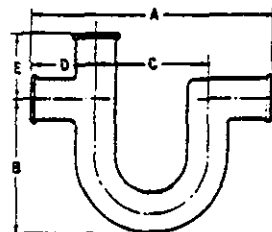
Traps available with B type cleanout. See Standard Cleanout, Page 21.



| Size<br>Inlet x<br>Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|---------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                   | 1½           | 11  | 6   | 5  | 3  | 3  |
| 2 x 2                     | 2            | 12  | 6¾  | 5½ | 3¾ | 3½ |
| 3 x 3                     | 3            | 14½ | 8¾  | 6½ | 4  | 4  |
| 4 x 4                     | 4            | 17½ | 9¾  | 7½ | 5  | 5  |
| *6 x 6                    | 4            | 38  | 14¾ | 24 | 7  | 7  |

\*No cleanouts on 6 x 6 traps.

## 6771 Running Trap (Vented)



| 6770<br>Art. No. | 6771<br>Art. No. |
|------------------|------------------|
| 6770- 1515       | 6771- 1515       |
| 2020             | 2020             |
| 3030             | 3030             |
| 4040             | 4040             |
| *6060†           | *6060†           |

\*No cleanouts on 6 x 6 traps.

# drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment

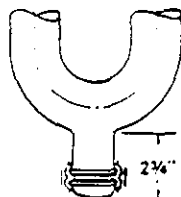
## Type B—Standard Cleanout

Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

To order standard traps with cleanouts use catalog number for proper style and add the letter B. (Example 6718-B-1515)  
For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

| Size | Art. No. |
|------|----------|
| 1½   | B        |



## accessories and hardware

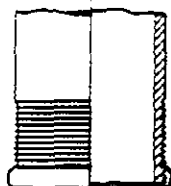
### 6680 Thread Adapters

#### (Threaded to Beaded Pipe)

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", and 4" sizes.

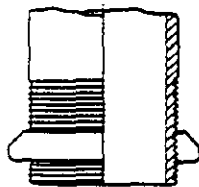
| Size | Art. No.  |
|------|-----------|
| 1½   | 6680-1500 |
| 2    | -2000     |
| 3    | -3000     |
| 4    | -4000     |



### 6685—Adjustable Thread Adapter

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.

| Size   | Art. No.  |
|--------|-----------|
| 2 x 1½ | 6685-2015 |



Use catalog dimensions for piping layout as gasket thickness allowance is included.

Manufactured per order. Not returnab

# accessories and hardware

## 6720 Sink Outlet Assembly (1½" and 2" sizes)

### 6720D 2"—For Use With Sinks Having 3½/32" Counterbore

Consists of:

6724 sink strainer (black fluorocarbon plastic) 1½" or 2"

6721 and 6721D sink outlet (black fluorocarbon plastic)

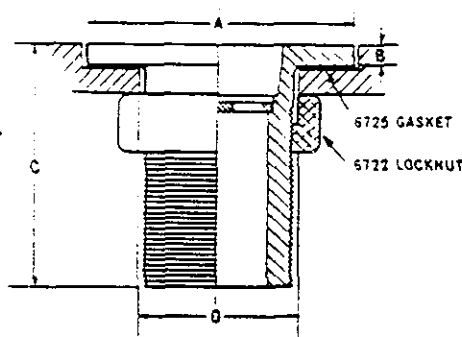
6725 gasket—neoprene

6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard overflows.

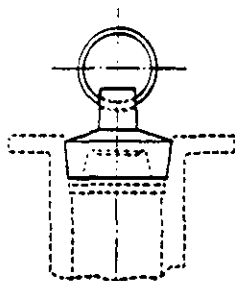
For sink outlet tailpiece connections, see No. 6728 dimensions on Page 23.

| Size | A  | B | C  | D  | Art. No.    |
|------|----|---|----|----|-------------|
| 1½   | 3¾ | ¼ | 2¾ | 2  | 6720- 1500  |
| 2    | 3¾ | ¼ | 3  | 2¾ | 2000        |
| 2    | 3¾ | ¼ | 3  | 2¾ | 6720D- 2000 |



## 6726 Sink Stopper

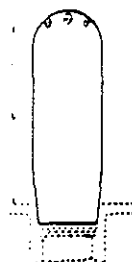
No. 6726 Sink Stopper is available in 1½" and 2" size in lead.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6726-1500 |
| 2    | -2000†    |

## 6727 Sink Overflow – Beehive Type

Sink Overflow is made of black fluorocarbon plastic. Beehive type can be modified to open type by cutting off top beehive section.



| Sink Outlet Size | Size   | Beehive Type Length | Art. No.   |
|------------------|--------|---------------------|------------|
| 1½               | 1½ x 4 | 4"                  | 6727- 1504 |
| 1½               | 1½ x 6 | 6"                  | 1506       |
| 1½               | 1½ x 8 | 8"                  | 1508       |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

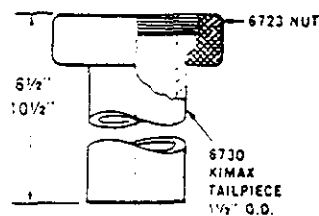
†Manufactured per order. Not returnable.

# accessories and hardware

## 6728 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having straight pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut . . . do not use pipe wrench.



| Size     | Art. No.  |
|----------|-----------|
| 1½ x 6½  | 6728-1060 |
| 1½ x 10½ | 1100      |

### Components of 6728

#### 6723-Nut

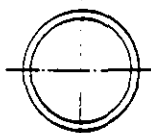
| Size | Art. No.  |
|------|-----------|
| 1½   | 6723-1500 |

#### 6730 Tail Piece

| Size     | Art. No.  |
|----------|-----------|
| 1½ x 6½  | 6730-1060 |
| 1½ x 10½ | 1100      |

## 6738—Gasket

Use gasket No. 6738 when connecting glass tailpiece #6728 to threaded metal pipe or plastic pipe.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6738-1500 |

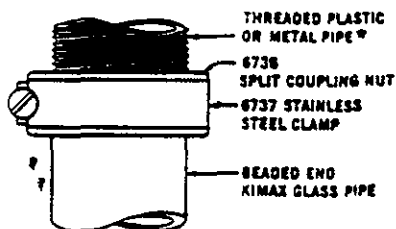
## 6735—1½" Split Coupling (Threaded to Beaded Pipe)

No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" I.P.S. pipe.

The assembly consists of:

- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

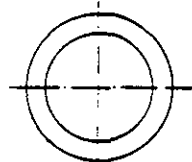
To install . . . remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6735-1500 |

## 6739 Gasket\*

Use gasket No. 6739 when connecting KIMAX glass pipe to threaded metal pipe, using No. 6735 split coupling.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6739-1500 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

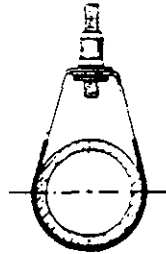
\*Manufactured per order. Not returnable



# accessories and hardware

## 7290 (1½", 2", 3", 4", 6" sizes) Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.

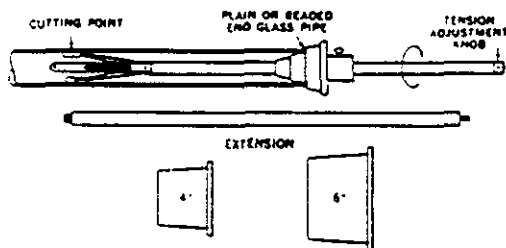


| Size | Art. No.  |
|------|-----------|
| 1½   | 7290-1500 |
| 2    | -2000     |
| 3    | -3000     |
| 4    | -4000     |
| 6    | -6000     |

## 7310-56802 KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut 1½"—6" glass drainage anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm subassembly and 1½"—4" centering cones and ring stop as shown.

Contact distributor for information & price.



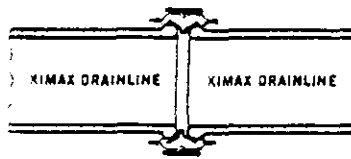
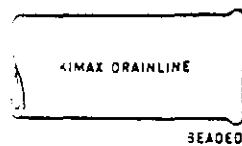
CENTERING CONES  
Order 6" centering cone separately.

# typical joint reference chart

## Type of Pipe

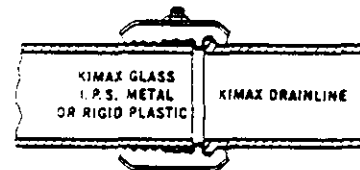
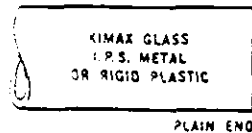
## Type of Joint

## Material Needed



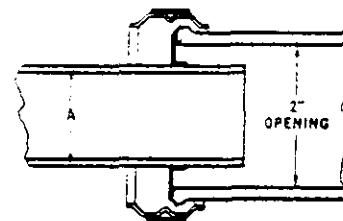
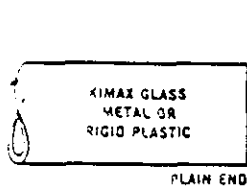
### KIMAX Drainline Coupling 6650

| Size | Code No.  |
|------|-----------|
| 1½   | 6650-1500 |
| 2    | 6650-2000 |
| 3    | 6650-3000 |
| 4    | 6650-4000 |
| 6    | 6650-6000 |



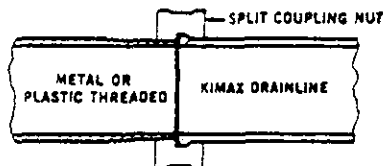
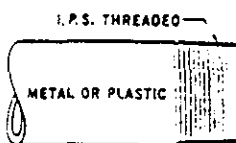
### KIMAX B/P Coupling 6661

| Pipe Size | Code No.  |
|-----------|-----------|
| 1½        | 6661-1500 |
| 2         | 6661-2000 |
| 3         | 6661-3000 |
| 4         | 6661-4000 |
| 6         | 6661-6000 |



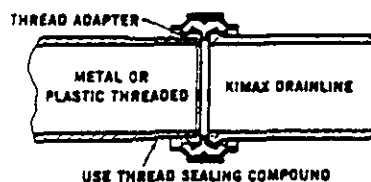
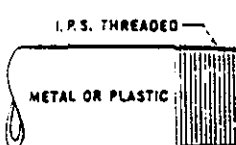
### KIMAX Adapter Coupling

| "A" Dimension<br>Pipe O.D. | Coupling<br>Size | Code No.  |
|----------------------------|------------------|-----------|
| 1.48—1.53                  | 2 x 1½           | 6655-2015 |
| 1.70—1.78                  | 2 x 1¾           | 6655-2017 |
| 1.82—1.90                  | 2 x 1⅞           | 6655-2018 |



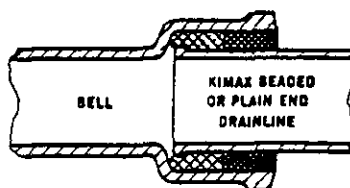
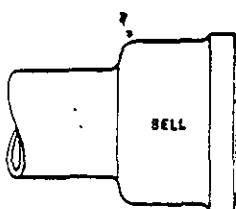
### KIMAX Split Coupling

| Pipe Size | Coupling<br>Code No. | Gasket<br>Code No. |
|-----------|----------------------|--------------------|
| 1½        | 6735-1500            | 6739-1500          |



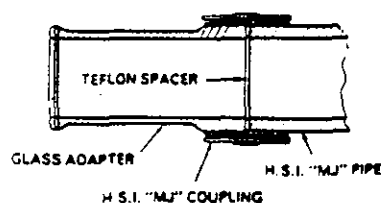
### KIMAX Thread Adapter and Drainline Coupling

| Pipe Size | Adapter<br>Code No. | Coupling<br>Code No. |
|-----------|---------------------|----------------------|
| 1½        | 6680-1500           | 6650-1500            |
| 2         | 6680-2000           | 6650-2000            |
| 3         | 6680-3000           | 6650-3000            |
| 4         | 6680-4000           | 6650-4000            |
| 6         | 6680-6000           | 6650-6000            |



### KIMAX Glass to Bell End Pipe

1. Pack hub half full with asbestos rope.
  2. Caulk with hot lead, lead wool or acid-proof cement.
- For Details, see Drainline Installation Manual.



### Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | Adapter<br>Code No. | MJ<br>Coupling         |
|-----------|---------------------|------------------------|
| 1½        | 6566-1500           | Furnished<br>By Others |
| 2         | 6566-2000           |                        |
| 3         | 6566-3000           |                        |
| 4         | 6566-4000           |                        |

# case quantities and weight per case

| Article                      | Size           | Case Qty. | Approx. Wt.        |
|------------------------------|----------------|-----------|--------------------|
| <b>Pipe-Straight Lengths</b> |                |           |                    |
| 6500                         | 1500           | 4         | 1 1/2 lbs. per ft. |
| 6501                         | 2000           | 4         | 1 1/2 " " "        |
| &                            | 3000           | 2         | 2 1/2 " " "        |
| 6504                         | 4000           | 1         | 4 " " "            |
|                              | 6000           | 1         | 6 " " "            |
| 6502                         | 1500           | 6         | 1 1/2 " " "        |
|                              | 2000           | 6         | 1 1/2 " " "        |
|                              | 3000           | 3         | 2 1/2 " " "        |
|                              | 4000           | 6         | 4 " " "            |
|                              | 6000           | 1         | 6 " " "            |
| <b>Sweeps or Bends</b>       |                |           |                    |
| 6511                         | All 1 1/2"     | 12        | 11 lbs. per Case   |
|                              | " 2"           | 6         | 9 " " "            |
|                              | " 3"           | 2         | 6 " " "            |
|                              | " 4"           | 1         | 6 " " "            |
|                              | " 6"           | 1         | 13 " " "           |
| 6512                         | " 1 1/2"       | 3         | 7 " " "            |
| &                            |                |           |                    |
| 6512P                        | 2"             | 6         | 8 " " "            |
| 6513                         | All 1 1/2"     | 18        | 15 " " "           |
|                              | 2"             | 12        | 18 " " "           |
|                              | 3" 90° only    | 3         | 9 " " "            |
|                              | Other than 90° | 4         | 12 " " "           |
|                              | 4"             | 1         | 6 " " "            |
|                              | 6"             | 1         | 13 " " "           |
| 6514                         | 1 1/2"         | 18        | 15 " " "           |
| 6518                         | 2"             | 8         | 8 " " "            |
|                              | 3"             | 2         | 4 " " "            |
|                              | 4"             | 1         | 5 " " "            |
|                              | 6"             | 1         | 10 " " "           |
| 6519                         | 1 1/2"         | 12        | 10 " " "           |
|                              | 2"             | 8         | 9 " " "            |
|                              | 3"             | 2         | 4 " " "            |
|                              | 4"             | 1         | 5 " " "            |
|                              | 6"             | 1         | 13 " " "           |
| 6519P                        | All sizes      | 4         | 8 " " "            |
| <b>Adjustable San T</b>      |                |           |                    |
| 6520                         | 1 1/2"         | 4         | 5 " " "            |
| 6530                         | 1 1/2"         | 4         | 5 " " "            |

| Article                 | Size         | Case Qty | Approx. Wt. (lbs.) |
|-------------------------|--------------|----------|--------------------|
| <b>Sanitary T</b>       |              |          |                    |
| 6521                    | 1 1/2"       | 12       | 15                 |
| &                       | 2"           | 3        | 12                 |
| 6541                    | 3"           | 2        | 8                  |
|                         | 3" x 3" only | 1        | 4                  |
|                         | All others   | 2        | 8                  |
|                         | 4"           | 1        | 8                  |
|                         | 6"           | 1        | 15                 |
| 6522                    | 1 1/2"       | 8        | 12                 |
| &                       | 2"           | 4        | 10                 |
| 6542                    | 3"           | 1        | 6                  |
|                         | 4"           | 1        | 10                 |
|                         | 6"           | 1        | 16                 |
| 6523                    | 1 1/2"       | 12       | 15                 |
|                         | 2"           | 8        | 12                 |
|                         | 3"           | 2        | 8                  |
|                         | 4"           | 1        | 8                  |
|                         | 6"           | 1        | 15                 |
| <b>Y Branch</b>         |              |          |                    |
| 6526                    | 1 1/2"       | 12       | 15                 |
|                         | 2"           | 6        | 9                  |
| 6546                    | 3"           | 2        | 8                  |
|                         | 4"           | 1        | 8                  |
|                         | 6"           | 1        | 15                 |
| 6527                    | 1 1/2"       | 8        | 12                 |
| &                       | 2"           | 4        | 10                 |
| 6547                    | 3"           | 1        | 4                  |
|                         | 4"           | 1        | 8                  |
|                         | 6"           | 1        | 15                 |
| <b>Cam Y &amp; 1/8"</b> |              |          |                    |
| 6528                    | 1 1/2"       | 12       | 15                 |
| &                       | 2"           | 6        | 9                  |
| 6548                    | 3" x 1 1/2"  | 2        | 8                  |
|                         | 3" x 2"      | 1        | 6                  |
|                         | 3" x 3"      | 1        | 7                  |
|                         | 4"           | 1        | 6                  |
|                         | 6"           | 1        | 7                  |
| 6529                    | 1 1/2"       | 8        | 12                 |
| &                       | 2"           | 4        | 10                 |
| 6549                    | 3"           | 1        | 5                  |
|                         | 4"           | 1        | 9                  |
|                         | 6"           | 1        | 16                 |

Items not listed are packed in quantity ordered.

# case quantities and weight per case

| Article                         | Size     | Case Qty. | Approx. Wt. (lbs.) |
|---------------------------------|----------|-----------|--------------------|
| <b>Partition Cross</b>          |          |           |                    |
| 6531                            | 2"       | 4         | 5                  |
| <b>Upright Y or H</b>           |          |           |                    |
| 6532                            | 1½"      | 8         | 10                 |
|                                 | 2"       | 4         | 6                  |
|                                 | 3"       | 1         | 4                  |
|                                 | 4"       | 1         | 10                 |
|                                 | 6"       | 1         | 16                 |
| <b>Reducers</b>                 |          |           |                    |
| 6536                            | 2"       | 18        | 14                 |
| &                               | 3"       | 6         | 9                  |
| 6537                            | 4"       | 1         | 3                  |
|                                 | 6"       | 1         | 6                  |
| <b>Vent Increases</b>           |          |           |                    |
| 6540                            | 1½"      | 4         | 6                  |
|                                 | 2"       | 4         | 7                  |
|                                 | 3"       | 2         | 6                  |
| <b>Cleanout Plugs</b>           |          |           |                    |
| 6544                            | 1½"      | 36        | 12                 |
|                                 | 2"       | 36        | 12                 |
|                                 | 3"       | 27        | 9                  |
|                                 | 4"       | 18        | 18                 |
|                                 | 6"       | 12        | 14                 |
| <b>U Bend</b>                   |          |           |                    |
| 6550                            | 1½"      | 8         | 10                 |
|                                 | 2"       | 4         | 10                 |
|                                 | 3"       | 2         | 15                 |
|                                 | 4"       | 1         | 11                 |
| <b>M. J. Adapters</b>           |          |           |                    |
| 6566                            | 1½"      | 8         | 6                  |
|                                 | 2"       | 8         | 7                  |
|                                 | 3"       | 1         | 2                  |
|                                 | 4"       | 1         | 3                  |
| <b>Swivel P Trap</b>            |          |           |                    |
| 6700                            | 1½"      | 4         | 12                 |
|                                 | 2" x 1½" | 4         | 12                 |
|                                 | 2"       | 2         | 6                  |
| <b>Inlet Only</b>               |          |           |                    |
| 6705                            | 1½"      | 6         | 9                  |
|                                 | 2" x 1½" | 6         | 14                 |
|                                 | 2" x 2"  | 4         | 10                 |
| <b>Swivel Drum Trap P Style</b> |          |           |                    |
| 6710                            | 1½"      | 1         | 5                  |
|                                 | 2" x 1½" | 1         | 6                  |
|                                 | 2" x 2"  | 1         | 9                  |

Items not listed are packed in quantity ordered.

| Article                     | Size     | Case Qty. | Approx. Wt. (lbs.) |
|-----------------------------|----------|-----------|--------------------|
| <b>Inlet or Outlet Only</b> |          |           |                    |
| 6715                        | 1½" x 3" | 2         | 10                 |
|                             | 2" x 3"  | 2         | 10                 |
|                             | 2" x 4"  | 1         | 10                 |
| 6716                        | 3" x 1½" | 2         | 10                 |
|                             | 4" x 2"  | 1         | 10                 |
| <b>P Trap</b>               |          |           |                    |
| 6718                        | 1½"      | 4         | 6                  |
|                             | 2"       | 4         | 6                  |
|                             | 3"       | 1         | 6                  |
|                             | 4"       | 1         | 10                 |
|                             | 6"       | 1         | 12                 |
| <b>Running Trap</b>         |          |           |                    |
| 6770                        | 1½"      | 2         | 15                 |
| &                           | 2"       | 2         | 16                 |
| 6771                        | 3"       | 1         | 7                  |
|                             | 4"       | 1         | 11                 |
|                             | 6"       | 1         | 18                 |
| <b>Interceptor Trap</b>     |          |           |                    |
| 6708                        | 4015     | 1         | 10                 |
| <b>Partition Trap</b>       |          |           |                    |
| 6614                        | 2"       | 1         | 5                  |
| <b>Cup Sinks</b>            |          |           |                    |
| All sizes                   |          | 1         | 3                  |
| <b>Couplings</b>            |          |           |                    |
| 6650                        | 1½"      | 50        | 20                 |
|                             | 2"       | 50        | 25                 |
|                             | 3"       | 24        | 17                 |
|                             | 4"       | 24        | 24                 |
|                             | 6"       | 10        | 20                 |
| 6655                        | All      | 50        | 20                 |
| 6661                        | 1½"      | 50        | 21                 |
|                             | 2"       | 50        | 25                 |
|                             | 3"       | 20        | 20                 |
|                             | 4"       | 12        | 23                 |
|                             | 6"       | 5         | 24                 |
| <b>Sink Outlet Assy.</b>    |          |           |                    |
| 6720                        | All      | 12        | 8                  |
| <b>Tailpiece Assy.</b>      |          |           |                    |
| 6728                        | 1½" x 6" | 12        | 10                 |
|                             | 1" x 10" | 8         | 11                 |

Distributed by:

"Specifications, dimensions and tolerances of all components — pipe, fittings and couplings — as illustrated in this publication, are engineered for safety and product performance reasons as a total O-I/Schott Acid Waste Drainline System. INTERCHANGING THESE O-I/SCHOTT COMPONENTS WITH SIMILAR PRODUCTS MANUFACTURED BY OTHERS, IN ACID WASTE DRAINLINE SYSTEMS, VOIDS ALL O-I/SCHOTT WARRANTIES OF PRODUCT PERFORMANCE AND INTEGRITY WITH RESPECT TO SUCH COMPONENTS."

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# KIMAX

GPD-1054  
Sept. 1970

## Beaded Process Pipe



**Catalog and  
Price List**

**OWENS-ILLINOIS**

Toledo, Ohio 43601 **①**

# KIMAX BEADED PROCESS PIPE

Recommended for use in chemical, pharmaceutical, textile, food, dairy and other processing where highly corrosive, sensitive, high purity products are conveyed.

## Unequaled — corrosion resistance —

can handle the widest range of corrosives and reagents.

All pipe and fittings are made of the same chemically inert Owens-Illinois (KG-33) borosilicate glass used in the manufacture of KIMAX glass laboratory ware and KIMAX glass drainline. Compression couplings seal glass to TFE gaskets in a manner that the flow comes in contact only with glass or TEFLON.

## 450° F. to freezing point temperature capability.

7123 couplings with VITON liners and TFE seals offer continuous service from 450°F. to freezing point.

7126 couplings with HYDRIN liners and TFE seals offer continuous service from 300°F. to freezing point.

## 100 to 30 PSI operating pressure —

depending on pipe I.D. See page 3.

## Stainless steel couplings (300 series SS) —

all glass beaded joints are made with single bolt, stainless steel band couplings containing a VITON or HYDRIN compression liner and TFE seal for maximum external and internal corrosion resistance.

## Built-in-ruggedness —

beaded pipe and fittings are manufactured from heavy schedule tubing, and tempered for extra strength.

## Easy and low cost to install.

- Joints are made in seconds with one bolt, stab couplings which seal even with line deflections and misalignment up to 4°.
- Pipe can be easily and quickly field cut and beaded where required without effecting pressure rating.

## Safety — added:

Translucent armoring of glass fiber cloth impregnated with polyester resin provides that extra protection in case of accidental rupture.

See page 4 and GPD-1050 for details.

## Assured Product Purity —

All wetted parts of system are chemically inert borosilicate glass or TFE. Parts per million pick up for distilled water . . . SiO<sub>2</sub> (less than .08 ppm), Boron (less than .01 ppm), Na (less than .01 ppm).

## System Versatility —

Adaptable to other piping systems; can easily be disassembled and reassembled to meet future requirements.

## Maintenance Free —

Smooth inner walls prevent scale build-up and line stoppages.

## Service —

National network of stocking distributors; field engineering staff for start up service.

## GUIDE SPECIFICATIONS

### I. General

- Contractor shall furnish and install a complete piping system as indicated. This system shall be made of borosilicate glass (Type 1), conforming to Federal Specification DD-G-5418 and as manufactured by Owens-Illinois under the trade name "KIMAX."
- This system shall include all glass piping and fittings in size 1/4, 1, 1 1/2, 2, 3, 4 and 6" I.D. as shown on the drawing along with the required couplings and padded supports.
- Coupling device shall be capable of maintaining a Teflon-to-glass seal with line deflections of at least 1/4" per foot of pipe length.
- The entire piping system shall be capable of withstanding working pressures as listed in GPD-1054.

### II. Installation

- The system shall be installed free of stress according to the manufacturer's recommended installation procedures.
- Padded pipe hangers shall be used on horizontal runs every 8 to 10 feet of pipe length, or more frequently when good piping practices indicate. The hanger should be located adjacent to a coupling wherever possible.
- Padded riser clamps shall be used to support vertical risers. Locate riser clamps at each floor or at center distance not to exceed 12'.
- Connection to valves and faucets shall be made with KIMAX adapters or according to recommendation by Owens-Illinois.
- All valves, meters, pumps, faucets, and other heavy equipment must be supported independently.
- To keep contamination to a minimum, all pipe, fittings and couplings should remain in their sealed cartons till just prior to their use.
- After installation, all remaining openings shall be sealed close to avoid contamination of the line.

### III. Protection of Pipe

- All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum of 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with Fiberglas, glass wool and or with a non-hardening caulking material.
- Glass Pipe shall not be installed in direct contact with concrete or metal.
- Glass pipe shall be protected against all weld splatter.

### IV. Test\*

Test in accordance to manufacturer's recommendations. See page 19 of GPD-1054.

Compressed air test method not recommended consult with manufacturer

KIMAX—Registered trademark of Owens-Illinois.  
TEFLON—Registered trademark of E. I. DuPont.

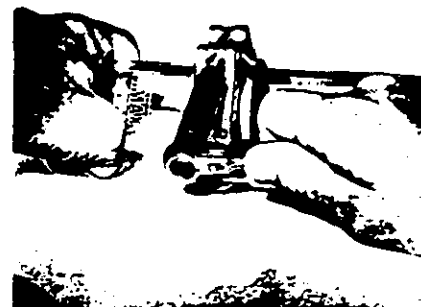
# PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPING SYSTEMS

| SYSTEM                                  | KIMAX BEADED<br>PROCESS PIPE<br>½" thru 6"                     | KIMAX CONICAL END<br>PROCESS PIPE<br>1" thru 6"         | KIMAX DRAINLINE<br>1½" thru 6"                          |
|-----------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| <b>PHYSICAL PROPERTIES:</b>             |                                                                |                                                         |                                                         |
| Working Pressure *                      | ½"-¾"-1" 100 PSI<br>1½"-2"-3" 75 PSI<br>4" 50 PSI<br>6" 30 PSI | 1"-3" 50 PSI<br>4" 35 PSI<br>6" 20 PSI                  | Gravity Flow                                            |
| Test Pressure *                         | 1½ Times Working Pressure                                      | 1½ Times Working Pressure                               | 22½ PSI                                                 |
| Operating Temperature<br>(Maximum)      | Freezing Point to<br>450° F or 300° F                          | Freezing Point to<br>450° F                             | Freezing Point of<br>Waste to 212° F                    |
| Glass Therm. Expansion                  | 32 x 10 <sup>-7</sup>                                          | 32 x 10 <sup>-7</sup>                                   | 32 x 10 <sup>-7</sup>                                   |
| Glass Therm. Conductivity               | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F            | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F     | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F     |
| Glass Therm. Shock Diff.                | ½"-3" 200° F<br>4" 175° F<br>6" 160° F                         | 1"-3" 200° F<br>4" 175° F<br>6" 160° F                  | 1½"-3" 200° F<br>4" 175° F<br>6" 160° F                 |
| Vacuum                                  | Full                                                           | Full                                                    | Full                                                    |
| <b>CHEMICAL PROPERTIES:</b>             |                                                                |                                                         |                                                         |
| Durability Acids                        | All Except Hydrofluoric or<br>Phosphoric with Fluorides        | All Except Hydrofluoric or<br>Phosphoric with Fluorides | All Except Hydrofluoric or<br>Phosphoric with Fluorides |
| Durability Alkalies                     | Some attack<br>above 120° F                                    | Some attack<br>above 120° F                             | Some attack<br>above 120° F                             |
| Coupling Outer Band                     | 1 bolt stainless<br>steel ½"-6"                                | Style I, II and<br>ASA Flange                           | 1 bolt stainless<br>steel                               |
| Coupling Compression<br>Liner/Seal Ring | HydriN/TFE Seal 300° F<br>Viton/TFE Seal 450° F                | Customer Selection                                      | Buna-N/TFE Seal                                         |
| <b>SYSTEM IDENTIFICATION:</b>           |                                                                |                                                         |                                                         |
|                                         | KIMAX<br>Yellow Label                                          | KIMAX<br>Yellow Label                                   | KIMAX<br>Green Label                                    |

\* Note: Gas pressure should not exceed 5 PSI. Consult your Owens-Illinois Representative.

## MAKING JOINTS WITH KIMAX PROCESS PIPE COUPLINGS

1. Dip coupling in water or wipe beaded ends of glass with damp cloth.
2. Snap coupling over one end of pipe making certain TFE liner is behind bead . . . then stab other section of pipe into opposite side of coupling.
3. Tighten coupling bolt with 6" ratchet wrench.





# KIMAX ARMORED BEADED GLASS PROCESS PIPE

For transportation of valuable or corrosive fluids where accidental rupture may expose personnel and facilities to injury, damage or loss of product.

## ADVANTAGES

1. Armoring contains fluids—allows orderly shutdown. See chemical resistance below.
2. Keeps glass intact for safe removal from system.
3. Retains basic advantage of a KIMAX Glass Pipe System.
4. Translucency allows detection of stoppages or damage.
5. Pipe can be field cut, beaded, and re-armored.
6. Economical one bolt pressure rated coupling permits easy installation, removal, and modification of systems.



*Translucency allows detection of stoppages or damage*



*KIMAX coupling design allows up to 4% deflection or misalignment.*



*Easy-to-use one-bolt couplings make field installation or removal simple.*

## ARMORING CHEMICAL RESISTANCE

*3-month direct exposure samples checked daily*

|                             |                 |
|-----------------------------|-----------------|
| 1. H <sub>2</sub> O         | No effect       |
| 2. N-Amyl Alcohol           | No effect       |
| 3. Methyl Alcohol           | No effect       |
| 4. Ammonium Hydroxide       | Attacked—3 days |
| 5. Sodium Hydroxide         | Attacked—1 week |
| 6. N-Octane                 | No effect       |
| 7. Benzene                  | No effect       |
| 8. Toluene                  | No effect       |
| 9. JP-4 Fuel                | No effect       |
| 10. Acetone                 | Attack—2 days   |
| 11. Methyl Ethyl Ketone     | Attack—2 days   |
| 12. Hydrogen Peroxide       | No effect       |
| 13. N-Butyric Acid (100%)   | No effect       |
| 14. Nitric Acid (70%)       | Attack—4 hours  |
| 15. Hydrochloric Acid (38%) | Attack—2 weeks  |
| 16. Sulphuric Acid (98%)    | Attack—6 hours  |
| 17. Acetic Acid (100%)      | Attack—3 days   |
| 18. Phosphoric Acid         | Attack—2 months |
| 19. Nitrobenzene            | Attack—2 weeks  |
| 20. Benzaldehyde            | Attack—5 days   |
| 21. Carbon Disulfide        | No effect       |
| 22. Carbon Tetrachloride    | No effect       |
| 23. Chloroform              | Attack—3 days   |
| 24. Methylene Chloride      | Attack—2 days   |

## PHYSICAL PROPERTIES

*(Armoring—"3M" Brand "SUNSET" Material)*

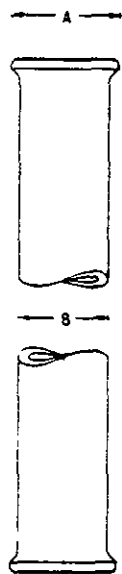
1. Color—translucent (light green tint).
2. Glass fiber cloth impregnated with polyester resin. (Non-toxic and contact not harmful).
3. Can endure a 10 ft./lb. impact without catastrophic failure.
4. Coverage—double wrap, total thickness .020.
5. Cured Properties—Environmental
  - a. Temperature Capability: 300°F. continuous, 350°F. intermittent operation.
  - b. Weathering Resistance:
    1. Weather-O-Meter 2500 hours. No adverse effects.
    2. Outdoor Aging (Minnesota-Florida-Colorado). No adverse effects—2 years.
    3. Not adversely affected by sunlight.
  - c. Salt Spray: 20% salt spray, 95°F. 1000 hours—No adverse effects.
  - d. UV Exposure: (Ford S-I Oven) 160°F., 3 months. Slight yellowing.
  - e. Extended Cold Aging (—28°F): No adverse effects. No loss of adhesion upon shock test.
6. Heat Resistance

| Time-Minutes | Temperature | Change in Sample           |
|--------------|-------------|----------------------------|
| 10           | 300°F       | No change                  |
| 10           | 400°F       | Discoloration              |
| 10           | 520°F       | Discoloration—some smolder |

**CONTACT YOUR NEAREST KIMAX REPRESENTATIVE FOR ADDITIONAL INFORMATION AND PRICES.**

# PROCESS PIPE AND FITTINGS

## 6300 BEADED PIPE



All pipe is available from stock in lengths shown.

### SPECIAL LENGTHS:

*KIMAX Beaded Process Pipe is designed for "on the job" cutting and beading. Pipe is easily cut and beaded with a KIMAX 7310-56802 or 7310-56903 Portable cutter and 7310-56801 Beading Kit.*

*Your KIMAX distributor or manufacturer will also provide special lengths at a slightly higher cost per foot.*

### NOTE:

*Field fabrication does not reduce pressure or temperature capability.*

*KIMAX Armored pipe can also be field fabricated.*

### 1/2" I.D.

| Length | A"     | B"  | Article    | Price   |
|--------|--------|-----|------------|---------|
| 3"     | 5 7/16 | 1/4 | 6300-48003 | \$ 2.75 |
| 4"     | 5 7/16 | 1/4 | 48004      | 2.75    |
| 6"     | 5 7/16 | 1/4 | 48006      | 2.75    |
| 48"    | 5 7/16 | 1/4 | 48048      | 4.25    |
| 96"    | 5 7/16 | 1/4 | 48096      | 5.95    |

### 3/4" I.D.

|     |       |   |            |         |
|-----|-------|---|------------|---------|
| 3"  | 1 1/2 | 1 | 6300-68003 | \$ 3.60 |
| 4"  | 1 1/2 | 1 | 68004      | 3.60    |
| 6"  | 1 1/2 | 1 | 68006      | 3.60    |
| 48" | 1 1/2 | 1 | 68048      | 5.35    |
| 96" | 1 1/2 | 1 | 68096      | 7.35    |

### 1" I.D.

|      |        |       |            |         |
|------|--------|-------|------------|---------|
| 3"   | 1 7/16 | 1 1/8 | 6300-10003 | \$ 5.40 |
| 4"   | 1 7/16 | 1 1/8 | 10004      | 5.40    |
| 6"   | 1 7/16 | 1 1/8 | 10006      | 5.40    |
| 48"  | 1 7/16 | 1 1/8 | 10048      | 9.05    |
| 96"  | 1 7/16 | 1 1/8 | 10096      | 13.25   |
| 120" | 1 7/16 | 1 1/8 | 10120      | 15.35   |

### 1 1/2" I.D.

|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 4"   | 2 1/16 | 1 7/16 | 6300-15004 | \$ 7.75 |
| 5"   | 2 1/16 | 1 7/16 | 15006      | 7.75    |
| 60"  | 2 1/16 | 1 7/16 | 15060      | 12.10   |
| 120" | 2 1/16 | 1 7/16 | 15120      | 24.20   |

### 2" I.D.

|      |       |       |            |         |
|------|-------|-------|------------|---------|
| 4"   | 2 3/8 | 2 1/8 | 6300-20004 | \$10.30 |
| 5"   | 2 3/8 | 2 1/8 | 20006      | 10.30   |
| 60"  | 2 3/8 | 2 1/8 | 20060      | 16.50   |
| 120" | 2 3/8 | 2 1/8 | 20120      | 33.00   |

### 3" I.D.

|      |        |       |            |         |
|------|--------|-------|------------|---------|
| 4"   | 3 1/16 | 3 1/8 | 6300-30004 | \$16.30 |
| 6"   | 3 1/16 | 3 1/8 | 30006      | 16.30   |
| 60"  | 3 1/16 | 3 1/8 | 30060      | 22.00   |
| 120" | 3 1/16 | 3 1/8 | 30120      | 44.00   |

### 4" I.D.

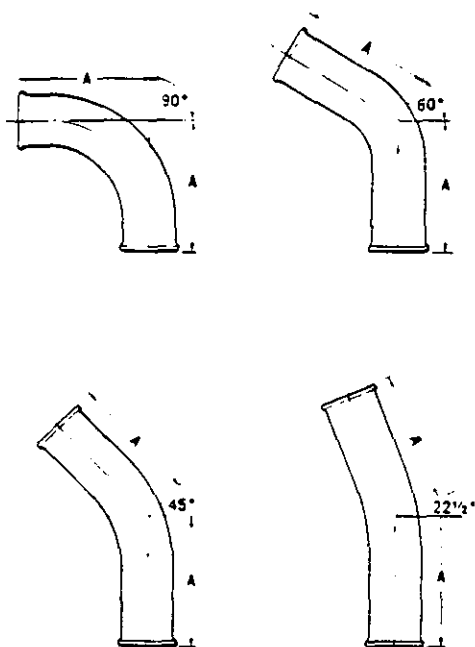
|      |       |       |            |         |
|------|-------|-------|------------|---------|
| 6"   | 4 3/8 | 4 1/8 | 6300-40006 | \$23.25 |
| 60"  | 4 3/8 | 4 1/8 | 40060      | 30.25   |
| 120" | 4 3/8 | 4 1/8 | 40120      | 60.50   |

### 6" I.D.

|      |   |        |            |         |
|------|---|--------|------------|---------|
| 6"   | 6 | 6 1/16 | 6300-60006 | \$34.85 |
| 60"  | 6 | 6 1/16 | 60060      | 48.40   |
| 120" | 6 | 6 1/16 | 60120      | 96.80   |

# PROCESS PIPE AND FITTINGS

## 6301 SWEEP ELBOW



90°

| Size         | A"    | Article   | Price   | Size         | A"    | Article   | Price   |
|--------------|-------|-----------|---------|--------------|-------|-----------|---------|
| 1/2" - 90°   | 2 1/4 | 6301-4890 | \$ 4.20 | 1/2" - 45°   | 2 1/4 | 6301-4845 | \$ 4.20 |
| 1/2" - 90°   | 2 1/4 | 6890      | 4.80    | 1/2" - 45°   | 2 1/4 | 6845      | 4.80    |
| 1" - 90°     | 2 1/4 | 1090      | 7.15    | 1" - 45°     | 2 1/4 | 1045      | 7.15    |
| 1 1/2" - 90° | 5     | 1590      | 7.50    | 1 1/2" - 45° | 3 1/2 | 1545      | 7.50    |
| 2" - 90°     | 6     | 2090      | 9.65    | 2" - 45°     | 4     | 2045      | 9.65    |
| 3" - 90°     | 7     | 3090      | 15.65   | 3" - 45°     | 5     | 3045      | 15.65   |
| 4" - 90°     | 10    | 4090      | 20.65   | 4" - 45°     | 7     | 4045      | 20.65   |
| 6" - 90°     | 12    | 6090      | 50.00   | 6" - 45°     | 9     | 6045      | 50.00   |

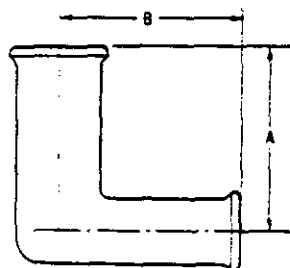
45°

60°

22 1/2°

| Size         | A"    | Article   | Price   | Size         | A"    | Article   | Price   |
|--------------|-------|-----------|---------|--------------|-------|-----------|---------|
| 1/2" - 60°   | 2 1/4 | 6301-4860 | \$ 4.20 | 1/2" - 22°   | 2 1/4 | 6301-4822 | \$ 4.20 |
| 1/2" - 60°   | 2 1/4 | 6860      | 4.80    | 1/2" - 22°   | 2 1/4 | 6822      | 4.80    |
| 1" - 60°     | 2 1/4 | 1060      | 7.15    | 1" - 22°     | 2 1/4 | 1022      | 7.15    |
| 1 1/2" - 60° | 3 1/2 | 1560      | 7.50    | 1 1/2" - 22° | 3 1/2 | 1522      | 7.50    |
| 2" - 60°     | 4     | 2060      | 9.65    | 2" - 22°     | 4     | 2022      | 9.65    |
| 3" - 60°     | 5     | 3060      | 15.65   | 3" - 22°     | 5     | 3022      | 15.65   |
| 4" - 60°     | 7     | 4060      | 20.65   | 4" - 22°     | 7     | 4022      | 20.65   |
| 6" - 60°     | 9     | 6060      | 50.00   | 6" - 22°     | 9     | 6022      | 50.00   |

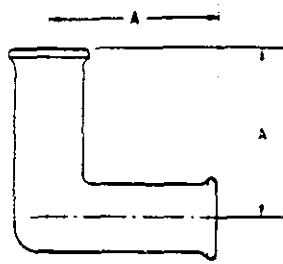
## 6302 REDUCER ELBOW



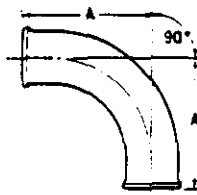
| Size          | A"    | B"    | Article   | Price   |
|---------------|-------|-------|-----------|---------|
| 1/4" x 1/2"   | 2 1/4 | 2 1/4 | 6302-6848 | \$ 7.80 |
| 1" x 1/2"     | 2 1/4 | 2 1/4 | 1048      | 9.60    |
| 1" x 3/4"     | 2 1/4 | 2 1/4 | 1068      | 9.60    |
| 1 1/2" x 1/2" | 3 1/2 | 3     | 1548      | 10.30   |
| 1 1/2" x 3/4" | 3 1/2 | 3     | 1568      | 10.30   |
| 1 1/2" x 1"   | 3 1/2 | 3     | 1510      | 10.30   |
| 2" x 1/2"     | 4     | 3     | 2048      | 13.80   |
| 2" x 3/4"     | 4     | 3     | 2068      | 13.80   |
| 2" x 1"       | 4     | 3     | 2010      | 13.80   |
| 2" x 1 1/2"   | 4     | 4     | 2015      | 13.80   |
| 3" x 1"       | 5     | 5     | 3010      | 21.65   |
| 3" x 1 1/2"   | 5     | 5     | 3015      | 21.65   |
| 3" x 2"       | 5     | 5     | 3020      | 21.65   |
| 4" x 1"       | 7     | 7     | 4010      | 30.90   |
| 4" x 1 1/2"   | 7     | 7     | 4015      | 30.90   |
| 4" x 2"       | 7     | 7     | 4020      | 30.90   |
| 4" x 3"       | 7     | 7     | 4030      | 30.90   |
| 6" x 1 1/2"   | 9     | 5 1/2 | 6015      | 58.70   |
| 6" x 2"       | 9     | 6     | 6020      | 58.70   |
| 6" x 3"       | 9     | 6 1/2 | 6030      | 58.70   |
| 6" x 4"       | 9     | 8     | 6040      | 58.70   |

# PROCESS PIPE AND FITTINGS

**6303 90°  
MITERED ELBOW**



**6304 90°  
SWEEP ELBOW**



**6303**

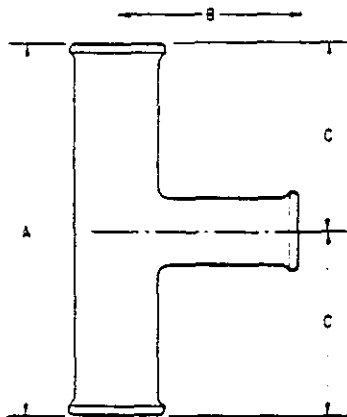
| Size      | A" | Article   | Price   |
|-----------|----|-----------|---------|
| 1½" - 90° | 3½ | 6303-1590 | \$10.30 |
| 2" - 90°  | 4  | 2090      | 13.80   |
| 3" - 90°  | 5  | 3090      | 21.65   |
| 4" - 90°  | 7  | 4090      | 30.90   |
| 6" - 90°  | 9  | 6090      | 58.70   |

**6304**

| Size      | A" | Article   | Price   |
|-----------|----|-----------|---------|
| 1½" - 90° | 3½ | 6304-1590 | \$ 7.50 |
| 2" - 90°  | 4  | 2090      | 9.65    |
| 3" - 90°  | 5  | 3090      | 15.65   |
| 4" - 90°  | 7  | 4090      | 20.65   |

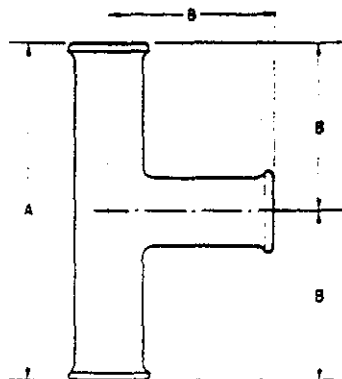
Compatible with 6310-T

**6310 STRAIGHT T**



| Size | A" | B" | Article   | Price   |
|------|----|----|-----------|---------|
| 1½"  | 4½ | 2½ | 6310-4848 | \$ 4.80 |
| 1"   | 5  | 2½ | 5868      | 5.40    |
| 1"   | 5½ | 2½ | 1010      | 8.70    |
| 1½"  | 7  | 3½ | 1515      | 12.80   |
| 2"   | 8  | 4  | 2020      | 15.00   |
| 3"   | 10 | 5  | 3030      | 20.00   |
| 4"   | 14 | 7  | 4040      | 33.75   |
| 6"   | 18 | 9  | 6060      | 50.00   |

**6311 REDUCING T (BRANCH)**

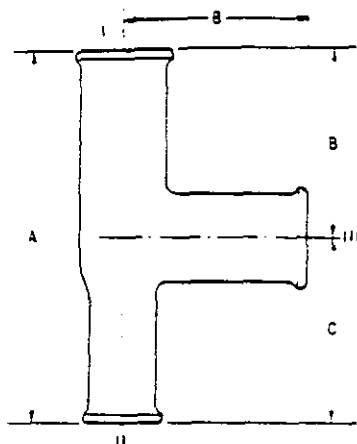


| Size.<br>Run x Branch | A" | B" | C" | Article   | Price   |
|-----------------------|----|----|----|-----------|---------|
| 1½" x ½"              | 5  | 2½ | 2½ | 6311-6848 | \$ 7.80 |
| 1" x ½"               | 5½ | 2½ | 2½ | 1048      | 9.50    |
| 1" x ¾"               | 5½ | 2½ | 2½ | 1068      | 9.60    |
| 1½" x ½"              | 7  | 3  | 3½ | 1548      | 12.80   |
| 1½" x ¾"              | 7  | 3  | 3½ | 1568      | 12.80   |
| 1½" x 1"              | 7  | 3  | 3½ | 1510      | 12.80   |
| 2" x ½"               | 8  | 3  | 4  | 2048      | 15.00   |
| 2" x ¾"               | 8  | 3  | 4  | 2068      | 15.00   |
| 2" x 1"               | 8  | 3  | 4  | 2010      | 15.00   |
| 2" x 1½"              | 8  | 3½ | 4  | 2015      | 15.00   |
| 3" x 1"               | 10 | 3½ | 5  | 3010      | 20.00   |
| 3" x 1½"              | 10 | 4  | 5  | 3015      | 20.00   |
| 3" x 2"               | 10 | 4½ | 5  | 3020      | 20.00   |
| 4" x 1"               | 14 | 4  | 7  | 4010      | 33.75   |
| 4" x 1½"              | 14 | 4½ | 7  | 4015      | 33.75   |
| 4" x 2"               | 14 | 5  | 7  | 4020      | 33.75   |
| 4" x 3"               | 14 | 5½ | 7  | 4030      | 33.75   |
| 6" x 1½"              | 18 | 5½ | 9  | 6015      | 50.00   |
| 6" x 2"               | 18 | 6  | 9  | 6020      | 50.00   |
| 6" x 3"               | 18 | 6½ | 9  | 6030      | 50.00   |
| 6" x 4"               | 18 | 8  | 9  | 6040      | 50.00   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

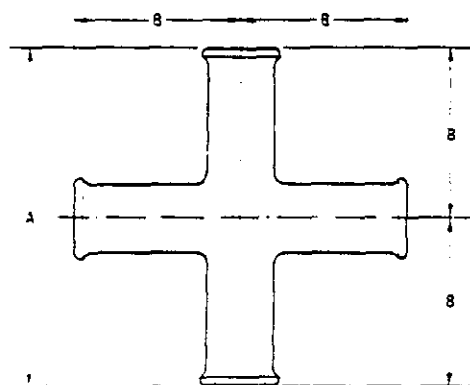
# PROCESS PIPE AND FITTINGS

## 6312 REDUCING T (RUN)



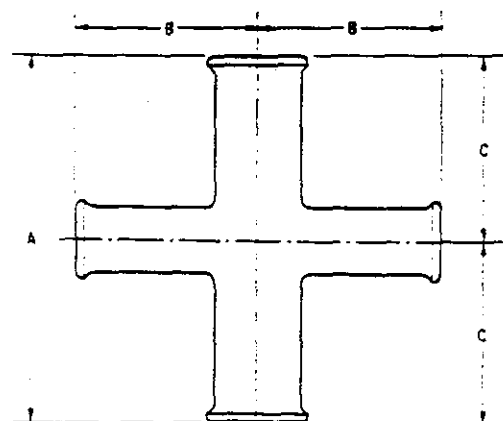
| Size                   | A"     | B"    | C"    | Article   | Price   |
|------------------------|--------|-------|-------|-----------|---------|
| 1/4" x 1/4" x 1/4"     | 5      | 2 1/2 | 2 1/2 | 6312-6848 | \$ 7.30 |
| 1" x 1/2" x 1"         | 5 1/2  | 2 1/2 | 2 1/2 | 1048      | 9.60    |
| 1" x 1/4" x 1"         | 5 1/2  | 2 1/2 | 2 1/2 | 1068      | 9.60    |
| 1 1/4" x 1/2" x 1 1/2" | 6 1/2  | 3 1/2 | 3     | 1548      | 12.30   |
| 1 1/4" x 1/4" x 1 1/2" | 6 1/2  | 3 1/2 | 3     | 1558      | 12.80   |
| 1 1/2" x 1" x 1 1/2"   | 6 1/2  | 3 1/2 | 3     | 1510      | 12.80   |
| 2" x 1/2" x 2"         | 7      | 4     | 3     | 2048      | 15.00   |
| 2" x 1/4" x 2"         | 7      | 4     | 3     | 2068      | 15.00   |
| 2" x 1" x 2"           | 7      | 4     | 3     | 2010      | 15.00   |
| 2" x 1 1/4" x 2"       | 7 1/2  | 4     | 3 1/2 | 2015      | 15.00   |
| 3" x 1" x 3"           | 8 1/2  | 5     | 3 1/2 | 3010      | 20.00   |
| 3" x 1 1/2" x 3"       | 9      | 5     | 4     | 3015      | 20.00   |
| 3" x 2" x 3"           | 10     | 4 1/2 | 5     | 3020      | 20.00   |
| 4" x 1" x 4"           | 14     | 4     | 7     | 4010      | 33.75   |
| 4" x 1 1/2" x 4"       | 14     | 4 1/2 | 7     | 4015      | 33.75   |
| 4" x 2" x 4"           | 14     | 5     | 7     | 4020      | 33.75   |
| 4" x 3" x 4"           | 14     | 5 1/2 | 7     | 4030      | 33.75   |
| 6" x 1" x 6"           | 14     | 9     | 5     | 6010      | 60.00   |
| 6" x 1 1/2" x 6"       | 14 1/2 | 9     | 5 1/2 | 6015      | 60.00   |
| 6" x 2" x 6"           | 15     | 9     | 6     | 6020      | 60.00   |
| 6" x 3" x 6"           | 15 1/2 | 9     | 6 1/2 | 6030      | 60.00   |
| 6" x 4" x 6"           | 17     | 9     | 8     | 6040      | 60.00   |

## 6320 STRAIGHT CROSS



| Size            | A"    | B"    | Article   | Price   |
|-----------------|-------|-------|-----------|---------|
| 1/2" x 1/2"     | 4 1/2 | 2 1/2 | 6320-4848 | \$ 5.70 |
| 1/4" x 1/4"     | 5     | 2 1/2 | 6868      | 6.90    |
| 1" x 1"         | 5 1/2 | 2 1/2 | 1010      | 11.10   |
| 1 1/2" x 1 1/2" | 7     | 3 1/2 | 1515      | 16.00   |
| 2" x 2"         | 8     | 4     | 2020      | 21.40   |
| 3" x 3"         | 10    | 5     | 3030      | 33.60   |
| 4" x 4"         | 14    | 7     | 4040      | 48.00   |
| 6" x 6"         | 18    | 9     | 6060      | 34.60   |

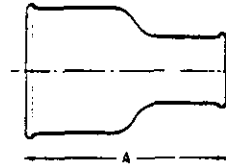
## 6350 REDUCER CROSS



| Size          | A"    | B"    | C"    | Article   | Price   |
|---------------|-------|-------|-------|-----------|---------|
| 1/4" x 1/4"   | 5     | 2 1/2 | 2 1/2 | 6350-6848 | \$ 9.60 |
| 1" x 1/2"     | 5 1/2 | 2 1/2 | 2 1/2 | 1048      | 13.10   |
| 1" x 1/4"     | 5 1/2 | 2 1/2 | 2 1/2 | 1068      | 13.10   |
| 1 1/4" x 1/2" | 7     | 3     | 3 1/2 | 1548      | 16.00   |
| 1 1/4" x 1/4" | 7     | 3     | 3 1/2 | 1558      | 16.00   |
| 1 1/2" x 1"   | 7     | 3     | 3 1/2 | 1510      | 16.00   |
| 2" x 1/2"     | 8     | 3     | 4     | 2048      | 21.40   |
| 2" x 1/4"     | 8     | 3     | 4     | 2068      | 21.40   |
| 2" x 1"       | 8     | 3     | 4     | 2010      | 21.40   |
| 2" x 1 1/4"   | 8     | 3 1/2 | 4     | 2015      | 21.40   |
| 3" x 1"       | 10    | 3 1/2 | 5     | 3010      | 33.60   |
| 3" x 1 1/2"   | 10    | 4     | 5     | 3015      | 33.60   |
| 3" x 2"       | 10    | 4 1/2 | 5     | 3020      | 33.60   |
| 4" x 1"       | 14    | 4     | 7     | 4010      | 48.00   |
| 4" x 1 1/2"   | 14    | 4 1/2 | 7     | 4015      | 48.00   |
| 4" x 2"       | 14    | 5     | 7     | 4020      | 48.00   |
| 4" x 3"       | 14    | 5 1/2 | 7     | 4030      | 48.00   |
| 6" x 1"       | 18    | 9     | 5     | 6010      | 32.10   |
| 6" x 1 1/2"   | 18    | 5 1/2 | 9     | 6015      | 32.10   |
| 6" x 2"       | 18    | 6     | 9     | 6020      | 32.10   |
| 6" x 3"       | 18    | 6 1/2 | 9     | 6030      | 32.10   |
| 6" x 4"       | 18    | 8     | 9     | 6040      | 32.10   |

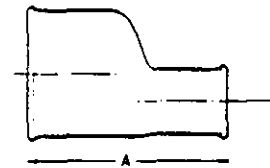
# PROCESS PIPE AND FITTINGS

## 6315 REDUCER (Straight)



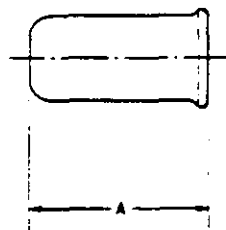
| Size          | A" | Article   | Price   | Size        | A" | Article   | Price   |
|---------------|----|-----------|---------|-------------|----|-----------|---------|
| 1/4" x 1/2"   | 4  | 6315-6348 | \$ 3.90 | 3" x 1 1/2" | 5  | 6315-3015 | \$ 9.40 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3020      | 10.65   |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      | 11.90   |
| 1 1/2" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      | 11.90   |
| 1 1/2" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      | 13.15   |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      | 15.65   |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 6" x 1"     | 9  | 6010      | 19.40   |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 6" x 1 1/2" | 9  | 6015      | 19.40   |
| 2" x 1"       | 4  | 2010      | 6.90    | 6" x 2"     | 9  | 6020      | 20.65   |
| 2" x 1 1/2"   | 4  | 2015      | 6.90    | 6" x 3"     | 9  | 6030      | 25.00   |
| 3" x 1"       | 5  | 3010      | 9.40    | 6" x 4"     | 9  | 6040      | 27.50   |

## 6340 REDUCER (Eccentric)



| Size          | A" | Article   | Price   | Size        | A" | Article   | Price   |
|---------------|----|-----------|---------|-------------|----|-----------|---------|
| 1/4" x 1/2"   | 4  | 6340-6848 | \$ 3.90 | 3" x 1 1/2" | 5  | 6340-3015 | \$ 9.40 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3020      | 10.65   |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      | 11.90   |
| 1 1/2" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      | 11.90   |
| 1 1/2" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      | 13.15   |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      | 15.65   |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 6" x 1"     | 9  | 6010      | 19.40   |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 6" x 1 1/2" | 9  | 6015      | 19.40   |
| 2" x 1"       | 4  | 2010      | 6.90    | 6" x 2"     | 9  | 6020      | 20.65   |
| 2" x 1 1/2"   | 4  | 2015      | 6.90    | 6" x 3"     | 9  | 6030      | 25.00   |
| 3" x 1"       | 5  | 3010      | 9.40    | 6" x 4"     | 9  | 6040      | 27.50   |

## 6336 END CAP



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2     | 6336-4800 | \$ 2.00 |
| 3/4"   | 2     | 6800      | 2.35    |
| 1"     | 2     | 1000      | 2.45    |
| 1 1/2" | 3     | 1500      | 3.50    |
| 2"     | 4     | 2000      | 4.70    |
| 3"     | 4 3/4 | 3000      | 7.35    |
| 4"     | 6     | 4000      | 10.50   |
| 6"     | 7     | 6000      | 14.10   |

## 6344 END PLUG

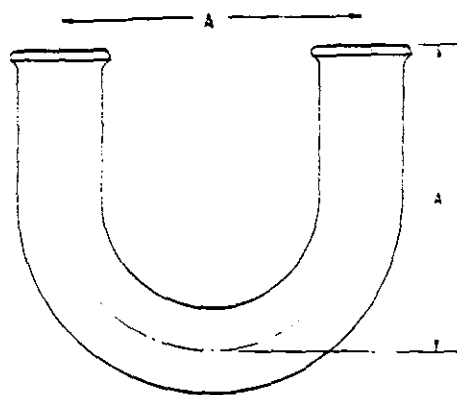


| Size   | A"    | Article   | Price  |
|--------|-------|-----------|--------|
| 1 1/2" | 1/2   | 6344-1500 | \$1.50 |
| 2"     | 1     | 2000      | 2.35   |
| 3"     | 1 1/4 | 3000      | 3.35   |
| 4"     | 1 1/4 | 4000      | 5.35   |
| 6"     | 1 1/2 | 6000      | 7.50   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

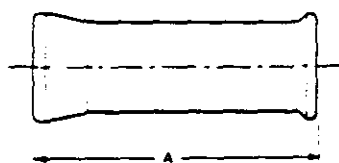
# PROCESS PIPE AND FITTINGS

## 6365 U BEND (Annealed)



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2 1/4 | 6365-4800 | \$ 6.30 |
| 3/4"   | 2 1/4 | 5800      | 7.55    |
| 1"     | 5 1/2 | 1000      | 11.80   |
| 1 1/2" | 7     | 1500      | 17.00   |
| 2"     | 7     | 2000      | 22.80   |
| 3"     | 9     | 3000      | 35.70   |
| 4"     | 12    | 4000      | 51.00   |

## 6366 ADAPTER Straight or Reducer (Conical to Beaded End Pipe)

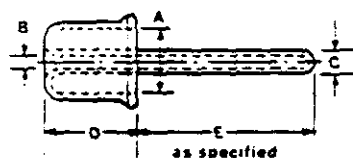


| Size Conical x Bead | A" | Article   | Price  | Size Conical x Bead | A" | Article   | Price   |
|---------------------|----|-----------|--------|---------------------|----|-----------|---------|
| 1/2" x 1/2"         | 4  | 6366-4848 | \$2.75 | 2" x 1 1/2"         | 4  | 6366-2015 | \$ 7.90 |
| 1/4" x 1/2"         | 4  | 5848      | 4.90   | 2" x 2"             | 4  | 2020      | 7.90    |
| 3/4" x 1/2"         | 4  | 5868      | 3.25   | 3" x 1"             | 5  | 3010      | 10.40   |
| 1" x 1/2"           | 4  | 1048      | 5.70   | 3" x 1 1/2"         | 5  | 3015      | 10.40   |
| 1" x 3/4"           | 4  | 1068      | 5.70   | 3" x 2"             | 5  | 3020      | 10.40   |
| 1" x 1"             | 4  | 1010      | 5.00   | 3" x 3"             | 5  | 3030      | 10.40   |
| 1 1/2" x 1/2"       | 4  | 1548      | 6.20   | 4" x 1"             | 7  | 4010      | 12.90   |
| 1 1/2" x 3/4"       | 4  | 1568      | 6.20   | 4" x 1 1/2"         | 7  | 4015      | 12.90   |
| 1 1/2" x 1"         | 4  | 1510      | 6.20   | 4" x 2"             | 7  | 4020      | 14.15   |
| 1 1/2" x 1 1/2"     | 4  | 1515      | 5.95   | 4" x 3"             | 7  | 4030      | 15.65   |
| 2" x 1/2"           | 4  | 2048      | 7.90   | 4" x 4"             | 7  | 4040      | 15.65   |
| 2" x 3/4"           | 4  | 2068      | 7.90   | 6" x 4"             | 9  | 6040      | 28.50   |
| 2" x 1"             | 4  | 2010      | 7.90   | 6" x 6"             | 9  | 6060      | 28.50   |

## THERMOMETER WELLS—Made to Order

### 6392 Single End

Length "E" must be specified (from min. 6" to max. 36").

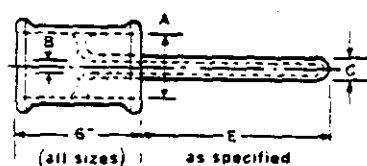


NOTE: All thermometer wells are annealed.

| A" Pipe Well I.D. | B"  | C"  | D"    | Article   | Price   |
|-------------------|-----|-----|-------|-----------|---------|
| 1 1/2"            | 1/4 | 1/4 | 2 1/4 | 6392-1538 | \$15.55 |
| 1 1/2"            | 1/2 | 1/4 | 2 1/4 | 1540      | 15.80   |
| 1 1/2"            | 3/4 | 1   | 2 1/4 | 1558      | 16.50   |
| 2"                | 1/4 | 1/4 | 2 1/4 | 1538      | 16.95   |
| 2"                | 1/2 | 1/4 | 2 1/4 | 2050      | 17.10   |
| 2"                | 3/4 | 1   | 2 1/4 | 2058      | 17.90   |
| 3"                | 1/4 | 1/4 | 3 1/4 | 3038      | 19.30   |
| 3"                | 1/2 | 1/4 | 3 1/4 | 3050      | 19.55   |
| 3"                | 3/4 | 1   | 3 1/4 | 3058      | 20.25   |

### 6395 Double End

Length "E" must be specified (from min. 6" to max. 36").



NOTE: All thermometer wells are annealed.

| A" Pipe Well I.D. | B"  | C"  | D" | Article   | Price   |
|-------------------|-----|-----|----|-----------|---------|
| 1 1/2"            | 1/4 | 1/4 | 6  | 6395-1538 | \$20.35 |
| 1 1/2"            | 1/2 | 1/4 | 6  | 1550      | 20.60   |
| 1 1/2"            | 3/4 | 1   | 6  | 1558      | 21.30   |
| 2"                | 1/4 | 1/4 | 6  | 2038      | 23.30   |
| 2"                | 1/2 | 1/4 | 6  | 2050      | 23.45   |
| 2"                | 3/4 | 1   | 6  | 2058      | 24.75   |
| 3"                | 1/4 | 1/4 | 6  | 3038      | 28.80   |
| 3"                | 1/2 | 1/4 | 6  | 3050      | 29.05   |
| 3"                | 3/4 | 1   | 6  | 3058      | 29.75   |

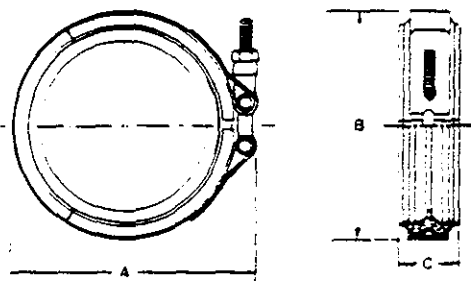
Use catalog dimensions for piping layout as gasket thickness allowance is included.

## ACCESSORIES AND HARDWARE

### PROCESS PIPE COUPLINGS (Bead to Bead)

Coupling assemblies consists of a 300 series stainless steel outer band with T-bolt and hex nut; either Viton or Hydrin liner and a TFE seal ring.

No. 7123 coupling is designed for temperature service up to 450° F. No. 7126 coupling for service up to 300° F.



NOTE: 7123 coupling is recommended for installations in corrosive atmosphere.

#### Consists of . . .

| Coupling No. | Liner Material | Max. Temp. | Band No. | Nut No. | Liner with Seal Ring |
|--------------|----------------|------------|----------|---------|----------------------|
| 7123         | Viton          | 450°       | 7125     | 5664    | 7124                 |
| 7126         | Hydrin         | 300°       | 7125     | 5664    | 7127                 |

### 7123 High Temp. — Viton Liner (450°)

| Size   | A"    | B"    | C"    | Article   | Price   |
|--------|-------|-------|-------|-----------|---------|
| 1/2"   | 1 1/4 | 1 1/4 | 1 1/4 | 7123-4800 | \$ 7.00 |
| 3/4"   | 1 1/4 | 1 1/4 | 1 1/4 | 5800      | 7.50    |
| 1"     | 2 1/4 | 1 1/4 | 1     | 1000      | 8.00    |
| 1 1/2" | 3     | 2 1/4 | 1 1/4 | 1500      | 9.00    |
| 2"     | 3 1/2 | 3 1/4 | 1 1/4 | 2000      | 10.00   |
| 3"     | 4 1/4 | 4 1/4 | 1 1/4 | 3000      | 14.00   |
| 4"     | 6     | 5 1/4 | 1 1/4 | 4000      | 20.00   |
| 6"     | 8 3/4 | 8     | 1 1/4 | 6000      | 30.00   |

### 7126 Med. Temp. — Hydrin Liner (300°)

| Size   | A"    | B"    | C"    | Article   | Price   |
|--------|-------|-------|-------|-----------|---------|
| 1/2"   | 1 1/4 | 1 1/4 | 1 1/4 | 7126-4800 | \$ 3.25 |
| 3/4"   | 1 1/4 | 1 1/4 | 1 1/4 | 5800      | 3.95    |
| 1"     | 2 1/4 | 1 1/4 | 1     | 1000      | 4.00    |
| 1 1/2" | 3     | 2 1/4 | 1 1/4 | 1500      | 5.30    |
| 2"     | 3 1/2 | 3 1/4 | 1 1/4 | 2000      | 6.00    |
| 3"     | 4 1/4 | 4 1/4 | 1 1/4 | 3000      | 9.00    |
| 4"     | 6     | 5 1/4 | 1 1/4 | 4000      | 14.00   |
| 6"     | 8 3/4 | 8     | 1 1/4 | 6000      | 21.00   |

### 7123-7126 COUPLING COMPONENTS

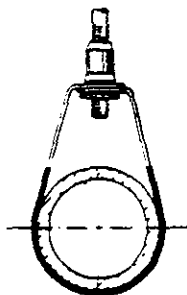
#### 7125 S.S. Band and Nut

#### 7124 T.F.E. Seal and Viton Liner

#### 7127 T.F.E. Seal and Viton Liner

| Size   | Article   | Price  | Size   | Article   | Price   | Size   | Article   | Price   |
|--------|-----------|--------|--------|-----------|---------|--------|-----------|---------|
| 1/2"   | 7125-4800 | \$1.90 | 1/2"   | 7124-4800 | \$ 5.75 | 1/2"   | 7127-4800 | \$ 2.05 |
| 3/4"   | 5800      | 1.90   | 3/4"   | 5800      | 5.25    | 3/4"   | 5800      | 2.75    |
| 1"     | 1000      | 1.95   | 1"     | 1000      | 5.35    | 1"     | 1000      | 2.85    |
| 1 1/2" | 1500      | 2.30   | 1 1/2" | 1500      | 7.20    | 1 1/2" | 1500      | 3.40    |
| 2"     | 2000      | 2.80   | 2"     | 2000      | 8.30    | 2"     | 2000      | 4.00    |
| 3"     | 3000      | 4.00   | 3"     | 3000      | 12.20   | 3"     | 3000      | 6.05    |
| 4"     | 4000      | 5.60   | 4"     | 4000      | 18.10   | 4"     | 4000      | 9.50    |
| 6"     | 6000      | 8.00   | 6"     | 6000      | 25.00   | 6"     | 6000      | 15.00   |

### 7290 PADDED PIPE HANGER



| Size   | Article   | Price  |
|--------|-----------|--------|
| 1/2"   | 7290-4800 | \$ .45 |
| 3/4"   | 5800      | .45    |
| 1"     | 1000      | .50    |
| 1 1/2" | 1500      | .50    |
| 2"     | 2000      | .60    |
| 3"     | 3000      | 2.00   |
| 4"     | 4000      | 2.20   |
| 6"     | 6000      | 7.20   |

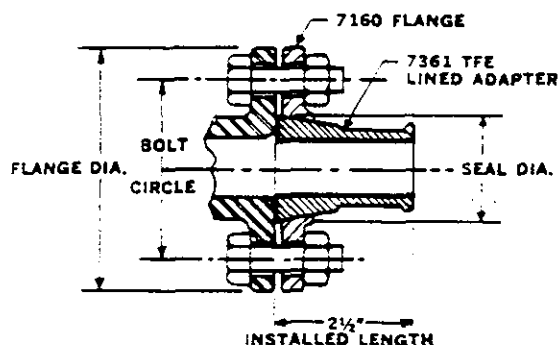
All hangers are zinc coated and have a factory applied plastic sleeve to prevent glass to metal contact. Use one hanger every 8 to 10 feet. Support all valves and meters individually.



## ACCESSORIES AND HARDWARE

### 7360 COUPLING KIT (125 lb. A.S.A. Flange to Beaded Pipe)

For maximum temperature and pressure applications.



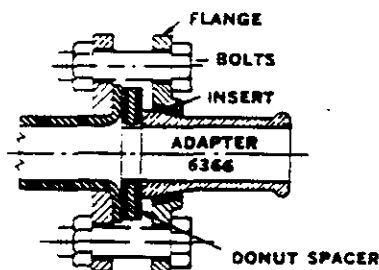
| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$10.00 |
| 1 1/2" | 1500      | 15.00   |
| 2"     | 2000      | 20.00   |
| 3"     | 3000      | 30.00   |
| 4"     | 4000      | 40.00   |
| 6"     | 6000      | 50.00   |

#### Assembly Consists of . . .

| Size   | one<br>Flange | T.F.E.<br>Adapter | 7190<br>Nuts & Bolts | Qty. |
|--------|---------------|-------------------|----------------------|------|
| 1"     | 7160-1000     | 7361-1000         | 1/2" - 13x2 1/4"     | 4    |
| 1 1/2" | 1500          | 1500              | 1/2" - 13x2 1/2"     | 4    |
| 2"     | 2000          | 2000              | 3/4" - 11x2 1/2"     | 4    |
| 3"     | 3000          | 3000              | 3/4" - 11x2 1/2"     | 4    |
| 4"     | 4000          | 4000              | 3/4" - 11x3 1/2"     | 4    |
| 6"     | 6000          | 6000              | 1/2" - 10x3 1/2"     | 4    |

### 7121 COUPLING (ASA Flanged Metal to Beaded End Pipe)

To join beaded glass pipe to inside coated metal pipe.



Adapter 6366 not included.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1/2"   | 7121-4800 | \$ 6.50 |
| 3/4"   | 6800      | 7.50    |
| 1"     | 1000      | 9.75    |
| 1 1/2" | 1500      | 11.75   |
| 2"     | 2000      | 13.95   |
| 3"     | 3000      | 17.25   |
| 4"     | 4000      | 26.95   |
| 6"     | 6000      | 45.00   |

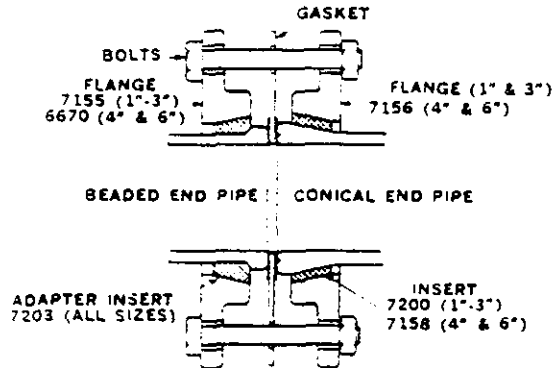
#### Assembly Consists of . . .

| Size   | Flange    | Insert    | Donut<br>Spacer | Adapter<br>Buttons | 7190<br>Nuts & Bolts | Qty. |
|--------|-----------|-----------|-----------------|--------------------|----------------------|------|
| 1/2"   | 7160-4800 | 7202-4800 | 7240-4800       | —                  | 1/2" - 13 x 2        | 4    |
| 3/4"   | 6800      | 6800      | 6800            | —                  | 1/2" - 13 x 2        | 4    |
| 1"     | 1000      | 7200-1000 | 1000            | —                  | 1/2" - 13 x 2        | 4    |
| 1 1/2" | 1500      | 1500      | 1500            | —                  | 1/2" - 13 x 2        | 4    |
| 2"     | 2000      | 2000      | 2000            | —                  | 3/4" - 11 x 2 1/2"   | 4    |
| 3"     | 3000      | 3000      | 3000            | —                  | 3/4" - 11 x 3        | 4    |
| 4"     | 7156-4000 | 7158-4000 | 4000            | 7230-99            | 3/4" - 18 x 3        | 3    |
| 6"     | 6000      | 6000      | 6000            | 7230-99            | 1/2" - 16 x 3        | 3    |

## ACCESSORIES AND HARDWARE

### \*7110 COUPLING ASSEMBLY (Beaded to Conical End Pipe)

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



\*Pressure rating limited to that of Conical Pipe System. Not to be used with Beaded Armored Pipe.

| Size | Article   | Price   |
|------|-----------|---------|
| 1"   | 7110-1000 | \$ 4.00 |
| 1½"  | 1500      | 4.60    |
| 2"   | 2000      | 5.50    |
| 3"   | 3000      | 11.25   |
| 4"   | 4000      | 24.10   |
| 6"   | 6000      | 31.10   |

### Assembly Consists of . . .

| Size | Flange                 | Insert                 | Gasket    | 7190 Nuts & Bolts — Qty. |
|------|------------------------|------------------------|-----------|--------------------------|
| 1"   | 7155-1000              | 7200-1000<br>7203-1000 | 7276-1000 | ½" — 13 x 2½" 4          |
| 1½"  | 1500                   | 7200-1500<br>7203-1500 | 1500      | ½" — 13 x 2½" 4          |
| 2"   | 2000                   | 7200-2000<br>7203-2000 | 2000      | ½" — 13 x 2½" 4          |
| 3"   | 3000                   | 7200-3000<br>7203-3000 | 3000      | ½" — 13 x 3" 4           |
| 4"   | 7156-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | ½" — 18 x 3" 3           |
| 6"   | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | ½" — 16 x 3" 3           |

### 7360, 7121, 7110 COUPLING KIT COMPONENTS

| Flange for 7360 |           |         | Insert for 7121                |           |         | Flange for 7110 (Need 2)    |           |             |
|-----------------|-----------|---------|--------------------------------|-----------|---------|-----------------------------|-----------|-------------|
| 1"              | 7160-1000 | \$ 3.00 | ½"                             | 7202-4800 | \$ .30  | 1"                          | 7155-1000 | \$ 1.00 ea. |
| 1½"             | 1500      | 4.00    | ¾"                             | 6800      | .30     | 1½"                         | 1500      | 1.50 ea.    |
| 2"              | 2000      | 4.50    | 1"                             | 7200-1000 | .50     | 2"                          | 2000      | 2.00 ea.    |
| 3"              | 3000      | 5.50    | 1½"                            | 1500      | .70     | 3"                          | 3000      | 3.00 ea.    |
| 4"              | 4000      | 10.75   | 2"                             | 2000      | .90     | 4"                          | 7156-4000 | 5.30 ea.    |
| 6"              | 6000      | 11.50   | 3"                             | 3000      | 1.35    | 4"                          | 6670-4000 | 6.90 ea.    |
| Adapter 7360    |           |         | 4"                             | 7158-4000 | 5.05    | 6"                          | 7156-6000 | 10.60 ea.   |
|                 |           |         | 6"                             | 6000      | 10.10   | 6"                          | 6670-6000 | 8.60 ea.    |
| Flange for 7121 |           |         | Donut Spacer for 7121          |           |         | Inserts for 7110 (one each) |           |             |
| 1"              | 7361-1000 | \$ 7.50 | ½"                             | 7240-4800 | \$ 4.00 | 1"                          | 7200-1000 | \$ .50 ea.  |
| 1½"             | 1500      | 11.50   | ¾"                             | 6800      | 4.50    |                             | 7203-1000 | 1.35 ea.    |
| 2"              | 2000      | 16.00   | 1"                             | 1000      | 5.50    | 1½"                         | 7200-1500 | .70 ea.     |
| 3"              | 3000      | 25.00   | 1½"                            | 1500      | 6.50    |                             | 7203-1500 | 1.45 ea.    |
| 4"              | 4000      | 30.00   | 2"                             | 2000      | 7.75    | 2"                          | 7200-2000 | .90 ea.     |
| 6"              | 6000      | 40.00   | 3"                             | 3000      | 10.00   |                             | 7203-2000 | 1.55 ea.    |
| Flange for 7121 |           |         | 4"                             | 4000      | 16.00   | 3"                          | 7200-3000 | 1.35 ea.    |
| ½"              | 7160-4800 | \$ 1.55 | 6"                             | 6000      | 24.00   |                             | 7203-3000 | 2.20 ea.    |
| ¾"              | 6800      | 2.00    | Adapter Button for 7121 (4-6") |           |         | 4"                          | 7158-4000 | 5.05 ea.    |
| 1"              | 1000      | 3.00    | 4"-6"                          | 7230-99   | \$ .10  |                             | 7203-4000 | 3.60 ea.    |
| 1½"             | 1500      | 4.00    |                                |           |         | 6"                          | 7158-6000 | 10.70 ea.   |
| 2"              | 2000      | 4.50    |                                |           |         |                             | 7203-6000 | 5.20 ea.    |
| 3"              | 3000      | 5.50    |                                |           |         |                             |           |             |
| 4"              | 7156-4000 | 5.30    |                                |           |         |                             |           |             |
| 6"              | 6000      | 10.60   |                                |           |         |                             |           |             |

### 7190 Bolts & Nuts

For all Coupling Kits & Assemblies

| Description   | Qty. | Article   | Price     |
|---------------|------|-----------|-----------|
| ½" - 18 x 2½" | 4    | 7190-1822 | \$ 10 ea. |
| ½" - 18 x 2½" | 4    | 1824      | 10 ea.    |
| ½" - 18 x 3"  | 8    | 1830      | 10 ea.    |
| ½" - 16 x 3"  | 8    | 1630      | 15 ea.    |
| ½" - 13 x 2"  | 4    | 1320      | 20 ea.    |
| ½" - 13 x 2½" | 4    | 1322      | 20 ea.    |
| ½" - 13 x 2½" | 4    | 1324      | 20 ea.    |
| ½" - 11 x 2½" | 4    | 1124      | 25 ea.    |
| ½" - 11 x 3"  | 4    | 1130      | 25 ea.    |
| ½" - 11 x 3½" | 4    | 1134      | 25 ea.    |
| ½" - 10 x 3½" | 4    | 1034      | 30 ea.    |

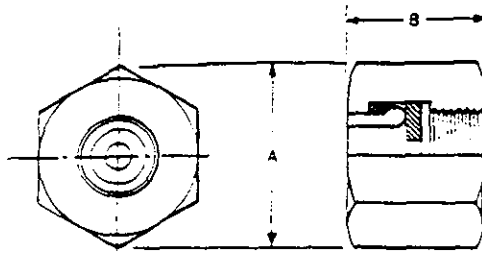
### Gasket for 7110

T.F.E. Machined (Full Flow) Gasket  
(Blue African Asbestos Filler)

| Description | Size | Article   | Price  |
|-------------|------|-----------|--------|
| Style II    | 1"   | 7276-1000 | \$ .85 |
| "           | 1½"  | 1500      | 1.10   |
| "           | 2"   | 2000      | 1.20   |
| "           | 3"   | 3000      | 2.40   |
| "           | 4"   | 4000      | 4.75   |
| "           | 6"   | 6000      | 7.30   |

## ACCESSORIES AND HARDWARE

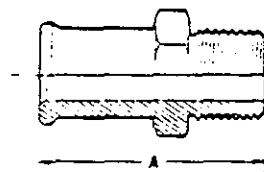
### 7340 FAUCET UNION—ALUMINUM (Beaded to 1/2" Metal IPS Threaded Pipe)



Replacement parts for No. 7340 assembly include No. 7343 gasket and No. 7344 cushion ring.

| Size               | A"    | B"    | Article   | Price  |
|--------------------|-------|-------|-----------|--------|
| 1/2" Assembly      | 1 1/4 | 1 1/4 | 7340-4800 | \$8.30 |
| 1/2" Gasket (TFE)  | —     | —     | 7343-4800 | .50    |
| 1/2" Cushion (TFE) | —     | —     | 7344-4800 | .50    |

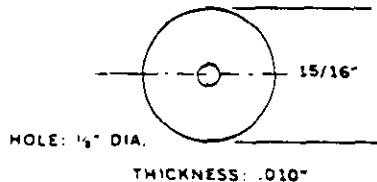
### 7350 Male Threaded ADAPTER (316 Stainless Steel)



Used to join threaded female fittings, valves and flanges to beaded pipe.

| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/4"   | 2 3/4 | 7350-6800 | \$12.35 |
| 1"     | 2 3/4 | 1000      | 14.85   |
| 1 1/2" | 2 3/4 | 1500      | 19.60   |

### 7348 Gasket — Flow Control (TFE)

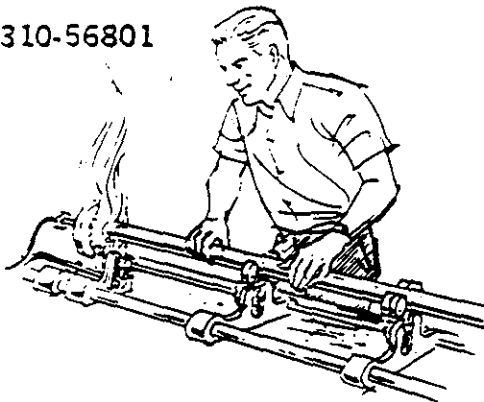


Place 7348 Flow Control Gasket into 7126 coupling — place at first horizontal joint from faucet.

| Size | Article   | Price  | Description |
|------|-----------|--------|-------------|
| 1/2" | 7348-4800 | \$5.50 | T.F.E.      |

Used to reduce surge and water hammer in distilled water systems.

### 7310-56801



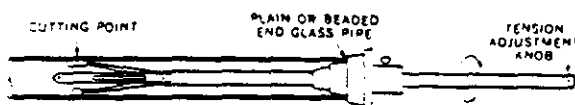
### BK-5 PORTABLE BEADING KIT

For fast, simplified field beading of glass pipe. Kit is designed so that operator can form a bead on 1/2" through 6" pipe that has same compatibility in coupling as factory beaded pipe. For operational details, consult KIMAX Cutting and Beading Manual TR-244 (February 1969).

PRICE ON REQUEST

### 7310-56802 Cutting 1 1/2", 2", 3", 4", 6" Pipe

### 7310-56803 Cutting 1/2", 3/4", 1" Pipe



### PORTABLE GLASS CUTTERS

For on-the-job scoring and cutting of special lengths of glass pipe. For operational details consult KIMAX Cutting and Beading Manual TR-244 (February 1969).

PRICE ON REQUEST

# ENGINEERING DATA

## COMPARATIVE WEIGHT

The following table indicates approximate weight of 2" diameter KIMAX Glass Pipe compared to the weight of other pipe material of the same diameter.

| Material                      | Approximate Weight (lbs./ft./2" dia.)  |
|-------------------------------|----------------------------------------|
| KIMAX Glass Pipe              | 1.10—1.20                              |
| PVC, Schedule 90              | Normal Impact 0.93<br>High Impact 0.93 |
| Hard Rubber                   | 1.58                                   |
| Graphite (Impervious)         | 1.70                                   |
| Resin-Bonded Asbestos         | 2.38                                   |
| Stainless Steel (Schedule 40) | 3.65                                   |
| Lead, Ex. Light               | 4.30                                   |
| Porcelain                     | 7.35                                   |
| High Silicon Iron             | 7.70                                   |

## OPERATING TEMPERATURES AND PRESSURES

KIMAX Glass Pipe will operate at temperatures up to 450° F. under normal conditions. Where operating temperatures exceed 250° F. (up to 450° F.), protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois, Glass Pipe Market Development, Toledo, Ohio 43601.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

| Maximum Operating Limits         |                |                |      |      |  |  |
|----------------------------------|----------------|----------------|------|------|--|--|
| PIPE SIZE                        | 1/4", 3/8", 1" | 1 1/2", 2", 3" | 4"   | 6"   |  |  |
| PRESSURE (psi)                   | 100            | 75             | 50   | 30   |  |  |
| MAX. TEMPERATURE (°F)            | 450            | 450            | 450  | 450  |  |  |
| MIN. TEMPERATURE (°F)            | -50*           | -30*           | -30* | -50* |  |  |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 200            | 200            | 175  | 160  |  |  |

\*Freezing point of conveyed material should be taken into consideration.

Note: Gas pressure should not exceed 5 PSI.

It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## THERMAL EXPANSION

When joining KIMAX Glass Pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Glass Pipe has a thermal expansion of .22"/100 ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| Material              | Relative Expansion                       |
|-----------------------|------------------------------------------|
| KIMAX Glass Pipe      | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (Impervious) | 1.30                                     |
| Steel                 | 3.60                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 6.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Schedule 80      | Normal Impact 15.00<br>High Impact 34.00 |

## FLOW CHARACTERISTICS — PRESSURE DROP

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| Fitting     | Equivalent Lengths (Feet) By Pipe Size |        |      |       |       |       |
|-------------|----------------------------------------|--------|------|-------|-------|-------|
|             | 1"                                     | 1 1/2" | 2"   | 3"    | 4"    | 6"    |
| 22 1/2° L   | .05                                    | .75    | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° L       | 1.3                                    | 1.9    | 2.5  | 3.8   | 5.0   | 7.5   |
| 60° L       | 2.1                                    | 3.0    | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° L       | 5.0                                    | 7.5    | 10.0 | 15.0  | 20.0  | 30.0  |
| Sweep L     | 1.7                                    | 2.5    | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.2                                    | 6.3    | 8.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.7                                    | 2.5    | 3.3  | 5.0   | 6.7   | 10.0  |
| T (S.O.)    | 5.0                                    | 7.5    | 10.0 | 15.0  | 20.0  | 30.0  |
| T (S.I.)    | 6.0                                    | 9.0    | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2    | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0    | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 36.00                                  | 54.0   | 72.0 | 108.0 | 144.0 | 215.0 |

| Flow Rate (Gals./Min.) |                 | Pressure Drop (PSI) Per 100 Ft. By Pipe Size |        |      |      |     |    |
|------------------------|-----------------|----------------------------------------------|--------|------|------|-----|----|
|                        |                 | 1"                                           | 1 1/2" | 2"   | 3"   | 4"  | 6" |
| 5                      | Glass           | 2.6                                          | —      | —    | —    | —   | —  |
|                        | Stainless Steel | 4.0                                          | —      | —    | —    | —   | —  |
| 10                     | Glass           | 5.5                                          | —      | —    | —    | —   | —  |
|                        | Stainless Steel | 7.7                                          | —      | —    | —    | —   | —  |
| 15                     | Glass           | 8.4                                          | —      | —    | —    | —   | —  |
|                        | Stainless Steel | 11.7                                         | —      | —    | —    | —   | —  |
| 20                     | Glass           | 11.3                                         | —      | —    | —    | —   | —  |
|                        | Stainless Steel | 15.5                                         | —      | —    | —    | —   | —  |
| 25                     | Glass           | 14.0                                         | 3      | 9    | —    | —   | —  |
|                        | Stainless Steel | 19.5                                         | 4      | 10   | —    | —   | —  |
| 50                     | Glass           | —                                            | 8.0    | 2.3  | 3    | —   | —  |
|                        | Stainless Steel | —                                            | 9.0    | 2.9  | 5    | —   | —  |
| 75                     | Glass           | —                                            | 14.0   | 4.1  | 5    | —   | —  |
|                        | Stainless Steel | —                                            | 16.2   | 5.0  | 9    | —   | —  |
| 100                    | Glass           | —                                            | —      | 6.2  | 1.0  | 4   | —  |
|                        | Stainless Steel | —                                            | —      | 8.0  | 1.3  | 5   | —  |
| 150                    | Glass           | —                                            | —      | 14.5 | 2.0  | 9   | —  |
|                        | Stainless Steel | —                                            | —      | —    | 2.7  | 1.0 | —  |
| 200                    | Glass           | —                                            | —      | —    | 3.5  | 1.2 | —  |
|                        | Stainless Steel | —                                            | —      | —    | 4.3  | 1.4 | —  |
| 300                    | Glass           | —                                            | —      | —    | 6.7  | 2.0 | 25 |
|                        | Stainless Steel | —                                            | —      | —    | 9.7  | 2.3 | 40 |
| 400                    | Glass           | —                                            | —      | —    | 12.7 | 3.0 | 55 |
|                        | Stainless Steel | —                                            | —      | —    | —    | 4.0 | 75 |

NOTE: Above pressure drops are only approximate. For more detailed data refer to equations for friction factors by Drew, Koo and McAdams, Trans. Am. Inst. Chem. Engrs. 26, 56 (1933); and Wilson, McAdams and Seitzer, Ind. Eng. Chem., 14, 105 (1922).

# ENGINEERING DATA

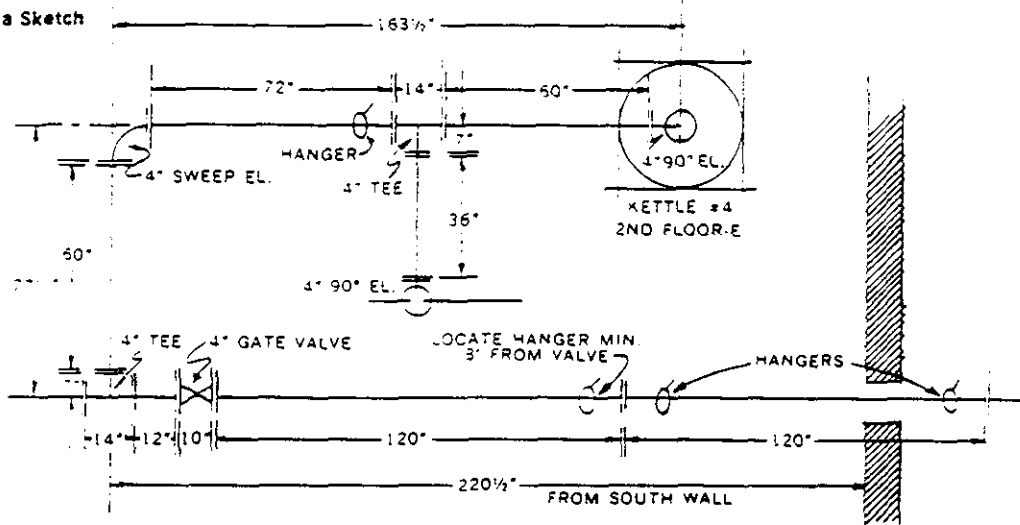
## LAYOUT

Layout of KIMAX Glass Pipe is similar to that of other materials. In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

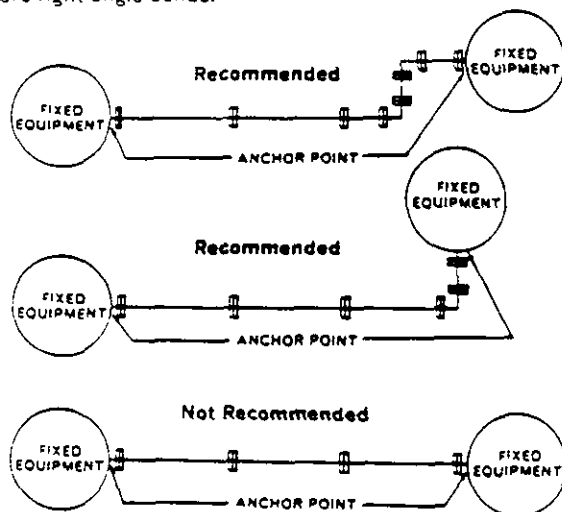
Typical Area Sketch



## ANCHOR POINTS

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks and pumps.

There should be only one anchor point in any straight run of pipe. Diagrams below show both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.



All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

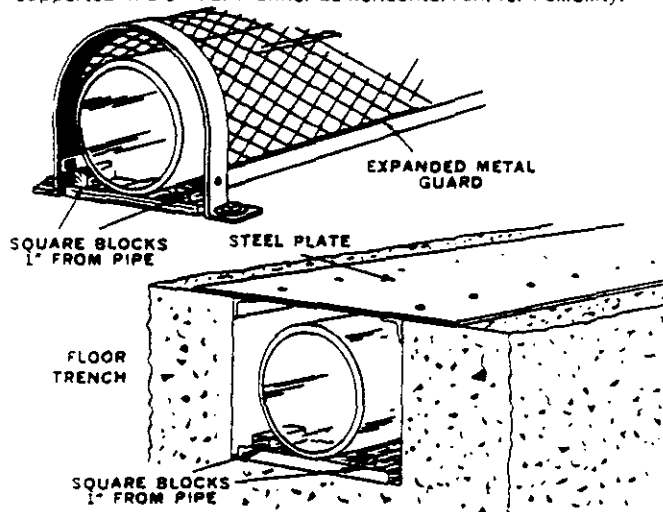
## HORIZONTAL LINE SUPPORT

Each 10-foot length of KIMAX pipe should be supported with at least one hanger, located about 1 foot from each end. See illustration of horizontal line support, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

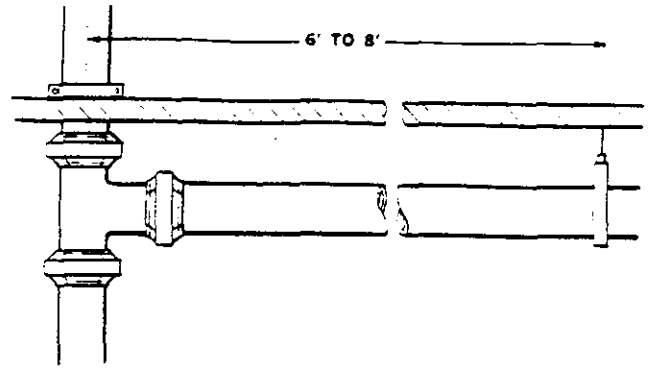
Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility.

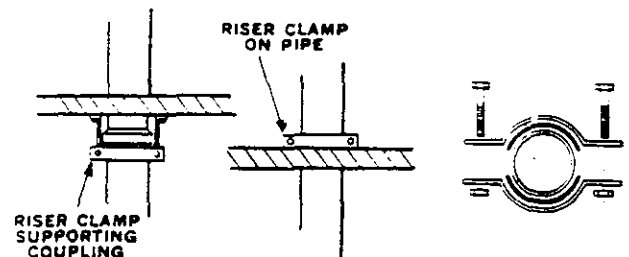


## INSTALLATION DATA

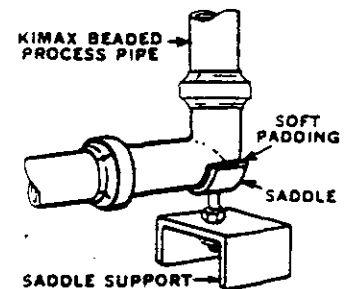
- Do not support vertical runs with horizontal lines. First hanger should be placed from 6 feet to 8 feet from column.



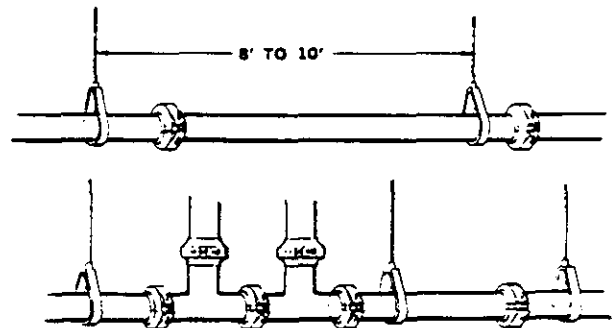
- Use KIMAX compression coupling without seal ring around O.D. of pipe and support to structure with a riser clamp or support ring.
- Clamps should be below coupling on riser where possible.
- Support need not be at joint.  
OR ...
- Use riser clamp lined with  $\frac{1}{4}$ " thick neoprene.
- Locate riser clamps at each floor or at center distance not to exceed 12 feet.



- The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

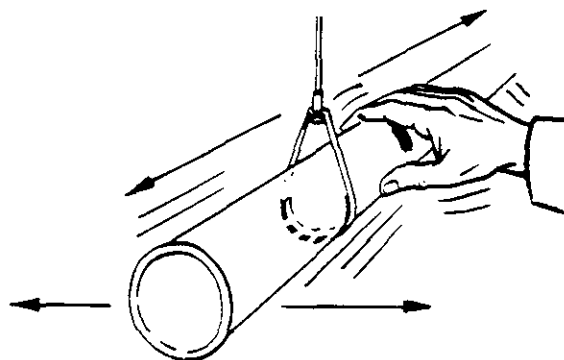


- Use padded hangers to prevent glass to metal contact. Space hangers to support lines every 8 feet to 10 feet.
- Use extra hanger when two or more couplings fall within hanger span.
- Independently support all valves, meters or any heavy equipment installed in line.



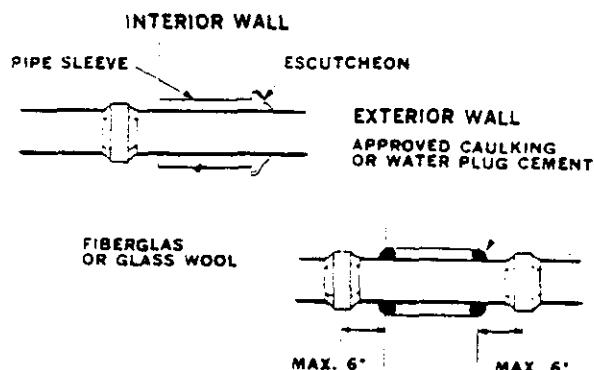
## INSTALLATION DATA

- Keep lines loose . . . when horizontal lines are hung they should be free to move sideways.
- Axial movement should be limited, but by no more than one (1) anchor point per 50' in any direction.



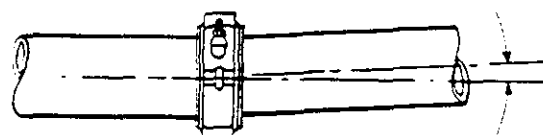
- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 6" on either side of wall.



- To pitch a line, snug coupling, cock joint to pitch required and tighten coupling.
- Pitch should not exceed 4°.

Note: Retighten all couplings bolts 24 hours after original installation . . . then pressure test lines.



### Vibration

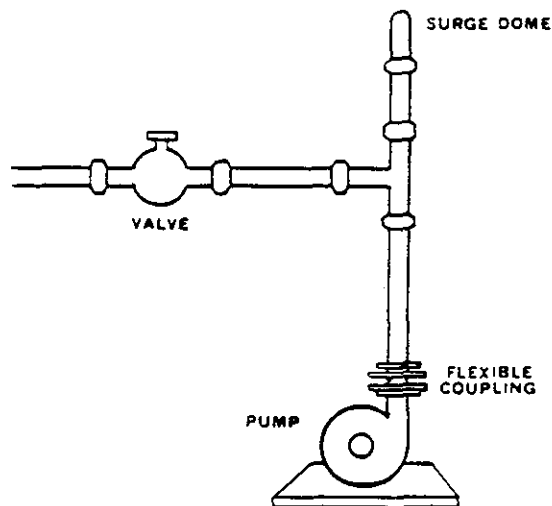
Connection to a pump or vibrating equipment is accomplished by using a flexible connection — either *expansion joints* or *flexible couplings*. The chemical properties, temperature and pressure of the transmitted material determine the type.

Vibration may also be dampened by use of a swing joint or by moving the pipe hanger away from the source of vibration.

### Pressure Surges Must Be Controlled To Prevent Excessive Pipe Movement

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For distilled water systems eliminate self closing "quick shut off" faucets or install No. 7348 flow restrictors.

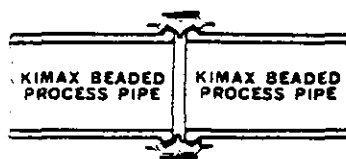


# TYPICAL JOINT REFERENCE CHART

## KIMAX Beaded Process Pipe

To:  
KIMAX Beaded Process Pipe  
(Factory or Field Beaded)

## Type of Joint



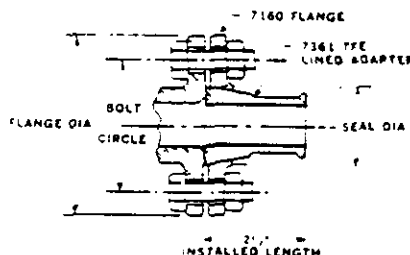
## Material Needed

### KIMAX 7125 Process Pipe Coupling

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1/2       | 7125-4800     | 2         | 7125-2000     |
| 3/4       | 7125-6800     | 3         | 7125-3000     |
| 1         | 7125-1000     | 4         | 7125-4000     |
| 1 1/2     | 7125-1500     | 6         | 7125-6000     |

See Page 11, GPD-1054

To:  
1", 1 1/2", 2", 3", 4" or 6"  
Beaded Pipe to A.S.A.  
Flanged Valves

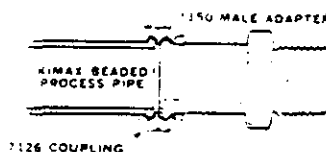


### KIMAX 7360 Coupling Assembly

| Pipe Size | Coupling Code |
|-----------|---------------|
| 1         | 7360-1000     |
| 1 1/2     | 7360-1500     |
| 2         | 7360-2000     |
| 3         | 7360-3000     |
| 4         | 7360-4000     |
| 6         | 7360-6000     |

See Page 12, GPD-1054

To:  
1/2", 1" or 1 1/2" Metal  
IPS (female)  
Threaded Pipe  
7350 S.S. (316)

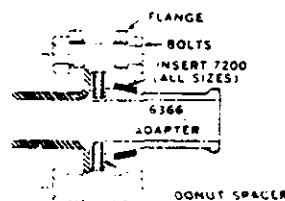


### KIMAX 7350 Adapter

| Pipe Size | Codes     |
|-----------|-----------|
| 1/2       | 7350-6800 |
| 3/4       | 7125-6800 |
| 1         | 7350-1000 |
| 1 1/2     | 7125-1000 |
| 2         | 7350-1500 |
| 3         | 7125-1500 |

See Page 14, GPD-1054

To:  
ASA Flanged Metal  
(glass, rubber or plastic  
lined) Pipe, Tanks  
or Valves

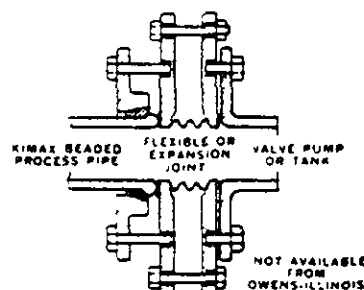


### KIMAX 7121 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1/2       | 7121-4800     |           |               |
| 3/4       | 7121-6800     |           |               |
| 1         | 7121-1000     | 3         | 7121-3000     |
| 1 1/2     | 7121-1500     | 4         | 7121-4000     |
| 2         | 7121-2000     | 6         | 7121-6000     |

See Page 12, GPD-1054

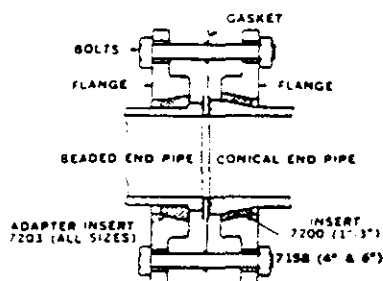
To:  
Valves, Pumps or Tanks  
(when vibration or expansion  
is a factor)



| 1" 3" Pipe      | Connect to | 4" 6" Pipe            |
|-----------------|------------|-----------------------|
| 1-7155 Flange   |            | 6366 Adapter          |
| 1-7200 Adapter  |            | 1-7156 Adapter Flange |
| 4-Bolts & Nuts* |            | 1-7158 Adapter Insert |
|                 |            | 8 Bolts & Nuts*       |

\*Contractor supply 3/16" bolts to length  
See Page 13, GPD-1054

To:  
KIMAX Conical End  
Process Pipe  
**LIMITED TO CONICAL  
PIPE PRESSURES &  
TEMPERATURES**



### KIMAX 7110 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1         | 7110-1000     | 3         | 7110-3000     |
| 1 1/2     | 7110-1500     | 4         | 7110-4000     |
| 2         | 7110-2000     | 6         | 7110-6000     |

See Page 13, GPD-1054



## TESTING AND CLEANING

In recognition of cold flow characteristics of plastics and elastomers, we recommend the following procedures:

- Tighten bolts on all couplings and flanges at time of installation.
- After 24 hours, retighten all bolts.
- Gently shake lines to make certain pipe is free of strain. There should be some limited movement in lines.
- Pressure test system with water at  $1\frac{1}{2}$  times specified working pressure. Do not test with air or gas.

If leaking occurs:

- Recheck couplings for loosened bolts.
- If leaking persists, remove coupling and check condition and positioning of compression liner and seal ring.

To clean system, flush lines with water, other cleaning fluids or atmospheric pressure steam (open drain). Do not use hydrofluoric acid, hot caustic solutions, abrasives or metallic tube cleaners.

# KIMAX<sup>®</sup> Beaded Process Pipe

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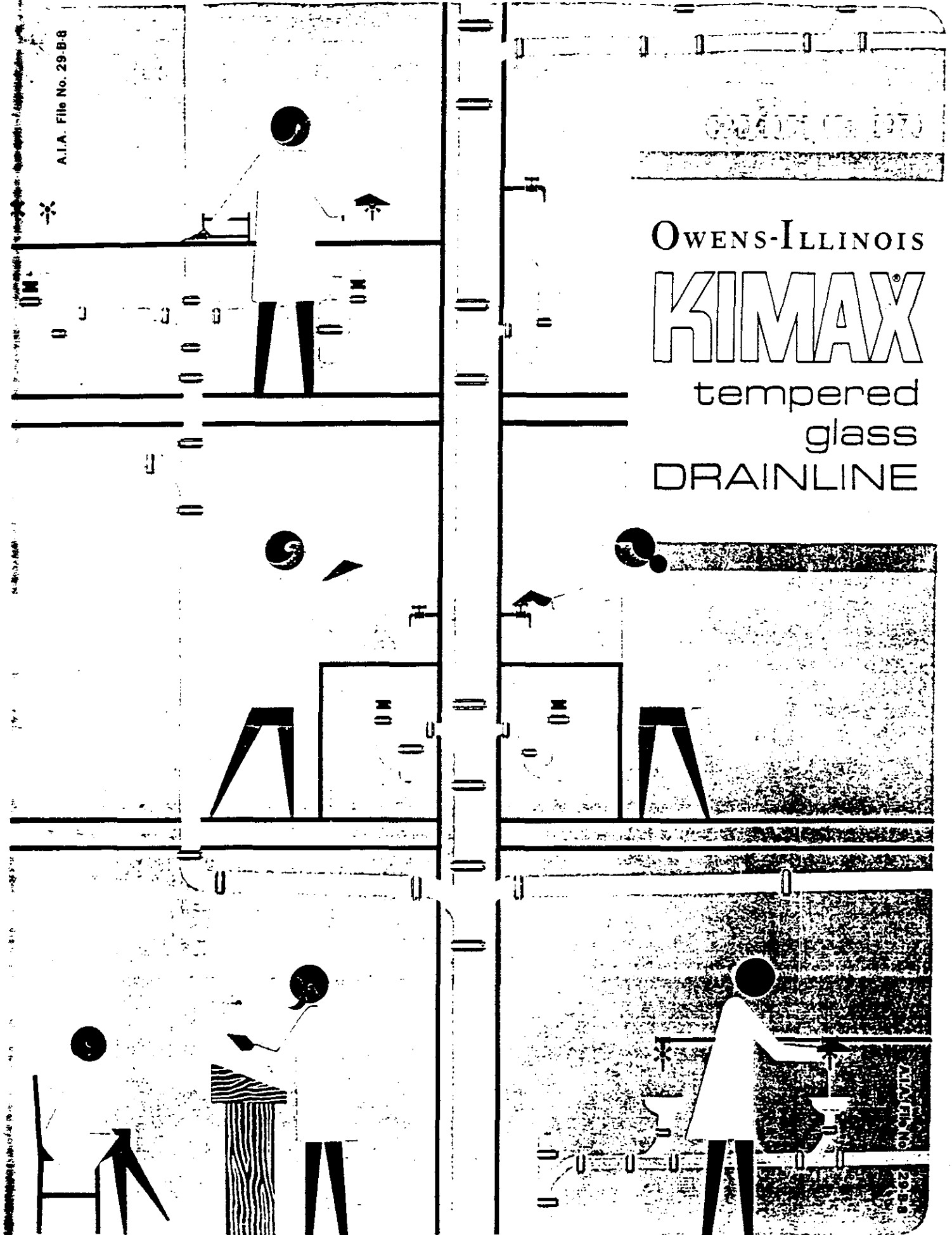
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OWENS-ILLINOIS  
**KIMAX**  
tempered  
glass  
DRAINLINE



# KIMAX TEMPERED GLASS DRAINLINE

...assured maximum corrosion resistance  
for chemical waste disposal systems

## Table of Contents

|                                   |       |
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## The most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\*

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

\*For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

factured with a stainless steel outer shell, Buna-N rubber liner and TFE\*\* seal ring. KIMAX sink is manufactured from filled TFE fluorocarbon, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

## Building Owners

KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today. KIMAX is a registered trademark of Owens-Illinois, Inc.

## Specifier

Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

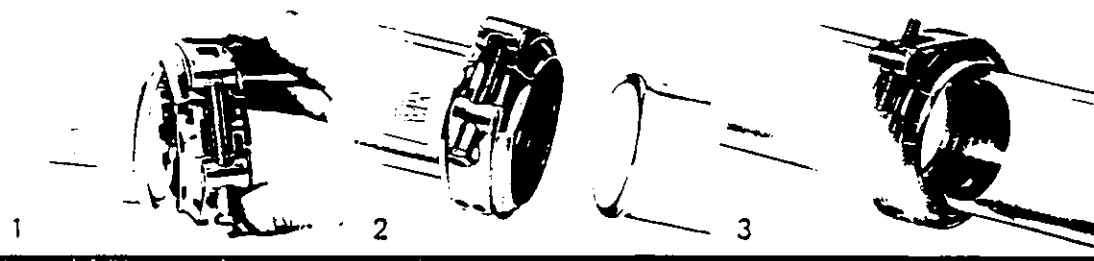
- All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires

only 1/2 to 1/3 as many hangers as conventional high silica iron pipe.

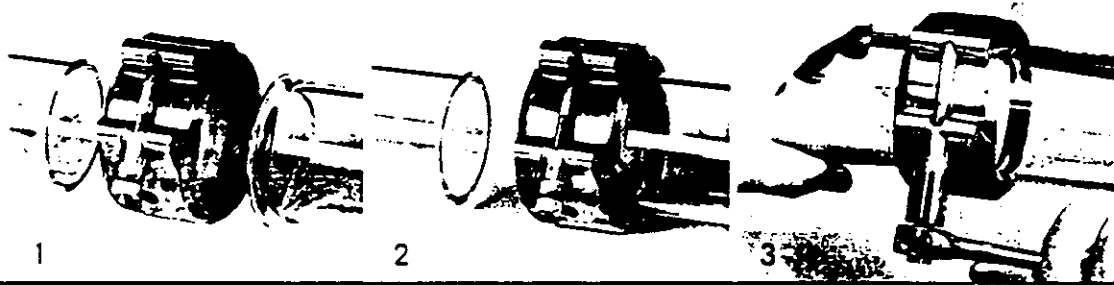
- Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

KIMAX  
Bead  
to Bead  
Drainline  
Coupling



KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling



## INSTALLATION ADVANTAGES

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual TR-427R. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted

coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos above). The coupling permits the joint to be deflected up to 4°.

### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the new B/P (bead to plain end) coupling system.

### ... Minimum Number of Hangers

KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.

## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Tempered Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a factory applied protective casing of thick expanded polystyrene. For recommended installation procedures



of KIMAX Drainline see Installation Manual TR-427R. Shown here is an example of KIMAX Drainline as installed underground.

### ... Adaptation to Other Materials

KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 21.

### ... Easily Handled

KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

## Recommended KIMAX Drainline Uses

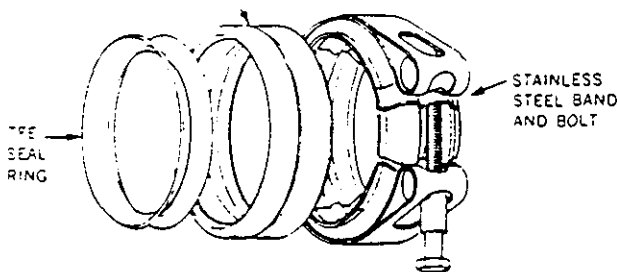
KIMAX Tempered Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem. It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and biochemistry laboratories; veterinary and medi-

cal colleges, research, and other institutional laboratories.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants... wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints

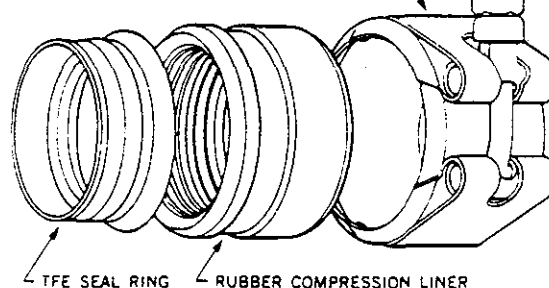
RUBBER COMPRESSION LINER



### KIMAX Drainline Coupling (Bead to Bead)

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoroethylene provide the required joint seal. Assembly of joint is simple... place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.

STAINLESS STEEL BAND AND BOLT



### KIMAX B/P Drainline Coupling (Beaded to Plain End)

This newly designed KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead. Schedule 40 plastic or metal pipe. It eliminates field beading of certain sizes of KIMAX glass drainline straight lengths... saving up to 60% of all beading time on average installations. Consult KIMAX B/P Coupling Bulletin No. TR-93-A for further information.

# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed borosilicate glass conforming to Federal Specification DD-G-541-A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B This system shall include all glass straight lengths, fittings and traps, compression type tetrafluoro-ethylene lined couplings and padded hanger supports. It shall also include factory-protected heavy schedule pipe for underground burial and recommended adapter couplings to connect to other piping material where applicable.
- C All pipe shall be installed free of strain in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8 to 10 ft on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A Glass-to-glass connections shall be made with KIMAX compression type couplings Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression inner to be made from Buna-N Rubber. Sealing gasket to be made from tetrafluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when collected up to 4" H<sub>2</sub>O.
- B Joints between glass and other types of piping material shall be made with KIMAX adapters and in accordance with manufacturer's recommendations.

### III. Protection of Pipe

- A All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.
- B Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C Glass pipe shall be protected against all weld splatter.

### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A **Excavation**—shall conform to National Plumbing Code A 40.8 Section 2.7.
  - 1 Bottom of trench shall be properly compacted, graded and the pipe supported throughout its entire length.
  - 2 At least 4" of properly compacted sand shall be used directly under the pipe.
- B **Buried Pipe**
  - 1 Straight lengths shall be heavy schedule 5 lengths protected in factory applied expanded polystyrene casing.
  - 2 All underground fittings shall be protected prior to back-filling with polyvinyl film (5 mil), Scotch Wrap, or Mastic-Text or approved equal.

### C Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: Acid Waste Drainline

This system shall be made of KIMAX tempered and annealed borosilicate glass and conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetrafluoro-ethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

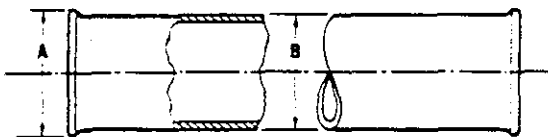
KIMAX factory-protected heavy schedule pipe, 5 lengths and wrapped fittings shall be installed in sand base and back filled in accordance with the manufacturer's instructions and governing plumbing code.

# PIPE AND FITTINGS

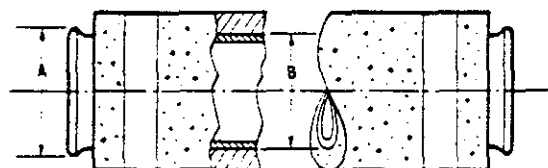
## Straight Lengths

**6500** 5-ft. lengths

**6501** 10-ft. lengths



**6502 EPS\* Covered** 5-ft. lengths (for underground use)



\* Expanded Polystyrene

**6504** Beaded one end only

## Pipe

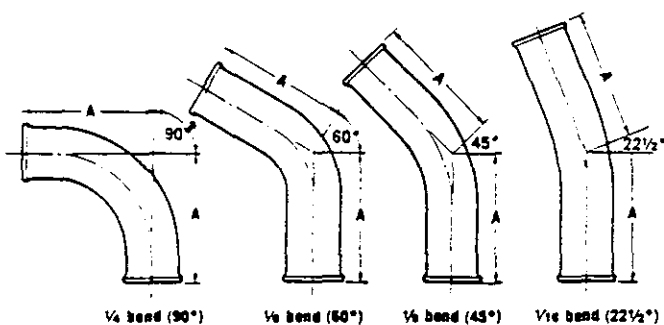
Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

| Size | Weight<br>lbs./ft. | A    | B (O.D.) |
|------|--------------------|------|----------|
| 1½   | 0.87               | 2.06 | 1.84     |
| 2    | 1.1                | 2.58 | 2.34     |
| 3    | 2.0                | 3.69 | 3.41     |
| 4    | 3.4                | 4.84 | 4.53     |
| 6    | 6.3                | 7.12 | 6.66     |

**6502** EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.

**6504** pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 7" of bead.

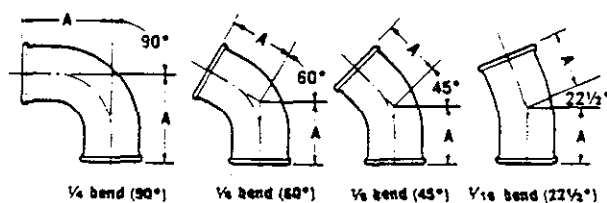
**6511**



## Sweeps

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |

**6513**



## Bends

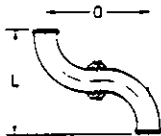
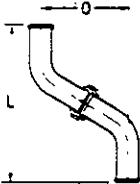
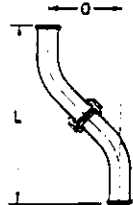
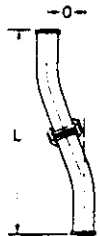
| Size | A<br>90° | A<br>60° | A<br>45° | A<br>22½° |
|------|----------|----------|----------|-----------|
| 1½   | 3        | 2¼       | 2        | 2         |
| 2    | 3½       | 2¾       | 2¼       | 2¼        |
| 3    | 5        | 3½       | 2¾       | 2¾        |
| 4    | 7        | 4½       | 3¼       | 3¼        |
| 6    | —        | —        | 7        | —         |

# PIPE AND FITTINGS

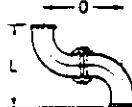
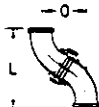
## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

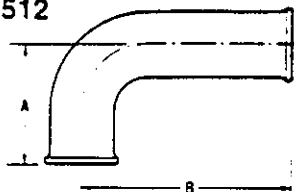
### 6511 Sweep Offsets

|       |  |    |  |        |  |        |  |       |
|-------|-----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------|
| Size  | L                                                                                 | O  | L                                                                                 | O      | L                                                                                   | O      | L                                                                                   | O     |
| 1 1/2 | 3                                                                                 | 9  | 13 1/2                                                                            | 7 1/2  | 15 3/4                                                                              | 6 3/4  | 17 3/4                                                                              | 3 3/4 |
| 2     | 10                                                                                | 10 | 16                                                                                | 5 3/4  | 17 1/4                                                                              | 7 1/4  | 19 1/4                                                                              | 3 1/4 |
| 3     | 13                                                                                | 13 | 19 1/2                                                                            | 11 1/4 | 22 1/4                                                                              | 9 1/4  | 25                                                                                  | 5     |
| 4     | 18                                                                                | 18 | 27                                                                                | 15 1/4 | 30 1/4                                                                              | 12 3/4 | 34 1/4                                                                              | 6 3/4 |
| 6     | 24                                                                                | 24 | 36                                                                                | 20 3/4 | 41                                                                                  | 17     | 46 1/4                                                                              | 9 1/4 |

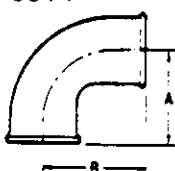
### 6513 Bend Offsets

|       |  |       |  |       |  |       |  |       |
|-------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|
| Size  | L                                                                                   | O     | L                                                                                   | O     | L                                                                                     | O     | L                                                                                     | O     |
| 1 1/2 | 6                                                                                   | 6     | 7 1/2                                                                               | 4 1/4 | 6 3/4                                                                                 | 2 1/4 | 7 3/4                                                                                 | 1 1/4 |
| 2     | 6 1/2                                                                               | 6 1/2 | 8 1/4                                                                               | 4 3/4 | 7 1/4                                                                                 | 3 1/4 | 8 1/4                                                                                 | 1 3/4 |
| 3     | 10                                                                                  | 10    | 10 1/2                                                                              | 6 1/4 | 9 1/4                                                                                 | 3 3/4 | 10 1/4                                                                                | 2 1/4 |
| 4     | 14                                                                                  | 14    | 13 1/4                                                                              | 7 1/4 | 11 1/4                                                                                | 4 1/4 | 10 3/4                                                                                | 2 3/4 |

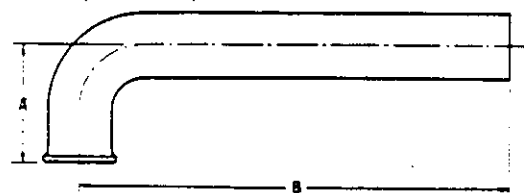
### 6512



### 6514



### 6512P (Annealed)\*



## Special Purpose Bends

|       | 6512  |       | 6512P |    | 6514  |   |
|-------|-------|-------|-------|----|-------|---|
| Size  | A     | B     | A     | B  | A     | B |
| 1 1/2 | 3 3/4 | 6     | 3 3/4 | 12 | 2 1/4 | 3 |
| 2     | 3 3/4 | 7 1/4 | 3 3/4 | 12 | —     | — |

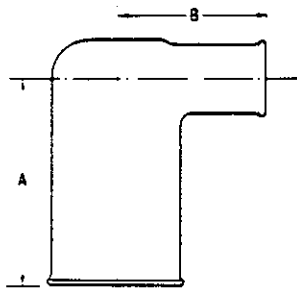
\*Can be field cut.



# PIPE AND FITTINGS

6518

## Quarter Bend Reducer

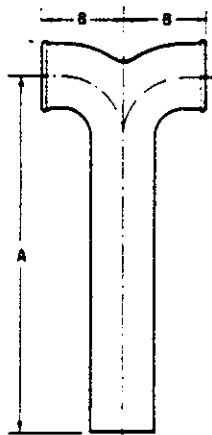
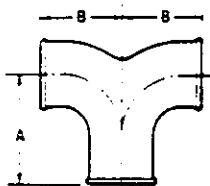


| Size   | A | B  |
|--------|---|----|
| 2 x 1½ | 4 | 3½ |
| 3 x 1½ | 5 | 4  |
| 3 x 2  | 5 | 4½ |
| 4 x 1½ | 7 | 4½ |
| 4 x 2  | 7 | 5  |
| 4 x 3  | 7 | 5½ |
| 6 x 1½ | 9 | 5½ |
| 6 x 2  | 9 | 6  |
| 6 x 3  | 9 | 6½ |
| 6 x 4  | 9 | 8  |

6519

6519P (Annealed)\*

## Double Quarter Bend



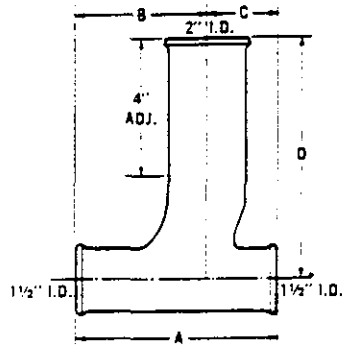
| Size          | 6519 |    | 6519P |    |
|---------------|------|----|-------|----|
|               | A    | B  | A     | B  |
| 1½            | 3    | 2½ | 10    | 2½ |
| ** 2 x 2 x 1½ | 3¼   | 2¼ | 10    | 2¼ |
| 2             | 3½   | 2¼ | 10    | 2¼ |
| 3             | 5    | 4½ |       |    |
| 4             | 6½   | 5¾ |       |    |
| 6             | 8½   | 7  |       |    |

\*Can be field cut.

\*\*Branch is 1½".

# PIPE AND FITTINGS

6520



## Adjustable Sanitary T

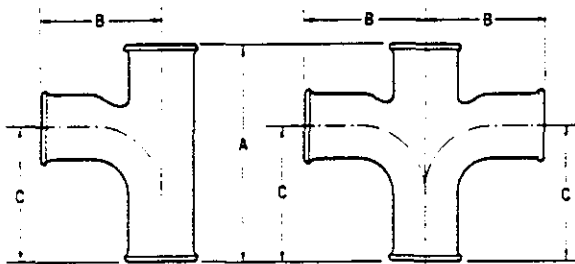
(One Adjustable Inlet)

| Size      | A | B     | C     | D |
|-----------|---|-------|-------|---|
| 1 1/2 x 2 | 6 | 3 3/4 | 2 1/8 | 7 |

6521 Single

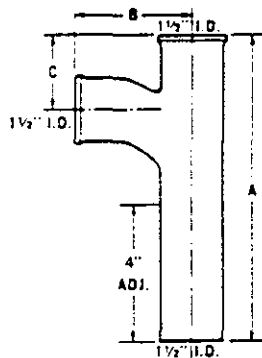
6522 Double

## Sanitary T



| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 3/4  |
| 2 x 1 1/2     | 8  | 3 3/4 | 5      |
| 2 x 2         | 8  | 4 1/2 | 5      |
| 3 x 1 1/2     | 12 | 4 1/4 | 7 1/4  |
| 3 x 2         | 12 | 5     | 7 1/4  |
| 3 x 3         | 12 | 6 3/4 | 7 1/4  |
| 4 x 1 1/2     | 14 | 4 7/8 | 8 3/4  |
| 4 x 2         | 14 | 5 5/8 | 8 3/4  |
| 4 x 3         | 14 | 7     | 8 3/4  |
| 4 x 4         | 14 | 8 1/4 | 8 3/4  |
| 6 x 2         | 20 | 6 3/4 | 12 3/4 |
| 6 x 3         | 20 | 8     | 12 3/4 |
| 6 x 4         | 20 | 9 1/4 | 12 3/4 |
| 6 x 6         | 20 | 12    | 12 3/4 |

6530 (Annealed)\*



## Adjustable Sanitary T

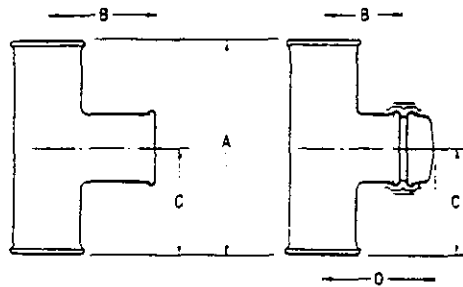
(Plain End Outlet)

| Size                  | A     | B     | C     |
|-----------------------|-------|-------|-------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 3/4 | 3 1/2 | 3 1/4 |

\*Can be field cut.

# PIPE AND FITTINGS

6523 Straight T



6524 Test T with Cleanout

Straight T

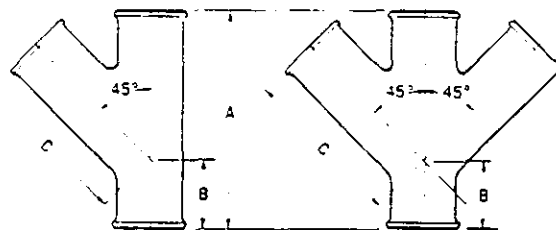
| Size          | A  | B      | C  |
|---------------|----|--------|----|
| 1 1/2 x 1 1/2 | 6  | 3 1/2  | 3  |
| 2 x 1 1/2     | 8  | 4 1/2  | 4  |
| 2 x 2         | 8  | 4 1/2  | 4  |
| 3 x 1 1/2     | 12 | 6 1/2  | 6  |
| 3 x 2         | 12 | 6 1/2  | 6  |
| 3 x 3         | 12 | 8 1/2  | 8  |
| 4 x 1 1/2     | 14 | 8 1/2  | 10 |
| 4 x 2         | 14 | 8 1/2  | 10 |
| 4 x 3         | 14 | 10 1/2 | 10 |
| 4 x 4         | 14 | 10 1/2 | 10 |
| 6 x 3         | 20 | 12 1/2 | 12 |
| 6 x 4         | 20 | 12 1/2 | 12 |
| 6 x 6         | 20 | 15     | 15 |

Test T with Cleanout

| Size          | A  | B     | C | D |
|---------------|----|-------|---|---|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 | 3 |
| 2 x 2         | 8  | 4 1/2 | 4 | 4 |
| 3 x 3         | 12 | 6 1/2 | 6 | 6 |
| 4 x 4         | 14 | 8 1/2 | 8 | 8 |

Test Tee and cleanout comes as complete assembly including cap and coupling.

6526 Single

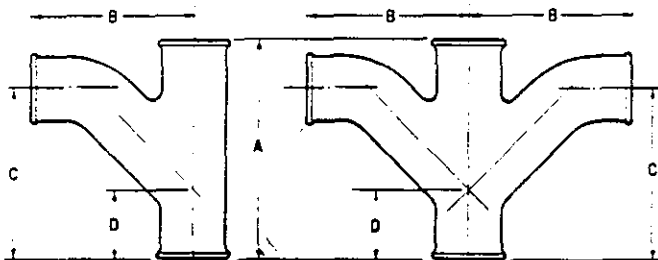


6527 Double

Drainline Y

| Size          | A  | B      | C      |
|---------------|----|--------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2  | 4 1/2  |
| 2 x 1 1/2     | 8  | 4 1/2  | 5 1/2  |
| 2 x 2         | 8  | 4 1/2  | 5      |
| 3 x 1 1/2     | 12 | 6 1/2  | 8 1/2  |
| 3 x 2         | 12 | 6 1/2  | 8 1/2  |
| 3 x 3         | 12 | 8 1/2  | 9      |
| 4 x 1 1/2     | 14 | 8 1/2  | 10 1/2 |
| 4 x 2         | 14 | 8 1/2  | 10 1/2 |
| 4 x 3         | 14 | 10 1/2 | 11 1/2 |
| 4 x 4         | 14 | 10 1/2 | 11 1/2 |
| 6 x 2         | 20 | 12 1/2 | 14     |
| 6 x 3         | 20 | 12 1/2 | 14     |
| 6 x 4         | 20 | 12 1/2 | 14     |
| 6 x 6         | 20 | 15     | 14     |

6528 Single

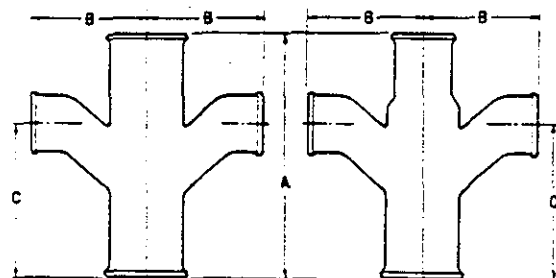


6529 Double

Combination Y and 1/8 Bend

| Size          | A  | B      | C      | D     |
|---------------|----|--------|--------|-------|
| 1 1/2 x 1 1/2 | 6  | 4 1/2  | 4 1/2  | 1 1/2 |
| 2 x 1 1/2     | 8  | 5 1/2  | 5 1/2  | 2 1/2 |
| 2 x 2         | 8  | 5 1/2  | 5 1/2  | 2 1/2 |
| 3 x 1 1/2     | 12 | 8 1/2  | 8 1/2  | 3 1/2 |
| 3 x 2         | 12 | 8 1/2  | 8 1/2  | 3 1/2 |
| 3 x 3         | 12 | 10 1/2 | 10 1/2 | 4 1/2 |
| 4 x 1 1/2     | 14 | 10 1/2 | 10 1/2 | 4 1/2 |
| 4 x 2         | 14 | 10 1/2 | 10 1/2 | 4 1/2 |
| 4 x 3         | 14 | 12 1/2 | 12 1/2 | 5 1/2 |
| 4 x 4         | 14 | 12 1/2 | 12 1/2 | 5 1/2 |
| 6 x 2         | 20 | 14 1/2 | 14 1/2 | 6 1/2 |
| 6 x 3         | 20 | 14 1/2 | 14 1/2 | 6 1/2 |
| 6 x 4         | 20 | 16 1/2 | 16 1/2 | 7 1/2 |
| 6 x 6         | 20 | 18 1/2 | 18 1/2 | 8 1/2 |

6531



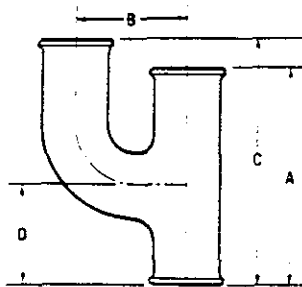
Partition Cross (Compact)

| Size                      | A | B     | C |
|---------------------------|---|-------|---|
| 2 x 1 1/2                 | 8 | 3 1/2 | 5 |
| 2 x 2                     | 8 | 4 1/2 | 5 |
| 2 x 1 1/2 x 1 1/2 x 1 1/2 | 8 | 3 1/2 | 5 |

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

# PIPE AND FITTINGS

## 6532 Single

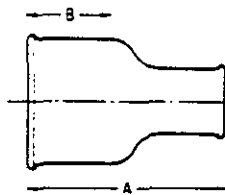


## Upright Y or H (vent branch)

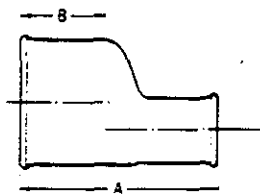
| Size    | A  | B  | C*  | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 3  | 6½  | 2¾ |
| 2 x 1½  | 8  | 3½ | 7½  | 3¾ |
| 2 x 2   | 8  | 4  | 8½  | 3¾ |
| 3 x 1½  | 12 | 3½ | 9½  | 4¾ |
| 3 x 2   | 12 | 4½ | 10½ | 4¾ |
| 3 x 3   | 12 | 6  | 13  | 5¾ |
| 4 x 1½  | 14 | 4½ | 13½ | 5¾ |
| 4 x 2   | 14 | 5  | 12  | 5¾ |
| 4 x 3   | 14 | 6½ | 14½ | 6¾ |
| 4 x 4   | 14 | 8  | 16½ | 6¾ |
| 6 x 3   | 20 | 7½ | 16½ | 7¾ |
| 6 x 4   | 20 | 9  | 19  | 8  |
| 6 x 6   | 20 | 12 | 21  | 12 |

\*C\* dimension may be longer or shorter than "A"

## 6536 Straight



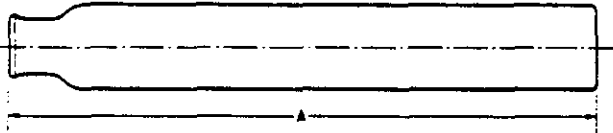
## 6537 Eccentric



## Reducers or Increasers

| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1¾       |
| 3 x 1½ | 5 | 2¼       |
| 3 x 2  | 5 | 2¼       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

## 6540



## Vent Increasers

| Size   | A  |
|--------|----|
| 1½ x 3 | 22 |
| 2 x 3  | 22 |
| 3 x 4  | 22 |

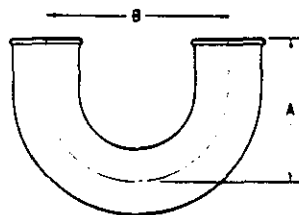
## 6544



## Cleanout Plug

| Size | A  |
|------|----|
| 1½   | ¾  |
| 2    | 1  |
| 3    | 1½ |
| 4    | 1¼ |
| 6    | 1½ |

## 6550



## U Bend (vent loop)

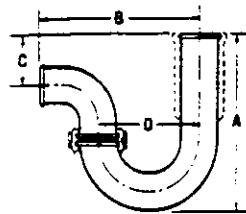
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |

Note: U bends (annealed only) are often used for vent loops. No. 6705 outlets on Swivel "S" Traps are also used as vent loops.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6700



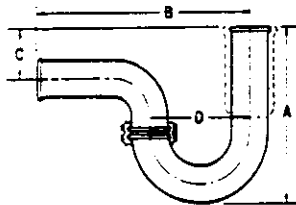
## Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  |
| 2 x 2                  | 9¼ | 8¾ | 1½ | 5¼ |

See Standard Cleanout, Page 14.

6701



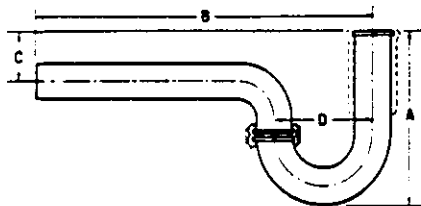
## Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 8¾ | 11 | 1½ | 5  |
| 2 x 1½                 | 8¾ | 11 | 1½ | 5  |
| 2 x 2                  | 9¼ | 13 | 1½ | 5¼ |

See Standard Cleanout, Page 14.

6704 (Plain End Outlet\*)



## Swivel Trap—P Style

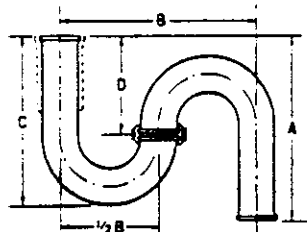
No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B   | C  | D  |
|------------------------|----|-----|----|----|
| 1½ x 1½                | 8¾ | 17  | 1½ | 5  |
| 2 x 1½                 | 8¾ | 17  | 1½ | 5  |
| 2 x 2                  | 9¼ | 17½ | 1½ | 5¼ |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

\* Annealed outlet. can be field cut.

6706



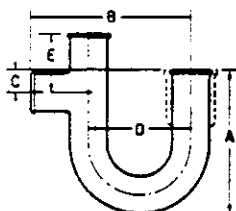
## Swivel Trap—S Style

No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.

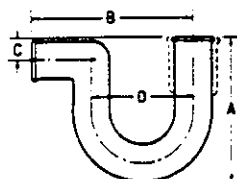
| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 10 | 10 | 8¾ | 5  |
| 2 x 1½                 | 10 | 10 | 8¾ | 5  |
| 2 x 2                  | 9¾ | 11 | 9¼ | 4¾ |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

6713 (Vented)



6718



## Trap—P Style

| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                | 1½           | 7   | 8   | 1  | 5  | 3  |
| *2 x 1½                | 1½           | 7¼  | 8   | 1½ | 5  | 3  |
| 2 x 2                  | 2            | 8¾  | 8¾  | 1½ | 5¼ | 3¼ |
| 3 x 3                  | 3            | 10¾ | 10¾ | 2  | 6¼ | 4  |
| 4 x 4                  | 4            | 12¾ | 12¾ | 2¼ | 7¼ | 5  |
| 6 x 6                  | 4            | 16¾ | 31  | 2¼ | 24 | 7  |

\* Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.

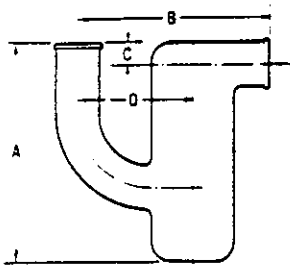
Traps available with B type cleanout. See Standard Cleanout, Page 14.

No cleanouts on 6 x 6 traps.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6707

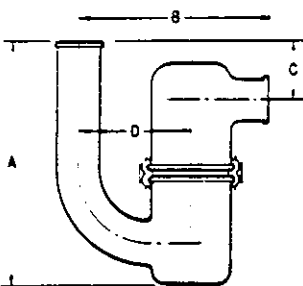


## Drum Trap—P Style

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. |
|------------------------|----|----|----|----|--------------|
| 1½ x 1½                | 9  | 8  | 1  | 4½ | 3            |
| 2 x 1½                 | 9  | 8  | 1½ | 4½ | 3            |
| 2 x 2                  | 9½ | 9½ | 2  | 5½ | 4            |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

6710



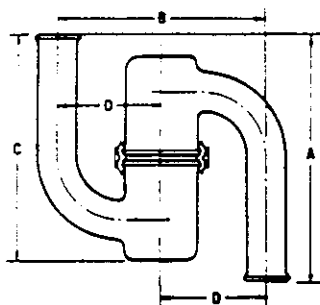
## Swivel Drum Trap—P Style

No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A   | B  | C  | D  | Body<br>I.D. |
|------------------------|-----|----|----|----|--------------|
| 1½ x 1½                | 10½ | 8  | 2½ | 4½ | 3            |
| 2 x 1½                 | 10½ | 8  | 2½ | 4½ | 3            |
| 2 x 2                  | 11  | 9½ | 3  | 5½ | 4            |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

6714



## Swivel Drum Trap—S Style

No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.

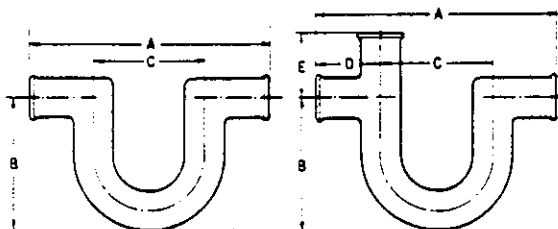
| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>I.D. |
|------------------------|-----|----|-----|----|--------------|
| 1½ x 1½                | 11½ | 9½ | 10½ | 4½ | 3            |
| 2 x 1½                 | 11½ | 9½ | 10½ | 4½ | 3            |
| 2 x 2                  | 11½ | 11 | 11  | 5½ | 4            |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

6770

6771 (Vented)

## Running Trap



| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                | 1½           | 11  | 6   | 5  | 3  | 3  |
| 2 x 2                  | 2            | 12  | 6½  | 5½ | 3½ | 3½ |
| 3 x 3                  | 3            | 14½ | 8½  | 6½ | 4  | 4  |
| 4 x 4                  | 4            | 17½ | 9½  | 7½ | 5  | 5  |
| *6 x 6                 | 4            | 38  | 12½ | 24 | 7  | 7  |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

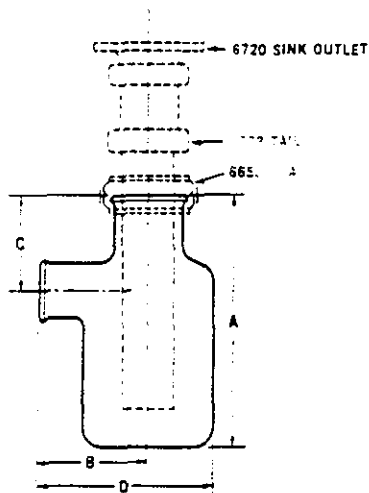
No cleanouts on 6 x 6 traps.

# DRAINLINE TRAPS

6614

## Partition Trap

(Consists of Trap Body Only)



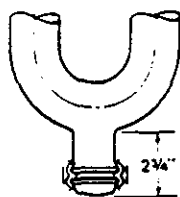
Available with 1½" and 2" outlets only. 1½" outlet trap has 2" inlet. Except No. 6655 adapter coupling.

| Outlet | A   | B   | C   | D  |
|--------|-----|-----|-----|----|
| 1½"    | 8½" | 3½" | 3½" | 6" |
| 2"     | 9½" | 3½" | 4½" | 6" |

Traps a. Partition always visible  
Traps available. See below

## Type B

## Standard Cleanout



Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

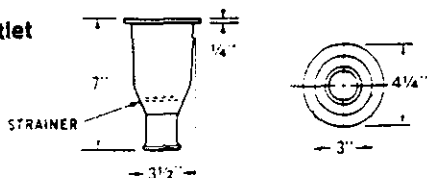
To order standard traps with cleanouts use catalog number for proper style and add the letter B.

For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

## CUP SINKS

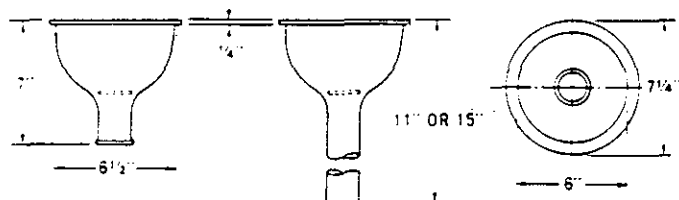
Outside surface of cupsink bodies has an opaque white surface. No. 6724 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded end traps or fittings.

### 6616 Beaded Outlet



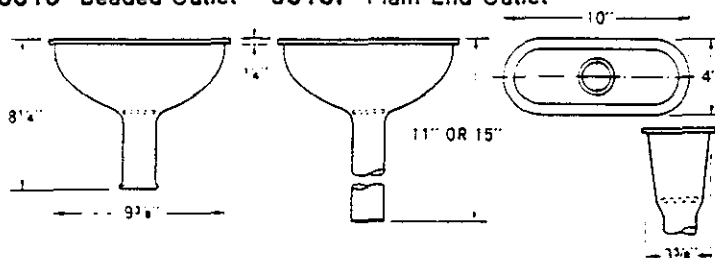
### 3" Hemispherical

### 6617 Beaded Outlet 6617P Plain End Outlet



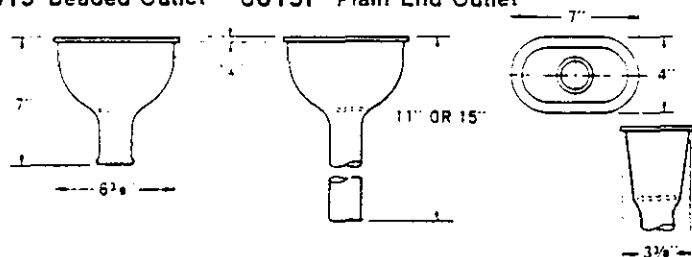
### 3" Hemispherical

### 6618 Beaded Outlet 6618P Plain End Outlet



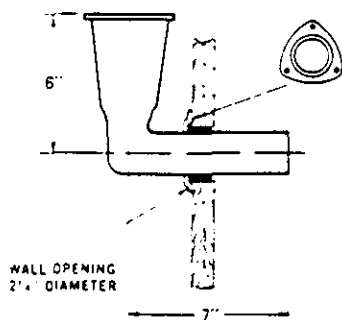
### 3" x 9" Oval

### 6619 Beaded Outlet 6619P Plain End Outlet

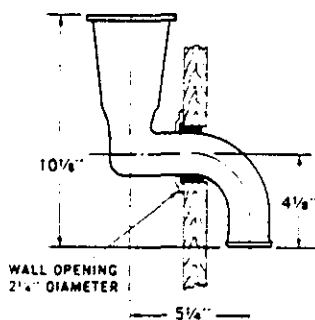


### 3" x 6" Oval

### 6627 3" x 6" Oval Horizontal, 1 1/2" Plain End Outlet



### 6628 3" x 6" Oval Vertical, 1 1/2" Outlet



### Wall Mounted Cup Sink

#### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2")

#### Vertical Outlet

No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2")

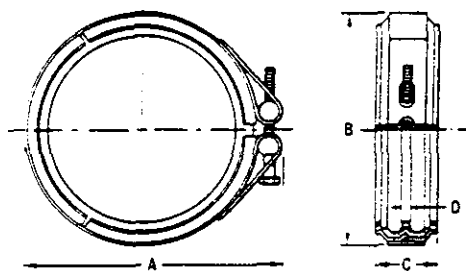
Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet. For No. 6628 assembly use No. 6650 1 1/2" size KIMAX coupling.



## ACCESSORIES AND HARDWARE

6650

### Drainline Coupling (Bead to Bead)



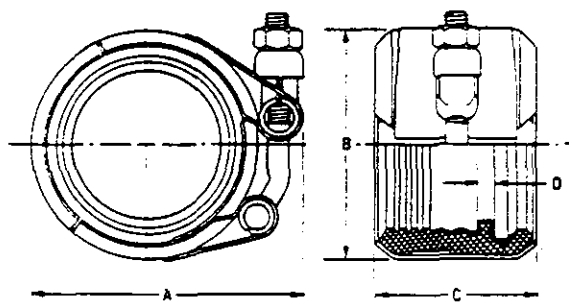
No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4" and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna-N rubber compression liner with TFE sealing
- No. 6653 stainless steel bolt

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2½ | 1¾ | ¾ | ¼-28 x 2½ |
| 2    | 3½ | 3½ | 1¾ | ¾ | ¼-28 x 2½ |
| 3    | 4¾ | 4¾ | 1¾ | ¾ | ¼-28 x 2½ |
| 4    | 6  | 5½ | 1½ | ¾ | ¼-28 x 3½ |
| 6    | 8¼ | 7¾ | 1¾ | ¾ | ½-24 x 4  |

6661

### B/P\* Drainline Coupling (Bead to Plain End)



No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3" or 4" KIMAX beaded glass drainline to plain end (cut) glass pipe lead, I.P.S. metal, or plastic pipe. This new exclusively designed KIMAX drainline coupling consists of the following components:

- No. 6662 stainless steel band with bolt
- No. 6663 Buna-N rubber compression liner with TFE seal ring
- No. 6664 silver plated stainless steel hex nut

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28      |
| 2    | 3¾ | 3¾ | 1¾ | ¾ | ¼-28      |
| 3    | 4½ | 4  | 2¾ | ¾ | ¼-24      |
| 4    | 6  | 5  | 2¾ | ¾ | ¼-24      |

\*Patent Pending

## ACCESSORIES AND HARDWARE

6655

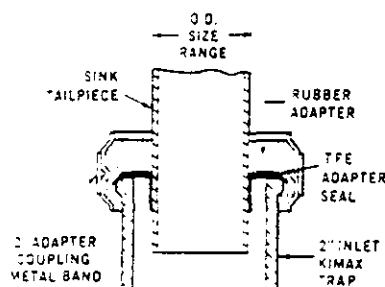
### Adapter Coupling

Patent Pending

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

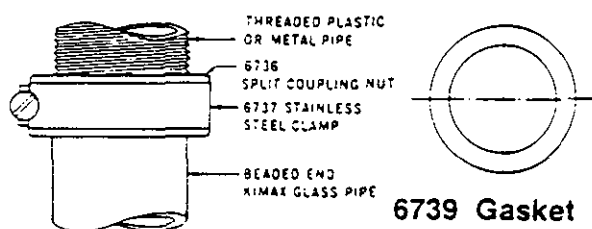
- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt, 1/4" — 28 x 2 1/2"



| Size       | Tailpiece Style                                                                                                                                                                     | O.D. Size Range |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2 x 1 1/2" | KIMAX glass tail pipe Extension No. 6723, metal tubing, and lead tailpiece extensions                                                                                               | 1.48 to 1.53    |
| 2 x 1 1/2" | Lead, Class C or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                                       | 1.70 to 1.75    |
| 2 x 1 1/2" | Plain end KIMAX Regular Schedule or Heavy Schedule 1 1/2" glass pipe or fittings<br>Duricon #SO-2<br>Duricon #11713<br>Lead — Class C or L, B or M<br>Plastic or Steel 1 1/2" (PSI) | 1.82 to 1.90    |

6735

### 1 1/2" Split Coupling (Threaded to Beaded Pipe)



#### 6739 Gasket

Use Gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe.

No. 6735, 1 1/2" Split Coupling is used to join 1 1/2" beaded glass pipe to a threaded 1 1/2" metal pipe.

The assembly consists of:

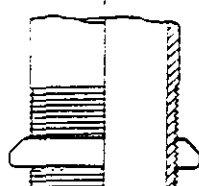
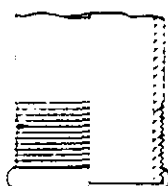
- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

To install — remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

6680

6685—Adjustable

### Thread Adapters (Threaded to Beaded Pipe)



Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

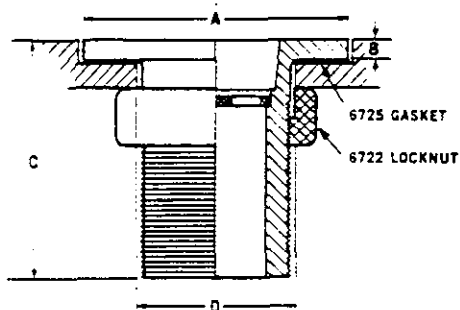
Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1 1/2" metal to 1 1/2" glass). Ideal for floor drain connections. In 1 1/2", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1 1/2" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1 1/2" size only.

## ACCESSORIES AND HARDWARE

**6720** (1½" and 2" sizes)

**6720D** 2" — For Use With Sinks Having 3½" Counterbore



### Sink Outlet Assembly

Consists of:

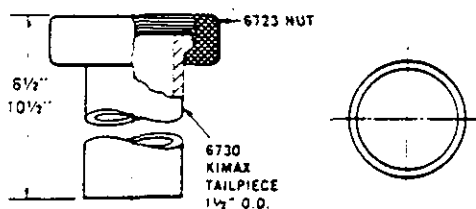
6724 sink strainer (black fluorocarbon plastic)  
6721 and 6721D sink outlet (black fluorocarbon plastic)  
6725 gasket—neoprene  
6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

|       | Size | A  | B | C  | D  |
|-------|------|----|---|----|----|
| 6720  | 1½   | 3½ | ¾ | 2¼ | 2  |
|       | 2    | 3½ | ¾ | 3  | 2¼ |
| 6720D | 2    | 3½ | ¾ | 3  | 2¼ |

For sink outlet to place connections see No. 6723 description below.

**6728**



**6738  
Gasket**

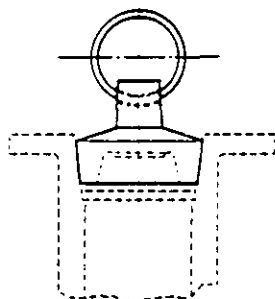
Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe.

### 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... do not use pipe wrench.

**6726**

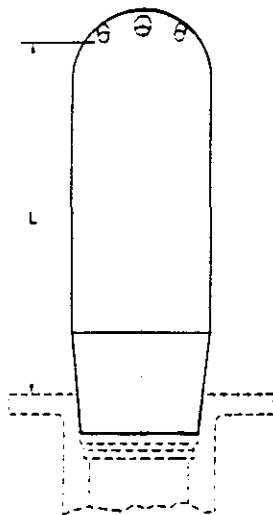


### Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead

## ACCESSORIES AND HARDWARE

6727

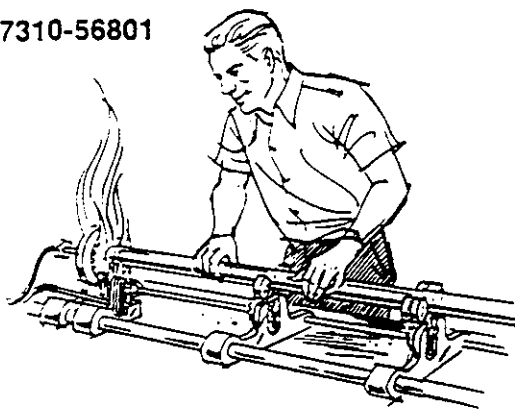


### Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" sink outlets only. Beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
|                  | 4"                  | 6" | 8" | 4"               | 6" | 8" |
| 1½"              | —                   | —  | —  | —                | —  | —  |
| 2"               | —                   | —  | —  | 4"               | 6" | 8" |

7310-56801

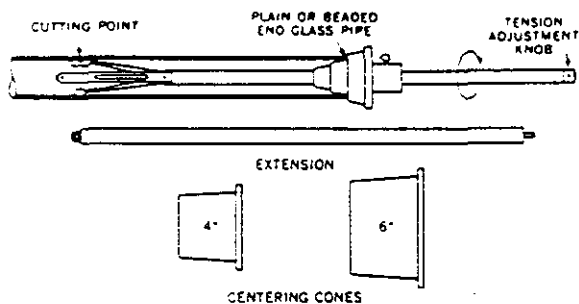


### KIMAX Portable Beading Kit

Used for field beading ½" through 6" glass pipe.

For more detailed information on the availability of the newest model kit (BK-5) and its operation, ask your KIMAX distributor or write the nearest O-I office listed on the back of this catalog.

7310-56802

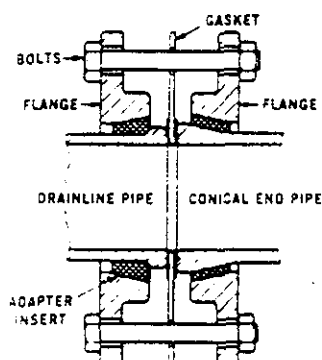


### KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut ½" — 6" glass drainline anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm sub-assembly and ½" — 6" centering cones and ring stop as shown. Stocked and sold by your KIMAX Glass Drainline distributor.

## ACCESSORIES AND HARDWARE

7110



### Coupling Assembly

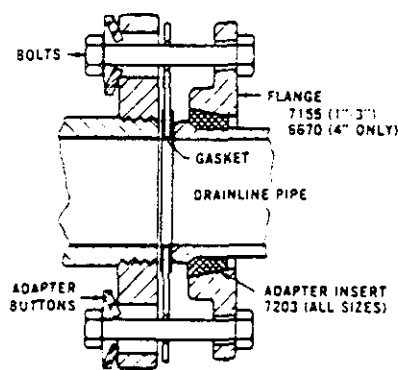
(Drainline to Conical End Pipe)

To join drainline glass pipe to conical end pipe. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

|   | Style II<br>Flange<br>No. | Adapter<br>Insert<br>Qty. No. | Gasket<br>Qty. No. | Bolts & Nuts<br>Qty. No.<br>Size |
|---|---------------------------|-------------------------------|--------------------|----------------------------------|
|   |                           | 1-7200<br>1-7203              | 1-7276             | 4-7190<br>5/8-18 x 2 1/2         |
| 2 |                           | 1-7200<br>1-7203              | 1-7276             | 4-7190<br>5/8-18 x 2 1/2         |
| 3 |                           |                               | 1-7276             | 4-7190<br>5/8-18 x 3             |
| 4 | 1-6670<br>1-7156          |                               | 1-7276             | 8-7190<br>5/8-18 x 3             |
| 6 | 1-6670<br>1-7156          |                               |                    | 8-7190<br>5/8-18 x 3             |

7120



\* ASA THREADED FLANGE

### Coupling Assembly

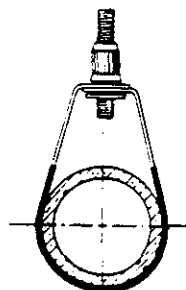
(Metal IPS to Beaded End Pipe)

To join drainline glass pipe to metal IPS threaded pipe. Kit includes flange, adapter insert, bolts, adapter buttons and TFE sheath gasket. ASA threaded flange not included.

| Pipe<br>Size | Style II<br>Flange<br>Qty. No. | Adapter<br>Insert<br>Qty. No. | Adapter<br>Buttons<br>Qty. No. | Gasket<br>Qty. No. | Bolts & Nuts<br>Qty. No.<br>Size |
|--------------|--------------------------------|-------------------------------|--------------------------------|--------------------|----------------------------------|
| 1            | 1-7155                         | 1-7203                        | 4-7230                         | 1-7276             | 4-7190<br>5/8-18 x 2 1/2         |
| 1 1/2        | 1-7155                         | 1-7203                        | 4-7230                         | 1-7276             | 4-7190<br>5/8-18 x 2 1/2         |
| 2            | 1-7155                         | 1-7203                        | 4-7230                         | 1-7276             | 4-7190<br>5/8-18 x 2 1/2         |
| 3            | 1-7155                         | 1-7203                        | 4-7230                         | 1-7276             | 4-7190<br>5/8-18 x 3             |
| 4            | 1-6670                         | 1-7203                        | 8-7230                         | 1-7276             | 8-7190<br>5/8-18 x 3             |
| 6            | 1-6670                         | 1-7203                        | 8-7230                         | 1-7276             | 8-7190<br>5/8-18 x 3             |

\* Flange should be placed far enough on pipe to permit machining end of pipe to provide a flat bearing surface for beaded glass pipe

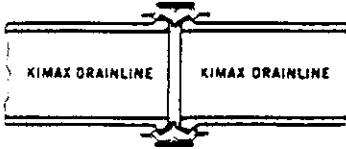
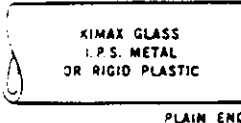
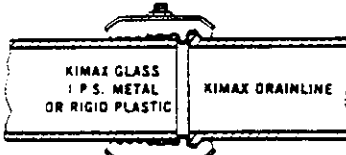
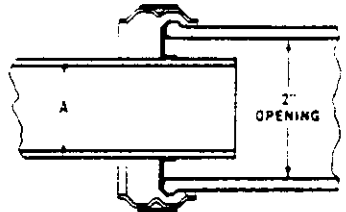
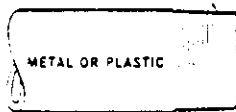
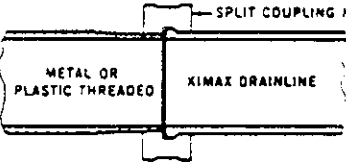
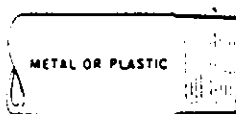
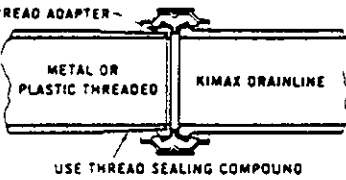
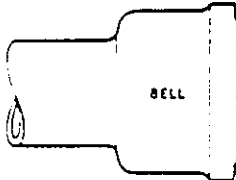
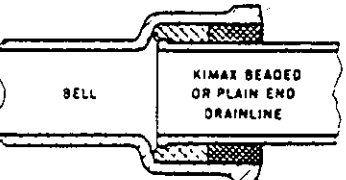
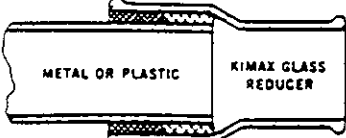
7290 (1 1/2", 2", 3", 4", 6" sizes)



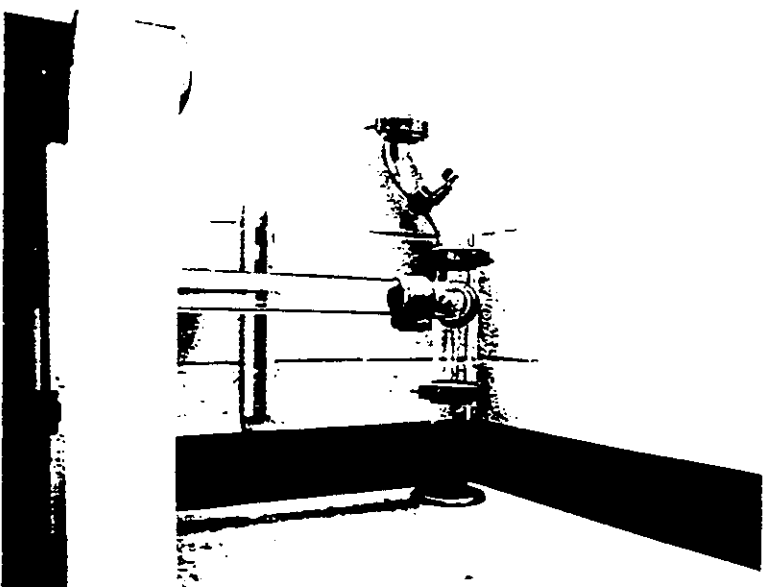
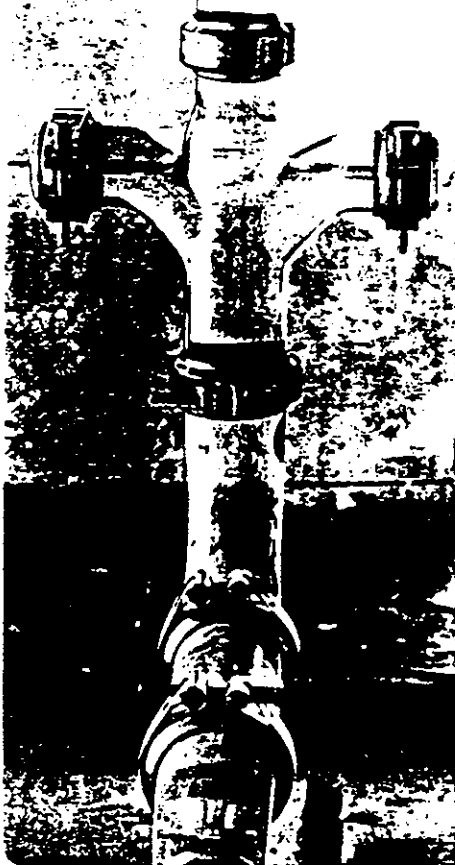
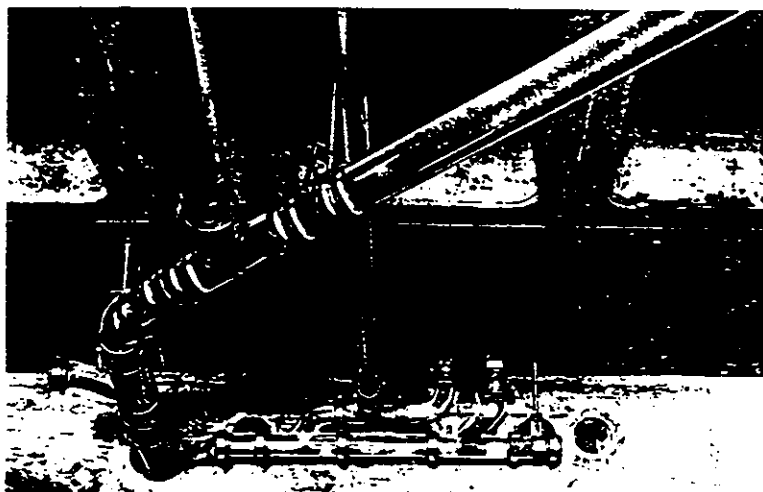
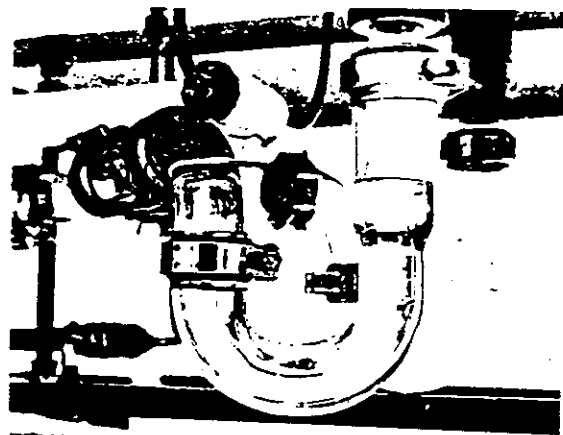
### Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L-5 Zinc coating.

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                             | Type of Joint                                                                                                                                                                                 | Material Needed                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|-----------|-----------|---|-----------|-----------|
|  <p>KIMAX DRAINLINE<br/>BEADED</p>                                      |  <p>KIMAX DRAINLINE KIMAX DRAINLINE</p>                                                                      | <p><b>KIMAX Drainline Coupling 6650</b></p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650-1500</td></tr><tr><td>2</td><td>6650-2000</td></tr><tr><td>3</td><td>6650-3000</td></tr><tr><td>4</td><td>6650-4000</td></tr><tr><td>6</td><td>6650-6000</td></tr></table>                                                                                                                                                            | Size                      | Code No.             | 1½                   | 6650-1500 | 2         | 6650-2000 | 3         | 6650-3000 | 4         | 6650-4000 | 6         | 6650-6000 |   |           |           |   |           |           |
| Size                                                                                                                                                     | Code No.                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6650-1500                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6650-2000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6650-3000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6650-4000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6650-6000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC<br/>PLAIN END</p> |  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC KIMAX DRAINLINE</p>                                    | <p><b>KIMAX B/P Coupling 6661</b></p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6661-1500</td></tr><tr><td>2</td><td>6661-2000</td></tr><tr><td>3</td><td>6661-3000</td></tr><tr><td>4</td><td>6661-4000</td></tr></table>                                                                                                                                                                                                  | Pipe Size                 | Code No.             | 1½                   | 6661-1500 | 2         | 6661-2000 | 3         | 6661-3000 | 4         | 6661-4000 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6661-1500                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6661-2000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6661-3000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6661-4000                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>METAL OR<br/>RIGID PLASTIC<br/>PLAIN END</p>        |  <p>A 2" OPENING</p>                                                                                         | <p><b>KIMAX Adapter Coupling</b></p> <table><tr><th>A" Dimension<br/>Pipe O.D.</th><th>Coupling<br/>Size</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>2 x 1½</td><td>6655-2015</td></tr><tr><td>1.70—1.78</td><td>2 x 1½</td><td>6655-2017</td></tr><tr><td>1.82—1.90</td><td>2 x 1½</td><td>6655-2018</td></tr></table>                                                                                                                         | A" Dimension<br>Pipe O.D. | Coupling<br>Size     | Code No.             | 1.48—1.53 | 2 x 1½    | 6655-2015 | 1.70—1.78 | 2 x 1½    | 6655-2017 | 1.82—1.90 | 2 x 1½    | 6655-2018 |   |           |           |   |           |           |
| A" Dimension<br>Pipe O.D.                                                                                                                                | Coupling<br>Size                                                                                                                                                                              | Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.48—1.53                                                                                                                                                | 2 x 1½                                                                                                                                                                                        | 6655-2015                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.70—1.78                                                                                                                                                | 2 x 1½                                                                                                                                                                                        | 6655-2017                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.82—1.90                                                                                                                                                | 2 x 1½                                                                                                                                                                                        | 6655-2018                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED —<br/>METAL OR PLASTIC</p>                        |  <p>SPLIT COUPLING NUT<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE</p>                                | <p><b>KIMAX Split Coupling</b></p> <table><tr><th>Pipe Size</th><th>Coupling<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635-1500</td><td>6739-1500</td></tr></table>                                                                                                                                                                                                                                                         | Pipe Size                 | Coupling<br>Code No. | Gasket<br>Code No.   | 1½        | 6635-1500 | 6739-1500 |           |           |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Coupling<br>Code No.                                                                                                                                                                          | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6635-1500                                                                                                                                                                                     | 6739-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED —<br/>METAL OR PLASTIC</p>                        |  <p>THREAD ADAPTER —<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE<br/>USE THREAD SEALING COMPOUND</p> | <p><b>KIMAX Thread Adapter and<br/>Drainline Coupling</b></p> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680-1500</td><td>6650-1500</td></tr><tr><td>2</td><td>6680-2000</td><td>6650-2000</td></tr><tr><td>3</td><td>6680-3000</td><td>6650-3000</td></tr><tr><td>4</td><td>6680-4000</td><td>6650-4000</td></tr><tr><td>6</td><td>6680-6000</td><td>6650-6000</td></tr></table> | Pipe Size                 | Adapter<br>Code No.  | Coupling<br>Code No. | 1½        | 6680-1500 | 6650-1500 | 2         | 6680-2000 | 6650-2000 | 3         | 6680-3000 | 6650-3000 | 4 | 6680-4000 | 6650-4000 | 6 | 6680-6000 | 6650-6000 |
| Pipe Size                                                                                                                                                | Adapter<br>Code No.                                                                                                                                                                           | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6680-1500                                                                                                                                                                                     | 6650-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6680-2000                                                                                                                                                                                     | 6650-2000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6680-3000                                                                                                                                                                                     | 6650-3000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6680-4000                                                                                                                                                                                     | 6650-4000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6680-6000                                                                                                                                                                                     | 6650-6000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>BELL</p>                                                          |  <p>BELL KIMAX BEADED<br/>OR PLAIN END<br/>DRAINLINE</p>                                                   | <p><b>KIMAX Glass to Bell End Pipe</b></p> <ol style="list-style-type: none"><li>1. Pack hub half full with asbestos rope.</li><li>2. Caulk with hot lead, lead wool or acid proof cement.</li></ol> <p>For Detail, see Drainline Installation Manual.</p>                                                                                                                                                                                              |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>METAL OR PLASTIC<br/>PLAIN</p>                                    |  <p>METAL OR PLASTIC KIMAX GLASS<br/>REDUCER</p>                                                           | <p><b>KIMAX Glass to Plain End Metal<br/>or Plastic</b> For Detail, see Drainline<br/>Installation Manual.</p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536-2015</td></tr><tr><td>3 x 2</td><td>6536-3020</td></tr><tr><td>4 x 3</td><td>6536-4030</td></tr><tr><td>6 x 4</td><td>6536-6040</td></tr></table>                                                                                                         | Pipe Size                 | Code No.             | 2 x 1½               | 6536-2015 | 3 x 2     | 6536-3020 | 4 x 3     | 6536-4030 | 6 x 4     | 6536-6040 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2 x 1½                                                                                                                                                   | 6536-2015                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3 x 2                                                                                                                                                    | 6536-3020                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4 x 3                                                                                                                                                    | 6536-4030                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6 x 4                                                                                                                                                    | 6536-6040                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |

## TYPICAL KIMAX DRAINLINE INSTALLATIONS



# KIMAX DRAINLINE INSTALLATIONS

Over the past years, there have been hundreds of KIMAX Glass Drainline installations, while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

## SCHOOLS AND UNIVERSITIES

University of Louisville (Medical Complex)  
Stout State University (Wisconsin)  
Roanoke Virginia Community College  
University of Rochester  
Clemson University  
University of Southern California  
University of Utah  
University of New Mexico  
Northern Arizona State University  
Whittier College  
Colorado State University  
Central Washington State University  
University of Idaho  
California State College  
Western Reserve University  
University of Minnesota  
Southern Methodist  
Oliver College  
Toledo University  
Bay Village High School (Ohio)  
Washington University (St. Louis, Mo.)  
St. John High School (Indiana)  
Kansas State University  
Port Lavaca High School (Texas)  
University of Texas  
Brescia College  
Adrian College (Michigan)  
University of Nebraska  
Port Huron Community College  
Palmyra High School (Wisconsin)  
University of Florida  
University of Virginia  
Duke University  
North Carolina State University  
Florida State University  
Rutgers University

Tacoma High School  
Washington State University  
Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pomona College  
Sophia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami (Florida)  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Shonomish High School  
University of Washington  
City of Detroit  
University of Michigan  
North Shore Junior College, Houston  
Boston College

## INDUSTRIAL

3M Company  
General Aniline Film Corporation  
Abbott Laboratories  
Ling-Temco-Vought  
Armco Steel  
Monsanto Chemical  
General Electric  
Uni-Royal

Morton Salt  
Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohm & Haas  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office Building, Boston  
B. F. Goodrich  
E. I. DuPont

## RESEARCH

Glidden-Durkee Research Center  
Upjohn Company  
Humble Oil Company  
Eli Lilly  
University of Wisconsin  
Miles Laboratories  
Parke-Davis  
A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Guillem Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Renter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
Texaco Experiment, Inc.

## HOSPITAL

Wesson Memorial Hospital (Massachusetts)  
University of Chicago (Illinois)  
Mayo Clinic (Minnesota)  
Houston Medical Center (Texas)  
St. Joseph's Hospital (Texas)  
Clarkston Hospital (Nebraska)  
Beaumont Hospital (Michigan)  
University of Louisville (Kentucky)  
Fairview Hospital (Minnesota)  
Columbia Hospital (Wisconsin)  
Lincoln Nebraska General Hospital  
Maynard Hospital, Seattle, Washington  
Botsford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minn.  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
Skin and Cancer Hospital, Philadelphia, Pennsylvania  
Germantown Hospital, Philadelphia, Pennsylvania  
Tyler Memorial Hospital, Meshoppen, Pennsylvania  
Emory University Hospital, Atlanta, Georgia  
Massachusetts General Hospital, Boston

## CANADIAN

Otto Mass Chemical Building,  
McGill University, Montreal  
Sherwin Williams, Montreal  
Smith, Kline & French Research Labs.  
University of Toronto Medical  
Science Building  
University of Alberta, Edmonton,  
Biological Sciences Building  
Department of Public Works Pathology  
Building, Halifax  
Ayerst, McKenna & Harrison, Montreal  
Moncton University, Moncton,  
New Brunswick  
Veterinary Diagnostic Laboratory, Regina  
Como Lake High School,  
Pt. Coquitlam, B.C.  
Tsawwassen School, Delta, B.C.  
St. Hyacinthe Agricultural Institute, Quebec



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# OWENS-ILLINOIS

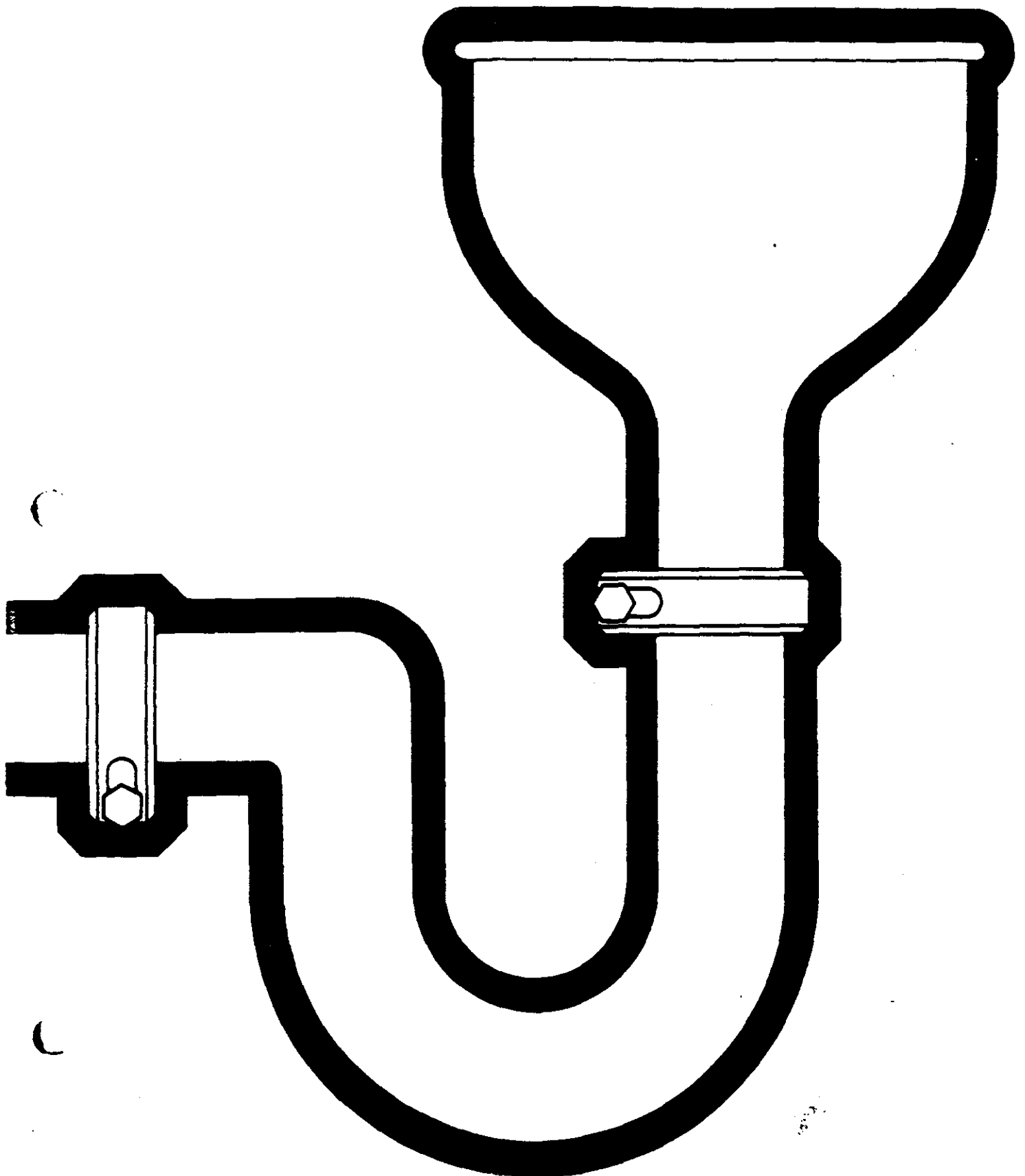
Toledo, Ohio 43601



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*F.E. Allen*

Fluid Process Systems  
Glass Drainline  
**FPS 65-3**  
From Owens-Illinois



## assured maximum corrosion resistance for chemical waste disposal systems

### KIMAX, the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\*.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manufactured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

**Building Owners:** KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- ☐ KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- ☐ Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- ☐ When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- ☐ All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- ☐ Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- ☐ All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\*For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetrafluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

**Specifier:** Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX glass drainline offers this freedom, confidence and reasonable cost because:

- ☐ All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- ☐ The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- ☐ The light weight of the KIMAX systems requires only 1/2 to 1/3 as many hangers as conventional high silica iron pipe.
- ☐ Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- ☐ Straight lengths of KIMAX pipe can be field cut to exact length.
- ☐ KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

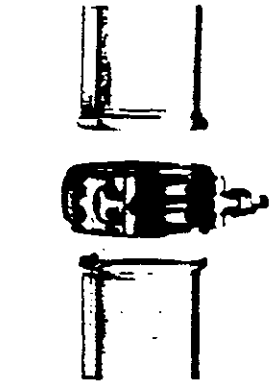
### Installation advantages:

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual FPS-650-1. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

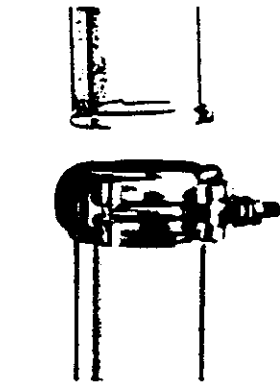
**Leak-Free Joint Assembly:** The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos). The coupling permits the joint to be deflected up to 4°.

**Field Fabrication:** KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the new B/P (bead to plain end) coupling system.

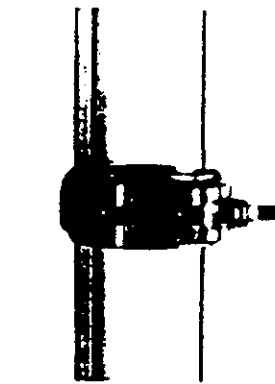
**Minimum Number of Hangers:** KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.



1

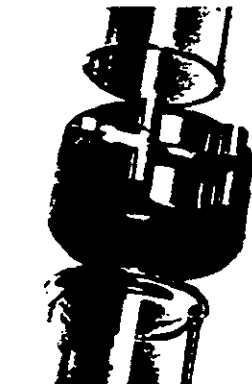


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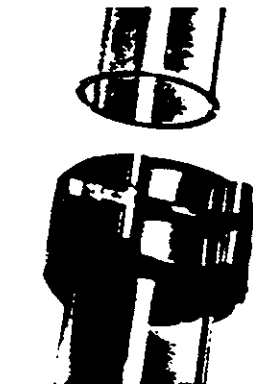


3

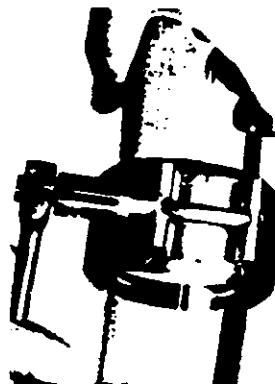
**KIMAX  
Bead to Bead  
Drainline  
Coupling**



1



2



3

**KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling**

# Other Kimax installation advantages include:

## **Below Ground Burial:**

KIMAX Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a protective casing of thick expanded polystyrene. For recommended installation procedures of KIMAX Drainline see Installation Manual FPS-650-1. Shown here is an example of KIMAX Drainline as installed underground.



## **Adaptation to Other Materials:**

KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 27.

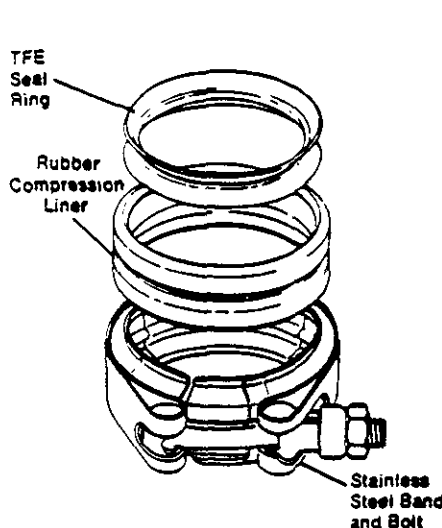
**Easily Handled:** KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

KIMAX Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem.

It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and bio-chemistry laboratories; veterinary and medical colleges, research, and other institutional laboratories.

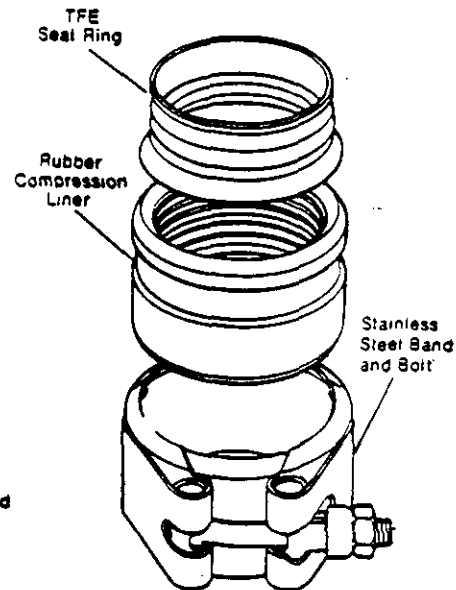
KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants . . . wherever corrosive chemical or solvent wastes present a disposal problem.

## **KIMAX Couplings Assure Quick, Positive Seal Joints**



### **KIMAX Drainline Coupling (Bead to Bead):**

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoro-ethylene provide the required joint seal. Assembly of joint is simple . . . place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.



### **KIMAX B/P Drainline Coupling (Beaded to Plain End):**

This newly designed KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of KIMAX glass drainline straight lengths.

# Guide Specifications

## Long form:

### ACID WASTE DRAINLINE

#### I. General

A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of borosilicate glass conforming to Federal Specification DD-G-541B and as manufactured under the trade name "KIMAX" by Owens-Illinois.

B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include protected pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.

C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

#### II. Connections

A. Glass-to-glass connections shall be made with KIMAX compression type couplings, Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Seal ring gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.

B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

#### III. Protection of Pipe

A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.

B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.

C. Glass pipe shall be protected against all weld splatter.

#### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

#### V. Underground Pipe

A. Excavation—shall conform to National Plumbing Code A 40.8 Section 2.7.

1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.

2. At least 4" of properly compacted sand or rock free soil shall be used directly under the pipe.

#### B. Buried Pipe

1. Straight lengths shall be protected in expanded polystyrene casing.

2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.

#### C. Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

#### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## Short form:

### ACID WASTE DRAINLINE

This system shall be made of KIMAX borosilicate glass and conforming to Federal Specification DD-G-541-B and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetra-fluoro-ethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of rock-free sand or soil compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendations.

KIMAX protected pipe, and wrapped fittings shall be installed and back filled in accordance with the manufacturer's instructions and governing plumbing code.

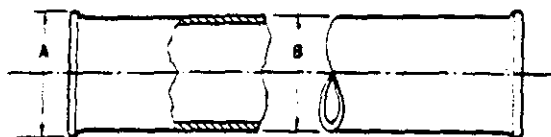
# pipe and fittings

## Straight Lengths—Pipe

Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

**6500** 5-ft. lengths

**6501** 10-ft. lengths

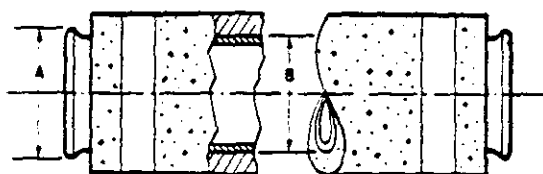


| Size | Weight<br>lbs./ft. | A    | B (O.D.) | 5 ft. lengths<br>Art. No. | Price   |
|------|--------------------|------|----------|---------------------------|---------|
| 1½   | 0.87               | 2.06 | 1.84     | 6500-1500                 | \$10.25 |
| 2    | 1.1                | 2.58 | 2.34     | -2000                     | 14.00   |
| 3    | 2.0                | 3.69 | 3.41     | -3000                     | 18.70   |
| 4    | 3.4                | 4.84 | 4.53     | -4000                     | 26.30   |
| 6    | 6.3                | 7.12 | 6.66     | -6000                     | 35.50   |

## 6502—EPS\* Covered

5-ft. lengths (for underground use)

6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.



\*Expanded Polystyrene

| 10 ft. lengths |         | EPS Covered |         |
|----------------|---------|-------------|---------|
| Art. No.       | Price   | Art. No.    | Price   |
| 6501-1500      | \$20.50 | 6502-1500   | \$11.55 |
| -2000          | 28.00   | -2000       | 15.60   |
| -3000          | 37.40   | -3000       | 21.35   |
| -4000          | 53.75   | -4000       | 31.20   |
| -6000          | 91.00   | -6000       | 55.10   |

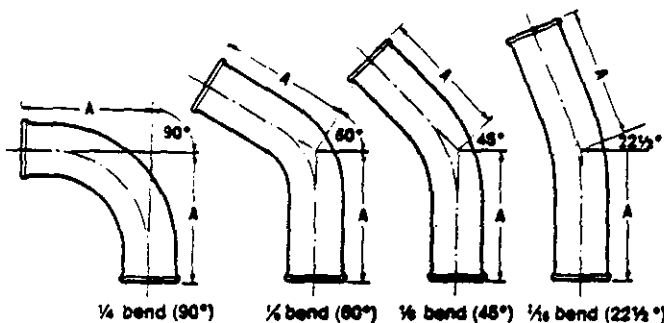
Beaded one end only

| Art. No.   | Price  |                                  |
|------------|--------|----------------------------------|
| *6504-1500 | \$2.25 | *6504 prices are priced per foot |
| -2000      | 3.05   |                                  |
| -3000      | 4.25   |                                  |
| -4000      | 5.85   |                                  |
| -6000      | 9.60   |                                  |

## 6504—Beaded one end only

6504 pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 7" of bead.

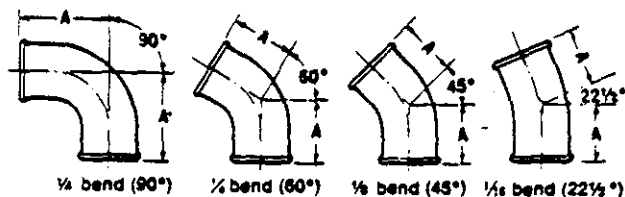
## 6511—Sweeps



| Size | A  | Art. No.  | Price   |
|------|----|-----------|---------|
| 1½   | 4½ | 6511-1590 | \$ 5.60 |
| 2    | 5  | -2090     | 7.20    |
| 3    | 6½ | -3090     | 11.70   |
| 4    | 9  | -4090     | 17.50   |
| 6    | 12 | -6090     | 48.50   |

| 60°       |         | 45°       |         | 22½°      |         |
|-----------|---------|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   | Art. No.  | Price   |
| 6511-1560 | \$ 5.60 | 6511-1545 | \$ 5.60 | 6511-1522 | \$ 5.60 |
| -2060     | 7.20    | -2045     | 7.20    | -2022     | 7.20    |
| -3060     | 11.70   | -3045     | 11.70   | -3022     | 11.70   |
| -4060     | 17.50   | -4045     | 17.50   | -4022     | 17.50   |
| -6060     | 48.50   | -6045     | 48.50   | -6022     | 48.50   |

## 6513—Bends



| Size | A 90° | A 60° | A 45° | A 22½° | Art. No.  | Price   |
|------|-------|-------|-------|--------|-----------|---------|
| 1½   | 3     | 2½    | 2     | 2      | 6513-1590 | \$ 5.60 |
| 2    | 3½    | 2¾    | 2½    | 2½     | -2090     | 7.20    |
| 3    | 5     | 3½    | 2¾    | 2¾     | -3090     | 11.70   |
| 4    | 7     | 4½    | 3¾    | 3¾     | -4090     | 17.50   |
| 6    | —     | —     | 7     | —      |           |         |

| 60°       |         | 45°       |         | 22½°      |         |
|-----------|---------|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   | Art. No.  | Price   |
| 6513-1560 | \$ 5.60 | 6513-1545 | \$ 5.60 | 6513-1522 | \$ 5.60 |
| -2060     | 7.20    | -2045     | 7.20    | -2022     | 7.20    |
| -3060     | 11.70   | -3045     | 11.70   | -3022     | 11.70   |
| -4060     | 17.50   | -4045     | 17.50   | -4022     | 17.50   |
|           |         | -6045     | 48.50   |           |         |

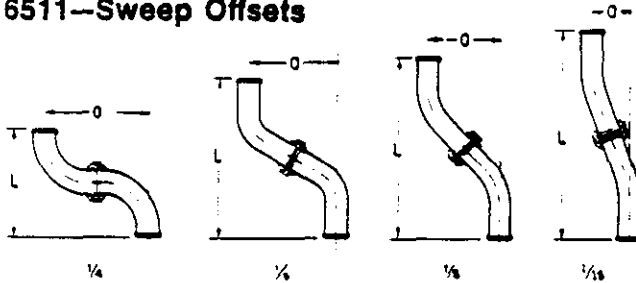
Use catalog dimensions for piping layout as gasket thickness allowance is included.

# pipe and fittings

## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

### 6511—Sweep Offsets



| Size | $\frac{1}{4}$ |    | $\frac{1}{2}$ |     | $\frac{3}{4}$ |     | $1$ |    |
|------|---------------|----|---------------|-----|---------------|-----|-----|----|
|      | L             | O  | L             | O   | L             | O   | L   | O  |
| 1½   | 9             | 9  | 13½           | 7½  | 15¾           | 6¾  | 17¾ | 3¾ |
| 2    | 10            | 10 | 15            | 8¾  | 17½           | 7½  | 19½ | 3½ |
| 3    | 13            | 13 | 19½           | 11¼ | 22¼           | 9¼  | 25  | 5  |
| 4    | 18            | 18 | 27            | 15¾ | 30¾           | 12¾ | 34¾ | 6¾ |
| 6    | 24            | 24 | 36            | 20¾ | 41            | 17  | 46¼ | 9¾ |

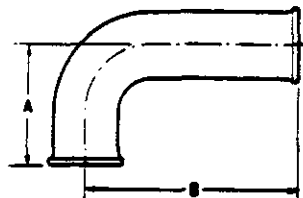
### 6513—Bend Offsets



| Size | $\frac{1}{4}$ |    | $\frac{1}{2}$ |    | $\frac{3}{4}$ |    | $1$ |    |
|------|---------------|----|---------------|----|---------------|----|-----|----|
|      | L             | O  | L             | O  | L             | O  | L   | O  |
| 1½   | 6             | 6  | 7½            | 4¾ | 6¾            | 2¾ | 7¾  | 1½ |
| 2    | 6½            | 6½ | 8¼            | 4¾ | 7¾            | 3¾ | 8¾  | 1¾ |
| 3    | 10            | 10 | 10½           | 6½ | 9¾            | 3¾ | 10½ | 2½ |
| 4    | 14            | 14 | 13½           | 7¾ | 11¾           | 4¾ | 10¾ | 2¾ |

## Special Purpose Bends

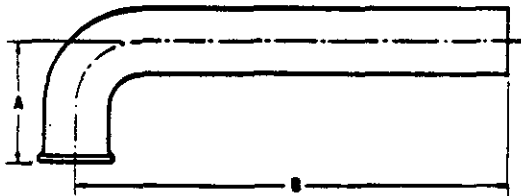
### 6512



| Size  | 6512 |    | 6512P |    | 6514 |   |
|-------|------|----|-------|----|------|---|
|       | A    | B  | A     | B  | A    | B |
| 1½-90 | 3¾   | 6  | 3¾    | 12 | 2½   | 3 |
| 2-90  | 3¾   | 7½ | 3¾    | 12 | —    | — |

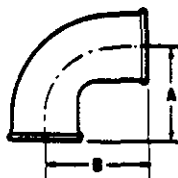
\*Can be field cut.

### 6512P (Annealed)\*



\*Can be field cut.

### 6514

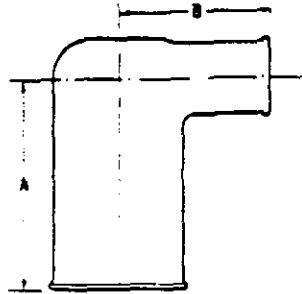


| 6512      |         | 6512P      |         | 6514      |        |
|-----------|---------|------------|---------|-----------|--------|
| Art. No.  | Price   | Art. No.   | Price   | Art. No.  | Price  |
| 6512-1590 | \$ 8.10 | 6512P-1590 | \$ 9.10 | 6514-1590 | \$8.10 |
| -2090     | 10.50   | -2090      | 11.20   |           |        |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

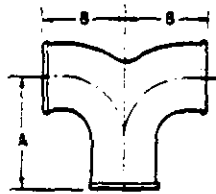


## 6518—Quarter Bend Reducer



| Size   | A | B  | Art. No.  | Price   |
|--------|---|----|-----------|---------|
| 2 x 1½ | 4 | 3½ | 6518-2015 | \$ 9.50 |
| 3 x 1½ | 5 | 4  | -3015     | 12.00   |
| 3 x 2  | 5 | 4½ | -3020     | 13.25   |
| 4 x 1½ | 7 | 4½ | -4015     | 16.00   |
| 4 x 2  | 7 | 5  | -4020     | 17.25   |
| 4 x 3  | 7 | 5½ | -4030     | 19.50   |
| 6 x 1½ | 9 | 5½ | -6015     | 37.00   |
| 6 x 2  | 9 | 6  | -6020     | 38.00   |
| 6 x 3  | 9 | 6½ | -6030     | 40.00   |
| 6 x 4  | 9 | 8  | -6040     | 42.00   |

## 6519—Double Quarter Bend

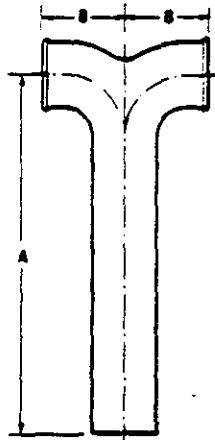


| Size         | 6519 |    | 6519P |    |
|--------------|------|----|-------|----|
|              | A    | B  | A     | B  |
| 1½           | 3    | 2½ | 10    | 2½ |
| **2 x 2 x 1½ | 3¼   | 2½ | 10    | 2½ |
| 2            | 3½   | 2½ | 10    | 2½ |
| 3            | 5    | 4½ |       |    |
| 4            | 6½   | 5½ |       |    |
| 6            | 8½   | 7  |       |    |

\*Can be field cut.

\*\*Branch is 1½".

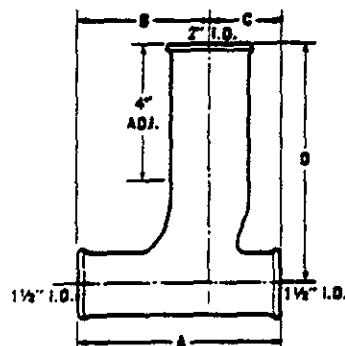
## 6519P



| 6519      |         | 6519P      |         |
|-----------|---------|------------|---------|
| Art. No.  | Price   | Art. No.   | Price   |
| 6519-1500 | \$ 9.90 | 6519P-1500 | \$11.50 |
| **2015    | 15.00   | -2000      | 13.90   |
| -2020     | 13.05   | **2015     | 13.90   |
| -3000     | 19.80   |            |         |
| -4000     | 30.65   |            |         |
| -6000     | 55.00   |            |         |

\*\*Branch is 1½" I.D.

## 6520—Adjustable Sanitary T (One Adjustable Inlet)

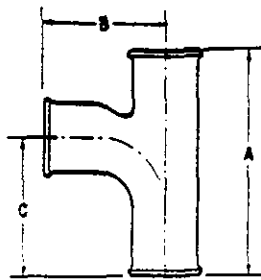


| Size        | A       | B  | C  | D |
|-------------|---------|----|----|---|
| 1½ x 1½ x 2 | 6       | 3½ | 2½ | 7 |
| Art. No.    | Price   |    |    |   |
| 6520-1520   | \$11.25 |    |    |   |

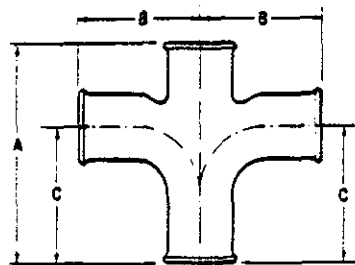
Use catalog dimensions for piping layout as gasket thickness allowance is included.

# pipe and fittings

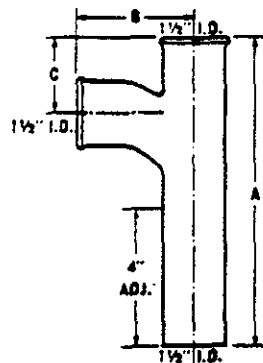
## 6521—Single Sanitary T



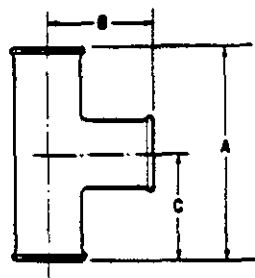
## 6522—Double



## 6530 Adjustable Sanitary T (Plain End Outlet)



## 6523—Straight T



| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 8  | 3 1/2 | 3 3/4  |
| 2 x 1 1/2     | 8  | 3 3/4 | 5      |
| 2 x 2         | 8  | 4 1/2 | 5      |
| 3 x 1 1/2     | 12 | 4 1/4 | 7 1/4  |
| 3 x 2         | 12 | 5     | 7 3/4  |
| 3 x 3         | 12 | 6 3/4 | 7 3/4  |
| 4 x 1 1/2     | 14 | 4 7/8 | 8 3/4  |
| 4 x 2         | 14 | 5 1/4 | 8 3/4  |
| 4 x 3         | 14 | 7     | 8 1/4  |
| 4 x 4         | 14 | 8 1/4 | 8 3/4  |
| 6 x 2         | 20 | 6 3/4 | 12 1/4 |
| 6 x 3         | 20 | 8     | 12 1/4 |
| 6 x 4         | 20 | 9 1/4 | 12 1/4 |
| 6 x 6         | 20 | 12    | 12 1/4 |

| Single    |         | Double    |         |
|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   |
| 6521-1515 | \$ 6.80 | 6522-1515 | \$10.65 |
| -2015     | 8.30    | -2015     | 12.50   |
| -2020     | 9.15    | -2020     | 13.60   |
| -3015     | 11.80   | -3015     | 16.05   |
| -3020     | 13.05   | -3020     | 18.35   |
| -3030     | 13.35   | -3030     | 19.65   |
| -4015     | 17.25   | -4015     | 28.00   |
| -4020     | 18.75   | -4020     | 28.50   |
| -4030     | 20.95   | -4030     | 31.00   |
| -4040     | 23.20   | -4040     | 34.80   |
| -6020     | 40.00   | -6020     | 44.20   |
| -6030     | 41.00   | -6030     | 49.00   |
| -6040     | 45.00   | -6040     | 53.50   |
| -6060     | 51.50   | -6060     | 71.00   |

| Size                  | A     | B     | C     | Art. No.  | Price  |
|-----------------------|-------|-------|-------|-----------|--------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 3/4 | 3 1/2 | 3 1/2 | 6530-1515 | \$9.50 |

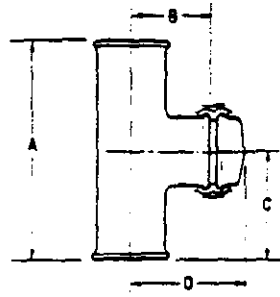
\* Can be field cut.

| Size          | A  | B     | C  | Art. No.  | Price   |
|---------------|----|-------|----|-----------|---------|
| 1 1/2 x 1 1/2 | 8  | 3     | 3  | 6523-1515 | \$10.10 |
| 2 x 1 1/2     | 8  | 3 3/4 | 4  | -2015     | 10.85   |
| 2 x 2         | 8  | 4     | 4  | -2020     | 11.00   |
| 3 x 1 1/2     | 12 | 4 1/2 | 6  | -3015     | 13.80   |
| 3 x 2         | 12 | 4 1/2 | 6  | -3020     | 14.10   |
| 3 x 3         | 12 | 6     | 6  | -3030     | 15.75   |
| 4 x 1 1/2     | 14 | 5     | 7  | -4015     | 16.70   |
| 4 x 2         | 14 | 5     | 7  | -4020     | 18.15   |
| 4 x 3         | 14 | 6 1/2 | 7  | -4030     | 23.25   |
| 4 x 4         | 14 | 8     | 7  | -4040     | 26.70   |
| 6 x 3         | 20 | 7 3/4 | 10 | -6030     | 53.50   |
| 6 x 4         | 20 | 9     | 10 | -6040     | 55.10   |
| 6 x 6         | 20 | 10    | 10 | -6060     | 62.80   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

## 6524—Test T with cleanout

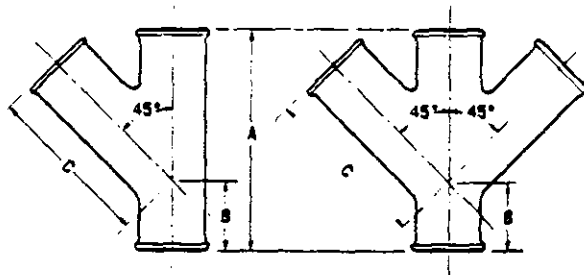
Test Tee and cleanout comes as complete assembly including cap and coupling.



| Size          | A  | B     | C | D     | Art. No.  | Price   |
|---------------|----|-------|---|-------|-----------|---------|
| 1 1/2 x 1 1/2 | 6  | 2 1/4 | 3 | 3 1/4 | 6524-1515 | \$14.70 |
| 2 x 2         | 8  | 2 1/4 | 4 | 3 1/4 | -2020     | 17.30   |
| 3 x 3         | 12 | 3 1/4 | 6 | 4 1/4 | -3030     | 23.40   |
| 4 x 4         | 14 | 4 1/4 | 7 | 5 1/4 | -4040     | 43.50   |

## Drainline Y 6526—Single

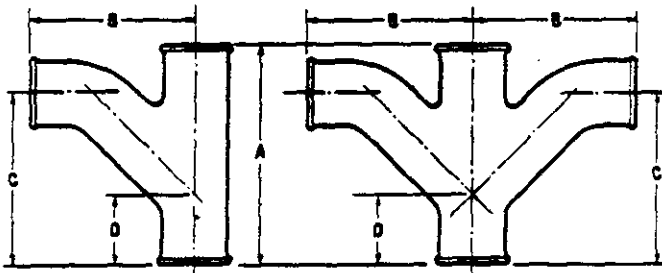
## 6527—Double



| Single Y      |    |       |        |           | Double  |           |
|---------------|----|-------|--------|-----------|---------|-----------|
| Size          | A  | B     | C      | Art. No.  | Price   | Art. No.  |
| 1 1/2 x 1 1/2 | 6  | 1 3/4 | 4 1/2  | 6526-1515 | \$ 8.10 | 6527-1515 |
| 2 x 1 1/2     | 8  | 2 1/2 | 4 3/4  | -2015     | 8.95    | -2015     |
| 2 x 2         | 8  | 2 1/2 | 6      | -2020     | 9.35    | -2020     |
| 3 x 1 1/2     | 12 | 3 3/4 | 5 1/2  | -3015     | 12.40   | -3015     |
| 3 x 2         | 12 | 3 3/4 | 6 3/4  | -3020     | 12.90   | -3020     |
| 3 x 3         | 12 | 3 3/4 | 8      | -3030     | 14.90   | -3030     |
| 4 x 1 1/2     | 14 | 4 1/2 | 8 3/4  | -4015     | 17.00   | -4015     |
| 4 x 2         | 14 | 4 1/2 | 7 1/2  | -4020     | 18.80   | -4020     |
| 4 x 3         | 14 | 4 1/2 | 8 3/4  | -4030     | 20.75   | -4030     |
| 4 x 4         | 14 | 4 1/2 | 10     | -4040     | 24.70   | -4040     |
| 6 x 2         | 20 | 5 3/4 | 9      | -6020     | 40.50   | -6020     |
| 6 x 3         | 20 | 5 3/4 | 10 3/4 | -6030     | 49.40   | -6030     |
| 6 x 4         | 20 | 5 3/4 | 11 1/2 | -6040     | 54.00   | -6040     |
| 6 x 6         | 20 | 5 3/4 | 14     | -6060     | 59.00   | -6060     |

## Combination Y and 1/8 Bend 6528—Single

## 6529—Double



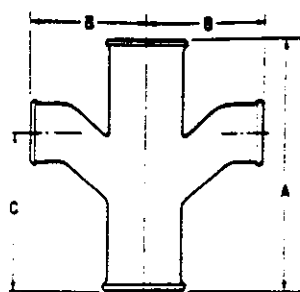
|         |    |    |     |    | Single    | Double  |           |         |  |
|---------|----|----|-----|----|-----------|---------|-----------|---------|--|
| Size    | A  | B  | C   | D  | Art. No.  | Price   | Art. No.  | P       |  |
| 1½ x 1½ | 6  | 4½ | 4¾  | 1¾ | 6528-1515 | \$ 8.50 | 6529-1515 | \$11.10 |  |
| 2 x 1½  | 8  | 4¾ | 5½  | 2½ | -2015     | 10.35   | -2015     | 11.10   |  |
| 2 x 2   | 8  | 6  | 6¼  | 2½ | -2020     | 11.90   | -2020     | 20.00   |  |
| 3 x 1½  | 12 | 5¾ | 7¼  | 3¾ | -3015     | 13.35   | -3015     | 21.00   |  |
| 3 x 2   | 12 | 6½ | 8   | 3¾ | -3020     | 14.40   | -3020     | 22.00   |  |
| 3 x 3   | 12 | 8½ | 9   | 3¾ | -3030     | 16.35   | -3030     | 25.00   |  |
| 4 x 1½  | 14 | 6  | 8½  | 4½ | -4015     | 17.75   | -4015     | 3.00    |  |
| 4 x 2   | 14 | 7  | 9¼  | 4½ | -4020     | 19.00   | -4020     | 3.00    |  |
| 4 x 3   | 14 | 9  | 10¼ | 4½ | -4030     | 21.50   | -4030     | 3.00    |  |
| 4 x 4   | 14 | 11 | 11  | 4½ | -4040     | 24.70   | -4040     | 5.00    |  |
| 6 x 2   | 20 | 8¾ | 11¾ | 5¾ | -6020     | 40.00   | -6020     | 5.00    |  |
| 6 x 3   | 20 | 10 | 12½ | 5¾ | -6030     | 43.70   | -6030     | 5.00    |  |
| 6 x 4   | 20 | 12 | 13½ | 5¾ | -6040     | 46.80   | -6040     | 7.00    |  |
| 6 x 6   | 20 | 15 | 14½ | 5¾ | -6060     | 56.00   | -6060     | 9.00    |  |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

# pipe and fittings

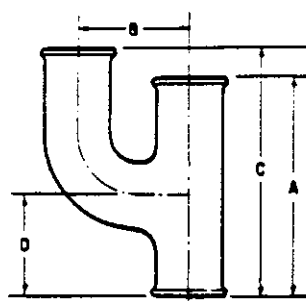
## 6531 Partition Cross (Compact)

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.



| Size             | A | B  | C | Art. No.  | Price   |
|------------------|---|----|---|-----------|---------|
| 2 x 1½           | 8 | 3¾ | 5 | 6531-2015 | \$16.10 |
| 2 x 2            | 8 | 4½ | 5 | -2020     | 18.90   |
| 2 x 1½ x 1½ x 1½ | 8 | 3¾ | 5 | -2151     | 21.65   |

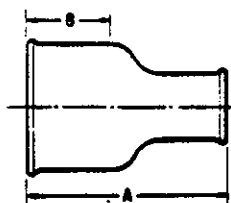
## 6532—Single Upright Y or H (vent branch)



| Size    | A  | B  | C*  | D  | Art. No.  | Price   |
|---------|----|----|-----|----|-----------|---------|
| 1½ x 1½ | 6  | 3  | 6¾  | 2¾ | 6532-1515 | \$22.10 |
| 2 x 1½  | 8  | 3¾ | 7¾  | 3¾ | -2015     | 22.10   |
| 2 x 2   | 8  | 4  | 8¾  | 3¾ | -2020     | 25.00   |
| 3 x 1½  | 12 | 3¾ | 9½  | 4¾ | -3015     | 25.20   |
| 3 x 2   | 12 | 4½ | 10¾ | 4¾ | -3020     | 27.30   |
| 3 x 3   | 12 | 6  | 13  | 5¾ | -3030     | 28.30   |
| 4 x 1½  | 14 | 4¾ | 10¾ | 5¾ | -4015     | 30.00   |
| 4 x 2   | 14 | 5  | 12  | 5¾ | -4020     | 32.40   |
| 4 x 3   | 14 | 6½ | 14¼ | 6¾ | -4030     | 36.50   |
| 4 x 4   | 14 | 8  | 16¾ | 6¾ | -4040     | 41.70   |
| 6 x 3   | 20 | 7¾ | 18¾ | 7¾ | -6030     | 55.00   |
| 6 x 4   | 20 | 9  | 19  | 8  | -6040     | 63.80   |
| 6 x 6   | 20 | 12 | 24  | 12 | -6060     | 86.00   |

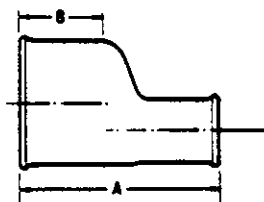
\*C\* dimension may be longer or shorter than "A"

## 6536—Straight Reducers or Increaseers



| Size   | A | B (min.) | Straight  |         | Eccentric |         |
|--------|---|----------|-----------|---------|-----------|---------|
|        |   |          | Art. No.  | Price   | Art. No.  | Price   |
| 2 x 1½ | 4 | 1¾       | 6536-2015 | \$ 4.95 | 6537-2015 | \$ 4.95 |
| 3 x 1½ | 5 | 2¼       | -3015     | 6.70    | -3015     | 6.70    |
| 3 x 2  | 5 | 2¼       | -3020     | 8.00    | -3020     | 8.00    |
| 4 x 1½ | 7 | 3        | -4015     | 10.40   | -4015     | 10.40   |
| 4 x 2  | 7 | 3        | -4020     | 11.35   | -4020     | 11.35   |
| 4 x 3  | 7 | 3        | -4030     | 12.35   | -4030     | 12.35   |
| 6 x 1½ | 9 | 4        | -6015     | 20.00   | -6015     | 20.00   |
| 6 x 2  | 9 | 4        | -6020     | 21.00   | -6020     | 21.00   |
| 6 x 3  | 9 | 4        | -6030     | 23.00   | -6030     | 23.00   |
| 6 x 4  | 9 | 4        | -6040     | 26.00   | -6040     | 26.00   |

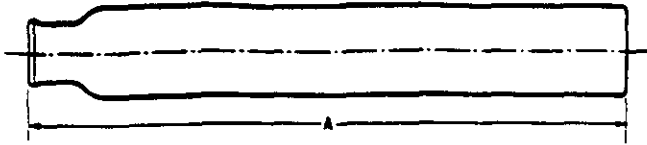
## 6537—Eccentric Reducers or Increaseers



Use catalog dimensions for piping layout as gasket thickness allowance is included.

# pipe and fittings

## 6540 Vent Increasers



| Size   | A  | Art. No.  | Price   |
|--------|----|-----------|---------|
| 1½ x 3 | 22 | 6540-1530 | \$17.50 |
| 2 x 3  | 22 | -2030     | 18.60   |
| 3 x 4  | 22 | -3040     | 25.50   |

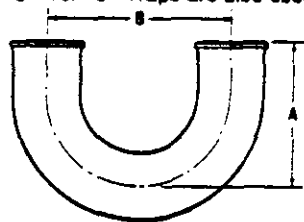
## 6544 Cleanout Plug



| Size | A  | Art. No.  | Price   |
|------|----|-----------|---------|
| 1½   | 1  | 6544-1500 | \$ 2.30 |
| 2    | 1  | -2000     | 2.90    |
| 3    | 1½ | -3000     | 4.10    |
| 4    | 1½ | -4000     | 7.10    |
| 6    | 1½ | -6000     | 10.40   |

## 6550 U Bend (vent loop)

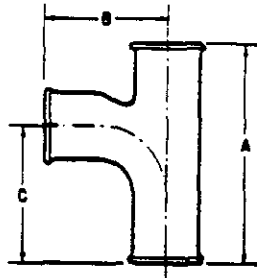
Note: U bends are often used for vent loops.  
No. 6705 outlets on Swivel "S" Traps are also used as vent loops.



| Size | A  | B  | Art. No.  | Price   |
|------|----|----|-----------|---------|
| 1½   | 4  | 5  | 6550-1500 | \$ 9.80 |
| 2    | 4½ | 5½ | -2000     | 12.30   |
| 3    | 5½ | 6½ | -3000     | 24.70   |
| 4    | 6½ | 7½ | -4000     | 32.90   |

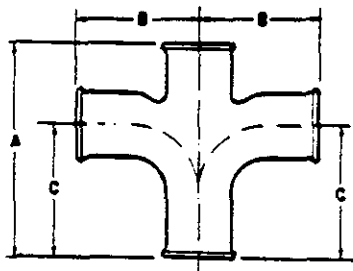
# compact fittings

## 6541 Single Sanitary T



| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 4½ | 2½ | 2½ |
| 2 x 1½  | 4¾ | 2¾ | 2¾ |
| 2 x 2   | 5¾ | 2¾ | 2¾ |
| 3 x 2   | 9  | 4¾ | 5½ |
| 3 x 3   | 9  | 4¾ | 5¾ |
| 4 x 1½  | 10 | 4¾ | 6¾ |
| 4 x 2   | 10 | 4¾ | 6¾ |
| 4 x 3   | 10 | 5¾ | 6¾ |
| 4 x 4   | 10 | 6¾ | 6¾ |
| 6 x 2   | 16 | 5¾ | 9½ |
| 6 x 3   | 16 | 6¾ | 9½ |
| 6 x 4   | 16 | 7¾ | 9½ |
| 6 x 6   | 16 | 9¾ | 9¾ |

## 6542 Double Sanitary T

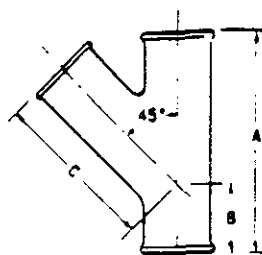


| Single    |         | Double    |         |
|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   |
| 6541-1515 | \$ 8.80 | 6542-4015 | \$21.40 |
| -2015     | 8.30    | -4020     | 28.00   |
| -2020     | 9.15    | -4030     | 32.00   |
| -3020     | 13.05   | -4040     | 34.80   |
| -3030     | 13.35   | -6020     | 44.20   |
| -4015     | 17.25   | -6030     | 48.00   |
| -4020     | 18.75   | -6040     | 55.00   |
| -4030     | 20.95   | -6060     | 75.00   |
| -4040     | 23.20   |           |         |
| -6020     | 39.00   |           |         |
| -6030     | 40.00   |           |         |
| -6040     | 47.75   |           |         |
| -6060     | 52.75   |           |         |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

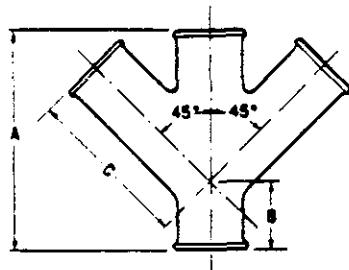
# compact fittings

## 6546 Single Drainline Y



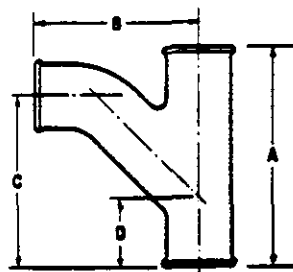
| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 5½ | 1½ | 4   |
| 2 x 2   | 5½ | 1½ | 4½  |
| 3 x 2   | 9  | 2½ | 6½  |
| 3 x 3   | 9  | 2½ | 7½  |
| 4 x 1½  | 10 | 3½ | 6½  |
| 4 x 2   | 10 | 2½ | 7½  |
| 4 x 3   | 10 | 2  | 8½  |
| 4 x 4   | 10 | 2  | 8½  |
| 6 x 2   | 16 | 4½ | 9½  |
| 6 x 3   | 16 | 5½ | 10½ |
| 6 x 4   | 16 | 4½ | 11½ |
| 6 x 6   | 16 | 4½ | 12½ |

## 6547 Double Drainline Y



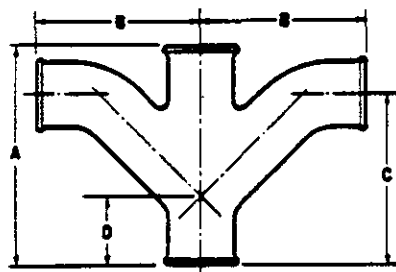
| Single<br>6546 |         | Double<br>6547 |         |
|----------------|---------|----------------|---------|
| Art. No.       | Price   | Art. No.       | Price   |
| 6546-1515      | \$ 9.00 | 6547-4015      | \$24.70 |
| -2020          | 9.90    | -4020          | 27.30   |
| -3020          | 12.90   | -4030          | 33.60   |
| -3030          | 14.90   | -4040          | 42.80   |
| -4015          | 17.00   | -6020          | 61.70   |
| -4020          | 18.80   | -6030          | 64.80   |
| -4030          | 20.75   | -6040          | 68.40   |
| -4040          | 24.70   | -6060          | 90.50   |
| -6020          | 40.00   |                |         |
| -6030          | 49.40   |                |         |
| -6040          | 54.00   |                |         |
| -6060          | 59.00   |                |         |

## 6548 Combination Y and ½ Bend



| Size   | A  | B   | C   | D  |
|--------|----|-----|-----|----|
| 2 x 1½ | 5½ | 3½  | 3½  | 1½ |
| 2 x 2  | 6  | 4½  | 4½  | 1½ |
| 3 x 2  | 9  | 6½  | 6½  | 2½ |
| 3 x 3  | 9  | 6½  | 6½  | 2½ |
| 4 x 1½ | 10 | 5½  | 6½  | 2½ |
| 4 x 2  | 10 | 5½  | 6½  | 2½ |
| 4 x 3  | 10 | 6½  | 7½  | 3½ |
| 4 x 4  | 10 | 6½  | 7½  | 2½ |
| 6 x 2  | 16 | 7½  | 9½  | 4½ |
| 6 x 3  | 16 | 8½  | 9½  | 4½ |
| 6 x 4  | 16 | 9½  | 10½ | 4½ |
| 6 x 6  | 16 | 11½ | 10½ | 3½ |

## 6549 Double Combination Y and ½ Bend

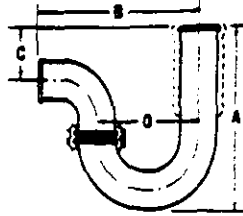


| Single<br>6548 |         | Double<br>6549 |         |
|----------------|---------|----------------|---------|
| Art. No.       | Price   | Art. No.       | Price   |
| 6548-2015      | \$10.35 | 6549-4015      | \$31.00 |
| -2020          | 11.90   | -4020          | 31.00   |
| -3020          | 14.40   | -4030          | 35.00   |
| -3030          | 16.35   | -4040          | 50.00   |
| -4015          | 17.75   | -6020          | 55.00   |
| -4020          | 19.00   | -6030          | 59.00   |
| -4030          | 21.50   | -6040          | 70.00   |
| -4040          | 24.70   | -6060          | 95.00   |
| -6020          | 40.00   |                |         |
| -6030          | 43.70   |                |         |
| -6040          | 46.60   |                |         |
| -6060          | 56.00   |                |         |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6700—Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.

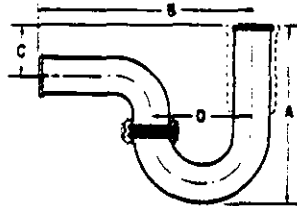


| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  | 6700-1515 | \$16.35 |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  | -2015     | 17.90   |
| 2 x 2                  | 9¼ | 8¾ | 1½ | 5½ | -2020     | 21.25   |

See Standard Cleanout, Page 17.

### 6701—Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

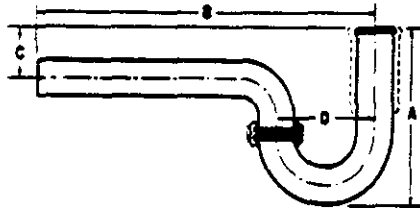


| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 9¼ | 11 | 1½ | 5  | 6701-1515 | \$18.70 |
| 2 x 1½                 | 8¾ | 11 | 1½ | 5  | -2015     | 22.00   |
| 2 x 2                  | 8¾ | 13 | 1¼ | 5½ | -2020     | 23.95   |

See Standard Cleanout, Page 17.

### 6704 (Plain End Outlet\*)

No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

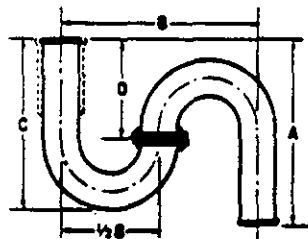


| Size<br>Inlet x Outlet | A  | B   | C  | D  | Art. No.  | Price   |
|------------------------|----|-----|----|----|-----------|---------|
| 1½ x 1½                | 8¾ | 17  | 1½ | 5  | 6704-1515 | \$19.30 |
| 2 x 1½                 | 8¾ | 17  | 1½ | 5  | -2015     | 20.85   |
| 2 x 2                  | 9¼ | 17½ | 1¼ | 5½ | -2020     | 24.80   |

\* Annealed outlet, can be field cut.

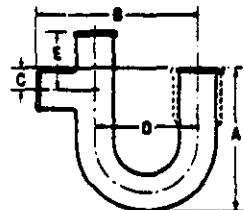
### 6706—Swivel Trap—S Style

No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 10 | 10 | 8¾ | 5  | 6706-1515 | \$18.90 |
| 2 x 1½                 | 10 | 10 | 8¾ | 5  | -2015     | 20.45   |
| 2 x 2                  | 9¾ | 11 | 9¼ | 4¾ | -2020     | 24.70   |

### 6713 (Vented)



| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Art. No.  | Price   |
|------------------------|--------------|-----|-----|----|----|----|-----------|---------|
| 1½ x 1½                | 1½           | 7   | 8   | 1  | 5  | 3  | 6713-1515 | \$17.00 |
| 2 x 1½                 | 1½           | 7½  | 8   | 1½ | 5  | 3  | -2015     | 18.00   |
| 2 x 2                  | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | -2020     | 19.55   |
| 3 x 3                  | 3            | 10¼ | 10½ | 2  | 6½ | 4  | -3030     | 41.60   |
| 4 x 4                  | 4            | 12¼ | 12½ | 2½ | 7½ | 5  | -4040     | 50.85   |
| 6 x 6                  | 4            | 16¾ | 31  | 2½ | 24 | 7  | ** -6060  | 166.20  |

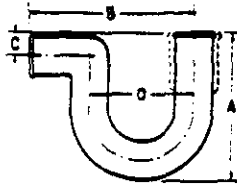
\* Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.

\*\* No cleanouts on 6 x 6 traps.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6718 Trap—P Style

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with B type cleanout. See Standard Cleanout.  
Page 17.  
No cleanouts on 6 x 6 traps.

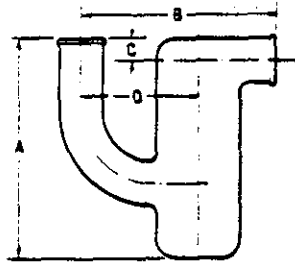


| Size<br>Inlet x<br>Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Art. No.  | P |
|---------------------------|--------------|-----|-----|----|----|----|-----------|---|
| 1½ x 1½                   | 1½           | 7   | 8   | 1  | 5  | 3  | 6718-1515 | s |
| 2 x 1½                    | 1½           | 7½  | 8   | 1½ | 5  | 3  | -2015     |   |
| 2 x 2                     | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | -2020     |   |
| 3 x 3                     | 3            | 10¼ | 10½ | 2  | 6½ | 4  | -3030     |   |
| 4 x 4                     | 4            | 12¼ | 12½ | 2½ | 7½ | 5  | -4040     |   |
| 6 x 6                     | 4            | 16¾ | 31  | 2½ | 24 | 7  | -6060     |   |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
\*\*No cleanouts on 6 x 6 traps.

### 6707—Drum Trap—P Style

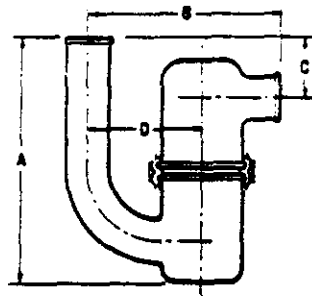
Traps available with B type cleanout. See Standard Cleanout.  
Page 17.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. | Art. No.  | P   |
|------------------------|----|----|----|----|--------------|-----------|-----|
| 1½ x 1½                | 9  | 8  | 1  | 4½ | 3            | 6707-1515 | s22 |
| 2 x 1½                 | 9  | 8  | 1½ | 4½ | 3            | -2015     | 23  |
| 2 x 2                  | 9¾ | 9¼ | 2  | 5½ | 4            | -2020     | 28  |

### 6710—Swivel Drum Trap—P Style

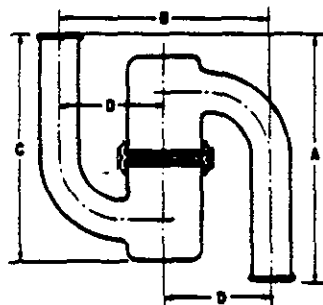
No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A   | B  | C  | D  | Body<br>I.D. | Art. No.  | Price |
|------------------------|-----|----|----|----|--------------|-----------|-------|
| 1½ x 1½                | 10¼ | 8  | 2½ | 4¾ | 3            | 6710-1515 | s29   |
| 2 x 1½                 | 10¼ | 8  | 2½ | 4¾ | 3            | -2015     | 31    |
| 2 x 2                  | 11  | 9¼ | 3  | 5½ | 4            | -2020     | 36    |

### 6714—Swivel Drum Trap—S Style

No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>I.D. | Art. No.  | Price |
|------------------------|-----|----|-----|----|--------------|-----------|-------|
| 1½ x 1½                | 11¼ | 9½ | 10¼ | 4¾ | 3            | 6714-1515 | s31.0 |
| 2 x 1½                 | 11¼ | 9½ | 10¼ | 4¾ | 3            | -2015     | 33.0  |
| 2 x 2                  | 11¼ | 11 | 11  | 5½ | 4            | -2020     | 38.0  |

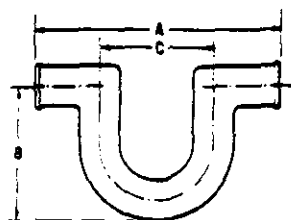
Traps available with B type cleanout. See Standard Cleanout.  
Page 17.



expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6770 Running Trap

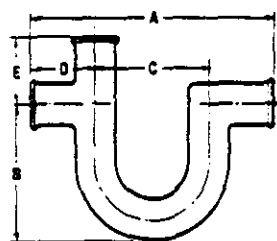
Traps available with B type cleanout. See Standard Cleanout, Page 17.



| Size<br>inlet x<br>Outlet | Vent<br>Size | A      | B      | C     | D     | E     |
|---------------------------|--------------|--------|--------|-------|-------|-------|
| 1 1/2 x 1 1/2             | 1 1/2        | 11     | 6      | 5     | 3     | 3     |
| 2 x 2                     | 2            | 12     | 6 1/4  | 5 1/2 | 3 1/4 | 3 1/2 |
| 3 x 3                     | 3            | 14 1/2 | 8 1/4  | 6 1/2 | 4     | 4     |
| 4 x 4                     | 4            | 17 1/2 | 9 3/4  | 7 1/2 | 5     | 5     |
| 6 x 6                     | 4            | 38     | 12 3/4 | 24    | 7     | 7     |

\*No cleanouts on 6 x 6 traps.

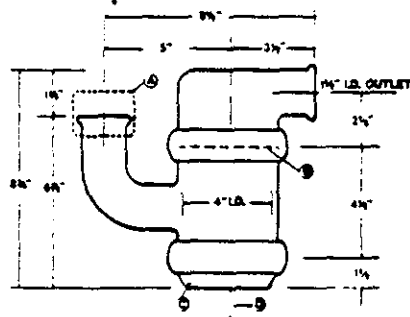
## 6771 (Vented)



| 6770      |          | 6771      |          |
|-----------|----------|-----------|----------|
| Art. No.  | Price    | Art. No.  | Price    |
| 6770-1515 | \$ 25.10 | 6771-1515 | \$ 28.10 |
| -2020     | 30.20    | -2020     | 35.50    |
| -3030     | 50.20    | -3030     | 58.00    |
| -4040     | 80.20    | -4040     | 85.20    |
| -6060     | 115.00   | -6060     | 170.50   |

\*No cleanouts on 6 x 6 traps.

## Interceptor Trap #6708-4015

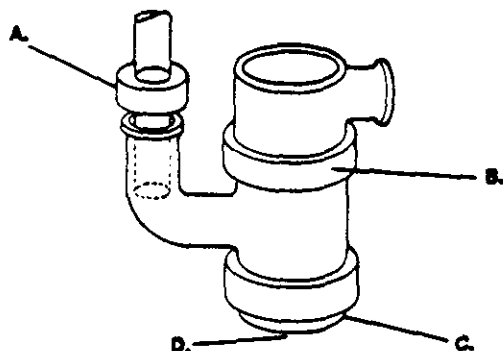


A. Adapter Coupling #6665-1512 (to connect to 1 1/2" O.D. tubing)  
(Rubber Seal) #6665-1515 (to connect to 1 1/2" O.D. tubing)

B. Perforated S.S. Screen 1/16" dia. holes 6 sq. in. free area opg.

C. Removable coupling/end cap for cleanout.

D. Min. 3" clearance required under trap for removal of end cap.



Use catalog dimensions for piping layout as gasket thickness allowance is included.

| ARTICLE NO. | Price   | DESCRIPTION                        |
|-------------|---------|------------------------------------|
| 6708-4015   | \$61.20 | 1 1/2" x 1 1/2" INTERCEPTOR TRAP   |
| 6665-1512   | 5.00    | 1 1/2" O.D. INLET ADAPTER COUPLING |
| 6665-1515   | 5.00    | 1 1/2" O.D. INLET ADAPTER COUPLING |

## Specifications

KIMAX Borosilicate Glass Interceptor Trap with 1 1/2" I.D. inlet, 1 1/2" I.D. outlet and 4" I.D. body. Perforated S.S. Screen Interceptor 4" dia. with 1/16" holes and effective 6 sq. in. free area opening. Bottom C.O. Coupling with end cap for cleaning.

## Connections

1. For DWV Service use KIMAX Adapter Coupling 6665-1515 for 1 1/2" O.D. tubing or 6665-1512 for 1 1/2" O.D. tubing. RUBBER SEAL ONLY.

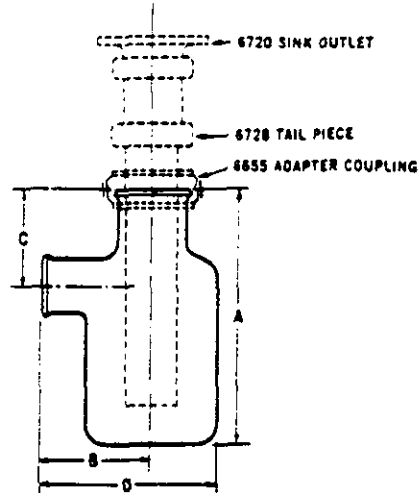
2. To connect to 1 1/2" IPS metal or rigid plastic plain end pipe, use KIMAX B/P Coupling 6661-1500.

3. To connect to 1 1/2" I.D. glass drainline, use KIMAX Couplings 6650-1500 or 6661-1500.

### 6614—Partition Trap (Consists of Trap Body Only)

Available with 1½" and 2" outlets only. 1½" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

Traps are non-siphoning with partition always visible.  
Traps available with B type cleanout. See below.



| Size<br>Inlet x Outlet | A  | B  | C  | D | Art. No.  | Price |
|------------------------|----|----|----|---|-----------|-------|
| 2 x 1½                 | 8½ | 3¾ | 3¼ | 6 | 6614-2015 | \$25  |
| 2 x 2                  | 8½ | 3¾ | 4¼ | 6 | -2020     | 28    |

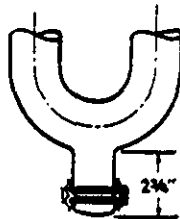
### Type B—Standard Cleanout

Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

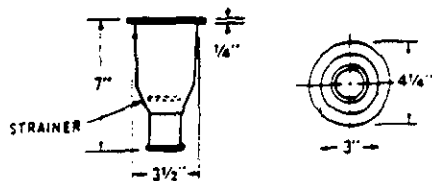
#### Ordering Information

To order standard traps with cleanouts use catalog number for proper style and add the letter B. (Example 6718-B-1515)  
For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

| Size | Art. No. | Price                      |
|------|----------|----------------------------|
| 1½   | B        | \$8.10 (Add to trap price) |



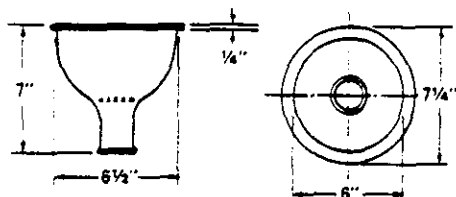
### 6616 Beaded Outlet 3" Hemispherical



No. 6724. 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/2) on outlet to connect to 2" expanded end traps or fittings.

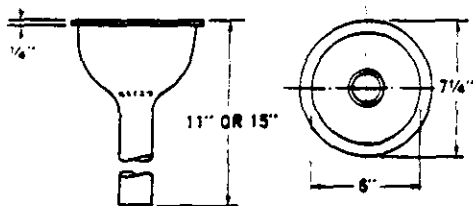
| Art. No.  | Price   |
|-----------|---------|
| 6616-3000 | \$15.00 |

### 6617 Beaded Outlet 6" Hemispherical



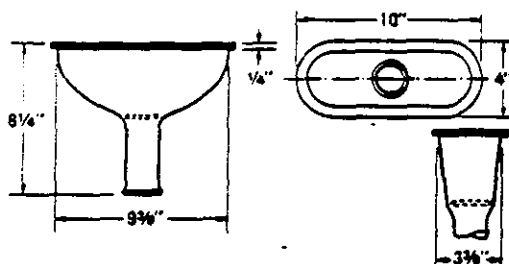
| Art. No.  | Price   |
|-----------|---------|
| 6617-6000 | \$15.00 |

### 6617P Plain End Outlet 6" Hemispherical



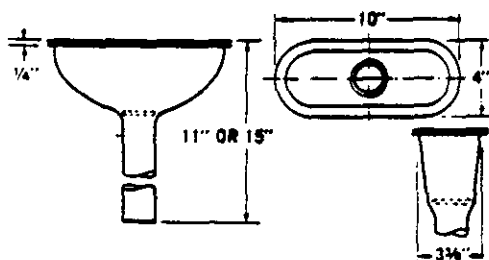
| Art. No.   | Price   |
|------------|---------|
| 6617P-6011 | \$15.00 |
| -6015      | 15.50   |

### 6618 Beaded Outlet 3" x 9" Oval



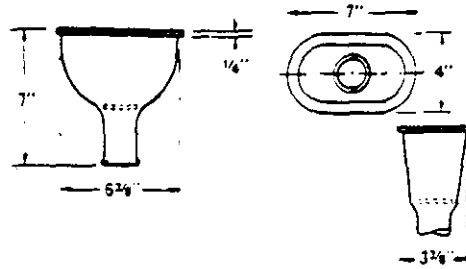
| Art. No.  | Price   |
|-----------|---------|
| 6618-3900 | \$18.00 |

### 6618P Plain End Outlet 3" x 9" Oval



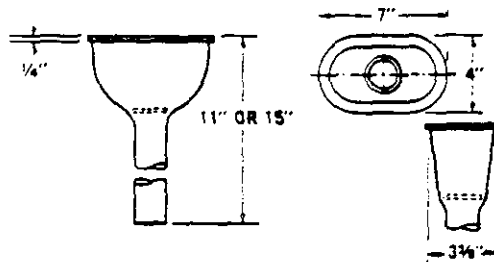
| Art. No.   | Price   |
|------------|---------|
| 6618P-3911 | \$18.50 |
| -3915      | 18.50   |

## 6619 Beaded Outlet 3" x 6" Oval



| Art. No.  | Price   |
|-----------|---------|
| 6619-3600 | \$12.90 |

## 6619P Plain End Outlet 3" x 6" Oval

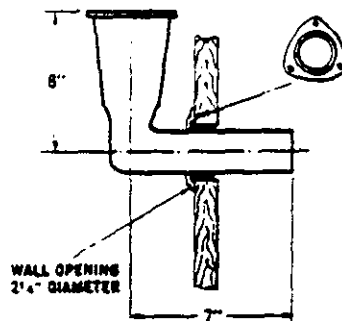


| Art. No.   | Price   |
|------------|---------|
| 6619P-3611 | \$12.85 |
| .3615      | 12.85   |

## 6724 Sink Strainer (All Cup Sinks)

| Size | Art No.   | Price  |
|------|-----------|--------|
| 2    | 6724-2000 | \$1.10 |

## 6627 3" x 6" Oval Horizontal, Wall Mounted Cup Sink 1 1/2" Plain End Outlet



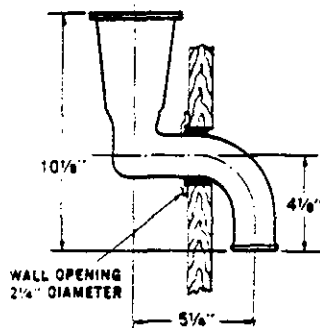
### Horizontal Outlet

- No. 6621 cup sink oval (3 x 6)
- No. 6724 2" sink strainer
- No. 7150 2" flange
- No. 7204 insert (2 x 1 1/2)

| Art No.   | Price   |
|-----------|---------|
| 6621-3600 | \$22.30 |
| 6724-2000 | 1.10    |
| 7150-2000 | 1.90    |
| 7204-2015 | 2.50    |

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet.

**6628 3" x 6" Oval Vertical,  
1½" Outlet  
Wall Mounted Cup Sink**



| Art. No.  | Price   |
|-----------|---------|
| 6628-3600 | \$32.00 |

**Vertical Outlet**

No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1½)

| Art No.   | Price   |
|-----------|---------|
| 6629-3600 | \$24.60 |
| 6724-2000 | 1.10    |
| 7150-2000 | 1.90    |
| 7204-2015 | 2.50    |

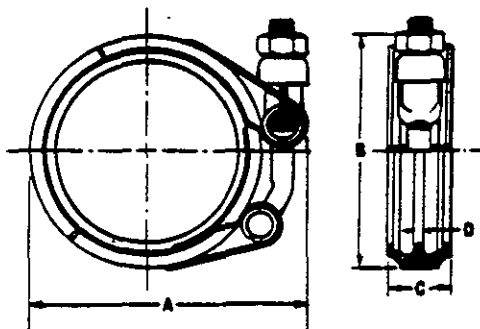
Mounting bolts or screws to be furnished by installer. For No. 6628 assembly use No. 6650 1½" size KIMAX coupling on outlet.

## accessories and hardware

### 6650—Drainline Coupling (Bead to Bead)

No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4", and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

No. 6651 segmented stainless steel outer band  
No. 6652 Buna-N rubber compression liner with TFE seal ring  
No. 6653 stainless steel bolt  
No. 6654 Silver plated stainless steel hex nut



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1⅞ | ⅞ | ¼—28 x 2¾ |
| 2    | 3½ | 3⅞ | 1⅞ | ⅞ | ¼—28 x 2¾ |
| 3    | 4¾ | 4¾ | 1⅞ | ⅞ | ¼—28 x 2¾ |
| 4    | 6  | 5½ | 1½ | ⅞ | ¼—28 x 3¼ |
| 6    | 8¾ | 7¾ | 1⅞ | ⅞ | ⅜—24 x 4  |

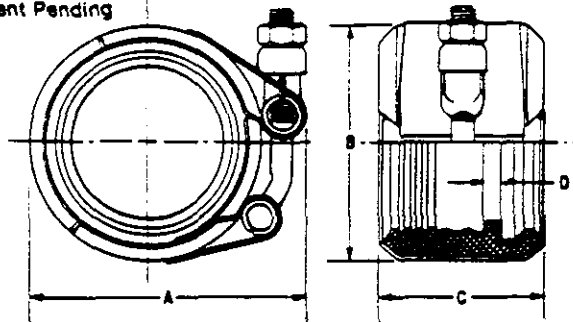
| 6650      |         |
|-----------|---------|
| Art. No.  | Price   |
| 6650-1500 | \$ 3.20 |
| -2000     | 4.10    |
| -3000     | 5.60    |
| -4000     | 9.25    |
| -6000     | 21.10   |

## 6661—B/P\* Drainline Coupling (Bead to Plain End)

No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3", 4" or 6" KIMAX beaded glass drainline to plain end (cut) glass pipe; lead, I.P.S. metal, or plastic pipe. This new exclusively designed KIMAX drainline coupling consists of the following components:

No. 6662 stainless steel band with bolt  
No. 6663 Buna-N rubber compression liner with TFE seal ring  
No. 6664 silver plated stainless steel hex nut

Patent Pending



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28      |
| 2    | 3¾ | 3¼ | 1¾ | ¾ | ¼-28      |
| 3    | 4¾ | 4¼ | 2¼ | ¾ | ¼-24      |
| 4    | 6  | 5¾ | 2¾ | ¾ | ¼-24      |
| 6    | 8¾ | 7¾ | 4  | 1 | ¼-24      |

| 6661 Art. No. | Price   |
|---------------|---------|
| 6661-1500     | \$ 4.10 |
| -2000         | 5.20    |
| -3000         | 9.50    |
| -4000         | 15.75   |
| -6000         | 54.00   |

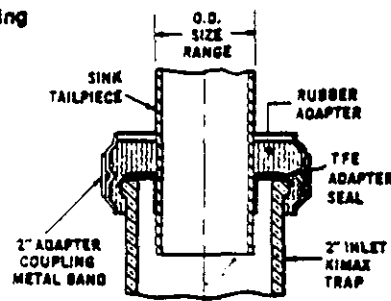
## 6655—Adapter Coupling

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

No. 6651 segmented stainless steel outer band  
No. 6657 Buna-N rubber adapter  
No. 6658 TFE adapter seal  
No. 6653 stainless steel bolt, ¼"-28 x 2¾"  
No. 6664 Silver plated stainless steel hex nut

Patent Pending



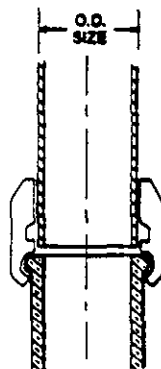
| Size   | Tailpiece Style                                                                                                                                                          | O.D. Size" |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                    | 1.48 to    |
| 2 x 1¾ | Lead, Class D or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                            | 1.70 to    |
| 2 x 1½ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Durcon #SO-2<br>Duriron #11713<br>Lead—Class C or L, 8 or M<br>Plastic or Steel (1½ IPS) | 1.82 to    |

| Art. No.  | Price  |
|-----------|--------|
| 6655-2015 | \$5.90 |
| -2017     | 5.90   |
| -2018     | 5.90   |

## 6665—Adapter Coupling

Used to join 1½" beaded KIMAX drainline pipe to 1¼" or 1½" O.D. tubing.

Note: Rubber seal only - not recommended where acids will come in contact with the coupling seal.



| Size    | Tailpiece Style |
|---------|-----------------|
| 1½ x 1¼ | 1¼" O.D. tubing |
| 1½ x 1½ | 1½" O.D. tubing |

| Art. No.  | Price  |
|-----------|--------|
| 6665-1512 | \$5.00 |
| -1515     | 5.00   |

# accessories and hardware

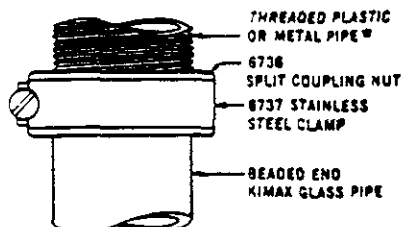
## 6735—1½" Split Coupling (Threaded to Beaded Pipe)

No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" metal pipe.

The assembly consists of:

No. 6736 split coupling nut  
No. 6737 stainless steel clamp

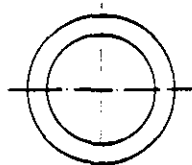
To install . . . remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.



| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6735-1500 | \$4.00 |

## • 6739 Gasket

Use gasket No. 6739 when connecting KIMAX glass pipe to threaded metal pipe.



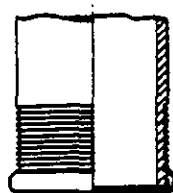
| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6739-1500 | \$1.40 |

## 6680 Thread Adapters (Threaded to Beaded Pipe)

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

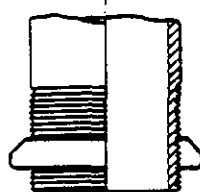
Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.



| Size | Art. No.  | Price   |
|------|-----------|---------|
| 1½   | 6680-1500 | \$ 4.10 |
| 2    | -2000     | 5.10    |
| 3    | -3000     | 7.20    |
| 4    | -4000     | 11.90   |

## 6685—Adjustable



| Size   | Art. No.  | Price  |
|--------|-----------|--------|
| 2 x 1½ | 6685-2015 | \$5.90 |

# accessories and hardware

## 6720 Sink Outlet Assembly (1½" and 2" sizes)

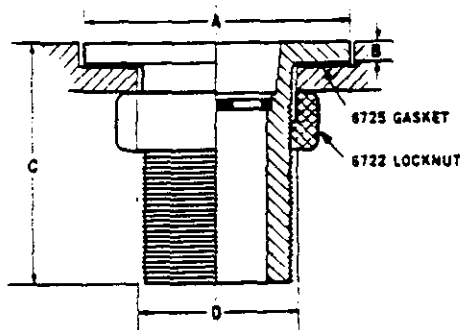
### 6720D 2"—For Use With Sinks Having 3½" Counterbore

Consists of:

- 6724 sink strainer (black fluorocarbon plastic)
- 6721 and 6721D sink outlet (black fluorocarbon plastic)
- 6725 gasket—neoprene
- 6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

For sink outlet tailpiece connections, see No. 6728 dimensions below.



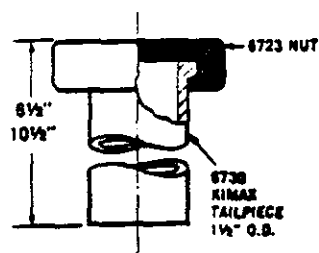
|       | Size | A  | B | C  | D  |
|-------|------|----|---|----|----|
| 6720  | 1½   | 3¾ | ¼ | 2¼ | 2  |
|       | 2    | 3¾ | ¼ | 3  | 2½ |
| 6720D | 2    | 3¾ | ¼ | 3  | 2½ |

| 6720      |         | 6720D      |         | 6722      |        |
|-----------|---------|------------|---------|-----------|--------|
| Art. No.  | Price   | Art. No.   | Price   | Art. No.  | Price  |
| 6720-1500 | \$12.00 | 6720D-2000 | \$25.50 | 6722-1500 | \$ .60 |
| -2000     | 25.50   |            |         | -2000     | 2.50   |

## 6728 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... do not use pipe wrench.



| Size     | Art. No.  | Price  |
|----------|-----------|--------|
| 1½ x 6½  | 6728-1060 | \$3.00 |
| 1½ x 10½ | -1100     | 3.50   |

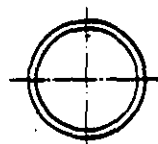
### Components of 6728

| 6723-Nut  |      |        |
|-----------|------|--------|
| Art. No.  | Size | Price  |
| 6723-1500 | 1½   | \$ .80 |

| 6730 Tail Piece |          |        |
|-----------------|----------|--------|
| Art. No.        | Size     | Price  |
| 6730-1060       | 1½ x 6½  | \$2.10 |
| -1100           | 1½ x 10½ | 3.00   |

## 6738—Gasket

Use gasket No. 6738 when connecting glass tailpiece #6728 to threaded metal pipe.



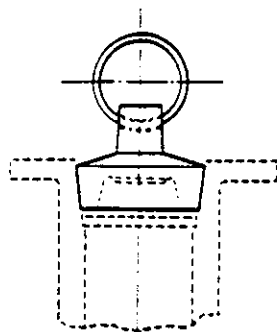
| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6738-1500 | \$1.70 |



# accessories and hardware

## 6726 Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead.

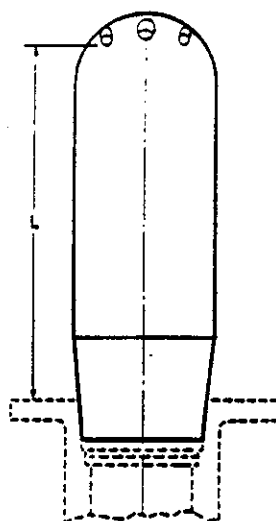


| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6726-1500 | \$4.00 |
| 2    | -2000     | 6.00   |

## 6727 Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" sink outlets only. 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
| 1½               | 4"                  | 6" | 8" | —                | —  | —  |
| 2                | —                   | —  | —  | 4"               | 6" | 8" |



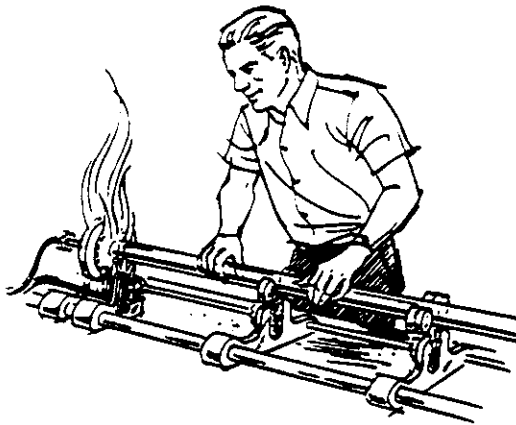
| Size   | Art. No.  | Price   |
|--------|-----------|---------|
| 1½ x 4 | 6727-1504 | \$10.00 |
| 1½ x 6 | -1506     | 11.00   |
| 1½ x 8 | -1508     | 11.50   |

# accessories and hardware

## 7310-56801 KIMAX Portable Beading Kit

Used for field beading  $\frac{1}{2}$ " through 6" glass pipe.

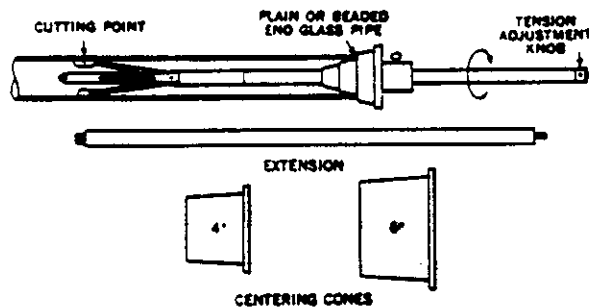
For more detailed information on the availability of the newest model kit (BK-5) and its operation, ask your KIMAX distributor or write the nearest O-I office listed on the back of this catalog.



## 7310-56802 KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut  $\frac{1}{2}$ "—6" glass drainage anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm subassembly and  $\frac{1}{2}$ "—4" centering cones and ring stop as shown.

Contact distributor for information & price.

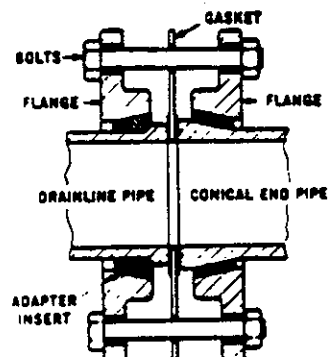


Order 6" centering cones separately.

## 7110 Coupling Assembly (Drainline to Conical End Pipe)

To join drainline glass pipe to conical end pipe. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

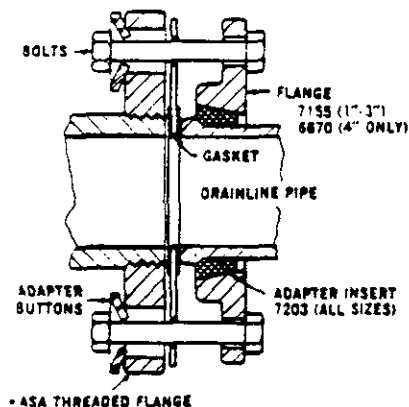


| Pipe Size      | Style II Flanges Qty. No. | Adapter Insert Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size                   |
|----------------|---------------------------|-------------------------|-----------------|----------------------------------------------|
| $1\frac{1}{2}$ | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>$\frac{1}{2}$ —18 x $2\frac{1}{2}$ |
| 2              | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-1790<br>$\frac{1}{2}$ —18 x $2\frac{1}{2}$ |
| 3              | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>$\frac{1}{2}$ —18 x 3              |
| 4              | 1-6670<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>$\frac{1}{2}$ —18 x 3              |
| 6              | 1-6670<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>$\frac{1}{2}$ —16 x 3              |

| Size           | Art. No.  | Price   |
|----------------|-----------|---------|
| $1\frac{1}{2}$ | 7110-1500 | \$12.40 |
| 2              | -2000     | 14.30   |
| 3              | -3000     | 19.40   |
| 4              | -4000     | 39.70   |
| 6              | -6000     | 67.45   |

## 7120 Coupling Assembly (Metal IPS to Beaded End Pipe)

To join drainline glass pipe to metal IPS threaded pipe. Kit includes flange, adapter insert, bolts, adapter buttons and TFE sheath gasket. ASA threaded flange not included.



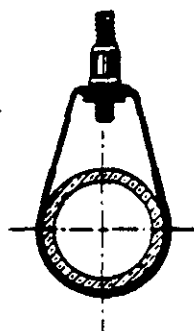
| Pipe Size | Style II Flange Qty. No. | Adapter Insert Qty. No. | Adapter Buttons Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size |
|-----------|--------------------------|-------------------------|--------------------------|-----------------|----------------------------|
| 1         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>1/4-18 x 2 1/2   |
| 1 1/2     | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>1/4-18 x 2 1/2   |
| 2         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>1/4-18 x 2 1/2   |
| 3         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>1/4-18 x 3       |
| 4         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>1/4-18 x 3       |
| 6         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>1/4-18 x 3       |

| Size  | Art. No.  | Price   |
|-------|-----------|---------|
| 1 1/2 | 7120-1500 | \$ 9.50 |
| 2     | -2000     | 11.00   |
| 3     | -3000     | 14.50   |
| 4     | -4000     | 25.80   |
| 6     | -6000     | 37.20   |

\*Flange should be placed far enough on pipe to permit machining end of pipe to provide a flat bearing surface for beaded glass pipe.

## 7290 (1 1/2", 2", 3", 4", 6" sizes) Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.



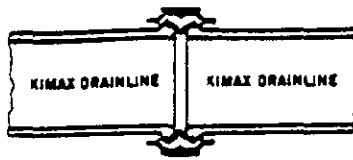
| Size  | Art. No.  | Price   |
|-------|-----------|---------|
| 1 1/2 | 7290-1500 | \$ 1.85 |
| 2     | -2000     | 1.95    |
| 3     | -3000     | 3.40    |
| 4     | -4000     | 3.70    |
| 6     | -6000     | 10.45   |

# Technical joint reference chart

## Type of Pipe

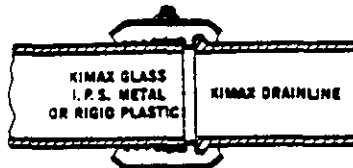
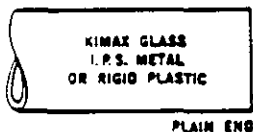
## Type of Joint

## Material Needed



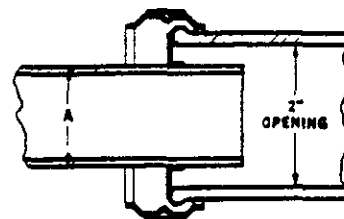
### KIMAX Drainline Coupling 6650

| Size | Code No.  |
|------|-----------|
| 1½   | 6650-1500 |
| 2    | 6650-2000 |
| 3    | 6650-3000 |
| 4    | 6650-4000 |
| 6    | 6650-6000 |



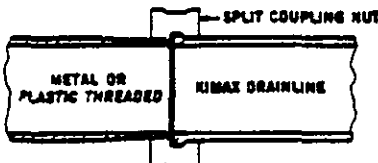
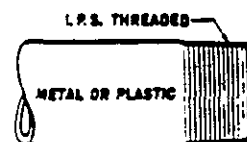
### KIMAX B/P Coupling 6661

| Pipe Size | Code No.  |
|-----------|-----------|
| 1½        | 6661-1500 |
| 2         | 6661-2000 |
| 3         | 6661-3000 |
| 4         | 6661-4000 |
| 6         | 6661-6000 |



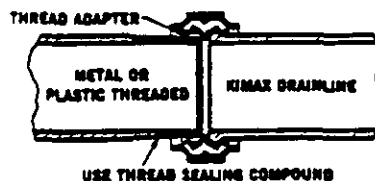
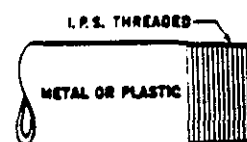
### KIMAX Adapter Coupling

| "A" Dimension<br>Pipe O.D. | Coupling<br>Size | Code No.  |
|----------------------------|------------------|-----------|
| 1.48—1.53                  | 2 x 1½           | 6655-2015 |
| 1.70—1.78                  | 2 x 1¾           | 6655-2017 |
| 1.82—1.90                  | 2 x 1⅞           | 6655-2018 |



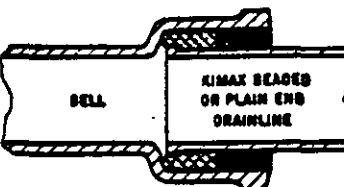
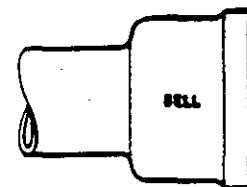
### KIMAX Split Coupling

| Pipe Size | Coupling<br>Code No. | Gasket<br>Code No. |
|-----------|----------------------|--------------------|
| 1½        | 6635-1500            | 6739-1500          |



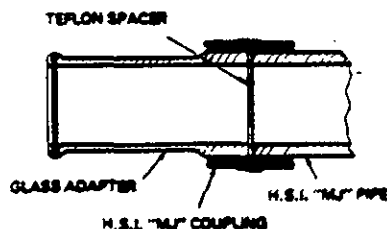
### KIMAX Thread Adapter and Drainline Coupling

| Pipe Size | Adapter<br>Code No. | Coupling<br>Code No. |
|-----------|---------------------|----------------------|
| 1½        | 6680-1500           | 6650-1500            |
| 2         | 6680-2000           | 6650-2000            |
| 3         | 6680-3000           | 6650-3000            |
| 4         | 6680-4000           | 6650-4000            |
| 6         | 6680-6000           | 6650-6000            |



### KIMAX Glass to Bell End Pipe

1. Pack hub half full with asbestos rope.
  2. Caulk with hot lead, lead wool or acid-proof cement.
- For Details, see Drainline Installation Manual.



### Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | Code No.  | Price   |
|-----------|-----------|---------|
| 1½        | 6566-1500 | \$ 8.00 |
| 2         | 6566-2000 | 10.00   |
| 3         | 6566-3000 | 12.00   |
| 4         | 6566-4000 | 14.00   |

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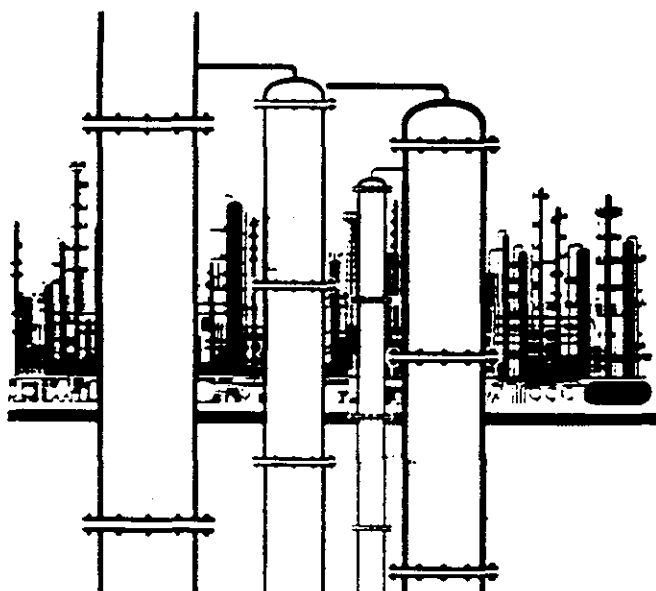


O.I. SCHOLT

Process Systems Inc.



# GLASS COMPONENTS FOR PROCESS APPLICATIONS



This Catalog, together with the O I/Schott Heat Exchanger and O I/Schott Valve catalogs, contain all of the essential components and information necessary for the design and preparation of engineering drawings for process plants and piping made from Duran® glass.

Depending upon the situation, these drawings can be made either by the user or by O I/Schott.

When the design is performed by O I/Schott the resulting quotation may include the following:

- Design and calculations of the desired process(es), based upon conceptual flow diagrams, and pertinent heat and material balances.
- Budgetary or firm price, based upon available information.
- Sketch showing basic plan and elevation views of proposed plant.
- After placement of order or letter of intent to purchase scale drawings with parts lists, and a perspective drawing of support structure, if applicable.

Frequently used unit processes or operations can often be taken as a basis for the initial concept. Several of these can be submitted in the form of customer information sheets for pre design guidance.

These sheets include a list of the detailed technical data required for O I/Schott to design your process, if desired.

The properties of borosilicate glass have led to its becoming a preferred material of construction for such diverse chemical engineering unit operations as

- Distillation
- Rectification
- Extraction
- Absorption
- Reaction

# INDEX



THINK  
GLASS

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\*See Separate Catalogs.



# PART NUMBER — CROSS REFERENCE

| Catalog<br>Ref. No. | Page | Catalog<br>Ref. No. | Page |
|---------------------|------|---------------------|------|
| ABS                 | 29   | KOL                 | 23   |
| AHA                 | 17   | KR                  | 13   |
| APK                 | 9    | L                   | 35   |
| AVER                | 40   | LTR                 | 25   |
| AVER...FU           | 42   | LTT                 | 26   |
| AVER...F            | 43   | MEZ                 | 31   |
| BO                  | 9    | MGE                 | 15   |
| BL                  | 13   | MKO                 | 24   |
| BRA                 | 28   | MKO...T             | 25   |
| DAS                 | 29   | OL                  | 18   |
| DICH                | 40   | RAS                 | 27   |
| EIN                 | 17   | RD                  | 21   |
| EIN                 | 28   | RE                  | 21   |
| FAL...V             | 41   | RLT                 | 30   |
| FAL                 | 43   | RO                  | 8    |
| FALD                | 42   | RO                  | 10   |
| FUL                 | 27   | RS                  | 11   |
| FURE                | 35   | RTE                 | 20   |
| FVER...U            | 42   | RU                  | 11   |
| FVER                | 43   | SCHE                | 38   |
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| GEKO                | 48   | THH                 | 34   |
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| GETR                | 50   | TS                  | 12   |
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| GEWI                | 47   | WID                 | 33   |
| GEZU                | 17   |                     |      |
| HAU                 | 17   |                     |      |
| HO                  | 13   |                     |      |



Glass Shell and Tube Heat Exchangers connected with 12" Diameter Pipe.

# O-I/SCHOTT PROCESS PLANTS AND PIPING OF BOROSILICATE GLASS



THINK  
GLASS

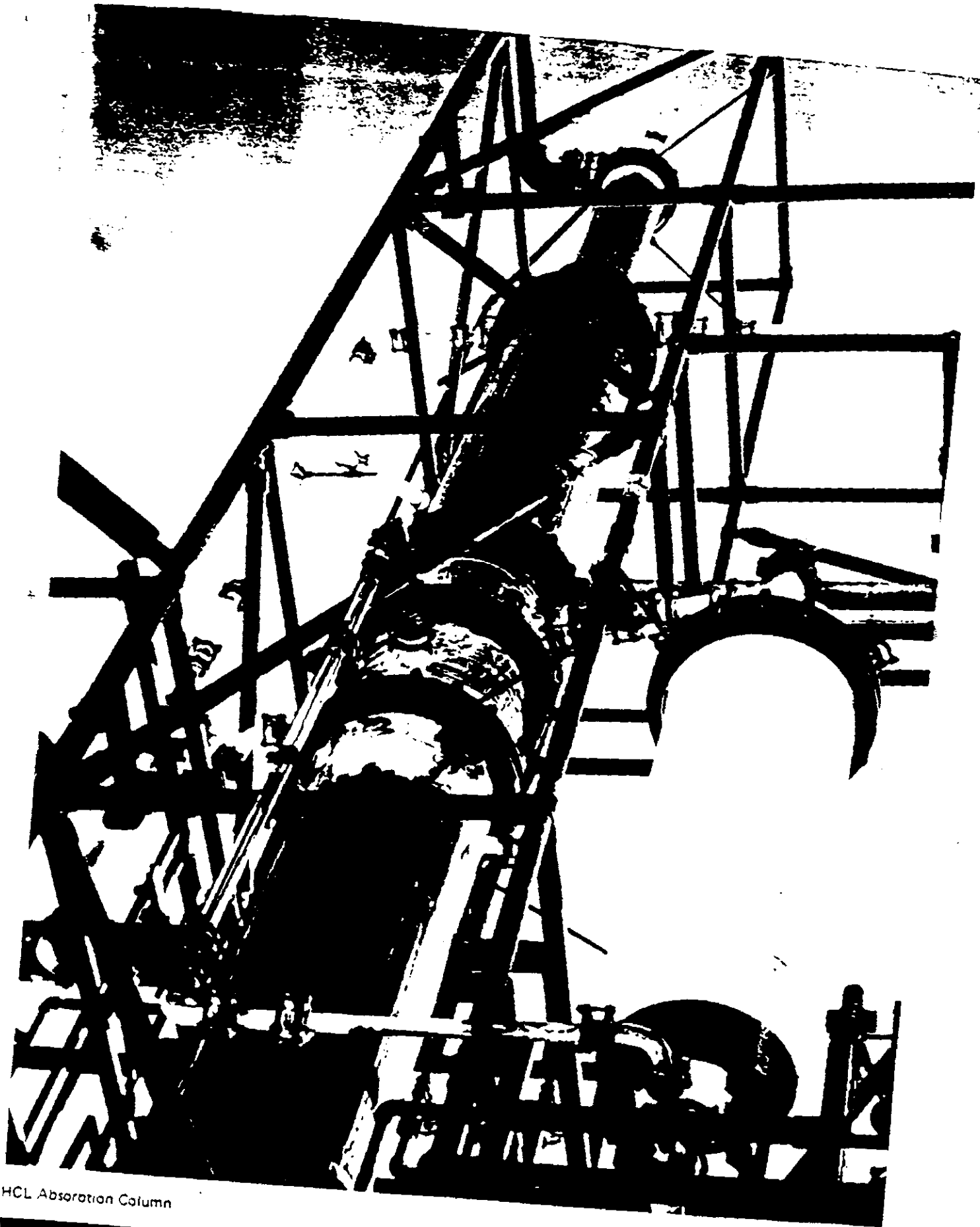
Borosilicate glass is the internationally standardized type of glass used for the construction of plants and piping in the chemical and pharmaceutical industries. Its steadily growing use is due to the many advantages of this glass over other conventional materials:

- outstanding corrosion resistance
- smooth pore-free surface
- transparency
- catalytic inertness
- no effect on taste and odor
- physiological inertness

Maximum use of the Borosilicate glass properties has resulted in a uniformly consistent modular construction system made up of standard parts ranging from nominal diameter (ND) of 15 to 1000 mm.

The main characteristic of O-I/SCHOTT piping and process components is the high operational safety combined with lowest maintenance costs - even in largescale chemical operations. The flange systems insures permanent seals at temperatures of up to 200°C.

The combination of O-I/SCHOTT Borosilicate glass with other high-quality corrosion-resistant materials (PTFE, titanium, tantalum, and graphite) has substantially expanded the versatility of chemical and pharmaceutical production processes.



HCL Absorption Column

# O-I/SCHOTT STANDARDIZED SYSTEM

## MODULAR CONSTRUCTION SYSTEM

Glass installations cannot be made in one piece but must be built of individual parts. This leads logically to the development of a modular construction system which today comprises all necessary components in nominal diameters of 15 to 1000 mm:

- process pipes with ND 15-300 mm
- effluent and vent pipes in the KIMAX<sup>®</sup> Drainage system with ND 40 to ND 150 mm
- fittings
- centrifugal and metering pumps
- vessels and stirrers
- columns with ND 80 to ND 1000 mm
- heat exchangers
- measuring and controlling devices

All individual dimensions in the unit construction system are chosen in convenient lengths.

## METRIC GRID SYSTEM

The basic measurement of the grid system is 25 mm. The installation lengths of all parts are equal to this basic length or to its multiples.

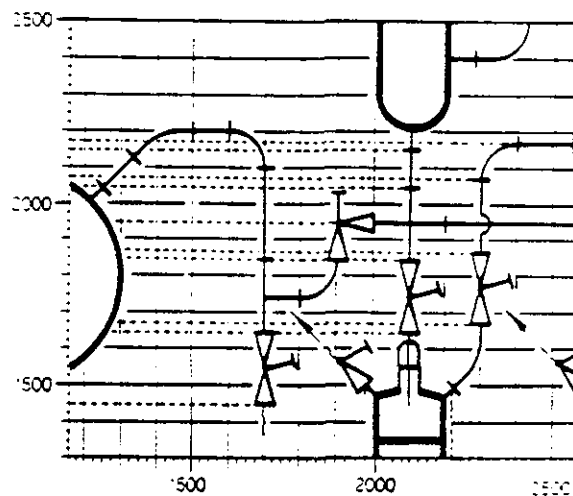
It is therefore possible to make closed pipe loops with the exclusive use of standard lengths with no need for special length or adaptors.

In addition to its practical advantages, a metric grid system is of substantial assistance to the designer in the planning stage of glass installations.

## INTERCHANGEABILITY

Logically, the grid system also means the complete interchangeability between different parts with the same nominal diameter. In this way, for example, Tee pieces can be replaced by 90° elbows, elbows by valves, valves by cross-pieces, etc.

The advantages of interchangeability are of particular importance if changing demands frequently make it necessary to modify the plan of the glass installation, as for example in a Pilot plant.



Interchangeability of the constructional parts with the same nominal diameter

# DURAN<sup>®</sup> BOROSILICATE GLASS— PROPERTIES AND FIELDS OF APPLICATION

## CHEMICAL PROPERTIES

The chemical stability of DURAN<sup>®</sup> is more comprehensive than that of any other known constructional material. It is highly resistant to water, acids, salt solutions, organic substances, and even halogens such as chlorine and bromine.

Only hydrofluoric acid, concentrated phosphoric acid, and strong alkalis at high temperatures can appreciably affect the glass surface.

In addition to this excellent corrosion resistance, the catalytic inertness of DURAN<sup>®</sup> constitutes a fundamental feature.

No heavy metals are released into the fluids to be processed.

and this means higher-purity products both in the pharmaceutical and in the chemical industry.

## MECHANICAL PROPERTIES

|                                        |                                                            |
|----------------------------------------|------------------------------------------------------------|
| Density                                | $\rho = 2.23 \text{ g/cm}^3$                               |
| Permissible tensile and bending stress | $\frac{K}{S} = 4 \text{ N/mm}^2 (0.4 \text{ kgf/mm}^2)$    |
| Permissible compressive stress         | $\frac{K}{S} = 100 \text{ N/mm}^2 (10 \text{ kgf/mm}^2)$   |
| Modulus of elasticity                  | $E = 63 \text{ kN/mm}^2 (6.3 \cdot 10^3 \text{ kgf/mm}^2)$ |
| Poisson's ratio                        | $\mu = 0.2$                                                |

The figures given for the permissible stresses include a safety factor.

It should be noted that the compressive strength of the glass is substantially higher than the tensile strength. This is an important factor in construction with glass.

## THERMAL PROPERTIES

|                                                      |                                                            |
|------------------------------------------------------|------------------------------------------------------------|
| Coefficient of linear expansion between 20 and 300°C | $\alpha = 3.25 \cdot 10^{-5}/\text{K}$                     |
| Mean specific heat: between 20 and 100°C             | $c = 0.84 \text{ J/gK} (0.2 \text{ cal/g deg})$            |
| between 20 and 300°C                                 | $c = 0.98 \text{ J/gK} (0.234 \text{ cal/g deg})$          |
| Thermal conductivity at 20°C                         | $\lambda = 1.17 \text{ W/mK} (1.005 \text{ kcal/m h deg})$ |
| between 20 and 100°C                                 | $\lambda = 1.21 \text{ W/mK} (1.04 \text{ kcal/m h deg})$  |
| between 20 and 200°C                                 | $\lambda = 1.31 \text{ W/mK} (1.13 \text{ kcal/m h deg})$  |
| Thermal diffusivity between 20 and 100°C             | $\alpha = 0.65 \cdot 10^{-6} \text{ m}^2/\text{s}$         |

## PERMISSIBLE OPERATING CONDITIONS

### Temperature

All glass parts and combinations of constructional parts in process plants and piping can be operated at temperatures of up to 200°C, provided that a lower permissible working temperature has not been specified separately for individual parts. Rapid temperature fluctuations in the medium or the media should not exceed a temperature difference of 100 K and may be restricted to lower values by the dimensions and the wall thickness of the components in question.

### Pressure

The permissible internal operating pressure depends on the nominal diameter of the glass part, its shape and also on the operating temperatures. The material of all joints and seals must also be taken into account.

In the case of a unit constructed of glass components having different nominal diameters and shapes, the overall permissible internal gauge pressure is always governed by the component with the lowest permissible operating gauge pressure.

The permissible operating gauge pressures of cylindrical DURAN<sup>®</sup> parts are shown below as functions of the nominal diameter and of the temperature difference  $\Delta T$  in the glass wall:

| Nominal Diameter<br>ND | Permissible operating pressure at |                          |                          |
|------------------------|-----------------------------------|--------------------------|--------------------------|
|                        | W/GLASS VALVES                    | $\Delta T = 0 \text{ K}$ | $\Delta T = 5 \text{ K}$ |
| ND 15                  |                                   |                          |                          |
| ND 25                  | 3 bar                             | 4 bar                    | 4 bar                    |
| ND 40                  |                                   |                          |                          |
| ND 50                  | 2 bar                             | 4 bar                    | 4 bar                    |
| ND 80                  | 1.5 bar                           | 3 bar                    | 3 bar                    |
| ND 100                 | 1 bar                             | 2 bar                    | 2 bar                    |
| ND 150                 |                                   |                          |                          |
| ND 200                 |                                   | 1 bar                    | 1 bar                    |
| ND 300                 |                                   |                          |                          |
| ND 400                 |                                   |                          |                          |
| ND 450                 |                                   |                          |                          |
| ND 600                 |                                   | 1 bar                    | 0.7 bar                  |
| ND 800                 |                                   |                          |                          |
| ND 1000                |                                   |                          |                          |

All parts are vacuum-tight

Particularly endangered parts of the plant can be provided with glassfibre-reinforced polyester resin impact protection. These measures are not intended to raise the permissible pressure loading but to protect parts in often-frequented places from external mechanical damage.

The permissible operating temperature of the glass fibre polyester-reinforced glass components is 120°C.



THINK  
GLASS

# PIPING AND FITTINGS

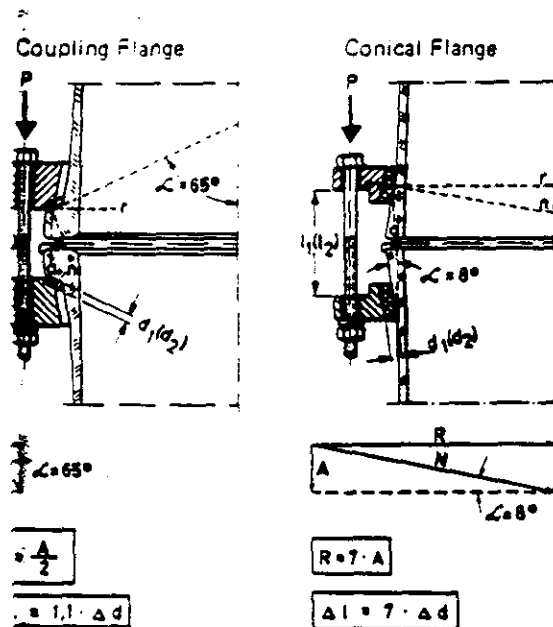
The modular construction system with its many practical advantages and the freedom from maintenance and safety in operation depends to a large extent on the quality of the connecting system.

The system is composed of:  
- glass ends to be joined  
- flanges with inserts, and  
-asket, almost invariably PTFE

Constructional parts listed in this Catalog are fitted with proven KF flange. This flange design has replaced the old flange previously used.

Comparison of the two systems shows clearly the drastic reduction in the harmful radial forces (R) due to the greater angle.

At the same axial force A, the undesired Radial Force R is 7 times higher on the conical pipe than on the KF pipe.



Comparison of the flange systems

In addition to this, there are the following advantages:

- Ovality of the glass ends now has scarcely any effect, since the flange is not directly in contact with the peripheral surface.
- continuous re-tightening of the joint is unnecessary because of the absence of thick inserts.
- no wedging up of the flange or the insert under the action of force and temperature, so that dismantling is easy
- permanent leak-tightness at all permissible operating temperatures even with frequent temperature cycling.

In piping construction the sealing surface of the glass is spherically ground in the form of a "ball" or a "socket" configuration designated by the symbols KF.

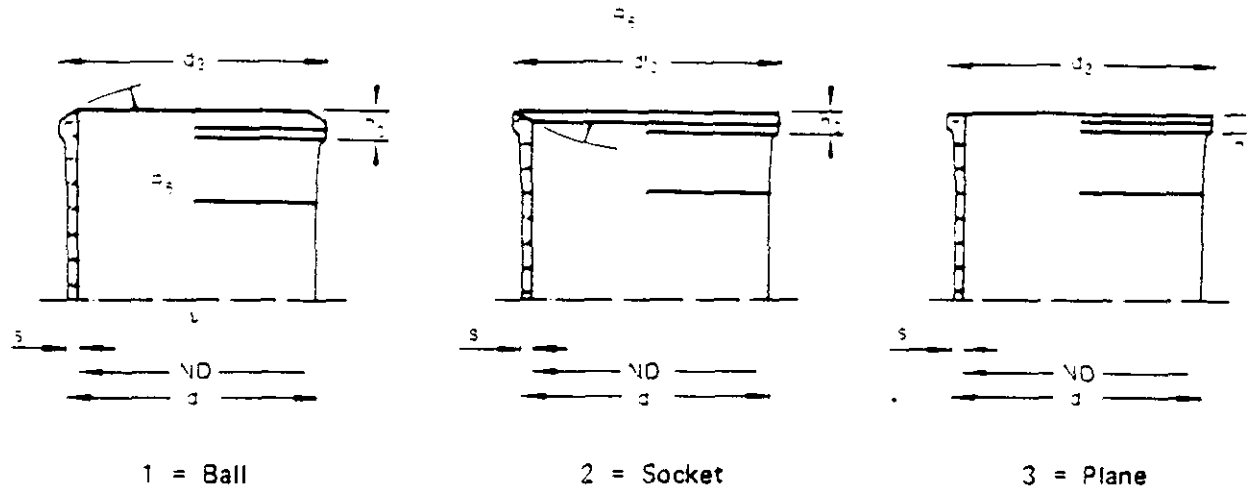
As a result of these spherical sealing surfaces, the pipes may be misaligned by up to 3°. This ensures stress-free assembly and permits the pipes to be installed with slopes without using special parts.

In column construction all vertically installed couplings have plane-parallel sealing surfaces. This assures perfectly vertical columns for all heights.

The various designs of the sealing surfaces are characterized by the following figures in the Catalog Number:

| Characteristic figure | Symbols | Joint Facts    |
|-----------------------|---------|----------------|
| ... 1                 | →       | Ball           |
| ... 2                 | Y       | Socket         |
| ... 3                 | ⊥       | Plane          |
| ... 4                 | △       | Conical        |
| ... 5                 | ○       | Beaded         |
| ... 6                 | —       | Cut and Glazed |

# GLASS CONFIGURAT

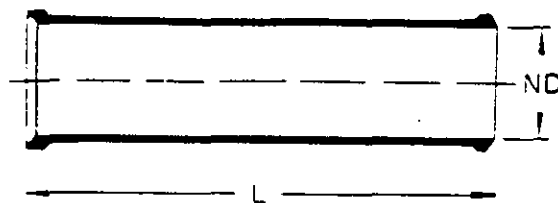


## DIMENSIONS

| ND   | d <sub>2</sub><br>(mm) |  |  | h <sub>3</sub><br>(mm) |  | R <sub>6</sub><br>(mm) | d<br>(mm)  | s<br>mm    |
|------|------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------|------------------------|------------|------------|
| 15   | 30                     | 12                                                                                 |                                                                                    | 11.5                   |                                                                                      | 18                     | 21.5 ± 0.5 | 3.25 ± 0.1 |
| 25   | 44                     | 13                                                                                 |                                                                                    | 11.5                   |                                                                                      | 25                     | 33 ± 1.0   | 4.5 ± 0.1  |
| 40   | 62                     | 16                                                                                 |                                                                                    | 15.5                   |                                                                                      | 40                     | 50 ± 1.0   | 6.0 ± 0.1  |
| 50   | 76                     | 17                                                                                 |                                                                                    | 15.5                   |                                                                                      | 50                     | 60 ± 1.5   | 6.0 ± 0.1  |
| 80   | 110                    | 24.5                                                                               |                                                                                    | 22.0                   |                                                                                      | 80                     | 90 ± 1.8   | 6.0 ± 0.1  |
| 100  | 130                    | 26                                                                                 |                                                                                    | 23.5                   |                                                                                      | 100                    | 110 ± 1.8  | 6.5 ± 0.1  |
| 150  | 184                    | 24                                                                                 |                                                                                    | 21.5                   |                                                                                      | 150                    | 165 ± 2.0  | 7.0 ± 0.1  |
| 200  | 233                    | 26                                                                                 |                                                                                    | 23.5                   |                                                                                      | 200                    | 215 ± 2.6  | 7.0 ± 0.1  |
| 300  | 338                    | 26                                                                                 |                                                                                    | 23                     |                                                                                      | 300                    | 315 ± 3.2  | 8.0 ± 0.1  |
| 400  | 465                    | —                                                                                  |                                                                                    | 22                     |                                                                                      | —                      | 417 ± 3.0  | 9.2 ± 0.2  |
| 450  | 526                    | —                                                                                  |                                                                                    | 25                     |                                                                                      | —                      | 468 ± 3.0  | 10.0 ± 0.3 |
| 600  | 684                    | —                                                                                  |                                                                                    | 30                     |                                                                                      | —                      | 623 ± 3.0  | 11.5 ± 0.2 |
| 800  | 916                    | —                                                                                  |                                                                                    | 44                     |                                                                                      | —                      | 843 ± 7.0  | 16.5 ± 0.1 |
| 1000 | 1088                   | —                                                                                  |                                                                                    | 44                     |                                                                                      | —                      | 1015 ± 6.0 | 15.0 ± 0.1 |



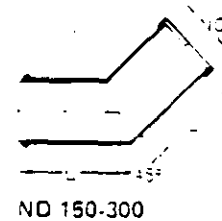
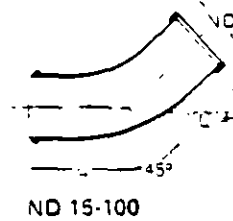
# PIPE SECTIONS



|    | L<br>(mm) | Catalog ref. | ND  | L<br>(mm) | Catalog ref. | ND   | L<br>(mm) | Catalog ref.    |
|----|-----------|--------------|-----|-----------|--------------|------|-----------|-----------------|
| 5  | 100       | RO 15 0100   | 30  | 125       | RO 30 0125   | 30   | 500       | RO 30 0500 33   |
|    | 125       | RO 15 0125   |     | 150       | RO 30 0150   |      | 1000      | RO 30 1000 33   |
|    | 150       | RO 15 0150   |     | 175       | RO 30 0175   |      | 1500      | RO 30 1500 33   |
|    | 175       | RO 15 0175   |     | 200       | RO 30 0200   | 100  | 500       | RO 100 0500 33  |
|    | 200       | RO 15 0200   |     | 300       | RO 30 0300   |      | 1000      | RO 100 1000 33  |
|    | 300       | RO 15 0300   |     | 400       | RO 30 0400   |      | 1500      | RO 100 1500 33  |
|    | 400       | RO 15 0400   |     | 500       | RO 30 0500   | 150  | 500       | RO 150 0500 33  |
|    | 500       | RO 15 0500   |     | 700       | RO 30 0700   |      | 1000      | RO 150 1000 33  |
|    | 700       | RO 15 0700   |     | 1000      | RO 30 1000   |      | 1500      | RO 150 1500 33  |
|    | 1000      | RO 15 1000   |     | 1500      | RO 30 1500   | 200  | 500       | RO 200 0500 33  |
| 15 | 1500      | RO 15 1500   | 100 | 2000      | RO 30 2000   |      | 1000      | RO 200 1000 33  |
|    | 2000      | RO 15 2000   |     | 3000      | RO 30 3000   |      | 1500      | RO 200 1500 33  |
|    |           |              |     |           |              | 300  | 500       | RO 300 0500 33  |
|    |           |              |     |           |              |      | 1000      | RO 300 1000 33  |
|    |           |              |     |           |              |      | 1500      | RO 300 1500 33  |
|    |           |              |     |           |              | 400  | 500       | RO 400 0500 33  |
|    |           |              |     |           |              |      | 1000      | RO 400 1000 33  |
|    |           |              |     |           |              |      | 1500      | RO 400 1500 33  |
|    |           |              |     |           |              | 450  | 500       | RO 450 0500 33  |
|    |           |              |     |           |              |      | 1000      | RO 450 1000 33  |
|    |           |              |     |           |              |      | 1500      | RO 450 1500 33  |
| 15 | 100       | RO 25 0100   | 150 | 125       | RO 100 0125  | 600  | 500       | RO 600 0500 33  |
|    | 125       | RO 25 0125   |     | 150       | RO 100 0150  |      | 1000      | RO 600 1000 33  |
|    | 150       | RO 25 0150   |     | 175       | RO 100 0175  |      | 1500      | RO 600 1500 33  |
|    | 175       | RO 25 0175   |     | 200       | RO 100 0200  | 800  | 500       | RO 800 0500 33  |
|    | 200       | RO 25 0200   |     | 300       | RO 100 0300  |      | 1000      | RO 800 1000 33  |
|    | 300       | RO 25 0300   |     | 400       | RO 100 0400  |      | 1500      | RO 800 1500 33  |
|    | 400       | RO 25 0400   |     | 500       | RO 100 0500  | 1000 | 500       | RO 1000 0500 33 |
|    | 500       | RO 25 0500   |     | 700       | RO 100 0700  |      | 1000      | RO 1000 1000 33 |
|    | 700       | RO 25 0700   |     | 1000      | RO 100 1000  |      | 1500      | RO 1000 1500 33 |
|    | 1000      | RO 25 1000   |     | 1500      | RO 100 1500  | 1500 | 500       | RO 1500 0500 33 |
| 30 | 1500      | RO 25 1500   | 200 | 2000      | RO 100 2000  |      | 1000      | RO 1500 1000 33 |
|    | 2000      | RO 25 2000   |     | 3000      | RO 100 3000  |      | 1500      | RO 1500 1500 33 |
|    | 3000      | RO 25 3000   |     |           |              | 200  | 150       | RO 200 0150     |
|    |           |              |     |           |              |      | 175       | RO 200 0175     |
|    |           |              |     |           |              |      | 200       | RO 200 0200     |
|    |           |              |     |           |              | 300  | 300       | RO 300 0300     |
|    |           |              |     |           |              |      | 400       | RO 300 0400     |
|    |           |              |     |           |              |      | 500       | RO 300 0500     |
|    |           |              |     |           |              | 400  | 700       | RO 400 0700     |
|    |           |              |     |           |              |      | 1000      | RO 400 1000     |
|    |           |              |     |           |              |      | 1500      | RO 400 1500     |
| 30 | 100       | RO 40 0100   | 150 | 2000      | RO 150 2000  | 500  | 2000      | RO 500 2000     |
|    | 125       | RO 40 0125   |     | 3000      | RO 150 3000  |      |           |                 |
|    | 150       | RO 40 0150   |     |           |              |      |           |                 |
|    | 175       | RO 40 0175   |     |           |              | 700  | 200       | RO 700 0200     |
|    | 200       | RO 40 0200   |     |           |              |      | 300       | RO 700 0300     |
|    | 300       | RO 40 0300   |     |           |              |      | 400       | RO 700 0400     |
|    | 400       | RO 40 0400   |     |           |              | 1000 | 500       | RO 1000 0500    |
|    | 500       | RO 40 0500   |     |           |              |      | 700       | RO 1000 0700    |
|    | 700       | RO 40 0700   |     |           |              |      | 1000      | RO 1000 1000    |
|    | 1000      | RO 40 1000   |     |           |              | 1500 | 1500      | RO 1500 1500    |
| 30 | 1500      | RO 40 1500   | 200 |           |              |      |           |                 |
|    | 2000      | RO 40 2000   |     |           |              |      |           |                 |
|    | 3000      | RO 40 3000   |     |           |              |      |           |                 |
|    |           |              |     |           |              | 300  | 200       | RO 300 0200     |
|    |           |              |     |           |              |      | 300       | RO 300 0300     |
|    |           |              |     |           |              |      | 400       | RO 300 0400     |
|    |           |              |     |           |              | 500  | 500       | RO 500 0500     |
|    |           |              |     |           |              |      | 700       | RO 500 0700     |
|    |           |              |     |           |              |      | 1000      | RO 500 1000     |
|    |           |              |     |           |              | 700  | 1500      | RO 700 1500     |
| 30 | 1500      | RO 50 1500   | 300 | 2000      | RO 300 2000  |      |           |                 |
|    | 2000      | RO 50 2000   |     |           |              |      |           |                 |
|    | 3000      | RO 50 3000   |     |           |              |      |           |                 |
|    |           |              |     |           |              | 1000 | 2000      | RO 1000 2000    |
|    |           |              |     |           |              |      |           |                 |
|    |           |              |     |           |              |      |           |                 |
|    |           |              |     |           |              | 1500 |           |                 |
|    |           |              |     |           |              |      |           |                 |
|    |           |              |     |           |              |      |           |                 |
|    |           |              |     |           |              | 2000 |           |                 |
|    |           |              |     |           |              |      |           |                 |
|    |           |              |     |           |              |      |           |                 |

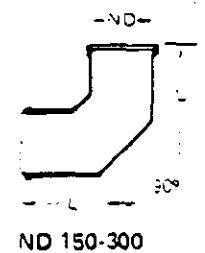
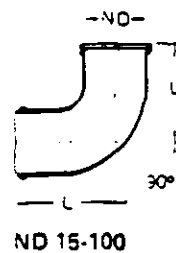
## KF ELBOWS 45°

| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 15  | 50        | 30 15/45     |
| 25  | 75        | 30 25/45     |
| 40  | 100       | 30 40/45     |
| 50  | 100       | 30 50/45     |
| 80  | 125       | 30 80/45     |
| 100 | 175       | 30 100/45    |
| 150 | 200       | 30 150/45    |
| 200 | 200       | 30 200/45    |
| 300 | 200       | 30 300/45    |



## KF ELBOWS 90°

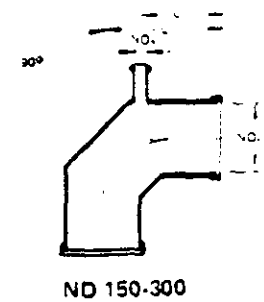
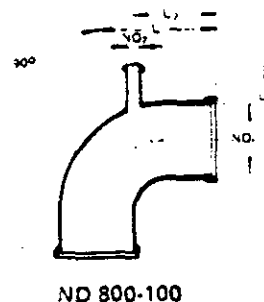
| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 15  | 50        | 30 15/90     |
| 25  | 100       | 30 25/90     |
| 40  | 150       | 30 40/90     |
| 50  | 150       | 30 50/90     |
| 80  | 200       | 30 80/90     |
| 100 | 250       | 30 100/90    |
| 150 | 250       | 30 150/90    |
| 200 | 300       | 30 200/90    |
| 300 | 400       | 30 300/90    |



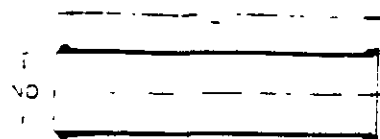
LARGER DIA ELBOWS AVAILABLE ON SPECIAL ORDER.

## 90°, WITH THERMOMETER BRANCH

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|
| 80              | 25              | 200       | 100                    | 100                    | APK 80       |
| 100             | 25              | 250       | 125                    | 100                    | APK 100      |
| 150             | 25              | 250       | 150                    | 150                    | APK 150      |
| 200             | 25              | 300       | 175                    | 150                    | APK 200      |
| 300             | 25              | 400       | 225                    | 225                    | APK 300      |



# PIPE ADAPTER



| ND  | L (mm) |                |                |                |                |
|-----|--------|----------------|----------------|----------------|----------------|
| 15  | 100    | RO 15 0100/11  | RO 15 0100/22  | RO 15 0100/13  | RO 15 0100/23  |
| 25  | 100    | RO 25 0100/11  | RO 25 0100/22  | RO 25 0100/13  | RO 25 0100/23  |
| 40  | 100    | RO 40 0100/11  | RO 40 0100/22  | RO 40 0100/13  | RO 40 0100/23  |
| 50  | 100    | RO 50 0100/11  | RO 50 0100/22  | RO 50 0100/13  | RO 50 0100/23  |
| 80  | 125    | RO 80 0125/11  | RO 80 0125/22  | RO 80 0125/13  | RO 80 0125/23  |
| 100 | 125    | RO 100 0125/11 | RO 100 0125/22 | RO 100 0125/13 | RO 100 0125/23 |
| 150 | 150    | RO 150 0150/11 | RO 150 0150/22 | RO 150 0150/13 | RO 150 0150/23 |
| 200 | 150    | RO 200 0150/11 | RO 200 0150/22 | RO 200 0150/13 | RO 200 0150/23 |
| 300 | 200    | RO 300 0200/11 | RO 300 0200/22 | RO 300 0200/13 | RO 300 0200/23 |
|     |        |                |                |                |                |
| 15  | 100    | RO 15 0100/15  | RO 15 0100/25  | RO 15 0100/35  |                |
| 25  | 100    | RO 25 0100/15  | RO 25 0100/25  | RO 25 0100/35  |                |
| 40  | 125    | RO 40 0125/15  | RO 40 0125/25  | RO 40 0125/35  |                |
| 50  | 125    | RO 50 0125/15  | RO 50 0125/25  | RO 50 0125/35  |                |
| 80  | 150    | RO 80 0150/15  | RO 80 0150/25  | RO 80 0150/35  |                |
| 100 | 150    | RO 100 0150/15 | RO 100 0150/25 | RO 100 0150/35 |                |
| 150 | 200    | RO 150 0200/15 | RO 150 0200/25 | RO 150 0200/35 |                |
|     |        |                |                |                |                |
| 25  | 100    | RO 25 0100/14  | RO 25 0100/24  | RO 25 0100/34  |                |
| 40  | 125    | RO 40 0125/14  | RO 40 0125/24  | RO 40 0125/34  |                |
| 50  | 125    | RO 50 0125/14  | RO 50 0125/24  | RO 50 0125/34  |                |
| 80  | 150    | RO 80 0150/14  | RO 80 0150/24  | RO 80 0150/34  |                |
| 100 | 150    | RO 100 0150/14 | RO 100 0150/24 | RO 100 0150/34 |                |
| 150 | 200    | RO 150 0200/14 | RO 150 0200/24 | RO 150 0200/34 |                |

## UNIVERSAL SPACERS, PTFE

For the nominal diameters of piping 15 to 150 the universal spacers can be used for connection of all types of joint faces and for the adjustment of lengths.

Permissible operating temperature: 120°C

Permissible operation gage pressure: corresponding to the maximum permissible pressure for the nominal diameter of the piping.

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 15 | 25     | RO 15 0025 U |
|    | 50     | RO 15 0050 U |
| 25 | 25     | RO 25 0025 U |
|    | 50     | RO 25 0050 U |
| 40 | 25     | RO 40 0025 U |
|    | 50     | RO 40 0050 U |
| 50 | 25     | RO 50 0025 U |
|    | 50     | RO 50 0050 U |

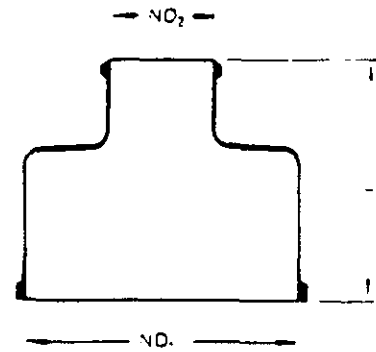
| ND  | L (mm) | Catalog ref.  |
|-----|--------|---------------|
| 80  | 50     | RO 80 0050 U  |
| 100 | 50     | RO 100 0050 U |
| 150 | 50     | RO 150 0050 U |

—ND—



# KF PIPE REDUCERS

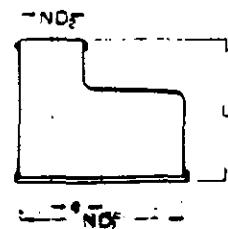
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) |               |               |               |
|-----------------|-----------------|-----------|---------------|---------------|---------------|
| 25              | 15              | 100       | RS 25/ 15/21  | -             | -             |
| 40              | 15              | 100       | RS 40/ 15/21  | -             | -             |
|                 | 25              | 100       | RS 40/ 25/21  | -             | -             |
| 50              | 15              | 100       | RS 50/ 15/21  | -             | -             |
|                 | 25              | 100       | RS 50/ 25/21  | -             | -             |
|                 | 40              | 100       | RS 50/ 40/21  | -             | -             |
| 30              | 25              | 125       | RS 30/ 25/21  | RS 30/ 25/31  | -             |
|                 | 40              | 125       | RS 30/ 40/21  | RS 30/ 40/31  | -             |
|                 | 50              | 125       | RS 30/ 50/21  | RS 30/ 50/31  | -             |
| 100             | 25              | 150       | RS 100/ 25/21 | RS 100/ 25/31 | -             |
|                 | 40              | 150       | RS 100/ 40/21 | RS 100/ 40/31 | -             |
|                 | 50              | 150       | RS 100/ 50/21 | RS 100/ 50/31 | -             |
|                 | 30              | 150       | RS 100/ 30/21 | RS 100/ 30/31 | RS 100/ 30/33 |
| 150             | 25              | 200       | RS 150/ 25/21 | RS 150/ 25/31 | -             |
|                 | 40              | 200       | RS 150/ 40/21 | RS 150/ 40/31 | -             |
|                 | 50              | 200       | RS 150/ 50/21 | RS 150/ 50/31 | -             |
|                 | 30              | 200       | RS 150/ 30/21 | RS 150/ 30/31 | -             |
|                 | 100             | 200       | RS 150/100/21 | RS 150/100/31 | RS 150/100/33 |
| 200             | 25              | 200       | RS 200/ 25/21 | RS 200/ 25/31 | -             |
|                 | 40              | 200       | RS 200/ 40/21 | RS 200/ 40/31 | -             |
|                 | 50              | 200       | RS 200/ 50/21 | RS 200/ 50/31 | -             |
|                 | 30              | 200       | RS 200/ 30/21 | RS 200/ 30/31 | -             |
|                 | 100             | 200       | RS 200/100/21 | RS 200/100/31 | RS 200/100/33 |
|                 | 150             | 225       | RS 200/150/21 | RS 200/150/31 | RS 200/150/33 |
| 300             | 25              | 275       | RS 300/ 25/21 | RS 300/ 25/31 | -             |
|                 | 40              | 275       | RS 300/ 40/21 | RS 300/ 40/31 | -             |
|                 | 50              | 275       | RS 300/ 50/21 | RS 300/ 50/31 | -             |
|                 | 30              | 275       | RS 300/ 30/21 | RS 300/ 30/31 | -             |
|                 | 100             | 300       | RS 300/100/21 | RS 300/100/31 | -             |
|                 | 150             | 300       | RS 300/150/21 | RS 300/150/31 | RS 300/150/33 |
|                 | 200             | 300       | RS 300/200/21 | RS 300/200/31 | RS 300/200/33 |
| 400             | 50              | 300       |               | RS 400/ 50/31 | -             |
|                 | 30              | 300       |               | RS 400/ 30/31 | -             |
|                 | 100             | 300       |               | RS 400/100/31 | -             |
|                 | 150             | 350       |               | RS 400/150/31 | -             |
|                 | 200             | 350       |               | -             | RS 400/200/33 |
|                 | 300             | 400       |               | -             | RS 400/300/33 |



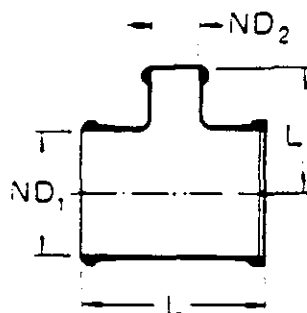
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm)      |                |   |
|-----------------|-----------------|----------------|----------------|---|
| 50              | 325             | RS 450/ 50/31  | -              | - |
| 30              | 325             | RS 450/ 30/31  | -              | - |
| 100             | 325             | RS 450/100/31  | -              | - |
| 150             | 375             | RS 450/150/31  | -              | - |
| 200             | 375             | -              | RS 450/200/33  | - |
| 300             | 400             | -              | RS 450/300/33  | - |
| 50              | 325             | RS 600/ 50/31  | -              | - |
| 80              | 325             | RS 600/ 80/31  | -              | - |
| 100             | 325             | RS 600/100/31  | -              | - |
| 150             | 375             | RS 600/150/31  | -              | - |
| 200             | 375             | RS 600/200/31  | -              | - |
| 300             | 425             | RS 600/300/31  | -              | - |
| 400             | 450             | -              | RS 600/400/33  | - |
| 450             | 450             | -              | RS 600/450/33  | - |
| 80              | 550             | RS 800/ 80/31  | -              | - |
| 100             | 550             | RS 800/100/31  | -              | - |
| 150             | 550             | RS 800/150/31  | -              | - |
| 200             | 550             | RS 800/200/31  | -              | - |
| 300             | 550             | RS 800/300/31  | -              | - |
| 400             | 550             | -              | RS 800/400/33  | - |
| 450             | 550             | -              | RS 800/450/33  | - |
| 600             | 500             | -              | RS 800/600/33  | - |
| 100             | 550             | RS 1000/100/31 | -              | - |
| 150             | 600             | RS 1000/150/31 | -              | - |
| 200             | 600             | RS 1000/200/31 | -              | - |
| 300             | 600             | RS 1000/300/31 | -              | - |
| 400             | 650             | -              | RS 1000/400/33 | - |
| 450             | 650             | -              | RS 1000/450/33 | - |
| 600             | 650             | -              | RS 1000/600/33 | - |

## KF PIPE REDUCERS, ECCENTRIC

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | ø<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|-----------|--------------|
| 50              | 25              | 100       | 13        | RU 50/25/21  |
| 30              | 25              | 125       | 28        | RU 80/25/21  |
| 100             | 25              | 150       | 35        | RU 100/25/21 |



# KF UNEQUAL TEE PIECES



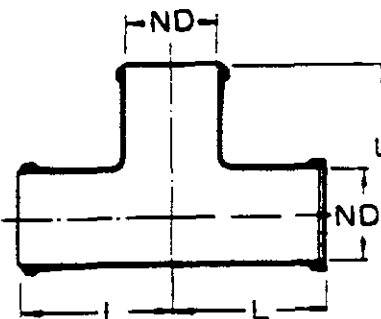
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.   |
|-----------------|-----------------|-----------|------------------------|----------------|
| 25              | 15              | 150       | 75                     | TS 25/ 15/121  |
| 40              | 25              | 200       | 100                    | TS 40/ 25/121  |
| 50              | 25              | 200       | 100                    | TS 50/ 25/121  |
|                 | 40              | 200       | 100                    | TS 50/ 40/121  |
| 80              | 25              | 200       | 100                    | TS 80/ 25/121  |
|                 | 40              | 250       | 100                    | TS 80/ 40/121  |
|                 | 50              | 250       | 100                    | TS 80/ 50/121  |
| 100             | 25              | 200       | 125                    | TS 100/ 25/121 |
|                 | 40              | 250       | 125                    | TS 100/ 40/121 |
|                 | 50              | 250       | 125                    | TS 100/ 50/121 |
|                 | 80              | 300       | 125                    | TS 100/ 80/121 |
| 150             | 25              | 200       | 150                    | TS 150/ 25/121 |
|                 | 40              | 250       | 150                    | TS 150/ 40/121 |
|                 | 50              | 250       | 150                    | TS 150/ 50/121 |
|                 | 80              | 300       | 150                    | TS 150/ 80/121 |
|                 | 100             | 300       | 150                    | TS 150/100/121 |
| 200             | 25              | 200       | 175                    | TS 200/ 25/121 |
|                 | 40              | 250       | 175                    | TS 200/ 40/121 |
|                 | 50              | 250       | 175                    | TS 200/ 50/121 |
|                 | 80              | 300       | 175                    | TS 200/ 80/121 |
|                 | 100             | 300       | 175                    | TS 200/100/121 |
|                 | 150             | 400       | 225                    | TS 200/150/121 |
| 300             | 25              | 300       | 225                    | TS 300/ 25/121 |
|                 | 40              | 400       | 225                    | TS 300/ 40/121 |
|                 | 50              | 400       | 225                    | TS 300/ 50/121 |
|                 | 80              | 400       | 225                    | TS 300/ 80/121 |
|                 | 100             | 400       | 225                    | TS 300/100/121 |
|                 | 150             | 500       | 275                    | TS 300/150/121 |
|                 | 200             | 600       | 275                    | TS 300/200/121 |

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.     |
|-----------------|-----------------|-----------|------------------------|------------------|
| 80              | 25              | 200       | 100                    | TS 80/ 25/ 331   |
|                 | 50              | 250       | 100                    | TS 80/ 50/ 331   |
| 100             | 25              | 200       | 125                    | TS 100/ 25/ 331  |
|                 | 50              | 250       | 125                    | TS 100/ 50/ 331  |
| 150             | 50              | 250       | 150                    | TS 150/ 50/ 331  |
|                 | 80              | 300       | 150                    | TS 150/ 80/ 331  |
| 200             | 50              | 250       | 175                    | TS 200/ 50/ 331  |
|                 | 80              | 300       | 175                    | TS 200/ 80/ 331  |
|                 | 100             | 300       | 175                    | TS 200/100/ 331  |
| 300             | 50              | 400       | 225                    | TS 300/ 50/ 331  |
|                 | 80              | 400       | 225                    | TS 300/ 80/ 331  |
|                 | 100             | 400       | 225                    | TS 300/100/ 331  |
|                 | 150             | 500       | 275                    | TS 300/150/ 331  |
| 400             | 80              | 400       | 275                    | TS 400/ 80/ 331  |
|                 | 150             | 500       | 325                    | TS 400/150/ 331  |
| 450             | 80              | 400       | 300                    | TS 450/ 80/ 331  |
|                 | 150             | 500       | 350                    | TS 450/150/ 331  |
| 600             | 80              | 600       | 375                    | TS 600/ 80/ 331  |
|                 | 150             | 600       | 425                    | TS 600/150/ 331  |
|                 | 300             | 900       | 500                    | TS 600/300/ 331  |
| 800             | 100             | 700       | 575                    | TS 800/100/ 331  |
|                 | 200             | 800       | 575                    | TS 800/200/ 331  |
|                 | 300             | 800       | 650                    | TS 800/300/ 331  |
| 1000            | 100             | 700       | 625                    | TS 1000/100/ 331 |
|                 | 200             | 800       | 675                    | TS 1000/200/ 331 |
|                 | 300             | 800       | 750                    | TS 1000/300/ 331 |

# KF EQUAL TEE PIECES



| ND  | L<br>(mm) | Catalog ref.          |
|-----|-----------|-----------------------|
| 15  | 50        | TS 15/121 TS 15/122   |
| 25  | 100       | TS 25/121 TS 25/122   |
| 40  | 150       | TS 40/121 TS 40/122   |
| 50  | 150       | TS 50/121 TS 50/122   |
| 80  | 200       | TS 80/121 TS 80/122   |
| 100 | 250       | TS 100/121 TS 100/122 |
| 150 | 250       | TS 150/121 TS 150/122 |
| 200 | 300       | TS 200/121 TS 200/122 |
| 300 | 400       | TS 300/121 TS 300/122 |

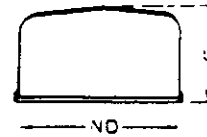


Other flange types can be supplied on request.

## KF PIPE CAPS



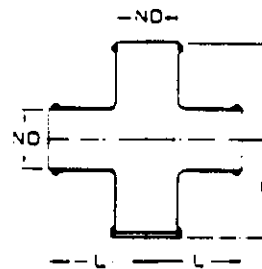
| L       | Catalog ref. |          |
|---------|--------------|----------|
| 50-85   | 3L 15/1      | 3L 15/2  |
| 50-85   | 3L 25/1      | 3L 25/2  |
| 85-110  | 3L 40/1      | 3L 40/2  |
| 110-115 | 3L 50/1      | 3L 50/2  |
| 110     | 3L 80/1      | 3L 80/2  |
| 112     | 3L 100/1     | 3L 100/2 |
| 113     | 3L 150/1     | 3L 150/2 |
| 122     | 3L 200/1     | 3L 200/2 |
| 171     | 3L 300/1     | 3L 300/2 |



## KF EQUAL CROSSES



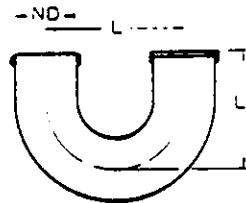
| D | L   | Catalog ref. |
|---|-----|--------------|
| 5 | 50  | KR 15        |
|   | 100 | KR 25        |
|   | 150 | KR 40        |
|   | 150 | KR 50        |
|   | 200 | KR 80        |
|   | 250 | KR 100       |
|   | 250 | KR 150       |



## KF U—BENDS



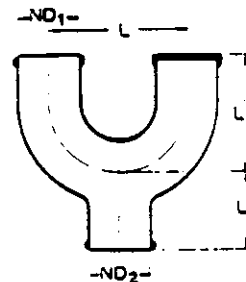
| ID  | L   | L <sub>1</sub> | Catalog ref. |
|-----|-----|----------------|--------------|
| 15  | 100 | 100            | UB 15        |
| 25  | 150 | 150            | UB 25        |
| 40  | 150 | 150            | UB 40        |
| 50  | 150 | 150            | UB 50        |
| 80  | 210 | 200            | UB 80        |
| 100 | 230 | 200            | UB 100       |

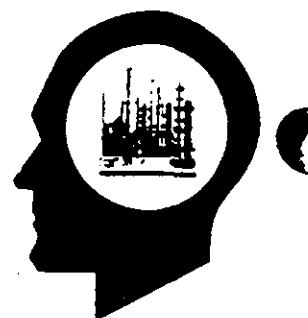


## KF U—BENDS WITH BOTTOM OUTLET



| VD <sub>1</sub> | ND <sub>2</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | Catalog ref. |
|-----------------|-----------------|-----|----------------|----------------|--------------|
| 15              | 15              | 100 | 100            | 100            | HO 15/15     |
| 25              | 25              | 150 | 100            | 150            | HO 25/25     |
| 40              | 25              | 150 | 100            | 150            | HO 40/25     |
| 50              | 25              | 150 | 100            | 150            | HO 50/25     |





**THINK  
GLASS**

# VESSELS AND STIRRERS

O-I/SCHOTT vessels and covers are available to meet wide-ranging requirements as condensers, evaporators, and stirred reactors: spherical vessels with capacities from 10 to 600 liters; cylindrical vessels with capacities of 5 to 500 liters. The design and configuration of the all-important openings on these vessels have been carefully arrived at for ease of maintenance and replacement. In addition to the types of vessels mentioned, vertical cylindrical vessels can be made up by the use of standard components to capacities of up to 3000 liters. Horizontal cylindrical vessels can be made up for almost any desired capacity.

The maximum allowable operating pressure for the cylindrical vessels is one bar depending on the temperature and the nominal diameter.

In the case of the spherical vessels the allowable operating pressure is 0.5 bar for sizes up to 50 liters, 0.3 bar for the 100 liter, 200 liter and 500 liter sizes. For heat exchangers to complement these vessels for cooling, or heating, see our Heat Exchange catalog. This catalog shows in detail glass and metal immersion heaters, coil and bayonet types, and other heating equipment, such as heating mantles and heating baths.

Glass vessels are supported by means of support rings and cradles described in the Structure Section of this catalog.

For large-volume vessels of the vertical or horizontal type O-I/SCHOTT will design and recommend an appropriate support structure.

For increased safety, all vessels can be provided with a glass fiber/polyester protective armoring. This protective covering is tightly wrapped around the outside of the glass component, and cured in place. It serves to guard against the loss of valuable process liquids and to protect the glass surfaces against damage.

For such armored vessels and components the catalog number of these parts must be supplemented by code letter "A".

A complete line of stirrers is available from O-I/Schott for their corrosion-resistant mixing vessels and stirred reactors. This includes paddles, anchor and suction stirrers, steel/PTFE, covered turbine stirrers for larger vessels and more severe applications.

Solid PTFE turbine stirrers are used particularly for highly viscous fluids. The drive and the type of the bearing for this purpose must also be selected appropriately. Depending on the length of the stirrer, single or double bearings are used.

Either single or double acting mechanical seals in a combination of ceramic and PTFE for extremely corrosive fluids are available. Fixed or variable speed drives, with TEFCO or completely explosion proof motors can be supplied.

All stirrers are designed to operate under full vacuum.

The following data can be used as a guide for the selection of an appropriate stirrers.

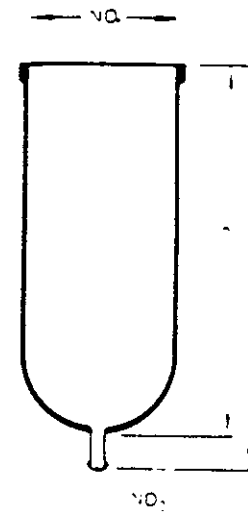
| Type of stirrer                                                          | DURAN®<br>stirrers<br>with shaft<br>diameters of |         | PTFE stirrers<br>with shaft<br>diameters of |         |
|--------------------------------------------------------------------------|--------------------------------------------------|---------|---------------------------------------------|---------|
|                                                                          | 32 mm                                            | 50 mm   | 32 mm                                       | 50 mm   |
| Maximum stirrer length<br>in pilot plant design<br>(Catalog ref. RTE...) | 850 mm                                           | —       | —                                           | —       |
| Maximum stirrer length<br>with single bearing<br>(Catalog ref. RE...)    | 850 mm                                           | 1300 mm | 950 mm                                      | 350 mm  |
| Maximum stirrer length<br>with double bearing<br>(Catalog ref. RD...)    | —*                                               | —*      | —*                                          | 1600 mm |

\*These stirrers are used almost exclusively with the single bearing which is adequate.

Glass vessels and components, coupled with corrosion-resistant stirrers constitute the major components of a versatile basic chemical reaction system. The addition of heat exchange equipment, packed columns, reflux splitters, measurement and control systems, broadens the applicability of such units for pilot plant, semi-works or production operations. Selection and investigation of the correct parameter(s) in an all-glass pilot plant can be an important adjunct for scaling-up to full-scale production operations.

# CYLINDRICAL VESSELS

These vessels can be supplied with graduations. The Catalog ref. must be supplemented by the Graduation letter or gal.



| Nominal capacity (l) | ND <sub>1</sub> | ND <sub>2</sub> | h (mm) | h <sub>1</sub> (mm) | Graduation (l) | Catalog ref. |
|----------------------|-----------------|-----------------|--------|---------------------|----------------|--------------|
| 5                    | 200             | 25              | 350    | 390                 | 0.2            | GER 5        |
| 10                   | 200             | 25              | 550    | 490                 | 0.2            | GER 10       |
| 30                   | 300             | 25              | 650    | 590                 | 0.5            | GER 30       |
| 50                   | 300             | 25              | 900    | 640                 | 0.5            | GER 50       |
| 100                  | 400             | 25              | 1000   | 940                 | 0.5            | GER 100      |
| 150                  | 400             | 25              | 1400   | 1340                | 0.5            | GER 150      |
| 200                  | 450             | 25              | 1500   | 1440                | 1.0            | GER 200      |
| 400                  | 600             | 50              | 1600   | 1540                | 2.0            | GER 400      |
| 500                  | 800             | 50              | 1250   | 1129                | 5.0            | GER 500      |

A special bulletin is available on portable cylindrical vessels.

# JACKETED VESSELS

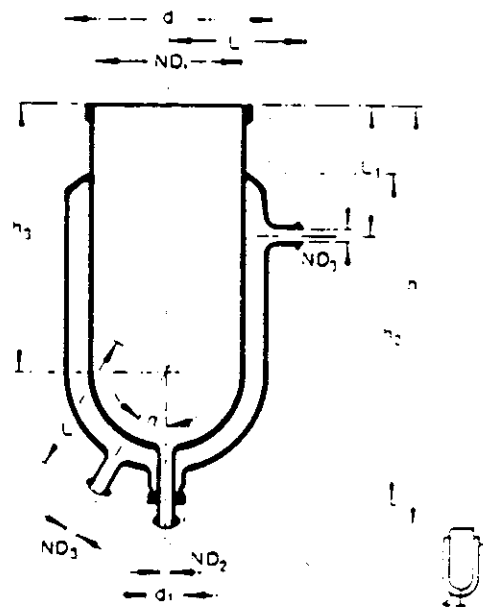
For heating or cooling, the cylindrical vessels may also be supplied with a heating or cooling jacket.

In the design of these vessels, which is adapted to the material used, the vessel and the jacket are fused or sealed with a permanently elastic silicone composition.

This leads to the following operating conditions:

- permissible temperature up to 150°C
- permissible gage pressure in the jacket 0.5 bar

The resistance of the silicone composition to chemicals permits the use of hot water and steam as well as the usual heat-carrier oils and cooling brines in the jacket space.



| Nominal capacity (l) | ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h (mm) | h <sub>2</sub> (mm) | Heat transfer area (m <sup>2</sup> ) | d (mm) | d <sub>1</sub> (mm) | h <sub>3</sub> (mm) | L (mm) | L <sub>1</sub> (mm) | α  | Catalog ref. |
|----------------------|-----------------|-----------------|-----------------|--------|---------------------|--------------------------------------|--------|---------------------|---------------------|--------|---------------------|----|--------------|
| 5                    | 150             | 25              | 25              | 625    | 473                 | 0.19                                 | 215    | 70                  | 380                 | 175    | 150                 | 45 | MGE 5        |
| 10                   | 200             | 25              | 25              | 675    | 518                 | 0.25                                 | 315    | 70                  | 380                 | 225    | 175                 | 30 | MGE 10       |
| 30                   | 300             | 25              | 25              | 775    | 560                 | 0.45                                 | 390    | 70                  | 430                 | 250    | 200                 | 30 | MGE 30       |
| 50                   | 300             | 25              | 25              | 1025   | 810                 | 0.69                                 | 390    | 70                  | 680                 | 250    | 200                 | 30 | MGE 50       |



# SPHERICAL VESSELS

The spherical vessel range offers a wide choice of side necks. They may be used for sprinklers, thermometers and inlet pipes, and for connecting vapor and evaporator circulation systems. All side necks have ball flanges.

When ordering, the desired nominal diameter should be added to the catalog number denoting the position of the side neck.

Ordering example:

GEK 50 ND<sub>1</sub> = 100 ND<sub>2</sub> = 25 ND<sub>3</sub> = 50 ND<sub>5</sub> = 25

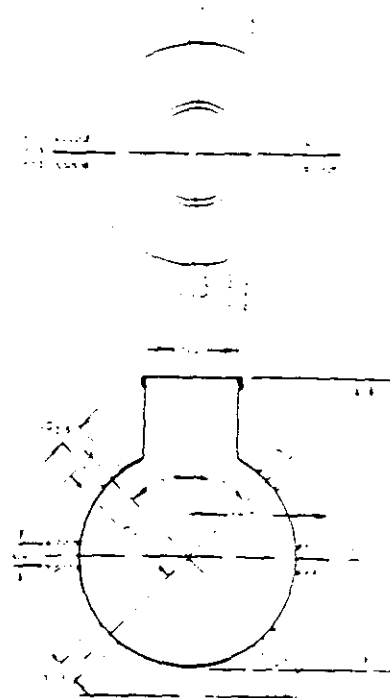
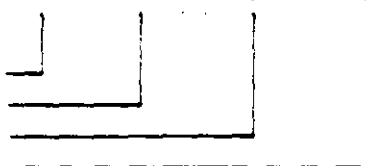
Spherical vessel 50 liters

Bottom neck ND<sub>1</sub> = 100 ball

Side neck ND<sub>2</sub> = 25 ball

Side neck ND<sub>3</sub> = 50 ball

Side neck ND<sub>5</sub> = 25 ball



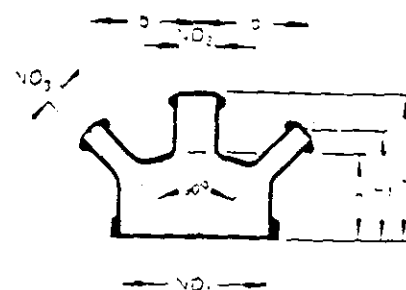
| Nominal Capacity (l) | ND (mm) | D (mm) | H    | H <sub>1</sub> | Catalog ref. |
|----------------------|---------|--------|------|----------------|--------------|
| 10                   | 100     | 280    | 390  | 250            | GEK 10       |
| 20                   | 100     | 350    | 475  | 300            | GEK 20       |
| 50                   | 200     | 490    | 645  | 400            | GEK 50       |
| 100                  | 200     | 610    | 755  | 450            | GEK 100      |
| 200                  | 300     | 750    | 925  | 550            | GEK 200      |
| 500                  | 400     | 1015   | 1208 | 700            | GEK 500      |

\*H<sub>2</sub> Dimension varies with Nozzle Diameter.

# COVERS



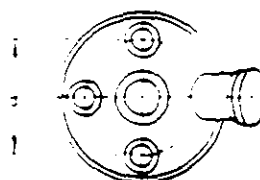
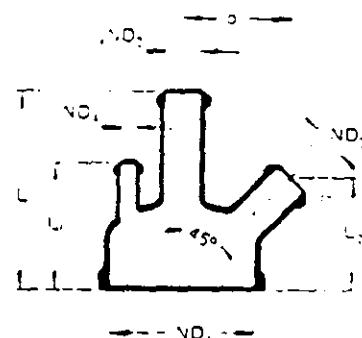
| NO <sub>1</sub> | NO <sub>2</sub> | NO <sub>3</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | h<br>(mm) | b<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|-----------|--------------|
| 100             | 50              | 2 x 25          | 150       | 121                    | 90        | 37        | HAU 100      |
| 150             | 50              | 2 x 25          | 175       | 122                    | 111       | 122       | HAU 150      |
| 200             | 50              | 2 x 25          | 175       | 146                    | 119       | 146       | HAU 200      |
| 300             | 50              | 2 x 25          | 225       | 197                    | 168       | 197       | HAU 300      |
| 400             | 50              | 2 x 25          | 300       | 247                    | 234       | 247       | HAU 400      |
| 450             | 50              | 2 x 25          | 325       | 247                    | 250       | 247       | HAU 450      |
| 500             | 50              | 2 x 25          | 325       | 222                    | 255       | 222       | HAU 500      |
| 600             | 30              | 2 x 30          | 350       | 387                    | 429       | 387       | HAU 600      |
| 1000            | 30              | 2 x 30          | 550       | 437                    | 440       | 512       | HAU 1000     |



## TOP COVERS



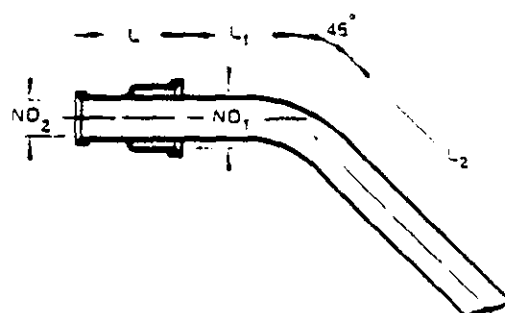
| NO <sub>1</sub> | NO <sub>2</sub> | NO <sub>3</sub> | NO <sub>4</sub> | d<br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | b<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------------|-----------|-----------|------------------------|------------------------|-----------|--------------|
| 200             | 50              | 50              | 3 x 25          | 150       | 275       | 175                    | 154                    | 154       | AHA 200/ 50  |
| 300             | 50              |                 |                 |           | 225       |                        |                        |           | AHA 300/ 50  |
|                 | 80              | 30              | 3 x 50          | 250       | 300       | 200                    | 187                    | 187       | AHA 300/ 80  |
|                 | 100             |                 |                 |           | 300       |                        |                        |           | AHA 300/100  |
| 400             | 50              |                 |                 |           | 300       |                        |                        |           | AHA 400/ 50  |
|                 | 80              | 100             | 3 x 50          | 300       | 300       | 275                    | 250                    | 250       | AHA 400/ 80  |
|                 | 100             |                 |                 |           | 300       |                        |                        |           | AHA 400/100  |
| 450             | 50              |                 |                 |           | 325       |                        |                        |           | AHA 450/ 50  |
|                 | 80              | 150             | 3 x 50          | 350       | 325       | 300                    | 284                    | 284       | AHA 450/ 80  |
|                 | 100             |                 |                 |           | 325       |                        |                        |           | AHA 450/100  |
| 600             | 50              |                 |                 |           | 325       |                        |                        |           | AHA 600/ 50  |
|                 | 80              | 150             | 3 x 50          | 400       | 325       | 300                    | 258                    | 358       | AHA 600/ 80  |
|                 | 100             |                 |                 |           | 325       |                        |                        |           | AHA 600/100  |



## INLET PIPES FOR SPHERICAL VESSELS

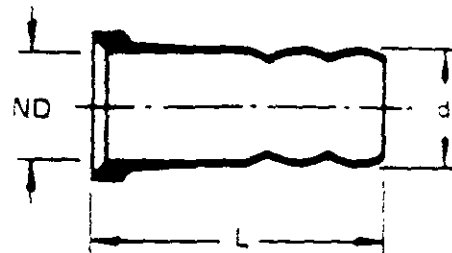


| NO <sub>1</sub> | NO <sub>2</sub> | Suitable for vessel | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|---------------------|-----------|------------------------|------------------------|--------------|
| 25              | 15              | GEK 10              | 100       | 115                    | 175                    | EIN 25/ 10K  |
| 50              | 25              | GEK 20              | 100       | 115                    | 225                    | EIN 50/ 20K  |
|                 |                 | GEK 50              | 100       | 135                    | 300                    | EIN 50/ 50K  |
|                 |                 | GEK 100             | 100       | 155                    | 400                    | EIN 50/100K  |
|                 |                 | GEK 200             | 100       | 175                    | 475                    | EIN 50/200K  |



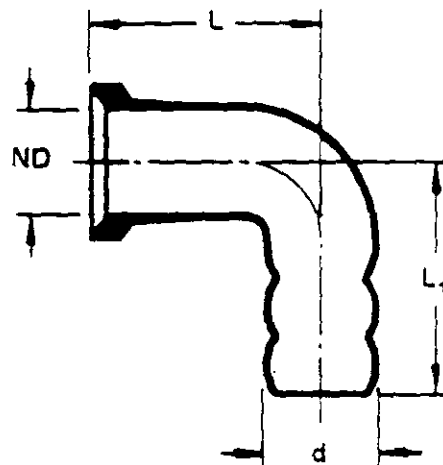
## KF HOSE CONNECTORS

| ND | d<br>(mm) | L<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 15 | 3         | 100       | OL 15/3      |
|    | 22        | 100       | OL 15/20     |
| 25 | 3         | 100       | OL 25/3      |
|    | 22        | 100       | OL 25/20     |
|    | 33        | 120       | OL 25/30     |
| 40 | 50        | 150       | OL 40/50     |
| 50 | 60        | 150       | OL 50/60     |



## KF HOSE CONNECTORS, ANGLED

| ND | d<br>(mm) | L<br>(mm) | L <sub>T</sub><br>(mm) | Catalog ref. |
|----|-----------|-----------|------------------------|--------------|
| 15 | 22        | 50        | 70                     | OL 15/20W    |
| 25 | 22        | 100       | 100                    | OL 25/20W    |
|    | 33        | 100       | 100                    | OL 25/30W    |



# HORIZONTAL PHASE SEPARATOR HEAD

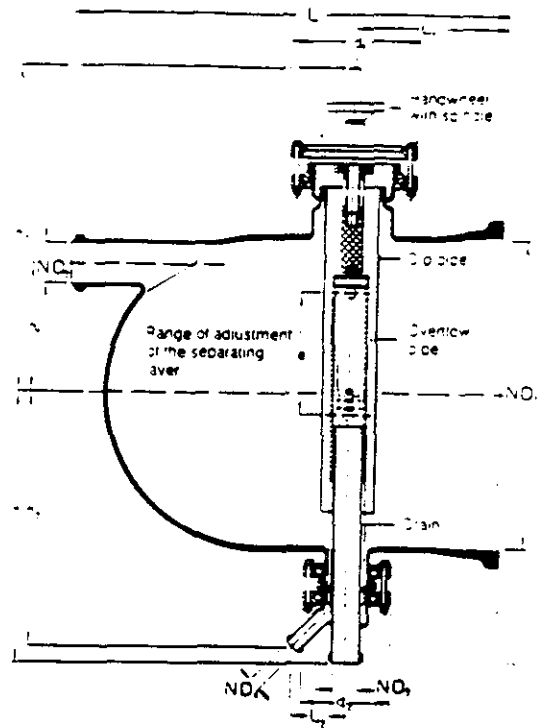
Continuous separation of immiscible liquids having different densities presupposes low flow velocities and the largest possible separating surface between the light and the heavy phases. These requirements are satisfied ideally by horizontal separator vessels.

The transparency of borosilicate glass ensures trouble-free operation by visual monitoring of the separation process.

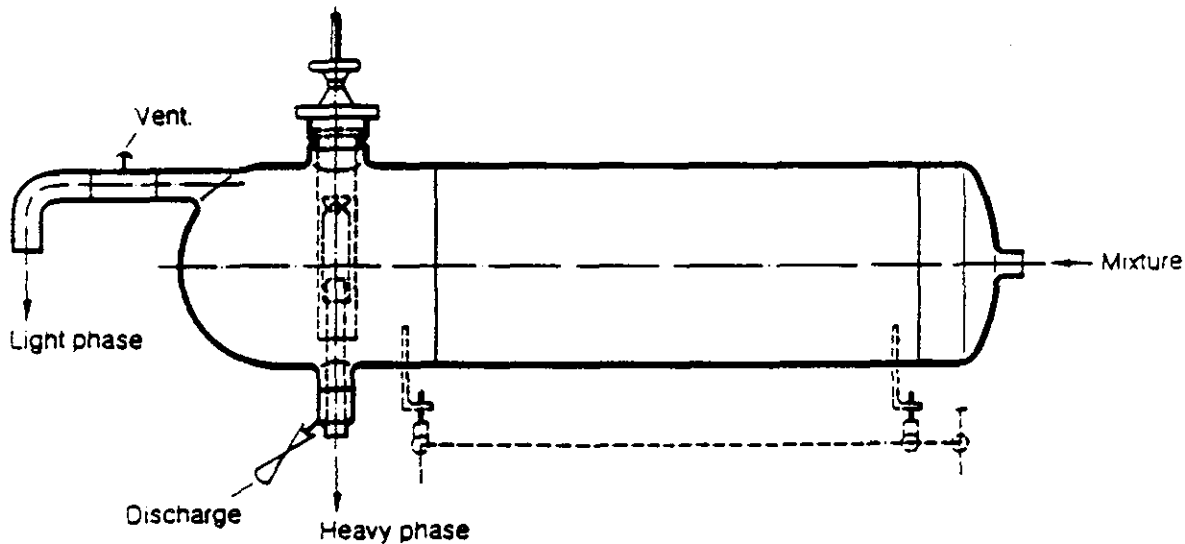
In order to be able to adjust the plane of separation continuously for different operating situations (variations in the amounts and densities), an adjusting device that can be operated from outside the vessel has been developed.

In a dip-oil there is an adjustable overflow pipe with inlet openings for the heavy phase at the upper end. The overflow pipe slides on the discharge pipe in liquid-tight manner. Please specify the necessary total volumes so that we can submit a construction proposal for the complete separating vessel including supports.

Catalog reference TFK includes only separating head as shown to the right.



| NO1 | NO2 | NO3 | NO4 | e<br>(mm) | h<br>(mm) | h1<br>(mm) | h2<br>(mm) | h3<br>(mm) | L<br>(mm) | L1<br>(mm) | L2<br>(mm) | d1<br>(mm) | d2<br>(mm) | Catalog ref. |
|-----|-----|-----|-----|-----------|-----------|------------|------------|------------|-----------|------------|------------|------------|------------|--------------|
| 200 | 25  | 25  | 25  | 85        | 325       | 75         | 322        | 317        | 375       | 150        | 97         | 172        | 131        | TFK 200      |
| 300 | 25  | 25  | 25  | 130       | 375       | 125        | 372        | 413        | 475       | 200        | 97         | 172        | 131        | TFK 300      |
| 400 | 50  | 50  | 25  | 180       | 450       | 150        | 422        | 577        | 625       | 250        | 99         | 247        | 172        | TFK 400      |
| 500 | 50  | 50  | 25  | 180       | 475       | 175        | 447        | 602        | 650       | 300        | 99         | 247        | 172        | TFK 500      |
| 600 | 80  | 50  | 25  | 260       | 550       | 250        | 522        | 755        | 850       | 300        | 99         | 247        | 172        | TFK 600      |



# STIRRERS. PILOT—PLANT TYPE

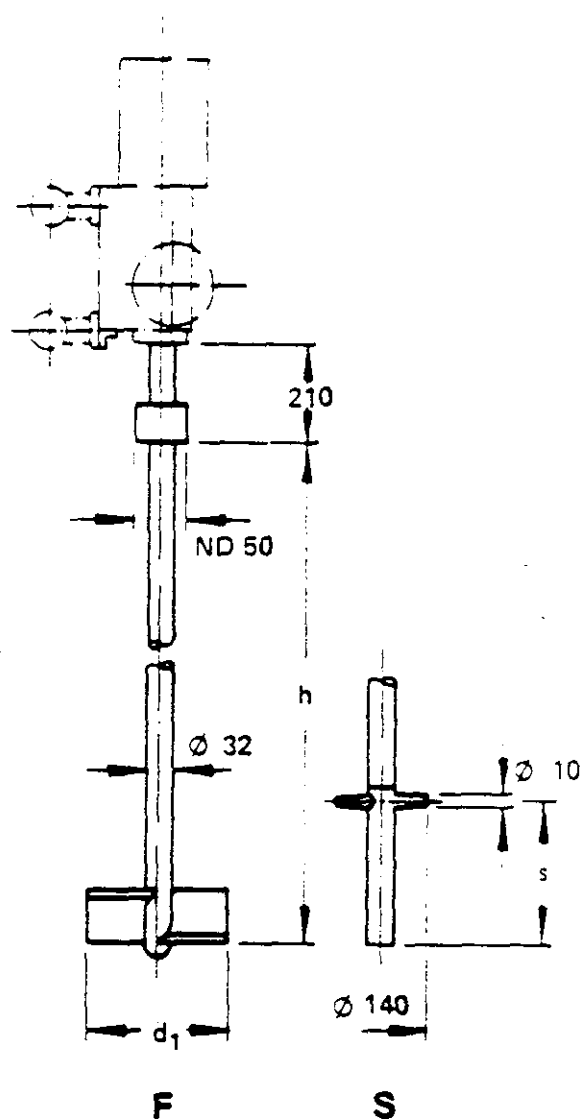
For stirring problems in the pilot-plant range this stirrer is made in a completely corrosion-resistant form for maximum stirrer lengths of up to 850 mm.

The OX-50-OTT paddle or suction stirrers are fixed directly to the driving shaft and are sealed by means of single-acting mechanical seals of PTFE/ceramic.

This construction also permits the stirrers to be used under vacuum.

Stirrer drives with variable speed are available.

Connection is by KF necks ND 50mm (ball, socket, or plane).



| Catalog ref. |                        |           |                |                 |
|--------------|------------------------|-----------|----------------|-----------------|
| h<br>(mm)    | d <sub>1</sub><br>(mm) | s<br>(mm) | Paddle stirrer | Suction stirrer |
| 40           | 90                     |           | RTE 32/450 F   | —               |
| 60           | 90                     |           | RTE 32/500 F   | —               |
| 80           | 140                    |           | RTE 32/550 F   | RTE 32/550 S... |
| 100          | 140                    | min. 150  | RTE 32/600 F   | RTE 32/600 S... |
| 120          | 140                    | max. 350  | RTE 32/650 F   | RTE 32/650 S... |
| 140          | 140                    |           | RTE 32/700 F   | RTE 32/700 S... |
| 160          | 140                    |           | RTE 32/750 F   | RTE 32/750 S... |
| 180          | 140                    |           | RTE 32/800 F   | RTE 32/800 S... |
| 200          | 140                    |           | RTE 32/850 F   | RTE 32/850 S... |

In the case of a suction stirrer the Catalog ref. must be supplemented by the dimension "S".

Example of Catalog ref.:

RTE 32/600 F

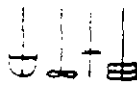
- paddle stirrer
- stirrer length
- stirrer with single-acting mechanical seal and shaft diameter 32 mm

# STIRRERS WITH SINGLE BEARING

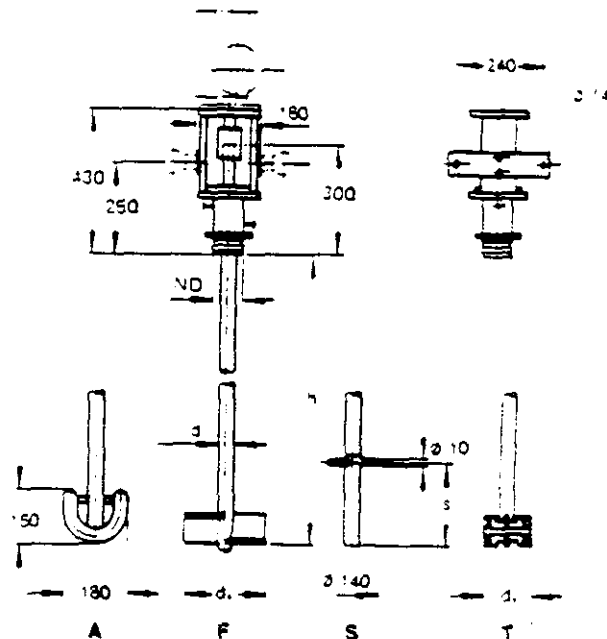
Safe construction of these stirrers makes it possible to work under normal pressure and vacuum conditions.

Above the seal, the stirrer shaft passes through a ball bearing and is rigidly connected with the motor shaft.

Connection to the KF 50 or 80 nozzles is made with PTFE universal bellows which are part of the stirrer assembly.



| d<br>(mm) | ND  | d <sub>1</sub><br>(mm)                                             | h<br>(mm) | s<br>(mm)    | Catalog ref. |
|-----------|-----|--------------------------------------------------------------------|-----------|--------------|--------------|
| 50        | 140 | max. 350                                                           | min. 150  | RE...32/...F |              |
|           |     |                                                                    |           | RE...32/...S |              |
|           |     |                                                                    |           | RE...32/...A |              |
|           |     |                                                                    |           | RE...32/...T |              |
| 80        | 190 | max. 1300 for<br>DURAN® stirrers<br>max. 1600 for<br>PTFE stirrers | min. 150  | RE...50/...F |              |
|           |     |                                                                    |           | RE...50/...S |              |
|           |     |                                                                    |           | RE...50/...A |              |
|           |     |                                                                    |           | RE...50/...T |              |



# STIRRERS WITH DOUBLE BEARING

This stirrer system is provided with a stirrer having a shaft 30 mm in diameter and is therefore suitable for high stresses. Because of the double bearing (two ball bearings), high power can be transmitted even in the case of long stirrers. The motor is connected through a flexible coupling.

Connection to KF 80 mm nozzles is made with PTFE bellows.

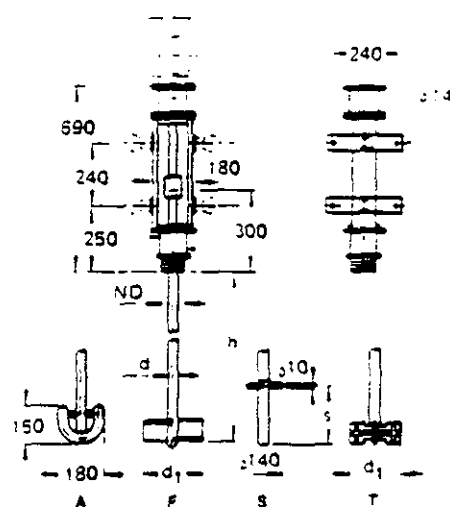
| d<br>(mm) | ND  | d <sub>1</sub><br>(mm)                                             | h<br>(mm) | s<br>(mm)    | Catalog ref. |
|-----------|-----|--------------------------------------------------------------------|-----------|--------------|--------------|
| 80        | 190 | max. 1300 for<br>DURAN® stirrers<br>max. 1600 for<br>PTFE stirrers | min. 150  | RD...50/...F |              |
|           |     |                                                                    |           | RD...50/...S |              |
|           |     |                                                                    |           | RD...50/...A |              |
|           |     |                                                                    |           | RD...50/...T |              |

Symbol E: single-acting mechanical seal incorporated in a housing with injection nozzles and a level indicator for the lubricant

Symbol D: double-acting mechanical seal with housing and connections for the barrier liquid

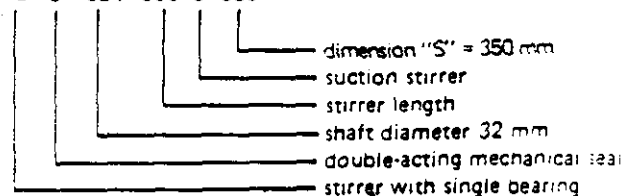
The mechanical seals can be changed without removing the stirrer and without dismantling the drive.

PTFE paddle stirrers and stirrers with several sets of stirring members can be supplied on request.



Example of Catalog ref.:

RE D 32 / 800 S 350



# COLUMN COMPONENTS



The O-I SCHOTT column component program contains all the necessary components in nominal diameters from 30 to 1000 mm. This permits complete and operationally safe solutions to designs both in the pilot plant and on the production scale.

The main advantages for users in the chemical and pharmaceutical industries are:

- the outstanding corrosion resistance of DURAN<sup>®</sup> and composite materials used
- the permanent fluid-tightness of the connecting flange system
- the consistent use of a modular construction system in a metric grid

The permissible temperatures and pressures of O-I/SCHOTT plant components are described in detail in the introductory section of the Catalog.

Because of the properties of borosilicate glass as a constructional material, DURAN<sup>®</sup> is particularly suitable for the solution of the following chemical-engineering tasks:

- distillation
- rectification
- extraction
- absorption
- reaction

The plant components necessary for this purpose are featured as standard items in the O-I/SCHOTT Program, which has been structured in a way that adaptation to a wide range of individual designs is possible by combining the individual components.

## COUPLINGS AND GASKETS

The section of the Catalog on "Couplings and Gaskets" contains the parts necessary for the construction and assembly of the equipment and the criteria for selecting them.

## PROTECTIVE COATING

O-I/SCHOTT offers a translucent polyester resin impregnated fiberglass protective covering which can be applied to the glass components.

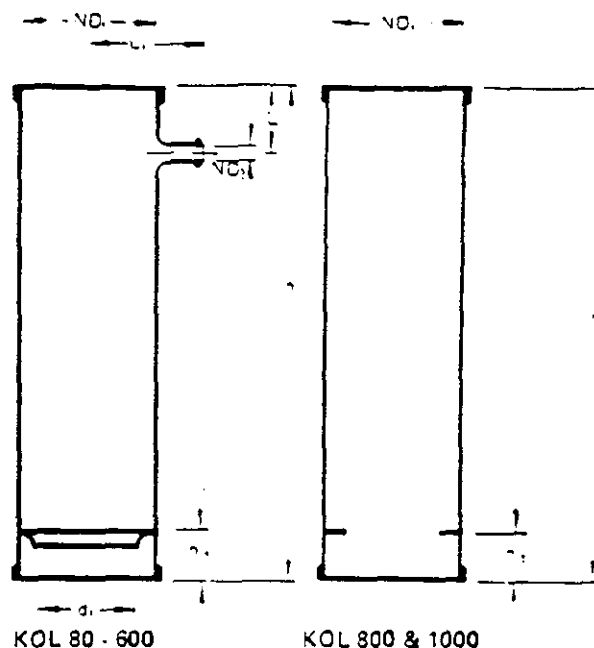
All components, even complicated ones, can be covered in this way. The maximum temperature is 120°C. This coating does not increase the operating pressure.

In ordering covered components, the catalog number must be supplemented by the symbol "A".

Combinations of the components into complete installations for various purposes are shown in O-I/SCHOTT process engineering information sheets. These show proven designs, for which detailed constructional drawings are available.

# COLUMN SECTIONS

Column sections are available in nominal diameters from 30 to 1000 mm. In all sections an internal packing support ring is fused to the glass which also serves as a redistributor.



Column section 1 m long



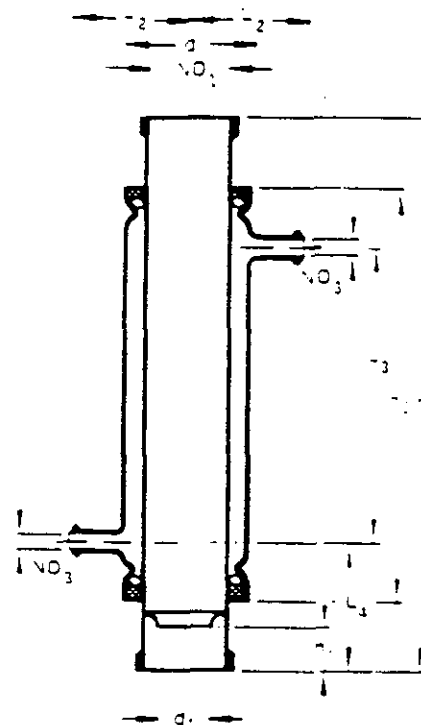
| ND <sub>1</sub> | ND <sub>2</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | Capacity |                 | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|-----------|------------------------|------------------------|----------|-----------------|--------------|
|                 |                 |           |                        |           |                        |                        | (l)      | ft <sup>3</sup> |              |
| 30              | 25              | 1000      | 55                     | 75        | 100                    | 45                     | 4        | 0.1             | KOL 30       |
| 100             | 25              | 1000      | 55                     | 75        | 125                    | 65                     | 7        | 0.2             | KOL 100      |
| 150             | 25              | 1000      | 75                     | 100       | 150                    | 105                    | 16       | 0.5             | KOL 150      |
| 200             | 25              | 1000      | 75                     | 100       | 175                    | 150                    | 29       | 1.0             | KOL 200      |
| 300             | 25              | 1000      | 105                    | 125       | 225                    | 200                    | 63       | 2.2             | KOL 300      |
| 400             | 25              | 1000      | 135                    | 150       | 275                    | 275                    | 113      | 4.0             | KOL 400      |
| 450             | 25              | 1000      | 135                    | 150       | 300                    | 300                    | 151      | 5.3             | KOL 450      |
| 600             | 25              | 1000      | 140                    | 150       | 375                    | 420                    | 240      | 8.5             | KOL 600      |

Column sections 1.5 m long

|      |    |      |     |     |     |     |     |      |                 |
|------|----|------|-----|-----|-----|-----|-----|------|-----------------|
| 150  | 25 | 1500 | 75  | 100 | 150 | 105 | 25  | 0.9  | KOL 150/1500    |
| 200  | 25 | 1500 | 75  | 100 | 175 | 150 | 45  | 1.6  | KOL 200/1500    |
| 300  | 25 | 1500 | 105 | 125 | 225 | 200 | 100 | 3.5  | KOL 300/1500    |
| 400  | 25 | 1500 | 135 | 150 | 275 | 275 | 175 | 6.2  | KOL 400/1500    |
| 450  | 25 | 1500 | 135 | 150 | 300 | 300 | 225 | 7.9  | KOL 450/1500    |
| 600  | 25 | 1500 | 140 | 150 | 375 | 420 | 380 | 13.4 | KOL 600/1500    |
| 800  | —  | 1500 | 250 | —   | —   | 700 | 600 | 21.2 | KOL 800/1500/L  |
| 1000 | —  | 1500 | 250 | —   | —   | 875 | 950 | 33.5 | KOL 1000/1500/L |



# JACKETED COLUMN SECTIONS



For controlling the temperature, the column sections may also be provided with a glass jacket.

In this design, adapted to the materials involved, the inner section and the jacket are fused together or are sealed with a permanently elastic silicone composition. This seal prevents impermissible high stresses between the inner and the outer parts.

This leads to the following operating conditions:

- permissible temperature up to 150°C
- permissible gage pressure in the jacket:
  - ND 80-ND 150 mm: 1.0 bar
  - ND 200-ND 300 mm: 0.5 bar

The chemical resistance of the silicone composition permits the use of hot water, steam, and the usual heat-carrier oils and cooling brines in the jacket space.

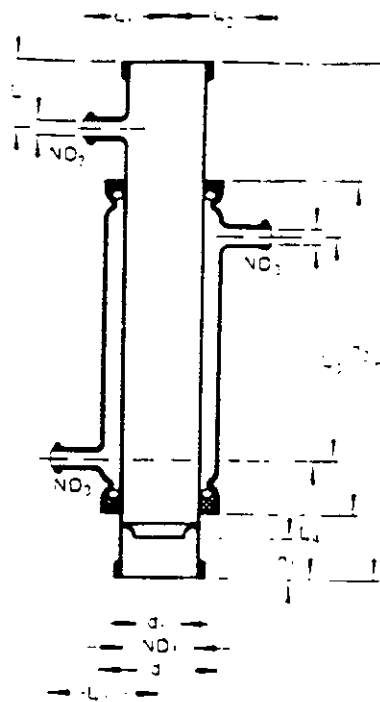
Column sections 1 m long

| ND <sub>1</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | Heat transfer area |                    | d<br>(mm) | d <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | L <sub>3</sub><br>(mm) | L <sub>4</sub><br>(mm) | Capacity |                    | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------------|--------------------|-----------|------------------------|------------------------|------------------------|------------------------|----------|--------------------|--------------|
|                 |                 |           |                        |                        | (m <sup>2</sup> )  | (ft <sup>2</sup> ) |           |                        |                        |                        |                        | (l)      | (ft <sup>3</sup> ) |              |
| 80              | 25              | 1000      | 40                     | 860                    | 0.23               | 2.47               | 115       | 45                     | 125                    | 750                    | 125                    | 4        | 0.1                | MKO 30       |
| 100             | 25              | 1000      | 40                     | 860                    | 0.28               | 3.01               | 135       | 65                     | 125                    | 750                    | 125                    | 7        | 0.2                | MKO 100      |
| 150             | 25              | 1000      | 60                     | 840                    | 0.41               | 4.41               | 190       | 105                    | 150                    | 700                    | 150                    | 16       | 0.5                | MKO 150      |
| 200             | 25              | 1000      | 60                     | 840                    | 0.53               | 5.70               | 270       | 150                    | 200                    | 700                    | 150                    | 29       | 1.0                | MKO 200      |
| 300             | 25              | 1000      | 30                     | 800                    | 0.73               | 7.85               | 390       | 200                    | 250                    | 650                    | 175                    | 63       | 2.2                | MKO 300      |

Column sections 1.5 m long

| ND <sub>1</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | Heat transfer area |                    | d<br>(mm) | d <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | L <sub>3</sub><br>(mm) | L <sub>4</sub><br>(mm) | Capacity |                    | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------------|--------------------|-----------|------------------------|------------------------|------------------------|------------------------|----------|--------------------|--------------|
|                 |                 |           |                        |                        | (m <sup>2</sup> )  | (ft <sup>2</sup> ) |           |                        |                        |                        |                        | (l)      | (ft <sup>3</sup> ) |              |
| 150             | 25              | 1500      | 60                     | 1340                   | 0.67               | 7.21               | 190       | 105                    | 150                    | 1200                   | 150                    | 25       | 0.9                | MKO 150 1500 |
| 200             | 25              | 1500      | 60                     | 1340                   | 0.87               | 9.36               | 270       | 150                    | 200                    | 1200                   | 150                    | 45       | 1.6                | MKO 200 1500 |
| 300             | 25              | 1500      | 30                     | 1300                   | 1.23               | 13.23              | 390       | 200                    | 250                    | 1150                   | 175                    | 100      | 3.5                | MKO 300 1500 |

# JACKETED COLUMN SECTIONS WITH SIDE ARM



is provided additionally with a thermometer side-arm

Sections 1 m length

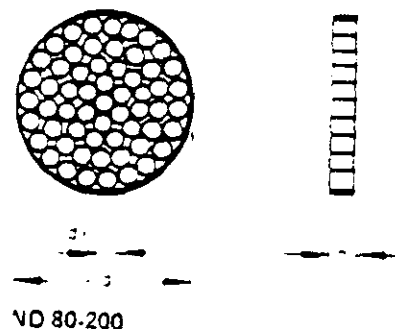
| Fig. | ND <sub>3</sub> | h    | h <sub>1</sub> | h <sub>2</sub> | Heat transfer area |                    | d    | d <sub>1</sub> | L    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | L <sub>4</sub> | Capacity |                    | Catalog ref. |
|------|-----------------|------|----------------|----------------|--------------------|--------------------|------|----------------|------|----------------|----------------|----------------|----------------|----------|--------------------|--------------|
|      |                 | (mm) | (mm)           | (mm)           | (m <sup>2</sup> )  | (ft <sup>2</sup> ) | (mm) | (mm)           | (mm) | (mm)           | (mm)           | (mm)           | (mm)           | (l)      | (ft <sup>3</sup> ) |              |
| 5    | 25              | 1000 | 40             | 300            | 0.22               | 2.36               | 115  | 45             | 75   | 100            | 125            | 700            | 125            | 4        | 0.1                | MKO 30 T     |
| 6    | 25              | 1000 | 40             | 300            | 0.27               | 2.90               | 135  | 65             | 75   | 125            | 125            | 700            | 125            | 7        | 0.2                | MKO 100 T    |
| 7    | 25              | 1000 | 60             | 750            | 0.39               | 4.20               | 190  | 105            | 100  | 150            | 150            | 650            | 150            | 16       | 0.5                | MKO 150 T    |
| 8    | 25              | 1000 | 60             | 755            | 0.49               | 5.27               | 270  | 150            | 100  | 175            | 200            | 625            | 150            | 29       | 1.0                | MKO 200 T    |
| 9    | 25              | 1000 | 30             | 750            | 0.68               | 7.32               | 390  | 200            | 125  | 225            | 250            | 575            | 175            | 63       | 2.2                | MKO 300 T    |

Sections 1.5 m long

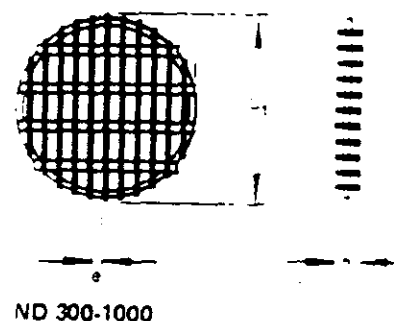
|   |    |      |    |      |      |       |     |     |     |     |     |      |     |     |     |                |
|---|----|------|----|------|------|-------|-----|-----|-----|-----|-----|------|-----|-----|-----|----------------|
| 5 | 25 | 1500 | 60 | 1250 | 0.47 | 5.05  | 190 | 105 | 100 | 150 | 150 | 1150 | 150 | 25  | 0.9 | MKO 150/1500 T |
| 5 | 25 | 1500 | 60 | 1255 | 0.83 | 8.93  | 270 | 150 | 100 | 175 | 200 | 1125 | 150 | 45  | 1.6 | MKO 200/1500 T |
| 5 | 25 | 1500 | 30 | 1250 | 1.18 | 12.70 | 390 | 200 | 125 | 225 | 250 | 1075 | 175 | 100 | 3.5 | MKO 300/1500 T |

# SUPPORTING GRIDS

| Suitable for ND | d<br>(mm) | d <sub>1</sub><br>(mm) | h<br>(mm) | Load bearing cap. |       | Catalog ref. |
|-----------------|-----------|------------------------|-----------|-------------------|-------|--------------|
|                 |           |                        |           | (kg)              | (lbs) |              |
| 30              | 70        | 11                     | 25        | 15                | 33    | TRA 30       |
| 100             | 90        | 11                     | 30        | 20                | 44    | TRA 100      |
| 150             | 140       | 13                     | 35        | 45                | 100   | TRA 150      |
| 200             | 160       | 20                     | 50        | 80                | 176   | TRA 200      |



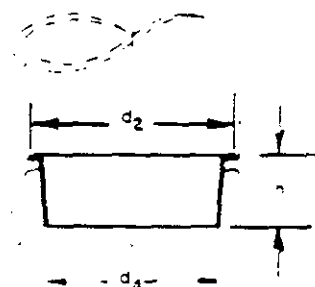
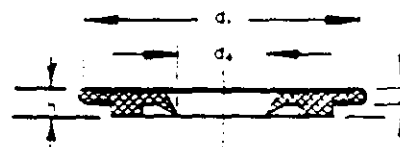
| Suitable for ND | L<br>(mm) | L <sub>1</sub><br>(mm) | e<br>(mm) | h<br>(mm) | Load bearing cap. |       | Catalog ref. |
|-----------------|-----------|------------------------|-----------|-----------|-------------------|-------|--------------|
|                 |           |                        |           |           | (kg)              | (lbs) |              |
| 300             | 265       | 275                    | 22        | 50        | 160               | 352   | TRR 300      |
| 400             | 363       | 370                    | 26        | 60        | 250               | 550   | TRR 400      |
| 450             | 390       | 430                    | 34        | 60        | 300               | 660   | TRR 450      |
| 600             | 570       | 575                    | 34        | 70        | 470               | 1034  | TRR 600      |
| 800             | 790       | 744                    | 39        | 130       | 1000              | 2200  | TRR 800      |
| 1000            | 960       | 960                    | 39        | 150       | 1200              | 2640  | TRR 1000     |



# GUIDING FUNNELS

TFE guiding funnels are inserted without additional gaskets.

| For ND | d<br>(mm) | d <sub>1</sub><br>(mm) | d <sub>4</sub><br>(mm) | h<br>(mm) | Catalog ref. |
|--------|-----------|------------------------|------------------------|-----------|--------------|
| 30     | 3         | 96                     | 55                     | 6         | LTT 80       |
| 100    |           | 116                    | 75                     |           | LTT 100      |
| 150    | 4         | 169                    | 105                    | 8         | LTT 150      |
| 200    |           | 220                    | 150                    |           | LTT 200      |
| 300    |           | 320                    | 230                    |           | LTT 300      |
| 400    | 5         | 435                    | 310                    | 10        | LTT 400      |
| 450    |           | 492                    | 350                    |           | LTT 450      |
| 600    |           | 645                    | 460                    |           | LTT 600      |

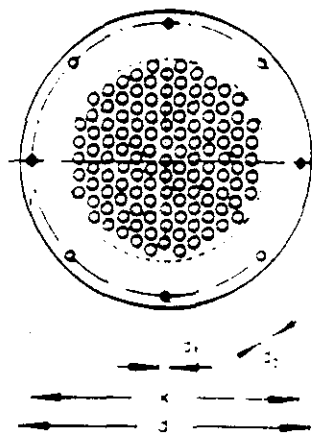


| For ND | d <sub>2</sub><br>(mm) | d <sub>4</sub><br>(mm) | h<br>(mm) | Catalog ref. |
|--------|------------------------|------------------------|-----------|--------------|
| 300    | 790                    | 600                    | 80        | LTR 800      |
| 1000   | 960                    | 800                    | 80        | LTR 1000     |

# PERFORATED RETENTION PLATES

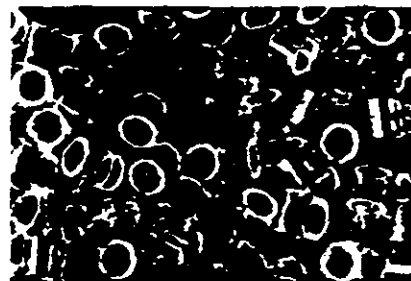
Use of the PTFE retention plates is recommended particularly when working in vacuum in order to retain the packing in the case of pressure surges. They are assembled by clamping between sections using collar gaskets (DICH. 117). Thickness = 1 mm.

| Plate for NO | d<br>(mm) | d <sub>2</sub><br>(mm) | No. of holes<br>d <sub>2</sub> | d <sub>1</sub><br>(mm) | No. of holes<br>d <sub>1</sub> | k<br>(mm) | Catalog ref. |
|--------------|-----------|------------------------|--------------------------------|------------------------|--------------------------------|-----------|--------------|
| 30           | 170       | 6                      | 109                            | 3.5                    | 6                              | 150       | FJL 30       |
| 100          | 190       | 6                      | 163                            | 3.5                    | 6                              | 170       | FJL 100      |
| 150          | 245       | 10                     | 151                            | 3.5                    | 3                              | 225       | FJL 150      |
| 200          | 300       | 15                     | 109                            | 3.5                    | 3                              | 280       | FJL 200      |
| 300          | 415       | 20                     | 151                            | 3.5                    | 12                             | 395       | FJL 300      |
| 400          | 515       | 20                     | 271                            | 3.5                    | 16                             | 495       | FJL 400      |
| 450          | 610       | 20                     | 261                            | 3.5                    | 16                             | 585       | FJL 450      |
| 600          | 735       | 25                     | 367                            | 13.0                   | 20                             | 710       | FJL 600      |



## RASCHIG RINGS

|    | Density (kg/m <sup>3</sup> ) |           | Surface area (m <sup>2</sup> /m <sup>3</sup> ) |           | Catalog ref. |
|----|------------------------------|-----------|------------------------------------------------|-----------|--------------|
|    | in bulk                      | in layers | in bulk                                        | in layers |              |
| 8  | 538                          | —         | 658                                            | —         | RAS 8        |
| 10 | 541                          | —         | 581                                            | —         | RAS 10       |
| 15 | 392                          | —         | 392                                            | —         | RAS 15       |
| 20 | 282                          | —         | 262                                            | —         | RAS 20       |
| 25 | 279                          | —         | 184                                            | —         | RAS 25       |
| 30 | 204                          | 225       | 131                                            | 142       | RAS 30       |
| 40 | 164                          | 199       | 93                                             | 111       | RAS 40       |
| 50 | 144                          | 178       | 83                                             | 90        | RAS 50       |



In addition to glass Raschig rings we supply packing bodies of all types and materials, depending on the design characteristics of the column.

## FILTER PLATES

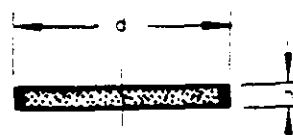
SCHOTT filter plates are edge-fused for clamping between K.F. plane flanges.

They are assembled by clamping between sections using collar gaskets (DICH. 117).

Catalog ref. must include the symbol for porosity.

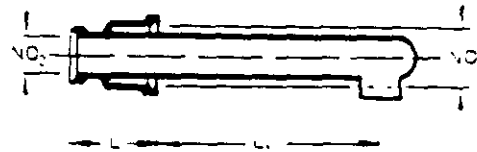
| Plate for NO | d<br>(mm) | h<br>(mm) | Porosity | Catalog ref. |
|--------------|-----------|-----------|----------|--------------|
| 80           | 110       | 11        | 0.2      | FIL 80/...   |
| 100          | 130       | 13        | 0.2      | FIL 100/...  |
| 150          | 185       | 16        | 0.2      | FIL 150/...  |
| 200          | 235       | 19        | 0.2      | FIL 200/...  |

| Porosity                                    | 0   | 1   | 2  |
|---------------------------------------------|-----|-----|----|
| Nominal values for max. diam. of pores (μm) | 150 | 30  | 40 |
|                                             | 10  | 10  | 10 |
|                                             | 200 | 150 | 30 |



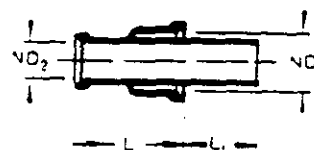
## NLET PIPES, ANGLED

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.    |
|-----------------|-----------------|-----------|------------------------|-----------------|
| 25              | 15              | 100       | 100                    | EIN 25/15/100 W |
|                 |                 | 100       | 100                    | EIN 50/25/100 W |
|                 |                 | 100       | 125                    | EIN 50/25/125 W |
|                 |                 | 100       | 150                    | EIN 50/25/150 W |
|                 |                 | 100       | 175                    | EIN 50/25/175 W |
| 50              | 25              | 100       | 225                    | EIN 50/25/225 W |
|                 |                 | 150       | 275                    | EIN 80/50/275 W |
|                 |                 | 150       | 300                    | EIN 80/50/300 W |
|                 |                 | 150       | 375                    | EIN 80/50/375 W |



## NLET PIPES

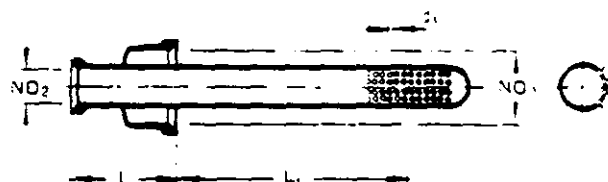
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|--------------|
| 25              | 15              | 100       | 100                    | EIN 25/15    |
| 50              | 25              | 100       | 100                    | EIN 50/25    |
| 30              | 50              | 150       | 100                    | EIN 80/50    |
| 30              | 30              | 150       | 100                    | EIN 100/80   |



For special lengths, the Catalog ref. must be supplemented by the desired length L<sub>1</sub> in mm, e.g. EIN 50/25 L<sub>1</sub> = 300.

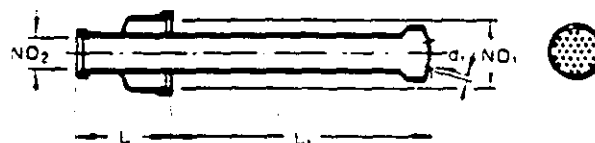
## PRINKLERS FOR HORIZONTAL MOUNTINGS

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | No. of bores | Catalog ref.    |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|-----------------|
| 25              | 15              | 100       | 150                    |                        | 48           | BRA 50/25/150 W |
|                 |                 | 100       | 175                    | 2                      | 48           | BRA 50/25/175 W |
|                 |                 | 100       | 225                    |                        | 48           | BRA 50/25/225 W |
| 50              | 25              | 150       | 275                    |                        | 80           | BRA 80/50/275 W |
|                 |                 | 150       | 300                    | 2                      | 80           | BRA 80/50/300 W |
|                 |                 | 150       | 375                    |                        | 80           | BRA 80/50/375 W |



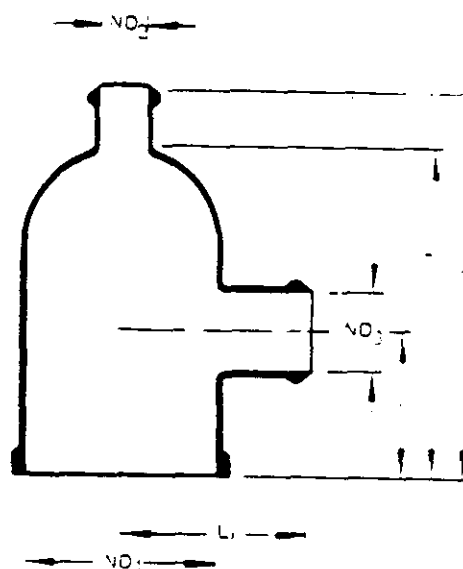
## PRINKLERS FOR VERTICAL MOUNTING

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | No. of bores | Catalog ref.     |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|------------------|
| 25              | 15              | 100       | 300                    |                        |              | BRA 50/25/300 S  |
|                 |                 | 100       | 400                    | 2                      | 61           | BRA 50/25/400 S  |
|                 |                 | 100       | 500                    |                        |              | BRA 50/25/500 S  |
| 50              | 25              | 150       | 300                    |                        |              | BRA 100/50/300 S |
|                 |                 | 150       | 400                    | 3                      | 127          | BRA 100/50/400 S |
|                 |                 | 150       | 500                    |                        |              | BRA 100/50/500 S |



# CLOSING COVERS

| NO <sub>2</sub> | NO <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|-----------|------------------------|--------------|
| 25              | 25              | 300       | 240                    | 100       | 100                    | ABS 30/ 25   |
|                 | 50              | 300       | 240                    | 125       | 100                    | ABS 30/ 50   |
| 25              | 25              | 300       | 240                    | 150       | 125                    | ABS 100/ 25  |
|                 | 50              | 300       | 240                    | 150       | 125                    | ABS 100/ 50  |
| 25              | 50              | 350       | 290                    | 150       | 150                    | ABS 150/ 50  |
|                 | 80              | 350       | 290                    | 150       | 150                    | ABS 150/ 30  |
| 50              | 50              | 400       | 340                    | 150       | 175                    | ABS 200/ 50  |
|                 | 80              | 400       | 340                    | 150       | 175                    | ABS 200/ 30  |
|                 | 100             | 450       | 390                    | 200       | 175                    | ABS 200/100  |
| 50              | 50              | 500       | 440                    | 200       | 225                    | ABS 300/ 50  |
|                 | 80              | 500       | 440                    | 200       | 225                    | ABS 300/ 30  |
|                 | 100             | 500       | 440                    | 200       | 225                    | ABS 300/100  |
|                 | 150             | 550       | 490                    | 250       | 275                    | ABS 300/150  |
| 50              | 80              | 550       | 490                    | 200       | 275                    | ABS 400/ 30  |
|                 | 150             | 550       | 590                    | 250       | 325                    | ABS 400/150  |
|                 | 200             | 750       | 590                    | 300       | 325                    | ABS 400/200  |
| 50              | 80              | 550       | 590                    | 300       | 300                    | ABS 450/ 80  |
|                 | 150             | 700       | 640                    | 350       | 350                    | ABS 450/150  |
|                 | 200             | 800       | 740                    | 400       | 350                    | ABS 450/200  |
| 50              | 80              | 850       | 790                    | 300       | 375                    | ABS 600/ 80  |
|                 | 200             | 850       | 790                    | 300       | 425                    | ABS 600/200  |
|                 | 300             | 950       | 790                    | 400       | 500                    | ABS 600/300  |

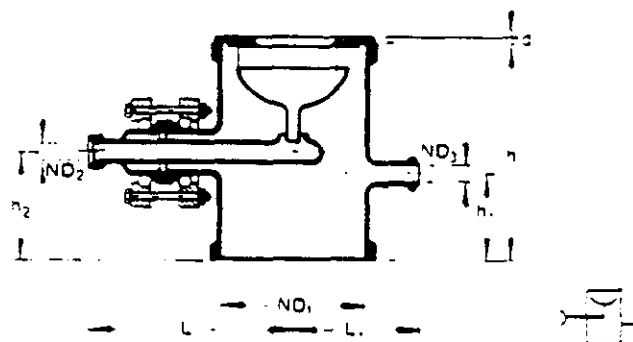


| NO <sub>1</sub> | NO <sub>2</sub> | NO <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.    |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|------------------------|-----------------|
| 300             | 30              | 200             | 1050      | 929                    | 400       | 575                    | ABS 300/ 30 200 |
|                 | 80              | 300             | 1050      | 929                    | 400       | 650                    | ABS 300/ 30 300 |
|                 | 150             | 200             | 1050      | 929                    | 400       | 575                    | ABS 300/150 200 |
|                 | 150             | 300             | 1050      | 929                    | 400       | 650                    | ABS 300/150 300 |

# DISTILLATE/TAKE-OFF

component is used to take off the distillate in glass  
tubs.

Each NO<sub>3</sub> is used for the insertion of a thermometer.



| NO <sub>2</sub> | NO <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | d<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|-----------|------------------------|-----------|--------------|
| 25              | 25              | 250       | 75                     | 125                    | 200       | 100                    | 3         | CAS 30       |
| 25              | 25              | 250       | 75                     | 125                    | 225       | 125                    | 3         | CAS 100      |
| 25              | 25              | 250       | 100                    | 125                    | 250       | 150                    | 4         | CAS 150      |
| 25              | 25              | 250       | 100                    | 125                    | 275       | 175                    | 4         | CAS 200      |
| 25              | 25              | 400       | 200                    | 200                    | 325       | 225                    | 5         | CAS 300      |
| 50              | 25              | 400       | 200                    | 200                    | 425       | 275                    | 5         | CAS 400      |
| 50              | 25              | 400       | 200                    | 200                    | 450       | 300                    | 5         | CAS 450      |
| 50              | 25              | 600       | 300                    | 300                    | 525       | 375                    | 5         | CAS 600      |

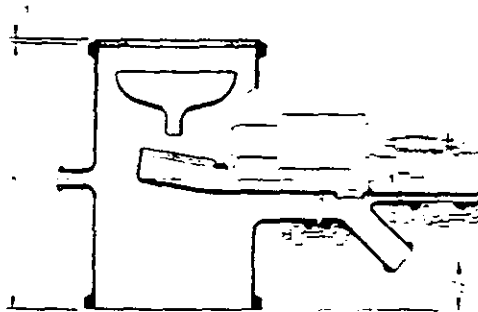
# FLUX DIVIDERS

Distillation columns reflux dividers are used to divide the condensate into reflux and product.

Distillate is led through a PTFE guiding funnel into a run-off pipe.

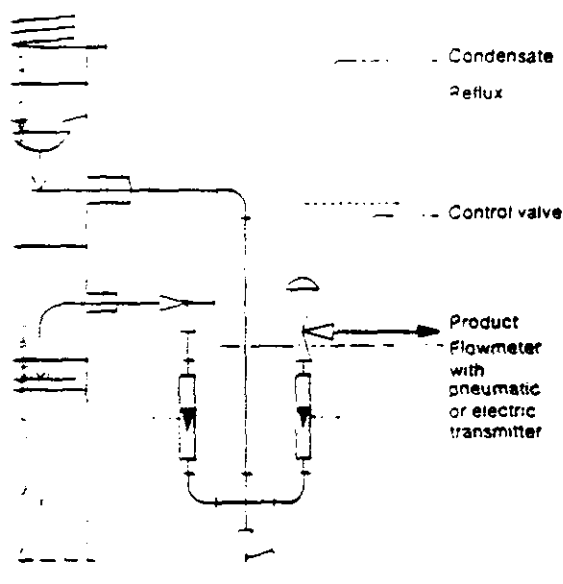
Pivot arm distributes the liquid into the take-off pipe or the column.

Movements of this pivot arm is controlled by an explosion-protected solenoid (24 VDC). By connecting this to a any desired reflux ratio can be obtained.



| $NO_2$ | $NO_3$ | $h$<br>(mm) | $h_1$<br>(mm) | $L$<br>(mm) | $L_1$<br>(mm) | $d$<br>(mm) | Catalog ref. |
|--------|--------|-------------|---------------|-------------|---------------|-------------|--------------|
| 25     | 25     | 300         | 54            | 247         | 125           | 3           | RLT 100      |
| 25     | 25     | 300         | 54            | 272         | 150           | 4           | RLT 150      |
| 25     | 25     | 300         | 54            | 297         | 175           | 4           | RLT 200      |
| 50     | 25     | 500         | 120           | 428         | 225           | 5           | RLT 300      |
| 50     | 25     | 500         | 120           | 478         | 275           | 5           | RLT 400      |
| 50     | 25     | 500         | 120           | 503         | 300           | 5           | RLT 450      |

Pneumatic actuation, supplement Catalog ref. with "P".



## Reflux Ratio Control outside the Column

For large diameter glass columns reflux division outside the column is used.

The total condensate of the column is continuously divided into two partial flows which are measured by flowmeters with pneumatic or electric transmitters.

A control circuit compares the ratio of the partial flows. The selected ratio is kept constant by the control valve in the discharged line.

The reflux ratio is maintained even if the amount of condensate varies.

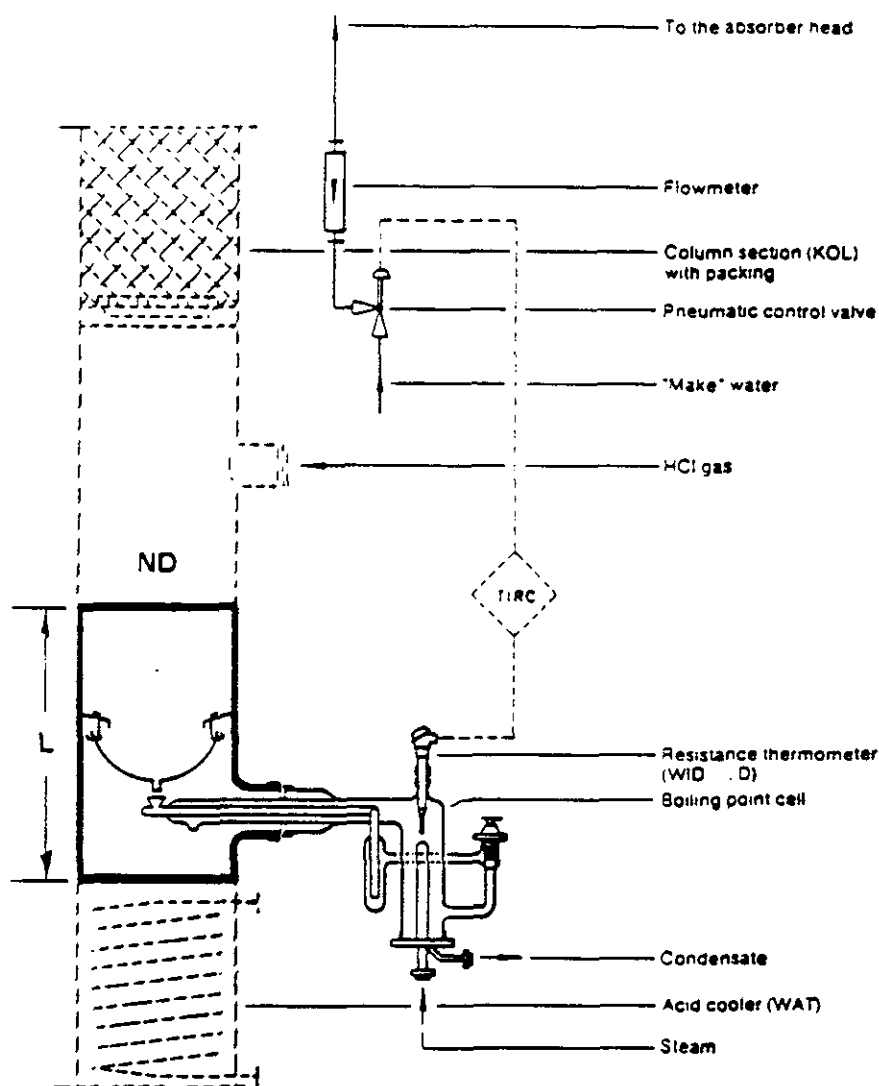
# BOILING POINT MEASURING CELL

To maintain a constant concentration of hydrochloric acid under varying HCL feed conditions.

The unit consists of a section which is installed as part of the column. This section will continuously take off a small amount of the HCL, bring it to boiling temperature with a tantalum Rayonet heater and return it to the column. A resistance thermometer measures this boiling temperature. This electrical signal is taken to a transmitter which changes the signal to a pneumatic one which in turn regulates the make-water control valve. Depending on the operating conditions, the HCL can be kept within 0.5% of the desired concentration.

| ND  | L   | Catalog ref. |
|-----|-----|--------------|
| 150 | 300 | MEZ 150      |
| 200 | 300 | MEZ 200      |
| 300 | 400 | MEZ 300      |
| 400 | 400 | MEZ 400      |
| 450 | 400 | MEZ 450      |
| 600 | 600 | MEZ 600      |

Supplement Catalog ref. with "E" for Electrical or "D" for Steam Heated or "E Ex" for Explosion Proof.





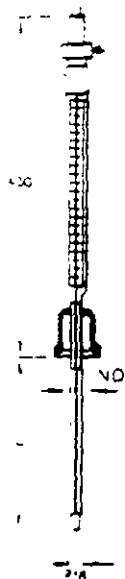
# CONTACT THERMOMETERS

Apart from standard range 0°C - 200°C these thermometers have contacts which can be adjusted by a rotary magnet.

This permits triggering of automatic switching operations when the preset temperature has been reached.

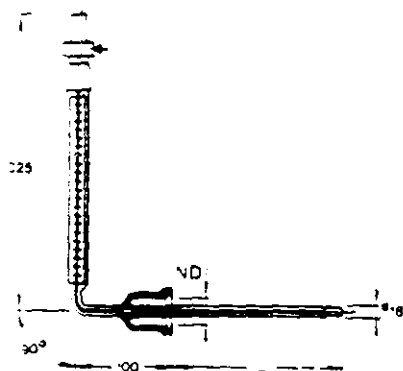
The maximum load is 30 mA. A protective relay should be used for higher switching outputs.

A two-core cable, 1.5 m long, is supplied for electrical connections.



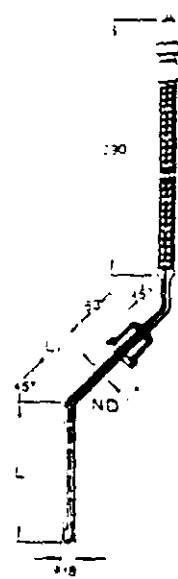
Contact Thermometer with straight stem

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THK 100      |
|    | 200    | THK 200      |
|    | 300    | THK 300      |



Contact Thermometer angled 90

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THK 100 W    |
|    | 150    | THK 150 W    |
|    | 200    | THK 200 W    |



Contact Thermometer for spherical vessels

| For spherical vessel | ND | L (mm) | L <sub>1</sub> (mm) | Catalog ref. |
|----------------------|----|--------|---------------------|--------------|
| GEK 10               | 25 | 175    | 115                 | THG 10 K     |
| GEK 20               |    | 225    | 125                 | THG 20 K     |
| GEK 50               |    | 300    | 250                 | THG 50 K     |
| GEK 100              |    | 400    | 135                 | THG 100 K    |
| GEK 200              |    | 475    | 155                 | THG 200 K    |

## ELECTRICAL LEVEL CONTROL

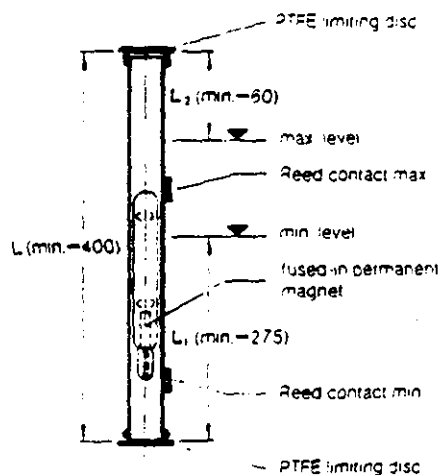
Contactless magnetic switches (Reed contacts) are used for the electric type of control and monitoring of liquid levels.

In parallel to the vessel to be controlled a vertical tube is set up, the length of which is governed by the possible level difference. The glass float with a fused-in permanent magnet moves in this tube. The number of switches attached to the vertical tube can be chosen at will.

The individual switch points are of the fail-safe type. The necessary switch boxes in the stock standard design (two switch points) are not explosion-proofed.

Please specify your requirements.

Catalog ref. FUST 25/R



# THERMOMETERS

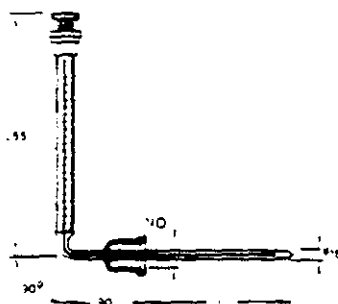
Thermometers are provided with ND 25 KF flanges of the socket type for easy insertion in thermometer branches. They are supplied with straight or angular stems. Thermometers with angles 45° and 90° are used in spherical vessels, covers and

columns and have a turning scale to give better reading. The standard model is designed for the temperature range 2° to ±200°C.



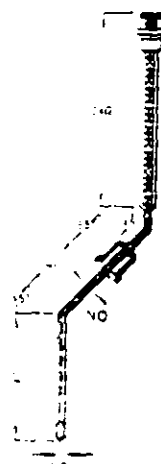
Thermometer with straight stem

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THE 25/100   |
|    | 200    | THE 25/200   |
|    | 300    | THE 25/300   |



Thermometer angled 90°

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 50     | THE 50 W     |
|    | 100    | THE 100 W    |
|    | 150    | THE 150 W    |
|    | 200    | THE 200 W    |



Thermometer for spherical vessels

| For spherical | ND | L (mm) | L <sub>1</sub> (mm) | Catalog ref. |
|---------------|----|--------|---------------------|--------------|
| GEK 10        | 25 | 175    | 115                 | THG 10       |
| GEK 20        |    | 225    | 125                 | THG 20       |
| GEK 50        |    | 300    | 150                 | THG 50       |
| GEK 100       |    | 400    | 135                 | THG 100      |
| GEK 200       |    | 475    | 155                 | THG 200      |

## RESISTANCE THERMOMETERS

KF resistance thermometers are used for the telemetering, recording and control of temperatures in O-I/SCHOTT glass installation.

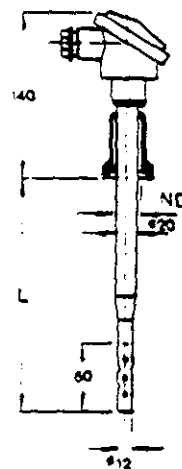
They ensure accurate, reproducible temperature measurements with short response times.

Glass resistance thermometers consist of two precision Pt 100 resistance coils, enclosed in a perforated guard tube, and of a plastic connecting head.

The KF flange is of the ND 25 socket type.

The measurement and control range lies between -200°C and +300°C.

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | WID 25/100 D |
|    | 150    | WID 25/150 D |
|    | 200    | WID 25/200 D |
|    | 300    | WID 25/300 D |



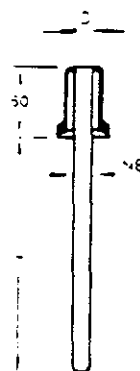
## THERMOMETER POCKET

This component is used as a guard for loosely inserted stem thermometers. When used vertically or at an angle, the sheath can be filled with liquid to ensure better heat conduction.

| VD | d<br>(mm) | L<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 15 | 9         | 50        | THH 15/ 50   |
| 25 | 13        | 100       | THH 25/100   |
|    |           | 150       | THH 25/150   |
|    |           | 200       | THH 25/200   |
|    |           | 250       | THH 25/250   |
|    |           | 300       | THH 25/300   |
|    |           | 400       | THH 25/400   |
| 50 | 17        | 150       | THH 50/150   |
|    |           | 200       | THH 50/200   |
|    |           | 250       | THH 50/250   |
|    |           | 300       | THH 50/300   |
|    |           | 400       | THH 50/400   |

Pockets of nominal diameter 50 mm may also serve for the insertion of quartz lamps.

The flange is a KF socket. Special lengths are available.



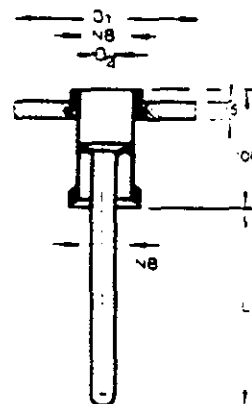
## THERMOMETER POCKET WITH PLANE FLANGE

With plane flange

This pocket can be filled with heat-conducting substances.

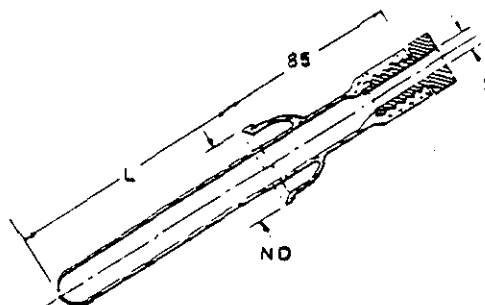
The adaptor coupling supplied with the thermometer is used to make a tight connection with thermometers made of other materials. A flat gasket should be used as a seal for the plane flange.

| ND | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | L<br>(mm) | Catalog ref. |
|----|------------------------|------------------------|-----------|--------------|
| 15 | 100                    | 9                      | 100       | THH 15/100 F |
| 25 | 125                    | 13                     | 150       | THH 25/150 F |
|    |                        |                        | 200       | THH 25/200 F |
| 50 | 175                    | 17                     | 200       | THH 50/200 F |



## THERMOCOUPLE POCKET

| ND | L<br>(mm) | D<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 25 | 150       | 6.3       | TP 25/150    |
| 40 | 175       | 6.3       | TP 40/175    |
| 50 | 200       | 6.3       | TP 50/200    |



## KF FLOW METERS

These instruments are based on the float principle and are suitable for the measurement of liquid and gas streams. The precision is  $\pm 2\%$  of the value read off at the upper edge of the float. KF flowmeters are installed vertically in pipelines and consist of a calibrated measuring tube 300 mm long. A single unit consists of the measuring tube, the float and screwed-in stops.

The flowmeter is graduated in mm and has a detachable scale held by clips. On the standard model this scale is calibrated for water at 20°C but it can be calibrated for other media and operating conditions. Calculation data are supplied with the instruments.

The lower flange (in the direction of flow) is socket type, the upper a ball type.

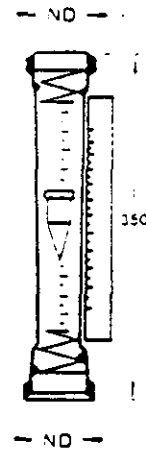
The following data are required when ordering flowmeters for other media and operating conditions:

1. Medium to be measured
2. Flow rate in  $\text{dm}^3/\text{min}$  or  $\text{m}^3/\text{h}$
3. Density of substance to be measured at operating conditions in  $\text{kg}/\text{litre}$  or  $\text{kg}/\text{m}^3$
4. Viscosity of the substance to be measured at operating conditions in  $\text{Pa} \cdot \text{s}$
5. Temperature at the measuring point, in °C
6. Operating pressure at the measuring point, in bar  
in the case of gases, state reference conditions, i.e. temperature, pressure.

Measuring range

| NO | Float    | Water 20°C (l/h) | Air (l/h)      | Catalog ref. |
|----|----------|------------------|----------------|--------------|
| 15 | Corundum | 0.025 - 0.25     | 1 - 13         | G 0.25/14    |
|    |          | 0.63 - 0.63      | 3 - 30         | G 0.63/33    |
|    |          | 0.4 - 4          | 17 - 170       | G 1/160      |
|    |          | 1 - 10           | 38 - 380       | G 10/400     |
|    |          | 4 - 40           | 140 - 1400     | G 40/1600    |
| 25 | PTFE     | 6.3 - 63         | 220 - 2200     | G 63/2400    |
|    |          | 16 - 160         | 600 - 6000     | G 1.400      |
| 40 | PTFE     | 40 - 400         | 1500 - 15000   | G 1.1000     |
|    |          | 63 - 630         | 2400 - 24000   | G 2.1600     |
| 80 | PTFE     | 100 - 1000       | 4000 - 40000   | G 2.2500     |
|    |          | 160 - 1600       | 6000 - 60000   | G 4.4000     |
|    |          | 250 - 2500       | 10000 - 100000 | G 4.6300     |
|    |          | 400 - 4000       | 15000 - 150000 | G 4.10000    |
|    |          | 630 - 6300       | -              | G 5.16000    |

150 250



## PNEUMATIC LEVEL CONTROL

For liquid level control the above-described pneumatic transmitter (Rota system) is again used, but in combination with a glass float provided with a magnetic core. The transmitter is fixed by a support to a KF pipe NO 50 mm, 500 mm long.

Two fixed stops limit the range of movement of the magnetic float. The maximum change in the level that can be covered is 170 mm and is shown on a horizontal scale graduated from 0 to 10. A mechanical system converts the measured values into pressures and thereby, through a controller, actuates a pneumatic regulator mechanism.

Instrument air at a pressure of 1.4 bar is required to operate the transmitter. The consumption of compressed air is about 350 l/h (normal state). The apparatus is adjusted in such a way that output pressures of 0.28 to 1 bar correspond to measured values 1 to 10 (10 to 100%). Feed and control air connections (cutting ring bolt coupling for 6 x 1 mm tube) are indicated on the apparatus.

The permissible temperature of the housing is 70°C.



Compl. unit

Catalog ref.

NO 50

PURE 1 P



**THINK  
GLASS**

# FLANGES AND GASKETS

The choice correct flanges and gaskets is an important factor for safe operation of glass installations.

The selection criteria are as follows:

- nominal diameter of the components
- type of media to be processed
- external corrosion

The couplings consist of split or unsplit flanges which transfer the bolt forces to the glass flange via inserts (see Figs. 1 and 3).

Permissible operating temperature 200°C.

## FLANGES AND INSERTS

For nominal diameters ND 15 - ND 300

Code letter "K"

Material: plastic

Inserts: plastic

Code letter "S"

Material: aluminum

Insert: ND 15 - 100: plastic

ND 150 - 300: aluminum

For special conditions the aluminum flanges may also be provided with a corrosion-resistant coating and/or the inserts can be made of stainless steel.

For nominal diameters ND 300 - ND 600

heavy cast iron flanges (symbol "G") in split form are used.

The inserts consist of adhesive-bonded rubber-asbestos strips.

For nominal diameters ND 800 and ND 1000

sectional steel rings in split form with adhesively lined inserts.

## GASKETS

PTFE is used as the gasket material because of its universal chemical resistance.

## NUTS AND BOLTS

The couplings include standard cadmium-plated bolts. For extreme conditions stainless-steel bolts and nuts can be applied.

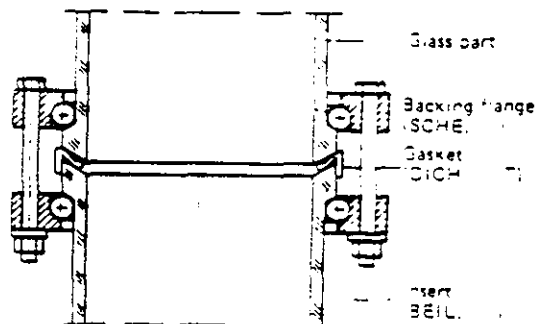


Fig. 1  
ND 15-300 mm "ball and socket" coupling

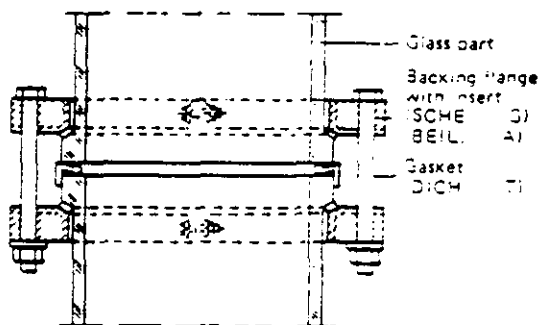


Fig. 2  
ND 300-600 mm "plane" coupling

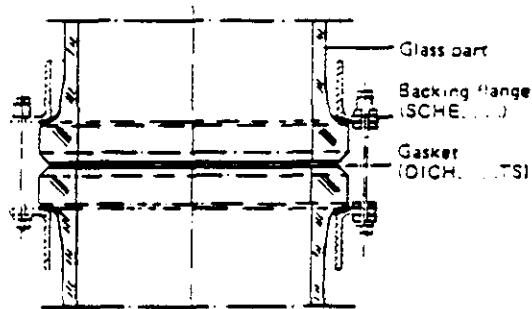


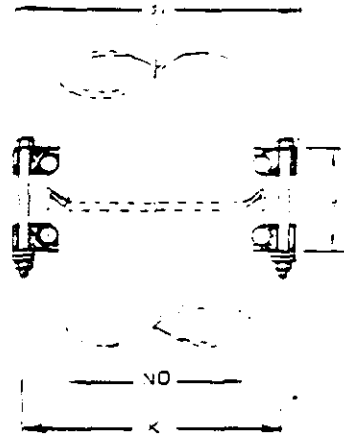
Fig. 3  
ND 800-1000 coupling

# FLANGE ASSEMBLIES ND 15 TO 300

For components ND 15 to 300 the flange assembly consists of two unsplined cast or aluminium flanges, two inserts, and the required number of cadmium plated steel bolts, nuts and washers. The Catalog reference for the coupling must include "K" for cast or "S" for aluminium.

When K/F loaders, filter plates, and supporting rings are incorporated couplings with longer bolts must be used.

Gaskets must be ordered separately.



| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | K<br>(mm) | Flange         | Insert          | Bolt with nut and washer | Catalog ref. |
|-----|-----------|------------------------|-----------|----------------|-----------------|--------------------------|--------------|
| 15  | 44        | 64                     | 50        | 2 x SCHE 15/K  | 2 x BEIL 15/K   | 3 x M 6 x 55             | SVER 15/K    |
| 25  | 51        | 92                     | 75        | 2 x SCHE 25/K  | 2 x BEIL 25/K   | 3 x M 8 x 60             | SVER 25/K    |
| 40  | 65        | 118                    | 100       | 2 x SCHE 40/K  | 2 x BEIL 40/K   | 3 x M 8 x 80             | SVER 40/K    |
| 50  | 73        | 131                    | 110       | 2 x SCHE 50/K  | 2 x BEIL 50/K   | 3 x M 8 x 80             | SVER 50/K    |
| 80  | 92        | 172                    | 150       | 2 x SCHE 80/K  | 2 x BEIL 80/K   | 6 x M 8 x 110            | SVER 80/K    |
| 100 | 93        | 192                    | 170       | 2 x SCHE 100/K | 2 x BEIL 100/K  | 6 x M 8 x 110            | SVER 100/K   |
| 150 | 95        | 247                    | 225       | 2 x SCHE 150/K | 2 x BEIL 150/K  | 8 x M 8 x 120            | SVER 150/K   |
| 200 | 103       | 307                    | 280       | 2 x SCHE 200/K | 2 x BEIL 200/PK | 8 x M 8 x 120            | SVER 200/K   |
| 300 | 107       | 425                    | 395       | 2 x SCHE 300/K | 2 x BEIL 300/PK | 12 x M 8 x 120           | SVER 300/K   |
| 15  | 44        | 64                     | 50        | 2 x SCHE 15/S  | 2 x BEIL 15/K   | 3 x M 6 x 55             | SVER 15/S    |
| 25  | 51        | 92                     | 75        | 2 x SCHE 25/S  | 2 x BEIL 25/K   | 3 x M 8 x 65             | SVER 25/S    |
| 40  | 65        | 118                    | 100       | 2 x SCHE 40/S  | 2 x BEIL 40/K   | 3 x M 8 x 80             | SVER 40/S    |
| 50  | 69        | 131                    | 110       | 2 x SCHE 50/S  | 2 x BEIL 50/K   | 3 x M 8 x 80             | SVER 50/S    |
| 80  | 92        | 172                    | 150       | 2 x SCHE 80/S  | 2 x BEIL 80/K   | 6 x M 8 x 110            | SVER 80/S    |
| 100 | 93        | 192                    | 170       | 2 x SCHE 100/S | 2 x BEIL 100/K  | 6 x M 8 x 110            | SVER 100/S   |
| 150 | 100       | 247                    | 225       | 2 x SCHE 150/S | 2 x BEIL 150/AS | 8 x M 8 x 120            | SVER 150/S   |
| 200 | 103       | 307                    | 280       | 2 x SCHE 200/S | 2 x BEIL 200/AS | 8 x M 8 x 120            | SVER 200/S   |
| 300 | 107       | 429                    | 395       | 2 x SCHE 300/S | 2 x BEIL 300/AS | 12 x M 8 x 120           | SVER 300/S   |

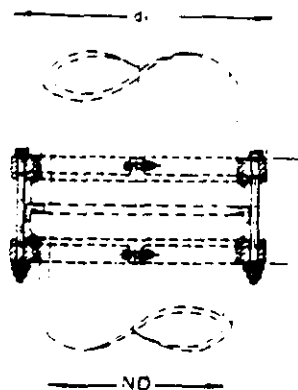
"S" type flange assemblies must be used in support rings.

# FLANGE ASSEMBLIES ND 300 TO 600

For components ND 300 to 600 the flange assembly consists of two solid grey cast iron flanges and the required number of cadmium plated steel bolts. The adhesively bonded liner in the flange avoids direct contact of glass and metal parts.

When supporting rings are included, couplings with longer bolts must be used.

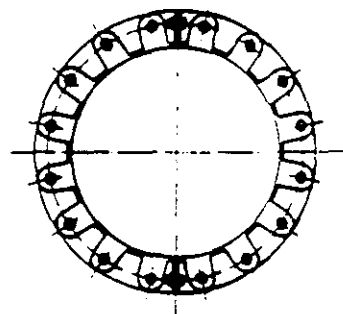
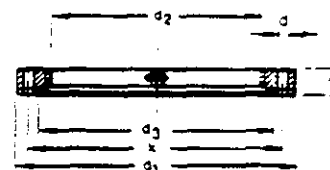
Gaskets must be ordered separately.



| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | flange         | Bolt with nut and washer          | Catalog ref. |
|-----|-----------|------------------------|----------------|-----------------------------------|--------------|
| 300 | 134       | 425                    | 2 x SCHE 300 G | 8 x M 8 x 150<br>4 x M 8 x 90     | SVER 300 G   |
| 400 | 134       | 525                    | 2 x SCHE 400 G | 12 x M 8 x 150<br>4 x M 8 x 90    | SVER 400 G   |
| 450 | 139       | 615                    | 2 x SCHE 450 G | 12 x M 8 x 150<br>4 x M 8 x 90    | SVER 450 G   |
| 600 | 172       | 755                    | 2 x SCHE 600 G | 16 x M 12 x 190<br>4 x M 12 x 120 | SVER 600 G   |

## FLANGES ND 300 TO 600

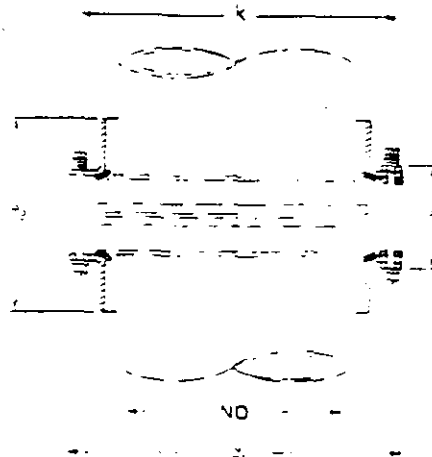
| ND  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | Number of holes | k<br>(mm) | d<br>(mm) | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|-----------------|-----------|-----------|--------------|
| 300 | 425                    | 326                    | 352                    | 40        | 12              | 395       | 9.5       | SCHE 300 G   |
| 400 | 525                    | 440                    | 464                    | 40        | 16              | 495       | 9.5       | SCHE 400 G   |
| 450 | 615                    | 501                    | 525                    | 40        | 16              | 585       | 9.5       | SCHE 450 G   |
| 600 | 755                    | 653                    | 685                    | 50        | 20              | 710       | 14.5      | SCHE 600 G   |



# FLANGE ASSEMBLIES ND 800/1000

For components ND 300 and 1000, the flange assembly consists of two split steel rings and the required amount of cadmium plated bolts, nuts, washers and springs.

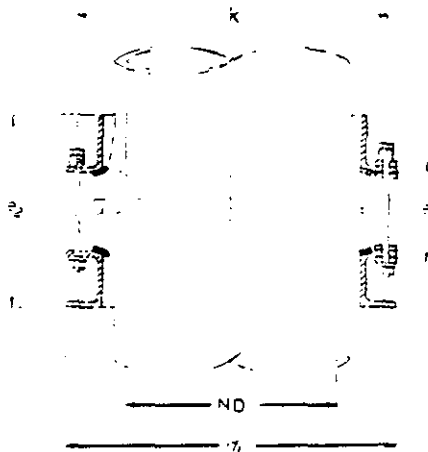
Gaskets must be ordered separately.



| ND   | $a_1$<br>(mm) | $a_2$<br>(mm) | $d_1$<br>(mm) | $k$<br>(mm) | Flange     | Bolt, nut<br>and washer | Spring          | Catalog ref. |
|------|---------------|---------------|---------------|-------------|------------|-------------------------|-----------------|--------------|
| 300  | 115           | 247           | 986           | 950         | 2xSCHE 300 | 8xM12x210<br>16xM12x180 | 24xOFED 7x15x45 | SVER 300     |
| 1000 | 117           | 249           | 1160          | 1120        | 2xSCHE1000 | 8xM12x210<br>20xM12x180 | 28xOFED 6x15x45 | SVER1000     |

## FLANGE ASSEMBLIES/SUPPORT RINGS ND 800/1000

These assemblies are used at the fixed point and are used as support rings.



| ND   | $a_1$<br>(mm) | $a_2$<br>(mm) | $d_1$<br>(mm) | $k$<br>(mm) | Flange                     | Bolt, nut<br>and washer | Spring          | Tapered<br>Washer | Catalog ref. |
|------|---------------|---------------|---------------|-------------|----------------------------|-------------------------|-----------------|-------------------|--------------|
| 300  | 114           | 290           | 986           | 950         | 1xSCHE 300<br>1xSCHE 800ZU | 8xM12x210<br>16xM12x180 | 24xOFED 7x15x45 | 24x14/434/C       | SVER 300ZU   |
| 1000 | 115           | 290           | 1170          | 1120        | 1xSCHE1000<br>1xSCHE1000ZU | 8xM12x210<br>20xM12x180 | 28xOFED 7x15x45 | 28x14/434/C       | SVER1000ZU   |

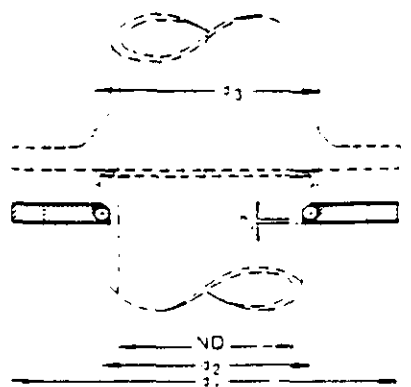


# ADAPTOR FLANGES

filled Aluminum adaptor flanges with plastic inserts are used to connect KF glass components to flanges of other materials (such as metal, plastic, ceramic, graphite, and filled and plated components). These permit the drilling of holes corresponding to those already present in the facing flange.

Adaptor flanges must be ordered separately.

These flanges can be ordered predrilled with an ANSI 150 lbs. pattern by adding "ASA 150" to the part number.

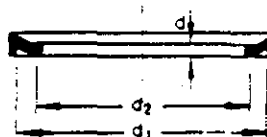


| D | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | Adaptor flange | Insert          | Catalog ref. |
|---|------------------------|------------------------|------------------------|-----------|------------------------|----------------|-----------------|--------------|
| 5 | 35                     | 31                     | 38                     | 10        | 4                      | 1 x ANSC 15    | 1 x BEIL 15 K   | AVER 15      |
| 5 | 115                    | 45                     | 56                     | 11        | 5                      | 1 x ANSC 25    | 1 x BEIL 25 K   | AVER 25      |
| 0 | 150                    | 63                     | 76                     | 13        | 7                      | 1 x ANSC 40    | 1 x BEIL 40 K   | AVER 40      |
| 0 | 165                    | 77                     | 90                     | 13        | 7                      | 1 x ANSC 50    | 1 x BEIL 50 K   | AVER 50      |
| 0 | 200                    | 111                    | 126                    | 17        | 9                      | 1 x ANSC 80    | 1 x BEIL 80 K   | AVER 80      |
| 0 | 220                    | 132                    | 148                    | 17        | 9                      | 1 x ANSC 100   | 1 x BEIL 100 K  | AVER 100     |
| 0 | 285                    | 187                    | 202                    | 17        | 8                      | 1 x ANSC 150   | 1 x BEIL 150 AS | AVER 150     |
| 0 | 340                    | 236                    | 254                    | 17        | 8                      | 1 x ANSC 200   | 1 x BEIL 200 AS | AVER 200     |
| 0 | 460                    | 341                    | 354                    | 22        | 8                      | 1 x ANSC 300   | 1 x BEIL 300 AS | AVER 300     |

## COLLAR GASKETS

TFE collar gaskets are used in the construction of glass apparatus for temperatures up to 200°C. They consist of an O-ring with centering collar. This form is particularly suitable for glass because of the high specific contact pressure that can be achieved with small forces. For ND 800 and 1000 a special TFE cord is used.

| D    | d<br>(mm) | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | Catalog ref. |
|------|-----------|------------------------|------------------------|--------------|
| 5    | 2.0       | 29                     | 23                     | DICH 15 T    |
| 25   | 2.0       | 43                     | 34                     | DICH 25 T    |
| 40   | 2.5       | 60                     | 51                     | DICH 40 T    |
| 50   | 2.5       | 74                     | 63                     | DICH 50 T    |
| 80   | 2.5       | 108                    | 96                     | DICH 80 T    |
| 100  | 3.0       | 128                    | 116                    | DICH 100 T   |
| 150  | 3.0       | 184                    | 169                    | DICH 150 T   |
| 200  | 3.0       | 231                    | 220                    | DICH 200 T   |
| 300  | 3.0       | 337                    | 321                    | DICH 300 T   |
| 400  | 4.0       | 468                    | 435                    | DICH 400 T   |
| 500  | 5.0       | 529                    | 492                    | DICH 450 T   |
| 600  | 6.0       | 688                    | 646                    | DICH 600 T   |
| 800  | —         | —                      | —                      | DICH 800 TS  |
| 1000 | —         | —                      | —                      | DICH 1000 TS |

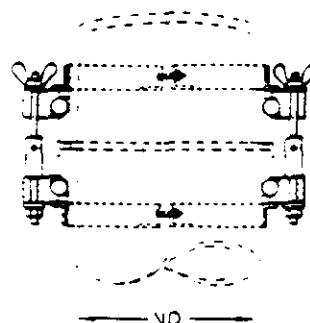


## QUICK—RELEASE COUPLINGS

Quick-release couplings are available for couplings that must frequently be opened (e.g., vessel closures, filling apertures, cleaning nozzles).

Hinged bolts and wing nuts in combination with split aluminum flanges permit easy handling. When the coupling is opened, the flanges are held on the glass parts by locking rings.

Gaskets must be ordered separately.



| ND  | Backing flange                   | Inserts         | Hinged bolts  | Locking rings | Catalog ref. |
|-----|----------------------------------|-----------------|---------------|---------------|--------------|
| 50  | 1 x SCHE 50 S<br>1 x SSCH 50 S   | 2 x BEIL 50 K   | 3 x SVGS 50   | 2 x SVSR 50   | SCHN 50      |
| 80  | 1 x SCHE 80 S<br>1 x SSCH 80 S   | 2 x BEIL 80 K   | 5 x SVGS 80   | 2 x SVSR 80   | SCHN 80      |
| 100 | 1 x SCHE 100 S<br>1 x SSCH 100 S | 2 x BEIL 100 K  | 6 x SVGS 80   | 2 x SVSR 100  | SCHN 100     |
| 150 | 1 x SCHE 150 S<br>1 x SSCH 150 S | 2 x BEIL 150 AS | 8 x SVGS 80   | 2 x SVSR 150  | SCHN 150     |
| 200 | 1 x SCHE 200 S<br>1 x SSCH 200 S | 2 x BEIL 300 AS | 8 x SVGS 200  | 2 x SVSR 200  | SCHN 200     |
| 300 | 1 x SCHE 300 S<br>1 x SSCH 300 S | 2 x BEIL 300 AS | 12 x SVGS 200 | 2 x SVSR 300  | SCHN 300     |

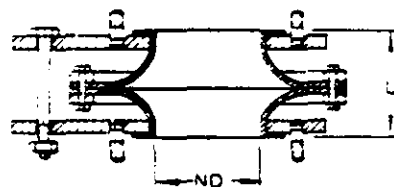
## VACUUM BELLOWS, PTFE

Because of their construction, these PTFE bellows are particularly suitable for apparatus and pipes operated at elevated temperatures under vacuum.

For connection to glass buttress ends, these must be provided with flat joint faces.

Range of use of the vacuum bellows:

- This design can be used at temperatures of up to 200°C both in vacuum and in the super-atmospheric pressure range (corresponding to the permissible operating pressures of the glass components).



| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 25  | 45        | FAL 25 V     |
| 40  | 50        | FAL 40 V     |
| 50  | 70        | FAL 50 V     |
| 80  | 95        | FAL 80 V     |
| 100 | 95        | FAL 100 V    |
| 150 | 120       | FAL 150 V    |
| 200 | 130       | FAL 200 V    |
| 300 | 145       | FAL 300 V    |

The Catalog ref. must be supplemented by a statement of whether the bellows are to be used.

- for coupling to glass parts on both sides, or
- for coupling to glass on one side and on the other side to a metal flange (with a statement of the nominal pressure and the hole pattern).

# UNIVERSAL BELLOWS, PTFE

| d<br>(mm) | L<br>(mm) | L <sub>min.</sub><br>(mm) | L <sub>max.</sub><br>(mm) | Catalog ref. |
|-----------|-----------|---------------------------|---------------------------|--------------|
| 20        | 75        | 70                        | 79                        | FALD 15 U    |
| 25        | 75        | 70                        | 79                        | FALD 25 U    |
| 32        | 100       | 95                        | 105                       | FALD 40 U    |
| 40        | 100       | 95                        | 105                       | FALD 50 U    |
| 50        | 100       | 95                        | 105                       | FALD 80 U    |
| 63        | 100       | 95                        | 105                       | FALD 100 U   |
| 80        | 125       | 120                       | 130                       | FALD 150 U   |

Universal PTFE bellows was specially designed to fit both spherical end forms without the use of separate

temperatures of up to 120°C, this pattern can be used both vacuum and pressure application (corresponding to the permissible working pressures of the glass components and dependent on nominal diameter).

at temperatures above 120°C up to max. 200°C the bellows can only be used at atmospheric pressure. For applications under higher stresses we recommend the use of vacuum bellows.

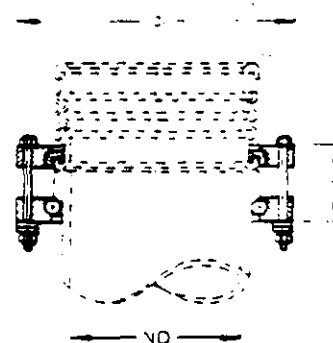
## FLANGE ASSEMBLIES FOR UNIVERSAL BELLOWS

Flange Assemblies are used for connecting the universal to KF components.

The Catalog ref. must include the letters

K - plastic  
S - aluminum

| d <sub>1</sub><br>(mm) | Flange    | Insert for<br>KF tube | Insert for<br>bellows | Bolt     | Catalog ref. |
|------------------------|-----------|-----------------------|-----------------------|----------|--------------|
| 64                     | 2xSCHE 15 | 1xBEIL 15             | 1xBEIL 15FD           | 3xM6x 50 | FVER 15U...  |
| 92                     | 2xSCHE 25 | 1xBEIL 25             | 1xBEIL 25FD           | 3xM8x 60 | FVER 25U...  |
| 118                    | 2xSCHE 40 | 1xBEIL 40             | 1xBEIL 40FD           | 3xM8x 70 | FVER 40U...  |
| 131                    | 2xSCHE 50 | 1xBEIL 50             | 1xBEIL 50FD           | 3xM8x 75 | FVER 50U...  |
| 172                    | 2xSCHE 80 | 1xBEIL 80             | 1xBEIL 80FD           | 6xM8x 90 | FVER 80U...  |
| 192                    | 2xSCHE100 | 1xBEIL100             | 1xBEIL100FD           | 6xM8x 90 | FVER100U...  |
| 247                    | 2xSCHE150 | 1xBEIL150             | 1xBEIL100FD           | 8xM8x100 | FVER150U...  |

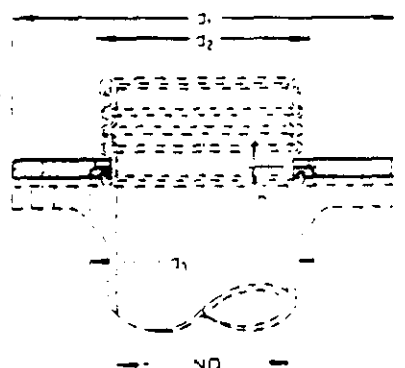


## ADAPTOR FLANGES FOR UNIVERSAL BELLOWS

Ad Aluminum adaptor flanges with special bellows inserts used to connect universal bellows to flanges of other

materials. These flanges can be predrilled with an ANSI 150 lbs hole pattern by adding "ASA 150" to the part numbers

| d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | flange    | Insert      | Catalog ref. |
|------------------------|------------------------|------------------------|-----------|------------------------|-----------|-------------|--------------|
| 95                     | 31                     | 38                     | 10        | 4                      | 1xANSC 15 | 1xBEIL 15FD | AVER 15FU    |
| 115                    | 45                     | 56                     | 11        | 5                      | 1xANSC 25 | 1xBEIL 25FD | AVER 25FU    |
| 150                    | 63                     | 76                     | 13        | 7                      | 1xANSC 40 | 1xBEIL 40FD | AVER 40FU    |
| 165                    | 77                     | 90                     | 13        | 7                      | 1xANSC 50 | 1xBEIL 50FD | AVER 50FU    |
| 200                    | 111                    | 126                    | 17        | 9                      | 1xANSC 80 | 1xBEIL 80FD | AVER 80FU    |
| 220                    | 132                    | 148                    | 17        | 9                      | 1xANSC100 | 1xBEIL100FD | AVER100FU    |
| 285                    | 187                    | 202                    | 17        | 8                      | 1xANSC150 | 1xBEIL150FD | AVER150FU    |



# PLAIN END PTFE BELLOWS

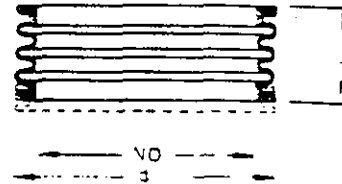
PTFE bellows are used to take up changes in length due to variations in temperature and to prevent the transmission of vibrations, such as those from stirred vessels or from pumps, to process units.

This type of bellows can be used only with flat joint faces. For the necessary couplings, see below:

Range of use of the bellows:

- At temperatures up to 120°C this form can be used both in vacuum and also in the overpressure range (corresponding to the permissible operating pressures of the glass components).
- At temperatures above 120°C to a maximum of 200°C the bellows can be used only at nominal pressure.

| NO  | d<br>(mm) | L<br>(mm) | L <sub>min</sub><br>(mm) | L <sub>max</sub><br>(mm) | Catalog ref. |
|-----|-----------|-----------|--------------------------|--------------------------|--------------|
| 15  | 30        | 50        | 45                       | 55                       | FAL 15       |
| 25  | 40        | 50        | 45                       | 55                       | FAL 25       |
| 40  | 52        | 50        | 45                       | 50                       | FAL 40       |
| 50  | 64        | 50        | 45                       | 50                       | FAL 50       |
| 80  | 100       | 50        | 45                       | 55                       | FAL 80       |
| 100 | 100       | 50        | 45                       | 55                       | FAL 100      |
| 150 | 132       | 75        | 70                       | 78                       | FAL 150      |
| 200 | 130       | 75        | 65                       | 90                       | FAL 200      |
| 300 | 138       | 100       | 85                       | 115                      | FAL 300      |



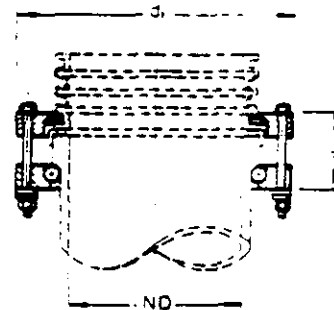
## FLANGE ASSEMBLIES FOR PLAIN END BELLOWS

These couplings are used to join bellows to KF components. They consist of two flanges, an insert (BEIL), a special bellows insert (BEIL) and the appropriate number of aluminum-coated steel bolts, nuts and washers.

The Catalog ref. must include the code letters

- K - plastic
- S - aluminum

| NO  | d<br>(mm) | d <sub>1</sub><br>(mm) | Flange    | Insert for<br>KF tube | Insert for<br>bellows | Bolt      | Catalog ref. |
|-----|-----------|------------------------|-----------|-----------------------|-----------------------|-----------|--------------|
| 15  | 41        | 64                     | 2xSCHE 15 | 1xBEIL 15             | 1xBEIL 15F            | 3xM6x 50  | FVER 15...   |
| 25  | 46        | 92                     | 2xSCHE 25 | 1xBEIL 25             | 1xBEIL 25F            | 3xM8x 55  | FVER 25...   |
| 40  | 52        | 118                    | 2xSCHE 40 | 1xBEIL 40             | 1xBEIL 40F            | 3xM8x 60  | FVER 40...   |
| 50  | 56        | 118                    | 2xSCHE 50 | 1xBEIL 50             | 1xBEIL 40F            | 3xM8x 65  | FVER 50...   |
| 80  | 70        | 172                    | 2xSCHE 80 | 1xBEIL 80             | 1xBEIL 80F            | 6xM8x 80  | FVER 80...   |
| 100 | 71        | 192                    | 2xSCHE100 | 1xBEIL100             | 1xBEIL100F            | 6xM8x 80  | FVER100...   |
| 150 | 72        | 247                    | 2xSCHE150 | 1xBEIL150             | 1xBEIL150F            | 8xM8x 90  | FVER150...   |
| 200 | 82        | 307                    | 2xSCHE200 | 1xBEIL200             | 1xBEIL200F            | 8xM8x100  | FVER200...   |
| 300 | 93        | 425                    | 2xSCHE300 | 1xBEIL300             | 1xBEIL300F            | 12xM8x110 | FVER300...   |

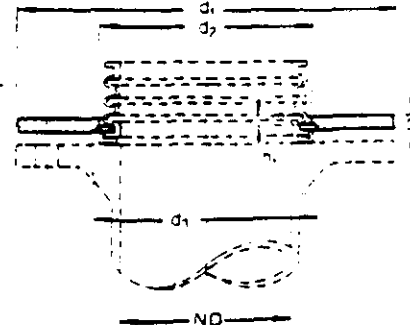


## ADAPTOR FLANGES FOR PLAIN END BELLOWS

To connect bellows to flanges of other materials, undrilled aluminum adaptor flanges with special bellows inserts are used.

These flanges can be ordered predrilled with an ANSI 150lbs hole pattern by adding "ASA 150" to the part number.

| NO  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | Flange    | Insert     | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|------------------------|-----------|------------|--------------|
| 15  | 95                     | 31                     | 38                     | 10        | 4                      | 1xANSC 15 | 1xBEIL 15F | AVER 15F     |
| 25  | 115                    | 45                     | 56                     | 11        | 5                      | 1xANSC 25 | 1xBEIL 25F | AVER 25F     |
| 40  | 150                    | 63                     | 76                     | 13        | 7                      | 1xANSC 40 | 1xBEIL 40F | AVER 40F     |
| 50  | 165                    | 77                     | 90                     | 13        | 7                      | 1xANSC 50 | 1xBEIL 50F | AVER 50F     |
| 80  | 200                    | 111                    | 126                    | 17        | 9                      | 1xANSC 80 | 1xBEIL 80F | AVER 80F     |
| 100 | 220                    | 132                    | 148                    | 17        | 9                      | 1xANSC100 | 1xBEIL100F | AVER100F     |
| 150 | 285                    | 187                    | 202                    | 17        | 8                      | 1xANSC150 | 1xBEIL150F | AVER150F     |
| 200 | 340                    | 236                    | 254                    | 17        | 8                      | 1xANSC200 | 1xBEIL200F | AVER200F     |
| 300 | 460                    | 341                    | 354                    | 22        | 8                      | 1xANSC300 | 1xBEIL300F | AVER300F     |



# SUPPORT STRUCTURE CONSTRUCTION



THINK  
GLASS

The operational safety of glass piping in installations depends on the correct choice, arrangement and assembly of the support structure and the associated components. The physical limitation of stock glass and the thermal and chemical requirements of the process conditions must be considered and accommodated.

In most cases these requirements can be satisfied by the use of rigid tubular framework. For this purpose O-I/SCHOTT uses schedule 40 galvanized pipe and the necessary clamp connections in sizes 1", 1 1/2", and 2".

The glass installations are fixed in the framework by means of support rings or support plates. The fixed points are normally located in the lower part of the installation in order to avoid tensile stresses caused by suspended loads.

Support plates are used to support vessels. Support rings take the weight of vertical installations always at the bottom flange. These supports are fixed in the tubular frameworks with threaded rods which also act as a leveling device.

In order to distribute the equipment weight counter-balances are available which are used particularly in the construction of tall columns. Lateral guides must also be provided.

In the design of this supporting construction for glass products care must always be taken to allow for thermal expansion. Thus two fixed points directly adjacent to one another must be avoided.

Piping running vertically is secured in the support rings and is laterally guided with clamps. Horizontal pipes are held with pipe clamps or pipe hangers. In most cases bellows are not required due to the very low coefficient of thermal expansion of glass in combination with the KF joint.

In the case of columns and vessels with nominal diameters of 800 to 1000 mm the fixed point supports are designed of structural steel members.

In all cases the operation of the process and the demands set by the properties of glass must be coordinated in designing the support structure. Thus platforms, stairs, ladders, hoists and central servicing positions can easily be incorporated at the design stage.

Because of the corrosive nature of fumes that may be involved, the framework can be additionally protected by means of epoxy paint. All frame parts and connecting elements are provided with a primer or with galvanized coating ready for such protective coating application, if deemed necessary.

# SUPPORT—STRUCTURE PIPE

Pipe used is SCHEDULE 40 in sizes of 1", 1½", and 2".  
Galvanized internally and externally. The pipe can be supplied  
in lengths of up to 21'.

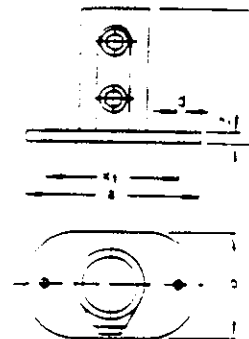
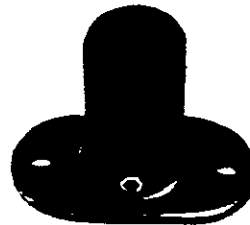
Catalog ref. must include a statement of the desired length  
of the pipe in inches.

| ND<br>(inch) | External diam.<br>(mm) | Wall thickness<br>(mm) | Catalog ref. |
|--------------|------------------------|------------------------|--------------|
| 1"           | 33.7                   | 3.25                   | GES- 6       |
| 1½"          | 48.3                   | 3.25                   | GES- 3       |
| 2"           | 60.3                   | 3.65                   | GES- 3       |

## PIPE BASES

Typical pipe supports are provided with feet which can be  
applied for the various sizes. The oval bottom-plate con-  
tains suitable bolt holes for anchoring.

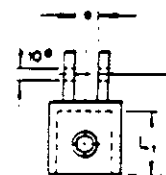
| Table for<br>Pipe Size | a<br>(mm) | b<br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | d<br>(mm) | k <sub>1</sub><br>(mm) | Catalog ref. |
|------------------------|-----------|-----------|-----------|------------------------|-----------|------------------------|--------------|
| 1"                     | 127       | 75        | 39        | 3                      | 14        | 39                     | GEKK 62-6    |
| 1½"                    | 152       | 89        | 114       | 3                      | 14        | 114                    | GEKK 62-8    |
| 2"                     | 165       | 102       | 127       | 9                      | 17.5      | 127                    | GEKK 62-9    |



## HINGED COUPLING TYPE 49

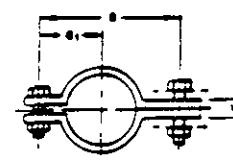
For diagonal bracing, hinged connectors of type 49 are used in  
combination with a diagonal clamp which can be put on later.

| Table for frame tube | L<br>(mm) | L <sub>1</sub><br>(mm) | e<br>(mm) | Catalog ref. |
|----------------------|-----------|------------------------|-----------|--------------|
| 1"                   | 60        | 35                     | 12        | GEKK 49-6    |
| 1½"                  | 76        | 51                     | 12        | GEKK 49-8    |
| 2"                   | 91        | 59                     | 12        | GEKK 49-9    |



## DIAGONAL CLAMP TYPE 49D

|     | a<br>(mm) | a <sub>1</sub><br>(mm) |            |
|-----|-----------|------------------------|------------|
| 1"  | 30        | 35                     | GEKK 49-6D |
| 1½" | 100       | 45                     | GEKK 49-8D |
| 2"  | 110       | 50                     | GEKK 49-9D |

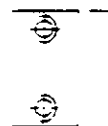


# PIPE COUPLINGS

| Table for<br>Pipe Size | L<br>(mm) | Catalog ref. |
|------------------------|-----------|--------------|
|------------------------|-----------|--------------|

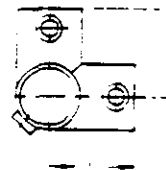
## COUPLING SLEEVE TYPE 14

|     |     |           |
|-----|-----|-----------|
| 1"  | 39  | GEKK 14-6 |
| 1½" | 102 | GEKK 14-8 |
| 2"  | 121 | GEKK 14-9 |



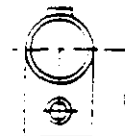
## CORNER COUPLING TYPE 21

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 21-6 |
| 1½" | 68 | GEKK 21-8 |
| 2"  | 84 | GEKK 21-9 |



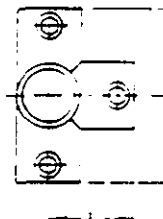
## T-COUPLING TYPE 10

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 10-6 |
| 1½" | 68 | GEKK 10-8 |
| 2"  | 84 | GEKK 10-9 |



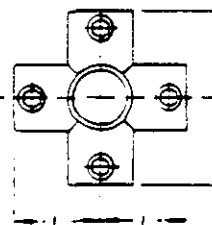
## T-COUPLING TYPE 35

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 35-6 |
| 1½" | 68 | GEKK 35-8 |
| 2"  | 84 | GEKK 35-9 |



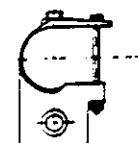
## FRAME CLAMP TYPE 40

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 40-6 |
| 1½" | 68 | GEKK 40-8 |
| 2"  | 84 | GEKK 40-9 |



## CROSS-COUPLING TYPE 16

|     |    |           |
|-----|----|-----------|
| 1"  | 53 | GEKK 16-6 |
| 1½" | 76 | GEKK 16-8 |
| 2"  | 90 | GEKK 16-9 |



## THREADED RODS

Threaded rods are used to fix components and bearing elements in the framework.

When supporting brackets and clamps are used, threaded rods are used for the lateral bracing of glass components. Pipes are fixed in combination with tube clamps and hangers.

Catalog ref. must be completed by the length in inches.

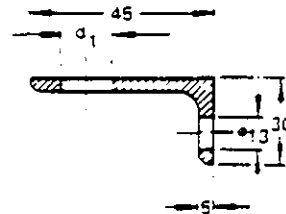
| Tie Rod | Catalog ref. |
|---------|--------------|
| M 8     | GEZU 3       |
| M 12    | GEZU 12      |
| M 16    | GEZU 16      |

## SUPPORTING BRACKETS

Supporting brackets are fixed by means of a bolt of the KF type to glass components to be braced laterally.

In order to achieve satisfactory support, at least two brackets placed by 90° must be applied. They are fixed to the frame with threaded rods and GEBE fixing clamps.

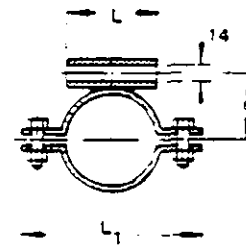
| For connection | d <sub>1</sub><br>(mm) | Catalog ref. |
|----------------|------------------------|--------------|
| 80 - 450       | 9                      | GEWI 8/12    |
| 500 - 1000     | 13                     | GEWI 12/12   |



## TIE ROD CLAMPS

These clamps are primarily used to connect tie rods to pipe frames for lateral supports.

| Available for<br>Pipe Size | e<br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|----------------------------|-----------|-----------|------------------------|--------------|
| 1"                         | 32        | 40        | 94                     | GEBE 6/12    |
| 1½"                        | 40        | 40        | 106                    | GEBE 8/12    |
| 2"                         | 46        | 40        | 126                    | GEBE 9/12    |



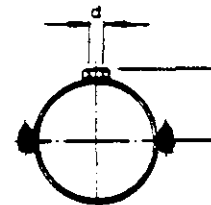
## TUBE CLAMPS

Pipes with nominal diameters of 15 to 300 mm are fixed with tube clamps in combination with screwed-in threaded rods of appropriate length.

Pipes with ND > 300 mm are braced laterally with support brackets and threaded rods.

The weight of vertically mounted piping must be taken up by other support rings.

| Available for<br>ND | d<br>(mm) | e<br>(mm) | Catalog ref. |
|---------------------|-----------|-----------|--------------|
| 15                  | M 12      | 26        | GERO 15 S    |
| 25                  | M 12      | 31        | GERO 25 S    |
| 40                  | M 12      | 40        | GERO 40 S    |
| 50                  | M 12      | 45        | GERO 50 S    |
| 80                  | M 12      | 60        | GERO 80 S    |
| 100                 | M 12      | 70        | GERO 100 S   |
| 150                 | M 12      | 98        | GERO 150 S   |
| 200                 | M 12      | 123       | GERO 200 S   |
| 300                 | M 12      | 173       | GERO 300 S   |



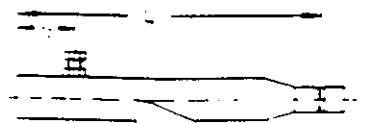


# ANTILEVER BRACKETS

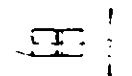
These components can be supplied for attachment to frame pipes of all diameters.

These brackets are suitable for fixing of components and also for application on of frame diamos of size 1 1/2", type 16. Appropriate forked brackets are inserted in the open pipe ends and fixed by means of a bolt.

| Suitable for<br>Pipe Size | b<br>(mm) | h<br>(mm) | L<br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|-----------|------------------------|--------------|
| 1"                        | 30        | 205       | 350       | 50                     | GEKO 6.350   |
| 1 1/2"                    | 50        | 205       | 350       | 50                     | GEKO 8.350   |
| 2"                        | 50        | 205       | 350       | 50                     | GEKO 9.350   |



Type 16  
DIN 2440



## FORKED BRACKETS

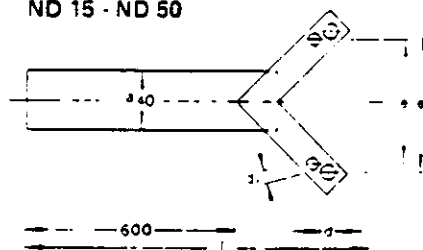
Forked brackets are provided for the fixing of components on nominal diameters of 15 to 200 mm in combination with antilever brackets of cross-sleeves.

For ND 15 to 50 mm, two bolts of the coupling are used for fixing in each case. In the case of ND 80 to 200 mm, the two welded-on tube sockets are used to take M 8 threaded rods.

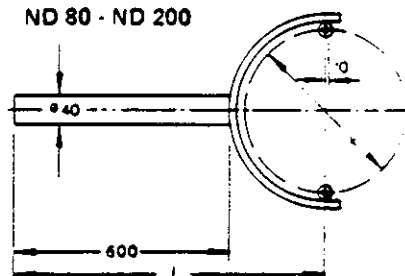
| Suitable for ND | d<br>(mm) | d <sub>1</sub><br>(mm) | e<br>(mm) | e <sub>1</sub><br>(mm) | L<br>(mm) | Catalog ref. |
|-----------------|-----------|------------------------|-----------|------------------------|-----------|--------------|
| 15              | 9.5       | 7                      | 44        | 65                     | 665       | GEKA 15/25   |
| 25              | 9.5       | 7                      | 44        | 65                     | 675       |              |
| 40              | 9.5       | 9.5                    | 78        | 95                     | 684       | GEKA 40/50   |
| 50              | 9.5       | 9.5                    | 78        | 95                     | 695       |              |

| Suitable for ND | k<br>(mm) | L<br>(mm) | Catalog ref. |
|-----------------|-----------|-----------|--------------|
| 80              | 150       | 698       | GEKA 80      |
| 100             | 170       | 706       | GEKA 100     |
| 150             | 225       | 736       | GEKA 150     |
| 200             | 280       | 763       | GEKA 200     |

ND 15 - ND 50



ND 80 - ND 200



# PIPE SLEEVES

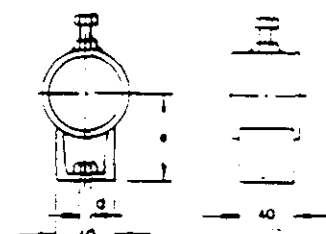
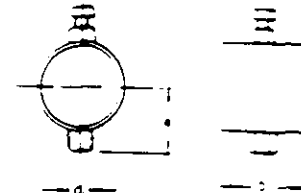
For the installation of support rings and support plates, and to pump and stirrers, frame sleeves with threaded holes for threaded rods can be supplied.

Cross-sleeves are used for fixing transverse tubes. The split limits their subsequent application to existing frameworks.

| Suitable for<br>Pipe Size | b<br>(mm) | d<br>(mm) | e<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|-----------|------------------------|--------------|
|---------------------------|-----------|-----------|-----------|------------------------|--------------|

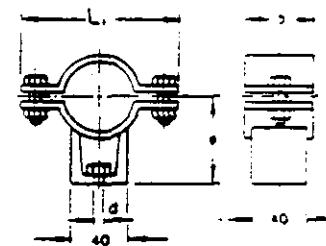
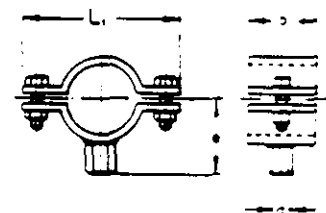
## CLOSED SLEEVES

|     |    |      |    |  |           |
|-----|----|------|----|--|-----------|
| 1"  | 30 | M 12 | 40 |  | GEHA 6/12 |
| 1½" | 50 | M 12 | 60 |  | GEHA 8/12 |
| 1½" | 50 | M 16 | 60 |  | GEHA 8/16 |
| 2"  | 50 | M 12 | 65 |  | GEHA 9/12 |
| 2"  | 50 | M 16 | 65 |  | GEHA 9/16 |



## SPLIT SLEEVES

|     |    |      |    |     |             |
|-----|----|------|----|-----|-------------|
| 1"  | 30 | M 12 | 40 |     | GEHA 6/12 G |
| 1½" | 50 | M 12 | 60 | 106 | GEHA 8/12 G |
| 1½" | 50 | M 16 | 60 | 106 | GEHA 8/16 G |
| 2"  | 50 | M 12 | 65 | 126 | GEHA 9/12 G |
| 2"  | 50 | M 16 | 65 | 126 | GEHA 9/16 G |

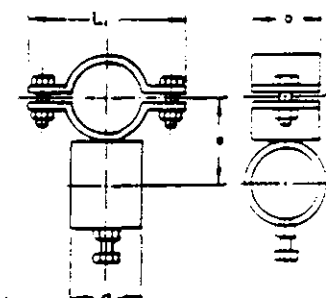


## CROSS-SLEEVES

|     |    |  |    |     |        |
|-----|----|--|----|-----|--------|
| 1"  | 30 |  | 42 | 94  | GEKR 6 |
| 1½" | 50 |  | 60 | 106 | GEKR 8 |
| 2"  | 50 |  | 70 | 126 | GEKR 9 |

Reduced cross-sleeves (for forked brackets)

|          |    |     |    |     |           |
|----------|----|-----|----|-----|-----------|
| 1" x 40  | 30 | 100 | 46 | 94  | GEKR 6/40 |
| 1½" x 40 | 50 | 100 | 54 | 106 | GEKR 8/40 |
| 2" x 40  | 50 | 100 | 60 | 126 | GEKR 9/40 |

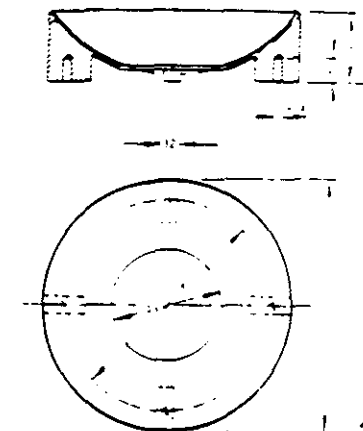


## SUPPORT CRADLES

satisfactory support, spherical vessels with a capacity of 50 l and more and cylindrical vessels with a capacity of 100 l and more are used in support. Cylindrical vessels up to a capacity of 50 l are fixed in the framework construction by means of "lower support rings".

Support cradles are provided with a felt insert and have a suitable bottom hole for the passage of bottom pipes up to ND 150 mm. The support cradles are fixed in the framework by means of four M 12 threaded rods in combination with GEHA sleeves.

| spherical vessels   | $h_2$<br>(mm) | $d_2$<br>(mm) | $e$<br>(mm) | $d_3$<br>(mm) | $k_1$<br>(mm) | $h$<br>(mm) | Catalog ref. |
|---------------------|---------------|---------------|-------------|---------------|---------------|-------------|--------------|
| GEK 50              | 270           | 440           | 255         | 280           | 360           | 126         | GETR 50 K    |
| GEK 100             | 330           | 500           | 299         | 340           | 422           | 122         | GETR 100 K   |
| GEK 200             | 360           | 620           | 385         | 460           | 544           | 118         | GETR 200 K   |
| GEK 500             | 510           | 980           | 566         | 450           | 800           | 280         | GETR 500 K   |
| cylindrical vessels |               |               |             |               |               |             |              |
| GER 100-150         | 250           | 374           | 207         | 214           | 292           | 126         | GETR 100 Z   |
| GER 200             | 250           | 528           | 300         | 220           | 424           | 208         | GETR 200 Z   |
| GER 400             | 330           | 500           | 299         | 340           | 422           | 122         | GETR 100 K   |
| GER 500             | 415           | —             | 500         | —             | 706           | 240         | GETR 500 Z   |



## COUNTER BALANCES

If glass installation exceeds 4 meters in height, a counterbalance may be required to relieve some of the excess weight from the fixed point. The O-I/Schott installation drawings show the positions of counterbalances when required including the amount of weights and the moment arm. (The maximum lever ratio is 1:10 - individual weights are 8.3 kg).

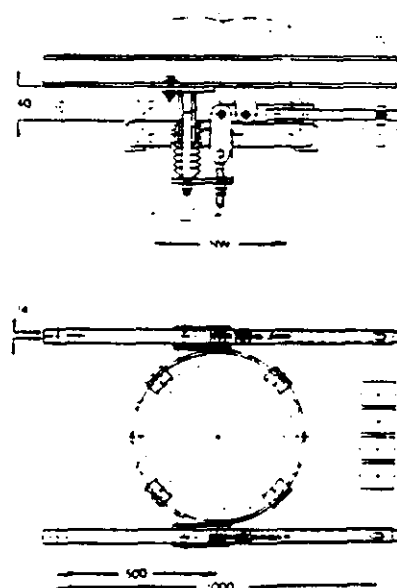
| Table for<br>ND | $e$<br>(mm) | Max<br>Weights | Catalog ref. |
|-----------------|-------------|----------------|--------------|
| 100             | 322         | 3              | GEGW 100     |
| 150             | 386         | 4              | GEGW 150     |
| 200             | 436         | 5              | GEGW 200     |
| 300             | 560         | 7              | GEGW 300     |
| 400             | 660         | 9              | GEGW 400     |
| 450             | 750         | 10             | GEGW 450     |
| 600             | 888         | 13             | GEGW 600     |
| 800             | 1110        | 20             | GEGW 800     |
| 1000            | 1290        | 20             | GEGW 1000    |

Counterweights GEGW 8.3

The necessary number of these weights must be given separately.

GEGW 800 and 1000 include flange assemblies.

For specific requirements contact O-I/Schott Engineering.

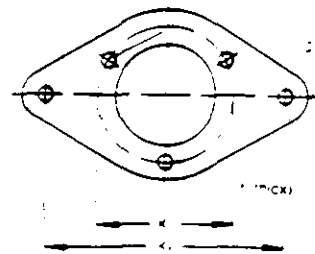


# LOWER SUPPORT RINGS

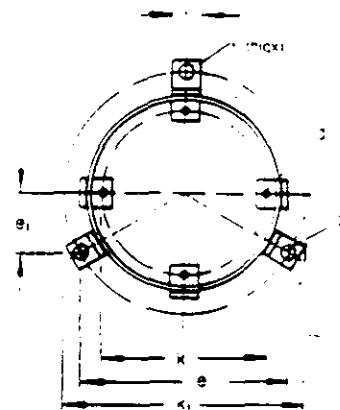
The weight of the glass installation and vertical pipes is carried by the lower support rings. The holes are adapted to the bolt diameter in the corresponding coupling flange. The support rings are fixed by threaded rods and pipe sleeves in the support structure.

| Suitable<br>for ND | d<br>(mm) | d <sub>1</sub><br>(mm) | k<br>(mm) | k <sub>1</sub><br>(mm) | L<br>(mm) | t<br>(mm) | e<br>(mm) | e <sub>1</sub><br>(mm) | Catalog ref. |
|--------------------|-----------|------------------------|-----------|------------------------|-----------|-----------|-----------|------------------------|--------------|
| 25                 | 9.5       | 14                     | 75        | 150                    | —         | 5         | —         | —                      | GETR 25 U    |
| 40                 | 9.5       | 14                     | 100       | 200                    | —         | 5         | —         | —                      | GETR 40 U    |
| 50                 | 9.5       | 14                     | 110       | 200                    | —         | 5         | —         | —                      | GETR 50 U    |
| 80                 | 10.0      | 14                     | 150       | 270                    | 25        | 5         | 234       | 68                     | GETR 80 U    |
| 100                | 10.0      | 14                     | 170       | 270                    | 25        | 5         | 234       | 68                     | GETR 100 U   |
| 150                | 10.0      | 14                     | 225       | 335                    | 35        | 5         | 290       | 84                     | GETR 150 U   |
| 200                | 10.0      | 14                     | 230       | 390                    | 35        | 5         | 338       | 98                     | GETR 200 U   |
| 300                | 10.0      | 18                     | 395       | 520                    | 55        | 7         | 450       | 130                    | GETR 300 U   |
| 400                | 10.0      | 18                     | 495       | 620                    | 55        | 7         | 537       | 155                    | GETR 400 U   |
| 450                | 10.0      | 18                     | 585       | 710                    | 55        | 7         | 615       | 178                    | GETR 450 U   |
| 600                | 15.0      | 18                     | 710       | 865                    | 80        | 9         | 749       | 216                    | GETR 600 U   |

GETR 25–50 U



GETR 80–600 U



NOTE – Supports can be used only in conjunction with S or G flange assemblies.

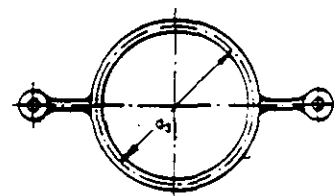
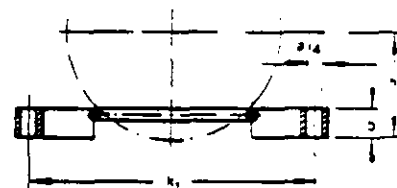
## SUPPORTING RINGS FOR SPHERICAL VESSELS AND PRODUCT CONDENSERS

Spherical vessels up to a capacity of 20 l and product condensers are installed with support rings. The support is covered. The framework is done with M 12 threaded rods using GEHA pipe sleeves.

| For spherical vessels | b<br>(mm) | d <sub>3</sub><br>(mm) | h <sub>2</sub><br>(mm) | k <sub>1</sub><br>(mm) | Catalog ref. |
|-----------------------|-----------|------------------------|------------------------|------------------------|--------------|
| GEK 10                | 25        | 200                    | 130                    | 320                    | GETR 10      |
| GEK 20                | 25        | 250                    | 155                    | 400                    | GETR 20      |

For product condensers

|       |    |     |   |     |        |
|-------|----|-----|---|-----|--------|
| PRO 2 | 20 | 78  | — | 200 | GETR 2 |
| PRO 4 | 20 | 118 | — | 200 | GETR 4 |



# SEMBLY AND START UP

of the increased use of glass in the chemical and pharmaceutical industries, many users are currently in a position to assemble the new installation correctly with their personnel.

OTT supports this development by holding training courses at their Vineland, New Jersey facility.

In addition to this, service engineers are available to train or assist your personnel, or assemble the entire plant.

OTT has developed the reputation of not only standing behind their products but also behind their installations. Your customer is assured assistance and service as long as our plant is in service.

When performing your own installation remember that the life of glass piping systems depend primarily on the correct assembly of the system.

During the initial assembly, a few basic points must be observed.

- In the case of vertical pipes or columns, determination of fixed points at the lowest parts of the installation.
- Compensation of temperature-induced changes in length, expansion, and structure effects by bellows.
- Location of pipe supports.

During the initial assembly of the piping system the following measures are necessary to ensure permanent fluid-tightness:

- Tightening of the whole installation, if possible, to the maximum operating temperature anticipated.
- Tightening of the connections to specified torque in the cold state.

The purpose of this operation is to achieve a substantial seating of the PTFE seals, so that the cold flow that still takes place can be taken up by the elasticity of the joint.

The torque values for tightening KF joints should be taken from the following table:

The Engineering and Tech Service group of O-I SCHOTT is always at your disposal to assist or answer any questions regarding the mechanical or chemical process design.

| Nominal Diameter | Torque in Nm and (in-lbs) for connections with flanges made from |               |              |
|------------------|------------------------------------------------------------------|---------------|--------------|
|                  | Plastic (k)                                                      | Cast Iron (G) | Aluminum (S) |
| ND 15            | 1.0 (9)                                                          | —             | 1.0 (9)      |
| ND 25            | 2.5 (22)                                                         | —             | 2.5 (22)     |
| ND 40            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 50            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 80            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 100           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 150           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 200           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 300           | 4.5 (40)                                                         | 6.0 (53)      | 6.0 (53)     |
| ND 400           | —                                                                | 9.0 (80)      | —            |
| ND 450           | —                                                                | 9.0 (80)      | —            |
| ND 600           | —                                                                | 15.0 (133)    | —            |
| ND 800           | —                                                                | 20.0 (177)    | —            |
| ND 1000          | —                                                                | 22.0 (195)    | —            |



OTES

| COMMON CONVERSIONS         |                        |                            |
|----------------------------|------------------------|----------------------------|
| Multiply                   | By                     | To Obtain                  |
| kg                         | 2.205                  | lbs.                       |
| mm                         | $3.937 \times 10^{-2}$ | inches                     |
| mm <sup>2</sup>            | $1.6 \times 10^{-3}$   | in <sup>2</sup>            |
| mm <sup>3</sup>            | $6.1 \times 10^{-5}$   | in <sup>3</sup>            |
| m                          | 3.281                  | ft.                        |
| m <sup>2</sup>             | $1.076 \times 10$      | ft. <sup>2</sup>           |
| m <sup>3</sup>             | $3.532 \times 10$      | ft. <sup>3</sup>           |
| kcal                       | 3.968                  | BTU                        |
| kcal/m <sup>2</sup> /hr/°C | $2.049 \times 10^{-1}$ | BTU/ft <sup>2</sup> /hr/°F |
| liters                     | $3.531 \times 10^{-2}$ | ft. <sup>3</sup>           |
| liters                     | $2.642 \times 10^{-1}$ | gallons US                 |
| liters                     | $1.0 \times 10^{-3}$   | m <sup>3</sup>             |
| Nm                         | 8.85                   | in/lbs.                    |



**SBY**  
**ESS SYSTEMS, INC.**

Heat exchangers  
 and Tube heat exchangers  
 Valves  
 Beaded Process Pipe  
 Drainline  
 Pipes  
 Engineered Glass Plants and  
 e and Field installations

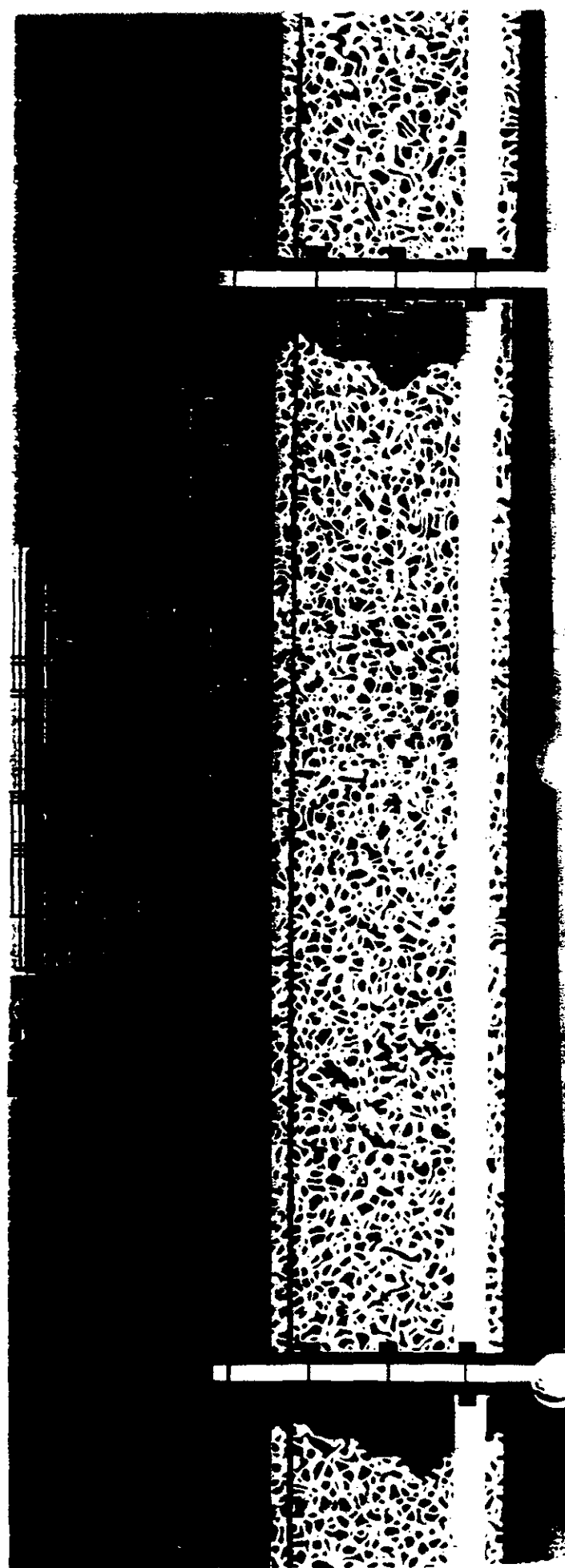
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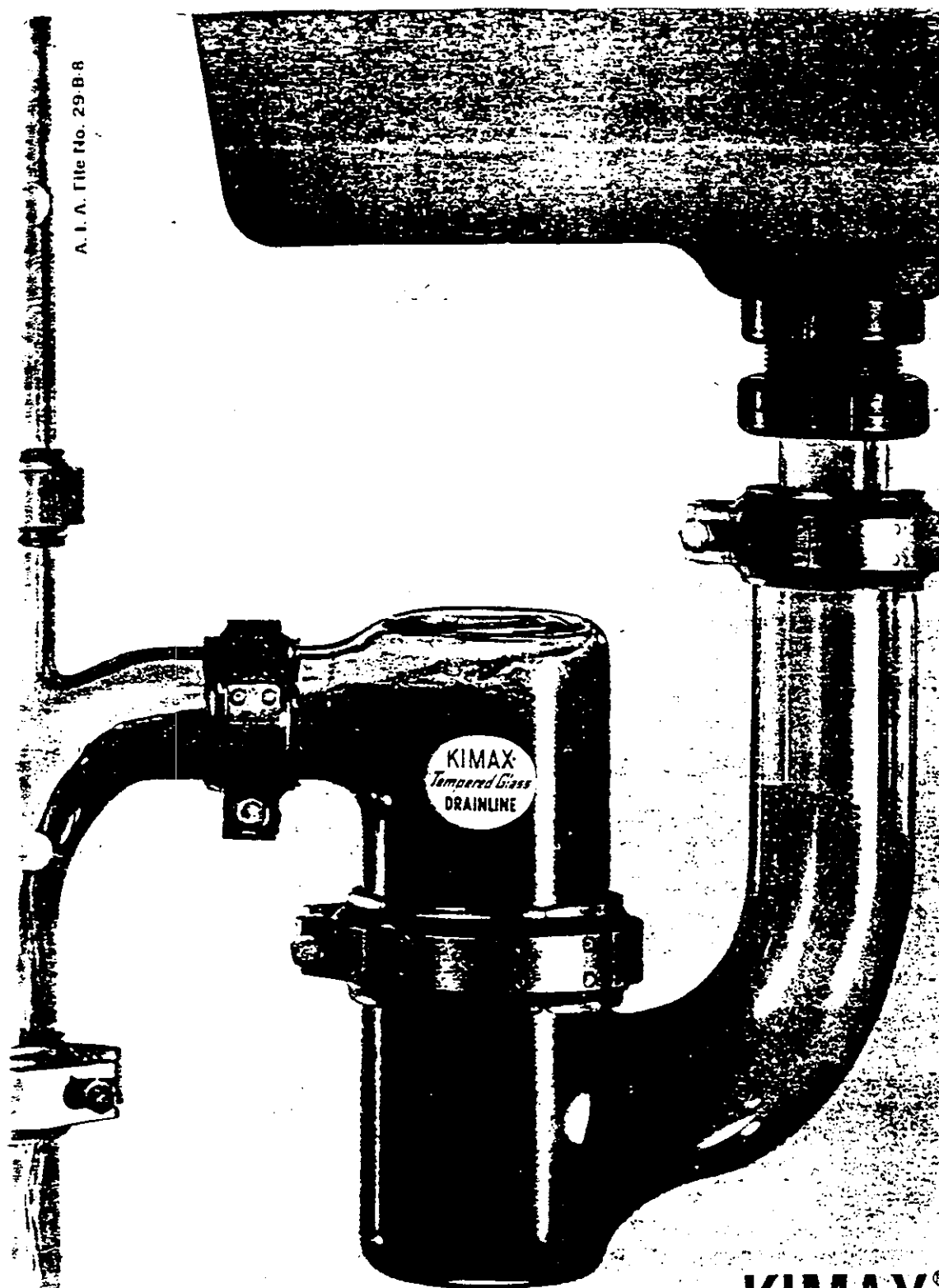
**SCHOTT**  
 s Systems Inc

W. BOULEVARD  
 O BOX 7  
 NJ JERSEY 08060-1107  
 91-692-1700

ATTACHMENT 1



TR-862  
February, 1966



OWENS-ILLINOIS

**KIMAX®**  
**TEMPERED**  
**GLASS**  
**DRAINLINE**

# KIMAX TEMPERED GLASS DRAINLINE

...assured maximum corrosion resistance  
for chemical waste disposal systems

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## KIMAX...the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for corrosion resistant waste disposal systems. To answer this need, Owens-Illinois has developed a Type I Borosilicate glass formula (KG-33) which is used in the manufacture of laboratory glassware, chemical process pipe and drainline. This KIMAX glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212 F continuously\*.

To make a drainline system truly corrosive resistant, all couplings and accessories must have similar corrosion resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

factured from 300 series stainless steel outer shell, Buna N rubber compression ring and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

### Building Owners

KIMAX glass drainline provides a most efficient low cost and maintenance free corrosive waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- Filled TFE sink outlets for maximum corrosion resistance at the sink connection.
- All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly corrosion and heat resistant drainline system.

\*TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.  
KIMAX is a registered trademark of Owens-Illinois, Inc.

\*For continuous operating temperatures above 212 F see your KIMAX representative for recommendations

## Specifier

Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

- All wetted parts of the system are borosilicate glass or TFE Polymer, thus, the "total" system is highly corrosive resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires only 1/2 to 1" as many hangers as conventional high silica iron pipe.
- Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and corrosive resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

## INSTALLATION

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in the new KIMAX Drainline Installation Manual TR-427. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX coupling assembly makes a unified TFE to glass seal for maximum corrosion resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos at right). The coupling is not rigid and does permit flexibility.

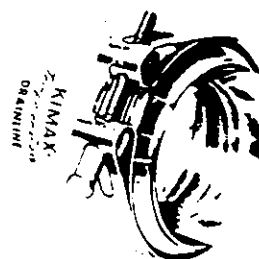
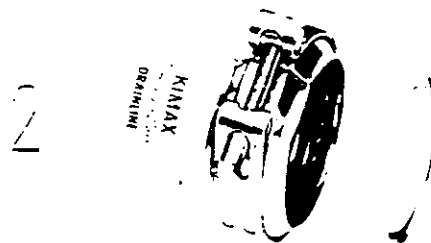
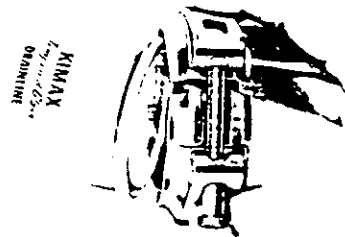
### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the KIMAX field beading kit. Detailed printed instructions and trained personnel are available to instruct the beading kit operator in its proper use. A burner arrange-

ment gives maximum fire power for fast beading of all sizes. Also, the specially designed burner for the KIMAX beading kit assures fast and complete stress relief of the field beaded ends.

### ... Minimum Number of Hangers

Because KIMAX Glass Drainline is so light, fewer hangers are needed for proper installation... up to 50% less than when other drainline materials are used. On horizontal runs, padded hangers are installed at 8 to 10 foot intervals. A padded clamp attached under the bottom coupling of vertical runs will control vertical and lateral movement while the remainder of the run can be supported at each floor (or in the case of 1 1/2" and/or 2" runs... every other floor) with padded clamps.



## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Drainline may be safely buried underground by following manufacturers' recommended procedures outlined in KIMAX Drainline Installation Procedures Bulletin No. TR-427.

### ... Adaption to Other Materials or Fittings

KIMAX Glass Drainline can be readily and effectively adapted to any other drainline material.

Recommended adapter materials and components are outlined on back pages of this catalog.

### ... Easily Handled

KIMAX Glass Drainline is usually delivered to job site in rugged shipper cartons. During construction, it is advisable to unpack only those sections needed for immediate fabrication or installation.

## Recommended KIMAX Drainline Uses

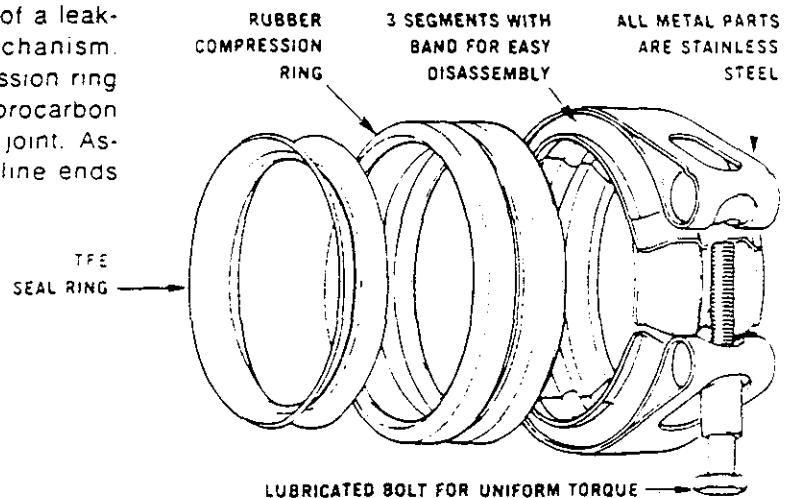
KIMAX Tempered Glass Drainline and Vent Systems are highly recommended as the specified medium of waste removal wherever corrosive chemical liquids present a disposal problem. It is particularly adaptable to drainline systems and underbench components in secondary school, college and university laboratories such as chemistry, biology, and bio-chemistry buildings; veterinary

medicine schools, research labs, and similar institutions of learning.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in: industrial laboratories, hospitals, institutional or research laboratories, food and chemical processing plants—wherever corrosive waste presents a disposal problem.

## KIMAX Coupling Assures Quick, Positive Seal Joints

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline couplings with compression ring of Buna-N rubber and seal ring of fluorocarbon polymer provide the required leak-free joint. Assembly of joint is simple...stab drainline ends into coupling and tighten one bolt.



# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed Borosilicate glass (Type I) conforming to Federal Specification DD-G-541-A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B This system shall include all glass straight lengths, fittings, traps, compression type fluorocarbon lined couplings and padded hanger supports. It shall also include factory protected heavy schedule pipe for underground burial and recommended adapter couplings to connect to other piping material where applicable.
- C All pipe shall be installed free of strain in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A Glass-to-glass connections shall be made with KIMAX one-bolt compression type couplings indicated from 100 series stainless steel construction of three (3) contoured 120° segments fastened to an outer band with integral carrier. The segments shall be contoured Buna-N resilient compound lining and a wide angle 30° fluorocarbon inner seal. When installed according to the manufacturer's recommendations, they shall provide a leak tight joint when deflected up to 4°.
- B Joints between glass and other types of piping material shall be made with KIMAX adapters and in accordance with manufacturer's recommendations.

### III. Protection of Pipe

- A All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fibreglass wool and/or with a non-hardening approved caulking material.
- B Glass pipe shall not be installed in direct contact with concrete. Fibreglass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C Glass pipe shall be protected against all weld spatter.

### IV. Tests

Test in accordance to manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A **Excavation**—shall conform to National Plumbing Code A 408 Section 2.7.
  - 1 Bottom of trench shall be properly compacted, graded and the pipe supported throughout its entire length.
  - 2 At least 4" of properly compacted sand shall be used directly under the pipe.
- B **Buried Pipe**
  - 1 Straight lengths shall be heavy schedule 5 lengths and shall include a factory-applied protective coating.
  - 2 Fittings and couplings shall receive a field-applied protective coating prior to back-filling. This coating may be Behr Manning Undercoat, Scotch Wrap, J. M. Trans-Tex, 3M ED-1221, or approved equal.
- C **Backfill**

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM:

### Specification for KIMAX Acid Waste Drainline and Vent System

This system shall be made of KIMAX tempered and annealed Borosilicate glass conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX one-bolt compression type stainless steel couplings with a fluorocarbon inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 408 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with stone-free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX heavy schedule factory protected pipe, 5 lengths and either wrapped or coated fittings and couplings shall be installed in sand base and back fill in accordance with the manufacturer's instructions and governing plumbing code.

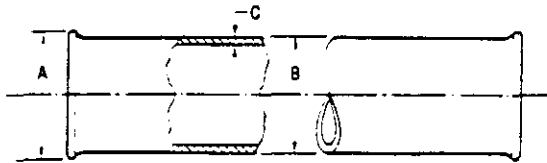
# PIPE AND FITTINGS

## Straight Lengths

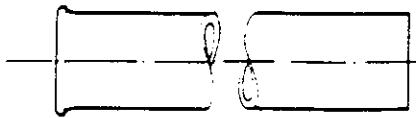
**6500** Regular Schedule 5-ft. lengths

**6501** Regular Schedule 10-ft. lengths

**6502** Heavy Schedule 5-ft. lengths



**6504** Nipple Stock



## Straight Lengths

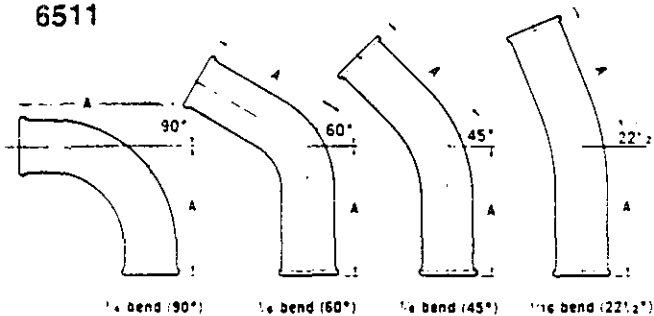
Standard lengths of KIMAX drain line are 5 and 10 feet. Special lengths (both ends beaded to a maximum of 15 feet) may be ordered as special items.

| Size  | Regular Schedule<br>(6500, 6501) |          |          | Heavy Schedule<br>(6502) |          |                    |
|-------|----------------------------------|----------|----------|--------------------------|----------|--------------------|
|       | A                                | B (O.D.) | C (Wall) | Weight<br>lbs./ft.       | C (Wall) | Weight<br>lbs./ft. |
| 1 1/2 | 2.06                             | 1.84     | 0.12     | 1.64                     | 0.17     | 2.37               |
| 2     | 2.58                             | 2.34     | 0.14     | 2.04                     | 0.20     | 3.11               |
| 3     | 3.69                             | 3.41     | 0.17     | 3.16                     | 0.23     | 4.63               |
| 4     | 4.84                             | 4.53     | 0.20     | 4.28                     | 0.26     | 6.15               |
| 6     | 7.12                             | 6.66     | 0.24     | 6.40                     | 0.32     | 9.67               |

KIMAX 6502 heavy schedule drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 ft.

Standard nipple stock is beaded one end and available in one foot increments up to 10 ft. All lengths are annealed.

**6511**

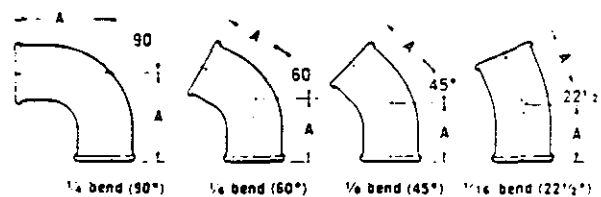


1/4 bend (90°) 1/4 bend (60°) 1/4 bend (45°) 1/4 bend (22 1/2°)

## Bends

| Size  | A     |
|-------|-------|
| 1 1/2 | 4 1/2 |
| 2     | 5     |
| 3     | 6 1/2 |
| 4     | 9     |
| 6     | 12    |

**6513**

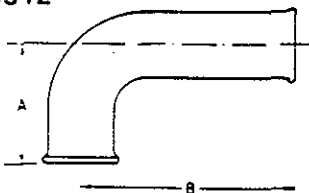


1/4 bend (90°) 1/4 bend (60°) 1/4 bend (45°) 1/4 bend (22 1/2°)

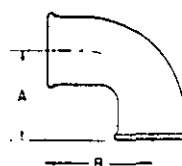
## Short Radius Bends

| Size  | A 90° | A 60° | A 45° | A 22 1/2° |
|-------|-------|-------|-------|-----------|
| 1 1/2 | 3     | 2 1/2 | 2     | 2         |
| 2     | 3 3/4 | 2 3/4 | 2 1/4 | 2 1/4     |
| 3     | 5     | 3 1/2 | 2 3/4 | 2 3/4     |
| 4     | 7     | 4 1/2 | 3 3/4 | 3 1/4     |

**6512**



**6514**



## Special Purpose Bends

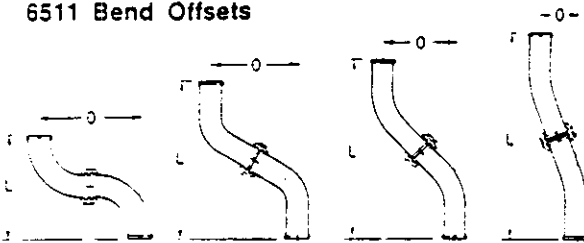
| Size  | 6512  |       | 6514  |       |
|-------|-------|-------|-------|-------|
|       | A     | B     | A     | B     |
| 1 1/2 | 3 3/8 | 6     | 2 1/2 | 3     |
| 2     | 3 5/8 | 7 1/2 | 3     | 3 3/4 |
| 1 1/2 |       |       |       |       |
| 2     |       |       |       |       |



# PIPE AND FITTINGS

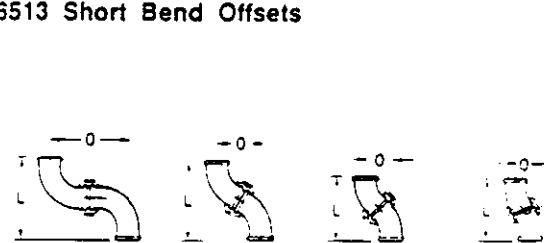
## Offset Made Using Standard Elbows

### 6511 Bend Offsets



| Size  | L  | O  | L      | O      | L      | O      | L      | O     |
|-------|----|----|--------|--------|--------|--------|--------|-------|
| 1 1/2 | 5  | 3  | 10 1/2 | 7 1/2  | 15 3/8 | 6 3/8  | 17 3/8 | 3 3/8 |
| 2     | 10 | 6  | 15     | 9 1/2  | 17 1/8 | 7 1/8  | 19 1/4 | 3 7/8 |
| 3     | 15 | 9  | 19 1/2 | 11 1/4 | 22 1/4 | 9 1/4  | 25     | 5     |
| 4     | 19 | 11 | 21     | 13 1/4 | 30 1/2 | 10 1/2 | 34 1/2 | 5 1/2 |
| 6     | 24 | 14 | 25     | 20 1/2 | 41     | 17     | 46 1/2 | 9 1/2 |

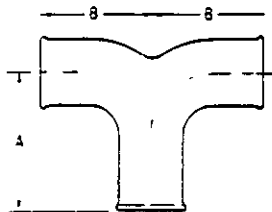
### 6513 Short Bend Offsets



| Size  | L     | O     | L      | O     | L      | O     | L      | O     |
|-------|-------|-------|--------|-------|--------|-------|--------|-------|
| 1 1/2 | 5     | 3     | 7 1/2  | 4 3/8 | 6 3/8  | 2 3/8 | 7 1/2  | 1 1/2 |
| 2     | 6 1/2 | 6 1/2 | 8 1/4  | 4 3/4 | 7 1/8  | 3 1/4 | 8 5/8  | 2 1/4 |
| 3     | 10    | 10    | 10 1/2 | 6 1/4 | 9 3/8  | 3 3/8 | 10 1/2 | 2 1/2 |
| 4     | 14    | 14    | 13 1/2 | 7 3/8 | 11 1/2 | 4 5/8 | 10 1/2 | 2 1/2 |

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements.

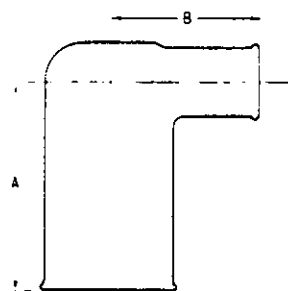
### 6533



### Double Quarter Bend

| Size  | A      | B     |
|-------|--------|-------|
| 1 1/2 | 3 3/4  | 3 1/2 |
| 2     | 5      | 4 1/2 |
| 3     | 7 1/4  | 6 3/8 |
| 4     | 8 3/4  | 8 1/4 |
| 6     | 12 3/8 | 12    |

### 6518

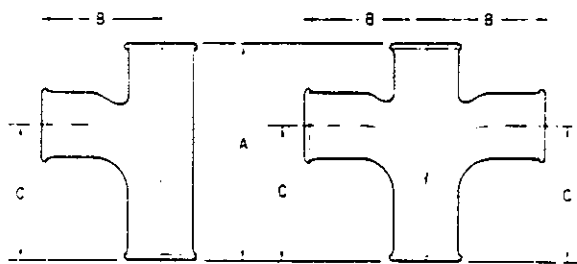


### Quarter Bend Reducer

| Size      | A | B     |
|-----------|---|-------|
| 2 x 1 1/2 | 4 | 3 1/2 |
| 3 x 1 1/2 | 5 | 4     |
| 3 x 2     | 5 | 4 1/2 |
| 4 x 1 1/2 | 7 | 4 1/2 |
| 4 x 2     | 7 | 5     |
| 4 x 3     | 7 | 5 1/2 |
| 6 x 1 1/2 | 9 | 5 1/2 |
| 6 x 2     | 9 | 6     |
| 6 x 3     | 9 | 6 1/2 |
| 6 x 4     | 9 | 8     |

### 6521 Single

### 6522 Double



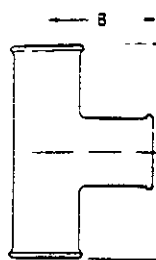
### T Branches

| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 3/4  |
| 2 x 1 1/2     | 8  | 3 3/4 | 5      |
| 2 x 2         | 8  | 4 1/2 | 5      |
| 3 x 1 1/2     | 10 | 4 1/4 | 7 1/4  |
| 3 x 2         | 10 | 5     | 7 1/4  |
| 3 x 3         | 10 | 6 3/8 | 7 1/4  |
| 4 x 1 1/2     | 14 | 4 7/8 | 8 1/2  |
| 4 x 2         | 14 | 5 5/8 | 8 3/4  |
| 4 x 3         | 14 | 7     | 8 3/4  |
| 4 x 4         | 14 | 8 1/2 | 9 1/2  |
| 6 x 2         | 20 | 6 3/4 | 12 3/8 |
| 6 x 3         | 20 | 8     | 12 3/8 |
| 6 x 4         | 20 | 9 3/4 | 12 3/8 |
| 6 x 6         | 20 | 12    | 12 3/8 |

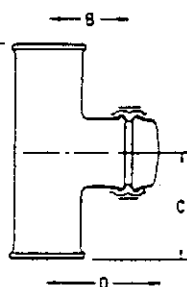


# PIPE AND FITTINGS

**6523 Straight T**



**6524 Cleanout & Test T**



**Straight T**

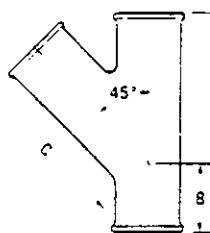
| Size          | A  | B     | C  |
|---------------|----|-------|----|
| 1 1/2 x 1 1/2 | 6  | 3     | 3  |
| 2 x 1 1/2     | 8  | 3 1/2 | 4  |
| 2 x 2         | 8  | 4     | 4  |
| 3 x 2         | 12 | 4 1/2 | 6  |
| 3 x 3         | 12 | 6     | 6  |
| 4 x 2         | 14 | 5     | 7  |
| 4 x 3         | 14 | 6 1/2 | 7  |
| 4 x 4         | 14 | 8     | 7  |
| 6 x 3         | 20 | 7 1/2 | 10 |
| 6 x 4         | 20 | 9     | 10 |
| 6 x 6         | 20 | 10    | 10 |

**Cleanout and Test T**

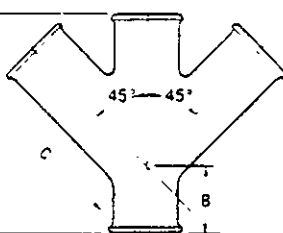
| Size          | A  | B     | C | D     |
|---------------|----|-------|---|-------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 | 3 1/2 |
| 2 x 2         | 8  | 4 1/2 | 4 | 3 1/2 |
| 3 x 3         | 12 | 6 1/2 | 6 | 4 1/2 |
| 4 x 4         | 14 | 8 1/2 | 7 | 5 1/2 |

Test Tee and cleanout comes as complete assembly including cap and coupling.

**6526 Single**



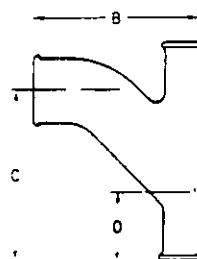
**6527 Double**



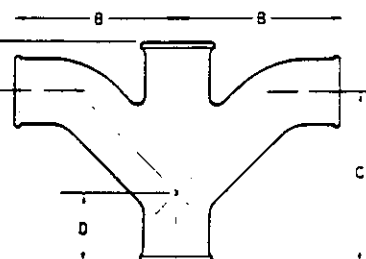
**Y Branches**

| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 1 7/8 | 4 1/2  |
| 2 x 1 1/2     | 8  | 2 1/2 | 4 1/2  |
| 2 x 2         | 8  | 2 1/2 | 6      |
| 3 x 1 1/2     | 12 | 3 3/4 | 5 1/2  |
| 3 x 2         | 12 | 3 3/4 | 5 1/2  |
| 3 x 3         | 12 | 3 3/4 | 8      |
| 4 x 1 1/2     | 14 | 4 1/2 | 6 3/4  |
| 4 x 2         | 14 | 4 1/2 | 7 1/2  |
| 4 x 3         | 14 | 4 1/2 | 8 3/4  |
| 4 x 4         | 14 | 4 1/2 | 10     |
| 6 x 2         | 20 | 5 3/4 | 9      |
| 6 x 3         | 20 | 5 3/4 | 10 3/8 |
| 6 x 4         | 20 | 5 3/4 | 11 1/2 |
| 6 x 6         | 20 | 5 3/4 | 14     |

**6528 Single**



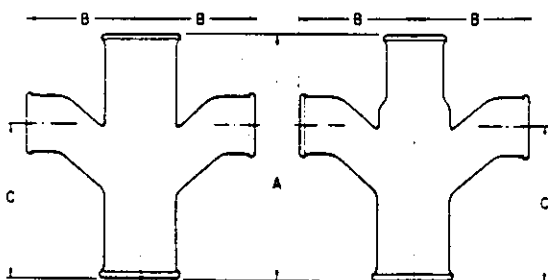
**6529 Double**



**Combination Y and 1/8 Bend**

| Size          | A  | B     | C      | D     |
|---------------|----|-------|--------|-------|
| 1 1/2 x 1 1/2 | 6  | 4 1/2 | 4 5/8  | 1 1/4 |
| 2 x 1 1/2     | 8  | 4 3/4 | 5 1/2  | 2 1/2 |
| 2 x 2         | 8  | 6     | 6 1/4  | 2 1/2 |
| 3 x 1 1/2     | 12 | 5 3/8 | 7 1/4  | 3 1/4 |
| 3 x 2         | 12 | 6 1/2 | 8      | 3 3/4 |
| 3 x 3         | 12 | 8 1/2 | 9      | 3 3/4 |
| 4 x 1 1/2     | 14 | 6     | 8 3/4  | 4 1/2 |
| 4 x 2         | 14 | 7     | 9 1/4  | 4 1/2 |
| 4 x 3         | 14 | 9     | 10 1/4 | 4 1/2 |
| 4 x 4         | 14 | 11    | 11     | 4 1/2 |
| 6 x 2         | 20 | 8 3/4 | 11 3/8 | 5 3/4 |
| 6 x 3         | 20 | 10    | 12 1/2 | 5 3/4 |
| 6 x 4         | 20 | 12    | 13 1/2 | 5 3/4 |
| 6 x 6         | 20 | 15    | 14 1/2 | 5 3/4 |

**6531**



**Partition Cross**

| Size                      | A | B     | C |
|---------------------------|---|-------|---|
| 2 x 1 1/2                 | 8 | 3 3/4 | 5 |
| 2 x 2                     | 8 | 4 1/2 | 5 |
| 2 x 1 1/2 x 1 1/2 x 1 1/2 | 8 | 3 3/4 | 5 |

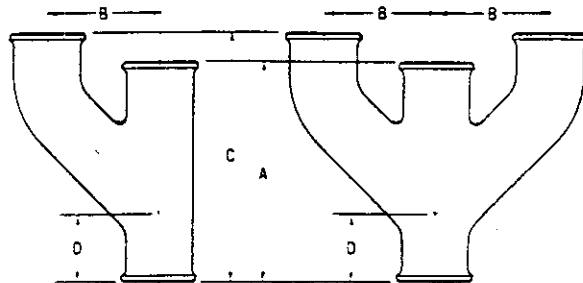
Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

# PIPE AND FITTINGS

6532 Single

6534 Double

Upright Y or H (vent branch)



| Size     | A  | B  | C** | D  |
|----------|----|----|-----|----|
| *1½ x 1½ | 5  | 3  | 6¾  | 1½ |
| *2 x 1½  | 8  | 3½ | 7½  | 2½ |
| *2 x 2   | 8  | 4  | 8¾  | 2½ |
| 3 x 1½   | 12 | 3¾ | 9½  | 3½ |
| 3 x 2    | 12 | 4½ | 10½ | 3½ |
| 3 x 3    | 12 | 6  | 10  | 3½ |
| 4 x 1½   | 14 | 4¾ | 10¾ | 4½ |
| 4 x 2    | 14 | 5  | 10  | 4½ |
| 4 x 3    | 14 | 6½ | 14½ | 4½ |
| 4 x 4    | 14 | 8  | 16¾ | 4½ |
| 6 x 3    | 20 | 7½ | 16¾ | 5½ |
| 6 x 4    | 20 | 9  | 19  | 5½ |
| 6 x 6    | 20 | 12 | 24  | 5½ |

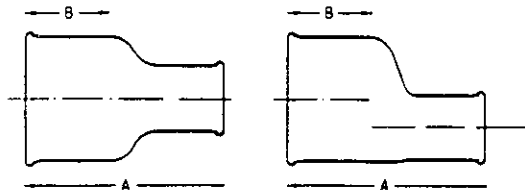
\* Double, available in these sizes only

\*\* D dimension may be longer or shorter than A

6536 Straight

6537 Eccentric

Reducers or Increaseers



| Size    | A | B (min.) |
|---------|---|----------|
| 2 x 1½  | 4 | 1¾       |
| *2½ x 2 | 5 | 3        |
| 3 x 1½  | 5 | 2½       |
| 3 x 2   | 5 | 2½       |
| 4 x 1½  | 7 | 3        |
| 4 x 2   | 7 | 3        |
| 4 x 3   | 7 | 3        |
| 6 x 1½  | 9 | 4        |
| 6 x 2   | 9 | 4        |
| 6 x 3   | 9 | 4        |
| 6 x 4   | 9 | 4        |

\* Used with adjustable joint (#6630)

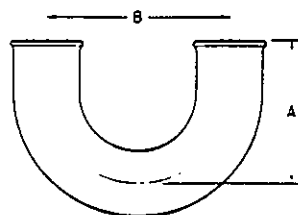
6544



Cleanout Plug

| Size | A* |
|------|----|
| 1½   | 7¾ |
| 2    | 1  |
| 3    | 1½ |
| 4    | 1¾ |
| 6    | 1½ |

6550



U Bend (vent loop)

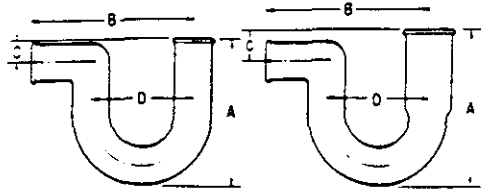
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

Note: U bends (an-nealed only) are often used for vent loops. Bottom sections of long S traps (#6562) are also used as vent loops.

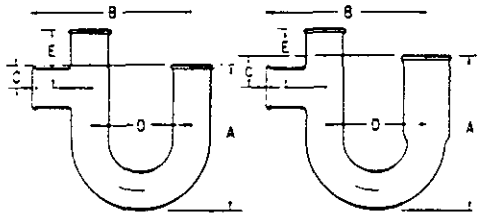
# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6718



6713



## Trap—P Style

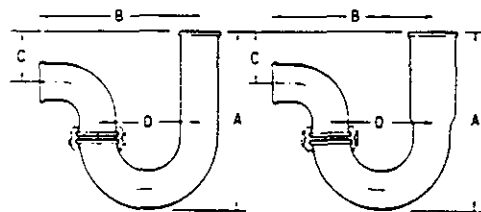
| Size          | Vent Size | A      | B      | C     | D     | E     | Seal Depth |
|---------------|-----------|--------|--------|-------|-------|-------|------------|
| 1 1/2 x 1 1/2 | 1 1/2     | 7      | 6      | 1     | 5     | 1     | 3 1/2      |
| 2 x 1 1/2     | 1 1/2     | 7 1/2  | 6      | 1 1/2 | 5     | 1     | 3 1/2      |
| 2 x 2         | 2         | 8 3/4  | 6 3/4  | 1 1/2 | 5 1/2 | 3 1/2 | 3 1/2      |
| 2 1/2 x 2     | 2         | 9 1/4  | 6 3/4  | 2     | 5 1/2 | 3 1/2 | 3 1/2      |
| 3 x 3         | 3         | 10 1/4 | 10 1/2 | 2     | 5 1/2 | 4     | 3 1/2      |
| 4 x 4         | 4         | 12 1/4 | 12 1/2 | 2 1/2 | 7 1/2 | 5     | 3 1/2      |
| 6 x 6         | 4         | 15 3/8 | 17     | 3 1/2 | 10    | 7     | 3 1/2      |

\*Use adapter coupling, #6653 for inlet joint.

\*\*Use 2" adjustable joint hardware assembly, #6660 for inlet joint.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6700

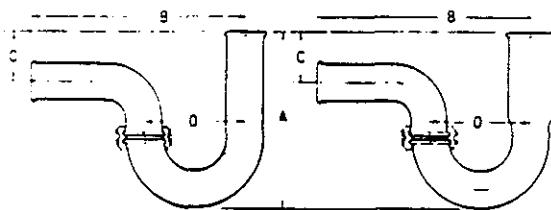


## Trap—P Style—Swivel

No. 6700 (short) Swivel P Trap Assembly consists of a No. 6705 inlet fitting with a No. 6514 Quarter Bend Outlet and a Standard KIMAX Coupling, No. 6650, at the swivel joint.

| Size          | A     | B     | C     | D     | Seal Depth |
|---------------|-------|-------|-------|-------|------------|
| 1 1/2 x 1 1/2 | 8 3/4 | 8     | 2 1/2 | 5     | 3 1/2      |
| 2 x 1 1/2     | 8 3/4 | 8     | 2 1/2 | 5     | 3 1/2      |
| 2 x 2         | 9 1/4 | 8 3/8 | 2 3/8 | 5 1/2 | 3 1/2      |
| 2 1/2 x 2     | 9 1/4 | 8 3/8 | 2 3/8 | 5 1/2 | 3 1/2      |

6701

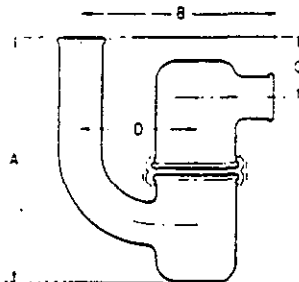


No. 6701 (long) Swivel P Trap Assembly consists of a No. 6705 inlet fitting with a No. 6512 Quarter Bend Outlet and a Standard KIMAX Coupling, No. 6650, at the swivel joint.

| SIZE          | A     | B  | C     | D     | Seal Depth |
|---------------|-------|----|-------|-------|------------|
| 1 1/2 x 1 1/2 | 8 3/4 | 11 | 1 5/8 | 5     | 3 1/2      |
| 2 x 1 1/2     | 8 3/4 | 11 | 1 5/8 | 5     | 3 1/2      |
| 2 x 2         | 9 1/4 | 13 | 1 1/4 | 5 1/2 | 3 1/2      |
| 2 1/2 x 2     | 9 1/4 | 13 | 1 1/4 | 5 1/2 | 3 1/2      |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6710



## Trap—P Style—Swivel Drum

No. 6710 Swivel Drum P trap assembly consists of a No. 6710 inlet fitting with a No. 6715 outlet fitting and a standard KIMAX coupling, No. 6650 at the swivel joint.

| Size          | A      | B     | C     | D     | Body I.D. | Seal Depth |
|---------------|--------|-------|-------|-------|-----------|------------|
| 1 1/2 x 1 1/2 | 10 1/4 | 8     | 2 1/2 | 4 1/2 | 3         | 3 1/2      |
| 2 x 1 1/2     | 10 1/4 | 8     | 2 1/2 | 4 1/2 | 3         | 3 1/2      |
| 2 x 2         | 11     | 9 1/4 | 3     | 5 1/2 | 4         | 3 1/2      |
| 2 1/2 x 2     | 11     | 9 1/4 | 3     | 5 1/2 | 4         | 3 1/2      |

\*Has expanded inlet.

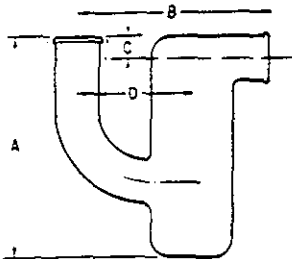
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6707

## Trap—P Style—Drum



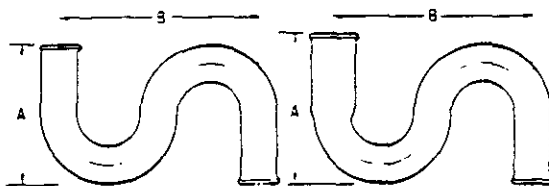
| Size          | A     | B     | C     | D      | Body I.D. | Seal Depth |
|---------------|-------|-------|-------|--------|-----------|------------|
| 1 1/2 x 1 1/2 | 9     | 8     | 1     | 23 1/2 | 3         | 3 1/2      |
| 2 x 1 1/2     | 9     | 8     | 1 1/2 | 23 1/2 | 3         | 3 1/2      |
| 2 x 2         | 9 1/4 | 9 1/4 | 2     | 25 1/2 | 4         | 3 1/2      |
| *2 1/2 x 2    | 9 1/4 | 9 1/4 | 2     | 25 1/2 | 4         | 3 1/2      |

\*Has expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6719

## Trap—S Style



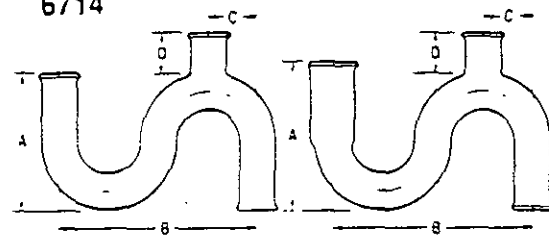
| Size          | Vent Size | A     | B  | C     | D     | Seal Depth |
|---------------|-----------|-------|----|-------|-------|------------|
| 1 1/2 x 1 1/2 | 1 1/2     | 6 1/4 | 10 | 2 1/2 | 2 1/4 | 3 1/2      |
| *2 x 1 1/2    | 1 1/2     | 7 1/4 | 10 | 2 1/2 | 2 1/4 | 3 1/2      |
| 2 x 2         | 2         | 8 1/4 | 11 | 2 3/4 | 2 1/2 | 3 1/2      |
| *2 1/2 x 2    | 2         | 8 1/4 | 11 | 2 3/4 | 2     | 3 1/2      |

\*Use adapter coupling, (#6655) for top joint.

\*\*Use C/I adjustable joint hardware assembly (#6660) for top joint.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

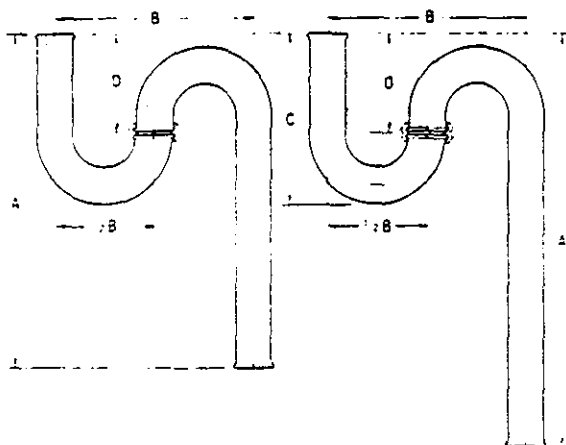
6714



6702

6703

## Trap—S Style—Long



Trap No. 6702 consists of a No. 6705 inlet section, a No. 6562 outlet eq. and a standard KIMAX coupling No. 6650 at the swivel joint. See chart below for layout dimensions.

Trap No. 6703 consists of a No. 6705 inlet section, a No. 6562 outlet eq. and a standard KIMAX coupling No. 6650 at the swivel joint.

6702

| Size          | A       | B  | C     | D     | Seal Depth |
|---------------|---------|----|-------|-------|------------|
| 1 1/2 x 1 1/2 | 157 1/8 | 10 | 8 3/4 | 5     | 4 1/8      |
| *2 x 1 1/2    | 167 1/8 | 10 | 8 3/4 | 5     | 4 1/8      |
| 2 x 2         | 207 1/2 | 11 | 9 1/4 | 4 7/8 | 5 1/4      |
| *2 1/2 x 2    | 207 1/2 | 11 | 9 1/4 | 4 7/8 | 5 1/4      |

6703

| Size          | A       | B  | C     | D | Seal Depth |
|---------------|---------|----|-------|---|------------|
| 1 1/2 x 1 1/2 | 207 1/8 | 10 | 8 3/4 | 5 | 4 1/8      |
| *2 x 1 1/2    | 207 1/8 | 10 | 8 3/4 | 5 | 4 1/8      |

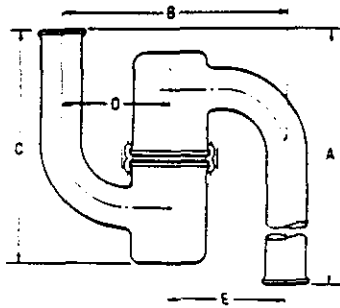
\*Have expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6711



## Trap—S Style—Swivel Drum

Swivel drum trap assemblies No. 6711 and No. 6712 consist of inlet section No. 6715, outlet section No. 6717 and a standard KIMAX coupling No. 6650 at the swivel joint. See charts below for exact dimensions.

6711

| Size    | A   | B   | C   | D  | E  | Body ID | Seal Depth |
|---------|-----|-----|-----|----|----|---------|------------|
| 1½ x 1½ | 16⅞ | 10  | 10¼ | 4⅞ | 5¼ | 3       | 3½         |
| 2 x 1½  | 16⅞ | 10  | 10¼ | 4⅞ | 5¼ | 3       | 3½         |
| 2 x 2   | 20⅞ | 11¼ | 11  | 5¼ | 5¾ | 4       | 3½         |
| 2½ x 2  | 20⅞ | 11¼ | 11  | 5¼ | 5¾ | 4       | 3½         |

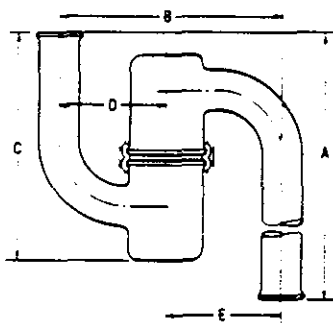
Traps available with either A or B type cleanout. See Standard Cleanouts. Page 13.

6712

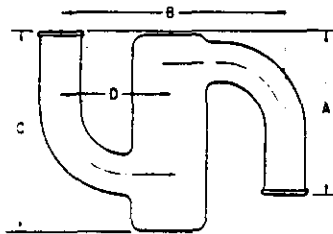
| Size    | A   | B  | C   | D  | E  | Body ID | Seal Depth |
|---------|-----|----|-----|----|----|---------|------------|
| 1½ x 1½ | 20⅞ | 10 | 10¼ | 4⅞ | 5¼ | 3       | 3½         |
| 2 x 1½  | 20⅞ | 10 | 10¼ | 4⅞ | 5¼ | 3       | 3½         |

Traps available with either A or B type cleanout. See Standard Cleanouts. Page 13.

6712



6708



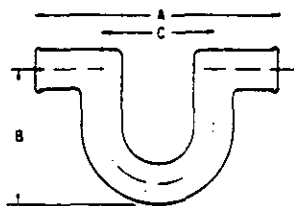
## Trap—S Style—Drum

| Size    | A  | B  | C  | D  | Body ID | Seal Depth |
|---------|----|----|----|----|---------|------------|
| 1½ x 1½ | 6⅞ | 10 | 9  | 4⅞ | 3       | 3½         |
| 2 x 1½  | 7⅞ | 10 | 9  | 4⅞ | 3       | 3½         |
| 2 x 2   | 8⅞ | 11 | 9¾ | 5¼ | 4       | 3½         |
| 2½ x 2  | 8⅞ | 11 | 9¾ | 5¼ | 4       | 3½         |

\*Has expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts. Page 13.

6770



## Trap—Running

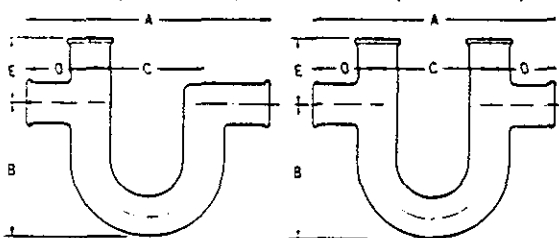
| Size    | Vent Size | A   | B   | C  | D  | E  | Seal Depth |
|---------|-----------|-----|-----|----|----|----|------------|
| 1½ x 1½ | 1½        | 11  | 6   | 5  | 3  | 3  | 3½         |
| 2 x 2   | 2         | 12  | 6⅞  | 5½ | 3½ | 3½ | 3½         |
| 3 x 3   | 3         | 14½ | 8¼  | 6½ | 4  | 4  | 3½         |
| 4 x 4   | 4         | 17½ | 9¾  | 7½ | 5  | 5  | 3½         |
| 6 x 6   | 4         | 24  | 12⅞ | 10 | 7  | 7  | 3½         |

\*Special order only

Traps available with either A or B type cleanout. See Standard Cleanouts. Page 13.

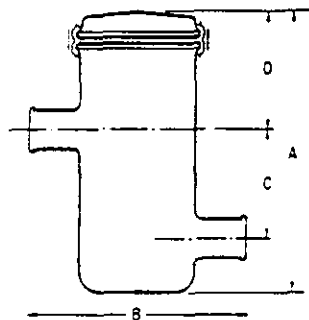
6771 (one vent)

6772 (two vents)



## DRAINLINE TRAPS

6576



### Trap—Drum (top cleanout)

This trap assembly consists of the following components:

- No. 6577, 6" glass body
- No. 6544, short cleanout plug
- No. 6650, 6" standard KIMAX coupling

| Size      | A    | B    | C   | D   | Body ID | Seal Depth |
|-----------|------|------|-----|-----|---------|------------|
| 1½" x 1½" | 13½" | 10½" | 4½" | 5½" | 6       | 1          |

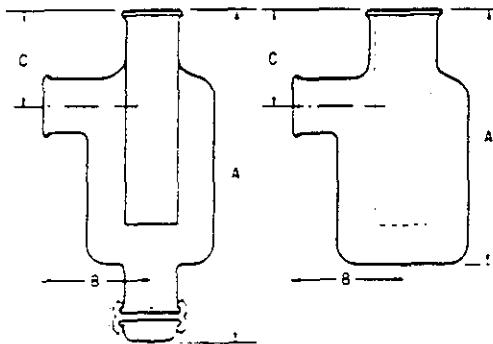
6612

6614

### Trap—Partition

No. 6612 partition trap with sealed-in partition is available in 1½" and 2" sizes only. Standard with B type cleanout.

No. 6614 partition trap is available in 1½" and 2" outlet sizes only. 1½" outlet trap has a 2" inlet to accept No. 6655 adapter coupling. 2" outlet trap has 2½" inlet to accept No. 6660 adjustable joint coupling.



6612

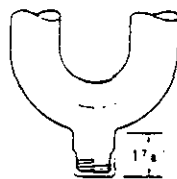
| Size Inlet x Outlet | A    | B   | C   | Seal Depth |
|---------------------|------|-----|-----|------------|
| 1½" x 1½"           | 11½" | 3½" | 3½" | 3½"        |
| 2" x 2"             | 12½" | 5½" | 4½" | 3½"        |

Both traps are non-siphoning with partition always visible.

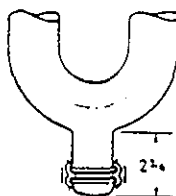
6614

| Size Inlet x Outlet | A   | B   | C   |
|---------------------|-----|-----|-----|
| 2" x 1½"            | 8½" | 3½" | 3½" |
| 2½" x 2"            | 9½" | 5½" | 4½" |

### Type A



### Type B



### Standard Cleanouts

Standard drainline trap cleanout Type A is fitted with a phenolic screw type cap with TFE liner (No. 6675). Type B cleanout consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

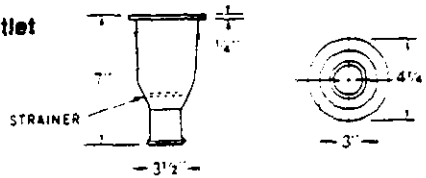
To order standard traps with cleanouts use catalog number for proper style and add the letter A or B for desired cleanout style.

For correct layout dimensions add 1 7/8" to overall trap height for cleanout Type A, or 2 1/4" for cleanout Type B.

## CUP SINKS

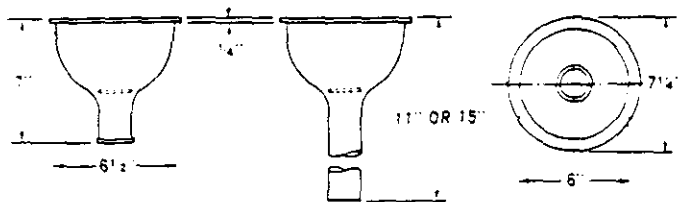
Outside surface of cupsink bodies has an opaque white surface. No. 6724 2" sink strainer furnished with all cup sinks. Specify overall desired length, either 11" or 15", when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded end traps or fittings.

**6616 Beaded Outlet**



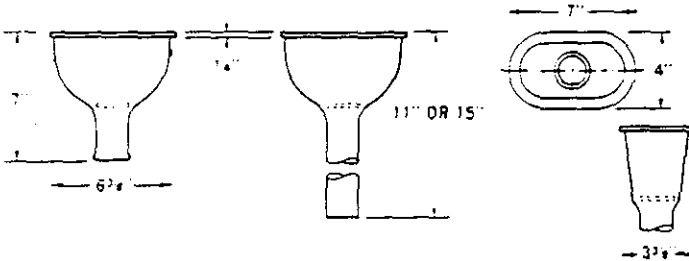
**3" Hemispherical**

**6617 Beaded Outlet 6617P Plain Outlet**



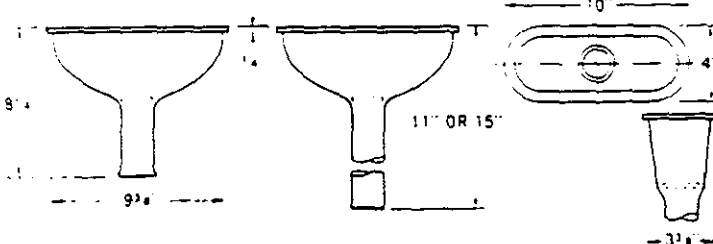
**6" Hemispherical**

**6619 Beaded Outlet 6619P Plain Outlet**



**3" x 6" Oval**

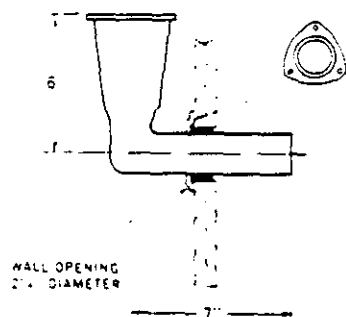
**6618 Beaded Outlet 6618P Plain Outlet**



**3" x 9" Oval**

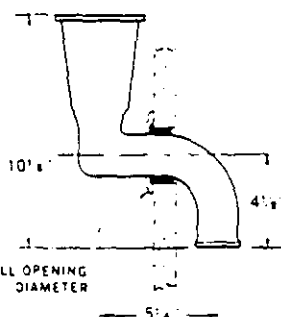
**6627**

**3" x 6" Oval Horizontal, 1 1/2" Outlet**



**6628**

**3" x 6" Oval Vertical, 1 1/2" Outlet**



### Wall Mounted Cup Sink

#### Horizontal Outlet

No. 6621 cup sink oval 10x6  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert 2 x 1 1/2"

#### Vertical Outlet

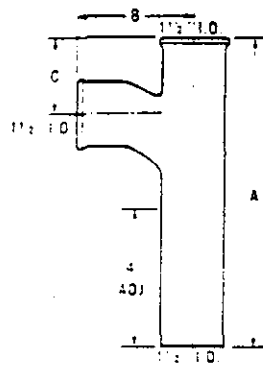
No. 6629 oval cup sink 10x6  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert 2 x 1 1/2"

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly, use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded end fittings. For No. 6628 assembly, use No. 6650 1 1/2" size standard KIMAX coupling.

# ADJUSTABLE UNDERBENCH FITTINGS

Field adjustments up to 4" are possible using adapter coupling No. 6655, 2 x 1 1/2" size

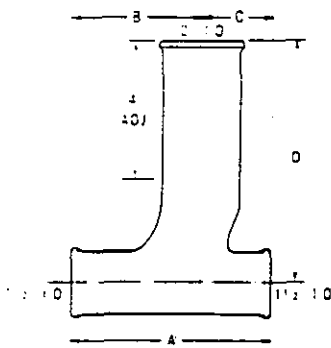
6525



Adjustable Sanitary T (Plain End)

| Size                  | A     | B     | C     |
|-----------------------|-------|-------|-------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 1/4 | 3 1/2 | 2 1/4 |

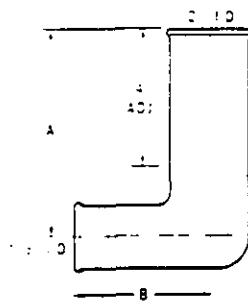
6520



Adjustable Sanitary T

| Size              | A | B     | C     | D |
|-------------------|---|-------|-------|---|
| 1 1/2 x 1 1/2 x 2 | 6 | 2 1/4 | 2 1/4 | 1 |

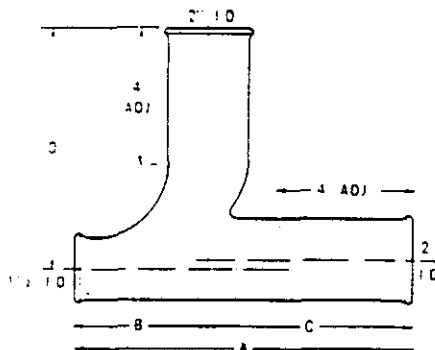
6517



Adjustable 1/4 Bend

| Size      | A | B |
|-----------|---|---|
| 2 x 1 1/2 | 6 | 4 |

6530



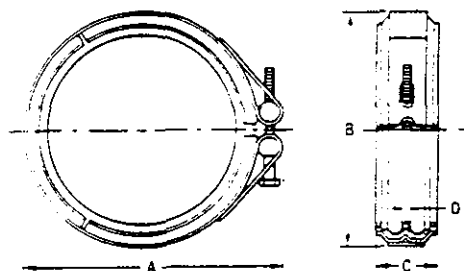
Adjustable Combination Y & 1/8 Bend

| Size          | A  | B | C | D |
|---------------|----|---|---|---|
| 1 1/2 x 2 x 2 | 10 | 4 | 5 | 1 |



## ACCESSORIES AND HARDWARE

6650



### Coupling

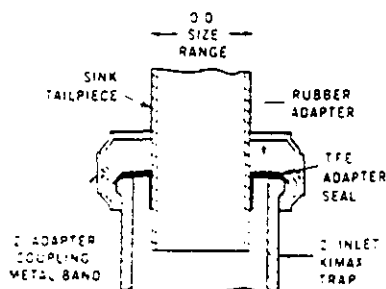
The patented KIMAX Standard Coupling No. 6650 consists of the following components:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna N rubber compression ring with TFE liner
- No. 6653 stainless steel bolt

For more detailed construction features, advantages, and installation procedures, see Page 3 and 4 of this catalog or KIMAX Drainline Installation Manual TR-427.

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2½ | 1½ | ¾ | ¼-28 x 2½ |
| 2    | 3½ | 3½ | 1½ | ¾ | ¼-28 x 2½ |
| 3    | 4½ | 4½ | 1½ | ¾ | ¼-28 x 2½ |
| 4    | 6  | 5½ | 1½ | ¾ | ¼-28 x 3½ |
| 6    | 8½ | 7½ | 2½ | ¾ | ¼-28 x 3½ |

6655



### Adapter Coupling Patent Pending

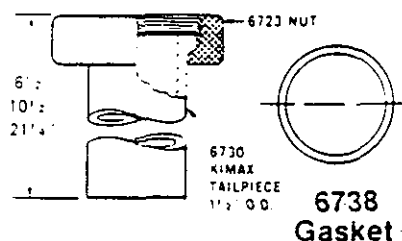
No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to unthreaded sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt

| Size   | Tailpiece Style                                                                                                                                                                             | O.D. Size Range |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                                       | 1.48 to 1.53    |
| 2 x 1¾ | Lead, Class D or XL tailpiece                                                                                                                                                               | 1.70 to 1.73    |
| 2 x 1¾ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Corrosion #14646<br>Durcon #S0-2<br>Durcon #11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 1.82 to 1.90    |

6728



### 1½" Coupling Nut and Tailpiece Assembly

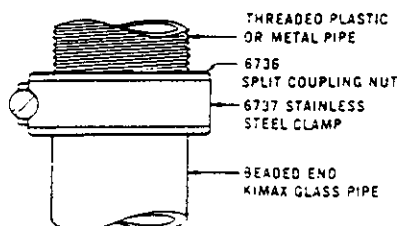
KIMAX tailpiece is available in 6½", 10½", 21½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length using No. 6729 cutter. Assembly No. 6728 consists of a No. 6729 phenolic nut and a No. 6730 KIMAX tailpiece.

**Note:** This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand-tighten coupling nut—do not use pipe wrench.

Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe.

## ACCESSORIES AND HARDWARE

### 6735 (1½"–2" sizes)

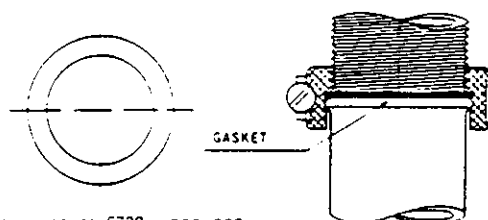


### Split Coupling Nut Assembly

No. 6735 split coupling nut assembly consists of a No. 6736 split coupling nut and a No. 6737 stainless steel clamp. To install, remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

Use to connect 1½" beaded glass pipe to a threaded 1½" metal pipe. Use a 6739 gasket.

### 6739 (1½"–2" sizes)

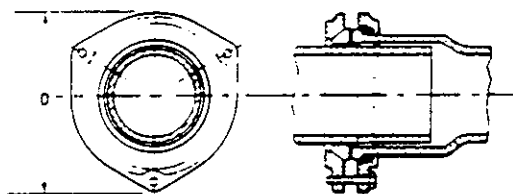


Use gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe.

### Gasket for Split Coupling Nut Assembly

When using KIMAX Split Coupling Nut No. 6735 to connect trap or beaded end pipe to threaded metal pipe, use Gasket No. 6739 as shown in drawing. Hand tighten nut No. 6735. Do not use pipe wrench.

### 6660



### Adjustable Joint

Adjustable joint permits space adjustment. Assembly No. 6660 consists of:

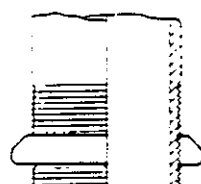
- No. 7206 aluminum inner flange
- No. 7150 aluminum outer flange
- No. 7227 TFE seal ring
- No. 7203 adapter insert (molded neoprene asbestos)
- No. 7226 rubber compression ring
- No. 7180 (3) aluminum (hex head 5/16"–18x1¼")

| Size | 0   |
|------|-----|
| 2    | 5½" |

### 6680



### 6685—Adjustable



### Bead Adapters

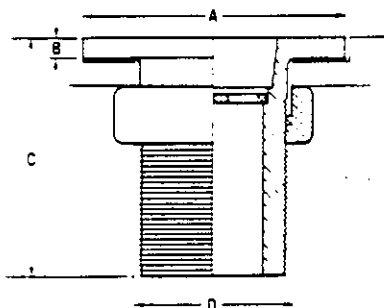
Threaded bead adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling No. 6650. All TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.

## ACCESSORIES AND HARDWARE

### 6720 (1½", 2", 3" sizes)



### Sink Outlet Assembly

Consists of:

6724 sink strainer—black fluorocarbon plastic

6721 sink outlet—black fluorocarbon plastic

6725 gasket—neoprene

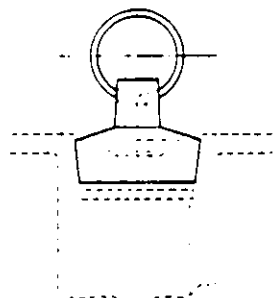
6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use JMW-60 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

| Size | A  | B | C  | D  |
|------|----|---|----|----|
| 1½   | 3½ | ½ | 2½ | 1½ |
| 2    | 4  | ¾ | 3  | 2  |
| 3    | 5  | 1 | 3  | 2½ |

For sink outlet tailpiece connections, see No. 6728 description, page 16, and No. 6735 description, page 17.

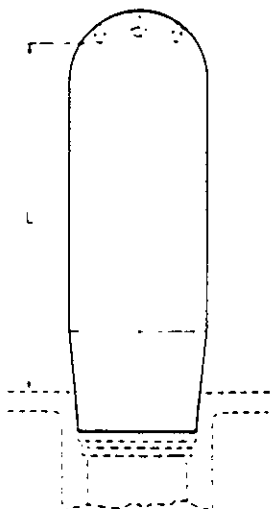
### 6726



### Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" sizes in white. 3" size only in black fluorocarbon.

### 6727



### Sink Overflow—Beehive and Open Type

Sink overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" and 3" sink outlets only. The beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
| 1½               | 4"                  | 6" | 8" | —                | —  | —  |
| 2                | —                   | —  | —  | 4"               | 6" | 8" |
| 3                | —                   | —  | —  | 4"               | 6" | 8" |

## ACCESSORIES AND HARDWARE

### 7310 KIMAX Portable Beading Kit

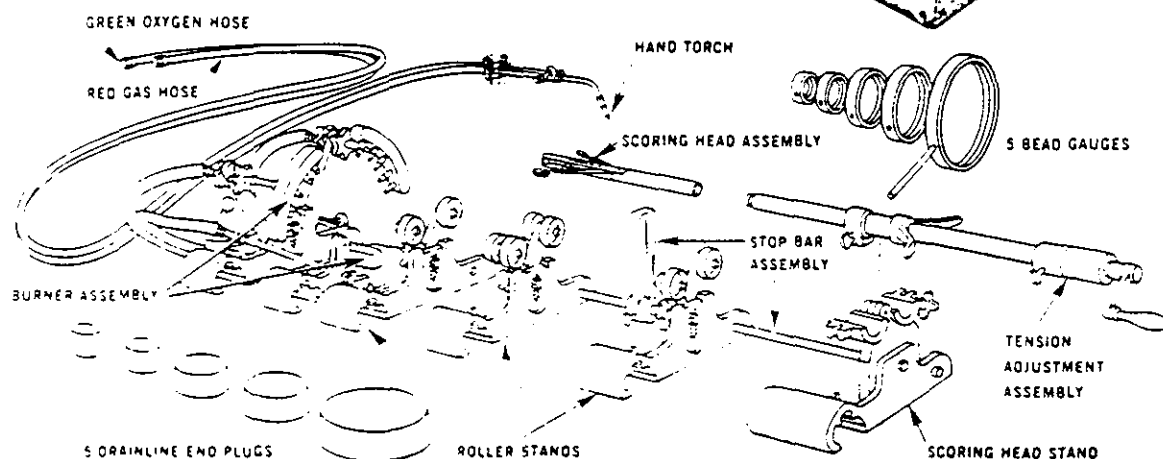
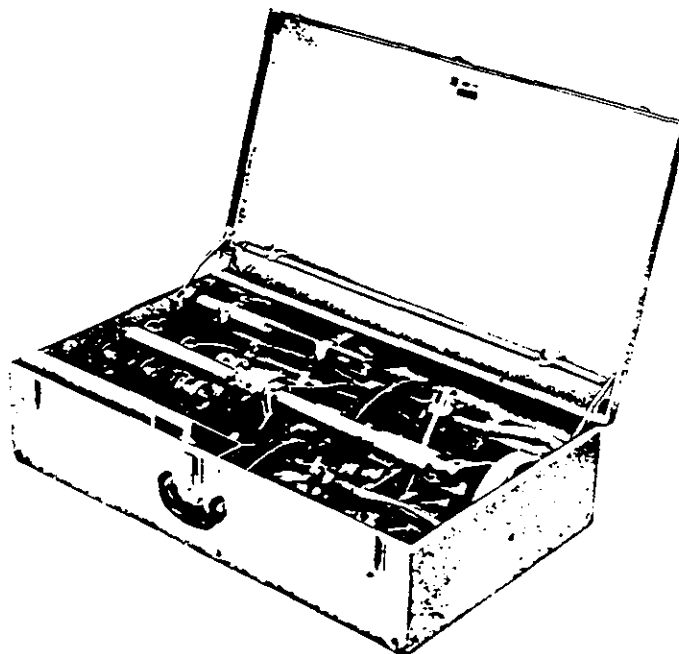
... for job-site

beading of

KIMAX Drainline

straight lengths

See Owens-Illinois Bulletin  
TR-244 for complete set-up  
and operating instructions.



Exploded view of KIMAX Portable Beading Kit components.

### 6729 Pipe Scoring Tool

For small field installations, No. 6729 tool can be used to trim ends of glass pipe to be inserted into KIMAX adapter coupling No. 6655 or adjustable joint No. 6660. After cut is completed, ends of pipe are wiped with 150 grit emery cloth. This tool is recommended for use on 1 1/4" ID and 1 1/2" ID pipe only.

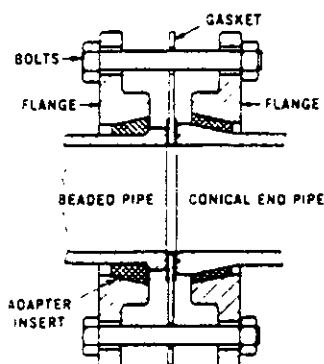
### 7290 Pipe Hangers (padded)

(1 1/2", 2", 3", 4", 6" sizes)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L-5 Zinc coating.

## ACCESSORIES AND HARDWARE

### 7110—Beaded Pipe to Conical End Pipe



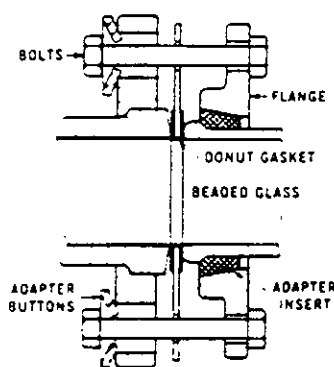
### Pipe Connection Assembly Kits

To join **Beaded end pipe to conical end pipe**, Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

| Pipe Size | Flange Qty. No.  | Insert Qty. No.  | Gasket No. | Bolts & Nuts Qty. Size   |
|-----------|------------------|------------------|------------|--------------------------|
| 1 1/2     | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 8-7190<br>1/4-18 x 2 1/2 |
| 2         | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 8-7190<br>1/4-18 x 2 1/2 |
| 3         | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 8-7190<br>1/4-18 x 3     |
| 4         | 1-6670<br>1-7156 | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>1/4-18 x 3     |
| 6         | 1-6670<br>1-7156 | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>1/4-18 x 3     |

### 7120—Beaded Pipe to U.S. Standard Flange (ASME Bolt Circle)

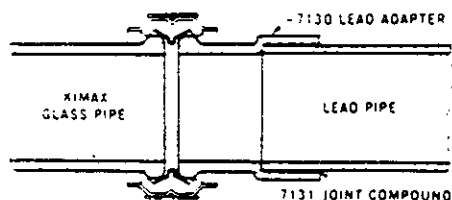


To join **beaded glass pipe to inside coated metal**, Kit includes all flanges, inserts, adapter inserts, bolts and adapter buttons.

Chart for parts included in kit.

| Flange Size | Flange Qty. No. | Inserts Qty. No. | Adapter Buttons | Donut Gasket Qty. No. | Bolts & Nuts Qty. Size   |
|-------------|-----------------|------------------|-----------------|-----------------------|--------------------------|
| 1 1/2       | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 8-7190<br>1/4-18 x 2 1/2 |
| 2           | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 8-7190<br>1/4-18 x 2 1/2 |
| 3           | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 8-7190<br>1/4-18 x 3     |
| 4           | 1-6670          | 1-7203           | 8-7230          | 1-7276                | 8-7190<br>1/4-18 x 3     |
| 6           | 1-6670          | 1-7203           | 8-7230          | 1-7276                | 8-7190<br>1/4-18 x 3     |

### 7130—Beaded Pipe to Lead Pipe



### Glass to Lead Pipe Adapter

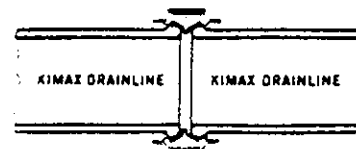
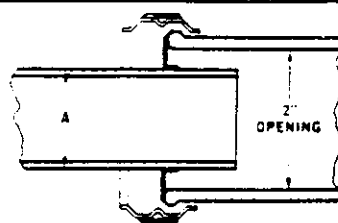
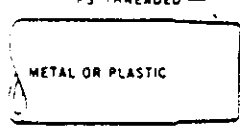
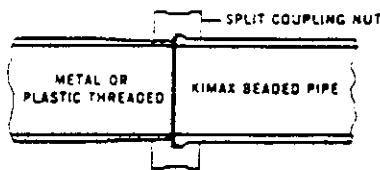
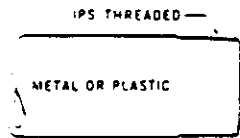
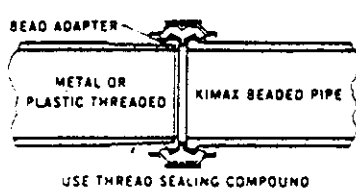
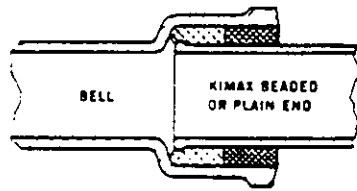
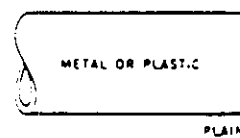
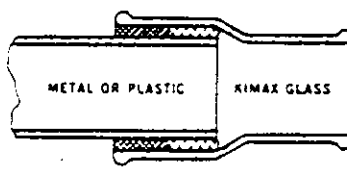
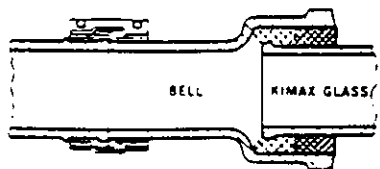
A lead adapter is available in 1 1/2 and 2" size only. Adapter is cemented onto plain end lead pipe with a lead-epoxy lead compound. Mixing instructions are included with joint compound.

Adapter No. 7130

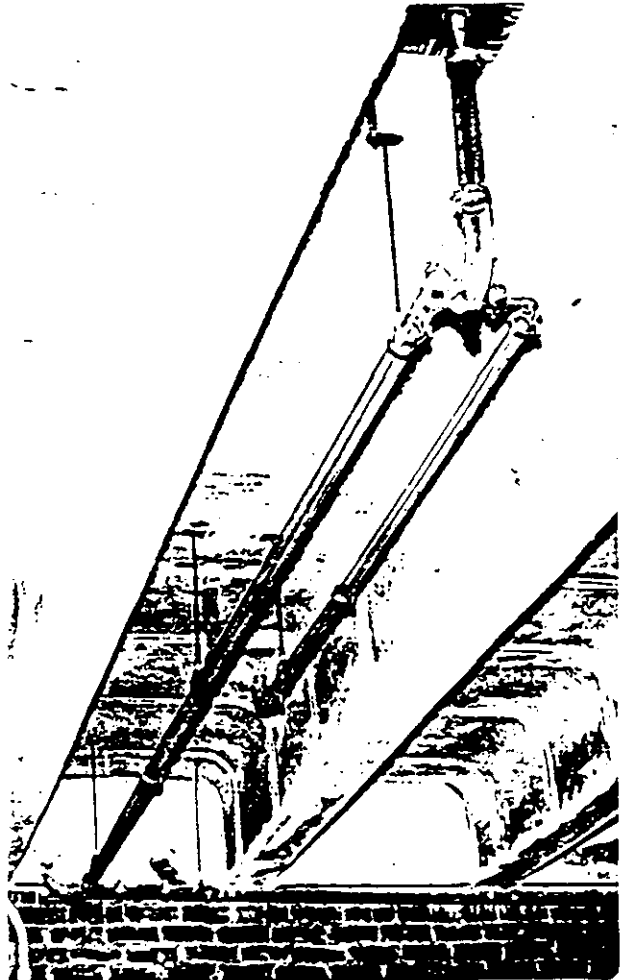
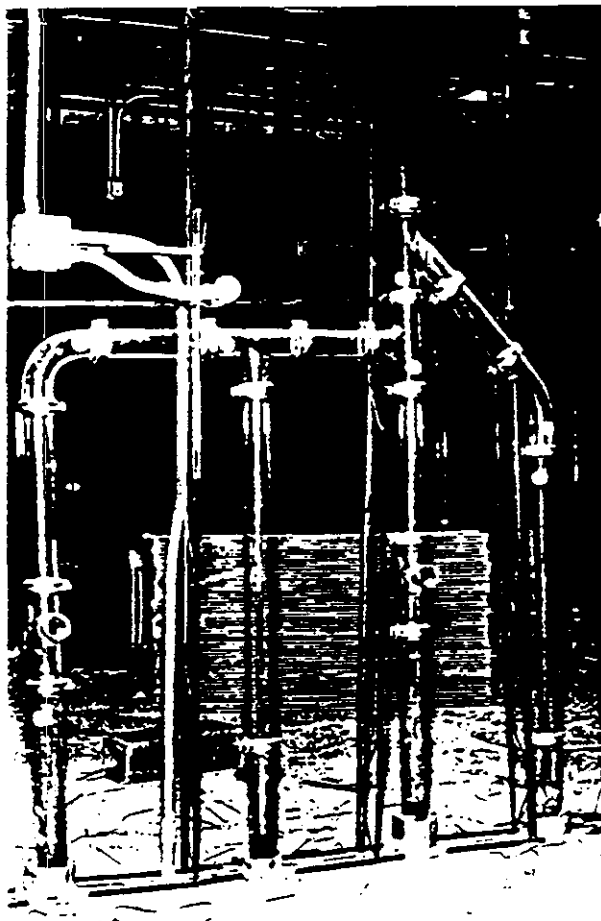
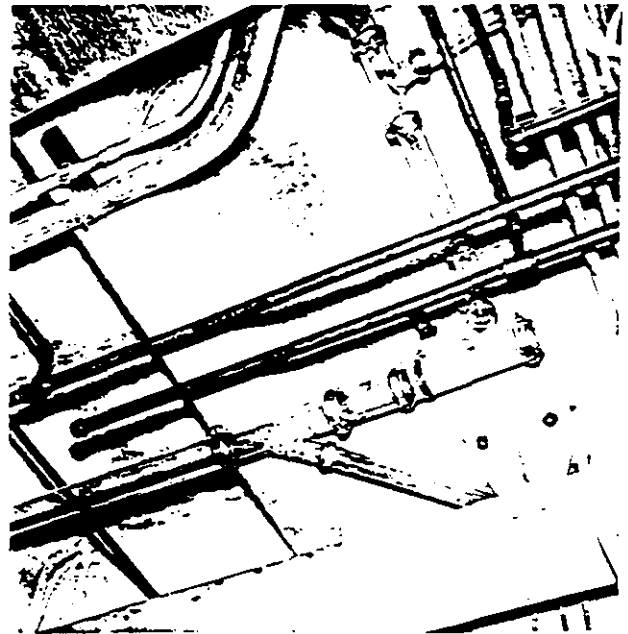
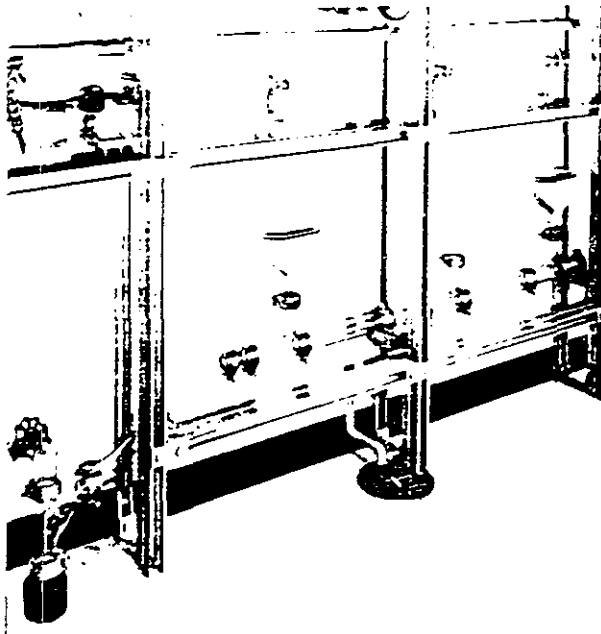
Joint Compound 7131

Use standard coupling No. 6650 to connect glass to lead adapter.

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                      | Type of Joint                                                                                                                                                                           | Material Needed                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------|----------------------|------|-----------|------|-----------|------|-------|------|------|------|---|------|------|---|------|------|
|  <p>KIMAX DRAINLINE<br/>BEADED</p>                               |  <p>KIMAX DRAINLINE KIMAX DRAINLINE</p>                                                               | <p><b>KIMAX Coupling</b></p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650</td></tr><tr><td>2</td><td>6650</td></tr><tr><td>3</td><td>6650</td></tr><tr><td>4</td><td>6650</td></tr><tr><td>6</td><td>6650</td></tr></table>                                                                                                                                           | Size                       | Code No.            | 1½                   | 6650 | 2         | 6650 | 3         | 6650 | 4     | 6650 | 6    | 6650 |   |      |      |   |      |      |
| Size                                                                                                                                              | Code No.                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                                | 6650                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                                 | 6650                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3                                                                                                                                                 | 6650                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4                                                                                                                                                 | 6650                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6                                                                                                                                                 | 6650                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>KIMAX GLASS<br/>METAL OR<br/>RIGID PLASTIC<br/>PLAIN END</p> |  <p>A 2" OPENING</p>                                                                                   | <p><b>KIMAX Adapter Coupling</b></p> <table><tr><th>"A" Dimension<br/>Pipe O.D.</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>6655</td></tr><tr><td>1.70—1.78</td><td>6655</td></tr><tr><td>1.82—1.90</td><td>6655</td></tr></table>                                                                                                                                                     | "A" Dimension<br>Pipe O.D. | Code No.            | 1.48—1.53            | 6655 | 1.70—1.78 | 6655 | 1.82—1.90 | 6655 |       |      |      |      |   |      |      |   |      |      |
| "A" Dimension<br>Pipe O.D.                                                                                                                        | Code No.                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.48—1.53                                                                                                                                         | 6655                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.70—1.78                                                                                                                                         | 6655                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.82—1.90                                                                                                                                         | 6655                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>1/2 IPS THREADED —<br/>METAL OR PLASTIC</p>                  |  <p>SPLIT COUPLING NUT<br/>METAL OR PLASTIC THREADED KIMAX BEADED PIPE</p>                            | <p><b>KIMAX Split Coupling Nut and Gasket</b></p> <table><tr><th>Pipe Size</th><th>Nut<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635</td><td>6739</td></tr><tr><td>2</td><td>6635</td><td>6739</td></tr></table>                                                                                                                                                   | Pipe Size                  | Nut<br>Code No.     | Gasket<br>Code No.   | 1½   | 6635      | 6739 | 2         | 6635 | 6739  |      |      |      |   |      |      |   |      |      |
| Pipe Size                                                                                                                                         | Nut<br>Code No.                                                                                                                                                                         | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                             |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                                | 6635                                                                                                                                                                                    | 6739                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                                 | 6635                                                                                                                                                                                    | 6739                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>1/2 IPS THREADED —<br/>METAL OR PLASTIC</p>                |  <p>BEAD ADAPTER<br/>METAL OR PLASTIC THREADED KIMAX BEADED PIPE<br/>USE THREAD SEALING COMPOUND</p> | <p><b>KIMAX Bead Adapter and Standard Coupling</b></p> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680</td><td>6650</td></tr><tr><td>2</td><td>6680</td><td>6650</td></tr><tr><td>3</td><td>6680</td><td>6650</td></tr><tr><td>4</td><td>6680</td><td>6650</td></tr><tr><td>6</td><td>6680</td><td>6650</td></tr></table> | Pipe Size                  | Adapter<br>Code No. | Coupling<br>Code No. | 1½   | 6680      | 6650 | 2         | 6680 | 6650  | 3    | 6680 | 6650 | 4 | 6680 | 6650 | 6 | 6680 | 6650 |
| Pipe Size                                                                                                                                         | Adapter<br>Code No.                                                                                                                                                                     | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                                | 6680                                                                                                                                                                                    | 6650                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                                 | 6680                                                                                                                                                                                    | 6650                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3                                                                                                                                                 | 6680                                                                                                                                                                                    | 6650                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4                                                                                                                                                 | 6680                                                                                                                                                                                    | 6650                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6                                                                                                                                                 | 6680                                                                                                                                                                                    | 6650                                                                                                                                                                                                                                                                                                                                                                                           |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>BELL</p>                                                   |  <p>BELL KIMAX BEADED OR PLAIN END</p>                                                               | <p><b>KIMAX Glass to Bell End Pipe</b></p> <ol style="list-style-type: none"><li>1. Pack hub half full with asbestos rope.</li><li>2. Caulk with hot lead, lead wool or acid proof cement.</li></ol> <p>For Detail, see TR-427</p>                                                                                                                                                             |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>METAL OR PLASTIC<br/>PLAIN</p>                             |  <p>METAL OR PLASTIC KIMAX GLASS</p>                                                                 | <p><b>KIMAX Glass to Plain End Metal or Plastic</b> For Detail, see TR-427</p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536</td></tr><tr><td>3 x 2</td><td>6536</td></tr><tr><td>4 x 3</td><td>6536</td></tr><tr><td>6 x 4</td><td>6536</td></tr></table>                                                                                                         | Size                       | Code No.            | 2 x 1½               | 6536 | 3 x 2     | 6536 | 4 x 3     | 6536 | 6 x 4 | 6536 |      |      |   |      |      |   |      |      |
| Size                                                                                                                                              | Code No.                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2 x 1½                                                                                                                                            | 6536                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3 x 2                                                                                                                                             | 6536                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4 x 3                                                                                                                                             | 6536                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6 x 4                                                                                                                                             | 6536                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|  <p>HIGH SILICA<br/>MECHANICAL JOINT</p>                       |  <p>BELL KIMAX GLASS</p>                                                                            | <p><b>KIMAX Glass to Adapter Hub for High Silica Iron Mechanical Joint</b></p> <p>For Detail, see TR-427</p>                                                                                                                                                                                                                                                                                   |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |

## TYPICAL KIMAX DRAINLINE INSTALLATIONS



## KIMAX DRAINLINE INSTALLATIONS

Over the past years there have been hundreds of KIMAX Glass Drainline installations, while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

### Schools and Universities

Rutgers University  
Tacoma High School  
Washington State University  
Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pamona College  
Sooonia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami, Florida  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Snohomish High School  
University of Washington  
City of Detroit  
University of Michigan  
University of Minnesota  
North Shore Junior College, Houston  
Boston College  
Florida State University

### Hospitals

Maynard Hospital, Seattle, Washington  
Beaumont Hospital, Detroit, Michigan  
Botsford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minnesota  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
Skin and Cancer Hospital, Philadelphia, Pennsylvania  
Germantown Hospital, Philadelphia, Pennsylvania  
Tyler Memorial Hospital, Meshoppen, Pennsylvania  
Emory University Hospital, Atlanta, Georgia

### Industrial

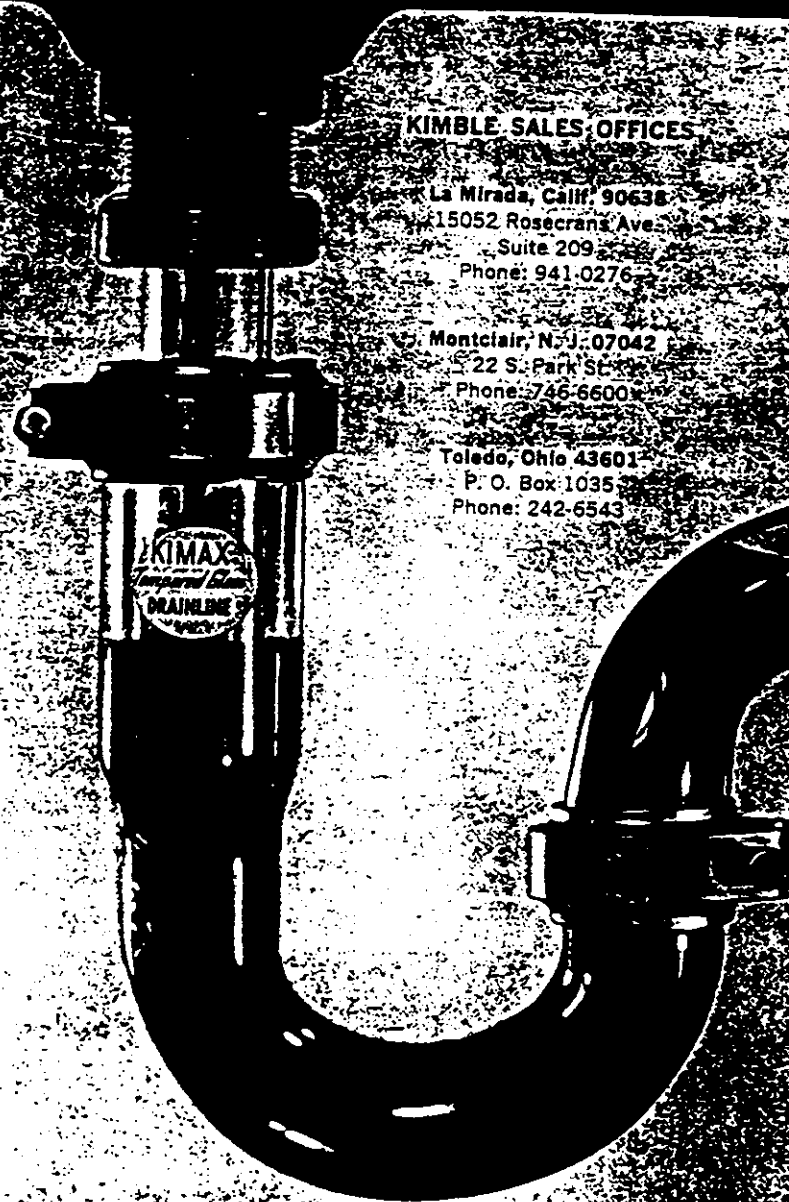
Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohn & Hass  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office Building, Boston  
B. F. Goodrich  
E. I. DuPont

### Research

A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Gilliam Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Reiter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
St. Hyacinthe Agricultural Institute  
Texaco Experiment, Inc.

... and many, many more!





#### KIMBLE SALES OFFICES

La Mirada, Calif. 90638

15052 Rosecrans Ave.

Suite 209

Phone: 941-0276

Montclair, N.J. 07042

22 S. Park St.

Phone: 746-6600

Toledo, Ohio 43601

P. O. Box 1035

Phone: 242-6543

## OWENS ILLINOIS

maker of Kimble Products

Toledo, Ohio 43601



**O-I / SCHOTT**

Process Systems, Inc.

1640 South West Boulevard

P. O. Box T

Vineland, New Jersey 08360-0136

Phone (609) 692-4700

TWX 510-687-8913

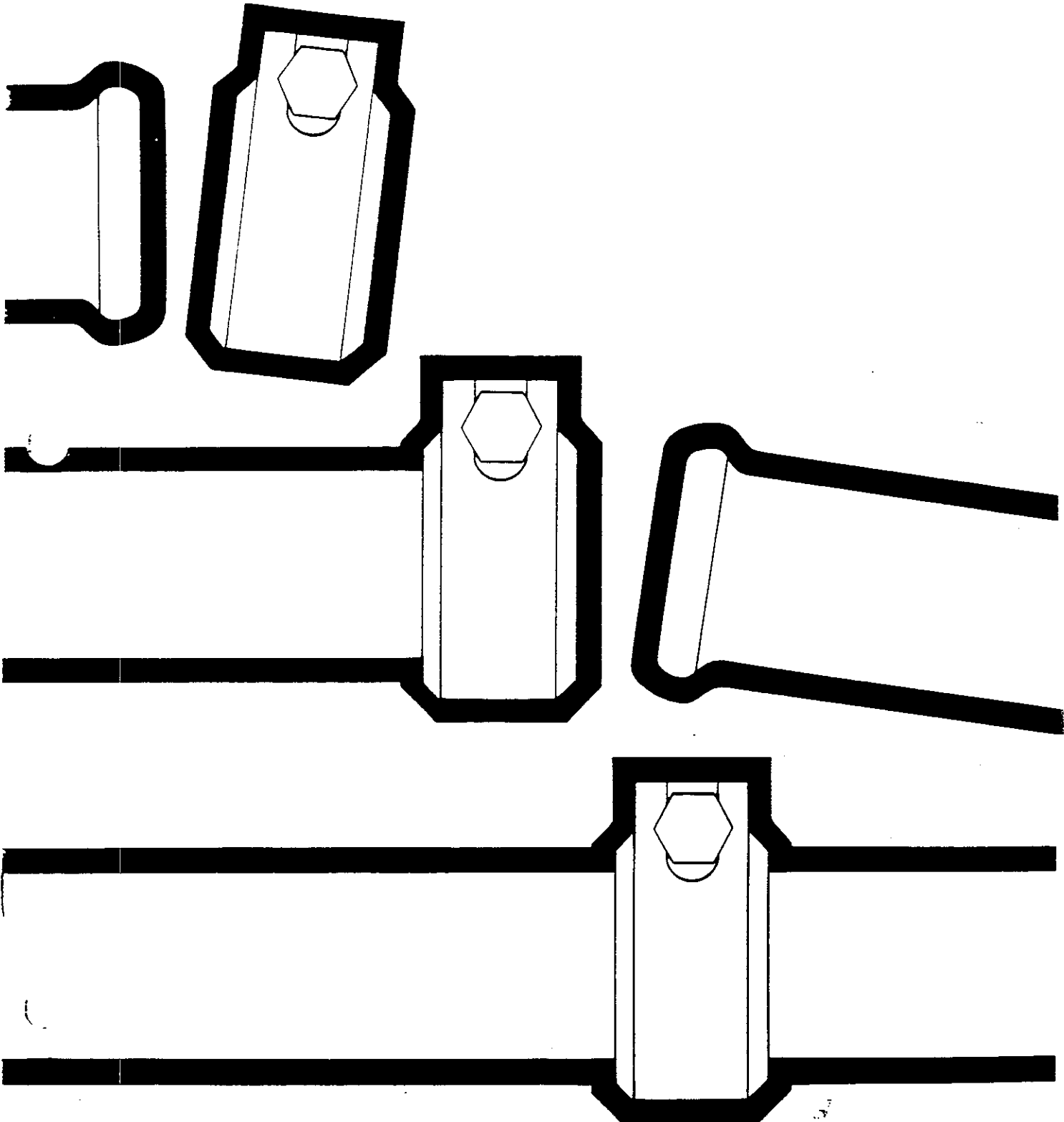
OI KIM VINE

**KIMAX<sup>®</sup>**

Glass Drainline

Installation Guide

OIS-65



# COMPLETE SYSTEM, RELIABLE, EASY TO INSTALL

## EASY TO INSTALL

With few exceptions, KIMAX glass drainline installs in much the same manner as you would install any drainline system.

KIMAX pipe and fittings possess good mechanical strength, so you don't need to handle the system with kid gloves.

There is no limit to the length or height to which KIMAX glass drainline can be installed. It can be encased inside a wall, accessible or not. It can be buried in the ground, underneath concrete, or inside any trough or sleeve.

For above ground installation, drainline pipe is available in 5' and 10' lengths in diameters from 1½" through 6". For underground use, 5' lengths come protected in factory-applied expanded polystyrene casing. The system also includes a complete line of glass fittings and traps, plus the accessories and hardware to meet virtually any chemical-waste disposal system requirement.

KIMAX drainline weighs less than conventional drainline materials, so it's easy to handle, fewer hangers and joints are required and sections can be preassembled and carried to the point of installation. Expansion is negligible; therefore expansion joints are not needed nor recommended.

## SIMPLE, LEAK-PROOF JOINTS

Conventional glass-to-glass connections are made quickly and simply using #6650 KIMAX couplings. Just as easily, you can join 1½", 2", 3", 4" and 6" glass (beaded end) drainline to plain end glass, metal or rigid plastic pipe using #6661 KIMAX B/P couplings. See opposite page for details.

When properly installed both couplings will provide leak-free joints — even with line deflections of up to four degrees.

With B/P couplings and the KIMAX portable glass cutter, you can cut and join 1½" through 6" glass drainline anywhere on the jobsite.

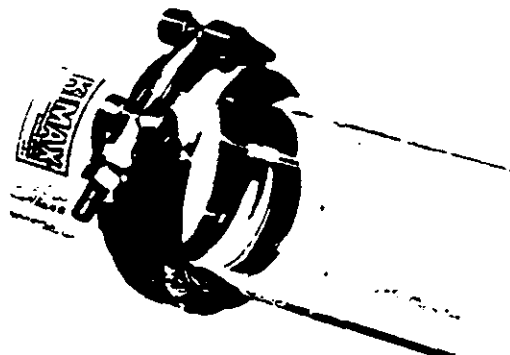
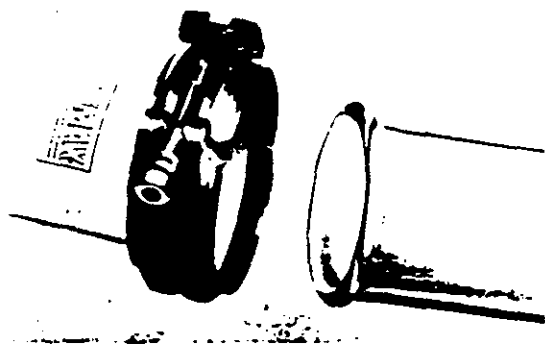


®KIMAX is the registered trademark of Owens-Illinois for pipe and fittings manufactured from borosilicate glass conforming to Federal Specification DD-G-541B, Military Specification, ASTM Specification.

## MAKING JOINTS WITH KIMAX #6650, 6661 COUPLINGS

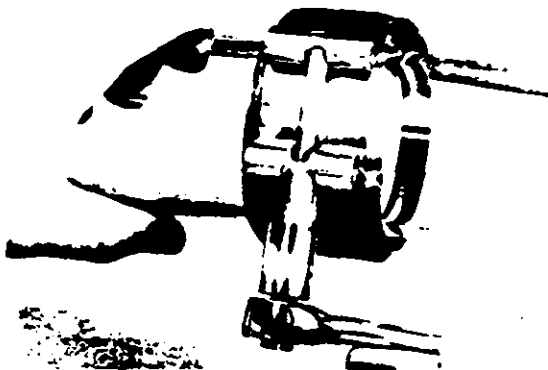
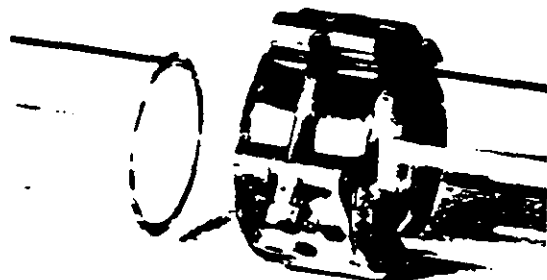
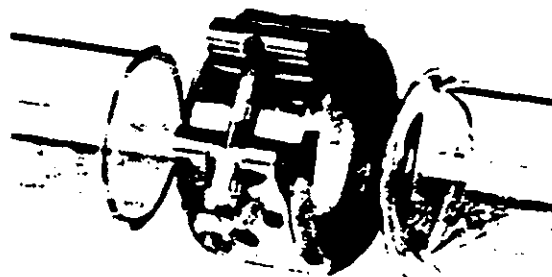
**JOINING KIMAX DRAINLINE TO KIMAX AND OTHER GLASS DRAINLINE PIPE AND FITTINGS USING #6650 KIMAX (Bead to Bead) DRAINLINE COUPLING.**

- Dip coupling in water or wet inside with damp cloth.
- Snap coupling over one end of pipe . . . then stab other section of pipe into opposite side of coupling. Start coupling from side opposite bolt as shown in top photo. Apply push and rotational pressure to snap coupling over bead.
- Tighten coupling bolt with 6" ratchet wrench.



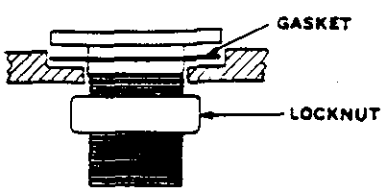
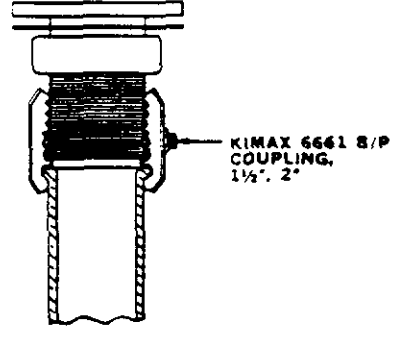
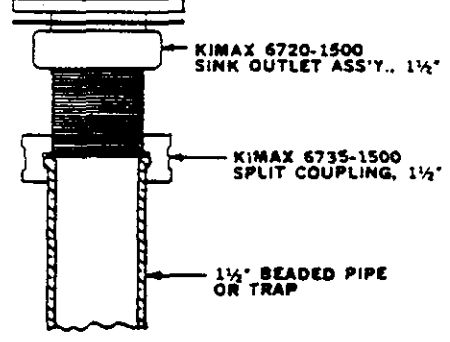
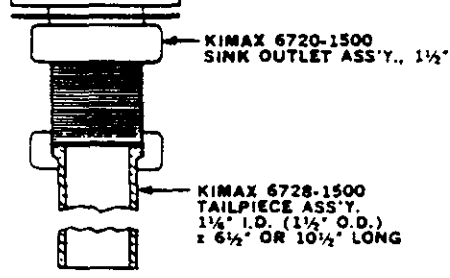
**JOINING KIMAX 1 1/2" THRU 6" DRAINLINE TO PLAIN END GLASS, METAL OR RIGID PLASTIC PIPE USING #6661 KIMAX B/P (Bead to Plain End) DRAINLINE COUPLING\*.**

- Wipe beaded end of glass pipe with damp cloth.
- Snap coupling over beaded end of pipe.
- Insert (do not force) plain pipe into opposite side of coupling — making certain that plain end is fully seated.
- Tighten coupling bolt(s) with 6" ratchet wrench.

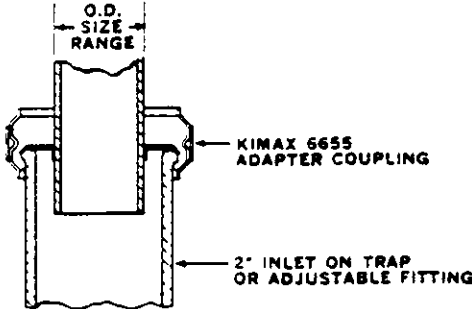
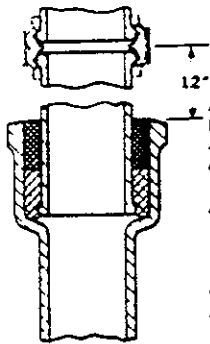
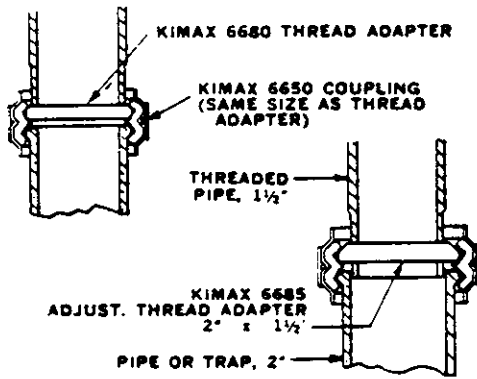
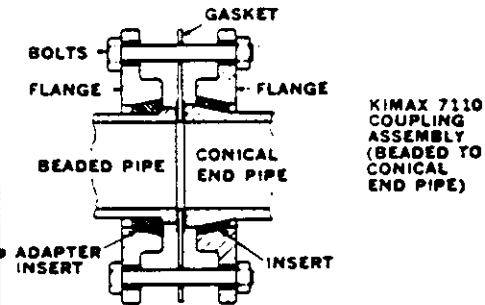


\*Now with B/P Couplings and the KIMAX Portable Glass Pipe Cutter (see page 9 for instructions), you can cut and join 1 1/2" thru 6" beaded to plain end glass drainline anywhere on the jobsite.

# TYPICAL JOINT REFERENCE CHART

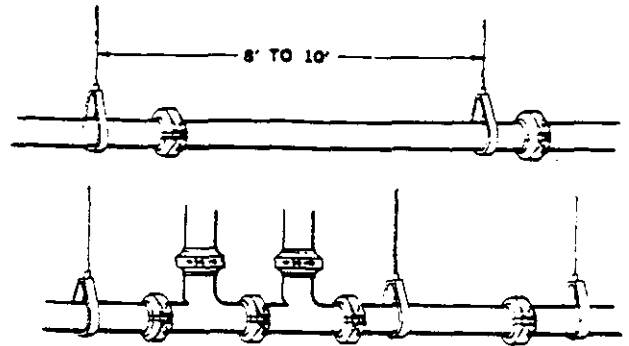
| Type of Joint                                                                                                      | Materials Needed                                                                                                                                                                                                                                                                                                                                  | Steps to be Taken                                                                                                                                                                                                                                                                                                                                 |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|-----|----|----------|----|-----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Installing<br>KIMAX Sink Outlet                                                                                    |  <table border="1"> <thead> <tr> <th>Size Outlet</th><th>Hole</th><th>Counterbore</th></tr> </thead> <tbody> <tr> <td>1½"</td><td>2"</td><td>3½" x ⅜"</td></tr> <tr> <td>2"</td><td>2½"</td><td>4½" x ⅜"</td></tr> </tbody> </table> | Size Outlet                                                                                                                                                                                                                                                                                                                                       | Hole | Counterbore | 1½" | 2" | 3½" x ⅜" | 2" | 2½" | 4½" x ⅜" | <ol style="list-style-type: none"> <li>1. Drill hole in sink bottom as indicated for size outlet being installed.</li> <li>2. Drill counter bore to proper diameter and depth.</li> <li>3. Smooth bottom of counter bore and insert gasket.</li> <li>4. Remove locknut and insert outlet through sink hole.</li> <li>5. Screw locknut tight against sink bottom.</li> <li>6. Seal gap between outlet lip and counterbore with acid-resistant 3M-EC-612 caulking compound or equivalent.</li> </ol> <p><b>Note:</b> Install stainless steel in same manner as above.</p> |
| Size Outlet                                                                                                        | Hole                                                                                                                                                                                                                                                                                                                                              | Counterbore                                                                                                                                                                                                                                                                                                                                       |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1½"                                                                                                                | 2"                                                                                                                                                                                                                                                                                                                                                | 3½" x ⅜"                                                                                                                                                                                                                                                                                                                                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2"                                                                                                                 | 2½"                                                                                                                                                                                                                                                                                                                                               | 4½" x ⅜"                                                                                                                                                                                                                                                                                                                                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1½", 2"<br>KIMAX Sink Outlet<br>to<br>KIMAX Beaded<br>Pipe or Trap<br>(same size)                                  |                                                                                                                                                                                                                                                                 | <ol style="list-style-type: none"> <li>1. Snap coupling over beaded end of pipe or trap.</li> <li>2. Slide opposite (grooved) side of coupling onto threaded outlet. Do not force but make certain that outlet end is fully seated in coupling.</li> <li>3. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol>                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1½" KIMAX<br>(or plastic or<br>metal I.P.S.<br>threaded) Sink<br>Outlets<br>to<br>1½" KIMAX Beaded<br>Pipe or Trap |                                                                                                                                                                                                                                                                | <ol style="list-style-type: none"> <li>1. Remove clamp from split coupling.</li> <li>2. Position coupling halves over glass bead.</li> <li>3. Replace and tighten clamp.</li> <li>4. Screw coupling onto threaded outlet.</li> </ol> <p><b>Note:</b> Use 6739 Gasket when connecting KIMAX beaded pipe or trap to metal threaded sink outlet.</p> |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1½" KIMAX<br>(or plastic or<br>metal I.P.S.<br>threaded) Sink<br>Outlets<br>to<br>1½" KIMAX<br>Tailpiece Assy.     |                                                                                                                                                                                                                                                                | <ol style="list-style-type: none"> <li>1. Slide plastic nut up to top (beaded end) of tailpiece.</li> <li>2. Screw nut onto threaded outlet.</li> </ol> <p><b>Note:</b> Use 6738 Gasket when connecting glass tailpiece to metal threaded sink outlet.</p>                                                                                        |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

# TYPICAL JOINT REFERENCE CHART

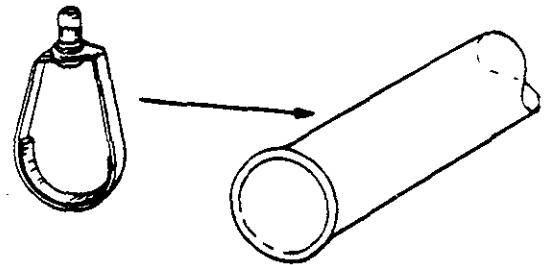
| Type of Joint                                                                                                                             | Materials Needed                                                                                                                                                                                                                                                                                                                                                                                                                           | Steps to be Taken                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------------|--------|---------------------------------------------------------------------------------------|--------------|--------|------------------------------------------------------------|--------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <p>1½" KIMAX (or other glass, metal or plastic) Plain End Tailpiece or Plain End Cupsink to 2" KIMAX Trap Inlet or Adjustable Fitting</p> |  <p>1½" x 1½" O.D. #6665-1512<br/>1½" x 1½" O.D. #6665-1515<br/>WITH RUBBER SEAL ONLY</p>                                                                                                                                                                                                                                                                | <ol style="list-style-type: none"> <li>1. Snap coupling over beaded end of trap inlet.</li> <li>2. Slide coupling up over plain end tailpiece or cup sink to desired height.</li> <li>3. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol> <p><b>Note:</b> Use KIMAX adapter coupling 2" x 1½" to connect to Pyrex sink outlet or plain end cupsink.</p> <table border="1"> <thead> <tr> <th>Coupling Size</th><th>Tailpiece Style</th><th>O.D. Size Range</th></tr> </thead> <tbody> <tr> <td>2 x 1½</td><td>KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions</td><td>1.48 to 1.53</td></tr> <tr> <td>2 x 1½</td><td>Lead, Class D or XL tailpiece PYREX tailpiece and cup sink</td><td>1.70 to 1.78</td></tr> <tr> <td>2 x 1½</td><td>Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #SO-2 Durcon #11713 Lead — Class C or L, B or M Plastic or Steel (1½ IPS)</td><td>1.82 to 1.90</td></tr> </tbody> </table> | Coupling Size | Tailpiece Style | O.D. Size Range | 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions | 1.48 to 1.53 | 2 x 1½ | Lead, Class D or XL tailpiece PYREX tailpiece and cup sink | 1.70 to 1.78 | 2 x 1½ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #SO-2 Durcon #11713 Lead — Class C or L, B or M Plastic or Steel (1½ IPS) | 1.82 to 1.90 |
| Coupling Size                                                                                                                             | Tailpiece Style                                                                                                                                                                                                                                                                                                                                                                                                                            | O.D. Size Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                                                                                                                                                                                                                                                                                      | 1.48 to 1.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | Lead, Class D or XL tailpiece PYREX tailpiece and cup sink                                                                                                                                                                                                                                                                                                                                                                                 | 1.70 to 1.78                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #SO-2 Durcon #11713 Lead — Class C or L, B or M Plastic or Steel (1½ IPS)                                                                                                                                                                                                                                                                              | 1.82 to 1.90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>KIMAX Beaded or Plain End Pipe to Metal Bell and Spigot Pipe</p>                                                                       |  <p>12"</p> <p>ASBESTOS ROPE AND LEAD OR FOLLOWING ACID-PROOF CEMENTS:</p> <ul style="list-style-type: none"> <li>• LITHARGE (2-3 PARTS) AND GLYCERIN (1 PART)</li> <li>• "SAUERISN" NO. 31-F FILLER</li> <li>• "SAUERISN" NO. 31-B BINDER</li> <li>• "WEDGETITE"</li> <li>• 3M-EC-612 CAULKING COMPOUND WHERE NON-HARDENING JOINT IS DESIRED</li> </ul> | <ol style="list-style-type: none"> <li>1. For line flexibility, place coupling within 12 inches of caulked joint.</li> <li>2. If using plain-end glass pipe, smooth external rough edges with fine carborundum stone or 150-grit emery cloth.</li> <li>3. Insert glass into hub using care so as not to scratch glass. Pack space between glass and hub firmly with asbestos rope, then back off glass ¼" to ½" from base of hub.</li> <li>4. Pour in lead* at lowest pour temperature and caulk lightly — or fill with acid-proof cement.</li> </ol> <p><b>Note:</b> If lead is used, preheat glass first until water drop sizzles.</p> <p>* Pack with lead wool if joining glass to vitreous tile hub.</p>                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>Metal or Plastic I.P.S. Threaded Pipe (straight or tapered), 1½", 2", 3", 4" or 6" to KIMAX Beaded Pipe or Trap (same size)</p>        |  <p>KIMAX 6680 THREAD ADAPTER</p> <p>KIMAX 6680 COUPLING (SAME SIZE AS THREAD ADAPTER)</p> <p>THREADED PIPE, 1½"</p> <p>KIMAX 6685 ADJUST. THREAD ADAPTER 2" x 1½"</p> <p>PIPE OR TRAP, 2"</p>                                                                                                                                                         | <ol style="list-style-type: none"> <li>1. Screw thread adapter onto threaded pipe until it "bottoms." With adjustable adapter, screw into threaded pipe until desired height adjustment is reached.</li> <li>2. Snap coupling over adapter.</li> <li>3. Stab beaded pipe or trap into opposite side of coupling.</li> <li>4. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol> <p><b>Note:</b> Use 6685 Adjust. Adapter to join 1½" threaded pipe to 2" KIMAX beaded trap or pipe.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>KIMAX (conical end) Process Pipe, 1½", 2", 3", 4" or 6" to KIMAX Beaded Pipe or Trap (same size)</p>                                   |  <p>GASKET</p> <p>BOLTS</p> <p>FLANGE</p> <p>FLANGE</p> <p>BEADED PIPE</p> <p>CONICAL END PIPE</p> <p>ADAPTER INSERT</p> <p>INSERT</p> <p>KIMAX 7110 COUPLING ASSEMBLY (BEADED TO CONICAL END PIPE)</p>                                                                                                                                                | <ol style="list-style-type: none"> <li>1. Disassemble coupling and remove inserts.</li> <li>2. Slide proper flange over conical end pipe and snap in flange insert.</li> <li>3. Slide other flange over beaded end pipe and snap in flange adapter insert.</li> <li>4. Slide both flanges firmly against pipe ends.</li> <li>5. Insert gasket between pipe ends.</li> <li>6. Replace bolts and tighten nuts evenly</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |

## HANGING KIMAX DRAINLINE . . . HORIZONTALLY

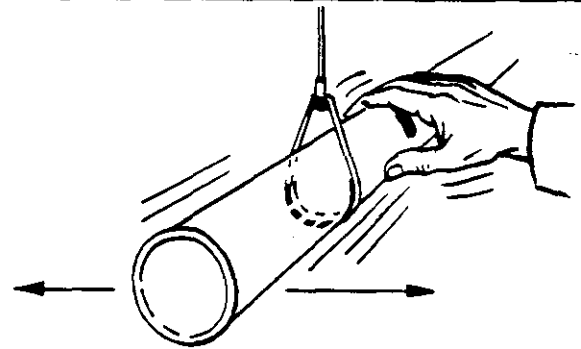
- Use padded (to prevent glass to metal contact) hangers to support lines every 8 feet to 10 feet.
- Use extra hanger when three or more couplings fall within 8 foot to 10 foot span.



- Do not pull or spring pipe into place. Move hanger to pipe . . . not pipe to hanger.
- Completely tighten coupling as each joint is made.

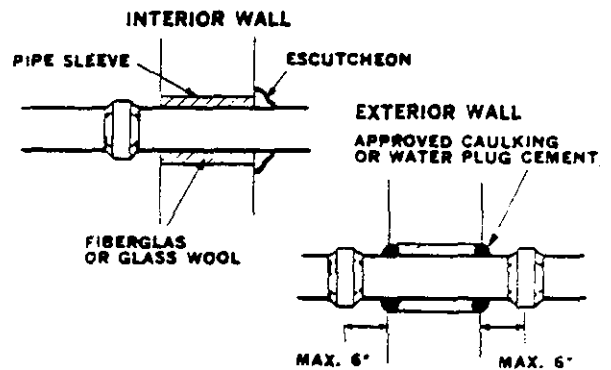


- Keep lines loose . . . when horizontal lines are hung they should be free to move sideways.

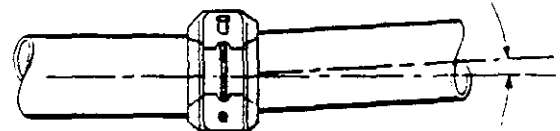


- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 6" on either side of wall.

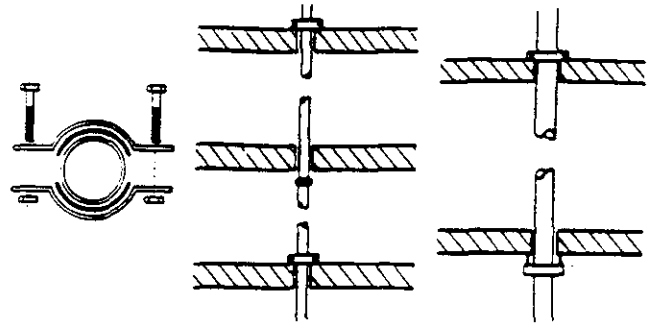


- To pitch a line, snug coupling, cock joint to pitch required and tighten coupling

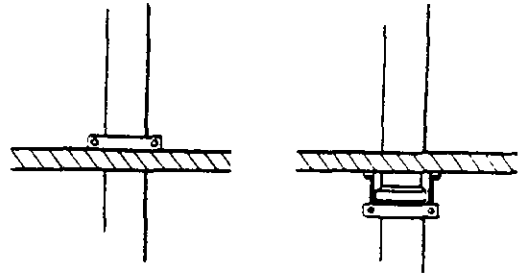


## HANGING KIMAX DRAINLINE... VERTICALLY

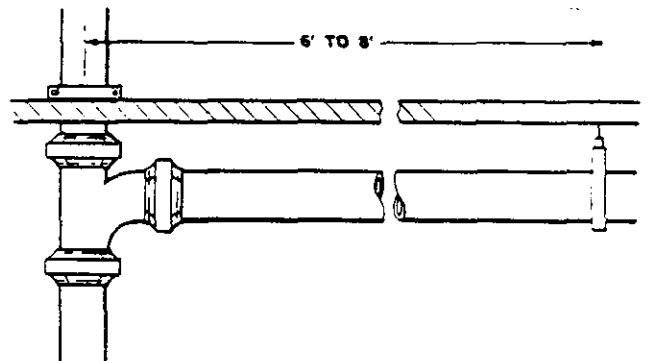
- Use riser clamp lined with  $\frac{1}{4}$ " thick neoprene.
- Support  $1\frac{1}{2}$ " and 2" stacks at every other floor.
- Support 3", 4" and 6" stacks at every floor.



- Place riser clamps either above or below floor.
- Clamp should be below bottom coupling in stack and, where possible, below coupling on every third floor.

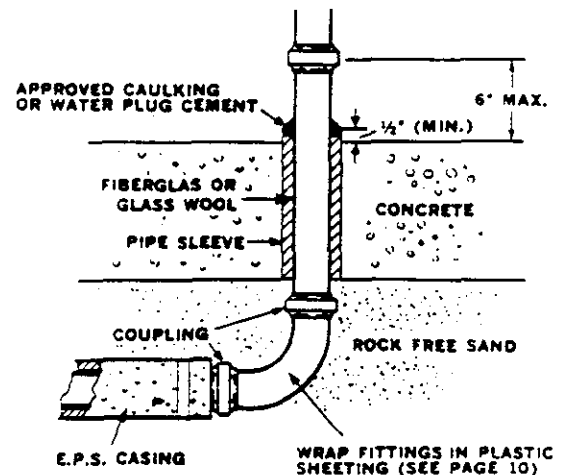


- Do not support vertical stacks with horizontal lines. First hanger should be placed from 6 feet to 8 feet from stack.



- Pipe passing through floors or slabs should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.
- Install coupling within 6" of floor or slab to give flexibility.

Note: For fire, water or explosion-proof floors, pack top of sleeve with caulking material or water plug cement.





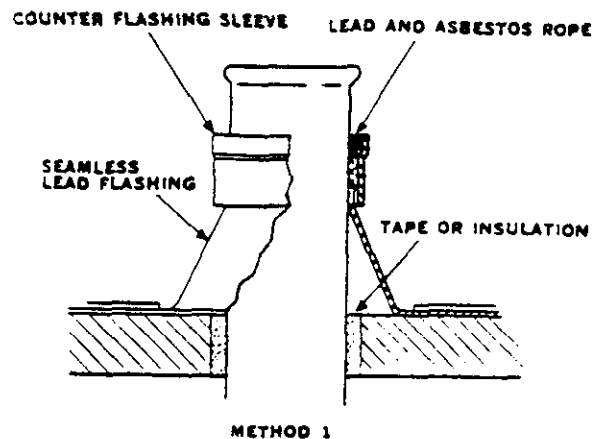
# HANGING KIMAX DRAINLINE ... VERTICALLY

## FLASHING THROUGH ROOF

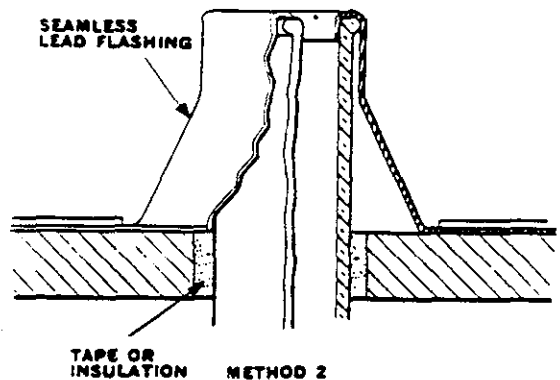
When flashing through a roof, wrap the vent pipe with tape or an insulating material and follow through using either of the methods indicated below:

**METHOD 1.** Seamless lead roof flashing with a caulked counter-flashing sleeve.

**METHOD 2.** Seamless lead or copper roof flashing.



METHOD 1

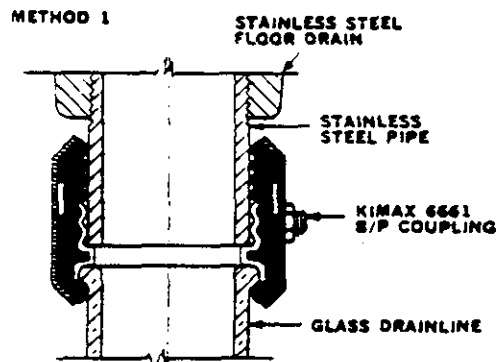


METHOD 2

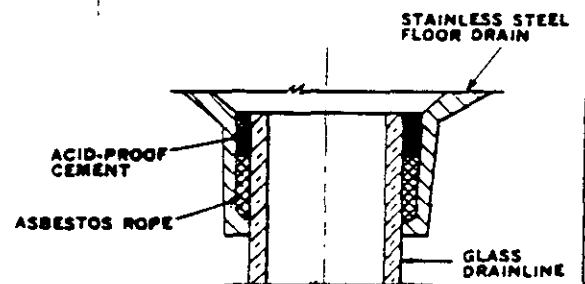
## CONNECTING TO FLOOR DRAIN

**METHOD 1.** Screw I.P.S. threaded metal nipple into outlet of floor drain and join the glass pipe or fitting to nipple using a KIMAX 6661 B/P Coupling.

**METHOD 2.** Cut glass pipe to desired length using KIMAX portable cutting tool. Smooth external sharp edges from cut end and insert into outlet of floor drain. Seal glass in place using asbestos rope and acid-proof cement.



METHOD 1



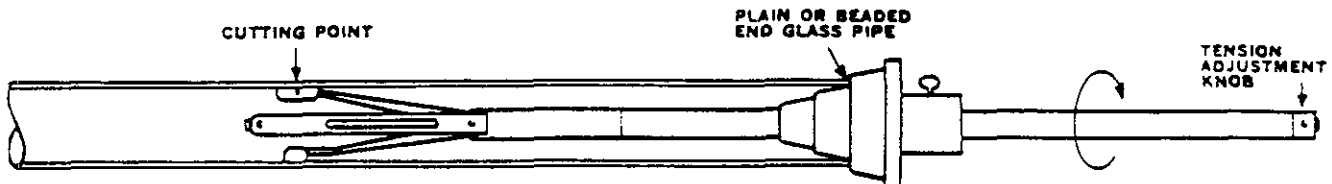
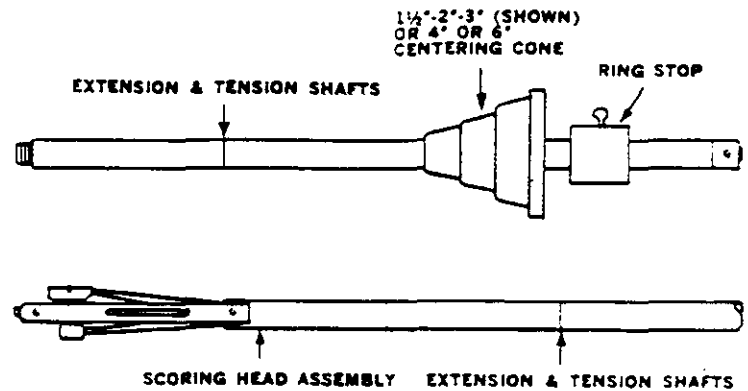
METHOD 2

# KIMAX PORTABLE CUTTER NO. 7310-56802

## TO ASSEMBLE CUTTER TOOL

1. Slide Centering Cone and Ring Stop onto Extension\* & Tension Shafts.
2. Firmly couple Tension Shaft to Scoring Head Assembly.

\*Use Extension Shaft if cutting pipe over 2½ feet long.



## TO USE CUTTER TOOL

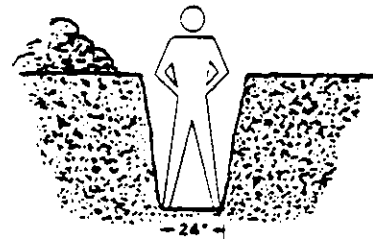
1. Measure length of pipe required and mark cutting point with grease pencil.
2. Insert Scoring Head into pipe with cutter wheel up.
3. Slide Centering Cone into pipe until firmly seated against cut or beaded end.
4. Slide Ring Stop against cone, align cutter wheel with pencil mark and then lock Ring Stop using thumb screw.
5. Turn Tension Adjustment Knob clockwise until cutter wheel contacts glass. Re-check alignment of cutter wheel with pencil mark.
6. Continue turning Tension Knob clockwise to give sufficient pressure on cutting wheel to score glass (medium to light score is desirable on 1½", 2" and 3" — heavy score on 4" and 6" pipe).
7. With pipe firmly pressed onto Centering Cone (and Cone against Ring Stop) — make test score (about ¼" long) by turning Tension Shaft. Make final tension adjustment if necessary.
8. Complete score by turning Tension Shaft one full turn — making sure to close cutting circle but not to score beyond the closing point.
9. Turn Tension Knob counter-clockwise to draw cutter wheel away from glass . . . and remove cutter tool from pipe. Do not drag scoring wheel against the pipe when removing the cutter.
10. Light crack-off torch (Burns-O-Matic or other suitable hand torch).
11. Apply heat on score mark. As pipe starts to separate follow score mark with flame. You may find it necessary to gently tap one end of pipe on table top to complete crack-off.
  - a. If cut end is to be used with KIMAX B/P Coupling, smooth external sharp edge at approximately 45° angle with fine carborundum stone or 150-grit emery cloth.
  - b. If end is to be beaded on KIMAX Beading Kit, do not smooth edge, but proceed with beading as described in KIMAX Cutting and Beading Manual.

NOTE: DO NOT ATTEMPT TO CUT WITHIN 8" OF A FACTORY BEADED PIPE END.

## INSTALLING KIMAX DRAINLINE . . . UNDERGROUND

### EXCAVATING TRENCH

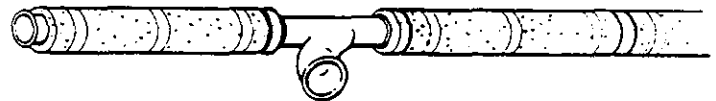
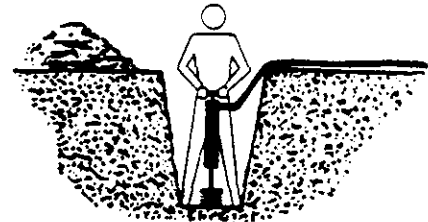
Excavate trench to workable width (24 inches at bottom) and 1 to 2 inches below final grade if clean dirt — 4 to 6 inches below grade if rocky or clay condition.



### TRENCH BEDDING

Trench should have firm bed in order to support pipe uniformly along its full length.

Back-fill to final grade with pea gravel or rock-free sand or soil. Tamp back-fill to assure firm bed and level off mounds or fill depressions with tamped soil.



### INSTALLING PIPE

Use 5-foot lengths of E.P.S. covered heavy schedule drainline pipe and fittings. Remove E.P.S. end caps only, couple pipe and/or fittings in usual manner.

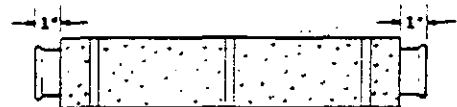
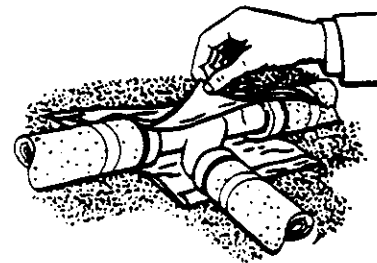
When convenient, assemble several joints to form a section, tighten couplings firmly and lower section into trench.

Protect fittings by wrapping them in polyvinyl film (5 mil), Scotch Wrap or J.M. Trans-Tex or equal.

Compact sand under fittings for support.

Check all joints and water test.

Note: When odd lengths of pipe are required, remove E.P.S. casing and field fabricate pipe to required length. Cut casing 2 inches shorter than new length and replace on pipe leaving 1 inch of pipe exposed at both ends.



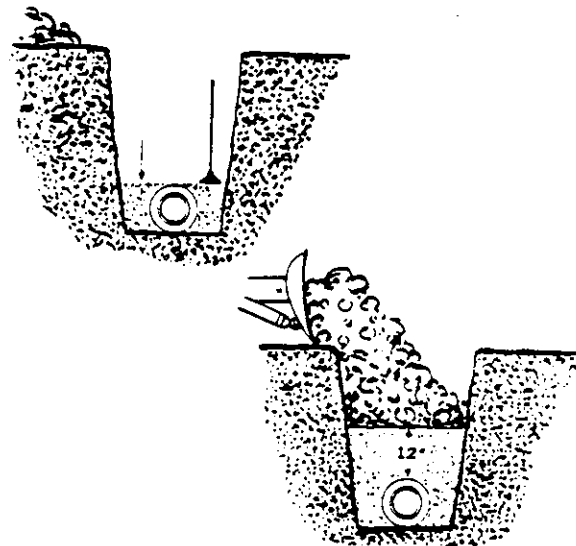
## INSTALLING KIMAX DRAINLINE . . . UNDERGROUND

### BACKFILLING TRENCH

Backfill trench with thin layers of rock-free sand or soil to 12 inches above glass pipe.

Tamp sand firmly with hand tamper or spray it with water to make sure it's firm.

Rest of trench can be filled with available soil using mechanical means.



## TESTING AND PROTECTING GLASS DRAINLINE

### TESTING

Shake lines to make sure there is no strain. There should be some limited movement in both vertical and horizontal lines.

Test lines in accordance with local codes. Air testing should not exceed 5 psi; water testing should not exceed 22 psi.

### IN CASE OF LEAK

Tighten coupling at leaking joint.

If joint continues to leak, remove coupling and make certain that rubber compression liner and TFE seal ring are free from dirt or other obstruction. Also that ends of pipe or fittings are properly seated in couplings.

Replace defective couplings and replace pipe or fittings if beaded ends are defective.

Check for good drainline alignment.

### PROTECTING

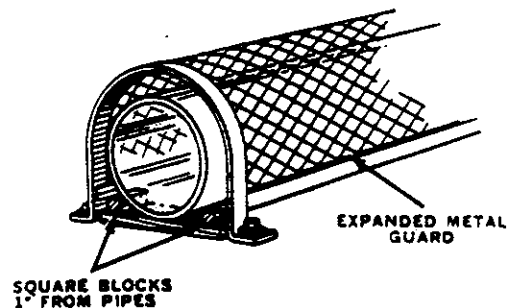
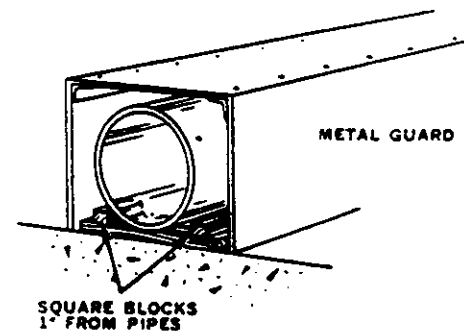
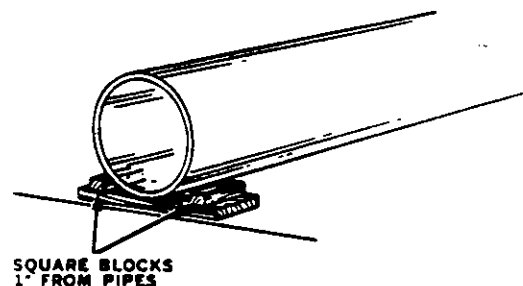
Avoid scratching glass. Keep pipe and fittings in shipping cartons until ready for use.

Avoid spattering glass while welding. Cover drainline with shipping carton or other protective material.

When exposed to heavy traffic, protect drainline with expanded metal, plywood enclosure or channel iron.

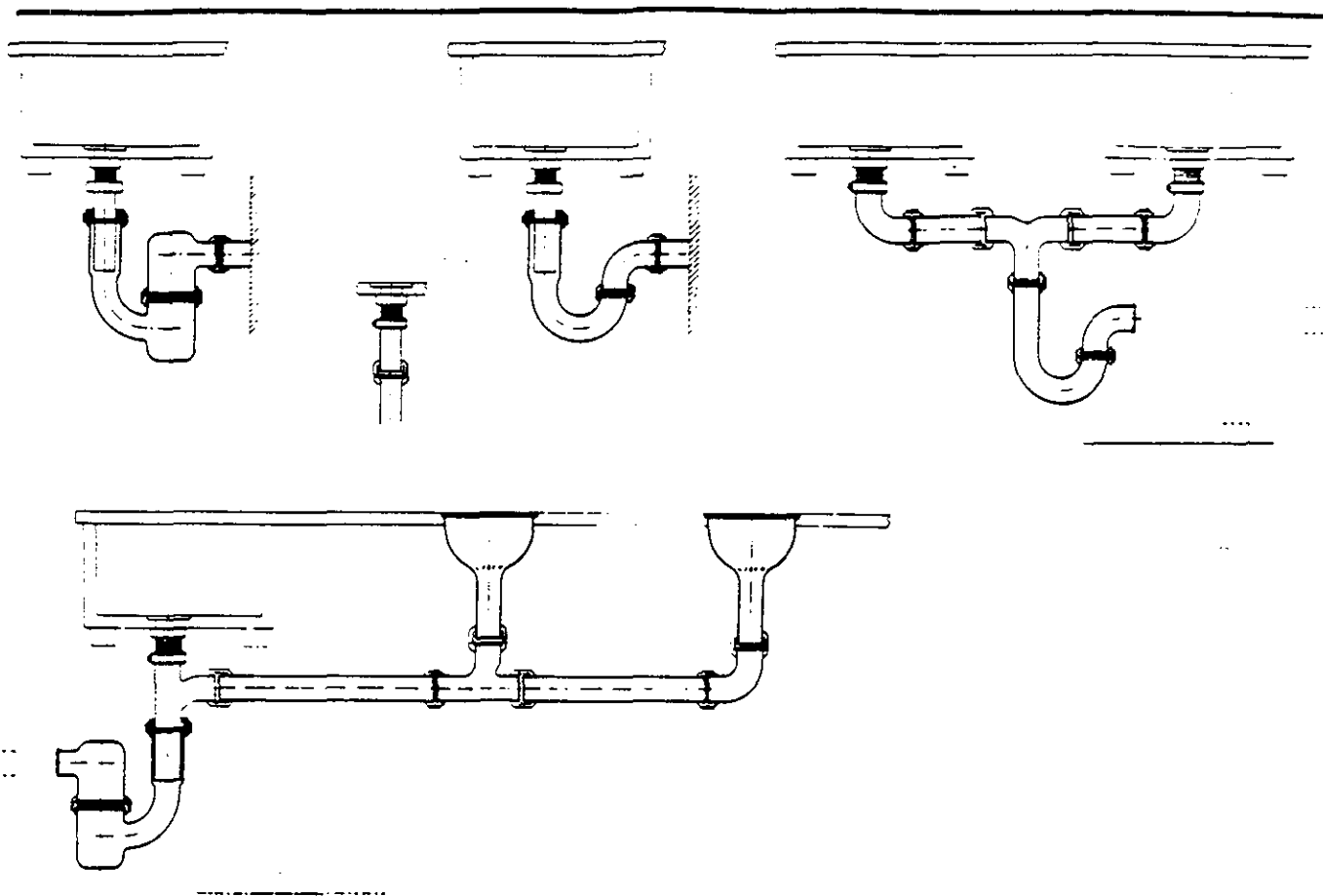
### CLEANING PROCEDURE

To clean drainline system, clear section of plugged drainline with wood pole, or add chemicals to system which will dissolve material causing stoppage.



# KIMAX<sup>®</sup>

Piping Systems



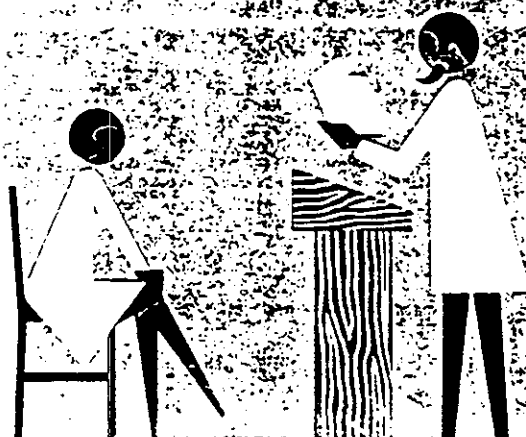
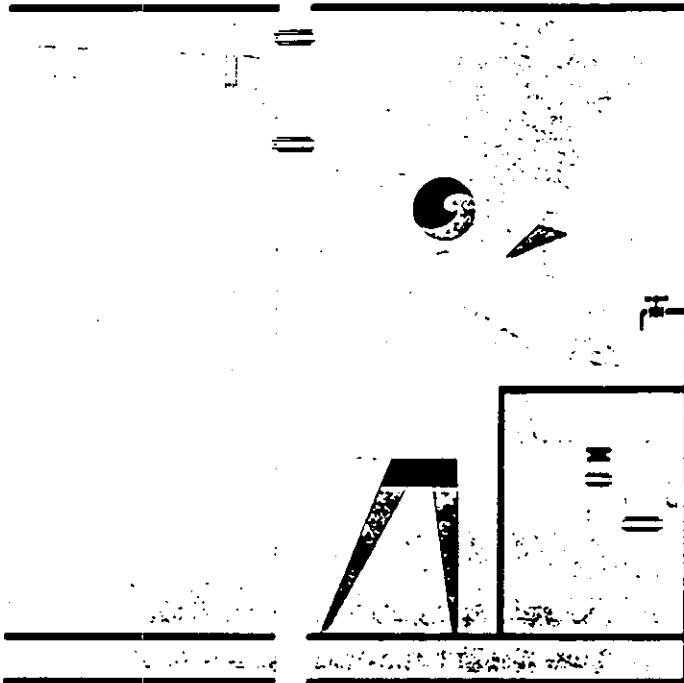
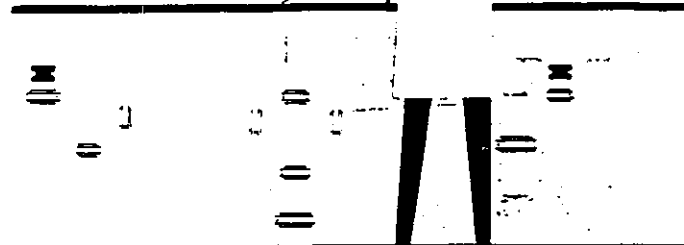
Distributed by:

**O-I / SCHOTT**  
Process Systems, Inc.

"Specifications, dimensions and tolerances of all components - pipe, fittings and couplings - as illustrated in this publication, are engineered for safety and product performance reasons as a total O-I/Schott Acid Waste Drainline System. INTERCHANGING THESE O-I/SCHOTT COMPONENTS WITH SIMILAR PRODUCTS MANUFACTURED BY OTHERS, IN ACID WASTE DRAINLINE SYSTEMS, VOIDS ALL O-I/SCHOTT WARRANTIES OF PRODUCT PERFORMANCE AND INTEGRITY WITH RESPECT TO SUCH COMPONENTS."

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OWENS-ILLINOIS  
**KIMAX**  
tempered  
glass  
DRAINLINE



# KIMAX TEMPERED GLASS DRAINLINE

...assured maximum corrosion resistance  
for chemical waste disposal systems

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### Table of Contents

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## GENERAL INFORMATION

### KIMAX TEMPERED GLASS DRAINLINE Chemical Waste and Vent Systems

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212 F continuously.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

factured for continuous operating temperatures above 212 F. See your KIMAX representative for recommendations.

factured from 300 series stainless steel, outer sheath, Buna-N rubber compression liner and TFE® sealing. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

### Building Owners

KIMAX glass drainline provides a most efficient, low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- When laboratory layout changes must be made, KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- All coupling joints are protected with TFE seals, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of materials makes a truly chemical and heat resistant drainline system.

TFE is the abbreviation given by the Society of Plastics Industry to tetrafluoroethylene resins or plastics—the most chemically and acid resistant plastic material in use today. KIMAX is a registered trademark of Owens-Illinois.

## Specifier

Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

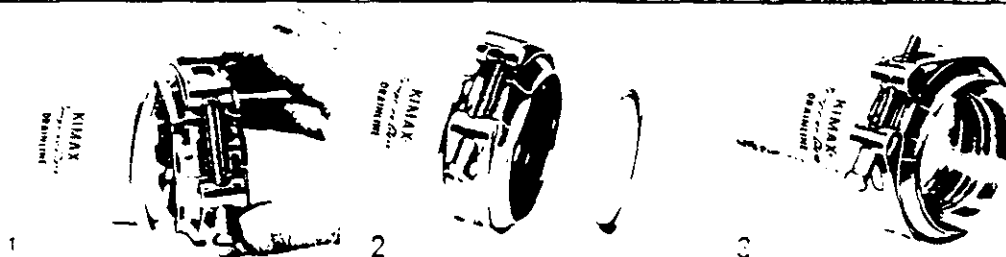
- All wetted parts of the system are borosilicate glass or TFE, thus, the total system is highly chemical resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires

only 1/2 to 1/3 as many hangers as conventional high silica iron pipe.

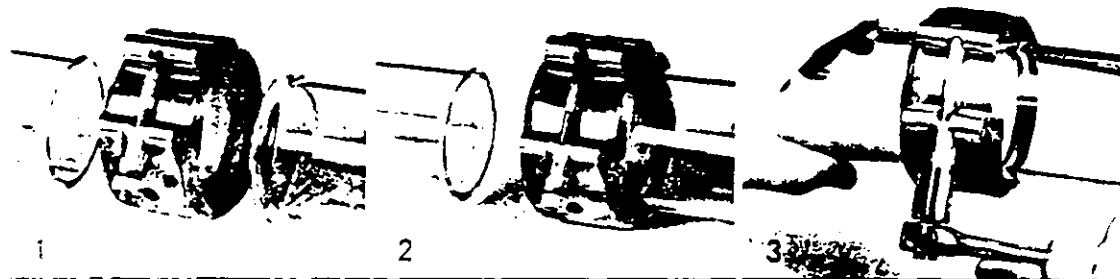
- Glass does not sag when exposed to boiling water; hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

KIMAX  
Bead  
to Bead  
Drainline  
Coupling



KIMAX B P  
Bead to  
Plain End  
Drainline  
Coupling



## INSTALLATION ADVANTAGES

Installation of KIMAX Glass Drainline is simple, fast and varies little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices for KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual TR-427R. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted

coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos above). The coupling permits the joint to be deflected up to 4°.

### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field beading kit, or by utilizing the new B P (bead to plain end) coupling system.

### ... Minimum Number of Hangers

KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.



## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Tempered Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a factory applied protective casing of thick expanded polystyrene. For recommended installation procedures



of KIMAX Drainline see Installation Manual. Shown here is an example of KIMAX Drainline as installed underground.

### ... Adaptation to Other Materials

KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 21.

### ... Easily Handled

KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

## Recommended KIMAX Drainline Uses

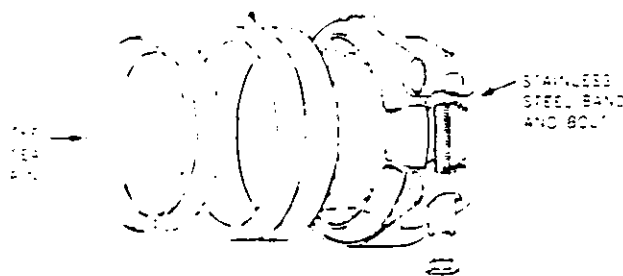
KIMAX Tempered Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem. It is particularly adaptable as drainline systems in secondary schools and college and university buildings, where it is especially recommended for chemistry, biology, and biochemistry laboratories, veterinary and medi-

cal colleges, research, and other institutional laboratories.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants, wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints

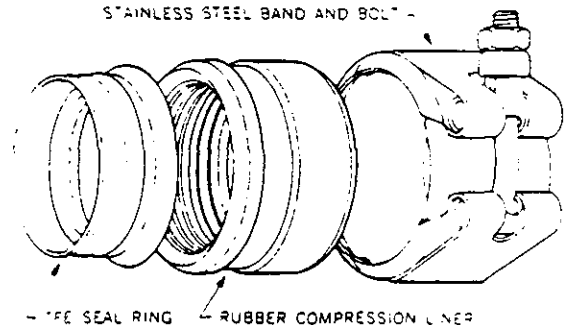
— BEADED DRAINLINE —



### KIMAX Drainline Coupling (Bead to Bead)

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoroethylene provide the required joint seal. Assembly of joint is simple — place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.

— STAINLESS STEEL BAND AND BOLT —



### KIMAX B/P Drainline Coupling (Beaded to Plain End)

This newly designed KIMAX Drainline Coupling (No. 6651) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end, but glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of certain sizes of KIMAX glass drainline straight lengths — saving up to 60% of all beading time on average installations. Consult KIMAX B/P Coupling Bulletin No. TR-93-A for further information.

# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed borosilicate glass conforming to Federal Specification DD-G-541A and as manufactured under the trade name KIMAX by Owens-Illinois.
- B This system shall include all glass straight lengths, fittings and traps, compression type tetrafluorethylene lined couplings and padded hanger supports. It shall also include factory-protected heavy schedule pipe for underground burial and recommended adapter couplings to connect to other piping material where applicable.
- C All pipe shall be installed free of strain in a manner to permit limited movement. Horizontal runs shall be supported by padded hanger or hangers 5 to 10 ft centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3 ft CD may be supported at every floor level. Three ft CD and greater shall be supported at every floor level.

### II. Connections

- A Glass-to-glass connections shall be made with KIMAX compression type couplings Article Nos. 6650 or 6661. Couplings outer shell and nut shall be made from 304 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Shell and basket to be made from tetrafluorethylene. When installed according to the manufacturer's recommendations they shall provide a leak-tight joint when subjected up to 4 psi.
- B Connections between glass and other types of piping material shall be made with KIMAX adapters and manufactured to manufacturer's recommendations.

### III. Protection of Pipe

- A All glass-to-glass and glass-to-other types of piping shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe CD. Space between pipe and sleeve shall be packed with fiber glass or glass wool and/or with a nonhardening approved caulking material.
- B Glass pipe shall be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used for insulate between the two materials.
- C Glass pipe shall be protected against all wind scatter.

### IV. Tests

Test in accordance to manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A **Excavation**—shall conform to National Plumbing Code A 408 Section 2.7.
  - 1 Bottom of trench shall be properly compacted, graded and the pipe supported throughout its entire length.
  - 2 At least 4" of properly compacted sand shall be used directly under the pipe.
- B **Buried Pipe**
  - 1 Straight lengths shall be heavy schedule 5 lengths protected in factory-applied expanded polystyrene casing.
  - 2 All underground fittings shall be protected prior to back-filling by wrapping in factory supplied padded shipping bags polyvinyl film 15 mil Scotch Wrap or 3 M Trans-Tex or approved equal.
- C **Backfill**

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover additional protection must be provided to protect pipe against crushing loads except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: Acid Waste Drainline

This system shall be made of KIMAX tempered and annealed borosilicate glass and conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings Article Nos. 6650 or 6661 with a tetrafluorethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

Note: Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 408 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full-length support. Back fill with rock free sand and or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX factory-protected heavy schedule pipe 5" lengths and wrapped fittings shall be installed in sand base and back filled in accordance with the manufacturer's instructions and governing plumbing code.

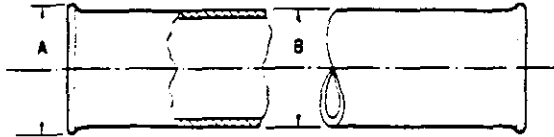
# PIPE AND FITTINGS

## Straight Lengths

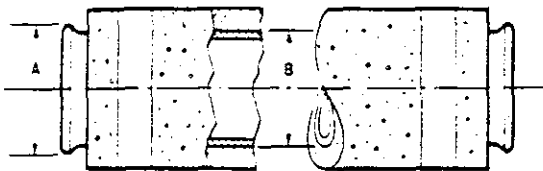
**6500** 5-ft. lengths

**6501** 10-ft. lengths

**6504** Nipple Stock (beaded one end only)



**6502 EPS\* Covered** 5-ft. lengths Heavy Schedule



\* Expanded Polystyrene

## Pipe

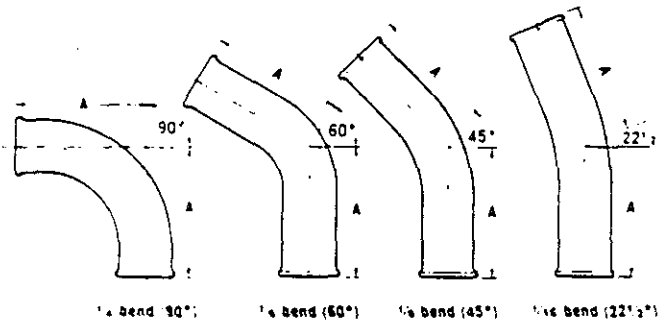
Standard lengths of KIMAX drain pipe are 5 feet and 10 feet. Special lengths, both ends beaded, up to a maximum of 15 feet may be ordered as special items.

| Size  | Regular Schedule<br>(6500, 6501) |          | Heavy Schedule<br>6502 |                   |
|-------|----------------------------------|----------|------------------------|-------------------|
|       | A                                | B (O.D.) | Weight<br>lbs. ft.     | Weight<br>bs. ft. |
| 1 1/2 | 2.06                             | 2.34     | 1.64                   | 1.7               |
| 2     | 2.58                             | 2.84     | 2.14                   | 2.2               |
| 3     | 3.69                             | 3.41     | 3.6                    | 3.7               |
| 4     | 4.84                             | 4.53     | 5.8                    | 6.0               |
| 6     | 7.12                             | 6.66     | 9.7                    | 10.0              |

KIMAX 6502 EPS covered drain pipe is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.

Standard nipple stock is beaded one end and available in one foot increments up to 10 ft. All lengths are annealed and can be field cut.

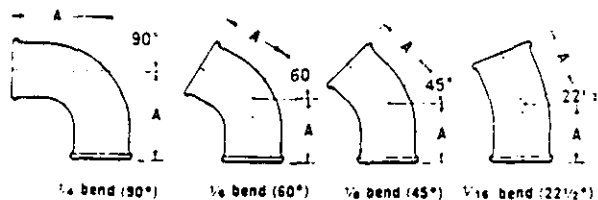
**6511**



## Sweeps

| Size  | A     |
|-------|-------|
| 1 1/2 | 4 1/2 |
| 2     | 5     |
| 3     | 6 1/2 |
| 4     | 9     |
| 6     | 12    |

**6513**



## Bends

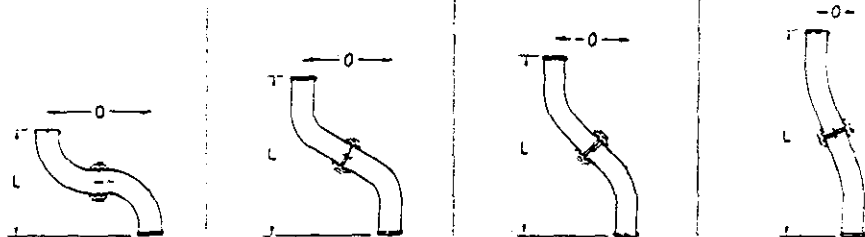
| Size  | A 90° | A 60° | A 45° | A 22 1/2° |
|-------|-------|-------|-------|-----------|
| 1 1/2 | 3     | 2 1/2 | 2     | 2         |
| 2     | 3 3/4 | 2 3/4 | 2 1/4 | 2 1/4     |
| 3     | 5     | 3 1/2 | 2 3/4 | 2 3/4     |
| 4     | 7     | 4 1/2 | 3 3/4 | 3 3/4     |

# PIPE AND FITTINGS

## Offsets Made Using Standard Sweeps and Bends

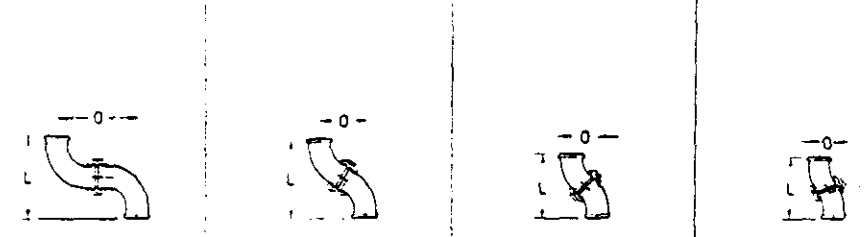
Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

### 6511 Sweep Offsets



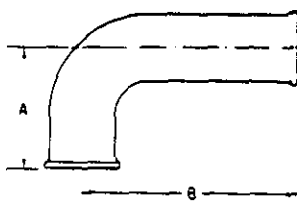
| Size | 1/4 |    | 1/6    |        | 1/8    |        | 1/16   |       |
|------|-----|----|--------|--------|--------|--------|--------|-------|
|      | L   | O  | L      | O      | L      | O      | L      | O     |
| 1    | 9   | 9  | 12 1/2 | 7 1/2  | 15 1/2 | 5 1/2  | 17 1/2 | 3     |
| 2    | 10  | 10 | 16     | 8 1/2  | 17 1/2 | 7 1/2  | 19 1/2 | 3 1/2 |
| 3    | 13  | 13 | 19 1/2 | 11 1/2 | 22 1/2 | 9 1/2  | 25     | 5     |
| 4    | 18  | 18 | 27     | 15 1/2 | 30 1/2 | 12 1/2 | 34 1/2 | 6 1/2 |
| 6    | 24  | 24 | 36     | 22 1/2 | 41     | 17     | 46 1/2 | 9 1/2 |

### 6513 Bend Offsets

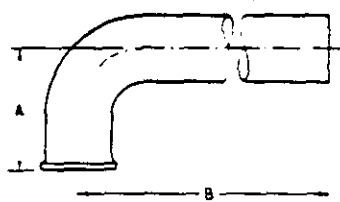


| Size | 1/4 |    | 1/6    |        | 1/8    |        | 1/16   |        |
|------|-----|----|--------|--------|--------|--------|--------|--------|
|      | L   | O  | L      | O      | L      | O      | L      | O      |
| 1    | 7   | 7  | 7 1/2  | 7 1/2  | 8 1/2  | 7 1/2  | 7 1/2  | 7 1/2  |
| 2    | 8   | 8  | 8 1/2  | 8 1/2  | 9 1/2  | 8 1/2  | 9 1/2  | 8 1/2  |
| 3    | 10  | 10 | 12 1/2 | 10 1/2 | 13 1/2 | 10 1/2 | 14 1/2 | 10 1/2 |
| 4    | 11  | 11 | 13 1/2 | 11 1/2 | 14 1/2 | 11 1/2 | 15 1/2 | 11 1/2 |

### 6512



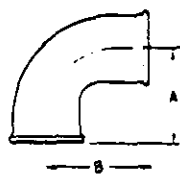
### 6512P (Annealed)\*



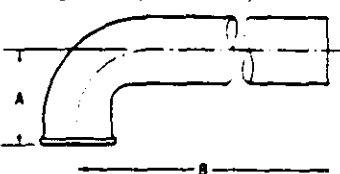
### Special Purpose Bends

| Size | 6512  |       | 6512P |       | 6514  |       | 6514P |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|
|      | A     | B     | A     | B     | A     | B     | A     | B     |
| 1    | 1 1/2 | 1 1/2 | 1 1/2 | 1 1/2 | 2 1/2 | 2 1/2 | 2 1/2 | 2 1/2 |
| 2    | 2 1/2 | 2 1/2 | 2 1/2 | 2 1/2 | 3 1/2 | 3 1/2 | 3 1/2 | 3 1/2 |

### 6514



### 6514P (Annealed)\*



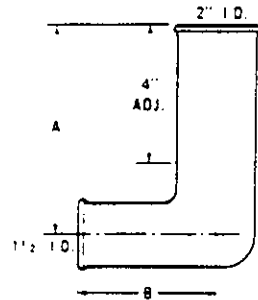
\*Can be field cut

Use catalog dimensions for piping layout as gasket thickness allowance is included

# PIPE AND FITTINGS

6517

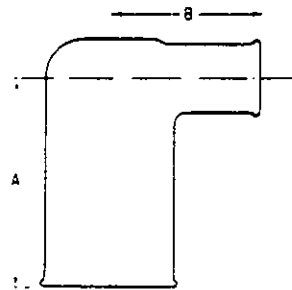
Adjustable 1/4 Bend



| Size      | A | B |
|-----------|---|---|
| 1 1/2 x 2 | 6 | 4 |

6518

Quarter Bend Reducer

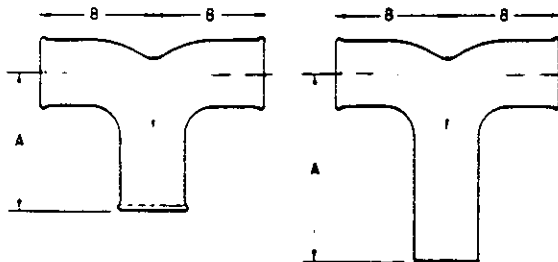


| Size      | A | B     |
|-----------|---|-------|
| 2 x 1 1/2 | 4 | 3 1/2 |
| 3 x 1 1/2 | 5 | 4     |
| 3 x 2     | 5 | 4 1/2 |
| 4 x 1 1/2 | 7 | 4 1/2 |
| 4 x 2     | 7 | 5     |
| 4 x 3     | 7 | 5 1/2 |
| 6 x 1 1/2 | 9 | 5 1/2 |
| 6 x 2     | 9 | 6     |
| 6 x 3     | 9 | 6 1/2 |
| 6 x 4     | 9 | 8     |

6533

6533P (Annealed)\*

Double Quarter Bend

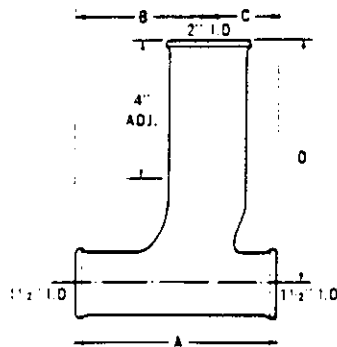


| Size  | 6533   |       | 6533P |       |
|-------|--------|-------|-------|-------|
|       | A      | B     | A     | B     |
| 1 1/2 | 3 3/4  | 3 1/2 | 10    | 2 1/2 |
| 2     | 5      | 4 1/2 | 10    | 4 1/2 |
| 3     | 7 1/4  | 6 3/8 |       |       |
| 4     | 8 3/4  | 8 1/4 |       |       |
| 6     | 12 3/8 | 12    |       |       |

\*Can be field cut

# PIPE AND FITTINGS

6520



## Adjustable Sanitary T

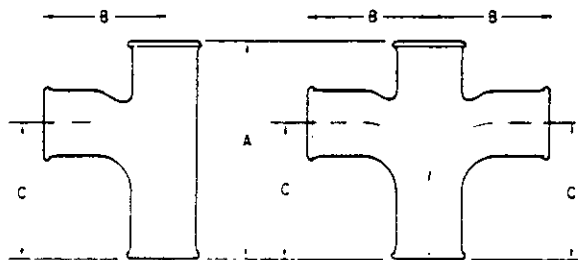
(One Adjustable Inlet)

| Size              | A | B     | C     | D |
|-------------------|---|-------|-------|---|
| 1 1/2 x 1 1/2 x 2 | 6 | 3 1/2 | 2 1/4 | - |

6521 Single

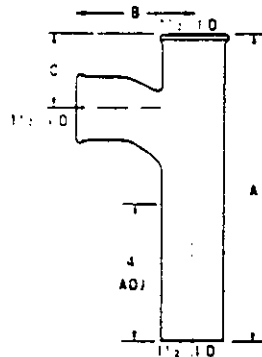
6522 Double

## Sanitary T



| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 1/2  |
| 2 x 1 1/2     | 8  | 3 3/4 | 5      |
| 2 x 2         | 8  | 4 1/2 | 5      |
| 3 x 1 1/2     | 12 | 4 1/2 | 7 1/4  |
| 3 x 2         | 12 | 5     | 7 1/4  |
| 3 x 3         | 12 | 6 3/8 | 7 1/4  |
| 4 x 1 1/2     | 14 | 4 7/8 | 8 3/4  |
| 4 x 2         | 14 | 5 5/8 | 8 3/4  |
| 4 x 3         | 14 | 7     | 8 3/4  |
| 4 x 4         | 14 | 8 1/4 | 8 3/4  |
| 6 x 2         | 20 | 6 3/4 | 12 3/8 |
| 6 x 3         | 20 | 8     | 12 3/8 |
| 6 x 4         | 20 | 9 1/4 | 12 3/8 |
| 6 x 6         | 20 | 12    | 12 3/8 |

6525 and 6525R\* (Annealed)



## Adjustable Sanitary T

(Plain End Outlet)

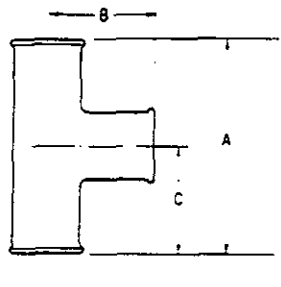
| Size                | A     | B | C |
|---------------------|-------|---|---|
| 6525 1 x 1 x 1 1/2  | 8 3/4 | 5 | 5 |
| 6525R 1 x 1 x 1 1/2 | 8 3/4 | 5 | 5 |

\*No. 6525R differs from No. 6525  
in length of C dimension only

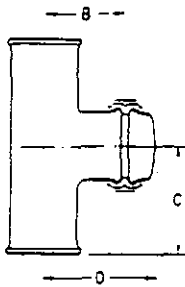
†Can be field cut

# PIPE AND FITTINGS

6523 Straight T



6524 Test T with Cleanout



Straight T

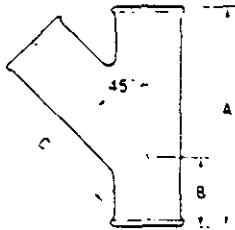
| Size          | A  | B     | C  |
|---------------|----|-------|----|
| 1 1/2 x 1 1/2 | 6  | 3     | 3  |
| 2 x 1 1/2     | 8  | 3 1/2 | 4  |
| 2 x 2         | 8  | 4     | 4  |
| 3 x 2         | 12 | 4 1/2 | 6  |
| 3 x 3         | 12 | 6     | 6  |
| 4 x 2         | 14 | 5     | 7  |
| 4 x 3         | 14 | 5 1/2 | 7  |
| 4 x 4         | 14 | 8     | 7  |
| 6 x 3         | 20 | 7 1/2 | 10 |
| 6 x 4         | 20 | 9     | 10 |
| 6 x 6         | 20 | 10    | 10 |

Test T with Cleanout

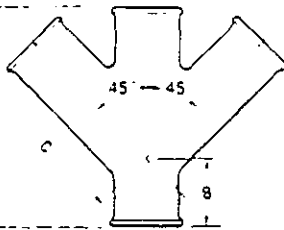
| Size          | A  | B     | C | D |
|---------------|----|-------|---|---|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 | 3 |
| 2 x 2         | 8  | 4     | 4 | 4 |
| 3 x 3         | 12 | 6     | 6 | 6 |
| 4 x 4         | 14 | 8     | 7 | 7 |

Test Tee and cleanout comes as complete assembly including cap and coupling

6526 Single



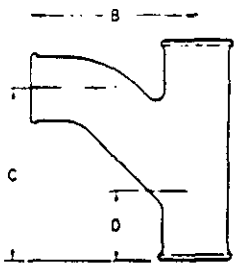
6527 Double



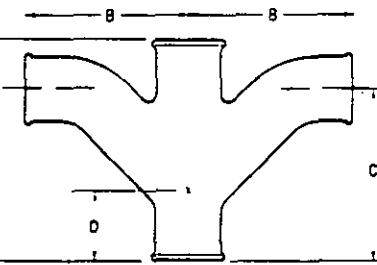
Drainline Y

| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 4 1/2  |
| 2 x 1 1/2     | 8  | 3 1/2 | 4 1/2  |
| 2 x 2         | 8  | 3 1/2 | 6      |
| 3 x 1 1/2     | 12 | 3 1/2 | 5 1/2  |
| 3 x 2         | 12 | 3 1/2 | 6 1/2  |
| 3 x 3         | 12 | 3 1/2 | 8      |
| 4 x 1 1/2     | 14 | 4 1/2 | 6 1/2  |
| 4 x 2         | 14 | 4 1/2 | 7 1/2  |
| 4 x 3         | 14 | 4 1/2 | 8 1/2  |
| 4 x 4         | 14 | 4 1/2 | 10     |
| 6 x 2         | 20 | 5 1/2 | 9      |
| 6 x 3         | 20 | 5 1/2 | 10 1/2 |
| 6 x 4         | 20 | 5 1/2 | 11 1/2 |
| 6 x 6         | 20 | 5 1/2 | 12     |

6528 Single



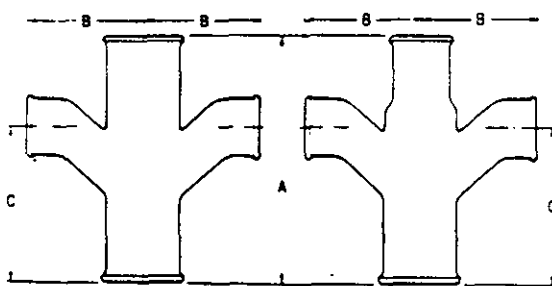
6529 Double



Combination Y and 1/8 Bend

| Size          | A  | B     | C      | D     |
|---------------|----|-------|--------|-------|
| 1 1/2 x 1 1/2 | 6  | 4 1/2 | 4 1/2  | 3 1/2 |
| 2 x 1 1/2     | 8  | 4 1/2 | 5 1/2  | 3 1/2 |
| 2 x 2         | 8  | 6     | 5 1/2  | 3 1/2 |
| 3 x 1 1/2     | 12 | 5 1/2 | 7 1/2  | 3 1/2 |
| 3 x 2         | 12 | 6 1/2 | 8      | 3 1/2 |
| 3 x 3         | 12 | 8 1/2 | 9      | 3 1/2 |
| 4 x 1 1/2     | 14 | 6     | 8 1/2  | 4 1/2 |
| 4 x 2         | 14 | 7     | 9 1/2  | 4 1/2 |
| 4 x 3         | 14 | 9     | 10 1/2 | 4 1/2 |
| 4 x 4         | 14 | 11    | 11     | 4 1/2 |
| 6 x 2         | 20 | 8 1/2 | 11 1/2 | 5 1/2 |
| 6 x 3         | 20 | 10    | 12 1/2 | 5 1/2 |
| 6 x 4         | 20 | 12    | 13 1/2 | 5 1/2 |
| 6 x 6         | 20 | 15    | 14 1/2 | 5 1/2 |

6531



Partition Cross (Compact)

| Size                      | A | B     | C |
|---------------------------|---|-------|---|
| 2 x 1 1/2                 | 8 | 3 1/2 | 5 |
| 2 x 2                     | 8 | 4 1/2 | 5 |
| 2 x 1 1/2 x 1 1/2 x 1 1/2 | 8 | 3 1/2 | 5 |

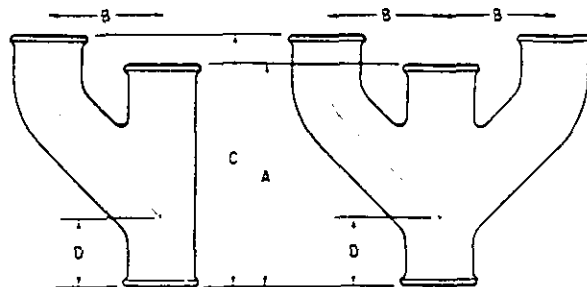
Partition crosses are designed to prevent cross-flow when sinks are connected back to back

# PIPE AND FITTINGS

6532 Single

6534 Double

Upright Y or H (vent branch)



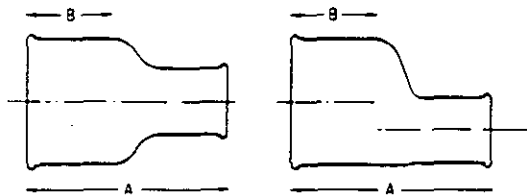
| Size     | A  | B  | C**  | D   |
|----------|----|----|------|-----|
| *1½ x 1½ | 6  | 3  | 67½  | 17½ |
| *2 x 1½  | 8  | 3½ | 75½  | 20½ |
| *2 x 2   | 8  | 4  | 67½  | 20½ |
| 3 x 1½   | 12 | 3½ | 91½  | 27½ |
| 3 x 2    | 12 | 4½ | 105½ | 31½ |
| 3 x 3    | 12 | 6  | 113  | 31½ |
| 4 x 1½   | 14 | 4½ | 103½ | 34½ |
| 4 x 2    | 14 | 6  | 110  | 34½ |
| 4 x 3    | 14 | 6½ | 149½ | 34½ |
| 4 x 4    | 14 | 8  | 160½ | 34½ |
| 6 x 3    | 20 | 7½ | 160½ | 51½ |
| 6 x 4    | 20 | 9  | 160  | 51½ |
| 6 x 6    | 20 | 12 | 24   | 51½ |

\* Double, available in these sizes only  
 \*\* C dimension may be longer or shorter than A

6536 Straight

6537 Eccentric

Reducers or Increases



| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1½       |
| 3 x 1½ | 5 | 2½       |
| 3 x 2  | 5 | 2½       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

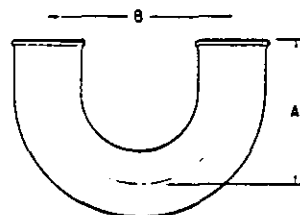
6544



Cleanout Plug

| Size | A   |
|------|-----|
| 1½   | 7½  |
| 2    | 1   |
| 3    | 11¼ |
| 4    | 11¼ |
| 6    | 11½ |

6550



U Bend (vent loop)

| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

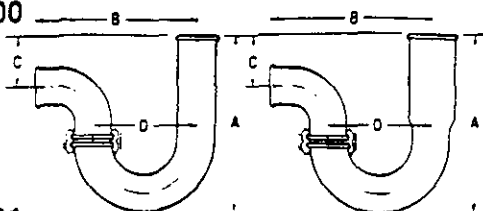
Note: U bends are heated only; are often used for vent loops. No. 6552 outlets on Swivel B. Traps are also used as vent loops.



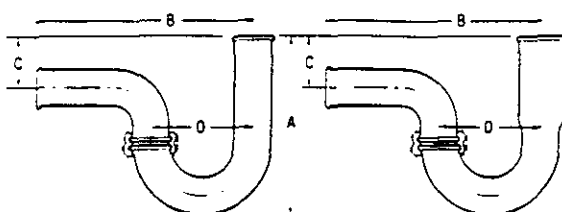
# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

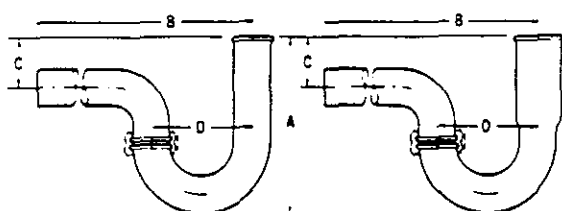
6700



6701



6704 (Plain End Outlet\*)



## Swivel Trap—P Style

No. 6700 short outlet Swivel P Trap assembly consists of a No. 6705 inlet with a No. 6514 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size Inlet x Outlet | A     | B     | C     | D | Seal Depth |
|---------------------|-------|-------|-------|---|------------|
| 1 1/2 x 1 1/2       | 3 1/2 | 3     | 2 1/2 | 5 | 1 1/2      |
| 2 x 1 1/2           | 3 1/2 | 3     | 2 1/2 | 5 | 1 1/2      |
| 2 x 2               | 3 1/2 | 3 1/2 | 2 1/2 | 5 | 1 1/2      |

No. 6701 long outlet Swivel P Trap assembly consists of a No. 6705 inlet with a No. 6514 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size Inlet x Outlet | A     | B  | C     | D | Seal Depth |
|---------------------|-------|----|-------|---|------------|
| 1 1/2 x 1 1/2       | 3 1/2 | 11 | 2 1/2 | 5 | 1 1/2      |
| 2 x 1 1/2           | 3 1/2 | 11 | 2 1/2 | 5 | 1 1/2      |
| 2 x 2               | 3 1/2 | 13 | 2 1/2 | 5 | 1 1/2      |

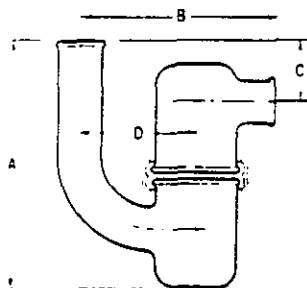
No. 6704 (plain end outlet) Swivel P Trap assembly consists of a No. 6705 inlet with a No. 6514 P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size Inlet x Outlet | A     | B      | C     | D | Seal Depth |
|---------------------|-------|--------|-------|---|------------|
| 1 1/2 x 1 1/2       | 3 1/2 | 17     | 2 1/2 | 5 | 1 1/2      |
| 2 x 1 1/2           | 3 1/2 | 17     | 2 1/2 | 5 | 1 1/2      |
| 2 x 2               | 3 1/2 | 17 1/2 | 2 1/2 | 5 | 1 1/2      |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

\*Annealed outlet can be field cut.

6710



## Swivel Drum Trap—P Style

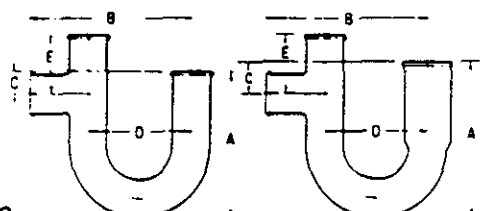
No. 6710 Swivel Drum P Trap assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size Inlet x Outlet | A      | B     | C     | D     | Body I.D. | Seal Depth |
|---------------------|--------|-------|-------|-------|-----------|------------|
| 1 1/2 x 1 1/2       | 10 1/2 | 3     | 2 1/2 | 4 1/2 | 1 1/2     | 1 1/2      |
| 2 x 1 1/2           | 10 1/2 | 3     | 2 1/2 | 4 1/2 | 1 1/2     | 1 1/2      |
| 2 x 2               | 11     | 3 1/2 | 3     | 5     | 1 1/2     | 1 1/2      |

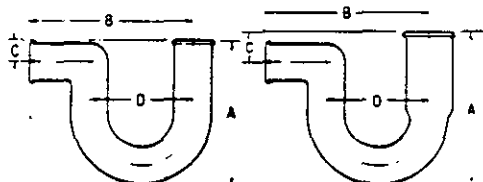
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

No. 6709 Swivel Drum P Trap has a 4" body in the 1 1/2 x 1 1/2 and 2 x 1 1/2 sizes only.

6713 (Vented)



6718



## Trap—P Style

| Size Inlet x Outlet | Vent Size | A      | B      | C     | D     | E | Seal Depth |
|---------------------|-----------|--------|--------|-------|-------|---|------------|
| 1 1/2 x 1 1/2       | 1 1/2     | 7      | 8      | 1     | 5     | 0 | 1 1/2      |
| 2 x 1 1/2           | 1 1/2     | 7 1/2  | 8      | 1 1/2 | 5     | 0 | 1 1/2      |
| 2 x 2               | 2         | 8 1/2  | 8 1/2  | 1 1/2 | 5     | 0 | 1 1/2      |
| 3 x 3               | 3         | 10 1/2 | 10 1/2 | 0     | 6 1/2 | 0 | 1 1/2      |
| 4 x 4               | 4         | 12 1/2 | 12 1/2 | 0     | 7 1/2 | 0 | 1 1/2      |
| 6 x 6               | 6         | 16 1/2 | 17 1/2 | 3 1/2 | 10    | 0 | 1 1/2      |

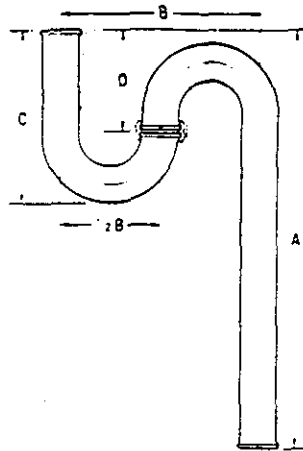
\*That expanded inlet. Use No. 6655 adapter coupling for inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6703



## Swivel Trap—S Style

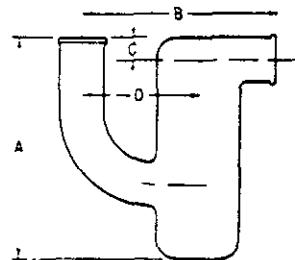
No. 6703 Swivel S Trap consists of a No. 6705 inlet with a No. 6662 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size Inlet x Outlet | A      | B  | C     | D     | Seal Depth |
|---------------------|--------|----|-------|-------|------------|
| 1" x 1"             | 20 1/2 | 10 | 5 1/2 | 5     | 3 1/2      |
| 2" x 1"             | 20 1/2 | 10 | 8 1/2 | 5     | 3 1/2      |
| 2" x 2"             | 20 1/2 | 11 | 9 1/2 | 4 1/2 | 5          |

Traps available with either A or B type cleanout. See Standard Cleanouts Page 14.

Annealed outlet can be field cut.

6707

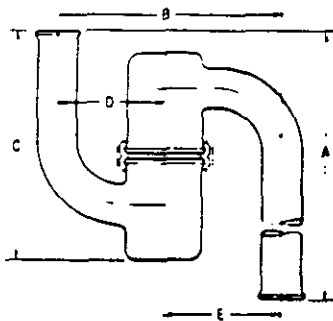


## Drum Trap—P Style

| Size Inlet x Outlet | A     | B     | C     | D     | Body I.D. | Seal Depth |
|---------------------|-------|-------|-------|-------|-----------|------------|
| 1" x 1"             | 9     | 8     | 1     | 4 1/2 | 3         | 1          |
| 2" x 1"             | 9     | 8     | 1 1/2 | 4 1/2 | 3         | 1          |
| 2" x 2"             | 9 1/2 | 9 1/2 | 0     | 5 1/2 | 4         | 1          |

Traps available with either A or B type cleanout. See Standard Cleanouts Page 14.

6712



## Swivel Drum Trap—S Style

No. 6712 Swivel Drum Trap assembly consists of one No. 6715 inlet and one No. 6717 outlet with a No. 6650 KIMAX coupling at the swivel joint.

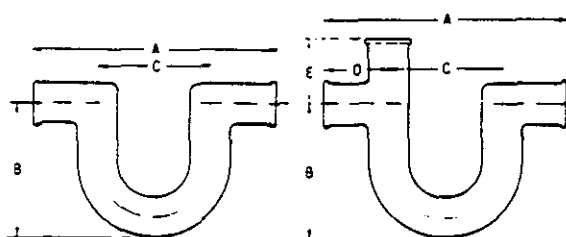
| Size Inlet x Outlet | A      | B      | C      | D     | E     | Body I.D. | Seal Depth |
|---------------------|--------|--------|--------|-------|-------|-----------|------------|
| 1" x 1"             | 20 1/2 | 10     | 10 1/2 | 4 1/2 | 5 1/2 | 3         | 3 1/2      |
| 2" x 1"             | 20 1/2 | 11     | 10 1/2 | 4 1/2 | 5 1/2 | 3         | 3 1/2      |
| 2" x 2"             | 20 1/2 | 11 1/2 | 11     | 5 1/2 | 5 1/2 | 4         | 3 1/2      |

Traps available with either A or B type cleanout. See Standard Cleanouts Page 14.

Annealed outlet can be field cut.

6770

6771 (Vented)



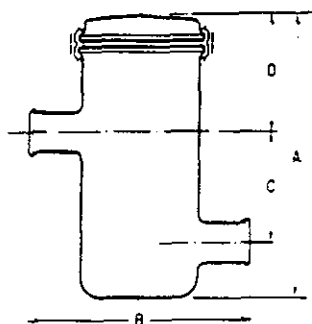
## Running Trap

| Size Inlet x Outlet | Vent Size | A      | B      | C     | D     | E     | Seal Depth |
|---------------------|-----------|--------|--------|-------|-------|-------|------------|
| 1" x 1"             | 1 1/2     | 11     | 6      | 5     | 3     | 3     | 3 1/2      |
| 2" x 2"             | 2         | 12     | 6 1/2  | 5 1/2 | 3 1/2 | 3 1/2 | 3 1/2      |
| 3" x 3"             | 3         | 14 1/2 | 8 1/2  | 6 1/2 | 4     | 4     | 3 1/2      |
| 4" x 4"             | 4         | 17 1/2 | 9 1/2  | 7 1/2 | 5     | 5     | 3 1/2      |
| 6" x 6"             | 6         | 21     | 12 1/2 | 10    | 7     | 7     | 3 1/2      |

Trap available with either A or B type cleanout. See Standard Cleanouts Page 14.

# DRAINLINE TRAPS

6576



## Drum Trap (top cleanout)

No. 6576 Drum Trap assembly consists of a No. 6677 A trap body, a No. 6644 short cleanout plug and a No. 6650 KIMAX coupling.

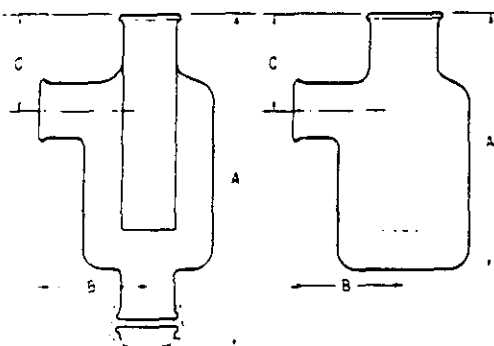
| Size<br>Inlet x Outlet | A      | B      | C     | D     | Body<br>ID | Seal<br>Depth |
|------------------------|--------|--------|-------|-------|------------|---------------|
| 1 1/2 x 1 1/2          | 13 1/4 | 10 1/4 | 4 1/2 | 5 1/4 | 1 1/2      | 1 1/4         |

\*Specify order.

6612

6614

## Partition Trap



No. 6612 Partition Trap with sealed-in partition is available in 1 1/2" and 2" sizes only. Standard with B type cleanout plug.

| Size<br>Inlet x Outlet | A      | B     | C     | Seal<br>Depth |
|------------------------|--------|-------|-------|---------------|
| 1 1/2 x 1 1/2          | 11 1/4 | 3 1/4 | 3 1/4 | 1 1/4         |
| 2 x 2                  | 12 1/4 | 5 1/4 | 4 1/4 | 1 1/4         |

No. 6614 Partition Trap is available with 1 1/2" and 2" outlet. The 2" outlet trap has 2" inlet to accept No. 6650 standard coupling.

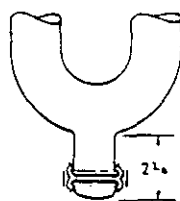
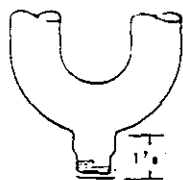
| Size<br>Inlet x Outlet | A     | B     | C     |
|------------------------|-------|-------|-------|
| 2 x 1 1/2              | 8 1/4 | 3 1/4 | 3 1/4 |

Both traps are non-siphoning with partition always visible.

## Type A

## Type B

## Standard Cleanouts



Standard drainline trap cleanout Type A is fitted with a standard KIMAX trap cap with TFE liner (No. 6675). Type B cleanout consists of a No. 6650 standard KIMAX coupling (1 1/2" and 2") and a No. 6644 short plug (1 1/2").

## Ordering Information

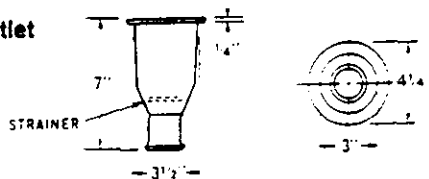
To order standard traps with cleanouts use catalog number for proper style and add the letter A or B for desired cleanout style.

For correct layout dimensions add 1 1/4" to overall trap height for cleanout Type A, or 2 1/4" for cleanout Type B.

## CUP SINKS

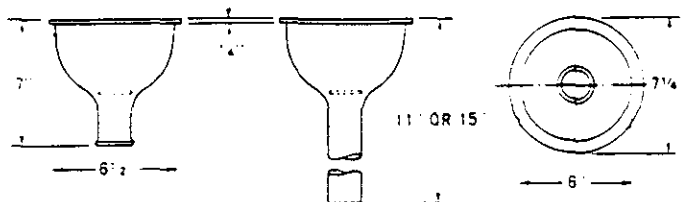
Outside surface of cupsink bodies has an opaque white surface. No. 6724 2" sink strainer furnished with all cup sinks. Specify overall desired length: either 11" or 15" when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded end traps or fittings.

**6616 Beaded Outlet**



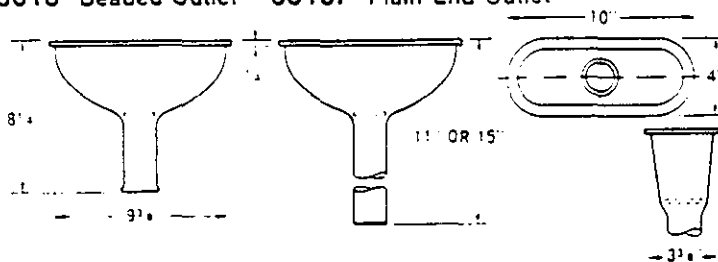
**3" Hemispherical**

**6617 Beaded Outlet 6617P Plain End Outlet**



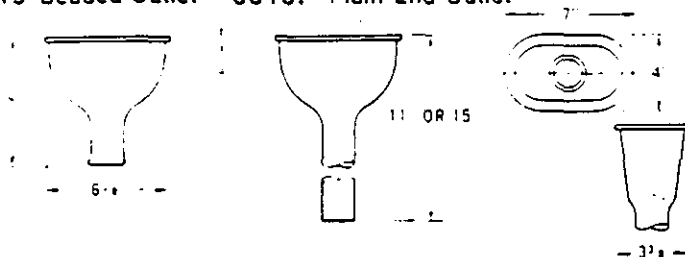
**6" Hemispherical**

**6618 Beaded Outlet 6618P Plain End Outlet**



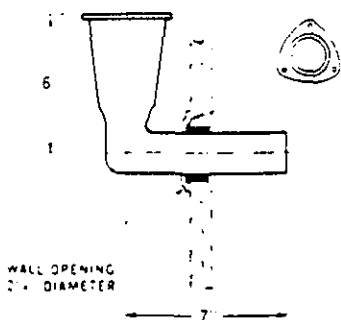
**3" x 9" Oval**

**6619 Beaded Outlet 6619P Plain End Outlet**

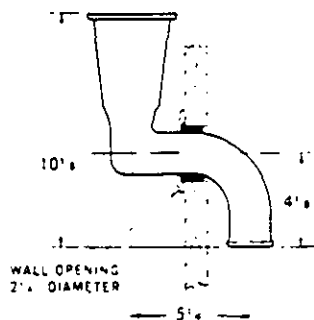


**3" x 6" Oval**

**6627 3" x 6" Oval Horizontal,  
1 1/2" Plain End Outlet**



**6628 3" x 6" Oval Vertical,  
1 1/2" Outlet**



## Wall Mounted Cup Sink

### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2")

### Vertical Outlet

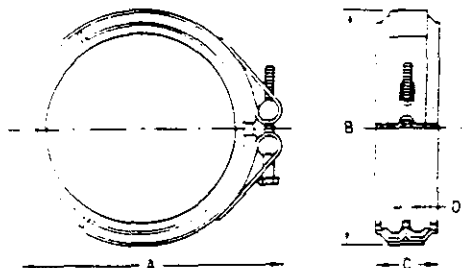
No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2")

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly, use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet. For No. 6628 assembly, use No. 6650 1" size KIMAX coupling.

## ACCESSORIES AND HARDWARE

6650

### Drainline Coupling (Bead to Bead)



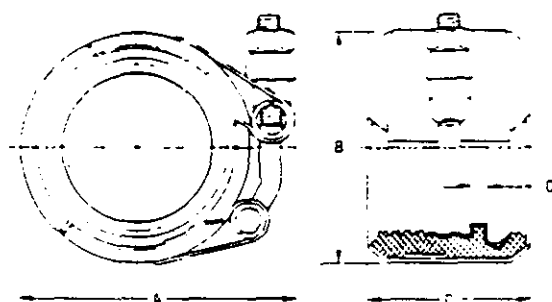
The 6650 Drainline Coupling is used for joining 1/2", 1", 2", 3", 4", and 6" K MAX Glass Drainline pipe and fittings. The Drainline Coupling consists of:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna-N rubber compression liner with TFE seal ring
- No. 6653 stainless steel bolt

| Size  | A     | B     | C     | D     | Bolt Size   |
|-------|-------|-------|-------|-------|-------------|
| 1 1/2 | 3     | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 2     | 3 1/2 | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 3     | 4 1/2 | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 4     | 5     | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 6     | 8 1/2 | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |

6661

### B/P\* Drainline Coupling (Bead to Plain End)



The 6661 B/P\* Drainline Coupling is used for joining 1/2", 1", 2", 3", 4", and 6" K MAX beaded glass drainline to plain end coupling and fittings. The coupling consists of the following components:

- No. 6662 stainless steel band with bolt
- No. 6663 Buna-N rubber compression liner with TFE seal ring
- No. 6664 nickel plated stainless steel nut nut

| Size | A     | B     | C     | D     | Bolt Size   |
|------|-------|-------|-------|-------|-------------|
| 1    | 3     | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 2    | 3 1/2 | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |
| 3    | 4 1/2 | 2 1/4 | 1 1/4 | 1 1/4 | 1/4 x 2 1/2 |

\*Bead to Plain End

## ACCESSORIES AND HARDWARE

6655

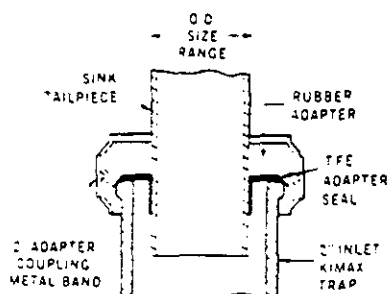
### Adapter Coupling

Patent Pending

No. 6655 Adapter Assembly is used to join KIMAX drain line pipe and drainings to plain end sink tailpieces.

The assembly consists of:

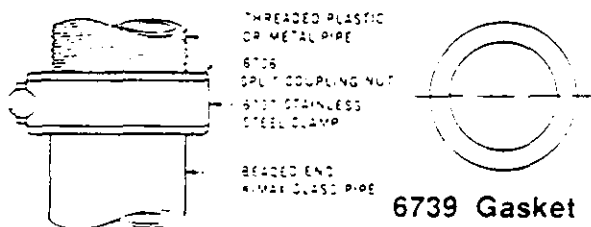
- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6658 TFE adapter seal
- No. 6653 stainless steel bolt 1/4" — 28 x 2 1/2"



| Size       | Tailpiece Style                                                                        | O.D. Size Range  |
|------------|----------------------------------------------------------------------------------------|------------------|
| 2 x 1 1/2" | KIMAX glass tail pipe Extension No. 6701 metal tailpiece and drain tail pipe extension | 1 1/2" to 2 1/2" |
| 2 x 1 1/2" | Joint Class C or L for drain PVC/PEX tailpiece and cup sink                            | 1 1/2" to 2 1/2" |
| 2 x 1 1/2" | Plain end KIMAX drain pipe extension with heavy flange or Class C or L for drain       | 1 1/2" to 2 1/2" |
| 2 x 1 1/2" | Joint — Class C or L, B or M Drain — Class C or L, B or M Drain — Steel 1/2" IPS       | 1 1/2" to 2 1/2" |

6735

### 1 1/2" Split Coupling (Threaded to Beaded Pipe)



#### 6739 Gasket

Use Gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe.

No. 6735 1 1/2" Split Coupling is used to join 1 1/2" beaded glass pipe to threaded metal pipe.

The assembly consists of:

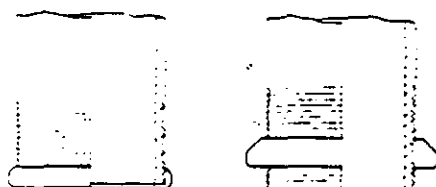
- No. 6735 1 1/2" split coupling nut
- No. 6737 1 1/2" stainless steel clamp

To install, remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

6680

6685—Adjustable

### Thread Adapters (Threaded to Beaded Pipe)



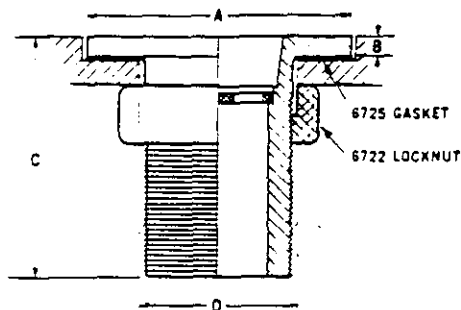
Thread adapters are used to provide beaded end on threaded pipe, connecting directly to KIMAX glass drainlines with No. 6655 adapter or TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads used in same size pipe (e.g. 1 1/2" metal to 1 1/2" glass). Ideas for drain pipe connections in 1 1/2", 2", 3", 4" and 6" sizes.

Adapter No. 6685 is designed to mate 1 1/2" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1 1/2" size only.

## ACCESSORIES AND HARDWARE

### 6720 (1½", 2", 3" sizes)



### Sink Outlet Assembly

Consists of:

- 6724 sink strainer—black fluorocarbon plastic
- 6721 sink outlet—black fluorocarbon plastic
- 6725 gasket—neoprene
- 6722 locknut

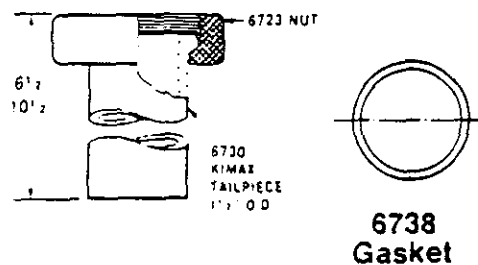
Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

| Size | A  | B  | C  | D  |
|------|----|----|----|----|
| 1½   | 3¼ | 1½ | 2½ | 1½ |
| 2    | 3½ | 1½ | 3  | 2¼ |
| 3    | 4½ | 2¼ | 3  | 3½ |

Note: Can be ordered with stainless steel taper if degree of taper needed for stainless steel sink adaptation is furnished.

For sink outlet tailpiece connections, see No. 6728 description below.

### 6728



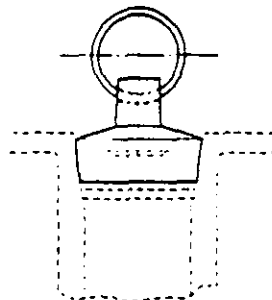
### 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 brand lock nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections, use gasket No. 6738 between metal and glass. Hand tighten coupling nut—do not use pipe wrench.

Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe.

### 6726

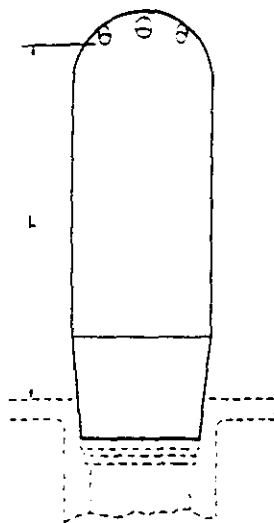


### Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead. 2" size only in black fluorocarbon.

## ACCESSORIES AND HARDWARE

6727

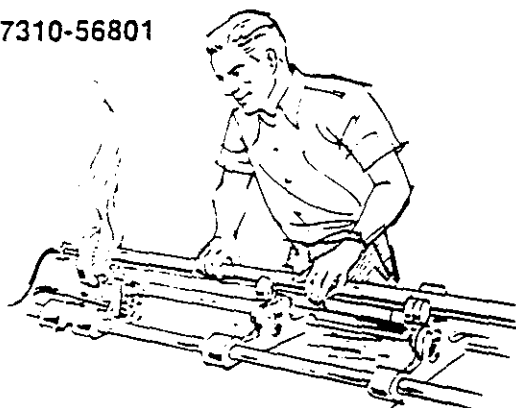


### Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2 and 3 sink outlets only. The beehive type can be modified by cutting off the beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
| 1 1/2"           | 4"                  | 6" | 9" | —                | —  | —  |
| 2"               | —                   | —  | —  | 4"               | 6" | 9" |
| 3"               | —                   | —  | —  | 4"               | 6" | 9" |

7310-56801



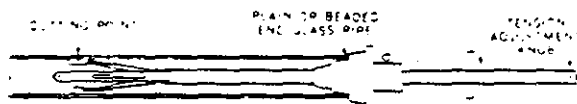
### KIMAX Portable Beading Kit

The KIMAX Portable Beading Kit is complete in every detail except for bottled gas for field beading of special lengths of KIMAX drainline.

For more detailed information on the availability of the newest model KIMAX BEK-3 and its operation, ask your KIMAX distributor or write the nearest Olin Kimble office listed on the back of this catalog.

7310-56802

### KIMAX Portable Glass Pipe Cutter

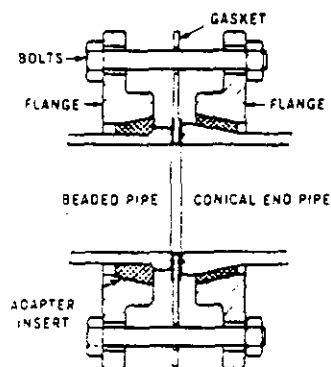


With the KIMAX Portable Glass Pipe Cutter and KIMAX B.P. 3 glass pipe, you can cut and join 1 1/2", 2" and 3" glass draining drainline on the job site. Complete cutter consists of a scoring wheel assembly and extension or tension arm subassembly, as shown. Stocked and sold by your KIMAX Glass Drainline distributor.



## ACCESSORIES AND HARDWARE

7110



### Coupling Assembly

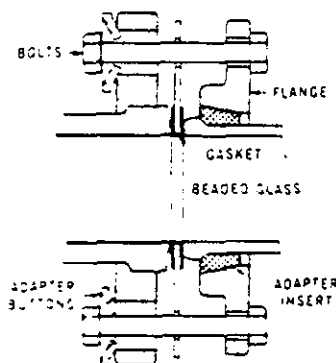
(Beaded to Conical End Pipe)

To join Beaded end pipe to conical end pipe, kit includes 2 flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

| Pipe Size | Style II Flanges Qty. No. | Insert Qty. No.  | Gasket No. | Bolts & Nuts Qty. Size     |
|-----------|---------------------------|------------------|------------|----------------------------|
| 1 1/2     | 1-7155                    | 1-7202<br>1-7203 | 1-7276     | 4-7187<br>1/4"-18 x 2 1/2" |
| 2         | 1-7155                    | 1-7202<br>1-7203 | 1-7276     | 4-7187<br>1/4"-18 x 2 1/2" |
| 3         | 1-7155                    | 1-7202<br>1-7203 | 1-7276     | 4-7187<br>1/4"-18 x 2 1/2" |
| 4         | 1-6670<br>1-7155          | 1-7202<br>1-7203 | 1-7276     | 8-7180<br>1/4"-18 x 2 1/2" |
| 6         | 1-6670<br>1-7155          | 1-7202<br>1-7203 | 1-7276     | 8-7180<br>1/4"-18 x 2 1/2" |

7120



### Coupling Assembly

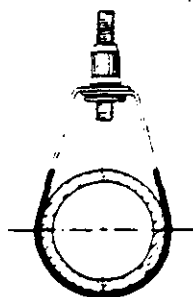
(ASME Flange to Beaded Pipe)

To join beaded glass pipe to inside coated metal, kit includes 2 flanges, inserts, adapter inserts, bolts and adapter buttons.

Chart for parts included in kit.

| Size  | Style II Flanges Qty. No. | Inserts Qty. No. | Adapter Buttons | Gasket Qty. No. | Bolts & Nuts Qty. Size     |
|-------|---------------------------|------------------|-----------------|-----------------|----------------------------|
| 1 1/2 | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7187<br>1/4"-18 x 2 1/2" |
| 2     | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7187<br>1/4"-18 x 2 1/2" |
| 3     | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7187<br>1/4"-18 x 2 1/2" |
| 4     | 1-6670                    | 1-7203           | 8-7230          | 1-7276          | 8-7180<br>1/4"-18 x 2 1/2" |
| 6     | 1-6670                    | 1-7203           | 8-7230          | 1-7276          | 8-7180<br>1/4"-18 x 2 1/2" |

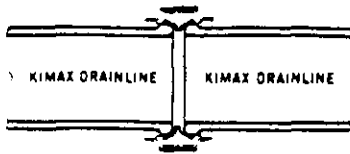
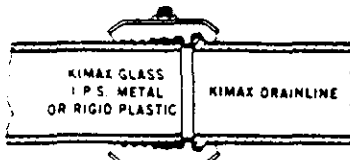
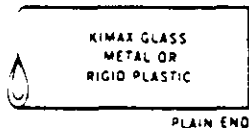
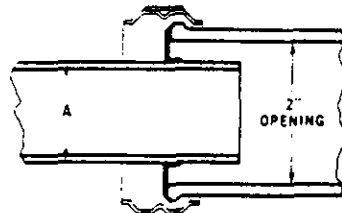
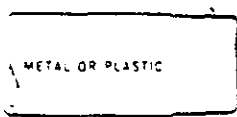
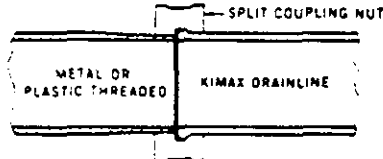
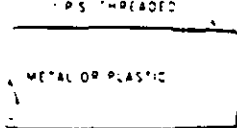
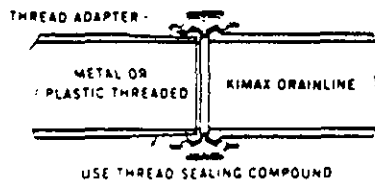
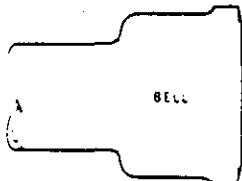
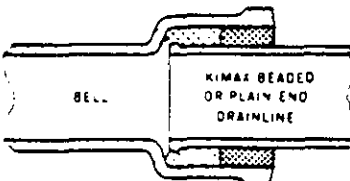
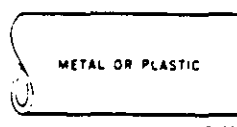
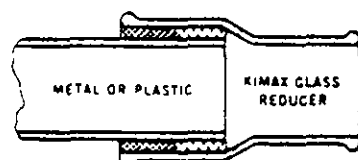
7290 (1 1/2", 2", 3", 4", 6" sizes)



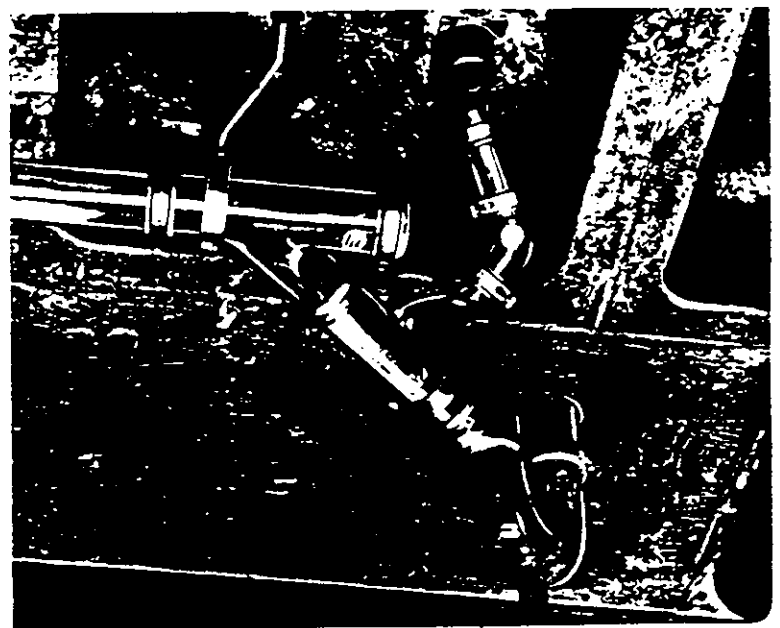
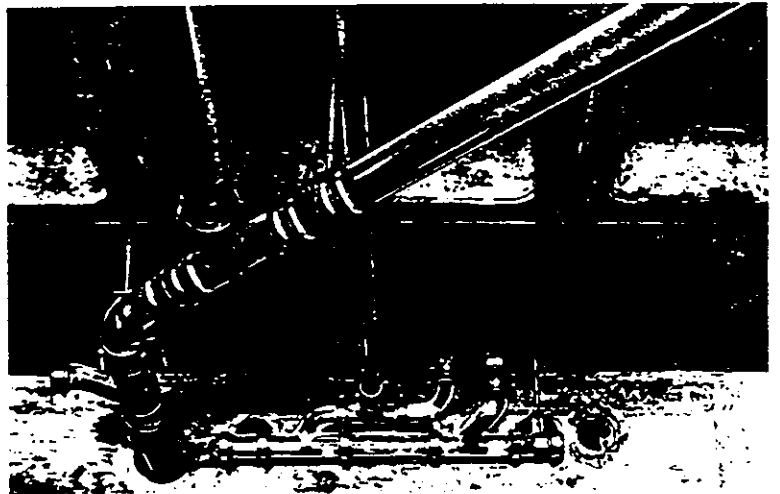
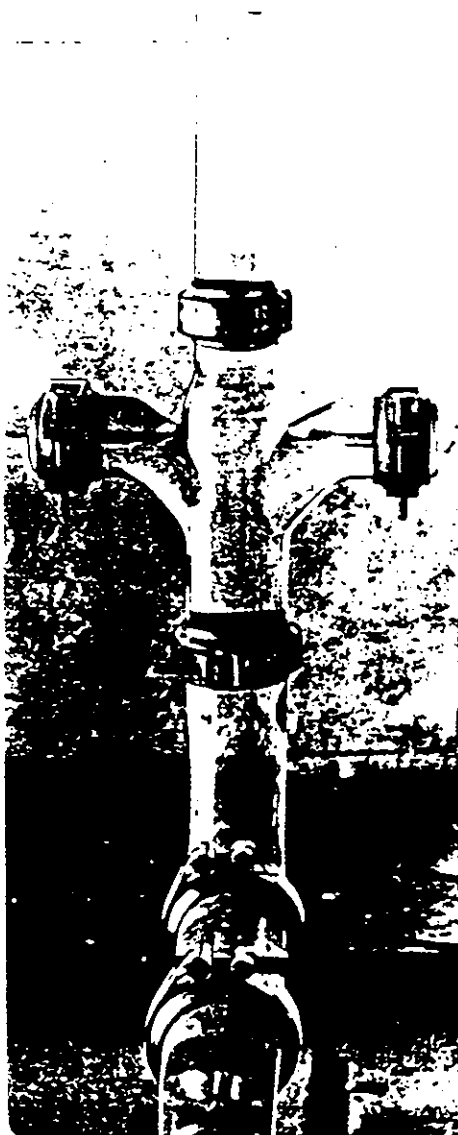
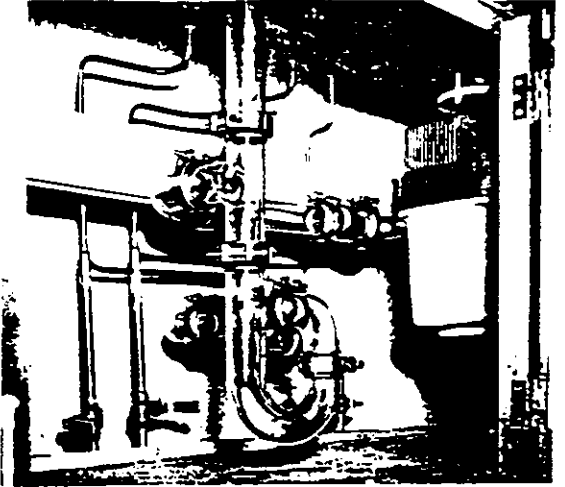
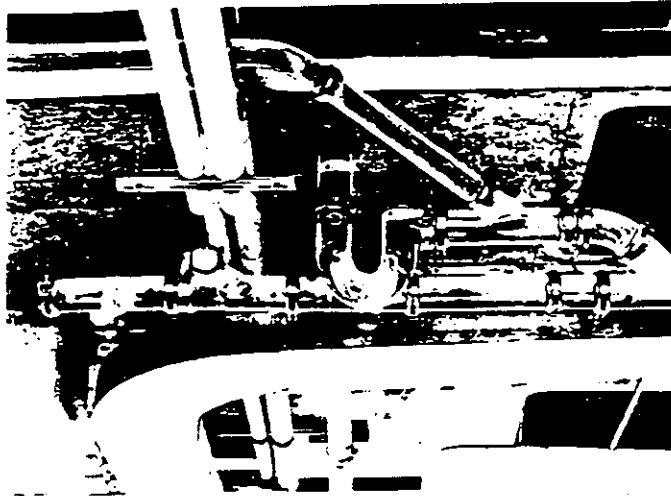
### Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral bushings. Standard finish on band is A S T M type 304 and coating.

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                             | Type of Joint                                                                                                                                                                                | Material Needed                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|-----------|-----------|---|-----------|-----------|
|  <p>KIMAX DRAINLINE<br/>BEADED</p>                                      |  <p>KIMAX DRAINLINE KIMAX DRAINLINE</p>                                                                    | <p><b>KIMAX Drainline Coupling 6650</b></p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650-1500</td></tr><tr><td>2</td><td>6650-2000</td></tr><tr><td>3</td><td>6650-3000</td></tr><tr><td>4</td><td>6650-4000</td></tr><tr><td>6</td><td>6650-6000</td></tr></table>                                                                                                                                                            | Size                       | Code No.             | 1½                   | 6650-1500 | 2         | 6650-2000 | 3         | 6650-3000 | 4         | 6650-4000 | 6         | 6650-6000 |   |           |           |   |           |           |
| Size                                                                                                                                                     | Code No.                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6650-1500                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6650-2000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6650-3000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6650-4000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6650-6000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC<br/>PLAIN END</p> |  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC KIMAX DRAINLINE</p>                                  | <p><b>KIMAX B/P Coupling 6661</b></p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6661-1500</td></tr><tr><td>2</td><td>6661-2000</td></tr><tr><td>3</td><td>6661-3000</td></tr></table>                                                                                                                                                                                                                                       | Pipe Size                  | Code No.             | 1½                   | 6661-1500 | 2         | 6661-2000 | 3         | 6661-3000 |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6661-1500                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6661-2000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6661-3000                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>METAL OR<br/>RIGID PLASTIC<br/>PLAIN END</p>        |  <p>A 2" OPENING</p>                                                                                      | <p><b>KIMAX Adapter Coupling</b></p> <table><tr><th>"A" Dimension<br/>Pipe O.D.</th><th>Coupling<br/>Size</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>2 x 1½</td><td>6655-2015</td></tr><tr><td>1.70—1.78</td><td>2 x 1½</td><td>6655-2017</td></tr><tr><td>1.82—1.90</td><td>2 x 1½</td><td>6655-2013</td></tr></table>                                                                                                                        | "A" Dimension<br>Pipe O.D. | Coupling<br>Size     | Code No.             | 1.48—1.53 | 2 x 1½    | 6655-2015 | 1.70—1.78 | 2 x 1½    | 6655-2017 | 1.82—1.90 | 2 x 1½    | 6655-2013 |   |           |           |   |           |           |
| "A" Dimension<br>Pipe O.D.                                                                                                                               | Coupling<br>Size                                                                                                                                                                             | Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.48—1.53                                                                                                                                                | 2 x 1½                                                                                                                                                                                       | 6655-2015                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.70—1.78                                                                                                                                                | 2 x 1½                                                                                                                                                                                       | 6655-2017                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.82—1.90                                                                                                                                                | 2 x 1½                                                                                                                                                                                       | 6655-2013                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED<br/>METAL OR PLASTIC</p>                          |  <p>SPLIT COUPLING NUT<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE</p>                             | <p><b>KIMAX Split Coupling</b></p> <table><tr><th>Pipe Size</th><th>Coupling<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635-1500</td><td>6739-1500</td></tr></table>                                                                                                                                                                                                                                                         | Pipe Size                  | Coupling<br>Code No. | Gasket<br>Code No.   | 1½        | 6635-1500 | 6739-1500 |           |           |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Coupling<br>Code No.                                                                                                                                                                         | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6635-1500                                                                                                                                                                                    | 6739-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED<br/>METAL OR PLASTIC</p>                          |  <p>THREAD ADAPTER<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE<br/>USE THREAD SEALING COMPOUND</p> | <p><b>KIMAX Thread Adapter and<br/>Drainline Coupling</b></p> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680-1500</td><td>6650-1500</td></tr><tr><td>2</td><td>6680-2000</td><td>6650-2000</td></tr><tr><td>3</td><td>6680-3000</td><td>6650-3000</td></tr><tr><td>4</td><td>6680-4000</td><td>6650-4000</td></tr><tr><td>6</td><td>6680-6000</td><td>6650-6000</td></tr></table> | Pipe Size                  | Adapter<br>Code No.  | Coupling<br>Code No. | 1½        | 6680-1500 | 6650-1500 | 2         | 6680-2000 | 6650-2000 | 3         | 6680-3000 | 6650-3000 | 4 | 6680-4000 | 6650-4000 | 6 | 6680-6000 | 6650-6000 |
| Pipe Size                                                                                                                                                | Adapter<br>Code No.                                                                                                                                                                          | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6680-1500                                                                                                                                                                                    | 6650-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6680-2000                                                                                                                                                                                    | 6650-2000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6680-3000                                                                                                                                                                                    | 6650-3000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6680-4000                                                                                                                                                                                    | 6650-4000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6680-6000                                                                                                                                                                                    | 6650-6000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>BELL</p>                                                          |  <p>BELL KIMAX BEADED<br/>OR PLAIN END<br/>DRAINLINE</p>                                                 | <p><b>KIMAX Glass to Bell End Pipe</b></p> <ol style="list-style-type: none"><li>1 Pack hub half full with asbestos rope</li><li>2 Caulk with hot lead, lead wool or acid proof cement</li></ol> <p>For Detail, see Drainline Installation Manual.</p>                                                                                                                                                                                                  |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>METAL OR PLASTIC<br/>PLAIN</p>                                    |  <p>METAL OR PLASTIC KIMAX GLASS<br/>REDUCER</p>                                                         | <p><b>KIMAX Glass to Plain End Metal<br/>or Plastic</b> For Detail, see Drainline<br/>Installation Manual</p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536-2015</td></tr><tr><td>3 x 2</td><td>6536-3020</td></tr><tr><td>4 x 3</td><td>6536-4030</td></tr><tr><td>6 x 4</td><td>6536-6040</td></tr></table>                                                                                                          | Pipe Size                  | Code No.             | 2 x 1½               | 6536-2015 | 3 x 2     | 6536-3020 | 4 x 3     | 6536-4030 | 6 x 4     | 6536-6040 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2 x 1½                                                                                                                                                   | 6536-2015                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3 x 2                                                                                                                                                    | 6536-3020                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4 x 3                                                                                                                                                    | 6536-4030                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6 x 4                                                                                                                                                    | 6536-6040                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |

## TYPICAL KIMAX DRAINLINE INSTALLATIONS



# KIMAX DRAINLINE INSTALLATIONS

Over the past years, there have been hundreds of KIMAX Glass Drainline installations while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

## SCHOOLS AND UNIVERSITIES

University of Southern California  
University of Utah  
University of New Mexico  
Northern Arizona State University  
Whittier College  
Colorado State University  
Central Washington State University  
University of Idaho  
California State College  
Western Reserve University  
University of Minnesota  
Southern Methodist  
Olivet College  
Toledo University  
Bay Village High School (Ohio)  
Washington University (St. Louis, Mo.)  
St. John High School (Indiana)  
Kansas State University  
Port Lavaca High School (Texas)  
University of Texas  
Brescia College  
Adrian College (Michigan)  
University of Nebraska  
Port Huron Community College  
Palmira High School (Wisconsin)  
University of Florida  
University of Virginia  
Duke University  
North Carolina State  
Florida State University  
Rutgers University  
Tadoma High School  
Washington State University

Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pomona College  
Sophia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami (Florida)  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Shonomish High School  
University of Washington  
City of Detroit  
University of Michigan  
North Shore Junior College, Houston  
Boston College

## INDUSTRIAL

Abbott Laboratories  
Ling-Temco-Vought  
Armco Steel  
Monsanto Chemical  
General Electric  
Uni-Rovar  
Morton Salt

Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohm & Haas  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office Building, Boston  
B. F. Goodrich  
E. I. DuPont

## RESEARCH

Humble Oil Company  
Eli Lilly  
University of Wisconsin  
Miles Laboratories  
Parke-Davis  
A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Gilliam Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Reiter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
Texaco Experiment, Inc.

## HOSPITALS

University of Chicago (Illinois)  
Mayo Clinic (Minnesota)  
Houston Medical Center (Texas)  
St. Joseph's Hospital (Texas)  
Clarkston Hospital (Nebraska)  
Beeumont Hospital (Michigan)  
University of Louisville (Kentucky)  
Fairview Hospital (Minnesota)  
Columbia Hospital (Wisconsin)  
Lincoln Nebraska General Hospital  
Maynard Hospital, Seattle, Washington  
Botsford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minn.  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
Skin and Cancer Hospital, Philadelphia, Pennsylvania  
Germantown Hospital, Philadelphia, Pennsylvania  
Tyler Memorial Hospital, Meshoppen, Pennsylvania  
Emory University Hospital, Atlanta, Georgia  
Massachusetts General Hospital, Boston

## CANADIAN

Otto Mass Chemical Building,  
McGill University, Montreal  
Sherwin Williams, Montreal  
Smith, Kline & French Research Labs  
University of Toronto Medical  
Science Building  
University of Alberta, Edmonton,  
Biological Sciences Building  
Department of Public Works Pathology  
Building, Halifax  
Avers, McKenna & Harrison, Montreal  
Moncton University, Moncton,  
New Brunswick  
Veterinary Diagnostic Laboratory, Regina  
Como Lake High School,  
Pt. Coquitlam, B. C.  
Tsawwassen School, Delta, B. C.  
St. Hyacinthe Agricultural Institute, Quebec

## KIMBLE SALES OFFICES

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1561 Bishop Hollow Run  
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AC/201 746-6600

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3901 Manden  
Apt. #1  
AC/713 524-9840

Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

La Mirada, Calif. 90638  
15052 Rosecrans Ave  
Suite 209  
AC/714 521-2271

Owens-Illinois  
International Division  
Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

# OWENS-ILLINOIS

maker of Kimble Products  
Toledo, Ohio 43601



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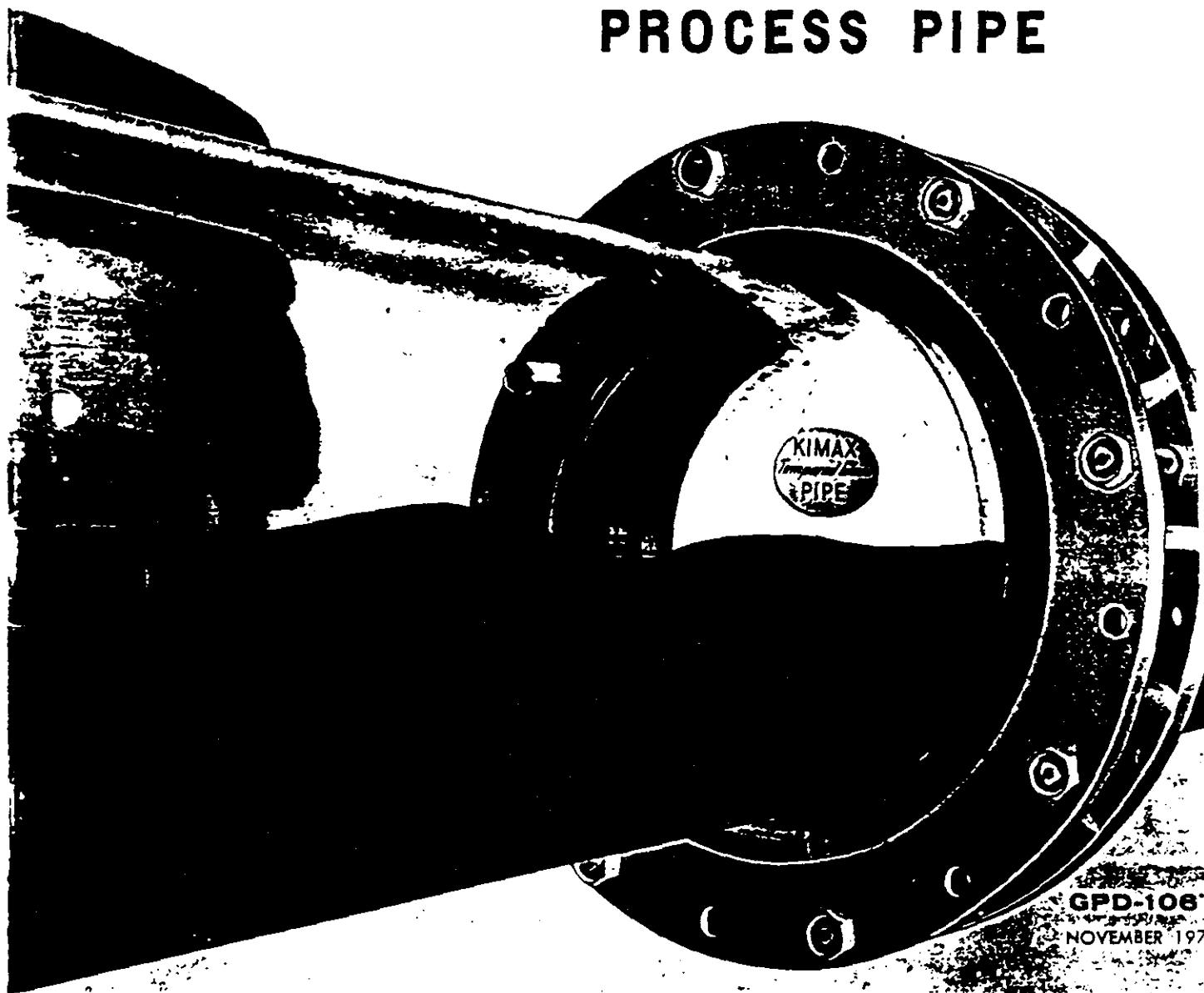
**EXHIBIT I**

**OWENS-ILLINOIS**

**KIMAX<sup>®</sup>**

**tempered glass**

**PROCESS PIPE**



**GPD-108**

**NOVEMBER 197**



# OWENS-ILLINOIS

GENERAL OFFICES • TOLEDO, OHIO 43601

## OWENS-ILLINOIS SALES OFFICES

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AC/312 964-2144

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2315 Moss Hill  
AC/713 465-4789

La Mirada, Calif. 90638  
15052 Rosacrans Ave.  
Suite 209  
AC/213 941-0276  
AC/714 521-2271

Vineland, N. J. 08360  
Crystal & Fowler Ave.  
AC/609 692-3600

Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

Owens-Illinois  
International Division  
Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

KIMAX Tempered Glass Pipe is manufactured and sold by the Consumer and Technical Products Division.

TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.



# KIMAX<sup>®</sup> *Tempered Glass* PIPE

This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from such causes, Owens-Illinois will, in full discharge of this warranty, replace such pipe at no charge.

## GENERAL INFORMATION

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## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

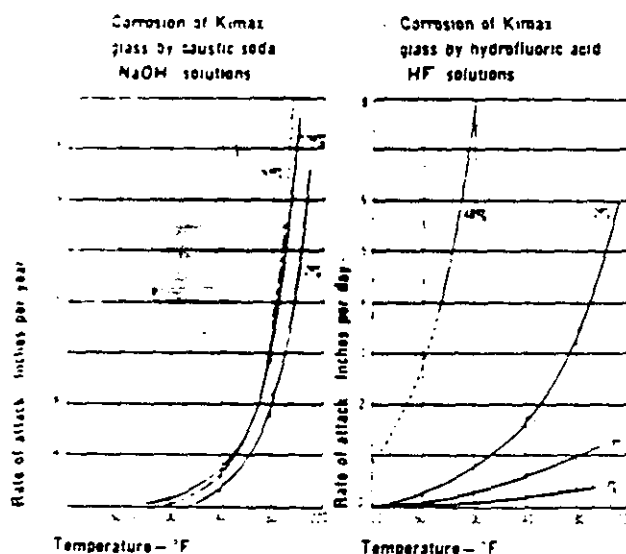
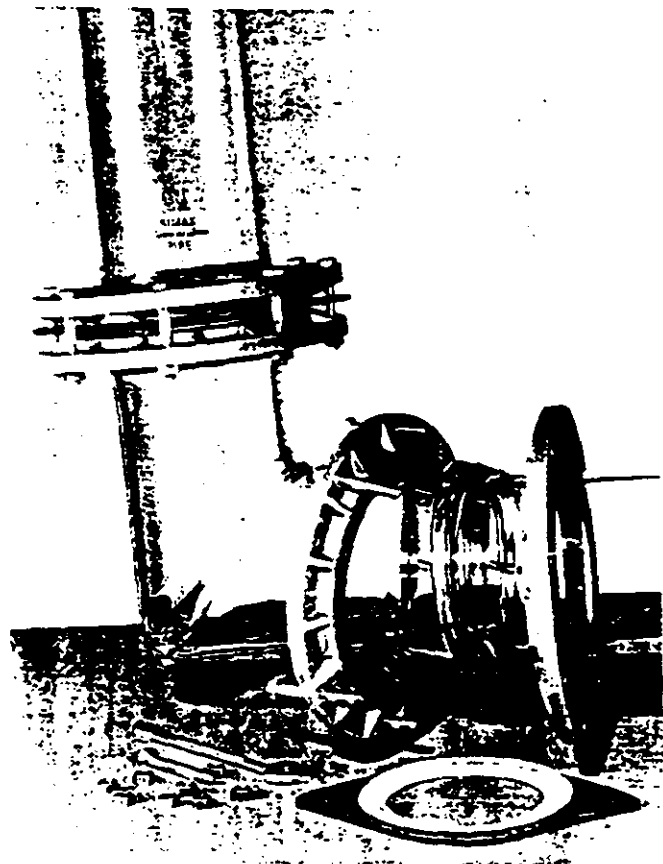
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels, boiling units, reaction chambers, and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GAS-FIT AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG 33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

**Economy** is inherent in KIMAX glass pipe systems. Materials are competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long lived.

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{2}$  to  $\frac{1}{4}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

## Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine drawn, heavy-wall tubing. Length dimensions are held to  $\pm 0.01$ "

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—triples the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as traps, U-bends, thermometer wells, and some tees are annealed only due to their shape. These annealed fittings are clearly identified.

## Physical Properties

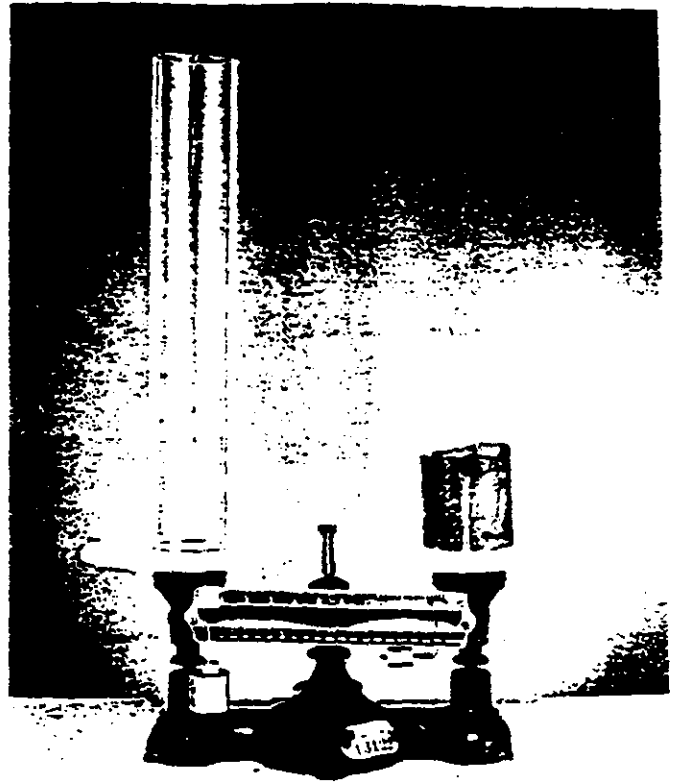
KIMAX (KG 33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products.

Operating temperatures extend up to 250° F under normal conditions. They may go up to 450° F if insulating protection is provided.

Thermal conductivity: 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F.

Thermal expansion of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

Thermal shock differential ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



## Ordering

When ordering a standard item please refer to KIMAX glass pipe distributors' price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

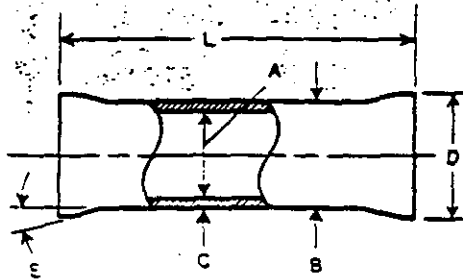
## Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

Non-stock items such as reducing tees and crosses with 3 and 4-way reductions; traps; U-returns and drainline Y's can be supplied by your KIMAX pipe distributor on special order.

# KIMAX GLASS PIPE AND FITTINGS

## STRAIGHT LENGTHS 6100



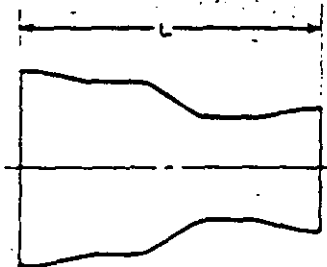
Standard lengths in all diameters are 6": 12": 18": 24": 30": 48": 60": 72": 84": 96": 108": and 120".

Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order.

| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs., FL | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | .156"     | 1 1/4"              | 12°                  | 3"                  | 50                 | 55                        |
| 1 1/2"                        | 1.844"            | .172"     | 2 1/4"              | 12°                  | 3 1/2"              | 100                | 55                        |
| 2"                            | 2.344"            | .172"     | 2 3/4"              | 12°                  | 4"                  | 113                | 55                        |
| 3"                            | 3.406"            | .203"     | 3 3/4"              | 12°                  | 5"                  | 200                | 55                        |
| 4"                            | 4.530"            | .265"     | 5 1/4"              | 21°                  | 5"                  | 240                | 55                        |
| 6"                            | 6.656"            | .328"     | 7 1/2"              | 21°                  | 5"                  | 500                | 55                        |

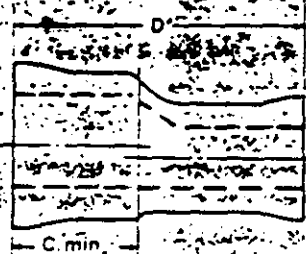
When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2 or 1          | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 7             |
| 6                     | 4, 3, 2, 1 1/2 or 1    | 9             |

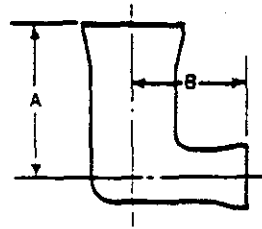
## ECCENTRIC REDUCERS 6240



| Pipe Size<br>(inches) | Reduced To<br>(inches) | C<br>Minimum<br>(inches) | D<br>(inches) |
|-----------------------|------------------------|--------------------------|---------------|
| 1 1/2                 | 1                      | 1 1/4                    | 4             |
| 2                     | 1 1/2 or 1             | 1 3/4                    | 4             |
| 3                     | 2, 1 1/2 or 1          | 2 1/4                    | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 3                        | 7             |
| 6                     | 4, 3, or 2             | 3                        | 9             |

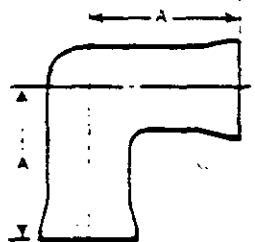
# KIMAX GLASS PIPE AND FITTING

## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1½                    | 1                      | 3½            | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1½                     | 4             | 3½            |
| 3                     | 1                      | 5             | 3½            |
| 3                     | 1½                     | 5             | 4             |
| 3                     | 2                      | 5             | 4½            |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1½                     | 7             | 4½            |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5½            |
| 6                     | 1                      | 9             | 5             |
| 6                     | 1½                     | 9             | 5½            |
| 6                     | 2                      | 9             | 6             |
| 6                     | 3                      | 9             | 6½            |
| 6                     | 4                      | 9             | 8             |

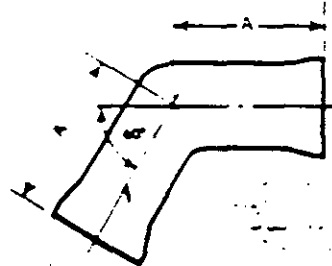
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

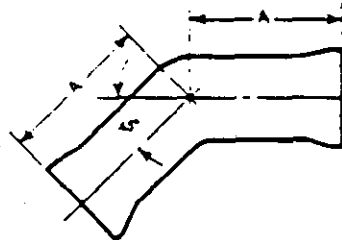
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

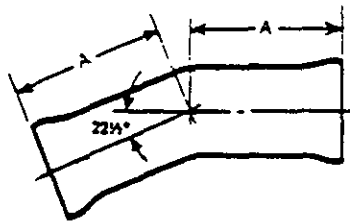
## 45° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

# 22½° ELBOWS 6201

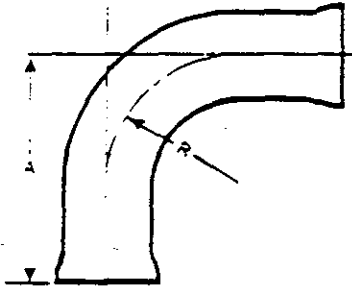


When ordering, specify degree of angle.

## KIMAX GLASS PIPE AND FITTINGS

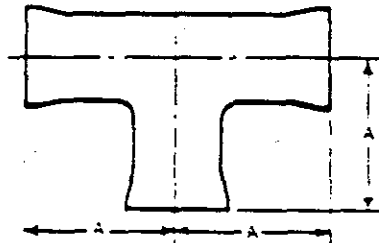
| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

# SWEEP ELBOWS 6239



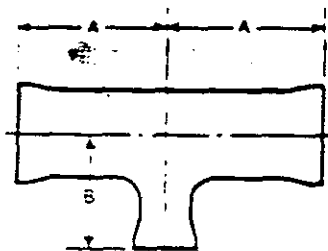
| Pipe Size<br>(inches) | A<br>(inches) | R<br>(inches) |
|-----------------------|---------------|---------------|
| 1                     | 4½            | 2½            |
| 1½                    | 6             | 3½            |
| 2                     | 6             | 3½            |
| 3                     | 7             | 4½            |
| 4                     | 10            | 6             |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

# REDUCING TEES 6211



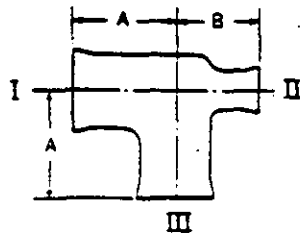
When ordering, specify pipe I.D. and bottom leg I.D.

| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1½                    | 1                      | 3½            | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1½                     | 4             | 3½            |
| 3                     | 1                      | 5             | 3½            |
| 3                     | 1½                     | 5             | 4             |
| 3                     | 2                      | 5             | 4½            |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1½                     | 7             | 4½            |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5½            |
| 6                     | 1                      | 9             | 5             |
| 6                     | 1½                     | 9             | 5½            |
| 6                     | 2                      | 9             | 6             |
| 6                     | 3                      | 9             | 6½            |
| 6                     | 4                      | 9             | 8             |

Other reduction combinations are available on special order to customer's specifications.

# KIMAX GLASS PIPE AND FITTING

## REDUCER TEES 6212

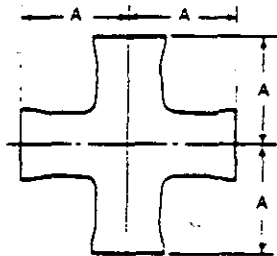


When ordering, specify pipe I.D. in this order: I, II, and III.

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|----------------------------|-----------------------------|------------------------------|---------------|---------------|
| 1½                         | 1                           | 1½                           | 3½            | 3             |
| 2                          | 1                           | 2                            | 4             | 3             |
| 2                          | 1½                          | 2                            | 4             | 3½            |
| 3                          | 1                           | 3                            | 5             | 3½            |
| 3                          | 1½                          | 3                            | 5             | 4             |
| 3                          | 2                           | 3                            | 5             | 4½            |
| 4                          | 1                           | 4                            | 7             | 4             |
| 4                          | 1½                          | 4                            | 7             | 4½            |
| 4                          | 2                           | 4                            | 7             | 5             |
| 4                          | 3                           | 4                            | 7             | 5½            |
| 6                          | 1                           | 6                            | 9             | 5             |
| 6                          | 1½                          | 6                            | 9             | 5½            |
| 6                          | 2                           | 6                            | 9             | 6             |
| 6                          | 3                           | 6                            | 9             | 6½            |
| 6                          | 4                           | 6                            | 9             | 8             |

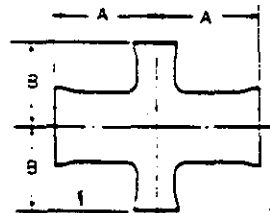
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

## REDUCER CROSSES 6250

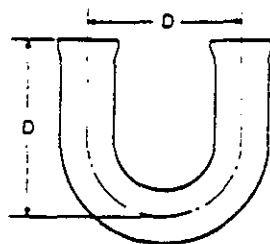


When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|
| 1½                    | 1                       | 3½            | 3             |
| 2                     | 1                       | 4             | 3             |
| 2                     | 1½                      | 4             | 3½            |
| 3                     | 1                       | 5             | 3½            |
| 3                     | 1½                      | 5             | 4             |
| 3                     | 2                       | 5             | 4½            |
| 4                     | 1                       | 7             | 4             |
| 4                     | 1½                      | 7             | 4½            |
| 4                     | 2                       | 7             | 5             |
| 4                     | 3                       | 7             | 5½            |
| 6                     | 1                       | 9             | 5             |
| 6                     | 1½                      | 9             | 5½            |
| 6                     | 2                       | 9             | 6             |
| 6                     | 3                       | 9             | 6½            |
| 6                     | 4                       | 9             | 8             |

Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265

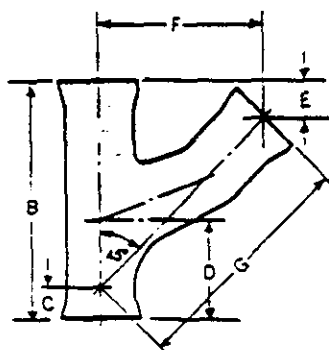


Use soft strip asbestos inserts (7202) only, with this fitting.

| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 5½            |
| 1½                    | 7             |
| 2                     | 7             |
| 3                     | 9             |
| 4                     | 12            |

# LATERAL "Y" 6230

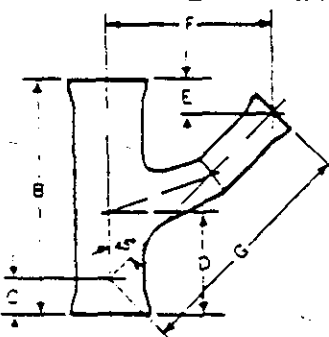
# KIMAX GLASS PIPE AND FITTINGS



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1                     | 5 1/2         | 3 1/2         | 1 3/4         | 1 1/4         | 3 3/4         | 5 1/4         |
| 1 1/2                 | 7             | 4 1/2         | 2 1/4         | 1 3/4         | 5 1/4         | 7 1/4         |
| 2                     | 9             | 5 1/2         | 3 1/4         | 2 1/4         | 6 1/4         | 8 1/4         |
| 3                     | 10            | 6 1/2         | 3 3/4         | 2 3/4         | 7 1/4         | 9 1/4         |
| 4                     | 14            | 8 1/2         | 4 1/4         | 3 1/4         | 9 1/4         | 11 1/4        |
| 6                     | 18            | 11 1/2        | 5 1/4         | 4 1/4         | 11 1/4        | 15 1/4        |

# LATERAL "Y" REDUCERS 6231

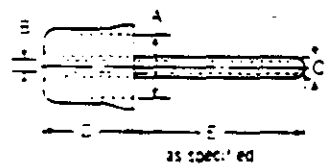


When ordering, specify I.D. of pipe and branch.

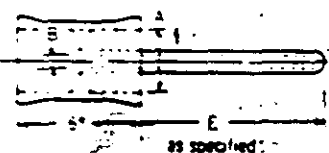
| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 8             | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 7 1/4         |
| 2                     | 1 1/2                   | 9             | 1 1/4         | 3 1/4         | 1 1/4         | 5 1/4         | 7 1/4         |
| 3                     | 1 1/2                   | 10            | 1 3/4         | 3 3/4         | 1 3/4         | 6 1/4         | 8 1/4         |
| 3                     | 2                       | 10            | 1 3/4         | 3 3/4         | 1 3/4         | 6 1/4         | 8 1/4         |
| 4                     | 1 1/2                   | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 11 1/4        |
| 4                     | 2                       | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 11 1/4        |
| 4                     | 3                       | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 11 1/4        |
| 6                     | 3                       | 18            | 3 1/4         | 5 1/4         | 3 1/4         | 11 1/4        | 15 1/4        |

# THERMOMETER WELLS (Annealed)

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.



6292 SINGLE END



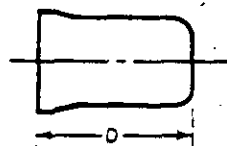
6295 DOUBLE END

When ordering, specify pipe I.D., bulb size, and tube length.

| A<br>Pipe Size<br>(inches) | B<br>For Ther-<br>mometer<br>Bulb Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches) |
|----------------------------|----------------------------------------------------|----------------------------|---------------|
| 1 1/2                      | 1/4                                                | 1/4                        | 2 1/4         |
| 1 1/2                      | 1/2                                                | 1/4                        | 2 1/4         |
| 1 1/2                      | 3/4                                                | 1                          | 2 1/4         |
| 2                          | 1/4                                                | 1/4                        | 2 1/4         |
| 2                          | 1/2                                                | 1/4                        | 2 1/4         |
| 2                          | 3/4                                                | 1                          | 2 1/4         |
| 3                          | 1/4                                                | 1/4                        | 3 1/4         |
| 3                          | 1/2                                                | 1/4                        | 3 1/4         |
| 3                          | 3/4                                                | 1                          | 3 1/4         |

# CAPS (Annealed) 6236

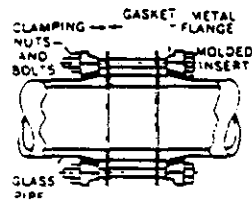
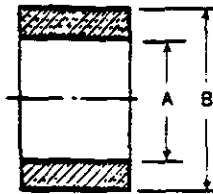
Use soft strip asbestos inserts (7202) with this fitting.



| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 2             |
| 1 1/2                 | 3             |
| 2                     | 4             |
| 3                     | 4 1/4         |
| 4                     | 6             |
| 6                     | 7             |



## STRAIGHT SPACERS 6260

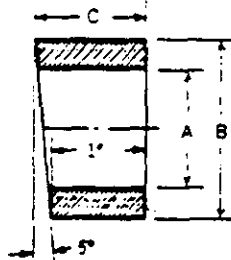


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4", and 5". Other lengths available on special order. Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/4                 |
| 1 1/2                      | 2 1/2                 |
| 2                          | 2 3/4                 |
| 3                          | 3 3/4                 |
| 4                          | 4 1/2                 |
| 6                          | 7 1/4                 |

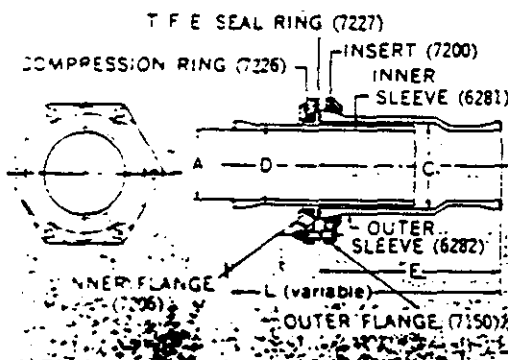
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on special order.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches) |
|----------------------------|-----------------------|---------------|
| 1                          | 1 1/4                 | 1 1/4         |
| 1 1/2                      | 2 1/2                 | 1 1/2         |
| 2                          | 2 3/4                 | 1 3/4         |
| 3                          | 3 3/4                 | 2 1/4         |
| 4                          | 4 1/2                 | 3 1/4         |

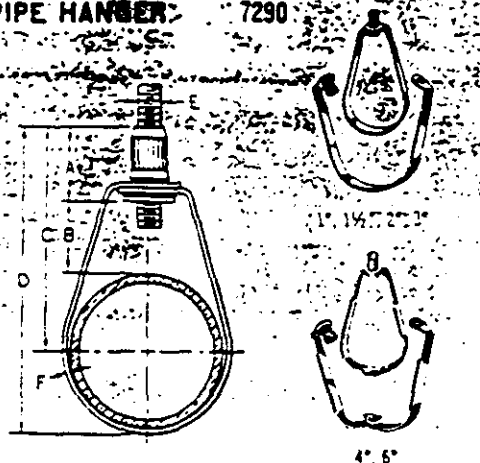
## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments up to 2 1/4". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1", 1 1/2", 2") and 15 p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281); outer sleeve (6282); inner flange (7206); outer flange (7150); insert (7200); T F E seal ring (7227); compression ring (7226); bolts (7180). All metal parts are aluminum. Three bolts (hex head 3/16 x 1 1/4) required for 1 1/2", 2", and 3" sizes. Six bolts required for 4" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | L<br>(Inches) |        |
|----------------------------|---------------|---------------|---------------|---------------|--------|
|                            |               |               |               | Min.          | Max.   |
| 1                          | 1 1/2         | 1 1/4         | 5 1/4         | 8 1/4         | 10 1/4 |
| 1 1/2                      | 2             | 1 1/2         | 6             | 9 1/4         | 11 1/4 |
| 2                          | 2 1/2         | 2 1/4         | 6 1/2         | 10            | 11 1/2 |
| 3                          | 3 1/2         | 3 1/4         | 8             | 11 1/4        | 14     |
| 4                          | 4 1/2         | 4 1/4         | 9             | 13 1/4        | 15 1/4 |

## PIPE HANGER 7290



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is released by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A     | B     | C     | D      | E   | F         |
|-----------------------|-------|-------|-------|--------|-----|-----------|
| 1                     | 1 1/4 | 1     | 2 3/4 | 3 1/4  | 1/2 | 1/2 x 1/2 |
| 1 1/2                 | 1 1/4 | 1 1/4 | 3 1/4 | 4 1/4  | 1/2 | 1/2 x 1/2 |
| 2                     | 1 1/4 | 1 1/4 | 3 3/4 | 4 1/4  | 1/2 | 1/2 x 1/2 |
| 3                     | 1 1/4 | 1 1/4 | 4 1/4 | 6 1/4  | 1/2 | 1/2 x 1/2 |
| 4                     | 1 1/4 | 1 1/4 | 5 1/4 | 7 1/4  | 1/2 | 1/2 x 1   |
| 6                     | 1 1/4 | 2 1/4 | 7 1/4 | 10 1/4 | 1/2 | 1/2 x 1   |

## FLANGES, GASKETS AND ACCESSORIES

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

### FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME bolt circle flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel.

### GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, Koroseal, and T F E lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler of soft asbestos (Blue African asbestos) with a machined T F E liner, are recommended. Other types of filler material may be used with T F E lined gaskets. Consult your distributor for details of performance and prices.

### INSERTS

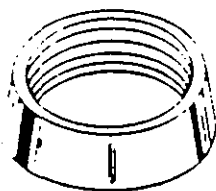
Used for cushioning pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all annealed fittings such as U bends, thermometer wells, and caps.

Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 13 for more information.

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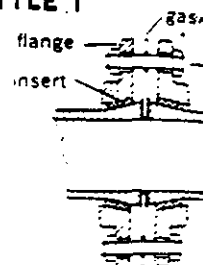
### FERRULE 7245



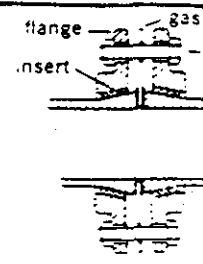
Stainless steel. To be welded, brazed or soldered to metal tubing. In 1", 1½", 2", 3", and 4" diameters.

### FLANGE SET 7100 STYLE I

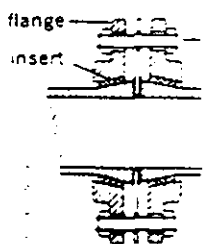
SIZES  
1", 1½", 2"



SIZE  
3"

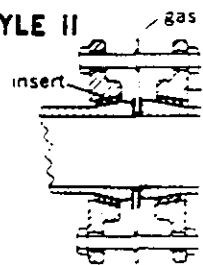


SIZES  
4", 6"

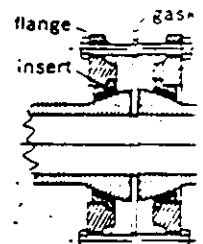


### FLANGE SET 7105 STYLE II

SIZES  
1", 1½", 2", 3"

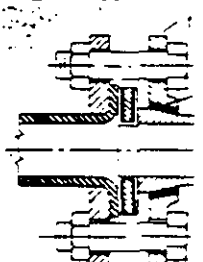


SIZES  
4", 6"



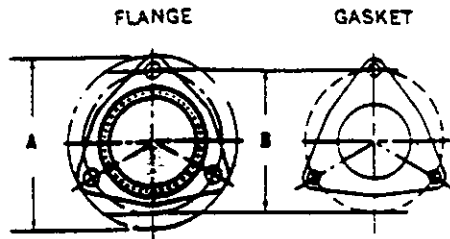
### ASME ADAPTER FLANGES 7160

SIZES  
1", 1½", 2", 3"



To adapt 4" and 6" glass pipe to an ASME Flange, use the following:  
STYLE I Aluminum—No. 7150, 1—7151 outer flange, 1—7153  
STYLE II Cast Iron—No. 7155, 1—7156 outer flange, 1—7158

## FLANGES, GASKETS AND ACCESSORIES

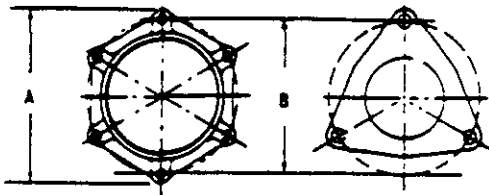


### FLANGE SET NO. 7100, 1", 1½", 2" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 3—7180 Aluminum Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¾ | 2¾ | ¼-13x2    |
| 1½        | 4¾ | 3¾ | ¼-13x2½   |
| 2         | 4¾ | 3¾ | ¼-13x2    |

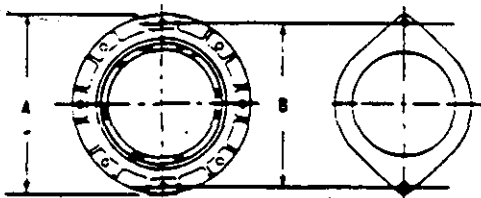


### FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 6—7180 Aluminum Bolts and Nuts

| Pipe Size | A | B  | Bolt Size |
|-----------|---|----|-----------|
| 3         | 6 | 5¼ | ¼-13x2    |



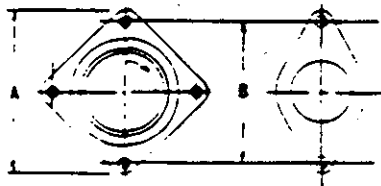
### FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components:

- 2—7151 Aluminum Outer Flanges\*
- 2—7153 Aluminum Inner Rings with 7202 insert cemented in place\*
- 8—7180 Aluminum Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¾  | 7¼ | ½-18x2½   |
| 6         | 10¾ | 9¾ | ½-16x3    |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.



### FLANGE SET NO. 7105, 1", 1½", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7155 Cast Iron Flanges
- 2—7200 Neoprene Asbestos Inserts
- 3—7190 Steel Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¾ | 3¾ | ¾-18x2    |
| 1½        | 4¾ | 4¾ | ¾-18x2½   |
| 2         | 5¾ | 4¾ | ¾-18x2½   |
| 3         | 5¾ | 5  | ¾-18x2    |



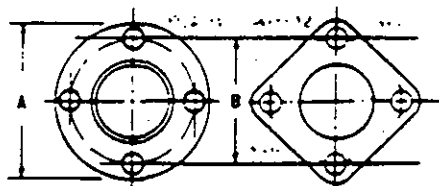
### FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7156 Cast Iron Outer Flange\*
- 2—7158 Cast Iron Inner Ring with 7202 Inserts cemented in place.\*
- 8—7190 Steel Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¾  | 7¼ | ½-18x2½   |
| 6         | 10¾ | 9¾ | ½-16x2½   |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring.



### ASME ADAPTER FLANGE NO. 7160, 1", 1½", 2", 3" I.D.

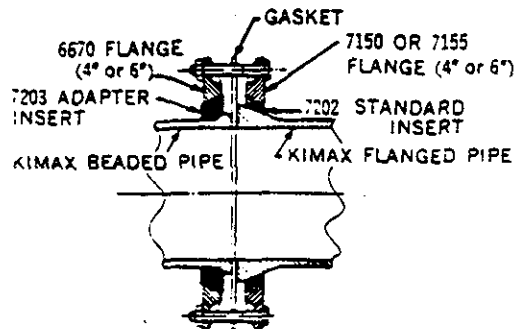
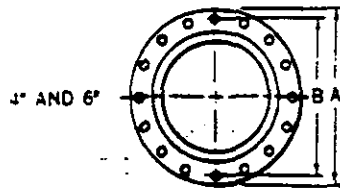
ASME Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

- 7200 for Conical End Tempered Glass
- 7202 Strip Insert for Conical End Annealed Glass
- 7203 Molded Adapter Insert for Beaded End Glass

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 4¾ | 3¾ | ¾-13x2    |
| 1½        | 5  | 3¾ | ¾-13x2½   |
| 2         | 6  | 4¾ | ¾-11x2½   |
| 3         | 7¾ | 5  | ¾-11x3    |

## ADAPTER FLANGE

6670



## FLANGES, GASKETS AND ACCESSORIES

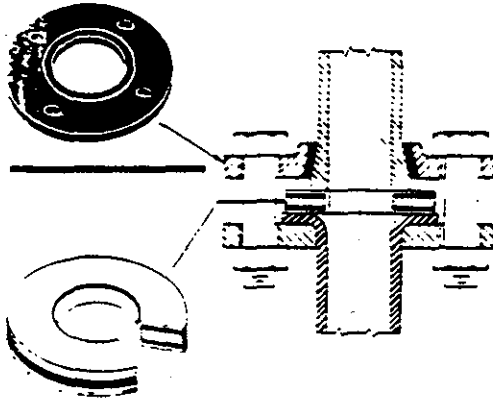
Used with Style I or Style II flanges to join field-beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(inches) |
| 4                     | 8 1/4  | 7 1/2            | 8                  | 3/4-18 x 2 1/4   |
| 6                     | 10 1/4 | 9 1/4            | 8                  | 3/4-16 x 2 1/4   |

For 1\" through 3\" beaded pipe, use Style II flange (7155) with adapter insert (7203).

## A.S.M.E. ADAPTER FLANGE 7160

Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel. In 1\", 1 1/2\", 2\", and 3\" sizes.



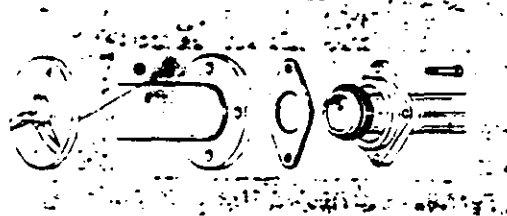
Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined T F E envelope.

Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(inches) | Thickness<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 3/16                  |
| 4                     | 3/16                  |
| 6                     | 1/2                   |

## DONUT SPACER 7240

## ADAPTER BUTTON 7230



Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(inches) | O.D.<br>(inches) | Height<br>(inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 3/4                |

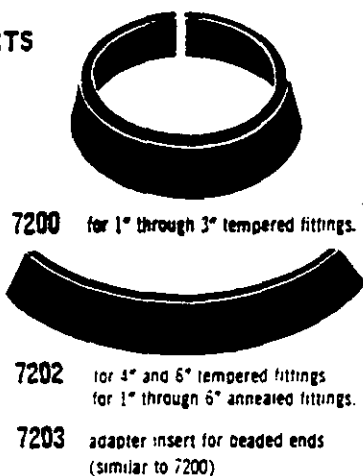
## SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1\" through 4\" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(inches) | I.D.<br>(inches) | Length<br>(inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1\" thru 4\"          | 3/16 min.        | 11 3/32            | .156                |
| 6"                    | 3/8 min.         | 11 3/32            | .156                |

## INSERTS



## FLANGES, GASKETS AND ACCESSORIES

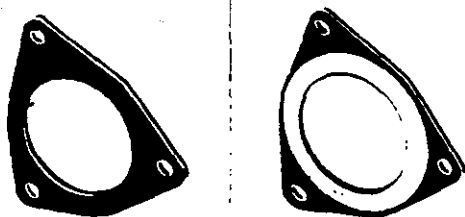
Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1 1/4", 2", 2 1/4", 3", 3 1/4", and 5" diameters. The 1", 1 1/4", 2", and 3" sizes are used with standard tempered glass pipe and fittings. Other sizes are for use with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

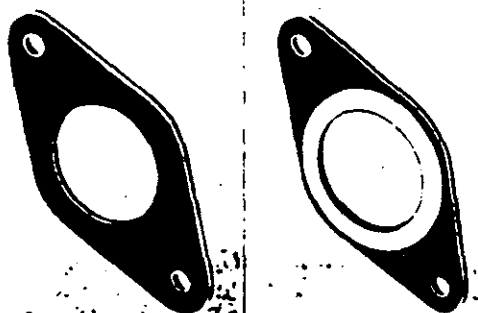
Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters, and with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

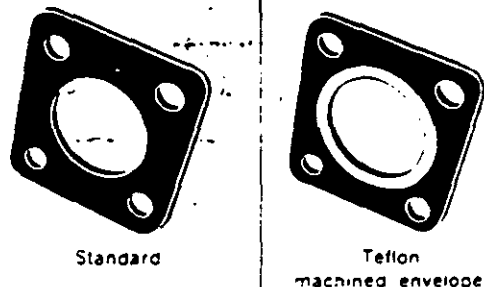
STYLE I (1", 1 1/4", 2", 2 1/4", 3" sizes only)



STYLE II (all sizes - also used for 4" and 6" Style I)



A.S.M.E. (1", 1 1/4", 2", 2 1/4", 3" sizes only)



Since the gasket is the only part of the joint assembly to come into contact with conveyed liquids, choice of gasket material is extremely important.

Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below.

When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of T F E are recommended.

The T F E machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

Standard filler for T F E machined envelope gasket is Blue African asbestos.

Other filler materials for T F E machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of T F E envelope gaskets are the same as that of the filler material.

| Catalog Number |          |          | Material                                               | Service                                                        | Maximum Working Temp., °F. |
|----------------|----------|----------|--------------------------------------------------------|----------------------------------------------------------------|----------------------------|
| Style I        | Style II | A.S.M.E. |                                                        |                                                                |                            |
| 7250           | 7251     | —        | Asbestos                                               | Organic and mineral acids, solvents and chlorinated compounds. | 400                        |
| 7260           | 7261     | —        | Neoprene                                               | Distilled water and mineral acids, except HNO <sub>3</sub>     | 220                        |
| 7275           | 7276     | 7277     | T F E Machined Envelope (Blue African Asbestos Filler) | All                                                            | 450                        |

# ENGINEERING

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Tempered Glass          | 1.10-1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.55                                     |
| Graphite (impervious)         | 1.00                                     |
| Resin-Bonded Asbestos         | 0.93                                     |
| Stainless Steel (Schedule 40) | 1.55                                     |
| Lead, Extra Light             | 4.80                                     |
| Porcelain                     | 1.05                                     |
| High Silicon Iron             | 1.10                                     |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING    | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |     |    |    |    |    |
|------------|----------------------------------------|-----|----|----|----|----|
|            | 1"                                     | 1½" | 2" | 3" | 4" | 6" |
| 90° El.    | 15                                     | 15  | 15 | 15 | 20 | 30 |
| 45° El.    | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Teel.      | 10                                     | 10  | 10 | 10 | 15 | 15 |
| 90° Tee    | 10                                     | 10  | 10 | 10 | 15 | 15 |
| 45° Tee    | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Flange     | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Gate Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Plug Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Ball Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Gate Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Plug Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |
| Ball Valve | 10                                     | 10  | 10 | 10 | 15 | 15 |

## Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 450°F under normal conditions. Where operating temperatures exceed 450°F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Kimble Products Glass Pipe Market Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table.

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 35   | 20   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 150  |

\*Freezing point of conveyed material should be taken into consideration.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of .0011 in./ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Tempered Glass  | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (impervious) | 1.30                                     |
| Steel                 | 3.60                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 6.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 15.00<br>High Impact 44.00 |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials. In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and T F E covered donut spacers.

## GASKET AND DONUT SPACER THICKNESS

| Material                                 | Pipe Diameter |     |    |    |    |    |
|------------------------------------------|---------------|-----|----|----|----|----|
|                                          | 1"            | 1½" | 2" | 3" | 4" | 6" |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| T F E Envelope                           | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| Solid Beaded Teflon                      | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| Donut Spacer                             | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

### Typical Area Sketch

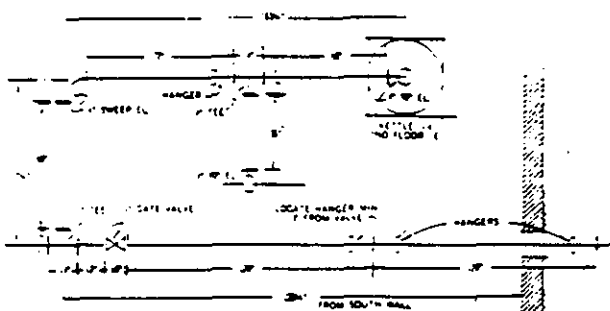


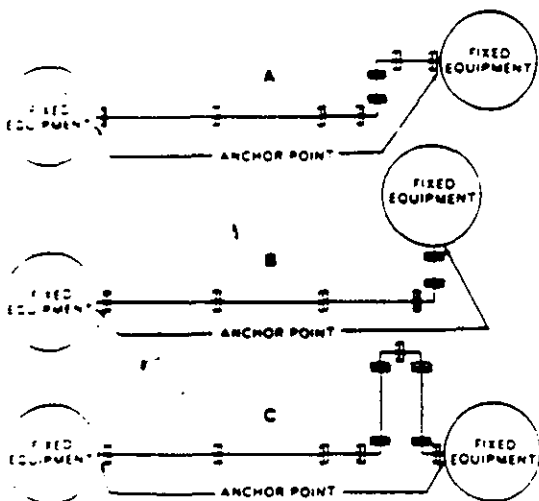
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

### A,B,C—Recommended Means



### D—Not Recommended

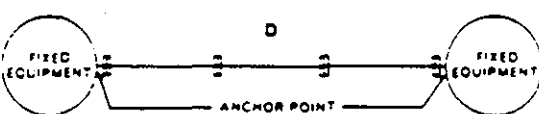


Figure 2

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 5, page 17.

Glass pipeline at floor level, ground level, or below grade level when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

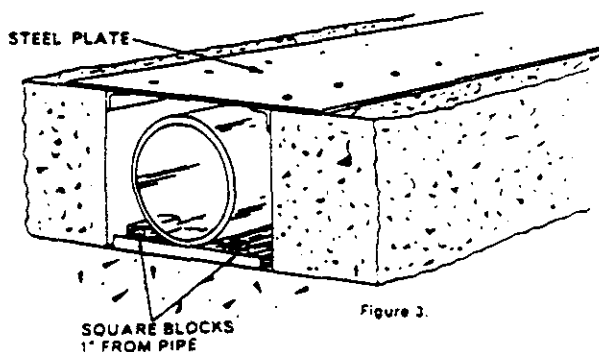
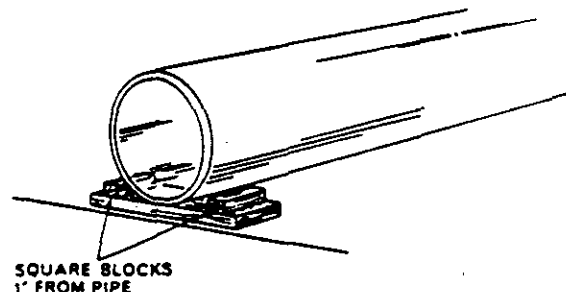
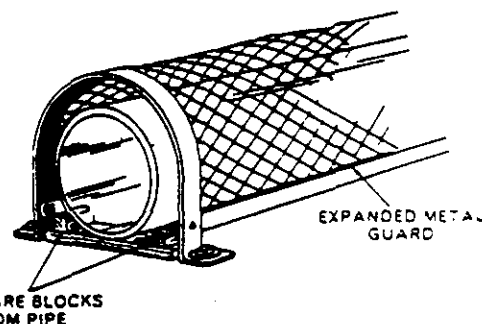
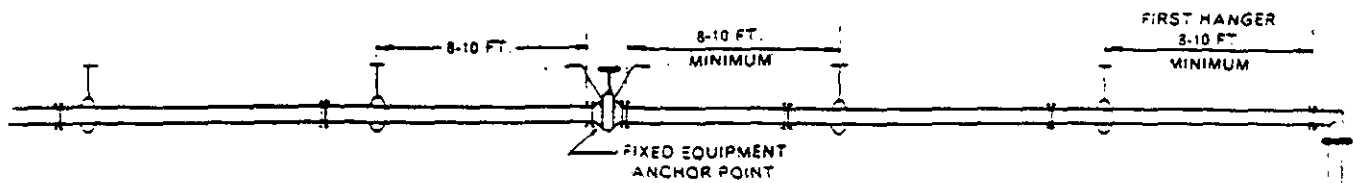


Figure 3

## ENGINEERING



### Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.

### Pipe Pitch

Normally, a pitch of 1/4" per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

### Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.)

In high traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

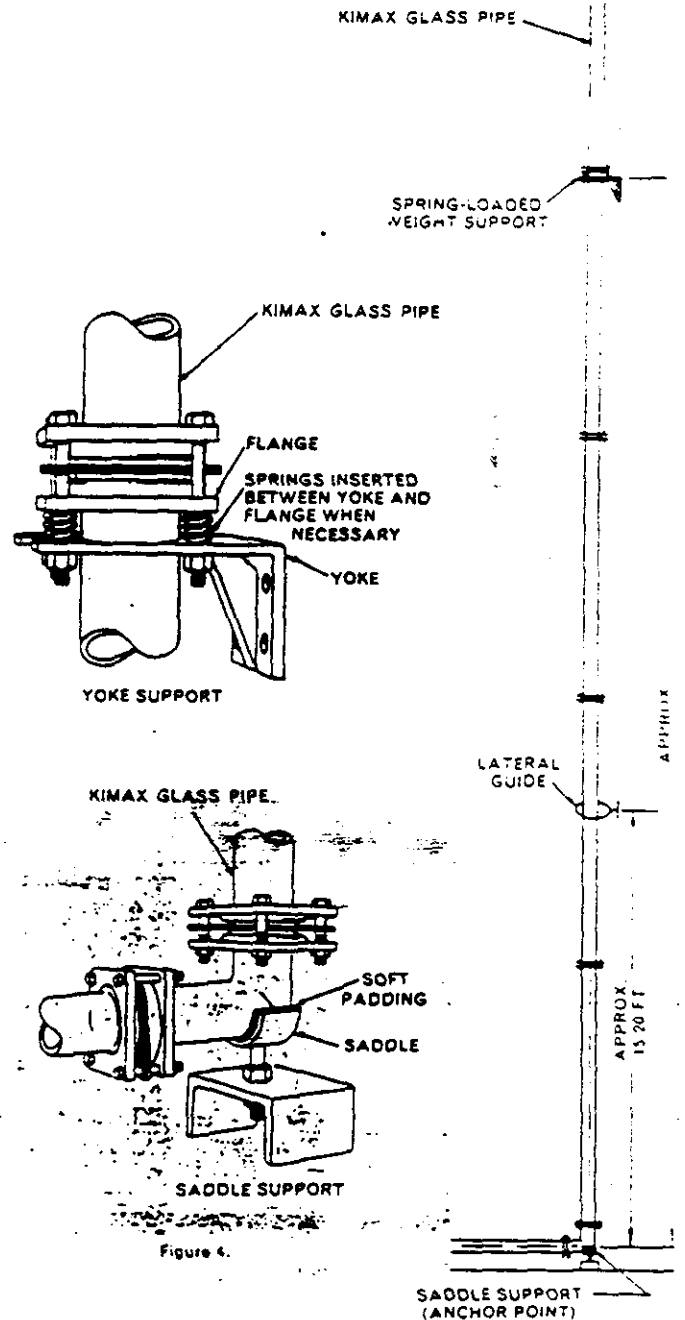


Figure 4.

Figure 5

Recommended Vertical Line Supports



## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

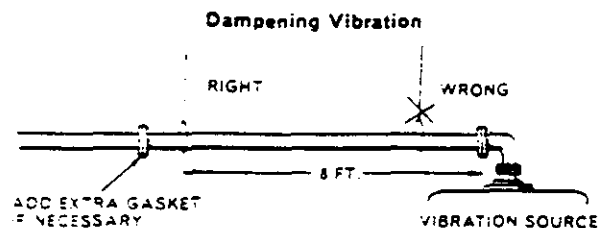


Figure 6

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe, two feet for 2" to 6" pipe. See Figure 7.

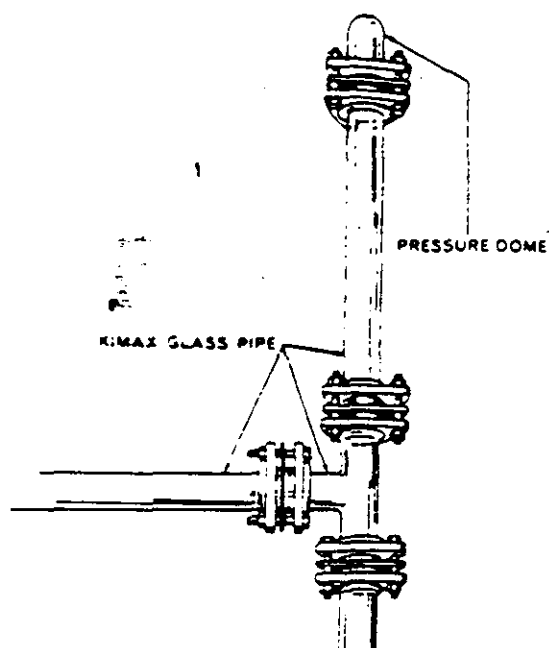


Figure 7

## Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings using Style I or Style II flanges. See Figure 8.

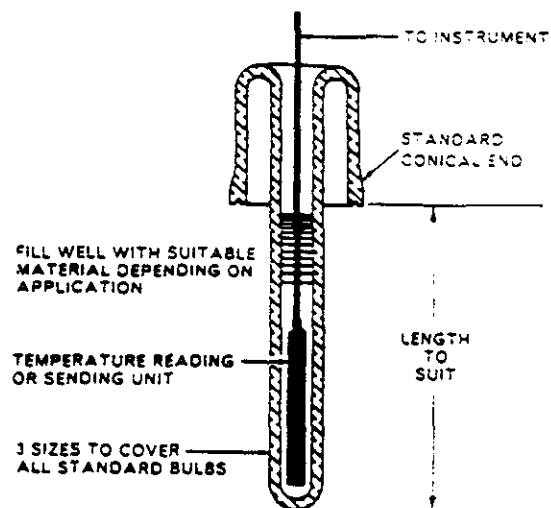


Figure 8

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

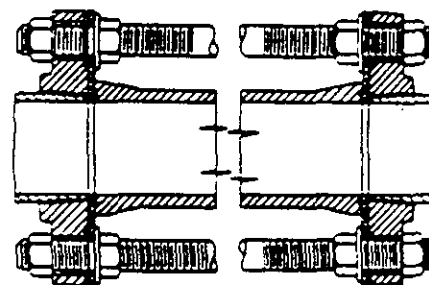


Figure 9

# ENGINEERING

## Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1", 1½", 2", 3", 4" and 6".

Standard lengths of KIMAX straight lengths vary from 6 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipeline design.

## Special Lengths

It may be necessary to order non-standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

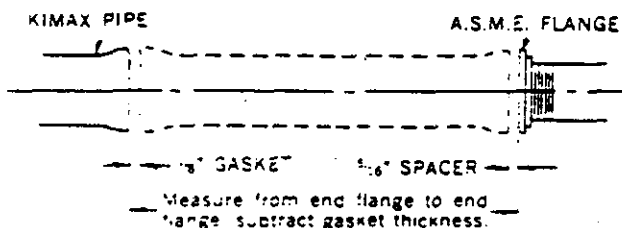


Figure 10

## Special Apparatus

The corrosion resistance and transparency of glass, and workability, make it ideal for fabricating into special shapes.

Such apparatus may be adapted from existing standard pipe and fittings (tubulated or perforated straight lengths, for instance); custom fabricated by modifying existing glass-form equipment (receiver vessels, separation units, etc.); and minor adapting of stock laboratory or industrial glass pipe (boiling flasks; distillation apparatus; offset columns, etc.).

Typical apparatus adapted for special uses are illustrated below.

Owens-Illinois and KIMAX Glass Pipe distributors will assist you in the development of specially fabricated glass apparatus for your particular requirements.

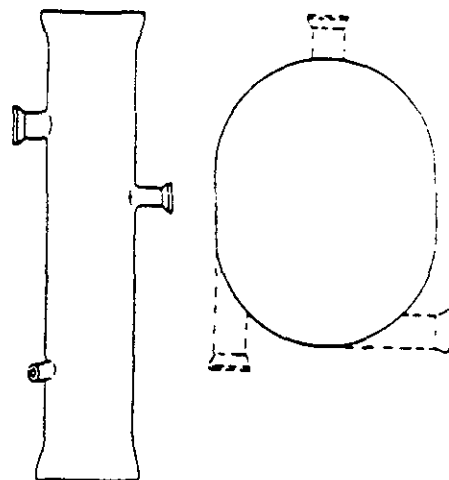


Figure 11

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

In long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

**MAXIMUM RECOMMENDED SPAN-FEET**

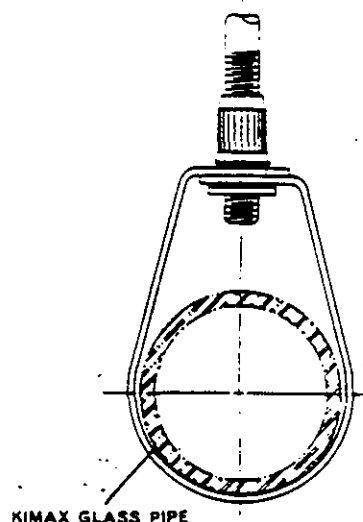
| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | -                                |
| 1 1/2"    | 9             | 9                              | -                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 6"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, hanger clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.

**Pipe Hanger**



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe support for proper alignment.

# INSTALLATION

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

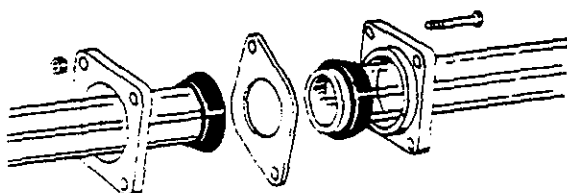
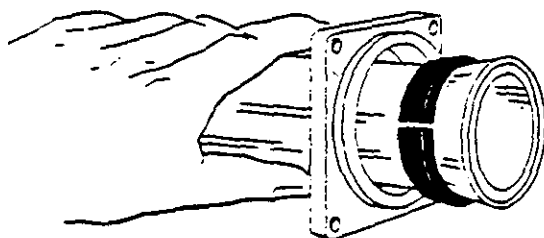
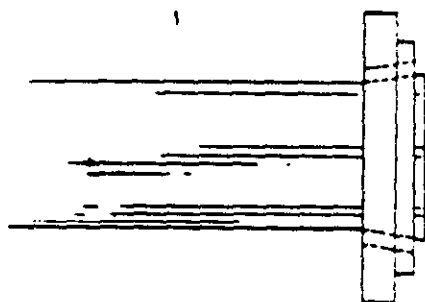


Figure 13.

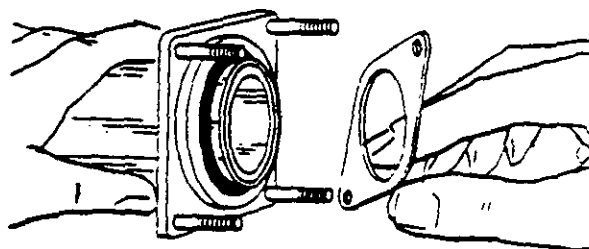
## Steps for Joint Assembly



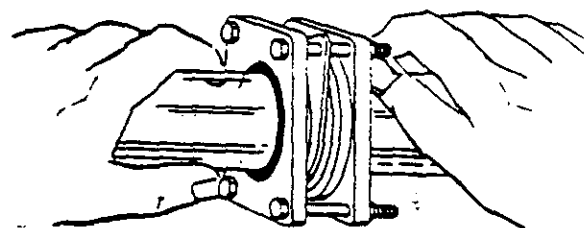
Step 1. Place the metal flange—small opening first—and the insert over the flared end of the pipe before the pipe is hung. For 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on bolt. Keep gaskets dry to avoid gaskets slipping out between flange under line pressure.



Step 4. Align gasket opening precisely with pipe opening to avoid obstructions to line flow (especially important in mill and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB.-FT.

| Pipe Size | Regular Gasket | Solid T F E Gasket |
|-----------|----------------|--------------------|
| 1"        | 2              | 2-3                |
| 1 1/2"    | 3-3.5          | 3-4                |
| 2"        | 3-4            | 4-5                |
| 3"        | 3-4            | 4-5                |
| 4"        | 3-4            | 5-7                |
| 6"        | 5-6            | 7-10               |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

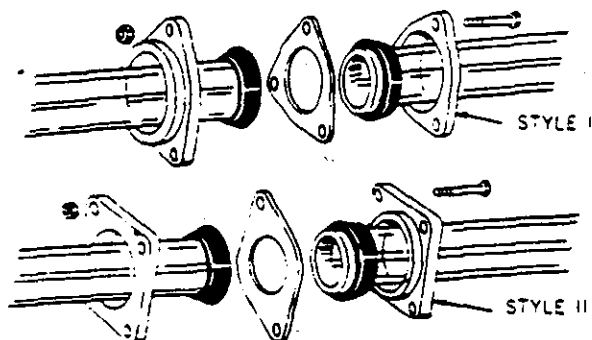
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

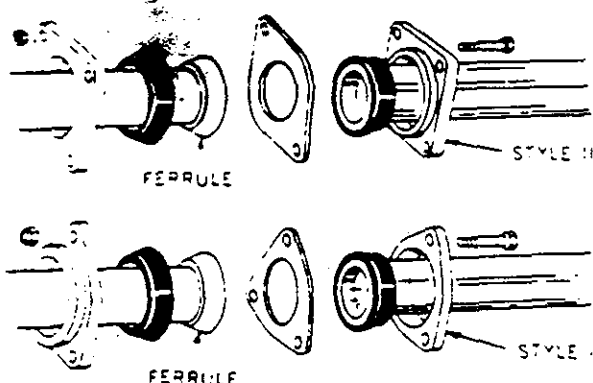
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe, and Style I flange and standard insert on flanged pipe.

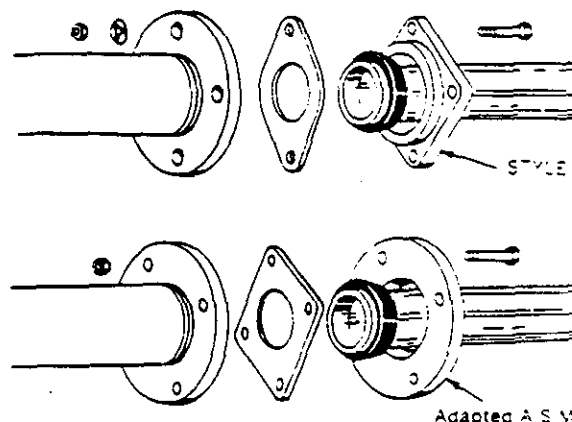
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges by sweating or brazing a stainless steel ferrule at each end.



### Glass to A.S.M.E., Flange

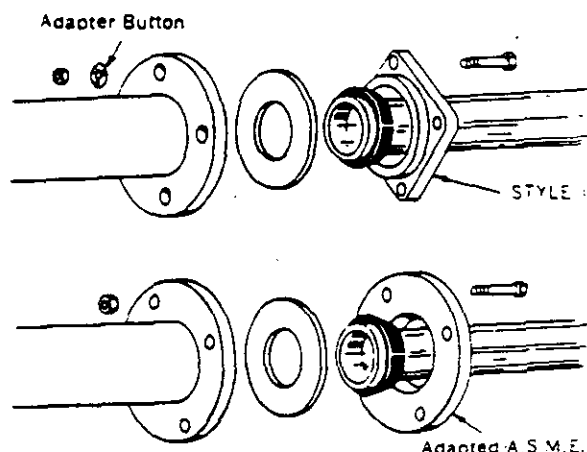
Glass can be mated to A.S.M.E. flanges by means of a Style I cast iron flange (all sizes have A.S.M.E. Bolt Circles); an adapted A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters only); or a 4" or 6" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in large A.S.M.E. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1", 2", and 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A T F E covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined T F E envelope.

# INSTALLATION

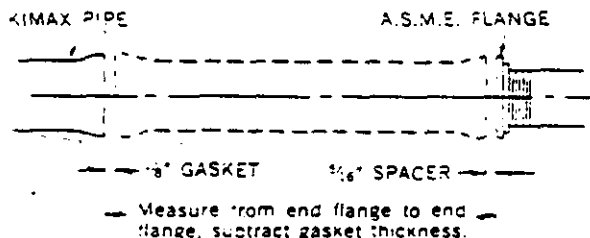
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. **Spacers.** Standard straight and 5° beveled spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 5" diameters, available in 1/2" to 2" lengths.

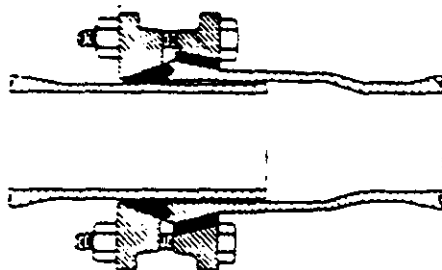
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Adjustable Joints.** Permit linear variations up to 2 1/4". Also used to correct misalignment.



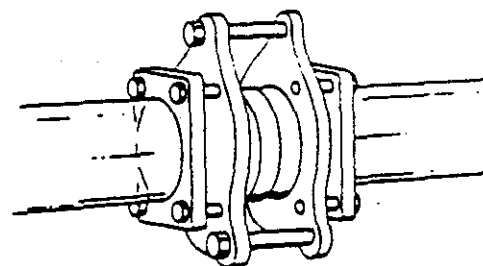
Long cut section of straight pipe may be used for inner glass sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTING section.

4. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. **Field Fabrication**—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) on beaded ends to mate with Style I or Style II flange with standard insert on flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

6. **Adjust Equipment.** It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment devices.

# TESTING AND MAINTENANCE

## Initial Tests

After installation is completed, but before the line is filled inspect for stress points as follows:

- **Shake the line.** If the line moves from side to side, it is probably free from bending loads.
- **Open a flanged joint.** If the flange does not move when bolts are removed, the pipe is not restrained.

## Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic system as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

## Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. **Inadequate bolt tightening:** Do not hesitate to "snug" bolts sufficiently.
2. **Misalignment:** Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. **Temperature cycling:** Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

## Cleaning

Purge lines with water, cleaning liquids, or steam with care. open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.

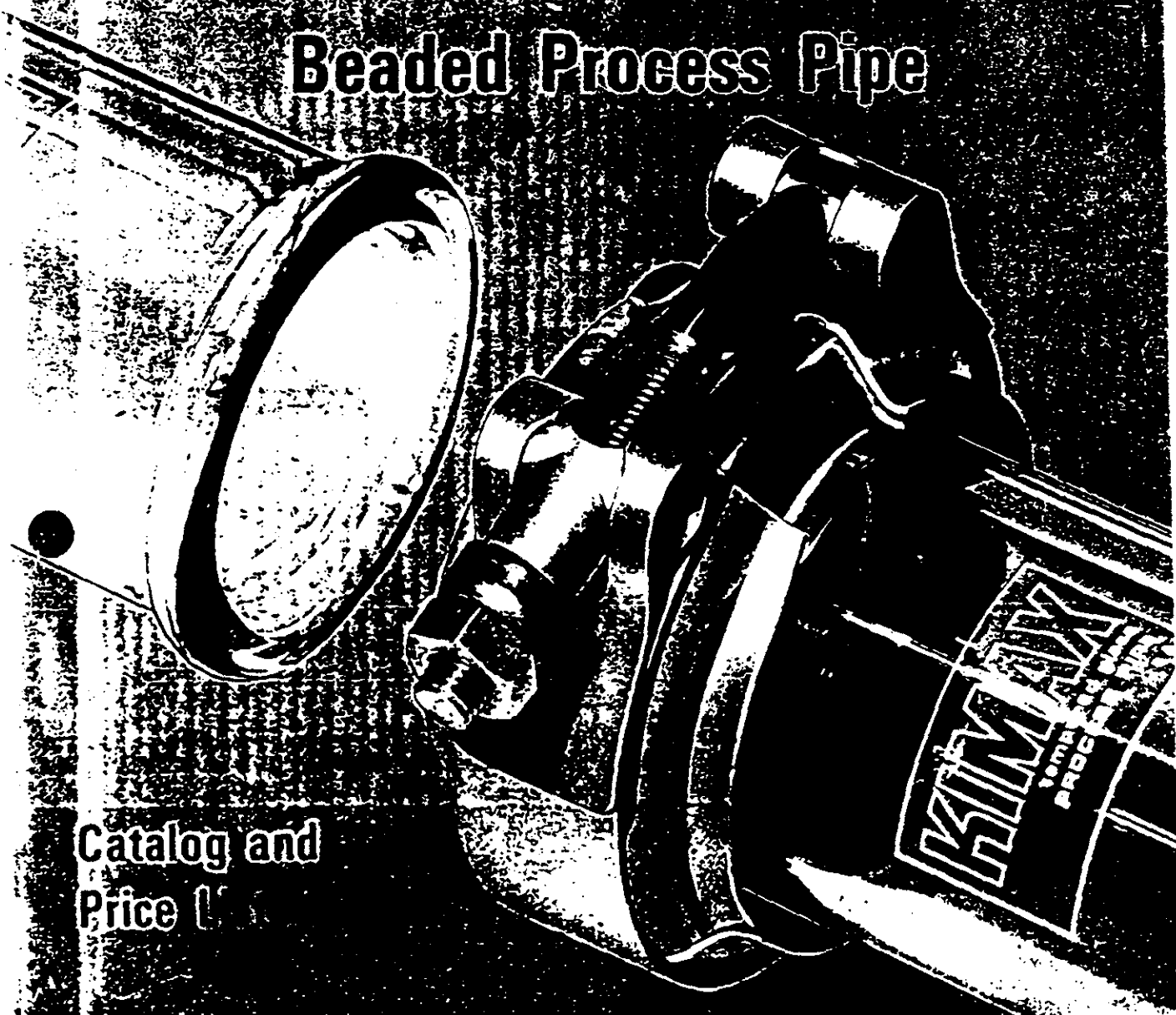
## SPECIAL ENGINEERING NOTES



# KIMAX

GPD-1054  
July 1971

## Beaded Process Pipe



Catalog and  
Price List

## Fluid Process Systems

OWENS ILLINOIS

Made in U.S.A. 

# KIMAX BEADED PROCESS PIPE

Recommended for chemical, pharmaceutical, textile, food, and other processing where highly corrosive, and high purity products are conveyed.

## 1. Unequaled — Corrosion resistance —

can handle the widest range of corrosives and reagents.

All pipe and fittings are made of the same chemically inert Owens-Illinois (KG-33) borosilicate glass used in the manufacture of KIMAX glass laboratory ware and KIMAX glass drainline. Compression couplings seal glass to TFE gaskets in a manner that the flow comes in contact only with glass or TEFLON.

## 2. 450° F. to freezing point temperature capability.

7123 couplings with VITON liners and TFE seals offer continuous service from 450°F. to freezing point.

7126 couplings with HYDRIN liners and TFE seals offer continuous service from 300°F. to freezing point.

## 3. 100 to 30 PSI operating pressure — depending on pipe I.D. See page 3.

## 4. Stainless steel couplings (300 series SS) — all glass beaded joints are made with single bolt, stainless steel band couplings, containing a VITON or HYDRIN compression liner and TFE seal for maximum external and internal corrosion resistance.

## 5. Built-in ruggedness —

beaded pipe and fittings are manufactured from heavy schedule tubing, and tempered for extra strength.

## 6. Easy and low cost to install.

Joints are made in seconds with one bolt, snap couplings which seal even with line deflections and misalignment up to 4°.

Pipe can be easily and quickly field cut and beaded where required without effecting pressure rating.

## 7. Safety — added

Translucent glass fiber cloth impregnated with epoxy resin provides that extra protection against accidental rupture. See page 4 for details.

## 8. Assured Purity —

All beaded pipe and fittings are chemically inert borosilicate glass or TFE. Parts per million pick up for distilled water:  $\text{SiO}_2$  (less than .08 ppm), Boron (less than .01 ppm), Na (less than .01 ppm).

## 9. System Versatility —

Adaptable to other piping systems; can easily be disassembled and reassembled to meet future requirements.

## 10. Maintenance Free —

Smooth inner walls prevent scale build-up and line stoppages.

## 11. Service —

National network of stocking distributors; field engineering staff for start up service.

## GUIDE SPECIFICATIONS

### I. General

- Contractor shall furnish and install a complete piping system as indicated. This system shall be made of borosilicate glass (Type I), conforming to Federal Specification DD-G-541B and as manufactured by Owens-Illinois under the trade name "KIMAX."
- This system shall include all glass piping and fittings in size  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1, 1 $\frac{1}{2}$ , 2, 3, 4 and 6" O.D. as shown on the drawing along with the required couplings and padded supports.
- Coupling device shall be capable of maintaining a Teflon-to-glass seal with line deflections of at least  $\frac{1}{4}$ " per foot of pipe length.
- The entire piping system shall be capable of withstanding working pressures as listed in GPD-1054 R.

### II. Installation

- The system shall be installed free of stress according to the manufacturer's recommended installation procedures.
- Padded pipe hangers shall be used on horizontal runs every 8 to 10 feet of pipe length, or more frequently when good piping practices indicate. The hanger should be located adjacent to a coupling wherever possible.
- Padded riser clamps shall be used to support vertical risers. Locate riser clamps at each floor or at center distance not to exceed 12'.
- Connection to valves and faucets shall be made with KIMAX adapters or according to recommendation by Owens-Illinois.
- All valves, meters, pumps, faucets, and other heavy equipment must be supported independently.
- To keep contamination to a minimum, all pipe, fittings and couplings should remain in their sealed cartons until just prior to their use.
- After installation, all remaining openings shall be sealed close to avoid contamination of the line.

### III. Protection of Pipe

- All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum of 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with Fiberglass, glass wool and/or with a non-hardening caulking material.
- Glass Pipe shall not be installed in direct contact with concrete or metal.
- Glass pipe shall be protected against all weld splatter.

### IV. Test\*

Test in accordance with manufacturer's recommendations. See Testing and Cleaning in GPD-1054 R.

\*Compressed air test method not recommended... consult manufacturer.

KIMAX—Registered trademark of Owens-Illinois.  
TEFLON—Registered trademark of E. I. DuPont.

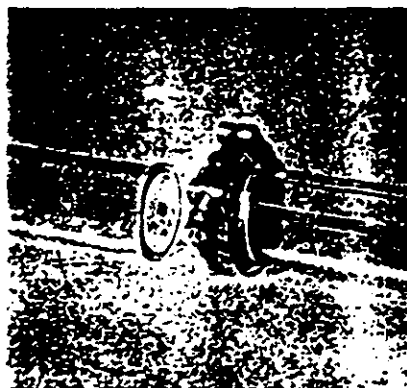
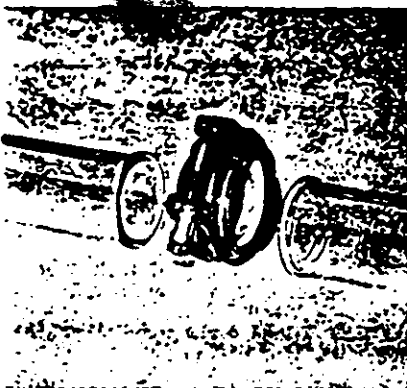
# PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPING SYSTEMS

| SYSTEM                              | KIMAX BEADED<br>PROCESS PIPE<br>1/2" thru 6"               | KIMAX CONICAL END<br>PROCESS PIPE<br>1" thru 6"           | KIMAX DRAINLINE<br>1/2" thru 6"                      |
|-------------------------------------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|
| <b>PHYSICAL PROPERTIES:</b>         |                                                            |                                                           |                                                      |
| Working Pressure                    | 1/2"-3": 100 PSI<br>4": 75 PSI<br>5": 50 PSI<br>6": 30 PSI | 1/2"-3": 50 PSI<br>4": 35 PSI<br>5": 20 PSI<br>6": 10 PSI | Gravity Flow                                         |
| Test Pressure                       | 1 1/2 Times Working Pressure                               | 1 1/2 Times Working Pressure                              | 20 PSI                                               |
| Operating Temperature (Maximum)     | Freezing Point to 450° F or 300° F                         | Freezing Point to 450° F                                  | Freezing Point or Waste to 212° F                    |
| Glass Therm. Expansion              | $32 \times 10^{-7}$                                        | $32 \times 10^{-7}$                                       | $32 \times 10^{-7}$                                  |
| Glass Therm. Conductivity           | 0.73 BTU/hr. (Ft. <sup>2</sup> F)/Ft. at 212° F            | 0.73 BTU/hr. (Ft. <sup>2</sup> F)/Ft. at 212° F           | 0.73 BTU/hr. (Ft. <sup>2</sup> F)/Ft. at 212° F      |
| Glass Therm. Shock Diff.            | 1"-3": 200° F<br>4": 175° F<br>5": 160° F                  | 1"-3": 200° F<br>4": 175° F<br>5": 160° F                 | 1"-3": 200° F<br>4": 175° F<br>5": 160° F            |
| Vacuum                              | Full                                                       | Full                                                      | Full                                                 |
| <b>CHEMICAL PROPERTIES:</b>         |                                                            |                                                           |                                                      |
| Resistant to Acids                  | All Except Hydrofluoric or Phosphoric with Fluorides       | All Except Hydrofluoric or Phosphoric with Fluorides      | All Except Hydrofluoric or Phosphoric with Fluorides |
| Resistant to Alkalies               | Some attack above 100° F                                   | Some attack above 120° F                                  | Some attack above 120° F                             |
| Joining Outer Band                  | 1 bolt stainless steel 1/2"-6"                             | Style I, II and ASA Flange                                | Bolted stainless steel                               |
| Joining Compression Outer Seal Ring | Hydric TFE Seal 300° F<br>Viton TFE Seal 450° F            | Customer Selection                                        | Buna-N/TFE Seal                                      |
| <b>SYSTEM IDENTIFICATION</b>        |                                                            |                                                           |                                                      |
|                                     | KIMAX<br>Yellow Label                                      | KIMAX<br>Yellow Label                                     | KIMAX<br>Green Label                                 |

Kimax has pressure recommendations. It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when Kimax pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## MAKING JOINTS WITH KIMAX PROCESS PIPE COUPLING

1. Dip coupling in water or wipe beaded ends of glass with damp cloth.
2. Snap coupling over one end of pipe making certain TFE liner is behind bead. Then stab other section of pipe into opposite side of coupling.
3. Tighten coupling bolt with 6" ratchet wrench until the gap between segments is approximately 1/16".

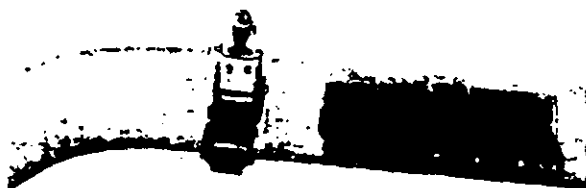


# KIMAX ARMORED BEADED GLASS PROCESS PIPE

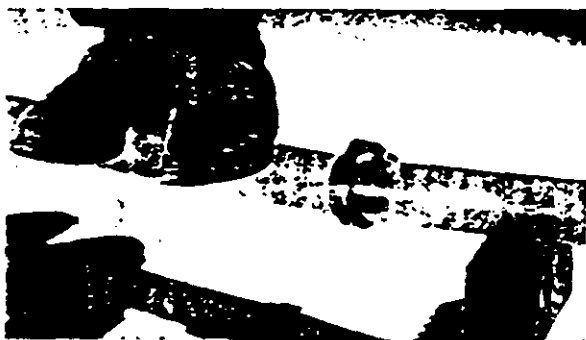
For transportation of valuable or corrosive fluids where accidental rupture ~~may~~ expose personnel and facilities to injury, damage or loss of product.

## ADVANTAGES

- 1. Armoring contains fluids — allows orderly shutdown. See chemical resistance below.
- 2. Keeps glass intact for safe removal from system.
- 3. Retains basic advantage of a KIMAX Glass Pipe System.
- 4. Translucency allows detection of stoppages or damage.
- 5. Pipe can be field cut, beaded, and re-armored.
- 6. Economical one-bolt pressure-rated coupling permits easy installation, removal, and modification of systems.



Translucency allows detection of stoppages or damage.



May be field cut and beaded up to 4° deflection or more.



Easy-to-use one-bolt couplings make field installation or removal simple.

## ARMORING CHEMICAL RESISTANCE

3-month direct exposure samples checked daily

|                             |                   |
|-----------------------------|-------------------|
| 1. H <sub>2</sub> O         | No effect         |
| 2. N-Amyl Alcohol           | No effect         |
| 3. Methyl Alcohol           | No effect         |
| 4. Ammonium Hydroxide       | Attached — 3 days |
| 5. Sodium Hydroxide         | Attached — 1 week |
| 6. N-Octane                 | No effect         |
| 7. Benzene                  | No effect         |
| 8. Toluene                  | No effect         |
| 9. JP-4 Fuel                | No effect         |
| 10. Acetone                 | Attack — 3 days   |
| 11. Methyl Ethyl Ketone     | Attack — 3 days   |
| 12. Hydrogen Peroxide       | No effect         |
| 13. N-Butyric Acid (100%)   | No effect         |
| 14. Nitric Acid (70%)       | Attack — 4 hours  |
| 15. Hydrochloric Acid (38%) | Attack — 2 weeks  |
| 16. Sulfuric Acid (98%)     | Attack — 1 hour   |
| 17. Acetic Acid (100%)      | Attack — 3 days   |
| 18. Phosphoric Acid         | Attack — 2 months |
| 19. Nitrobenzene            | Attack — 2 weeks  |
| 20. Benzaldehyde            | Attack — 3 days   |
| 21. Carbon Disulfide        | No effect         |
| 22. Carbon Tetrachloride    | No effect         |
| 23. Chloroform              | Attack — 3 days   |
| 24. Methylene Chloride      | Attack — 3 days   |

## PHYSICAL PROPERTIES

Armoring — "3M" Brand "SUNSE" Material

- 1. Color — translucent (light green tint)
- 2. Glass fiber cloth impregnated with polyester resin. Non-toxic and contact not harmful.
- 3. Can endure 3,000 ft./lb. impact without catastrophic failure.
- 4. Coverage — double wrap, total thickness .002.
- 5. Cured Properties — Environmental
  - a. Temperature Capability
    - 300°F continuous, 350°F intermittent operation
  - b. Weathering Resistance
    - 1. Weather-O-Meter 2500 hours. No adverse effects.
    - 2. Outdoor Aging (Minnesota-Florida-Colorado). No adverse effects — 2 years.
    - 3. Not adversely affected by sunlight.
  - c. Salt Spray: 20% salt spray, 95°F, 1000 hours — No adverse effects.
  - d. UV Exposure (Ford S-1 Oven) 160°F, 3 months. Slight yellowing.
  - e. Extended Cold Aging (—28°F). No adverse effects. No loss of adhesion upon shock test.

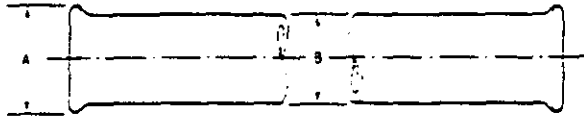
### 6. Heat Resistance

| Time-Minutes | Temperature | Change in Sample             |
|--------------|-------------|------------------------------|
| 10           | 300°F       | No change                    |
| 10           | 400°F       | Discoloration                |
| 10           | 520°F       | Discoloration — some smolder |

CONTACT YOUR NEAREST KIMAX REPRESENTATIVE FOR ADDITIONAL INFORMATION AND PRICES.

# PROCESS PIPE AND FITTINGS

## 6300 BEADED PIPE



All pipe is available from stock in lengths shown.

### SPECIAL LENGTHS:

KIMAX Beaded Process Pipe is designed for "on the job" cutting and beading. Pipe is easily cut and beaded with a KIMAX 7310-56802 or 7310-56803 Portable cutter and 7310-56801 Beading Kit.

Your KIMAX distributor or manufacturer will also provide special lengths at a slightly higher cost per foot.

### NOTE:

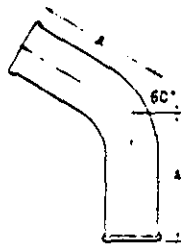
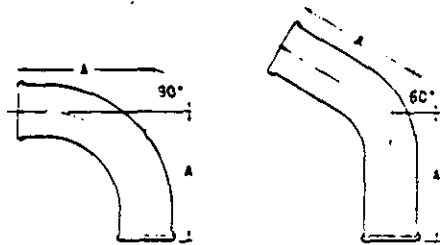
Field fabrication does not reduce pressure or temperature capability.

KIMAX Armored pipe can also be field fabricated.

| 1" I.D. |            |         | 1 1/2" I.D. |            |         | 2" I.D. |            |         | 2 1/2" I.D. |            |         | 3" I.D. |            |         | 4" I.D. |            |         | 6" I.D. |            |         |
|---------|------------|---------|-------------|------------|---------|---------|------------|---------|-------------|------------|---------|---------|------------|---------|---------|------------|---------|---------|------------|---------|
| Length  | Article    | Price   | Length      | Article    | Price   | Length  | Article    | Price   | Length      | Article    | Price   | Length  | Article    | Price   | Length  | Article    | Price   | Length  | Article    | Price   |
| 12"     | 6300-10003 | \$ 3.40 | 12"         | 6300-15003 | \$ 3.40 | 12"     | 6300-20003 | \$ 3.40 | 12"         | 6300-25003 | \$ 3.40 | 12"     | 6300-30003 | \$ 3.40 | 12"     | 6300-40003 | \$ 3.40 | 12"     | 6300-60003 | \$ 3.40 |
| 14"     | 6300-10004 | 3.40    | 14"         | 6300-15004 | 3.40    | 14"     | 6300-20004 | 3.40    | 14"         | 6300-25004 | 3.40    | 14"     | 6300-30004 | 3.40    | 14"     | 6300-40004 | 3.40    | 14"     | 6300-60004 | 3.40    |
| 16"     | 6300-10006 | 3.40    | 16"         | 6300-15006 | 3.40    | 16"     | 6300-20006 | 3.40    | 16"         | 6300-25006 | 3.40    | 16"     | 6300-30006 | 3.40    | 16"     | 6300-40006 | 3.40    | 16"     | 6300-60006 | 3.40    |
| 18"     | 6300-10010 | 3.40    | 18"         | 6300-15010 | 3.40    | 18"     | 6300-20010 | 3.40    | 18"         | 6300-25010 | 3.40    | 18"     | 6300-30010 | 3.40    | 18"     | 6300-40010 | 3.40    | 18"     | 6300-60010 | 3.40    |
| 20"     | 6300-10018 | 3.45    | 20"         | 6300-15018 | 3.45    | 20"     | 6300-20018 | 3.45    | 20"         | 6300-25018 | 3.45    | 20"     | 6300-30018 | 3.45    | 20"     | 6300-40018 | 3.45    | 20"     | 6300-60018 | 3.45    |
| 24"     | 6300-10024 | 3.45    | 24"         | 6300-15024 | 3.45    | 24"     | 6300-20024 | 3.45    | 24"         | 6300-25024 | 3.45    | 24"     | 6300-30024 | 3.45    | 24"     | 6300-40024 | 3.45    | 24"     | 6300-60024 | 3.45    |
| 30"     | 6300-10030 | 3.50    | 30"         | 6300-15030 | 3.50    | 30"     | 6300-20030 | 3.50    | 30"         | 6300-25030 | 3.50    | 30"     | 6300-30030 | 3.50    | 30"     | 6300-40030 | 3.50    | 30"     | 6300-60030 | 3.50    |
| 36"     | 6300-10036 | 3.50    | 36"         | 6300-15036 | 3.50    | 36"     | 6300-20036 | 3.50    | 36"         | 6300-25036 | 3.50    | 36"     | 6300-30036 | 3.50    | 36"     | 6300-40036 | 3.50    | 36"     | 6300-60036 | 3.50    |
| 48"     | 6300-10048 | 3.55    | 48"         | 6300-15048 | 3.55    | 48"     | 6300-20048 | 3.55    | 48"         | 6300-25048 | 3.55    | 48"     | 6300-30048 | 3.55    | 48"     | 6300-40048 | 3.55    | 48"     | 6300-60048 | 3.55    |
| 60"     | 6300-10060 | 3.55    | 60"         | 6300-15060 | 3.55    | 60"     | 6300-20060 | 3.55    | 60"         | 6300-25060 | 3.55    | 60"     | 6300-30060 | 3.55    | 60"     | 6300-40060 | 3.55    | 60"     | 6300-60060 | 3.55    |
| 72"     | 6300-10072 | 3.55    | 72"         | 6300-15072 | 3.55    | 72"     | 6300-20072 | 3.55    | 72"         | 6300-25072 | 3.55    | 72"     | 6300-30072 | 3.55    | 72"     | 6300-40072 | 3.55    | 72"     | 6300-60072 | 3.55    |
| 84"     | 6300-10084 | 3.55    | 84"         | 6300-15084 | 3.55    | 84"     | 6300-20084 | 3.55    | 84"         | 6300-25084 | 3.55    | 84"     | 6300-30084 | 3.55    | 84"     | 6300-40084 | 3.55    | 84"     | 6300-60084 | 3.55    |
| 96"     | 6300-10096 | 3.55    | 96"         | 6300-15096 | 3.55    | 96"     | 6300-20096 | 3.55    | 96"         | 6300-25096 | 3.55    | 96"     | 6300-30096 | 3.55    | 96"     | 6300-40096 | 3.55    | 96"     | 6300-60096 | 3.55    |
| 108"    | 6300-10108 | 3.55    | 108"        | 6300-15108 | 3.55    | 108"    | 6300-20108 | 3.55    | 108"        | 6300-25108 | 3.55    | 108"    | 6300-30108 | 3.55    | 108"    | 6300-40108 | 3.55    | 108"    | 6300-60108 | 3.55    |
| 120"    | 6300-10120 | 3.55    | 120"        | 6300-15120 | 3.55    | 120"    | 6300-20120 | 3.55    | 120"        | 6300-25120 | 3.55    | 120"    | 6300-30120 | 3.55    | 120"    | 6300-40120 | 3.55    | 120"    | 6300-60120 | 3.55    |

# PROCESS PIPE AND FITTINGS

## 6301 SWEEP ELBOW



90°

45°

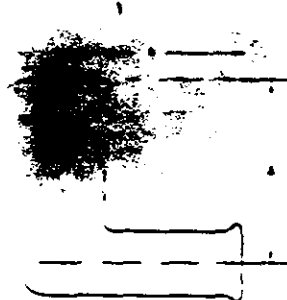
| Size       | A"    | Article   | Price   | Size       | A"    | Article   | Price   |
|------------|-------|-----------|---------|------------|-------|-----------|---------|
| 1/2" 90°   | 2 1/4 | 6301-4890 | \$ 4.20 | 1/2" 45°   | 2 1/4 | 6301-4845 | \$ 4.20 |
| 3/4" 90°   | 2 1/2 | 6290      | 4.30    | 1" 45°     | 2 1/2 | 6345      | 4.20    |
| 1" 90°     | 2 3/4 | 1090      | 7.15    | 1 1/2" 45° | 2 3/4 | 1045      | 7.15    |
| 1 1/2" 90° | 3     | 1590      | 7.50    | 2" 45°     | 3     | 1545      | 7.50    |
| 2" 90°     | 4     | 2090      | 9.65    | 2 1/2" 45° | 4     | 2045      | 9.65    |
| 2 1/2" 90° | 5     | 3090      | 15.65   | 3" 45°     | 5     | 3045      | 15.65   |
| 3" 90°     | 6     | 4090      | 20.65   | 4" 45°     | 6     | 4045      | 20.65   |
| 4" 90°     | 8     | 5090      | 50.00   | 5" 45°     | 8     | 5045      | 50.00   |

60°

22 1/2°

| Size       | A"    | Article   | Price   | Size           | A"    | Article   | Price   |
|------------|-------|-----------|---------|----------------|-------|-----------|---------|
| 1/2" 60°   | 2 1/4 | 6301-4860 | \$ 4.20 | 1/2" 22 1/2°   | 2 1/4 | 6301-4822 | \$ 4.20 |
| 3/4" 60°   | 2 1/2 | 6260      | 4.30    | 1" 22 1/2°     | 2 1/2 | 6322      | 4.20    |
| 1" 60°     | 2 3/4 | 1060      | 7.15    | 1 1/2" 22 1/2° | 2 3/4 | 1022      | 7.15    |
| 1 1/2" 60° | 3     | 1560      | 7.50    | 2" 22 1/2°     | 3     | 1522      | 7.50    |
| 2" 60°     | 4     | 2060      | 9.65    | 2 1/2" 22 1/2° | 4     | 2022      | 9.65    |
| 2 1/2" 60° | 5     | 3060      | 15.65   | 3" 22 1/2°     | 5     | 3022      | 15.65   |
| 3" 60°     | 6     | 4060      | 20.65   | 4" 22 1/2°     | 6     | 4022      | 20.65   |
| 4" 60°     | 8     | 5060      | 50.00   | 5" 22 1/2°     | 8     | 5022      | 50.00   |

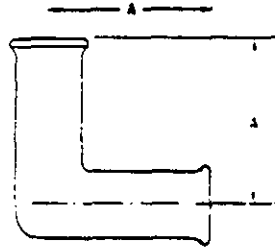
## 6302 REDUCER ELBOW



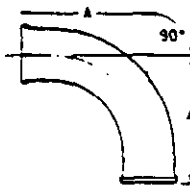
| Size            | A"    | B"    | Article   | Price   |
|-----------------|-------|-------|-----------|---------|
| 1/2" x 1/2"     | 2 1/4 | 2 1/4 | 6302-5845 | \$ 4.20 |
| 3/4" x 3/4"     | 2 1/2 | 2 1/2 | 1045      | 4.30    |
| 1" x 1"         | 2 3/4 | 2 3/4 | 1165      | 7.15    |
| 1 1/2" x 1 1/2" | 3     | 3     | 1545      | 7.50    |
| 2" x 2"         | 4     | 4     | 1565      | 7.50    |
| 2 1/2" x 2 1/2" | 5     | 5     | 1510      | 10.00   |
| 3" x 3"         | 6     | 6     | 2045      | 13.80   |
| 3 1/2" x 3 1/2" | 7     | 7     | 2065      | 13.80   |
| 4" x 4"         | 8     | 8     | 2010      | 13.80   |
| 4 1/2" x 4 1/2" | 9     | 9     | 2015      | 13.80   |
| 5" x 5"         | 10    | 10    | 3010      | 21.65   |
| 5 1/2" x 5 1/2" | 11    | 11    | 3015      | 21.65   |
| 6" x 6"         | 12    | 12    | 3020      | 21.65   |
| 6 1/2" x 6 1/2" | 13    | 13    | 4010      | 20.90   |
| 7" x 7"         | 14    | 14    | 4015      | 20.90   |
| 8" x 8"         | 15    | 15    | 4020      | 20.90   |
| 9" x 9"         | 16    | 16    | 4030      | 20.90   |
| 10" x 10"       | 17    | 17    | 5015      | 53.70   |
| 12" x 12"       | 19    | 19    | 6020      | 53.70   |
| 14" x 14"       | 21    | 21    | 6030      | 53.70   |
| 16" x 16"       | 23    | 23    | 6040      | 53.70   |

# PROCESS PIPE AND FITTINGS

## 6303 90° MITERED ELBOW



## 6304 90° SHORT RADIUS ELBOW



### 6303

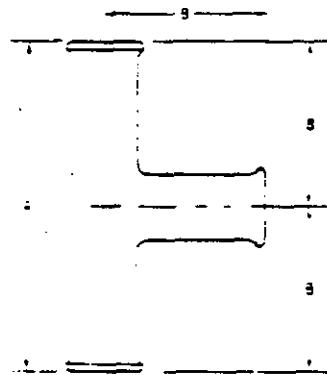
| Size       | A"    | Article   | Price   |
|------------|-------|-----------|---------|
| 1 1/2" 90° | 3 1/2 | 6303-1590 | \$10.50 |
| 2" 90°     | 4     | 2090      | 12.50   |
| 3" 90°     | 5     | 3090      | 15.55   |
| 4" 90°     | 7     | 4090      | 20.50   |
| 5" 90°     | 9     | 5090      | 28.70   |

### 6304

| Size       | A"    | Article   |
|------------|-------|-----------|
| 1 1/2" 90° | 2 1/2 | 6304-1590 |
| 2" 90°     | 3     | 2081      |
| 3" 90°     | 4     | 3081      |
| 4" 90°     | 5     | 4081      |

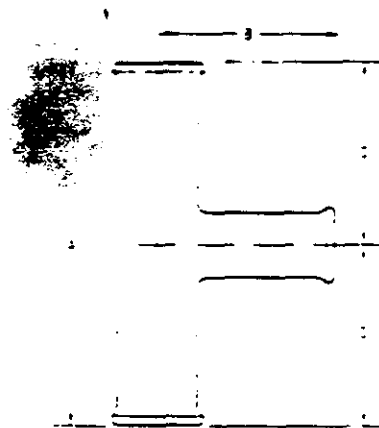
Interchangeable with 6310-TEE

## 6310 STRAIGHT T



| Size   | A"    | B"    | Article   | Price   |
|--------|-------|-------|-----------|---------|
| 1 1/2" | 4 1/2 | 2 1/2 | 6310-4848 | \$ 4.50 |
| 2"     | 5     | 2 1/2 | 5868      | 5.50    |
| 3"     | 6 1/2 | 3 1/2 | 1010      | 8.70    |
| 4"     | 7     | 3 1/2 | 1515      | 12.50   |
| 5"     | 8     | 4     | 2020      | 15.50   |
| 6"     | 10    | 5     | 3030      | 21.00   |
| 8"     | 14    | 7     | 4040      | 30.75   |
| 10"    | 18    | 9     | 5050      | 40.00   |

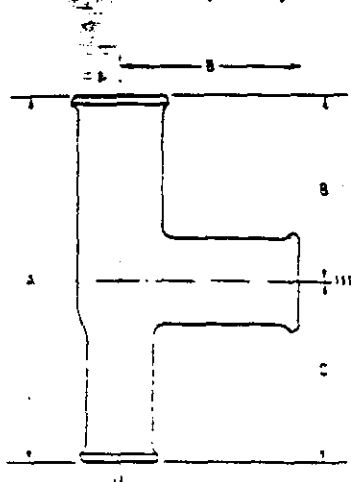
## 6311 REDUCING T (BRANCH)



| Size Run x Branch | A     | B"    | C"    | Article   | Price   |
|-------------------|-------|-------|-------|-----------|---------|
| 1 1/2" x 1 1/2"   | 5     | 2 1/2 | 2 1/2 | 6311-5848 | \$ 7.50 |
| 2" x 1 1/2"       | 5 1/2 | 2 1/2 | 2 1/2 | 1048      | 8.50    |
| 3" x 1 1/2"       | 6 1/2 | 2 1/2 | 2 1/2 | 1068      | 9.50    |
| 4" x 1 1/2"       | 7     | 3     | 3 1/2 | 1548      | 12.50   |
| 5" x 1 1/2"       | 7     | 3     | 3 1/2 | 1558      | 12.50   |
| 6" x 1 1/2"       | 7     | 3     | 3 1/2 | 1510      | 12.50   |
| 2" x 1"           | 3     | 3     | 4     | 2048      | 15.00   |
| 3" x 1"           | 3     | 3     | 4     | 2053      | 15.00   |
| 4" x 1"           | 5     | 3     | 4     | 2010      | 15.00   |
| 5" x 1"           | 5     | 3 1/2 | 4     | 2015      | 15.00   |
| 6" x 1"           | 10    | 3 1/2 | 5     | 3010      | 20.00   |
| 8" x 1"           | 10    | 4     | 5     | 3015      | 20.00   |
| 10" x 1"          | 10    | 4 1/2 | 5     | 3020      | 20.00   |
| 4" x 3/4"         | 14    | 4     | 7     | 4010      | 30.75   |
| 6" x 3/4"         | 14    | 4 1/2 | 7     | 4015      | 30.75   |
| 8" x 3/4"         | 14    | 5     | 7     | 4020      | 30.75   |
| 10" x 3/4"        | 14    | 5 1/2 | 7     | 4030      | 30.75   |
| 6" x 1 1/4"       | 18    | 5 1/2 | 9     | 5015      | 40.00   |
| 8" x 1 1/4"       | 13    | 6     | 9     | 5020      | 40.00   |
| 10" x 1 1/4"      | 12    | 6 1/2 | 9     | 5030      | 40.00   |
| 6" x 4"           | 12    | 8     | 3     | 6040      | 50.00   |

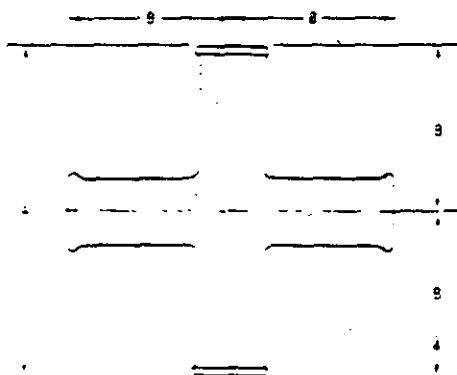
# PROCESS PIPE AND FITTINGS

## 6312 REDUCING T (RUN)



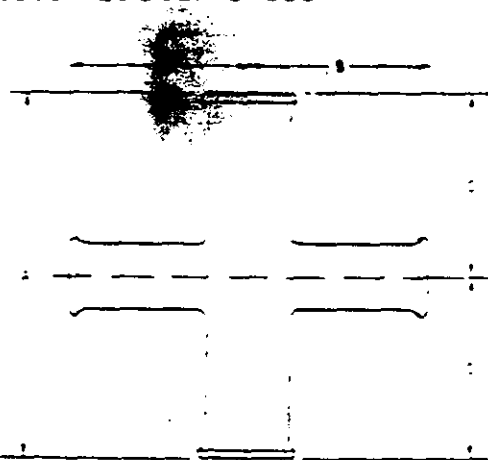
| Size   |        |          | A"    | B"    | C"    | Article   | Price   |
|--------|--------|----------|-------|-------|-------|-----------|---------|
| I      | II     | III      |       |       |       |           |         |
| 1/2"   | x 1/2" | x 1/2"   | 5     | 2 1/2 | 3 1/2 | 6312 5348 | \$ 1.30 |
| 1"     | x 1/2" | x 1"     | 5 1/2 | 2 1/2 | 2 1/2 | 6312 5349 | 1.50    |
| 1"     | x 1/2" | x 1"     | 5 1/2 | 2 1/2 | 2 1/2 | 6312 5350 | 1.50    |
| 1 1/2" | x 1/2" | x 1 1/2" | 6 1/2 | 2 1/2 | 2 1/2 | 6312 5351 | 1.50    |
| 1 1/2" | x 1/2" | x 1 1/2" | 6 1/2 | 2 1/2 | 2 1/2 | 6312 5352 | 1.50    |
| 1 1/2" | x 1"   | x 1 1/2" | 6 1/2 | 3 1/4 | 2 1/2 | 6312 5353 | 1.50    |
| 2"     | x 1/2" | x 2"     | 7     | 4     | 2 1/2 | 6312 5354 | 1.50    |
| 2"     | x 1/2" | x 2"     | 7     | 4     | 2 1/2 | 6312 5355 | 1.50    |
| 2"     | x 1"   | x 2"     | 7     | 4     | 2 1/2 | 6312 5356 | 1.50    |
| 2 1/2" | x 1/2" | x 2 1/2" | 7 1/2 | 4     | 2 1/2 | 6312 5357 | 1.50    |
| 2 1/2" | x 1/2" | x 2 1/2" | 7 1/2 | 4     | 2 1/2 | 6312 5358 | 1.50    |
| 2 1/2" | x 1"   | x 2 1/2" | 7 1/2 | 4     | 2 1/2 | 6312 5359 | 1.50    |
| 3"     | x 1/2" | x 3"     | 8     | 5     | 2 1/2 | 6312 5360 | 1.50    |
| 3"     | x 1/2" | x 3"     | 8     | 5     | 2 1/2 | 6312 5361 | 1.50    |
| 3"     | x 1"   | x 3"     | 8     | 5     | 2 1/2 | 6312 5362 | 1.50    |
| 3 1/2" | x 1/2" | x 3 1/2" | 9     | 6     | 2 1/2 | 6312 5363 | 1.50    |
| 3 1/2" | x 1/2" | x 3 1/2" | 9     | 6     | 2 1/2 | 6312 5364 | 1.50    |
| 3 1/2" | x 1"   | x 3 1/2" | 9     | 6     | 2 1/2 | 6312 5365 | 1.50    |
| 4"     | x 1/2" | x 4"     | 10    | 7     | 2 1/2 | 6312 5366 | 1.50    |
| 4"     | x 1/2" | x 4"     | 10    | 7     | 2 1/2 | 6312 5367 | 1.50    |
| 4"     | x 1"   | x 4"     | 10    | 7     | 2 1/2 | 6312 5368 | 1.50    |
| 4 1/2" | x 1/2" | x 4 1/2" | 11    | 8     | 2 1/2 | 6312 5369 | 1.50    |
| 4 1/2" | x 1/2" | x 4 1/2" | 11    | 8     | 2 1/2 | 6312 5370 | 1.50    |
| 4 1/2" | x 1"   | x 4 1/2" | 11    | 8     | 2 1/2 | 6312 5371 | 1.50    |
| 5"     | x 1/2" | x 5"     | 12    | 9     | 2 1/2 | 6312 5372 | 1.50    |
| 5"     | x 1/2" | x 5"     | 12    | 9     | 2 1/2 | 6312 5373 | 1.50    |
| 5"     | x 1"   | x 5"     | 12    | 9     | 2 1/2 | 6312 5374 | 1.50    |
| 5 1/2" | x 1/2" | x 5 1/2" | 13    | 10    | 2 1/2 | 6312 5375 | 1.50    |
| 5 1/2" | x 1/2" | x 5 1/2" | 13    | 10    | 2 1/2 | 6312 5376 | 1.50    |
| 5 1/2" | x 1"   | x 5 1/2" | 13    | 10    | 2 1/2 | 6312 5377 | 1.50    |

## 6320 STRAIGHT CROSS



| Size   |          | A"    | B"    | Article   | Price   |
|--------|----------|-------|-------|-----------|---------|
| I      | II       |       |       |           |         |
| 1"     | x 1/2"   | 4 1/2 | 2 1/2 | 6320 4848 | \$ 5.10 |
| 1"     | x 1/2"   | 5     | 2 1/2 | 6320 4849 | 5.30    |
| 1"     | x 1"     | 5 1/2 | 2 1/2 | 6320 4850 | 5.50    |
| 1 1/2" | x 1 1/2" | 7     | 3 1/2 | 6320 4851 | 5.50    |
| 2"     | x 2"     | 8     | 4     | 6320 4852 | 5.50    |
| 2"     | x 3"     | 10    | 5     | 6320 4853 | 5.50    |
| 2"     | x 4"     | 12    | 7     | 6320 4854 | 5.50    |
| 2"     | x 6"     | 15    | 9     | 6320 4855 | 5.50    |

## 6350 REDUCER CROSS

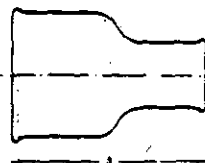


| Size   |        | A"    | B"    | C"    | Article   | Price   |
|--------|--------|-------|-------|-------|-----------|---------|
| Run    | Branch |       |       |       |           |         |
| 1"     | x 1/2" | 5     | 2 1/2 | 2 1/2 | 6350 5848 | \$ 1.50 |
| 1"     | x 1/2" | 5 1/2 | 2 1/2 | 2 1/2 | 6350 5849 | 1.50    |
| 1"     | x 1/2" | 5 1/2 | 2 1/2 | 2 1/2 | 6350 5850 | 1.50    |
| 1 1/2" | x 1/2" | 6 1/2 | 2 1/2 | 2 1/2 | 6350 5851 | 1.50    |
| 1 1/2" | x 1/2" | 6 1/2 | 2 1/2 | 2 1/2 | 6350 5852 | 1.50    |
| 1 1/2" | x 1"   | 6 1/2 | 3 1/4 | 2 1/2 | 6350 5853 | 1.50    |
| 2"     | x 1/2" | 7     | 4     | 2 1/2 | 6350 5854 | 1.50    |
| 2"     | x 1/2" | 7     | 4     | 2 1/2 | 6350 5855 | 1.50    |
| 2"     | x 1"   | 7     | 4     | 2 1/2 | 6350 5856 | 1.50    |
| 2 1/2" | x 1/2" | 7 1/2 | 4     | 2 1/2 | 6350 5857 | 1.50    |
| 2 1/2" | x 1/2" | 7 1/2 | 4     | 2 1/2 | 6350 5858 | 1.50    |
| 2 1/2" | x 1"   | 7 1/2 | 4     | 2 1/2 | 6350 5859 | 1.50    |
| 3"     | x 1/2" | 8     | 5     | 2 1/2 | 6350 5860 | 1.50    |
| 3"     | x 1/2" | 8     | 5     | 2 1/2 | 6350 5861 | 1.50    |
| 3"     | x 1"   | 8     | 5     | 2 1/2 | 6350 5862 | 1.50    |
| 3 1/2" | x 1/2" | 9     | 6     | 2 1/2 | 6350 5863 | 1.50    |
| 3 1/2" | x 1/2" | 9     | 6     | 2 1/2 | 6350 5864 | 1.50    |
| 3 1/2" | x 1"   | 9     | 6     | 2 1/2 | 6350 5865 | 1.50    |
| 4"     | x 1/2" | 10    | 7     | 2 1/2 | 6350 5866 | 1.50    |
| 4"     | x 1/2" | 10    | 7     | 2 1/2 | 6350 5867 | 1.50    |
| 4"     | x 1"   | 10    | 7     | 2 1/2 | 6350 5868 | 1.50    |
| 4 1/2" | x 1/2" | 11    | 8     | 2 1/2 | 6350 5869 | 1.50    |
| 4 1/2" | x 1/2" | 11    | 8     | 2 1/2 | 6350 5870 | 1.50    |
| 4 1/2" | x 1"   | 11    | 8     | 2 1/2 | 6350 5871 | 1.50    |
| 5"     | x 1/2" | 12    | 9     | 2 1/2 | 6350 5872 | 1.50    |
| 5"     | x 1/2" | 12    | 9     | 2 1/2 | 6350 5873 | 1.50    |
| 5"     | x 1"   | 12    | 9     | 2 1/2 | 6350 5874 | 1.50    |
| 5 1/2" | x 1/2" | 13    | 10    | 2 1/2 | 6350 5875 | 1.50    |
| 5 1/2" | x 1/2" | 13    | 10    | 2 1/2 | 6350 5876 | 1.50    |
| 5 1/2" | x 1"   | 13    | 10    | 2 1/2 | 6350 5877 | 1.50    |
| 6"     | x 1/2" | 14    | 11    | 2 1/2 | 6350 5878 | 1.50    |
| 6"     | x 1/2" | 14    | 11    | 2 1/2 | 6350 5879 | 1.50    |
| 6"     | x 1"   | 14    | 11    | 2 1/2 | 6350 5880 | 1.50    |
| 6 1/2" | x 1/2" | 15    | 12    | 2 1/2 | 6350 5881 | 1.50    |
| 6 1/2" | x 1/2" | 15    | 12    | 2 1/2 | 6350 5882 | 1.50    |
| 6 1/2" | x 1"   | 15    | 12    | 2 1/2 | 6350 5883 | 1.50    |



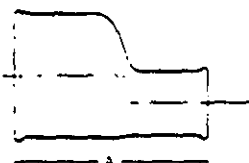
## PROCESS PIPE AND FITTINGS

### 6315 REDUCER (Straight)



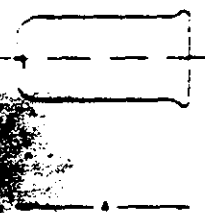
| Size          | A" | Article   | Price   | Size        | A" | Article   | Price |
|---------------|----|-----------|---------|-------------|----|-----------|-------|
| 1/2" x 1/2"   | 4  | 6315-6848 | \$ 2.90 | 3" x 2 1/2" | 8  | 6315-2015 | 9.40  |
| 1/2" x 3/4"   | 4  | 1048      | 4.70    | 3" x 2"     | 8  | 4001      | 8.25  |
| 1/2" x 1"     | 4  | 1068      | 4.70    | 4" x 3"     | 7  | 4002      | 8.25  |
| 1/2" x 1 1/4" | 4  | 1548      | 5.20    | 4" x 2 1/2" | 7  | 4003      | 8.25  |
| 1/2" x 1 1/2" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4004      | 8.25  |
| 1/2" x 2"     | 4  | 1510      | 5.20    | 4" x 1 1/2" | 7  | 4005      | 8.25  |
| 1" x 1/2"     | 4  | 2048      | 6.90    | 5" x 1"     | 9  | 6001      | 10.50 |
| 1" x 3/4"     | 4  | 2068      | 6.90    | 5" x 1 1/2" | 9  | 6002      | 10.50 |
| 1" x 1"       | 4  | 2010      | 6.90    | 5" x 2"     | 9  | 6003      | 10.50 |
| 1" x 1 1/4"   | 4  | 2015      | 6.90    | 5" x 2 1/2" | 9  | 6004      | 10.50 |
| 1" x 1 1/2"   | 4  | 2010      | 9.40    | 5" x 3"     | 9  | 6005      | 10.50 |

### 6340 REDUCER (Eccentric)



| Size          | A" | Article   | Price   | Size        | A" | Article   | Price |
|---------------|----|-----------|---------|-------------|----|-----------|-------|
| 1/2" x 1/2"   | 4  | 6340-6848 | \$ 3.90 | 3" x 2 1/2" | 8  | 6340-2015 | 9.40  |
| 1/2" x 3/4"   | 4  | 1048      | 4.70    | 3" x 2"     | 8  | 4001      | 8.25  |
| 1/2" x 1"     | 4  | 1068      | 4.70    | 4" x 3"     | 7  | 4002      | 8.25  |
| 1/2" x 1 1/4" | 4  | 1548      | 5.20    | 4" x 2 1/2" | 7  | 4003      | 8.25  |
| 1/2" x 1 1/2" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4004      | 8.25  |
| 1/2" x 2"     | 4  | 1510      | 5.20    | 4" x 1 1/2" | 7  | 4005      | 8.25  |
| 1" x 1/2"     | 4  | 2048      | 6.90    | 5" x 1"     | 9  | 6001      | 10.50 |
| 1" x 3/4"     | 4  | 2068      | 6.90    | 5" x 1 1/2" | 9  | 6002      | 10.50 |
| 1" x 1"       | 4  | 2010      | 6.90    | 5" x 2"     | 9  | 6003      | 10.50 |
| 1" x 1 1/4"   | 4  | 2015      | 6.90    | 5" x 2 1/2" | 9  | 6004      | 10.50 |
| 1" x 1 1/2"   | 4  | 2010      | 9.40    | 5" x 3"     | 9  | 6005      | 10.50 |

### 6336 END CAP



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2     | 6336-4800 | \$ 2.25 |
| 1/2"   | 2     | 5800      | 2.25    |
| 1"     | 2     | 1000      | 2.45    |
| 1 1/4" | 3     | 1500      | 2.50    |
| 2"     | 4     | 2000      | 4.70    |
| 2"     | 4 1/2 | 2000      | 7.25    |
| 4"     | 6     | 4000      | 10.50   |
| 5"     | 7     | 6000      | 14.00   |

### 6344 END PLUG

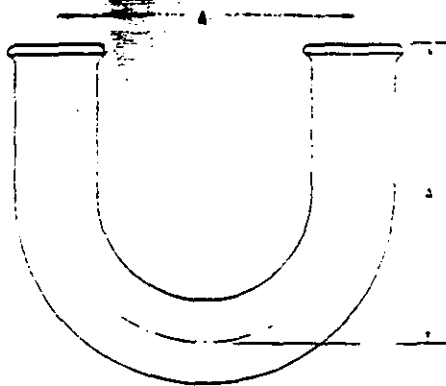


| Size   | A"    | Article   | Price  |
|--------|-------|-----------|--------|
| 1/2"   | 1/2   | 6344-1500 | \$1.90 |
| 1"     | 1     | 2000      | 2.25   |
| 1 1/4" | 1 1/4 | 3000      | 2.25   |
| 2"     | 1 1/4 | 4000      | 5.25   |
| 5"     | 1 1/2 | 6000      | 7.90   |

Use catalog dimensions for piping layout as gasket thickness allowance is included

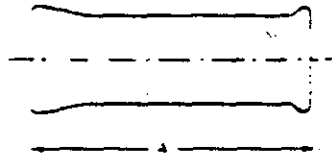
## PROCESS PIPE AND FITTINGS

### 6365 U BEND (Annealed)



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2 1/2 | 6365-4800 | \$ 8.00 |
| 3/4"   | 2 1/2 | 5800      | 7.55    |
| 1"     | 3 1/2 | 1000      | 11.30   |
| 1 1/4" | 7     | 1500      | 17.00   |
| 2"     | 7     | 2000      | 22.00   |
| 3"     | 9     | 3000      | 28.75   |
| 4"     | 12    | 4000      | 37.00   |

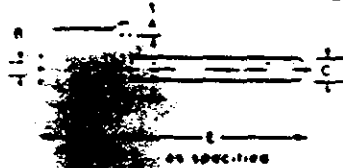
### 6366 ADAPTER Straight or Reducer (Conical to Beaded End Pipe)



| Size<br>Conical<br>x Bead | A" | Article   | Price  | Size<br>Conical<br>x Bead | A" | Article   | Price   |
|---------------------------|----|-----------|--------|---------------------------|----|-----------|---------|
| 1/2" x 1/2"               | 4  | 6366-4848 | \$2.75 | 2" x 2"                   | 4  | 6066-2015 | \$ 7.75 |
| 1/2" x 3/4"               | 4  | 5848      | 4.90   | 2" x 2 1/2"               | 4  | 2020      | 7.50    |
| 1/2" x 1"                 | 4  | 5868      | 5.05   | 2" x 3"                   | 5  | 2010      | 10.40   |
| 1/2" x 1 1/4"             | 4  | 1048      | 5.70   | 2" x 3 1/2"               | 5  | 2015      | 11.40   |
| 1/2" x 1 1/2"             | 4  | 1068      | 5.70   | 2" x 4"                   | 5  | 2020      | 11.40   |
| 1/2" x 2"                 | 4  | 1010      | 5.00   | 2" x 5"                   | 5  | 2030      | 11.40   |
| 1/2" x 2 1/2"             | 4  | 1548      | 6.20   | 4" x 2"                   | 7  | 4010      | 10.90   |
| 1/2" x 3"                 | 4  | 1568      | 6.20   | 4" x 2 1/2"               | 7  | 4015      | 11.90   |
| 1/2" x 3 1/2"             | 4  | 1510      | 6.20   | 4" x 3"                   | 7  | 4020      | 14.00   |
| 1/2" x 4"                 | 4  | 1515      | 5.95   | 4" x 3 1/2"               | 7  | 4030      | 15.00   |
| 1/2" x 4 1/2"             | 4  | 2048      | 7.90   | 4" x 4"                   | 7  | 4040      | 15.00   |
| 1/2" x 5"                 | 4  | 2068      | 7.90   | 5" x 4"                   | 9  | 5040      | 18.00   |
| 1/2" x 6"                 | 4  | 2010      | 7.90   | 5" x 5"                   | 9  | 5060      | 18.00   |

### THERMOMETER WELLS—Made to Order 6392 Single End

Length E must be specified from min. 6" to max. 36"

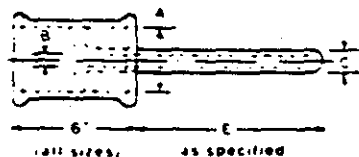


NOTE: All thermometer wells are annealed

| A"<br>Pipe<br>Size | Well<br>I.D.<br>B" | C"  | D"    | Article   | Price   |
|--------------------|--------------------|-----|-------|-----------|---------|
| 1/2"               | 1/8                | 1/8 | 2 1/4 | 6392-1538 | \$15.35 |
| 1/2"               | 1/8                | 1/8 | 2 1/2 | 1550      | 15.30   |
| 1/2"               | 1/8                | 1/8 | 2 3/4 | 1558      | 15.30   |
| 1/2"               | 1/8                | 1/8 | 2 1/2 | 2038      | 19.35   |
| 1/2"               | 1/8                | 1/8 | 2 1/2 | 2050      | 17.00   |
| 1/2"               | 1/8                | 1/8 | 2 1/2 | 2058      | 17.90   |
| 1/2"               | 1/8                | 1/8 | 3 1/4 | 3038      | 19.30   |
| 1/2"               | 1/8                | 1/8 | 3 1/4 | 3050      | 19.55   |
| 1/2"               | 1/8                | 1/8 | 3 1/2 | 3058      | 20.25   |

### 6395 Double End

Length E must be specified from min. 6" to max. 36"



NOTE: All thermometer wells are annealed

| A"<br>Pipe<br>Size | Well<br>I.D.<br>B" | C"  | D" | Article   | Price   |
|--------------------|--------------------|-----|----|-----------|---------|
| 1/2"               | 1/8                | 1/8 | 5  | 6395-1538 | \$20.35 |
| 1/2"               | 1/8                | 1/8 | 6  | 1550      | 20.90   |
| 1/2"               | 1/8                | 1/8 | 5  | 1558      | 21.30   |
| 1/2"               | 1/8                | 1/8 | 6  | 2038      | 23.00   |
| 1/2"               | 1/8                | 1/8 | 6  | 2050      | 23.45   |
| 1/2"               | 1/8                | 1/8 | 6  | 2058      | 24.15   |
| 3/4"               | 1/8                | 1/8 | 5  | 3038      | 19.30   |
| 3/4"               | 1/8                | 1/8 | 5  | 3050      | 19.05   |
| 3/4"               | 1/8                | 1/8 | 6  | 3058      | 19.75   |

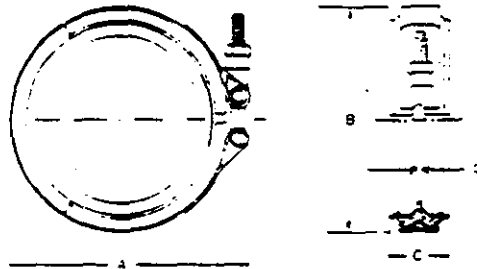
Use catalog dimensions for piping layout as gasket thickness allowance is included

## ACCESSORIES AND HARDWARE

### PROCESS PIPE COUPLINGS (Bead on Bead)

Coupling assemblies consists of a 300 series stainless steel outer band with T-bolt and hex nut, either Viton or Hydrin liner and a TFE seal ring.

No. 7123 coupling is designed for temperature service up to 450° F. No. 7126 coupling for service up to 300° F.



### 7123 High Temp. — Viton Liner (450°) (Re

| Size   | A"    | B"    | C"    | D"    | Article   | Pr |
|--------|-------|-------|-------|-------|-----------|----|
| 1/2"   | 1 1/4 | 1 1/4 | 1/2   | 1/2   | 7123-4800 | 1  |
| 3/4"   | 1 3/4 | 1 3/4 | 3/4   | 3/4   | 5800      | 1  |
| 1"     | 2 1/4 | 2 1/4 | 1     | 1     | 1000      | 1  |
| 1 1/2" | 3     | 3 1/4 | 1 1/2 | 1 1/2 | 1500      | 1  |
| 2"     | 3 3/4 | 3 3/4 | 1 3/4 | 1 3/4 | 2000      | 1  |
| 3"     | 4 3/4 | 4 3/4 | 2 1/4 | 2 1/4 | 3000      | 1  |
| 4"     | 5     | 5 1/2 | 2 3/4 | 2 3/4 | 4000      | 1  |
| 6"     | 8 1/4 | 8     | 3 1/4 | 3 1/4 | 6000      | 1  |

### 7126 Med. Temp. — Hydrin Liner (300°) (Bla

| Size   | A"    | B"    | C"    | D"    | Article   | Pr |
|--------|-------|-------|-------|-------|-----------|----|
| 1/2"   | 1 1/4 | 1 1/4 | 1/2   | 1/2   | 7126-4800 | 1  |
| 3/4"   | 1 3/4 | 1 3/4 | 3/4   | 3/4   | 5800      | 1  |
| 1"     | 2 1/4 | 2 1/4 | 1     | 1     | 1000      | 1  |
| 1 1/2" | 3     | 3 1/4 | 1 1/2 | 1 1/2 | 1500      | 1  |
| 2"     | 3 3/4 | 3 3/4 | 1 3/4 | 1 3/4 | 2000      | 1  |
| 3"     | 4 3/4 | 4 3/4 | 2 1/4 | 2 1/4 | 3000      | 1  |
| 4"     | 5     | 5 1/2 | 2 3/4 | 2 3/4 | 4000      | 1  |
| 6"     | 8 1/4 | 8     | 3 1/4 | 3 1/4 | 6000      | 1  |

### 7123-7126 COUPLING COMPONENTS

#### 7125 S.S. Band and Nut      7124 T.F.E. Seal and Viton Liner      7127 T.F.E. and Hydrin L

| Size   | Article   | Price  | Size   | Article   | Price   | Size   | Article   |
|--------|-----------|--------|--------|-----------|---------|--------|-----------|
| 1/2"   | 7125-4800 | \$1.90 | 1/2"   | 7124-4800 | \$ 8.75 | 1/2"   | 7127-4800 |
| 3/4"   | 5800      | 1.90   | 3/4"   | 5800      | 8.05    | 3/4"   | 5800      |
| 1"     | 1000      | 1.95   | 1"     | 1000      | 8.05    | 1"     | 1000      |
| 1 1/2" | 1500      | 2.00   | 1 1/2" | 1500      | 12.00   | 1 1/2" | 1500      |
| 2"     | 2000      | 2.20   | 2"     | 2000      | 12.00   | 2"     | 2000      |
| 3"     | 3000      | 3.00   | 3"     | 3000      | 12.00   | 3"     | 3000      |
| 4"     | 4000      | 3.50   | 4"     | 4000      | 18.00   | 4"     | 4000      |
| 6"     | 6000      | 5.00   | 6"     | 6000      | 25.00   | 6"     | 6000      |

#### Consists of . . .

| Coupling No. | Liner Material | Max. Temp. | Band No. | Nut No. | Liner with Seal Ring |
|--------------|----------------|------------|----------|---------|----------------------|
| 7123         | Viton          | 450°       | 7125     | 5800    | 7124                 |
| 7126         | Hydrin         | 300°       | 7125     | 5800    | 7127                 |

### 7290 PADDED PIPE HANGER



All hangers are zinc coated and have a factory applied plastic sleeve to prevent glass to metal contact. All hangers are 10 feet. Supports, valves and meters included.

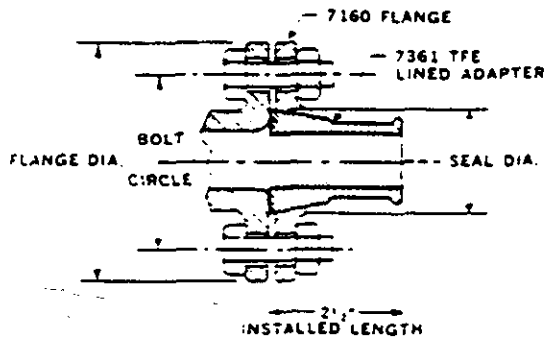
| Size   | Article   | Price   |
|--------|-----------|---------|
| 1/2"   | 7290-4800 | \$ 4.00 |
| 3/4"   | 5800      | 4.00    |
| 1"     | 1000      | 5.00    |
| 1 1/2" | 1500      | 5.00    |
| 2"     | 2000      | 6.00    |
| 3"     | 3000      | 8.00    |
| 4"     | 4000      | 10.00   |
| 6"     | 6000      | 12.00   |

## ACCESSORIES AND HARDWARE

### 7360 COUPLING KIT

(125 lb. A. Flange to Beaded Pipe)

For maximum temperature and pressure applications.



Bolts and Nuts not included.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$10.30 |
| 1 1/4" | 1500      | 15.00   |
| 2"     | 2000      | 20.00   |
| 3"     | 3000      | 30.00   |
| 4"     | 4000      | 40.00   |
| 5"     | 5000      | 50.00   |

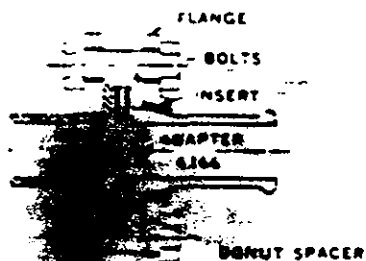
Assembly Consists of . . .

| Size   | Flange    | T.F.E. Lined Adapter | A Dia. | B Bolt G.D. | C Diameter | Bolt Qty. & Size |
|--------|-----------|----------------------|--------|-------------|------------|------------------|
| 1"     | 7160-1000 | 7361-1000            | 4 1/4" | 3 1/8"      | 1 1/4"     | 4 - 1/2"         |
| 1 1/4" | 1500      | 1500                 | 5"     | 3 7/8"      | 1 3/4"     | 4 - 1/2"         |
| 2"     | 2000      | 2000                 | 5 1/2" | 4 1/4"      | 2"         | 4 - 1/2"         |
| 3"     | 3000      | 3000                 | 7 1/4" | 5"          | 2 1/4"     | 4 - 1/2"         |
| 4"     | 4000      | 4000                 | 8 1/2" | 5 7/8"      | 2 3/4"     | 4 - 1/2"         |
| 5"     | 5000      | 5000                 | 11"    | 9 1/4"      | 3 1/4"     | 8 - 1/2"         |

### 7121 COUPLING

(ASA Flanged Metal to Beaded End Pipe)

From beaded glass pipe to inside coated metal pipe



Adapter when not included

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7121-4800 | \$ 8.50 |
| 1 1/4" | 5800      | 11.50   |
| 2"     | 1000      | 17.75   |
| 3"     | 1500      | 21.75   |
| 4"     | 2000      | 26.00   |
| 5"     | 3000      | 32.25   |
| 6"     | 4000      | 38.50   |

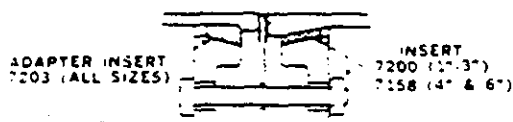
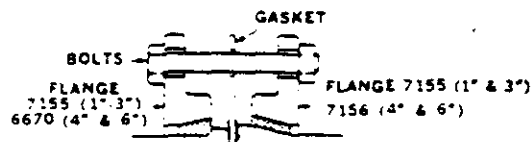
Assembly Consists of . . .

| Size   | Flange    | Insert    | Donut Spacer | Adapter Buttons | 7190 Nuts & Bolts | Qty |
|--------|-----------|-----------|--------------|-----------------|-------------------|-----|
| 1"     | 7121-4800 | 7122-4800 | 7240-4800    | —               | 1/2" - 13 x 2     | 4   |
| 1 1/4" | 5800      | 5800      | 6800         | —               | 1/2" - 13 x 2     | 4   |
| 2"     | 1000      | 7200-1000 | 1000         | —               | 1/2" - 13 x 2     | 4   |
| 3"     | 1500      | 1500      | 1500         | —               | 1/2" - 13 x 2     | 4   |
| 4"     | 2000      | 2000      | 2000         | —               | 1/2" - 13 x 2     | 4   |
| 5"     | 3000      | 3000      | 3000         | —               | 1/2" - 13 x 2     | 4   |
| 6"     | 4000      | 7153-4000 | 4000         | 7230-39         | 1/2" - 13 x 3     | 4   |
| 7"     | 5000      | 5000      | 5000         | 7230-39         | 1/2" - 13 x 3     | 4   |

## ACCESSORIES AND HARDWARE

### \*7110 COUPLING ASSEMBLY (Beaded to Conical End Pipe)

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



\*Pressure rating limited to that of Conical Pipe System.  
Not to be used with Beaded Armored Pipe.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7110-1000 | \$ 4.00 |
| 1 1/2" | 1500      | 4.50    |
| 2"     | 2000      | 5.00    |
| 3"     | 3000      | 6.00    |
| 4"     | 4000      | 7.00    |
| 6"     | 6000      | 10.00   |

### Assembly Consists of . . .

| Size   | Flange                 | Insert                 | Gasket    | 7190 Nuts & Bolts - Qty. |
|--------|------------------------|------------------------|-----------|--------------------------|
| 1"     | 7155-1000              | 7200-1000<br>7203-1000 | 7075-1000 | 1 1/2" - 10 ea.          |
| 1 1/2" | 1500                   | 7200-1500<br>7203-1500 | 1500      | 1 1/2" - 10 ea.          |
| 2"     | 2000                   | 7200-2000<br>7203-2000 | 2000      | 2" - 10 ea.              |
| 3"     | 3000                   | 7200-3000<br>7203-3000 | 3000      | 3" - 10 ea.              |
| 4"     | 7156-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | 4" - 10 ea.              |
| 6"     | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | 6" - 10 ea.              |

### 7360, 7121, 7110 COUPLING KIT COMPONENTS

#### Flange for 7360

|        |           |         |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$ 3.00 |
| 1 1/2" | 1500      | 3.50    |
| 2"     | 2000      | 4.00    |
| 3"     | 3000      | 5.00    |
| 4"     | 4000      | 6.00    |
| 6"     | 6000      | 10.00   |

#### Adapter for 7360

|        |           |         |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$ 3.00 |
| 1 1/2" | 1500      | 3.50    |
| 2"     | 2000      | 4.00    |
| 3"     | 3000      | 5.00    |
| 4"     | 4000      | 6.00    |
| 6"     | 6000      | 10.00   |

#### Flange for 7121

|        |           |         |
|--------|-----------|---------|
| 1"     | 7121-1000 | \$ 3.00 |
| 1 1/2" | 1500      | 3.50    |
| 2"     | 2000      | 4.00    |
| 3"     | 3000      | 5.00    |
| 4"     | 4000      | 6.00    |
| 6"     | 6000      | 10.00   |

#### Insert for 7121

|        |           |         |
|--------|-----------|---------|
| 1"     | 7121-1000 | \$ 3.00 |
| 1 1/2" | 1500      | 3.50    |
| 2"     | 2000      | 4.00    |
| 3"     | 3000      | 5.00    |
| 4"     | 4000      | 6.00    |
| 6"     | 6000      | 10.00   |

#### Donut Spacer for 7121

|        |           |         |
|--------|-----------|---------|
| 1"     | 7121-1000 | \$ 4.00 |
| 1 1/2" | 1500      | 4.50    |
| 2"     | 2000      | 5.00    |
| 3"     | 3000      | 6.00    |
| 4"     | 4000      | 7.00    |
| 6"     | 6000      | 10.00   |

#### Adapter Button for 7121 4-6"

|       |         |         |
|-------|---------|---------|
| 4" 6" | 7121-46 | \$ 1.00 |
|-------|---------|---------|

#### Flange for 7110 (Need 2)

|        |           |            |
|--------|-----------|------------|
| 1"     | 7110-1000 | \$ 1.00 ea |
| 1 1/2" | 1500      | 1.50 ea    |
| 2"     | 2000      | 2.00 ea    |
| 3"     | 3000      | 3.00 ea    |
| 4"     | 7156-4000 | 5.00 ea    |
| 4"     | 6670-4000 | 5.90 ea    |
| 6"     | 7156-6000 | 10.00 ea   |
| 6"     | 6670-6000 | 8.60 ea    |

#### Inserts for 7110 (one each)

|        |           |           |
|--------|-----------|-----------|
| 1"     | 7200-1000 | \$ .60 ea |
| 1 1/2" | 7203-1000 | 1.25 ea.  |
| 1 1/2" | 7200-1500 | .70 ea.   |
| 1 1/2" | 7203-1500 | 1.45 ea.  |
| 2"     | 7200-2000 | .90 ea    |
| 2"     | 7203-2000 | 1.65 ea.  |
| 3"     | 7200-3000 | 1.35 ea   |
| 3"     | 7203-3000 | 2.20 ea   |
| 4"     | 7158-4000 | 5.05 ea   |
| 4"     | 7203-4000 | 3.50 ea   |
| 6"     | 7158-6000 | 10.70 ea  |
| 6"     | 7203-6000 | 6.20 ea.  |

### 7190 Bolts & Nuts

For all Coupling Kits & Assemblies

| Description        | Qty. | Article   | Price   |
|--------------------|------|-----------|---------|
| 1/4" x 18 x 2 1/2" | 4    | 7190-1820 | \$ 1.00 |
| 1/4" x 18 x 2 1/2" | 4    | 1820      | 1.00    |
| 1/4" x 18 x 3"     | 4    | 1830      | 1.00    |
| 1/4" x 16 x 3"     | 3    | 1630      | 1.00    |
| 1/4" x 13 x 2"     | 4    | 1320      | 1.00    |
| 1/4" x 13 x 2 1/2" | 4    | 1325      | 1.00    |
| 1/4" x 11 x 2 1/2" | 4    | 1125      | 1.00    |
| 1/4" x 11 x 3"     | 4    | 1130      | 1.00    |
| 1/4" x 11 x 3 1/2" | 4    | 1135      | 1.00    |
| 1/4" x 10 x 3 1/2" | 4    | 1035      | 1.00    |

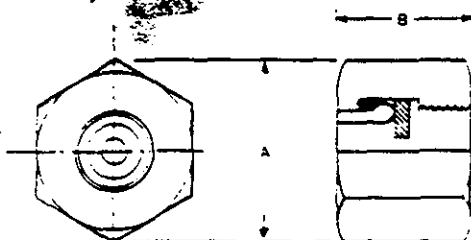
### Gasket for 7110

T.F.E. Machined (Full Flow) Gasket  
(Blue African Asbestos Filler)

| Description | Size   | Article   | Price   |
|-------------|--------|-----------|---------|
| Style II    | 1"     | 7075-1000 | \$ 1.00 |
| "           | 1 1/2" | 1500      | 1.00    |
| "           | 2"     | 2000      | 1.00    |
| "           | 3"     | 3000      | 1.00    |
| "           | 4"     | 4000      | 1.00    |
| "           | 6"     | 6000      | 1.00    |

## ACCESSORIES AND HARDWARE

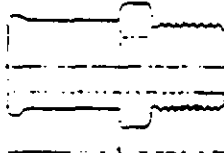
### 7340 FAUCET UNION—ALUMINUM (Beaded to 1/2" Metal IPS Straight Pipe Thread)



Replacement parts for No. 7340 assembly include No. 7343 gasket and No. 7344 cushion ring.

| Size               | A"    | B"    | Article   | Price  |
|--------------------|-------|-------|-----------|--------|
| 1/2" Assembly      | 1 3/4 | 1 1/4 | 7340-4800 | \$8.00 |
| 1/2" Gasket (TFE)  | —     | —     | 7343-4800 | 50     |
| 1/2" Cushion (TFE) | —     | —     | 7344-4800 | 50     |

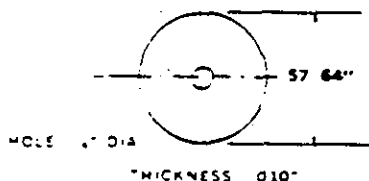
### 7350 Male Threaded ADAPTER (316 Stainless Steel)



Used to join threaded female fittings, valves and hangers to beaded pipe.

| Size   | A"    | Article   | Price            |
|--------|-------|-----------|------------------|
| 1/2"   | 2 3/4 | 7350-4800 | \$10.00          |
| 3/4"   | 2 3/4 | 5300      | 12.00            |
| 1"     | 2 3/4 | 1000      | 14.00            |
| 1 1/2" | 2 3/4 | 1500      | 19.00            |
| 2"     | 2 3/4 | 2000      | Price on Request |
| 3"     | 2 3/4 | 3000      |                  |
| 4"     | 2 3/4 | 4000      |                  |

### 7348 Gasket — Flow Control (TFE)

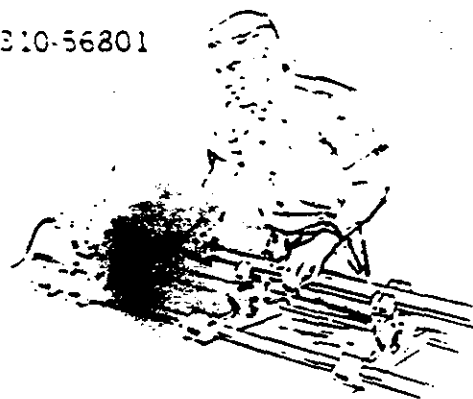


Place 7348 Flow Control Gasket into 7106 coupling — place at first horizontal joint from faucet.

| Size | Article   | Price | Description |
|------|-----------|-------|-------------|
| 1/2" | 7348-4800 | \$50  | TFE         |

Used to reduce surge and water hammer in distilled water systems.

7310-56801



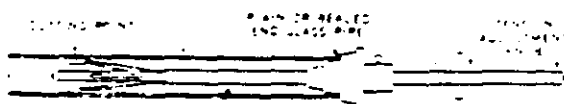
### BK-5 PORTABLE BEADING KIT

For fast, simplified field beading of glass pipe, kit is designed so that operator can form a bead on 1/2" through 6" pipe that has same compatibility in coupling as factory beaded pipe. For operational details, consult KIMAX Cutting and Beading Manual GPD-1066.

PRICE ON REQUEST

7310-56802 Cutting 1 1/2", 2", 3", 4", 6" Pipe

7310-56803 Cutting 1/2", 3/4", 1" Pipe



### PORTABLE GLASS CUTTERS

For on-the-job scoring and cutting of special lengths of glass pipe. For operational details consult KIMAX Cutting and Beading Manual GPD-1066.

PRICE ON REQUEST

## ENGINEERING DATA

### COMPARATIVE WEIGHT

The following table indicates approximate weight of 2" diameter KLEVE-Glass Pipe compared to the weight of other pipe material of the same diameter.

| Material                           | Approximate Weight<br>lbs. ft./2 dia. |
|------------------------------------|---------------------------------------|
| ASTM A 360 Pipe                    | 1.10-1.20                             |
| A.C. Concrete Pipe (normal weight) | 1.30                                  |
| 1'-3" thick                        | 1.30                                  |
| Hard Rubber                        | 1.50                                  |
| Concrete (lightweight)             | 1.0                                   |
| Asph. Bonded Asbestos              | 1.30                                  |
| Lowest Steel Concrete (1')         | 1.35                                  |
| Cast in place                      | 1.40                                  |
| Portland -                         | 1.35                                  |
| High Density                       | 1.40                                  |

### OPERATING TEMPERATURES AND PRESSURES

• MAX Glass Block operates at temperatures up to 150°F under normal conditions. Where operating temperatures exceed 150°F up to 165°F, protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation, please recommend temperatures and pressures consult Owens Corning Fibre Process Systems C & T Division, 1980.

1. This number depending on 13 for a MAX glass size under normal  
temperature and size in the following table

| Operating Condition | Maximum Temperature (°C) | Maximum Pressure (bar) | Maximum Flow (m³/hr) |
|---------------------|--------------------------|------------------------|----------------------|
| Normal Operation    | 150                      | 10                     | 100                  |
| Emergency Shutdown  | 180                      | 12                     | 120                  |
| Startup Sequence    | 120                      | 8                      | 80                   |
| Shutdown Sequence   | 100                      | 6                      | 60                   |

Training and maintenance of the materiel should be taken into consideration to insure proper use of the recommended materiel.

## THE RING EXPANSION

... must be taken into consideration and allow  
... the ...

\* That the case has a terms expansion of 100/100  
\* That the terms factor as 100 relative expansion of other

| Material                  | Relative Expansion |
|---------------------------|--------------------|
| Aluminum Duct Iron        | 1.0                |
| Cast Iron                 | 0.7                |
| Cast Steel - Austenitic   | 1.2                |
| Steel                     | 0.6                |
| High Carbon Iron          | 0.5                |
| Cast Steel - Mild         | 0.7                |
| Refrigerated Alloys       | 0.4                |
| High Pressure Die Casting | 0.3                |
| High Speed                | 0.2                |

### FLOW CHARACTERISTICS - PRESSURE DROP

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction in KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the pipe becomes crusted with scale build-up.

Pressure drop increases as the number of stages increases. The chart below states the equivalent length for various fittings based on water at 100°F.

| Fitting     | Equivalent Lengths (Feet) By Pipe Size |        |       |         |         |         |
|-------------|----------------------------------------|--------|-------|---------|---------|---------|
|             | 1"                                     | 1 1/2" | 2"    | 3"      | 4"      | 6"      |
| 22 1/2" L   | 15                                     | 15     | 15    | 15      | 15      | 15      |
| 15" L       | 15                                     | 15     | 15    | 15      | 15      | 15      |
| 50" L       | 20                                     | 20     | 20    | 20      | 20      | 20      |
| 30" L       | 30                                     | 30     | 30    | 30      | 30      | 30      |
| Sweep L     | 15                                     | 15     | 15    | 15      | 15      | 15      |
| Re: Bend    | 40                                     | 40     | 40    | 40      | 40      | 40      |
| T (Run)     | 15                                     | 15     | 15    | 15      | 15      | 15      |
| T (S.O.)    | 50                                     | 50     | 50    | 50      | 50      | 50      |
| T (S.I.)    | 50                                     | 90     | 100   | 130     | 140     | 140     |
| Gate Valve  | 15                                     | 20     | 20    | 40      | 50      | 50      |
| Plug Valve  | 20                                     | 30     | 40    | 50      | 50      | 50      |
| Globe Valve | 25-30                                  | 50-70  | 70-80 | 100-120 | 120-140 | 140-160 |

| Flow Rate    |       | Pressure Drop (PSI) Per 100 Ft. By Pipe Size |     |    |    |    |    |
|--------------|-------|----------------------------------------------|-----|----|----|----|----|
| (Gals./Min.) |       | 1"                                           | 1½" | 2" | 3" | 4" | 6" |
| 5            | Glass | 2.5                                          | —   | —  | —  | —  | —  |
| Gals.        | Steel | 4.0                                          | —   | —  | —  | —  | —  |
| 10           | Glass | 5.5                                          | —   | —  | —  | —  | —  |
| Gals.        | Steel | 7.7                                          | —   | —  | —  | —  | —  |
| 15           | Glass | 8.4                                          | —   | —  | —  | —  | —  |
| Gals.        | Steel | 12.7                                         | —   | —  | —  | —  | —  |
| 20           | Glass | 11.0                                         | —   | —  | —  | —  | —  |
| Gals.        | Steel | 15.5                                         | —   | —  | —  | —  | —  |
| 25           | Glass | 14.0                                         | 3   | 3  | —  | —  | —  |
| Gals.        | Steel | 19.5                                         | 4   | 10 | —  | —  | —  |
| 30           | Glass | —                                            | 30  | 20 | 3  | —  | —  |
| Gals.        | Steel | —                                            | 30  | 24 | 3  | —  | —  |
| 35           | Glass | —                                            | 40  | 31 | 5  | —  | —  |
| Gals.        | Steel | —                                            | 50  | 30 | 5  | —  | —  |
| 40           | Glass | —                                            | —   | 50 | 10 | 4  | —  |
| Gals.        | Steel | —                                            | —   | 30 | 10 | —  | —  |
| 45           | Glass | —                                            | —   | 45 | 20 | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | 20 | —  | —  |
| 50           | Glass | —                                            | —   | —  | 30 | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | 30 | —  | —  |
| 55           | Glass | —                                            | —   | —  | 50 | 5  | —  |
| Gals.        | Steel | —                                            | —   | —  | 30 | —  | —  |
| 60           | Glass | —                                            | —   | —  | —  | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | —  | —  | —  |
| 65           | Glass | —                                            | —   | —  | 50 | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | 30 | —  | —  |
| 70           | Glass | —                                            | —   | —  | —  | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | —  | —  | —  |
| 75           | Glass | —                                            | —   | —  | —  | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | —  | —  | —  |
| 80           | Glass | —                                            | —   | —  | —  | —  | —  |
| Gals.        | Steel | —                                            | —   | —  | —  | —  | —  |

NOTE Above pressure drops are only approximate. For more detailed data refer to equations for friction factors of Green and McAdams, Trans. Am. Inst. Chem. Engrs. 36, 355 (1942) and Wilson, McAdams and Seitzer, Ind. Eng. Chem. 35, 2177 (1923).

## ENGINEERING DATA

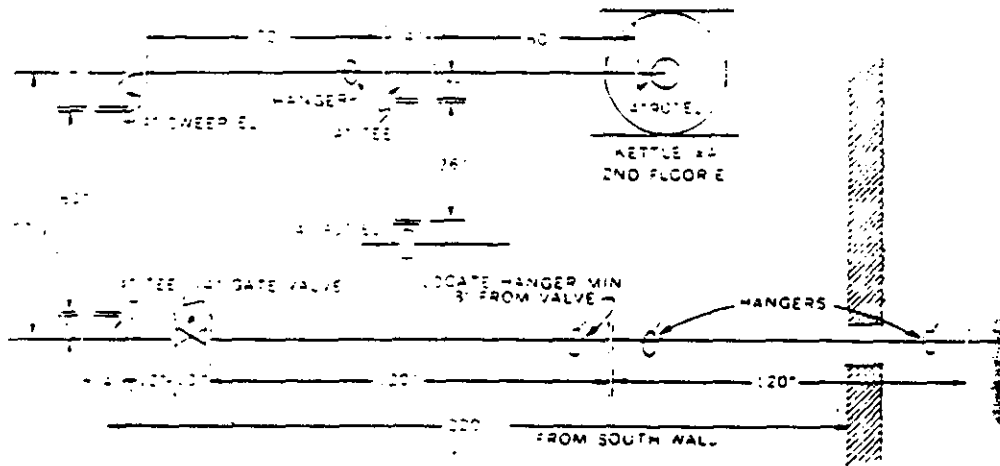
## LAYOUT

Layout of KIMAX Glass Pipe is similar to that of other materials. In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Consideration should be given to anchor point locations and line flexibility. Line flexibility can be achieved by use of right angle bends and elbows.

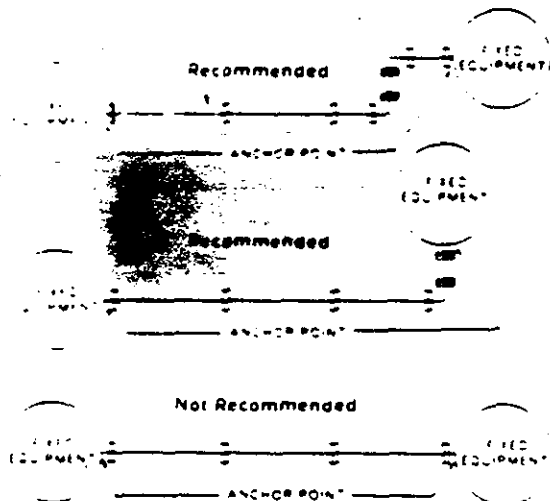
### Typical Area Sketch



## ANCHOR POINTS

...from the following sources: (1) from feed streams such as independent-  
ly supported valves, and from possible connections to fixed  
equipment such as reactors, tanks and pumps.

1. The first of these is the fact that the Government has not yet decided whether it will accept the offer of the United States to provide a loan of \$100 million to the Government of the Republic of China for the purpose of financing the construction of a new airport at Taichung. This decision is of great importance to the Government of the Republic of China, as it will determine whether it will be able to finance the construction of this important project. The Government of the Republic of China has been unable to obtain the necessary funds from the United States, and it is therefore unable to proceed with the construction of the airport. This is a serious situation, as the airport is one of the most important projects of the Government of the Republic of China, and it is essential that it be completed as soon as possible. The Government of the Republic of China is therefore appealing to the United States to provide the loan, and it is hoped that the United States will agree to do so.



• All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and thus prevents sags.

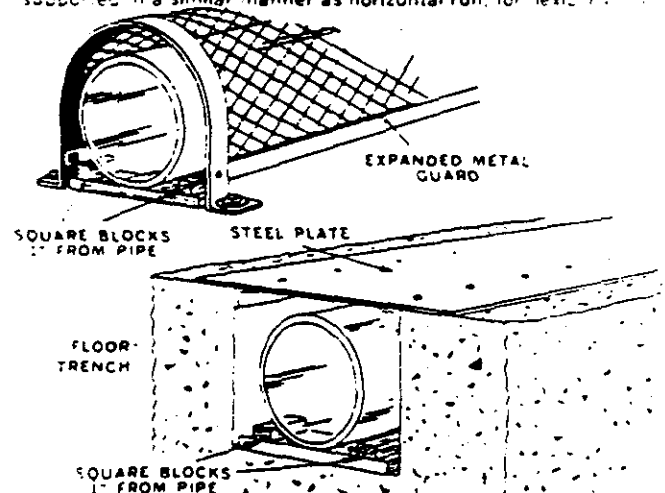
### HORIZONTAL LINE SUPPORT

Each 10-foot length of KIMAX pipe should be supported with at least one hanger located about 1 foot from each end. See illustration of horizontal line support, page 17.

Loss pipeline at floor level, ground level, or below grade level when exposed to traffic should be protected. The pipe should be supported by padded pipe hangers, padded blocks with close fitted side wedges, or any other loose lateral guide.

**Do not use notched supports. The pipe must be free to move 1/8 inch sideways in order to prevent bending moment in other sections of the piping system.**

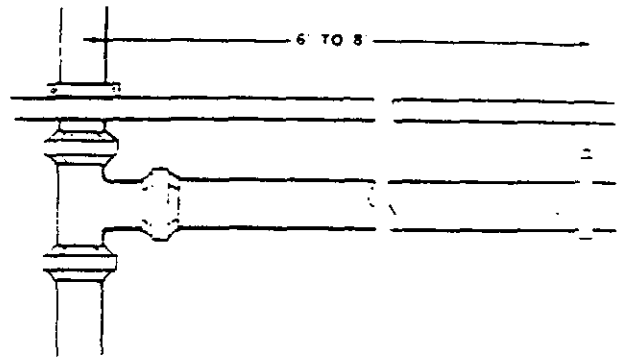
Flaring below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility.



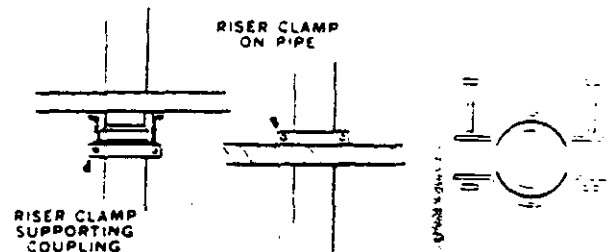


## INSTALLATION DATA

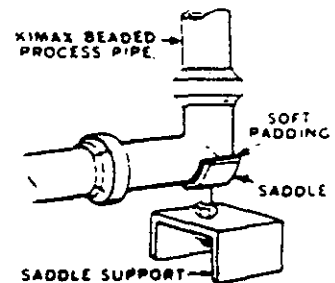
- Do not support vertical runs with horizontal lines. First hanger should be placed from 6 feet to 8 feet from column.



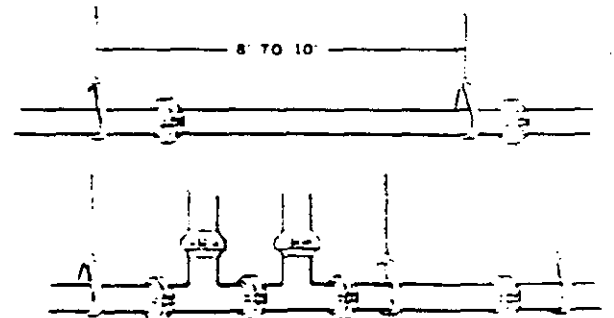
- Use KIMAX compression coupling without sealing around O.D. of pipe and support to structure with a riser clamp or supporting ring.
- Clamps should be below coupling on riser where possible.
- Support need not be at joint or
- Use riser clamp lined with 1/4" thick neoprene.
- Locate riser clamps at each floor or at center; distance not to exceed 12 feet.



- Use saddle support used beneath 90 degree elbows in the bottom of a vertical riser. It is important that the center line of the saddle center is in the center line of the riser. Do not support the vertical riser by more than one rigid support.

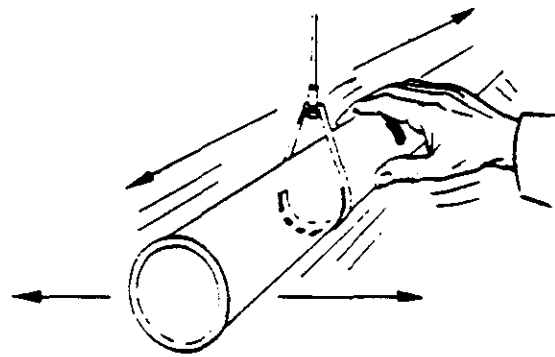


- Use padded hangers to prevent pipe to metal contact. Space hangers to support lines evenly. Hanger to 10 feet.
- Use extra hanger when two or more couplings fall within hanger span.
- Independently support all valves, meters or other heavy equipment installed in line.



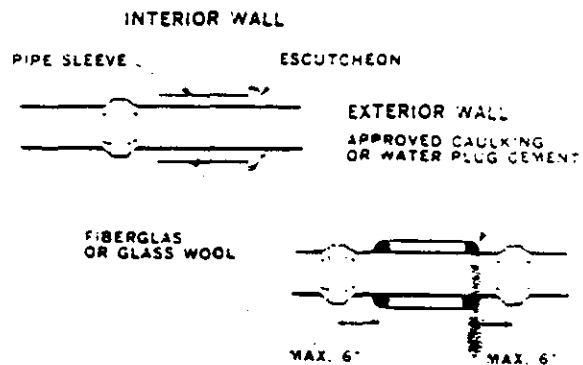
## INSTALLATION DATA

- Keep lines **loose** ... when horizontal lines are hung they should be free to move sideways.
- Axial movement should be limited, but by no more than one (1) anchor point per 50' in any direction.

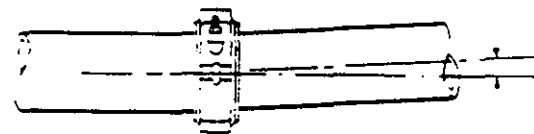


- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with fiberglass or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 5" on either side of wall.



- Tighten line end coupling, back-bolt to limit required and tighten coupling.
  - Tighten limit should exceed 45°.
- Note: At max. moment bend, at extreme open end, limit points should be retightened.



### Vibration

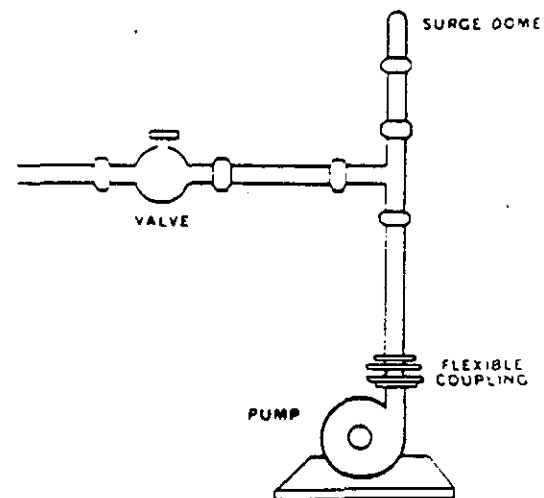
When connected to a pump or vibrating equipment is piping, the piping should have a flexible connection — either a surge dome or flexible couplings. The piping should be checked for temperature and pressure fluctuations. Material determine the type.

Vibration should be damped or use of a surge dome or moving the pipe hanger away from the source of vibration.

### Pressure Surges Must Be Controlled To Prevent Excessive Pipe Movement

To reduce pressure surges install a pressure dome on the discharge side of a pump next to the valve or at the top of the vertical section of a discharge line.

For distilled water systems eliminate self-priming. Quick shut-off faucets or install No. 7345 flow restrictors.



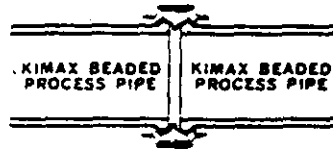
# TYPICAL JOINT REFERENCE CHART

## KIMAX Beaded Process Pipe

## Type of Joint

## Material Needed

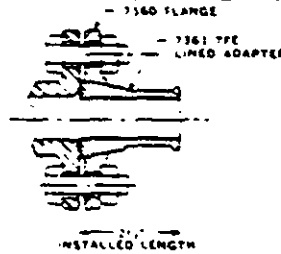
To:  
KIMAX Beaded Process Pipe  
(Factory or Field Beaded)



| KIMAX 7126 Process Pipe Coupling |               |           |               |
|----------------------------------|---------------|-----------|---------------|
| Pipe Size                        | Coupling Code | Pipe Size | Coupling Code |
| 1/2"                             | 7126-4800     | 3"        | 7126-2000     |
| 3/4"                             | 7126-6800     | 4"        | 7126-1500     |
| 1"                               | 7126-1000     | 5"        | 7126-8000     |
| 1 1/4"                           | 7126-1500     | 6"        | 7126-6000     |

See Page 11, GPD-1054R

To:  
1", 1 1/2", 2", 3", 4" or 6"  
Beaded Pipe to A.S.A.  
Flanged Valves

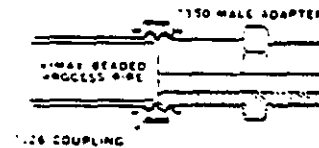


| KIMAX 7360 Coupling Assembly |               |
|------------------------------|---------------|
| Pipe Size                    | Coupling Code |

|        |           |
|--------|-----------|
| 1"     | 7360-1000 |
| 1 1/2" | 7360-1500 |
| 2"     | 7360-2000 |
| 3"     | 7360-3000 |
| 4"     | 7360-4000 |
| 6"     | 7360-6000 |

See Page 12, GPD-1054R

To:  
1/2" thru 4"  
IPS (female)  
Threaded Pipe  
7350 S.S. (316)

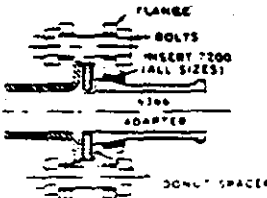


## KIMAX 7350 Adapter

| Pipe Size | Codes     | Pipe Size | Codes     |
|-----------|-----------|-----------|-----------|
| 1/2"      | 7350-4800 | 3"        | 7350-2000 |
| 3/4"      | 7126-4800 | 4"        | 7126-1500 |
| 1"        | 7350-6800 | 5"        | 7126-8000 |
| 1 1/4"    | 7126-1000 | 6"        | 7126-6000 |
| 1 1/2"    | 7126-1500 |           |           |
| 2"        | 7126-2000 |           |           |

See Page 13, GPD-1054R

To:  
ASA Flanged Mats  
Glass Ladders or Digestive  
Tank Pipe, Tanks  
etc.

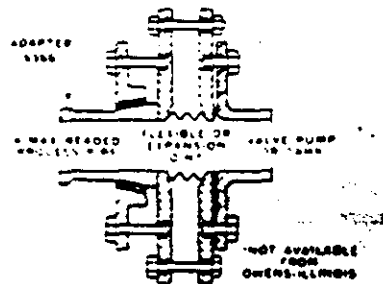


## KIMAX 7121 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1/2"      | 7121-4800     | 3"        | 7121-2000     |
| 3/4"      | 7121-6800     | 4"        | 7121-1500     |
| 1"        | 7121-1000     | 5"        | 7121-8000     |
| 1 1/4"    | 7121-1500     | 6"        | 7121-6000     |
| 2"        | 7121-2000     |           |               |

See Page 12, GPD-1054R

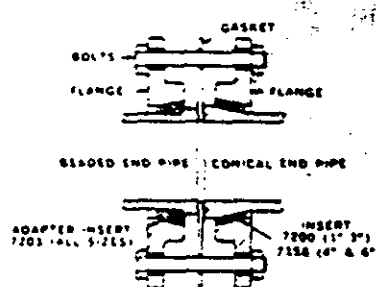
To:  
KIMAX Beaded Process Pipe  
with 1/2" or 3/4" Expansion  
Joint



| Connect to     |                |
|----------------|----------------|
| 1" 3" Pipe     | 4" 6" Pipe     |
| 1-6366 Adapter | 1-6366 Adapter |
| 1-7155 Flange  | 1-7156 Flange  |
| 1-7200 Insert  | 1-7158 Insert  |
| 4-Bolts & Nuts | 8-Bolts & Nuts |

\*Contractor supply 3/8" bolts to length  
See Page 13, GPD-1054R

To:  
KIMAX Conical End  
Process Pipe  
LIMITED TO CONICAL  
PIPE PRESSURES &  
TEMPERATURES  
NOT TO BE USED WITH  
BEADED ARMORED PIPE.



## KIMAX 7110 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1"        | 7110-1000     | 3"        | 7110-3000     |
| 1 1/2"    | 7110-1500     | 4"        | 7110-4000     |
| 2"        | 7110-2000     | 6"        | 7110-6000     |

See Page 13, GPD-1054R

## TESTING AND CLEANING

In recognition of cold flow characteristics of plastics and elastomers, we recommend the following procedures:

- Tighten bolts on all couplings and flanges at time of installation.
- For maximum efficiency at extreme operating conditions, joints should be retightened after 24 hours.
- Gently snake lines to make certain pipe is free of strain. There should be some limited movement in lines.
- Pressure test system with water at  $1\frac{1}{2}$  times specified working pressure. Do not test with air or gas.

If leaking occurs:

- Recheck couplings for loosened bolts.
- If leaking persists, remove coupling and check condition and positioning of compression liner and seal ring.

To clean system, flush lines with water, other cleaning fluids or atmospheric pressure steam (open drain). Do not use hydrofluoric acid, hot caustic solutions, abrasives or metallic tube cleaners.

# KIMAX Beaded Process Pipe

### OWENS-ILLINOIS SALES OFFICES

Atlanta, Ga. 30341  
100 Peachtree St. N.E.  
Atlanta, Ga. 30341  
AC 404 525 1000

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Illinois 60515  
1000 Business Court  
AC 312 966 1000

Houston, Texas 77055  
10000 West Loop  
Houston, Texas 77055  
AC 713 466 4766

Owens-Illinois  
International Division  
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P.O. Box 1035  
AC 419 242 6543

La Mirada, Calif. 90638  
15052 Rosecrans Ave.  
Suite 209  
AC 818 941 0276  
AC 714 821 2271

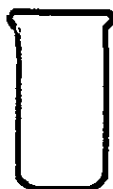
Vineland, N.J. 08360  
Crystal & Fowler Ave.  
AC 609 692 4606  
AC 609 692 6299

Toledo, Ohio 43601  
P.O. Box 1035

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Toledo, Ohio 43601

# OWENS-ILLINOIS **KIMAX**<sup>®</sup>

## TEMPERED GLASS PRODUCTS



**KIMAX TEMPERED GLASS  
DRAINLINE**

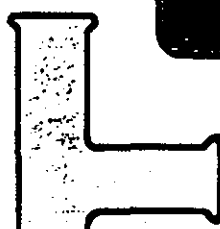
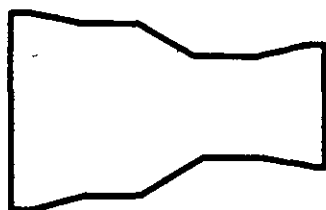
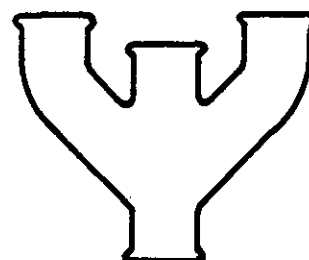
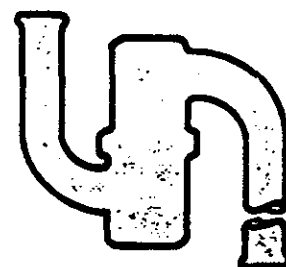
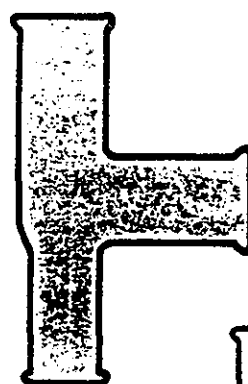
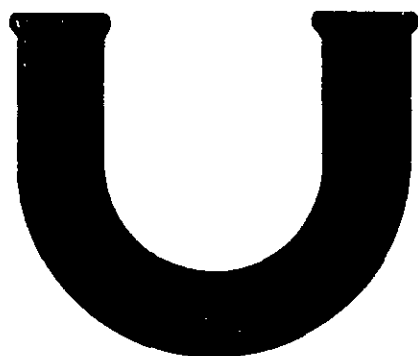
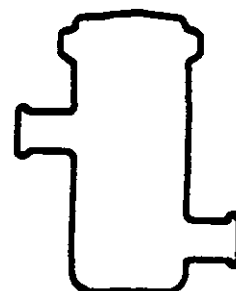
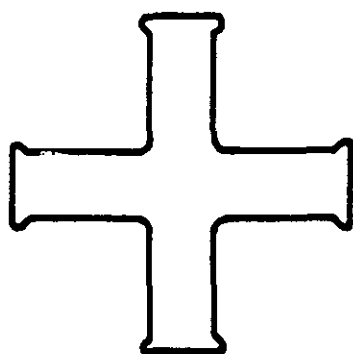
... Assured maximum corrosion resistance for  
chemical waste disposal systems

**KIMAX BEADED GLASS  
PIPE**

... For distilled water, dairy, chemical and food  
processing, and other industrial installations

**KIMAX PROCESS GLASS  
PIPE**

... Has found wide application in a variety of in-  
dustrial installations



## PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPE

| SYSTEM                      | KIMAX DRAINLINE<br>1½" thru 6"                       | KIMAX BEADED PIPE<br>½" thru 4"                      | KIMAX PROCESS CONICAL<br>END PIPE 1" thru 8"                |
|-----------------------------|------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------|
| <b>PHYSICAL PROPERTIES:</b> |                                                      |                                                      |                                                             |
| Working Pressure            | Gravity Flow                                         | ½"-¾"-1" 100 PSI<br>1½"-2"-3" 75 PSI<br>4" 50 PSI    | 1"-3" 50 PSI<br>4" 35 PSI<br>6" 20 PSI                      |
| Test Pressure <b>[MAX]</b>  | 22½ PSI                                              | Twice Working Pressure <b>[MAX]</b>                  | Twice Working Pressure                                      |
| Operating Temp.             | Freezing Point of<br>Waste to 212° F                 | Freezing Point to<br>350° F                          | Freezing Point to<br>450° F                                 |
| Glass Therm. Exp.           | 32 x 10 <sup>-7</sup>                                | 32 x 10 <sup>-7</sup>                                | 32 x 10 <sup>-7</sup>                                       |
| Glass Therm. Conductivity   | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/<br>FT at 212° F   | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/<br>FT at 212° F   | 0.73 BTU/hr./Ft. <sup>2</sup> /F°/<br>FT at 212° F          |
| Glass Therm. Shock Diff.    | 1½"-3" 200° F<br>4" 175° F<br>6" 160° F              | ½"-3" 200° F<br>4" 175° F                            | 1"-3" 200° F<br>4" 175° F<br>6" 160° F                      |
| Vacuum                      | Full                                                 | Full                                                 | Full                                                        |
| <b>CHEMICAL PROPERTIES</b>  |                                                      |                                                      |                                                             |
| Durability<br>Acids         | All Except Hydrofluoric<br>Phosphoric with Fluorides | All Except Hydrofluoric<br>Phosphoric with Fluorides | All Except Hydrofluoric<br>Phosphoric with Fluorides        |
| Alkalies                    | Some attack<br>above 150° F                          | Some attack<br>above 150° F                          | Some attack<br>above 150° F                                 |
| Coupling                    | 1 bolt stainless<br>steel                            | 1 bolt stainless<br>steel 1"-4"<br>Plastic ½" + ¾"   | Style I, II and<br>ASME Flange<br><i>Expand information</i> |
| Coupling Gasket             | Buna-N/TFE Seal                                      | *Viton/TFE Seal 450° F<br>Hydrin/TFE Seal 350° F     | Customer Selection                                          |
| Identification              | KIMAX<br>Green Label                                 | KIMAX<br>Yellow Label                                | KIMAX<br>Yellow Label                                       |

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KIMAX is a registered trademark of Owens-Illinois, Inc.

\*See Gasket Selection Chart

Owens-Illinois has developed a complete line of KIMAX tempered glass products that specifically answer the requirements of widely diversified piping systems. Made from durable, Type I borosilicate glass which features maximum chemical durability, corrosion resistance, heat and shock resistance, low maintenance cost, and transparency. Owens-Illinois has also developed and patented couplings and other hardware accessories that provide a piping system that is easily installed; easily maintained, and assures long, trouble-free service life. KIMAX Piping Systems have three styles to best serve your needs.

- KIMAX Drainline for waste disposal

- KIMAX Beaded Process Pipe for pressure service
- KIMAX Conical End Process Pipe for pressure service

#### Important features to:

#### BUILDING OWNER

- Low installation cost
- Maximum corrosion resistance
- Heat resistance
- Fire proof
- Transparency for simple inspection
- System easily altered to meet new layout conditions

# KIMAX® TEMPERED GLASS PRODUCTS

#### SPECIFIER

Architects and specifying engineers are constantly in search of materials which will give new freedom in design, confidence in performance, and reasonable installation costs. All KIMAX glass piping system products offer these provisions because;

- All KIMAX pipe may be installed behind walls, over-head against ceilings, or underground with confidence.
- Light weight of KIMAX glass piping system
- requires only  $\frac{1}{2}$  to  $\frac{1}{3}$  as many hangers as other conventional systems.
- All wetted parts are borosilicate glass or TFE\*; thus, the total system is highly chemical resistant.
- Glass does not sag when exposed to boiling water. Hangers may be placed up to 10' apart.
- Low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.

# **① KIMAX TEMPERED GLASS DRAINLINE**

## **RECOMMENDED USES**

KIMAX Drainline is recommended for corrosive waste disposal from laboratory and industrial process areas. Because of the excellent corrosion resistance KIMAX Glass Drainline can be recommended for all corrosive service except where large quantities of HF Acid are used. KIMAX Drainline is recommended for service where temperatures range from freezing point of the waste to 212°F continuous and even up to 250°F for short periods of time.

## **INSTALLATION**

KIMAX Glass Drainline installation techniques are similar to other drainline materials designed for the same type service. However, with the KIMAX Bead to Bead Coupling and the new KIMAX Bead to Plain End Coupling, joining of the pipe and fitting is now very simple.

Suggested installation practices are found in the KIMAX Drainline Installation Manual. Owens-Illinois sales and field engineering representatives are also available for on-the-job service and training.

### **... Easily Assembled**

The patented KIMAX coupling assemblies described below makes installation simple and time-saving. The coupling bolts are to be firmly tightened. We recommend the use of a ratchet wrench with a 4"

to 6" handle. Coupling design permits the joint to be deflected up to 4°.

### **... Field Fabrication**

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site by the use of a KIMAX field "beading kit" or by using the new B/P (bead to plain end) coupling system.

### **... Below Ground**

KIMAX Glass Drainline may be safely specified for underground installations.

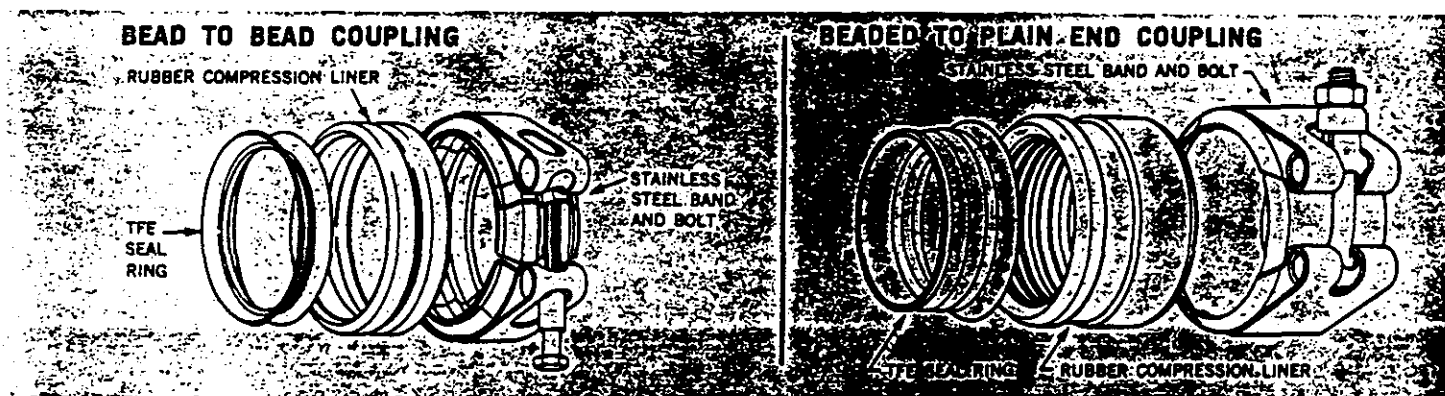
### **... Adaptation to Other Materials**

KIMAX Glass Drainline can be readily joined to other drainline materials.

### **... Easily Handled**

Because KIMAX Glass Drainline is about 1/3 the weight of conventional iron pipe, straight lengths and fittings are easily transported to point of installation. All fittings and straight lengths are packaged in corrugated cartons for shipment and storage.

For a condensed listing of KIMAX Drainline pipe, fittings, and accessories, see Pages 6 thru 11 of this catalog, or write for complete KIMAX Tempered Glass Drainline Catalog (TR862R) and Installation Manual to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P.O. Box 1035, Toledo, Ohio 43601.



### **... Quick Positive Seal Joint**

One of the most important components of a leak-free drainline system is the joint mechanism. The KIMAX drainline coupling Article No. 6650, (beaded to beaded pipe) and the new B/P (beaded to plain end) coupling No. 6661 illustrated above, will assure the proper joint seal . . . with ease of assembly and disassembly. All coupling joints are protected with

TFE seal rings, therefore providing a complete drainline system with all wetted surfaces of either KIMAX borosilicate glass or TFE\* plastic.

\*TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.



# SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed Borosilicate glass (Type I), conforming to Federal Specification DD-G-541A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B. This system shall include all glass straight lengths, fittings, traps, compression type fluoro-carbon lined couplings and padded hanger supports. It shall also include factory protected heavy schedule pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.
- C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A. Glass-to-glass connections shall be made with KIMAX one-bolt compression type couplings fabricated from 300 series stainless steel consisting of three (3) contoured 120° segments fastened to an outer band with integral barrel nut and trunion; contoured Buna N resilient compression ring and a wide angle 30° fluoro-carbon inner seal ring. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.
- B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

### III. Protection of Pipe

- A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiberglass, glass wool and/or with a non-hardening approved caulking material.
- B. Glass pipe shall not be installed in direct contact with concrete. Fiberglass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C. Glass pipe shall be protected against all weld splatter.

### IV. Tests

Test in accordance to manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A. Excavation—shall conform to National Plumbing Code A 40.8 Section 2.7.
  1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
  2. At least 4" of properly compacted sand shall be used directly under the pipe.
- B. Buried Pipe
  1. Straight lengths shall be heavy schedule 5' lengths and shall include a factory-applied protective coating.
  2. Fittings and couplings shall receive a field-applied protective coating prior to back-filling. This coating may be Behr Manning Undercoat, Scotch Wrap, J. M. Trans-Tex, 3M EC-1221, or approved equal.
- C. Backfill
 

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: \_\_\_\_\_

### Specification for KIMAX Acid Waste Drainline and Vent System

This system shall be made of KIMAX tempered and annealed Borosilicate glass conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX one-bolt compression type stainless steel couplings with a fluoro-carbon inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

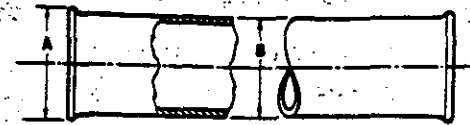
KIMAX heavy schedule factory protected pipe, 5' lengths, and either wrapped or coated fittings and couplings shall be installed in sand base and back fill in accordance with the manufacturer's instructions and governing plumbing code.

# I KIMAX TEMPERED GLASS PRODUCTS

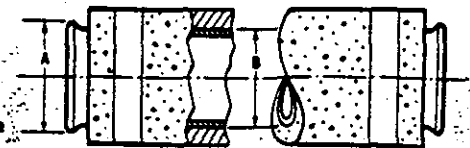
## Drainline PIPE AND FITTINGS

### STRAIGHT LENGTHS PIPE

6500 5-ft. lengths  
6501 10-ft. lengths  
6504 Nipple Stock (beaded one end only)



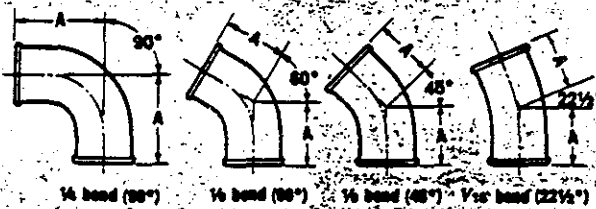
### 6502 EPS\* Covered 5-ft. lengths Heavy Schedule



\*Expanded Polystyrene

| Size | Regular Schedule<br>(6500, 6501) |          | Heavy Schedule<br>(6502) |                      |
|------|----------------------------------|----------|--------------------------|----------------------|
|      | A                                | B (O.D.) | Weight<br>lbs. / ft.     | Weight<br>lbs. / ft. |
| 1½   | 2.06                             | 1.84     | 0.64                     | 0.87                 |
| 2    | 2.58                             | 2.34     | 0.94                     | 1.1                  |
| 3    | 3.69                             | 3.41     | 1.6                      | 2.0                  |
| 4    | 4.84                             | 4.53     | 2.6                      | 3.4                  |
| 6    | 7.12                             | 6.66     | 4.7                      | 6.3                  |

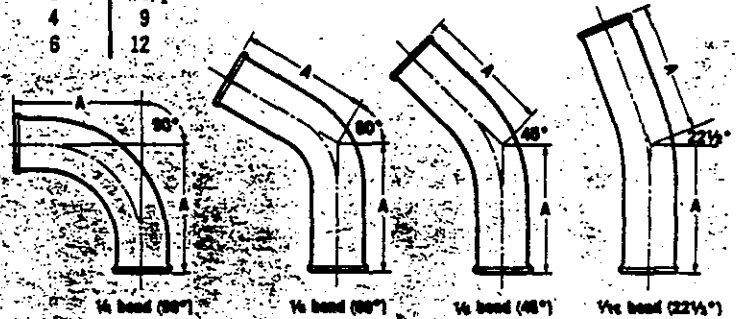
### 6513 BENDS



| Size | 90° | 60° | 45° | 22½° |
|------|-----|-----|-----|------|
| 1½   | 3   | 2½  | 2½  | 2½   |
| 2    | 3½  | 2½  | 2½  | 2½   |
| 3    | 5   | 3½  | 2½  | 2½   |
| 4    | 7   | 4½  | 3½  | 3½   |

### 6511 SWEEPS

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |



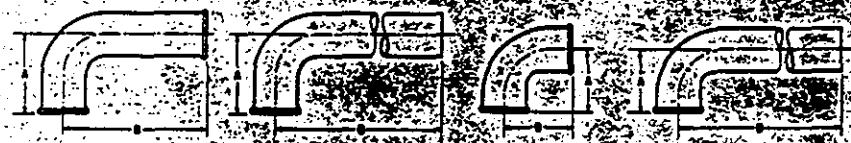
### SPECIAL PURPOSE BENDS

#### 6512

#### 6512P (ANNEALED)\*

#### 6514

#### 6514P (ANNEALED)\*



| Size | A  | B  | A  | B  | A  | B  | A  | B  |
|------|----|----|----|----|----|----|----|----|
| 1½   | 3½ | 6  | 3½ | 12 | 2½ | 3  | 2½ | 3  |
| 2    | 3½ | 7½ | 3½ | 12 | 3  | 3½ | 3  | 12 |

\*Can be field cut.

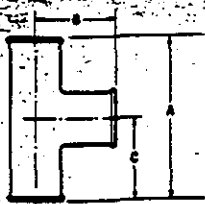
### 6513 BEND OFFSETS

| Size | L  | ½  | θ  | L   | ½  | θ  | L   | ½  | θ  | L   | ½  | θ  |
|------|----|----|----|-----|----|----|-----|----|----|-----|----|----|
| 1½   | 6  | 6½ | 6½ | 7½  | 4½ | 2½ | 7½  | 4½ | 2½ | 7½  | 4½ | 2½ |
| 2    | 10 | 10 | 10 | 10½ | 6½ | 3½ | 10½ | 6½ | 3½ | 10½ | 6½ | 3½ |
| 3    | 14 | 14 | 14 | 13½ | 7½ | 4½ | 13½ | 7½ | 4½ | 13½ | 7½ | 4½ |

### 6511 SWEEP OFFSETS

| Size | L  | ½  | θ   | L   | ½   | θ   | L   | ½   | θ   | L   | ½  | θ  |
|------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|
| 1½   | 9  | 9  | 13½ | 7½  | 15½ | 6½  | 17½ | 7½  | 17½ | 19½ | 3½ | 3½ |
| 2    | 10 | 10 | 15  | 8½  | 17½ | 7½  | 22½ | 9½  | 22½ | 25  | 5  | 5  |
| 3    | 13 | 13 | 19½ | 11½ | 22½ | 12½ | 30½ | 12½ | 34½ | 34½ | 6½ | 6½ |
| 4    | 18 | 18 | 27  | 15½ | 30½ | 17  | 41  | 17  | 46½ | 46½ | 9½ | 9½ |

# 6523 STRAIGHT T 6524 TEST T WITH CLEANOUT



STRAIGHT T

| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 2   | 12 | 4½ | 6  |
| 3 x 3   | 12 | 6  | 6  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7½ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

TEST T WITH CLEANOUT

| Size    | A  | B  | C | D  |
|---------|----|----|---|----|
| 1½ x 1½ | 6  | 2¾ | 3 | 3¾ |
| 2 x 2   | 8  | 2½ | 4 | 3½ |
| 3 x 3   | 12 | 3¾ | 6 | 4¾ |
| 4 x 4   | 14 | 4¾ | 7 | 5¾ |

Test Tee and cleanout comes as complete assembly including cap and coupling.

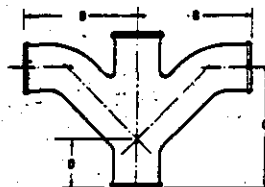
# COMBINATION Y AND ½ BEND

6528 SINGLE

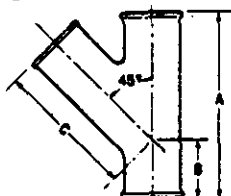


| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 4½ | 4½  | 1½ |
| 2 x 1½  | 8  | 4¾ | 5½  | 2½ |
| 2 x 2   | 8  | 6  | 6½  | 2½ |
| 3 x 1½  | 12 | 5¾ | 7½  | 3½ |
| 3 x 2   | 12 | 6½ | 8   | 3½ |
| 3 x 3   | 12 | 8½ | 9   | 3½ |
| 4 x 1½  | 14 | 6  | 8½  | 4½ |
| 4 x 2   | 14 | 7  | 9½  | 4½ |
| 4 x 3   | 14 | 9  | 10½ | 4½ |
| 4 x 4   | 14 | 11 | 11  | 4½ |
| 6 x 2   | 20 | 8½ | 11½ | 5½ |
| 6 x 3   | 20 | 10 | 12½ | 5½ |
| 6 x 4   | 20 | 12 | 13½ | 5½ |
| 6 x 6   | 20 | 15 | 14½ | 5½ |

6529 DOUBLE



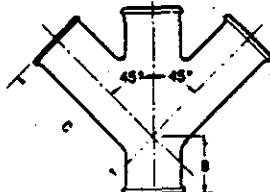
6526 SINGLE



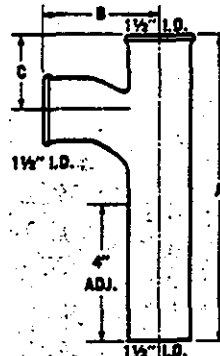
DRAINLINE Y

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 1½ | 4½  |
| 2 x 1½  | 8  | 2½ | 4½  |
| 2 x 2   | 8  | 2½ | 6   |
| 3 x 1½  | 12 | 3¾ | 5½  |
| 3 x 2   | 12 | 3¾ | 6½  |
| 3 x 3   | 12 | 3¾ | 8   |
| 4 x 1½  | 14 | 4½ | 6½  |
| 4 x 2   | 14 | 4½ | 7½  |
| 4 x 3   | 14 | 4½ | 8½  |
| 4 x 4   | 14 | 4½ | 10  |
| 6 x 2   | 20 | 5¾ | 9   |
| 6 x 3   | 20 | 5¾ | 10½ |
| 6 x 4   | 20 | 5¾ | 11½ |
| 6 x 6   | 20 | 5¾ | 14  |

6527 DOUBLE



6525 and 6525R\* (ANNEALED)\*



Adjustable Sanitary T (PLAIN END OUTLET)

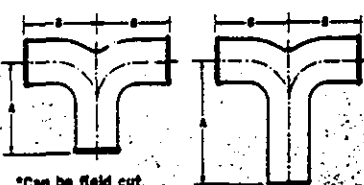
| Size               | A  | B  | C  |
|--------------------|----|----|----|
| 6525 1½ x 1½ x 1½  | 8½ | 3½ | 2½ |
| 6525R 1½ x 1½ x 1½ | 8½ | 3½ | 3½ |

\*No. 6525R differs from No. 6525 in length of "C" dimensions only.

†Can be field cut.

DOUBLE QUARTER BEND

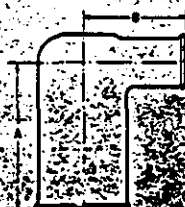
6533 6533P (ANNEALED)\*



\*Can be field cut.

| Size | A   | B  | A  | B  |
|------|-----|----|----|----|
| 1½   | 3¾  | 3¾ | 10 | 3¾ |
| 2    | 5   | 4½ | 10 | 4½ |
| 3    | 7¾  | 6¾ |    |    |
| 4    | 8¾  | 8¾ |    |    |
| 6    | 12¾ | 12 |    |    |

6518 QUARTER BEND REDUCER



| Size   | A | B  |
|--------|---|----|
| 2 x 1½ | 4 | 3½ |
| 3 x 1½ | 5 | 4½ |
| 3 x 2  | 5 | 4½ |
| 4 x 1½ | 7 | 4½ |
| 4 x 2  | 7 | 5½ |
| 4 x 3  | 7 | 5½ |
| 6 x 1½ | 9 | 5½ |
| 6 x 2  | 9 | 6½ |
| 6 x 3  | 9 | 6½ |
| 6 x 4  | 9 | 8  |

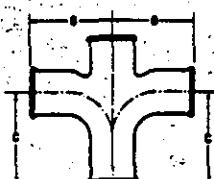
6521 SINGLE



SANITARY T

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 3½ | 3½  |
| 2 x 1½  | 8  | 3¾ | 5   |
| 2 x 2   | 8  | 4½ | 5   |
| 3 x 1½  | 12 | 4½ | 7½  |
| 3 x 2   | 12 | 5  | 7½  |
| 3 x 3   | 12 | 6¾ | 7½  |
| 4 x 1½  | 14 | 4½ | 8½  |
| 4 x 2   | 14 | 5½ | 8½  |
| 4 x 3   | 14 | 7  | 8½  |
| 4 x 4   | 14 | 8½ | 8½  |
| 6 x 2   | 20 | 6¾ | 12½ |
| 6 x 3   | 20 | 8  | 12½ |
| 6 x 4   | 20 | 9¾ | 12½ |
| 6 x 6   | 20 | 12 | 12½ |

6522 DOUBLE



UPRIGHT Y OR H (vent branch)

6532 SINGLE



| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 3¾ | 6½  | 1½ |
| 2 x 1½  | 8  | 3¾ | 7½  | 2½ |
| 2 x 2   | 8  | 4½ | 8½  | 2½ |
| 3 x 1½  | 12 | 3¾ | 9½  | 3½ |
| 3 x 2   | 12 | 4½ | 10½ | 3½ |
| 3 x 3   | 12 | 6¾ | 11½ | 3½ |
| 4 x 1½  | 14 | 4½ | 10½ | 4½ |
| 4 x 2   | 14 | 5½ | 11½ | 4½ |
| 4 x 3   | 14 | 7  | 12½ | 4½ |
| 4 x 4   | 14 | 8½ | 13½ | 4½ |
| 6 x 2   | 20 | 6¾ | 16½ | 5½ |
| 6 x 3   | 20 | 8  | 17½ | 5½ |
| 6 x 4   | 20 | 9¾ | 18½ | 5½ |
| 6 x 6   | 20 | 12 | 19½ | 5½ |

6534 DOUBLE



\*Double available in these sizes only.

\*\*"C" dimension may be longer or shorter than "A".

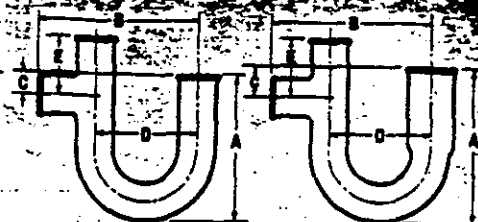
OWENS-ILLINOIS

Use catalog dimensions for piping layout as gasket thickness allowance is included.

# KIMAX TEMPERED GLASS PRODUCTS

## Drainline PIPE AND FITTINGS

0713 (vented)



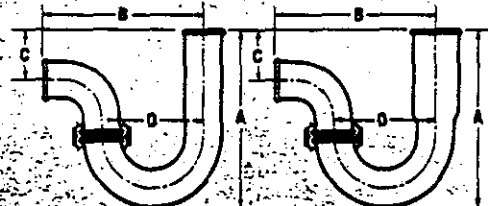
6718

### TRAP—P STYLE

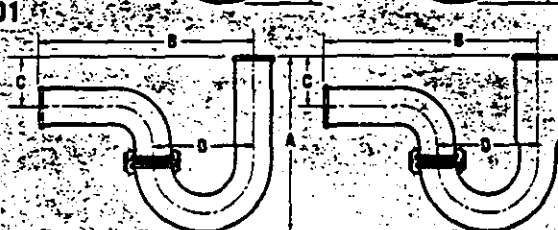
| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Seal<br>Depth |
|------------------------|--------------|-----|-----|----|----|----|---------------|
| 1½ x 1½                | 1½           | 7   | 7½  | 1  | 5  | 3  | 3½            |
| 2 x 1½                 | 1½           | 7½  | 8   | 1½ | 5  | 3  | 3½            |
| 2 x 2                  | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | 3½            |
| 3 x 3                  | 3            | 10¼ | 10½ | 2  | 6½ | 4  | 3½            |
| 4 x 4                  | 4            | 12¼ | 12½ | 2½ | 7½ | 5  | 3½            |
| 6 x 6                  | 4            | 16¾ | 17  | 3½ | 10 | 7  | 3½            |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 11.

6700



6701



### Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 8  | 2½ | 5  | 3¾            |
| 2 x 1½                 | 8¾ | 8  | 2½ | 5  | 3¾            |
| 2 x 2                  | 9¼ | 8¾ | 1½ | 5½ | 4¾            |

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 11 | 1¾ | 5  | 4¾            |
| 2 x 1½                 | 8¾ | 11 | 1¾ | 5  | 4¾            |
| 2 x 2                  | 9¼ | 13 | 1¾ | 5½ | 5¾            |

6704 (Plain End Outlet\*)

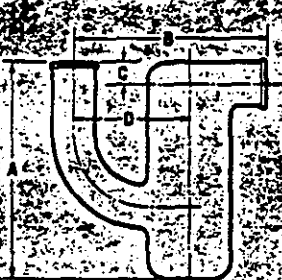


No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B   | C  | D  | Seal<br>Depth |
|------------------------|----|-----|----|----|---------------|
| 1½ x 1½                | 8¾ | 17  | 2½ | 5  | 3¾            |
| 2 x 1½                 | 8¾ | 17  | 2½ | 5  | 3¾            |
| 2 x 2                  | 9¼ | 17¾ | 1¾ | 5½ | 4¾            |

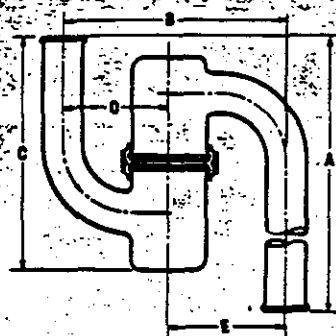
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 11.  
\*Annealed outlet, can be field cut.

6707: DRUM TRAP—P STYLE



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. | Seal<br>Depth |
|------------------------|----|----|----|----|--------------|---------------|
| 1½ x 1½                | 9  | 8  | 1  | 4¾ | 3            | 3½            |
| 2 x 1½                 | 9  | 8  | 1½ | 4¾ | 3            | 3½            |
| 2 x 2                  | 9¾ | 9¾ | 2  | 5½ | 4            | 3½            |

Traps available with either A or B type cleanout. See Standard Cleanouts.



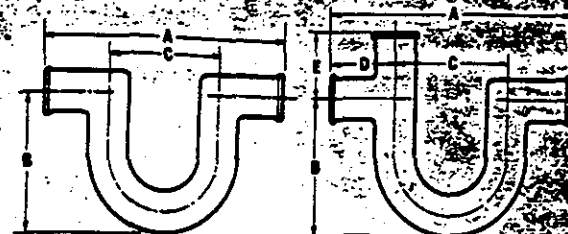
No. 6712 Swivel Drum Trap assembly consists of one No. 6715 inlet and one No. 6717 outlet with a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A   | B   | C   | D  | E  | Body<br>I.D. | Seal<br>Depth |
|------------------------|-----|-----|-----|----|----|--------------|---------------|
| 1½ x 1½                | 20% | 10  | 10¼ | 4¾ | 5¾ | 3            | 3¾            |
| 2 x 1½                 | 20% | 10  | 10¼ | 4¾ | 5¾ | 3            | 3¾            |
| 2 x 2                  | 20% | 11¼ | 11  | 5½ | 5¾ | 4            | 3¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts. Annealed outlet, can be field cut.

6770

6771 (Vented)

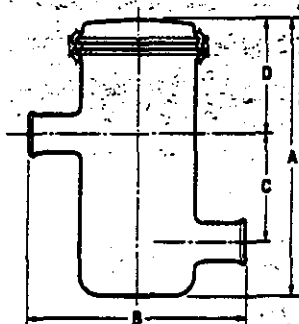


| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Seal<br>Depth |
|------------------------|--------------|-----|-----|----|----|----|---------------|
| 1½ x 1½                | 1½           | 11  | 6   | 5  | 3  | 3  | 3¾            |
| 2 x 2                  | 2            | 12  | 6¾  | 5½ | 3¾ | 3¾ | 3¾            |
| 3 x 3                  | 3            | 14½ | 8¾  | 6½ | 4  | 4  | 3¾            |
| 4 x 4                  | 4            | 17½ | 9¾  | 7½ | 5  | 5  | 3¾            |
| *6 x 6                 | 4            | 24  | 12¾ | 10 | 7  | 7  | 3¾            |

Traps available with either A or B type cleanout. See Standard Cleanouts.

### DRUM TRAP (top cleanout)

6576



TYPE A

TYPE B

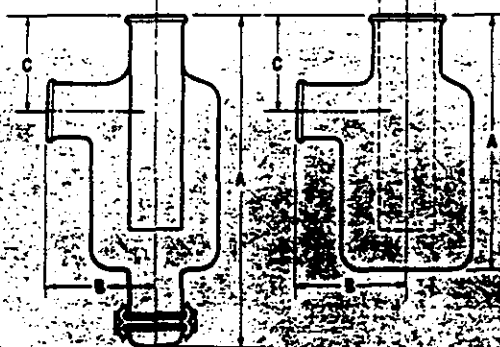
| Size<br>Inlet x Outlet | A   | B   | C  | D  | Body<br>I.D. | Seal<br>Depth |
|------------------------|-----|-----|----|----|--------------|---------------|
| *1½ x 1½               | 13¾ | 10½ | 4½ | 5¾ | 6            | 3             |

\*Special order

### PARTITION TRAP

6612

6614



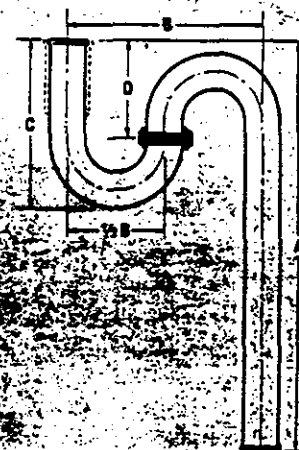
| Size<br>Inlet x Outlet | A   | B  | C  | Seal<br>Depth |
|------------------------|-----|----|----|---------------|
| 1½ x 1½                | 11¼ | 3¾ | 3¾ | 3¾            |
| 2 x 2                  | 12¼ | 5¼ | 4¼ | 3¾            |

| Size<br>Inlet x Outlet | A  | B  | C  |
|------------------------|----|----|----|
| 2 x 1½                 | 8¾ | 3¾ | 3¾ |

Both traps are non-siphoning with partition always visible.

### SWIVEL TRAP—S STYLE

6703

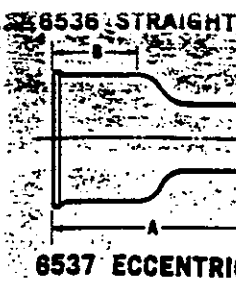


| Size<br>Inlet x Outlet | A   | B  | C  | D  | Seal<br>Depth |
|------------------------|-----|----|----|----|---------------|
| 1½ x 1½                | 20% | 10 | 8¾ | 5¾ | 4¾            |
| 2 x 1½                 | 20% | 10 | 8¾ | 5¾ | 4¾            |
| 2 x 2                  | 20% | 11 | 9¾ | 4¾ | 5¾            |

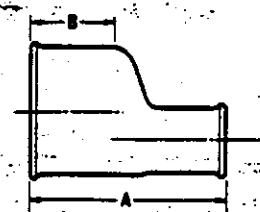
Traps available with either A or B type cleanout. See Standard Cleanouts. Annealed outlet, can be field cut.

# I KIMAX TEMPERED GLASS PRODUCTS

## Drainline PIPE AND FITTINGS



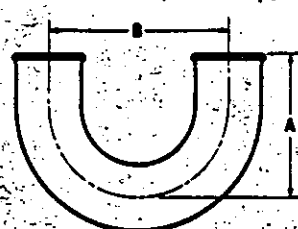
6537 ECCENTRIC



### REDUCERS OR INCREASERS

| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1½       |
| 3 x 1½ | 5 | 2½       |
| 3 x 2  | 5 | 2½       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

6550 U BEND (vent loop)



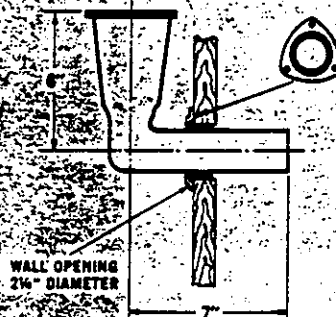
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

Note: U bends (annealed only) are often used for vent loops. No. 6552 outlets on Swivel "S" Traps are also used as vent loops.

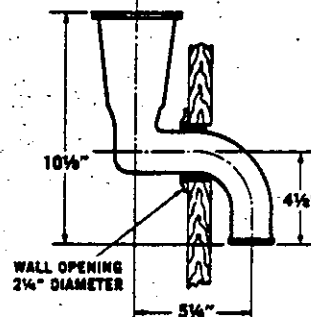
### CUP SINKS

Outside surface of cupsink bodies has an opaque white surface. No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1½) on outlet to connect to 2" expanded end traps or fittings.

6627 3" x 6" OVAL HORIZONTAL, 1½" PLAIN END OUTLET



6628 3" x 6" OVAL VERTICAL, 1½" OUTLET



### WALL MOUNTED CUP SINK

Horizontal Outlet:  
No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7158 2" flange  
No. 7204 insert (2 x 1½)

Vertical Outlet:  
No. 6628 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7158 2" flange  
No. 7204 insert (2 x 1½)

### 6617 BEADED OUTLET

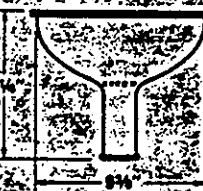


### 6617P PLAIN END OUTLET



### 6" HEMISPHERICAL

### 6618 BEADED OUTLET



### 6618P PLAIN END OUTLET

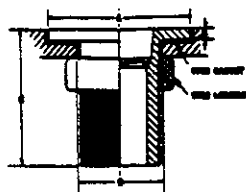


### 3" x 9" OVAL



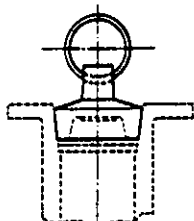


# 6720 SINK OUTLET ASSEMBLY (1½", 2", 3" sizes)



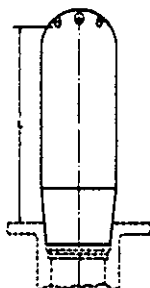
| Size | A  | B | C  | D  |
|------|----|---|----|----|
| 1½   | 3¾ | ¼ | 2¾ | 2  |
| 2    | 3¾ | ¼ | 3  | 2¾ |
| 3    | 4¾ | ½ | 3  | 3¾ |

## 6726 SINK STOPPER



No. 6726 Sink Stopper is available in 1½" and 2" size in lead; 3" size only in black fluorocarbon.

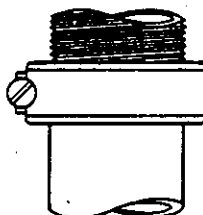
## 6727 SINK OVERFLOW (Beehive and Open Type)



Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" and 3" sink outlets only. 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length | Open Type Length |
|------------------|---------------------|------------------|
| 1½               | 4" 6" 8"            | —                |
| 2                | —                   | 4" 6" 8"         |
| 3                | —                   | 4" 6" 8"         |

## 6735 1½" SPLIT COUPLING (Threaded to Beaded Pipe)



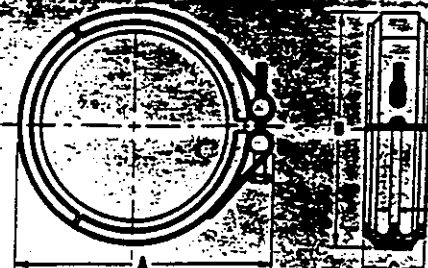
No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" metal pipe.

The assembly consists of:

- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

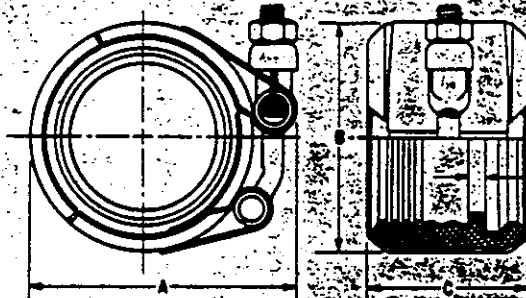
To install... remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

# 6650 DRAINLINE COUPLING (Bead to Bead)



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 2    | 3¾ | 3¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 3    | 4¾ | 4¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 4    | 6  | 5½ | 1¾ | ¾ | ¼-28 x 3¾ |
| 6    | 8¾ | 7¾ | 1¾ | ¾ | ¼-24 x 4" |

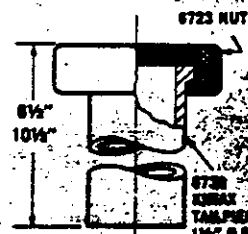
## 6661 B/P\* DRAINLINE COUPLING (Bead to Plain End)



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 2    | 3¾ | 3¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 3    | 4¾ | 4¾ | 2¾ | ¾ | ¼-24 x 4" |

\*Patent Pending

## 6728 1½" TAILPIECE ASSEMBLY



KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 plastic nut and a No. 6730 KIMAX tailpiece.

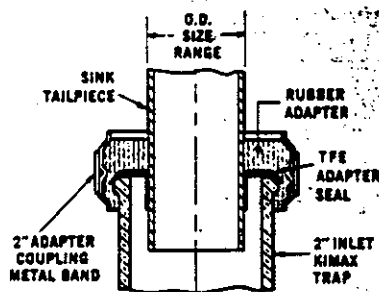
Note: This assembly can be used on other 1½" plastic or metal sink outlets having a 1½" threaded hole for metal outlet connections. See gasket No. 6738 between metal sink and plastic drain coupling (B/P). (B/P) Tailpiece branch.

## 6655 ADAPTER COUPLING Patent Pending

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt, ¼-28 x 2¾



| Size   | Tailpiece Style                                                                                                                                                               | Part Number |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                         | 6728-15153  |
| 2 x 1¾ | Lead, Class D or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                                 | 6728-15170  |
| 2 x 1½ | Plain end KIMAX Regular, Schedule 40 or Heavy Schedule 1½ glass pipe or fittings<br>Duriron #50-2<br>Duriron #11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 6728-15190  |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

OWENS-ILLINOIS

# **KIMAX** BEADED GLASS PROCESS PIPE

Owens-Illinois has developed KIMAX Beaded Glass Pipe to specifically answer the need for a process piping system that will contribute a minimum of contamination to the product conveyed. KIMAX Beaded Process Pipe is made of durable Type I borosilicate glass.

## **RECOMMENDED USES**

KIMAX Beaded Glass Pipe is specially recommended for use in piping system applications for the transportation of materials such as distilled water, milk, or corrosive liquids in the food or chemical processing industries. It is specifically designed for use wherever the transfer of fluids demands a sanitary corrosion resistant or visually inspected system.

## **ADVANTAGES**

- Corrosion Resistant
- Transparent
- Can be field fabricated
- Lightweight
- Pressure and high temperature rated
- Economical . . . easily installed and modified

## **INSTALLATION**

**LAYOUT** . . . of KIMAX Beaded Glass Pipe is similar to that of any other piping material. No allowance for expansion is necessary.

**PIPE HANGING** . . . is similar to other glass pipe with hanger spacing every 8 or 10 feet.

**NEW KIMAX COUPLINGS** . . . assures quick, simplified installation . . . positive seal joints. Developed specially for KIMAX Beaded Pipe which provides a positive compression, leak-proof seal.

For condensed listing of pipe, fittings, and accessories, turn to Page 13 and 14. For complete information, write for catalog on KIMAX Beaded Glass Pipe to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P. O. Box 1035, Toledo, Ohio 43601.



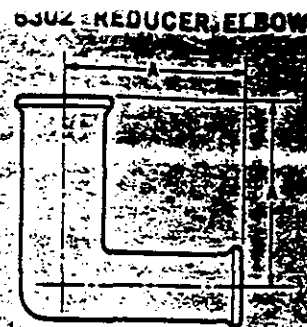
# **KIMAX**

## **TEMPERED**

## **GLASS**

## **PRODUCTS**

**Beaded Glass  
Process Pipe  
PIPE AND FITTINGS**



| Size        | A     | B     | C |
|-------------|-------|-------|---|
| 1/4x1/4     | 2 1/4 | 2 1/4 | 4 |
| 1/2x1/2     | 2 1/4 | 2 1/4 | 5 |
| 3/4x3/4     | 2 1/4 | 2 1/4 | 5 |
| 1x1         | 3 1/4 | 3 1/4 | 5 |
| 1 1/2x1 1/2 | 3 1/4 | 3 1/4 | 7 |
| 2x2         | 4     | 4     | 7 |
| 2 1/2x2 1/2 | 4     | 4     | 7 |
| 3x3         | 4     | 4     | 7 |

all reducer elbows are tempered

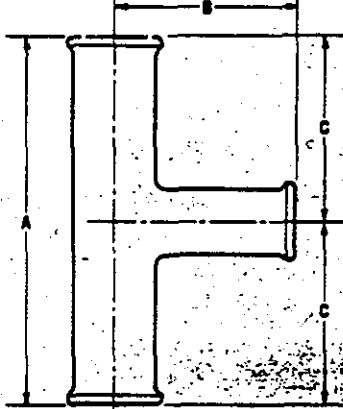
### 6310 STRAIGHT T



| Size  | A     | B     | C     |
|-------|-------|-------|-------|
| 1/4   | 4 1/4 | 2 1/4 | 2 1/4 |
| 1/2   | 5     | 2 1/4 | 2 1/4 |
| 3/4   | 5 1/4 | 2 1/4 | 2 1/4 |
| 1     | 7     | 3 1/4 | 3 1/4 |
| 1 1/2 | 8     | 4     | 4     |
| 2     | 10    | 5     | 5     |
| 3     | 14    | 7     | 7     |

all straight T fittings are tempered

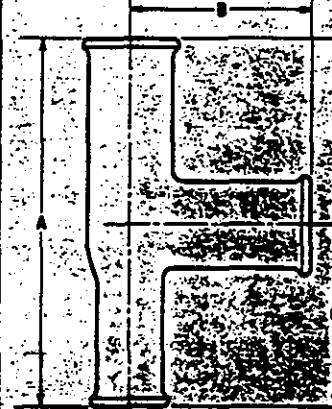
### 6311 REDUCING T



| Size        | A     | B     | C     |
|-------------|-------|-------|-------|
| 1/4x1/4     | 5     | 2 1/4 | 2 1/4 |
| 1/2x1/2     | 5 1/4 | 2 1/4 | 2 1/4 |
| 3/4x3/4     | 5 1/4 | 2 1/4 | 2 1/4 |
| 1x1         | 7     | 3 1/4 | 3 1/4 |
| 1 1/2x1 1/2 | 7     | 3 1/4 | 3 1/4 |
| 2x2         | 8     | 4     | 4     |
| 2 1/2x2 1/2 | 8     | 4     | 4     |
| 3x3         | 8     | 4     | 4     |
| 3 1/2x3 1/2 | 10    | 5     | 5     |
| 4x4         | 10    | 5     | 5     |
| 4 1/2x4 1/2 | 14    | 7     | 7     |
| 5x5         | 14    | 7     | 7     |
| 6x6         | 14    | 7     | 7     |

all T fittings are tempered

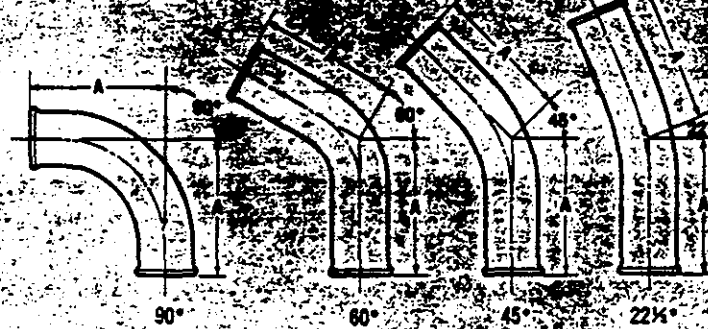
### 6312 REDUCING T (THROUGH)



| Size        | A     | B     | C     |
|-------------|-------|-------|-------|
| 1/4x1/4     | 5     | 2 1/4 | 2 1/4 |
| 1/2x1/2     | 5 1/4 | 2 1/4 | 2 1/4 |
| 3/4x3/4     | 5 1/4 | 2 1/4 | 2 1/4 |
| 1x1         | 7     | 3 1/4 | 3 1/4 |
| 1 1/2x1 1/2 | 7     | 3 1/4 | 3 1/4 |
| 2x2         | 8     | 4     | 4     |
| 2 1/2x2 1/2 | 8     | 4     | 4     |
| 3x3         | 8     | 4     | 4     |
| 3 1/2x3 1/2 | 10    | 5     | 5     |
| 4x4         | 10    | 5     | 5     |
| 4 1/2x4 1/2 | 14    | 7     | 7     |
| 5x5         | 14    | 7     | 7     |
| 6x6         | 14    | 7     | 7     |

all T fittings are tempered

### 6301 SWEEP ELBOW



| Size  | A     | B     | C     |
|-------|-------|-------|-------|
| 1/4   | 2 1/4 | 2 1/4 | 2 1/4 |
| 1/2   | 2 1/4 | 2 1/4 | 2 1/4 |
| 3/4   | 2 1/4 | 2 1/4 | 2 1/4 |
| 1     | 3 1/4 | 3 1/4 | 3 1/4 |
| 1 1/2 | 3 1/4 | 3 1/4 | 3 1/4 |
| 2     | 4     | 4     | 4     |
| 2 1/2 | 4     | 4     | 4     |
| 3     | 4     | 4     | 4     |
| 3 1/2 | 5     | 5     | 5     |
| 4     | 5     | 5     | 5     |
| 4 1/2 | 7     | 7     | 7     |
| 5     | 7     | 7     | 7     |

all sweep elbows are tempered

### 6300 STRAIGHT LENGTHS



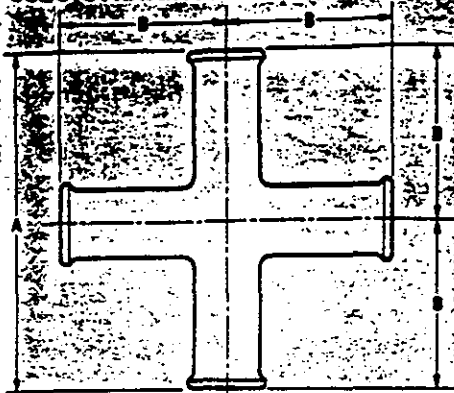
Straight lengths are tempered on ends only and available from stock in lengths shown. Special straight lengths, factory beaded, available on order at slightly higher cost per foot of pipe. For 1 1/2" and larger pipe see KIMAX Process Pipe Catalog No. TR-89.

| Size  | A     | B     |
|-------|-------|-------|
| 1/4   | 3 1/4 | 3 1/4 |
| 1/2   | 1 1/4 | 1 1/4 |
| 3/4   | 1 1/4 | 1 1/4 |
| 1     | 2 1/4 | 2 1/4 |
| 1 1/2 | 2 1/4 | 2 1/4 |
| 2     | 3 1/4 | 3 1/4 |
| 3     | 4     | 4     |

Special lengths are normally cut and beaded on the job by using a KIMAX BK-4 Beading Kit.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6320 STRAIGHT CROSS



| Size  | A     | B     |
|-------|-------|-------|
| 1/2   | 4 1/2 | 2 1/2 |
| 3/4   | 5     | 2 1/2 |
| 1     | 5 1/2 | 2 1/2 |
| 1 1/4 | 7     | 3 1/2 |
| 2     | 8     | 4     |
| 3     | 10    | 5     |
| 4     | 14    | 7     |

all cross fittings are tempered

### STRAIGHT REDUCER

6315

### ADAPTER

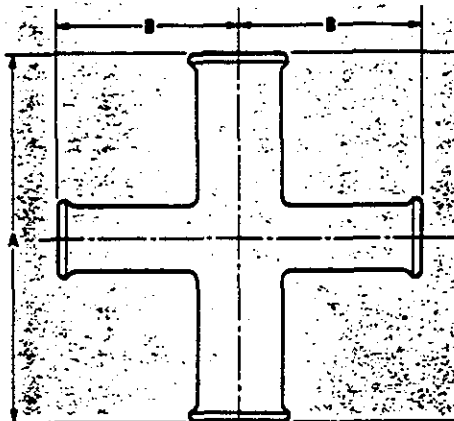
6366



| Size        | A |
|-------------|---|
| 1/2x1/2     | 4 |
| 1x1         | 4 |
| 1 1/4x1 1/4 | 4 |
| 2x2         | 5 |
| 3x3         | 7 |

all reducer fittings are tempered

### 6350 REDUCER CROSS

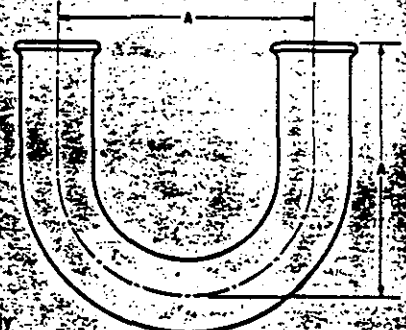


| Size        | A     | B     |
|-------------|-------|-------|
| 1/2x1/2     | 5     | 2 1/2 |
| 1x1         | 5 1/2 | 2 1/2 |
| 1 1/4x1 1/4 | 7     | 3 1/2 |
| 2x2         | 8     | 4     |
| 2 1/2x2 1/2 | 8     | 4     |
| 3x3         | 10    | 5     |
| 3 1/2x3 1/2 | 10    | 5     |
| 4x4         | 14    | 7     |
| 4 1/2x4 1/2 | 14    | 7     |
| 6x6         | 14    | 7     |

all cross fittings are tempered

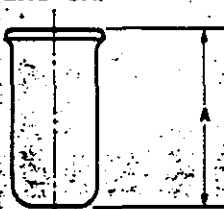
### 6365 U BEND

| Size  | A     |
|-------|-------|
| 1/2   | 2 1/2 |
| 3/4   | 2 1/2 |
| 1     | 4 1/2 |
| 1 1/4 | 7     |
| 2     | 7     |
| 3     | 9     |
| 4     | 12    |



all U Bends are annealed only

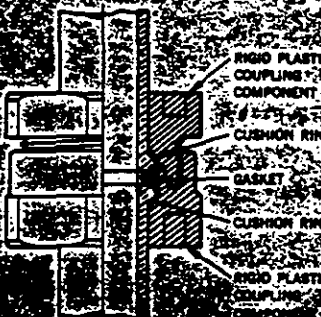
### 6336 END CAP



| Size  | A |
|-------|---|
| 1/2   | 2 |
| 3/4   | 2 |
| 1     | 2 |
| 1 1/4 | 2 |
| 2     | 2 |
| 3     | 2 |
| 4     | 2 |

ends and caps annealed only

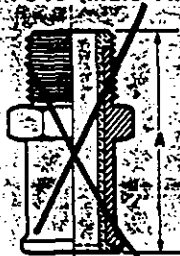
### 7300 COUPLING (For Pipe Sizes 1/2, 3/4, 1)



Of split nut design, the KIMAX all plastic coupling (patent applied for) assembly is complete with TFE gasket and moulded inserts. The coupling is rated at 100 PSI continuous service at 250°F.

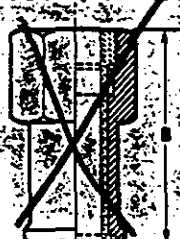
### ADAPTERS

#### 7345 (Male Threaded)



Glass pipe to standard pipe thread adapters. This fitting is used to convert standard pipe threads to a glass bead. Available in male or female taper thread style. Fittings are made of aluminum with TFE linings.

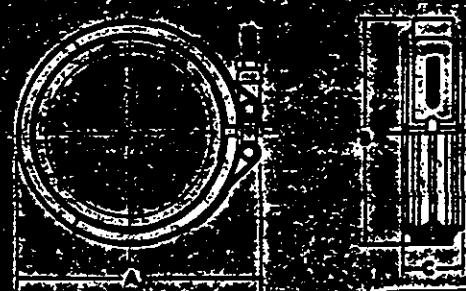
#### 7348 (Female Threaded)



| Size | A     | B     |
|------|-------|-------|
| 1/2  | 2 1/2 | 2 1/2 |
| 3/4  | 2 1/2 | 2 1/2 |

all conical end adapters are tempered

### 7120 COUPLING (Banded)



For use in joining 1/2, 3/4, 1, 1 1/4, 2, 3, and 4" KIMAX banded pipe. Assembly consists of a stainless steel band with TFE (fluoropolymer) elastomer O-ring (hydrofluorocarbon elastomer) pressure ring and TFE lining.

| Size  | A     | B     | C     |
|-------|-------|-------|-------|
| 1/2   | 2 1/2 | 2 1/2 | 1 1/2 |
| 3/4   | 2 1/2 | 2 1/2 | 1 1/2 |
| 1     | 3 1/2 | 3 1/2 | 1 1/2 |
| 1 1/4 | 4 1/2 | 4 1/2 | 1 1/2 |
| 2     | 5 1/2 | 5 1/2 | 1 1/2 |

See KIMAX Process Pipe Catalog No. TR-99 for flanges to connect conical ends to standard KIMAX Process Pipe.

Contact your KIMAX Distributor for availability of 1/2" and 3/4" banded couplings. Use catalog dimensions for piping layout as gasket thickness allowance is included.

# KIMAX TEMPERED GLASS CONICAL END PROCESS PIPE

## RECOMMENDED USES

KIMAX Glass Conical End Process Pipe has found wide application in a variety of industries. Some of the current users are chemical, food, dairy products, and pharmaceutical processors; textile, paper and pulp mills; photoengravers; aeronautical researchers and atomic energy plants.

## ADVANTAGES

**ADAPTABILITY** . . . readily joined to other materials including threaded pipe, straight tubing, beaded glass pipe, and glass lined steel.

**CORROSION RESISTANCE** . . . made of durable Type I borosilicate glass for maximum resistance to corrosion and scale build-up.

**DURABILITY** . . . all pipe ends and most fittings are tempered for maximum strength. Because of their shape, certain fittings cannot be tempered. Non-tempered items are stress relieved and are prominently marked so the installer may select the proper soft insert.

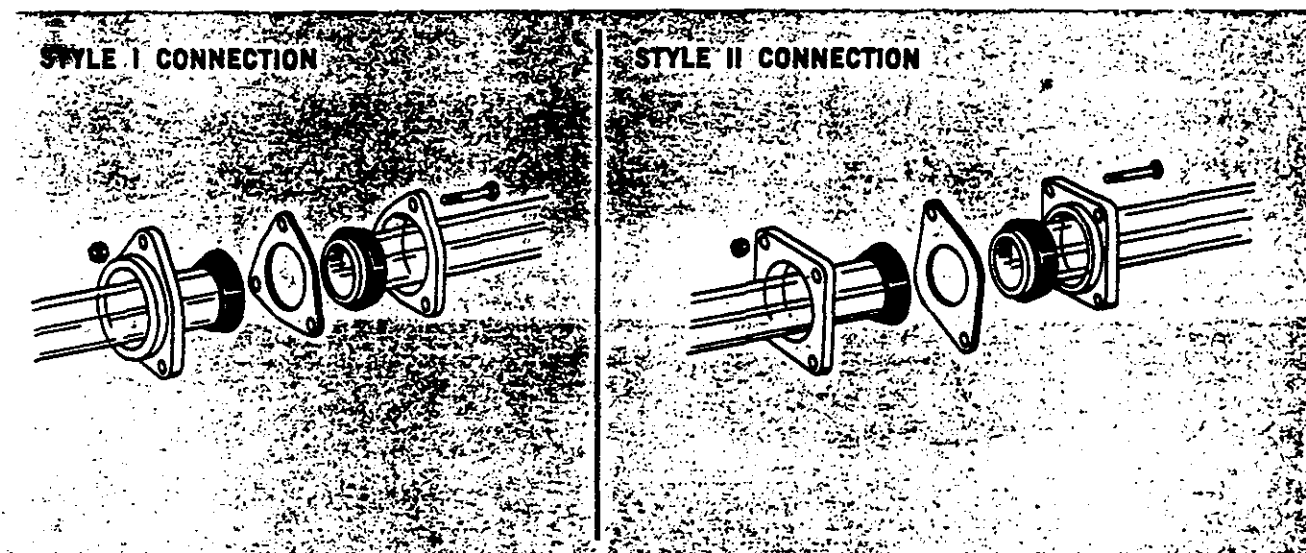
**ECONOMY** . . . Material is competitively priced . . . installation costs are low . . . maintenance costs negligible, and long service life of the total glass pipe system assured.

**LIGHTWEIGHT** . . . KIMAX Glass Process Pipe weighs less than other materials performing comparable functions. It requires fewer hangers; is easier to install.

**TRANSPARENCY** . . . is an aid in many processes such as inspection of dye lines and food lines, or wherever visual inspection is vital to product production or to the flow of liquids.

**PHYSICAL PROPERTIES** . . . See Physical and Chemical Properties Chart, Page 2.

For condensed listings of pipe, fittings and accessories, see Pages 16 thru 19. For complete KIMAX Process Pipe Catalog and/or Process Pipe Installation Manual, request same by writing to Owens-Illinois, Advertising and Sales Promotion Dept., C & T P Division, P. O. Box 1035, Toledo, Ohio 43601.



# **KIMAX** **TEMPERED** **GLASS** **PRODUCTS**

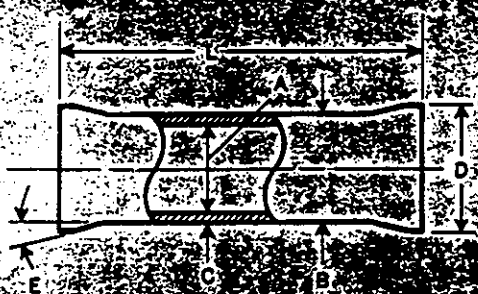
## *Process Pipe* **PIPE AND FITTINGS**

### 6210 TEES



| Pipe Size<br>(Inches) | A<br>(± 1/4 in.) |
|-----------------------|------------------|
| 1-2                   | 2 3/4            |
| 2 1/2                 | 3 3/4            |
| 3                     | 4                |
| 4                     | 5                |
| 5                     | 7                |
| 6                     | 9                |

### 6100 STRAIGHT LENGTHS

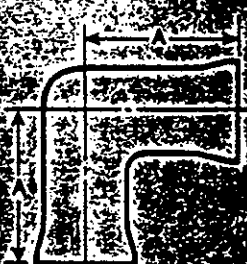


Standard lengths in all diameters are 6", 12", 18", 24", 30", 48", 60", 72", 84", 96", 108", and 120". Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is ± 1/4".

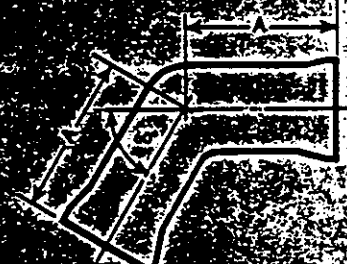
| A<br>Pipe Size<br>Nom. I.D. | B<br>Pipe<br>O.D. | C<br>Wall<br>Thick. | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | F<br>Min.<br>Length | Weight<br>Lbs./Ft. | Ps.<br>Recom.<br>Pressure |
|-----------------------------|-------------------|---------------------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                          | 1.313             | .156                | 2 1/4               | 12°                  | 3"                  | .60                | 55                        |
| 1 1/4"                      | 1.844             | .172                | 3 1/4               | 12°                  | 3 3/4"              | 1.0                | 55                        |
| 2"                          | 2.344             | .172                | 4 1/4               | 12°                  | 4"                  | 1.13               | 55                        |
| 3"                          | 3.408             | .203                | 6 3/4               | 12°                  | 5"                  | 2.0                | 55                        |
| 4"                          | 4.530             | .265                | 8 1/2               | 21°                  | 6"                  | 3.4                | 35                        |
| 6"                          | 6.656             | .328                | 12 1/2              | 21°                  | 8"                  | 6.3                | 20                        |

When ordering, specify pipe I.D. and length in inches.

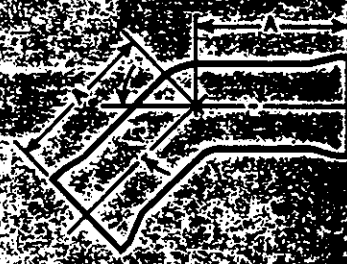
### 6201 ELBOWS



90° ELBOWS



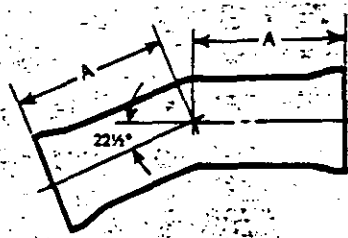
60° ELBOWS



45° ELBOWS

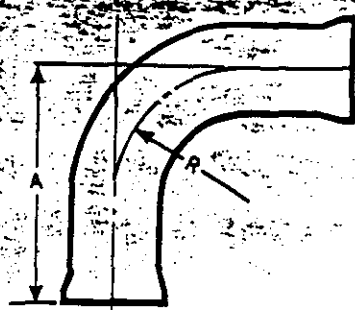
| Pipe Size<br>(Inches) | A<br>(± 1/4 in.) |
|-----------------------|------------------|
| 1                     | 2 3/4            |
| 1 1/4                 | 3 3/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

When ordering, specify degree of angle.



6201 22 1/2° ELBOWS

| Pipe Size<br>(Inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 3/4            |
| 1 1/2                 | 3 3/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

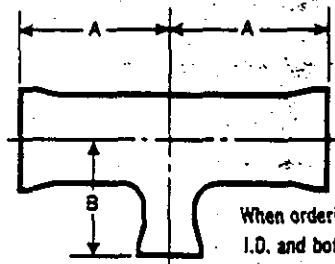


6239 SWEEP ELBOWS

| Pipe Size<br>(Inches) | A<br>(± 1/8 in.) | R<br>(± 1/8 in.) |
|-----------------------|------------------|------------------|
| 1                     | 4 3/4            | 2 3/4            |
| 1 1/2                 | 5                | 3 3/4            |
| 2                     | 6                | 3 3/4            |
| 3                     | 7                | 4 3/4            |
| 4                     | 10               | 6                |

When ordering, specify degree of angle.

6211 REDUCING TEES

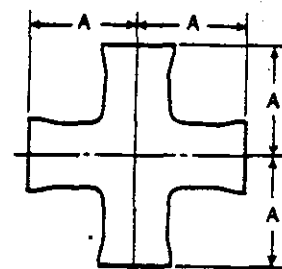


When ordering, specify pipe  
I.D. and bottom leg I.D.

| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|-----------------------|------------------------|------------------|------------------|
| 1 1/2                 | 1                      | 3 3/4            | 3                |
| 2                     | 1                      | 4                | 3                |
| 2                     | 1 1/2                  | 4                | 3 3/4            |
| 3                     | 1                      | 5                | 3 3/4            |
| 3                     | 1 1/2                  | 5                | 4                |
| 3                     | 2                      | 5                | 4 1/4            |
| 4                     | 1                      | 7                | 4                |
| 4                     | 1 1/2                  | 7                | 4 1/4            |
| 4                     | 2                      | 7                | 5                |
| 4                     | 3                      | 7                | 5 1/4            |
| 6                     | 1                      | 9                | 5                |
| 6                     | 1 1/2                  | 9                | 5 1/4            |
| 6                     | 2                      | 9                | 6                |
| 6                     | 3                      | 9                | 6 1/4            |
| 6                     | 4                      | 9                | 8                |

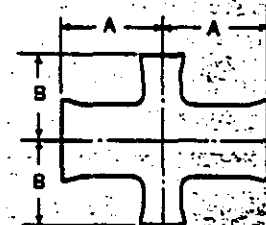
Other reduction combinations are available on special order to customer's specifications.

6220 CROSSES



| Pipe Size<br>(Inches) | A<br>(± 1/8 in.) |
|-----------------------|------------------|
| 1                     | 2 3/4            |
| 1 1/2                 | 3 3/4            |
| 2                     | 4                |
| 3                     | 5                |
| 4                     | 7                |
| 6                     | 9                |

6250 REDUCER CROSSES



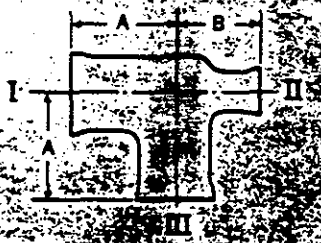
| Pipe Size<br>(Inches) | Branch Size<br>(Inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|-----------------------|-------------------------|------------------|------------------|
| 1 1/2                 | 1                       | 3 3/4            | 3                |
| 2                     | 1                       | 4                | 3                |
| 2                     | 1 1/2                   | 4 1/4            | 3 3/4            |
| 3                     | 1                       | 5                | 3 3/4            |
| 3                     | 1 1/2                   | 5                | 4                |
| 3                     | 2                       | 5                | 4 1/4            |
| 4                     | 1                       | 7                | 4                |
| 4                     | 1 1/2                   | 7 1/4            | 4 1/4            |
| 4                     | 2                       | 7 1/4            | 5                |
| 4                     | 3                       | 7                | 5 1/4            |
| 6                     | 1                       | 9                | 5                |
| 6                     | 1 1/2                   | 9                | 5 1/4            |
| 6                     | 2                       | 9                | 6                |
| 6                     | 3                       | 9                | 6 1/4            |
| 6                     | 4                       | 9                | 8                |

Other reduction combinations are available on special order to customer's specifications.

When ordering, specify I.D. of pipe and branch.

6212 REDUCER TEES

When ordering, specify pipe I.D.  
in this order; I, II, and III.



| I<br>Pipe Size<br>(Inches) | II<br>Pipe Size<br>(Inches) | III<br>Pipe Size<br>(Inches) | A<br>(± 1/8 in.) | B<br>(± 1/8 in.) |
|----------------------------|-----------------------------|------------------------------|------------------|------------------|
| 1 1/2                      | 1                           | 1 1/2                        | 3 3/4            | 3                |
| 2                          | 1                           | 2                            | 4                | 3                |
| 2                          | 1 1/2                       | 2                            | 4                | 3 3/4            |
| 3                          | 1                           | 3                            | 5                | 3 3/4            |
| 3                          | 1 1/2                       | 3                            | 5                | 4                |
| 3                          | 2                           | 3                            | 5                | 4 1/4            |
| 4                          | 1                           | 4                            | 7                | 4                |
| 4                          | 1 1/2                       | 4                            | 7                | 4 1/4            |
| 4                          | 2                           | 4                            | 7                | 5                |
| 4                          | 3                           | 4                            | 7                | 5 1/4            |
| 6                          | 1                           | 6                            | 9                | 5                |
| 6                          | 1 1/2                       | 6                            | 9                | 5 1/4            |
| 6                          | 2                           | 6                            | 9                | 6                |
| 6                          | 3                           | 6                            | 9                | 6 1/4            |
| 6                          | 4                           | 6                            | 9                | 8                |

Other reduction combinations are available on special order to customer's specifications.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

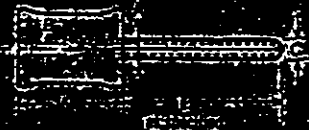




# Process Pipe

## PIPE AND FITTINGS

6292  
SINGLE END

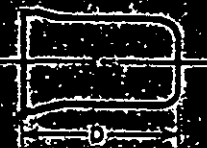


**6295**  
**DOUBLE-END**

The monomer yields from the polymerization and the monomer yields from the polymerization of the monomer (1) are shown in Table 1. The monomer yields from the polymerization of the monomer (1) are shown in Table 1.

| 10-15-74<br>Frank | 10-16-74<br>Gill<br>Frank | 10-17-74<br>Frank | 10-18-74<br>Frank |
|-------------------|---------------------------|-------------------|-------------------|
| 10-19-74<br>Frank | 10-20-74<br>Frank         | 10-21-74<br>Frank | 10-22-74<br>Frank |
| 10-23-74<br>Frank | 10-24-74<br>Frank         | 10-25-74<br>Frank | 10-26-74<br>Frank |
| 10-27-74<br>Frank | 10-28-74<br>Frank         | 10-29-74<br>Frank | 10-30-74<br>Frank |
| 10-31-74<br>Frank | 11-1-74<br>Frank          | 11-2-74<br>Frank  | 11-3-74<br>Frank  |
| 11-4-74<br>Frank  | 11-5-74<br>Frank          | 11-6-74<br>Frank  | 11-7-74<br>Frank  |
| 11-8-74<br>Frank  | 11-9-74<br>Frank          | 11-10-74<br>Frank | 11-11-74<br>Frank |
| 11-12-74<br>Frank | 11-13-74<br>Frank         | 11-14-74<br>Frank | 11-15-74<br>Frank |
| 11-16-74<br>Frank | 11-17-74<br>Frank         | 11-18-74<br>Frank | 11-19-74<br>Frank |
| 11-20-74<br>Frank | 11-21-74<br>Frank         | 11-22-74<br>Frank | 11-23-74<br>Frank |
| 11-24-74<br>Frank | 11-25-74<br>Frank         | 11-26-74<br>Frank | 11-27-74<br>Frank |
| 11-28-74<br>Frank | 11-29-74<br>Frank         | 11-30-74<br>Frank | 12-1-74<br>Frank  |
| 12-2-74<br>Frank  | 12-3-74<br>Frank          | 12-4-74<br>Frank  | 12-5-74<br>Frank  |
| 12-6-74<br>Frank  | 12-7-74<br>Frank          | 12-8-74<br>Frank  | 12-9-74<br>Frank  |
| 12-10-74<br>Frank | 12-11-74<br>Frank         | 12-12-74<br>Frank | 12-13-74<br>Frank |
| 12-14-74<br>Frank | 12-15-74<br>Frank         | 12-16-74<br>Frank | 12-17-74<br>Frank |
| 12-18-74<br>Frank | 12-19-74<br>Frank         | 12-20-74<br>Frank | 12-21-74<br>Frank |
| 12-22-74<br>Frank | 12-23-74<br>Frank         | 12-24-74<br>Frank | 12-25-74<br>Frank |
| 12-26-74<br>Frank | 12-27-74<br>Frank         | 12-28-74<br>Frank | 12-29-74<br>Frank |
| 12-30-74<br>Frank | 12-31-74<br>Frank         | 1-1-75<br>Frank   | 1-2-75<br>Frank   |
| 1-3-75<br>Frank   | 1-4-75<br>Frank           | 1-5-75<br>Frank   | 1-6-75<br>Frank   |
| 1-7-75<br>Frank   | 1-8-75<br>Frank           | 1-9-75<br>Frank   | 1-10-75<br>Frank  |
| 1-11-75<br>Frank  | 1-12-75<br>Frank          | 1-13-75<br>Frank  | 1-14-75<br>Frank  |
| 1-15-75<br>Frank  | 1-16-75<br>Frank          | 1-17-75<br>Frank  | 1-18-75<br>Frank  |
| 1-19-75<br>Frank  | 1-20-75<br>Frank          | 1-21-75<br>Frank  | 1-22-75<br>Frank  |
| 1-23-75<br>Frank  | 1-24-75<br>Frank          | 1-25-75<br>Frank  | 1-26-75<br>Frank  |
| 1-27-75<br>Frank  | 1-28-75<br>Frank          | 1-29-75<br>Frank  | 1-30-75<br>Frank  |
| 1-31-75<br>Frank  | 2-1-75<br>Frank           | 2-2-75<br>Frank   | 2-3-75<br>Frank   |
| 2-4-75<br>Frank   | 2-5-75<br>Frank           | 2-6-75<br>Frank   | 2-7-75<br>Frank   |
| 2-8-75<br>Frank   | 2-9-75<br>Frank           | 2-10-75<br>Frank  | 2-11-75<br>Frank  |
| 2-12-75<br>Frank  | 2-13-75<br>Frank          | 2-14-75<br>Frank  | 2-15-75<br>Frank  |
| 2-16-75<br>Frank  | 2-17-75<br>Frank          | 2-18-75<br>Frank  | 2-19-75<br>Frank  |
| 2-20-75<br>Frank  | 2-21-75<br>Frank          | 2-22-75<br>Frank  | 2-23-75<br>Frank  |
| 2-24-75<br>Frank  | 2-25-75<br>Frank          | 2-26-75<br>Frank  | 2-27-75<br>Frank  |
| 2-28-75<br>Frank  | 2-29-75<br>Frank          | 2-30-75<br>Frank  | 3-1-75<br>Frank   |
| 3-2-75<br>Frank   | 3-3-75<br>Frank           | 3-4-75<br>Frank   | 3-5-75<br>Frank   |
| 3-6-75<br>Frank   | 3-7-75<br>Frank           | 3-8-75<br>Frank   | 3-9-75<br>Frank   |
| 3-10-75<br>Frank  | 3-11-75<br>Frank          | 3-12-75<br>Frank  | 3-13-75<br>Frank  |
| 3-14-75<br>Frank  | 3-15-75<br>Frank          | 3-16-75<br>Frank  | 3-17-75<br>Frank  |
| 3-18-75<br>Frank  | 3-19-75<br>Frank          | 3-20-75<br>Frank  | 3-21-75<br>Frank  |
| 3-22-75<br>Frank  | 3-23-75<br>Frank          | 3-24-75<br>Frank  | 3-25-75<br>Frank  |
| 3-26-75<br>Frank  | 3-27-75<br>Frank          | 3-28-75<br>Frank  | 3-29-75<br>Frank  |
| 3-30-75<br>Frank  | 3-31-75<br>Frank          | 4-1-75<br>Frank   | 4-2-75<br>Frank   |
| 4-3-75<br>Frank   | 4-4-75<br>Frank           | 4-5-75<br>Frank   | 4-6-75<br>Frank   |
| 4-7-75<br>Frank   | 4-8-75<br>Frank           | 4-9-75<br>Frank   | 4-10-75<br>Frank  |
| 4-11-75<br>Frank  | 4-12-75<br>Frank          | 4-13-75<br>Frank  | 4-14-75<br>Frank  |
| 4-15-75<br>Frank  | 4-16-75<br>Frank          | 4-17-75<br>Frank  | 4-18-75<br>Frank  |
| 4-19-75<br>Frank  | 4-20-75<br>Frank          | 4-21-75<br>Frank  | 4-22-75<br>Frank  |
| 4-23-75<br>Frank  | 4-24-75<br>Frank          | 4-25-75<br>Frank  | 4-26-75<br>Frank  |
| 4-27-75<br>Frank  | 4-28-75<br>Frank          | 4-29-75<br>Frank  | 4-30-75<br>Frank  |
| 4-31-75<br>Frank  | 5-1-75<br>Frank           | 5-2-75<br>Frank   | 5-3-75<br>Frank   |
| 5-4-75<br>Frank   | 5-5-75<br>Frank           | 5-6-75<br>Frank   | 5-7-75<br>Frank   |
| 5-8-75<br>Frank   | 5-9-75<br>Frank           | 5-10-75<br>Frank  | 5-11-75<br>Frank  |
| 5-12-75<br>Frank  | 5-13-75<br>Frank          | 5-14-75<br>Frank  | 5-15-75<br>Frank  |
| 5-16-75<br>Frank  | 5-17-75<br>Frank          | 5-18-75<br>Frank  | 5-19-75<br>Frank  |
| 5-20-75<br>Frank  | 5-21-75<br>Frank          | 5-22-75<br>Frank  | 5-23-75<br>Frank  |
| 5-24-75<br>Frank  | 5-25-75<br>Frank          | 5-26-75<br>Frank  | 5-27-75<br>Frank  |
| 5-28-75<br>Frank  | 5-29-75<br>Frank          | 5-30-75<br>Frank  | 5-31-75<br>Frank  |
| 6-1-75<br>Frank   | 6-2-75<br>Frank           | 6-3-75<br>Frank   | 6-4-75<br>Frank   |
| 6-5-75<br>Frank   | 6-6-75<br>Frank           | 6-7-75<br>Frank   | 6-8-75<br>Frank   |
| 6-9-75<br>Frank   | 6-10-75<br>Frank          | 6-11-75<br>Frank  | 6-12-75<br>Frank  |
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| 6-17-75<br>Frank  | 6-18-75<br>Frank          | 6-19-75<br>Frank  | 6-20-75<br>Frank  |
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| 11-20-76<br>Frank | 11-21-76<br>Frank         |                   |                   |

U.S. GPO: 1967-0-280-733

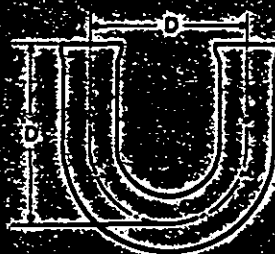


| Product | Unit  |
|---------|-------|
| 1000    | 1000  |
| 2000    | 2000  |
| 3000    | 3000  |
| 4000    | 4000  |
| 5000    | 5000  |
| 6000    | 6000  |
| 7000    | 7000  |
| 8000    | 8000  |
| 9000    | 9000  |
| 10000   | 10000 |

| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | L<br>(± 1/2 in.) |
|-----------------------|------------------------|------------------|
| 1 1/2                 | 1                      | 4                |
| 2                     | 1 1/2                  | 4                |
| 3                     | 2 1/2                  | 3                |
| 4                     | 3 1/2                  | 7                |
| 6                     | 4 3/4, 2 1/2 or 2      | 9                |

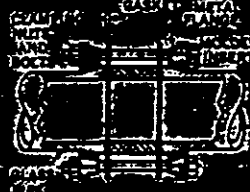
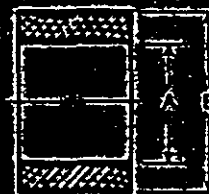
| Pipe Size<br>(Inches) | Reduced To<br>5 (Inches) | Min.<br>(Inches) | D<br>(Inches) |
|-----------------------|--------------------------|------------------|---------------|
| 1½                    | 2                        | 1½               | 4             |
| 2                     | 2 ¼ or 1½                | 1¾               | 5             |
| 3                     | 2 ½ or 1¾                | 1½               | 5 ½           |
| 4                     | 3: 2 ½ or 1¾             | 3                | 6             |
| 6                     | 4: 3 or 2                | 3                | 9             |

Use soft strip asbestos inserts (7202) only, with this fitting.



| Pipe Size<br>(Inches) | $\frac{D}{4}$ |
|-----------------------|---------------|
| 1                     | 3             |
| 1 1/2                 | 7             |
| 2                     | 7             |
| 3                     | 0             |
| 4                     | 0             |

Strapline spacers offer simple way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are 1/4", 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4", and 5". Other lengths available on special order. Annealed only.



### Typical Spacer Assembly:

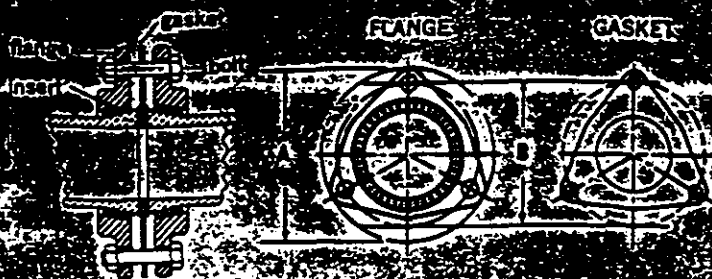
| 1<br>Pen Size<br>(Inches) | 1<br>Pen Size<br>(Inches) |
|---------------------------|---------------------------|
| 11                        | 11                        |
| 12                        | 12                        |
| 13                        | 13                        |
| 14                        | 14                        |
| 15                        | 15                        |
| 16                        | 16                        |
| 17                        | 17                        |
| 18                        | 18                        |
| 19                        | 19                        |
| 20                        | 20                        |
| 21                        | 21                        |
| 22                        | 22                        |
| 23                        | 23                        |
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| 31                        | 31                        |
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| 38                        | 38                        |
| 39                        | 39                        |
| 40                        | 40                        |
| 41                        | 41                        |
| 42                        | 42                        |
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| 47                        | 47                        |
| 48                        | 48                        |
| 49                        | 49                        |
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| 91                        | 91                        |
| 92                        | 92                        |
| 93                        | 93                        |
| 94                        | 94                        |
| 95                        | 95                        |
| 96                        | 96                        |
| 97                        | 97                        |
| 98                        | 98                        |
| 99                        | 99                        |
| 100                       | 100                       |

10. Use in filling out lines where some degree of plating is required. Sold as:  
22 parts of 1013 only; 2 Annealed only; 2 Other; lengths available on special order.



| A<br>Finger<br>(Index) | B<br>Finger<br>(Index) | C<br>Finger<br>(Index) |
|------------------------|------------------------|------------------------|
| 11                     | 12                     | 13                     |
| 12                     | 13                     | 14                     |
| 13                     | 14                     | 15                     |
| 14                     | 15                     | 16                     |
| 15                     | 16                     | 17                     |

# FLANGES, GASKETS AND ACCESSORIES

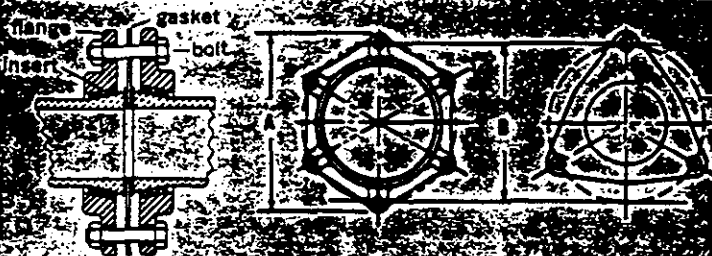


## FLANGE SET NO. 7100, 1 1/2" AND 2" I.D.

STYLE I Aluminum Set contains the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 3—7180 Aluminum Bolts and Nuts

| Pipe Size | A     | D     | Bolt Size |
|-----------|-------|-------|-----------|
| 1 1/2     | 3 1/2 | 2 1/2 | 3/8"      |
| 2         | 4 1/2 | 3 1/2 | 3/8"      |
| 2 1/2     | 5 1/2 | 4 1/2 | 3/8"      |

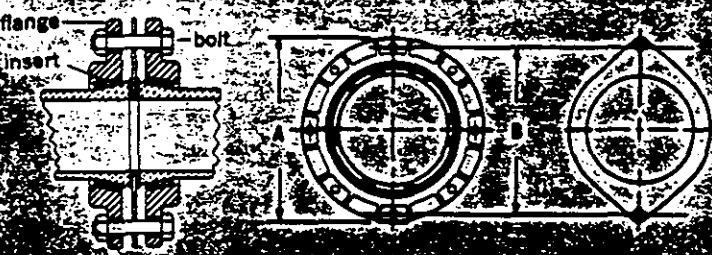


## FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contains the following components:

- 2—7150 Aluminum Flanges
- 2—7200 Neoprene Asbestos Inserts
- 6—7180 Aluminum Bolts and Nuts

| Pipe Size | A | D     | Bolt Size |
|-----------|---|-------|-----------|
| 3         | 6 | 5 1/2 | 3/8"      |



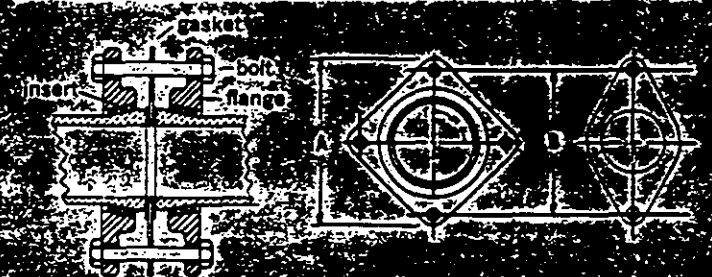
## FLANGE SET NO. 7100, 4" AND 6" I.D.

STYLE I Aluminum Set contains the following components:

- 2—7151 Aluminum Outer Flanges
- 2—7153 Aluminum Inner Rings with 7202 Insert cemented in place
- 8—7180 Aluminum Bolts and Nuts

| Pipe Size | A      | D     | Bolt Size |
|-----------|--------|-------|-----------|
| 4         | 8 1/2  | 7 1/4 | 3/8"      |
| 6         | 10 1/2 | 9 1/4 | 3/8"      |

May be ordered separately as: No. 7150 Flange Assembly containing one (1) Outer Flange and one (1) 7153 Inner Ring.

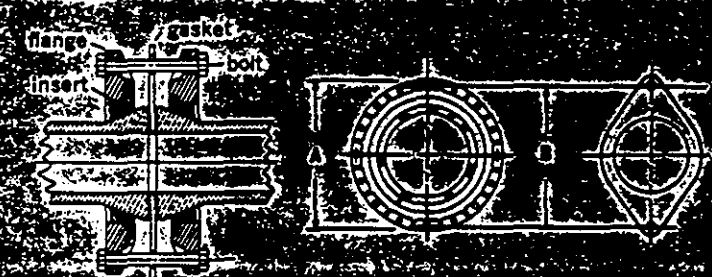


## FLANGE SET NO. 7105, 1 1/2" AND 2" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7155 Cast Iron Flanges
- 2—7200 Neoprene Asbestos Inserts
- 4—7190 Steel Bolts and Nuts

| Pipe Size | A     | D     | Bolt Size |
|-----------|-------|-------|-----------|
| 1 1/2     | 3 1/2 | 2 1/2 | 3/8"      |
| 2         | 4 1/2 | 3 1/2 | 3/8"      |
| 2 1/2     | 5 1/2 | 4 1/2 | 3/8"      |
| 3         | 6 1/2 | 5 1/2 | 3/8"      |



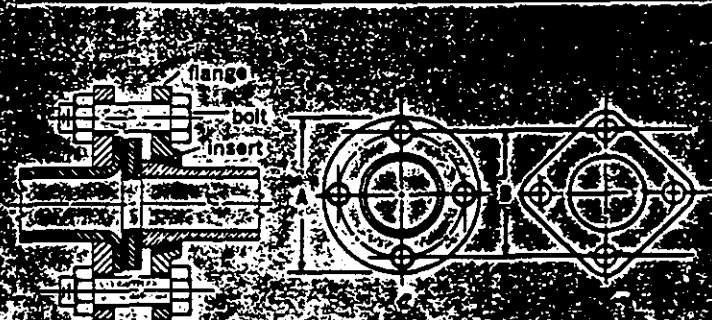
## FLANGE SET NO. 7105, 4" AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2—7155 Cast Iron Flanges
- 2—7156 Cast Iron Inner Rings with 7202 Insert cemented in place
- 4—7190 Steel Bolts and Nuts

| Pipe Size | A      | D     | Bolt Size |
|-----------|--------|-------|-----------|
| 4         | 8 1/2  | 7 1/4 | 3/8"      |
| 6         | 10 1/2 | 9 1/4 | 3/8"      |

May be ordered separately as: No. 7155 Flange Assembly containing one (1) Outer Flange and one (1) 7156 Inner Ring.

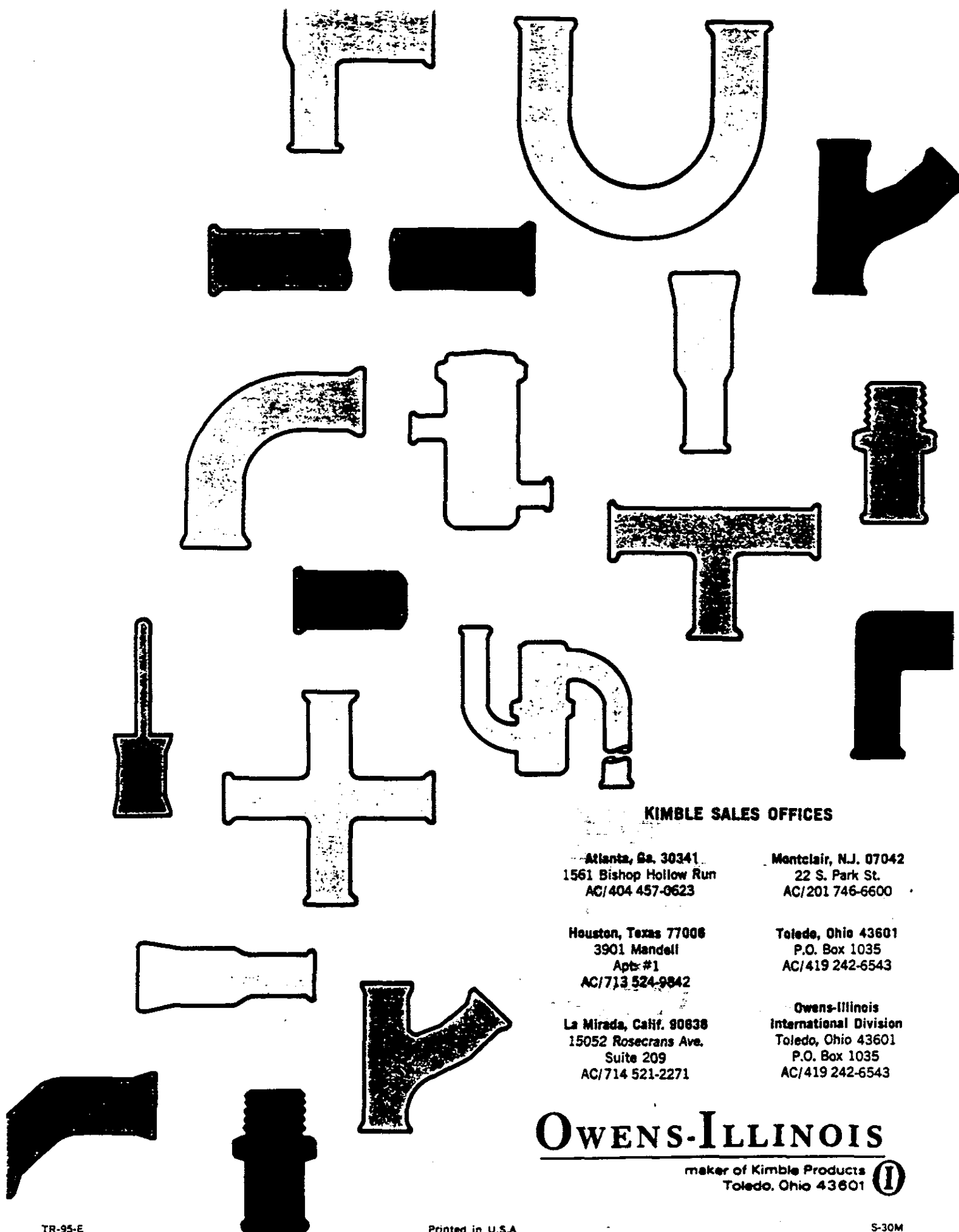


## ASME ADAPTER FLANGE NO. 7110, 1 1/2" AND 2" I.D.

ASME Flange sets contain the following components:

- 2—7200 for Carbon Steel Flanges
- 2—7202 for Carbon Steel Flanges
- 2—7203 for Carbon Steel Flanges

| Pipe Size | A     | D     | Bolt Size |
|-----------|-------|-------|-----------|
| 1 1/2     | 3 1/2 | 2 1/2 | 3/8"      |
| 2         | 4 1/2 | 3 1/2 | 3/8"      |
| 2 1/2     | 5 1/2 | 4 1/2 | 3/8"      |
| 3         | 6 1/2 | 5 1/2 | 3/8"      |



#### KIMBLE SALES OFFICES

Atlanta, Ga. 30341  
1561 Bishop Hollow Run  
AC/404 457-0623

Montclair, N.J. 07042  
22 S. Park St.  
AC/201 746-6600

Houston, Texas 77006  
3901 Mandell  
Apt. #1  
AC/713 524-9842

Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

La Mirada, Calif. 90638  
15052 Rosecrans Ave.  
Suite 209  
AC/714 521-2271

Owens-Illinois  
International Division  
Toledo, Ohio 43601  
P.O. Box 1035  
AC/419 242-6543

## OWENS-ILLINOIS

maker of Kimble Products   
Toledo, Ohio 43601

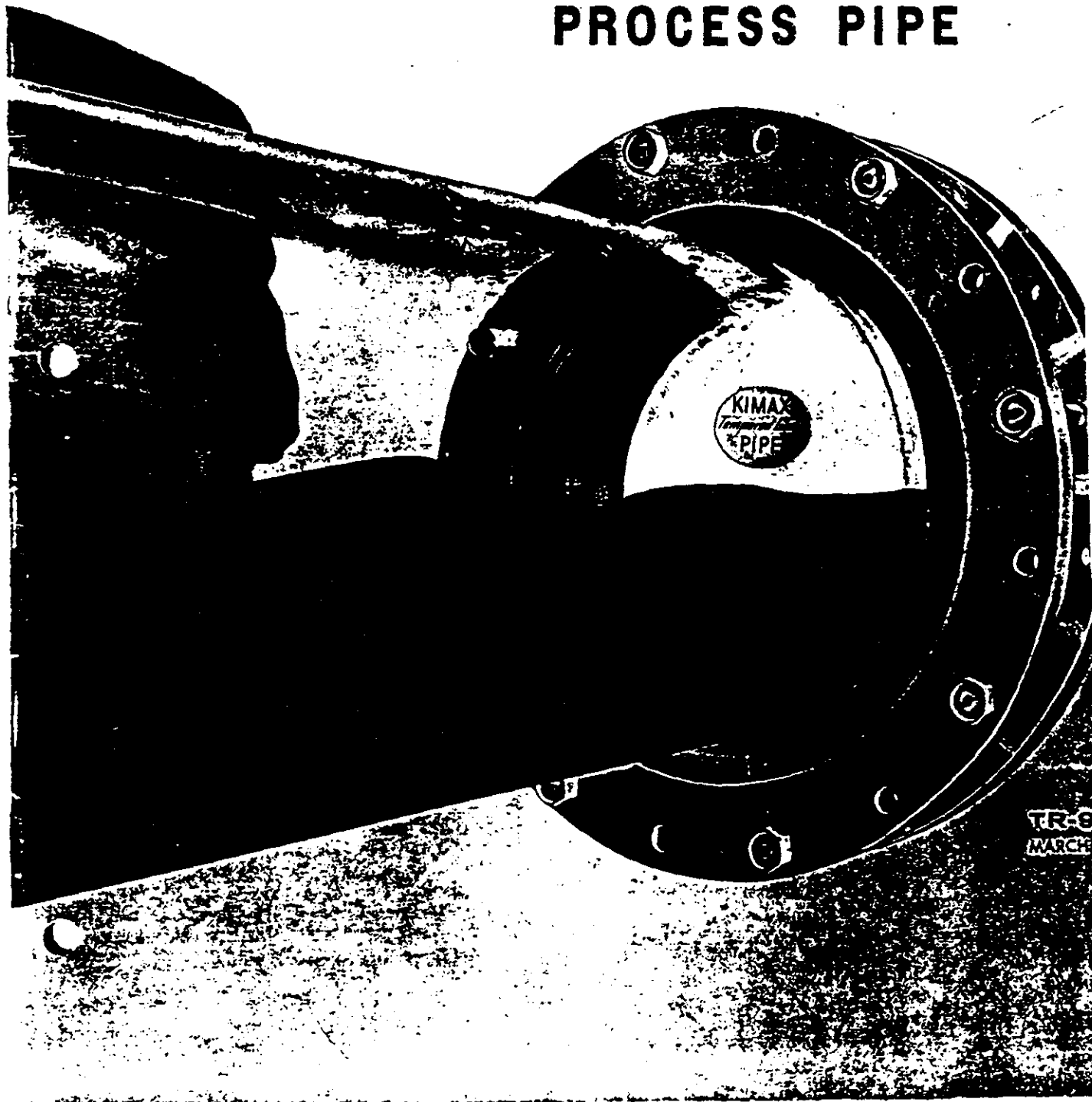


**OWENS-ILLINOIS**

**KIMAX<sup>®</sup>**

**tempered glass**

**PROCESS PIPE**



**TR-9**  
**MARCH**



# OWENS-ILLINOIS

GENERAL OFFICES • TOLEDO 1, OHIO

## BRANCH SALES OFFICES

Boston 16, Mass.  
1206 Statler Office Bldg.  
Phone: 482-9085

Chicago 6, Ill.  
20 N. Wacker Drive  
Phone: 782-6090

Detroit 2, Mich.  
5-207 General Motors Bldg.  
Phone: 872-0812

Indianapolis 2, Ind.  
1800 N. Meridian St.  
Phone: 925-8110

Los Angeles 5, Calif.  
3461 W. 8th St.  
Phone: 385-3471

Montclair, N. J.  
22 S. Park St.  
Phone: 746-6600

Philadelphia 7, Pa.  
12 S. 12th St.  
Phone: 922-2538

Pittsburgh 28, Pa.  
300 Cedar Blvd.  
Phone: 563-4042

KIMAX Tempered Glass Pipe is manufactured and  
sold by the Consumer and Technical Products Division.

## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

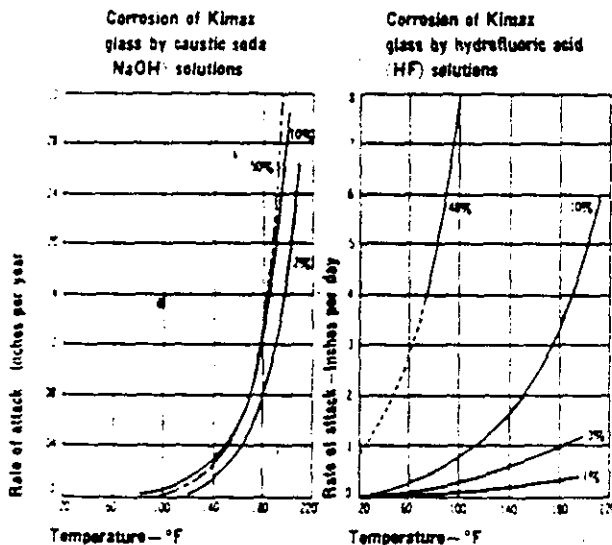
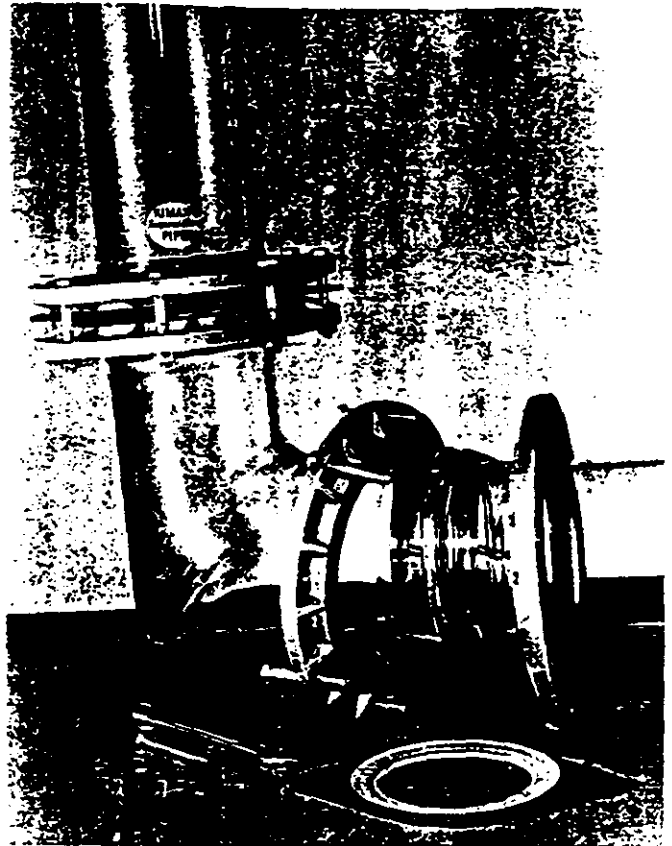
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

**Economy** is inherent in KIMAX glass pipe systems. Material is competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.



This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from such causes, Owens-Illinois will, in full discharge of this warranty, replace such pipe at no charge.

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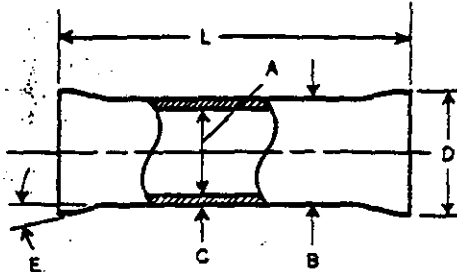
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# KIMAX GLASS PIPE AND FITTINGS

## STRAIGHT LENGTHS 6100

Standard lengths in all diameters are 6"; 12"; 18"; 24"; 30"; 48"; 60"; 72"; 84"; 96"; 108"; and 120".

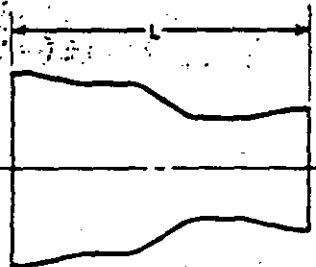
Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is  $\pm \frac{1}{32}$ ".



| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs./Ft. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | .156"     | 1 1/16"             | 12°                  | 3"                  | .60                | 55                        |
| 1 1/2"                        | 1.844"            | .172"     | 2 1/4"              | 12°                  | 3 1/2"              | 1.0                | 55                        |
| 2"                            | 2.344"            | .172"     | 2 3/4"              | 12°                  | 4"                  | 1.13               | 55                        |
| 3"                            | 3.406"            | .203"     | 3 7/8"              | 12°                  | 5"                  | 2.0                | 55                        |
| 4"                            | 4.530"            | .265"     | 5 1/16"             | 21°                  | 6"                  | 3.4                | 35                        |
| 6"                            | 6.656"            | .328"     | 7 1/16"             | 21°                  | 6"                  | 6.3                | 20                        |

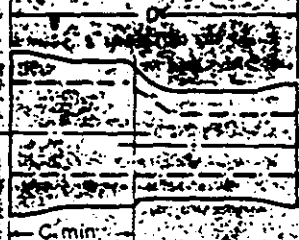
When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | L<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|------------------------|-------------------------------|
| 1 1/2                 | 1                      | 4                             |
| 2                     | 1 1/2 or 1             | 4                             |
| 3                     | 2, 1 1/2 or 1          | 5                             |
| 4                     | 3, 2, 1 1/2 or 1       | 7                             |
| 6                     | 4, 3, 2, 1 1/2 or 1    | 9                             |

## ECCENTRIC REDUCERS 6240



| Pipe Size<br>(Inches) | Reduced To<br>(Inches) | C<br>Minimum<br>(Inches) | D<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|------------------------|--------------------------|-------------------------------|
| 1 1/2                 | 1                      | 1 1/2                    | 4                             |
| 2                     | 1 1/2 or 1             | 1 1/2                    | 4                             |
| 3                     | 2, 1 1/2, or 1         | 2 1/2                    | 5                             |
| 4                     | 3, 2, 1 1/2, or 1      | 3                        | 7                             |
| 6                     | 4, 3, or 2             | 3                        | 9                             |

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{2}$  to  $\frac{1}{4}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

## Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing. Length dimensions are held to  $\pm \frac{1}{32}$ ".

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—triples the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as caps, U-bends, thermometer wells, and some traps are annealed only due to their shape. These annealed fittings are clearly identified.

## Physical Properties

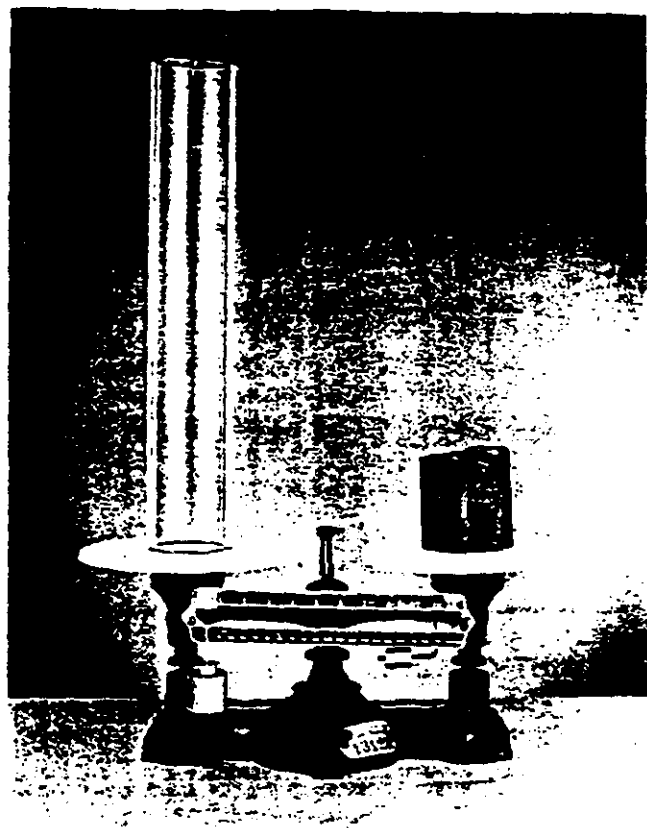
KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

**Operating temperatures** extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

**Thermal conductivity:** 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F.

**Thermal expansion** of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

**Thermal shock differential** ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



## Ordering

When ordering a standard item please refer to KIMAX glass pipe distributors' price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

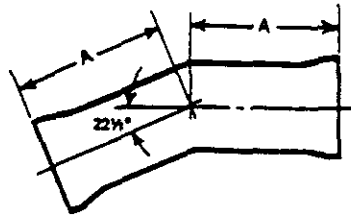
## Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

Non-stock items such as reducing tees and crosses with 3 and 4-way reductions; traps; U-returns and drainline Y's can be supplied by your KIMAX pipe distributor on special order.

# 22½° ELBOWS 6201

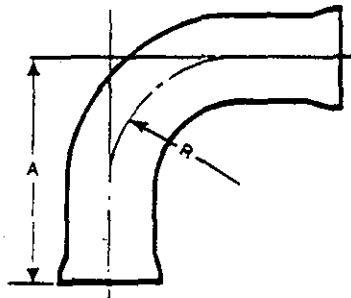
# KIMAX GLASS PIPE AND FITTINGS



When ordering, specify degree of angle.

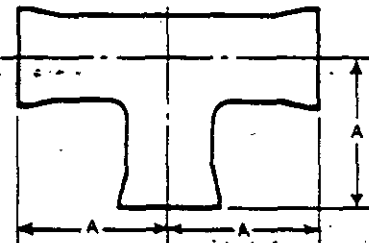
| Pipe Size<br>(inches) | A<br>(± 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 2½                |
| 1½                    | 3½                |
| 2                     | 4                 |
| 3                     | 5                 |
| 4                     | 7                 |
| 6                     | 9                 |

# SWEEP ELBOWS 6239



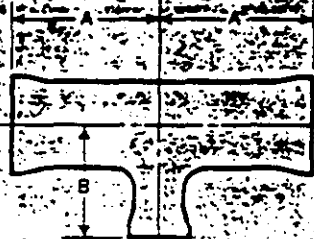
| Pipe Size<br>(inches) | A<br>(± 1/32 in.) | R<br>(± 1/32 in.) |
|-----------------------|-------------------|-------------------|
| 1                     | 4½                | 2½                |
| 1½                    | 5                 | 3½                |
| 2                     | 6                 | 3½                |
| 3                     | 7                 | 4½                |
| 4                     | 10                | 6                 |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(± 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 2½                |
| 1½                    | 3½                |
| 2                     | 4                 |
| 3                     | 5                 |
| 4                     | 7                 |
| 6                     | 9                 |

# REDUCING TEES 6211



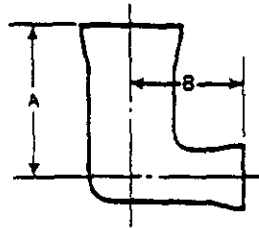
When ordering, specify pipe I.D. and bottom leg I.D.

| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(± 1/32 in.) | B<br>(± 1/32 in.) |
|-----------------------|------------------------|-------------------|-------------------|
| 1½                    | 1                      | 3½                | 3                 |
| 2                     | 1                      | 4                 | 3                 |
| 2                     | 1½                     | 4                 | 3½                |
| 3                     | 1                      | 5                 | 3½                |
| 3                     | 1½                     | 5                 | 4                 |
| 3                     | 2                      | 5                 | 4½                |
| 4                     | 1                      | 7                 | 4                 |
| 4                     | 1½                     | 7                 | 4½                |
| 4                     | 2                      | 7                 | 5                 |
| 4                     | 3                      | 7                 | 5½                |
| 6                     | 1                      | 9                 | 5                 |
| 6                     | 1½                     | 9                 | 5½                |
| 6                     | 2                      | 9                 | 6                 |
| 6                     | 3                      | 9                 | 6½                |
| 6                     | 4                      | 9                 | 8                 |

Other reduction combinations are available on special order to customer's specifications.

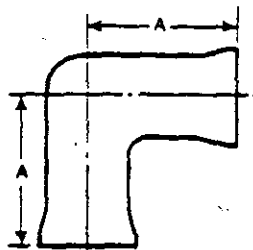
# KIMAX GLASS PIPE AND FITTING

## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                      | 3½                             | 3                              |
| 2                     | 1                      | 4                              | 3                              |
| 2                     | 1½                     | 4                              | 3½                             |
| 3                     | 1                      | 5                              | 3½                             |
| 3                     | 1½                     | 5                              | 4                              |
| 3                     | 2                      | 5                              | 4½                             |
| 4                     | 1                      | 7                              | 4                              |
| 4                     | 1½                     | 7                              | 4½                             |
| 4                     | 2                      | 7                              | 5                              |
| 4                     | 3                      | 7                              | 5½                             |
| 6                     | 1                      | 9                              | 5                              |
| 6                     | 1½                     | 9                              | 5½                             |
| 6                     | 2                      | 9                              | 6                              |
| 6                     | 3                      | 9                              | 6½                             |
| 6                     | 4                      | 9                              | 8                              |

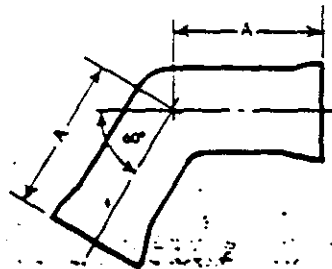
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2½                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

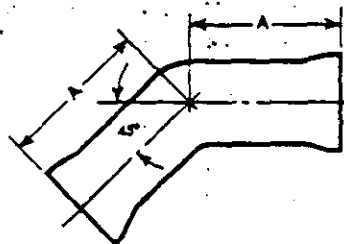
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2½                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

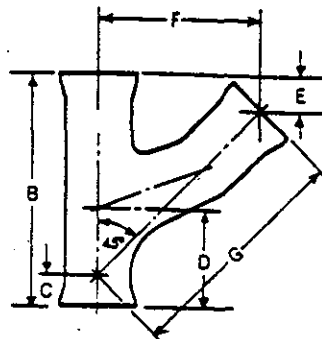
## 45° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2½                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

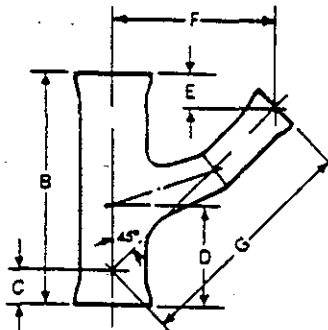




When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>( $\pm \frac{1}{32}$ in.) | C<br>(inches) | D<br>( $\pm \frac{1}{32}$ in.) | E<br>( $\pm \frac{1}{32}$ in.) | F<br>( $\pm \frac{1}{32}$ in.) | G<br>(inches) |
|-----------------------|--------------------------------|---------------|--------------------------------|--------------------------------|--------------------------------|---------------|
| 1                     | 5½                             | ¾             | 1⅞                             | ¾                              | 3¾                             | 5⅞            |
| 1½                    | 7                              | 1             | 2⅞                             | 1⅞                             | 5⅞                             | 7⅞            |
| 2                     | 8                              | 1¼            | 3½                             | 1¾                             | 5¾                             | 7⅞            |
| 3                     | 10                             | 1⅞            | 3⅞                             | 1¾                             | 7⅞                             | 9⅞            |
| 4                     | 14                             | 2¼            | 4⅞                             | 2⅞                             | 9⅞                             | 13            |
| 6                     | 18                             | 3¼            | 7⅞                             | 2⅞                             | 11⅞                            | 16¾           |

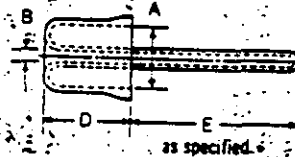
LATERAL "Y" REDUCERS 6231



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>( $\pm \frac{1}{32}$ in.) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|--------------------------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 8                              | 1¼            | 3½            | 1¾            | 5¾            | 7⅞            |
| 2                     | 1½                      | 8                              | 1¼            | 3½            | 1¾            | 5¾            | 7⅞            |
| 3                     | 1½                      | 10                             | 1⅞            | 3⅞            | 1¾            | 7⅞            | 9⅞            |
| 3                     | 2                       | 10                             | 1⅞            | 3⅞            | 1¾            | 7⅞            | 9⅞            |
| 4                     | 1½                      | 14                             | 2¼            | 4⅞            | 2⅞            | 9⅞            | 13            |
| 4                     | 2                       | 14                             | 2¼            | 4⅞            | 2⅞            | 9⅞            | 13            |
| 4                     | 3                       | 14                             | 2¼            | 4⅞            | 2⅞            | 9⅞            | 13            |
| 6                     | 3                       | 18                             | 3¼            | 7⅞            | 2⅞            | 11⅞           | 16¾           |

THERMOMETER WELLS (Annealed)



6292 SINGLE END



6295 DOUBLE END

When ordering, specify pipe I.D., well size, and tube length.

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.

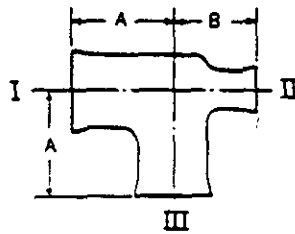
| A<br>Pipe Size<br>(inches) | B<br>For Thermometer<br>Well Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches) |
|----------------------------|-----------------------------------------------|----------------------------|---------------|
| 1½                         | ¾                                             | ¾                          | 2¾            |
| 1½                         | ¾                                             | ¾                          | 2¾            |
| 1½                         | ¾                                             | 1                          | 2¾            |
| 2                          | ¾                                             | ¾                          | 2¾            |
| 2                          | ¾                                             | ¾                          | 2¾            |
| 2                          | ¾                                             | 1                          | 2¾            |
| 3                          | ¾                                             | ¾                          | 3¾            |
| 3                          | ¾                                             | ¾                          | 3¾            |
| 3                          | ¾                                             | 1                          | 3¾            |

Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(inches) | D<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2                              |
| 1½                    | 3                              |
| 2                     | 4                              |
| 3                     | 4¾                             |
| 4                     | 6                              |
| 6                     | 7                              |

# KIMAX GLASS PIPE AND FITTING

## REDUCER TEES 6212

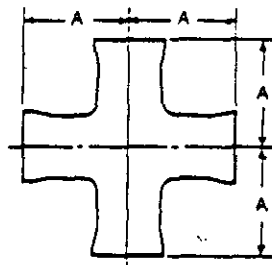


When ordering, specify pipe I.D. in this order: I, II, and III.

| I<br>Pipe Size<br>(Inches) | II<br>Pipe Size<br>(Inches) | III<br>Pipe Size<br>(Inches) | A<br>( $\pm \frac{1}{2}$ in.) | B<br>( $\pm \frac{1}{2}$ in.) |
|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------------------------|
| 1½                         | 1                           | 1½                           | 3½                            | 3                             |
| 2                          | 1                           | 2                            | 4                             | 3                             |
| 2                          | 1½                          | 2                            | 4                             | 3½                            |
| 3                          | 1                           | 3                            | 5                             | 3½                            |
| 3                          | 1½                          | 3                            | 5                             | 4                             |
| 3                          | 2                           | 3                            | 5                             | 4½                            |
| 4                          | 1                           | 4                            | 7                             | 4                             |
| 4                          | 1½                          | 4                            | 7                             | 4½                            |
| 4                          | 2                           | 4                            | 7                             | 5                             |
| 4                          | 3                           | 4                            | 7                             | 5½                            |
| 6                          | 1                           | 6                            | 9                             | 5                             |
| 6                          | 1½                          | 6                            | 9                             | 5½                            |
| 6                          | 2                           | 6                            | 9                             | 6                             |
| 6                          | 3                           | 6                            | 9                             | 6½                            |
| 6                          | 4                           | 6                            | 9                             | 8                             |

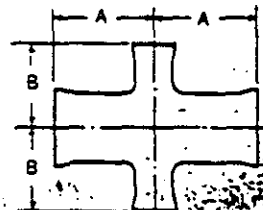
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(Inches) | A<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|-------------------------------|
| 1                     | 2¾                            |
| 1½                    | 3½                            |
| 2                     | 4                             |
| 3                     | 5                             |
| 4                     | 7                             |
| 6                     | 9                             |

## REDUCER CROSSES 6250

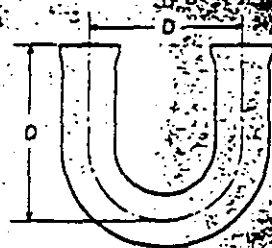


When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(Inches) | Branch Size<br>(Inches) | A<br>( $\pm \frac{1}{2}$ in.) | B<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|-------------------------|-------------------------------|-------------------------------|
| 1½                    | 1                       | 3½                            | 3                             |
| 2                     | 1                       | 4                             | 3                             |
| 2                     | 1½                      | 4                             | 3½                            |
| 3                     | 1                       | 5                             | 3½                            |
| 3                     | 1½                      | 5                             | 4                             |
| 3                     | 2                       | 5                             | 4½                            |
| 4                     | 1                       | 7                             | 4                             |
| 4                     | 1½                      | 7                             | 4½                            |
| 4                     | 2                       | 7                             | 5                             |
| 4                     | 3                       | 7                             | 5½                            |
| 6                     | 1                       | 9                             | 5                             |
| 6                     | 1½                      | 9                             | 5½                            |
| 6                     | 2                       | 9                             | 6                             |
| 6                     | 3                       | 9                             | 6½                            |
| 6                     | 4                       | 9                             | 8                             |

Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265



Use soft strip asbestos inserts (7202) only, with this fitting.

| Pipe Size<br>(Inches) | D<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|-------------------------------|
| 1                     | 5½                            |
| 1½                    | 7                             |
| 2                     | 7                             |
| 3                     | 9                             |
| 4                     | 12                            |

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

## FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME bolt circle flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally

for joining KIMAX glass pipe to glass lined steel.

See pages 11 and 12 for details of flange assemblies and components.

Other materials and special coatings available from your distributor.

## GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, Koroseal, and Teflon<sup>®</sup>-lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler

of soft asbestos (Blue African asbestos) with a machined Teflon liner, are recommended. Other types of filler material may be used with Teflon lined gaskets. Consult your distributor for details of performance and prices.

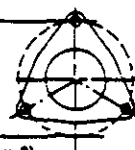
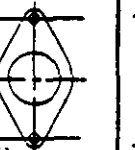
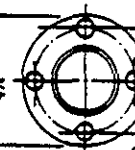
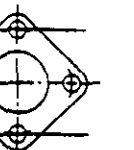
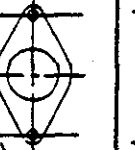
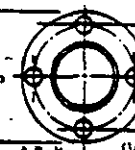
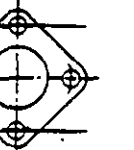
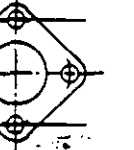
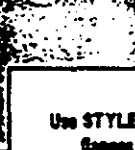
## INSERTS

Used for cushioning pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all annealed fittings such as U-bends; thermometer wells; and caps.

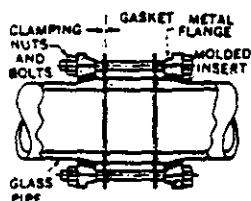
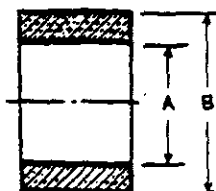
Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 13 for more information.

\*DuPont T.M.

| Pipe Size                                                                                                                                                                                                                                                | STYLE I                                                                             |                                                                                     | STYLE II (A.S.M.E. Bolt Circle)                                                     |                                                                                       | A.S.M.E.                                                                              |                                                                                       | Pipe  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------|
|                                                                                                                                                                                                                                                          | Aluminum Flange                                                                     | Gaskets                                                                             | Cast Iron Flange                                                                    | Gaskets                                                                               | Adapter Flanges                                                                       | Gaskets                                                                               |       |
| 1"                                                                                                                                                                                                                                                       |    |    |    |    |    |    | 1     |
| 1 1/2"                                                                                                                                                                                                                                                   |   |   |   |   |   |   | 1 1/2 |
| 2"                                                                                                                                                                                                                                                       |  |  |  |  |  |  | 2     |
| 3"                                                                                                                                                                                                                                                       |  |  |  |  |  |  | 3     |
| 4"                                                                                                                                                                                                                                                       |  |  |  |  |  |  | 4     |
| 6"                                                                                                                                                                                                                                                       |  |  |  |  |  |  | 6     |
| <div style="border: 1px solid black; padding: 10px; text-align: center;">                     Use STYLE I or II<br/>                     Flanges for<br/>                     4 inch and 6 inch<br/>                     A.S.M.E.                 </div> |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |       |

## STRAIGHT SPACERS 6260

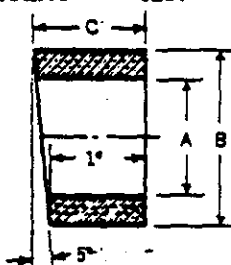


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4", and 5". Other lengths available on special order. Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/4                 |
| 1 1/2                      | 2 1/4                 |
| 2                          | 2 3/4                 |
| 3                          | 3 3/4                 |
| 4                          | 5 1/4                 |
| 6                          | 7 1/2                 |

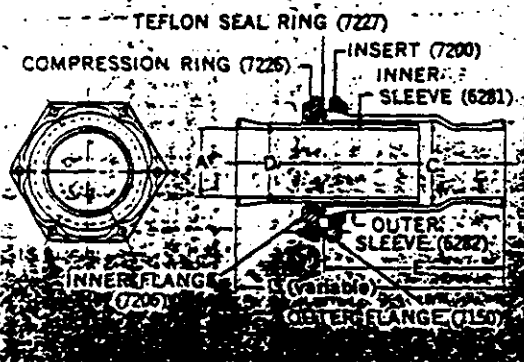
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on special order.

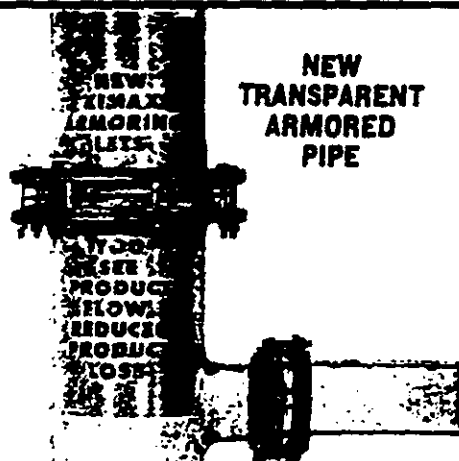
| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches) |
|----------------------------|-----------------------|---------------|
| 1                          | 1 1/4                 | 1 1/4         |
| 1 1/2                      | 2 1/4                 | 1 1/4         |
| 2                          | 2 3/4                 | 1 1/4         |
| 3                          | 3 3/4                 | 1 1/4         |
| 4                          | 5 1/4                 | 1 1/4         |

## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments up to 2 1/4". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1", 1 1/2", 2") and 15 p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281); outer sleeve (6282); inner flange (7205); outer flange (7150); insert (7200); Teflon seal ring (7227); compression ring (7226); bolts (7180). All metal parts are aluminum. Three bolts (hex head 3/8-18 x 1 1/4") required for 1 1/2", 2", and 3" sizes. Six bolts required for 4" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | L<br>(inches) | Min.   | Max.   |
|----------------------------|---------------|---------------|---------------|---------------|--------|--------|
| 1                          | 1 1/2         | 1 1/4         | 5 1/2         | 8 1/2         | 8 1/2  | 10 1/2 |
| 1 1/2                      | 2             | 1 3/4         | 6             | 9 1/2         | 9 1/2  | 11 1/2 |
| 2                          | 2 1/2         | 2 1/4         | 6 1/2         | 10            | 10     | 11 1/2 |
| 3                          | 3 1/2         | 3 1/4         | 8             | 11 1/2        | 11 1/2 | 14     |
| 4                          | 4 1/2         | 4 1/4         | 9             | 13 1/2        | 13 1/2 | 15 1/2 |



A new armoring process developed by Owens-Illinois Technical Center engineers provides excellent visibility for constant inspection of process.

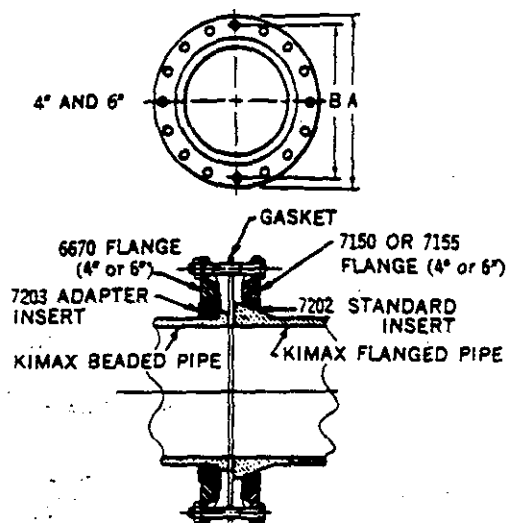
Armoring consists of coating exterior surfaces of straight pipe and fittings with layers of polyester resin and fiberglass particles. This coating imparts exceptionally high resistance to mechanical shock and abrasion, greatly reducing the possibility of breakage. Should breakage occur, the polyester coating will retain glass fragments, reducing product loss at the point of breakage and preventing contamination of products flowing through the line.

KIMAX Glass Pipe, armored by the new process operates at temperatures up to 250° F. Chemical resistance is the same as that of unarmored pipe.

For more information about KIMAX armored pipe, consult your KIMAX Glass Pipe distributor or write to: Glass Pipe Market Development, Consumer and Technical Products Division, Owens-Illinois, Toledo 1, Ohio.

## ADAPTER FLANGE

6670



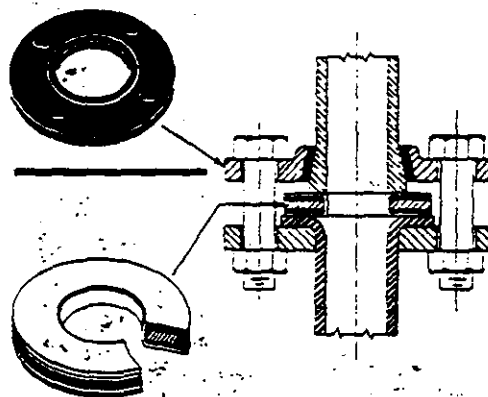
## FLANGES, GASKETS AND ACCESSORIES

Used with Style I or Style II flanges to join field-beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(Inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(Inches) |
| 4                     | 8 1/4  | 7 1/2            | 8                  | 3/16-18 x 2 1/4  |
| 6                     | 10 1/4 | 9 1/4            | 8                  | 1/4-16 x 2 1/4   |

For 1" through 3" beaded pipe, use Style II flange (7155) with adapter insert (7203).

## A.S.M.E. ADAPTER FLANGE 7160



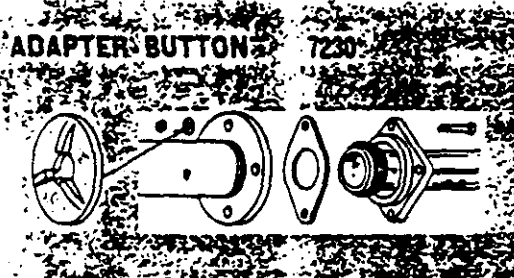
Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel. In 1", 1 1/2", 2", and 3" sizes.

Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.

Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(Inches) | Thickness<br>(Inches) |
|-----------------------|-----------------------|
| 1                     | 1/4                   |
| 1 1/2                 | 1/4                   |
| 2                     | 1/4                   |
| 3                     | 3/16                  |
| 4                     | 3/16                  |
| 6                     | 1/4                   |

## DONUT SPACER 7240



Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.

| I.D.<br>(Inches) | O.D.<br>(Inches) | Height<br>(Inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 1/4                |

## SPRING 7235



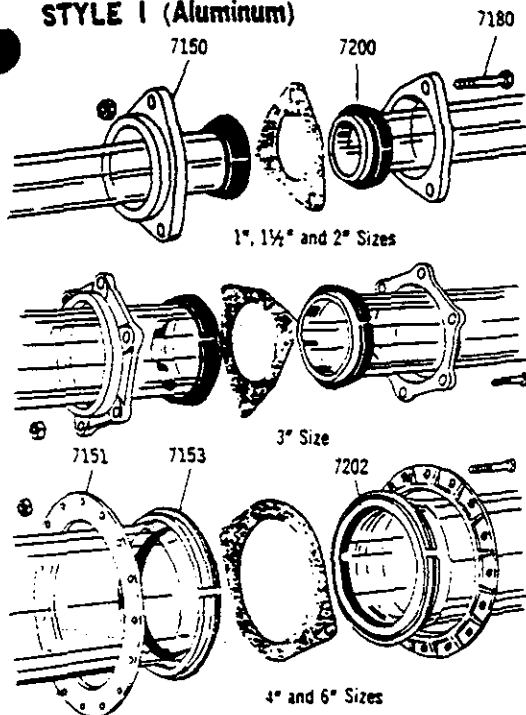
Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.

| Pipe Size<br>(Inches) | I.D.<br>(Inches) | Length<br>(Inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1" thru 4"            | 3/16 min.        | 1 1/2              | .156                |
| 6"                    | 1/2 min.         | 1 1/2              | .156                |

## FLANGES, GASKETS AND ACCESSORIES

### FLANGE SET 7100

#### STYLE I (Aluminum)



Style I Flange Set Assembly (7100) in 1", 1 1/2", 2", and 3" diameters consists of the following individual components:

- 2 aluminum flanges (7150)
- 2 molded neoprene asbestos inserts (7200)
- 3 aluminum bolts with nuts (7180) for 1", 1 1/2" and 2"; 6 bolts for 3" size

In 4" and 6" diameters, assembly (7100) consists of:

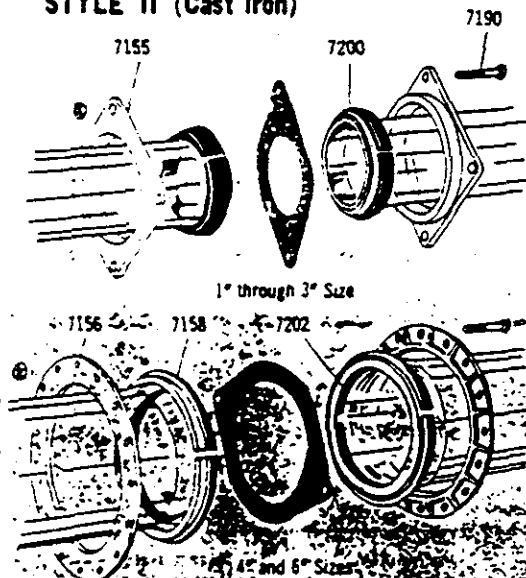
- 2 aluminum flanges (7150) consisting of outer flanges (7151) and inner rings (7153) complete with inserts (7202) cemented in.
- 8 aluminum bolts with nuts (7180)

Inner rings of 4" and 6" diameter flanges snap into outer flanges. The 4" and 6" flanges have A.S.M.E. bolt circles.

Interface gaskets must be ordered separately. See page 13.

### FLANGE SET 7105

#### STYLE II (Cast Iron)



Style II flanges are coated with corrosion-resistant paint.

In the 1", 1 1/2", 2", and 3" diameters, flange set assembly (7105) consists of the following individual components:

- 2 cast iron flanges (7155)
- 2 molded neoprene asbestos inserts (7200)
- 4 steel bolts with nuts (7190)

In the 4" and 6" diameters, assembly (7105) includes:

- 2 cast iron flanges (7155) consisting of outer flanges (7156) and inner rings (7158) complete with inserts (7202) cemented in.
- 8 steel bolts with nuts (7190)

All sizes of Style II flanges have A.S.M.E. bolt circles. Inner rings of the 4" and 6" sizes, snap into outer flanges.

Interface gaskets must be ordered separately. See page 13.

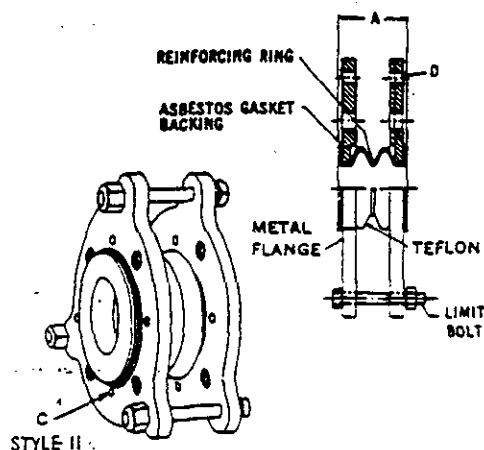
#### FERRULE 7245



Stainless steel. To be welded, brazed or soldered to metal tubing. In 1", 1 1/2", 2", 3", and 4" diameters.

# **FLEXIBLE JOINT 7280**

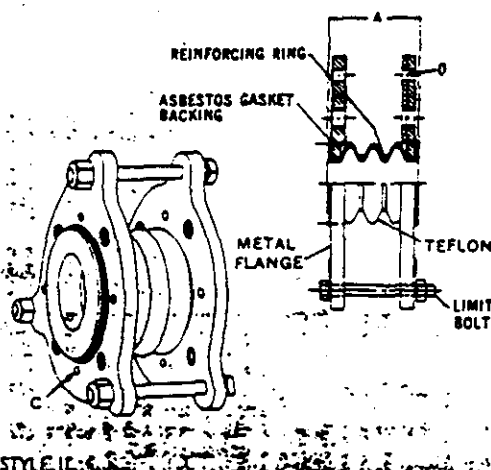
# **FLANGES, GASKETS AND ACCESSORIES**



High density Teflon bellows (2 convolutions) have rounded contours and are stress relieved for extra strength under load. Flanges are double drilled and tapped with ASME bolt circles for use with Style II, ASME, or ASA Series 15 flanges. Will connect to glass, glass lined steel, and iron flanges. Complete with 3 limit bolts but without flange bolts.

| Pipe Size (Inches) | Nom. Length | A Max. Travel | Normal Travel | No. Holes | C Thread | Bolt Circle | D Bolt Dia. | Bolt Circle |
|--------------------|-------------|---------------|---------------|-----------|----------|-------------|-------------|-------------|
| 1                  | 1 1/8       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 3 1/2       | 1/2         | 5 1/2       |
| 1 1/2              | 1 3/8       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 3 3/4       | 1/2         | 5 3/4       |
| 2                  | 1 7/8       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 4 1/4       | 1/2         | 6 1/4       |
| 3                  | 2 1/4       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 6           | 1/2         | 8 1/4       |
| 4                  | 2 3/4       | ± 1/8         | ± 1/8         | 8         | 1/8-18   | 7 1/2       | 1/2         | 9 1/4       |
| 6                  | 2 3/4       | ± 1/8         | ± 1/8         | 8         | 1/8-16   | 9 1/4       | 1/2         | 12 1/4      |

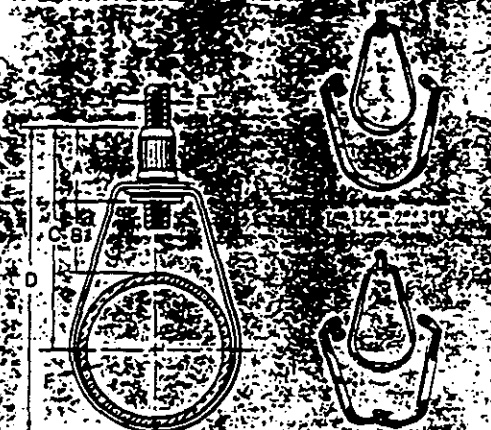
# **EXPANSION JOINT 7285**



Similar to Flexible Joint (7280) but with additional convolutions to permit more face-to-face adjustment.

| Pipe Size (Inches) | Nom. Length | A Max. Travel | Normal Travel | No. Holes | C Thread | Bolt Circle | D Bolt Dia. | Bolt Circle |
|--------------------|-------------|---------------|---------------|-----------|----------|-------------|-------------|-------------|
| 1                  | 1 1/8       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 3 1/2       | 1/2         | 5 1/2       |
| 1 1/2              | 1 3/8       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 3 3/4       | 1/2         | 5 3/4       |
| 2                  | 2 1/4       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 4 1/4       | 1/2         | 6 1/4       |
| 3                  | 3 1/4       | ± 1/8         | ± 1/8         | 4         | 1/8-18   | 6           | 1/2         | 8 1/4       |
| 4                  | 3 3/4       | ± 1/8         | ± 1/8         | 8         | 1/8-18   | 7 1/2       | 1/2         | 9 1/4       |
| 6                  | 3 3/4       | ± 1/8         | ± 1/8         | 8         | 1/8-16   | 9 1/4       | 1/2         | 12 1/4      |

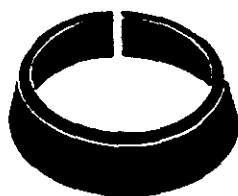
# **PIPE HANGER 7290**



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is reseated by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size (Inches) | A     | B     | C     | D      | E   | F         |
|--------------------|-------|-------|-------|--------|-----|-----------|
| 1                  | 1 1/8 | 1     | 2 3/4 | 3 1/8  | 1/2 | 1/8 x 1/2 |
| 1 1/2              | 1 3/8 | 1 1/8 | 3 1/4 | 4 1/8  | 1/2 | 1/8 x 1/2 |
| 2                  | 1 7/8 | 1 3/8 | 3 3/4 | 4 3/8  | 1/2 | 1/8 x 1/2 |
| 3                  | 2 1/4 | 1 7/8 | 4 1/4 | 6 1/8  | 1/2 | 1/8 x 1/2 |
| 4                  | 2 3/4 | 2 1/8 | 5 1/4 | 7 1/8  | 1/2 | 1/8 x 1/2 |
| 6                  | 3 1/4 | 2 3/8 | 7 1/4 | 10 1/8 | 1/2 | 1/8 x 1/2 |

## INSERTS



**7200** for 1" through 3" tempered fittings.



**7202.** for 4" and 6" tempered fittings  
for 1" through 6" annealed fittings.

**7203** adapter insert for beaded ends  
(similar to 7200)

## FLANGES, GASKETS AND ACCESSORIES

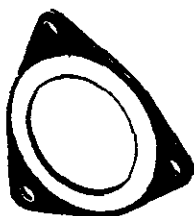
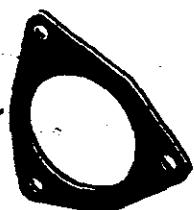
Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1½", 2", 2½", 3", 3½", and 5" diameters. The 1", 1½", 2", and 3" sizes are used with standard tempered glass pipe and fittings. Other sizes are for use with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters; and with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

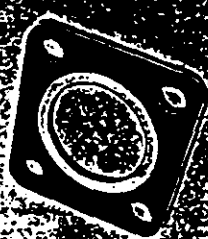
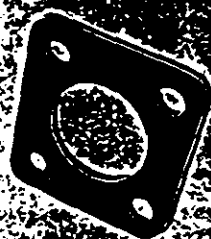
**STYLE I** (1", 1½", 2", 2½", 3" sizes only)



**STYLE II** (all sizes-also used for 4" and 6" Style I)



**A.S.M.E.** (1½", 2", 2½", 3" sizes only)



Standard

Teflon machined envelope

Since the gasket is the only part of the joint assembly to come into contact with conveyed liquids, choice of gasket material is extremely important.

Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below.

When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of Teflon are recommended.

The Teflon machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

Standard filler for Teflon machined envelope gasket is Blue African asbestos.

Other filler materials for Teflon machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of Teflon envelope gaskets are the same as that of the filler material.

| Catalog Number |          |          | Material                                                | Service                                                               | Maximum Working Temp., °F. |
|----------------|----------|----------|---------------------------------------------------------|-----------------------------------------------------------------------|----------------------------|
| Style I        | Style II | A.S.M.E. |                                                         |                                                                       |                            |
| 7250           | 7251     | —        | Asbestos                                                | Organic and mineral acids, solvents and chlorinated compounds.        | 400                        |
| 7255           | 7256     | —        | Gum Rubber                                              | Food products, mineral acids, except HNO <sub>3</sub> .               | 200                        |
| 7260           | 7261     | —        | Neoprene                                                | Distilled water and mineral acids, except HNO <sub>3</sub> .          | 220                        |
| 7265           | 7266     | 7267     | Koroseal                                                | Mineral acids including HNO <sub>3</sub> , and chlorinated compounds. | 150                        |
| 7270           | 7271     | —        | Silicone Rubber                                         | All                                                                   | 450                        |
| 7275           | 7276     | 7277     | Teflon Machined Envelope (Blue African Asbestos Filler) | All                                                                   | 450                        |

| Material                                 | Pipe Size |          |         |         |         |         |
|------------------------------------------|-----------|----------|---------|---------|---------|---------|
|                                          | 1" Dia.   | 1½" Dia. | 2" Dia. | 3" Dia. | 4" Dia. | 6" Dia. |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"        | ¼"       | ¼"      | ¼"      | ¼"      | ¼"      |
| Teflon Envelope                          | ⅛"        | ⅛"       | ⅛"      | ⅛"      | ⅛"      | ⅛"      |



# ENGINEERING

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

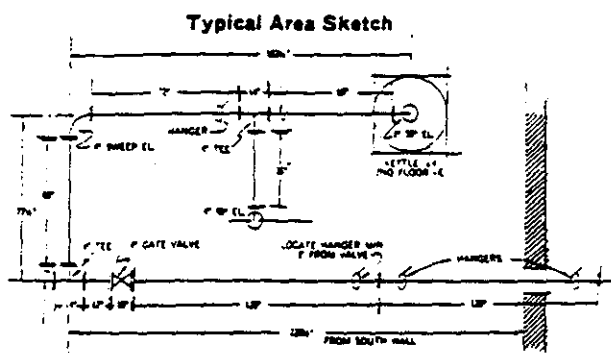


Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

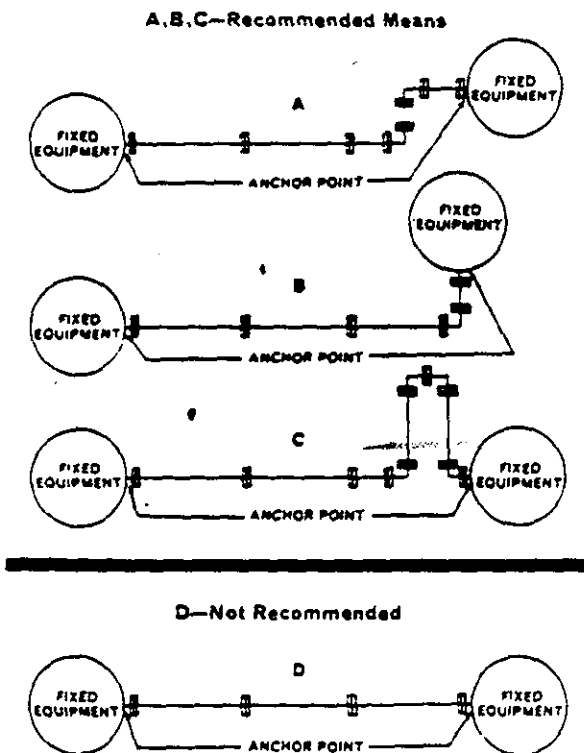


Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 5, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

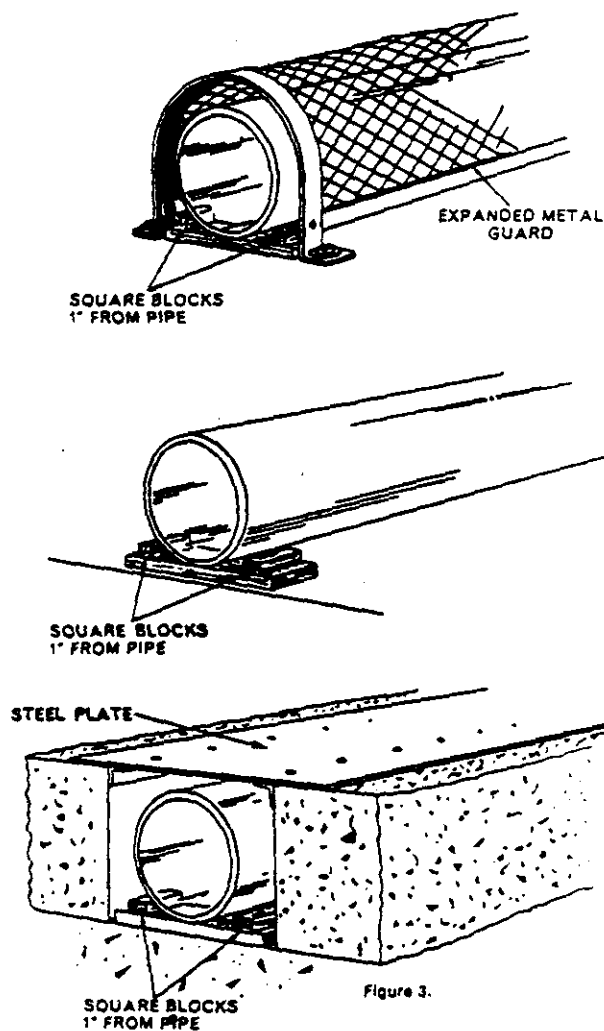


Figure 3.

### Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Tempered Glass          | 1.10-1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.58                                     |
| Graphite (impervious)         | 1.70                                     |
| Resin-Bonded Asbestos         | 2.88                                     |
| Stainless Steel (Schedule 40) | 3.65                                     |
| Lead, Ex. Light               | 4.80                                     |
| Porcelain                     | 7.35                                     |
| High Silicon Iron             | 7.70                                     |

### Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |     |      |      |      |      |
|-------------|----------------------------------------|-----|------|------|------|------|
|             | 1"                                     | 1½" | 2"   | 3"   | 4"   | 6"   |
| 22½" L      | 0.5                                    | .75 | 1.0  | 1.5  | 2.0  | 3.0  |
| 45" L       | 1.3                                    | 1.9 | 2.5  | 3.8  | 5.0  | 7.5  |
| 50" L       | 2.1                                    | 3.0 | 4.1  | 6.3  | 8.3  | 12.5 |
| 90" L       | 5.0                                    | 7.5 | 10.0 | 15.0 | 20.0 | 30.0 |
| Sweep L     | 1.7                                    | 2.5 | 3.3  | 5.0  | 6.7  | 10.0 |
| Ret. Bend   | 4.2                                    | 6.3 | 8.3  | 12.5 | 16.7 | 25.0 |
| T (Run)     | 1.7                                    | 2.5 | 3.3  | 5.0  | 6.7  | 10.0 |
| T (S.O.)    | 5.0                                    | 7.5 | 10.0 | 15.0 | 20.0 | 30.0 |
| T (S.I.)    | 6.0                                    | 9.0 | 12.0 | 18.0 | 24.0 | 36.0 |
| Gate Valve  | 1.5                                    | 2.2 | 3.0  | 4.5  | 6.0  | 9.0  |
| Plug Valve  | 2.0                                    | 3.0 | 4.0  | 6.0  | 8.0  | 12.0 |
| Globe Valve | 2.5                                    | 3.8 | 5.0  | 7.5  | 10.0 | 15.0 |

### Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Kimble Products, Glass Pipe Market Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

### MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 35   | 20   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50°       | -50° | -50° |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 160  |

\*Freezing point of conveyed material should be taken into consideration.

### Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of .0022" ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Tempered Glass  | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (impervious) | 1.30                                     |
| Steel                 | 3.60                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 6.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 16.00<br>High Impact 44.00 |

### Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and Teflon-covered donut spacers:

### GASKET AND DONUT SPACER THICKNESS

| Material                                 | Pipe Diameter |     |    |    |    |    |
|------------------------------------------|---------------|-----|----|----|----|----|
|                                          | 1"            | 1½" | 2" | 3" | 4" | 6" |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |
| Teflon Envelope                          | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Solid Beaded Teflon                      | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Donut Spacer                             | ¼"            | ¼"  | ¼" | ¼" | ¼" | ¼" |

# ENGINEERING

## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

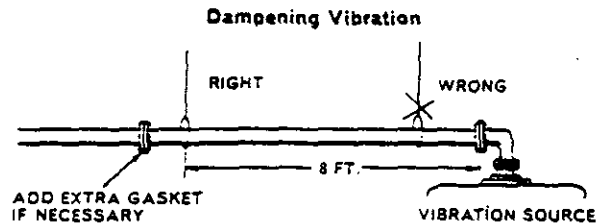


Figure 6.

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 5" pipe. See Figure 7.

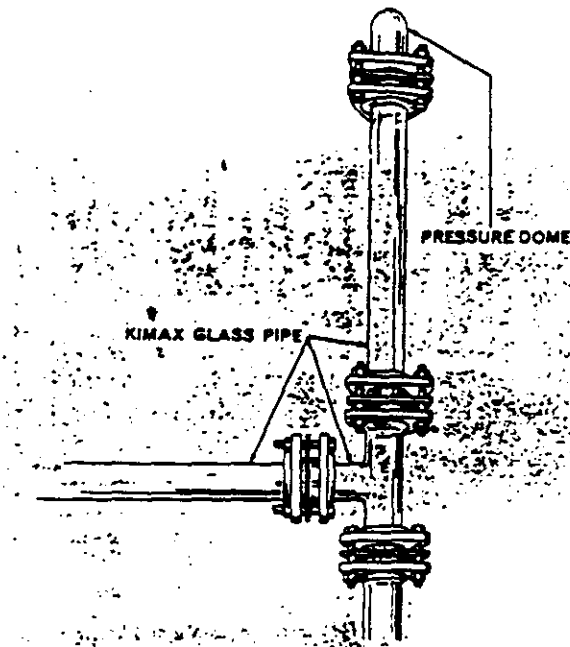


Figure 7.

## Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings, using Style I or Style II flanges. See Figure 8.

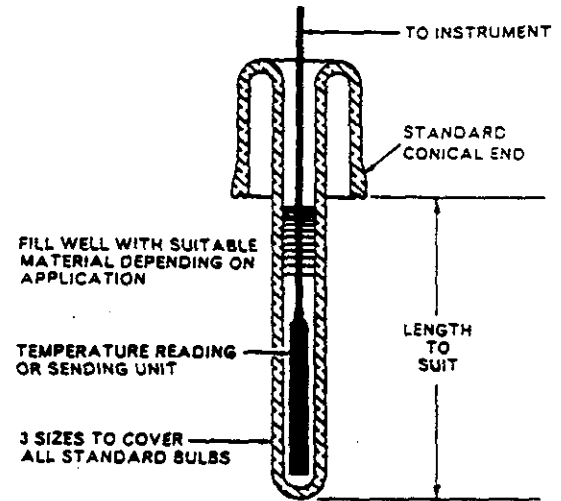


Figure 8.

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

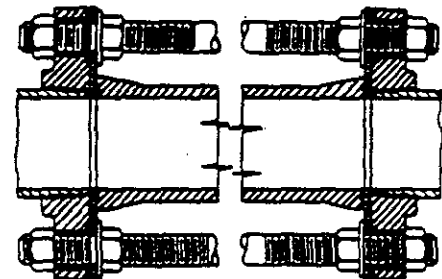
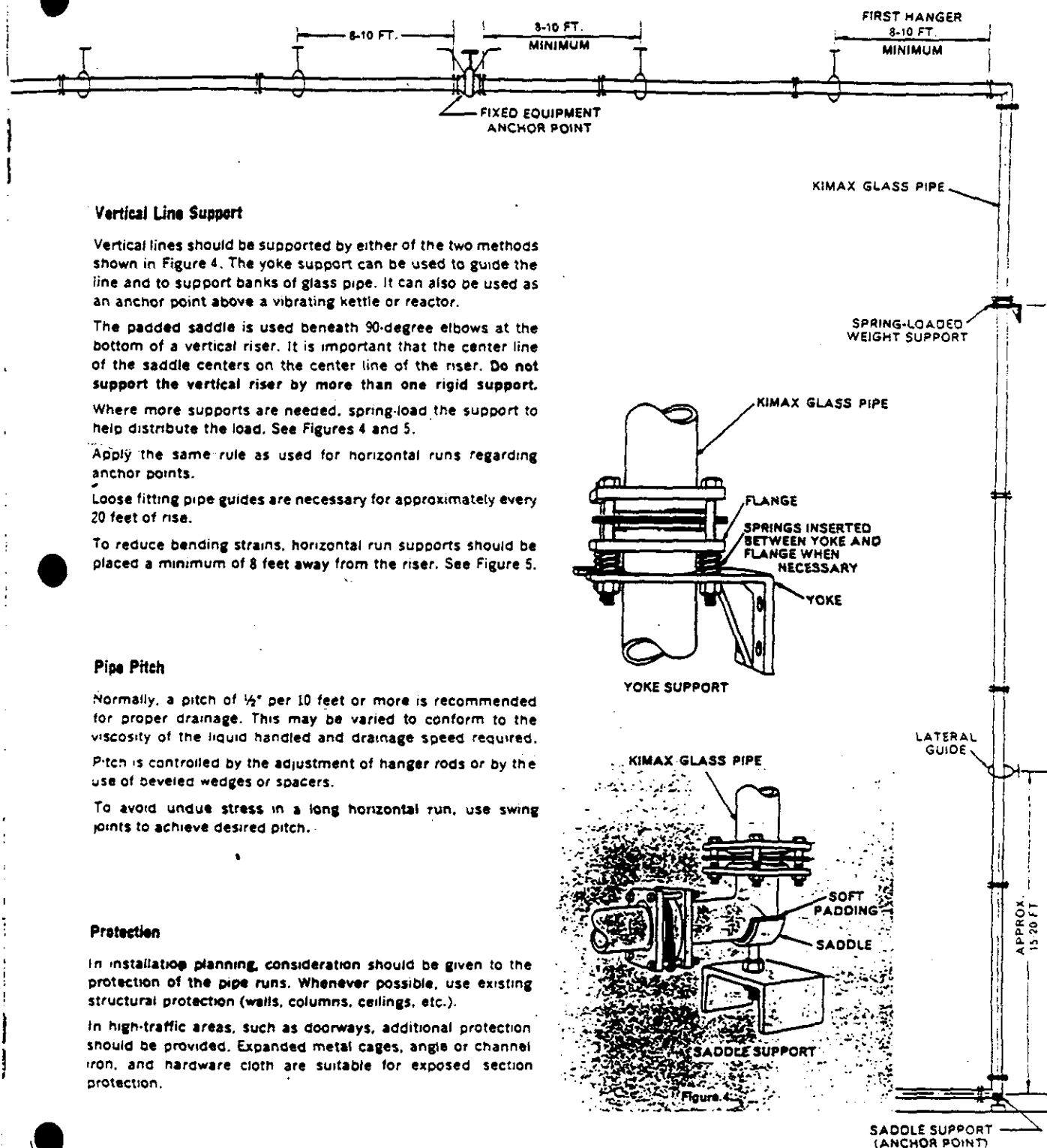


Figure 9.



### Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.

### Pipe Pitch

Normally, a pitch of  $\frac{1}{2}$ " per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

### Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high-traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

Figure 5.

Recommended Vertical Line Supports

# INSTALLATION

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending-moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

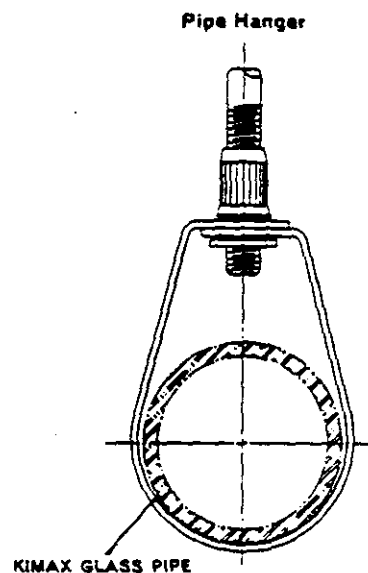
## MAXIMUM RECOMMENDED SPAN-FEET

| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | 7                                |
| 1 1/2"    | 9             | 9                              | 7                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 6"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, I-beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.

### Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1"; 1½"; 2"; 3"; 4" and 6".

Standard lengths of KIMAX straight lengths vary from 6 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipe-line design.

### Special Lengths

It may be necessary to order non-standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

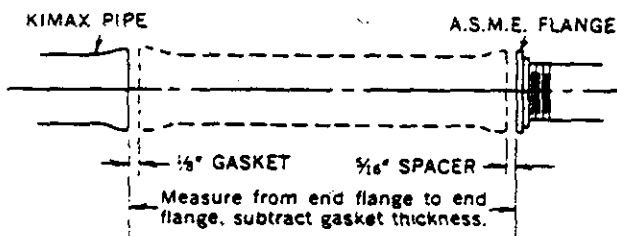


Figure 10.

### Special Apparatus

The corrosion resistance and transparency of glass, and workability, make it ideal for fabricating into special shape

Such apparatus may be adapted from existing standard pipe and fittings (tubulated or perforated straight lengths, for instance); custom fabricated by modifying existing glass-forming equipment (receiver vessels, separation units, etc.); and minor adapting of stock laboratory or industrial glass pieces (boiling flasks; distillation apparatus; offset columns, etc.)

Typical apparatus adapted for special uses are illustrated below

Owens-Illinois and KIMAX Glass Pipe distributors will assist you in the development of specially fabricated glass apparatus for your particular requirements.

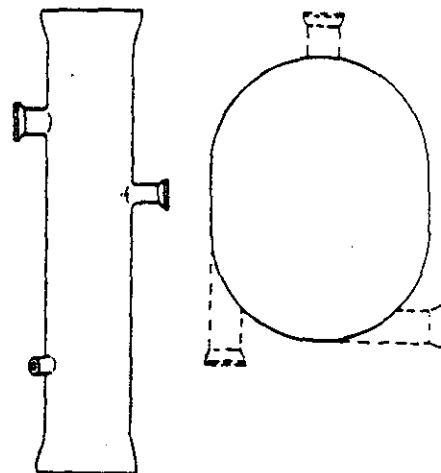


Figure 11.

# INSTALLATION

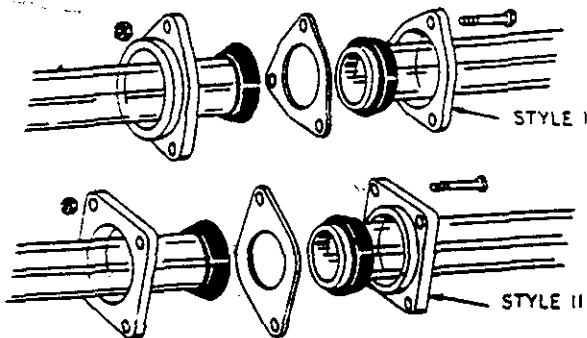
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

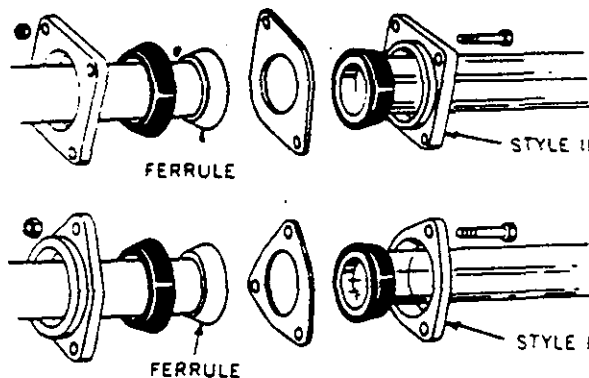
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#5670) and adapter insert (#7203) on beaded pipe, and Style II flange and standard insert on flanged pipe.

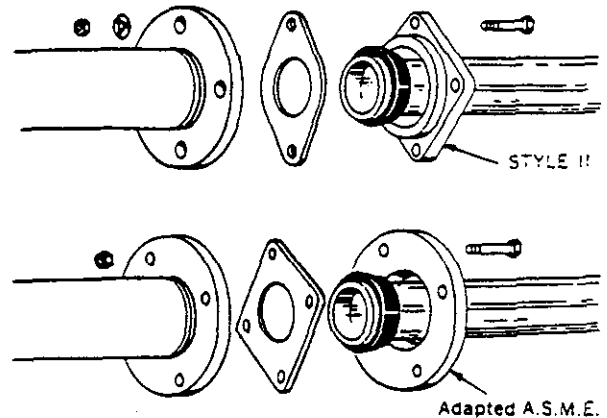
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule (#7245) to the tubing end.



### Glass to A.S.M.E. Flange

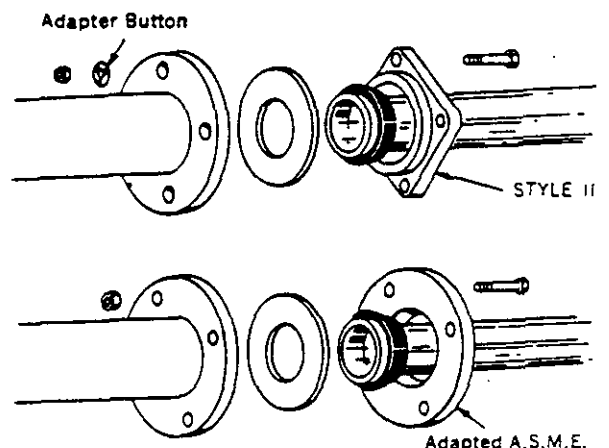
Glass can be mated to A.S.M.E. flanges by means of a Style II cast iron flange (all sizes have A.S.M.E. Bolt Circles); an adapted A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters only); or a 4" or 6" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.M.E. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A Teflon-covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined Teflon envelope.

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

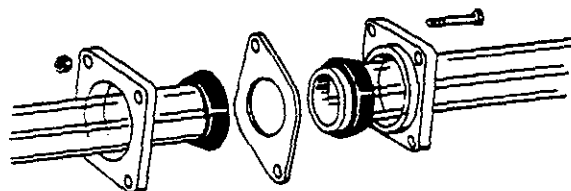
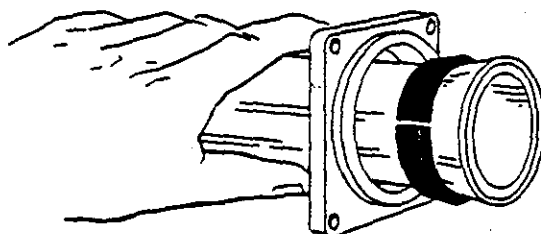
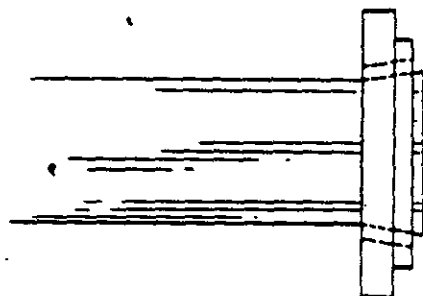


Figure 13.

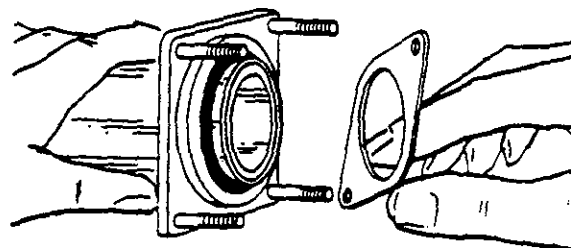
## Steps for Joint Assembly



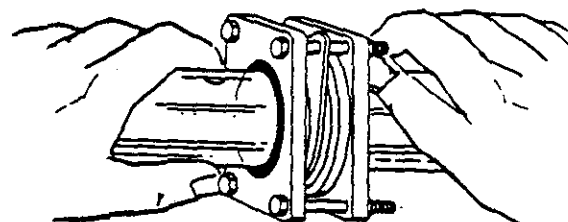
Step 1. Place the metal flange—small opening first—and the insert, over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on bolt. Keep gaskets dry to avoid gaskets slipping out between flange under line pressure.



Step 4. Align gasket opening precisely with pipe opening, avoid obstructions to line flow (especially important in milk and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB./FT.

| Pipe Size | Regular Gasket | Solid Teflon Gasket |
|-----------|----------------|---------------------|
| 1"        | 2              | 2-3                 |
| 1½"       | 3-3.5          | 3-4                 |
| 2"        | 3-4            | 4-5                 |
| 3"        | 3-4            | 4-5                 |
| 4"        | 3-4            | 5-7                 |
| 6"        | 5-6            | 7-10                |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.



## TESTING AND MAINTENANCE

### Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- Shake the line. If the line moves from side to side, it is probably free from bending loads.
- Open a flanged joint. If the flange does not move when bolts are removed, the pipe is not restrained.

### Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

### Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. Inadequate bolt tightening: Do not hesitate to "snug" bolts sufficiently.
2. Misalignment: Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. Temperature cycling: Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

### Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.

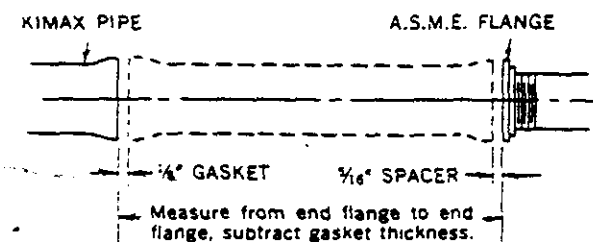
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. Odd lengths. Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. Spacers. Standard straight and 5° beveled spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 6" diameters, available in 1/2" to 2" lengths.

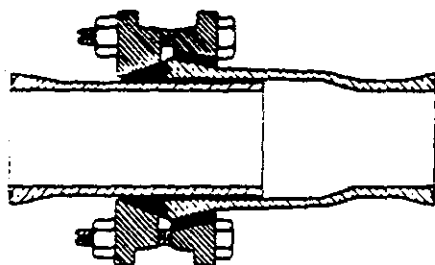
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. Adjustable Joints. Permit linear variations up to 2 3/4". Also used to correct misalignment.



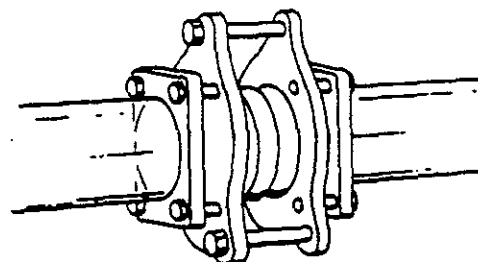
Long cut section of straight pipe may be used for inner glass sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTING section.

4. Flexible Couplings and Expansion Joints. Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. Field Fabrication—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) on beaded ends to mate with Style I or Style II flange with standard insert on flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

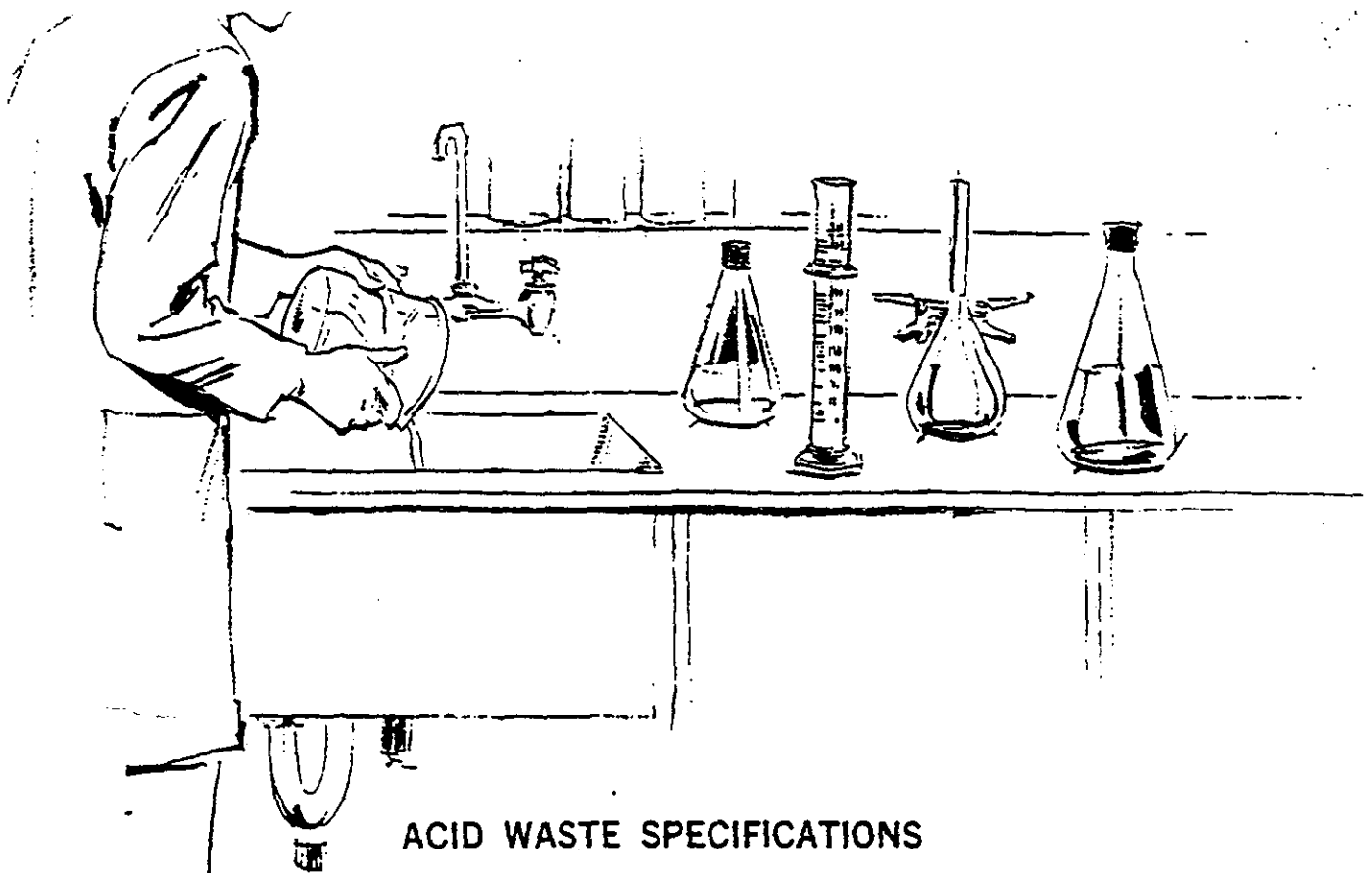
6. Adjust Equipment. It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment devices.

OWENS-ILLINOIS

KIMAX<sup>®</sup>  
Tempered Glass  
DRAINLINE

TF-25  
September 1951





## ACID WASTE SPECIFICATIONS

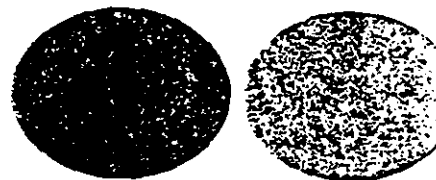
1. All drainlines which carry acid or corrosive wastes shall be "Kimax" brand low expansion, tempered, chemically durable borosilicate Type I Class A glass as manufactured by Owens-Illinois Glass Company.
2. All vents carrying corrosive fumes shall be of Kimax tempered drainline.
3. Underground drainlines shall be heavy schedule Kimax tempered drainline with regular schedule fittings and standard Kimax one bolt couplings. Maximum lengths of straight pipe shall be 5 ft. All pipe, fittings and couplings shall be liberally coated with not less than 1/16" mastic before back-filling. Backfill of not less than 4" of rock-free sand should surround pipe.
4. All glass-to-glass joints shall be made with the Kimax one bolt compression coupling. This coupling shall consist of a 360 segmented stainless steel outer band, Buna N rubber compression ring, and Teflon seal ring. Each coupling is to be installed and tightened in accordance with the manufacturer's recommendations.
5. All Kimax drainlines and vents shall be installed free of strain. Vertical runs shall be supported by padded Riser clamps. 1 1/4" and 2" should be supported at every other floor, 3", 4" and 6" at every floor. Horizontal runs shall be supported by padded clevis or trapeze hangers every 8 to 10 ft. Set pitch at joint maximum 1/4" per ft. for 1 1/4" and 2" pipe and 3/16" per ft. for 3", 4" and 6" pipe. Tighten coupling bolt before going on to the next section. Test all vertical and horizontal lines for strain by shaking.

**Layout practice:** Layout practice and all fittings shall conform to plumbing codes governing the project.

**Installation:** This installation shall be in accordance with the manufacturer's recommendation unless otherwise noted and commensurable with good drainline piping practice.

# OWENS-ILLINOIS

**KIMAX®**  
Tempered Glass  
DRAINLINE



## ADVANTAGES

Resistant to more corrosive wastes than any other piping and venting material.

Complete flexibility — can be easily installed, disassembled and reinstalled to meet new layout demands.

Transparency makes visual inspection possible.

Ultra-smooth walls discourage scale build-up.

Kimax borosilicate glass is extremely resistant to thermal shock.

Low expansion KIMAX glass eliminates need for expansion joints or loops.

Supported weight is 1/7 that of high silicon iron materials and requires only 1/2 to 1/3 as many hanger supports.

Kimax glass is rodent and fireproof.

Glass drainline can be field-fabricated, and is salvageable.

KIMAX glass drainline can be readily dismantled and re-used.

## GENERAL INFORMATION

KIMAX Tempered Glass Drainline is the most universally corrosion-resistant system for disposal of chemical wastes.

### Glass Components

KIMAX Drainline straight lengths and fittings are made from KG-33 Type I borosilicate glass long used in the manufacture of laboratory apparatus. It will resist destructive action of all corrosive wastes except concentrated hydrofluoric acid; phosphoric acid with fluorides; and hot, concentrated sodium and potassium hydroxides.

Most fittings and ends of all straight lengths (5' and 10') are tempered for extra strength. A few fittings and short nipple stock are annealed only. These are clearly identified.

### Kimax Coupling

Glass lengths and fittings are joined to each other and to other materials simply and quickly by means of one-bolt, pre-assembled compression coupling. The seal ring, which is the only coupling part which comes in contact with corrosive waste, is made of Teflon®.

### Accessories

The KIMAX Drainline system contains all accessories needed for complete installation from sink to sewer, and for connection to other materials.

Accessories range from sink tailpiece assemblies to threaded bead and flange adapters.

\*DuPont Trademark—FEP 110

## KIMAX COUPLING ASSURES QUICK, POSITIVE SEAL JOINTS

KIMAX drainline couplings are engineered to assure leak-free compression joints, under severe corrosion conditions.

The pre-assembled unit consists of (1) an outer shell of stainless steel, segmented for easy disassembly, (2) Buna N rubber compression ring to cushion glass beaded ends and (3) Teflon seal ring.

The Stainless Steel Outer Shell encloses the rubber compression ring completely, eliminating the possibility of the ring bulging up when the coupling is tightened. A few turns of the lubricated bolt locks the shell in position.

The Compression Ring is made of Buna N rubber assuring user of many years of trouble-free service.

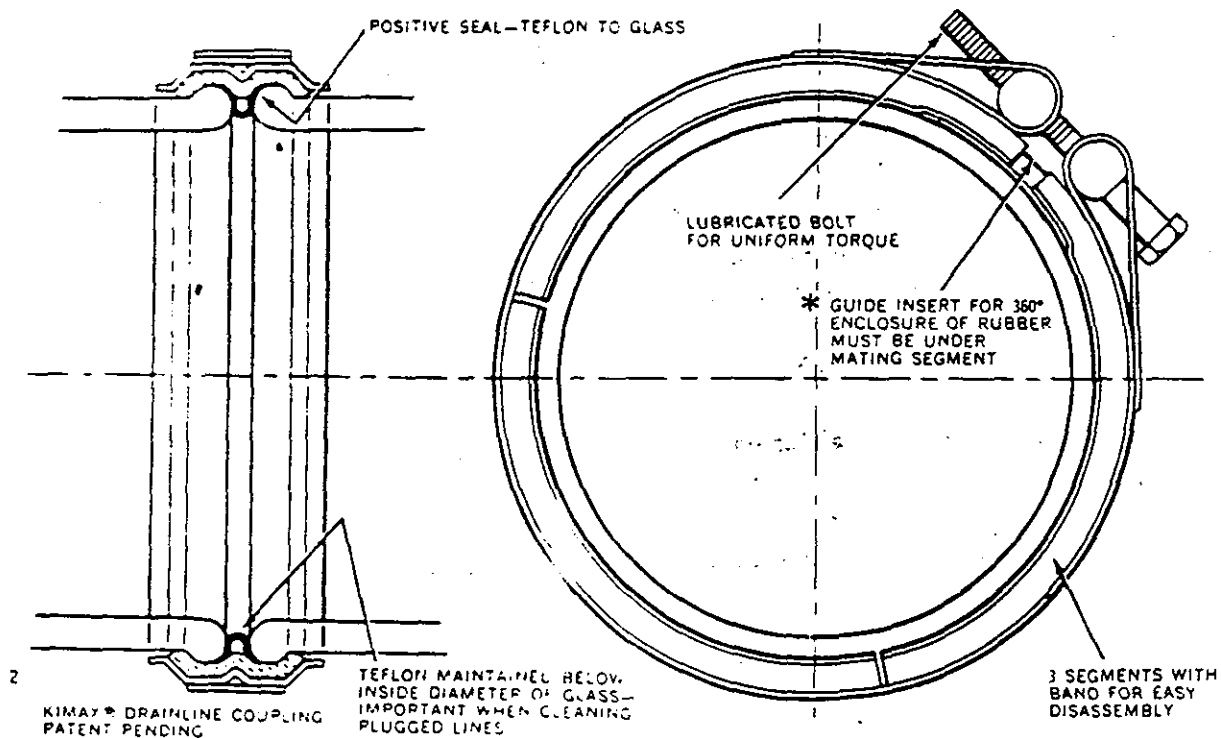
The Teflon Seal Ring is maintained below the inside diameter of the glass to prevent damage when routing out a line with a plastic-covered snake or a wooden rod.

### Making the Joint

Assembling a joint is fast and simple with the KIMAX drainline coupling:

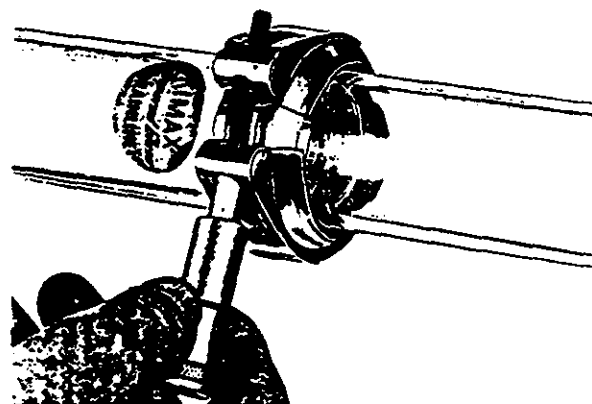
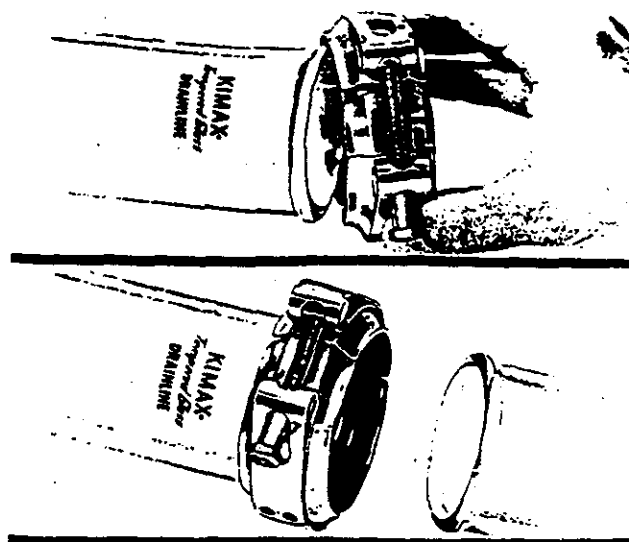
1. Wet the coupling.
2. Push both pipe ends into the coupling firmly but gently.
3. Make sure that the guide insert slides *under* the matching segment of the stainless steel outer shell.\*
4. When the glass is in its final position, tighten the lubricated bolt with a wrench to the following torques:

| Pipe Size       | Minimum Recommended Torque<br>(Pound Inches) |
|-----------------|----------------------------------------------|
| 1½", 2", 3", 4" | 50                                           |
| 5"              | 80                                           |



## SERVICE RECOMMENDATIONS

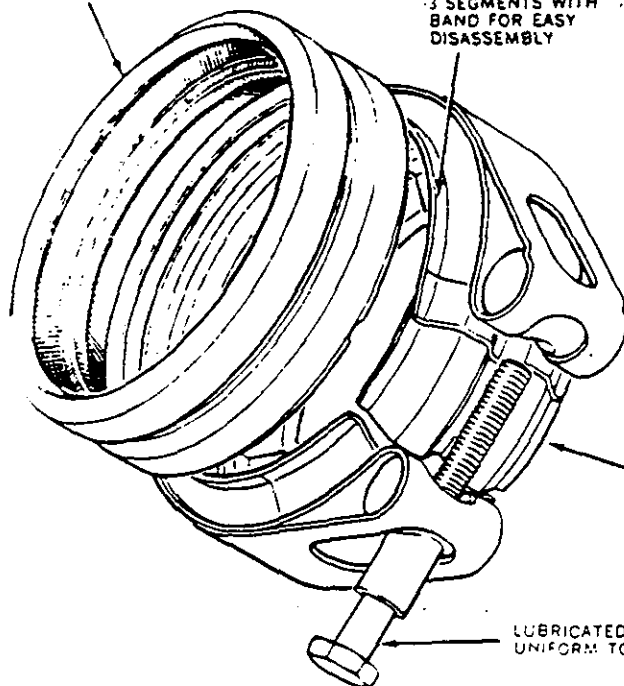
1. Maximum continuous operating temperature—212°F. May be subjected to 250°F for short periods.
2. Minimum testing pressure: 5 psi
3. Maximum testing pressure: 15 psi
4. Retighten all couplings to recommended torque, 24 hours or more after installation to compensate for initial set of Teflon seal.
5. Couplings disassembled and reinstalled should be tested for leakage. Rubber compression ring and Teflon seal may require replacement to correct leakage.



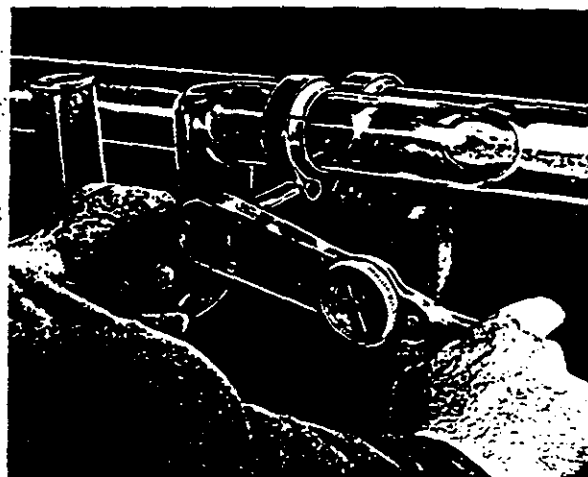
A positive-seal joint is made quickly by pushing both pipe ends into the wetted coupling insert, then tighten the single lubricated bolt after glass is in final position.

4. RUBBER COMPRESSION RING AND TEFLOM SEAL RING ASSEMBLY

3 SEGMENTS WITH BAND FOR EASY DISASSEMBLY

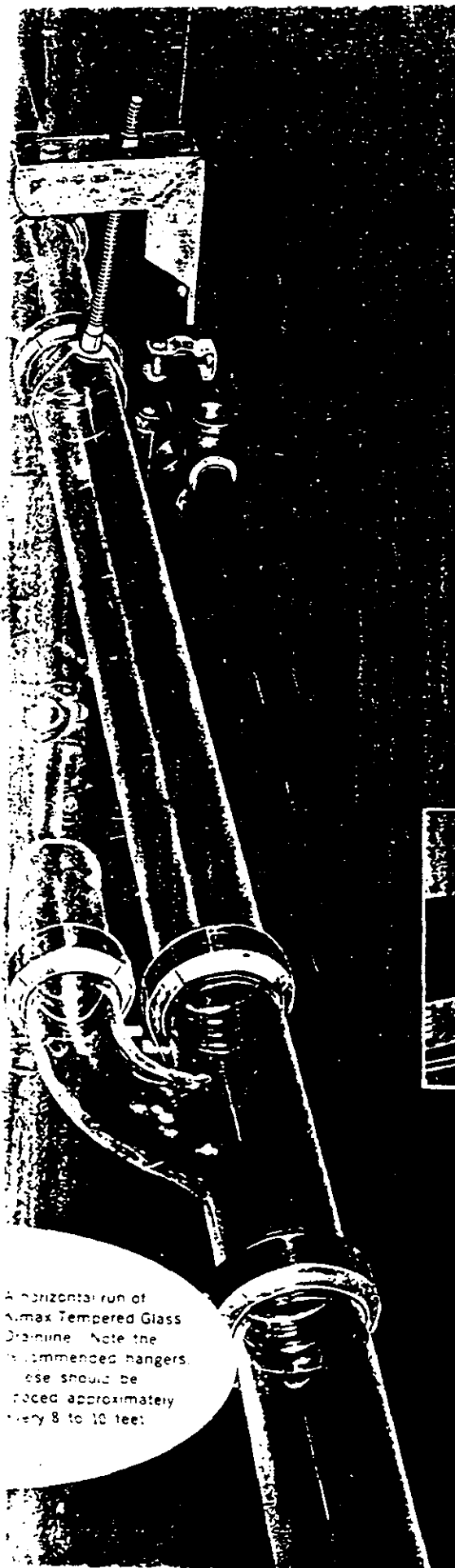


LUBRICATED BOLT FOR UNIFORM TORQUE



When the line is in its final position, the coupling bolt is tightened to 50 inch-pounds of torque for 1½", 2", 3" and 4" diameter pipe; 80 inch-pounds for 6" pipe.

ALL METAL PARTS ARE STAINLESS STEEL



A horizontal run of Kimax Tempered Glass Drainline. Note the recommended hangers. These should be spaced approximately every 8 to 10 feet.

## SYSTEM DESIGN

Layout of a KIMAX drainline system is substantially the same as that of any well-designed waste system.

Dimensions of all glass parts listed on pages 8 to 16 are nominal and include allowance for coupling liner thickness.

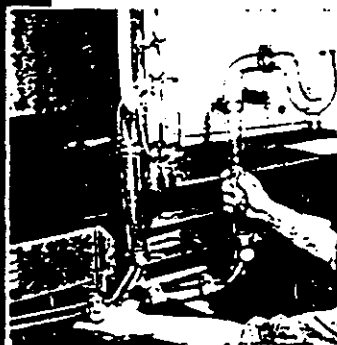
Expansion rate is only .22 inches per 100°F, per 100 feet, thus expansion joints are unnecessary.

It is not necessary to install inverted traps at the end of a horizontal run to keep the line full when hot wastes are conveyed.

Length of vertical or horizontal runs of KIMAX drainline systems is unlimited. Lines can be buried to any depth.

## INSTALLATION

Installation techniques for KIMAX Tempered Glass Drainline are simple and fast. Glass to glass joints are made by stabbing beaded ends into a wetted coupling and tightening the single coupling bolt to required torque (see pages 2 - 3).



Each joint should be finger-tightened until glass section is in final position. Then, all coupling bolts must be tightened to proper torque. Layouts for hard-to-reach places can be made up and installed as a unit (see photo).

KIMAX drainline, like any pipe, should not be forced into place. Horizontal line hangers should allow lateral movement and should be adjusted to pipe, not pipe to hangers.

Odd lengths can be made on the job with the KIMAX Beading Kit. Field Beading Manual TR-244 contains detailed instructions. Short nipple stock is available for most economical fabrication of short pieces.

## Handling Procedures

During installation, it is advisable to unpack only those sections needed for immediate installation. Unpacked pieces should be placed on cardboard, paper or wood. Do not place glass parts on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter and other surface damage. Pieces so damaged should be replaced.



## Lines Below Ground

KIMAX glass drainline may be buried underground to any depth. Standard straight lengths and couplings may be encased in protective sleeves or placed in covered troughs.

When burying glass drainline without protective sleeves or troughs, use heavy-schedule straight lengths, 5' long, and regular fittings.

Coat unprotected, buried pipe and fittings with at least 1/16" mastic. Backfill carefully with rock-free sand, placing 4" sand under pipe and 4 to 12 inches of rock-free sand on top.

## Horizontal Runs

Support horizontal runs every 8 to 10 feet, never closer unless there are more than two joints in an 8 - 10 foot section. Use padded hangers, either clevis or trapeze type.

To pitch a line, couple first straight length loosely. Adjust hanger to proper pitch. Tighten coupling to recommended torque.

Maximum allowable pitch per joint is:

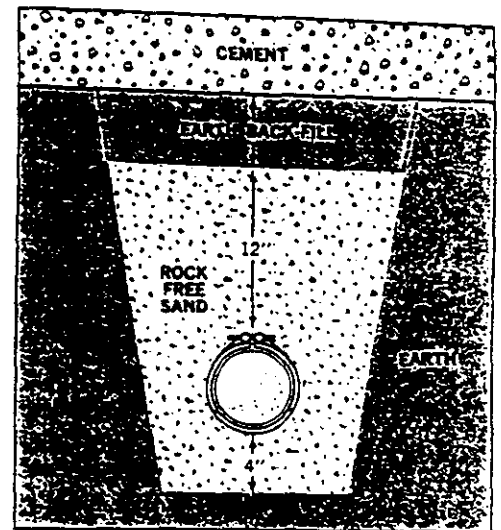
| Pipe Diameter | Maximum Pitch |
|---------------|---------------|
| 1 1/2", 2"    | 1/4" per foot |
| 2", 4", 6"    | 3/8" per foot |

When horizontal runs rest on flat surface, wall brackets, shelves, floors, place square guide blocks or pins on either side of each run to allow approximately 1/2 inch lateral movement (see center illustrations, page 6).

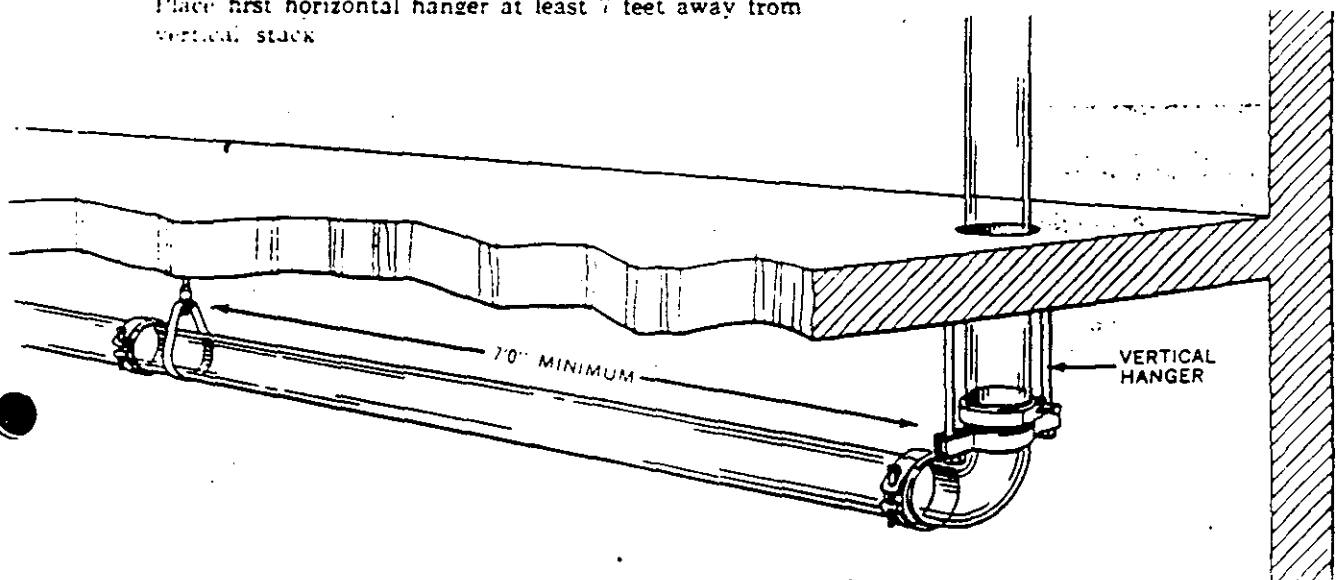
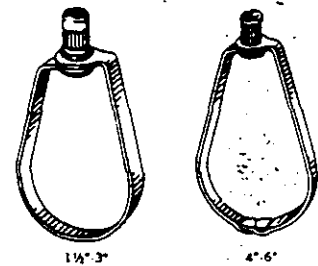
## Vertical Runs

All vertical runs must be independently supported. Place padded riser clamps under the bottom coupling in a vertical stack (see diagram below). Support 3", 4" and 6" diameter vertical runs with riser clamps at each floor. Support 1 1/2" and 2" runs at every other floor.

Do not use horizontal lines to support vertical runs. Place first horizontal hanger at least 7 feet away from vertical stack.



**Burial Underground or Underneath Concrete.** Use heavy schedule straight lengths and regular fittings, maximum length 5 feet. Coat heavily with at least 1/16" of mastic. Backfill carefully, top and bottom, with rock-free fill dirt.



## INSTALLATION (Continued)

### Pipe Protection

When exposed to traffic, glass lines at floor level, ground level or below grade, should be protected by expanded metal or similar guards.

### Causes of Initial Leakage

If leakage occurs during initial water tests, it may be due to one of the following reasons:

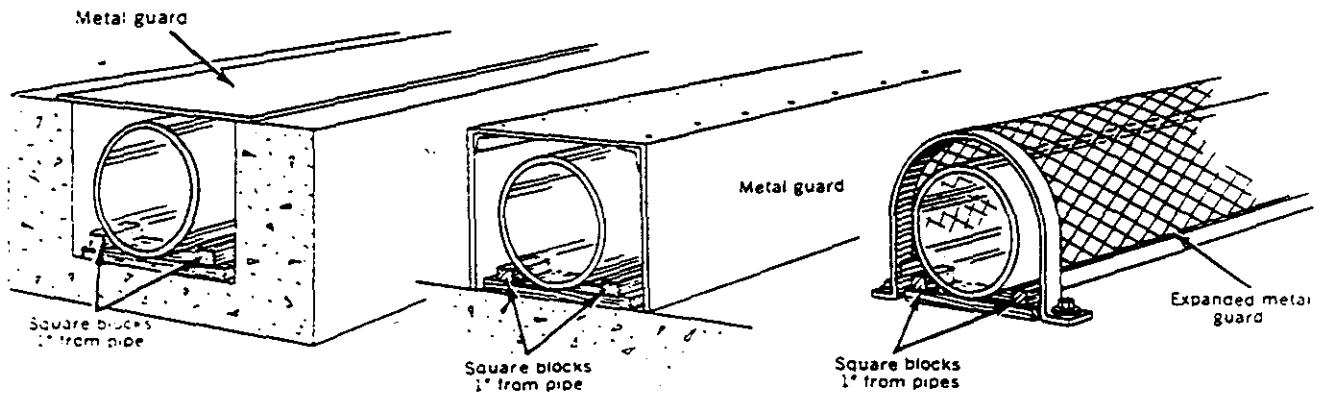
- 1) Coupling bolt not tightened to proper torque.
- 2) Dirt or foreign particles may be lodged on coupling liner or glass beaded ends.
- 3) Glass beads may be cracked, chipped or under size. Replace glass section, if necessary.

- 4) Glass beads are not properly seated in coupling.
- 5) Glass pipe is not properly aligned resulting in a poorly sealed joint.
- 6) Coupling parts may be incorrectly assembled or defective. Replace, if necessary.

### Removing Obstructions

Obstructions may be removed in one of three ways:

- 1) Dissolve the obstruction with chemicals (except concentrated hydrofluoric acid).
- 2) Remove plugged section and rod out with wood pole.
- 3) Use plastic-covered snake.



## JOINING KIMAX GLASS DRAINLINE TO OTHER MATERIALS

### To KIMAX Process Pipe

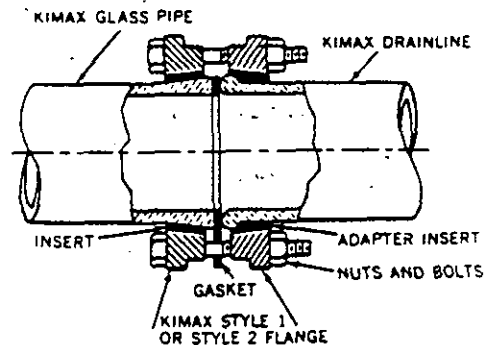
To adapt drainline to KIMAX process pipe, use the following assemblies depending on pipe size.

#### 1 1/2", 2" and 3" diameters

- 2 Style II metal flanges #7155
- 1 standard insert #7200
- 1 adapter insert #7203
- 1 Teflon machined envelope gasket #7276
- 4 steel bolts and nuts #7190

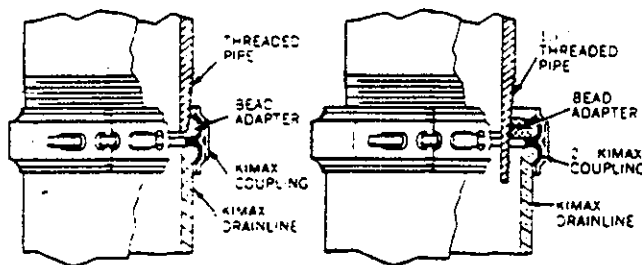
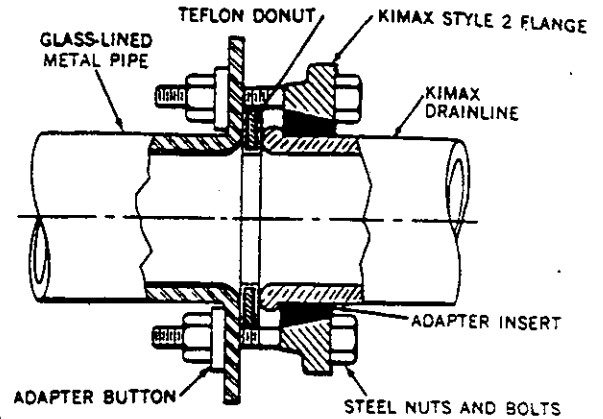
#### 4" and 6" diameters

- 1 Style II metal flange #7155
- 1 adapter metal flange #6670
- 1 adapter insert #7203
- 1 Teflon machined envelope gasket #7276
- 8 steel nuts and bolts #7190



## To Glass-Lined Metal Pipe

Use KIMAX Style II flange (#7155 for 1½" through 3" sizes, and adapter flange #6670 for 4" and 6") with adapter insert (#7203) on beaded glass drainline. Adapter buttons (#7230) must be used as shown in ASME flange to center smaller diameter bolts.

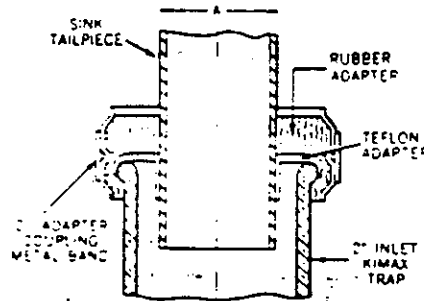


## To Threaded Pipe

To join KIMAX drainline to threaded sink tailpieces or threaded vent stacks of the same diameter, use Teflon bead adapter #6680 and drainline coupling #6650.

To join 1½" threaded sink tailpieces to KIMAX traps with expanded inlets (2" x 1½"), use adjustable bead adapter #6685 and KIMAX coupling #6650.

Brush acid-proof cement on pipe threads before applying bead adapters.



## To Unthreaded Sink Tailpieces

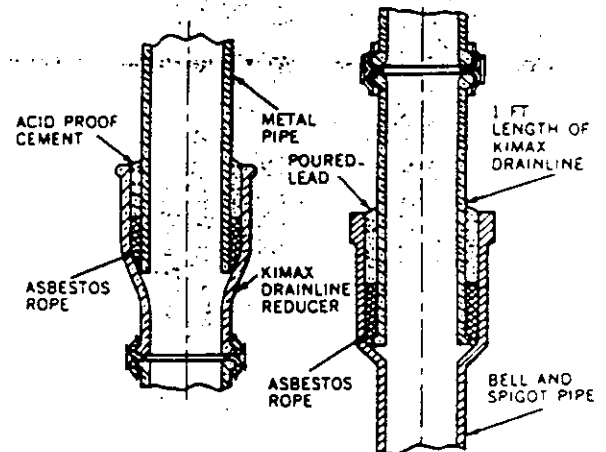
Adapter coupling #6655 is designed to join standard 1½", 1¼" and 1⅜" sink tailpieces to KIMAX glass traps with expanded inlets (2" x 1½"). Coupling #6655 is designed to permit height adjustment without the need to cut sink tailpieces to exact length.

## To Bell and Spigot

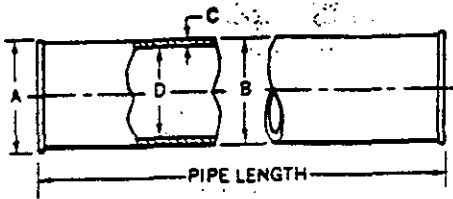
All joints should be vertical or 45° from vertical rather than horizontal to avoid accumulation of corrosive wastes.

1. Clean all surfaces thoroughly.
2. Place layer of asbestos rope or 1/8" asbestos gasket between glass and metal.
3. Insert male pipe end making sure that glass does not contact metal.
4. Pack hub halfway up with asbestos rope; do not use impregnated rope which inhibits sealing.
5. Seal joint with acid-proof cement, sealing cement or expanding iron hydraulic seal cement.

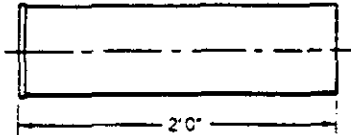
When KIMAX male end is to be sealed into metal bell, preheat glass and metal bell uniformly to 200° F. Seal with molten lead at lowest pouring point. Caulk lightly after cooling.



6500—regular schedule, 5-ft. lengths  
 6501—regular schedule, 10-ft. lengths  
 6502—heavy schedule, 5-ft. lengths\*



6503—NIPPLE STOCK, 2-ft. lengths\*\*



## STRAIGHT LENGTHS

Standard lengths of regular drainline are 5 and 10 feet. Special lengths, up to 15 feet may be ordered as special items and these items are priced on a per-foot basis to the next nearest foot, plus 10% for special handling.

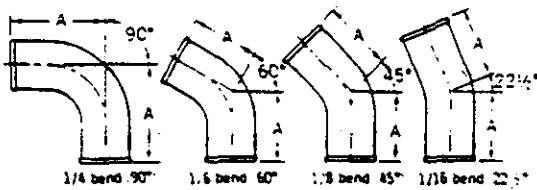
| Size | Regular Schedule<br>(6500, 6501, 6503) |        |          |        |                   | Heavy Schedule<br>(6502)* |        |                   |
|------|----------------------------------------|--------|----------|--------|-------------------|---------------------------|--------|-------------------|
|      | A                                      | B (OD) | C (wall) | D (ID) | weight<br>lbs/ft. | C (wall)                  | D (ID) | weight<br>lbs/ft. |
| 1½   | 2.95                                   | 1.84   | 0.12     | 1.60   | 0.64              | 0.17                      | 1½     | 0.37              |
| 2    | 2.58                                   | 2.34   | 0.14     | 2.06   | 0.94              | 0.17                      | 2      | 1.1               |
| 3    | 3.69                                   | 3.41   | 0.17     | 3.07   | 1.6               | 0.20                      | 3      | 2.0               |
| 4    | 4.84                                   | 4.53   | 0.20     | 4.13   | 2.6               | 0.25                      | 4      | 3.4               |
| 6    | 7.12                                   | 6.66   | 0.24     | 6.18   | 4.7               | 0.33                      | 6      | 5.3               |

\*KIMAX heavy schedule drainline (marked "H-S") is designed for burying underground or under concrete. Maximum length recommended for burial is 5 feet.

\*\*Nipple stock is annealed only, beaded on one end and available in 2-foot lengths. regular schedule weight. Most economical way to make up short lengths.

6511

## BENDS

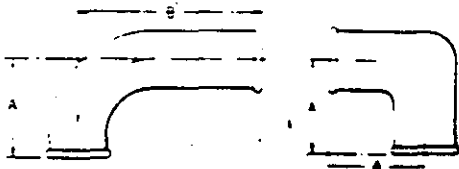


| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |

6512

6513

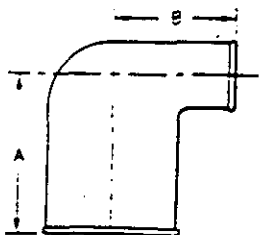
## SHORT RADIUS QUARTER BENDS



| Size | 6512 |    | 6513 |
|------|------|----|------|
|      | A    | B  | A    |
| 1½   | 3½   | 6  | 3    |
| 2    | 3¾   | 7½ |      |

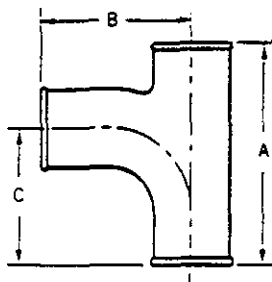
6518

## QUARTER BEND REDUCER



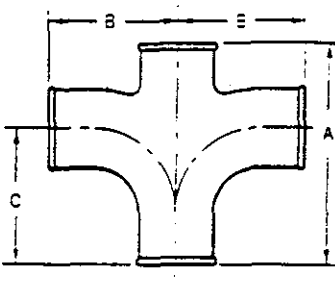
| Size   | A | B  |
|--------|---|----|
| 2 x 1½ | 4 | 3½ |
| 3 x 1½ | 5 | 4  |
| 3 x 2  | 5 | 4½ |
| 4 x 1½ | 7 | 4½ |
| 4 x 2  | 7 | 5  |
| 4 x 3  | 7 | 5½ |
| 6 x 1½ | 9 | 5½ |
| 6 x 2  | 9 | 6  |
| 6 x 3  | 9 | 6½ |
| 6 x 4  | 9 | 8  |

6521



drainline T branch

6522

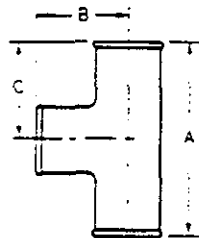


double branch drainline T

## T BRANCHES

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 3½ | 3¾  |
| 2 x 1½  | 8  | 3½ | 5   |
| 2 x 2   | 8  | 4½ | 5   |
| 3 x 1½  | 12 | 4½ | 7¾  |
| 3 x 2   | 12 | 5  | 7¾  |
| 3 x 3   | 12 | 6½ | 7¾  |
| 4 x 1½  | 14 | 4½ | 8¾  |
| 4 x 2   | 14 | 5½ | 8¾  |
| 4 x 3   | 14 | 7  | 8¾  |
| 4 x 4   | 14 | 8¾ | 8¾  |
| 6 x 2   | 20 | 6½ | 12¾ |
| 6 x 3   | 20 | 8  | 12¾ |
| 6 x 4   | 20 | 9¾ | 12¾ |
| 6 x 6   | 20 | 12 | 12¾ |

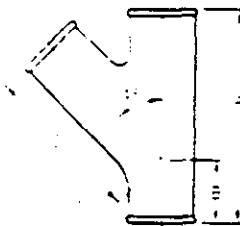
6523



## STRAIGHT TEE

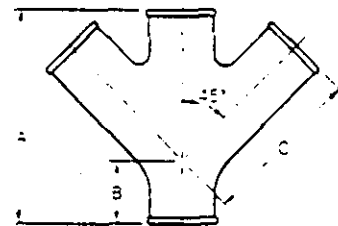
| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 2   | 12 | 4½ | 5  |
| 3 x 3   | 12 | 6  | 5  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7¾ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

6526



drainline Y branch

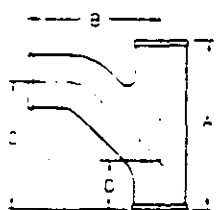
6527

double branch  
drainline Y

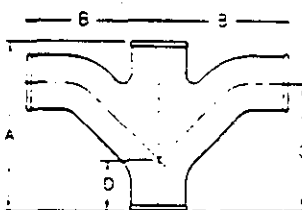
## Y BRANCHES

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 1½ | 4½  |
| 2 x 1½  | 8  | 2½ | 4½  |
| 2 x 2   | 8  | 2½ | 5   |
| 3 x 1½  | 12 | 3½ | 5½  |
| 3 x 2   | 12 | 3½ | 6½  |
| 3 x 3   | 12 | 3½ | 8   |
| 4 x 1½  | 14 | 4½ | 6½  |
| 4 x 2   | 14 | 4½ | 7½  |
| 4 x 3   | 14 | 4½ | 8½  |
| 4 x 4   | 14 | 4½ | 10  |
| 6 x 2   | 20 | 5½ | 9   |
| 6 x 3   | 20 | 5½ | 10½ |
| 6 x 4   | 20 | 5½ | 11½ |
| 6 x 6   | 20 | 5½ | 14  |

6528

drainline combination  
Y and 1/8 bend

6529

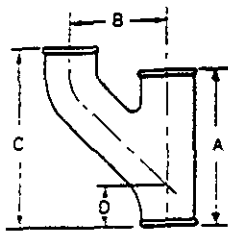
double branch  
drainline combination  
Y and 1/8 bend

## COMBINATION Y AND 1/8 BEND

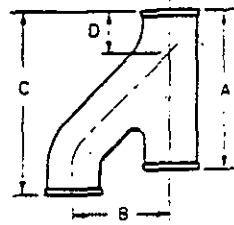
| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 4½ | 4½  | 1  |
| 2 x 1½  | 8  | 4½ | 5½  | 2½ |
| 2 x 2   | 8  | 6  | 6½  | 2½ |
| 3 x 1½  | 12 | 5½ | 7½  | 3½ |
| 3 x 2   | 12 | 6½ | 8   | 3½ |
| 3 x 3   | 12 | 8½ | 9   | 3½ |
| 4 x 1½  | 14 | 6  | 8½  | 4½ |
| 4 x 2   | 14 | 7  | 9½  | 4½ |
| 4 x 3   | 14 | 9  | 10½ | 4½ |
| 4 x 4   | 14 | 11 | 11  | 4½ |
| 6 x 2   | 20 | 8½ | 11½ | 5½ |
| 6 x 3   | 20 | 10 | 12½ | 5½ |
| 6 x 4   | 20 | 12 | 13½ | 5½ |
| 6 x 6   | 20 | 15 | 14½ | 5½ |

6532

# UPRIGHT Y OR H FITTING (and vent branch)



upright Y or H fitting



vent branch

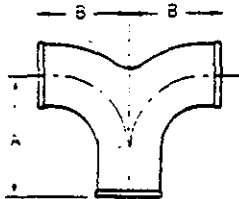
Note: above fittings identical

| Size    | A  | B  | D  | C*  |
|---------|----|----|----|-----|
| 1½ x 1½ | 6  | 3  | 1½ | 6½  |
| 2 x 1½  | 8  | 3½ | 2½ | 7½  |
| 2 x 2   | 8  | 4  | 2½ | 8½  |
| 3 x 1½  | 12 | 3½ | 3½ | 9½  |
| 3 x 2   | 12 | 4½ | 3½ | 10½ |
| 3 x 3   | 12 | 5  | 3½ | 11  |
| 4 x 1½  | 14 | 4½ | 4½ | 10½ |
| 4 x 2   | 14 | 5  | 4½ | 12  |
| 4 x 3   | 14 | 6½ | 4½ | 14½ |
| 4 x 4   | 14 | 8  | 4½ | 16½ |
| 6 x 3   | 20 | 7½ | 5½ | 16½ |
| 6 x 4   | 20 | 9  | 5½ | 19  |
| 6 x 6   | 20 | 12 | 5½ | 24  |

\* "C" dimension may be higher or lower than "A."

6533

# DOUBLE QUARTER BEND

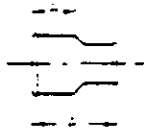


| Size | A   | B  |
|------|-----|----|
| 1½   | 3½  | 3½ |
| 2    | 5   | 4½ |
| 3    | 7¾  | 6½ |
| 4    | 8¾  | 8¾ |
| 6    | 12½ | 12 |

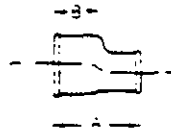
6536

6537

# REDUCERS



reducer and increaser \*



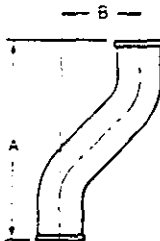
reducer eccentric

| Size    | A | B (min.) |
|---------|---|----------|
| 2 x 1½  | 4 | 1½       |
| *2½ x 2 | 5 | 3        |
| 3 x 1½  | 5 | 2½       |
| 3 x 2   | 5 | 2½       |
| *3½ x 3 | 7 | 4        |
| 4 x 1½  | 7 | 3        |
| 4 x 2   | 7 | 3        |
| 4 x 3   | 7 | 3        |
| *5 x 4  | 9 | 5½       |
| 6 x 1½  | 9 | 4        |
| 6 x 2   | 9 | 4        |
| 6 x 3   | 9 | 4        |
| 6 x 4   | 9 | 4        |

\*Used with adjustable joint (#6660)

6540

# OFFSET



| Size | A  | B Offset | Size | A  | B Offset |
|------|----|----------|------|----|----------|
| 1½   | 12 | 2        | 3    | 15 | 6        |
| 1½   | 12 | 3        | 3    | 15 | 8        |
| 1½   | 12 | 4        | 3    | 15 | 10       |
| 1½   | 12 | 6        | 3    | 15 | 12       |
| 1½   | 12 | 8        | 4    | 20 | 2        |
| 1½   | 12 | 10       | 4    | 20 | 4        |
| 1½   | 12 | 12       | 4    | 20 | 6        |
| 2    | 12 | 2        | 4    | 20 | 8        |
| 2    | 12 | 4        | 4    | 20 | 10       |
| 2    | 12 | 6        | 4    | 20 | 12       |
| 2    | 12 | 8        | 6    | 25 | 4        |
| 2    | 12 | 10       | 6    | 25 | 6        |
| 2    | 12 | 12       | 6    | 25 | 8        |
| 3    | 15 | 2        | 6    | 25 | 10       |
| 3    | 15 | 4        | 6    | 25 | 12       |

6544



Short cleanout plug

6545 (annealed)

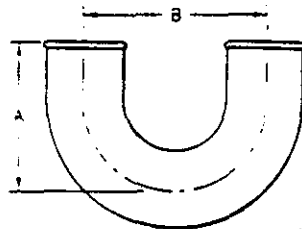


Long cleanout plug

## CLEANOUT PLUGS

| Size | A  | B  |
|------|----|----|
| 1½   | ¾  | 3½ |
| 2    | 1  | 3¾ |
| 3    | 1½ | 4½ |
| 4    | 1¾ | 5½ |
| 6    | 1½ | 6½ |

6550



## U BEND (Vent Loop)

| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

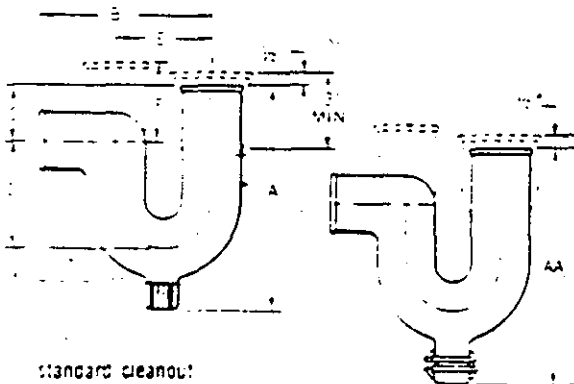
NOTE: U bends (annealed only) are often used for vent loops. Bottom sections of long S traps (#6562) are also used as vent loops.

6554—without vent

6554-A—without vent

6555—with vent

6555-A—with vent



standard cleanout

large cleanout

## P TRAP

Available in two cleanout styles. Standard cleanouts supplied with phenolic screw caps (#6675) with Teflon liners.

Large cleanout traps supplied with 1½" KIMAX coupling #6650 and 1½" short cleanout plug #6544.

Traps without cleanouts (annealed only) are available on special order. Cleanouts are recommended for all traps.

Expanded inlets of reducer traps have 3" minimum depth to permit height adjustments.

| Size    | vent size | seal depth | A   | B   | C  | D  | E  | F  | AA  |
|---------|-----------|------------|-----|-----|----|----|----|----|-----|
| 1½ x 1½ | 1½        | 3½         | 8½  | 8   | 1  | 5  | 5  | 3  | 9½  |
| 2 x 2   | 2         | 3½         | 8½  | 8   | 1  | 5  | 5  | 3  | 9½  |
| 3 x 3   | 3         | 3½         | 9½  | 8½  | 1½ | 5½ | 5½ | 3½ | 10½ |
| 4 x 4   | 4         | 3½         | 9½  | 8   | 1  | 5  | 5  | 3  | 9½  |
| 6 x 6   | 6         | 3½         | 9½  | 8½  | 1½ | 5½ | 5½ | 3½ | 10½ |
| 1½ x 3  | 1½        | 3½         | 12  | 10½ | 2  | 6½ | 6½ | 4  | 12½ |
| 2 x 4   | 2         | 3½         | 12  | 10½ | 2  | 6½ | 6½ | 4  | 12½ |
| 3 x 4   | 3         | 3½         | 14  | 12½ | 2½ | 7½ | 7½ | 5  | 14½ |
| 4 x 6   | 4         | 3½         | 18½ | 17  | 3½ | 9½ | 10 | 7  | 18½ |

\*Use adapter coupling (#6655) for top joint.

\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.

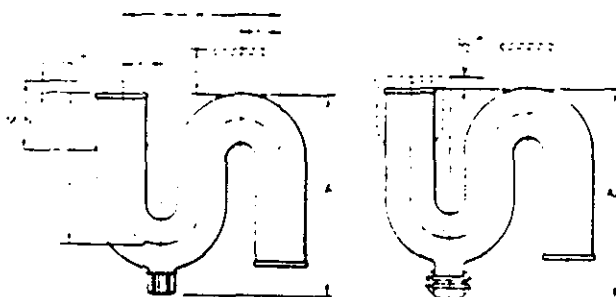
\*\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.

6556—without vent

6556-A—without vent

6557—with vent

6557-A—with vent



standard cleanout

large cleanout

## S TRAP

In two cleanout styles. Traps without cleanouts (annealed only) available on special order. Cleanouts recommended for all traps.

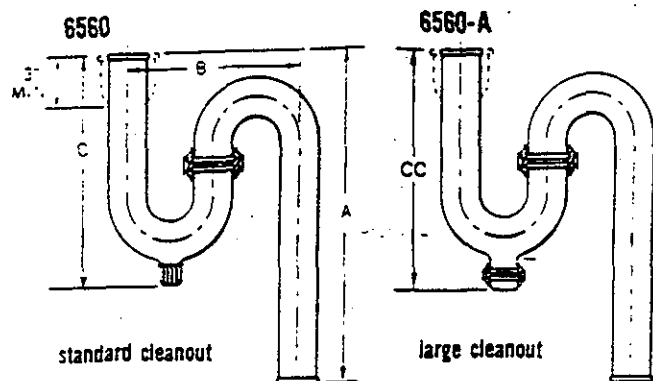
Large cleanout traps supplied with 1½" KIMAX coupling #6650 and 1½" short cleanout plug #6544.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

| Size    | vent size | seal depth | A   | B  | C  | E  | F  | AA  |
|---------|-----------|------------|-----|----|----|----|----|-----|
| 1½ x 1½ | 1½        | 3½         | 8½  | 10 | 6  | 2½ | 2½ | 9½  |
| 2 x 2   | 2         | 3½         | 8½  | 10 | 6  | 2½ | 2½ | 9½  |
| 3 x 3   | 3         | 3½         | 9½  | 11 | 7  | 2½ | 2½ | 10½ |
| 4 x 4   | 4         | 3½         | 9½  | 11 | 7  | 2½ | 2½ | 10½ |
| 6 x 6   | 6         | 3½         | 12  | 13 | 8½ | 3½ | 2½ | 12½ |
| 1½ x 4  | 1½        | 3½         | 14  | 15 | 10 | 3½ | 3½ | 14½ |
| 2 x 6   | 2         | 3½         | 18½ | 20 | 13 | 5  | 3½ | 18½ |

\*Use adapter coupling (#6655) for top joint.

\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.



## LONG S TRAP

Trap #6560 consists of top section #6561; bottom section #6562 (annealed only); and KIMAX coupling #6650.

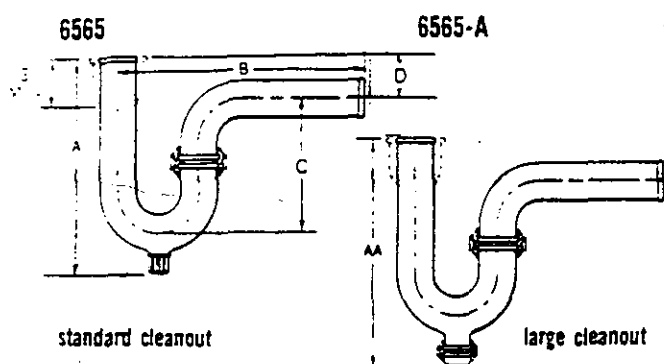
Trap #6560-A consists of top section #6561-A (with 1½" KIMAX coupling #6650 and short plug #6544); bottom section #6562 (annealed only) and KIMAX coupling #6650.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

| Size     | seal depth | A   | Max. B | C  | CC  |
|----------|------------|-----|--------|----|-----|
| 1½ x 1½  | 5¼         | 16¼ | 10     | 8½ | 11½ |
| 1½ x 1½  | 5¼         | 20¼ | 10     | 8½ | 11½ |
| 2 x 1½   | 5¼         | 16¼ | 10     | 8½ | 11½ |
| 2 x 1½   | 5¼         | 20¼ | 10     | 8½ | 11½ |
| 2 x 2    | 5¼         | 20¼ | 11     | 9½ | 12½ |
| **2½ x 2 | 5¼         | 20¼ | 11     | 9½ | 12½ |

\*Use adapter coupling (#6655) for top joint.

\*\*Use adjustable joint (#6660) for top joint.



## LONG P TRAP

Long P trap assembly #6565 (standard cleanout) consists of top section #6561; horizontal section #6512; and KIMAX coupling #6650.

Assembly #6565-A (large cleanout) consists of top section #6561-A (with 1½" KIMAX coupling #6650 and short plug #6544); horizontal section #6512; and KIMAX coupling #6650.

Expanded inlets of reducer traps have 3" minimum depth for height adjustment.

| Size     | seal depth | A   | B  | C  | D  | AA  |
|----------|------------|-----|----|----|----|-----|
| 1½ x 1½  | 5¼         | 10½ | 11 | 6½ | 1½ | 11½ |
| *2 x 1½  | 5¼         | 10½ | 11 | 6½ | 1½ | 11½ |
| 2 x 2    | 5¼         | 11½ | 13 | 7½ | 1½ | 12½ |
| **2½ x 2 | 5¼         | 11½ | 13 | 7½ | 1½ | 12½ |

\*Use adapter coupling (#6655) for top joint.

\*\*Use adjustable joint (#6660) for top joint.

6570 —without vents

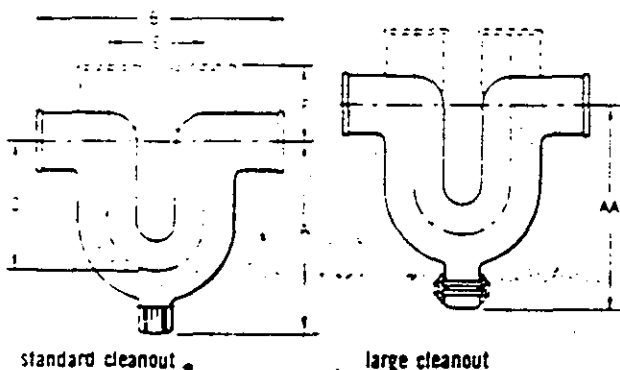
6571 —with 1 vent

6572 —with 2 vents

6570-A—without vents

6571-A—with 1 vent

6572-A—with 2 vents



## RUNNING TRAP

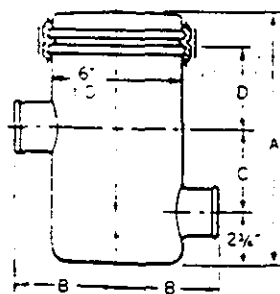
In two cleanout styles and with 3 vent options.

Running traps with large cleanouts supplied with 1½" KIMAX coupling #6650 and short cleanout plug #6544.

Traps without cleanouts supplied on special order, annealed only. Cleanouts recommended for all traps.

| Size    | vent size | seal depth | A   | B   | C  | E  | F  | AA  |
|---------|-----------|------------|-----|-----|----|----|----|-----|
| 1½ x 1½ | 1½        | 3¼         | 7¼  | 11  | 5  | 5  | 3  | 8½  |
| 2 x 2   | 2         | 3¼         | 8¾  | 12  | 5½ | 5½ | 3½ | 9¾  |
| 2 x 3   | 3         | 3¼         | 10  | 14½ | 6½ | 6½ | 4  | 10½ |
| 4 x 4   | 4         | 3¼         | 11½ | 17½ | 7½ | 7½ | 5  | 12½ |
| 6 x 6   | 4         | 3¼         | 14¼ | 24  | 9½ | 10 | 7  | 15½ |

6576



## DRUM TRAP (top cleanout)

Assembly #6576 consists of following components

6" glass body #6577

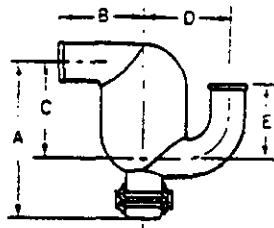
6" short cleanout plug #6544

6" drainline coupling #6650

| Size | seal depth | A   | B  | C  | D  |
|------|------------|-----|----|----|----|
| 1½   | 2½         | 13¼ | 5¼ | 4½ | 4¼ |
| 2    | 2½         | 13¼ | 5¼ | 4½ | 4¼ |
| 3    | 2½         | 14¼ | 6¼ | 5½ | 4¼ |



6585

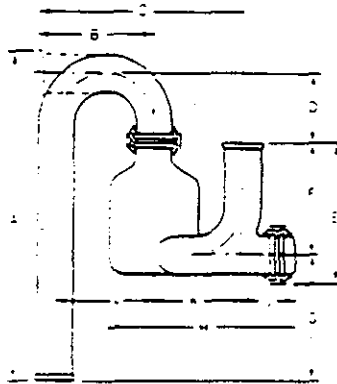
**DRUM TRAP (bottom cleanout)**

Assembly #6585 consists of following components:

- glass body #6586
- short cleanout plug #6544
- drainline coupling #6650

| Size | seal depth | A  | B  | C  | D  | E  |
|------|------------|----|----|----|----|----|
| 1½   | 3          | 8½ | 4½ | 4½ | 4½ | 3½ |
| 2    | 3½         | 9½ | 5  | 5½ | 5½ | 4½ |

6590—vertical outlet,  
6591—horizontal outlet.

**CENTRIFUGAL DRUM TRAP (side cleanout)**

Assembly #6590 consists of following components:

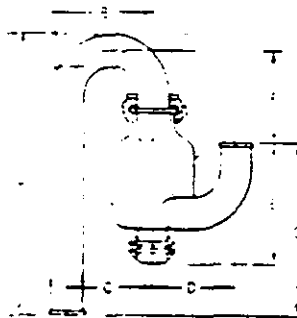
- glass body #6592
- vertical outlet #6562\*
- short cleanout plug #6544
- 2 drainline couplings #6650

Assembly #6591 is same as #6590 except that horizontal outlet #6510 is used in place of vertical outlet #6562.

| Size | seal depth | A   | B  | C   | D  | E  | F  | G  | H   | J  | K  | L  |
|------|------------|-----|----|-----|----|----|----|----|-----|----|----|----|
| 1½   | 2½         | 16½ | 6  | 10½ | 3½ | 7  | 5½ | 5½ | 10½ | 3½ | 4½ | 1  |
| 2    | 3          | 20½ | 7¼ | 13  | 3¾ | 7½ | 6  | 9½ | 12½ | 4  | 5½ | 1½ |

\*Same as bottom section of long S trap (#6560). Annealed only.

6600—vertical outlet,  
6601—horizontal outlet.

**CENTRIFUGAL DRUM TRAP (bottom cleanout)**

The adjustable connection at the top of the body permits approximately 2½" variation in the depth of seal.

- Vertical outlet assembly #6600 consists of
- glass body #6602
  - vertical outlet #6603 (annealed only)
  - short cleanout plug #6544
  - drainline coupling #6650
  - adapter coupling #6650 for 1½" size or adjustable joint #6604 for 2" size

Horizontal outlet assembly #6601 is same as #6600 except that horizontal outlet #6604 is used in place of vertical outlet.

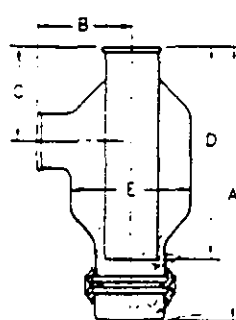
| Size | seal depth | A   | B  | C  | D  | E  | F  | G   |
|------|------------|-----|----|----|----|----|----|-----|
| 1½   | 2½         | 16½ | 6  | 5  | 4½ | 2½ | 5½ | 10  |
| 2    | 3          | 20½ | 7¼ | 5½ | 5½ | 9  | 4½ | 14½ |

6610

6612



without partition



with sealed-in partition

**PARTITION TRAPS**

Assembly #6610 consists of:

- glass body #6611 (without partition)
- 2" drainline coupling #6650
- 3" short cleanout plug #6544

To connect trap assembly #6610 to threaded sink tailpiece, thread bead adapter #6620 on tailpiece, join to beaded end of straight length cut to desired length, using coupling #6650. Or push end of straight length into trap inlet through adjustable connection (adapter coupling #6650 for 1½" size, adjustable joint #6660 for 2" and 3" sizes).

Drain line partition trap assembly #6612 consists of glass body #6613, with sealed-in partition (annealed only), 2" coupling #6650 and 3" short cleanout plug #6544.

Both traps are non-siphoning with the partition always visible.

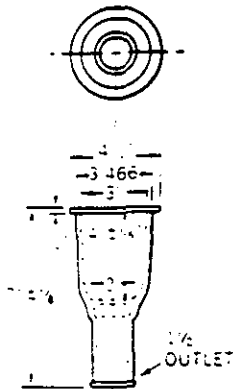
| Size | seal depth | A   | B  | C  | D   | E |
|------|------------|-----|----|----|-----|---|
| 1½   | 3½         | 8½  | 3½ | 3½ | 7½  | 3 |
| 2    | 3½         | 11½ | 5½ | 4½ | 9   | 5 |
| 2    | 3½         | 11½ | 4½ | 4½ | 9   | 5 |
| 3    | 4          | 16½ | 6½ | 5  | 10½ | 5 |

\*Available only without partition

## CUP SINKS

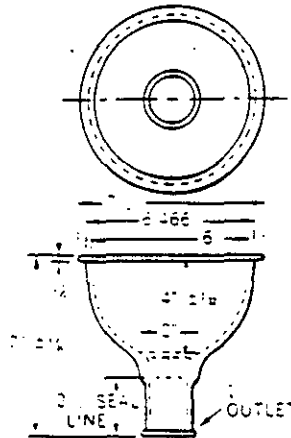
6616

3" hemispherical cup sink



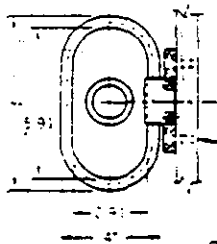
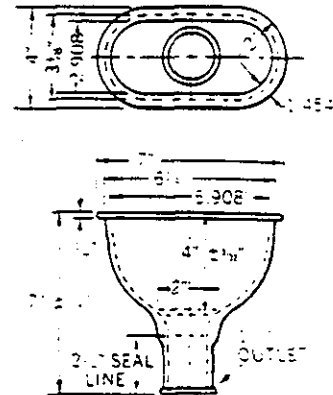
6617

6" hemispherical cup sink



6619

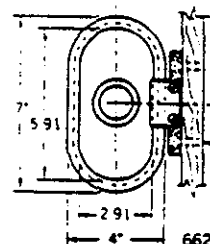
3" x 6" oval cup sink / straight sides



6620

3" x 6" end cup sink,  
oval, straight sides

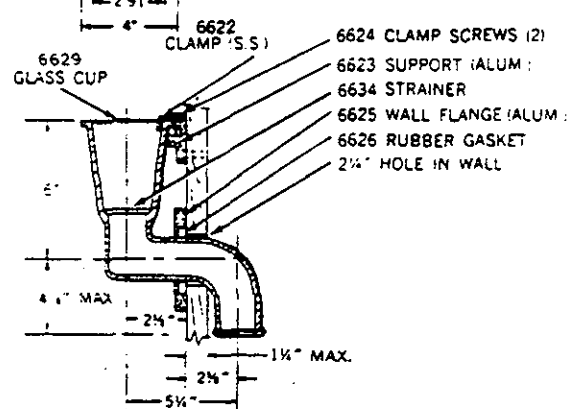
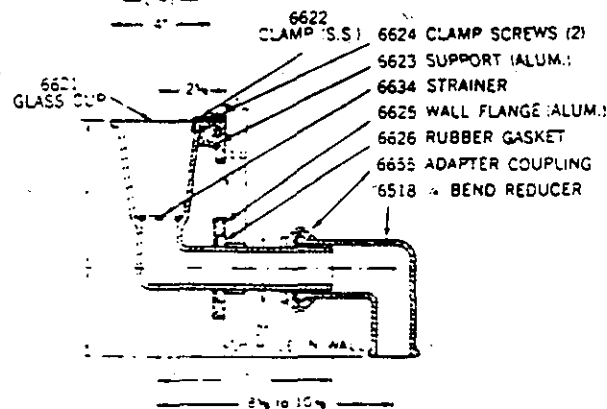
6627 MOUNTING BOLTS (4)



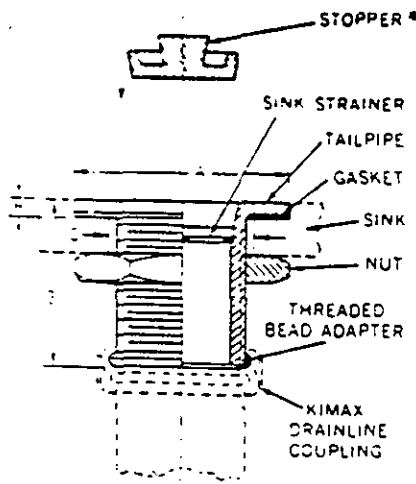
6628

3" x 6" Cup Sink, Offset  
Vertical Outlet, Straight Sides

6627 MOUNTING BOLTS (4)



6630



### 5 PIECE SINK TAILPIECE ASSEMBLY

Assembly #6630 includes Teflon tailpipe #6631; tailpipe locknut #6632; one Teflon strainer #6634; rubber gasket #6635; and Teflon bead adapter #6680. Teflon stopper #6637 must be ordered separately.

The tailpiece is tightened with a single nut. Teflon bead adapter #6680 is threaded to the tailpipe and joined to KIMAX drainline traps by means of KIMAX coupling #6650.

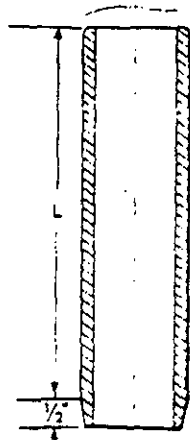
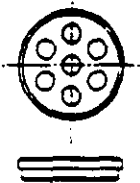
Three-inch lengths are standard. Longer tailpipes available on special order at extra cost.

| Size  | Recommended sink opening dimensions |     |       |
|-------|-------------------------------------|-----|-------|
|       | A                                   | B   | C     |
| 1 1/2 | 3 1/2                               | 1/2 | 2     |
| 2     | 4                                   | 1/2 | 2 1/2 |
| 3     | 5                                   | 1/2 | 3 1/2 |

NOTE: Tailpipe #6631, strainer #6634 & stopper #6637 are made of a filled Teflon material.

6638

BEE HIVE CAP



## STANDING OVERFLOW

Made from corrosion resistant filled Teflon available in three standard lengths. Precision tapered at lower end to fit tightly into mating taper of tailpipe. Beehive cap (#6639) must be ordered separately.

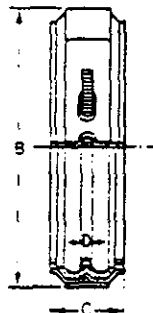
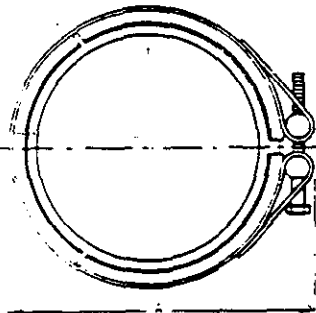
STANDING OVERFLOW (6638)

| Size      | L (length) |
|-----------|------------|
| 1 1/2 x 4 | 4          |
| 1 1/2 x 6 | 6          |
| 1 1/2 x 8 | 8          |
| 2 x 4     | 4          |
| 2 x 6     | 6          |
| 2 x 8     | 8          |
| 3 x 4     | 4          |
| 3 x 6     | 6          |
| 3 x 8     | 8          |

BEEHIVE CAP (6639)

| Size  |
|-------|
| 1 1/2 |
| 2     |
| 3     |

6650



## DRAINLINE COUPLING \*

Positive-seal compression coupling #6650 consists of following components:

Segmented stainless steel outer band #6651.

Buna N rubber compression ring with Teflon® liner #6652.

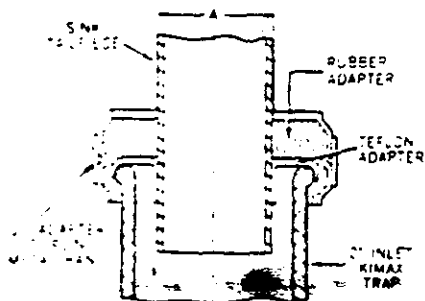
Stainless steel bolt #6653.

For details of construction, see pages 4-5.

| Size  | A     | B     | C     | D   |
|-------|-------|-------|-------|-----|
| 1 1/2 | 3     | 2 1/2 | 1 1/4 | 3/4 |
| 2     | 3 1/2 | 3 1/4 | 1 1/4 | 3/4 |
| 3     | 4 1/4 | 4 1/4 | 1 1/4 | 3/4 |
| 4     | 6     | 5 1/2 | 1 1/4 | 3/4 |
| 6     | 8 1/4 | 7 1/4 | 1 1/4 | 3/4 |

\*Patent Pending

6655



## ADAPTER COUPLING (assembly)

Assembly #6655 is used to join KIMAX drainline to unthreaded sink tailpieces. Assembly consists of:

Segmented stainless steel outer band #6651

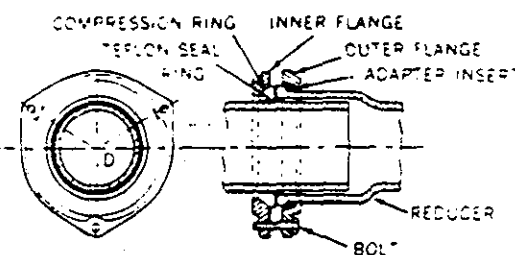
Buna N rubber adapter #6657

Teflon adapter #6656

Stainless steel bolt #6653

| Size  | Type of 1 1/2" Sink Strainer                                                                                                                              | A<br>Sink Strainer O.D. |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 1 1/2 | Metal tubing and lead                                                                                                                                     | 1.48" - 1.53"           |
| 2     | Lead, class "D" or "XL"                                                                                                                                   | 1.70" - 1.78"           |
| 3     | Corrosiron #14646; Durcon #SO-2<br>Duriron #11713; Lead, class "B",<br>"C", "L" or "M"; Plastic or steel<br>(1 1/2" I.P.S.); Vulcathene #505 and<br>glass | 1.82" - 1.90"           |

6660



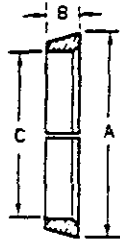
## ADJUSTABLE JOINT (hardware only)

Adjustable joint permits space adjustment from 1 1/4" to 5" depending on size. Assembly #6660 consists of:

- aluminum inner flange #7206.
- aluminum outer flange #7150
- Teflon seal ring (hat gasket) #7227.
- adapter insert (molded neoprene asbestos) #7203
- rubber compression ring #7226.
- 3 aluminum (hex head 3/16" - 18 x 1 1/4") bolts #7180 for 1 1/2", 2" and 3" sizes or 6 (hex head 3/16" - 18 x 1 1/4") aluminum bolts #7180 for 4" size

| Size  | D     | adjustment |
|-------|-------|------------|
| 1 1/2 | 4 1/4 | 1 1/4      |
| 2     | 5 1/4 | 2 1/4      |
| 3     | 6 1/4 | 3 1/4      |
| 4     | 8 1/4 | 5          |

7203

**ADAPTER INSERT (Molded)**

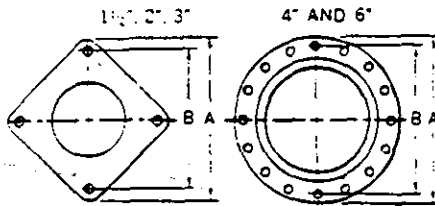
Neoprene molded insert is used when joining KIMAX drainline to other piping materials. These inserts will work with either Style I & Style II flanges for glass pipe. The 2½", 3½" and 5" sizes are used only with adjustable joints.

| Size | A   | B   | C    |
|------|-----|-----|------|
| 1½"  | 2¾" | ¾"  | 1.91 |
| 2"   | 2½" | ¾"  | 2.43 |
| 2½"  | 3¾" | ¾"  | 3.00 |
| 3"   | 4¾" | ¾"  | 3.53 |
| 3½"  | 5"  | ¾"  | 4.28 |
| 4"   | 6"  | 1½" | 4.62 |
| 5"   | 6¾" | ¾"  | 5.63 |
| 6"   | 8¾" | ¾"  | 6.85 |

\*Use #6670 metal flange only.

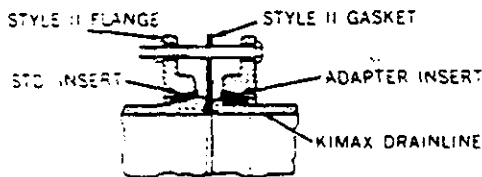
7155

6670

**METAL FLANGES**

Style II cast iron  
1½", 2", 3"

Metal flange cast iron  
4" and 6"



Cast-iron flanges are used to join KIMAX drainline to KIMAX process pipe or to glass-lined metal pipe. They are commonly used to join KIMAX process pipe to itself.

Flange #7155 is used on 1½", 2" and 3" drainline ends and adapter flange #6670 on 4" and 6" sizes. Adapter insert #7203 must be used between flange and drainline.

Flange #7155 is used with standard insert #7200 or #7202 for all sizes of process pipe. The 4" and 6" sizes are similar in shape to Flange #6670 but have inner snap-rings with cemented inserts.

All sizes of both flanges have A.S.M.E. bolt circles.

For bolt sizes and number required, see table below.

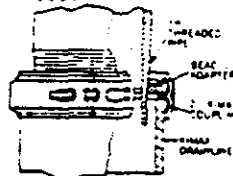
| Size | A    | B<br>Bolt Circle | No. Bolts | Bolt Size   |
|------|------|------------------|-----------|-------------|
| 1½"  | 4¾"  | 3¾"              | 4         | ¾"-18 x 2½" |
| 2"   | 5¾"  | 4½"              | 4         | ¾"-18 x 2½" |
| 3"   | 6¾"  | 6"               | 4         | ¾"-18 x 3"  |
| 4"   | 8¾"  | 7½"              | 8         | ¾"-18 x 2½" |
| 6"   | 10¾" | 9½"              | 8         | ¾"-18 x 2½" |

6680



standard

6685



adjustable

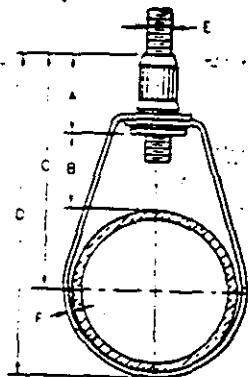
**BEAD ADAPTERS (threaded)**

Threaded bead adapters are used to provide beaded mating surface on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling #6650. All Teflon construction.

Adapter #6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4" and 6" sizes.

Adapter #6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments.

7290

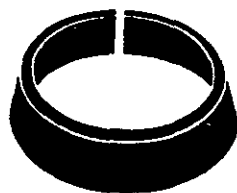
**"AUTO-GRIP"® HANGER**

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type U.S. Zinc coating. See page 8 for operating instructions.

| Size | A   | B   | C   | D    | E  | F       |
|------|-----|-----|-----|------|----|---------|
| 1½"  | 1¾" | 1½" | 3½" | 4¾"  | ¾" | ¾" x ¾" |
| 2"   | 1¾" | 1½" | 3½" | 4¾"  | ¾" | ¾" x ¾" |
| 3"   | 1¾" | 1½" | 4½" | 6¾"  | ¾" | ¾" x 1" |
| 4"   | 1¾" | 1½" | 5½" | 7¾"  | ¾" | ¾" x 1" |
| 6"   | 1¾" | 2½" | 7¾" | 10¾" | ¾" | ¾" x 1" |

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7200



7202



### INSERTS

For use with glass process pipe and fittings to cushion glass from metal flange.

Insert #7200 is molded neoprene asbestos. The 1", 1½", 2", and 3" sizes are used with standard tempered pipe and fittings.

Insert #7202 is a neoprene asbestos strip insert used for 1" through 6" annealed fittings and for use as replacement parts for 4" and 6" tempered pipe and fittings.

7276



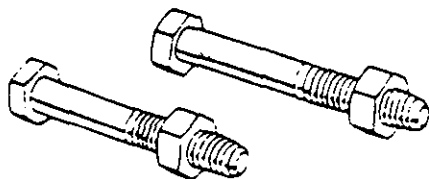
### INTERFACE GASKET

Used when joining KIMAX tempered glass drainline to KIMAX process pipe and KIMAX process pipe to itself.

Teflon machined envelope is a one-piece liner. Inner diameter is same as glass to prevent constriction of flow at the joint. Standard filler is Blue African asbestos.

Maximum working temperature of gasket is 450° F. Gasket thickness is 1/16" in 1", 1½", 2", and 3" sizes; ¼" in 4" and 6" sizes.

7190

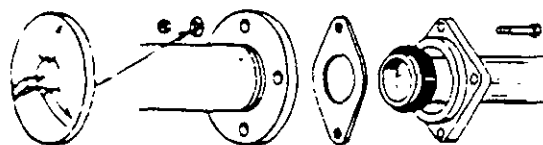


### BOLTS & NUTS

Steel bolts and nuts #7190 are required to fasten metal flanges when joining KIMAX drainline to process pipe or to glass-lined metal pipe.

Four bolts needed for 1½", 2", and 3" sizes; eight bolts needed for 4" and 6" sizes.

7230

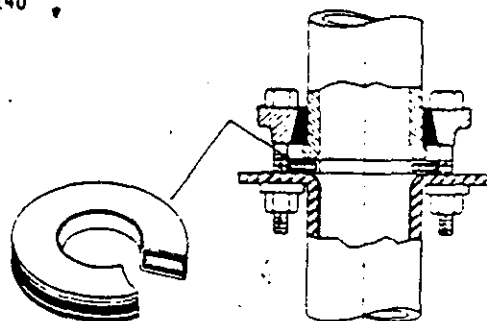


### ADAPTER BUTTON

Used to center smaller diameter Style II steel bolts in larger holes of A.S.M.E. flange when adapting KIMAX glass drainline to glass-lined metal pipe. One size of button is used for all sizes of flanges.

| I.D.  | O.D. | Height |
|-------|------|--------|
| .390" | 1¼"  | ¼"     |

7240



### DONUT SPACER

Teflon-covered donut spacer must be interposed between KIMAX drainline and glass-lined metal pipe.

Spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.

| PIPE SIZE<br>(inches) | THICKNESS<br>(inches) |
|-----------------------|-----------------------|
| 1                     | ¼                     |
| 1½                    | ¼                     |
| 2                     | ¼                     |
| 3                     | ⅜                     |
| 4                     | ⅜                     |
| 6                     | ½                     |



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22 S. Park St.  
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Toledo 1, Ohio  
P. O. Box 1035  
Phone: 242-6543

**OWENS-ILLINOIS**

Maker of Kimble Products   
Toledo 1, Ohio

KIMAX Tempered Drainline is manufactured and sold by the Consumer and Technical Products Division

TR-2

*Installing* **KIMAX  
TEMPERED  
GLASS  
DRAINLINE**



**OWENS-ILLINOIS GLASS COMPANY**  
CONSUMER AND TECHNICAL PRODUCTS DIVISION

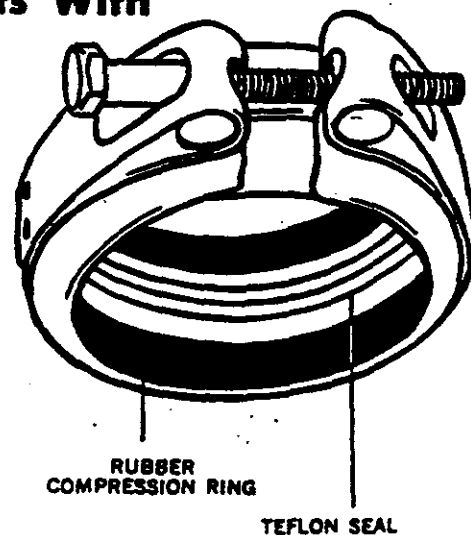
## **Kimax\* Tempered Glass Drainline**

### **IS EASY TO INSTALL BECAUSE . . .**

- Kimax Glass Drainline weighs just a fraction of conventional drainline materials.
- Longer lengths are available. Therefore fewer joints are required.
- Expansion is negligible; therefore expansion joints are not needed or recommended.
- Joints can be made faster. They're easier to handle and require fewer hangers because hangers are placed farther apart.
- Kimax glass possesses good mechanical strength. You don't have to handle it with kid gloves.
- There is no limit to the length or height to which Kimax glass drainline can be installed. It can be encased inside a wall, accessible or not. It can be buried in the ground, underneath concrete, or inside any trough or sleeve.

### **Making Corrosion Resistant Joints With The Kimax Coupling**

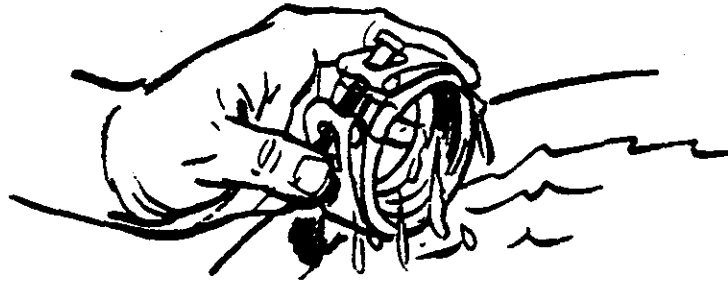
- All the metal parts are stainless steel. Inside, the coupling has a rubber compression ring and a Teflon seal ring.
- The coupling works like this: When tightened the metal band causes the Teflon seal ring and the glass beads to exert pressure on one another.



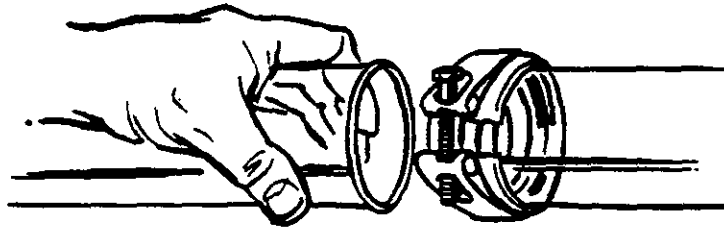
- Kimax is a registered trademark of Owens-Illinois, Toledo 1, Ohio
- While all instructions in this manual have been tried and tested in actual installations, the actual installation procedures used are at the discretion and responsibility of the contractor or installer.



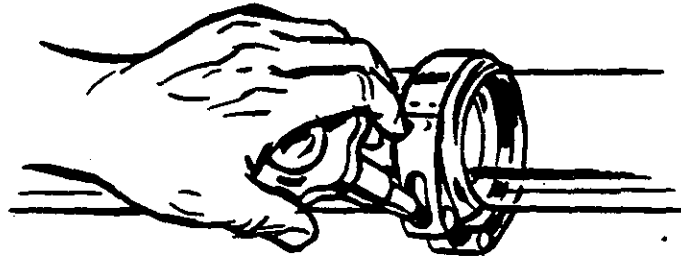
## How To Use The Kimax Coupling



1. Dip the coupling into a bucket of water or wet the inside with a damp sponge or cloth.



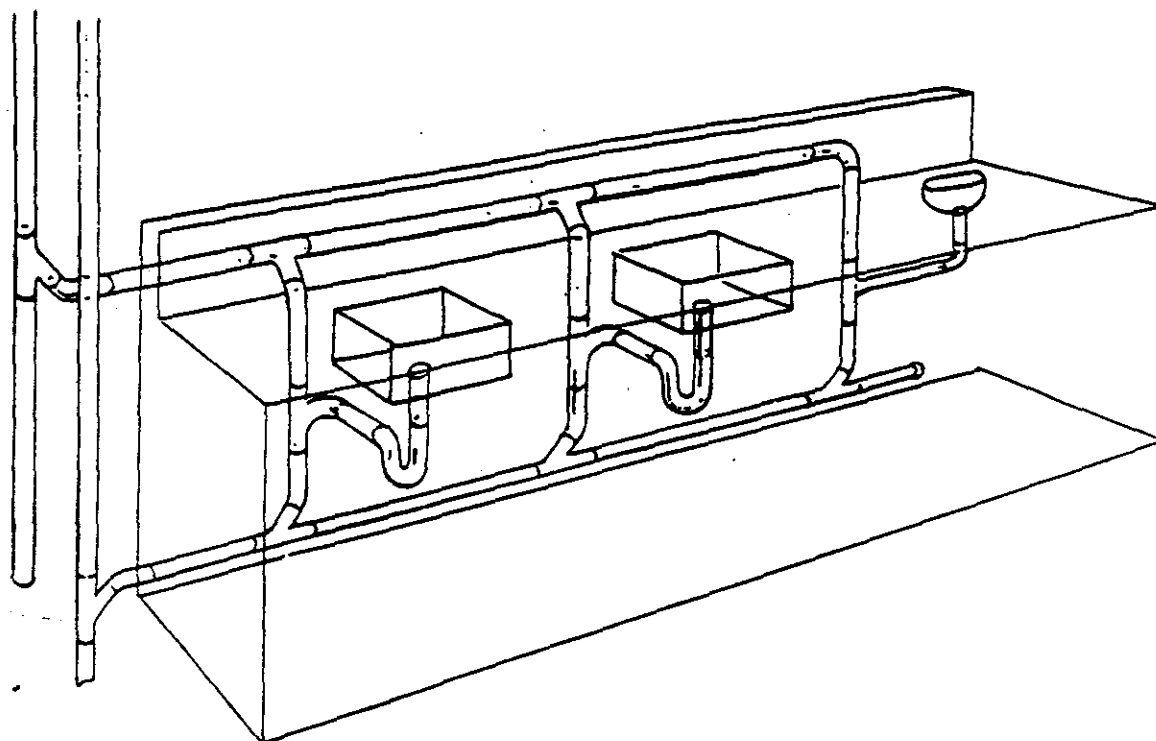
2. Push the coupling over one drainline section and then push the other section into the coupling.



3. Once the beads are seated properly you should be able to rotate the coupling on the glass. Tighten the bolt with a palm ratchet wrench until coupling firmly grips the glass.

### FOUR THINGS TO REMEMBER ABOUT THE KIMAX COUPLING

- The nut is assembled in the coupling so you won't have to hunt for it. However, it can easily be removed and replaced if necessary.
- A more positive Teflon to glass seal is obtained if all couplings are retightened to recommended torque 24 hours after being installed. This compensates for the cold flow in the Teflon seal ring.
- When dismantling the coupling it is recommended that any rubber and Teflon parts be checked for damage before being reinstalled. They may need replacing.
- Maximum continuous operating temperature is 212°F. (May be subjected to 250°F for short periods.)



## **Kimax Layouts Are Simple**

**THEY'RE SIMILAR TO DRAINLINE JOBS WITH OTHER MATERIALS**

### **REMEMBER THIS**

- Catalog dimensions for each length of drainline or fitting are given to the center of the gasket inside each drainline coupling. This means you forget about gasket thickness for layout purposes.
- In planning a Kimax drainline system, use catalog dimensions for straight lengths and fittings, since gasket thicknesses have been allowed for.
- Installation layout is simple because of the Owens-Illinois Kimax coupling assembly. With this one-piece coupling you tighten only one bolt for each joint. (It is available with a built-in positive seal detector upon request.)

## Burying Kimax Drainline

### PREPARING THE TRENCH

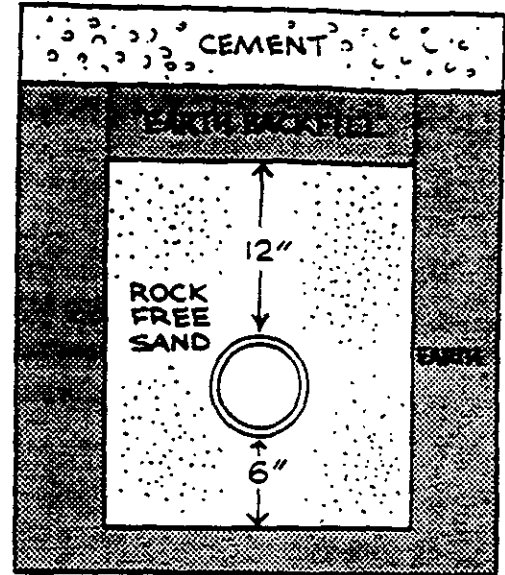
1. Dig trench to workable width and necessary depth dimensions as shown in illustration.
2. Partially refill the trench with 6 inches of rock-free sand.
3. Tamp the grade to assure a firm foundation for laying the drainline.

### LAYING THE DRAINLINE

4. Use 5-foot lengths of heavy schedule drainline with regular fittings. No expansion joints are needed since there's little or no expansion.
5. The line should be wrapped to prevent serious scratching of the glass. The recommended procedure is wrapping the line from bead to bead with JM E20 polyethylene tape or its equivalent. Or the line can be coated with at least 1/16" of ordinary automotive undercoating or other suitable mastic.
6. Lay the drainline in the trench with normal pitch ( $\frac{1}{4}$  inch per foot up to 3 inches,  $\frac{1}{8}$  inch per foot above 3 inches). You can assemble it above the ground, or in the trench, depending on job conditions.
7. Check all joints for tightness. If fittings in pre-assembled section are to be adjusted for position when laid in the trench, tighten coupling only half way so fittings can be rotated.
8. Test the line to make sure there are no leaks. If there is a leak, tighten leaking joint. If it still leaks make sure rubber compression ring and Teflon seal are dirt free. Be sure coupling and beads are not defective. Make sure beads are seated properly in the coupling. Check to see that the drainline alignment is satisfactory.

### BACKFILLING THE TRENCH

9. Backfill the trench with thin layers of rock free sand to 12 inches above the top of the drainline.
10. Tamp sand down firmly or spray it with water to make sure it's firm.
11. Fill the rest of the trench and complete floor or slab.



# Hanging Kimax Drainline

## HORIZONTAL RUNS

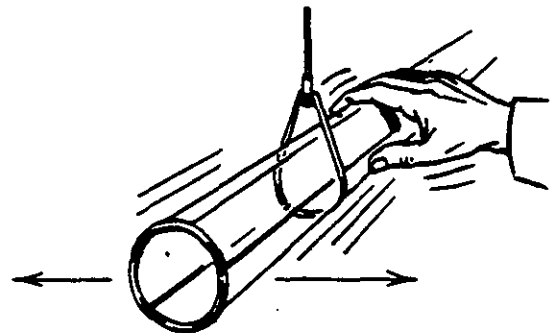
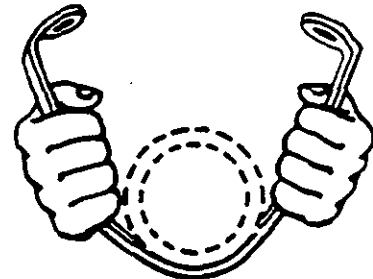
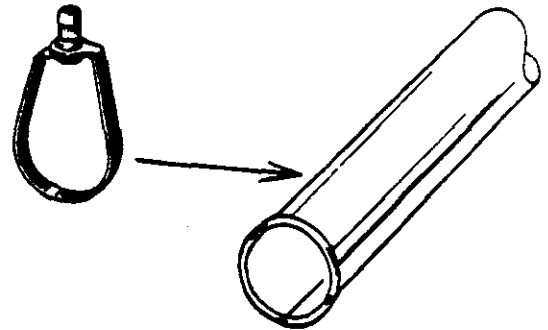
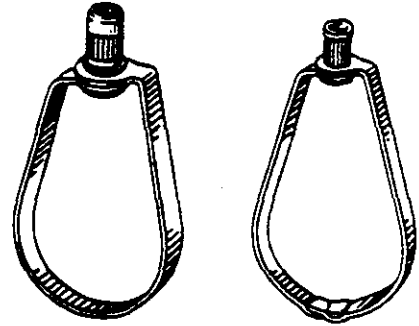
Use these "Auto-Grip"\* hangers or an equivalent to support the line every eight to ten feet. Notice: they are padded to prevent metal to glass contact.

1. Fit the hangers to the drainline, not the drainline to the hangers.

2. Spread the hanger and slip over drainline.

3. Tighten each coupling as you make it and never pull or spring the drainline into place.

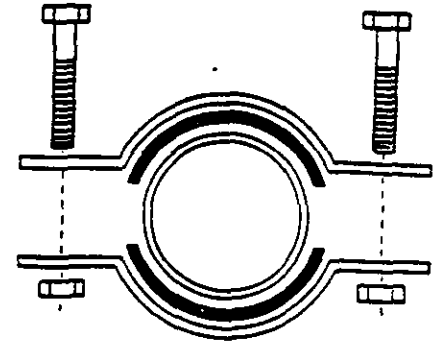
4. When the drainline is hung it should be free to move sideways.



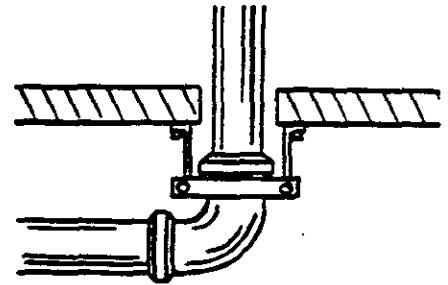
\* "Auto-Grip" is a registered trademark of the Automatic Sprinkler Corp. of America, Youngstown, Ohio.

## VERTICAL RUNS

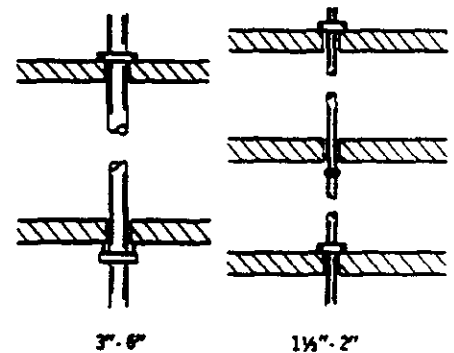
1. Riser clamp lined with  $\frac{1}{4}$ " thick neoprene should be installed under a coupling every third floor whenever possible.



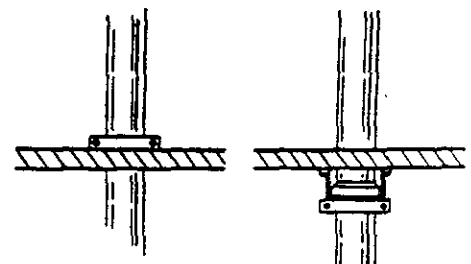
2. Use a ring support under bottom coupling.



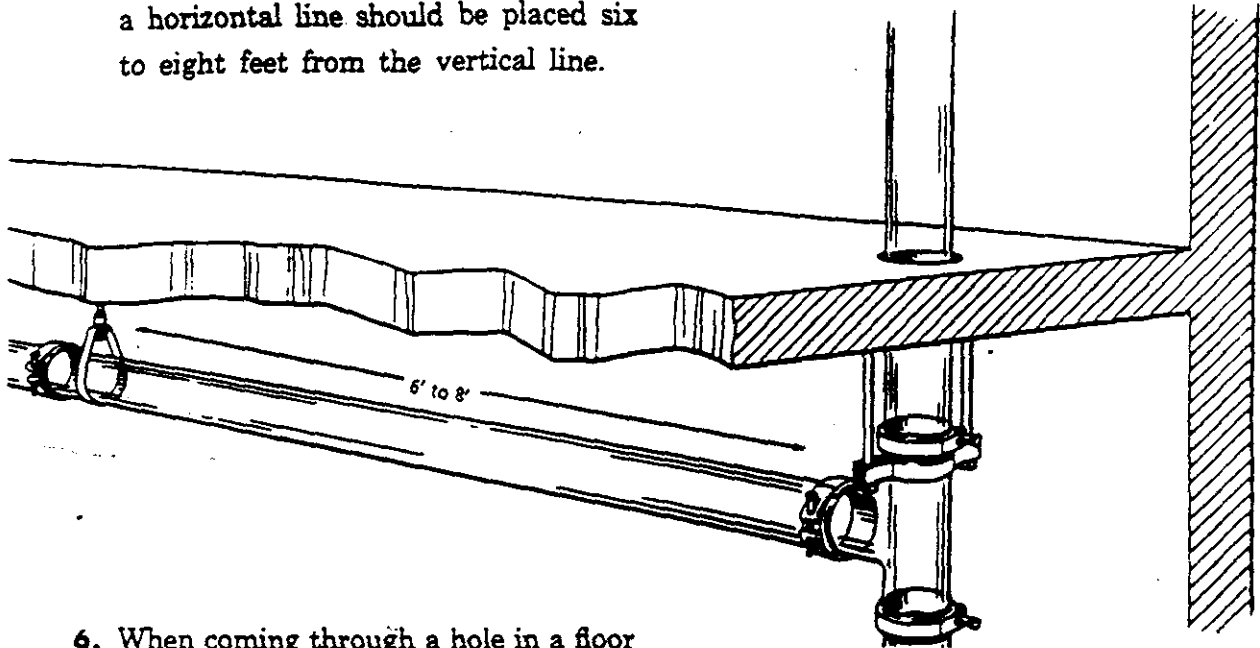
3. Support 3", 4" and 6" stacks at every floor. Support 1½" and 2" stacks every other floor.



4. Place riser clamps either above the floor or below it as indicated. Whenever practical every third support in a vertical run should be positioned directly below a coupling.

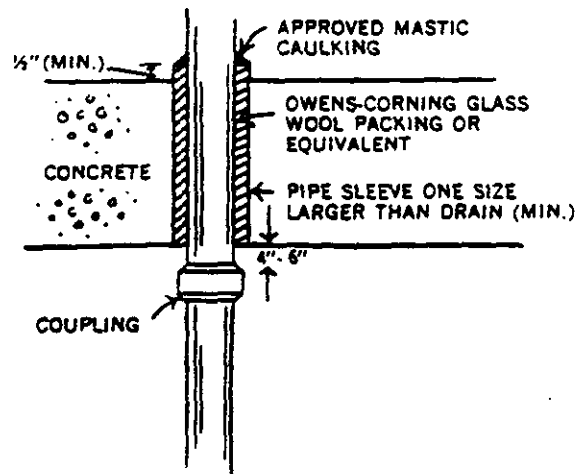


5. Do not support vertical runs with horizontal drainlines. The first hanger on a horizontal line should be placed six to eight feet from the vertical line.



6. When coming through a hole in a floor make sure drainline is not touching the floor.

7. To bring a drainline through a concrete floor, insert a pipe sleeve one size larger than drain into floor. Insert drainline and pack Owens-Corning glass wool or an equivalent insulation around it in sleeve. Seal above with an approved mastic caulking. Secure drainline with a coupling four to six inches below concrete slab for added flexibility.

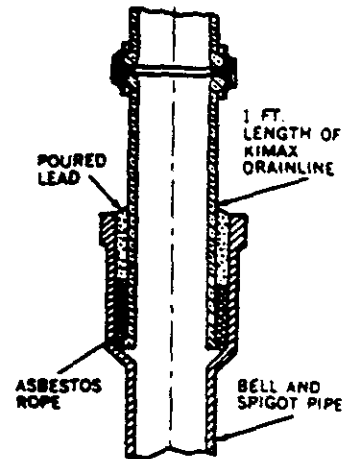


## Making Joints With Kimax Drainline

### JOINING KIMAX DRAINLINE TO METAL BELL AND SPIGOT PIPE

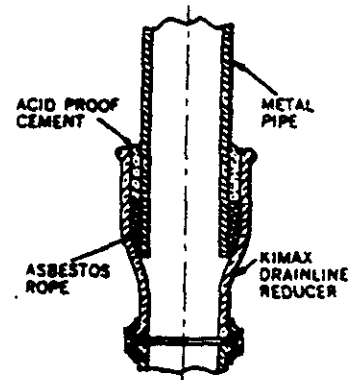
1. Pack the joint well with asbestos rope.
2. Pre-heat both pipes to the point where a drop of water sizzles.
3. Pour in hot lead and caulk.

**NOTE:** It is important to leave a space of several inches from top of joint to first coupling.



### JOINING METAL PIPE TO A KIMAX REDUCER

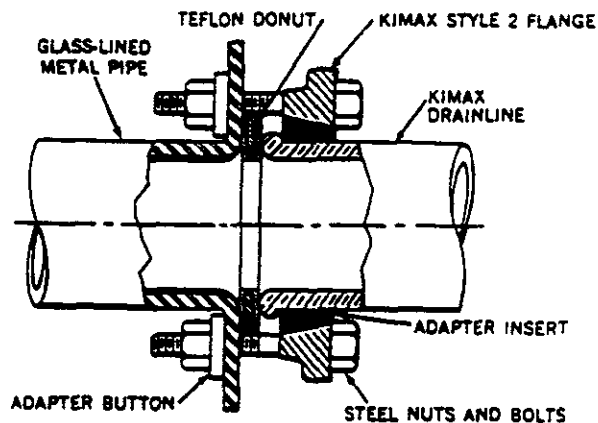
1. Make sure inside surface of drainline is clean.
2. Pack with asbestos rope.
3. Pack the joint with acid-proof cement.



**NOTE:** Whenever possible join glass to metal in a vertical position. Horizontal lines have a pocket where corrosive wastes collect and attack the packing.

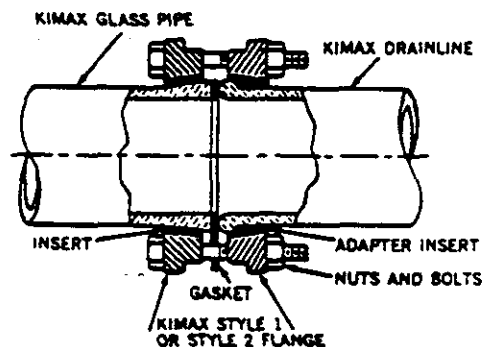
### JOINING KIMAX DRAINLINE TO GLASS LINED METAL PIPE

1. Use a Kimax flange that fits with an ASME bolt circle, an adapter insert, a set of adapter buttons and a Teflon donut gasket.
2. Insert the adapter insert next to the flanged metal pipe. Hold the Kimax drainline in place and insert the Teflon donut gasket as shown. Insert the bolt through a Kimax flange and through the metal flange. Set with an adapter button as shown and secure with a nut. Connection is now complete and secure with the Teflon donut protecting both the glass drainline and the glass lined metal pipe.



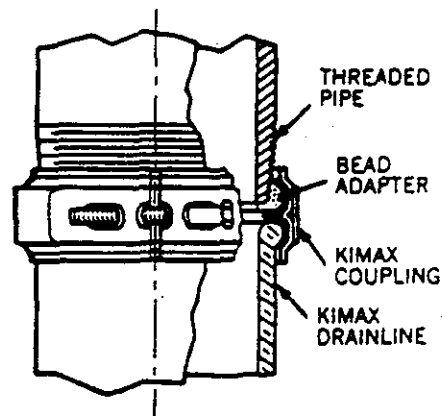
### JOINING KIMAX DRAINLINE TO KIMAX PROCESS PIPE

In this application two Kimax metal flanges are used as indicated. After inserting adapter inserts and Teflon interface gasket, bolt the two flanges together and secure with nuts.



### JOINING KIMAX DRAINLINE TO THREADED METAL OR PLASTIC PIPE

1. When joining Kimax drainline to threaded metal or plastic pipe use a threaded bead adapter. Just turn it snugly on the end of the tail piece or pipe for a ready made bead.
2. When using the bead adapter on metal, coat the metal threads with acid proof cement before you screw the adapter on.
3. Then use a standard Kimax coupling.

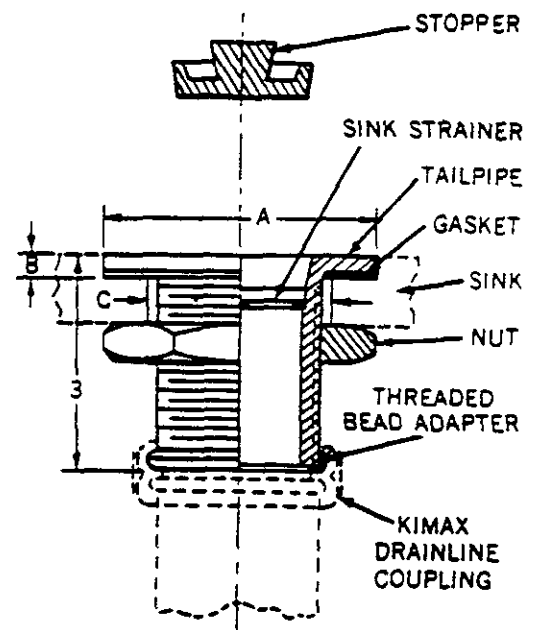




## Making Sink Connections With Kimax Drainline

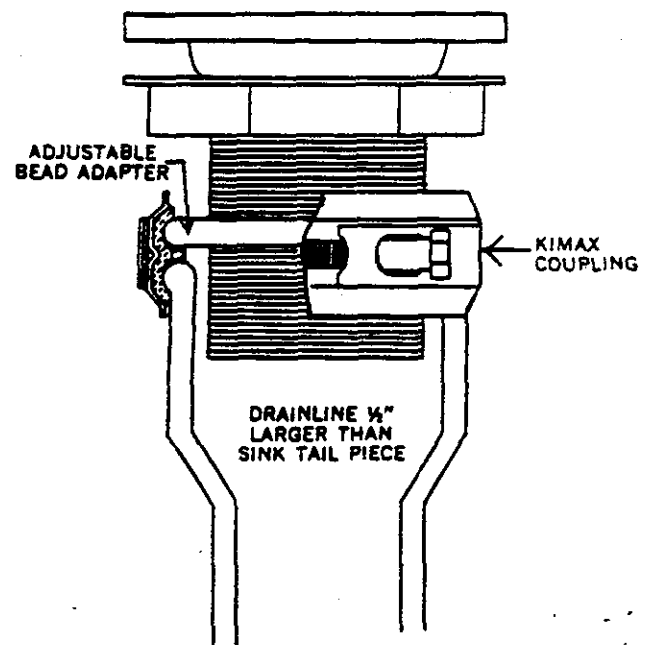
### USE THIS THREADED BEAD ADAPTER TO JOIN DRAINLINE TO THREADED SINK TAIL PIECE

Screw bead adapter onto sink tail piece. Push Kimax coupling over bead adapter and then push drainline into the coupling. Tighten bolt.



### USE THIS ADJUSTABLE BEAD ADAPTER WHEN HEIGHT ADJUSTMENT IS DESIRED

Screw adjustable bead adapter onto tail piece to desired height. Push coupling over bead adapter. Position drainline end over tail piece and push it into the coupling. Tighten bolt. Adjustable bead adapter is readily available in 2" x 1½" size. Contact an Owens-Illinois representative for other special sizes.



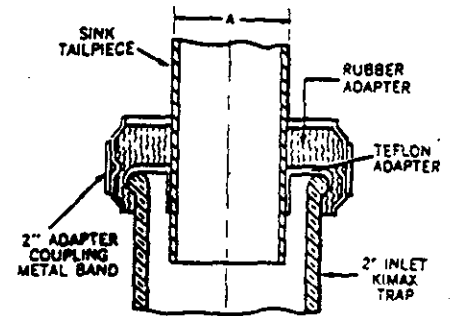
**USE THIS ADAPTER COUPLING TO JOIN KIMAX DRAINLINE TO**

**SMOOTH TAIL PIECES**

**PARTITION TRAPS WITHOUT SEALED  
IN PARTITIONS**

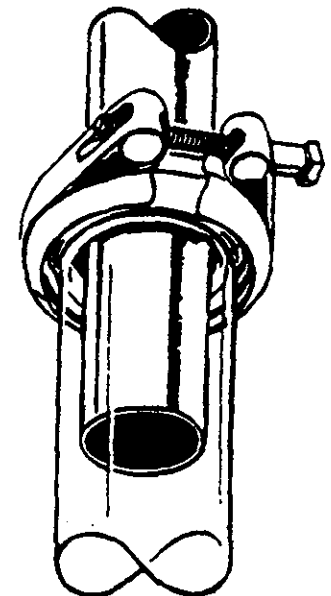
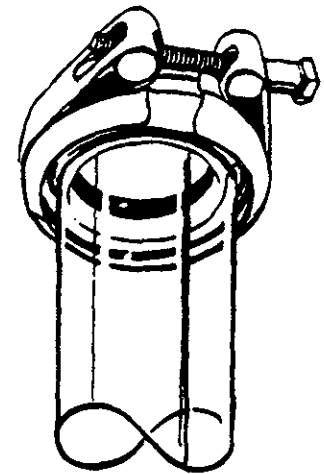
**DRAIN TRAPS AND END CUP SINKS**

**3 I.D. SIZES — 1½", 1¾" AND 1⅞"**



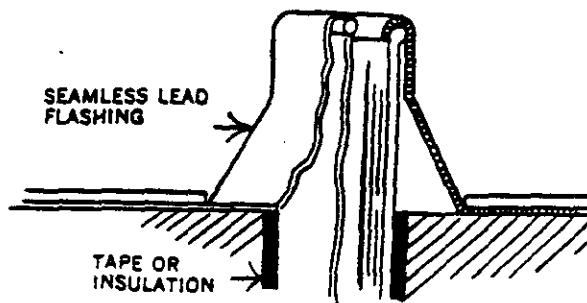
**FOLLOW THESE STEPS**

1. Wet the adapter coupling.
2. Slip it over the bead on the outgoing drainline, trap or drainline reducer.
3. Slide the incoming tail piece or pipe through the coupling.
4. When everything is in position tighten the bolt to recommended torque.



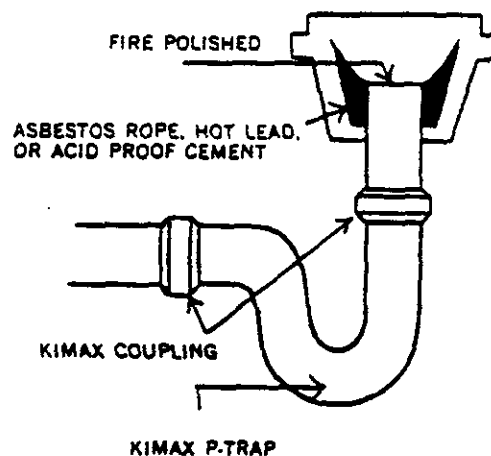
### Flashing For Kimax Drainline

When installing through a slab roof or metal deck use seamless lead flashing as shown.



### Connecting Kimax Drainline To A Floor Drain

Drawing shows how to attach a Kimax drainline to a floor drain with a Kimax coupling and a Kimax P trap. Use a drainline of the proper diameter and length which is beaded at one end and fire polished\* at the other. Insert the fire polished end into outlet or floor drain. Make sure glass is flush with bottom of drain. Seal joint by packing with asbestos rope, hot lead or acid proof cement. Attach beaded end of the drainline to standard Kimax P trap with standard Kimax coupling. Be sure to lay underground glass pipe and fittings on a minimum of 6" of sand and follow procedure for underground installations.

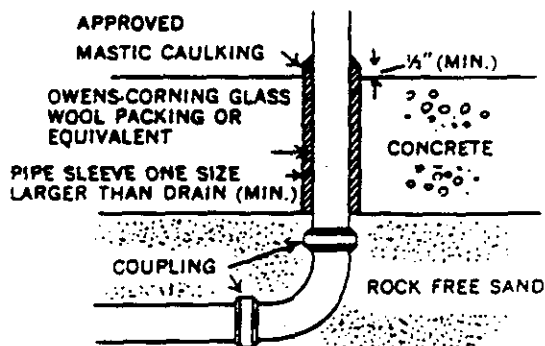


### Connecting Kimax Drainline To A Threaded Floor Drain

When connecting Kimax drainline to a threaded floor drain use a threaded bead adapter and a standard Kimax coupling. Turn the bead adapter on the end of the floor drain and secure the joint with a standard Kimax coupling.

### Bringing Kimax Drainline Through A Concrete Slab

To bring a drainline through a concrete slab from underground insert a pipe sleeve one size larger than the drain into slab. Insert drainline and pack Owens-Corning glass wool or an equivalent insulation around it in sleeve. Seal top with an approved mastic caulking. Under the slab the drainline must be completely cushioned with rock free sand.



\* Kimax Drainline can be fire polished with the Kimax Beading Kit. Fire polishing smooths the edges of glass that have been cut. Slowly rotate cut end of glass in flame until surface begins to glow. Remove glass from flame.

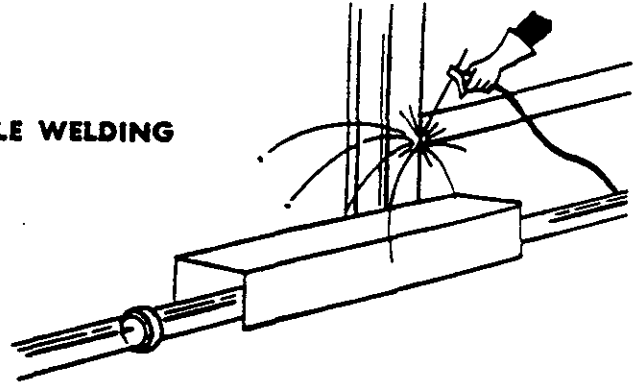
# Protecting Kimax Drainline

## AVOID SCRATCHING GLASS

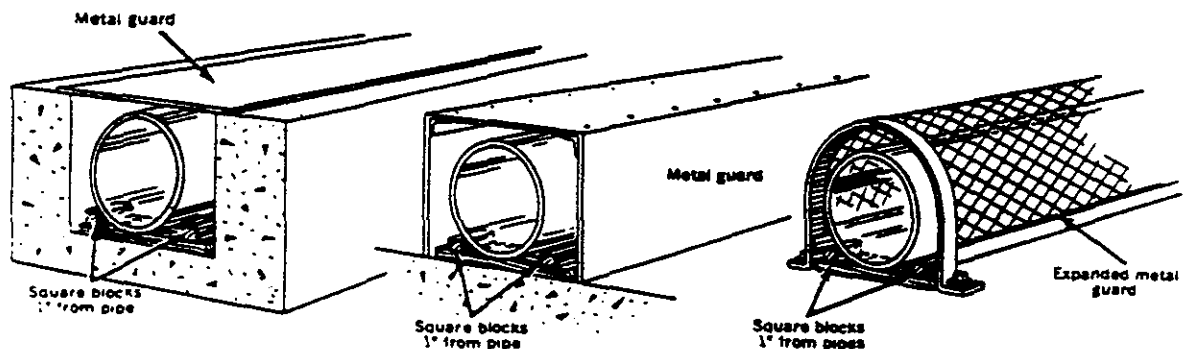
Keep drainline in shipping carton until ready for use.

## AVOID SPATTERING GLASS WHILE WELDING

Protect the drainline by covering it with a carton or cardboard.



## WHEN EXPOSED TO HEAVY TRAFFIC



Drainline should be protected by expanded metal, plywood enclosure, channel iron, etc. It should be supported by rubberized pipe, rollers, padded blocks with loose fitting side wedges, or other

loose lateral guides. The drainline must be free to move sideways to prevent bending moments in other sections of the system.

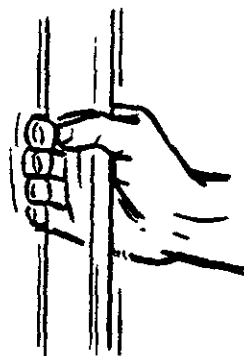
## CLEANING PROCEDURES

To clean drainline system rod out section of plugged drainline with wood pole, or add chemicals to the system which will dissolve the stoppage, or use a plastic-covered snake.

## Testing Kimax Drainline

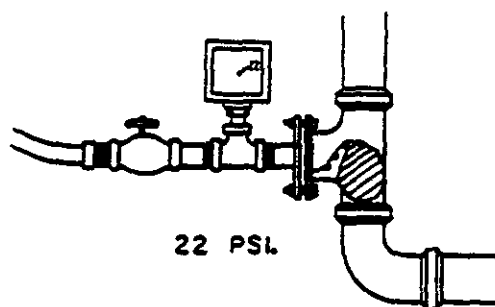
**SHAKE THE LINE TO MAKE SURE THERE IS NO STRAIN**

Be sure drainline is loose. If not, make necessary adjustments.



### **BE SURE THERE ARE NO LEAKS**

- Test the line in accordance with local codes.
- Use water pressure of 5 to 22 psi for 15 minutes.
- Check to see that all couplings are tight and leak-free.



### **IN CASE OF A LEAK FOLLOW THIS PROCEDURE**

1. Tighten leaking joint.
2. If it still leaks remove the coupling and make sure rubber compression ring and Teflon seal are free from dirt or other obstructions.
3. Make sure coupling and beads are not defective. Replace coupling or drainline when necessary.
4. Make sure drainline alignment is good.
5. Make sure beads are properly seated in coupling.



**KIMBLE GENERAL  
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Phone: 385-3471

Montclair, N. J.  
22 S. Park St.  
Phone: 746-6600

Toledo 1, Ohio  
P. O. Box 1035  
Phone: 242-6543

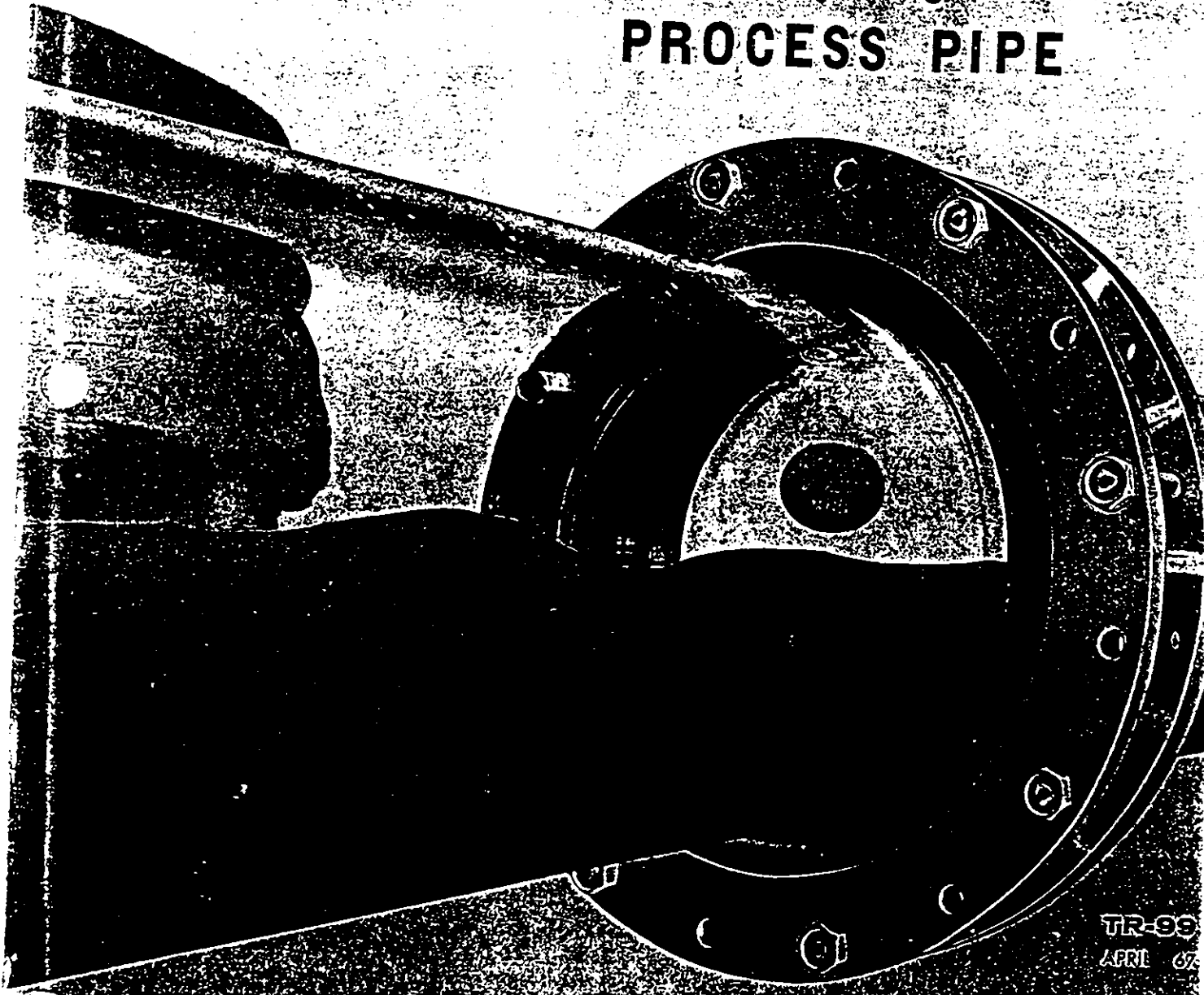
**OWENS-ILLINOIS**

maker of Kimble Products  
Toledo 1, Ohio **®**

KIMAX Tempered Drainline is manufactured and sold by the Consumer and Technical Products Division

4 TR-427 Printed in U.S.A. 4-5M

**OWENS-ILLINOIS**  
**KIMAX<sup>®</sup>**  
tempered glass  
**PROCESS PIPE**



TR-99  
APRIL 67



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KIMAX Tempered Glass Pipe is manufactured and sold by the Consumer and Technical Products Division.

TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.



## KIMAX<sup>®</sup> Tempered Glass PIPE

This label which is placed on every piece of KIMAX Tempered Glass Pipe before shipment, is your warranty against defects in material or workmanship. If failure results from such causes, Owens-Illinois will, in full discharge of this warranty, replace such pipe at no charge.

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## GENERAL INFORMATION

### Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

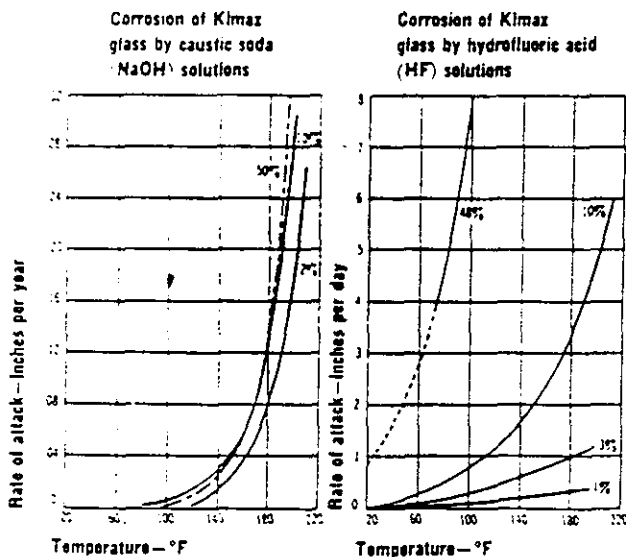
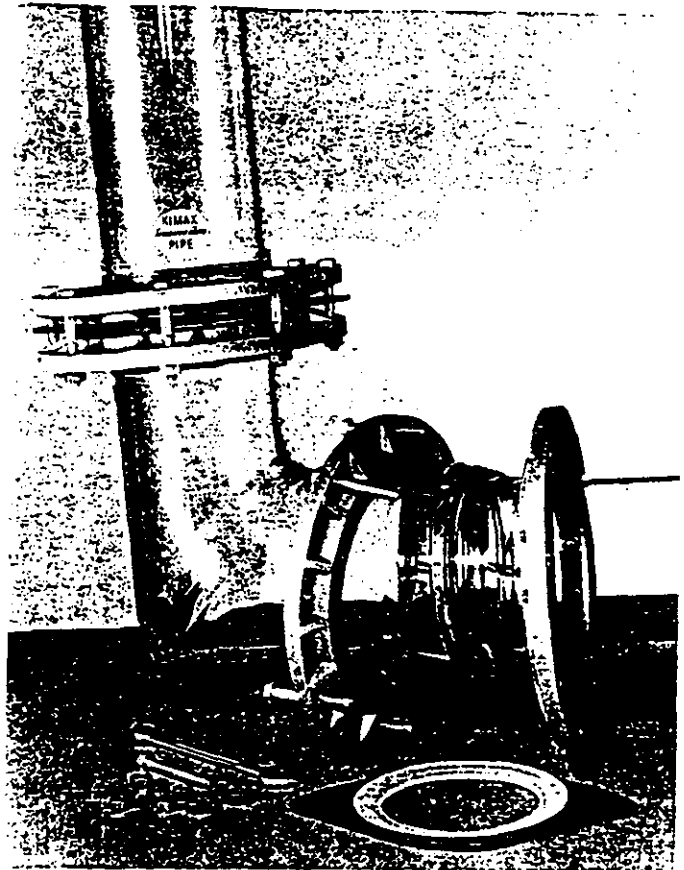
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

### Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

**Economy** is inherent in KIMAX glass pipe systems. Material is competitively priced. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.

**Lightweight.** KIMAX glass pipe weighs  $\frac{1}{3}$  to  $\frac{1}{4}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

**No Scale Build-up.** The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

**Purity of products and processes** is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

**Thermal Properties.** KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

**Transparency** is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

## Manufacturing Characteristics

KIMAX Tempered Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing. Length dimensions are held to  $\pm \frac{1}{32}$ ".

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

Selective tempering—the adding of surface or skin stress—triples the mechanical shock resistance of straight length ends and of most fittings.

A few fittings such as caps, U-bends, thermometer wells, and some traps are annealed only due to their shape. These annealed fittings are clearly identified.

## Physical Properties

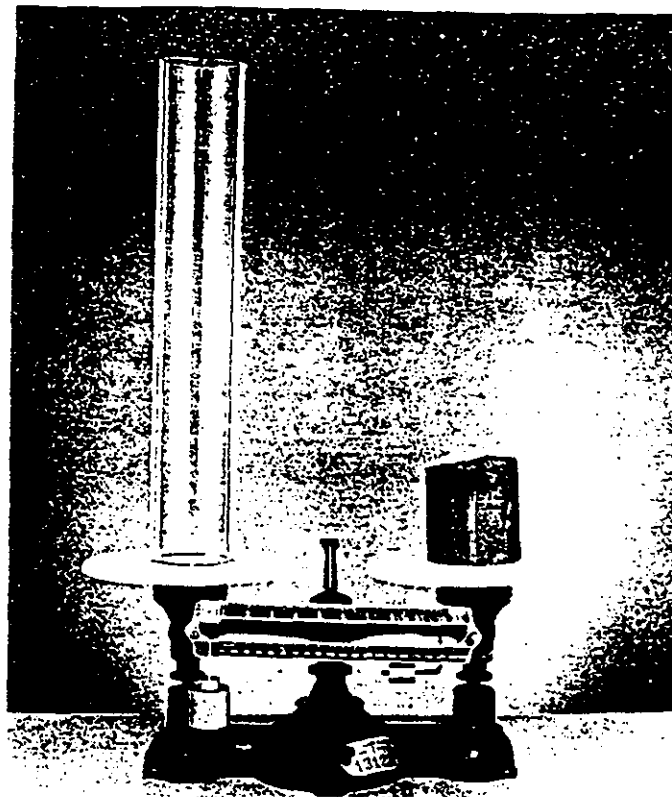
KIMAX (KG 33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

Operating temperatures extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

Thermal conductivity: 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F

Thermal expansion of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

Thermal shock differential ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



## Ordering

When ordering a standard item please refer to KIMAX glass pipe distributors' price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

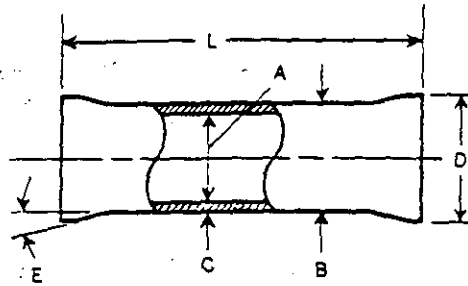
## Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

Non-stock items such as reducing tees and crosses with 3 and 4-way reductions; traps; U-returns and drainline Y's can be supplied by your KIMAX pipe distributor on special order.

# KIMAX GLASS PIPE AND FITTINGS

## STRAIGHT LENGTHS 6100



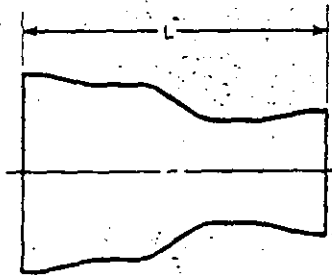
Standard lengths in all diameters are 6"; 12"; 18"; 24"; 30"; 48"; 60"; 72"; 84"; 96"; 108"; and 120".

Intermediate odd lengths are available on special order. Factory-made odd lengths are tempered. Special lengths up to 15 feet supplied on special order. Tolerance on length and I.D. is  $\pm \frac{1}{32}$ ".

| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs./Fl. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|--------------------|---------------------------|
| 1"                            | 1.313"            | .156"     | 1 1/4"              | 12°                  | 3"                  | .60                | 55                        |
| 1 1/2"                        | 1.844"            | .172"     | 2 1/4"              | 12°                  | 3 1/2"              | 1.0                | 55                        |
| 2"                            | 2.344"            | .172"     | 2 3/4"              | 12°                  | 4"                  | 1.13               | 55                        |
| 3"                            | 3.406"            | .203"     | 3 15/32"            | 12°                  | 5"                  | 2.0                | 55                        |
| 4"                            | 4.530"            | .265"     | 5 1/32"             | 21°                  | 6"                  | 3.4                | 35                        |
| 6"                            | 6.656"            | .328"     | 7 1/32"             | 21°                  | 6"                  | 6.3                | 20                        |

When ordering, specify pipe I.D. and length in inches.

## STRAIGHT REDUCERS 6215



| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>( $\pm \frac{1}{2}$ in.) |
|-----------------------|------------------------|-------------------------------|
| 1 1/2                 | 1                      | 4                             |
| 2                     | 1 1/2 or 1             | 4                             |
| 3                     | 2, 1 1/2, or 1         | 5                             |
| 4                     | 3, 2, 1 1/2, or 1      | 7                             |
| 6                     | 4, 3, 2, 1 1/2, or 1   | 9                             |

## ECCENTRIC REDUCERS 6240

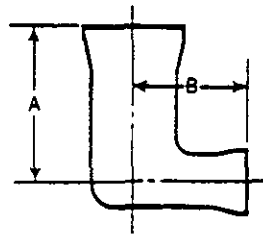


| Pipe Size<br>(inches) | Reduced To<br>(inches) | C<br>Minimum<br>(inches) | D<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------|--------------------------------|
| 1 1/2                 | 1                      | 1 1/4                    | 4                              |
| 2                     | 1 1/2 or 1             | 1 1/4                    | 4                              |
| 3                     | 2, 1 1/2, or 1         | 2 1/4                    | 5                              |
| 4                     | 3, 2, 1 1/2, or 1      | 3                        | 7                              |
| 6                     | 4, 3, or 2             | 3                        | 9                              |

# KIMAX GLASS PIPE AND FITTING

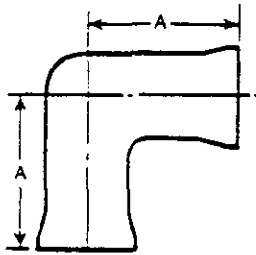


## REDUCER ELBOWS 6202



| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                      | 3½                             | 3                              |
| 2                     | 1                      | 4                              | 3                              |
| 2                     | 1½                     | 4                              | 3½                             |
| 3                     | 1                      | 5                              | 3½                             |
| 3                     | 1½                     | 5                              | 4                              |
| 3                     | 2                      | 5                              | 4½                             |
| 4                     | 1                      | 7                              | 4                              |
| 4                     | 1½                     | 7                              | 4½                             |
| 4                     | 2                      | 7                              | 5                              |
| 4                     | 3                      | 7                              | 5½                             |
| 6                     | 1                      | 9                              | 5                              |
| 6                     | 1½                     | 9                              | 5½                             |
| 6                     | 2                      | 9                              | 6                              |
| 6                     | 3                      | 9                              | 6½                             |
| 6                     | 4                      | 9                              | 8                              |

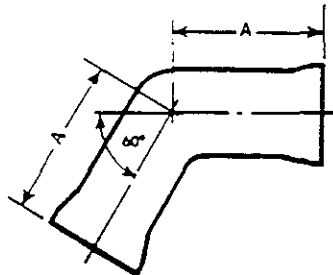
## 90° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

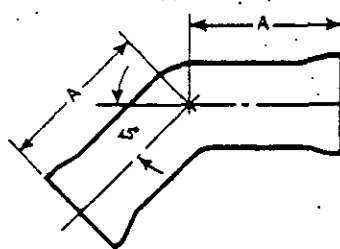
## 60° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

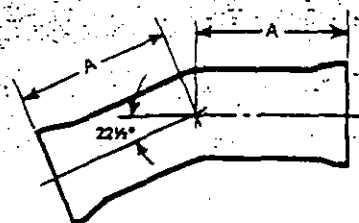
## 45° ELBOWS 6201



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2¾                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

When ordering, specify degree of angle.

# 22½° ELBOWS 6201

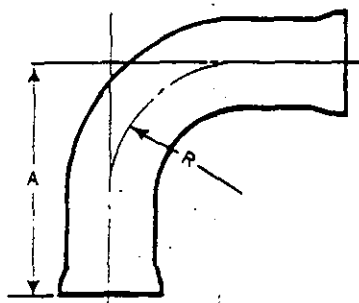


When ordering, specify degree of angle.

# KIMAX GLASS PIPE AND FITTINGS

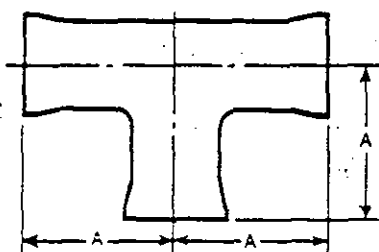
| Pipe Size<br>(inches) | A<br>(± 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 2¾                |
| 1½                    | 3½                |
| 2                     | 4                 |
| 3                     | 5                 |
| 4                     | 7                 |
| 6                     | 9                 |

# SWEEP ELBOWS 6239



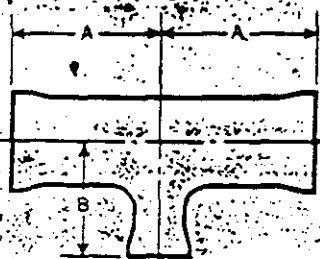
| Pipe Size<br>(inches) | A<br>(= 1/32 in.) | R<br>(= 1/2 in.) |
|-----------------------|-------------------|------------------|
| 1                     | 4¾                | 2¾               |
| 1½                    | 5                 | 3½               |
| 2                     | 6                 | 3½               |
| 3                     | 7                 | 4½               |
| 4                     | 10                | 6                |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(± 1/32 in.) |
|-----------------------|-------------------|
| 1                     | 2¾                |
| 1½                    | 3½                |
| 2                     | 4                 |
| 3                     | 5                 |
| 4                     | 7                 |
| 6                     | 9                 |

# REDUCING TEES 6211



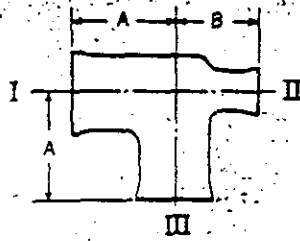
When ordering, specify pipe I.D. and bottom leg I.D.

| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(± 1/32 in.) | B<br>(± 1/32 in.) |
|-----------------------|------------------------|-------------------|-------------------|
| 1½                    | 1                      | 3½                | 3                 |
| 2                     | 1                      | 4                 | 3                 |
| 2                     | 1½                     | 4                 | 3½                |
| 3                     | 1                      | 5                 | 3½                |
| 3                     | 1½                     | 5                 | 4                 |
| 3                     | 2                      | 5                 | 4½                |
| 4                     | 1                      | 7                 | 4                 |
| 4                     | 1½                     | 7                 | 4½                |
| 4                     | 2                      | 7                 | 5                 |
| 4                     | 3                      | 7                 | 5½                |
| 6                     | 1                      | 9                 | 5                 |
| 6                     | 1½                     | 9                 | 5½                |
| 6                     | 2                      | 9                 | 6                 |
| 6                     | 3                      | 9                 | 6½                |
| 6                     | 4                      | 9                 | 8                 |

Other reduction combinations are available on special order to customer's specifications.

# KIMAX GLASS PIPE AND FITTINGS

## REDUCER TEES 6212

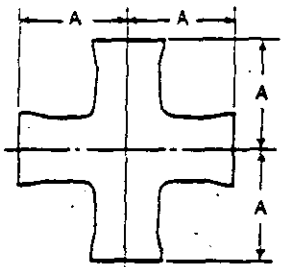


When ordering, specify pipe I.D. in this order; I, II, and III.

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|----------------------------|-----------------------------|------------------------------|--------------------------------|--------------------------------|
| 1½                         | 1                           | 1½                           | 3½                             | 3                              |
| 2                          | 1                           | 2                            | 4                              | 3                              |
| 2                          | 1½                          | 2                            | 4                              | 3½                             |
| 3                          | 1                           | 3                            | 5                              | 3½                             |
| 3                          | 1½                          | 3                            | 5                              | 4                              |
| 3                          | 2                           | 3                            | 5                              | 4½                             |
| 4                          | 1                           | 4                            | 7                              | 4                              |
| 4                          | 1½                          | 4                            | 7                              | 4½                             |
| 4                          | 2                           | 4                            | 7                              | 5                              |
| 4                          | 3                           | 4                            | 7                              | 5½                             |
| 6                          | 1                           | 6                            | 9                              | 5                              |
| 6                          | 1½                          | 6                            | 9                              | 5½                             |
| 6                          | 2                           | 6                            | 9                              | 6                              |
| 6                          | 3                           | 6                            | 9                              | 6½                             |
| 6                          | 4                           | 6                            | 9                              | 8                              |

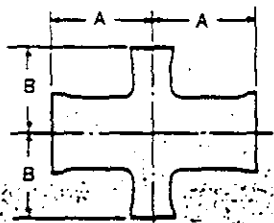
Other reduction combinations are available on special order to customer's specifications.

## CROSSES 6220



| Pipe Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2½                             |
| 1½                    | 3½                             |
| 2                     | 4                              |
| 3                     | 5                              |
| 4                     | 7                              |
| 6                     | 9                              |

## REDUCER CROSSES 6250

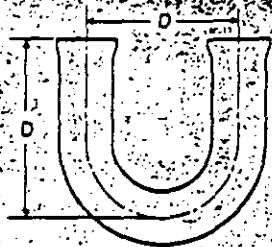


When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>( $\pm \frac{1}{32}$ in.) | B<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|-------------------------|--------------------------------|--------------------------------|
| 1½                    | 1                       | 3½                             | 3                              |
| 2                     | 1                       | 4                              | 3                              |
| 2                     | 1½                      | 4                              | 3½                             |
| 3                     | 1                       | 5                              | 3½                             |
| 3                     | 1½                      | 5                              | 4                              |
| 3                     | 2                       | 5                              | 4½                             |
| 4                     | 1                       | 7                              | 4                              |
| 4                     | 1½                      | 7                              | 4½                             |
| 4                     | 2                       | 7                              | 5                              |
| 4                     | 3                       | 7                              | 5½                             |
| 6                     | 1                       | 9                              | 5                              |
| 6                     | 1½                      | 9                              | 5½                             |
| 6                     | 2                       | 9                              | 6                              |
| 6                     | 3                       | 9                              | 6½                             |
| 6                     | 4                       | 9                              | 8                              |

Other reduction combinations are available on special order to customer's specifications.

## "U" BEND (Annealed) 6265

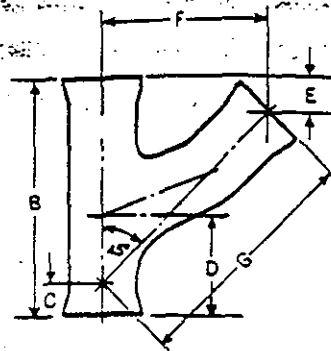


Use soft strip asbestos inserts (7202) only, with this fitting.

| Pipe Size<br>(inches) | D<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 5½                             |
| 1½                    | 7                              |
| 2                     | 7                              |
| 3                     | 9                              |
| 4                     | 12                             |

# KIMAX GLASS PIPE AND FITTINGS

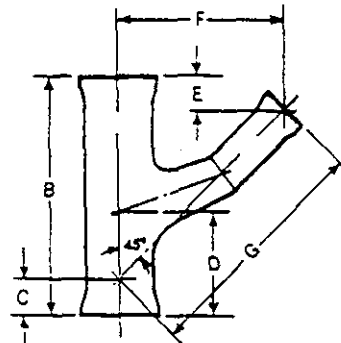
## LATERAL "Y" 6230



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>( $\pm \frac{1}{32}$ in.) | C<br>(inches)   | D<br>( $\pm \frac{1}{32}$ in.)   | E<br>( $\pm \frac{1}{32}$ in.) | F<br>( $\pm \frac{1}{32}$ in.) | G<br>(inches)     |
|-----------------------|--------------------------------|-----------------|----------------------------------|--------------------------------|--------------------------------|-------------------|
| 1                     | 5 $\frac{1}{4}$                | $\frac{3}{4}$   | 1 $\frac{19}{32}$                | $\frac{1}{4}$                  | 3 $\frac{1}{4}$                | 5 $\frac{31}{64}$ |
| 1 $\frac{1}{2}$       | 7                              | 1               | 2 $\frac{1}{16}$                 | 1 $\frac{15}{16}$              | 5 $\frac{1}{16}$               | 7 $\frac{5}{32}$  |
| 2                     | 8                              | 1 $\frac{1}{4}$ | 3 $\frac{1}{8}$                  | 1 $\frac{1}{4}$                | 5 $\frac{3}{8}$                | 7 $\frac{31}{64}$ |
| 3                     | 10                             | 1 $\frac{3}{8}$ | 3 $\frac{21}{32}$                | 1 $\frac{3}{8}$                | 7 $\frac{1}{8}$                | 9 $\frac{63}{64}$ |
| 4                     | 14                             | 2 $\frac{1}{4}$ | 4 $\frac{15}{16}$                | 2 $\frac{1}{16}$               | 9 $\frac{1}{16}$               | 13                |
| 6                     | 18                             | 3 $\frac{1}{4}$ | 7 $\frac{1}{8} \pm \frac{1}{16}$ | 2 $\frac{29}{32}$              | 11 $\frac{27}{32}$             | 16 $\frac{1}{2}$  |

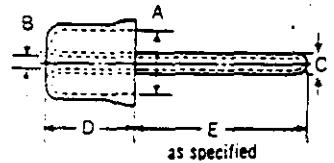
## LATERAL "Y" REDUCERS 6231



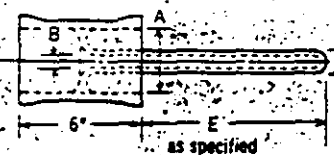
When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>( $\pm \frac{1}{32}$ in.) | C<br>(inches)   | D<br>(inches)     | E<br>(inches)     | F<br>(inches)      | G<br>(inches)     |
|-----------------------|-------------------------|--------------------------------|-----------------|-------------------|-------------------|--------------------|-------------------|
| 2                     | 1                       | 8                              | 1 $\frac{1}{4}$ | 3 $\frac{1}{2}$   | 1 $\frac{1}{8}$   | 5 $\frac{1}{8}$    | 7 $\frac{41}{64}$ |
| 2                     | 1 $\frac{1}{2}$         | 8                              | 1 $\frac{1}{4}$ | 3 $\frac{1}{2}$   | 1 $\frac{1}{8}$   | 5 $\frac{3}{8}$    | 7 $\frac{41}{64}$ |
| 3                     | 1 $\frac{1}{2}$         | 10                             | 1 $\frac{3}{8}$ | 3 $\frac{21}{32}$ | 1 $\frac{3}{8}$   | 7 $\frac{1}{16}$   | 9 $\frac{63}{64}$ |
| 3                     | 2                       | 10                             | 1 $\frac{3}{8}$ | 3 $\frac{21}{32}$ | 1 $\frac{3}{8}$   | 7 $\frac{1}{16}$   | 9 $\frac{63}{64}$ |
| 4                     | 1 $\frac{1}{2}$         | 14                             | 2 $\frac{1}{4}$ | 4 $\frac{15}{16}$ | 2 $\frac{1}{16}$  | 9 $\frac{1}{16}$   | 13                |
| 4                     | 2                       | 14                             | 2 $\frac{1}{4}$ | 4 $\frac{15}{16}$ | 2 $\frac{1}{16}$  | 9 $\frac{1}{16}$   | 13                |
| 4                     | 3                       | 14                             | 2 $\frac{1}{4}$ | 4 $\frac{15}{16}$ | 2 $\frac{1}{16}$  | 9 $\frac{1}{16}$   | 13                |
| 6                     | 3                       | 18                             | 3 $\frac{1}{4}$ | 7 $\frac{1}{8}$   | 2 $\frac{29}{32}$ | 11 $\frac{27}{32}$ | 16 $\frac{1}{2}$  |

## THERMOMETER WELLS (Annealed)



6292 SINGLE END



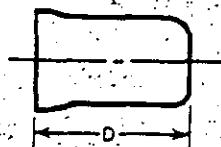
6295 DOUBLE END

When ordering, specify pipe I.D.; bulb size; and tube length.

Thermometer wells (annealed) protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified (from 6" to 36"). Use soft strip asbestos insert (7202) with thermometer wells.

| A<br>Pipe Size<br>(inches) | B<br>For Ther-<br>mometer<br>Bulb Size<br>(inches) | C<br>Tube Size<br>(inches) | D<br>(inches)   |
|----------------------------|----------------------------------------------------|----------------------------|-----------------|
| 1 $\frac{1}{4}$            | $\frac{3}{4}$                                      | $\frac{3}{4}$              | 2 $\frac{1}{4}$ |
| 1 $\frac{1}{2}$            | $\frac{3}{4}$                                      | $\frac{3}{4}$              | 2 $\frac{1}{4}$ |
| 1 $\frac{1}{2}$            | $\frac{3}{4}$                                      | 1                          | 2 $\frac{1}{4}$ |
| 2                          | $\frac{3}{4}$                                      | $\frac{3}{4}$              | 2 $\frac{1}{4}$ |
| 2                          | $\frac{1}{2}$                                      | $\frac{3}{4}$              | 2 $\frac{1}{4}$ |
| 2                          | $\frac{3}{4}$                                      | 1                          | 2 $\frac{1}{4}$ |
| 3                          | $\frac{3}{4}$                                      | $\frac{3}{4}$              | 3 $\frac{1}{2}$ |
| 3                          | $\frac{1}{2}$                                      | $\frac{3}{4}$              | 3 $\frac{1}{2}$ |
| 3                          | $\frac{3}{4}$                                      | 1                          | 3 $\frac{1}{2}$ |

## CAPS (Annealed) 6236

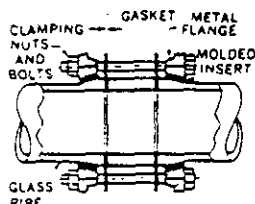
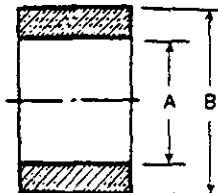


Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(Inches) | D<br>( $\pm \frac{1}{32}$ in.) |
|-----------------------|--------------------------------|
| 1                     | 2                              |
| 1 $\frac{1}{2}$       | 3                              |
| 2                     | 4                              |
| 3                     | 4 $\frac{3}{4}$                |
| 4                     | 6                              |
| 6                     | 7                              |



## STRAIGHT SPACERS 6260

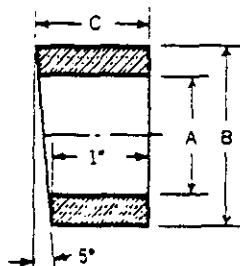


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in line. Hardware and gaskets must be ordered separately. Standard lengths are  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", 1",  $1\frac{1}{2}$ ", 2",  $2\frac{1}{2}$ ", 3", 4", and 5". Other lengths available on special order. Annealed only.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | $1\frac{1}{16}$       |
| $1\frac{1}{2}$             | $2\frac{1}{32}$       |
| 2                          | $2\frac{1}{16}$       |
| 3                          | $3\frac{7}{32}$       |
| 4                          | $5\frac{11}{32}$      |
| 6                          | $7\frac{1}{2}$        |

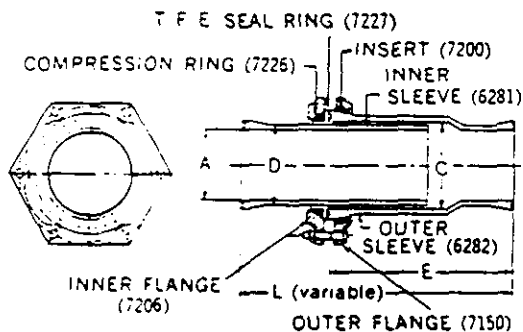
## 5° BEVEL SPACERS 6261



For use in filling out lines where some degree of pitch is required. Sold as separate units only. Annealed only. Other lengths available on special order.

| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) | C<br>(inches)    |
|----------------------------|-----------------------|------------------|
| 1                          | $1\frac{17}{64}$      | $1\frac{1}{4}$   |
| $1\frac{1}{2}$             | $2\frac{1}{32}$       | $1\frac{1}{4}$   |
| 2                          | $2\frac{43}{64}$      | $1\frac{13}{64}$ |
| 3                          | $3\frac{27}{32}$      | $1\frac{21}{64}$ |
| 4                          | $5\frac{21}{64}$      | $1\frac{13}{32}$ |

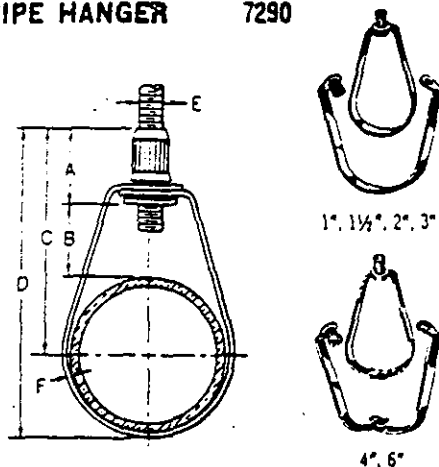
## ADJUSTABLE JOINT 6280



New, improved design of adjustable joint permits space adjustments up to  $2\frac{1}{4}$ ". Also used to correct slight misalignment. Maximum recommended temperature—250°F. Maximum pressure—30 p.s.i. (1",  $1\frac{1}{2}$ ", 2") and 15 p.s.i. (3" and 4"). Assembly consists of inner sleeve (6281); outer sleeve (6282); inner flange (7206); outer flange (7150); insert (7200); T F E seal ring (7227); compression ring (7226); bolts (7180). All metal parts are aluminum. Three bolts (hex head  $\frac{3}{16}$ "-18 x  $1\frac{1}{4}$ ") required for  $1\frac{1}{2}$ ", 2", and 3" sizes. Six bolts required for 4" size.

| A<br>Pipe Size<br>(inches) | C<br>(inches)  | D<br>(inches)    | E<br>(inches)  | L<br>(inches)<br>Min. Max.      |
|----------------------------|----------------|------------------|----------------|---------------------------------|
| 1                          | $1\frac{1}{2}$ | $1\frac{1}{4}$   | $5\frac{1}{2}$ | $8\frac{3}{4}$ $10\frac{1}{4}$  |
| $1\frac{1}{2}$             | 2              | $1\frac{27}{32}$ | 6              | $9\frac{1}{4}$ $11\frac{1}{4}$  |
| 2                          | $2\frac{1}{2}$ | $2\frac{11}{32}$ | $6\frac{1}{2}$ | 10 $11\frac{1}{2}$              |
| 3                          | $3\frac{1}{2}$ | $3\frac{3}{32}$  | 8              | $11\frac{1}{4}$ 14              |
| 4                          | $4\frac{1}{2}$ | $4\frac{1}{2}$   | 9              | $13\frac{1}{4}$ $15\frac{1}{4}$ |

## PIPE HANGER 7290



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is resealed by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A               | B              | C               | D               | E             | F                              |
|-----------------------|-----------------|----------------|-----------------|-----------------|---------------|--------------------------------|
| 1                     | $1\frac{1}{16}$ | 1              | $2\frac{3}{8}$  | $3\frac{1}{16}$ | $\frac{3}{8}$ | $\frac{1}{16}$ x $\frac{3}{8}$ |
| $1\frac{1}{2}$        | $1\frac{1}{16}$ | $1\frac{1}{8}$ | $3\frac{3}{8}$  | $4\frac{1}{16}$ | $\frac{3}{8}$ | $\frac{1}{16}$ x $\frac{3}{8}$ |
| 2                     | $1\frac{1}{16}$ | $1\frac{1}{4}$ | $3\frac{3}{8}$  | $4\frac{1}{16}$ | $\frac{3}{8}$ | $\frac{1}{16}$ x $\frac{3}{8}$ |
| 3                     | $1\frac{1}{8}$  | $1\frac{1}{2}$ | $4\frac{3}{8}$  | $6\frac{3}{8}$  | $\frac{1}{2}$ | $\frac{1}{16}$ x $\frac{1}{2}$ |
| 4                     | $1\frac{1}{8}$  | $1\frac{3}{4}$ | $5\frac{1}{16}$ | $7\frac{1}{16}$ | $\frac{1}{2}$ | $\frac{1}{8}$ x 1              |
| 6                     | $1\frac{1}{2}$  | 2              | $7\frac{1}{16}$ | $10\frac{3}{8}$ | $\frac{3}{4}$ | $\frac{1}{4}$ x 1              |

## FLANGES, GASKETS AND ACCESSORIES

KIMAX Tempered Glass Pipe and fittings can be joined by means of metal flanges, cushioned from the glass by molded or strip asbestos inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

### FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. Only the 4" and 6" sizes have ASME bolt circles and can mate with an ASME flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASME bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe with an ASME bolt circle flange.

ASME Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel.

### GASKETS

Service requirements and temperature ranges for all standard gasket materials are listed on page 13. Common materials include neoprene, gum rubber, asbestos, Koroseal, and T F E\*-lined gaskets with resilient filler.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler of soft asbestos (Blue African asbestos) with a machined T F E liner, are recommended. Other types of filler material may be used with T F E lined gaskets. Consult your distributor for details of performance and prices.

### INSERTS

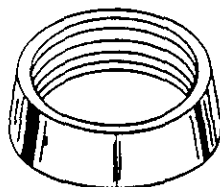
Used for cushioning pipe ends from metal flanges. Molded asbestos inserts are used for tempered pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of tempered pipe and fittings and for all annealed fittings such as U-bends; thermometer wells; and caps.

Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 13 for more information.

\*DuPont T.M.

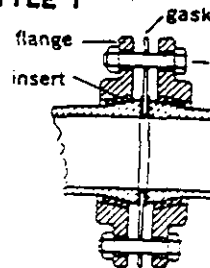
### FERRULE 7245



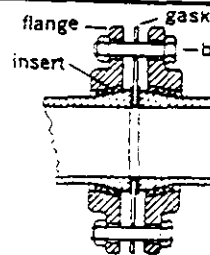
Stainless steel. To be welded, brazed or soldered to metal tubing. In 1", 1½", 2", 3", and 4" diameters.

### FLANGE SET 7100 STYLE I

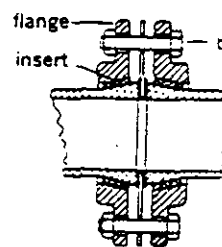
SIZES  
1", 1½", 2"



SIZE  
3"

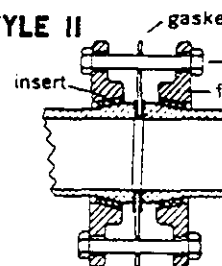


SIZES  
4", 6"

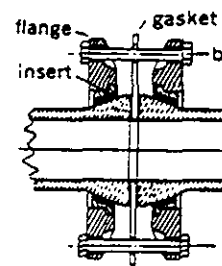


### FLANGE SET 7105 STYLE II

SIZES  
1", 1½", 2", 3"

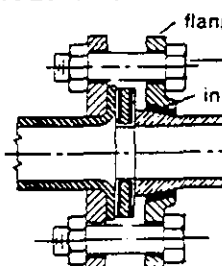


SIZES  
4", 6"



### ASME ADAPTER FLANGES 7160

SIZES  
1", 1½", 2", 3"



To adapt 4" and 6" glass pipe to an ASME Flange, use the following  
STYLE I Aluminum—No. 7150, 1-7151 outer flange, 1-7153 inner  
STYLE II Cast Iron—No. 7155, 1-7156 outer flange, 1-7158 inner

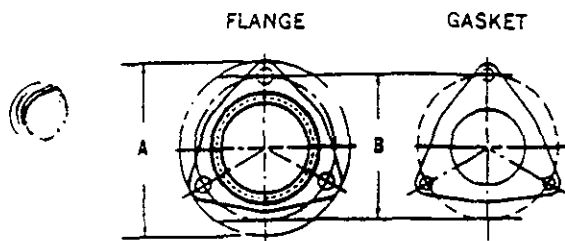
# FLANGES, GASKETS AND ACCESSORIES

## FLANGE SET NO. 7100, 1", 1½", 2" I.D.

STYLE I Aluminum Set contain the following components:

- 2-7150 Aluminum Flanges
- 2-7200 Neoprene Asbestos Inserts
- 3-7180 Aluminum Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¾ | 2¾ | ¾-18x2    |
| 1½        | 4¼ | 3¾ | ¾-18x1½   |
| 2         | 4⅞ | 3¾ | ¾-18x2    |

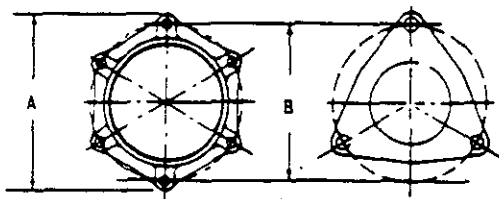


## FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components:

- 2-7150 Aluminum Flanges
- 2-7200 Neoprene Asbestos Inserts
- 6-7180 Aluminum Bolts and Nuts

| Pipe Size | A | B  | Bolt Size |
|-----------|---|----|-----------|
| 3         | 6 | 5¾ | ¾-13x2½   |



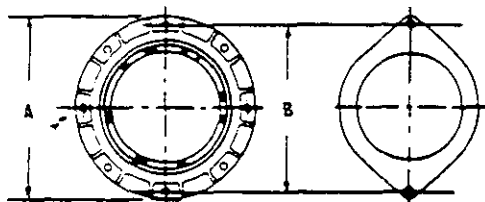
## FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components:

- 2-7151 Aluminum Outer Flanges\*
- 2-7153 Aluminum Inner Rings with 7202 Insert cemented in place\*
- 8-7180 Aluminum Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¾  | 7½ | ¾-18x2½   |
| 6         | 10¾ | 9½ | ¾-16x3    |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.

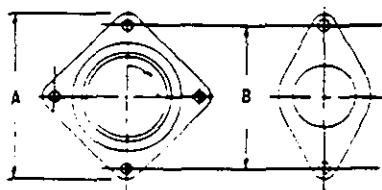


## FLANGE SET NO. 7105, 1", 1½", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2-7155 Cast Iron Flanges
- 2-7200 Neoprene Asbestos Inserts
- 4-7190 Steel Bolts and Nuts

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 3¾ | 3¾ | ¾-18x2½   |
| 1½        | 4¾ | 4¾ | ¾-18x2½   |
| 2         | 5⅞ | 4¾ | ¾-18x2½   |
| 3         | 6⅞ | 6  | ¾-18x3    |



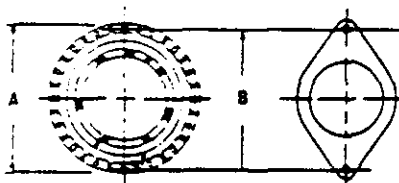
## FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components:

- 2-7156 Cast Iron Outer Flange\*
- 2-7158 Cast Iron Inner Ring with 7202 Inserts cemented in place.\*
- 8-7190 Steel Bolts and Nuts.

| Pipe Size | A   | B  | Bolt Size |
|-----------|-----|----|-----------|
| 4         | 8¾  | 7½ | ¾-18x2½   |
| 6         | 10¾ | 9½ | ¾-16x2½   |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring.

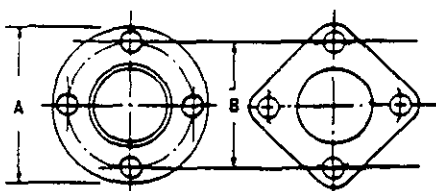


## ASME ADAPTER FLANGE NO. 7160, 1", 1½", 2", 3" I.D.

ASME Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

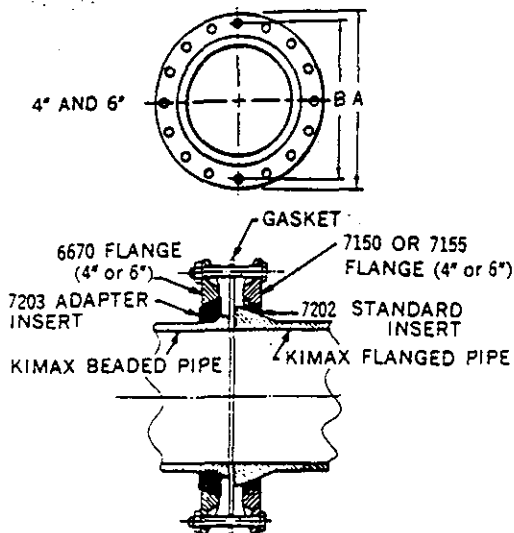
- 7200 for Conical End Tempered Glass
- 7202 Strip Insert for Conical End Annealed Glass
- 7203 Molded Adapter Insert for Beaded End Glass

| Pipe Size | A  | B  | Bolt Size |
|-----------|----|----|-----------|
| 1         | 4¾ | 3¾ | ¾-13x2    |
| 1½        | 5  | 3¾ | ¾-13x2½   |
| 2         | 6  | 4¾ | ¾-11x2½   |
| 3         | 7½ | 6  | ¾-11x3    |



## ADAPTER FLANGE

6670



## FLANGES, GASKETS AND ACCESSORIES

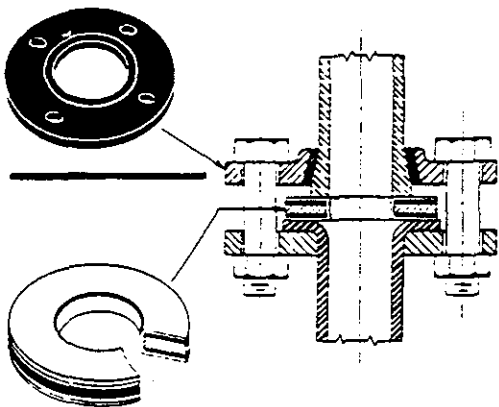
Used with Style I or Style II flanges to join field-beaded pipe to flanged pipe. Cast iron construction. Adapter insert (7203) needed between adapter flange and beaded pipe. Order bolts and nuts (7190) separately.

| Pipe Size<br>(inches) | A      | B<br>Bolt Circle | Bolts              |                  |
|-----------------------|--------|------------------|--------------------|------------------|
|                       |        |                  | Number<br>Required | Size<br>(inches) |
| 4                     | 8 1/4  | 7 1/2            | 8                  | 3/16-18 x 2 1/4  |
| 6                     | 10 1/4 | 9 1/2            | 8                  | 3/8-16 x 2 1/4   |

For 1" through 3" beaded pipe, use Style II flange (7155) with adapter insert (7203).

## A.S.M.E. ADAPTER FLANGE 7160

Machined to accept conical insert (7200) or adapter insert (7203). Used to join KIMAX Glass Pipe to glass-lined steel. In 1", 1 1/2", 2", and 3" sizes.



Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined T F E envelope.

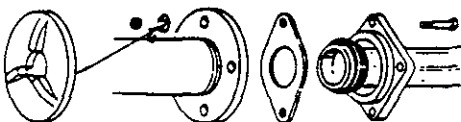
Required for joining glass pipe to glass-lined steel using A.S.M.E. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size<br>(inches) | Thickness<br>(inches) |
|-----------------------|-----------------------|
| 1                     | 3/4                   |
| 1 1/2                 | 3/4                   |
| 2                     | 3/4                   |
| 3                     | 3/16                  |
| 4                     | 3/16                  |
| 6                     | 3/8                   |

## DONUT SPACER 7240

## ADAPTER BUTTON 7230

Used to center smaller diameter Style II bolts in larger holes of A.S.M.E. flange when adapting glass pipe to A.S.M.E. flange or glass-lined steel. One size of button is used for all sizes of flanges.



| I.D.<br>(inches) | O.D.<br>(inches) | Height<br>(inches) |
|------------------|------------------|--------------------|
| .390 to .398     | 1 1/4            | 3/4                |

## SPRING 7235

Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.



| Pipe Size<br>(inches) | I.D.<br>(inches) | Length<br>(inches) | Diameter<br>of Wire |
|-----------------------|------------------|--------------------|---------------------|
| 1" thru 4"            | 3/16 min.        | 1 1/2              | .156                |
| 6"                    | 3/8 min.         | 1 3/4              | .156                |

## INSERTS



**7200** for 1" through 3" tempered fittings.



**7202** for 4" and 6" tempered fittings for 1" through 6" annealed fittings.

**7203** adapter insert for beaded ends (similar to 7200)

## FLANGES, GASKETS AND ACCESSORIES

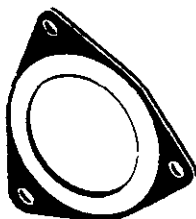
Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1½", 2", 2½", 3", 3½", and 5" diameters. The 1", 1½", 2", and 3" sizes are used with standard tempered glass pipe and fittings. Other sizes are for use with adjustable joint 6280.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" tempered pipe and fittings and for 1" through 6" annealed fittings.

Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters; and with Adapter Flange (6670) in 4" and 6" diameters.

## INTERFACE GASKETS

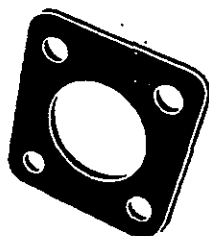
**STYLE I** (1", 1½", 2", 2½", 3" sizes only)



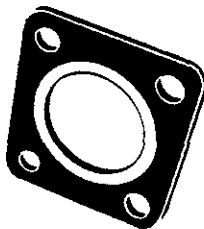
**STYLE II** (all sizes-also used for 4" and 6" Style I)



**A.S.M.E.** (1", 1½", 2", 3" sizes only)



Standard



Teflon machined envelope

Since the gasket is the only part of the joint assembly to come into contact with conveyed liquids, choice of gasket material is extremely important.

Common gasket materials are neoprene, gum rubber, asbestos and silicone rubber. Service requirements for each type are listed below.

When pipelines must convey a variety of liquids with different corrosive properties, gaskets containing machined envelopes of TFE are recommended.

The TFE machined envelope is a one-piece liner. Its inner diameter is the same as the pipe, to prevent constriction of flow at the joint.

Standard filler for TFE machined envelope gasket is Blue African asbestos.

Other filler materials for TFE machined envelope gaskets are available on special order from your distributor, in a variety of thicknesses. Working temperatures of TFE envelope gaskets are the same as that of the filler material.

| Catalog Number |          | A.S.M.E. | Material                                             | Service                                                               | Maximum Working Temp., °F. |
|----------------|----------|----------|------------------------------------------------------|-----------------------------------------------------------------------|----------------------------|
| Style I        | Style II |          |                                                      |                                                                       |                            |
| 7250           | 7251     | —        | Asbestos                                             | Organic and mineral acids, solvents and chlorinated compounds.        | 400                        |
| 7255           | 7256     | —        | Gum Rubber                                           | Food products, mineral acids, except HNO <sub>3</sub> .               | 200                        |
| 7260           | 7261     | —        | Neoprene                                             | Distilled water and mineral acids, except HNO <sub>3</sub> .          | 220                        |
| 7265           | 7266     | 7267     | Koroseal                                             | Mineral acids including HNO <sub>3</sub> , and chlorinated compounds. | 150                        |
| 7270           | 7271     | —        | Silicone Rubber                                      | All                                                                   | 450                        |
| 7275           | 7276     | 7277     | TFE Machined Envelope (Blue African Asbestos Filler) | All                                                                   | 450                        |

| Material                                 | Pipe Size |          |         |         |         |         |
|------------------------------------------|-----------|----------|---------|---------|---------|---------|
|                                          | 1" Dia.   | 1½" Dia. | 2" Dia. | 3" Dia. | 4" Dia. | 6" Dia. |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ¼"        | ¼"       | ¼"      | ¼"      | ¼"      | ¼"      |
| TFE Envelope                             | ⅛"        | ⅛"       | ⅛"      | ⅛"      | ⅛"      | ⅛"      |

# ENGINEERING

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Tempered Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Tempered Glass          | 1.10-1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.58                                     |
| Graphite (impervious)         | 1.70                                     |
| Resin-Bonded Asbestos         | 2.88                                     |
| Stainless Steel (Schedule 40) | 3.65                                     |
| Lead, Ex. Light               | 4.80                                     |
| Porcelain                     | 7.35                                     |
| High Silicon Iron             | 7.70                                     |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 22½° L      | 0.6                                    | .75  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° L       | 1.3                                    | 1.9  | 2.5  | 3.8   | 5.0   | 7.5   |
| 60° L       | 2.1                                    | 3.0  | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° L       | 3.0                                    | 4.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Sweep L     | 1.7                                    | 2.6  | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.0                                    | 6.3  | 8.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.7                                    | 2.6  | 3.3  | 5.0   | 6.7   | 10.0  |
| T (S.C.)    | 6.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| T (S.L.)    | 6.0                                    | 9.0  | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2  | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 36.0                                   | 54.0 | 72.0 | 108.0 | 144.0 | 215.0 |

## Operating Temperatures and Pressures

KIMAX Tempered Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois Kimble Products, Glass Pipe Market Development, Toledo 1, Ohio.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 35   | 20   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 160  |

\*Freezing point of conveyed material should be taken into consideration.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Tempered Glass Pipe has a thermal expansion of .0022" ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION |
|-----------------------|--------------------|
| KIMAX Tempered Glass  | 1.00               |
| Porcelain             | 1.30               |
| Graphite (impervious) | 1.30               |
| Steel                 | 3.60               |
| High Silicon Iron     | 4.90               |
| Stainless Steel       | 6.20               |
| Resin-bonded Asbestos | 10.00              |
| PVC, Sched. 80        | 16.00              |
| Normal Impact         | 16.00              |
| High Impact           | 44.00              |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and T F E-covered donut spacers:

## GASKET AND DONUT SPACER THICKNESS

| Material                                 | Pipe Diameter |     |    |    |    |    |
|------------------------------------------|---------------|-----|----|----|----|----|
|                                          | 1"            | 1½" | 2" | 3" | 4" | 6" |
| Asbestos, Neoprene, Koroseal, Gum Rubber | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| T F E Envelope                           | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Solid Beaded Teflon                      | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Donut Spacer                             | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

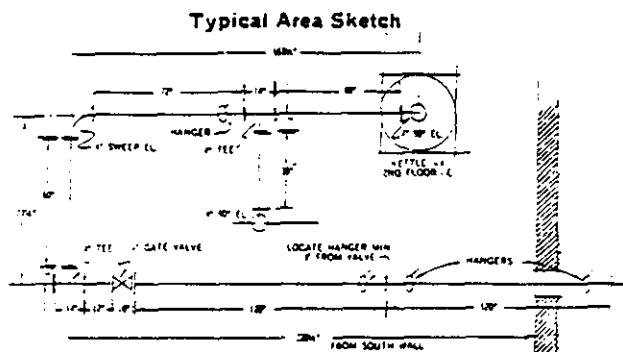


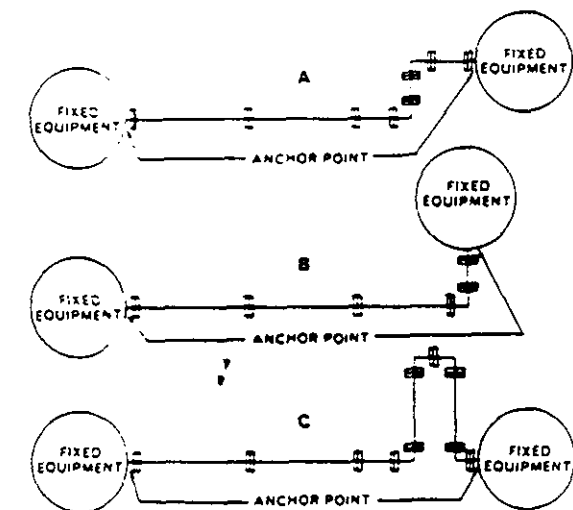
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible nose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

## A,B,C—Recommended Means



## D—Not Recommended

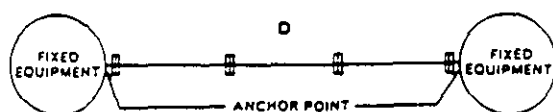


Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 5, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

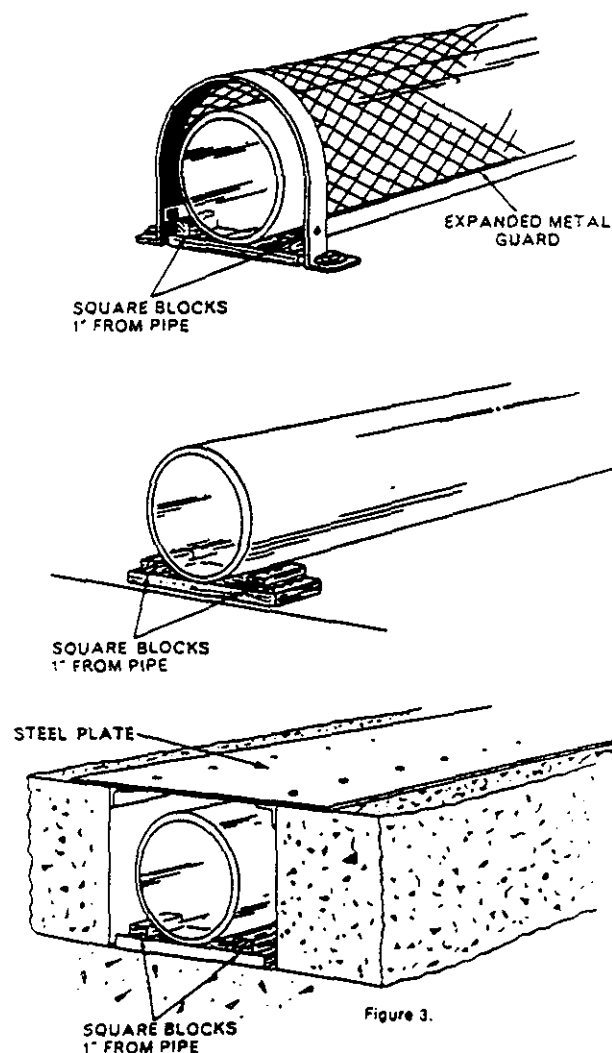
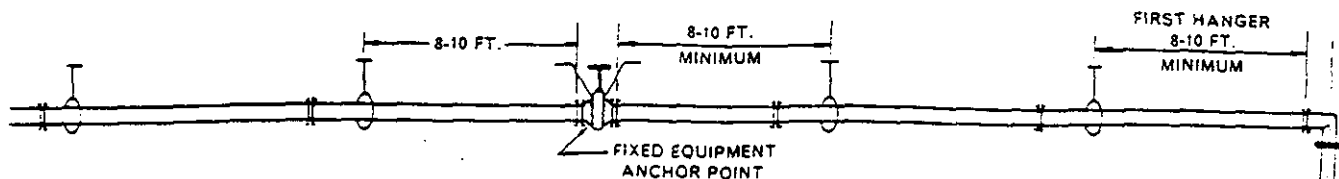


Figure 3.



## Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support. Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 8 feet away from the riser. See Figure 5.

## Pipe Pitch

Normally, a pitch of  $\frac{1}{2}$ " per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

## Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high-traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

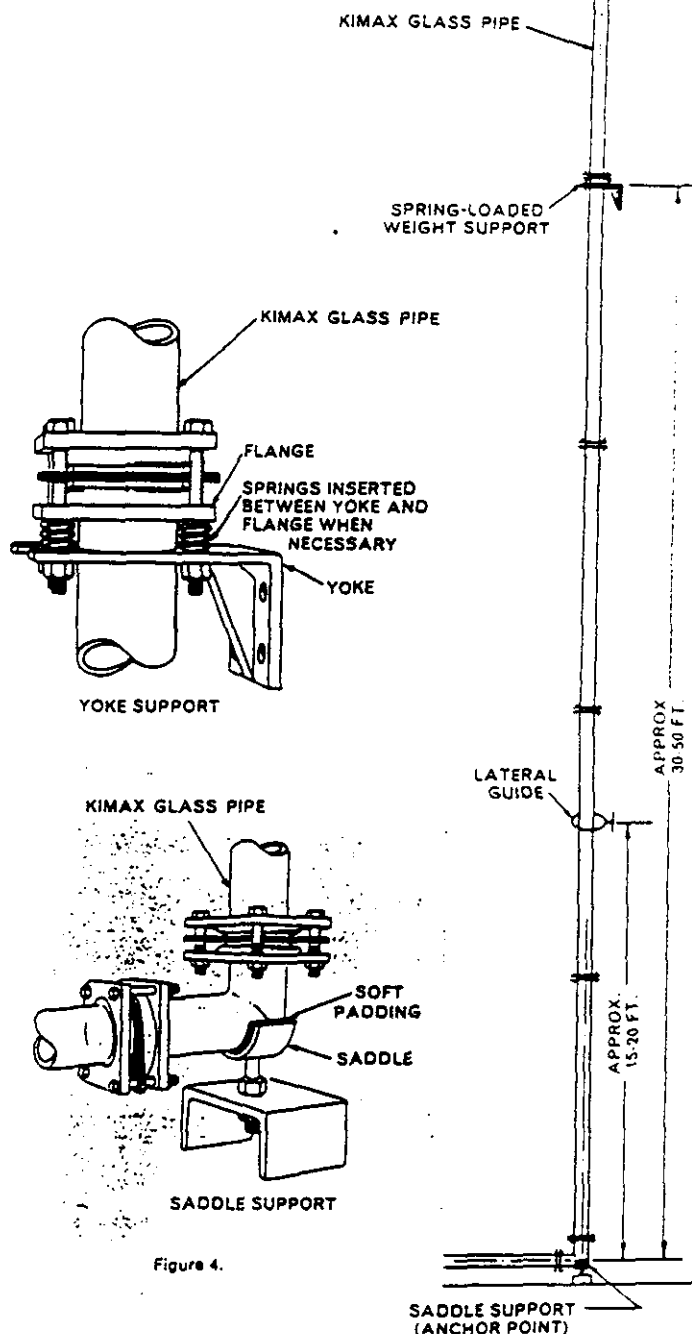


Figure 4.

Figure 5.

Recommended Vertical Line Supports



## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

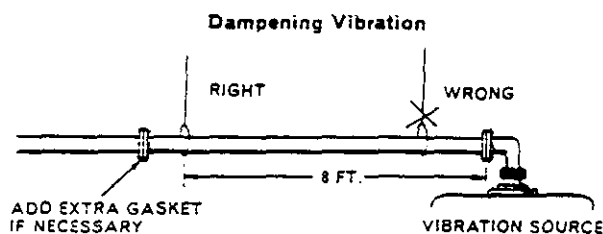


Figure 6.

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 6" pipe. See Figure 7.

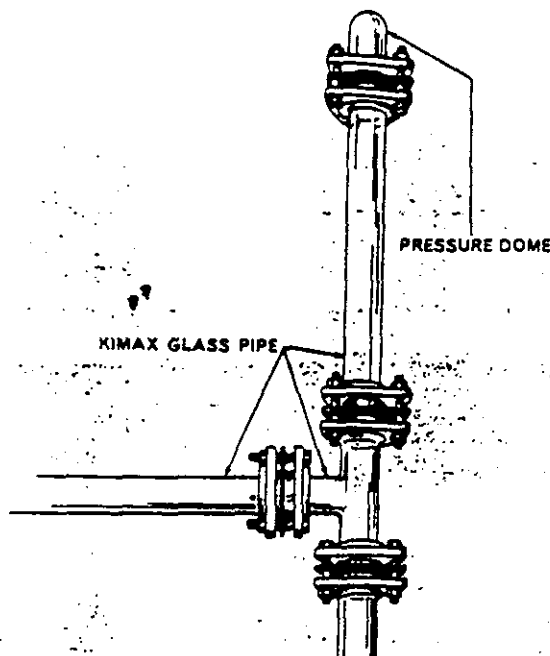


Figure 7.

## Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings, using Style I or Style II flanges. See Figure 8.

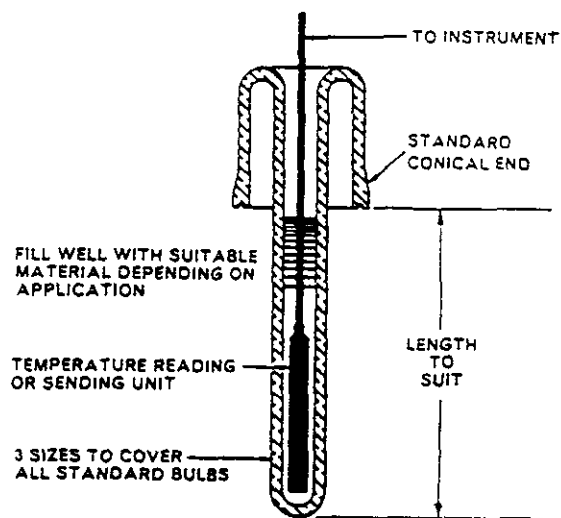


Figure 8.

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.M.E. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

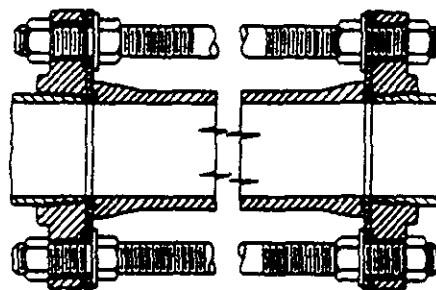


Figure 9.

# ENGINEERING

## Standard Dimensions

Standard diameters of KIMAX Tempered Glass Pipe and Fittings are 1"; 1½"; 2"; 3"; 4" and 6".

Standard lengths of KIMAX straight lengths vary from 6 inches to 10 feet. Exact lengths and minimum lengths for each diameter are given in the KIMAX GLASS PIPE AND FITTINGS section.

Standard wall thickness, outside diameters and approximate weights are listed in the same section.

Use of standard straight lengths and fittings will simplify pipe-line design.

## Special Lengths

It may be necessary to order non-standard straight lengths to fill out the line.

Intermediate odd lengths are available through your KIMAX Glass Pipe Distributor. Such lengths are flanged and tempered and are priced at the next longest standard length.

When measuring for non-standard lengths, be sure to allow for gasket thickness.

Other methods of making up space variations are illustrated and described in the INSTALLATION section.

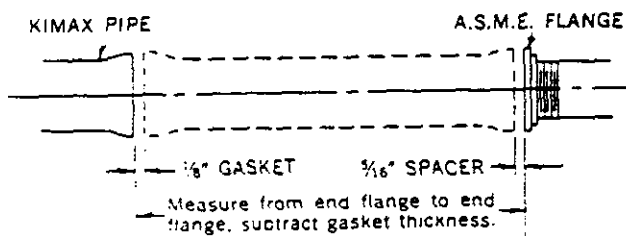


Figure 10.

## Special Apparatus

The corrosion resistance and transparency of glass, and its workability, make it ideal for fabricating into special shapes.

Such apparatus may be adapted from existing standard pipe and fittings (tubulated or perforated straight lengths, for instance); custom fabricated by modifying existing glass-forming equipment (receiver vessels, separation units, etc.); and by minor adapting of stock laboratory or industrial glass pieces (boiling flasks; distillation apparatus; offset columns, etc.)

Typical apparatus adapted for special uses are illustrated below.

Owens-Illinois and KIMAX Glass Pipe distributors will assist you in the development of specially fabricated glass apparatus for your particular requirements.

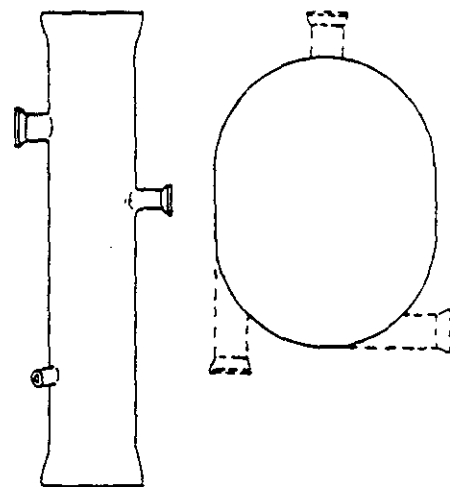


Figure 11.

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

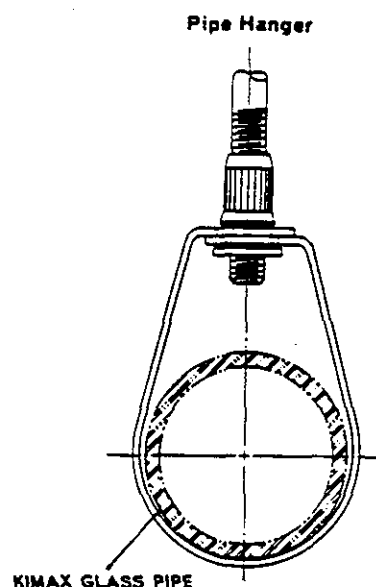
**MAXIMUM RECOMMENDED SPAN-FEET**

| Pipe Size | Fluid in Pipe |                                |                                  |
|-----------|---------------|--------------------------------|----------------------------------|
|           | Gas           | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8             | 8                              | 7                                |
| 1½"       | 9             | 9                              | 7                                |
| 2"        | 9             | 9                              | 8                                |
| 3"        | 9             | 9                              | 8                                |
| 4"        | 10            | 10                             | 8                                |
| 6"        | 10            | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, I-beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.



## Assembling The Line

Installation of KIMAX Tempered Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.

# INSTALLATION

## Joint Assembly

The ends of KIMAX Tempered Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

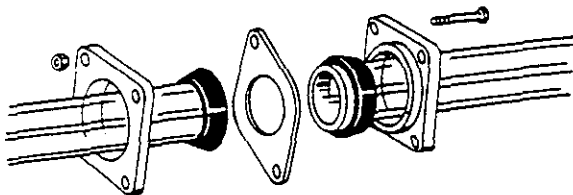
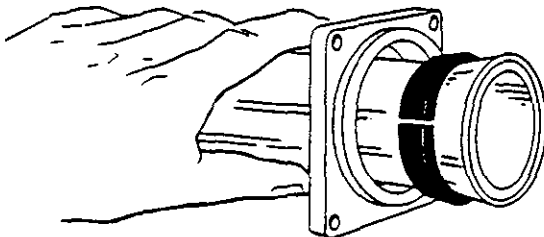
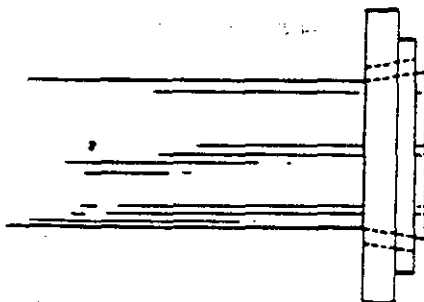


Figure 13.

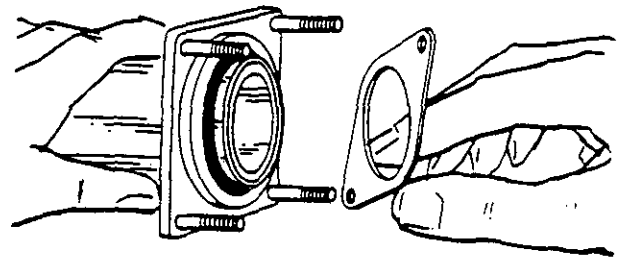
## Steps for Joint Assembly



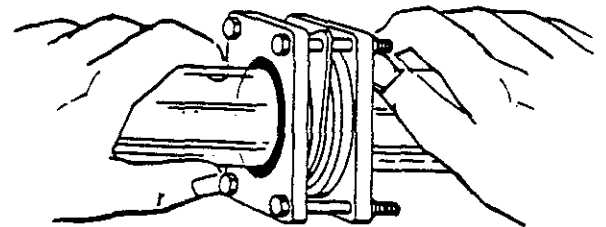
Step 1. Place the metal flange—small opening first—and the insert, over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



Step 2. Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



Step 3. Place bolts in flange holes and locate gasket on bolts. Keep gaskets dry to avoid gaskets slipping out between flanges under line pressure.



Step 4. Align gasket opening precisely with pipe opening to avoid obstructions to line flow (especially important in milk and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB./FT.

| Pipe Size | Regular Gasket | Solid T F E Gasket |
|-----------|----------------|--------------------|
| 1"        | 2              | 2-3                |
| 1½"       | 3-3.5          | 3-4                |
| 2"        | 3-4            | 4-5                |
| 3"        | 3-4            | 4-5                |
| 4"        | 3-4            | 5-7                |
| 6"        | 5-6            | 7-10               |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

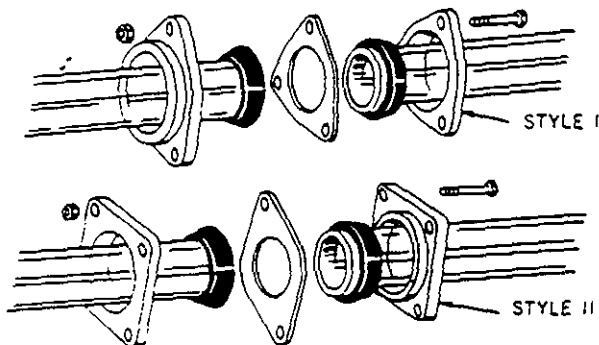
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

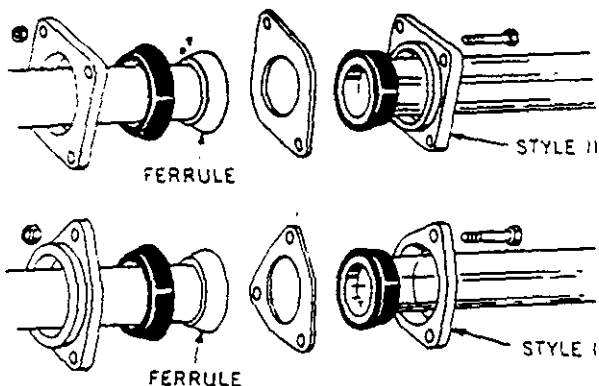
When joining KIMAX Tempered Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe; and Style II flange and standard insert on flanged pipe.

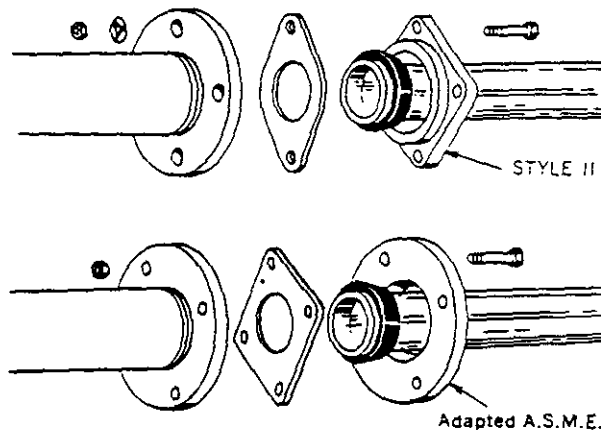
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule (#7245) to the tubing end.



### Glass to A.S.M.E., Flange

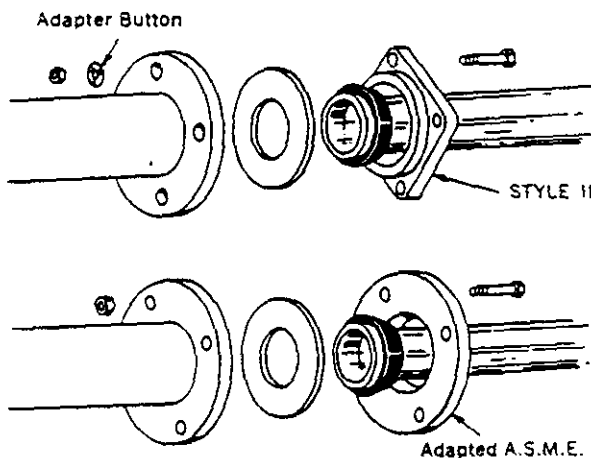
Glass can be mated to A.S.M.E. flanges by means of a Style cast iron flange (all sizes have A.S.M.E. Bolt Circles); an adapted A.S.M.E. flange #7160 (1", 1½", 2" and 3" diameters only); or 4" or 6" diameter Style I aluminum flange which has A.S.M.E. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.M.E. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.M.E. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A T F E-covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined T F E envelope.

# INSTALLATION

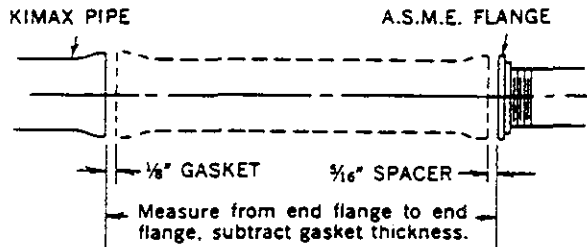
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. **Spacers.** Standard straight and 5° beveled spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 6" diameters, available in 1/2" to 2" lengths.

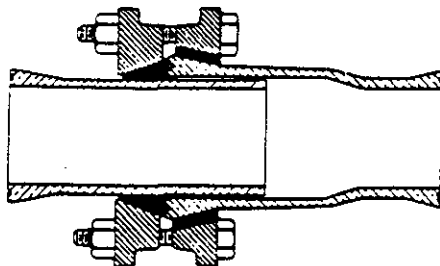
Beveled 5° spacers are stocked in 1-inch lengths and 1" through 4" diameters. One 5° beveled spacer will pitch the line 1" per foot.

When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Adjustable Joints.** Permit linear variations up to 2 1/4". Also used to correct misalignment.



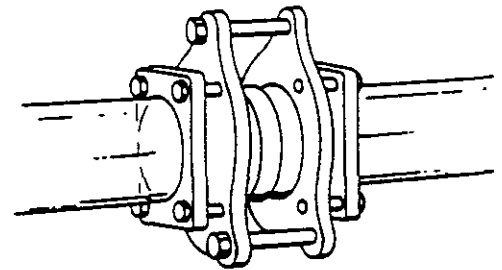
Long cut section of straight pipe may be used for inner glass sleeve where quick line changes are desired.

For dimensions, etc. see KIMAX GLASS PIPE AND FITTINGS section.

4. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.

For dimensions, see FLANGES, GASKETS AND ACCESSORIES section.



5. **Field Fabrication**—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—TR-244.

Use Adapter Flange (#6670) and Adapter Insert (#7203) on beaded ends to mate with Style I or Style II flange with standard insert on flanged pipe. See FLANGES, GASKETS AND ACCESSORIES section.

6. **Adjust Equipment.** It may be easier and simpler to adjust the length of adjoining pipe (other than glass) or to move equipment slightly, in order to avoid special adjustment devices.

# TESTING AND MAINTENANCE

## Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- **Shake the line.** If the line moves from side to side, it is probably free from bending loads.
- **Open a flanged joint.** If the flange does not move when bolts are removed, the pipe is not restrained.

## Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at  $1\frac{1}{2}$  times standard operation pressure. Do not exceed  $1\frac{1}{2}$  times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

## Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. **Inadequate bolt tightening:** Do not hesitate to "snug" bolts sufficiently.
2. **Misalignment:** Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. **Temperature cycling:** Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

## Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.



## PRICE LIST TR-264-A

September, 1963

Owens-Illinois KIMAX®

### Tempered Glass DRAINLINE and Fittings

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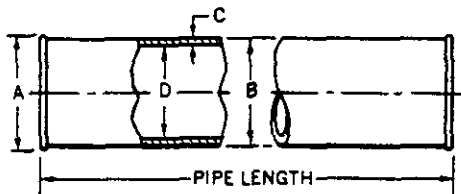
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The prices set forth herein are considered by Owens-Illinois as fair and reasonable, and are suggested for all sales except in Missouri, Vermont, Texas and the District of Columbia. Actual prices are within the sole discretion of the distributor.

## STRAIGHT LENGTHS

Standard lengths of regular drainline are 5 and 10 feet. Special lengths, up to 15 feet may be ordered as special items and are priced on a per-foot basis to the next nearest foot, plus 10% for special handling.



\*KIMAX heavy schedule drainline (marked "H-S") is designed for burying underground or under concrete. Maximum length recommended for burial is 5 feet.

## KIMAX DRAINLINE PIPE AND FITTINGS

### 6500—regular schedule, 5-ft. lengths

| Size     | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 5' | 2.06 | 1.84   | 0.12     | 1.60   | 4 pcs.        | 18 lbs.                          | \$10.00                |
| 2        | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 25                               | 13.50                  |
| 3        | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 23                               | 20.00                  |
| 4        | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 20                               | 27.50                  |
| 6        | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 33                               | 44.00                  |

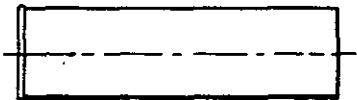
### 6501—regular schedule, 10-ft. lengths

| Size      | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|-----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 10' | 2.06 | 1.84   | 0.12     | 1.60   | 4             | 35 lbs.                          | 20.00                  |
| 2         | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 48                               | 27.00                  |
| 3         | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 45                               | 40.00                  |
| 4         | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 40                               | 55.00                  |
| 6         | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 60                               | 88.00                  |

### 6502—heavy schedule, 5-ft. lengths\*

| Size     | C (wall) | D (ID) | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|----------|----------|--------|---------------|--------------------------------------|------------------------|
| 1½" x 5' | 0.17     | 1½     | 4 pcs.        | 24 lbs.                              | \$11.00                |
| 2        | 0.17     | 2      | 4             | 29                                   | 15.00                  |
| 3        | 0.20     | 3      | 2             | 25                                   | 22.50                  |
| 4        | 0.26     | 4      | 1             | 24                                   | 30.00                  |
| 6        | 0.33     | 6      | 1             | 36                                   | 49.00                  |

## STRAIGHT LENGTHS

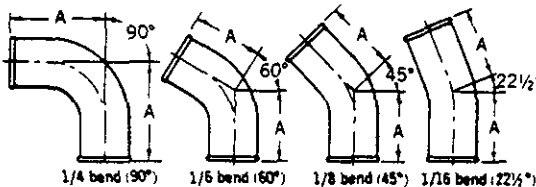


\*\*Nipple stock is annealed only, beaded on one end and available in 2-foot lengths, regular schedule weight. Most economical way to make up short lengths.

### 6503—NIPPLE STOCK, 2-ft. lengths\*\*

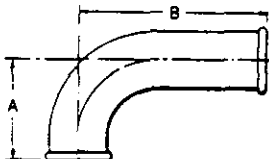
| Size     | A    | B (OD) | C (wall) | D (ID) | Case Quantity | Approx. Shipping Weight Per Case | Suggested Resale Price |
|----------|------|--------|----------|--------|---------------|----------------------------------|------------------------|
| 1½" x 2' | 2.06 | 1.84   | 0.12     | 1.60   | 4 pcs.        | 8 lbs.                           | \$ 4.00                |
| 2        | 2.58 | 2.34   | 0.14     | 2.06   | 4             | 10                               | 5.40                   |
| 3        | 3.69 | 3.41   | 0.17     | 3.07   | 2             | 9                                | 8.00                   |
| 4        | 4.84 | 4.53   | 0.20     | 4.13   | 1             | 8                                | 11.00                  |
| 6        | 7.12 | 6.66   | 0.24     | 6.18   | 1             | 12                               | 17.50                  |

## BENDS 6511



| Size | A  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|---------------|--------------------------------------|------------------------|
| 1½"  | 4½ | 4 pcs.        | 5 lbs.                               | \$ 5.50                |
| 2    | 5  | 4             | 6                                    | 7.00                   |
| 3    | 6½ | 1             | 3                                    | 12.50                  |
| 4    | 9  | 1             | 8                                    | 16.50                  |
| 6    | 12 | 1             | 14                                   | 35.00                  |

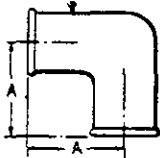
## SHORT RADIUS QUARTER BENDS



### 6512

| Size | A  | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 3¾ | 6  | 4 pcs.        | 5 lbs.                               | \$7.50                 |
| 2    | 3¾ | 7½ | 4             | 6                                    | 9.00                   |

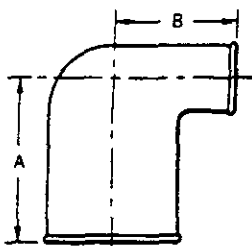
## SHORT RADIUS QUARTER BENDS



### 6513

| Size | A | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|---|---------------|--------------------------------------|------------------------|
| 1½"  | 3 | 4 pcs.        | 5 lbs.                               | \$7.50                 |

## QUARTER BEND REDUCER



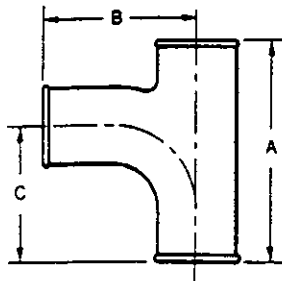
### 6518

| Size     | A | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|----------|---|----|---------------|--------------------------------------|------------------------|
| 2" x 1½" | 4 | 3¾ | 4 pcs.        | 5 lbs.                               | \$ 8.00                |
| 3 x 1½   | 5 | 4  | 1             | 2                                    | 10.00                  |
| 3 x 2    | 5 | 4½ | 1             | 2                                    | 11.00                  |
| 4 x 1½   | 7 | 4½ | 1             | 3                                    | 11.50                  |
| 4 x 2    | 7 | 5  | 1             | 3                                    | 12.50                  |
| 4 x 3    | 7 | 5½ | 1             | 3                                    | 14.00                  |
| 6 x 1½   | 9 | 5½ | 1             | 8                                    | 27.00                  |
| 6 x 2    | 9 | 6  | 1             | 8                                    | 28.50                  |
| 6 x 3    | 9 | 6½ | 1             | 9                                    | 30.00                  |
| 6 x 4    | 9 | 8  | 1             | 9                                    | 32.00                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

## T BRANCHES

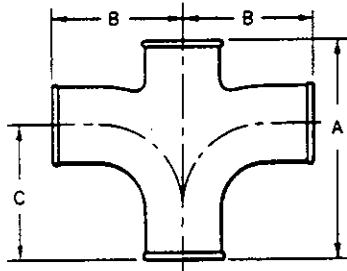
### 6521—drainline T branch



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3½ | 3¾  | 4 pcs.        | 5 lbs.                               | \$ 7.25                |
| 2 x 1½    | 8  | 3¾ | 5   | 4             | 7                                    | 8.75                   |
| 2 x 2     | 8  | 4½ | 5   | 4             | 8                                    | 9.75                   |
| 3 x 1½    | 12 | 4¼ | 7½  | 1             | 3                                    | 10.75                  |
| 3 x 2     | 12 | 5  | 7½  | 1             | 4                                    | 13.25                  |
| 3 x 3     | 12 | 6¾ | 7½  | 1             | 5                                    | 13.50                  |
| 4 x 1½    | 14 | 4¾ | 8¾  | 1             | 6                                    | 17.50                  |
| 4 x 2     | 14 | 5¾ | 8¾  | 1             | 7                                    | 19.00                  |
| 4 x 3     | 14 | 7  | 8¾  | 1             | 7                                    | 21.25                  |
| 4 x 4     | 14 | 8¾ | 8¾  | 1             | 13                                   | 25.00                  |
| 6 x 2     | 20 | 6¾ | 12¾ | 1             | 14                                   | 33.00                  |
| 6 x 3     | 20 | 8  | 12¾ | 1             | 15                                   | 34.00                  |
| 6 x 4     | 20 | 9¾ | 12¾ | 1             | 18                                   | 37.00                  |
| 6 x 6     | 20 | 12 | 12¾ | 1             | 20                                   | 41.00                  |

## T BRANCHES

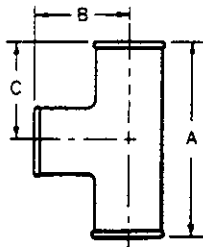
### 6522—double branch drainline T



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3½ | 3¾  | 4 pcs.        | 7 lbs.                               | \$11.25                |
| 2 x 1½    | 8  | 3¾ | 5   | 4             | 10                                   | 12.50                  |
| 2 x 2     | 8  | 4½ | 5   | 4             | 10                                   | 14.50                  |
| 3 x 1½    | 12 | 4¼ | 7½  | 1             | 4                                    | 15.00                  |
| 3 x 2     | 12 | 5  | 7½  | 1             | 5                                    | 20.50                  |
| 3 x 3     | 12 | 6¾ | 7½  | 1             | 7                                    | 22.00                  |
| 4 x 1½    | 14 | 4¾ | 8¾  | 1             | 10                                   | 24.00                  |
| 4 x 2     | 14 | 5¾ | 8¾  | 1             | 11                                   | 28.00                  |
| 4 x 3     | 14 | 7  | 8¾  | 1             | 12                                   | 32.00                  |
| 4 x 4     | 14 | 8¾ | 8¾  | 1             | 14                                   | 39.00                  |
| 6 x 2     | 20 | 6¾ | 12¾ | 1             | 15                                   | 43.00                  |
| 6 x 3     | 20 | 8  | 12¾ | 1             | 17                                   | 44.00                  |
| 6 x 4     | 20 | 9¾ | 12¾ | 1             | 20                                   | 52.00                  |
| 6 x 6     | 20 | 12 | 12¾ | 1             | 22                                   | 62.00                  |

## STRAIGHT TEE

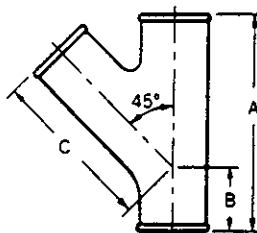
### 6523



| Size      | A  | B  | C  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3  | 3  | 4 pcs.        | 5 lbs.                               | \$10.25                |
| 2 x 1½    | 8  | 3¾ | 4  | 4             | 7                                    | 11.00                  |
| 2 x 2     | 8  | 4  | 4  | 4             | 8                                    | 12.00                  |
| 3 x 2     | 12 | 4½ | 6  | 1             | 4                                    | 15.75                  |
| 3 x 3     | 12 | 6  | 6  | 1             | 5                                    | 16.00                  |
| 4 x 2     | 14 | 5  | 7  | 1             | 8                                    | 19.00                  |
| 4 x 3     | 14 | 6½ | 7  | 1             | 11                                   | 23.50                  |
| 4 x 4     | 14 | 8  | 7  | 1             | 11                                   | 24.00                  |
| 6 x 3     | 20 | 7¾ | 10 | 1             | 15                                   | 52.00                  |
| 6 x 4     | 20 | 9  | 10 | 1             | 18                                   | 53.50                  |
| 6 x 6     | 20 | 10 | 10 | 1             | 20                                   | 56.00                  |

## Y BRANCHES

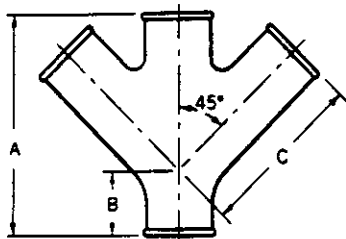
### 6526—drainline Y branch



| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 1¾ | 4½  | 4 pcs.        | 5 lbs.                               | \$ 8.50                |
| 2 x 1½    | 8  | 2½ | 4¾  | 4             | 8                                    | 9.00                   |
| 2 x 2     | 8  | 2½ | 6   | 4             | 9                                    | 10.00                  |
| 3 x 1½    | 12 | 3¾ | 5½  | 1             | 4                                    | 12.50                  |
| 3 x 2     | 12 | 3¾ | 6¾  | 1             | 4                                    | 13.00                  |
| 3 x 3     | 12 | 3¾ | 8   | 1             | 4                                    | 15.00                  |
| 4 x 1½    | 14 | 4½ | 6¾  | 1             | 7                                    | 16.00                  |
| 4 x 2     | 14 | 4½ | 7½  | 1             | 8                                    | 17.00                  |
| 4 x 3     | 14 | 4½ | 8¾  | 1             | 8                                    | 23.00                  |
| 4 x 4     | 14 | 4½ | 10  | 1             | 13                                   | 25.00                  |
| 6 x 2     | 20 | 5¾ | 9   | 1             | 14                                   | 34.50                  |
| 6 x 3     | 20 | 5¾ | 10¾ | 1             | 15                                   | 44.00                  |
| 6 x 4     | 20 | 5¾ | 11½ | 1             | 18                                   | 45.50                  |
| 6 x 6     | 20 | 5¾ | 14  | 1             | 20                                   | 50.50                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

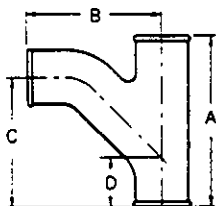
## Y BRANCHES



### 6527—double branch drainline Y

| Size      | A  | B  | C   | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 1½ | 4½  | 4 pcs.        | 7 lbs.                               | \$12.50                |
| 2 x 1½    | 8  | 2½ | 4½  | 4             | 10                                   | 13.50                  |
| 2 x 2     | 8  | 2½ | 6   | 4             | 10                                   | 14.50                  |
| 3 x 1½    | 12 | 3½ | 5½  | 1             | 4                                    | 17.00                  |
| 3 x 2     | 12 | 3½ | 6½  | 1             | 7                                    | 19.00                  |
| 3 x 3     | 12 | 3½ | 8   | 1             | 8                                    | 23.00                  |
| 4 x 1½    | 14 | 4½ | 6½  | 1             | 13                                   | 25.00                  |
| 4 x 2     | 14 | 4½ | 7½  | 1             | 13                                   | 26.50                  |
| 4 x 3     | 14 | 4½ | 8½  | 1             | 14                                   | 34.00                  |
| 4 x 4     | 14 | 4½ | 10  | 1             | 14                                   | 48.00                  |
| 6 x 2     | 20 | 5½ | 9   | 1             | 15                                   | 60.00                  |
| 6 x 3     | 20 | 5½ | 10½ | 1             | 17                                   | 63.00                  |
| 6 x 4     | 20 | 5½ | 11½ | 1             | 20                                   | 66.50                  |
| 6 x 6     | 20 | 5½ | 14  | 1             | 22                                   | 88.00                  |

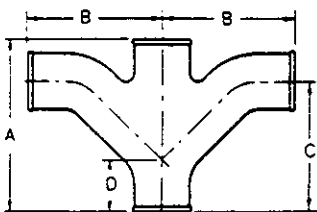
## COMBINATION Y AND 1/8 BEND



### 6528—drainline combination Y and 1/8 bend

| Size      | A  | B  | C   | D  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 4½ | 4½  | 1½ | 4 pcs.        | 8 lbs.                               | \$ 9.00                |
| 2 x 1½    | 8  | 4½ | 5½  | 2½ | 4             | 8                                    | 9.50                   |
| 2 x 2     | 8  | 6  | 6½  | 2½ | 4             | 10                                   | 12.75                  |
| 3 x 1½    | 12 | 5½ | 7½  | 3½ | 1             | 4                                    | 11.50                  |
| 3 x 2     | 12 | 6½ | 8   | 3½ | 1             | 4                                    | 13.50                  |
| 3 x 3     | 12 | 8½ | 9   | 3½ | 1             | 5                                    | 16.50                  |
| 4 x 1½    | 14 | 6  | 8½  | 4½ | 1             | 8                                    | 14.75                  |
| 4 x 2     | 14 | 7  | 9½  | 4½ | 1             | 8                                    | 18.00                  |
| 4 x 3     | 14 | 9  | 10½ | 4½ | 1             | 9                                    | 21.75                  |
| 4 x 4     | 14 | 11 | 11  | 4½ | 1             | 12                                   | 27.00                  |
| 6 x 2     | 20 | 8½ | 11½ | 5½ | 1             | 15                                   | 31.00                  |
| 6 x 3     | 20 | 10 | 12½ | 5½ | 1             | 17                                   | 39.00                  |
| 6 x 4     | 20 | 12 | 13½ | 5½ | 1             | 21                                   | 41.50                  |
| 6 x 6     | 20 | 15 | 14½ | 5½ | 1             | 23                                   | 48.50                  |

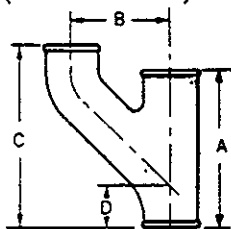
## COMBINATION Y AND 1/8 BEND



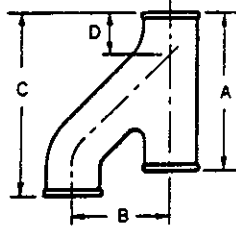
### 6529—double branch drainline combination Y and 1/8 bend

| Size      | A  | B  | C   | D  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|-----|----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 4½ | 4½  | 1½ | 4 pcs.        | 8 lbs.                               | \$14.75                |
| 2 x 1½    | 8  | 4½ | 5½  | 2½ | 4             | 11                                   | 15.75                  |
| 2 x 2     | 8  | 6  | 6½  | 2½ | 4             | 13                                   | 18.50                  |
| 3 x 1½    | 12 | 5½ | 7½  | 3½ | 1             | 4                                    | 22.00                  |
| 3 x 2     | 12 | 6½ | 8   | 3½ | 1             | 6                                    | 22.75                  |
| 3 x 3     | 12 | 8½ | 9   | 3½ | 1             | 11                                   | 30.00                  |
| 4 x 1½    | 14 | 6  | 8½  | 4½ | 1             | 11                                   | 25.00                  |
| 4 x 2     | 14 | 7  | 9½  | 4½ | 1             | 12                                   | 26.50                  |
| 4 x 3     | 14 | 9  | 10½ | 4½ | 1             | 14                                   | 31.25                  |
| 4 x 4     | 14 | 11 | 11  | 4½ | 1             | 18                                   | 46.50                  |
| 6 x 2     | 20 | 8½ | 11½ | 5½ | 1             | 18                                   | 49.50                  |
| 6 x 3     | 20 | 10 | 12½ | 5½ | 1             | 19                                   | 52.00                  |
| 6 x 4     | 20 | 12 | 13½ | 5½ | 1             | 20                                   | 65.00                  |
| 6 x 6     | 20 | 15 | 14½ | 5½ | 1             | 22                                   | 78.00                  |

## UPRIGHT Y OR H FITTING (and vent branch)



upright Y or H fitting



vent branch

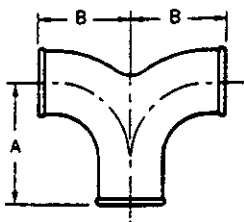
Note: above fittings identical

### 6532

| Size      | A  | B  | D  | C*  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|-----------|----|----|----|-----|---------------|--------------------------------------|------------------------|
| 1½" x 1½" | 6  | 3  | 1½ | 6½  | 4 pcs.        | 7 lbs.                               | \$20.00                |
| 2 x 1½    | 8  | 3½ | 2½ | 7½  | 4             | 8                                    | 20.00                  |
| 2 x 2     | 8  | 4  | 2½ | 8½  | 4             | 10                                   | 22.50                  |
| 3 x 1½    | 12 | 3½ | 3½ | 9½  | 1             | 4                                    | 22.00                  |
| 3 x 2     | 12 | 4½ | 3½ | 10½ | 1             | 4                                    | 24.00                  |
| 3 x 3     | 12 | 6  | 3½ | 13  | 1             | 4                                    | 28.00                  |
| 4 x 1½    | 14 | 4½ | 4½ | 10½ | 1             | 10                                   | 30.00                  |
| 4 x 2     | 14 | 5  | 4½ | 12  | 1             | 11                                   | 32.00                  |
| 4 x 3     | 14 | 6½ | 4½ | 14½ | 1             | 12                                   | 36.00                  |
| 4 x 4     | 14 | 8  | 4½ | 16½ | 1             | 14                                   | 41.00                  |
| 6 x 3     | 20 | 7½ | 5½ | 16½ | 1             | 17                                   | 58.00                  |
| 6 x 4     | 20 | 9  | 5½ | 19  | 1             | 20                                   | 62.50                  |
| 6 x 6     | 20 | 12 | 5½ | 24  | 1             | 22                                   | 72.00                  |

\*"C" dimension may be higher or lower than "A."

## DOUBLE QUARTER BEND



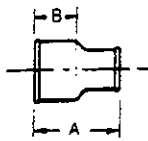
### 6533

| Size | A   | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|-----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 3½  | 3½ | 4 pcs.        | 8 lbs.                               | \$ 9.00                |
| 2    | 5   | 4½ | 4             | 10                                   | 12.00                  |
| 3    | 7½  | 6½ | 1             | 5                                    | 20.00                  |
| 4    | 8½  | 8½ | 1             | 18                                   | 31.00                  |
| 6    | 12½ | 12 | 1             | 25                                   | 50.00                  |

# KIMAX DRAINLINE PIPE AND FITTINGS

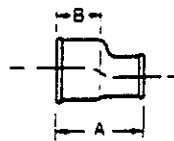
## REDUCERS

6536



reducer and increaser

6537

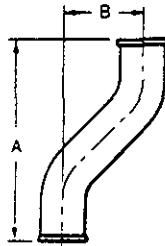


reducer eccentric

| Size        | A | B (min.) | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price 6536 | Suggested Resale Price 6537 |
|-------------|---|----------|---------------|--------------------------------------|-----------------------------|-----------------------------|
| 2" x 1 1/2" | 4 | 1 1/4    | 4 pcs.        | 3 lbs.                               | \$ 4.50                     | \$ 4.50                     |
| *2 1/2 x 2  | 5 | 3        | 4             | 4                                    | 6.00                        | 6.50                        |
| 3 x 1 1/2   | 5 | 2 1/4    | 1             | 1                                    | 6.50                        | 6.50                        |
| 3 x 2       | 5 | 2 1/4    | 1             | 2                                    | 8.00                        | 8.00                        |
| *3 1/2 x 3  | 7 | 4        | 1             | 2                                    | 8.50                        | 8.50                        |
| 4 x 1 1/2   | 7 | 3        | 1             | 3                                    | 8.00                        | 8.00                        |
| 4 x 2       | 7 | 3        | 1             | 3                                    | 8.50                        | 8.50                        |
| 4 x 3       | 7 | 3        | 1             | 3                                    | 10.00                       | 10.00                       |
| *5 x 4      | 9 | 5 1/2    | 1             | 4                                    | 15.00                       | 18.50                       |
| 6 x 1 1/2   | 9 | 4        | 1             | 4                                    | 12.50                       | 12.50                       |
| 6 x 2       | 9 | 4        | 1             | 5                                    | 13.50                       | 13.50                       |
| 6 x 3       | 9 | 4        | 1             | 5                                    | 15.50                       | 15.50                       |
| 6 x 4       | 9 | 4        | 1             | 5                                    | 17.00                       | 17.00                       |

\*Used with adjustable joint (#6660)

## OFFSETS



6540

| Offset B Dimension          | Suggested Resale Prices |         |         |         |          |
|-----------------------------|-------------------------|---------|---------|---------|----------|
|                             | Pipe Sizes              |         |         |         |          |
|                             | 1 1/2"                  | 2"      | 3"      | 4"      | 6"       |
| 2"                          | \$15.00                 | \$16.00 | \$20.50 | \$26.50 | —        |
| 3                           | 16.00                   | —       | —       | —       | —        |
| 4                           | 16.50                   | 18.50   | 22.00   | 31.50   | \$ 74.00 |
| 6                           | 19.00                   | 20.50   | 23.50   | 53.50   | 84.00    |
| 8                           | 19.50                   | 22.00   | 25.00   | 63.00   | 93.00    |
| 10                          | 35.00                   | 31.50   | 47.50   | 71.00   | 100.00   |
| 12                          | 38.00                   | 33.00   | 53.50   | 84.00   | 110.00   |
| Approximate Shipping Weight | 3 lbs.                  | 3 lbs.  | 6 lbs.  | 8 lbs.  | 20 lbs.  |
| A Dimension                 | 12                      | 12      | 15      | 20      | 25       |

When ordering Drainline Offset specify pipe size and desired offset. All sizes of offsets are packaged 1 Per Shipper Carton.

## CLEANOUT PLUGS



Short cleanout plug

6544

| Size   | A     | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|--------|-------|---------------|--------------------------------------|------------------------|
| 1 1/2" | 3/4   | 4 pcs.        | 1 lb.                                | \$2.00                 |
| 2      | 1     | 4             | 1                                    | 2.50                   |
| 3      | 1 1/4 | 1             | 1                                    | 4.00                   |
| 4      | 1 1/4 | 1             | 1                                    | 7.00                   |
| 6      | 1 1/4 | 1             | 1                                    | 9.50                   |

## CLEANOUT PLUGS



Long cleanout plug

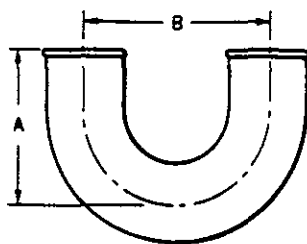
6545 (annealed)

| Size   | B     | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|--------|-------|---------------|--------------------------------------|------------------------|
| 1 1/2" | 3 3/4 | 4 pcs.        | 2 lbs.                               | \$ 3.00                |
| 2      | 3 3/4 | 4             | 3                                    | 3.50                   |
| 3      | 4 3/4 | 1             | 1                                    | 5.00                   |
| 4      | 5 3/4 | 1             | 3                                    | 11.50                  |
| 6      | 6 1/2 | 1             | 4                                    | 17.50                  |

# KIMAX DRAINLINE PIPE AND FITTINGS



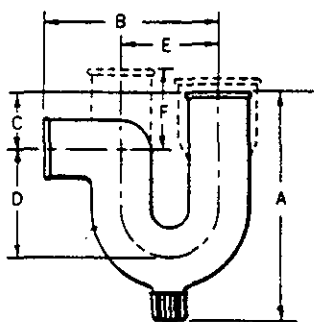
U BEND (Vent Loop)



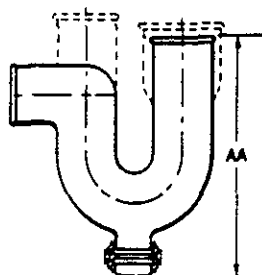
6550

| Size | A  | B  | Case Quantity | Approximate Shipping Weight Per Case | Suggested Resale Price |
|------|----|----|---------------|--------------------------------------|------------------------|
| 1½"  | 4  | 5  | 4 pcs.        | 5 lbs.                               | \$ 9.50                |
| 2    | 4½ | 5½ | 4             | 5                                    | 12.00                  |
| 3    | 5½ | 6½ | 1             | 8                                    | 24.00                  |
| 4    | 6½ | 7½ | 1             | 11                                   | 32.00                  |
| 6    | 8½ | 10 | 1             | 20                                   | 90.00                  |

P TRAP



standard cleanout



large cleanout

6554—without vent

6554-A—without vent

6555—with vent

6555-A—with vent

| Size      | Vent Size | Seal Depth | A   | B   | C  | D  | E  | F  | AA   | Case Quantity |
|-----------|-----------|------------|-----|-----|----|----|----|----|------|---------------|
| 1½" x 1½" | 1½"       | 3¾"        | 8½" | 8   | 1  | 5  | 5  | 3  | 9½"  | 1 pc.         |
| *2 x 1½"  | 1½"       | 3¾"        | 8½" | 8   | 1  | 5  | 5  | 3  | 9½"  | 1             |
| 2 x 2     | 2         | 3¾"        | 9½" | 8½  | 1½ | 5½ | 5½ | 3½ | 10½" | 1             |
| 2½ x 1½"  | 1½"       | 3¾"        | 8½" | 8   | 1  | 5  | 5  | 3  | 9½"  | 1             |
| **2½ x 2  | 2         | 3¾"        | 9½" | 8½  | 1½ | 5½ | 5½ | 3½ | 10½" | 1             |
| 3 x 3     | 3         | 3¾"        | 12  | 10½ | 2  | 6½ | 6½ | 4  | 12½" | 1             |
| ***3½ x 3 | 3         | 3¾"        | 12  | 10½ | 2  | 6½ | 6½ | 4  | 12½" | 1             |
| 4 x 4     | 4         | 3¾"        | 14  | 12½ | 2½ | 7½ | 7½ | 5  | 14½" | 1             |
| 6 x 6     | 4         | 3¾"        | 18½ | 17  | 3½ | 9½ | 10 | 7  | 18½" | 1             |

## Suggested Resale Prices

| Size      | Shipping Weight Per Case | Assembly Without Vent 6554 | Assembly With Vent 6555 | Body Only 6553 W/O Vent | Body Only 6553A With Vent |
|-----------|--------------------------|----------------------------|-------------------------|-------------------------|---------------------------|
| 1½" x 1½" | 3 lbs.                   | \$13.50                    | \$18.00                 | \$16.00                 | \$20.50                   |
| *2 x 1½"  | 4                        | 14.00                      | 18.50                   | 16.50                   | 21.00                     |
| 2 x 2     | 4                        | 20.00                      | 24.50                   | 21.00                   | 26.00                     |
| 2½ x 1½"  | 4                        | 22.00                      | 26.50                   | 25.00                   | 29.50                     |
| **2½ x 2  | 4                        | 35.00                      | 39.50                   | 39.50                   | 44.00                     |
| 3 x 3     | 7                        | 42.50                      | 47.00                   | 49.00                   | 53.50                     |
| ***3½ x 3 | 7                        | 60.00                      | 64.50                   | 66.00                   | 70.50                     |
| 4 x 4     | 10                       | 62.00                      | 66.50                   | 68.00                   | 72.50                     |
| 6 x 6     | 15                       | 170.00                     | 174.50                  | 180.00                  | 184.50                    |

6675 Extra Phenolic Caps—for 6554 or 6555.....\$ .35 each

6544 Short Clean-Out Plugs—(1½") for 6554A and 6555A.....\$2.00 each

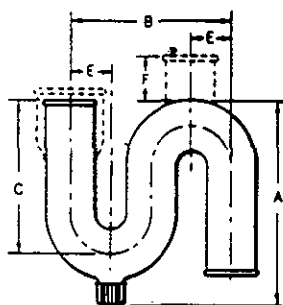
6650 Extra Drainline Coupling for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.

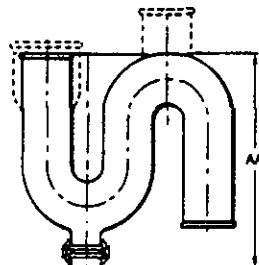
\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.

\*\*\*Use 3" adjustable joint, hardware assembly (#6660) for top joint.

S TRAP



standard cleanout



large cleanout

6556—without vent

6556-A—without vent

6557—with vent

6557-A—with vent

| Size      | Vent Size | Seal Depth | A   | B  | C  | E  | F  | AA   | Case Quantity |
|-----------|-----------|------------|-----|----|----|----|----|------|---------------|
| 1½" x 1½" | 1½"       | 3¾"        | 8½" | 10 | 6  | 2½ | 2½ | 9½"  | 1 pc.         |
| *2 x 1½"  | 1½"       | 3¾"        | 8½" | 10 | 6  | 2½ | 2½ | 9½"  | 1             |
| 2 x 2     | 2         | 3¾"        | 9½" | 11 | 7  | 2½ | 2½ | 10½" | 1             |
| **2½ x 2  | 2         | 3¾"        | 9½" | 11 | 7  | 2½ | 2½ | 10½" | 1             |
| 3 x 3     | 3         | 3¾"        | 12  | 13 | 8½ | 3½ | 2½ | 12½" | 1             |
| 4 x 4     | 4         | 3¾"        | 14  | 15 | 10 | 3½ | 3½ | 14½" | 1             |
| 6 x 6     | 4         | 3¾"        | 18½ | 20 | 13 | 5  | 3½ | 18½" | 1             |

## Suggested Resale Prices

| Size      | Shipping Weight Per Case | Assembly Without Vent 6556 | Assembly With Vent 6557 | Body Only 6556 | Body Only 6556A |
|-----------|--------------------------|----------------------------|-------------------------|----------------|-----------------|
| 1½" x 1½" | 4 lbs.                   | \$18.00                    | \$20.50                 | \$19.50        | \$22.00         |
| *2 x 1½"  | 5                        | 16.50                      | 21.00                   | 20.00          | 24.50           |
| 2 x 2     | 6                        | 18.50                      | 23.00                   | 22.50          | 27.00           |
| **2½ x 2  | 6                        | 19.50                      | 24.00                   | 23.00          | 28.00           |
| 3 x 3     | 9                        | 45.00                      | 49.50                   | 50.00          | 54.50           |
| 4 x 4     | 14                       | 68.00                      | 70.50                   | 72.50          | 75.00           |
| 6 x 6     | 19                       | 140.00                     | 144.50                  | 150.00         | 154.50          |

6675 Extra Phenolic Caps for 6556 and 6557.....\$ .35 each

6544 Short Clean-Out Plugs (1½") for 6556A and 6557A.....\$2.00 each

6650 Extra Drainline Coupling for Clean-Out Plug (1½").....\$2.50 each

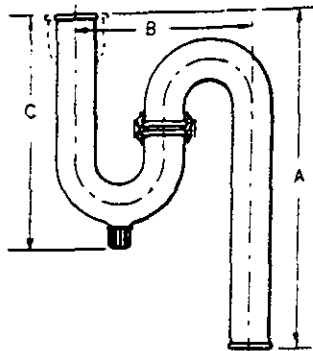
\*Use adapter coupling (#6655) for top joint.

\*\*Use 2" adjustable joint, hardware assembly (#6660) for top joint.

# KIMAX DRAINLINE PIPE AND FITTINGS

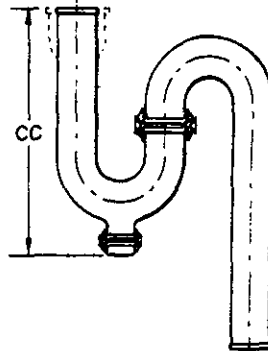
## LONG S TRAP

6560



standard cleanout

6560-A



large cleanout

| Size              | Seal Depth | A    | B   | Maximum C | CC    | Case Quantity | Shpg. Wt. Per Case |
|-------------------|------------|------|-----|-----------|-------|---------------|--------------------|
| 1½" x 1½" x 16½"  | 5¼"        | 16½" | 10" | 8½½"      | 11½½" | 1 pc.         | 6 lbs.             |
| 1½" x 1½" x 20½"  | 5¼"        | 20½" | 10" | 8½½"      | 11½½" | 1             | 7                  |
| *2 x 1½" x 16½"   | 5¼"        | 16½" | 10" | 8½½"      | 11½½" | 1             | 7                  |
| 2 x 1½" x 20½"    | 5¼"        | 20½" | 10" | 8½½"      | 11½½" | 1             | 8                  |
| 2 x 2" x 20½"     | 5¼"        | 20½" | 11" | 9½½"      | 12½½" | 1             | 9                  |
| **2½" x 2" x 20½" | 5¼"        | 20½" | 11" | 9½½"      | 12½½" | 1             | 9                  |

### Suggested Resale Prices

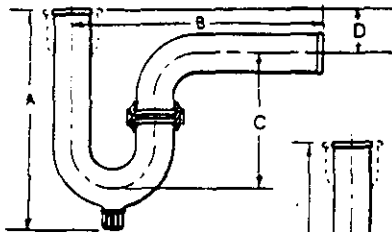
| Size              | Complete 6560 | 6560A   | Inlet Pipe 6561 | 6561A   | Outlet Pipe 6562 | Coupling 6650 |
|-------------------|---------------|---------|-----------------|---------|------------------|---------------|
| 1½" x 1½" x 16½"  | \$23.00       | \$27.50 | \$12.50         | \$17.00 | \$ 8.00          | \$2.50        |
| 1½" x 1½" x 20½"  | 23.50         | 28.00   | 12.50           | 17.00   | 8.50             | 2.50          |
| *2 x 1½" x 16½"   | 24.00         | 28.50   | 13.50           | 18.00   | 9.00             | 2.50          |
| 2 x 1½" x 20½"    | 24.50         | 29.00   | 13.50           | 18.00   | 9.50             | 2.50          |
| 2 x 2" x 20½"     | 29.00         | 33.50   | 15.00           | 19.50   | 10.70            | 3.30          |
| **2½" x 2" x 20½" | 31.00         | 35.50   | 17.00           | 21.50   | 10.70            | 3.30          |

6675 Extra Phenolic Caps for 6560 and 6561.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6560A and 6561A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

\*Use adapter coupling (#6655) for top joint.  
 \*\*Use adjustable joint (#6660) for top joint.

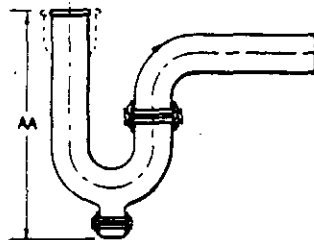
## LONG P TRAP

6565



standard cleanout

6565-A



large cleanout

| Size       | Seal Depth | A     | B   | C   | D    | AA    | Case Quantity | Shpg. Wt. Per Case |
|------------|------------|-------|-----|-----|------|-------|---------------|--------------------|
| 1½" x 1½"  | 5¼"        | 10½½" | 11" | 6½" | 1½½" | 11½½" | 1 pc.         | 1 lbs.             |
| *2 x 1½"   | 5¼"        | 10½½" | 11" | 6½" | 1½½" | 11½½" | 1             | -                  |
| 2 x 2"     | 5¼"        | 11½½" | 13" | 7½" | 1½"  | 12½½" | 1             | -                  |
| **2½" x 2" | 5¼"        | 11½½" | 13" | 7½" | 1½"  | 12½½" | -             | -                  |

### Suggested Resale Prices

| Size       | Complete 6565 | 6565A   | Inlet Pipe 6561 | 6561A   | Outlet Pipe 6572 | Coupling 6650 |
|------------|---------------|---------|-----------------|---------|------------------|---------------|
| 1½" x 1½"  | \$22.50       | \$27.00 | \$12.50         | \$17.00 | \$7.50           | \$2.50        |
| *2 x 1½"   | 23.50         | 28.00   | 13.50           | 18.00   | 7.50             | 2.50          |
| 2 x 2"     | 27.30         | 31.80   | 15.00           | 19.50   | 9.00             | 3.30          |
| **2½" x 2" | -             | -       | -               | -       | -                | -             |

6675 Extra Phenolic Caps for 6565 and 6561.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6565A and 6561A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

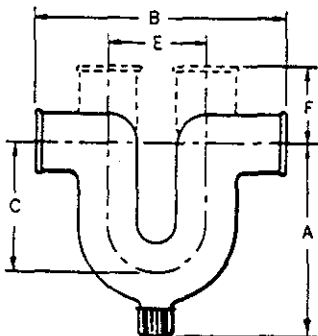
\*Use adapter coupling (#6655) for top joint.  
 \*\*Use adjustable joint (#6660) for top joint.

## RUNNING TRAP

6570

6571

6572

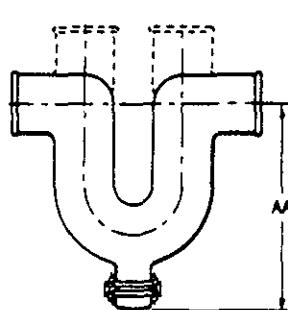


standard cleanout

6570-A

6571-A

6572-A



large cleanout

| Size      | Vent Size | Seal Depth | A     | B    | C   | E   | F   | AA    | Case Quantity | Shpg. Wt. Per Case |
|-----------|-----------|------------|-------|------|-----|-----|-----|-------|---------------|--------------------|
| 1½" x 1½" | 1½"       | 3½"        | 7½½"  | 11"  | 5"  | 5"  | 3"  | 8½½"  | 1 pc.         | 3 lbs.             |
| 2 x 2"    | 2"        | 3½"        | 8½½"  | 12"  | 5½" | 5½" | 3½" | 9½½"  | 1             | 4                  |
| 3 x 3"    | 3"        | 3½"        | 10"   | 14½" | 6½" | 6½" | 4"  | 10½½" | 1             | 5                  |
| 4 x 4"    | 4"        | 3½"        | 11½"  | 17½" | 7½" | 7½" | 5"  | 12½"  | 1             | 7                  |
| 6 x 6"    | 4"        | 3½"        | 14½½" | 24"  | 9½" | 10" | 7"  | 15½½" | 1             | 15                 |

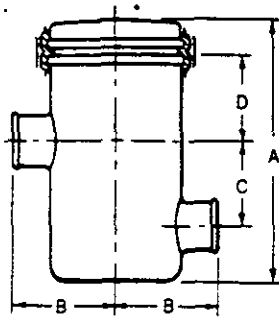
### Suggested Resale Prices

| Size      | Complete Without Vent 6570 | 6570A   | Complete With 1 Vent 6571 | 6571A   | Complete With 2 Vents 6572 | 6572A   |
|-----------|----------------------------|---------|---------------------------|---------|----------------------------|---------|
| 1½" x 1½" | \$20.00                    | \$24.50 | \$23.00                   | \$27.50 | \$25.00                    | \$29.50 |
| 2 x 2"    | 30.00                      | 34.50   | 35.00                     | 39.50   | 37.00                      | 41.50   |
| 3 x 3"    | 60.00                      | 64.50   | 57.00                     | 61.50   | 60.00                      | 64.50   |
| 4 x 4"    | 83.50                      | 88.00   | 89.50                     | 94.00   | 96.00                      | 100.50  |
| 6 x 6"    | 170.00                     | 174.50  | 180.00                    | 184.50  | 185.00                     | 189.50  |

6675 Extra Phenolic Caps for 6570, 6571 or 6572.....\$ .35 each  
 6544 Short Clean-Out Plugs (1½") for 6570A, 6571A and 6572A.....\$2.00 each  
 6650 Extra Couplings for Clean-Out Plug (1½").....\$2.50 each

# KIMAX DRAINLINE PIPE AND FITTINGS

## DRUM TRAP (top cleanout)



6576

Assembly #6576 consists of following components:

- 6" glass body #6577
- 6" short cleanout plug #6544
- 6" drainline coupling #6650

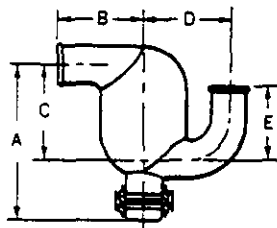
| Size | Seal Depth | A    | B   | C   | D   | Case Quantity |
|------|------------|------|-----|-----|-----|---------------|
| 1½"  | 2½"        | 13⅞" | 5½" | 4½" | 4½" | 1 pc.         |
| 2"   | 2½"        | 13⅞" | 5½" | 4½" | 4½" | 1             |
| 3"   | 2½"        | 14⅞" | 6½" | 5½" | 4½" | 1             |

### Suggested Resale Prices

| Size | 6576 or 6577 Case Quantity | 6576 Shpg. Wt. | 6576 Complete | 6577 Shpg. Wt. | 6577 Body Only |
|------|----------------------------|----------------|---------------|----------------|----------------|
| 1½"  | 1 pc.                      | 9 lbs.         | \$70.00       | 7 lbs.         | \$45.50        |
| 2"   | 1                          | 9              | 78.00         | 7              | 53.50          |
| 3"   | 1                          | 11             | 88.00         | 9              | 63.50          |

6544 Extra 6" Clean-Out Plugs for 6544.....\$ 9.50 each  
6650 Extra 6" Couplings for 6650.....\$14.00 each

## DRUM TRAP (bottom cleanout)



6585

Assembly #6585 consists of following components:

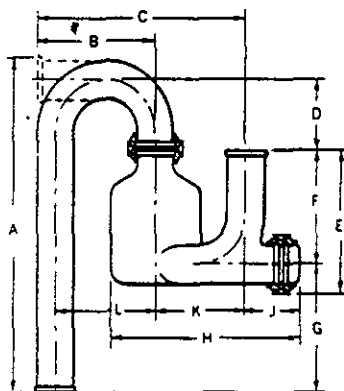
- glass body #6586
- short cleanout plug #6544
- drainline coupling #6650

| Size | Seal Depth | A   | B   | C   | D   | E   | Case Quantity | Shpg. Wt. Per Case |
|------|------------|-----|-----|-----|-----|-----|---------------|--------------------|
| 1½"  | 3"         | 8½" | 4½" | 4½" | 4½" | 3½" | 1 pc.         | 7 lbs.             |
| 2"   | 3½"        | 9½" | 5"  | 5½" | 5½" | 4½" | 1             | 8                  |

### Suggested Resale Prices

| Size | Complete 6585 | Body Only 6586 | Case Quantity | Shpg. Wt. Per Case | Plug 6544 | Coupling 6650 |
|------|---------------|----------------|---------------|--------------------|-----------|---------------|
| 1½"  | \$19.00       | \$14.50        | 1 pc.         | 6 lbs.             | \$2.00    | \$2.50        |
| 2"   | 21.00         | 16.20          | 1             | 7                  | 2.50      | 3.30          |

## CENTRIFUGAL DRUM TRAP (side cleanout)



6590—vertical outlet

6591—horizontal outlet

Assembly #6590 consists of following components:

- glass body #6592
- vertical outlet #6562\*
- short cleanout plug #6544
- 2 drainline couplings #6650

Assembly #6591 is same as #6590 except that horizontal outlet #6512 is used in place of vertical outlet #6562.

| Size | Seal Depth | A    | B   | C    | D   | E   | F   | G   | H    | J   | K   | L   |
|------|------------|------|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| 1½"  | 7½"        | 16½" | 6"  | 10½" | 3½" | 7"  | 5½" | 6½" | 10½" | 3½" | 4½" | 5"  |
| 2"   | 7½"        | 20½" | 7½" | 13"  | 3½" | 7½" | 6"  | 9½" | 12½" | 4"  | 5½" | 5½" |

### Suggested Resale Prices

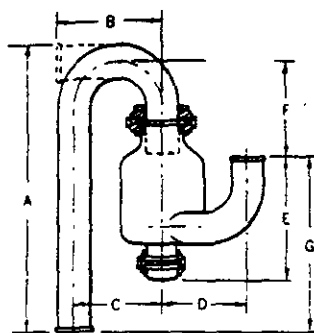
| Size | Case Quantity | Shpg. Wt. Per Case | Vertical Complete 6590 | Horizontal Complete 6591 | Body Only 6592 | Vertical Outlet Only 6562 | Horizontal Outlet Only 6512 | Plug 6544 | Coupling 6650 |
|------|---------------|--------------------|------------------------|--------------------------|----------------|---------------------------|-----------------------------|-----------|---------------|
| 1½"  | 1 pc.         | 28 lbs.            | \$48.00                | \$42.00                  | \$32.50        | \$ 8.00                   | \$7.50                      | \$2.00    | \$2.50        |
| 2"   | 1             | 22                 | 68.00                  | 64.20                    | 39.50          | 10.70                     | 9.90                        | 2.50      | 3.30          |

\*Same as bottom section of long S trap (#6560). Annealed only.



# KIMAX DRAINLINE PIPE AND FITTINGS

## CENTRIFUGAL DRUM TRAP (bottom cleanout)



6600—vertical outlet

6601—horizontal outlet

The adjustable connection at the top of the body permits approximately 2½" variation in the depth of seal.

Vertical outlet assembly #6600 consists of:

- glass body #6602
- vertical outlet #6603 (annealed only)
- short cleanout plug #6544
- drainline coupling #6650
- \*adapter coupling #6655 for 1½" size or
- \*adjustable joint #6660 for 2" size

Horizontal outlet assembly #6601 is same as #6600 except that horizontal outlet #6604 is used in place of vertical outlet.

| Size | Seal Depth | A    | B   | C   | D   | E   | F   | G    | Case Quantity | Shpg. Wt. Per Case |
|------|------------|------|-----|-----|-----|-----|-----|------|---------------|--------------------|
| 1½"  | 7½"        | 16½" | 6"  | 5"  | 4½" | 7½" | 5½" | 10"  | 1 pc.         | 20 lbs.            |
| 2"   | 7½"        | 20½" | 7½" | 5½" | 5½" | 9"  | 4½" | 14½" | 1             | 22                 |

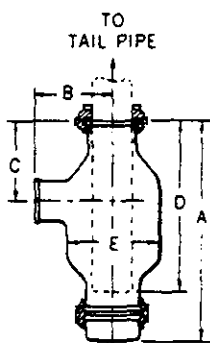
### Suggested Resale Prices

| Size | Vertical Complete 6600 | Horizontal Complete 6601 | Body Only 6602 | Vertical Outlet Only 6603 | Horizontal Outlet Only 6604 | *6655 or *6660 | Plug 6544 | Coupling 6650 |
|------|------------------------|--------------------------|----------------|---------------------------|-----------------------------|----------------|-----------|---------------|
| 1½"  | \$42.00                | \$40.00                  | \$24.50        | \$ 7.00                   | \$6.00                      | \$6.00         | \$2.00    | \$2.50        |
| 2"   | \$4.00                 | \$2.00                   | \$8.70         | 10.00                     | 8.00                        | 9.50           | 2.50      | 3.30          |

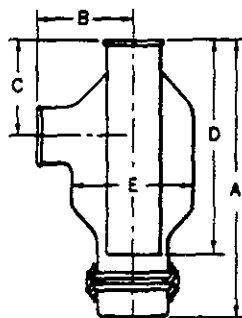
## PARTITION TRAPS

6610

6612



without partition



with sealed-in partition

Assembly #6610 consists of:

- glass body #6611 (without partition)
- 3" drainline coupling #6650
- 3" short cleanout plug #6544

To connect trap assembly #6610 to threaded sink tailpiece, thread bead adapter #6680 on tailpiece. Join to beaded end of straight length cut to desired length, using coupling #6650. Slip cut end of straight length into trap inlet through adjustable connection (adapter coupling #6655 for 1½" size; adjustable joint #6660 for 2" and 3" sizes).

Drainline partition trap assembly #6612 consists of glass body #6613, with sealed-in partition (annealed only), 3" coupling #6650 and 3" short cleanout plug #6544.

Both traps are non-siphoning with the partition always visible.

| Size      | Seal Depth | A    | B   | C   | D    | E  | Case Quantity | Shipping Weight Per Case | Without Partition 6610 |
|-----------|------------|------|-----|-----|------|----|---------------|--------------------------|------------------------|
| 1½" x 3½" | 3½"        | 8½"  | 3½" | 3½" | 7½"  | 3" | 1 pc.         | 2 lbs.                   | \$20.00                |
| 2 x 5½"   | 3½"        | 11½" | 5½" | 4½" | 9"   | 5" | 1             | 4                        | 35.00                  |
| *2 x 4½"  | 3½"        | 11½" | 4½" | 4½" | 9"   | 5" | 1             | 4                        | 40.00                  |
| 3 x 6½"   | 4"         | 16½" | 6½" | 5"  | 10½" | 6" | 1             | 7                        | 52.00                  |

### Suggested Resale Prices

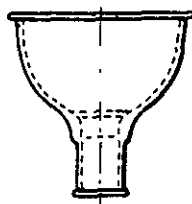
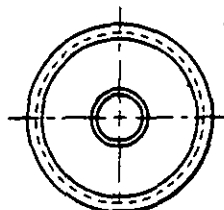
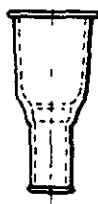
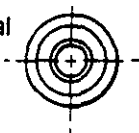
| Size      | Body Only for 6610 6611 | With Partition 6612 | Shipping Weight Per Case | Body Only for 6612 6613 | Plug 3" 6544 | Coupling 3" 6650 |
|-----------|-------------------------|---------------------|--------------------------|-------------------------|--------------|------------------|
| 1½" x 3½" | \$11.00                 | \$28.00             | 6 lbs.                   | \$19.00                 | \$4.00       | \$6.00           |
| 2 x 5½"   | 25.00                   | 38.00               | 6                        | 29.00                   | 4.00         | 5.00             |
| *2 x 4½"  | 31.00                   | —                   | —                        | —                       | 4.00         | 5.00             |
| 3 x 6½"   | 43.00                   | 56.00               | 9                        | 48.00                   | 4.00         | 5.00             |

\*Available only without partition.

## CUP SINKS

6616

3" hemispherical cup sink



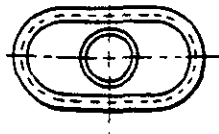
6617

6" hemispherical cup sink

| Size | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|------|---------------|--------------------------|------------------------|
| 3"   | 1 pc.         | 3 lbs.                   | \$12.00                |
| Size | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
| 6"   | 1 pc.         | 9 lbs.                   | \$12.00                |

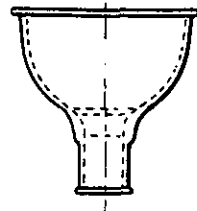
# KIMAX DRAINLINE PIPE AND FITTINGS

## CUP SINKS

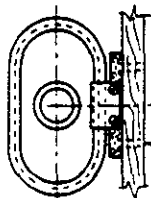


6619—3'' x 6'' oval cup sink (straight sides)

| Size      | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|-----------|---------------|--------------------------|------------------------|
| 3'' x 6'' | 1 pc.         | 4 lbs.                   | \$10.00                |



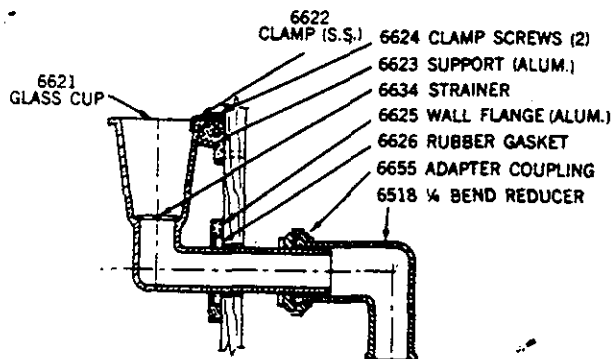
## CUP SINK



6620—1½'' Outlet  
3'' x 6'' end cup sink,  
oval, straight sides

6627 MOUNTING BOLTS (4)

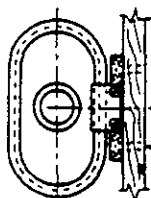
| Size      | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |
|-----------|---------------|--------------------------|------------------------|
| 3'' x 6'' | 1 pc.         | 18 lbs.                  | \$35.75                |



### Assembly Component Parts

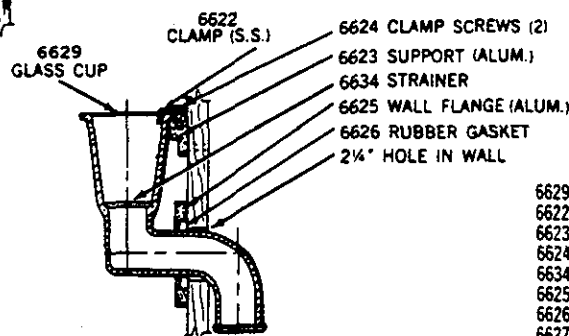
|                                               |         |
|-----------------------------------------------|---------|
| 6621 End Cup Sink, Glass Only.....            | \$14.50 |
| 6622 Clamp (S.S.).....                        | 1.50    |
| 6623 Sink Support (Aluminum).....             | 2.00    |
| 6624 Clamp Screws, Round Head, ¼" x 1¼".....  | .10     |
| 6634 Ebon Sink Strainer, 2".....              | 1.00    |
| 6625 Wall Flange (Aluminum), 4½" x 3¼".....   | 1.75    |
| 6626 Wall Flange Gasket (Rubber).....         | .60     |
| 6627 Flat Head Mounting Screws, ¼" x 1¼"..... | .10     |
| 6655 Adapter Coupling Assembly, 1½".....      | 6.00    |
| 6518 Quarter Bend Reducer, 2" x 1½".....      | 8.00    |

## CUP SINKS



6628—1½'' Outlet  
3'' x 6'' Cup Sink, Offset  
Vertical Outlet, Straight Sides

6627 MOUNTING BOLTS (4)

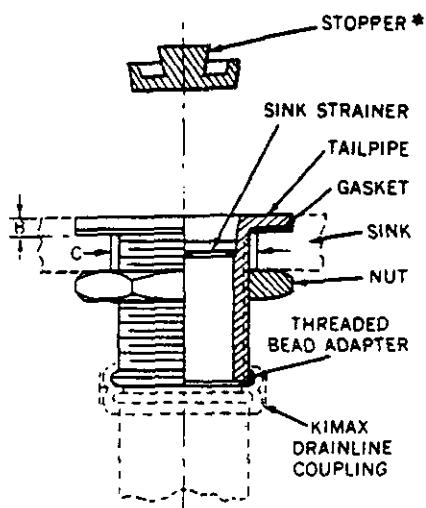


### Assembly Component Parts

|                                               |         |
|-----------------------------------------------|---------|
| 6629 End Cup Sink (Glass Only).....           | \$20.00 |
| 6622 Clamp (S.S.).....                        | 1.50    |
| 6623 Sink Support (Aluminum).....             | 2.00    |
| 6624 Clamp Screws, Round Head, ¼" x 1¼".....  | .10     |
| 6634 Ebon Sink Strainer, 2".....              | 1.00    |
| 6625 Wall Flange (Aluminum), 4½" x 3¼".....   | 1.75    |
| 6626 Wall Flange Gasket (Rubber).....         | .60     |
| 6627 Flat Head Mounting Screws, ¼" x 1¼"..... | .10     |

# KIMAX DRAINLINE PIPE AND FITTINGS

## 5 PIECE SINK TAILPIECE ASSEMBLY



### 6630

Assembly #6630 includes Teflon tailpipe #6631; tailpipe locknut #6632; one Teflon strainer #6634; rubber gasket #6635; and Teflon bead adapter #6680.

\*Ebolon stopper #6637 must be ordered separately. 1½" \$2.90, 2" \$5.00, 3" \$8.00.

The tailpiece is tightened with a single nut. Teflon bead adapter #6680 is threaded to the tailpipe and joined to KIMAX drainline traps by means of KIMAX coupling #6650.

Three-inch lengths are standard. Longer tailpipes available on special order at extra cost.

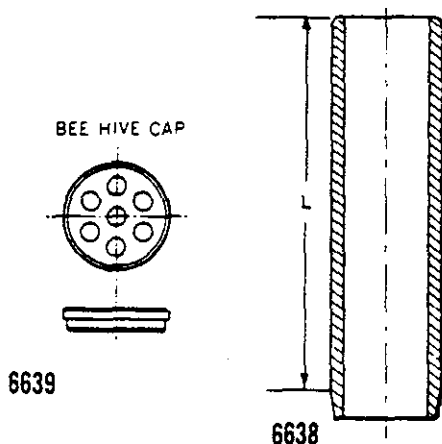
| Size | Recommended sink opening dimensions |       |       | Case Quantity | Shpg. Wt. Per Case | Complete #6630 |
|------|-------------------------------------|-------|-------|---------------|--------------------|----------------|
|      | A                                   | B     | C     |               |                    |                |
| 1½"  | 3 15/32                             | 1 1/2 | 2     | 1 pc.         | 2 lbs.             | \$18.50        |
| 2    | 4                                   | 1 1/8 | 2 1/4 | 1             | 2                  | 31.50          |
| 3    | 5                                   | 1 1/8 | 3 1/4 | 1             | 3                  | 48.00          |

| Suggested Resale Prices |                 |                |                |              |               |
|-------------------------|-----------------|----------------|----------------|--------------|---------------|
| Size                    | Tailpiece #6631 | Lock Nut #6632 | Strainer #6634 | Gasket #6635 | Adapter #6680 |
| 1½"                     | \$13.85         | \$1.25         | \$ .75         | \$ .15       | \$2.65        |
| 2                       | 25.00           | 2.00           | 1.00           | .20          | 4.20          |
| 3                       | 38.00           | 3.00           | 2.00           | .35          | 5.60          |

NOTE: Tailpipe #6631, strainer #6634 & stopper #6637 are made of a filled Teflon material.

## STANDING OVERFLOW

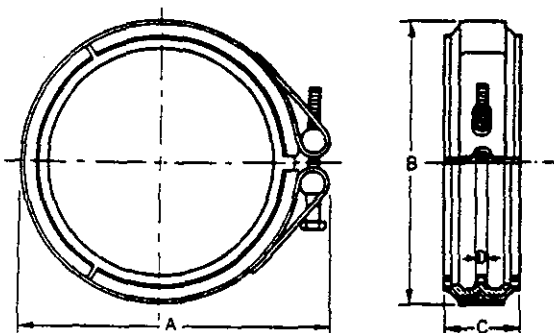


### 6638

Made from corrosion resistant filled Teflon available in three standard lengths. Precision tapered at lower end to fit tightly into mating taper of tailpipe. Beehive cap (#6639) must be ordered separately.

| 6638 Size | L (length) | Suggested Resale Price | 6639 Size | Suggested Resale Price |
|-----------|------------|------------------------|-----------|------------------------|
| 1½" x 4"  | 4"         | \$ 3.30 each           | 1½"       | \$2.40 each            |
| 1½" x 6   | 6          | 5.00 each              | 2         | 3.00 each              |
| 1½" x 8   | 8          | 6.00 each              | 3         | 5.00 each              |
| 2 x 4     | 4          | 9.00 each              |           |                        |
| 2 x 6     | 6          | 11.00 each             |           |                        |
| 2 x 8     | 8          | 13.00 each             |           |                        |
| 3 x 4     | 4          | 10.00 each             |           |                        |
| 3 x 6     | 6          | 12.00 each             |           |                        |
| 3 x 8     | 8          | 14.00 each             |           |                        |

## DRAINLINE COUPLING\*



### 6650

Positive-seal compression coupling #6650 consists of following components:

Segmented stainless steel outer band #6651.

Buna N rubber compression ring with Teflon® liner #6652.

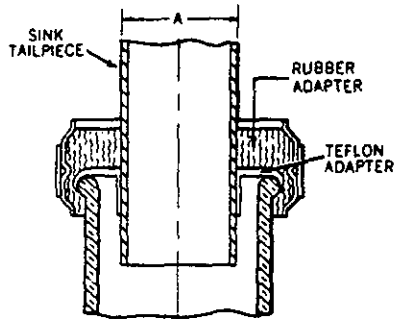
Stainless steel bolt #6653.

| Size | Case Quantity | Shipping Weight Per Case | Suggested Resale Price |                 |                               |           |
|------|---------------|--------------------------|------------------------|-----------------|-------------------------------|-----------|
|      |               |                          | 6650 Complete Assembly | 6651 Metal Band | 6652 Rubber Sleeve With Liner | 6653 Bolt |
| 1½"  | 10 pcs.       | 4 lbs.                   | \$2.50                 | \$1.10          | \$1.80                        | \$ .20    |
| 2    | 10            | 5                        | 3.30                   | 1.40            | 2.50                          | .20       |
| 3    | 10            | 7                        | 5.00                   | 2.20            | 3.65                          | .20       |
| 4    | 10            | 10                       | 6.60                   | 2.80            | 5.00                          | .30       |
| 6    | 10            | 13                       | 14.00                  | 5.00            | 8.70                          | .30       |

\*Patent pending

# KIMAX DRAINLINE PIPE AND FITTINGS

## ADAPTER COUPLING (assembly)



6655

### Suggested Resale Prices

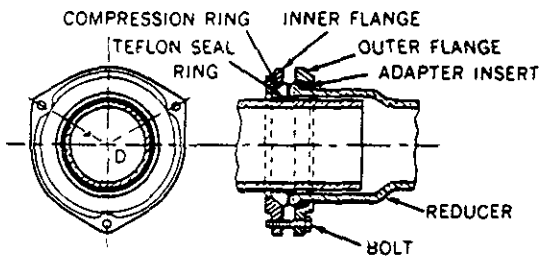
| Size        | 6655 Complete | 6656 Teflon Adapter | 6657 Buna-N Adapter | 6651 Metal Band 2" Size | 6653 Bolt 2" Size |
|-------------|---------------|---------------------|---------------------|-------------------------|-------------------|
| 2" x 1 1/2" | \$6.00 each   | \$3.60 each         | \$ .80 each         | \$1.40 each             | \$ .20 each       |
| 2 x 1 1/4   | 6.00 each     | 3.60 each           | .80 each            | 1.40 each               | .20 each          |
| 2 x 1 1/8   | 6.00 each     | 3.60 each           | .80 each            | 1.40 each               | .20 each          |

Assembly #6655 is used to join KIMAX drainline to unthreaded sink tailpieces. Assembly consists of:

Segmented stainless steel outer band #6651  
Buna N rubber adapter #6657  
Teflon adapter #6656  
Stainless steel bolt #6653

Size 2" ..... \$1.40 each  
All Listed Sizes ..... .80 each  
All Listed Sizes ..... 3.60 each  
All Listed Sizes ..... .20 each

## ADJUSTABLE JOINT (hardware only)



6660

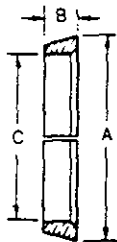
Adjustable joint permits space adjustment from 1 1/4" to 5" depending on size. Assembly #6660 consists of:

- aluminum inner flange #7206.
- aluminum outer flange #7150.
- Teflon seal ring (hat gasket) #7227.
- adapter insert (molded neoprene asbestos) #7203.
- rubber compression ring #7226.
- 3 aluminum (hex head 5/16" - 18 x 1 1/4") bolts #7180 for 1 1/2", 2" and 3" sizes or 6 (hex head 5/16" - 18 x 1 1/2") aluminum bolts #7180 for 4" size.

### Suggested Resale Prices

| Size   | D      | Adjustment | Case Quantity | Complete 6660 | Inner Flange 7206 | Outer Flange 7150 | Teflon Seal Ring 7227 | Adapter Insert 7203 | Comp. Ring 7226 | Alum. Bolts 7180 |
|--------|--------|------------|---------------|---------------|-------------------|-------------------|-----------------------|---------------------|-----------------|------------------|
| 1 1/2" | 4 1/2" | 1 1/2"     | 1 pc.         | \$ 7.00       | \$1.00            | \$ .70            | \$ 3.00               | \$1.00              | \$ .40          | \$ .85           |
| 2      | 5 1/4" | 2 1/2"     | 1             | 9.50          | 1.00              | 1.30              | 4.50                  | 1.20                | .80             | .95              |
| 3      | 6 3/4" | 3 1/2"     | 1             | 13.00         | 2.20              | 1.75              | 6.75                  | 1.90                | 1.00            | .95              |
| 4      | 8 3/4" | 5"         | 1             | 21.00         | 2.75              | 2.00              | 10.15                 | 2.00                | 2.00            | .95              |

## ADAPTER INSERT (Molded)



K-7203

Neoprene molded insert is used when joining KIMAX drainline to other piping materials. These inserts will work with either Style I & Style II flanges for glass pipe. The 2 1/2", 3 1/2" and 5" sizes are used only with adjustable joints.

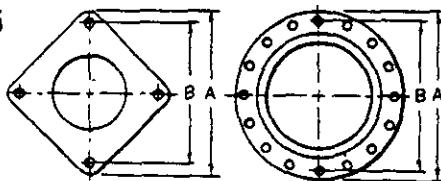
| Size   | A       | B     | C    | Suggested Resale Price |
|--------|---------|-------|------|------------------------|
| 1 1/2" | 2 1/16  | 3/16  | 1.91 | \$1.00 each            |
| 2      | 2 13/16 | 3/16  | 2.43 | 1.20 each              |
| 2 1/2  | 3 3/4   | 3/4   | 3.00 | 1.40 each              |
| 3      | 4 3/16  | 3/4   | 3.53 | 1.90 each              |
| 3 1/2  | 5       | 3/4   | 4.28 | 2.10 each              |
| *4     | 6       | 11/16 | 4.62 | 2.60 each              |
| 5      | 6 3/4   | 3/4   | 5.63 | 3.70 each              |
| *6     | 8 3/4   | 3/4   | 6.85 | 5.50 each              |

\*Use #6670 metal flange only.

## METAL FLANGES

6670

7155



Style II cast iron  
(1-1/2", 2", 3")

Metal flange cast iron  
(4" and 6")

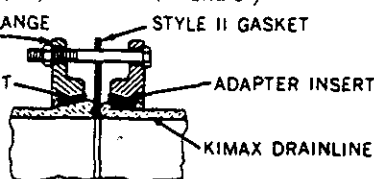
STYLE II FLANGE

STYLE II GASKET

STD. INSERT

ADAPTER INSERT

KIMAX DRAINLINE



Cast-iron flanges are used to join KIMAX drainline to KIMAX process pipe or to glass-lined metal pipe. They are commonly used to join KIMAX process pipe to itself.

Flange #7155 is used on 1 1/2", 2" and 3" drainline ends and adapter flange #6670 on 4" and 6" sizes. Adapter insert #7203 must be used between flange and drainline.

Flange #7155 is used with standard insert #7200 or #7202 for all sizes of process pipe. The 4" and 6" sizes are similar in shape to Flange #6670 but have inner snap-rings with cemented inserts.

All sizes of both flanges have A.S.M.E. bolt circles.

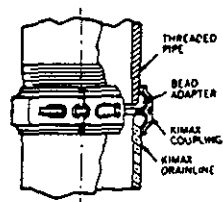
For bolt sizes and number required, see table below.

| Catalog Number | Size   | A       | B Bolt Circle | No. Bolts | Bolt Size           | Suggested Resale Price |
|----------------|--------|---------|---------------|-----------|---------------------|------------------------|
| 7155           | 1 1/2" | 4 1/2"  | 3 3/4"        | 4         | 5/16" - 18 x 2 1/4" | \$1.05 each            |
| 7155           | 2      | 5 1/4"  | 4 3/4"        | 4         | 5/16" - 18 x 2 1/4" | 1.55 each              |
| 7155           | 3      | 6 3/4"  | 6             | 4         | 5/16" - 18 x 3      | 1.85 each              |
| 6670           | 4      | 8 3/4"  | 7 1/2"        | 8         | 5/16" - 18 x 2 1/4" | 5.00 each              |
| 6670           | 6      | 10 3/4" | 9 1/2"        | 8         | 3/4" - 16 x 2 1/4"  | 7.00 each              |

# KIMAX DRAINLINE PIPE AND FITTINGS

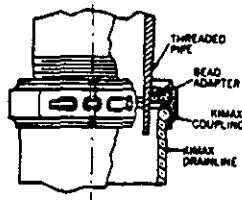
## BEAD ADAPTERS (threaded)

6680



standard

6685



adjustable

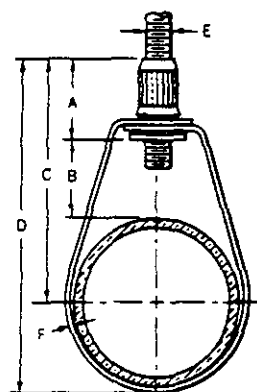
Threaded bead adapters are used to provide beaded mating surface on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling #6650. All-Teflon construction.

Adapter #6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4" and 6" sizes.

Adapter #6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments.

| 6680 | Size     | Suggested Resale Price |
|------|----------|------------------------|
|      | 1½"      | \$ 2.85 each           |
|      | 2        | 4.20 each              |
|      | 3        | 5.60 each              |
|      | 4        | 8.80 each              |
|      | 6        | 14.50 each             |
| 6685 | Size     | Suggested Resale Price |
|      | 2" x 1½" | \$ 4.20 each           |

## "AUTO-GRIP"® HANGER



7290

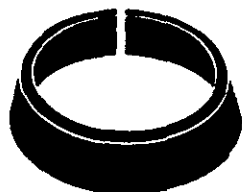
Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating. See page 8 for operating instructions.

| Size | A  | B  | C  | D   | E | F        | Suggested Resale Price |
|------|----|----|----|-----|---|----------|------------------------|
| 1½"  | 1⅞ | 1½ | 3¼ | 4⅞  | ¾ | 1/16 x ¾ | \$ .45                 |
| 2    | 1⅞ | 1½ | 3½ | 4⅞  | ¾ | 1/16 x ¾ | .48                    |
| 3    | 1⅞ | 1½ | 4¼ | 6¾  | ¾ | 3/32 x ¾ | .78                    |
| 4    | 1½ | 1½ | 5⅞ | 7⅞  | ¾ | 1/8 x 1  | 1.60                   |
| 6    | 1½ | 2¾ | 7⅞ | 10¾ | ¾ | 1/8 x 1  | 2.35                   |

® TM of Automatic Sprinkler Corporation of America.

## INSERTS

7200



7202



For use with glass process pipe and fittings to cushion glass from metal flange.

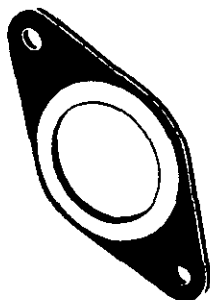
Insert #7200 is molded neoprene asbestos. The 1½", 2", and 3" sizes are used with standard tempered pipe and fittings; 1½", 2", 2½", 3½", and 5" are used with adjustable joint.

Insert #7202 is a neoprene asbestos strip insert used for 1½" through 6" annealed fittings and for use as replacement parts for 4" and 6" tempered pipe and fittings.

| 7200 Size | Suggested Resale Price | 7202 Size | Suggested Resale Price |
|-----------|------------------------|-----------|------------------------|
| 1½"       | \$ .45                 | 1½"       | \$ .45                 |
| 2         | .50                    | 2         | .50                    |
| 2½        | .75                    | 3         | .75                    |
| 3         | .75                    | 4         | .75                    |
| 3½        | .90                    | 6         | 1.45                   |
| 5         | 1.10                   |           |                        |

## INTERFACE GASKET

7276



Used when joining KIMAX tempered glass drainline to KIMAX process pipe and KIMAX process pipe to itself.

Teflon machined envelope is a one-piece liner. Inner diameter is same as glass to prevent constriction of flow at the joint. Standard filler is Blue African asbestos.

Maximum working temperature of gasket is 450° F. Gasket thickness is 1/16" in 1½", 2" and 3" sizes; 1/8" in 4" and 6" sizes.

| Size | Suggested Resale Price |
|------|------------------------|
| 1½"  | \$ .65                 |
| 2    | .75                    |
| 3    | 1.50                   |
| 4    | 2.50                   |
| 6    | 3.75                   |

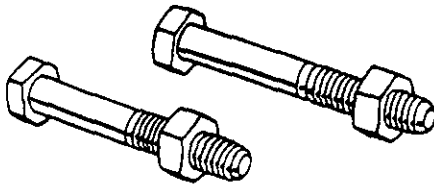
# KIMAX DRAINLINE PIPE AND FITTINGS

## BOLTS & NUTS

7190

Steel bolts and nuts 7190 are required to fasten metal flanges when joining KIMAX drainline to process pipe or to glass-lined metal pipe.

Four bolts needed for 1½", 2", and 3" sizes; eight bolts needed for 4" and 6" sizes.

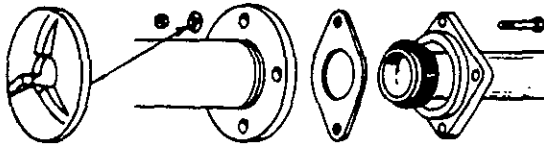


| Size        | Suggested Resale Price |
|-------------|------------------------|
| ¾"-18 x 1¼" | \$ .03                 |
| ¾"-18 x 2   | .03                    |
| ¾"-18 x 2¼  | .03                    |
| ¾"-18 x 2½  | .03                    |
| ¾"-18 x 3   | .03                    |
| ¾"-16 x 2½  | .03                    |

## ADAPTER BUTTON

7230

Used to center smaller diameter Style II steel bolts in larger holes of A.S.M.E. flange when adapting KIMAX glass drainline to glass-lined metal pipe. One size of button is used for all sizes of flanges.



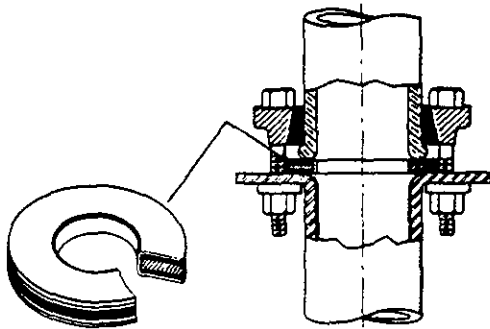
| I.D.  | O.D. | Height | Suggested Resale Price |
|-------|------|--------|------------------------|
| .390" | 1¼"  | ¼"     | \$ .05                 |

## DONUT SPACER

7240

Teflon-covered donut spacer must be interposed between KIMAX drainline and glass-lined metal pipe.

Spacer consists of steel ring cushioned with soft asbestos and covered with a machined Teflon envelope.



| Size | Thickness | Suggested Resale Price |
|------|-----------|------------------------|
| 1½"  | ¼"        | \$ 6.00                |
| 2    | ¼"        | 9.80                   |
| 3    | ¾"        | 13.40                  |
| 4    | ¾"        | 15.50                  |
| 6    | ¾"        | 24.00                  |

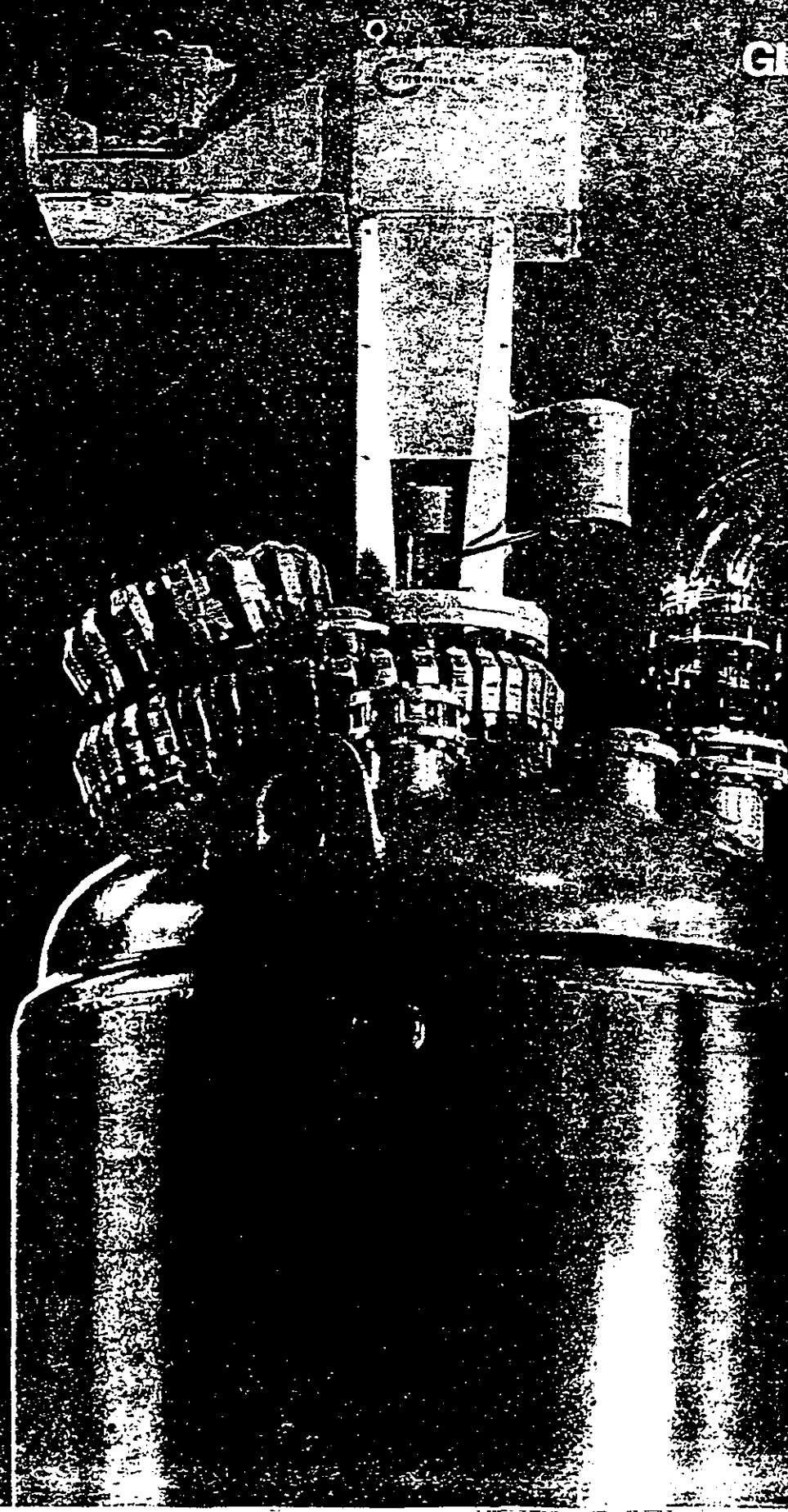


**SCHWELM** 

**Owens-Illinois**

**STANDARD  
GLASS-LINED  
REACTORS**

**The Alternative  
Glass-Lined  
Reactor**





9 standard sizes  
from 300 to 5,000  
gallons. Other sizes  
available.

Chemineer drive, type  
HTN, with dry well  
output - tight seal to  
prevent oil leakage

Seal cartridge can be  
removed and seal  
changed without dis-  
turbing the drive or  
entering the vessel.  
Can be bench tested  
before installation.

Backed up by  
Schweim's 70 years  
of experience in glass-  
lined steel vessels

Top and bottom  
lifting lugs

Type CRT gaskets  
used throughout

Exclusive Schweim  
583-A green glass,  
high acid/alkali resis-  
tant tested at  
20,000 volts



Manufactured to  
ASME standards

One piece all-  
welded construction



Two 150 lb. rated  
sight glass units

Entire unit fully  
interchangeable  
with existing  
equipment now  
available in regard  
to nozzle orientation

Complete with 3-blade  
retreat impeller and  
adjustable finger  
baffle

Restricted tantalum  
thermowell tips avail-  
able for baffles or  
bottom outlet valve

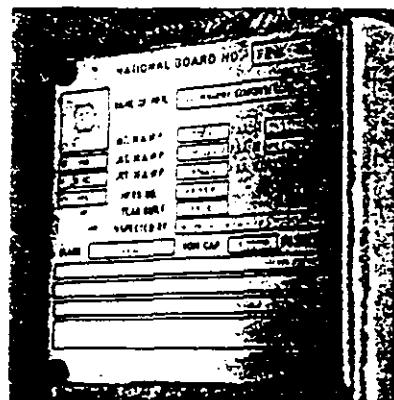
Offset bottom outlet  
for easy cleaning

Adjustable leg support  
(side lug support or  
side skirt support  
available)

# The best of two countries, joined to bring you the alternative glass-lined reactor.

The proven Schwelm reactor. Designed and manufactured to the most exacting West German standards. Tested and retested to make sure it surpasses all applicable American standards. And proven in use all over the world.

Now Schwelm reactors are brought to the American market by Owens-Illinois to give the chemical and pharmaceutical industries an alternative source for glass-lined reactors. It's an alternative source with all the resources of Owens-Illinois behind it, combining the technical service and marketing facilities of O-I with the reactor expertise and experience of Schwelm.



The result is what we believe to be a better glass-lined reactor. The engineers and technicians of Schwelm and O-I worked for over three years to prepare for the American market, and it draws heavily on every one of

Schwelm's 70 years of experience in manufacturing glass-lined steel vessels.

Each vessel is built to ASME and ANSI specifications and can be code

stamped. And each brings you the superior design features and performance characteristics described in detail in the following pages.

## Why a glass-lined reactor?

For many years glass has been used for chemical processes because of its high degree of chemical resistivity. Glass is an ideal choice when you need a high degree of acid or alkali resistivity, absolute product purity, ease of cleaning, minimum product adherence, or when you want to change processes frequently over a varying range of corrosive conditions.

However, the use of glass is restricted in terms of the size of the vessels, and in terms of pressure and thermal shock.

So glass-lined steel was born. Vessels of all-welded tough carbon steel to which has been fused a smooth, corrosion-resistant, chemically inert glassed interior. The glass provides resistance to chemical attack by acids or alkalis, but unlike glass alone it has sufficient flexibility to follow every movement of the steel, to expand or contract as the steel does. This is because of the high compressive stress of the glass lining at room temperature, and today glass-lined steel equipment is used wherever aggressive media are used or stored, where purity is essential, and for polymerization processes in chemical, pharmaceutical, and food and

beverage industries.

During a temperature rise, compressive stress will decrease and precautions must be taken to avoid creating tension stress. Tension stress in the glass lining can be caused by filling a hot empty vessel with a cold liquid, or by firing a cold vessel by introducing a heating medium into the jacket. Table I below shows the allowable  $\Delta T$  to prevent excess tension stress.

In the past, the greatest value of a glass-lined vessel was its acid resistivity but today just as much or more value is placed on its equally important resistivity to alkali attack. Extensive work in the Schwelm laboratory for glass-lining research led to improving the alkali resistivity of our glass lining with the use of exclusive additives, and today our lining shows far better test results than in the past. In addition, resistivity to thermal shocks, and anti-stick characteristics have been improved.

The very low corrosion rate per time unit in the case of chemical attack guarantees a long service life for Schwelm glass-lined equipment, and those corrosion rates are more specifically detailed in Table II below.

TABLE I Allowable  $\Delta T$  for standard reactors with Schwelm 583-A glass lining

| Filling a hot empty vessel with a cold liquid |     |                      |     | Firing a cold vessel by introducing heating medium into jacket |     |                              |     |
|-----------------------------------------------|-----|----------------------|-----|----------------------------------------------------------------|-----|------------------------------|-----|
| Glass lining temperature                      |     | Min. temp. of liquid |     | Glass lining temperature                                       |     | Max. temp. of heating medium |     |
| °C                                            | °F  | °C                   | °F  | °C                                                             | °F  | °C                           | °F  |
| 80                                            | 176 | -40                  | -40 | 0                                                              | 32  | 150                          | 302 |
| 100                                           | 212 | -40                  | -40 | 20                                                             | 68  | 165                          | 329 |
| 120                                           | 248 | -20                  | -4  | 40                                                             | 104 | 180                          | 356 |
| 140                                           | 284 | 0                    | 32  | 60                                                             | 140 | 195                          | 383 |
| 160                                           | 320 | +20                  | 68  | 80                                                             | 176 | 210                          | 410 |
| 180                                           | 356 | 40                   | 104 | 100                                                            | 212 | 220                          | 428 |
| 200                                           | 392 | 80                   | 176 | 120                                                            | 248 | 235                          | 455 |
| 220                                           | 428 | 100                  | 212 | 140                                                            | 284 | 250                          | 482 |
| 240                                           | 464 | 140                  | 284 | 160                                                            | 320 | 265                          | 509 |
|                                               |     |                      |     | 180                                                            | 356 | 275                          | 527 |
|                                               |     |                      |     | 200                                                            | 392 | 280                          | 536 |

TABLE II Alkalis & Acid Resistance (g/sq. m. per day)

| TESTING AGENT             | 40°C 50°C 60°C 70°C 80°C 90°C 100°C |             |              |             |              |             |              | 5% 10% 40% Concentrated |             |              |             |              |             |              |
|---------------------------|-------------------------------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------------------|-------------|--------------|-------------|--------------|-------------|--------------|
|                           | LIQUID PHASE                        | VAPOR PHASE | LIQUID PHASE | VAPOR PHASE | LIQUID PHASE | VAPOR PHASE | LIQUID PHASE | LIQUID PHASE            | VAPOR PHASE | LIQUID PHASE | VAPOR PHASE | LIQUID PHASE | VAPOR PHASE | LIQUID PHASE |
| Phosphoric Acid $H_3PO_4$ | 0.09                                | 0.09        | 0.12         | 0.15        | 0.19         | 0.12        | 0.34         | 0.77                    | -           | -            | -           | -            | -           | -            |
| Acetic Acid $CH_3COOH$    | 0.23                                | 0.33        | 0.08         | 0.10        | 0.17         | 0.23        | 0.22         | 0.25                    | -           | -            | -           | -            | -           | -            |
| Nitric Acid $HNO_3$       | 0.14                                | 0.14        | 0.10         | 0.12        | 0.05         | 0.25        | 0.00         | 0.30                    | -           | -            | -           | -            | -           | -            |
| Sulphuric Acid $H_2SO_4$  | 0.21                                | 0.18        | 0.18         | 0.18        | 0.32         | 0.34        | -            | -                       | -           | -            | -           | -            | -           | -            |
| Hydrochloric Acid $HCl$   | -                                   | -           | -            | -           | -            | -           | -            | -                       | -           | -            | -           | 0.14         | 0.27        | -            |

# Six specific reasons why the Schwelm glass-lined reactor is the better glass-lined reactor.

A better product doesn't just happen—it's the result of specific improvements that step-by-step build better results for you. Specific improvements like these:

## 1 The exclusive Schwelm 583-A green glass lining.

The Schwelm 583-A green glass lining that is standard in Schwelm reactors is the result of years of research and experience, and there is no other glass lining exactly like it in the world today. It offers you three key benefits: (1) excellent corrosion resistance that can handle acids and alkalis under severe thermal conditions; (2) unique anti-sticking properties that make it well-suited for polymerization; and (3) better thermal shock qualities, verified by laboratory tests.

Other glass linings can give you one or two of these key benefits, but only a Schwelm 583-A glass lining can give you all three benefits in one lining.

## 2 Our new computer controlled firing furnace.

One of the reasons Schwelm quality control is unusually effective is our new million-dollar computer controlled furnace. Every glass ground and finish coat means another trip into the furnace to fuse the glass lining to the steel. Our new furnace controls the heat more accurately because it's computer controlled, gives cleaner heat because it's electric, and gives you a better lining because the cleaner heat means fewer pinhole impurities to cause imperfections.

## 3 An outside coat of glass, too?

Yes, believe it or not. It doesn't show, it doesn't give you a glass-lined exterior, it just gives you a

better product. By putting an outside coat of glass on the vessel before it's put into the furnace for its first firing, we significantly reduce the scaling of the steel and the number of particles of fly-ash that normally flake off during the firing process. Why is that important to you? Because it's those particles of fly-ash that are a major cause of pinhole imperfections in the interior glass lining. Fewer particles, fewer imperfections. More Schwelm.

## 4 Why our round holes stay round:

Before the steel vessel goes into the furnace for firing, a heavy rein-

forcing ring is welded onto the main port where the drive will be fitted. This makes sure our round holes stay round and don't sag during the red-hot firing process. More importantly to you, this results in less warpage and means that the gasket will usually fit without shimmying or with a minimum of shimmying.

## 5 Nobody's perfect, but we're a little closer.

As you can imagine, the fusing of a glass lining to an all-steel vessel is a complicated and delicate operation. The Schwelm glass lining process has been developed and



Glass is sprayed on the outside of the vessel, too, before its first firing.

corrected through years of experience to yield glass linings to exacting specifications and characteristics in the application of glass linings to steel pinhole imperfections



Plugged lining to correct imperfections.

occasionally develop and are corrected with plugs. Schweim quality control is unusually demanding and incorporates several unusual steps in the manufacturing process. The result is that a high percentage of our vessels are plug-free. We meet and usually exceed all specifications in this area.

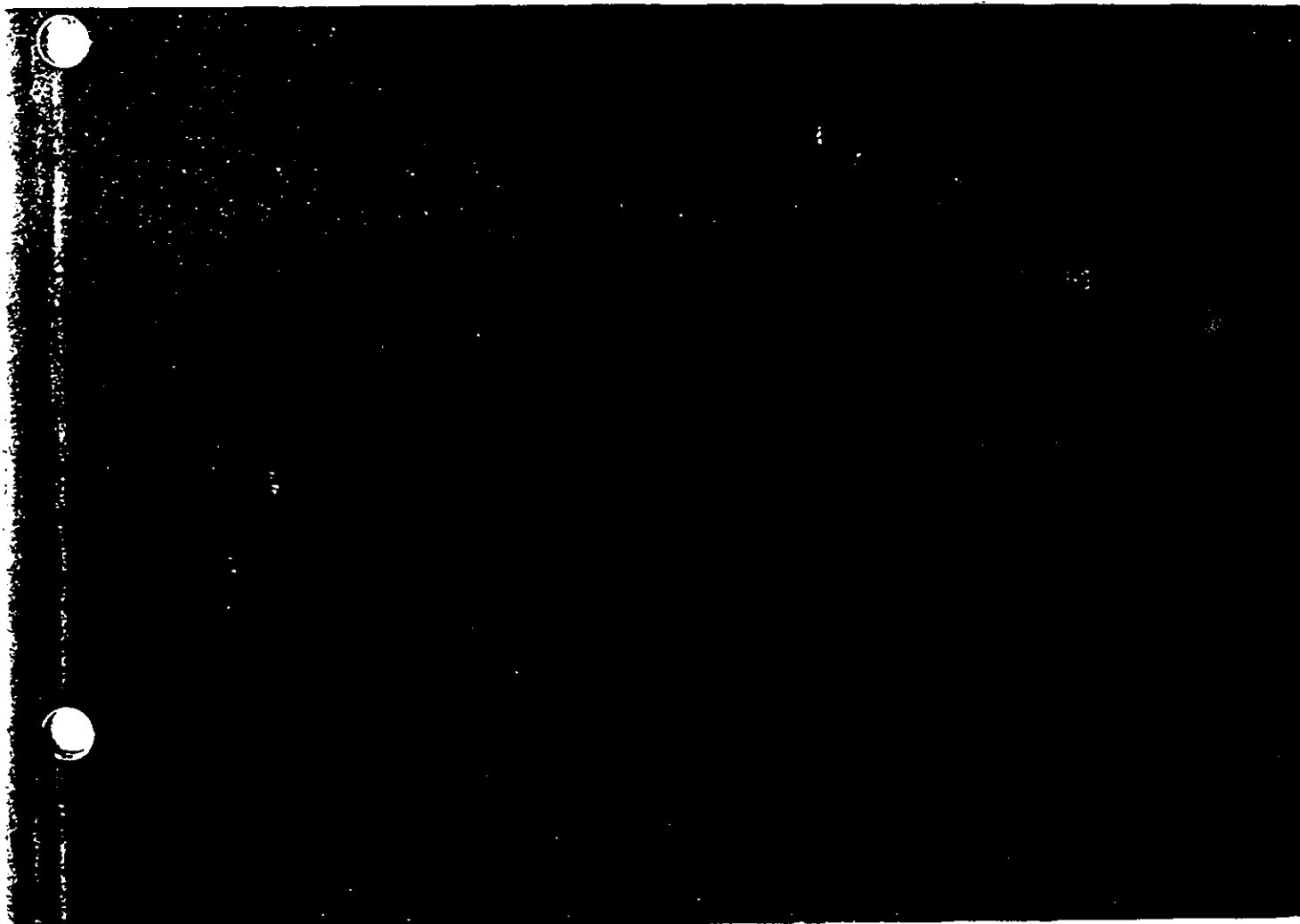
As we said, nobody's perfect but we're a little closer.

## 6 When bigger means better:

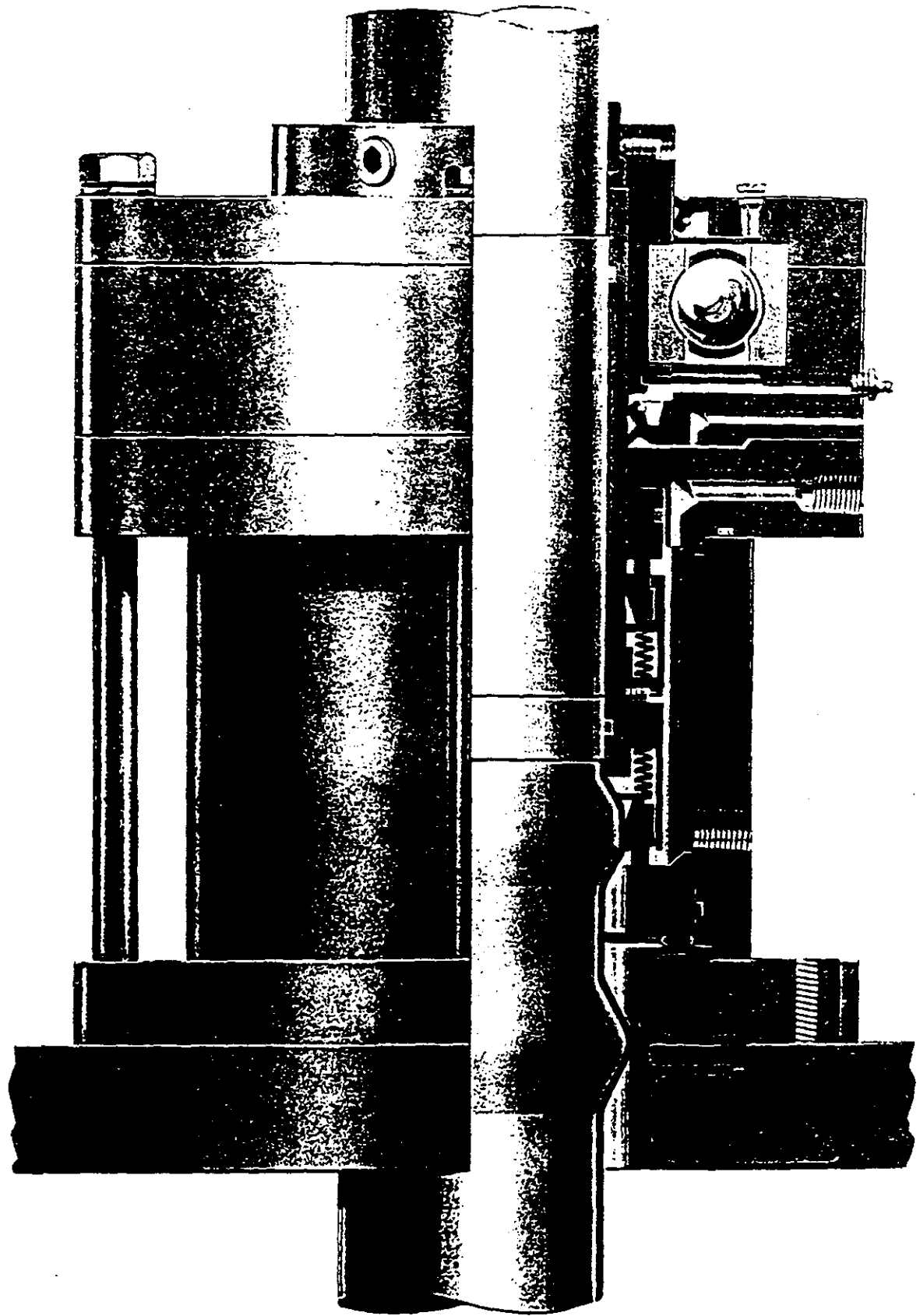
Bigger doesn't always mean better, but here are three specific cases when it does: (a) Bigger pipe leg couplings. We use four-inch pipe

leg couplings instead of three-inch. That means they're 33 1/3% bigger. Sturdier, safer, more durable. (b) Bigger clamps. Every one of the clamps we use for man-ways and assembly covers is bigger. They hold better, are easier to handle. (c) Bigger test limits. As a regular standard, we hydro-test all units in our plant at limits 35% greater than those called for by ASME Section 8 code.

In each of these cases, bigger means better, it takes us longer and costs us more, but it gives you a better product. More strength, more dependability, more Schweim. Another of those specific reasons the alternative glass-lined reactor may be the better glass-lined reactor.



**And reason #7: the dependable  
Chemineer HTN drive.**



A better reactor should have a better drive unit, so we're using the one we think is the best available: the Chemineer HTN drive.

#### **Closed tank agitators.**

Chemineer HTN mechanical seal agitators provide reliable sealing for high pressures. All units are supplied with a removable cartridge double mechanical seal assembly (shown on facing page) for seal change simplicity. This seal cartridge can be bench tested prior to installation. No additional headroom over the drive is required for seal change, and no special tools or hoists are usually needed. The seal cartridge can be replaced without disturbing the drive or entering the vessel. The seal housing is supplied with a cooling jacket.

#### **Low profile angle drive.**

The low profile right angle configuration is ideal for low headroom applications, and allows complete access to change gears without disturbing the motor or drive bearings. Single drive configuration for all requirements eliminates design problems, extra service parts and delivery delays because no modifications are required.

#### **Change gears.**

Easy access change gears are spline or taper hub mounted for rapid change in field. No special tools or hoists are needed. Motor is not disturbed, and no internal drive parts need be changed. Access to change gears requires only the removal of the change gear plate.

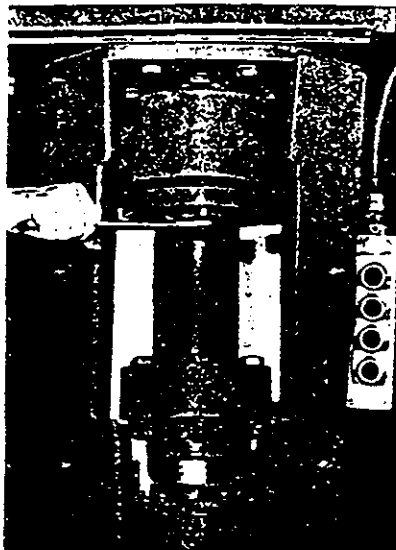
#### **Dry well output shaft seal.**

All sizes are provided with a dry well output shaft seal to preclude the possibility of oil leakage.

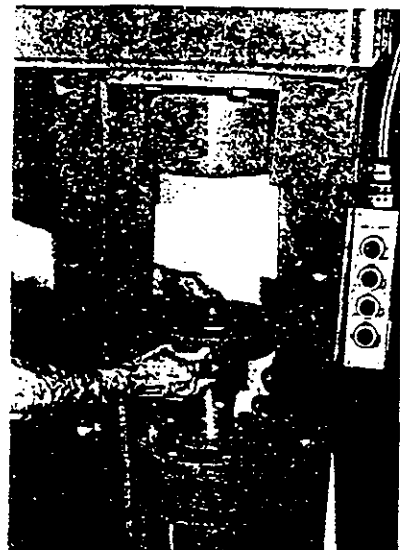
#### **TIMKEN bearings throughout.**

All drive bearings in all sizes are TIMKEN tapered roller bearings, another industry first for Chemineer. The large load carrying capacity of this design is unmatched, with 30,000-hour B-10 minimum bearing life. TIMKEN's most popular sizes are used and bearings will normally be available from a local distributor.

## **Here's how easy Chemineer seal maintenance is:**



**1.** Cartridge mechanical seals, good to 5,000 psi, are easily removed. No extra headroom required. Agitator shaft drops less than 1/2" into a catcher bracket in the mounting flange when the shaft spacer is unbolted.



**3.** Tapered coupling easily removed from agitator shaft. All disassembly operations done within pedestal opening. All shaft components taper or tenon fit and match marked to restore factory alignment on reassembly.



**2.** Shaft spacer easily removed. No special tools required for this or any maintenance operations. No blocking of the agitator shaft and impeller required.



**4.** Cartridge seal lifted off. Easily accessible components. Cartridge uses standard John Crane seals—available locally. Bench pressure test both statically and in rotation before assembly.

# RTG-300

## 300 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                  |              |
|------------------|--------------|
| Shell            | SA-285 Gr B  |
| Jacket           | SA-285 Gr B  |
| Heads            | SA-285 Gr B  |
| Clamps           | SA-193 B7    |
| Pac Type Nozzles | SA-350 Gr LF |
| Nozzles          | SA-350 Gr LF |
| Split Loose      |              |
| Flanges          | SA-350 Gr LF |

### SPECIFICATIONS

| Design                  | Jacket                                          | Shell  |
|-------------------------|-------------------------------------------------|--------|
| Working Pressure        | 100w/PSI                                        | 100PSI |
| Test Pressure           | 150                                             | 150    |
| Design Temperature (°F) | 400                                             | 400    |
| Capacity (gals)         | 73                                              | 383    |
| Joint Efficiency        | 0.85                                            | 0.85   |
| Welds                   | Partially radiographed and dye penetrant tested |        |

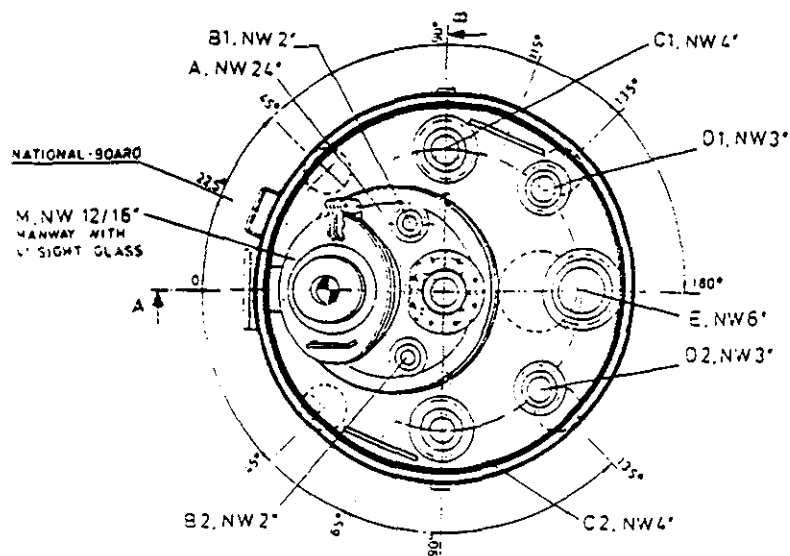
Execution of welds acc. to  
Work Standard WN 211 02 0001

### STEEL THICKNESS (inches)

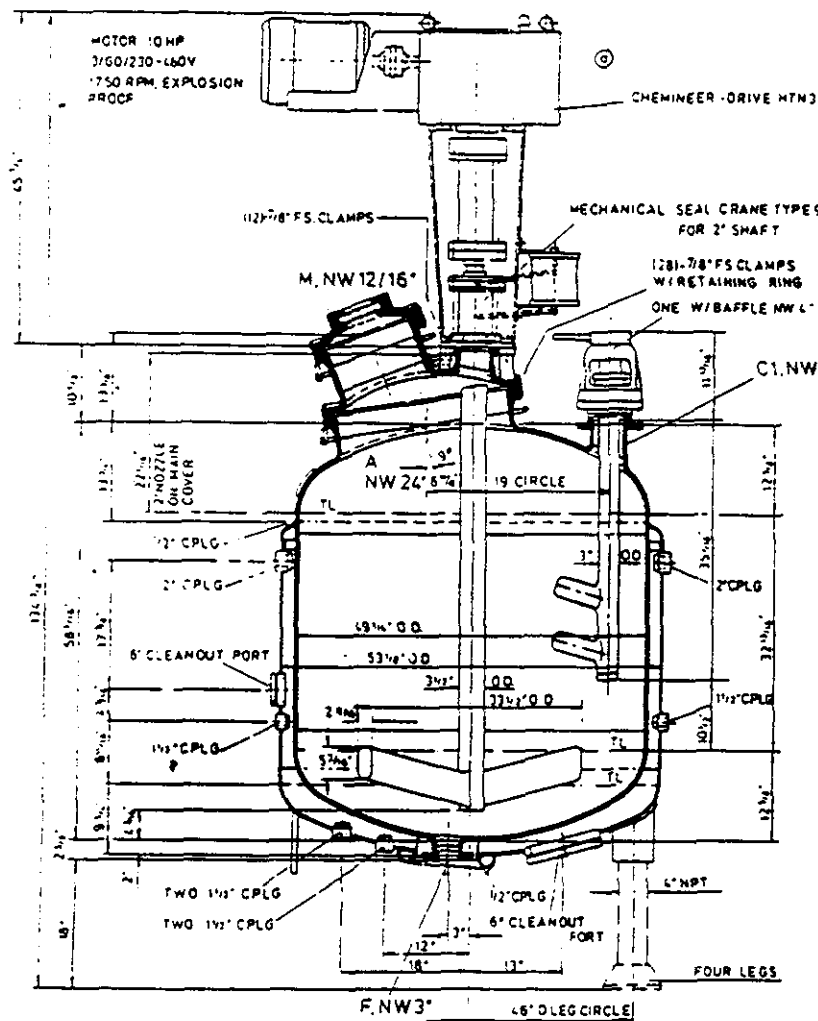
|              |        |
|--------------|--------|
| Top Head     | 5/8"   |
| Bottom Head  | 5/8"   |
| Inner Shell  | 5/8"   |
| Jacket Head  | 15/32" |
| Jacket Shell | 25/64" |

### WEIGHT (pounds)

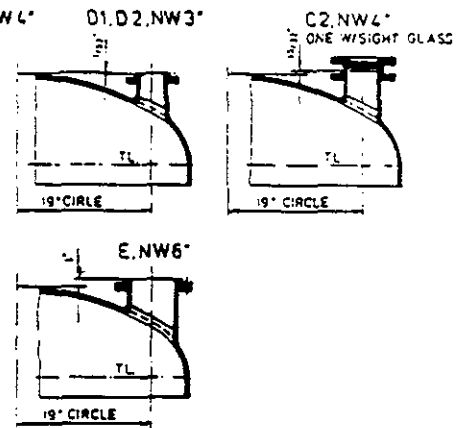
|                               |       |
|-------------------------------|-------|
| Base body: no accessories     | 3,900 |
| Complete with drive system    | 5,000 |
| Jacket & shell filled w/water | 8,800 |



PLAN VIEW - TRUE ORIENTATION



SECTION A-B



### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1 current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5 series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A; highly acid/alkali thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-500

## 500 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |               |
|------------------------|---------------|
| Shell                  | SA-285 Gr. B  |
| Jacket                 | SA-285 Gr. B  |
| Heads                  | SA-285 Gr. B  |
| Clamps                 | SA-193 B7     |
| Pad Type Nozzles       | SA-350 Gr. LF |
| Nozzles                | SA-350 Gr. LF |
| Split Loose<br>Flanges | SA-350 Gr. LF |

### SPECIFICATIONS

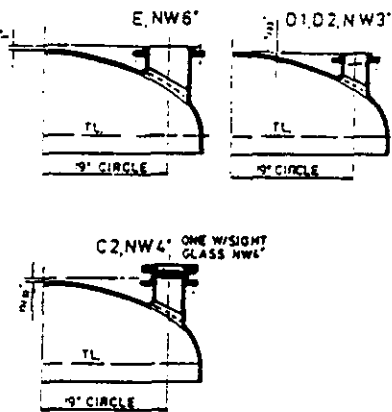
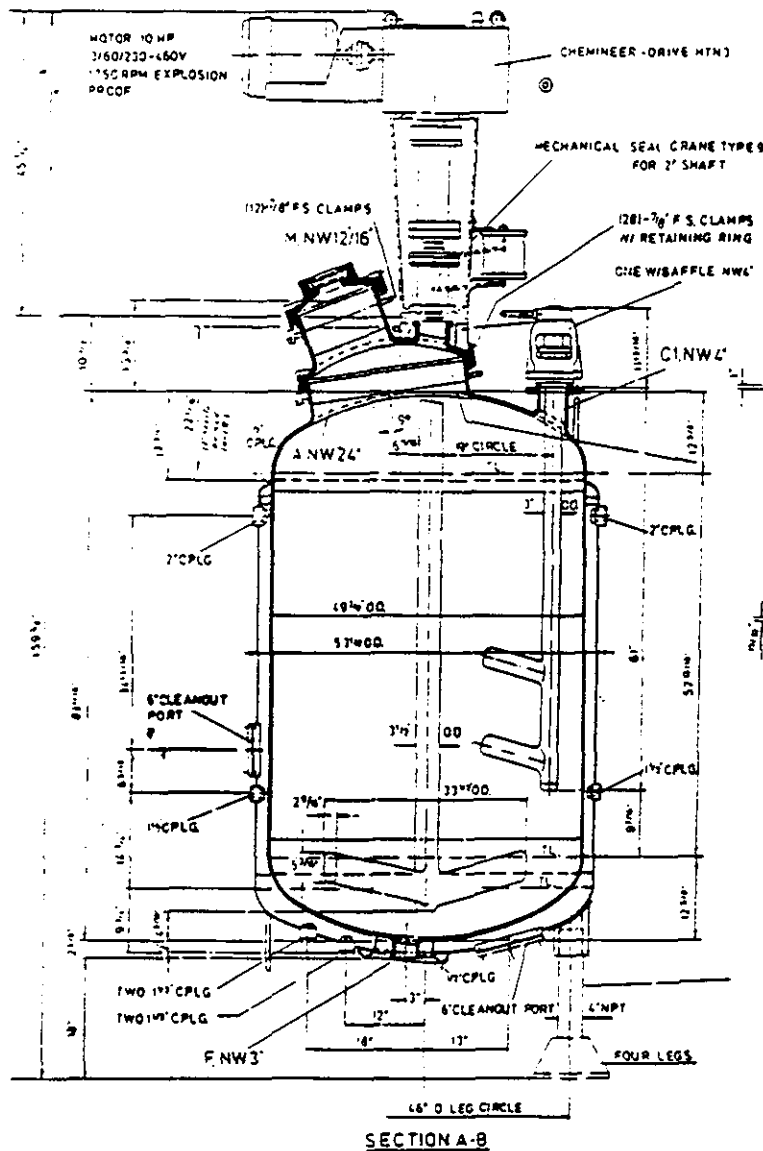
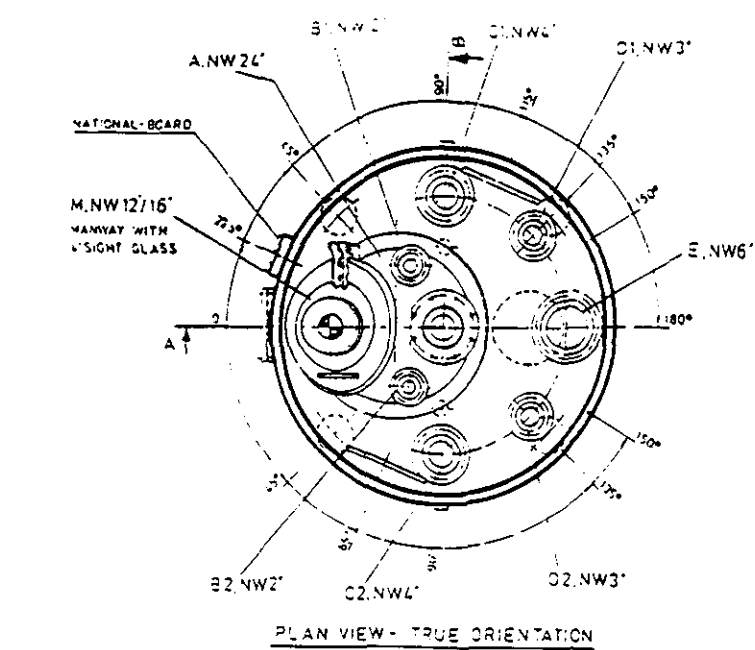
|                                             |                                                    |          |
|---------------------------------------------|----------------------------------------------------|----------|
| Design                                      | Jacket                                             | Shell    |
| Working Pressure<br>(psi)                   | 90 w/FV                                            | 100 & FV |
| Test Pressure<br>(psi)                      | 135                                                | 150      |
| Design Temperature<br>(°F)                  | 400                                                | 400      |
| Capacity (gals)                             | 100                                                | 580      |
| Joint Efficiency                            | 0.85                                               | 0.85     |
| Welds                                       | Partially radiographed<br>and dye penetrant tested |          |
| Execution of welds acc. to<br>Work Standard | WN 211.02.0001                                     |          |

### STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 5/8"   |
| Bottom Head  | 5/8"   |
| Inner Shell  | 5/8"   |
| Jacket Head  | 15/32" |
| Jacket Shell | 25/64" |

### WEIGHT (pounds)

|                               |          |
|-------------------------------|----------|
| Base body, no accessories     | = 5,000  |
| Complete with drive system    | = 6,100  |
| Jacket & shell filled w/water | = 11,800 |



### GENERAL NOTES

1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schweiß glass 583-A: highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing



750 Gallon Jacketed  
Glass-Lined Reactor

|                  |                |
|------------------|----------------|
| Shell            | SA-285 Gr. B   |
| Jacket           | SA-285 Gr. B   |
| Heads            | SA-285 Gr. B   |
| Clamps           | SA-193 B7      |
| Pad Twoe Nozzles | SA-350 Gr. LF1 |
| Nozzles          | SA-350 Gr. LF1 |
| Solit Loose      |                |
| Flanges          | SA-350 Gr. LF1 |

| Design                  | Jacket                                          | Shell  |
|-------------------------|-------------------------------------------------|--------|
| Working Pressure (psi)  | 90 w/FV                                         | 100&FV |
| Test Pressure (psi)     | 135                                             | 150    |
| Design Temperature (°F) | 400                                             | 400    |
| Capacity (gals)         | = 121                                           | = 925  |
| Joint Efficiency        | 0.85                                            | 0.85   |
| Welds                   | Partially radiographed and dye penetrant tested |        |

STEEL THICKNESS (inches)

|                   |        |
|-------------------|--------|
| Top Head.....     | 25/32" |
| Bottom Head.....  | 25/32" |
| Inner Shell.....  | 23/32" |
| Jacket Head.....  | 15/32" |
| Jacket Shell..... | 7/16"  |

|                                         |          |
|-----------------------------------------|----------|
| Base body, no accessories . . . . .     | = 7,100  |
| Complete with drive system . . . . .    | = 8,300  |
| Jacket & shell filled w/water . . . . . | = 17,000 |



1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schwelm glass 583-A: highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing

## C

SECTION 4-9

# RTG-1500

## 1500 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |               |
|------------------------|---------------|
| Shell                  | SA-285 Gr. B  |
| Jacket                 | SA-285 Gr. B  |
| Heads                  | SA-285 Gr. B  |
| Clamps                 | SA-193 B7     |
| Pad Type Nozzles       | SA-350 Gr. LF |
| Nozzles                | SA-350 Gr. LF |
| Split Loose<br>Flanges | SA-350 Gr. LF |

### SPECIFICATIONS

| Design                  | Jacket                                          | Shell    |
|-------------------------|-------------------------------------------------|----------|
| Working Pressure (psii) | 90 w/FV                                         | 100 & FV |
| Test Pressure (psii)    | 135                                             | 150      |
| Design Temperature (°F) | 400                                             | 400      |
| Capacity (gals)         | ≈ 206                                           | ≈ 1810   |
| Joint Efficiency        | 0.85                                            | 0.85     |
| Welds                   | Partially radiographed and dye penetrant tested |          |

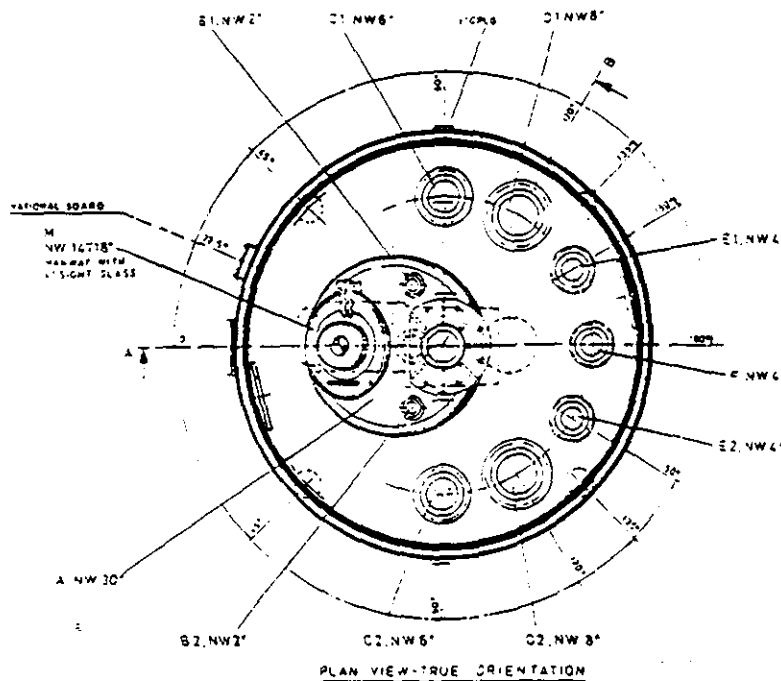
Execution of welds acc. to  
Work Standard WN 211 02 0001

### STEEL THICKNESS (inches)

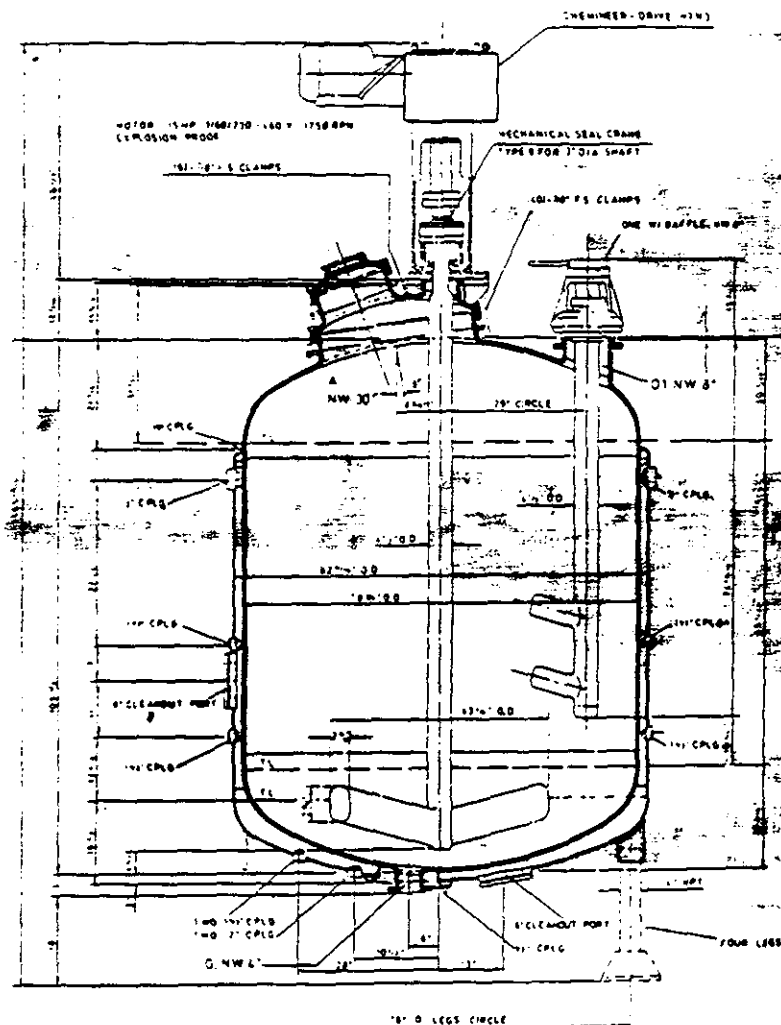
|              |        |
|--------------|--------|
| Top Head     | 15/16" |
| Bottom Head  | 15/16" |
| Inner Shell  | 55/64" |
| Jacket Head  | 19/32" |
| Jacket Shell | 33/64" |

### WEIGHT (pounds)

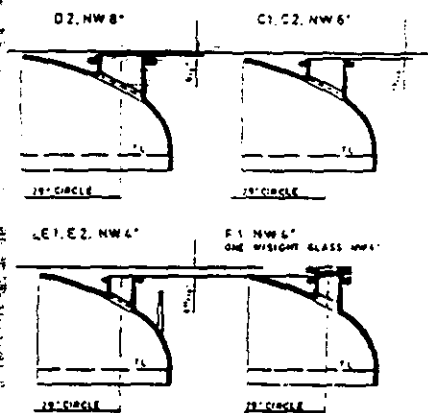
|                               |          |
|-------------------------------|----------|
| Base body, no accessories     | ≈ 12,500 |
| Complete with drive system    | ≈ 14,200 |
| Jacket & shell filled w/water | ≈ 31,000 |



PLAN VIEW-TRUE ORIENTATION



SECTION A-B



### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-2000

## 2000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |               |
|------------------------|---------------|
| Shell                  | SA-285 Gr B   |
| Jacket                 | SA-285 Gr B   |
| Heads                  | SA-285 Gr B   |
| Clamps                 | SA-193 B7     |
| Pad Type Nozzles       | SA-350 Gr LF1 |
| Nozzles                | SA-350 Gr LF1 |
| Split Loose<br>Flanges | SA-350 Gr LF1 |

### SPECIFICATIONS

| Design                  | Jacket                                          | Shell  |
|-------------------------|-------------------------------------------------|--------|
| Working Pressure (psi)  | 90w/FV                                          | 100&FV |
| Test Pressure (psi)     | 135                                             | 150    |
| Design Temperature (°F) | 400                                             | 400    |
| Capacity (gals)         | ±220                                            | ±2170  |
| Joint Efficiency        | 0.85                                            | 0.85   |
| Welds                   | Partially radiographed and dye penetrant tested |        |

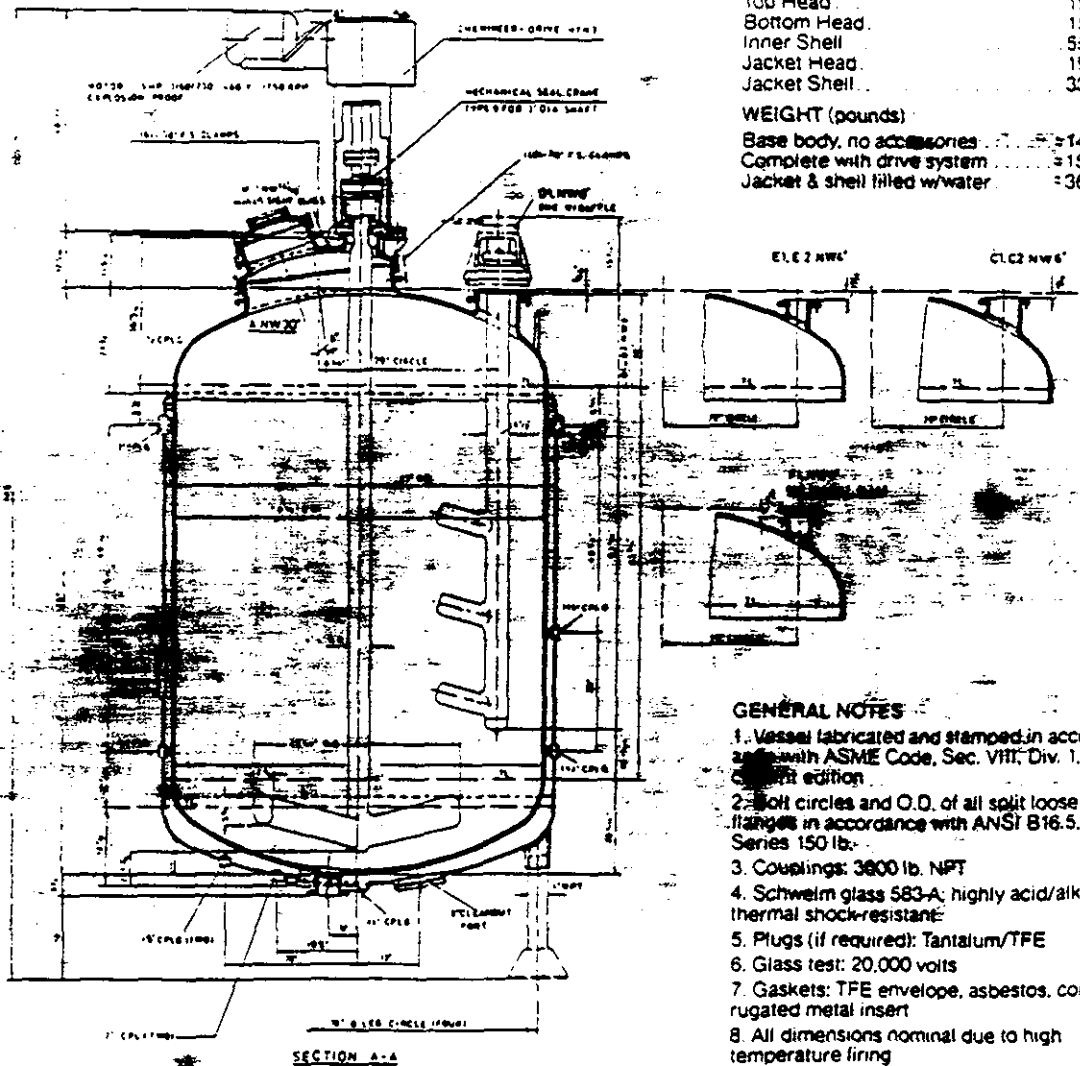
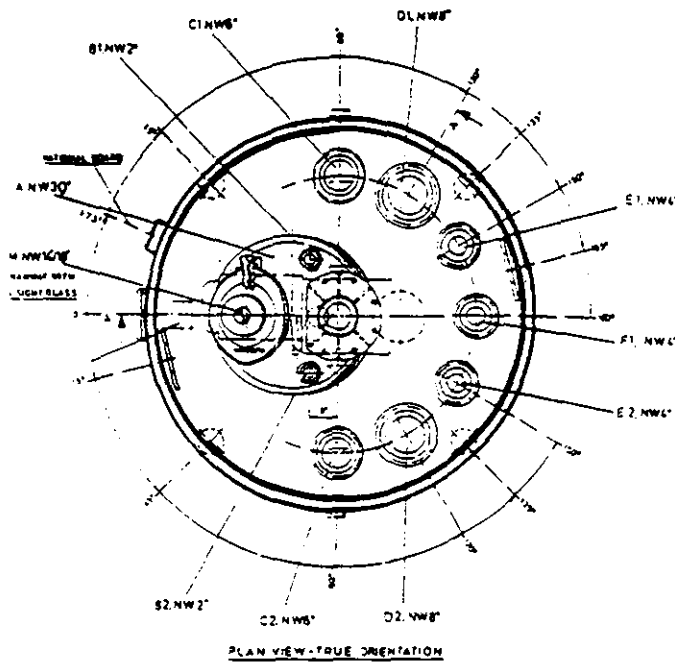
Execution of welds acc. to  
Work Standard WN 211 02.0001

### STEEL THICKNESS (inches)

|              |        |
|--------------|--------|
| Top Head     | 15/16" |
| Bottom Head  | 15/16" |
| Inner Shell  | 55/64" |
| Jacket Head  | 19/32" |
| Jacket Shell | 33/64" |

### WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 14,350 |
| Complete with drive system    | 15,050 |
| Jacket & shell filled w/water | 36,150 |



### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, 1982 edition.
- Split circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3600 lb. NPT
- Schweil glass 583-A; highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

# RTG-3000

## 3000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |                |
|------------------------|----------------|
| Shell                  | SA-285 Gr. B   |
| Jacket                 | SA-285 Gr. B   |
| Heads                  | SA-285 Gr. B   |
| Clamps                 | SA-193 B7      |
| Pad Type Nozzles       | SA-350 Gr. LF1 |
| Nozzle                 | SA-350 Gr. LF1 |
| Split Loose<br>Flanges | SA-350 Gr. LF1 |

### SPECIFICATIONS

| Design                     | Jacket                                             | Shell  |
|----------------------------|----------------------------------------------------|--------|
| Working Pressure<br>(psi)  | 90w/FV                                             | 100&FV |
| Test Pressure<br>(psi)     | 135                                                | 150    |
| Design Temperature<br>(°F) | 400                                                | 400    |
| Capacity (gals)            | 265                                                | 3450   |
| Joint Efficiency           | 0.85                                               | 0.85   |
| Welds                      | Partially radiographed<br>and dye penetrant tested |        |

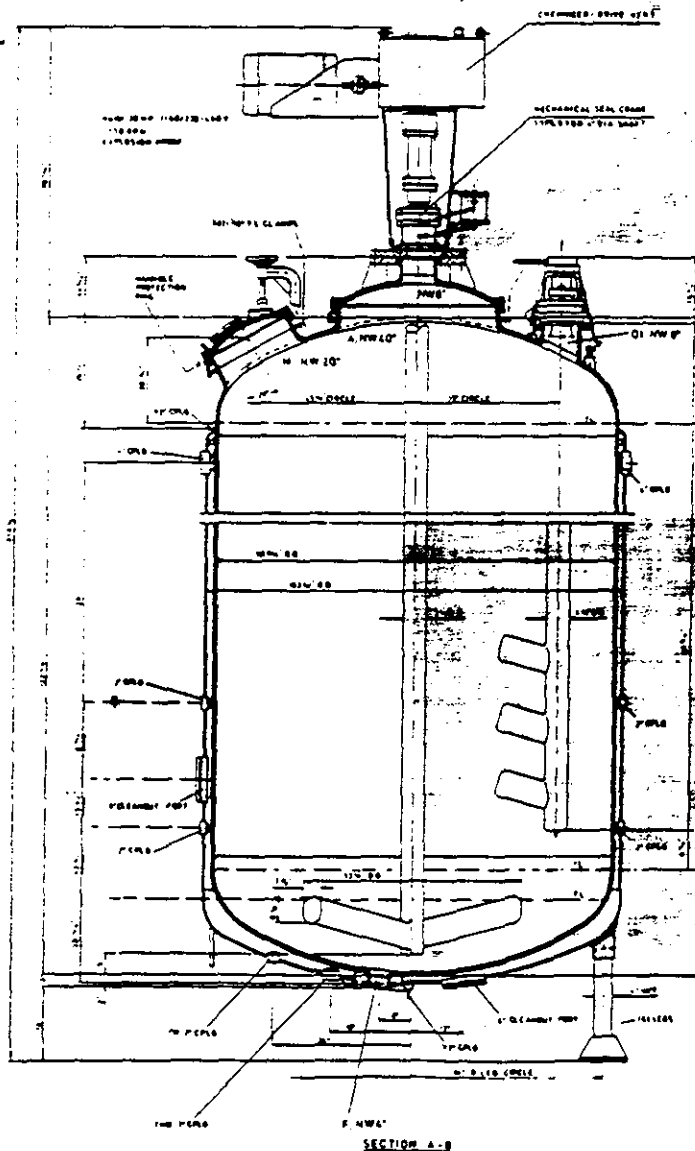
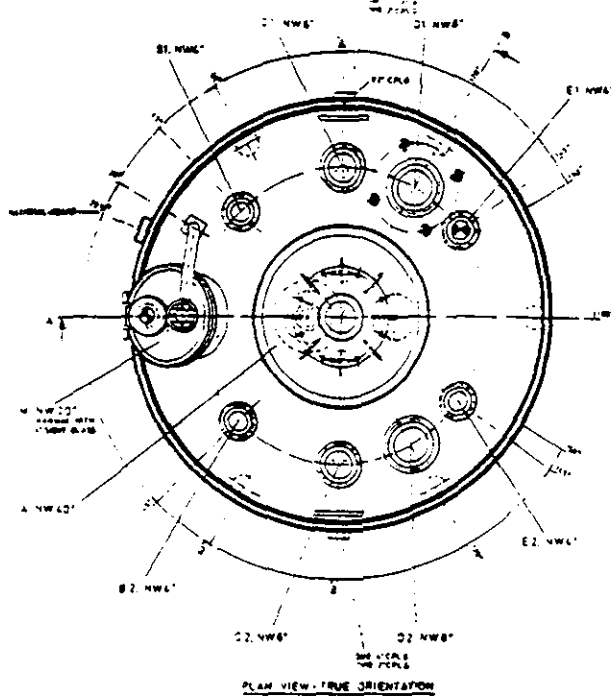
Execution of welds acc. to  
Work Standard... WN 211 02 0001

### STEEL THICKNESS (inches)

|              |         |
|--------------|---------|
| Top Head     | 1-1/64" |
| Bottom Head  | 1-1/64" |
| Inner Shell  | 1-1/64" |
| Jacket Head  | 5/8"    |
| Jacket Shell | 35/64"  |

### WEIGHT (pounds)

|                               |        |
|-------------------------------|--------|
| Base body, no accessories     | 23,350 |
| Complete with drive system    | 25,750 |
| Jacket & shell filled w/water | 56,700 |



### GENERAL NOTES

1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schweiss glass 583-A: highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing

4000 Gallon Jacketed  
Glass-Lined Reactor

## MATERIALS OF CONSTRUCTION

|                        |                |
|------------------------|----------------|
| Shell                  | SA-285 Gr. B   |
| Jacket                 | SA-285 Gr. B   |
| Heads                  | SA-285 Gr. B   |
| Clamps                 | SA-193 B7      |
| Pad Type Nozzles       | SA-350 Gr. LF1 |
| Nozzles                | SA-350 Gr. LF1 |
| Split Loose<br>Flanges | SA-350 Gr. LF1 |

## SPECIFICATIONS

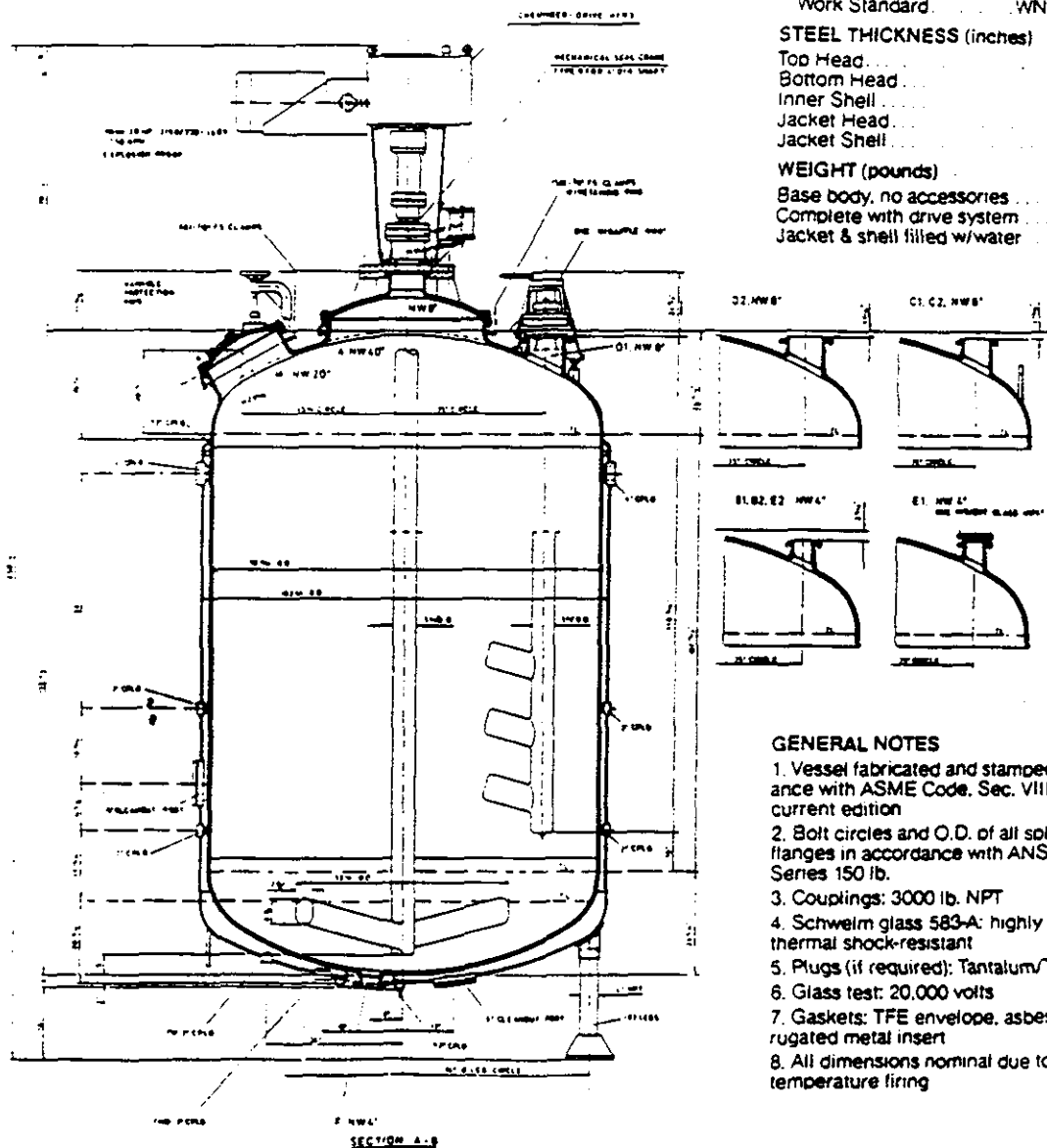
| Design                       | Jacket                                             | Shell   |
|------------------------------|----------------------------------------------------|---------|
| Working Pressure<br>(psi)... | 90w/FV                                             | 1003/FV |
| Test Pressure<br>(psi)       | 135                                                | 150     |
| Design Temperature<br>(°F)   | 400                                                | 400     |
| Capacity (gals)...           | =325                                               | =4465   |
| Joint Efficiency.            | 0.85                                               | 0.85    |
| Welds                        | Partially radiographed<br>and dye penetrant tested |         |
| Execution of welds acc. to   |                                                    |         |
| Work Standard.               | WN 211.02.0001                                     |         |

## STEEL THICKNESS (inches)

|                   |         |
|-------------------|---------|
| Top Head.....     | 1-1/64" |
| Bottom Head.....  | 1-1/64" |
| Inner Shell.....  | 1-1/64" |
| Jacket Head.....  | 5/8"    |
| Jacket Shell..... | 35/64"  |

## WEIGHT (pounds)

|                               |         |
|-------------------------------|---------|
| Base body, no accessories     | =28,100 |
| Complete with drive system    | =31,050 |
| Jacket & shell filled w/water | =71,000 |



## GENERAL NOTES

1. Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
2. Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
3. Couplings: 3000 lb. NPT
4. Schweinf glass 583-A: highly acid/alkali/thermal shock-resistant
5. Plugs (if required): Tantalum/TFE
6. Glass test: 20,000 volts
7. Gaskets: TFE envelope, asbestos, corrugated metal insert
8. All dimensions nominal due to high temperature firing

# RTG-5000

## 5000 Gallon Jacketed Glass-Lined Reactor

### MATERIALS OF CONSTRUCTION

|                        |                |
|------------------------|----------------|
| Shell                  | SA-285 Gr. B   |
| Jacket                 | SA-285 Gr. B   |
| Heads                  | SA-285 Gr. B   |
| Clamps                 | SA-193 B7      |
| Pad Type Nozzles       | SA-350 Gr. LF1 |
| Nozzles                | SA-350 Gr. LF1 |
| Split Loose<br>Flanges | SA-350 Gr. LF1 |

### SPECIFICATIONS

| Design                     | Jacket                                             | Shell  |
|----------------------------|----------------------------------------------------|--------|
| Working Pressure<br>(psi)  | 90w/FV                                             | 100&FV |
| Test Pressure<br>(psi)     | 135                                                | 150    |
| Design temperature<br>(°F) | 400                                                | 400    |
| Capacity (gals)            | ±430                                               | ±5690  |
| Joint Efficiency           | 0.85                                               | 0.85   |
| Welds                      | Partially radiographed<br>and dye penetrant tested |        |

Execution of welds acc. to  
Work Standard. WN 211.02.0001

### STEEL THICKNESS (inches)

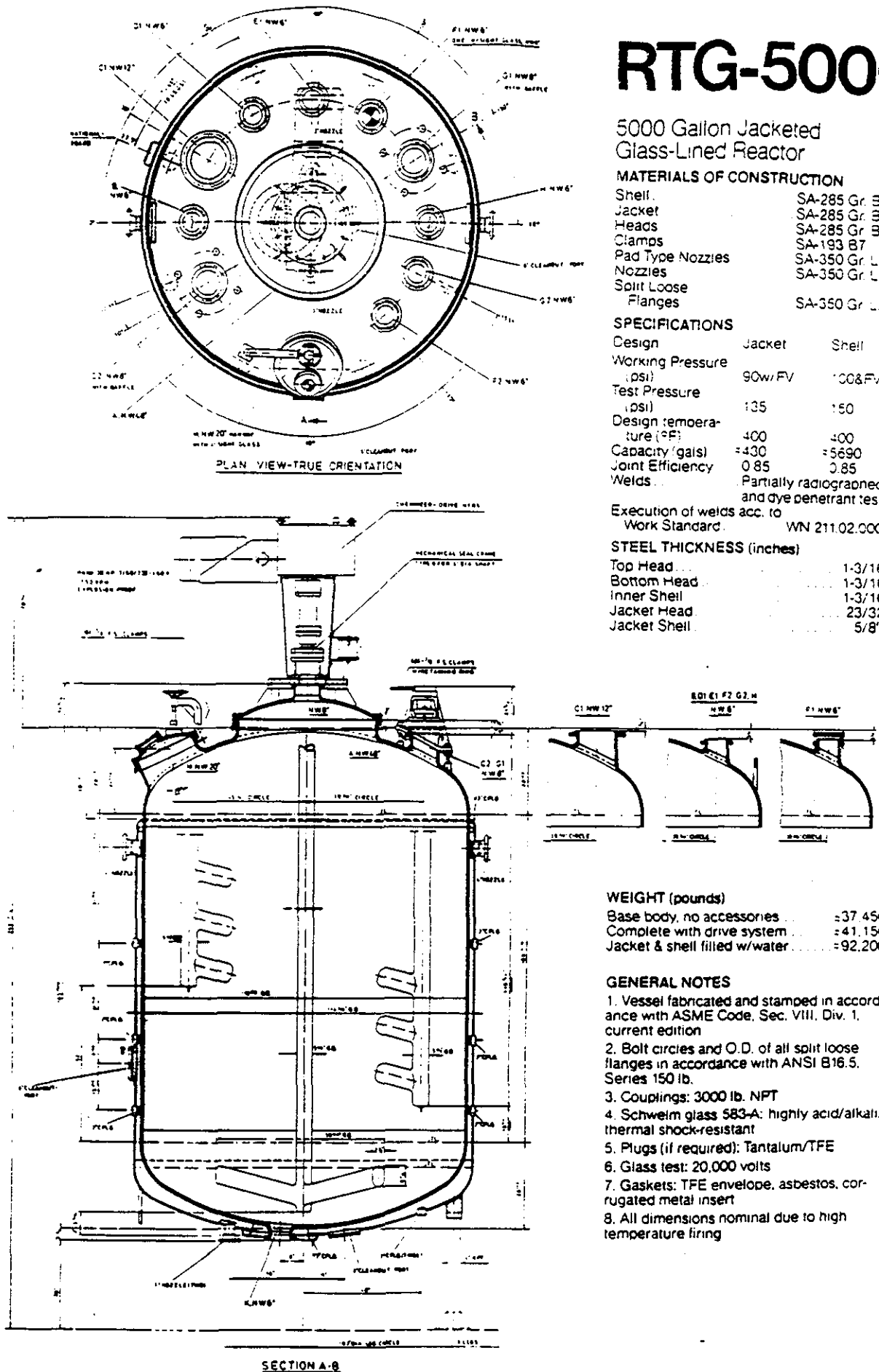
|              |         |
|--------------|---------|
| Top Head     | 1-3/16" |
| Bottom Head  | 1-3/16" |
| Inner Shell  | 1-3/16" |
| Jacket Head  | 23/32"  |
| Jacket Shell | 5/8"    |

### WEIGHT (pounds)

|                               |         |
|-------------------------------|---------|
| Base body, no accessories     | ±37,450 |
| Complete with drive system    | ±41,150 |
| Jacket & shell filled w/water | ±92,200 |

### GENERAL NOTES

- Vessel fabricated and stamped in accordance with ASME Code, Sec. VIII, Div. 1, current edition
- Bolt circles and O.D. of all split loose flanges in accordance with ANSI B16.5, Series 150 lb.
- Couplings: 3000 lb. NPT
- Schweini glass 583-A: highly acid/alkali/thermal shock-resistant
- Plugs (if required): Tantalum/TFE
- Glass test: 20,000 volts
- Gaskets: TFE envelope, asbestos, corrugated metal insert
- All dimensions nominal due to high temperature firing

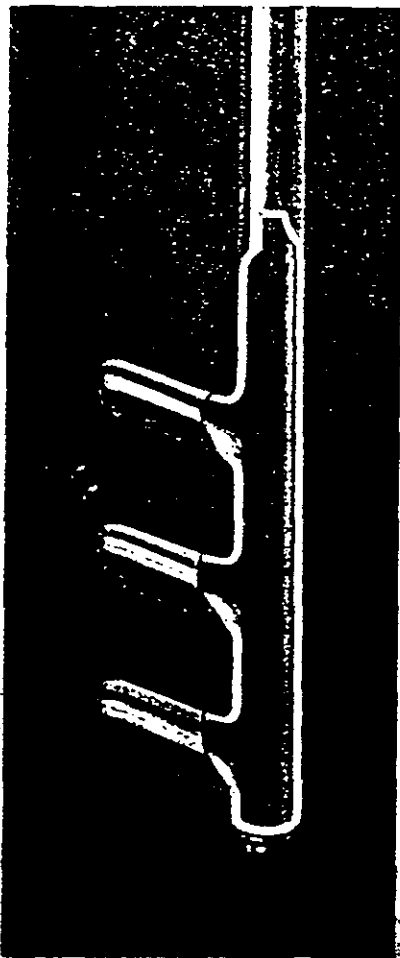


SECTION A-B

# Accessories

## Bottom Flush Valves

Glass-lined and either manual or pneumatic actuated.



## Temperature Sensing

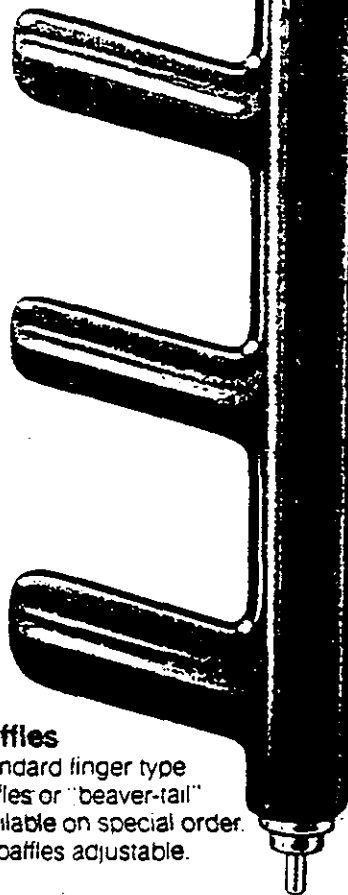
Tantalum tips available in the baffle or on the bottom flush valves.

## Jacket Agitator Nozzles

Assure uniform heating or cooling of the vessel.

## Baffles

Standard finger type baffles or "beaver-tail" available on special order. All baffles adjustable.



## Agitators

Standard 3-blade retreat curve agitators.

## 6" Jacket Cleanout Ports

Available on standard jacketed reactors.



## Manhole Protection Rings

Glass-lined steel protection rings furnished as standard.

## Blue or White Glass

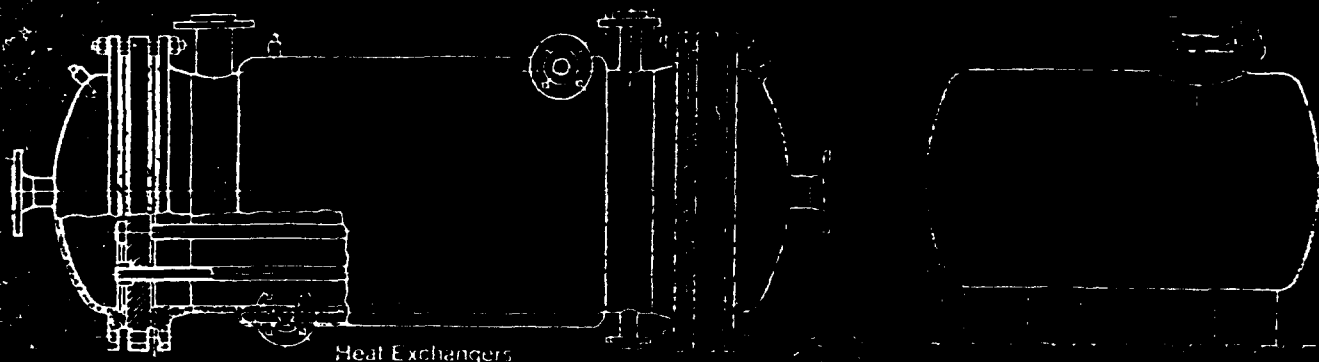
Schwelm 583-A green glass is furnished as standard due to its excellent acid and alkali resistance and to its unsurpassed anti-stick properties. If desired, Cobalt blue or white glass is also available.

## Continuous Fault Detector

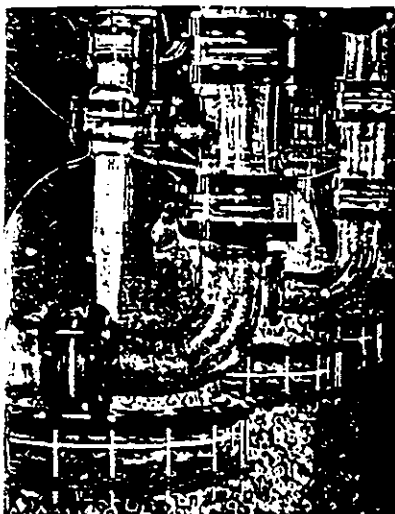
Serves as an immediate alarm system in case of any lining failure, which avoids serious damage and corresponding expensive repairs.



# Other glass-lined steel equipment available from Schwelm/Owens-Illinois:



# Now one source can supply the entire system: Owens-Illinois.



## 1. The well-known Schott process pipe and systems.

Schott chemical process systems have over 100 years of experience behind them, are performing all over the world, and are backed up by the marketing and service capabilities of Owens-Illinois.

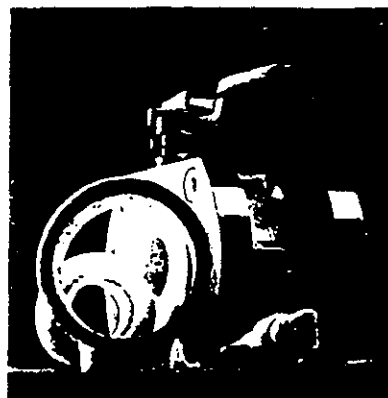
All Schott systems and components are made of DURAN® 50 borosilicate glass for corrosion resistance, durability, transparency and the maintenance of product purity. It has the lowest coefficient of expansion of any corrosion-resistant glass, offers exceptional resistance to thermal shock, and withstands maximum operating temperatures at 200°C.

Technical assistance is available from design concept through installation and maintenance.

## 2. Our exclusive CER-VIT® Ball Valves.

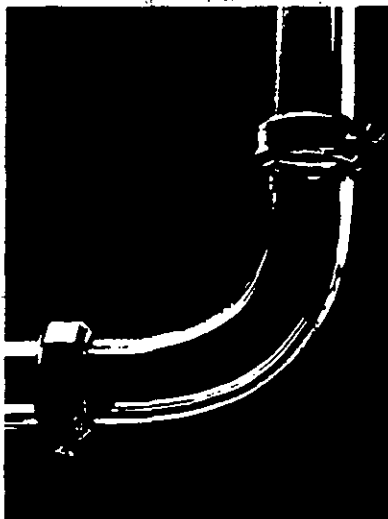
CER-VIT is the exclusive O-I glass ceramic that resists most acids, has a near zero coefficient of expansion, and provides excellent shock resistance. It also handles

alkali solutions in moderate concentrations and temperatures, as well as most other organic and inorganic solvents. These valves give you worry-free operation under normal vibration, pressure and temperature fluctuations, and are easy to handle during installation and maintenance.



## 3. Our tested KIMAX® glass pipe.

KIMAX is tough, corrosion-resistant piping made of our KG-33 borosilicate glass, and resists a wide range of corrosives and reagents. It can withstand operating pressures



to 100 psi up to 300°F according to pipe ID. It adapts well with existing systems and can be modified as your needs change.

## 4. And of course, the proven Schwelm reactors.

We hope this catalog has been helpful in telling you some of the specific details that make the Schwelm glass-lined reactor truly the alternative reactor you should consider. However, we also realize that there is much more you'll want to know before making your final decision.



For more information—about the Schwelm reactor or any other part of the system—call or write today. Contact your nearest Fluid Process Systems sales office and they'll be happy to answer your questions promptly.

**The systems source.**

®DURAN: Jena Schott of Mainz, Germany  
®CER-VIT: Owens-Illinois

®KIMAX: Owens-Illinois

## **The Alternative Glass-Lined Reactor**

### **Manufacturing Engineering**

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P.O. Box 2187  
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(609) 692-3600 Ext. 457

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**The systems source.**

  
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Fluid Process  
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Vineland, New Jersey 08360

**O-I / SCHOTT**

Process Systems, Inc.

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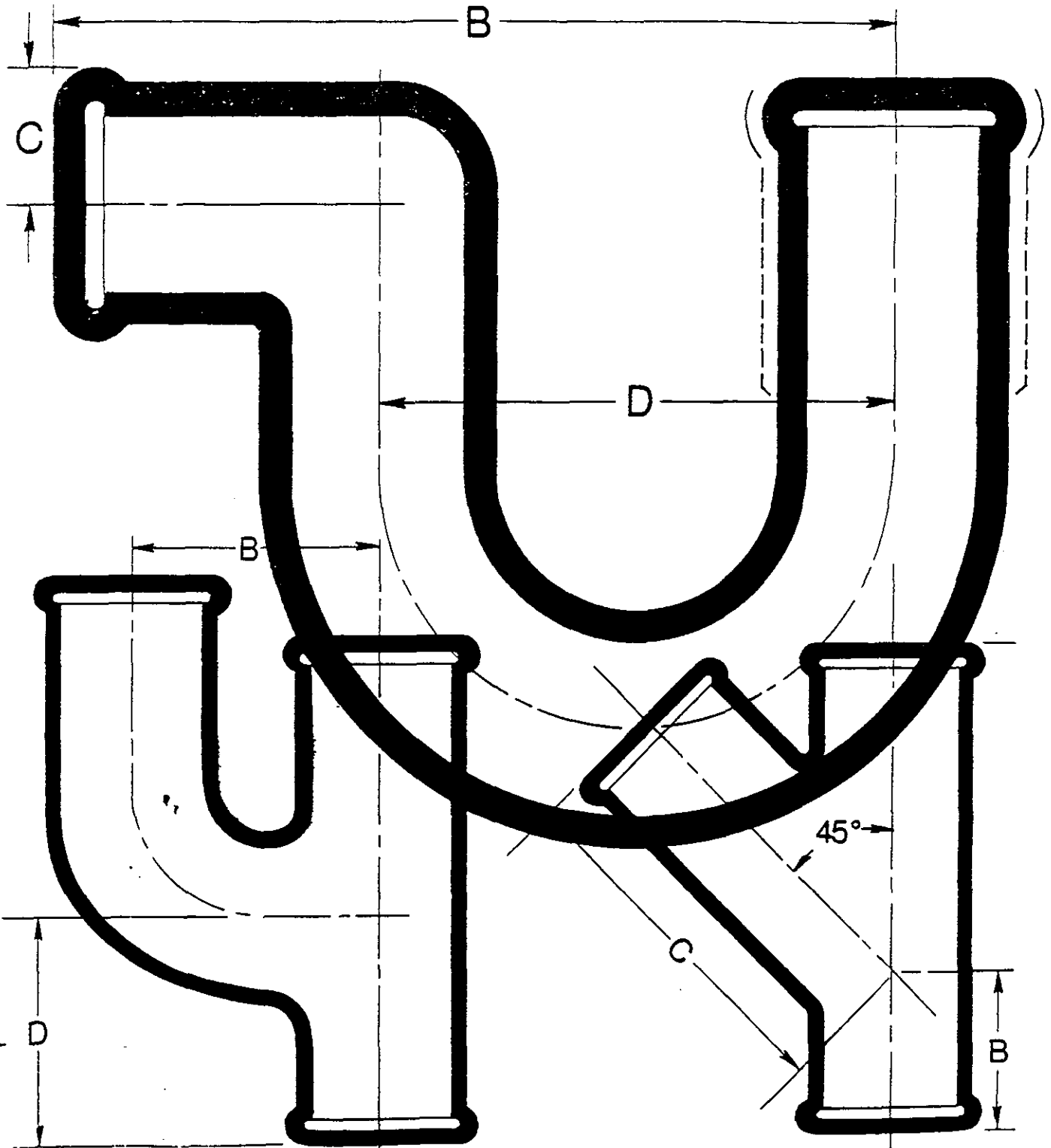
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OI KIM VINE

## Glass Drainline

CATALOG: C-65-5



## assured maximum corrosion resistance for chemical waste disposal systems

### KIMAX, the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need O-I/Schott has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\* at atmospheric pressure.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manufactured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

**Building Owners:** KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- ☐ KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- ☐ Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- ☐ When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- ☐ All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- ☐ Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- ☐ All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\* For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

\*\* TFE is the abbreviation given by the Society of Plastic Industry to tetrafluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

**Specifier:** Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX glass drainline offers this freedom, confidence and reasonable cost because:

- ☐ All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- ☐ The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- ☐ The light weight of the KIMAX systems requires only 1/2 to 3/4 as many hangers as conventional high silicon iron pipe.
- ☐ Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- ☐ Straight lengths of KIMAX pipe can be field cut to exact length.
- ☐ KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

### Installation advantages:

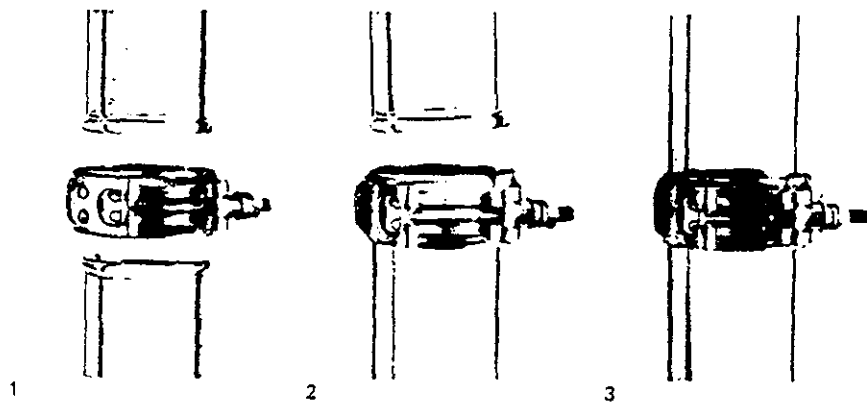
Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual FPS-650-1. O-I/Schott sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installation. KIMAX Drainline systems do provide certain installation advantages which are:

**Leak-Free Joint Assembly:** The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos). The coupling permits the joint to be deflected up to 4°.

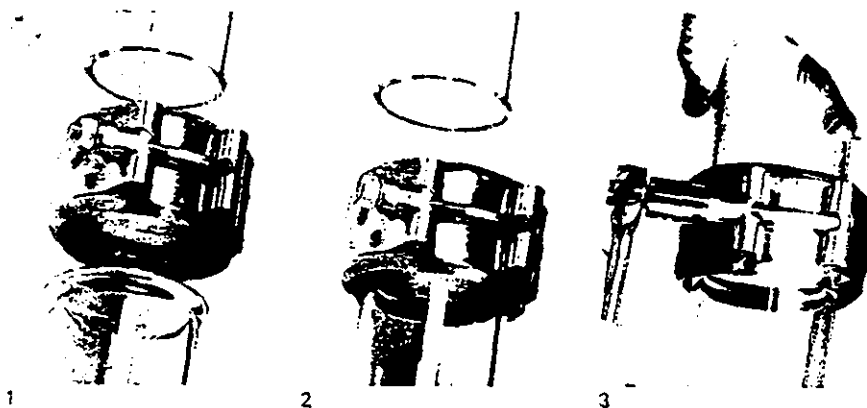
**Field Fabrication:** KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the B/P (bead to plain end) coupling system.

**Minimum Number of Hangers:** KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.

**NOTE:** Gas pressure recommendations: It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.



KIMAX  
Bead to Bead  
Drainline  
Coupling



KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling

# Other Kimax installation advantages include:

**Below Ground Burial:** KIMAX Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a protective casing of thick expanded polystyrene. For recommended installation procedures of KIMAX Drainline see Installation Manual FPS-650-1. Shown here is an example of KIMAX Drainline as installed underground.



**Adaptation to Other Materials:** KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 25.

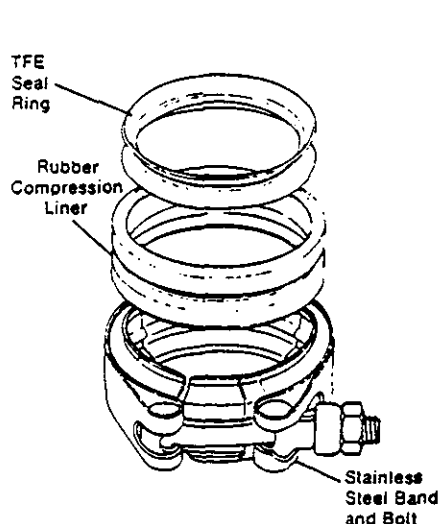
**Easily Handled:** KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

KIMAX Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem.

It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and bio-chemistry laboratories; veterinary and medical colleges, research, and other institutional laboratories.

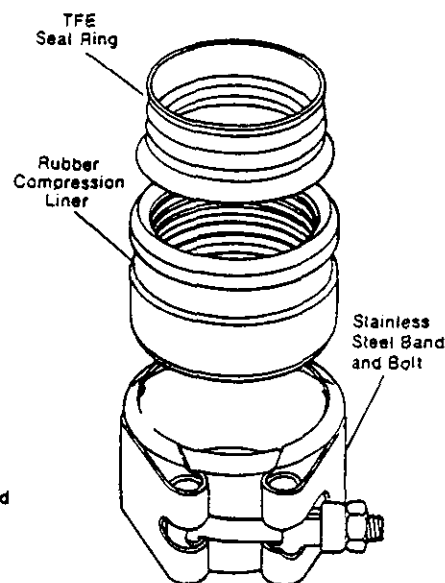
KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants . . . wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints



### KIMAX Drainline Coupling (Bead to Bead):

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoro-ethylene provide the required joint seal. Assembly of joint is simple . . . place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.



### KIMAX B/P Drainline Coupling (Beaded to Plain End):

The KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of KIMAX glass drainline straight lengths.

# Guide Specifications

## Long form:

### ACID WASTE DRAINLINE

#### I. General

A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of borosilicate glass conforming to Federal Specification DD-G-541B and Military Specification MIL-P-22561B (YD) as manufactured under the trade name "KIMAX" by O-I/Schott.

B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include protected pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.

C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

#### II. Connections

A. Glass-to-glass connections shall be made with KIMAX compression type couplings, Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Seal ring gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.

B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

#### III. Protection of Pipe

A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.

B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.

C. Glass pipe shall be protected against all weld spatter.

#### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

#### V. Underground Pipe

A. Excavation—shall conform to National Plumbing Code A 40.8 Section 2.7.

1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.

2. At least 4" of properly compacted sand or rock free soil shall be used directly under the pipe.

#### B. Buried Pipe

1. Straight lengths shall be protected in expanded polystyrene casing.

2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.

#### C. Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

#### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## Short form:

### ACID WASTE DRAINLINE

This system shall be made of KIMAX borosilicate glass and conforming to Federal Specification DD-G-541-B and Military Specification MIL-P-22561-B (YD) as manufactured by O-I/Schott. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetra-fluoroethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

Note: Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of rock-free sand or soil compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendations.

KIMAX protected pipe, and wrapped fittings shall be installed and back filled in accordance with the manufacturer's instructions and governing plumbing code.



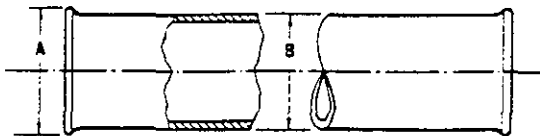
# pipe and fittings

## Straight Lengths—Pipe

Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

**6500 5-ft. lengths**

**6501 10-ft. lengths**

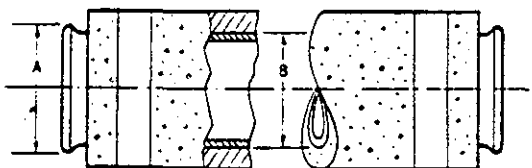


| Size | Weight<br>lbs./ft. | A    | 8 (O.D.) | 5 ft. lengths<br>Art. No. | 10 ft. lengths<br>Art. No. |
|------|--------------------|------|----------|---------------------------|----------------------------|
| 1½   | 0.87               | 2.06 | 1.84     | 6500- 1500                | 6501- 1500                 |
| 2    | 1.1                | 2.58 | 2.34     | 2000                      | 2000                       |
| 3    | 2.0                | 3.69 | 3.41     | 3000                      | 3000                       |
| 4    | 3.4                | 4.84 | 4.53     | 4000                      | 4000                       |
| 6    | 6.3                | 7.12 | 6.66     | 6000                      | 6000                       |

## 6502—EPS\* Covered

5-ft. lengths (for underground use)

6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.



\*Expanded Polystyrene

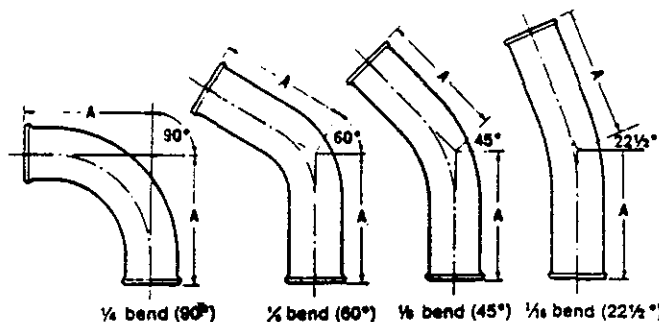
EPS Covered Art. No.      Beaded one end only Art. No.

|            |             |
|------------|-------------|
| 6502- 1500 | 6504- 1500† |
| 2000       | 2000†       |
| 3000       | 3000†       |
| 4000       | 4000†       |
| 6000       | 6000†       |

## 6504—Beaded one end only

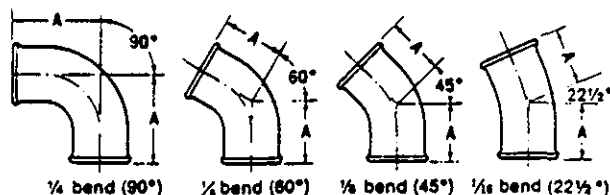
6504 pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 8" of bead.

## 6511—Sweeps



| Size | A  | 90°<br>Art. No. | 60°<br>Art. No. | 45°<br>Art. No. | 22½°<br>Art. No. |
|------|----|-----------------|-----------------|-----------------|------------------|
| 1½   | 4½ | 6511- 1590      | 6511- 1560      | 6511- 1545      | 6511- 1522       |
| 2    | 5  | 2090            | 2060            | 2045            | 2022†            |
| 3    | 6½ | 3090            | 3060†           | 3045            | 3022†            |
| 4    | 9  | 4090            | 4060†           | 4045            | 4022†            |
| 6    | 12 | 6090            | 6060†           | 6045            | 6022†            |

## 6513—Bends



| Size            | A                | 90°<br>Art. No. | 60°<br>Art. No. |
|-----------------|------------------|-----------------|-----------------|
| 1½              | 3                | 2½              | 2               |
| 2               | 3½               | 2½              | 2½              |
| 3               | 5                | 3½              | 2½              |
| 4               | 7                | 4½              | 3½              |
| 6               | —                | —               | 7               |
| 45°<br>Art. No. | 22½°<br>Art. No. |                 |                 |
| 6513- 1545      | 6513- 1522       |                 |                 |
| 2045            | 2022             |                 |                 |
| 3045            | 3022†            |                 |                 |
| 4045            | 4022†            |                 |                 |
| 6045            |                  |                 |                 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

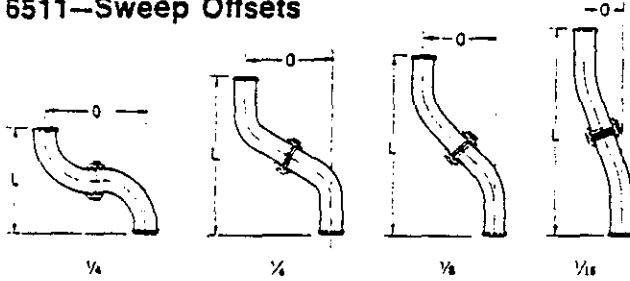
†Manufactured per order. Not returnable.

# pipe and fittings

## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

### 6511—Sweep Offsets



| Size  | $\frac{1}{4}$ |    | $\frac{1}{2}$ |        | $\frac{3}{4}$ |        | $1\frac{1}{2}$ |       |
|-------|---------------|----|---------------|--------|---------------|--------|----------------|-------|
|       | L             | O  | L             | O      | L             | O      | L              | O     |
| 1 1/2 | 9             | 9  | 13 1/2        | 7 7/8  | 15 3/4        | 6 3/8  | 17 1/8         | 3 3/8 |
| 2     | 10            | 10 | 15            | 8 3/4  | 17 1/8        | 7 1/8  | 19 1/4         | 3 7/8 |
| 3     | 13            | 13 | 19 1/2        | 11 1/4 | 22 1/4        | 9 1/4  | 25             | 5     |
| 4     | 18            | 18 | 27            | 15 5/8 | 30 3/4        | 12 3/4 | 34 5/8         | 6 7/8 |
| 6     | 24            | 24 | 36            | 20 3/4 | 41            | 17     | 46 1/4         | 9 1/4 |

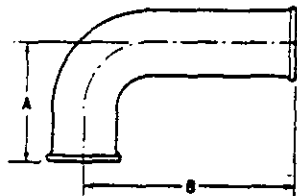
### 6513—Bend Offsets



| Size  | $\frac{1}{4}$ |       | $\frac{1}{2}$ |       | $\frac{3}{4}$ |       | $1\frac{1}{2}$ |       |
|-------|---------------|-------|---------------|-------|---------------|-------|----------------|-------|
|       | L             | O     | L             | O     | L             | O     | L              | O     |
| 1 1/2 | 6             | 6     | 7 1/2         | 4 3/8 | 6 7/8         | 2 7/8 | 7 3/4          | 1 1/2 |
| 2     | 6 1/2         | 6 1/2 | 8 1/4         | 4 3/4 | 7 3/4         | 3 1/4 | 8 3/8          | 1 3/4 |
| 3     | 10            | 10    | 10 1/2        | 6 1/8 | 9 3/4         | 3 7/8 | 10 1/2         | 2 1/8 |
| 4     | 14            | 14    | 13 1/2        | 7 7/8 | 11 1/8        | 4 3/8 | 10 3/4         | 2 1/2 |

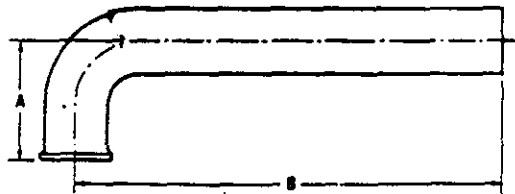
## Special Purpose Bends

### 6512 Long 90°



| Size      | 6512  |       | Art. No.   |
|-----------|-------|-------|------------|
|           | A     | B     |            |
| 1 1/2-90° | 3 3/8 | 6     | 6512- 1590 |
| 2-90°     | 3 3/8 | 7 1/2 | 2090       |

### 6512P\* (Annealed) Plain End

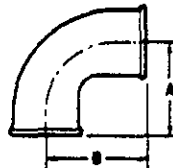


\*Can be field cut.

| Size      | 6512P |    | Art. No.    |
|-----------|-------|----|-------------|
|           | A     | B  |             |
| 1 1/2-90° | 3 3/8 | 12 | 6512P- 1590 |
| 2-90°     | 3 3/8 | 12 | 2090        |

\*Can be field cut.

### 6514 Short 90°



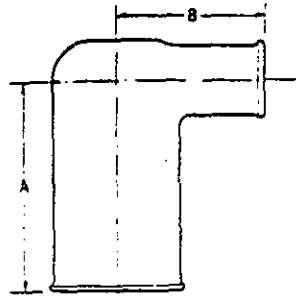
| Size      | A     | B | Art. No.   |
|-----------|-------|---|------------|
| 1 1/2-90° | 2 1/2 | 3 | 6514- 1590 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

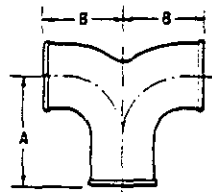
# pipe and fittings

## 6518—Quarter Bend Reducer



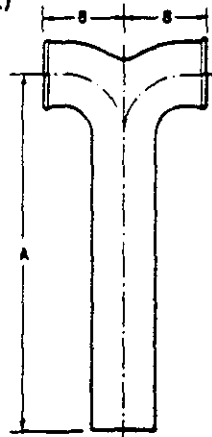
| Size   | A | B  | Art. No.  |
|--------|---|----|-----------|
| 2 x 1½ | 4 | 3½ | 6518-2015 |
| 3 x 1½ | 5 | 4  | -3015     |
| 3 x 2  | 5 | 4½ | -3020     |
| 4 x 1½ | 7 | 4½ | -4015 †   |
| 4 x 2  | 7 | 5  | -4020 †   |
| 4 x 3  | 7 | 5½ | -4030 †   |
| 6 x 1½ | 9 | 5½ | -6015 †   |
| 6 x 2  | 9 | 6  | -6020 †   |
| 6 x 3  | 9 | 6½ | -6030 †   |
| 6 x 4  | 9 | 8  | -6040 †   |

## 6519—Double Quarter Bend



| Size         | A  | B  | Art. No.   |
|--------------|----|----|------------|
| 1½           | 3  | 2½ | 6519- 1500 |
| **2 x 2 x 1½ | 3¼ | 2¼ | **2015†    |
| 2            | 3½ | 2½ | 2020       |
| 3            | 5  | 4½ | 3000       |
| 4            | 6½ | 5¾ | 4000†      |
| 6            | 8½ | 7  | 6000†      |

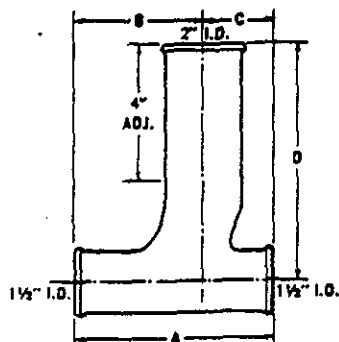
## 6519P—Double Quarter Bend (Plain End Outlet)\*



| Size         | A  | B  | Art. No.    |
|--------------|----|----|-------------|
| 1½           | 10 | 2½ | 6519P- 1500 |
| **2 x 2 x 1½ | 10 | 2¼ | **2015†     |
| 2            | 10 | 2½ | 2020†       |
| 3            |    |    |             |
| 4            |    |    |             |
| 6            |    |    |             |

\*Can be field cut.  
\*\*Branch is 1½".

## 6520—Adjustable Sanitary T (One Adjustable Inlet)



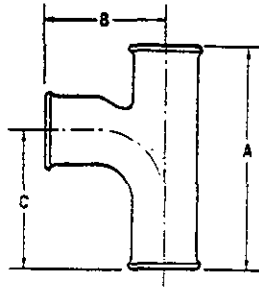
| Size        | A | B     | C     | D | Art. No.   |
|-------------|---|-------|-------|---|------------|
| 1½ x 1½ x 2 | 6 | 3-7/8 | 2-1/8 | 7 | 6520- 1520 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

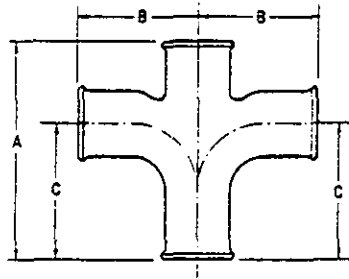
†Manufactured per order. Not returnable.

# pipe and fittings

## 6521—Single Sanitary T

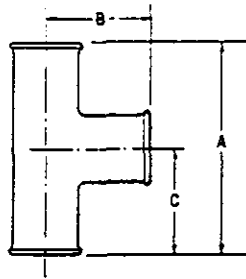


## 6522—Double



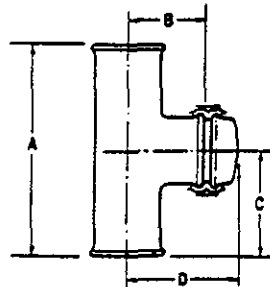
| Size    | A  | B  | C   | Single<br>Art. No. | Double<br>Art. No. |
|---------|----|----|-----|--------------------|--------------------|
| 1½ x 1½ | 6  | 3½ | 3¾  | 6521-1515          | 6522-1515          |
| 2 x 1½  | 8  | 3¾ | 5   | 2015               | 2015               |
| 2 x 2   | 8  | 4½ | 5   | 2020               | 2020               |
| 3 x 1½  | 12 | 4½ | 7½  | 3015               | 3015†              |
| 3 x 2   | 12 | 5  | 7½  | 3020               | 3020               |
| 3 x 3   | 12 | 6¾ | 7½  | 3030               | 3030               |
| 4 x 1½  | 14 | 4½ | 8½  | 4015               | 4015†              |
| 4 x 2   | 14 | 5¾ | 8½  | 4020               | 4020               |
| 4 x 3   | 14 | 7  | 8½  | 4030               | 4030†              |
| 4 x 4   | 14 | 8½ | 8½  | 4040               | 4040               |
| 6 x 2   | 20 | 6¾ | 12¾ | 6020†              | 6020†              |
| 6 x 3   | 20 | 8  | 12¾ | 6030†              | 6030†              |
| 6 x 4   | 20 | 9½ | 12¾ | 6040               | 6040†              |
| 6 x 6   | 20 | 12 | 12¾ | 6060               | 6060†              |

## 6523—Straight T



| Size    | A  | B  | C  | Art. No.  |
|---------|----|----|----|-----------|
| 1½ x 1½ | 6  | 3  | 3  | 6523-1515 |
| 2 x 1½  | 8  | 3¾ | 4  | 2015      |
| 2 x 2   | 8  | 4  | 4  | 2020      |
| 3 x 1½  | 12 | 4½ | 6  | 3015      |
| 3 x 2   | 12 | 4½ | 6  | 3020      |
| 3 x 3   | 12 | 6  | 6  | 3030      |
| 4 x 1½  | 14 | 5  | 7  | 4015†     |
| 4 x 2   | 14 | 5  | 7  | 4020      |
| 4 x 3   | 14 | 6½ | 7  | 4030†     |
| 4 x 4   | 14 | 8  | 7  | 4040      |
| 6 x 3   | 20 | 7¾ | 10 | 6030†     |
| 6 x 4   | 20 | 9  | 10 | 6040†     |
| 6 x 6   | 20 | 10 | 10 | 6060      |

## 6524—Test T with cleanout



| Size    | A  | B  | C | D  | Art. No.  |
|---------|----|----|---|----|-----------|
| 1½ x 1½ | 6  | 2½ | 3 | 3¾ | 6524-1515 |
| 2 x 2   | 8  | 2½ | 4 | 3¾ | 2020      |
| 3 x 3   | 12 | 3¾ | 6 | 4½ | 3030      |
| 4 x 4   | 14 | 4¾ | 7 | 5¾ | 4040      |

Test Tee and cleanout comes as complete assembly including cap and coupling.

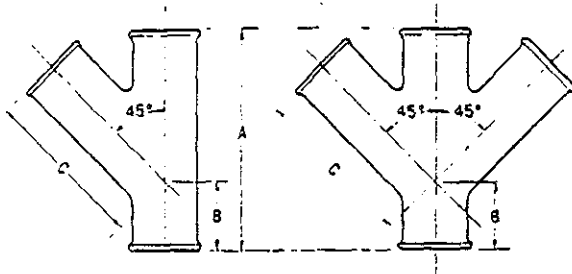
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

## Drainline Y 6526—Single

## 6527—Double

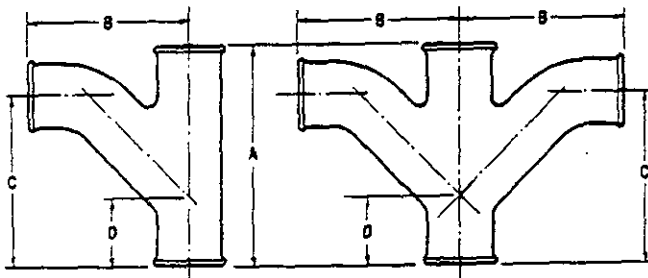


| Size          | A  | B     | C      | Single Y<br>Art. No. | Double Y<br>Art. No. |
|---------------|----|-------|--------|----------------------|----------------------|
| 1 1/2 x 1 1/2 | 6  | 1 3/8 | 4 1/2  | 6526-1515            | 6527-1515            |
| 2 x 1 1/2     | 8  | 2 1/2 | 4 1/2  | -2015                | -2015†               |
| 2 x 2         | 8  | 2 1/2 | 6      | -2020                | -2020                |
| 3 x 1 1/2     | 12 | 3 3/4 | 5 1/2  | -3015                | -3015†               |
| 3 x 2         | 12 | 3 3/4 | 6 3/4  | -3020                | -3020                |
| 3 x 3         | 12 | 3 3/4 | 8      | -3030                | -3030                |
| 4 x 1 1/2     | 14 | 4 1/2 | 6 3/8  | -4015                | -4015†               |
| 4 x 2         | 14 | 4 1/2 | 7 1/2  | -4020                | -4020†               |
| 4 x 3         | 14 | 4 1/2 | 8 3/4  | -4030                | -4030                |
| 4 x 4         | 14 | 4 1/2 | 10     | -4040                | -4040                |
| 6 x 2         | 20 | 5 3/4 | 9      | -6020                | -6020†               |
| 6 x 3         | 20 | 5 3/4 | 10 3/8 | -6030                | -6030†               |
| 6 x 4         | 20 | 5 3/4 | 11 1/2 | -6040                | -6040†               |
| 6 x 6         | 20 | 5 3/4 | 14     | -6060                | -6060†               |

## Combination Y and 1/8 Bend

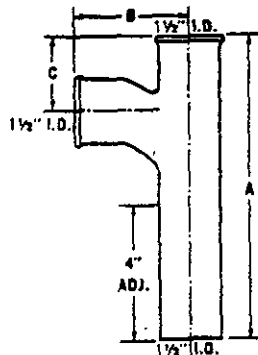
### 6528—Single

### 6529—Double



| Size          | A  | B     | C      | D     | Single<br>Art. No. | Double<br>Art. No. |
|---------------|----|-------|--------|-------|--------------------|--------------------|
| 1 1/2 x 1 1/2 | 6  | 4 1/2 | 4 3/4  | 1 1/2 | 6528-1515          | 6529-1515          |
| 2 x 1 1/2     | 8  | 4 3/4 | 5 1/2  | 2 1/2 | -2015              | -2015              |
| 2 x 2         | 8  | 6     | 6 1/4  | 2 1/2 | -2020              | -2020              |
| 3 x 1 1/2     | 12 | 5 3/4 | 7 1/8  | 3 3/4 | -3015              | -3015              |
| 3 x 2         | 12 | 6 1/2 | 8      | 3 3/4 | -3020              | -3020              |
| 3 x 3         | 12 | 8 1/2 | 9      | 3 3/4 | -3030              | -3030              |
| 4 x 1 1/2     | 14 | 6     | 8 1/2  | 4 1/2 | -4015              | -4015†             |
| 4 x 2         | 14 | 7     | 9 1/4  | 4 1/2 | -4020              | -4020              |
| 4 x 3         | 14 | 9     | 10 1/4 | 4 1/2 | -4030              | -4030              |
| 4 x 4         | 14 | 11    | 11     | 4 1/2 | -4040              | -4040              |
| 6 x 2         | 20 | 8 1/4 | 11 1/8 | 5 3/4 | -6020†             | -6020†             |
| 6 x 3         | 20 | 10    | 12 1/2 | 5 3/4 | -6030              | -6030†             |
| 6 x 4         | 20 | 12    | 13 1/2 | 5 3/4 | -6040              | -6040†             |
| 6 x 6         | 20 | 15    | 14 1/2 | 5 3/4 | -6060              | -6060†             |

## 6530 Adjustable Sanitary T (Plain End Outlet) \*



| Size                  | A     | B     | C     | Art. No.  |
|-----------------------|-------|-------|-------|-----------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 3/4 | 3 1/2 | 3 1/2 | 6530-1515 |

\* Can be field cut.

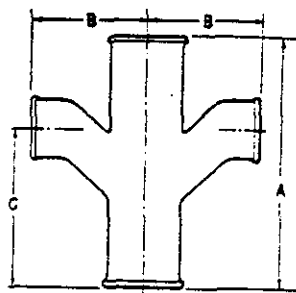
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

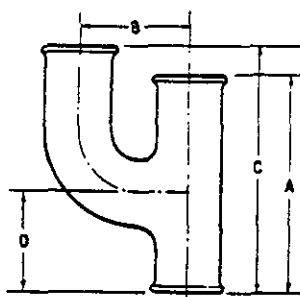
## 6531 Partition Cross (Compact)

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.



| Size             | A | B  | C | Art. No.   |
|------------------|---|----|---|------------|
| 2 x 1½           | 8 | 3¼ | 5 | 6531-2015† |
| 2 x 2            | 8 | 4½ | 5 | 2020†      |
| 2 x 1½ x 1½ x 1½ | 8 | 3¼ | 5 | 2151       |

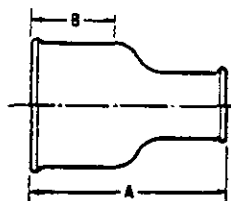
## 6532—Single Upright Y or H (vent branch)



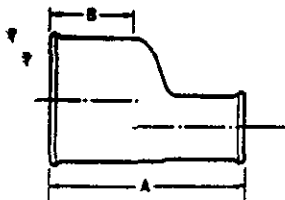
| Size    | A  | B  | C*  | D  | Art. No.   |
|---------|----|----|-----|----|------------|
| 1½ x 1½ | 6  | 3  | 6½  | 2¾ | 6532-1515† |
| 2 x 1½  | 8  | 3¼ | 7½  | 3¾ | -2015      |
| 2 x 2   | 8  | 4  | 8½  | 3¾ | -2020†     |
| 3 x 1½  | 12 | 3¾ | 9½  | 4¾ | -3015†     |
| 3 x 2   | 12 | 4½ | 10½ | 4¾ | -3020†     |
| 3 x 3   | 12 | 6  | 13  | 5¾ | -3030†     |
| 4 x 1½  | 14 | 4¾ | 10¾ | 5¾ | -4015†     |
| 4 x 2   | 14 | 5  | 12  | 5¾ | -4020†     |
| 4 x 3   | 14 | 6½ | 14½ | 6¾ | -4030†     |
| 4 x 4   | 14 | 8  | 16¾ | 6¾ | -4040†     |
| 6 x 3   | 20 | 7¾ | 16¾ | 7¾ | -6030†     |
| 6 x 4   | 20 | 9  | 19  | 8  | -6040†     |
| 6 x 6   | 20 | 12 | 24  | 12 | -6060†     |

\*"C" dimension may be longer or shorter than "A"

## 6536—Straight Reducers or Increases

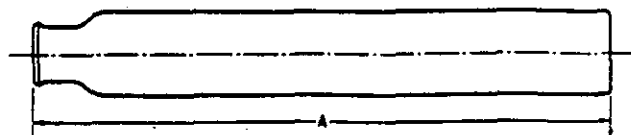


## 6537—Eccentric Reducers or Increases



| Size   | A | B (min.) | Straight Art. No. | Eccentric Art. No. |
|--------|---|----------|-------------------|--------------------|
| 2 x 1½ | 4 | 1¾       | 6536-2015         | 6537-2015          |
| 3 x 1½ | 5 | 2¼       | -3015             | -3015              |
| 3 x 2  | 5 | 2¾       | -3020             | -3020              |
| 4 x 1½ | 7 | 3        | -4015             | -4015†             |
| 4 x 2  | 7 | 3        | -4020             | -4020†             |
| 4 x 3  | 7 | 3        | -4030             | -4030†             |
| 6 x 1½ | 9 | 4        | -6015†            | -6015†             |
| 6 x 2  | 9 | 4        | -6020†            | -6020†             |
| 6 x 3  | 9 | 4        | -6030             | -6030†             |
| 6 x 4  | 9 | 4        | -6040             | -6040†             |

## 6540 Vent Increases



| Size   | A  | Art. No.   |
|--------|----|------------|
| 1½ x 3 | 22 | 6540-1530† |
| 2 x 3  | 22 | -2030      |
| 3 x 4  | 22 | -3040†     |

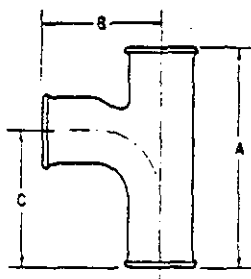
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

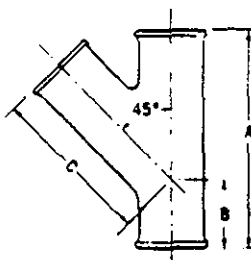
## compact fittings

### 6541 Single Sanitary T



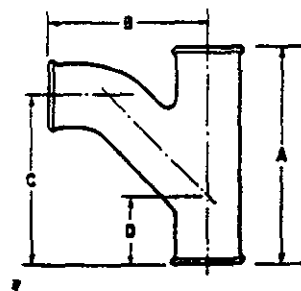
| Size    | A  | B  | C  | Art. No.   |
|---------|----|----|----|------------|
| 1½ x 1½ | 4½ | 2½ | 2½ | 6541- 1515 |
| 2 x 1½  | 4¾ | 2¾ | 2¾ | 2015       |
| 2 x 2   | 5½ | 3  | 2¾ | 2020       |
| 3 x 2   | 9  | 4½ | 5½ | 3020       |
| 3 x 3   | 9  | 4½ | 5½ | 3030       |
| 4 x 1½  | 10 | 4¾ | 6¾ | 4015†      |
| 4 x 2   | 10 | 4¾ | 6¾ | 4020†      |
| 4 x 3   | 10 | 5¾ | 6¾ | 4030       |
| 4 x 4   | 10 | 6¼ | 6¾ | 4040       |
| 6 x 2   | 16 | 5¾ | 9½ | 6020†      |
| 6 x 3   | 16 | 6¾ | 9½ | 6030†      |
| 6 x 4   | 16 | 7¾ | 9½ | 6040†      |
| 6 x 6   | 16 | 9¾ | 9½ | 6060†      |

### 6546 Single Drainline Y



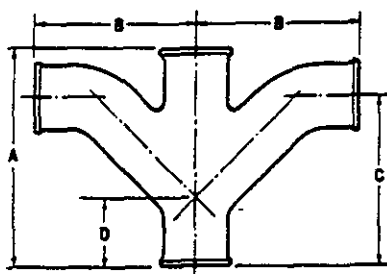
| Size    | A  | B  | C   | Art. No.   |
|---------|----|----|-----|------------|
| 1½ x 1½ | 5¾ | 1½ | 4   | 6546- 1515 |
| 2 x 2   | 5¾ | 1½ | 4¾  | 2020       |
| 3 x 2   | 9  | 2½ | 6½  | 3020       |
| 3 x 3   | 9  | 2½ | 7½  | 3030       |
| 4 x 1½  | 10 | 3¾ | 6¼  | 4015†      |
| 4 x 2   | 10 | 2¾ | 7¾  | 4020       |
| 4 x 3   | 10 | 2  | 8¾  | 4030†      |
| 4 x 4   | 10 | 2  | 8¾  | 4040       |
| 6 x 2   | 16 | 4¾ | 9¾  | 6020†      |
| 6 x 3   | 16 | 5½ | 10¾ | 6030†      |
| 6 x 4   | 16 | 4½ | 11¾ | 6040†      |
| 6 x 6   | 16 | 4¾ | 12¾ | 6060†      |

### 6548 Combination Y and ½ Bend



| Size   | A  | B   | C   | D  |
|--------|----|-----|-----|----|
| 2 x 1½ | 5¾ | 3¾  | 3¾  | 1¾ |
| 2 x 2  | 6  | 4¾  | 4¾  | 1½ |
| 3 x 2  | 9  | 6½  | 6½  | 2¾ |
| 3 x 3  | 9  | 6½  | 6½  | 2¼ |
| 4 x 1½ | 10 | 5¾  | 6¾  | 2¾ |
| 4 x 2  | 10 | 5¾  | 6¾  | 2¾ |
| 4 x 3  | 10 | 6¾  | 7¾  | 3¾ |
| 4 x 4  | 10 | 6¾  | 7¾  | 2¾ |
| 6 x 2  | 16 | 7¾  | 9¾  | 4¾ |
| 6 x 3  | 16 | 8½  | 9¾  | 4¾ |
| 6 x 4  | 16 | 9¾  | 10¾ | 4¾ |
| 6 x 6  | 16 | 11¼ | 10¾ | 3½ |

### 6549 Double Combination Y and ½ Bend



| Single<br>6548<br>Art. No. | Double<br>6549<br>Art. No. |
|----------------------------|----------------------------|
| 6548- 2015                 | 6549- 4015†                |
| 2020                       | 4020                       |
| 3020                       | 4030                       |
| 3030                       | 4040                       |
| 4015†                      | 6020†                      |
| 4020                       | 6030†                      |
| 4030                       | 6040†                      |
| 4040                       | 6060†                      |
| 6020†                      |                            |
| 6030†                      |                            |
| 6040†                      |                            |
| 6060†                      |                            |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# pipe and fittings

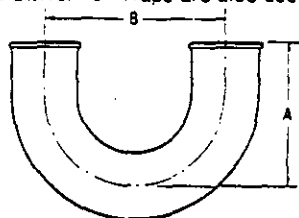
## 6544 Cleanout Plug



| Size | A  | Art. No.  |
|------|----|-----------|
| 1½   | 1  | 6544-1500 |
| 2    | 1  | -2000     |
| 3    | 1½ | -3000     |
| 4    | 1½ | -4000     |
| 6    | 1½ | -6000     |

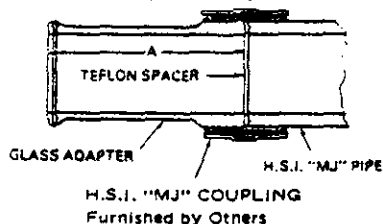
## 6550 U Bend (vent loop)

Note: U bends are often used for vent loops.  
No. 6705 outlets on Swivel "S" Traps are also used as vent loops.



| Size | A  | B  | Art. No.  |
|------|----|----|-----------|
| 1½   | 4  | 5  | 6550-1500 |
| 2    | 4½ | 5½ | -2000     |
| 3    | 5½ | 6½ | -3000     |
| 4    | 6½ | 7½ | -4000†    |

## 6566 - "MJ" Pipe Adapter\*



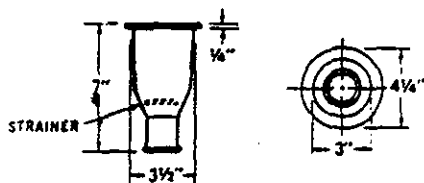
\*6566 "MJ" Pipe Adapter consists of glass adapter and teflon spacer.

## Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | A  | Art. No.  |
|-----------|----|-----------|
| 1½        | 3½ | 6566-1500 |
| 2         | 4  | 2000      |
| 3         | 5  | 3000      |
| 4         | 6  | 4000      |

# cup sinks

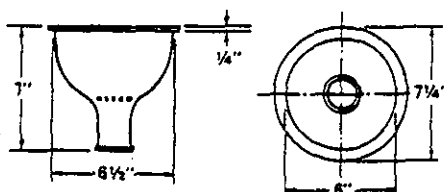
## 6616 Beaded Outlet 3" Hemispherical



No. 6724, 2" sink strainer furnished with all cup sinks. Use No. 6655 adapter coupling (2 x 1-7/8) on plain end outlets to connect to 2" expanded end traps or fittings, or No. 6661 coupling to connect to 1½" beaded end pipe or fitting.

Art. No.  
6616-3000

## 6617 Beaded Outlet 6" Hemispherical



Art. No.  
6617-6000

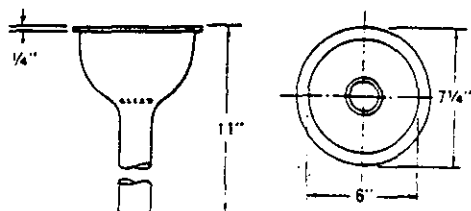
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.



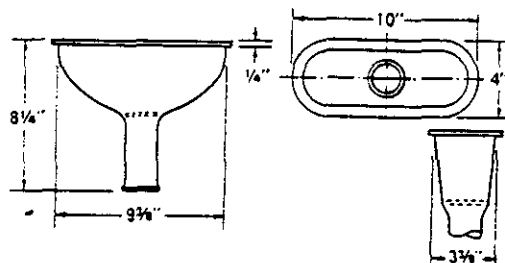
# cup sinks

**6617P Plain End Outlet 6" Hemispherical**



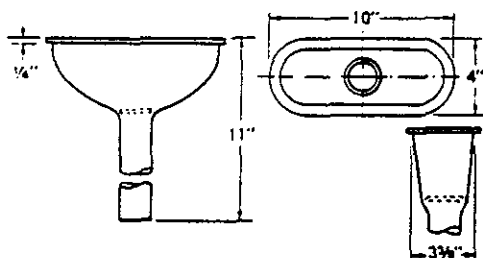
Art. No.  
6617P-6011

**6618 Beaded Outlet 3" x 9" Oval**



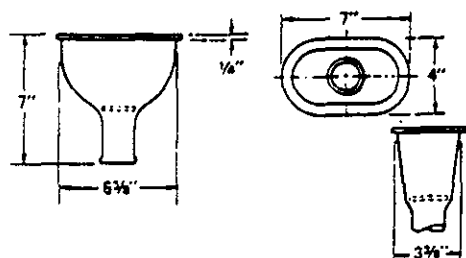
Art. No.  
6618-390Q

**6618P Plain End Outlet 3" x 9" Oval**



Art. No.  
6618P-3911

**6619 Beaded Outlet 3" x 6" Oval**



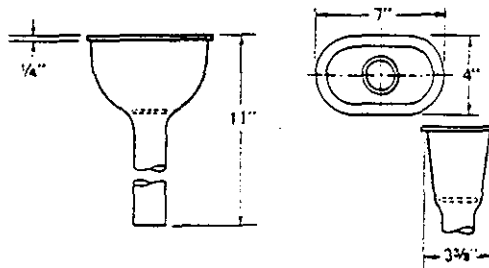
Art. No.  
6619-3600

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

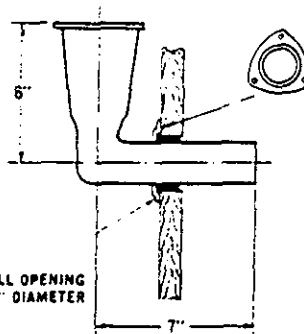
# cup sinks

## 6619P Plain End Outlet 3" x 6" Oval



Art. No.  
6619P-3611

## 6627 3" x 6" Oval Horizontal, Wall Mounted Cup Sink 1 1/2" Plain End Outlet



### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

WALL OPENING  
2 1/4" DIAMETER

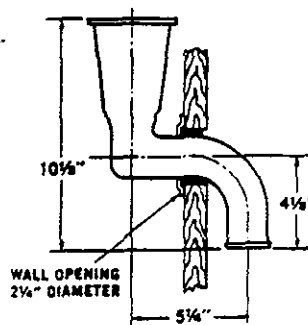
Art. No.  
6627-3600

### Components

Art No.  
6621-3600  
6724-2000  
7150-2000  
7204-2015

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet.

## 6628 3" x 6" Oval Vertical, 1 1/2" Outlet Wall Mounted Cup Sink



### Vertical Outlet

No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

WALL OPENING  
2 1/4" DIAMETER

Art. No.  
6628-3600†

### Components

Art No.  
6629-3600†  
6724-2000  
7150-2000  
7204-2015

Mounting bolts or screws to be furnished by installer. For No. 6628 assembly use No. 6650 1 1/2" size KIMAX coupling on outlet.

## 6724 Sink Strainer (All Cup Sinks)

| Size | Art No.   |
|------|-----------|
| 2    | 6724-2000 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable

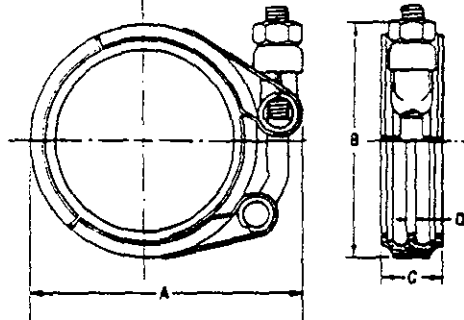
# couplings

## 6650—Drainline Coupling (Bead to Bead)

No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4", and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna-N rubber compression liner with TFE seal ring
- No. 6653 stainless steel bolt
- No. 6664 Silver plated stainless steel hex nut

Patented



| Size | A  | B  | C  | D    | Bolt Size    | Art. No.   |
|------|----|----|----|------|--------------|------------|
| 1½   | 3  | 2¾ | 1¾ | 3/16 | 1/4 -28 x 2¾ | 6650- 1500 |
| 2    | 3¾ | 3¼ | 1¾ | 3/16 | 1/4 -28 x 2¾ | 2000       |
| 3    | 4¾ | 4¼ | 1¾ | 3/16 | 1/4 -28 x 2¾ | 3000       |
| 4    | 6  | 5½ | 1½ | 3/16 | 1/4 -28 x 3¼ | 4000       |
| 6    | 8¾ | 7¾ | 1¾ | 1/4  | 5/16 -24 x 4 | 6000       |

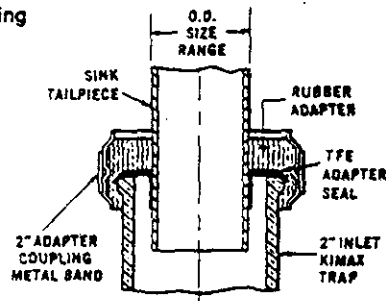
## 6655—Adapter Coupling

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6658 TFE adapter seal
- No. 6653 stainless steel bolt, ¼"-28 x 2¾
- No. 6664 Silver plated stainless steel hex nut

Patent Pending



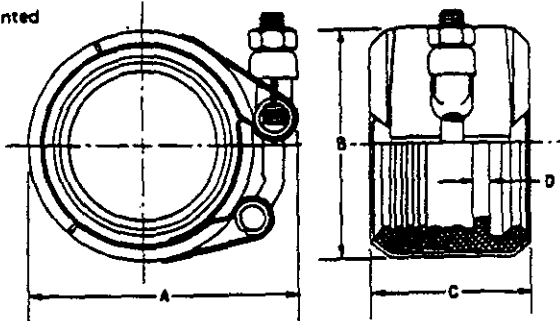
| Size      | Tailpiece Style                                                                                                                                                            | O.D. Size Range | Art. No.   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|
| 2 x 1½    | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                      | 1.48 to 1.53    | 6655- 2015 |
| 2 x 1¾    | Lead, Class Q or XL tailpiece PYREX tailpiece and cup sink                                                                                                                 | 1.70 to 1.78    | 2017       |
| 2 x 1-7/8 | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Durcon = SO-2<br>Duriron = 11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 1.82 to 1.90    | 2018       |

## 6661—B/P Drainline Coupling (Bead to Plain End)

No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3", 4" or 6" KIMAX beaded glass drainline to plain end (cut) glass pipe; lead, I.P.S. metal, or plastic pipe. This exclusively designed KIMAX drainline coupling consists of the following components:

- No. 6662 stainless steel band with bolt
- No. 6663 Buna-N rubber compression liner with TFE seal ring
- No. 6664 silver plated stainless steel hex nut

Patented



| Size | A  | B  | C  | D    | Bolt Size   | Art. No.   |
|------|----|----|----|------|-------------|------------|
| 1½   | 3  | 2¾ | 1¾ | 3/16 | 1/4-28      | 6661- 1500 |
| 2    | 3¾ | 3¼ | 1¾ | 3/16 | 1/4-28      | 2000       |
| 3    | 4¾ | 4¼ | 2¾ | 3/16 | 5/16-24     | 3000       |
| 4    | 6  | 5¾ | 2¾ | 3/16 | 5/16-24 (2) | 4000       |
| 6    | 8¾ | 7¾ | 4  | 1/4  | 5/16-24 (2) | 6000       |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

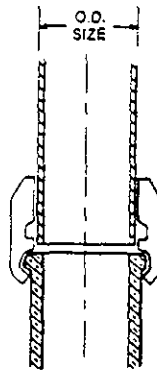
†Manufactured per order. Not returnable.

# couplings

## 6665—Adapter Coupling

Used to join 1½" beaded KIMAX drainline pipe to 1¼" or 1½" O.D. tubing.

Note: Rubber seal only - not recommended where solvents will come in contact with the coupling seal.



| Size    | Tailpiece Style | Art. No.   |
|---------|-----------------|------------|
| 1½ x 1¼ | 1¼" O.D. tubing | 6665-1512† |
| 1½ x 1½ | 1½" O.D. tubing | 1515       |

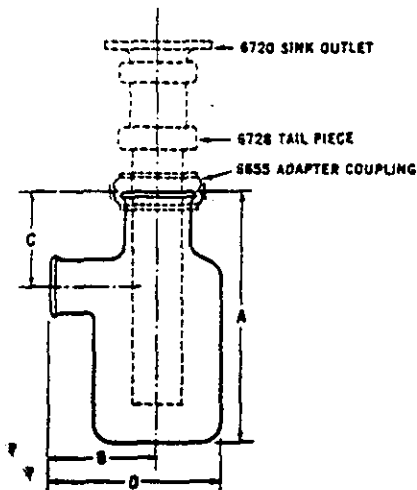
## drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

### 6614—Partition Trap (Consists of Trap Body Only)

Available with 2" inlet only. 1½" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

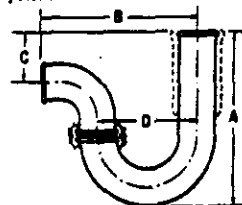
Traps are non-siphoning with partition always visible.  
Traps available with B type cleanout. See Standard Cleanout, Page 21.



| Size<br>Inlet x Outlet | A  | B  | C  | D | Art. No.  |
|------------------------|----|----|----|---|-----------|
| 2 x 1½                 | 8½ | 3¾ | 3¾ | 6 | 6614-2015 |
| 2 x 2                  | 8½ | 3¾ | 4¾ | 6 | -2020     |

### 6700—Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  |
|------------------------|----|----|----|----|-----------|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  | 6700-1515 |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  | -2015     |
| 2 x 2                  | 9¼ | 8¾ | 1¾ | 5½ | -2020     |

See Standard Cleanout, Page 21.

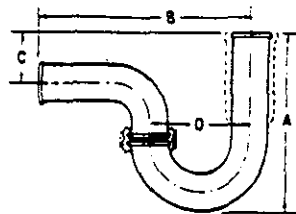
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# drainline traps Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6701—Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

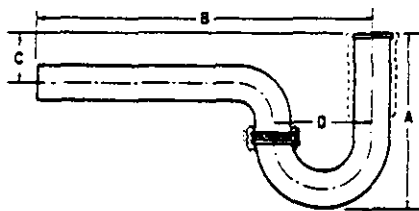


| Size<br>Inlet x Outlet | A     | B  | C     | D     | Art. No.  |
|------------------------|-------|----|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 9 1/4 | 11 | 1 3/8 | 5     | 6701-1515 |
| 2 x 1 1/2              | 8 3/4 | 11 | 1 3/8 | 5     | -2015     |
| 2 x 2                  | 8 3/4 | 13 | 1 1/4 | 5 1/2 | -2020     |

See Standard Cleanout, Page 21.

## 6704—Swivel Trap—P Style (Plain End Outlet\*)

No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

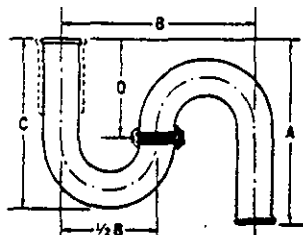


| Size<br>Inlet x Outlet | A     | B      | C     | D     | Art. No.  |
|------------------------|-------|--------|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 8 3/4 | 17     | 1 3/8 | 5     | 6704-1515 |
| 2 x 1 1/2              | 8 3/4 | 17     | 1 3/8 | 5     | -2015     |
| 2 x 2                  | 9 1/4 | 17 1/2 | 1 1/4 | 5 1/2 | -2020     |

\*Plain end outlet, can be field cut.

## 6706—Swivel Trap—S Style

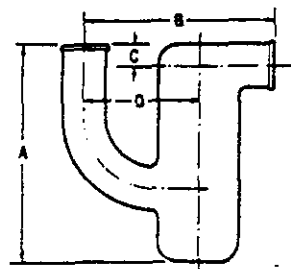
No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A     | B  | C     | D     | Art. No.  |
|------------------------|-------|----|-------|-------|-----------|
| 1 1/2 x 1 1/2          | 10    | 10 | 8 3/4 | 5     | 6706-1515 |
| 2 x 1 1/2              | 10    | 10 | 8 3/4 | 5     | -2015     |
| 2 x 2                  | 9 3/4 | 11 | 9 1/4 | 4 3/8 | -2020     |

## 6707—Drum Trap—P Style

Traps available with S type cleanout. See Standard Cleanout, Page 21.



| Size<br>Inlet x Outlet | A     | B     | C     | D     | Body<br>I.D. | Art. No.  |
|------------------------|-------|-------|-------|-------|--------------|-----------|
| 1 1/2 x 1 1/2          | 9     | 8     | 1     | 4 3/4 | 3            | 6707-1515 |
| 2 x 1 1/2              | 9     | 8     | 1 1/2 | 4 3/4 | 3            | -2015     |
| 2 x 2                  | 9 3/4 | 9 1/4 | 2     | 5 1/2 | 4            | -2020     |

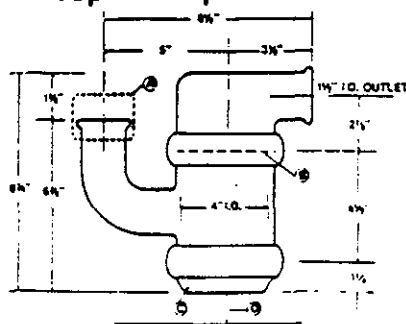
Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6708—Interceptor Trap

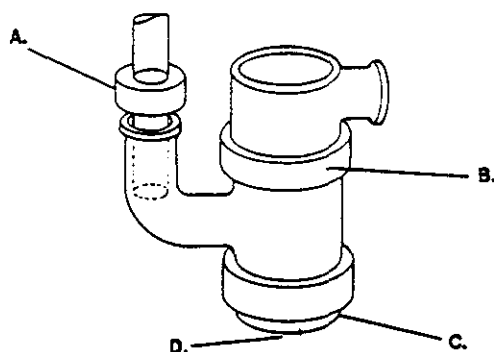


A. Adapter Coupling #6665-1512 (to connect to 1 1/4" O.D. tubing)  
(Rubber Seal) #6665-1515 (to connect to 1 1/2" O.D. tubing)

B. Perforated S.S. Screen 1/16" dia. holes 6 sq. in. free area opp.

C. Removable coupling/end cap for cleanout.

D. Min. 3" clearance required under trap for removal of end cap.



| Size              | Description      | Art. No.   |
|-------------------|------------------|------------|
| 1 1/2" x 1 1/4"   | Interceptor Trap | 6708- 4015 |
| 1 1/4" O.D. Inlet | Adapter Coupling | 6665- 1512 |
| 1 1/2" O.D. Inlet | Adapter Coupling | 6665- 1515 |

### Specifications

KIMAX Borosilicate Glass Interceptor Trap with 1 1/2" I.D. inlet, 1 1/2" I.D. outlet and 4" I.D. body. Perforated S.S. Screen Interceptor 4" dia. with 1/16" holes and effective 6 sq. in. free area opening. Bottom C.O. Coupling with end cap for cleaning.

### Connections

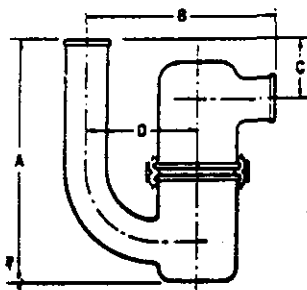
1. For DWV Service use KIMAX Adapter Coupling 6665-1515 for 1 1/2" OD. tubing or 6665-1512 for 1 1/4" O.D. tubing. RUBBER SEAL ONLY.

2. To connect to 1 1/2" IPS metal or rigid plastic plain end pipe, use KIMAX B/P Coupling 6661-1500.

3. To connect to 1 1/2" I.D. glass drainline, use KIMAX Couplings 6650-1500 or 6661-1500.

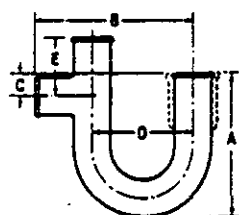
## 6710—Swivel Drum Trap—P Style

No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size Inlet x Outlet | A      | B     | C     | D     | Body I.D. | Art. No.  |
|---------------------|--------|-------|-------|-------|-----------|-----------|
| 1 1/2 x 1 1/2       | 10 1/4 | 8     | 2 1/2 | 4 3/4 | 3         | 6710-1515 |
| 2 x 1 1/2           | 10 1/4 | 8     | 2 1/2 | 4 3/4 | 3         | -2015     |
| 2 x 2               | 11     | 9 1/4 | 3     | 5 1/2 | 4         | -2020     |

## 6713—Trap—P Style (Vented)†



| Size Inlet x Outlet | Vent Size | A      | B      | C     | D     | E     | Art. No.    |
|---------------------|-----------|--------|--------|-------|-------|-------|-------------|
| 1 1/2 x 1 1/2       | 1 1/2     | 7      | 8      | 1     | 5     | 3     | 6713- 1515† |
| *2 x 1 1/2          | 1 1/2     | 7 1/2  | 8      | 1 1/2 | 5     | 3     | *2015†      |
| 2 x 2               | 2         | 8 1/4  | 8 1/4  | 1 1/2 | 5 1/2 | 3 1/2 | 2020†       |
| 3 x 3               | 3         | 10 1/4 | 10 1/2 | 2     | 6 1/2 | 4     | 3030†       |
| 4 x 4               | 4         | 12 1/4 | 12 1/2 | 2 1/2 | 7 1/2 | 5     | 4040†       |
| 6 x 6               | 4         | 16 3/4 | 31     | 2 1/2 | 24    | 7     | **6060†     |

\*Has expanded inlet. Use No. 6656 adapter coupling for inlet joint.

\*\*No cleanouts on 6 x 6 traps.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

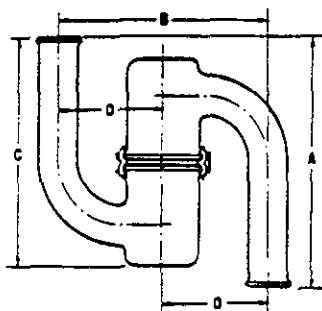
†Manufactured per order. Not returnable.

# drainline traps

Expanded inlets of traps have 4" minimum depth to permit adjustment.

## 6714—Swivel Drum Trap—S Style

No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.

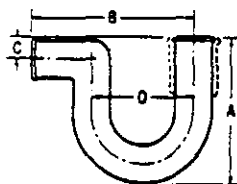


| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>I.D. | Art. No.  |
|------------------------|-----|----|-----|----|--------------|-----------|
| 1½ x 1½                | 11¼ | 9½ | 10¼ | 4¾ | 3            | 6714-1515 |
| 2 x 1½                 | 11¼ | 9½ | 10¼ | 4¾ | 3            | -2015     |
| 2 x 2                  | 11¼ | 11 | 11  | 5½ | 4            | -2020     |

Traps available with B type cleanout. See Standard Cleanout, Page 21.

## 6718 Trap—P Style

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with B type cleanout. See Standard Cleanout, Page 21.

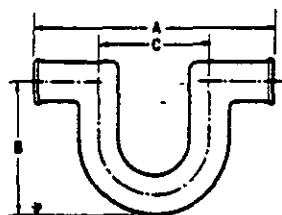


| Size<br>Inlet x<br>Outlet | A   | B   | C  | D  | E  | Art. No.  |
|---------------------------|-----|-----|----|----|----|-----------|
| 1½ x 1½                   | 7   | 8   | 1  | 5  | 3  | 6718-1515 |
| 2 x 1½                    | 7½  | 8   | 1½ | 5  | 3  | -2015     |
| 2 x 2                     | 8¾  | 8¾  | 1½ | 5½ | 3½ | -2020     |
| 3 x 3                     | 10¼ | 10½ | 2  | 6½ | 4  | -3030     |
| 4 x 4                     | 12¼ | 12½ | 2½ | 7½ | 5  | -4040     |
| 6 x 6                     | 18½ | 31  | 3¾ | 24 | 7  | **6060†   |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
\*\*No cleanouts on 6 x 6 traps.

## 6770 Running Trap

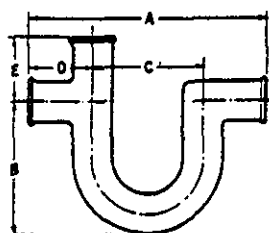
Traps available with B type cleanout. See Standard Cleanout, Page 21.



| Size<br>Inlet x<br>Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|---------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                   | 1½           | 11  | 6   | 5  | 3  | 3  |
| 2 x 2                     | 2            | 12  | 6½  | 5½ | 3¾ | 3½ |
| 3 x 3                     | 3            | 14½ | 8¾  | 6½ | 4  | 4  |
| 4 x 4                     | 4            | 17½ | 9¾  | 7½ | 5  | 5  |
| *6 x 6                    | 4            | 38  | 14¾ | 24 | 7  | 7  |

\*No cleanouts on 6 x 6 traps.

## 6771 Running Trap (Vented)



| 6770<br>Art. No. | 6771<br>Art. No. |
|------------------|------------------|
| 6770- 1515       | 6771- 1515       |
| 2020             | 2020             |
| 3030             | 3030             |
| 4040             | 4040             |
| *6060†           | *6060†           |

\*No cleanouts on 6 x 6 traps.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.

# drainline traps Expanded inlets of traps have 4" minimum depth to permit adjustment.

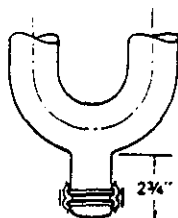
## Type B—Standard Cleanout

Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

To order standard traps with cleanouts use catalog number for proper style and add the letter B. (Example 6718-B-1515)  
For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

| Size | Art. No. |
|------|----------|
| 1½   | 8        |



## accessories and hardware

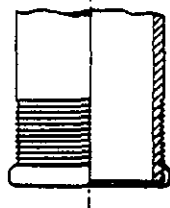
### 6680 Thread Adapters

#### (Threaded to Beaded Pipe)

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", and 4" sizes.

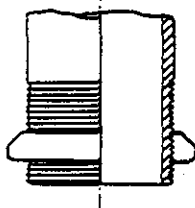
| Size | Art. No.  |
|------|-----------|
| 1½   | 6680-1500 |
| 2    | -2000     |
| 3    | -3000     |
| 4    | -4000     |



### 6685—Adjustable Thread Adapter

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.

| Size   | Art. No.  |
|--------|-----------|
| 2 x 1½ | 6685-2015 |



Use catalog dimensions for piping layout as gasket thickness allowance is included.

†Manufactured per order. Not returnable.



# accessories and hardware

## 6720 Sink Outlet Assembly (1½" and 2" sizes)

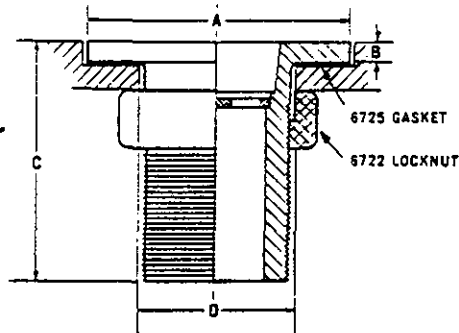
### 6720D 2"—For Use With Sinks Having 3⅝" Counterbore

Consists of:

6724 sink strainer (black fluorocarbon plastic) 1½" or 2"  
6721 and 6721D sink outlet (black fluorocarbon plastic)  
6725 gasket—neoprene  
6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard overflows.

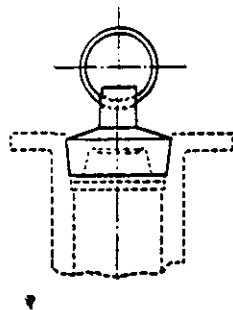
For sink outlet tailpiece connections, see No. 6728 dimensions on Page 23.



| Size | A  | B | C  | D  | Art. No.    |
|------|----|---|----|----|-------------|
| 1½   | 3¾ | ¼ | 2¾ | 2  | 6720- 1500  |
| 2    | 3⅞ | ¼ | 3  | 2¾ | 2000        |
| 2    | 3¾ | ¼ | 3  | 2¾ | 6720D- 2000 |

## 6726 Sink Stopper

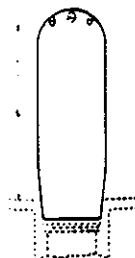
No. 6726 Sink Stopper is available in 1½" and 2" size in lead.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6726-1500 |
| 2    | -2000†    |

## 6727 Sink Overflow – Beehive Type

Sink Overflow is made of black fluorocarbon plastic. Beehive type can be modified to open type by cutting off top beehive section.



| Sink Outlet Size | Size   | Beehive Type Length | Art. No.   |
|------------------|--------|---------------------|------------|
| 1½               | 1½ x 4 | 4"                  | 6727- 1504 |
| 1½               | 1½ x 6 | 6"                  | 1506       |
| 1½               | 1½ x 8 | 8"                  | 1508       |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

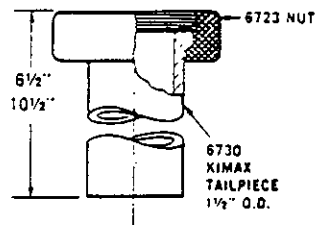
†Manufactured per order. Not returnable.

# accessories and hardware

## 6728 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having straight pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut . . . do not use pipe wrench.



| Size     | Art. No.  |
|----------|-----------|
| 1½ x 6½  | 6728-1060 |
| 1½ x 10½ | -1100     |

### Components of 6728 6723-Nut

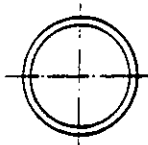
| Size | Art. No.  |
|------|-----------|
| 1½   | 6723-1500 |

### 6730 Tail Piece

| Size     | Art. No.  |
|----------|-----------|
| 1½ x 6½  | 6730-1060 |
| 1½ x 10½ | -1100     |

## 6738—Gasket

Use gasket No. 6738 when connecting glass tailpiece #6728 to threaded metal pipe or plastic pipe.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6738-1500 |

## 6735—1½" Split Coupling (Threaded to Beaded Pipe)

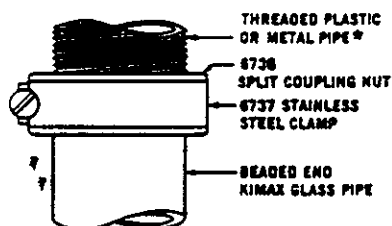
No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" I.P.S. pipe.

The assembly consists of:

No. 6736 split coupling nut

No. 6737 stainless steel clamp

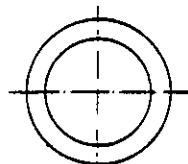
To install . . . remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6735-1500 |

## 6739 Gasket\*

Use gasket No. 6739 when connecting KIMAX glass pipe to threaded metal pipe, using No. 6735 split coupling.



| Size | Art. No.  |
|------|-----------|
| 1½   | 6739-1500 |

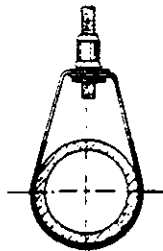
Use catalog dimensions for piping layout as gasket thickness allowance is included.

\*Manufactured per order. Not returnable.

# accessories and hardware

## 7290 (1½", 2", 3", 4", 6" sizes) Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.

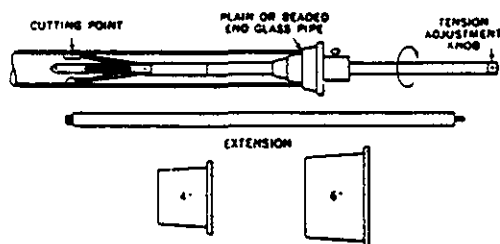


| Size | Art. No.  |
|------|-----------|
| 1½   | 7290-1500 |
| 2    | -2000     |
| 3    | -3000     |
| 4    | -4000     |
| 6    | -6000     |

## 7310-56802 KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut 1½"—6" glass drainage anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm subassembly and 1½"—4" centering cones and ring stop as shown.

Contact distributor for information & price.



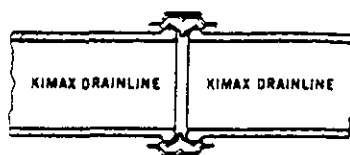
CENTERING CONES  
Order 6" centering cone separately.

# typical joint reference chart

## Type of Pipe

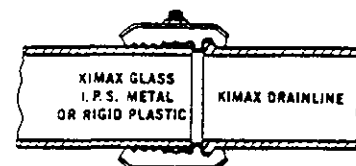
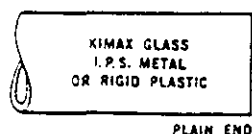
## Type of Joint

## Material Needed



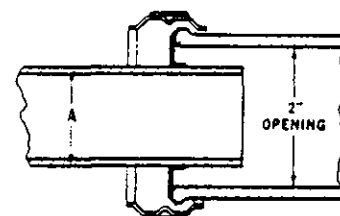
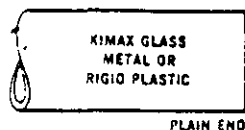
### KIMAX Drainline Coupling 6650

| Size  | Code No.  |
|-------|-----------|
| 1 1/2 | 6650-1500 |
| 2     | 6650-2000 |
| 3     | 6650-3000 |
| 4     | 6650-4000 |
| 6     | 6650-6000 |



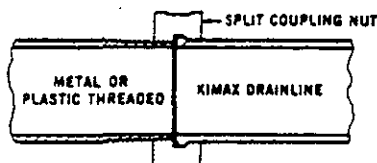
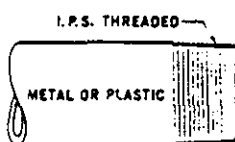
### KIMAX B/P Coupling 6661

| Pipe Size | Code No.  |
|-----------|-----------|
| 1 1/2     | 6661-1500 |
| 2         | 6661-2000 |
| 3         | 6661-3000 |
| 4         | 6661-4000 |
| 6         | 6661-6000 |



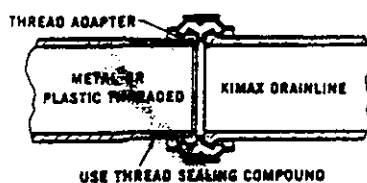
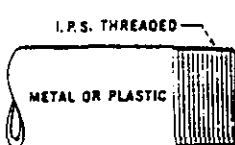
### KIMAX Adapter Coupling

| "A" Dimension<br>Pipe O.D. | Coupling<br>Size | Code No.  |
|----------------------------|------------------|-----------|
| 1.48—1.53                  | 2 x 1 1/2        | 6655-2015 |
| 1.70—1.78                  | 2 x 1 3/4        | 6655-2017 |
| 1.82—1.90                  | 2 x 1 7/8        | 6655-2018 |



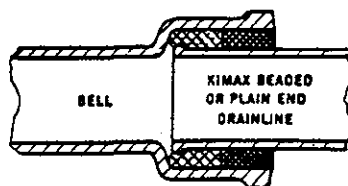
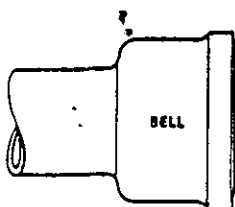
### KIMAX Split Coupling

| Pipe Size | Coupling<br>Code No. | Gasket<br>Code No. |
|-----------|----------------------|--------------------|
| 1 1/2     | 6735-1500            | 6739-1500          |



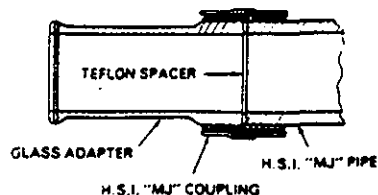
### KIMAX Thread Adapter and Drainline Coupling

| Pipe Size | Adapter<br>Code No. | Coupling<br>Code No. |
|-----------|---------------------|----------------------|
| 1 1/2     | 6680-1500           | 6650-1500            |
| 2         | 6680-2000           | 6650-2000            |
| 3         | 6680-3000           | 6650-3000            |
| 4         | 6680-4000           | 6650-4000            |
| 6         | 6680-6000           | 6650-6000            |



### KIMAX Glass to Bell End Pipe

1. Pack hub half full with asbestos rope.
  2. Caulk with hot lead, lead wool or acid-proof cement.
- For Details, see Drainline Installation Manual.



### Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | Adapter<br>Code No. | MJ<br>Coupling |
|-----------|---------------------|----------------|
| 1 1/2     | 6566-1500           | Furnished      |
| 2         | 6566-2000           | By Others      |
| 3         | 6566-3000           |                |
| 4         | 6566-4000           |                |

# case quantities and weight per case

| Article                      | Size           | Case Qty. | Approx. Wt.      |
|------------------------------|----------------|-----------|------------------|
| <b>Pipe-Straight Lengths</b> |                |           |                  |
| 6500                         | 1500           | 4         | 1½ lbs. per ft.  |
| 6501                         | 2000           | 4         | 1½ " " "         |
| &                            | 3000           | 2         | 2½ " " "         |
| 6504                         | 4000           | 1         | 4 " " "          |
|                              | 6000           | 1         | 6 " " "          |
| 6502                         | 1500           | 6         | 1½ " " "         |
|                              | 2000           | 6         | 1½ " " "         |
|                              | 3000           | 8         | 2½ " " "         |
|                              | 4000           | 6         | 4 " " "          |
|                              | 6000           | 1         | 6 " " "          |
| <b>Sweeps or Bends</b>       |                |           |                  |
| 6511                         | All 1½"        | 12        | 11 lbs. per Case |
|                              | " 2"           | 6         | 9 " " "          |
|                              | " 3"           | 2         | 6 " " "          |
|                              | " 4"           | 1         | 6 " " "          |
|                              | " 6"           | 1         | 13 " " "         |
| 6512                         | " 1½"          | 8         | 7 " " "          |
| &                            |                |           |                  |
| 6512P                        | 2"             | 6         | 8 " " "          |
| 6513                         | All 1½"        | 18        | 15 " " "         |
|                              | 2"             | 12        | 18 " " "         |
|                              | 3" 90° only    | 3         | 9 " " "          |
|                              | Other than 90° | 4         | 12 " " "         |
|                              | 4"             | 1         | 6 " " "          |
|                              | 6"             | 1         | 13 " " "         |
| 6514                         | 1½"            | 18        | 15 " " "         |
| 6518                         | 2"             | 8         | 8 " " "          |
|                              | 3"             | 2         | 4 " " "          |
|                              | 4"             | 1         | 5 " " "          |
|                              | 6"             | 1         | 10 " " "         |
| 6519                         | 1½"            | 12        | 10 " " "         |
|                              | 2"             | 8         | 9 " " "          |
|                              | 3"             | 2         | 4 " " "          |
|                              | 4"             | 1         | 5 " " "          |
|                              | 6"             | 1         | 13 " " "         |
| 6519P                        | All sizes      | 4         | 8 " " "          |
| <b>Adjustable San T</b>      |                |           |                  |
| 6520                         | 1½"            | 4         | 5 " " "          |
| 6530                         | 1½"            | 4         | 5 " " "          |

| Article                 | Size         | Case Qty. | Approx. Wt. (lbs.) |
|-------------------------|--------------|-----------|--------------------|
| <b>Sanitary T</b>       |              |           |                    |
| 6521                    | 1½"          | 12        | 15                 |
| &                       | 2"           | 8         | 12                 |
| 6541                    | 3"           | 2         | 8                  |
|                         | 3" x 3" only | 1         | 4                  |
|                         | All others   | 2         | 8                  |
|                         | 4"           | 1         | 8                  |
|                         | 6"           | 1         | 15                 |
| 6522                    | 1½"          | 8         | 12                 |
| &                       | 2"           | 4         | 10                 |
| 6542                    | 3"           | 1         | 6                  |
|                         | 4"           | 1         | 10                 |
|                         | 6"           | 1         | 16                 |
| 6523                    | 1½"          | 12        | 15                 |
|                         | 2"           | 8         | 12                 |
|                         | 3"           | 2         | 8                  |
|                         | 4"           | 1         | 8                  |
|                         | 6"           | 1         | 15                 |
| <b>Y Branch</b>         |              |           |                    |
| 6526                    | 1½"          | 12        | 15                 |
|                         | 2"           | 6         | 9                  |
| 6546                    | 3"           | 2         | 8                  |
|                         | 4"           | 1         | 8                  |
|                         | 6"           | 1         | 15                 |
| 6527                    | 1½"          | 8         | 12                 |
| &                       | 2"           | 4         | 10                 |
| 6547                    | 3"           | 1         | 4                  |
|                         | 4"           | 1         | 8                  |
|                         | 6"           | 1         | 15                 |
| <b>Com Y &amp; 1/8"</b> |              |           |                    |
| 6528                    | 1½"          | 12        | 15                 |
| &                       | 2"           | 6         | 9                  |
| 6548                    | 3" x 1½"     | 2         | 8                  |
|                         | 3" x 2"      | 1         | 6                  |
|                         | 3" x 3"      | 1         | 7                  |
|                         | 4"           | 1         | 6                  |
|                         | 6"           | 1         | 7                  |
| 6529                    | 1½"          | 8         | 12                 |
| &                       | 2"           | 4         | 10                 |
| 6549                    | 3"           | 1         | 5                  |
|                         | 4"           | 1         | 9                  |
|                         | 6"           | 1         | 16                 |

Items not listed are packed in quantity ordered.

# case quantities and weight per case

| Article                         | Size     | Case Qty. | Approx. Wt. (lbs.) |
|---------------------------------|----------|-----------|--------------------|
| <b>Partition Cross</b>          |          |           |                    |
| 6531                            | 2"       | 4         | 5                  |
| <b>Upright Y or H</b>           |          |           |                    |
| 6532                            | 1½"      | 8         | 10                 |
|                                 | 2"       | 4         | 6                  |
|                                 | 3"       | 1         | 4                  |
|                                 | 4"       | 1         | 10                 |
|                                 | 6"       | 1         | 16                 |
| <b>Reducers</b>                 |          |           |                    |
| 6536                            | 2"       | 18        | 14                 |
| &                               | 3"       | 6         | 9                  |
| 6537                            | 4"       | 1         | 3                  |
|                                 | 6"       | 1         | 6                  |
| <b>Vent Increasers</b>          |          |           |                    |
| 6540                            | 1½"      | 4         | 6                  |
|                                 | 2"       | 4         | 7                  |
|                                 | 3"       | 2         | 6                  |
| <b>Cleanout Plugs</b>           |          |           |                    |
| 6544                            | 1½"      | 36        | 12                 |
|                                 | 2"       | 36        | 12                 |
|                                 | 3"       | 27        | 9                  |
|                                 | 4"       | 18        | 18                 |
|                                 | 6"       | 12        | 14                 |
| <b>U Bend</b>                   |          |           |                    |
| 6550                            | 1½"      | 8         | 10                 |
|                                 | 2"       | 4         | 10                 |
|                                 | 3"       | 2         | 15                 |
|                                 | 4"       | 1         | 11                 |
| <b>M. J. Adapters</b>           |          |           |                    |
| 6566                            | 1½"      | 8         | 6                  |
|                                 | 2"       | 8         | 7                  |
|                                 | 3"       | 1         | 2                  |
|                                 | 4"       | 1         | 3                  |
| <b>Swivel P Trap</b>            |          |           |                    |
| 6700                            | 1½"      | 4         | 12                 |
|                                 | 2" x 1½" | 4         | 12                 |
|                                 | 2"       | 2         | 6                  |
| <b>Inlet Only</b>               |          |           |                    |
| 6705                            | 1½"      | 6         | 9                  |
|                                 | 2" x 1½" | 6         | 14                 |
|                                 | 2" x 2"  | 4         | 10                 |
| <b>Swivel Drum Trap P Style</b> |          |           |                    |
| 6710                            | 1½"      | 1         | 5                  |
|                                 | 2" x 1½" | 1         | 6                  |
|                                 | 2" x 2"  | 1         | 9                  |

Items not listed are packed in quantity ordered.

| Article                     | Size     | Case Qty. | Approx. Wt. |
|-----------------------------|----------|-----------|-------------|
| <b>Inlet or Outlet Only</b> |          |           |             |
| 6715                        | 1½" x 3" | 2         | 10          |
|                             | 2" x 3"  | 2         | 14          |
|                             | 2" x 4"  | 1         | 8           |
| 6716                        | 3" x 1½" | 2         | 6           |
|                             | 4" x 2"  | 1         | 4           |
| <b>P Trap</b>               |          |           |             |
| 6718                        | 1½"      | 4         | 8           |
|                             | 2"       | 4         | 9           |
|                             | 3"       | 1         | 6           |
|                             | 4"       | 1         | 10          |
|                             | 6"       | 1         | 18          |
| <b>Running Trap</b>         |          |           |             |
| 6770                        | 1½"      | 2         | 15          |
| &                           | 2"       | 2         | 16          |
| 6771                        | 3"       | 1         | 7           |
|                             | 4"       | 1         | 11          |
|                             | 6"       | 1         | 18          |
| <b>Interceptor Trap</b>     |          |           |             |
| 6708                        | 4015     | 1         | 10          |
| <b>Partition Trap</b>       |          |           |             |
| 6614                        | 2"       | 1         | 5           |
| <b>Cup Sinks</b>            |          |           |             |
| All sizes                   |          | 1         | 3           |
| <b>Couplings</b>            |          |           |             |
| 6650                        | 1½"      | 50        | 20          |
|                             | 2"       | 50        | 25          |
|                             | 3"       | 24        | 17          |
|                             | 4"       | 24        | 24          |
|                             | 6"       | 10        | 20          |
| 6655                        | All      | 50        | 20          |
| 6661                        | 1½"      | 50        | 21          |
|                             | 2"       | 50        | 25          |
|                             | 3"       | 20        | 20          |
|                             | 4"       | 12        | 23          |
|                             | 6"       | 5         | 24          |
| <b>Sink Outlet Assy.</b>    |          |           |             |
| 6720                        | All      | 12        | 8           |
| <b>Tailpiece Assy.</b>      |          |           |             |
| 6728                        | 1½" x 6" | 12        | 10          |
|                             | 1" x 10" | 8         | 11          |

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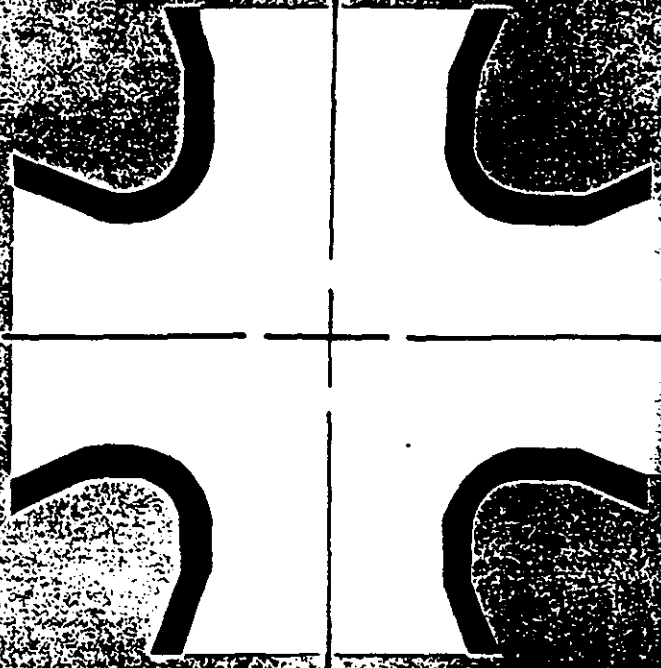
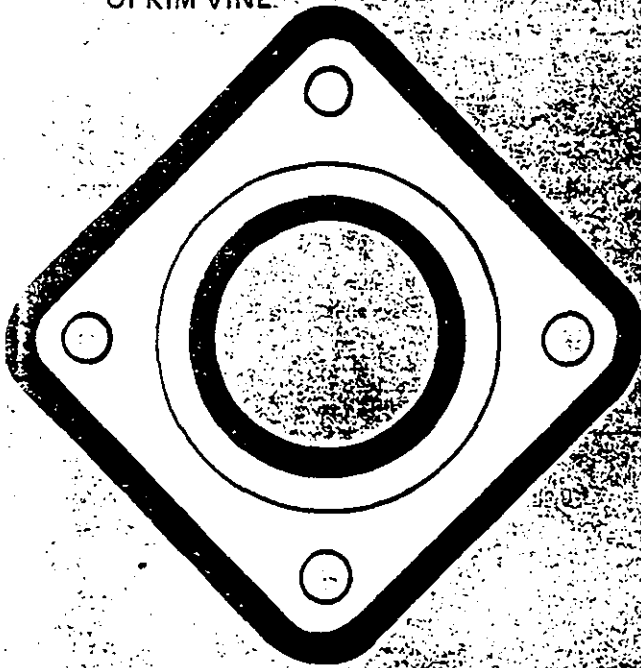
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OI KIM VINE

Conical End Process Pipe  
FPS-61-3





# KIMAX conical end GLASS PROCESS PIPE

## Uses

KIMAX Tempered Glass Pipe has found wide application in a variety of industries. Among current users of KIMAX process pipe are chemical, food, dairy products and pharmaceutical processors; textiles; paper and pulp; photo engravers; aeronautical researchers and atomic energy plants.

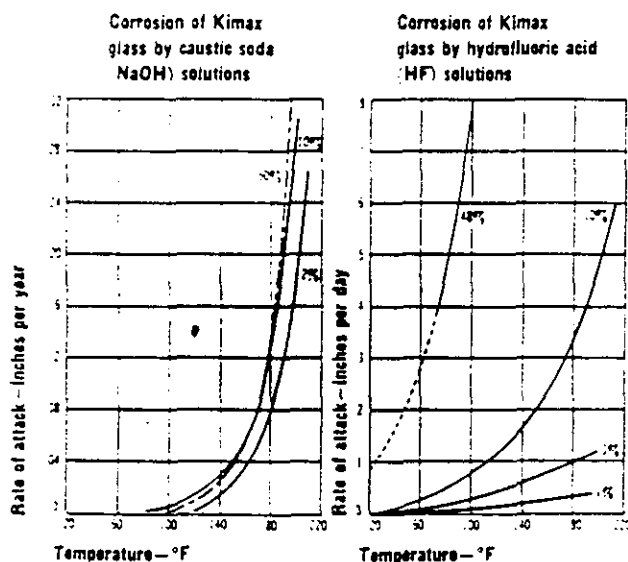
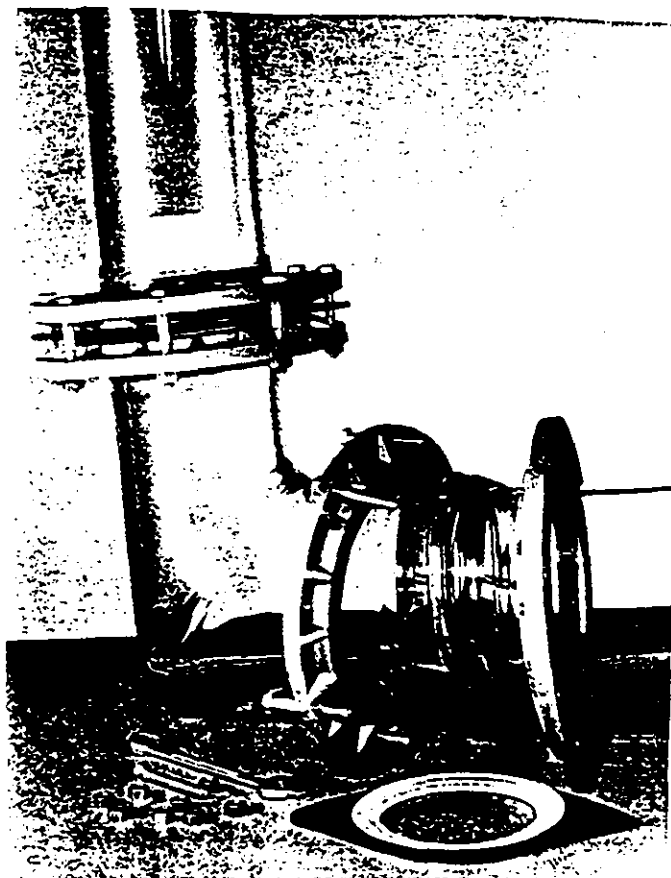
The transparency and corrosion resistance of KIMAX pipe makes it suitable for untold applications where observation of the process is vital. For instance, many engineers insert short lengths of KIMAX pipe in non-transparent pipe systems for use as sight flow indicators.

KIMAX glass pipe and fittings can be easily fabricated at the factory into special shapes for special uses. Some examples are receiver vessels; boiling units; reaction chambers; and tubulated pipe.

## Advantages

**Adaptability.** KIMAX glass pipe is readily joined to other materials including threaded pipe, straight tubing and glass-lined steel, by means of standard coupling devices listed in the FLANGE, GASKET AND ACCESSORIES Section.

**Corrosion Resistance.** KIMAX Glass Pipe is manufactured from KG-33 borosilicate glass, the same "hard" glass used in laboratory apparatus for its chemical durability and thermal shock resistance.



KIMAX pipe resists attack from most chemicals including mineral and organic acids;  $\text{SO}_2$  vapor; chlorinated hydrocarbons; organic solvents; hydrogen peroxide and a wide variety of corrosive mixtures. It is not recommended for use with hydrofluoric acid; phosphoric acid with fluorides; or hot potassium and sodium hydroxides.

Solutions containing alkalis attack glass very slowly at room temperatures. The rate of attack increases rapidly as temperature increases, as shown in the accompanying table.

**Durability.** Uniform, heavy walls and selective tempering (adding surface stress) of all straight lengths and most fittings impart exceptional strength and ability to resist impact damage. Caps, U-bends, thermometer wells, spacers and some traps are annealed only, due to their shape. These parts are clearly identified.

Economy is inherent in KIMAX glass pipe systems. Installation costs are low. Maintenance costs are negligible. And, KIMAX systems are long-lived.

Lightweight. KIMAX glass pipe weighs  $\frac{1}{3}$  to  $\frac{1}{6}$  less than materials performing a similar function. It requires fewer hangers and is easier to install. For comparative weights of process pipe materials, see ENGINEERING Section.

No Scale Build-up. The surface of KG-33 glass is extra smooth and hard, discouraging scale build-up and reducing pressure drop due to friction.

Purity of products and processes is assured by corrosion resistance of KIMAX glass and its freedom from scale build-up.

Thermal Properties. KIMAX pipe will operate in temperatures up to 450° F. Its low coefficient of expansion (see Physical Properties) permits quick transition from cleaning steam to flow of cold liquids.

Transparency is an aid in many processes such as inspection of dye lines and food lines. Transparency permits constant inspection of sedimentation, crystallization or discoloration of liquids. It also enables quick location of stoppages and instant detection of lines that need cleaning.

#### Manufacturing Characteristics

KIMAX Glass Pipe and Fittings are made from machine-drawn, heavy-wall tubing.

Ends are precisely formed and heat-treated for extra strength required to withstand compressive forces at the joint.

#### Physical Properties

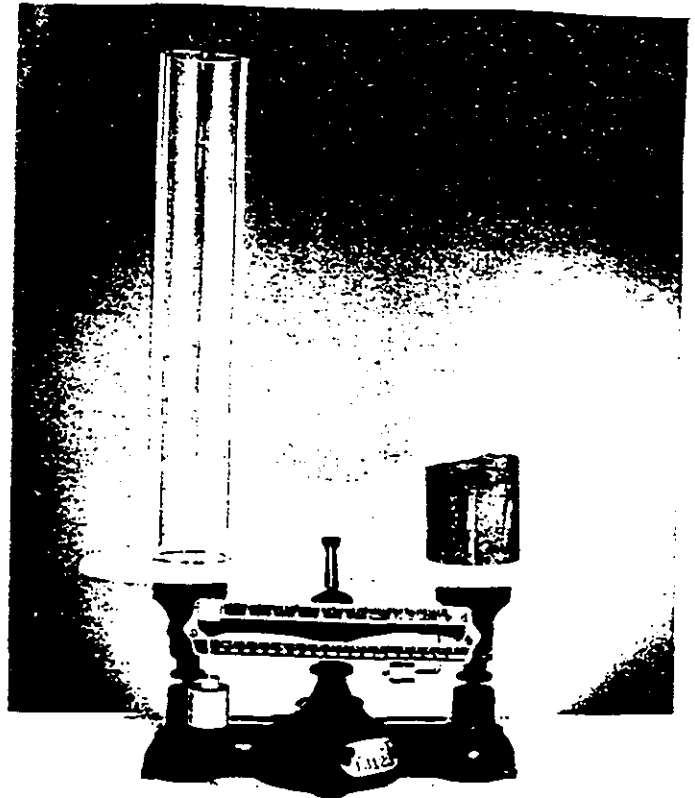
KIMAX (KG-33) borosilicate glass embodies superior physical properties that make it ideally suited for trouble-free conveying of a wide range of liquid and semi-liquid products:

Operating temperatures extend up to 250°F under normal conditions. They may go up to 450° F if insulating protection is provided.

Thermal conductivity: 0.73 B.T.U./hr./ft.<sup>2</sup>/F°/ft. at 212° F.

Thermal expansion of KIMAX pipe is 0.22 inches per 100 feet per 100° F temperature change.

Thermal shock differential ranges from 160° F to 210° F depending on diameter. See MAXIMUM OPERATING LIMITS table, page 15.



#### Ordering

When ordering a standard item please refer to KIMAX glass pipe price list for catalog number. Specify each item by catalog number, quantity, size (I.D.) and length in inches. Distributors' price list will contain carton quantities and shipping weights.

Rough sketches of proposed lines showing center-to-face dimensions are helpful when asking for a quotation. Your distributor will assist you to lay out lines at lowest cost and to provide technical assistance and installation counsel.

#### Non-Standard Items

KIMAX glass pipe and fittings (other than those listed in this manual) may be prefabricated to your special requirement.

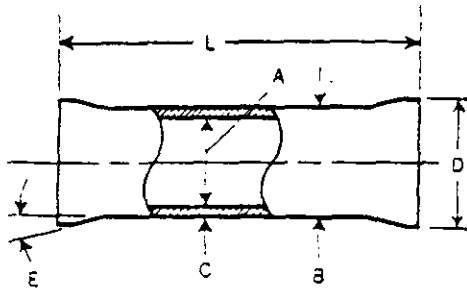
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TFE is the abbreviation given by the Society of Plastic Industry to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

Standard lengths in all diameters are 6": 12": 18": 24": 30": 36": 48": 60": 72": 84": 96": 108": and 120".

Intermediate odd lengths are available on special order. Special lengths up to 15 feet supplied on special order.

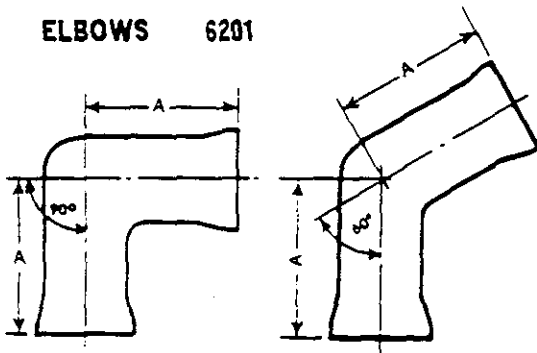


| A<br>Pipe Size<br>(Nom. I.D.) | B<br>Pipe<br>O.D. | C<br>Wall | D<br>Flange<br>O.D. | E<br>Flange<br>Angle | L<br>Min.<br>Length | Weight<br>Lbs., Ft. | Psi<br>Recom.<br>Pressure |
|-------------------------------|-------------------|-----------|---------------------|----------------------|---------------------|---------------------|---------------------------|
| 1"                            | 1 1/4"            | 3/32"     | 1 3/4"              | 12°                  | 3"                  | 60                  | 55                        |
| 1 1/2"                        | 1 7/8"            | 1/16"     | 2 1/4"              | 12°                  | 3 1/2"              | 10                  | 55                        |
| 2"                            | 2 1/8"            | 1/16"     | 2 3/4"              | 12°                  | 4"                  | 113                 | 55                        |
| 3"                            | 3 1/2"            | 1/16"     | 3 3/4"              | 12°                  | 5"                  | 50                  | 55                        |
| 4"                            | 4 1/2"            | 1/16"     | 5 1/4"              | 21°                  | 6"                  | 34                  | 55                        |
| 6"                            | 6 1/2"            | 1/16"     | 7 1/4"              | 21°                  | 6"                  | 93                  | 55                        |

When ordering, specify pipe I.D. and length in inches.

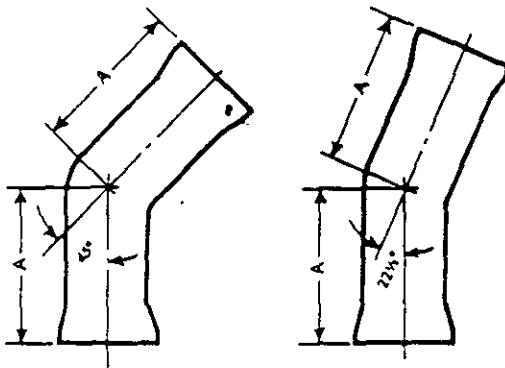
SEE CURRENT PRICE LIST FOR ARTICLE NUMBERS

## ELBOWS 6201

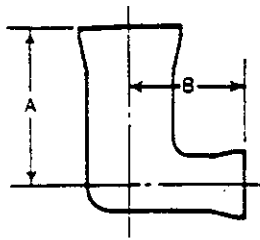


| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2 1/4         |
| 1 1/2                 | 3 1/2         |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

When ordering, specify degree of angle.

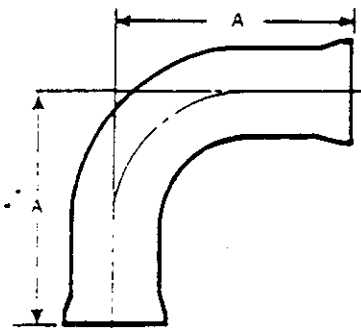


# REDUCER ELBOWS 6202



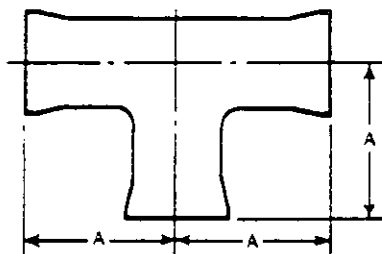
| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1½                    | 1                      | 3½            | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1½                     | 4             | 3½            |
| 3                     | 1                      | 5             | 3½            |
| 3                     | 1½                     | 5             | 4             |
| 3                     | 2                      | 5             | 4½            |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1½                     | 7             | 4½            |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5½            |
| 6                     | 1                      | 9             | 5             |
| 6                     | 1½                     | 9             | 5½            |
| 6                     | 2                      | 9             | 6             |
| 6                     | 3                      | 9             | 6½            |
| 6                     | 4                      | 9             | 7             |

# SWEEP ELBOWS 6239



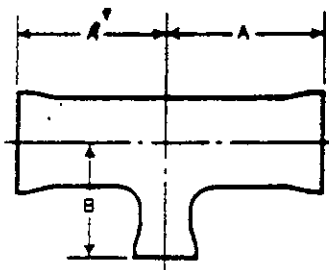
| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 4½            |
| 1½                    | 5             |
| 2                     | 6             |
| 3                     | 7             |
| 4                     | 10            |

# TEES 6210



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2½            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

# REDUCING TEES 6211

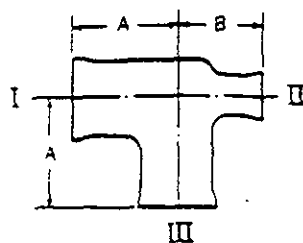


| Pipe Size<br>(inches) | Reduced To<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|------------------------|---------------|---------------|
| 1½                    | 1                      | 3½            | 3             |
| 2                     | 1                      | 4             | 3             |
| 2                     | 1½                     | 4             | 3½            |
| 3                     | 1                      | 5             | 3½            |
| 3                     | 1½                     | 5             | 4             |
| 3                     | 2                      | 5             | 4½            |
| 4                     | 1                      | 7             | 4             |
| 4                     | 1½                     | 7             | 4½            |
| 4                     | 2                      | 7             | 5             |
| 4                     | 3                      | 7             | 5½            |
| 6                     | 1                      | 9             | 5             |
| 6                     | 1½                     | 9             | 5½            |
| 6                     | 2                      | 9             | 6             |
| 6                     | 3                      | 9             | 6½            |
| 6                     | 4                      | 9             | 7             |

When ordering, specify pipe run I.D. and branch I.D.

Other reduction combinations are available on special order to customer's specifications.

# REDUCER TEES 6212

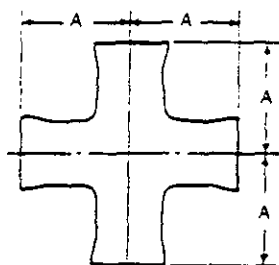


When ordering, specify pipe I.D. in this order: I, II, and III.

| I<br>Pipe Size<br>(inches) | II<br>Pipe Size<br>(inches) | III<br>Pipe Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|----------------------------|-----------------------------|------------------------------|---------------|---------------|
| 1½                         | 1                           | 1½                           | 3½            | 3             |
| 2                          | 1                           | 2                            | 4             | 3             |
| 2                          | 1½                          | 2                            | 4             | 3½            |
| 3                          | 1                           | 3                            | 5             | 3½            |
| 3                          | 1½                          | 3                            | 5             | 4             |
| 3                          | 2                           | 3                            | 5             | 4½            |
| 4                          | 1                           | 4                            | 7             | 4             |
| 4                          | 1½                          | 4                            | 7             | 4½            |
| 4                          | 2                           | 4                            | 7             | 5             |
| 4                          | 3                           | 4                            | -             | 5½            |
| 5                          | 1                           | 6                            | 9             | 5             |
| 5                          | 1½                          | 6                            | 9             | 5½            |
| 5                          | 2                           | 6                            | 9             | 6             |
| 5                          | 3                           | 6                            | 9             | 6½            |
| 6                          | 4                           | 6                            | 9             | 7             |

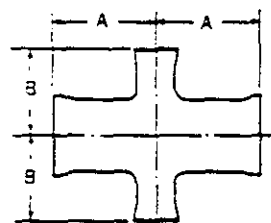
Other reduction combinations are available on special order to customer's specifications.

# CROSSES 6220



| Pipe Size<br>(inches) | A<br>(inches) |
|-----------------------|---------------|
| 1                     | 2¾            |
| 1½                    | 3½            |
| 2                     | 4             |
| 3                     | 5             |
| 4                     | 7             |
| 6                     | 9             |

# REDUCER CROSSES 6250

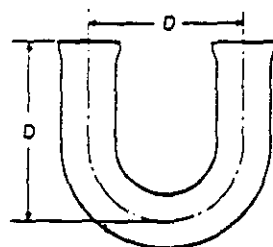


When ordering, specify I.D. of pipe run and branch I.D.

| Pipe Size<br>(inches) | Branch Size<br>(inches) | A<br>(inches) | B<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|
| 1½                    | 1                       | 3½            | 3             |
| 2                     | 1                       | 4             | 3             |
| 2                     | 1½                      | 4             | 3½            |
| 3                     | 1                       | 5             | 3½            |
| 3                     | 1½                      | 5             | 4             |
| 3                     | 2                       | 5             | 4½            |
| 4                     | 1                       | 7             | 4             |
| 4                     | 1½                      | 7             | 4½            |
| 4                     | 2                       | 7             | 5             |
| 4                     | 3                       | 7             | 5½            |
| 6                     | 1                       | 9             | 5             |
| 6                     | 1½                      | 9             | 5½            |
| 6                     | 2                       | 9             | 6             |
| 6                     | 3                       | 9             | 6½            |
| 6                     | 4                       | 9             | 8             |

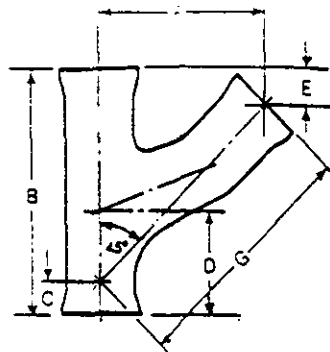
Other reduction combinations are available on special order to customer's specifications.

# "U" BEND 6265



Use soft strip asbestos inserts (7202) only, with this fitting.

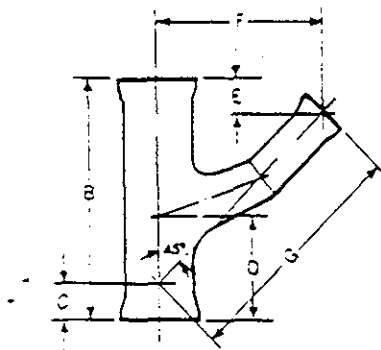
| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 5½            |
| 1½                    | 7             |
| 2                     | 7             |
| 3                     | 9             |
| 4                     | 12            |



When ordering, specify I.D. of pipe and branch.

| Pipe Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1                     | 5 1/2         | 1/8           | 1 1/4         | 1/4           | 3 1/2         | 5 1/2         |
| 1 1/2                 | 7             | 1             | 2 1/4         | 1 1/4         | 5 1/4         | 7 1/2         |
| 2                     | 8             | 1 1/4         | 3 1/4         | 1 1/2         | 5 3/4         | 7 1/2         |
| 3                     | 10            | 1 1/2         | 3 1/2         | 1 3/4         | 7 1/4         | 8 1/2         |
| 4                     | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 10            |
| 6                     | 18            | 3 1/4         | 7 1/4         | 2 3/4         | 11 1/2        | 16 1/4        |

## LATERAL "Y" REDUCERS 6231

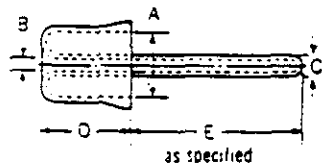


When ordering, specify I.D. of pipe and branch.

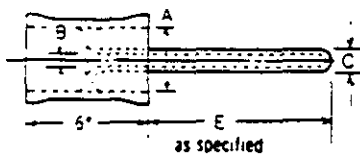
| Pipe Size<br>(inches) | Branch Size<br>(inches) | B<br>(inches) | C<br>(inches) | D<br>(inches) | E<br>(inches) | F<br>(inches) | G<br>(inches) |
|-----------------------|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 2                     | 1                       | 8             | 1 1/4         | 3 1/4         | 1 1/2         | 5 1/4         | 7 1/2         |
| 2                     | 1 1/4                   | 8             | 1 1/4         | 3 1/4         | 1 1/2         | 5 1/4         | 7 1/2         |
| 3                     | 1 1/2                   | 10            | 1 1/2         | 3 1/2         | 1 3/4         | 7 1/4         | 8 1/2         |
| 3                     | 2                       | 10            | 1 1/2         | 3 1/2         | 1 3/4         | 7 1/4         | 8 1/2         |
| 4                     | 1 1/4                   | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 10            |
| 4                     | 2                       | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 10            |
| 4                     | 3                       | 14            | 2 1/4         | 4 1/4         | 2 1/4         | 9 1/4         | 10            |
| 6                     | 3                       | 18            | 3 1/4         | 7 1/4         | 2 3/4         | 11 1/2        | 16 1/4        |

## THERMOMETER WELLS

Thermometer wells protect thermometers and thermocouples in corrosive atmospheres. Length "E" must be specified. Use soft strip asbestos insert (7202) with thermometer wells.



6292 SINGLE END



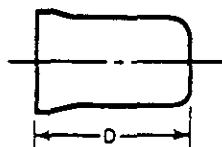
6295 DOUBLE END

When ordering, specify pipe I.D., well I.D., and tube length.

| A<br>Pipe Size<br>(inches) | B<br>Min.<br>Well<br>I.D.<br>(inches) | C<br>Tube Size<br>(inches)<br>O.D. | D<br>(inches) |
|----------------------------|---------------------------------------|------------------------------------|---------------|
| 1                          | 1/2                                   | 3/8                                | 2 1/4         |
| 1 1/2                      | 1/2                                   | 3/8                                | 2 1/4         |
| 1 1/2                      | 3/4                                   | 7/8                                | 2 1/4         |
| 2                          | 1/2                                   | 3/8                                | 2 1/4         |
| 2                          | 3/4                                   | 3/8                                | 2 1/4         |
| 2                          | 3/4                                   | 7/8                                | 2 1/4         |
| 3                          | 1/2                                   | 3/8                                | 3 1/4         |
| 3                          | 3/4                                   | 3/8                                | 3 1/4         |
| 3                          | 3/4                                   | 7/8                                | 3 1/4         |

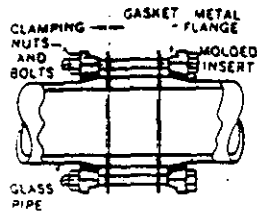
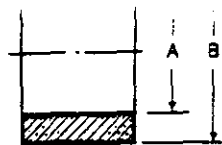
## CAPS

6236



Use soft strip asbestos inserts (7202) with this fitting.

| Pipe Size<br>(inches) | D<br>(inches) |
|-----------------------|---------------|
| 1                     | 2             |
| 1 1/2                 | 3             |
| 2                     | 4             |
| 3                     | 4 1/4         |
| 4                     | 6             |
| 6                     | 7             |

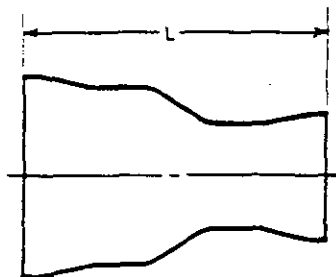


Typical Spacer Assembly

Straight spacers offer simple way to fill short gaps in the hardware and gaskets must be ordered separately. Standard lengths are 1/4", 1/2", 1", 1 1/2", 2", 2 1/2", 3", 4", and 5". Other lengths available on special order

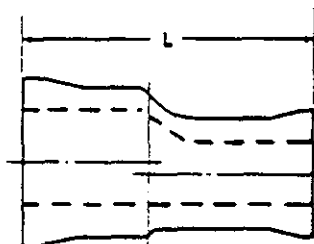
| A<br>Pipe Size<br>(inches) | B<br>O.D.<br>(inches) |
|----------------------------|-----------------------|
| 1                          | 1 1/4                 |
| 1 1/2                      | 2 1/4                 |
| 2                          | 2 3/4                 |
| 3                          | 3 3/4                 |
| 4                          | 4 1/2                 |
| 5                          | 7 1/4                 |

## STRAIGHT REDUCERS 6215



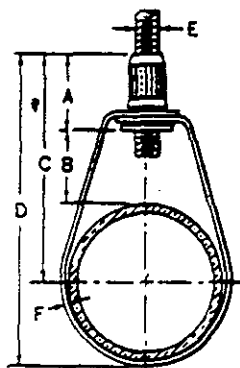
| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2 or 1          | 5             |
| 4                     | 3, 2, 1 1/2 or 1       | 7             |
| 6                     | 4, 3, 2, 1 1/2 or 1    | 9             |

## ECCENTRIC REDUCERS 6240



| Pipe Size<br>(inches) | Reduced To<br>(inches) | L<br>(inches) |
|-----------------------|------------------------|---------------|
| 1 1/2                 | 1                      | 4             |
| 2                     | 1 1/2 or 1             | 4             |
| 3                     | 2, 1 1/2, or 1         | 5             |
| 4                     | 3, 2, 1 1/2, or 1      | 7             |
| 6                     | 4, 3, 2, or 1 1/2      | 9             |

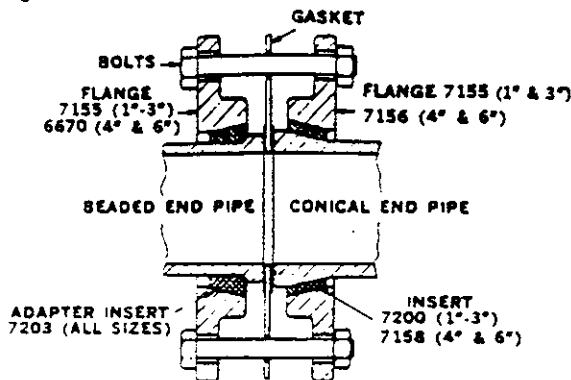
## PIPE HANGER 7290



Designed especially for glass pipe, these zinc coated hangers have integral cushions to prevent metal-to-glass contact. Unique locking action permits rapid installation, cuts assembly time by as much as 80%. A simple squeeze releases the insert allowing the band to be spread and slipped over the pipe. Insert is released by thumb pressure after realignment of holes and is threaded freely on to hanger rod.

| Pipe Size<br>(inches) | A     | B     | C     | D      | E   | F         |
|-----------------------|-------|-------|-------|--------|-----|-----------|
| 1                     | 1 1/8 | 1     | 2 3/4 | 3 1/8  | 3/4 | 1/8 x 3/4 |
| 1 1/2                 | 1 1/4 | 1 1/4 | 3 1/4 | 4 1/8  | 3/4 | 1/8 x 3/4 |
| 2                     | 1 1/2 | 1 1/2 | 3 3/4 | 4 3/4  | 3/4 | 1/8 x 3/4 |
| 3                     | 1 3/4 | 1 3/4 | 4 1/4 | 6 1/4  | 3/4 | 1/2 x 3/4 |
| 4                     | 1 7/8 | 1 3/4 | 5 1/2 | 7 1/2  | 3/4 | 3/4 x 1   |
| 5                     | 1 7/8 | 2 3/4 | 7 1/4 | 10 1/4 | 3/4 | 3/4 x 1   |

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



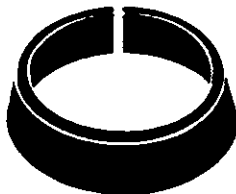
\*Pressure rating limited to that of Conical Pipe System.

Not to be used with Beaded Armored Pipe.

## Assembly Consists of . . .

| Size   | Flange                 | Insert                 | Gasket    | 7190 Nuts & Bolts — Qty. |
|--------|------------------------|------------------------|-----------|--------------------------|
| 1"     | 7155-1000              | 7200-1000<br>7203-1000 | 7276-1000 | 1/4" — 18 x 2 1/2" 4     |
| 1 1/2" | 1500                   | 7200-1500<br>7203-1500 | 1500      | 1/4" — 18 x 2 1/2" 4     |
| 2"     | 2000                   | 7200-2000<br>7203-2000 | 2000      | 1/4" — 18 x 2 1/2" 4     |
| 3"     | 3000                   | 7200-3000<br>7203-3000 | 3000      | 1/4" — 18 x 3 4          |
| 4"     | 7156-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | 1/4" — 18 x 3 3          |
| 6"     | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | 1/4" — 18 x 3 3          |

## INSERTS



7200 for 1" through 3"

7202 for 4" and 6"

Also available for 1" through 6" for certain fittings

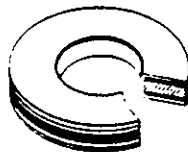
7203 adapter insert for beaded ends (similar to 7200)

Insert 7200 is molded neoprene asbestos construction. It is available in 1", 1 1/2", 2", and 3" diameters. The 1", 1 1/2", 2", and 3" sizes are used with standard glass pipe and fittings.

Insert 7202 is a neoprene asbestos strip insert designed for use with 4" and 6" pipe and fittings and for 1" through 6" as specified on certain fittings.

Adapter insert 7203 is a molded insert designed for use on field-beaded pipe, with Style I and Style II flanges in 1" through 3" diameters; and with Adapter Flange (6670) in 4" and 6" diameters.

## DONUT SPACER 7240

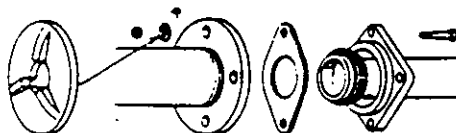


Donut spacer consists of steel ring cushioned with soft asbestos and covered with a machined TFE envelope.

Required for joining glass pipe to glass-lined steel using A.S.A. Adapter (7160) or Style II flange (7155), because of radius at gasket face of glass-lined steel flange.

| Pipe Size (inches) | Thickness (inches) |
|--------------------|--------------------|
| 1                  | 1/4                |
| 1 1/2              | 1/4                |
| 2                  | 1/4                |
| 3                  | 3/16               |
| 4                  | 1/4                |
| 6                  | 1/4                |

## ADAPTER BUTTON 7230



| I.D. (inches) | O.D. (inches) | Height (inches) |
|---------------|---------------|-----------------|
| .390 to .398  | 1 1/4         | 1/4             |

## SPRING 7235



Used to load joints to compensate for temperature cycling and to spring load pipe hangers. One size used for 1" through 4" flanges. Longer bolts needed to accommodate springs.

| Pipe Size (inches) | I.D. (inches) | Length (inches) | Diameter of Wire |
|--------------------|---------------|-----------------|------------------|
| 1" thru 4"         | 3/16 min.     | 1 1/2           | .156             |
| 6"                 | 3/8 min.      | 1 1/2           | .156             |



# FLANGES, GASKETS AND ACCESSORIES

KIMAX Glass Pipe and fittings are joined by means of metal flanges, cushioned from the glass by molded or strip inserts. Interface gaskets placed between the pipe ends prevent glass to glass contact.

## FLANGES

Style I Aluminum Flanges are used to join KIMAX pipe to KIMAX pipe or to metal tubing containing a ferrule. The 4" and 6" sizes have ASA bolt circles and can mate with an ASA flange. Bolts and nuts for Style I flanges are aluminum.

Style II flanges are cast iron protected by heavy coats of corrosion-resistant paint. All sizes have ASA bolt circles. They are used to join KIMAX pipe to KIMAX pipe or to pipe flanges with an ASA bolt circle.

ASA Adapter flanges are available in 1" through 3" sizes and are used principally for joining KIMAX glass pipe to glass lined steel pipe.

## GASKETS

Gasket thickness and temperature ranges for all standard gasket materials are listed on page 16. Common materials include neoprene, asbestos and TFE machined envelope gaskets.

Since the type of service will determine the type of gasket material required, selection of gaskets is left to the user. Gaskets are not included in flange sets.

When resilience and corrosion resistance are required, gaskets containing a filler of soft asbestos (Blue African asbestos) with a machined T F E liner, are recommended. Other types of filler material may be used with T F E lined gaskets. Consult your distributor for details of performance and prices.

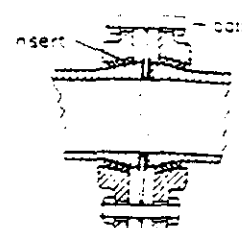
## INSERTS

Used for cushioning pipe ends from metal flanges. Molded inserts are used for standard pipe and fittings 1" through 3" in diameter. Strip inserts are used for 4" and 6" sizes of standard pipe and fittings and for certain fittings, such as U-bends; thermometer wells; and caps.

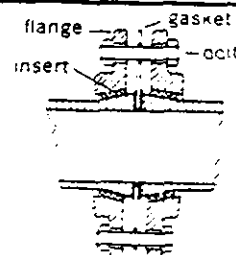
Inserts are cemented into inner rings of all Style I and Style II 4" and 6" flanges.

See page 9 for more information.

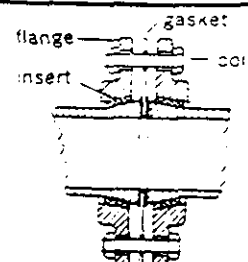
SIZES  
1", 1½", 2"



SIZE  
3"

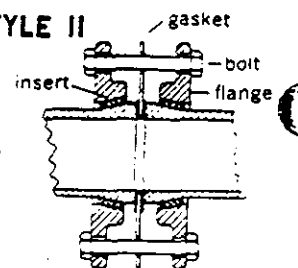


SIZES  
4", 6"

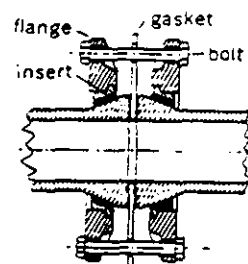


FLANGE SET 7105 STYLE II  
(Cast Iron)

SIZES  
1", 1½", 2", 3"



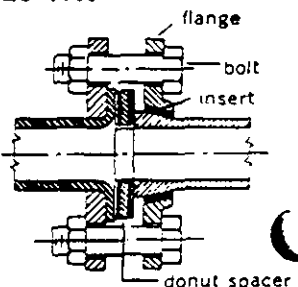
SIZES  
4", 6"



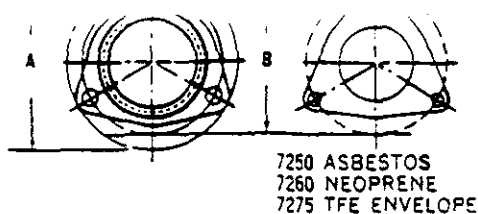
ASA ADAPTER FLANGES 7160

(Cast Iron)

SIZES  
1", 1½", 2", 3"

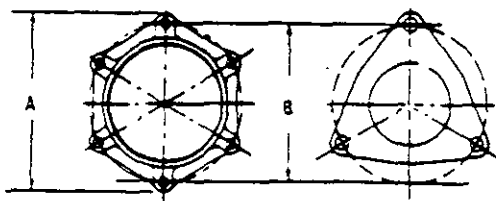


To adapt 4" and 6" glass pipe to an ASA Flange, use the following:  
STYLE I Aluminum—No. 7150, 1—7151 outer flange, 1—7153 inner ring  
STYLE II Cast Iron—No. 7155, 1—7156 outer flange, 1—7158 inner ring



2-7150 Aluminum Flanges  
2-7200 Neoprene Asbestos Inserts  
3-7180 Aluminum Bolts and Nuts

| Pipe Size | A     | B     | Bolt Size     |
|-----------|-------|-------|---------------|
| 1         | 3 3/4 | 2 3/4 | 1/4-13x2      |
| 1 1/2     | 4 1/4 | 3 3/4 | 5/16-18x1 1/4 |
| 2         | 4 1/8 | 3 3/8 | 3/8-18x2      |

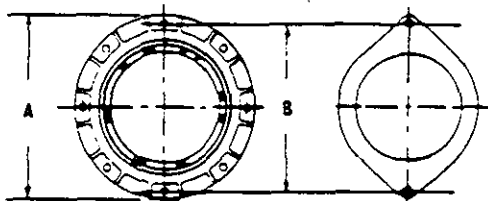


#### FLANGE SET NO. 7100, 3" I.D.

STYLE I Aluminum Set contain the following components:

2-7150 Aluminum Flanges  
2-7200 Neoprene Asbestos Inserts  
6-7180 Aluminum Bolts and Nuts

| Pipe Size | A | B     | Bolt Size    |
|-----------|---|-------|--------------|
| 3         | 5 | 5 1/4 | 1/2-13x2 1/4 |



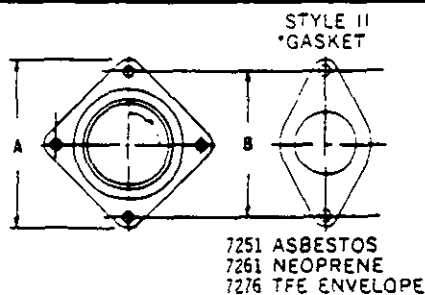
#### FLANGE SET NO. 7100, 4 AND 6" I.D.

STYLE I Aluminum Set contain the following components:

2-7151 Aluminum Outer Flanges\*  
2-7153 Aluminum Inner Rings with 7202 insert cemented in place\*  
8-7180 Aluminum Bolts and Nuts.

| Pipe Size | A      | B     | Bolt Size    |
|-----------|--------|-------|--------------|
| 4         | 8 3/4  | 7 1/4 | 3/8-18x2 1/4 |
| 5         | 10 1/4 | 9 1/2 | 1/2-16x3     |

\* May be ordered separately as No. 7150 Flange Assembly consisting of one (1) 7151 Outer Flange and one (1) 7153 Inner Ring.

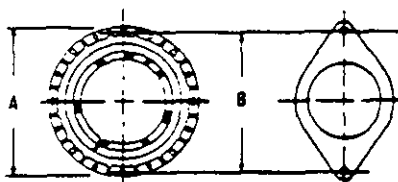


#### FLANGE SET NO. 7105, 1", 1 1/2", 2", 3" I.D.

STYLE II Cast Iron Flange sets contain the following components:

2-7155 Cast Iron Flanges  
2-7200 Neoprene Asbestos Inserts  
4-7190 Steel Bolts and Nuts

| Pipe Size | A     | B     | Bolt Size     |
|-----------|-------|-------|---------------|
| 1         | 3 3/4 | 3 1/4 | 1/4-18x2 1/4  |
| 1 1/2     | 4 1/4 | 3 3/4 | 5/16-18x2 1/4 |
| 2         | 5 1/8 | 4 1/2 | 3/8-18x2 1/2  |
| 3         | 5 1/4 | 6     | 1/2-18x3      |



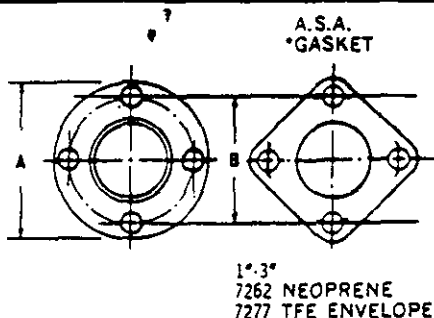
#### FLANGE SET NO. 7105, 4 AND 6" I.D.

STYLE II Cast Iron Flange sets contain the following components:

2-7156 Cast Iron Outer Flange\*  
2-7158 Cast Iron Inner Ring with 7202 Inserts cemented in place\*  
8-7190 Steel Bolts and Nuts.

| Pipe Size | A      | B     | Bolt Size    |
|-----------|--------|-------|--------------|
| 4         | 8 3/4  | 7 1/4 | 3/8-18x2 1/4 |
| 6         | 10 1/4 | 9 1/2 | 1/2-16x2 1/2 |

\* May be ordered separately as No. 7155 Flange Assembly consisting of one (1) 7156 Outer Flange and one (1) 7158 Inner Ring.



#### ASA ADAPTER FLANGE NO. 7160, 1", 1 1/2", 2", 3" I.D.

ASA Flange does not come with insert or bolts. Order the proper inserts and bolts for use intended.

7200 for Conical End Glass  
7202 Strip Insert for Conical End fittings as specified.  
7203 Molded Adapter Insert for Beaded End Glass

| Pipe Size | A     | B     | Bolt Size**   |
|-----------|-------|-------|---------------|
| 1         | 4 1/4 | 3 3/4 | 1/4-13x2      |
| 1 1/2     | 5     | 3 3/4 | 5/16-13x2 1/4 |
| 2         | 6     | 4 1/2 | 3/8-11x2 1/2  |
| 3         | 7 1/4 | 6     | 1/2-11x3      |

\*SEE PAGE 16 FOR GASKET THICKNESS.

\*\*4 bolts required for each flange.

## Handling and Storage

Although basic pipe-handling techniques apply to glass pipe, it is advisable to take a few additional precautions.

After inspection of shipment, separate the order into groups of like components, and store them, in shipping cartons, in a safe place at the job site.

During the installation, unpack only those pieces needed for immediate hanging, placing them on cardboard, paper or wood. Do not place unprotected glass pieces on glass, concrete or steel.

Exposed pipe and fittings should be protected from scratching, weld spatter or other surface damage. Pipe so damaged should be replaced.

## Pipe Hanging

As with any piping material, glass piping should be installed without mechanical restraint or so installed to allow expansion or building movement to avoid line stress.

Stress damage will not cause immediate failure, but fracturing may occur after a period of expansion and contraction while the line is under load. Therefore, hangers should not clamp the glass pipe tightly. Both lengthwise and sideways movement is necessary.

Lengthwise motion in a straight run should be limited by no more than one anchor point, preferably near the center of the run.

More than one anchor point in a straight run will force the lengthwise motion to produce a bending moment between the two anchor points, and result in gasket leakage at the joints. Where two anchor points are necessary, make use of elbows to permit flexure or use an expansion joint.

Glass piping should also have some lateral flexibility. Excessive swinging can be corrected by an occasional support.

On long runs it is recommended that each 10-foot length of KIMAX glass pipe be supported with a hanger approximately 1 foot from each end. Supporting each end of the pipe allows disassembly of the pipe for removing objects, cleaning out stoppage, or replacing the gasket while the pipe is held in place. See table below for maximum spans.

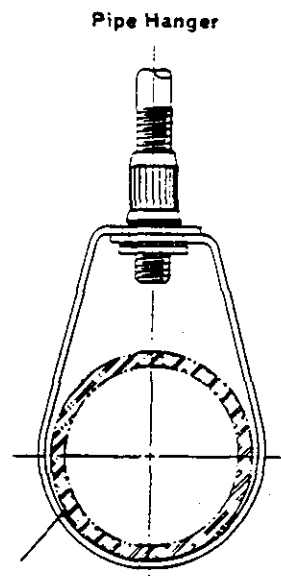
## MAXIMUM RECOMMENDED SPAN-FEET

| Pipe Size | Gas | Fluid in Pipe                  |                                  |
|-----------|-----|--------------------------------|----------------------------------|
|           |     | Specific Gravity less than 1.3 | Specific Gravity 1.3 and Greater |
| 1"        | 8   | 8                              | 7                                |
| 1½"       | 9   | 9                              | 7                                |
| 2"        | 9   | 9                              | 8                                |
| 3"        | 9   | 9                              | 8                                |
| 4"        | 10  | 10                             | 8                                |
| 6"        | 10  | 10                             | 8                                |

## Hanger Supports

The correct type of hanger support should be used for the structural material to which it is to be attached. There are many types for a specific material such as concrete insert, pipe flange, swivel hanger flange, wood beam attachment, I-beam clamp, adjustable swinging hanger flange and others.

The illustrated pipe hanger, specifically designed for glass pipe, is recommended. These zinc coated hangers have integral cushions to prevent metal-to-glass contact, and a quick locking action which permits rapid installation. The pipe is free to flex sideways and lengthwise. Rigid clamp hangers are used to prevent sideways of pipe when hanger rod and pipe runs are extra long.



## Assembling The Line

Installation of KIMAX Glass pipelines is relatively simple if these initial steps are followed:

1. Support the first length of pipe temporarily, starting from a fixed point such as pump or tank. When connecting to the bottom of a tank, always insert valve between tank and glass pipe.
2. Connect the pipe to the fixed joint loosely.
3. Align the pipe with the flange assembly by adjusting the support.
4. Tighten flange bolts to proper torque. Check pipe supports for proper alignment.

## Joint Assembly

The ends of KIMAX Glass pipe and fittings are flared to take a special metal flange which is cushioned from the glass by means of a neoprene asbestos insert.

The insert distributes bolting forces uniformly over the conical pipe ends.

An interface gasket is placed between the grooved pipe ends, and the ends are drawn together with flange bolts.

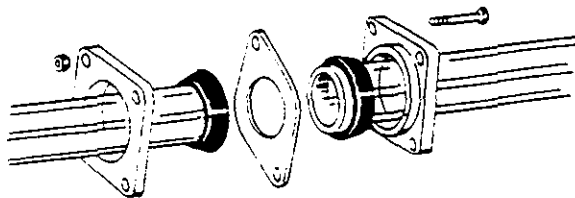
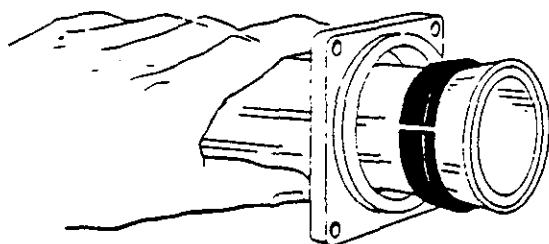
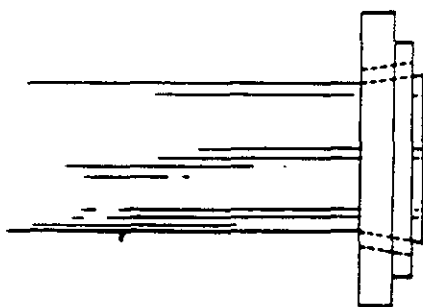


Figure 13.

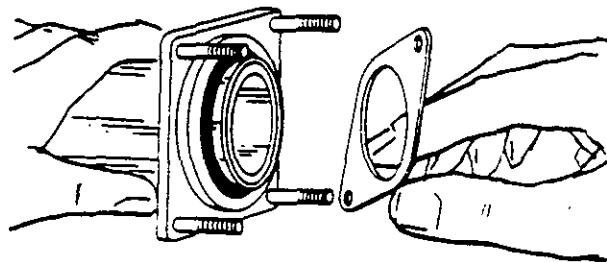
## Steps for Joint Assembly



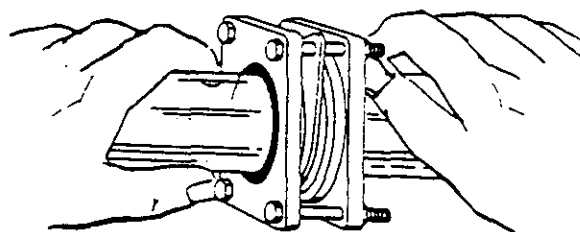
**Step 1.** Place the metal flange—small opening first—and the insert, over the flared end of the pipe before the pipe is hung. In 4" and 6" sizes, the insert is cemented into the flange.



**Step 2.** Pull the flange and insert into position, making sure that the insert is flush with the metal flange face at the end of the pipe.



**Step 3.** Place bolts in flange holes and locate gasket on bolts. Keep gaskets dry to avoid gaskets slipping out between flanges under line pressure.



**Step 4.** Align gasket opening precisely with pipe opening to avoid obstructions to line flow (especially important in milk and food lines). Be sure flange assembly is square with pipe. Tighten nuts uniformly. Do not rotate bolts—they may twist interface gasket out of alignment.

## Bolting Torques

KIMAX Glass Pipe is strong enough and flanged ends are designed to take high bolting torques. If higher torques than those recommended in the table below, are required to stop a leak, the problem may be caused by misalignment.

### RECOMMENDED BOLTING TORQUES LB./FT.

| Pipe Size | Regular Gasket | Solid T F E Gasket |
|-----------|----------------|--------------------|
| 1"        | 2              | 2-3                |
| 1½"       | 3-3.5          | 3-4                |
| 2"        | 3-4            | 4-5                |
| 3"        | 3-4            | 4-5                |
| 4"        | 3-4            | 5-7                |
| 6"        | 5-6            | 7-10               |

Occasionally, a line will leak after it has been in service for a short time. This may be caused by gradual seating of the inserts. To correct leakage, retighten bolts at the leaking joint. All joints should be inspected one to two days after connection and bolts retightened to take up slack from gasket compression.

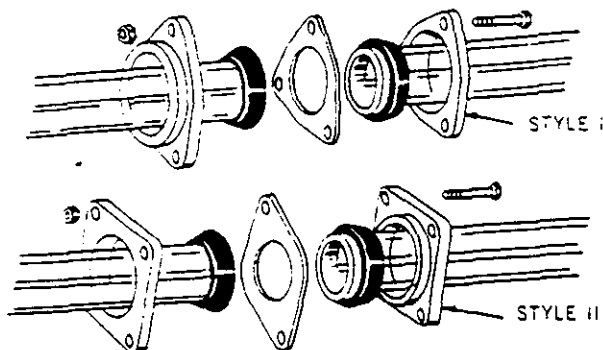
## Good Bolting Practices

1. Practice with a torque wrench to get the feel of the torque needed.
2. Tighten nuts (do not rotate bolts) uniformly all around flange.
3. Use ratchet-type socket wrenches.
4. Do not use less than recommended bolting torques.
5. Tighten each section joint completely as it is assembled before going on to next joint.

## Connecting To Various Materials

### Glass to glass

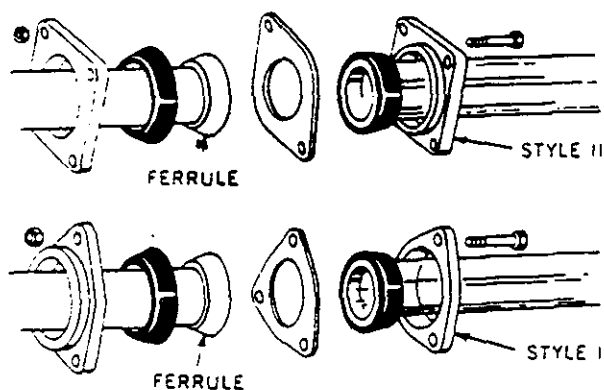
When joining KIMAX Glass Pipe to itself, use either Style I aluminum flanges or Style II cast iron flanges with inserts, nuts and bolts, and gaskets. For dimensions of all parts, see FLANGE, GASKETS AND ACCESSORIES section.



To join standard flanged pipe to field-beaded glass pipe, use adapter flange (#6670) and adapter insert (#7203) on beaded pipe, and Style II flange and standard insert on flanged pipe.

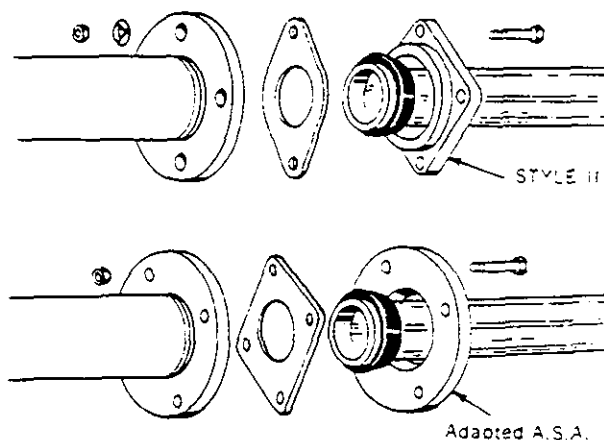
### Glass to Metal Tubing

Metal tubing can be adapted for use with either Style I or Style II flanges, by sweating or brazing a stainless steel ferrule to the tubing end.



### Glass to A.S.A., Flange

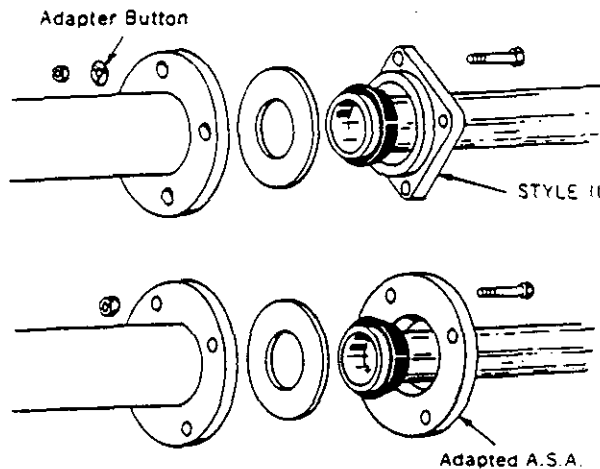
Glass can be mated to A.S.A. flanges by means of a Style I cast iron flange (all sizes have A.S.A. Bolt Circles); an adapted A.S.A. flange #7160 (1", 1½", 2" and 3" diameters only); or a 4" or 6" diameter Style I aluminum flange which has A.S.A. Bolt Circles.



A nickel steel adapter button (#7230) must be placed on the smaller diameter Style I or II bolt, for centering bolt in larger A.S.A. flange bolt holes. Raised part of button goes in bolt hole.

### Glass to Glass-lined Steel

KIMAX Glass Pipe can be joined to glass lined steel by means of adapted A.S.A. flange (#7160) or Style II flange in 1" thru 3" sizes; or by Style I or II flanges in 4" and 6" sizes. Use adapter button (#7230) with Style I or II flange bolts.



A TFE-covered donut spacer replaces the interface gasket. The donut spacer is required to prevent crazing of the glass lining at the radius of the metal pipe.

The spacer consists of an asbestos cushioned steel ring covered with a machined TFE envelope.

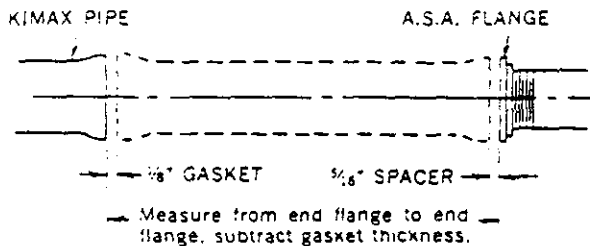
## Line Adjustments

Use of standard lengths will simplify installation and allow sufficient flexibility in line make-up.

The 13 standard straight lengths vary from 6 inches to 10 feet. Standard pipe sizes (I.D.) range from 1 inch to 6 inches.

Since Kimax Glass Pipe should never be forced or snapped into place, it may be necessary to utilize one or more of various devices to compensate for minor errors or to connect to fixed equipment.

1. **Odd lengths.** Special odd lengths can be ordered from your KIMAX Glass Pipe distributor. When measuring, be sure to allow for gasket thickness.



2. **Spacers.** Standard straight spacers, made from heavy-wall tubing, may be inserted between standard pipe ends, using an extra gasket and longer bolts.

Straight spacers are available in lengths from 1/2" to 5" except for 6" diameters, available in 1/2" to 2" lengths.

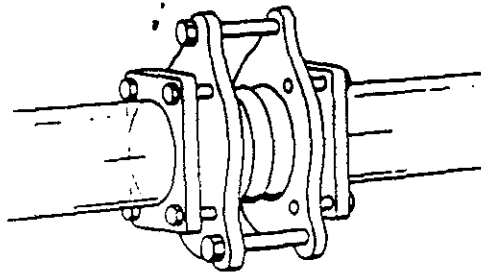
When inserting spacers, square spacer and gasket, and check alignment as with a standard joint.

See KIMAX GLASS PIPE AND FITTINGS section for dimensions.



3. **Flexible Couplings and Expansion Joints.** Used to compensate for vibration when lines are connected to pumps, vibrating reactors, etc. Also used to allow for differences in expansion of other piping and equipment or to correct slight misalignment.

Flexible joints and expansion joints are not recommended for food, pharmaceutical or other sanitary applications because of drainage problems.



4. **Field Fabrication**—KIMAX pipe may be cut and beaded by means of a beading kit available from your KIMAX distributor. Beaded joints should be held to a minimum.

Since the bead is designed to fit the grooved end of flanged pipe, one half of the joint may be beaded. Two beaded ends will give an unsatisfactory amount of gasket bearing surface.

Complete information on field beading equipment and techniques is available from your distributor. Ask for Field Beading Manual—GPO-1066.

## TESTING AND MAINTENANCE

### Initial Tests

After installation is completed, but before the line is filled, inspect for stress points as follows:

- **Shake the line.** If the line moves from side to side, it is probably free from bending loads.
- **Open a flanged joint.** If the flange does not move when bolts are removed, the pipe is not restrained.

### Testing for Leakage

In testing for leakage it is recommended that water be used. Do not test with air pressure, even for pneumatic systems, as any leakage can be readily detected. Charge the line with water at 1 1/2 times standard operation pressure. Do not exceed 1 1/2 times maximum pressure recommendations (see ENGINEERING SECTION) for size of line used.

Should joint leakage occur, recheck flange assembly alignment. Tighten flange assembly and repeat test.

### Causes of Leakage

Persistent leakage is usually due to one of these causes:

1. **Inadequate bolt tightening:** Do not hesitate to "snug" bolts sufficiently.
2. **Misalignment:** Flange not square with line; gasket out of alignment with pipe opening; or hangers not adjusted properly.
3. **Temperature cycling:** Spring-loaded bolting or Teflon machined-envelope gaskets will eliminate leakage caused by "flow" of solid Teflon gaskets resulting from temperature cycling.

### Cleaning

Purge lines with water, cleaning liquids, or steam with drain open. Caution: Do not use hot caustic solutions, abrasives, metallic tube cleaners or hydrofluoric acid.

## Comparative Weight

The following table indicates approximate weight of 2" diameter KIMAX Glass Pipe compared to the weight of other pipe material of the same diameter.

| MATERIAL                      | APPROXIMATE WEIGHT<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Glass                   | 1.10-1.20                                |
| PVC—Sched. 80                 |                                          |
| Normal and High Impact        | 0.93                                     |
| Hard Rubber                   | 1.53                                     |
| Graphite (impervious)         | 1.70                                     |
| Resin-Bonded Asbestos         | 2.33                                     |
| Stainless Steel (Schedule 40) | 3.55                                     |
| Lead, Ex. Light               | 4.30                                     |
| Porcelain                     | 7.35                                     |
| High Silicon Iron             | 7.70                                     |

## Flow Characteristics—Pressure Drop

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| FITTING     | EQUIVALENT LENGTHS (FEET) BY PIPE SIZE |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 22½° L      | 0.5                                    | .75  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° L       | 1.3                                    | 1.9  | 2.5  | 3.8   | 5.0   | 7.5   |
| 60° L       | 3.1                                    | 3.0  | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° L       | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Sweep L     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.2                                    | 6.3  | 8.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| T (S.O.)    | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| T (S.I.)    | 6.0                                    | 9.0  | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2  | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 36.0                                   | 54.0 | 72.0 | 108.0 | 144.0 | 216.0 |

## Operating Temperatures and Pressures†

KIMAX Glass Pipe will operate in temperatures up to 250° F under normal conditions. Where operating temperatures exceed 250° F (up to 450°F), it is advisable to protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult O-I/SCHOTT Process Systems, Inc., Vineland, N.J. 08360.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

## MAXIMUM OPERATING LIMITS

| PIPE SIZE                        | 1" thru 3" | 4"   | 6"   |
|----------------------------------|------------|------|------|
| PRESSURE (psi)                   | 50         | 35   | 20   |
| MAX. TEMPERATURE (°F)            | 450        | 450  | 450  |
| MIN. TEMPERATURE (°F)            | -50*       | -50* | -50* |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 210        | 175  | 160  |

\*Freezing point of conveyed material should be taken into consideration.

†NOTE: Gas pressure recommendations: It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## Thermal Expansion

When joining KIMAX glass pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Glass Pipe has a thermal expansion of .0022" ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| MATERIAL              | RELATIVE EXPANSION                       |
|-----------------------|------------------------------------------|
| KIMAX Glass           | 1.00                                     |
| Porcelain             | 1.30                                     |
| Graphite (impervious) | 1.30                                     |
| Steel                 | 3.50                                     |
| High Silicon Iron     | 4.90                                     |
| Stainless Steel       | 6.20                                     |
| Resin-bonded Asbestos | 10.00                                    |
| PVC, Sched. 80        | Normal Impact 15.00<br>High Impact 44.00 |

## Layout

Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Allowance must be made at each joint for thickness of gaskets and T F E-covered donut spacers:

## GASKET AND DONUT SPACER THICKNESS

| Material            | Maximum Working Temp., °F. | Pipe Diameter |     |    |    |    |    |
|---------------------|----------------------------|---------------|-----|----|----|----|----|
|                     |                            | 1"            | 1½" | 2" | 3" | 4" | 6" |
| Asbestos, Neoprene  | 400/220                    | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| TFE Envelope        | 450                        | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Solid Beaded Teflon | 450                        | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |
| Donut Spacer        | 450                        | ⅛"            | ⅛"  | ⅛" | ⅛" | ⅛" | ⅛" |

## Layout (continued)

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

### Typical Area Sketch

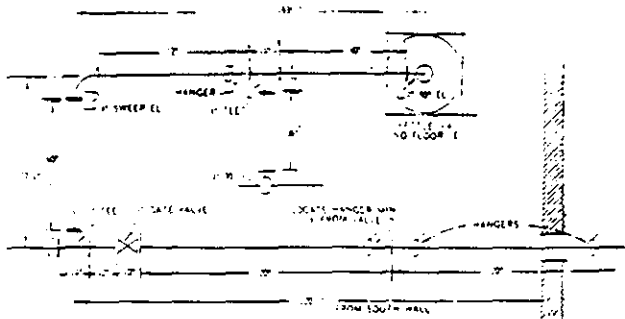


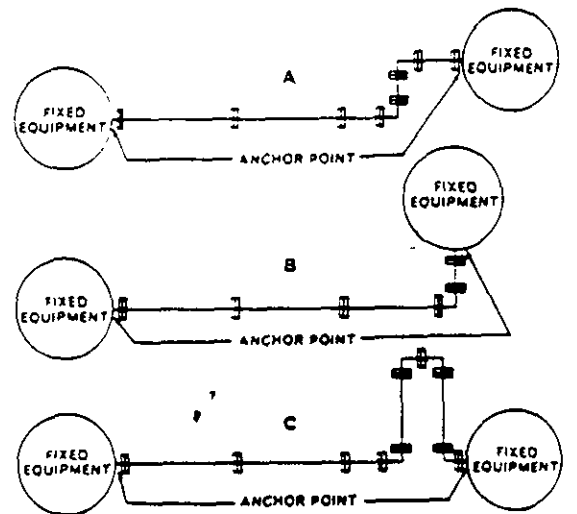
Figure 1

## Anchor Points

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks, pumps and independently supported valves.

There should be only one anchor point in any straight run of pipe unless flexible hose or an expansion joint is used. Figure 2 shows both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.

### A,B,C—Recommended Means



### D—Not Recommended

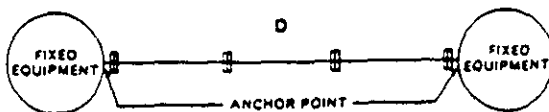


Figure 2.

All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

## Horizontal Line Support

Each 10-foot length of KIMAX pipe should be supported with two hangers, located about 1 foot from each end. See illustration of horizontal line support at top of Figure 3, page 13.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected by expanded metal, plywood enclosure, channel-iron, etc. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways and vertically in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility—See figure 3.

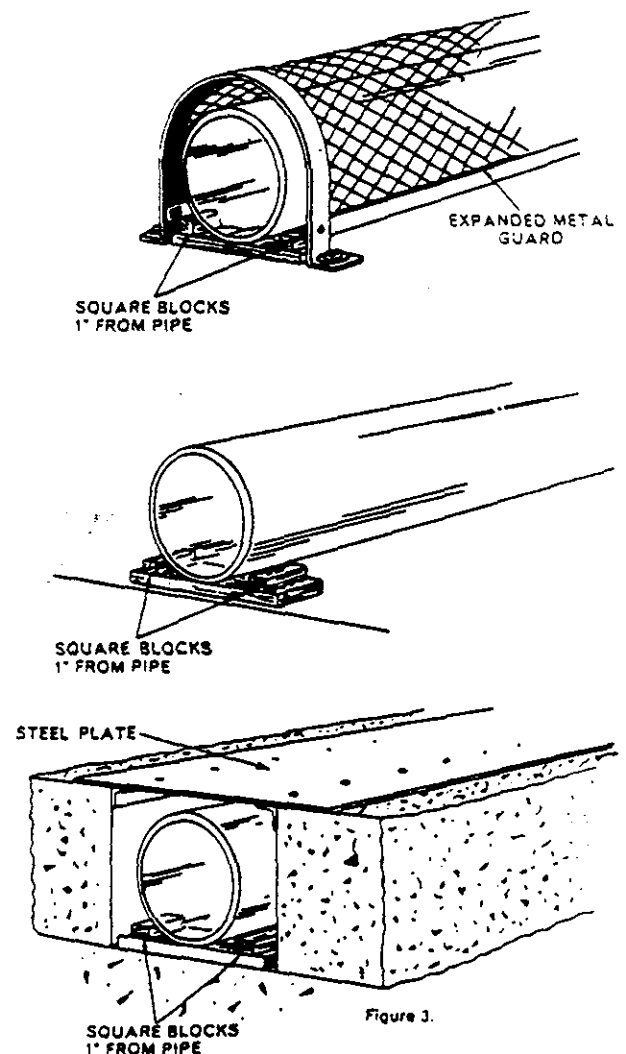
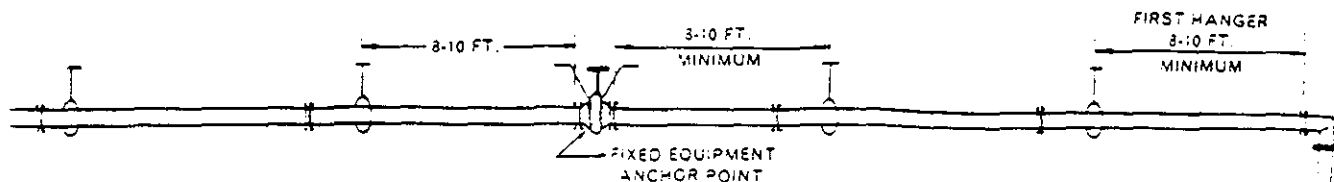


Figure 3.





### Vertical Line Support

Vertical lines should be supported by either of the two methods shown in Figure 4. The yoke support can be used to guide the line and to support banks of glass pipe. It can also be used as an anchor point above a vibrating kettle or reactor.

The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. Do not support the vertical riser by more than one rigid support.

Where more supports are needed, spring-load the support to help distribute the load. See Figures 4 and 5.

Apply the same rule as used for horizontal runs regarding anchor points.

Loose fitting pipe guides are necessary for approximately every 20 feet of rise.

To reduce bending strains, horizontal run supports should be placed a minimum of 3 feet away from the riser. See Figure 5.

### Pipe Pitch

Normally, a pitch of 1/4" per 10 feet or more is recommended for proper drainage. This may be varied to conform to the viscosity of the liquid handled and drainage speed required.

Pitch is controlled by the adjustment of hanger rods or by the use of beveled wedges or spacers.

To avoid undue stress in a long horizontal run, use swing joints to achieve desired pitch.

### Protection

In installation planning, consideration should be given to the protection of the pipe runs. Whenever possible, use existing structural protection (walls, columns, ceilings, etc.).

In high-traffic areas, such as doorways, additional protection should be provided. Expanded metal cages, angle or channel iron, and hardware cloth are suitable for exposed section protection.

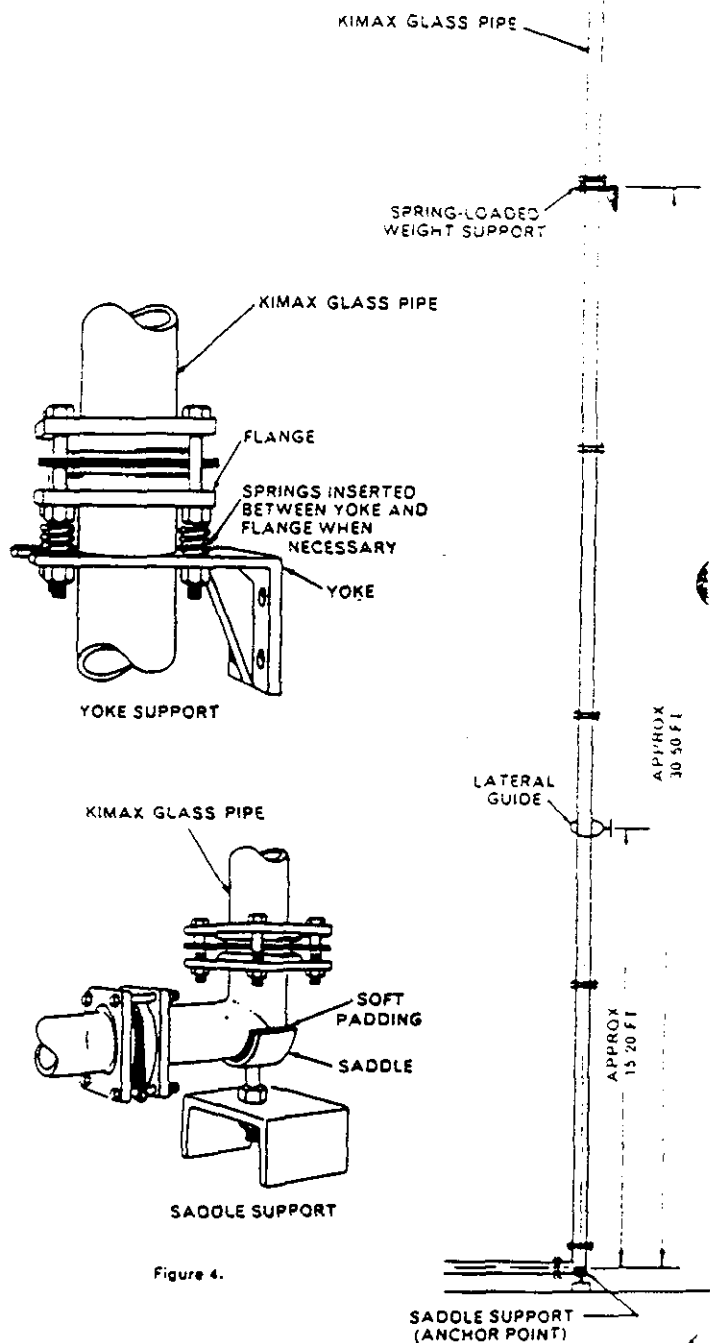


Figure 4.

Figure 5.

Recommended Vertical Line Supports

## Vibration

Connection to vibrating buildings and equipment is accomplished by using a flexible connection—either rubber hose, expansion joints or flexible couplings. The chemical properties of the transmitted material determine the type of flexible connection.

Vibration may also be dampened by use of a swing joint or by moving the support away from the source of vibration (Figure 6).

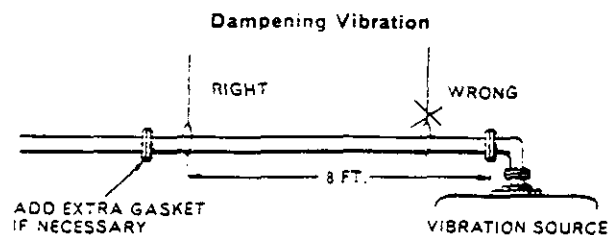


Figure 6.

## Pressure Surges

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For installation on a riser, use a tee at the top, plus a straight section, then a cap.

As a general rule, the following lengths of straight sections apply: one foot for 1" and 1½" pipe; two feet for 2" to 6" pipe. See Figure 7.

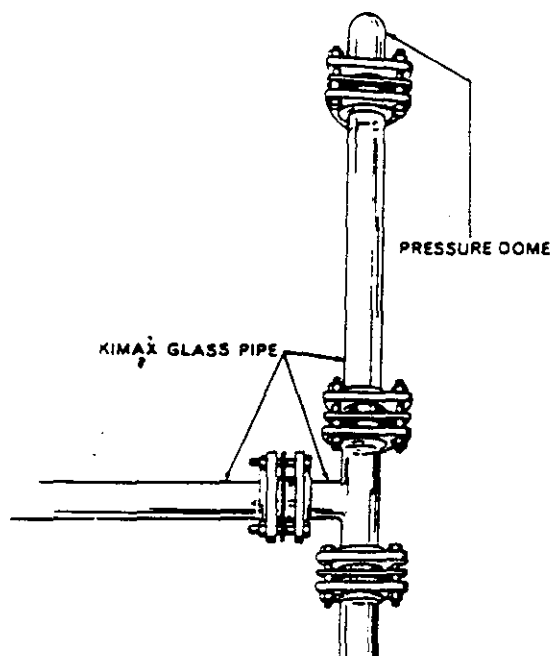


Figure 7.

## Thermometer Wells

Thermometer wells are used with corrosive liquid operations to protect thermometers and thermocouples.

For an atmosphere-tight installation, a double-ended well may be used for bolting on instrument heads. Thermometer wells are installed in the same manner as KIMAX glass pipe fittings, using Style I or Style II flanges. See Figure 3.

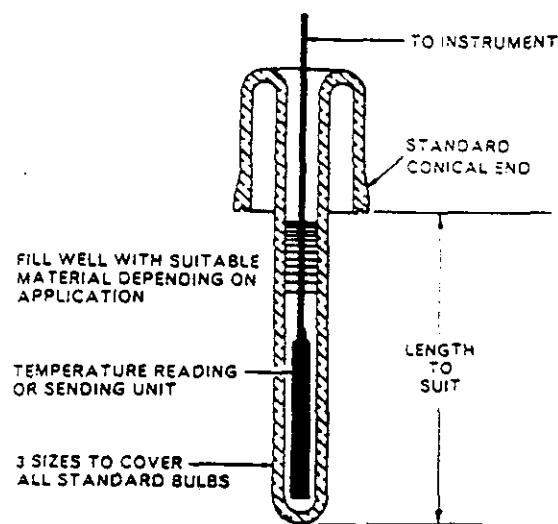


Figure 8.

## Sight Flow Indicator

A standard length, 6 or 12 inches long, may be installed in metal lines as a sight flow indicator.

The glass should be inserted between the two metal pipe flanges, using A.S.A. gaskets on each end.

Draw up flanges to proper torque with through-bolts. To minimize strain on glass, use nuts on both sides of flanges. See Figure 9.

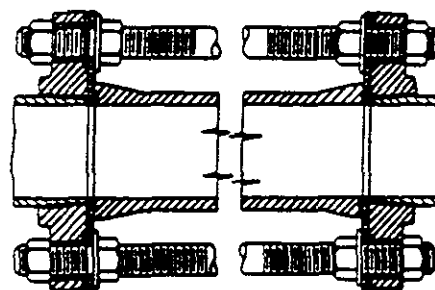


Figure 9.

## Other Products by O-I SCHOTT Process Systems, Inc.

1. Beaded Glass Pipe
2. Beaded Glass Armored Pipe
3. Cer-Vit Ball Valves
4. Complete Pre-Engineered Glass Plants by Schott
5. KIMAX Heat Exchangers and Pilot Plants
6. Glass Drainline

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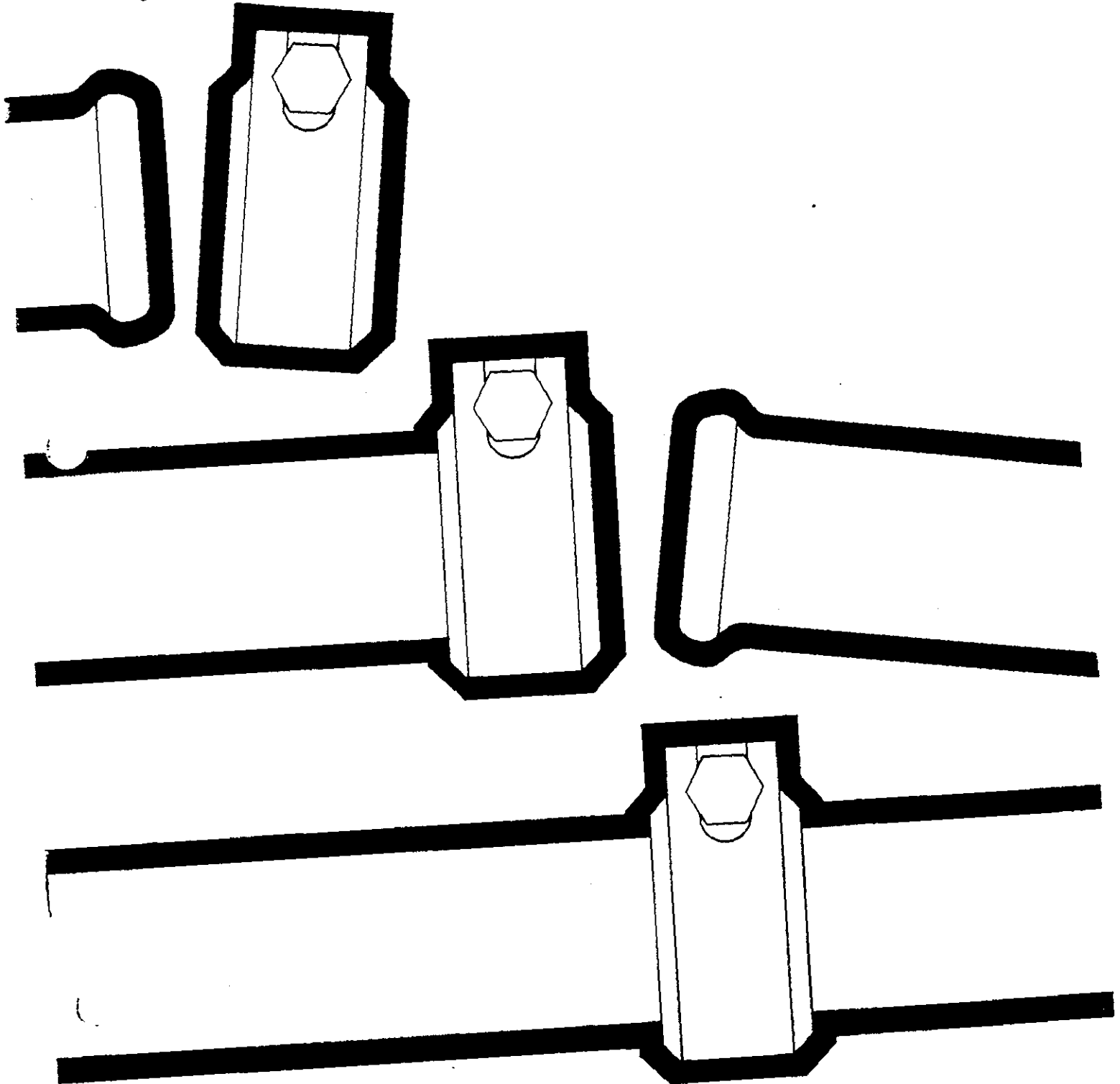
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OI KIM VINE

**KIMAX<sup>®</sup>**

Glass Drainline  
Installation Guide  
OIS-65



## COMPLETE SYSTEM, RELIABLE, EASY TO INSTALL

### EASY TO INSTALL

With few exceptions, KIMAX glass drainline installs in much the same manner as you would install any drainline system.

KIMAX pipe and fittings possess good mechanical strength, so you don't need to handle the system with kid gloves.

There is no limit to the length or height to which KIMAX glass drainline can be installed. It can be encased inside a wall, accessible or not. It can be buried in the ground, underneath concrete, or inside any trough or sleeve.

For above ground installation, drainline pipe is available in 5' and 10' lengths in diameters from 1½" through 6". For underground use, 5' lengths come protected in factory-applied expanded polystyrene casing. The system also includes a complete line of glass fittings and traps, plus the accessories and hardware to meet virtually any chemical-waste disposal system requirement.

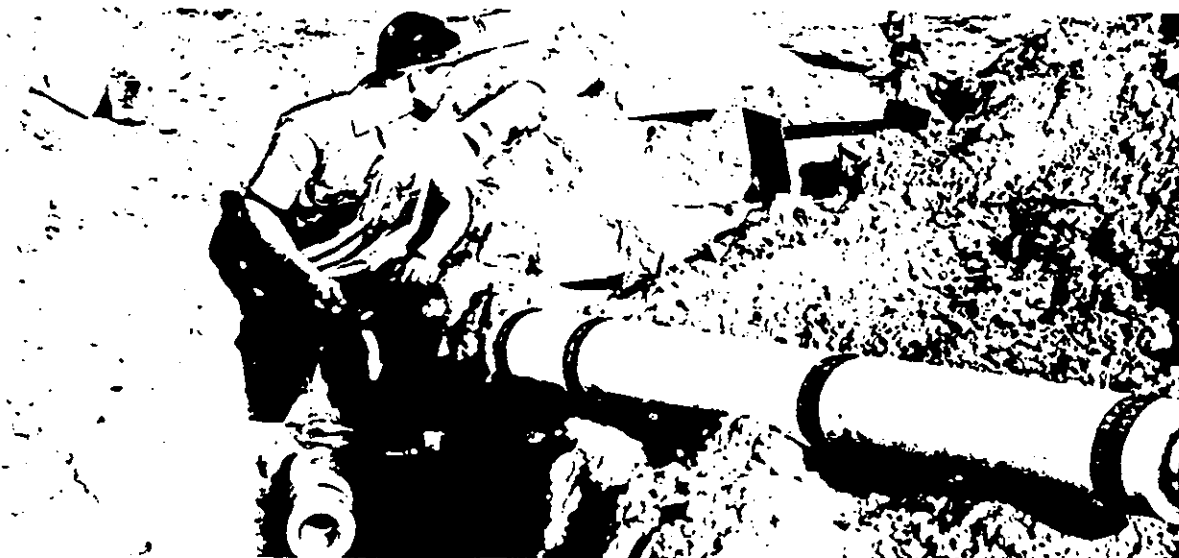
KIMAX drainline weighs less than conventional drainline materials, so it's easy to handle, fewer hangers and joints are required and sections can be preassembled and carried to the point of installation. Expansion is negligible; therefore expansion joints are not needed nor recommended.

### SIMPLE, LEAK-PROOF JOINTS

Conventional glass-to-glass connections are made quickly and simply using #6650 KIMAX couplings. Just as easily, you can join 1½", 2", 3", 4" and 6" glass (beaded end) drainline to plain end glass, metal or rigid plastic pipe using #6661 KIMAX B/P couplings. See opposite page for details.

When properly installed both couplings will provide leak-free joints — even with line deflections of up to four degrees.

With B/P couplings and the KIMAX portable glass cutter, you can cut and join 1½" through 6" glass drainline anywhere on the jobsite.

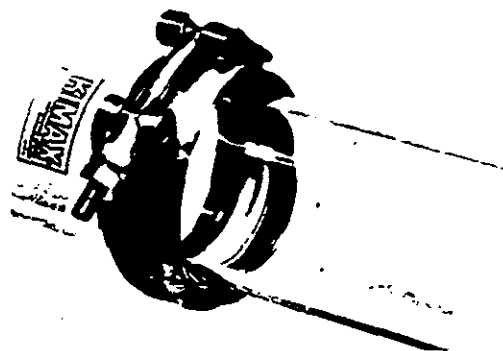
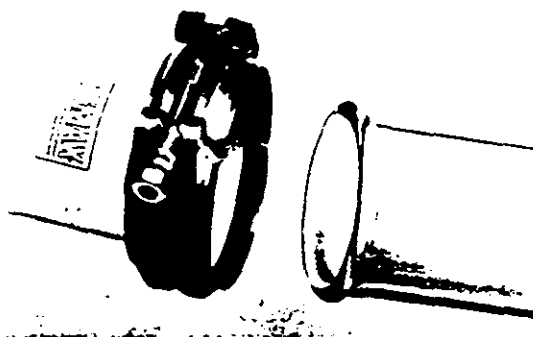
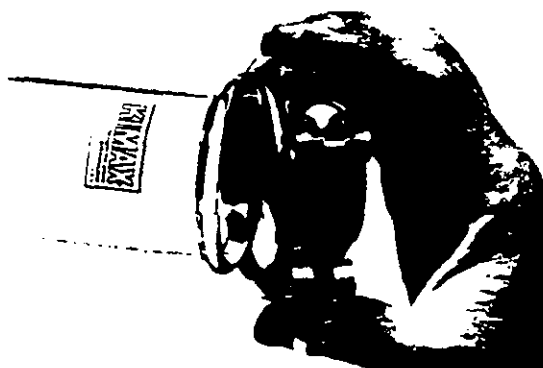


©KIMAX is the registered trademark of Owens-Illinois for pipe and fittings manufactured from borosilicate glass conforming to Federal Specification DD-G-541B, Military Specification, ASTM Specification.

## MAKING JOINTS WITH KIMAX #6650, 6661 COUPLINGS

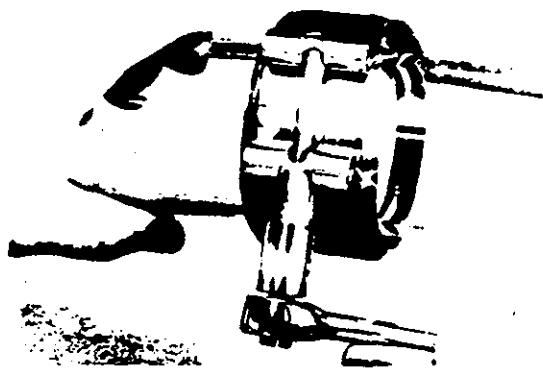
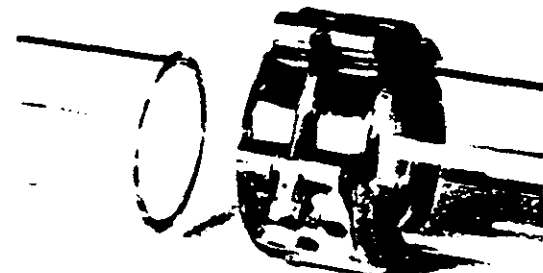
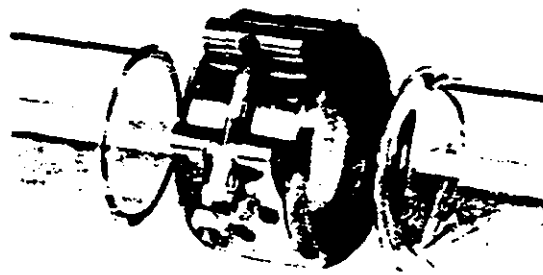
**JOINING KIMAX DRAINLINE TO KIMAX AND OTHER GLASS DRAINLINE PIPE AND FITTINGS USING #6650 KIMAX (Bead to Bead) DRAINLINE COUPLING.**

- Dip coupling in water or wet inside with damp cloth.
- Snap coupling over one end of pipe . . . then stab other section of pipe into opposite side of coupling. Start coupling from side opposite bolt as shown in top photo. Apply push and rotational pressure to snap coupling over bead.
- Tighten coupling bolt with 6" ratchet wrench.



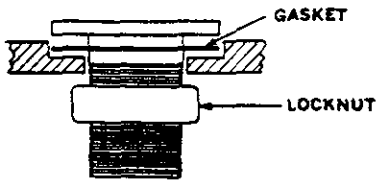
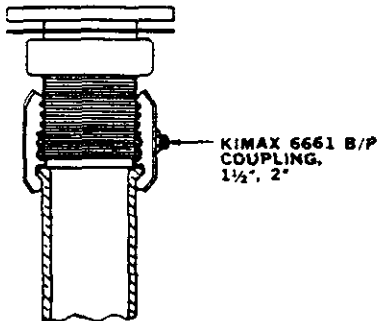
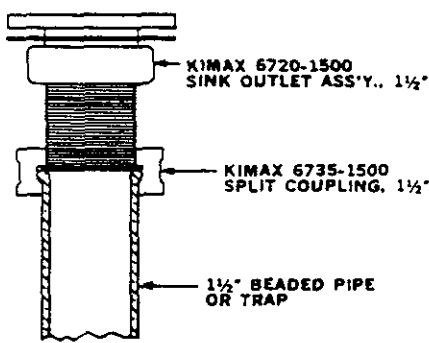
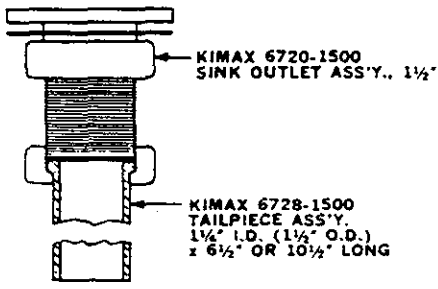
**JOINING KIMAX 1½" THRU 6" DRAINLINE TO PLAIN END GLASS, METAL OR RIGID PLASTIC PIPE USING #6661 KIMAX B/P (Bead to Plain End) DRAINLINE COUPLING\*.**

- Wipe beaded end of glass pipe with damp cloth.
- Snap coupling over beaded end of pipe.
- Insert (do not force) plain pipe into opposite side of coupling — making certain that plain end is fully seated.
- Tighten coupling bolt(s) with 6" ratchet wrench.

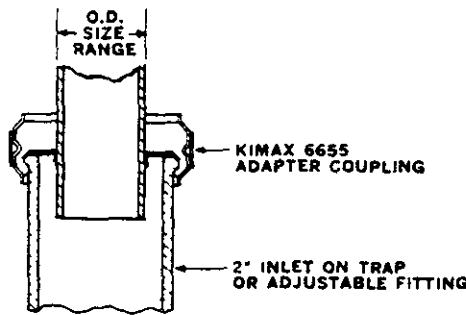
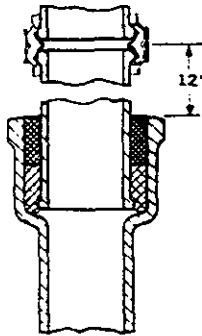
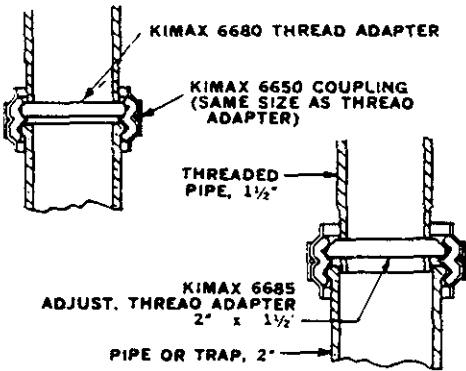
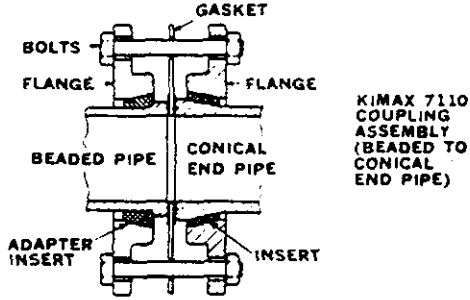


\*Now with B/P Couplings and the KIMAX Portable Glass Pipe Cutter (see page 9 for instructions), you can cut and join 1½" thru 6" beaded to plain end glass drainline anywhere on the jobsite.

# TYPICAL JOINT REFERENCE CHART

| Type of Joint                                                                                        | Materials Needed                                                                                                                                                                                                                                                                                                                                   | Steps to be Taken                                                                                                                                                                                                                                                                                                                                 |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------|-----|----|----------|----|-----|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Installing KIMAX Sink Outlet</b>                                                                  |  <p>GASKET</p> <p>LOCKNUT</p> <table border="1"> <thead> <tr> <th>Size Outlet</th><th>Hole</th><th>Counterbore</th></tr> </thead> <tbody> <tr> <td>1½"</td><td>2"</td><td>3½" x ⅝"</td></tr> <tr> <td>2"</td><td>2½"</td><td>4⅞" x ⅞"</td></tr> </tbody> </table> | Size Outlet                                                                                                                                                                                                                                                                                                                                       | Hole | Counterbore | 1½" | 2" | 3½" x ⅝" | 2" | 2½" | 4⅞" x ⅞" | <ol style="list-style-type: none"> <li>1. Drill hole in sink bottom as indicated for size outlet being installed.</li> <li>2. Drill counter bore to proper diameter and depth.</li> <li>3. Smooth bottom of counter bore and insert gasket.</li> <li>4. Remove locknut and insert outlet through sink hole.</li> <li>5. Screw locknut tight against sink bottom.</li> <li>6. Seal gap between outlet lip and counterbore with acid-resistant 3M-EC-612 caulking compound or equivalent.</li> </ol> <p><b>Note:</b> Install stainless steel in same manner as above.</p> |
| Size Outlet                                                                                          | Hole                                                                                                                                                                                                                                                                                                                                               | Counterbore                                                                                                                                                                                                                                                                                                                                       |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1½"                                                                                                  | 2"                                                                                                                                                                                                                                                                                                                                                 | 3½" x ⅝"                                                                                                                                                                                                                                                                                                                                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2"                                                                                                   | 2½"                                                                                                                                                                                                                                                                                                                                                | 4⅞" x ⅞"                                                                                                                                                                                                                                                                                                                                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>1½", 2" KIMAX Sink Outlet to KIMAX Beaded Pipe or Trap (same size)</b>                            |  <p>KIMAX 6661 B/P COUPLING, 1½", 2"</p>                                                                                                                                                                                                                          | <ol style="list-style-type: none"> <li>1. Snap coupling over beaded end of pipe or trap.</li> <li>2. Slide opposite (grooved) side of coupling onto threaded outlet. Do not force but make certain that outlet end is fully seated in coupling.</li> <li>3. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol>                          |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>1½" KIMAX (or plastic or metal I.P.S. threaded) Sink Outlets to 1½" KIMAX Beaded Pipe or Trap</b> |  <p>KIMAX 6720-1500 SINK OUTLET ASS'Y., 1½"</p> <p>KIMAX 6735-1500 SPLIT COUPLING, 1½"</p> <p>1½" BEADED PIPE OR TRAP</p>                                                                                                                                       | <ol style="list-style-type: none"> <li>1. Remove clamp from split coupling.</li> <li>2. Position coupling halves over glass bead.</li> <li>3. Replace and tighten clamp.</li> <li>4. Screw coupling onto threaded outlet.</li> </ol> <p><b>Note:</b> Use 6739 Gasket when connecting KIMAX beaded pipe or trap to metal threaded sink outlet.</p> |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>1½" KIMAX (or plastic or metal I.P.S. threaded) Sink Outlets to 1½" KIMAX Tailpiece Assy.</b>     |  <p>KIMAX 6720-1500 SINK OUTLET ASS'Y., 1½"</p> <p>KIMAX 6728-1500 TAILPIECE ASS'Y. 1½" I.D. (1½" O.D.) ± 6½" OR 10½" LONG</p>                                                                                                                                  | <ol style="list-style-type: none"> <li>1. Slide plastic nut up to top (beaded end) of tailpiece.</li> <li>2. Screw nut onto threaded outlet.</li> </ol> <p><b>Note:</b> Use 6738 Gasket when connecting glass tailpiece to metal threaded sink outlet.</p>                                                                                        |      |             |     |    |          |    |     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

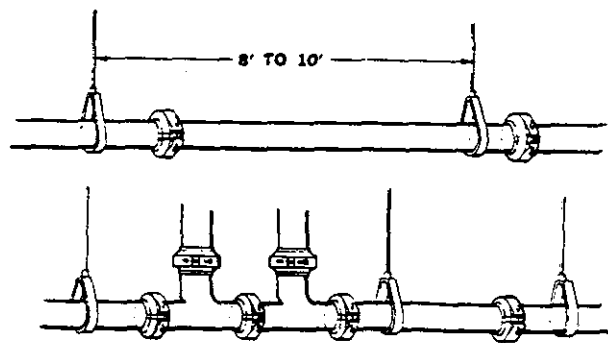
# TYPICAL JOINT REFERENCE CHART

| Type of Joint                                                                                                                             | Materials Needed                                                                                                                                                                                                                                                                                                                                                                                                                    | Steps to be Taken                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------|-----------------|--------|---------------------------------------------------------------------------------------|--------------|--------|------------------------------------------------------------|--------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <p>1½" KIMAX (or other glass, metal or plastic) Plain End Tailpiece or Plain End Cupsink to 2" KIMAX Trap Inlet or Adjustable Fitting</p> |  <p>1½" x 1½" O.D. #6665-1512<br/>1½" x 1½" O.D. #6665-1515<br/>WITH RUBBER SEAL ONLY</p>                                                                                                                                                                                                                                                         | <ol style="list-style-type: none"> <li>1. Snap coupling over beaded end of trap inlet.</li> <li>2. Slide coupling up over plain end tailpiece or cup sink to desired height.</li> <li>3. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol> <p><b>Note:</b> Use KIMAX adapter coupling 2" x 1½" to connect to Pyrex sink outlet or plain end cupsink.</p> <table border="1"> <thead> <tr> <th>Coupling Size</th><th>Tailpiece Style</th><th>O.D. Size Range</th></tr> </thead> <tbody> <tr> <td>2 x 1½</td><td>KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions</td><td>1.48 to 1.53</td></tr> <tr> <td>2 x 1½</td><td>Lead, Class D or XL tailpiece PYREX tailpiece and cup sink</td><td>1.70 to 1.78</td></tr> <tr> <td>2 x 1½</td><td>Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #50-2 Duriron #1713 Lead — Class C or L, 8 or M Plastic or Steel (1½ IPS)</td><td>1.82 to 1.90</td></tr> </tbody> </table> | Coupling Size | Tailpiece Style | O.D. Size Range | 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions | 1.48 to 1.53 | 2 x 1½ | Lead, Class D or XL tailpiece PYREX tailpiece and cup sink | 1.70 to 1.78 | 2 x 1½ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #50-2 Duriron #1713 Lead — Class C or L, 8 or M Plastic or Steel (1½ IPS) | 1.82 to 1.90 |
| Coupling Size                                                                                                                             | Tailpiece Style                                                                                                                                                                                                                                                                                                                                                                                                                     | O.D. Size Range                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                                                                                                                                                                                                                                                                               | 1.48 to 1.53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | Lead, Class D or XL tailpiece PYREX tailpiece and cup sink                                                                                                                                                                                                                                                                                                                                                                          | 1.70 to 1.78                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| 2 x 1½                                                                                                                                    | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings Durcon #50-2 Duriron #1713 Lead — Class C or L, 8 or M Plastic or Steel (1½ IPS)                                                                                                                                                                                                                                                                       | 1.82 to 1.90                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>KIMAX Beaded or Plain End Pipe to Metal Bell and Spigot Pipe</p>                                                                       |  <p>ASBESTOS ROPE AND LEAD OR FOLLOWING ACID-PROOF CEMENTS:</p> <ul style="list-style-type: none"> <li>• LITHARGE (2-3 PARTS) AND GLYCERIN (1 PART)</li> <li>• "SAUERREISN" NO. 31-F FILLER</li> <li>• "SAUERREISN" NO. 31-B BINDER</li> <li>• "WEDGETITE"</li> <li>• 3M-EC-612 CAULKING COMPOUND WHERE NON-HARDENING JOINT IS DESIRED</li> </ul> | <ol style="list-style-type: none"> <li>1. For line flexibility, place coupling within 12 inches of caulked joint.</li> <li>2. If using plain-end glass pipe, smooth external rough edges with fine carborundum stone or 150-grit emery cloth.</li> <li>3. Insert glass into hub using care so as not to scratch glass. Pack space between glass and hub firmly with asbestos rope — then back off glass ⅛" to ¼" from base of hub.</li> <li>4. Pour in lead* at lowest pour temperature and caulk lightly — or fill with acid-proof cement.</li> </ol> <p><b>Note:</b> If lead is used, preheat glass first until water drop sizzles.</p> <p>* Pack with lead wool if joining glass to vitreous tile hub.</p>                                                                                                                                                                                                                                                                                          |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>Metal or Plastic I.P.S. Threaded Pipe (straight or tapered), 1½", 2", 3", 4" or 6" to KIMAX Beaded Pipe or Trap (same size)</p>        |  <p>KIMAX 6685 ADJUST. THREAD ADAPTER 2" x 1½"</p> <p>PIPE OR TRAP, 2"</p>                                                                                                                                                                                                                                                                      | <ol style="list-style-type: none"> <li>1. Screw thread adapter onto threaded pipe until it "bottoms." With adjustable adapter, screw into threaded pipe until desired height adjustment is reached.</li> <li>2. Snap coupling over adapter.</li> <li>3. Stab beaded pipe or trap into opposite side of coupling.</li> <li>4. Tighten coupling bolt with 6 inch ratchet wrench.</li> </ol> <p><b>Note:</b> Use 6685 Adjust. Adapter to join 1½" threaded pipe to 2" KIMAX beaded trap or pipe.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |
| <p>KIMAX (conical end) Process Pipe, 1½", 2", 3", 4" or 6" to KIMAX Beaded Pipe or Trap (same size)</p>                                   |  <p>KIMAX 7110 COUPLING ASSEMBLY (BEADED TO CONICAL END PIPE)</p>                                                                                                                                                                                                                                                                               | <ol style="list-style-type: none"> <li>1. Disassemble coupling and remove inserts.</li> <li>2. Slide proper flange over conical end pipe and snap in flange insert.</li> <li>3. Slide other flange over beaded end pipe and snap in flange adapter insert.</li> <li>4. Slide both flanges firmly against pipe ends.</li> <li>5. Insert gasket between pipe ends.</li> <li>6. Replace bolts and tighten nuts evenly.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                 |                 |        |                                                                                       |              |        |                                                            |              |        |                                                                                                                                                               |              |

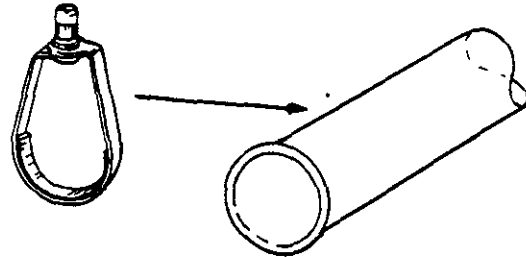


## HANGING KIMAX DRAINLINE ... HORIZONTALLY

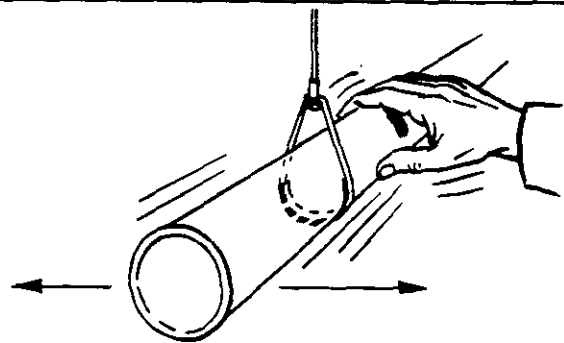
- Use padded (to prevent glass to metal contact) hangers to support lines every 8 feet to 10 feet.
- Use extra hanger when three or more couplings fall within 8 foot to 10 foot span.



- Do not pull or spring pipe into place. Move hanger to pipe ... not pipe to hanger.
- Completely tighten coupling as each joint is made.

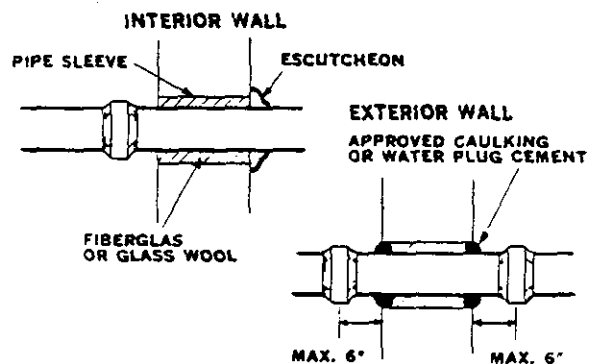


- Keep lines loose ... when horizontal lines are hung they should be free to move sideways.

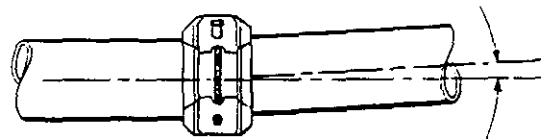


- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 6" on either side of wall.

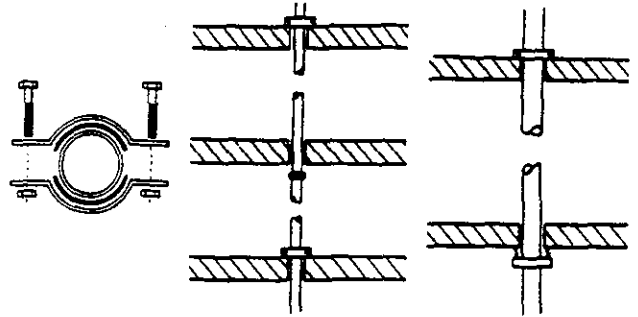


- To pitch a line, snug coupling, cock joint to pitch required and tighten coupling

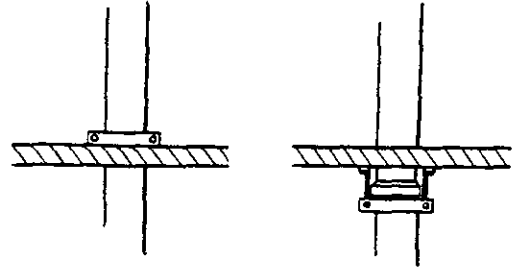


## HANGING KIMAX DRAINLINE ... VERTICALLY

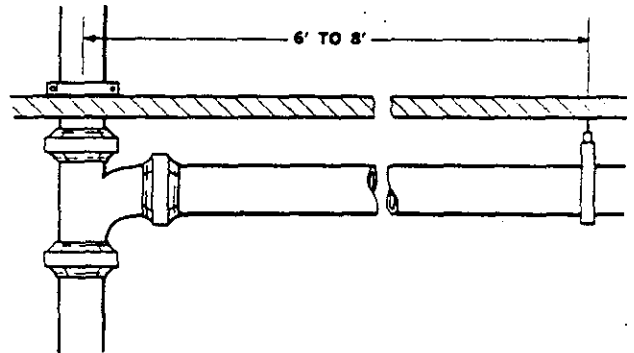
- Use riser clamp lined with  $\frac{1}{4}$ " thick neoprene.
- Support  $1\frac{1}{2}$ " and 2" stacks at every other floor.
- Support 3", 4" and 6" stacks at every floor.



- Place riser clamps either above or below floor.
- Clamp should be below bottom coupling in stack and, where possible, below coupling on every third floor.

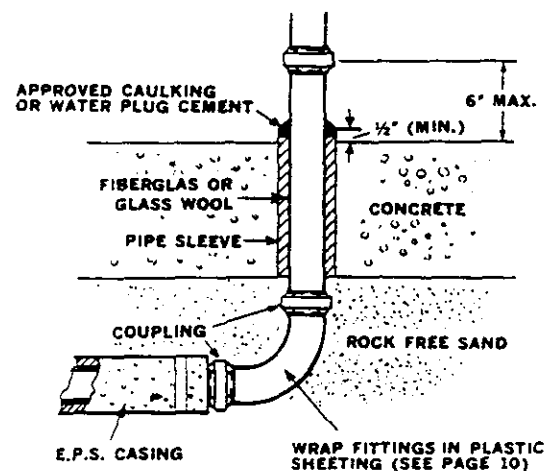


- Do not support vertical stacks with horizontal lines. First hanger should be placed from 6 feet to 8 feet from stack.



- Pipe passing through floors or slabs should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.
- Install coupling within 6" of floor or slab to give flexibility.

Note: For fire, water or explosion-proof floors, pack top of sleeve with caulking material or water plug cement.



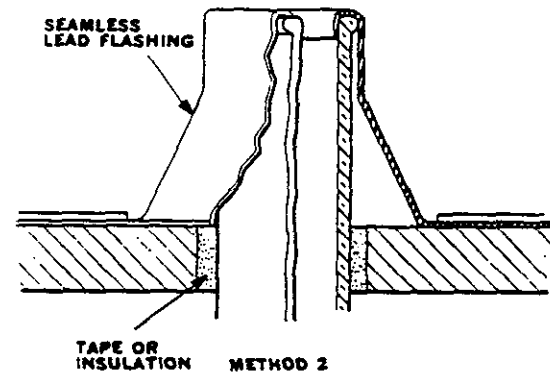
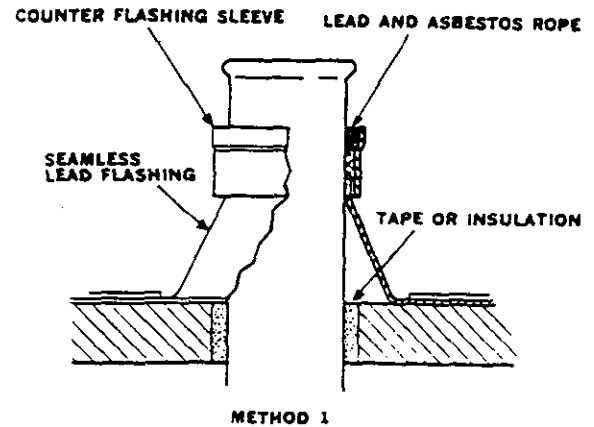
# HANGING KIMAX DRAINLINE . . . VERTICALLY

## FLASHING THROUGH ROOF

When flashing through a roof, wrap the vent pipe with tape or an insulating material and follow through using either of the methods indicated below:

**METHOD 1.** Seamless lead roof flashing with a caulked counter-flashing sleeve.

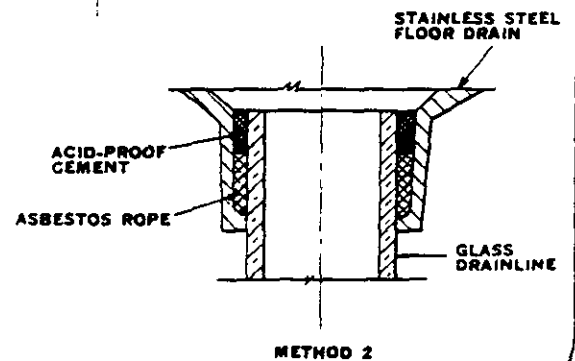
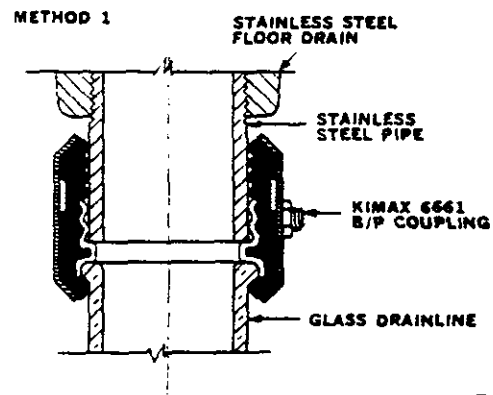
**METHOD 2.** Seamless lead or copper roof flashing.



## CONNECTING TO FLOOR DRAIN

**METHOD 1.** Screw I.P.S. threaded metal nipple into outlet of floor drain and join the glass pipe or fitting to nipple using a KIMAX 6661 B/P Coupling.

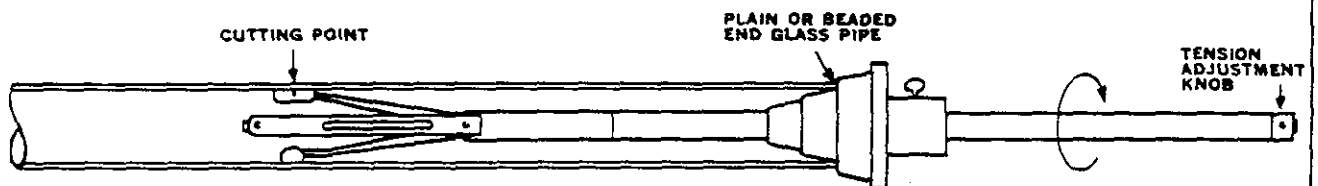
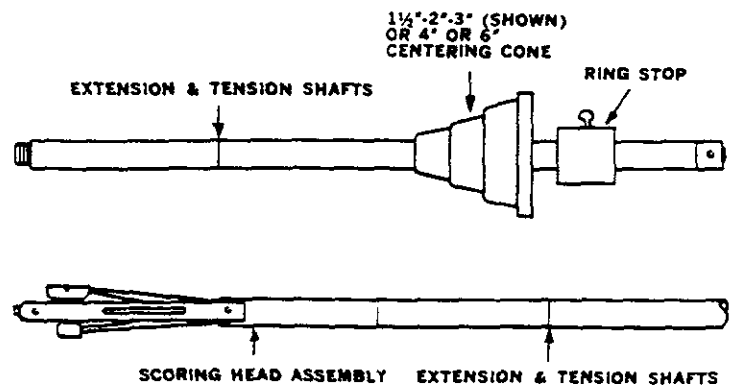
**METHOD 2.** Cut glass pipe to desired length using KIMAX portable cutting tool. Smooth external sharp edges from cut end and insert into outlet of floor drain. Seal glass in place using asbestos rope and acid-proof cement.



# KIMAX PORTABLE CUTTER NO. 7310-56802

## TO ASSEMBLE CUTTER TOOL

1. Slide Centering Cone and Ring Stop onto Extension\* & Tension Shafts.
  2. Firmly couple Tension Shaft to Scoring Head Assembly.
- \*Use Extension Shaft if cutting pipe over 2½ feet long.



## TO USE CUTTER TOOL

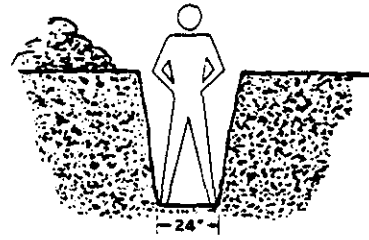
1. Measure length of pipe required and mark cutting point with grease pencil.
2. Insert Scoring Head into pipe with cutter wheel up.
3. Slide Centering Cone into pipe until firmly seated against cut or beaded end.
4. Slide Ring Stop against cone, align cutter wheel with pencil mark and then lock Ring Stop using thumb screw.
5. Turn Tension Adjustment Knob clockwise until cutter wheel contacts glass. Re-check alignment of cutter wheel with pencil mark.
6. Continue turning Tension Knob clockwise to give sufficient pressure on cutting wheel to score glass (medium to light score is desirable on 1½", 2" and 3" — heavy score on 4" and 6" pipe).
7. With pipe firmly pressed onto Centering Cone (and Cone against Ring Stop) — make test score (about ¼" long) by turning Tension Shaft. Make final tension adjustment if necessary.
8. Complete score by turning Tension Shaft one full turn — making sure to close cutting circle but not to score beyond the closing point.
9. Turn Tension Knob counter-clockwise to draw cutter wheel away from glass . . . and remove cutter tool from pipe. Do not drag scoring wheel against the pipe when removing the cutter.
10. Light crack-off torch (Burns-O-Matic or other suitable hand torch).
11. Apply heat on score mark. As pipe starts to separate follow score mark with flame. You may find it necessary to gently tap one end of pipe on table top to complete crack-off.
  - a. If cut end is to be used with KIMAX B/P Coupling, smooth external sharp edge at approximately 45° angle with fine carborundum stone or 150-grit emery cloth.
  - b. If end is to be beaded on KIMAX Beading Kit, do not smooth edge, but proceed with beading as described in KIMAX Cutting and Beading Manual.

NOTE: DO NOT ATTEMPT TO CUT WITHIN 8" OF A FACTORY BEADED PIPE END.

## INSTALLING KIMAX DRAINLINE . . . UNDERGROUND

### EXCAVATING TRENCH

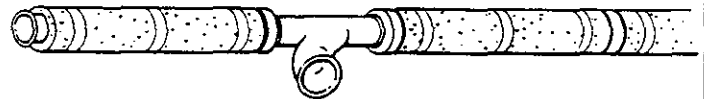
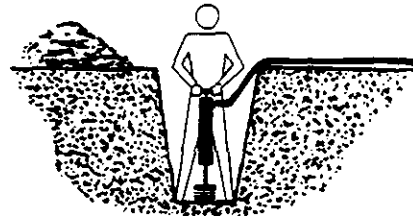
Excavate trench to workable width (24 inches at bottom) and 1 to 2 inches below final grade if clean dirt — 4 to 6 inches below grade if rocky or clay condition.



### TRENCH BEDDING

Trench should have firm bed in order to support pipe uniformly along its full length.

Back-fill to final grade with pea gravel or rock-free sand or soil. Tamp back-fill to assure firm bed and level off mounds or fill depressions with tamped soil.



### INSTALLING PIPE

Use 5-foot lengths of E.P.S. covered heavy schedule drainline pipe and fittings. Remove E.P.S. end caps only, couple pipe and/or fittings in usual manner.

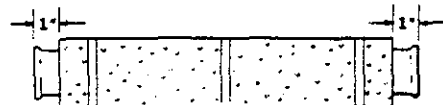
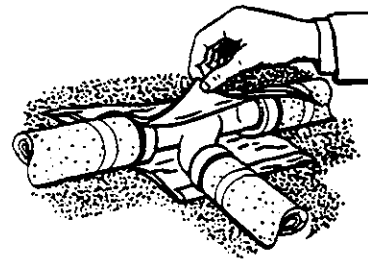
When convenient, assemble several joints to form a section, tighten couplings firmly and lower section into trench.

Protect fittings by wrapping them in polyvinyl film (5 mil), Scotch Wrap or J.M. Trans-Tex or equal.

Compact sand under fittings for support.

Check all joints and water test.

Note: When odd lengths of pipe are required, remove E.P.S. casing and field fabricate pipe to required length. Cut casing 2 inches shorter than new length and replace on pipe leaving 1 inch of pipe exposed at both ends.



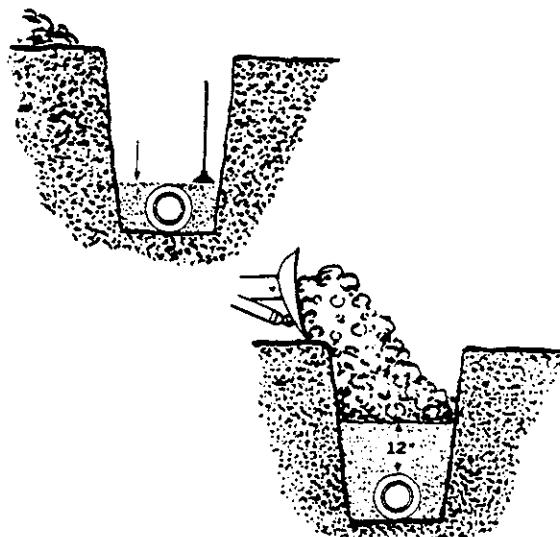
## INSTALLING KIMAX DRAINLINE . . . UNDERGROUND

### BACKFILLING TRENCH

Backfill trench with thin layers of rock-free sand or soil to 12 inches above glass pipe.

Tamp sand firmly with hand tamper or spray it with water to make sure it's firm.

Rest of trench can be filled with available soil using mechanical means.



## TESTING AND PROTECTING GLASS DRAINLINE

### TESTING

Shake lines to make sure there is no strain. There should be some limited movement in both vertical and horizontal lines.

Test lines in accordance with local codes. Air testing should not exceed 5 psi; water testing should not exceed 22 psi.

### IN CASE OF LEAK

Tighten coupling at leaking joint.

If joint continues to leak, remove coupling and make certain that rubber compression liner and TFE seal ring are free from dirt or other obstruction. Also that ends of pipe or fittings are properly seated in couplings.

Replace defective couplings and replace pipe or fittings if beaded ends are defective.

Check for good drainline alignment.

### PROTECTING

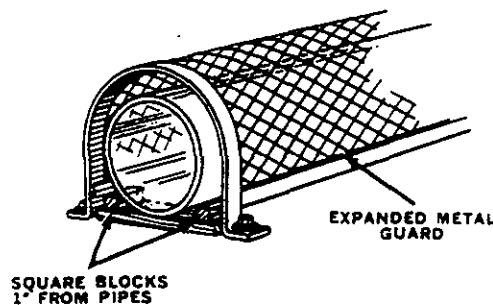
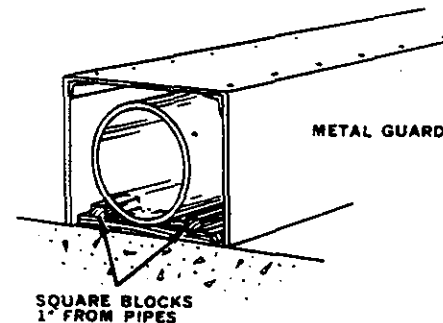
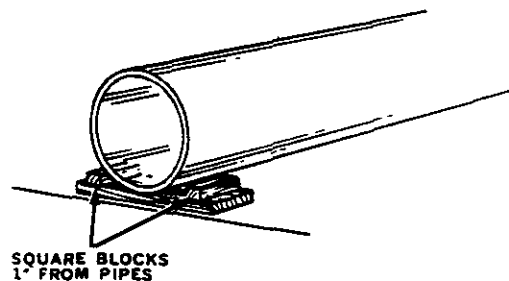
Avoid scratching glass. Keep pipe and fittings in shipping cartons until ready for use.

Avoid spattering glass while welding. Cover drainline with shipping carton or other protective material.

When exposed to heavy traffic, protect drainline with expanded metal, plywood enclosure or channel iron.

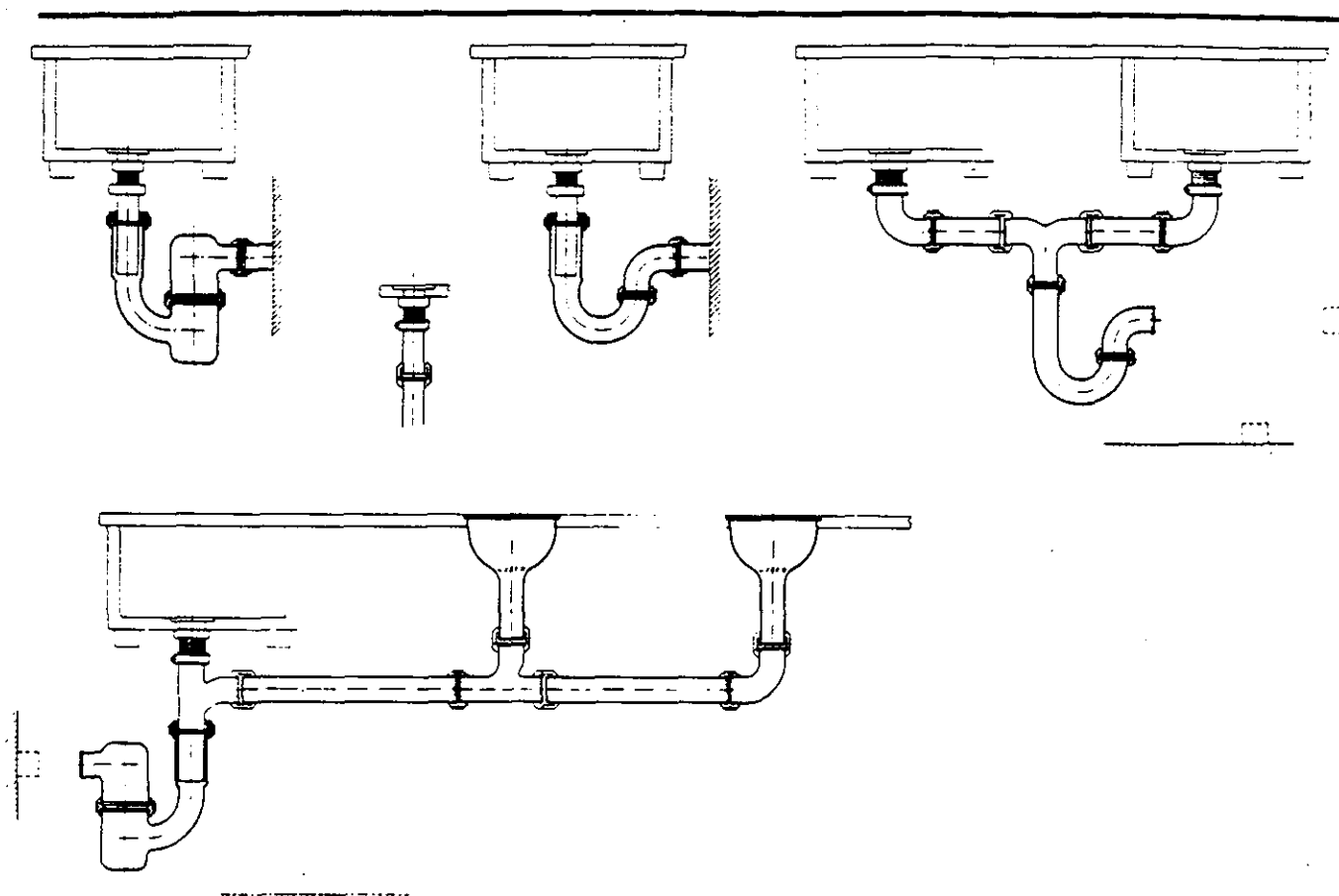
### CLEANING PROCEDURE

To clean drainline system, clear section of plugged drainline with wood pole, or add chemicals to system which will dissolve material causing stoppage.



# KIMAX<sup>®</sup>

Piping Systems



Distributed by:

**O-I / SCHOTT**  
Process Systems, Inc.

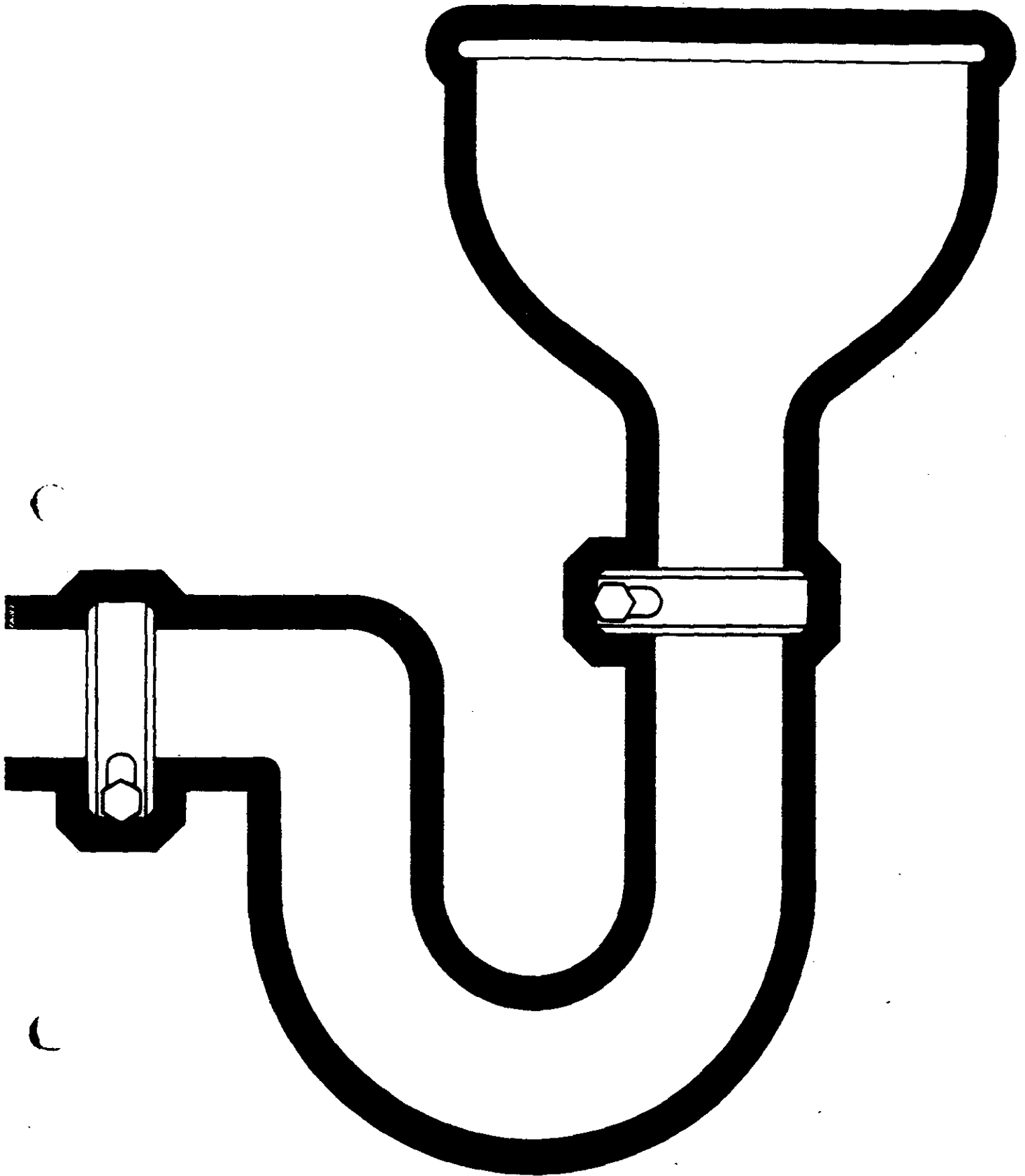
"Specifications, dimensions and tolerances of all components - pipe, fittings and couplings - as illustrated in this publication, are engineered for safety and product performance reasons as a total O-I/Schott Acid Waste Drainline System. INTERCHANGING THESE O-I/SCHOTT COMPONENTS WITH SIMILAR PRODUCTS MANUFACTURED BY OTHERS, IN ACID WASTE DRAINLINE SYSTEMS, VOIDS ALL O-I/SCHOTT WARRANTIES OF PRODUCT PERFORMANCE AND INTEGRITY WITH RESPECT TO SUCH COMPONENTS."

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*F.L. Elder*

Fluid Process Systems  
Glass Drainline  
**FPS 65-3**  
From Owens-Illinois





## assured maximum corrosion resistance for chemical waste disposal systems

### KIMAX, the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\*.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manufactured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

**Building Owners:** KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- ☐ KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- ☐ Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- ☐ When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- ☐ All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- ☐ Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- ☐ All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\*For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetrafluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.

KIMAX is a registered trademark of Owens-Illinois, Inc.

**Specifier:** Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX glass drainline offers this freedom, confidence and reasonable cost because:

- ☐ All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- ☐ The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- ☐ The light weight of the KIMAX systems requires only 1/2 to 1/3 as many hangers as conventional high silica iron pipe.
- ☐ Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- ☐ Straight lengths of KIMAX pipe can be field cut to exact length.
- ☐ KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

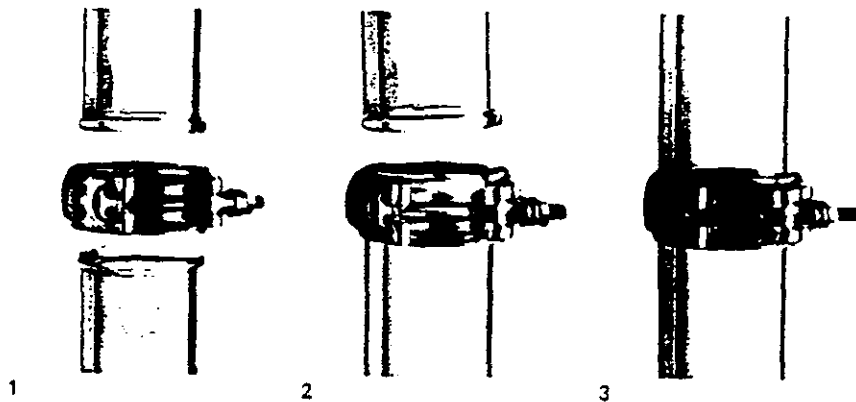
### Installation advantages:

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual FPS-650-1. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

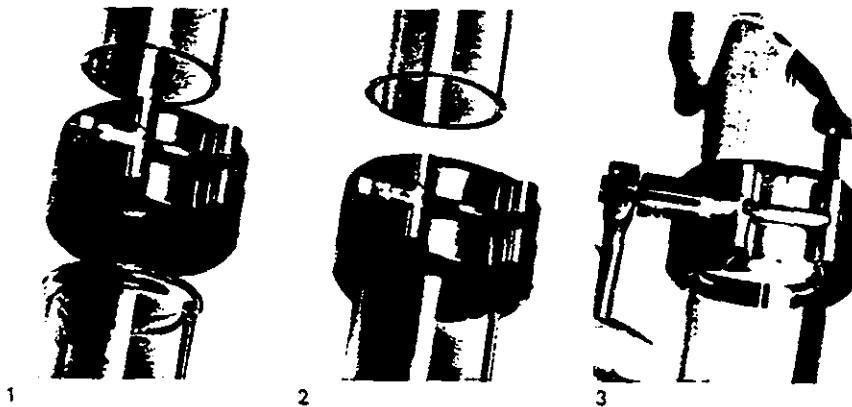
**Leak-Free Joint Assembly:** The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos). The coupling permits the joint to be deflected up to 4°.

**Field Fabrication:** KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the new B/P (bead to plain end) coupling system.

**Minimum Number of Hangers:** KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.



**KIMAX  
Bead to Bead  
Drainline  
Coupling**



**KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling**

# Other Kimax installation advantages include:

**Below Ground Burial:** KIMAX Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a protective casing of thick expanded polystyrene. For recommended installation procedures of KIMAX Drainline see Installation Manual FPS-650-1. Shown here is an example of KIMAX Drainline as installed underground.



**Adaptation to Other Materials:** KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 27.

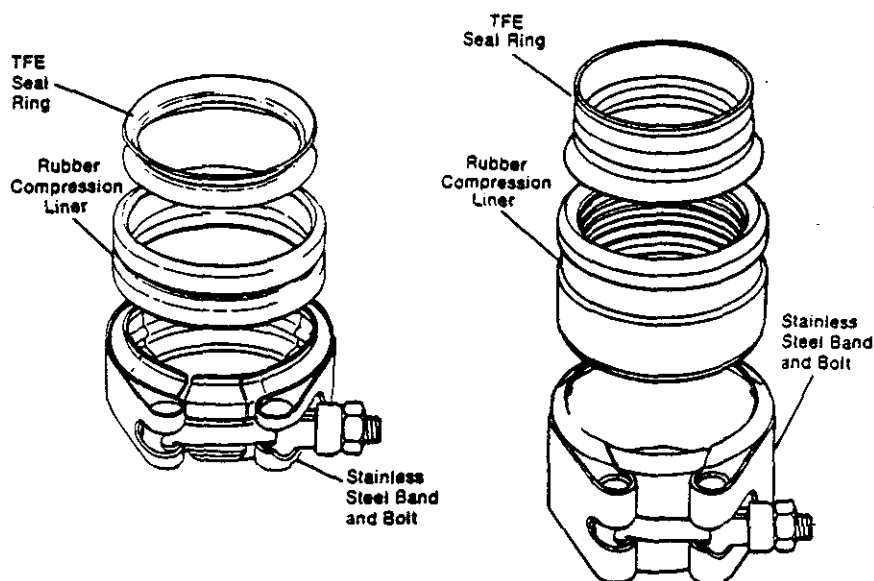
**Easily Handled:** KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

KIMAX Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem.

It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and bio-chemistry laboratories; veterinary and medical colleges, research, and other institutional laboratories.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants . . . wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints



### KIMAX Drainline Coupling (Bead to Bead):

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoro-ethylene provide the required joint seal. Assembly of joint is simple . . . place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.

### KIMAX B/P Drainline Coupling (Beaded to Plain End):

This newly designed KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of KIMAX glass drainline straight lengths.

## Long form:

### ACID WASTE DRAINLINE

#### I. General

A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of borosilicate glass conforming to Federal Specification DD-G-541B and as manufactured under the trade name "KIMAX" by Owens-Illinois.

B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include protected pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.

C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

#### II. Connections

A. Glass-to-glass connections shall be made with KIMAX compression type couplings, Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Seal ring gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.

B. Joints between glass and other types of piping material shall be made with KIMAX adapters and/or according to manufacturer's recommendations.

#### III. Protection of Pipe

A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.

B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.

C. Glass pipe shall be protected against all weld splatter.

#### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

#### V. Underground Pipe

A. **Excavation**—shall conform to National Plumbing Code A 40.8 Section 2.7.

1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.

2. At least 4" of properly compacted sand or rock free soil shall be used directly under the pipe.

#### B. Buried Pipe

1. Straight lengths shall be protected in expanded polystyrene casing.

2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.

#### C. Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

#### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## Short form:

### ACID WASTE DRAINLINE

This system shall be made of KIMAX borosilicate glass and conforming to Federal Specification DD-G-541-B and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetra-fluoro-ethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of rock-free sand or soil compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendations.

KIMAX protected pipe, and wrapped fittings shall be installed and back filled in accordance with the manufacturer's instructions and governing plumbing code.

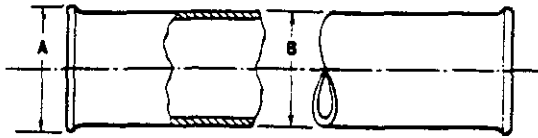
# pipe and fittings

## Straight Lengths—Pipe

Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

**6500** 5-ft. lengths

**6501** 10-ft. lengths

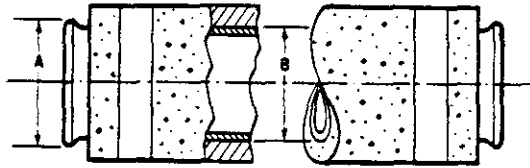


| Size | Weight<br>lbs./ft. | A    | B (O.D.) | 5 ft. lengths<br>Art. No. | Price   |
|------|--------------------|------|----------|---------------------------|---------|
| 1½   | 0.87               | 2.06 | 1.84     | 6500-1500                 | \$10.25 |
| 2    | 1.1                | 2.58 | 2.34     | -2000                     | 14.00   |
| 3    | 2.0                | 3.69 | 3.41     | -3000                     | 18.70   |
| 4    | 3.4                | 4.84 | 4.53     | -4000                     | 26.90   |
| 6    | 6.3                | 7.12 | 6.66     | -6000                     | 45.50   |

## 6502—EPS\* Covered

5-ft. lengths (for underground use)

6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.



\*Expanded Polystyrene

| 10 ft. lengths |         | EPS Covered |         |
|----------------|---------|-------------|---------|
| Art. No.       | Price   | Art. No.    | Price   |
| 6501-1500      | \$20.50 | 6502-1500   | \$11.55 |
| -2000          | 28.00   | -2000       | 15.60   |
| -3000          | 37.40   | -3000       | 21.35   |
| -4000          | 53.75   | -4000       | 31.20   |
| -6000          | 91.00   | -6000       | 55.10   |

Beaded one end only

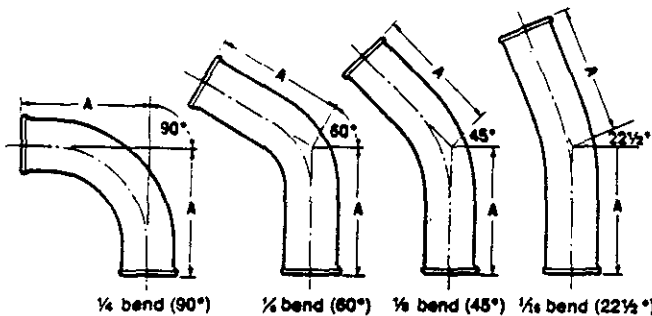
| Art. No.   | Price  |  |
|------------|--------|--|
| *6504-1500 | \$2.25 |  |
| -2000      | 3.05   |  |
| -3000      | 4.25   |  |
| -4000      | 5.85   |  |
| -6000      | 9.60   |  |

\*6504 prices are priced per foot

## 6504—Beaded one end only

6504 pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 7" of bead.

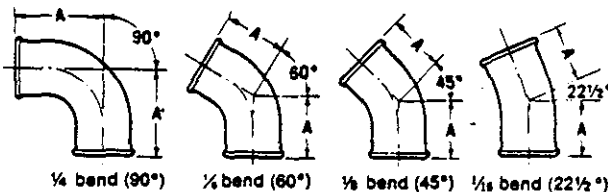
## 6511—Sweeps



| Size | A  | Art No.   | Price   |
|------|----|-----------|---------|
| 1½   | 4½ | 6511-1590 | \$ 5.60 |
| 2    | 5  | -2090     | 7.20    |
| 3    | 6½ | -3090     | 11.70   |
| 4    | 9  | -4090     | 17.50   |
| 6    | 12 | -6090     | 48.50   |

| 60°       |         | 45°       |         | 22½°      |         |
|-----------|---------|-----------|---------|-----------|---------|
| Art No.   | Price   | Art No.   | Price   | Art No.   | Price   |
| 6511-1560 | \$ 5.60 | 6511-1545 | \$ 5.60 | 6511-1522 | \$ 5.60 |
| -2060     | 7.20    | -2045     | 7.20    | -2022     | 7.20    |
| -3060     | 11.70   | -3045     | 11.70   | -3022     | 11.70   |
| -4060     | 17.50   | -4045     | 17.50   | -4022     | 17.50   |
| -6060     | 48.50   | -6045     | 48.50   | -6022     | 48.50   |

## 6513—Bends



| Size | A 90° | A 60° | A 45° | A 22½° | 90°<br>Art No. | Price   |
|------|-------|-------|-------|--------|----------------|---------|
| 1½   | 3     | 2½    | 2     | 2      | 6513-1590      | \$ 5.60 |
| 2    | 3¾    | 2¾    | 2¼    | 2¼     | -2090          | 7.20    |
| 3    | 5     | 3½    | 2¾    | 2¾     | -3090          | 11.70   |
| 4    | 7     | 4½    | 3¾    | 3¾     | -4090          | 17.50   |
| 6    | —     | —     | 7     | —      |                |         |

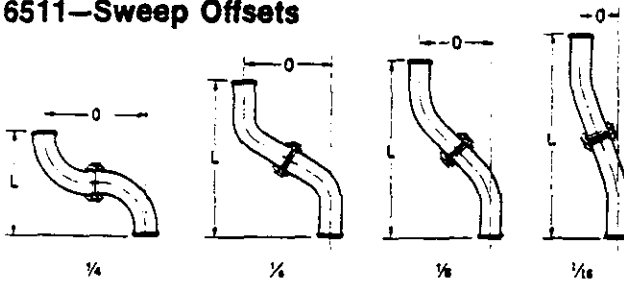
| 60°       |         | 45°       |         | 22½°      |         |
|-----------|---------|-----------|---------|-----------|---------|
| Art No.   | Price   | Art No.   | Price   | Art No.   | Price   |
| 6513-1560 | \$ 5.60 | 6513-1545 | \$ 5.60 | 6513-1522 | \$ 5.60 |
| -2060     | 7.20    | -2045     | 7.20    | -2022     | 7.20    |
| -3060     | 11.70   | -3045     | 11.70   | -3022     | 11.70   |
| -4060     | 17.50   | -4045     | 17.50   | -4022     | 17.50   |
|           |         | -6045     | 48.50   |           |         |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

### 6511—Sweep Offsets



| Size  | $\frac{1}{4}$ |    | $\frac{1}{2}$ |        | $\frac{3}{4}$ |        | $1\frac{1}{2}$ |       |
|-------|---------------|----|---------------|--------|---------------|--------|----------------|-------|
|       | L             | O  | L             | O      | L             | O      | L              | O     |
| 1 1/2 | 9             | 9  | 13 1/2        | 7 7/8  | 15 3/4        | 6 3/4  | 17 3/4         | 3 3/4 |
| 2     | 10            | 10 | 15            | 8 3/4  | 17 1/4        | 7 1/4  | 19 1/4         | 3 3/8 |
| 3     | 13            | 13 | 19 1/2        | 11 1/4 | 22 1/4        | 9 1/4  | 25             | 5     |
| 4     | 18            | 18 | 27            | 15 3/8 | 30 3/4        | 12 3/4 | 34 3/8         | 6 7/8 |
| 6     | 24            | 24 | 36            | 20 3/4 | 41            | 17     | 46 1/4         | 9 1/4 |

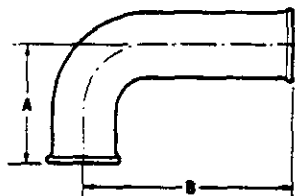
### 6513—Bend Offsets



| Size  | $\frac{1}{4}$ |       | $\frac{1}{2}$ |       | $\frac{3}{4}$ |       | $1\frac{1}{2}$ |       |
|-------|---------------|-------|---------------|-------|---------------|-------|----------------|-------|
|       | L             | O     | L             | O     | L             | O     | L              | O     |
| 1 1/2 | 6             | 6     | 7 1/2         | 4 3/8 | 6 3/8         | 2 7/8 | 7 3/4          | 1 1/2 |
| 2     | 6 1/2         | 6 1/2 | 8 1/4         | 4 3/4 | 7 3/4         | 3 3/4 | 8 3/4          | 1 3/4 |
| 3     | 10            | 10    | 10 1/2        | 6 1/4 | 9 3/4         | 3 3/4 | 10 1/2         | 2 1/8 |
| 4     | 14            | 14    | 13 1/2        | 7 7/8 | 11 1/8        | 4 3/8 | 10 3/4         | 2 1/2 |

## Special Purpose Bends

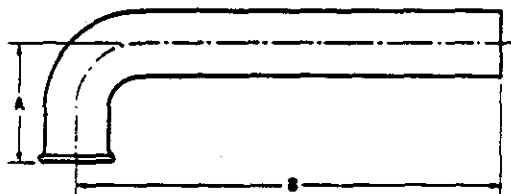
### 6512



| Size      | 6512  |       | 6512P |    | 6514  |   |
|-----------|-------|-------|-------|----|-------|---|
|           | A     | B     | A     | B  | A     | B |
| 1 1/2-90° | 3 3/4 | 6     | 3 3/4 | 12 | 2 1/2 | 3 |
| 2-90°     | 3 3/4 | 7 1/2 | 3 3/4 | 12 | —     | — |

\*Can be field cut.

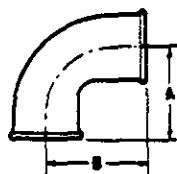
### 6512P (Annealed)\*



\*Can be field cut.

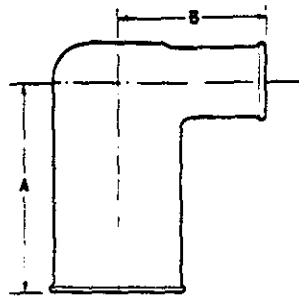
| 6512      |         | 6512P      |         | 6514      |        |
|-----------|---------|------------|---------|-----------|--------|
| Art. No.  | Price   | Art. No.   | Price   | Art. No.  | Price  |
| 6512-1590 | \$ 8.10 | 6512P-1590 | \$ 9.10 | 6514-1590 | \$8.10 |
| -2090     | 10.50   | -2090      | 11.20   |           |        |

### 6514



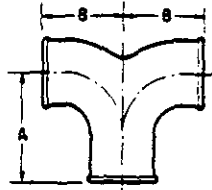
Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6518—Quarter Bend Reducer

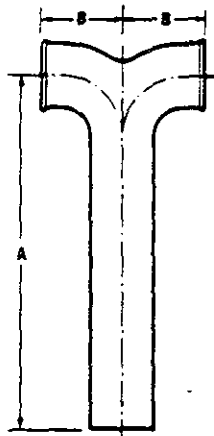


| Size   | A | B  | Art. No.  | Price   |
|--------|---|----|-----------|---------|
| 2 x 1½ | 4 | 3½ | 6518-2015 | \$ 9.50 |
| 3 x 1½ | 5 | 4  | -3015     | 12.00   |
| 3 x 2  | 5 | 4½ | -3020     | 13.25   |
| 4 x 1½ | 7 | 4½ | -4015     | 16.00   |
| 4 x 2  | 7 | 5  | -4020     | 17.25   |
| 4 x 3  | 7 | 5½ | -4030     | 19.50   |
| 6 x 1½ | 9 | 5½ | -6015     | 37.00   |
| 6 x 2  | 9 | 6  | -6020     | 38.00   |
| 6 x 3  | 9 | 6½ | -6030     | 40.00   |
| 6 x 4  | 9 | 8  | -6040     | 42.00   |

### 6519—Double Quarter Bend



### 6519P



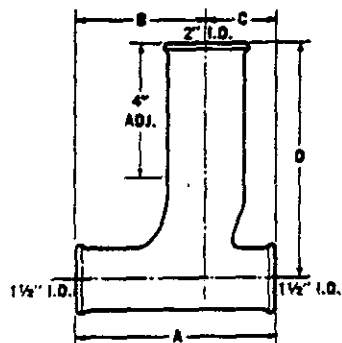
| Size         | 6519 |    | 6519P |    |
|--------------|------|----|-------|----|
|              | A    | B  | A     | B  |
| 1½           | 3    | 2½ | 10    | 2½ |
| **2 x 2 x 1½ | 3¼   | 2¼ | 10    | 2¼ |
| 2            | 3½   | 2¼ | 10    | 2¼ |
| 3            | 5    | 4½ |       |    |
| 4            | 6½   | 5¼ |       |    |
| 6            | 8½   | 7  |       |    |

\*Can be field cut.  
\*\*Branch is 1½".

| 6519      |         | 6519P      |         |
|-----------|---------|------------|---------|
| Art. No.  | Price   | Art. No.   | Price   |
| 6519-1500 | \$ 9.90 | 6519P-1500 | \$11.50 |
| ** -2015  | 15.00   | -2000      | 13.90   |
| -2020     | 13.05   | ** -2015   | 13.90   |
| -3000     | 19.80   |            |         |
| -4000     | 30.65   |            |         |
| -6000     | 55.00   |            |         |

\*\* Branch is 1½" I.D.

### 6520—Adjustable Sanitary T (One Adjustable Inlet)



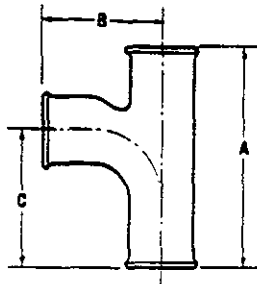
| Size        | A | B  | C  | D |
|-------------|---|----|----|---|
| 1½ x 1½ x 2 | 6 | 3¾ | 2¾ | 7 |

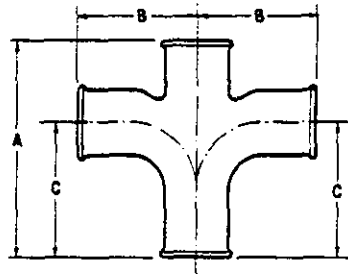
| Art. No.  | Price   |
|-----------|---------|
| 6520-1520 | \$11.25 |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

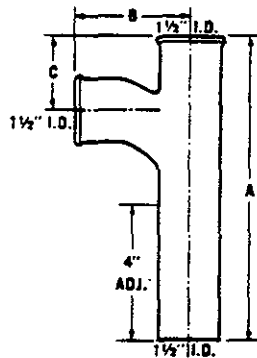
### 6521—Single Sanitary T



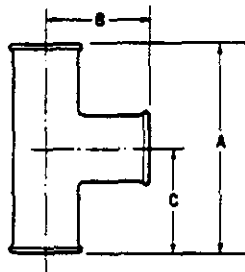
### 6522—Double



### 6530 Adjustable Sanitary T (Plain End Outlet)



### 6523—Straight T



| Size          | A  | B     | C      |
|---------------|----|-------|--------|
| 1 1/2 x 1 1/2 | 6  | 3 1/2 | 3 3/4  |
| 2 x 1 1/2     | 8  | 3 3/4 | 5      |
| 2 x 2         | 8  | 4 1/2 | 5      |
| 3 x 1 1/2     | 12 | 4 1/4 | 7 1/4  |
| 3 x 2         | 12 | 5     | 7 1/4  |
| 3 x 3         | 12 | 6 3/4 | 7 1/4  |
| 4 x 1 1/2     | 14 | 4 7/8 | 8 3/4  |
| 4 x 2         | 14 | 5 5/8 | 8 3/4  |
| 4 x 3         | 14 | 7     | 8 3/4  |
| 4 x 4         | 14 | 8 1/4 | 8 3/4  |
| 6 x 2         | 20 | 6 3/4 | 12 3/4 |
| 6 x 3         | 20 | 8     | 12 3/4 |
| 6 x 4         | 20 | 9 1/4 | 12 3/4 |
| 6 x 6         | 20 | 12    | 12 3/4 |

| Single    |         | Double    |         |
|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   |
| 6521-1515 | \$ 6.80 | 6522-1515 | \$10.65 |
| -2015     | 8.30    | -2015     | 12.50   |
| -2020     | 9.15    | -2020     | 13.60   |
| -3015     | 11.80   | -3015     | 16.05   |
| -3020     | 13.05   | -3020     | 18.35   |
| -3030     | 13.35   | -3030     | 19.65   |
| -4015     | 17.25   | -4015     | 28.00   |
| -4020     | 18.75   | -4020     | 28.50   |
| -4030     | 20.95   | -4030     | 31.00   |
| -4040     | 23.20   | -4040     | 34.80   |
| -6020     | 40.00   | -6020     | 44.20   |
| -6030     | 41.00   | -6030     | 49.00   |
| -6040     | 45.00   | -6040     | 53.50   |
| -6060     | 51.50   | -6060     | 71.00   |

| Size                  | A     | B     | C     | Art. No.  | Price  |
|-----------------------|-------|-------|-------|-----------|--------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 3/4 | 3 1/2 | 3 1/2 | 6530-1515 | \$9.50 |

\* Can be field cut.

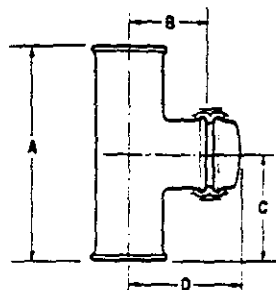
| Size          | A  | B     | C  | Art. No.  | Price   |
|---------------|----|-------|----|-----------|---------|
| 1 1/2 x 1 1/2 | 6  | 3     | 3  | 6523-1515 | \$10.10 |
| 2 x 1 1/2     | 8  | 3 3/4 | 4  | -2015     | 10.85   |
| 2 x 2         | 8  | 4     | 4  | -2020     | 11.00   |
| 3 x 1 1/2     | 12 | 4 1/2 | 6  | -3015     | 13.80   |
| 3 x 2         | 12 | 4 1/2 | 6  | -3020     | 14.10   |
| 3 x 3         | 12 | 6     | 6  | -3030     | 15.75   |
| 4 x 1 1/2     | 14 | 5     | 7  | -4015     | 16.70   |
| 4 x 2         | 14 | 5     | 7  | -4020     | 18.15   |
| 4 x 3         | 14 | 6 1/2 | 7  | -4030     | 23.25   |
| 4 x 4         | 14 | 8     | 7  | -4040     | 26.70   |
| 6 x 3         | 20 | 7 3/4 | 10 | -6030     | 53.50   |
| 6 x 4         | 20 | 9     | 10 | -6040     | 55.10   |
| 6 x 6         | 20 | 10    | 10 | -6060     | 62.80   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.



## 6524—Test T with cleanout

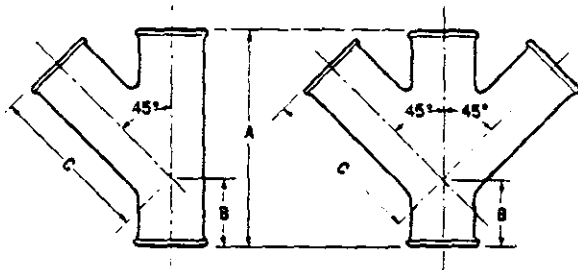
Test Tee and cleanout comes as complete assembly including cap and coupling.



| Size    | A  | B  | C | D  | Art. No.  | Price   |
|---------|----|----|---|----|-----------|---------|
| 1½ x 1½ | 6  | 2½ | 3 | 3½ | 6524-1515 | \$14.70 |
| 2 x 2   | 8  | 2½ | 4 | 3½ | -2020     | 17.30   |
| 3 x 3   | 12 | 3½ | 6 | 4½ | -3030     | 23.40   |
| 4 x 4   | 14 | 4½ | 7 | 5½ | -4040     | 43.50   |

## Drainline Y 6526—Single

## 6527—Double

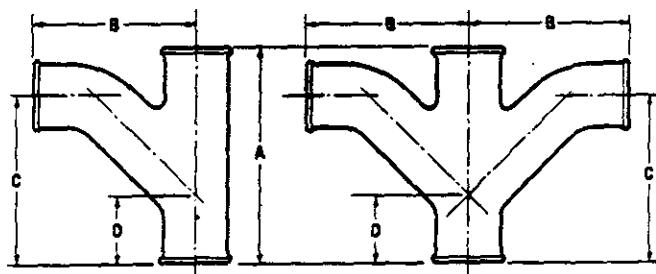


|         |    |    |     | Single Y  |         | Double Y  |         |
|---------|----|----|-----|-----------|---------|-----------|---------|
| Size    | A  | B  | C   | Art. No.  | Price   | Art. No.  | Price   |
| 1½ x 1½ | 6  | 1½ | 4½  | 6526-1515 | \$ 8.10 | 6527-1515 | \$11.00 |
| 2 x 1½  | 8  | 2½ | 4¾  | -2015     | 8.95    | -2015     | 14.00   |
| 2 x 2   | 8  | 2½ | 6   | -2020     | 9.35    | -2020     | 15.00   |
| 3 x 1½  | 12 | 3¾ | 5½  | -3015     | 12.40   | -3015     | 17.00   |
| 3 x 2   | 12 | 3¾ | 6¾  | -3020     | 12.90   | -3020     | 19.00   |
| 3 x 3   | 12 | 3¾ | 8   | -3030     | 14.90   | -3030     | 22.00   |
| 4 x 1½  | 14 | 4½ | 6¾  | -4015     | 17.00   | -4015     | 24.00   |
| 4 x 2   | 14 | 4½ | 7½  | -4020     | 18.80   | -4020     | 27.00   |
| 4 x 3   | 14 | 4½ | 8¾  | -4030     | 20.75   | -4030     | 33.00   |
| 4 x 4   | 14 | 4½ | 10  | -4040     | 24.70   | -4040     | 42.00   |
| 6 x 2   | 20 | 5¾ | 9   | -6020     | 40.50   | -6020     | 61.00   |
| 6 x 3   | 20 | 5¾ | 10¾ | -6030     | 49.40   | -6030     | 64.00   |
| 6 x 4   | 20 | 5¾ | 11½ | -6040     | 54.00   | -6040     | 68.00   |
| 6 x 6   | 20 | 5¾ | 14  | -6060     | 59.00   | -6060     | 90.00   |

## Combination Y and 1/8 Bend

## 6528—Single

## 6529—Double

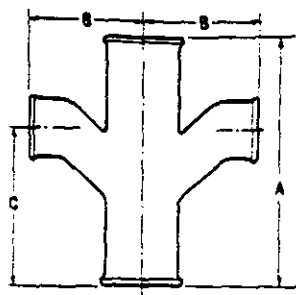


|         |    |    |     | Single    |         | Double    |         |
|---------|----|----|-----|-----------|---------|-----------|---------|
| Size    | A  | B  | C   | Art. No.  | Price   | Art. No.  | Price   |
| 1½ x 1½ | 6  | 4½ | 4¾  | 6528-1515 | \$ 8.50 | 6529-1515 | \$16.00 |
| 2 x 1½  | 8  | 4¾ | 5½  | -2015     | 10.35   | -2015     | 16.40   |
| 2 x 2   | 8  | 6  | 6¼  | -2020     | 11.90   | -2020     | 20.25   |
| 3 x 1½  | 12 | 5¾ | 7¼  | -3015     | 13.35   | -3015     | 21.70   |
| 3 x 2   | 12 | 6½ | 8   | -3020     | 14.40   | -3020     | 22.45   |
| 3 x 3   | 12 | 8½ | 9   | -3030     | 16.35   | -3030     | 29.65   |
| 4 x 1½  | 14 | 6  | 8½  | -4015     | 17.75   | -4015     | 31.00   |
| 4 x 2   | 14 | 7  | 9¼  | -4020     | 19.00   | -4020     | 31.00   |
| 4 x 3   | 14 | 9  | 10¼ | -4030     | 21.50   | -4030     | 35.00   |
| 4 x 4   | 14 | 11 | 11  | -4040     | 24.70   | -4040     | 50.00   |
| 6 x 2   | 20 | 8¾ | 11¾ | -6020     | 40.00   | -6020     | 55.00   |
| 6 x 3   | 20 | 10 | 12½ | -6030     | 43.70   | -6030     | 59.00   |
| 6 x 4   | 20 | 12 | 13½ | -6040     | 46.60   | -6040     | 70.00   |
| 6 x 6   | 20 | 15 | 14½ | -6060     | 56.00   | -6060     | 95.00   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

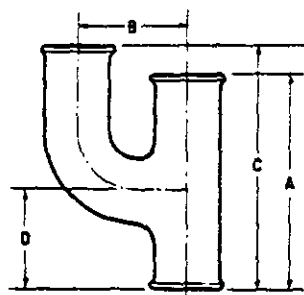
### 6531 Partition Cross (Compact)

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.



| Size             | A | B  | C | Art. No.  | Price   |
|------------------|---|----|---|-----------|---------|
| 2 x 1½           | 8 | 3¾ | 5 | 6531-2015 | \$16.10 |
| 2 x 2            | 8 | 4½ | 5 | -2020     | 18.90   |
| 2 x 1½ x 1½ x 1½ | 8 | 3¾ | 5 | -2151     | 21.65   |

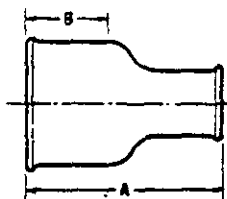
### 6532—Single Upright Y or H (vent branch)



| Size    | A  | B  | C*  | D  | Art. No.  | Price   |
|---------|----|----|-----|----|-----------|---------|
| 1½ x 1½ | 6  | 3  | 6¾  | 2¾ | 6532-1515 | \$22.10 |
| 2 x 1½  | 8  | 3¾ | 7¾  | 3¾ | -2015     | 22.10   |
| 2 x 2   | 8  | 4  | 8¾  | 3¾ | -2020     | 25.00   |
| 3 x 1½  | 12 | 3¾ | 9½  | 4¾ | -3015     | 25.20   |
| 3 x 2   | 12 | 4½ | 10¾ | 4¾ | -3020     | 27.30   |
| 3 x 3   | 12 | 6  | 13  | 5¾ | -3030     | 28.30   |
| 4 x 1½  | 14 | 4¾ | 10¾ | 5¾ | -4015     | 30.00   |
| 4 x 2   | 14 | 5  | 12  | 5¾ | -4020     | 32.40   |
| 4 x 3   | 14 | 6½ | 14¼ | 6¾ | -4030     | 36.50   |
| 4 x 4   | 14 | 8  | 16¾ | 6¾ | -4040     | 41.70   |
| 6 x 3   | 20 | 7¾ | 16¾ | 7¾ | -6030     | 55.00   |
| 6 x 4   | 20 | 9  | 19  | 8  | -6040     | 63.80   |
| 6 x 6   | 20 | 12 | 24  | 12 | -6060     | 86.00   |

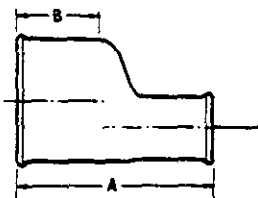
\*"C" dimension may be longer or shorter than "A"

### 6536—Straight Reducers or Increases



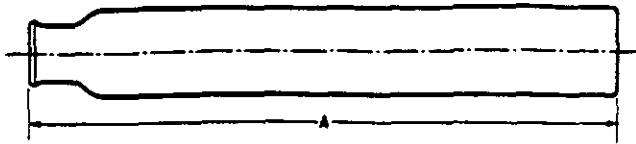
| Size   | A | B (min.) | Straight  |         | Eccentric |         |
|--------|---|----------|-----------|---------|-----------|---------|
|        |   |          | Art. No.  | Price   | Art. No.  | Price   |
| 2 x 1½ | 4 | 1¾       | 6536-2015 | \$ 4.95 | 6537-2015 | \$ 4.95 |
| 3 x 1½ | 5 | 2¼       | -3015     | 6.70    | -3015     | 6.70    |
| 3 x 2  | 5 | 2¼       | -3020     | 8.00    | -3020     | 8.00    |
| 4 x 1½ | 7 | 3        | -4015     | 10.40   | -4015     | 10.40   |
| 4 x 2  | 7 | 3        | -4020     | 11.35   | -4020     | 11.35   |
| 4 x 3  | 7 | 3        | -4030     | 12.35   | -4030     | 12.35   |
| 6 x 1½ | 9 | 4        | -6015     | 20.00   | -6015     | 20.00   |
| 6 x 2  | 9 | 4        | -6020     | 21.00   | -6020     | 21.00   |
| 6 x 3  | 9 | 4        | -6030     | 23.00   | -6030     | 23.00   |
| 6 x 4  | 9 | 4        | -6040     | 26.00   | -6040     | 26.00   |

### 6537—Eccentric Reducers or Increases



Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6540 Vent Increasers



| Size   | A  | Art. No.  | Price   |
|--------|----|-----------|---------|
| 1½ x 3 | 22 | 6540-1530 | \$17.50 |
| 2 x 3  | 22 | -2030     | 18.60   |
| 3 x 4  | 22 | -3040     | 25.50   |

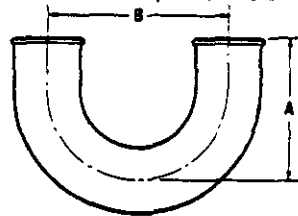
### 6544 Cleanout Plug



| Size | A  | Art. No.  | Price   |
|------|----|-----------|---------|
| 1½   | 1  | 6544-1500 | \$ 2.30 |
| 2    | 1  | -2000     | 2.90    |
| 3    | 1½ | -3000     | 4.10    |
| 4    | 1½ | -4000     | 7.10    |
| 6    | 1½ | -6000     | 10.40   |

### 6550 U Bend (vent loop)

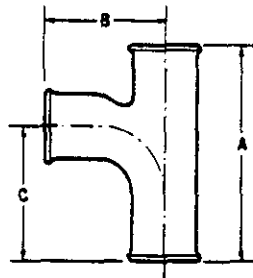
Note: U bends are often used for vent loops.  
No. 6705 outlets on Swivel "S" Traps are also used as vent loops.



| Size | A  | B  | Art. No.  | Price   |
|------|----|----|-----------|---------|
| 1½   | 4  | 5  | 6550-1500 | \$ 9.80 |
| 2    | 4½ | 5½ | -2000     | 12.30   |
| 3    | 5½ | 6½ | -3000     | 24.70   |
| 4    | 6½ | 7½ | -4000     | 32.90   |

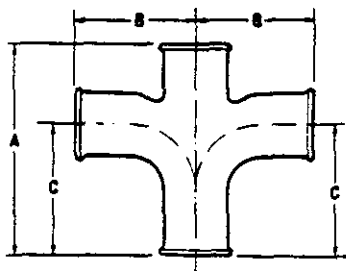
## compact fittings

### 6541 Single Sanitary T



| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 4½ | 2½ | 2¼ |
| 2 x 1½  | 4¾ | 2¾ | 2¾ |
| 2 x 2   | 5¾ | 2¾ | 2¾ |
| 3 x 2   | 9  | 4¼ | 5¼ |
| 3 x 3   | 9  | 4¼ | 5¼ |
| 4 x 1½  | 10 | 4¾ | 6¾ |
| 4 x 2   | 10 | 4¾ | 6¾ |
| 4 x 3   | 10 | 5¾ | 6¾ |
| 4 x 4   | 10 | 6¼ | 6¾ |
| 6 x 2   | 16 | 5¾ | 9½ |
| 6 x 3   | 16 | 6¾ | 9½ |
| 6 x 4   | 16 | 7¾ | 9½ |
| 6 x 6   | 16 | 9¾ | 9½ |

### 6542 Double Sanitary T

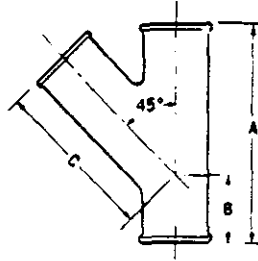


| Single    |         | Double    |         |
|-----------|---------|-----------|---------|
| Art. No.  | Price   | Art. No.  | Price   |
| 6541-1515 | \$ 6.80 | 6542-4015 | \$21.40 |
| -2015     | 8.30    | -4020     | 28.00   |
| -2020     | 9.15    | -4030     | 32.00   |
| -3020     | 13.05   | -4040     | 34.80   |
| -3030     | 13.35   | -6020     | 44.20   |
| -4015     | 17.25   | -6030     | 48.00   |
| -4020     | 18.75   | -6040     | 55.00   |
| -4030     | 20.95   | -6060     | 75.00   |
| -4040     | 23.20   |           |         |
| -6020     | 39.00   |           |         |
| -6030     | 40.00   |           |         |
| -6040     | 47.75   |           |         |
| -6060     | 52.75   |           |         |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

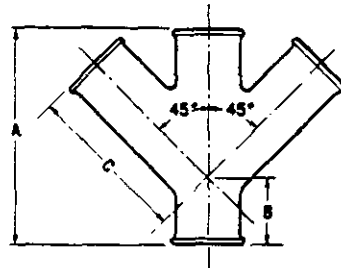
# Compact fittings

## 6546 Single Drainline Y



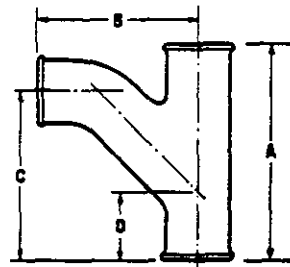
| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 5½ | 1½ | 4   |
| 2 x 2   | 5¾ | 1¾ | 4½  |
| 3 x 2   | 9  | 2¼ | 6¼  |
| 3 x 3   | 9  | 2¼ | 7¼  |
| 4 x 1½  | 10 | 3½ | 6¼  |
| 4 x 2   | 10 | 2¾ | 7¼  |
| 4 x 3   | 10 | 2  | 8½  |
| 4 x 4   | 10 | 2  | 8¾  |
| 6 x 2   | 16 | 4¾ | 9¾  |
| 6 x 3   | 16 | 5½ | 10¾ |
| 6 x 4   | 16 | 4½ | 11½ |
| 6 x 6   | 16 | 4¾ | 12¾ |

## 6547 Double Drainline Y



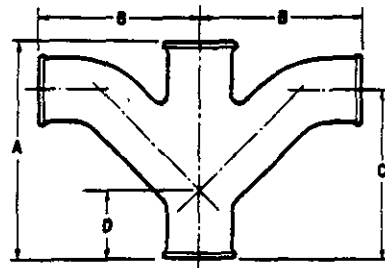
| Single<br>6546 |         | Double<br>6547 |         |
|----------------|---------|----------------|---------|
| Art. No.       | Price   | Art. No.       | Price   |
| 6546-1515      | \$ 9.00 | 6547-4015      | \$24.70 |
| -2020          | 9.90    | -4020          | 27.30   |
| -3020          | 12.90   | -4030          | 33.60   |
| -3030          | 14.90   | -4040          | 42.80   |
| -4015          | 17.00   | -6020          | 61.70   |
| -4020          | 18.80   | -6030          | 64.80   |
| -4030          | 20.75   | -6040          | 68.40   |
| -4040          | 24.70   | -6060          | 90.50   |
| -6020          | 40.00   |                |         |
| -6030          | 49.40   |                |         |
| -6040          | 54.00   |                |         |
| -6060          | 59.00   |                |         |

## 6548 Combination Y and ½ Bend



| Size   | A  | B   | C   | D  |
|--------|----|-----|-----|----|
| 2 x 1½ | 5½ | 3¾  | 3¾  | 1¾ |
| 2 x 2  | 6  | 4¾  | 4¾  | 1½ |
| 3 x 2  | 9  | 6¼  | 6¼  | 2¾ |
| 3 x 3  | 9  | 6¼  | 6¼  | 2¼ |
| 4 x 1½ | 10 | 5¾  | 6¾  | 2¾ |
| 4 x 2  | 10 | 5¾  | 6¾  | 2¾ |
| 4 x 3  | 10 | 6¾  | 7¾  | 3¾ |
| 4 x 4  | 10 | 6¾  | 7¾  | 2¾ |
| 6 x 2  | 16 | 7¾  | 9¾  | 4¾ |
| 6 x 3  | 16 | 8¼  | 9¾  | 4¾ |
| 6 x 4  | 16 | 9¼  | 10¾ | 4¾ |
| 6 x 6  | 16 | 11¼ | 10¾ | 3½ |

## 6549 Double Combination Y and ½ Bend

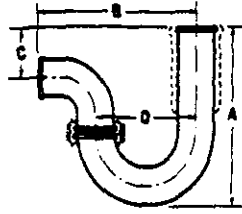


| Single<br>6548 |         | Double<br>6549 |         |
|----------------|---------|----------------|---------|
| Art. No.       | Price   | Art. No.       | Price   |
| 6548-2015      | \$10.35 | 6549-4015      | \$31.00 |
| -2020          | 11.90   | -4020          | 31.00   |
| -3020          | 14.40   | -4030          | 35.00   |
| -3030          | 16.35   | -4040          | 50.00   |
| -4015          | 17.75   | -6020          | 55.00   |
| -4020          | 19.00   | -6030          | 59.00   |
| -4030          | 21.50   | -6040          | 70.00   |
| -4040          | 24.70   | -6060          | 95.00   |
| -6020          | 40.00   |                |         |
| -6030          | 43.70   |                |         |
| -6040          | 48.60   |                |         |
| -6060          | 56.00   |                |         |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6700—Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.

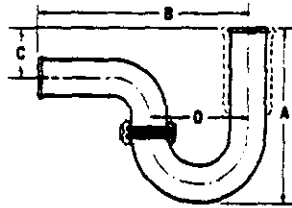


| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  | 6700-1515 | \$16.35 |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  | -2015     | 17.90   |
| 2 x 2                  | 9¼ | 8¾ | 1¾ | 5½ | -2020     | 21.25   |

See Standard Cleanout, Page 17.

### 6701—Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

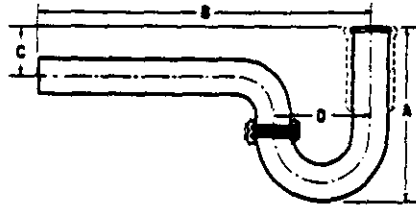


| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 9¼ | 11 | 1¾ | 5  | 6701-1515 | \$18.70 |
| 2 x 1½                 | 8¾ | 11 | 1¾ | 5  | -2015     | 22.00   |
| 2 x 2                  | 8¾ | 13 | 1¼ | 5½ | -2020     | 23.95   |

See Standard Cleanout, Page 17.

### 6704 (Plain End Outlet\*)

No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

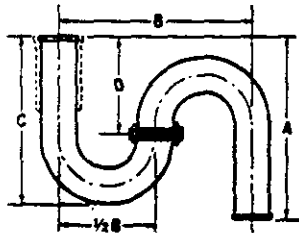


| Size<br>Inlet x Outlet | A  | B   | C  | D  | Art. No.  | Price   |
|------------------------|----|-----|----|----|-----------|---------|
| 1½ x 1½                | 8¾ | 17  | 1¾ | 5  | 6704-1515 | \$19.30 |
| 2 x 1½                 | 8¾ | 17  | 1¾ | 5  | -2015     | 20.85   |
| 2 x 2                  | 9¼ | 17½ | 1¼ | 5½ | -2020     | 24.80   |

\* Annealed outlet, can be field cut.

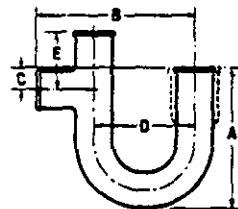
### 6706—Swivel Trap—S Style

No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Art. No.  | Price   |
|------------------------|----|----|----|----|-----------|---------|
| 1½ x 1½                | 10 | 10 | 8¾ | 5  | 6706-1515 | \$18.90 |
| 2 x 1½                 | 10 | 10 | 8¾ | 5  | -2015     | 20.45   |
| 2 x 2                  | 9¾ | 11 | 9¼ | 4¾ | -2020     | 24.70   |

### 6713 (Vented)



| Size<br>Inlet x<br>Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Art. No.  | Price   |
|---------------------------|--------------|-----|-----|----|----|----|-----------|---------|
| 1½ x 1½                   | 1½           | 7   | 8   | 1  | 5  | 3  | 6713-1515 | \$17.00 |
| 2 x 1½                    | 1½           | 7½  | 8   | 1½ | 5  | 3  | -2015     | 18.00   |
| 2 x 2                     | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | -2020     | 19.55   |
| 3 x 3                     | 3            | 10¼ | 10½ | 2  | 6½ | 4  | -3030     | 41.60   |
| 4 x 4                     | 4            | 12¼ | 12½ | 2½ | 7½ | 5  | -4040     | 50.85   |
| 6 x 6                     | 4            | 18¾ | 31  | 2½ | 24 | 7  | **6060    | 166.20  |

\* Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.

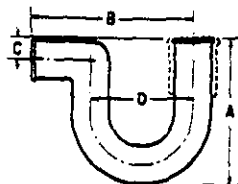
\*\* No cleanouts on 6 x 6 traps.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

### 6718 Trap—P Style

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
Traps available with B type cleanout. See Standard Cleanout, Page 17.

No cleanouts on 6 x 6 traps.

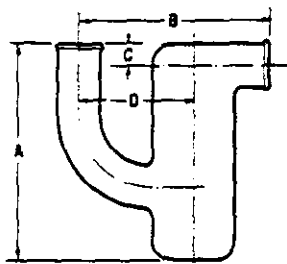


| Size<br>Inlet x<br>Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Art. No.  | P  |
|---------------------------|--------------|-----|-----|----|----|----|-----------|----|
| 1½ x 1½                   | 1½           | 7   | 8   | 1  | 5  | 3  | 6718-1515 | \$ |
| *2 x 1½                   | 1½           | 7½  | 8   | 1½ | 5  | 3  | -2015     | -  |
| 2 x 2                     | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ | -2020     | 1  |
| 3 x 3                     | 3            | 10¼ | 10½ | 2  | 6½ | 4  | -3030     | 3  |
| 4 x 4                     | 4            | 12¼ | 12½ | 2½ | 7½ | 5  | -4040     | 4  |
| 6 x 6                     | 4            | 16¾ | 31  | 2½ | 24 | 7  | **6060    | 17 |

\*Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.  
\*\* No cleanouts on 6 x 6 traps.

### 6707—Drum Trap—P Style

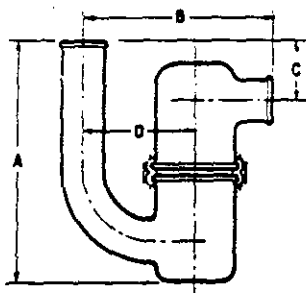
Traps available with B type cleanout. See Standard Cleanout, Page 17.



| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. | Art. No.  | Pri  |
|------------------------|----|----|----|----|--------------|-----------|------|
| 1½ x 1½                | 9  | 8  | 1  | 4¾ | 3            | 6707-1515 | \$22 |
| 2 x 1½                 | 9  | 8  | 1½ | 4¾ | 3            | -2015     | 23   |
| 2 x 2                  | 9¾ | 9¾ | 2  | 5½ | 4            | -2020     | 28   |

### 6710—Swivel Drum Trap—P Style

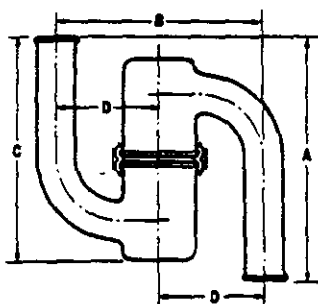
No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.



| Size<br>Inlet x Outlet | A   | B  | C  | D  | Body<br>I.D. | Art. No.  | Price  |
|------------------------|-----|----|----|----|--------------|-----------|--------|
| 1½ x 1½                | 10¼ | 8  | 2½ | 4¾ | 3            | 6710-1515 | \$29.0 |
| 2 x 1½                 | 10¼ | 8  | 2½ | 4¾ | 3            | -2015     | 31.0   |
| 2 x 2                  | 11  | 9¾ | 3  | 5½ | 4            | -2020     | 36.0   |

### 6714—Swivel Drum Trap—S Style

No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.



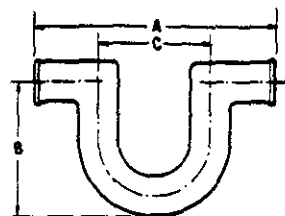
| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>I.D. | Art. No.  | Price   |
|------------------------|-----|----|-----|----|--------------|-----------|---------|
| 1½ x 1½                | 11¼ | 9½ | 10¼ | 4¾ | 3            | 6714-1515 | \$31.00 |
| 2 x 1½                 | 11¼ | 9½ | 10¼ | 4¾ | 3            | -2015     | 33.00   |
| 2 x 2                  | 11¼ | 11 | 11  | 5½ | 4            | -2020     | 38.00   |

Traps available with B type cleanout. See Standard Cleanout, Page 17.

Use catalog dimensions for piping layout as gasket thickness allowance is included.

## 6770 Running Trap

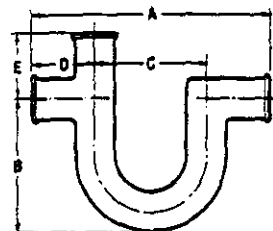
Traps available with B type cleanout. See Standard Cleanout, Page 17.



| Size<br>Inlet x<br>Outlet | Vent<br>Size | A      | B      | C     | D     | E     |
|---------------------------|--------------|--------|--------|-------|-------|-------|
| 1 1/2 x 1 1/2             | 1 1/2        | 11     | 6      | 5     | 3     | 3     |
| 2 x 2                     | 2            | 12     | 6 1/4  | 5 1/2 | 3 1/4 | 3 1/2 |
| 3 x 3                     | 3            | 14 1/2 | 8 1/4  | 6 1/2 | 4     | 4     |
| 4 x 4                     | 4            | 17 1/2 | 9 3/4  | 7 1/2 | 5     | 5     |
| *6 x 6                    | 4            | 38     | 12 3/8 | 24    | 7     | 7     |

\*No cleanouts on 6 x 6 traps.

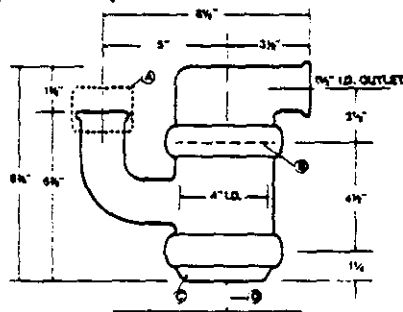
## 6771 (Vented)



| 6770      |          | 6771      |          |
|-----------|----------|-----------|----------|
| Art. No.  | Price    | Art. No.  | Price    |
| 6770-1515 | \$ 25.10 | 6771-1515 | \$ 28.10 |
| -2020     | 30.20    | -2020     | 35.50    |
| -3030     | 50.20    | -3030     | 58.00    |
| -4040     | 80.20    | -4040     | 85.20    |
| *-6060    | 115.00   | *-6060    | 170.50   |

\*No cleanouts on 6 x 6 traps.

## Interceptor Trap #6708-4015



| ARTICLE NO. | Price   | DESCRIPTION                        |
|-------------|---------|------------------------------------|
| 6708-4015   | \$61.20 | 1 1/2" x 1 1/2" INTERCEPTOR TRAP   |
| 6665-1512   | 5.00    | 1 1/4" O.D. INLET ADAPTER COUPLING |
| 6665-1515   | 5.00    | 1 1/2" O.D. INLET ADAPTER COUPLING |

A. Adapter Coupling #6665-1512 (to connect to 1 1/4" O.D. tubing)  
(Rubber Seal) #6665-1515 (to connect to 1 1/2" O.D. tubing)

B. Perforated S.S. Screen 1/16" dia. holes 6 sq. in. free area opg.

C. Removable coupling/end cap for cleanout.

D. Min. 3" clearance required under trap for removal of end cap.

### Specifications

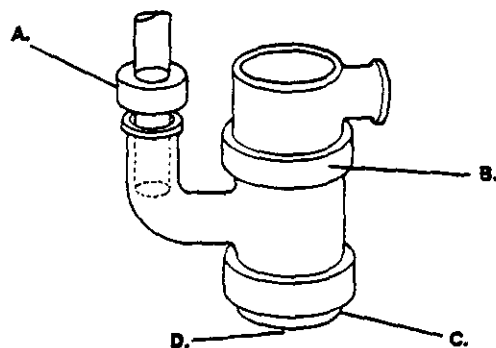
KIMAX Borosilicate Glass Interceptor Trap with 1 1/2" I.D. inlet, 1 1/2" I.D. outlet and 4" I.D. body. Perforated S.S. Screen Interceptor 4" dia. with 1/16" holes and effective 6 sq. in. free area opening. Bottom C.O. Coupling with end cap for cleaning.

### Connections

1. For DWV Service use KIMAX Adapter Coupling 6665-1515 for 1 1/2" O.D. tubing or 6665-1512 for 1 1/4" O.D. tubing. RUBBER SEAL ONLY.

2. To connect to 1 1/2" IPS metal or rigid plastic plain end pipe, use KIMAX B/P Coupling 6661-1500.

3. To connect to 1 1/2" I.D. glass drainline, use KIMAX Couplings 6650-1500 or 6661-1500.

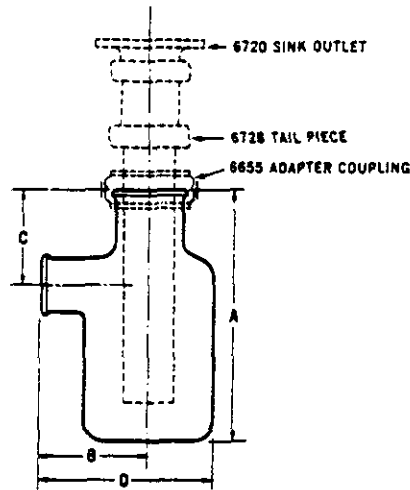


Use catalog dimensions for piping layout as gasket thickness allowance is included.

## 6614—Partition Trap (Consists of Trap Body Only)

Available with 1½" and 2" outlets only. 1½" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

Traps are non-siphoning with partition always visible.  
Traps available with B type cleanout. See below.



| Size<br>Inlet x Outlet | A  | B  | C  | D | Art. No.  | Price   |
|------------------------|----|----|----|---|-----------|---------|
| 2 x 1½                 | 8½ | 3¾ | 3¾ | 6 | 6614-2015 | \$25.00 |
| 2 x 2                  | 8½ | 3¾ | 4¼ | 6 | -2020     | 28.30   |

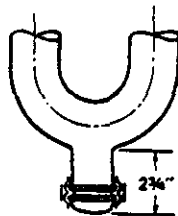
## Type B—Standard Cleanout

Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

To order standard traps with cleanouts use catalog number for proper style and add the letter B. (Example 6718-B-1515)  
For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

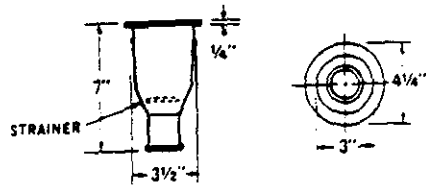
| Size | Art. No. | Price                      |
|------|----------|----------------------------|
| 1½   | B        | \$8.10 (Add to trap price) |



Use catalog dimensions for piping layout as gasket thickness allowance is included.



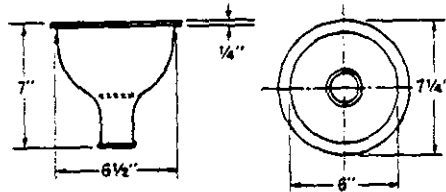
### 6616 Beaded Outlet 3" Hemispherical



No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/4") on outlet to connect to 2" expanded end traps or fittings.

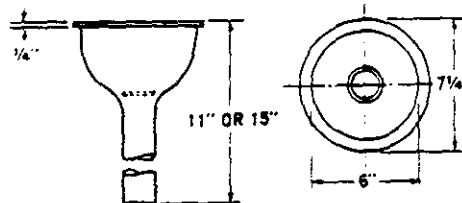
| Art. No.  | Price   |
|-----------|---------|
| 6616-3000 | \$15.00 |

### 6617 Beaded Outlet 6" Hemispherical



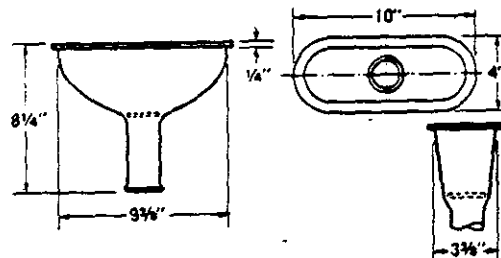
| Art. No.  | Price   |
|-----------|---------|
| 6617-6000 | \$15.00 |

### 6617P Plain End Outlet 6" Hemispherical



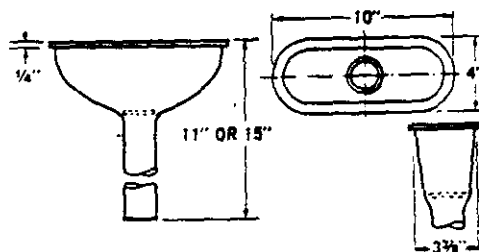
| Art. No.   | Price   |
|------------|---------|
| 6617P-6011 | \$15.00 |
| .6015      | 15.50   |

### 6618 Beaded Outlet 3" x 9" Oval



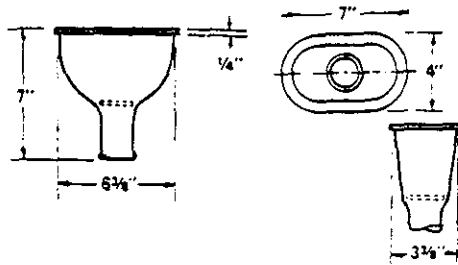
| Art. No.  | Price   |
|-----------|---------|
| 6618-3900 | \$18.00 |

### 6618P Plain End Outlet 3" x 9" Oval



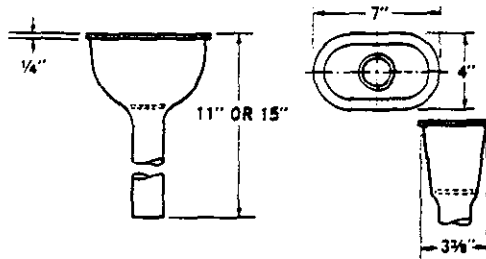
| Art. No.   | Price   |
|------------|---------|
| 6618P-3911 | \$18.50 |
| .3915      | 18.50   |

### 6619 Beaded Outlet 3" x 6" Oval



| Art. No.  | Price   |
|-----------|---------|
| 6619-3600 | \$12.90 |

### 6619P Plain End Outlet 3" x 6" Oval

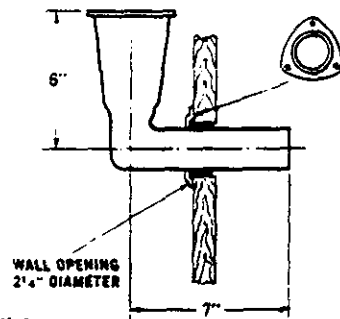


| Art. No.   | Price   |
|------------|---------|
| 6619P-3611 | \$12.85 |
| -3615      | 12.85   |

### 6724 Sink Strainer (All Cup Sinks)

| Size | Art. No.  | Price  |
|------|-----------|--------|
| 2    | 6724-2000 | \$1.10 |

### 6627 3" x 6" Oval Horizontal, Wall Mounted Cup Sink 1 1/2" Plain End Outlet

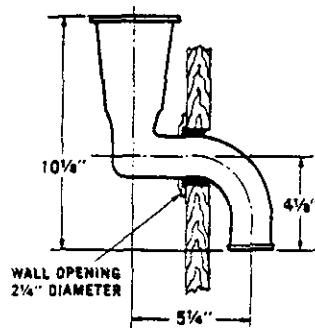


**Horizontal Outlet**  
 No. 6621 cup sink oval (3 x 6)  
 No. 6724 2" sink strainer  
 No. 7150 2" flange  
 No. 7204 insert (2 x 1 1/2)

| Art. No.  | Price   |
|-----------|---------|
| 6621-3600 | \$22.30 |
| 6724-2000 | 1.10    |
| 7150-2000 | 1.90    |
| 7204-2015 | 2.50    |

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/2") on outlet to connect to 2" expanded inlet.

**6628 3" x 6" Oval Vertical,  
1½" Outlet  
Wall Mounted Cup Sink**



| Art. No.  | Price   |
|-----------|---------|
| 6628-3600 | \$32.00 |

**Vertical Outlet**

No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1½)

| Art No.   | Price   |
|-----------|---------|
| 6629-3600 | \$24.60 |
| 6724-2000 | 1.10    |
| 7150-2000 | 1.90    |
| 7204-2015 | 2.50    |

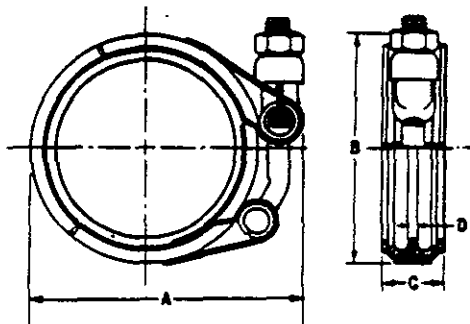
Mounting bolts or screws to be furnished by installer. For No. 6628 assembly use No. 6650 1½" size KIMAX coupling on outlet.

## accessories and hardware

### 6650—Drainline Coupling (Bead to Bead)

No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4", and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

No. 6651 segmented stainless steel outer band  
No. 6652 Buna-N rubber compression liner with TFE seal ring  
No. 6653 stainless steel bolt  
No. 6664 Silver plated stainless steel hex nut



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼—28 x 2¾ |
| 2    | 3½ | 3½ | 1¾ | ¾ | ¼—28 x 2¾ |
| 3    | 4¾ | 4¾ | 1¾ | ¾ | ¼—28 x 2¾ |
| 4    | 6  | 5½ | 1½ | ¾ | ¼—28 x 3¼ |
| 6    | 8¼ | 7¾ | 1¾ | ¾ | ¾—24 x 4  |

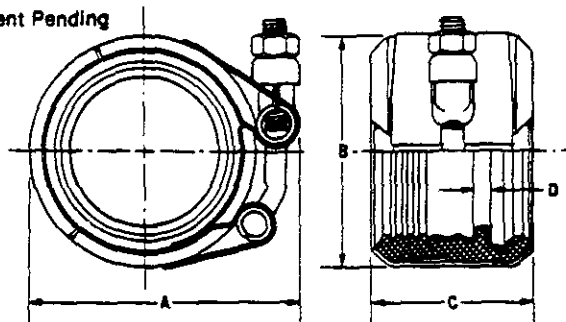
| 6650      |         |
|-----------|---------|
| Art. No.  | Price   |
| 6650-1500 | \$ 3.20 |
| -2000     | 4.10    |
| -3000     | 5.60    |
| -4000     | 9.25    |
| -6000     | 21.10   |

## 6661—B/P\* Drainline Coupling (Bead to Plain End)

No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3", 4" or 6" KIMAX beaded glass drainline to plain end (cut) glass pipe; lead, I.P.S. metal, or plastic pipe. This new exclusively designed KIMAX drainline coupling consists of the following components:

- No. 6662 stainless steel band with bolt
- No. 6663 Buna-N rubber compression liner with TFE seal ring
- No. 6664 silver plated stainless steel hex nut

Patent Pending



| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28      |
| 2    | 3¾ | 3¼ | 1¾ | ¾ | ¼-28      |
| 3    | 4½ | 4¼ | 2¾ | ¾ | ¾-24      |
| 4    | 6  | 5¾ | 2¾ | ¾ | ¾-24 (2)  |
| 6    | 8¾ | 7¾ | 4  | ¾ | ¾-24 (2)  |

| 6661<br>Art. No. | Price   |
|------------------|---------|
| 6661-1500        | \$ 4.10 |
| -2000            | 5.20    |
| -3000            | 9.50    |
| -4000            | 15.75   |
| -6000            | 54.00   |

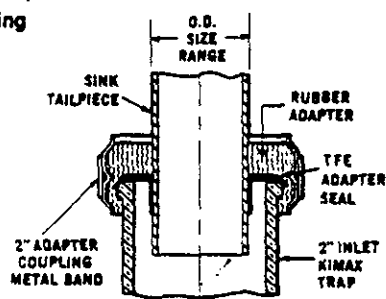
## 6655—Adapter Coupling

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt, ¼"-28 x 2¾"
- No. 6664 Silver plated stainless steel hex nut

Patent Pending



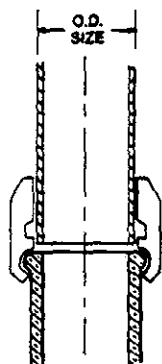
| Size   | Tailpiece Style                                                                                                                                                          | O.D.<br>Size Range |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                    | 1.48 to 1.5        |
| 2 x 1¾ | Lead, Class D or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                            | 1.70 to 1.7        |
| 2 x 1½ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Durcon =SO-2<br>Duriron =11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 1.82 to 1.9        |

| Art. No.  | Price  |
|-----------|--------|
| 6655-2015 | \$5.90 |
| -2017     | 5.90   |
| -2018     | 5.90   |

## 6665—Adapter Coupling

Used to join 1½" beaded KIMAX drainline pipe to 1¼" or 1½" O.D. tubing.

Note: Rubber seal only - not recommended where acids will come in contact with the coupling seal.



| Size    | Tailpiece Style |
|---------|-----------------|
| 1½ x 1¼ | 1¼" O.D. tubing |
| 1½ x 1½ | 1½" O.D. tubing |

| Art. No.  | Price  |
|-----------|--------|
| 6665-1512 | \$5.00 |
| -1515     | 5.00   |

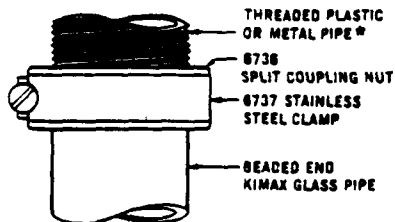
## 6735—1½" Split Coupling (Threaded to Beaded Pipe)

No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" metal pipe.

The assembly consists of:

No. 6736 split coupling nut  
No. 6737 stainless steel clamp

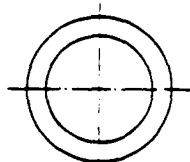
To install . . . remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.



| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6735-1500 | \$4.00 |

## • 6739 Gasket

Use gasket No. 6739 when connecting KIMAX glass pipe to threaded metal pipe.



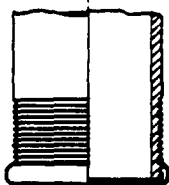
| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6739-1500 | \$1.40 |

## 6680 Thread Adapters (Threaded to Beaded Pipe)

Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

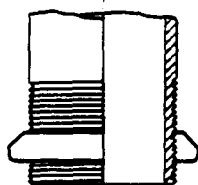
Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.



| Size | Art. No.  | Price   |
|------|-----------|---------|
| 1½   | 6680-1500 | \$ 4.10 |
| 2    | -2000     | 5.10    |
| 3    | -3000     | 7.20    |
| 4    | -4000     | 11.90   |

## 6685—Adjustable



| Size   | Art. No.  | Price  |
|--------|-----------|--------|
| 2 x 1½ | 6685-2015 | \$5.90 |

## 6720 Sink Outlet Assembly (1½" and 2" sizes)

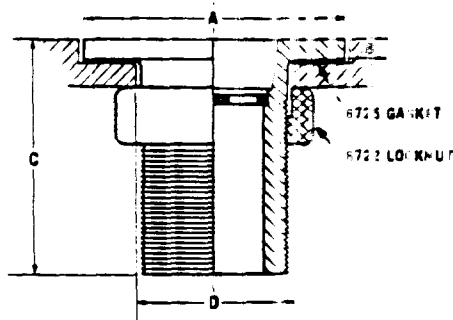
### 6720D 2"—For Use With Sink Having 3⅝" Counterbore

Consists of:

- 6724 sink strainer (black fluorocarbon plastic)
- 6721 and 6721D sink outlet (black fluorocarbon plastic)
- 6725 gasket—neoprene
- 6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3-4-E 2-1/2" plugging compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

For sink outlet tailpiece connections, see No. 6728 dimensions below.



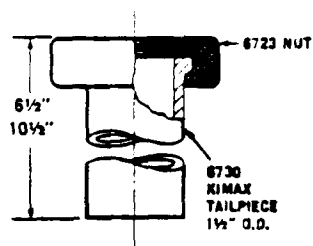
|       | Size | A  | B | C  | D  |
|-------|------|----|---|----|----|
| 6720  | 1½   | 3⅝ | ¼ | 2¾ | 2  |
|       | 2    | 3⅝ | ¼ | 3  | 2⅝ |
| 6720D | 2    | 3⅝ | ¼ | 3  | 2⅝ |

| 6720     |         | 6720D      |         | 6722      |        |
|----------|---------|------------|---------|-----------|--------|
| Art. No. | Price   | Art. No.   | Price   | Art. No.  | Price  |
| 6720-500 | \$12.00 | 6720D-2000 | \$25.50 | 6722-1500 | \$ .60 |
| -1000    | 25.50   |            |         | -2000     | 2.50   |

## 6728 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... do not use pipe wrench.



| Size     | Art. No.  | Price  |
|----------|-----------|--------|
| 1½ x 6½  | 6728-1060 | \$3.00 |
| 1½ x 10½ | -1100     | 3.50   |

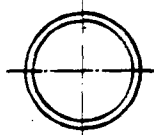
### Components of 6728

| 6723-Nut  |      |        |
|-----------|------|--------|
| Art. No.  | Size | Price  |
| 6723-1500 | 1½   | \$ .80 |

| 6730 Tail Piece |          |        |
|-----------------|----------|--------|
| Art. No.        | Size     | Price  |
| 6730-1060       | 1½ x 6½  | \$2.10 |
| -1100           | 1½ x 10½ | 3.00   |

## 6738—Gasket

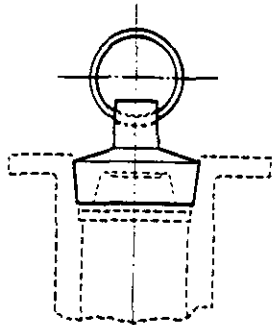
Use gasket No. 6738 when connecting glass tailpiece #6728 to threaded metal pipe.



| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6738-1500 | \$1.70 |

## 6726 Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead.

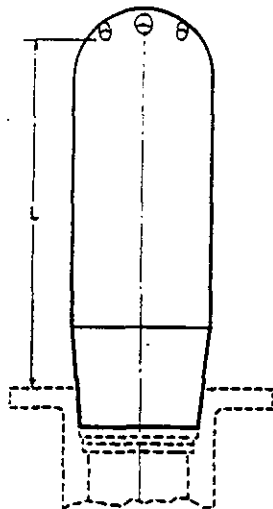


| Size | Art. No.  | Price  |
|------|-----------|--------|
| 1½   | 6726-1500 | \$4.00 |
| 2    | -2000     | 6.00   |

## 6727 Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" sink outlets only. . . . 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet<br>Size | Beehive Type<br>Length |    |    | Open Type<br>Length |    |    |
|---------------------|------------------------|----|----|---------------------|----|----|
| 1½                  | 4"                     | 6" | 8" | —                   | —  | —  |
| 2                   | —                      | —  | —  | 4"                  | 6" | 8" |

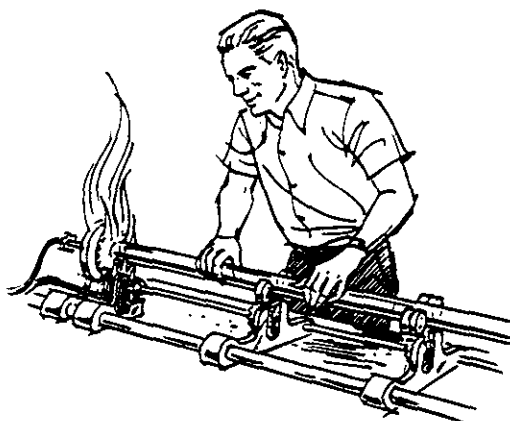


| Size   | Art. No.  | Price   |
|--------|-----------|---------|
| 1½ x 4 | 6727-1504 | \$10.00 |
| 1½ x 6 | -1506     | 11.00   |
| 1½ x 8 | -1508     | 11.50   |

## 7310-56801 KIMAX Portable Beading Kit

Used for field beading  $\frac{1}{2}$ " through 6" glass pipe.

For more detailed information on the availability of the newest model kit (BK-5) and its operation, ask your KIMAX distributor or write the nearest O-I office listed on the back of this catalog.

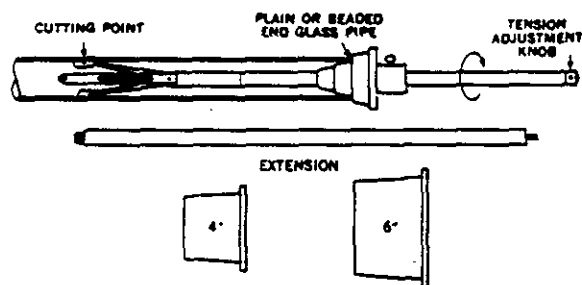


## 7310-56802

### KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut  $1\frac{1}{2}$ "—6" glass drainage anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm subassembly and  $1\frac{1}{2}$ "—4" centering cones and ring stop as shown.

Contact distributor for information & price.

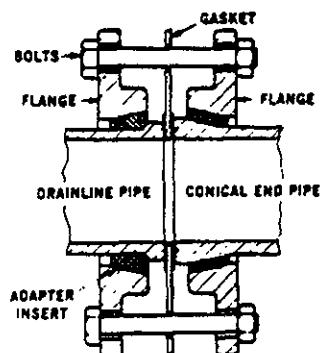


Order 6" centering cones separately.

## 7110 Coupling Assembly (Drainline to Conical End Pipe)

To join drainline glass pipe to conical end pipe. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.



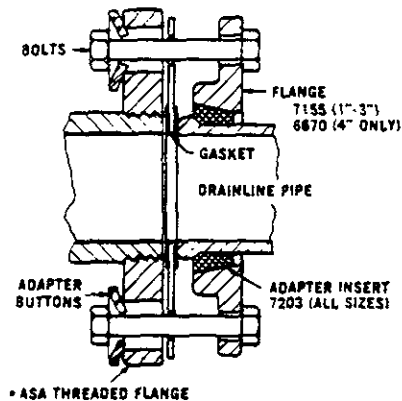
| Pipe Size | Style II Flanges Qty. No. | Adapter Insert Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size |
|-----------|---------------------------|-------------------------|-----------------|----------------------------|
| 1½        | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>¾—18 x 2½        |
| 2         | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-1790<br>¾—18 x 2½        |
| 3         | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>¾—18 x 3         |
| 4         | 1-8870<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>¾—18 x 3         |
| 6         | 1-8870<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>¾—16 x 3         |

| Size | Art. No.  | Price   |
|------|-----------|---------|
| 1½   | 7110-1500 | \$12.40 |
| 2    | -2000     | 14.30   |
| 3    | -3000     | 19.40   |
| 4    | -4000     | 39.70   |
| 6    | -6000     | 67.45   |



## 7120 Coupling Assembly (Metal IPS to Beaded End Pipe)

To join drainline glass pipe to metal IPS threaded pipe. Kit includes flange, adapter insert, bolts, adapter buttons and TFE sheath gasket. ASA threaded flange not included.



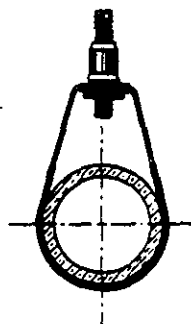
\*Flange should be placed far enough on pipe to permit machining end of pipe to provide a flat bearing surface for beaded glass pipe.

| Pipe Size | Style II Flange Qty. No. | Adapter Insert Qty. No. | Adapter Buttons Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size |
|-----------|--------------------------|-------------------------|--------------------------|-----------------|----------------------------|
| 1         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>3/16-18 x 2 1/2  |
| 1 1/2     | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>3/16-18 x 2 1/2  |
| 2         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>3/16-18 x 2 1/2  |
| 3         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>3/16-18 x 3      |
| 4         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>3/16-18 x 3      |
| 6         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>3/16-18 x 3      |

| Size  | Art. No.  | Price   |
|-------|-----------|---------|
| 1 1/2 | 7120-1500 | \$ 9.50 |
| 2     | -2000     | 11.00   |
| 3     | -3000     | 14.50   |
| 4     | -4000     | 25.80   |
| 6     | -6000     | 37.20   |

## 7290 (1 1/2", 2", 3", 4", 6" sizes) Pipe Hangers (padded)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.



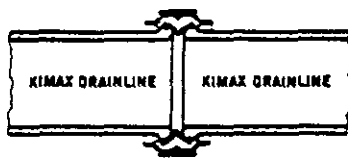
| Size  | Art. No.  | Price   |
|-------|-----------|---------|
| 1 1/2 | 7290-1500 | \$ 1.65 |
| 2     | -2000     | 1.95    |
| 3     | -3000     | 3.40    |
| 4     | -4000     | 3.70    |
| 6     | -6000     | 10.45   |

# typical joint reference chart

## Type of Pipe

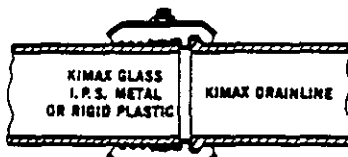
## Type of Joint

## Material Needed



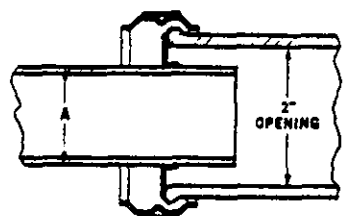
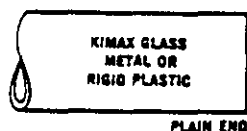
### KIMAX Drainline Coupling 6650

| Size | Code No.  |
|------|-----------|
| 1½   | 6650-1500 |
| 2    | 6650-2000 |
| 3    | 6650-3000 |
| 4    | 6650-4000 |
| 6    | 6650-6000 |



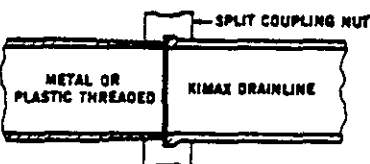
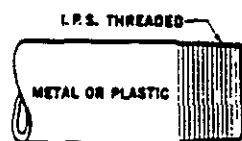
### KIMAX B/P Coupling 6661

| Pipe Size | Code No.  |
|-----------|-----------|
| 1½        | 6661-1500 |
| 2         | 6661-2000 |
| 3         | 6661-3000 |
| 4         | 6661-4000 |
| 6         | 6661-6000 |



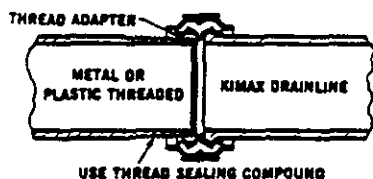
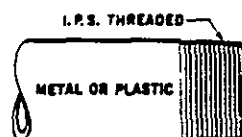
### KIMAX Adapter Coupling

| "A" Dimension<br>Pipe O.D. | Coupling<br>Size | Code No.  |
|----------------------------|------------------|-----------|
| 1.48—1.53                  | 2 x 1½           | 6655-2015 |
| 1.70—1.78                  | 2 x 1¾           | 6655-2017 |
| 1.82—1.90                  | 2 x 2            | 6655-2018 |



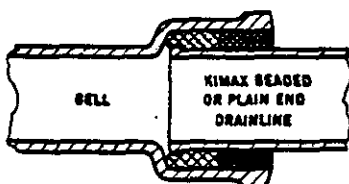
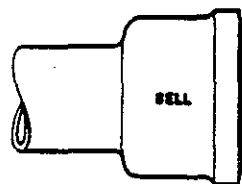
### KIMAX Split Coupling

| Pipe Size | Coupling<br>Code No. | Gasket<br>Code No. |
|-----------|----------------------|--------------------|
| 1½        | 6635-1500            | 6739-1500          |



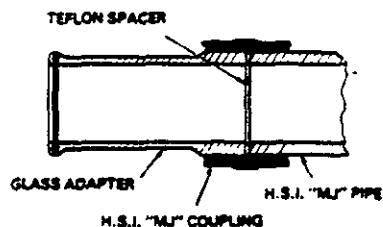
### KIMAX Thread Adapter and Drainline Coupling

| Pipe Size | Adapter<br>Code No. | Coupling<br>Code No. |
|-----------|---------------------|----------------------|
| 1½        | 6680-1500           | 6650-1500            |
| 2         | 6680-2000           | 6650-2000            |
| 3         | 6680-3000           | 6650-3000            |
| 4         | 6680-4000           | 6650-4000            |
| 6         | 6680-6000           | 6650-6000            |



### KIMAX Glass to Bell End Pipe

1. Pack hub half full with asbestos rope.
  2. Caulk with hot lead, lead wool or acid-proof cement.
- For Details, see Drainline Installation Manual.



### Glass Adapter to H.S.I. "MJ" Pipe

| Pipe Size | Code No.  | Price   |
|-----------|-----------|---------|
| 1½        | 6566-1500 | \$ 8.00 |
| 2         | 6566-2000 | 10.00   |
| 3         | 6566-3000 | 12.00   |
| 4         | 6566-4000 | 14.00   |

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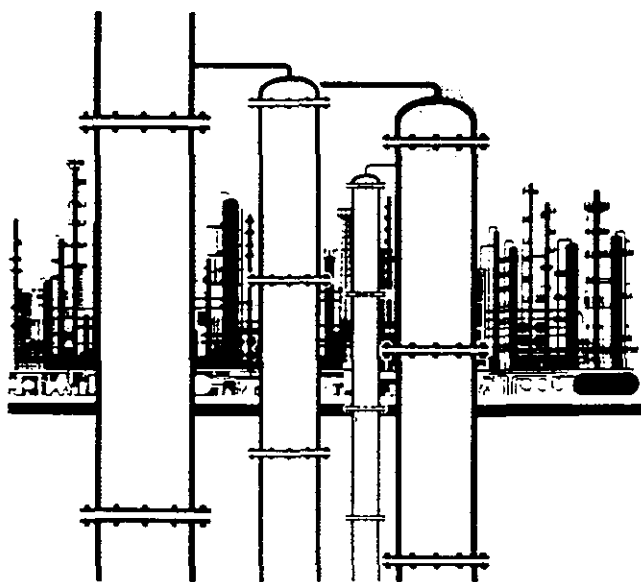
O-I SCHOTT

Process Systems Inc.



THINK  
GLASS

# GLASS COMPONENTS FOR PROCESS APPLICATIONS



This Catalog, together with the O-I/Schott Heat Exchanger and O-I/Schott Valve catalogs, contain all of the essential components and information necessary for the design and preparation of engineering drawings for process plants and piping made from Duran<sup>®</sup> glass.

Depending upon the situation, these drawings can be made either by the user or by O-I/Schott.

When the design is performed by O-I/Schott the resulting quotation may include the following:

- Design and calculations of the desired process(es), based upon conceptual flow diagrams, and pertinent heat and material balances.
- Budgetary or firm price, based upon available information.
- Sketch showing basic plan and elevation views of proposed plant.
- After placement of order or letter of intent to purchase scale drawings with parts lists, and a perspective drawing of support structure, if applicable.

Frequently used unit processes or operations can often be taken as a basis for the initial concept. Several of these can be submitted in the form of customer information sheets for pre design guidance.

These sheets include a list of the detailed technical data required for O-I/Schott to design your process, if desired.

The properties of borosilicate glass have led to its becoming a preferred material of construction for such diverse chemical engineering unit operations as:

- Distillation
- Rectification
- Extraction
- Absorption
- Reaction

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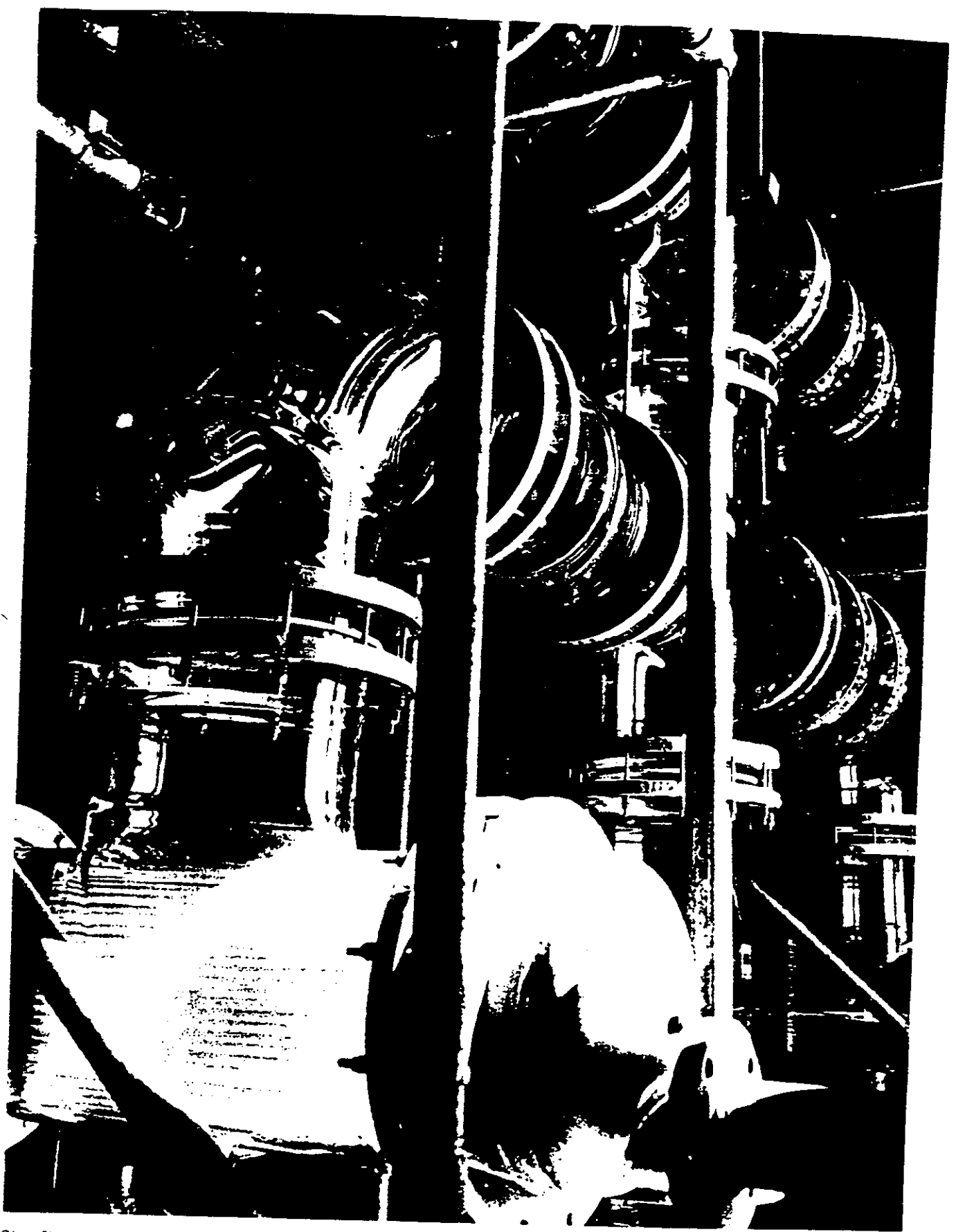
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\*See Separate Catalogs.

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# PART NUMBER — CROSS REFERENCE

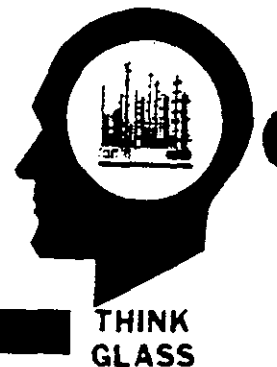
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Glass Shell and Tube Heat Exchangers connected with 12" Diameter Pipe.



# O-I/SCHOTT PROCESS PLANTS AND PIPING OF BOROSILICATE GLASS



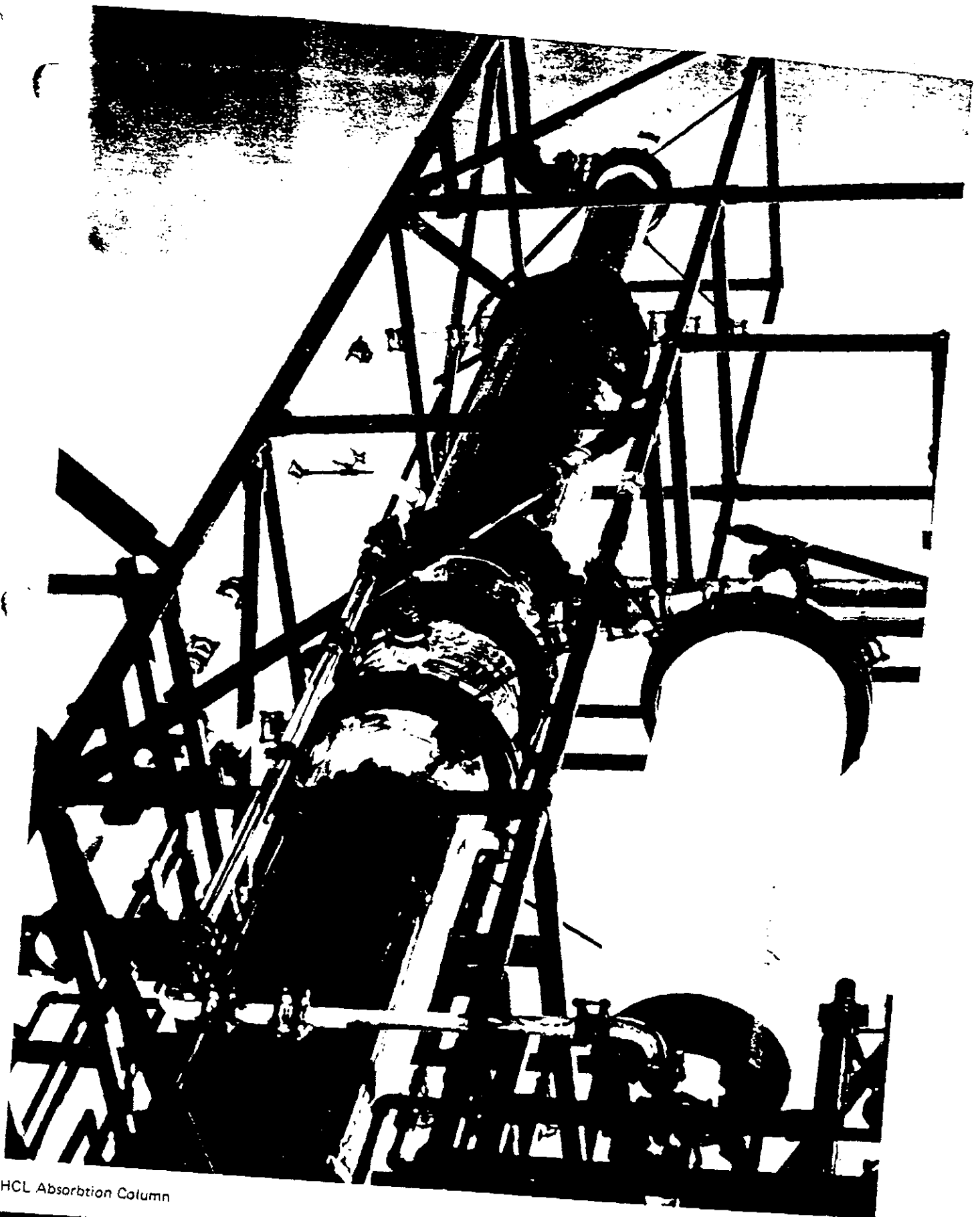
 Borosilicate glass is the internationally standardized type of glass used for the construction of plants and piping in the chemical and pharmaceutical industries. Its steadily growing use is due to the many advantages of this glass over other conventional materials:

- outstanding corrosion resistance
- smooth pore-free surface
- transparency
- catalytic inertness
- no effect on taste and odor
- physiological inertness

Maximum use of the Borosilicate glass properties has resulted in a uniformly consistent modular construction system made up of standard parts ranging from nominal diameter (ND) of 15 to 1000 mm.

The main characteristic of O-I/SCHOTT piping and process components is the high operational safety combined with lowest maintenance costs - even in largescale chemical operations. The flange systems insures permanent seals at temperatures of up to 200°C.

The combination of O-I/SCHOTT Borosilicate glass with other high-quality corrosion-resistant materials (PTFE, titanium, tantalum, and graphite) has substantially expanded the versatility of chemical and pharmaceutical production processes.



HCL Absorption Column

# O-I/SCHOTT STANDARDIZED SYSTEM

## MODULAR CONSTRUCTION SYSTEM

Glass installations cannot be made in one piece but must be built of individual parts. This leads logically to the development of a modular construction system which today comprises all necessary components in nominal diameters of 15 to 1000 mm:

- process pipes with ND 15 300 mm
- effluent and vent pipes in the KIMAX® Drainage system with ND 40 to ND 150 mm
- fittings
- centrifugal and metering pumps
- vessels and stirrers
- columns with ND 80 to ND 1000 mm
- heat exchangers
- measuring and controlling devices

All individual dimensions in the unit construction system are chosen in convenient lengths.

## METRIC GRID SYSTEM

The basic measurement of the grid system is 25 mm. The installation lengths of all parts are equal to this basic length or to its multiples.

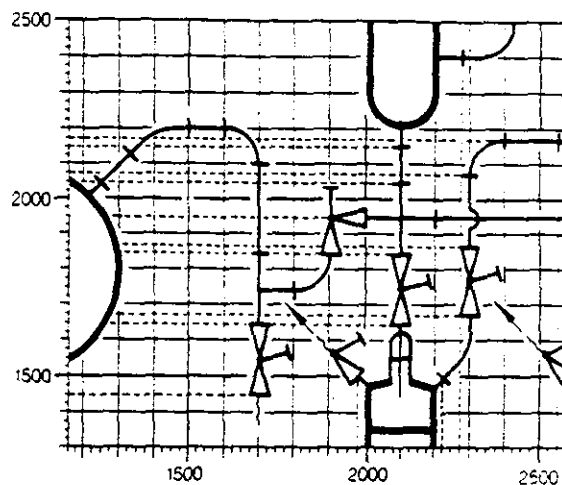
It is therefore possible to make closed pipe loops with the exclusive use of standard lengths with no need for special length or adaptors.

In addition to its practical advantages, a metric grid system is of substantial assistance to the designer in the planning stage of glass installations.

## INTERCHANGEABILITY

Logically, the grid system also means the complete interchangeability between different parts with the same nominal diameter. In this way, for example, Tee pieces can be replaced by 90° elbows, elbows by valves, valves by cross-pieces, etc.

The advantages of interchangeability are of particular importance if changing demands frequently make it necessary to modify the plan of the glass installation, as for example in a Pilot plant.



Interchangeability of the constructional parts with the same nominal diameter

DURAN<sup>®</sup> is the registered trademark for the 3.3 borosilicate glass manufactured by SCHOTT. The material is used exclusively for the construction of process plant and piping. It contains about 81% of silica (SiO<sub>2</sub>) and 13% of boric oxide (B<sub>2</sub>O<sub>3</sub>), and is distinguished above all by its high chemical stability and temperature resistance.

# DURAN<sup>®</sup> BOROSILICATE GLASS— PROPERTIES AND FIELDS OF APPLICATION

## CHEMICAL PROPERTIES

The chemical stability of DURAN<sup>®</sup> is more comprehensive than that of any other known constructional material. It is highly resistant to water, acids, salt solutions, organic substances, and even halogens such as chlorine and bromine.

Only hydrofluoric acid, concentrated phosphoric acid, and strong alkalis at high temperatures can appreciably effect the glass surface.

In addition to this excellent corrosion resistance, the catalytic inertness of DURAN<sup>®</sup> constitutes a fundamental feature. No heavy metals are released into the fluids to be processed, and this means higher-purity products both in the pharmaceutical and in the chemical industry.

## MECHANICAL PROPERTIES

|                                        |                                                            |
|----------------------------------------|------------------------------------------------------------|
| Density                                | $\rho = 2.23 \text{ g/cm}^3$                               |
| Permissible tensile and bending stress | $\frac{K}{S} = 4 \text{ N/mm}^2 (0.4 \text{ kgf/mm}^2)$    |
| Permissible compressive stress         | $\frac{K}{S} = 100 \text{ N/mm}^2 (10 \text{ kgf/mm}^2)$   |
| Modulus of elasticity                  | $E = 63 \text{ kN/mm}^2 (6.3 \cdot 10^3 \text{ kgf/mm}^2)$ |
| Poisson's ratio                        | $\mu = 0.2$                                                |

The figures given for the permissible stresses include a safety factor.

It should be noted that the compressive strength of the glass is substantially higher than the tensile strength. This is an important factor in construction with glass.

## THERMAL PROPERTIES

|                                                                                             |                                                            |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Coefficient of linear expansion between 20 and 300°C $\alpha = 3.25 \cdot 10^{-5}/\text{K}$ |                                                            |
| Mean specific heat:                                                                         |                                                            |
| between 20 and 100°C                                                                        | $c = 0.84 \text{ J/gK} (0.2 \text{ cal/g deg})$            |
| between 20 and 300°C                                                                        | $c = 0.98 \text{ J/gK} (0.234 \text{ cal/g deg})$          |
| Thermal conductivity                                                                        |                                                            |
| at 20°C                                                                                     | $\lambda = 1.17 \text{ W/mK} (1.005 \text{ kcal/m h deg})$ |
| between 20 and 100°C                                                                        | $\lambda = 1.21 \text{ W/mK} (1.04 \text{ kcal/m h deg})$  |
| between 20 and 200°C                                                                        | $\lambda = 1.31 \text{ W/mK} (1.13 \text{ kcal/m h deg})$  |
| Thermal diffusivity                                                                         |                                                            |
| Between 20 and 100°C                                                                        | $\alpha = 0.65 \cdot 10^{-6} \text{ m}^2 \text{ s}$        |

## PERMISSIBLE OPERATING CONDITIONS

### Temperature

All glass parts and combinations of constructional parts in process plants and piping can be operated at temperatures of up to 200°C, provided that a lower permissible working temperature has not been specified separately for individual parts. Rapid temperature fluctuations in the medium or the media should not exceed a temperature difference of 120 K and may be restricted to lower values by the dimensions and the wall thickness of the components in question.

### Pressure

The permissible internal operating pressure depends on the nominal diameter of the glass part, its shape and also, on the operating temperatures. The material of all joints and seals must also be taken into account.

In the case of a unit constructed of glass components having different nominal diameters and shapes, the overall permissible internal gauge pressure is always governed by the component with the lowest permissible operating gage pressure.

The permissible operating gage pressures of cylindrical DURAN<sup>®</sup> parts are shown below as functions of the nominal diameter and of the temperature difference  $\Delta T$  in the glass wall:

| Nominal Diameter |                | Permissible operating pressure at |                          |  |
|------------------|----------------|-----------------------------------|--------------------------|--|
| ND               | W/GLASS VALVES | $\Delta T = 0 \text{ K}$          | $\Delta T = 5 \text{ K}$ |  |
| ND 15            |                |                                   |                          |  |
| ND 25            | 3 bar          | 4 bar                             | 4 bar                    |  |
| ND 40            |                |                                   |                          |  |
| ND 50            | 2 bar          | 4 bar                             | 4 bar                    |  |
| ND 80            | 1.5 bar        | 3 bar                             | 3 bar                    |  |
| ND 100           | 1 bar          | 2 bar                             | 2 bar                    |  |
| ND 150           |                |                                   |                          |  |
| ND 200           |                | 1 bar                             | 1 bar                    |  |
| ND 300           |                |                                   |                          |  |
| ND 400           |                |                                   |                          |  |
| ND 450           |                |                                   |                          |  |
| ND 600           |                | 1 bar                             | 0.7 bar                  |  |
| ND 800           |                |                                   |                          |  |
| ND 1000          |                |                                   |                          |  |

All parts are vacuum-tight

Particularly endangered parts of the plant can be provided with glassfibre-reinforced polyester resin impact protection. These measures are not intended to raise the permissible pressure loading but to protect parts in often-frequented places from external mechanical damage.

The permissible operating temperature of the glass fibre/polyester-reinforced glass components is 120°C.



THINK  
GLASS

# PIPING AND FITTINGS

The modular construction system with its many practical advantages and the freedom from maintenance and safety in operation depends to a large extent on the quality of the connecting system.

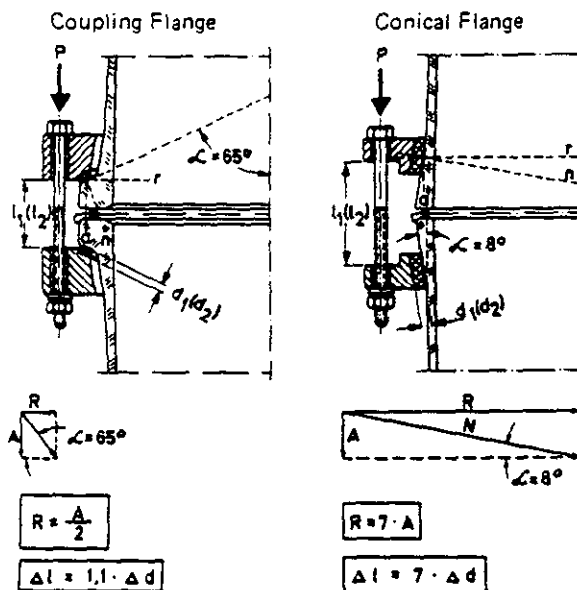
Such a system is composed of

- the glass ends to be joined
- the flanges with inserts, and
- gasket, almost invariably PTFE

All constructional parts listed in this Catalog are fitted with the proven KF flange. This flange design has replaced the conical flange previously used.

Comparison of the two systems shows clearly the drastic reduction in the harmful radial forces ( $R$ ) due to the greater flange angle.

With the same axial force  $A$ , the undesired Radial Force  $R$  is 14 times higher on the conical pipe than on the KF pipe.



Comparison of the flange systems

In addition to this, there are the following advantages:

- Ovality of the glass ends now has scarcely any effect, since, the flange is not directly in contact with the periphery.
- continuous re-tightening of the joint is unnecessary because of the absence of thick inserts.
- no wedging up of the flange or the insert under the action of force and temperature, so that dismantling is easy.
- permanent leak-tightness at all permissible operating temperatures even with frequent temperature cycling.

In piping construction the sealing surface of the glass is spherically ground in the form of a "ball" or a "socket" configuration designated by the symbols KF.

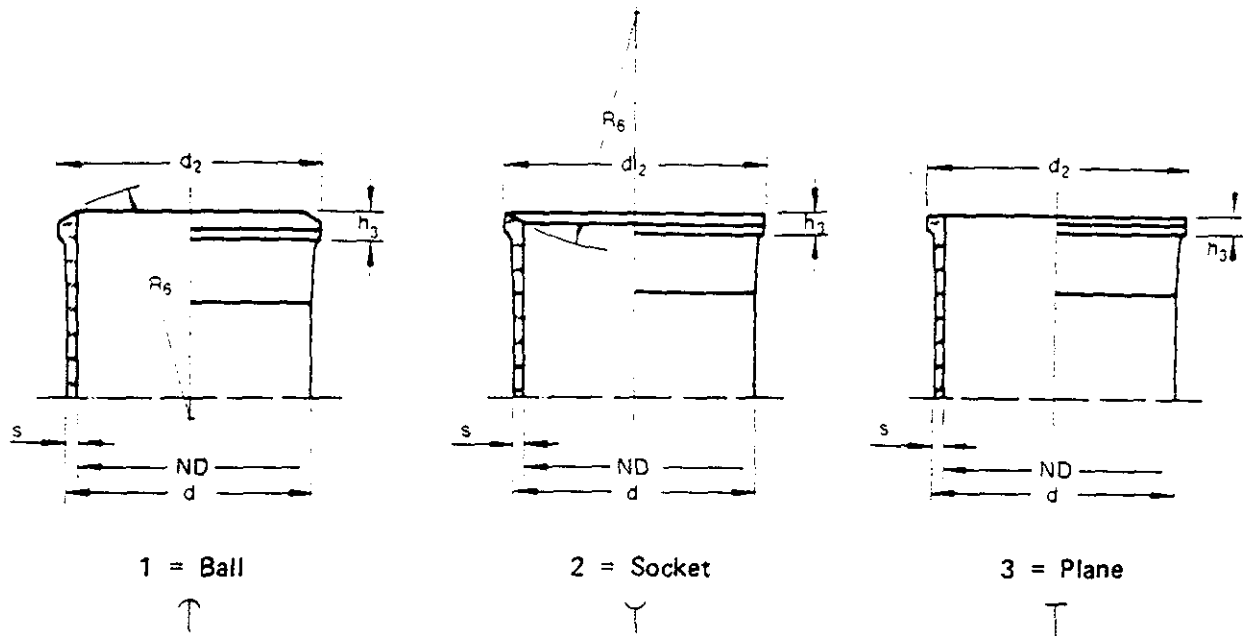
As a result of these spherical sealing surfaces, the pipes may be misaligned by up to  $3^\circ$ . This ensures stress-free assembly and permits the pipes to be installed with slopes without using special parts.

In column construction all vertically installed couplings have plane-parallel sealing surfaces. This assures perfectly vertical columns for all heights.

The various designs of the sealing surfaces are characterized by the following figures in the Catalog Number:

| Characteristic figure | Symbols         | Joint Facts    |
|-----------------------|-----------------|----------------|
| ... 1                 | $\rightarrow$ + | Ball           |
| ... 2                 | $\leftarrow$ -  | Socket         |
| ... 3                 | $\perp$ -       | Plane          |
| ... 4                 | $\nabla$        | Conical        |
| ... 5                 | $\bigcirc$      | Beaded         |
| ... 6                 | $\text{—}$      | Cut and Glazed |

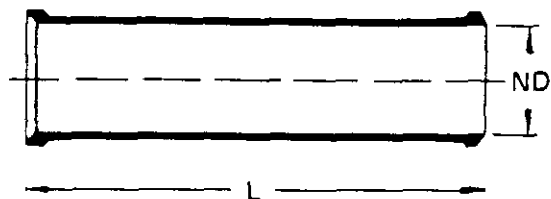
# GLASS CONFIGURATION



## DIMENSIONS

| ND   | d <sub>2</sub><br>(mm) | $\begin{array}{c} \uparrow \\ \downarrow \end{array}$ | h <sub>3</sub><br>(mm) | $\begin{array}{c} \uparrow \\ \downarrow \end{array}$ | R <sub>6</sub><br>(mm) | d<br>(mm)   | s<br>(mm) |
|------|------------------------|-------------------------------------------------------|------------------------|-------------------------------------------------------|------------------------|-------------|-----------|
| 15   | 30                     | 12                                                    | 11.5                   | 18                                                    | 21.5 ± 0.5             | 3.25 ± 0.25 |           |
| 25   | 44                     | 13                                                    | 11.5                   | 25                                                    | 33 ± 1.0               | 4.5 ± 0.5   |           |
| 40   | 62                     | 16                                                    | 15.5                   | 40                                                    | 50 ± 1.0               | 5.0 ± 0.5   |           |
| 50   | 76                     | 17                                                    | 15.5                   | 50                                                    | 60 ± 1.5               | 5.0 ± 0.5   |           |
| 80   | 110                    | 24.5                                                  | 22.0                   | 80                                                    | 90 ± 1.8               | 5.0 ± 0.6   |           |
| 100  | 130                    | 26                                                    | 23.5                   | 100                                                   | 110 ± 1.8              | 5.5 ± 0.7   |           |
| 150  | 184                    | 24                                                    | 21.5                   | 150                                                   | 165 ± 2.0              | 7.0 ± 1.0   |           |
| 200  | 233                    | 26                                                    | 23.5                   | 200                                                   | 215 ± 2.6              | 7.0 ± 1.1   |           |
| 300  | 338                    | 26                                                    | 23                     | 300                                                   | 315 ± 3.2              | 8.0 ± 1.2   |           |
| 400  | 465                    | —                                                     | 22                     | —                                                     | 417 ± 3.0              | 9.2 ± 2.8   |           |
| 450  | 526                    | —                                                     | 25                     | —                                                     | 468 ± 3.0              | 10.0 ± 3.0  |           |
| 600  | 684                    | —                                                     | 30                     | —                                                     | 623 ± 3.0              | 11.5 ± 2.5  |           |
| 800  | 916                    | —                                                     | 44                     | —                                                     | 843 ± 7.0              | 16.5 ± 1.5  |           |
| 1000 | 1088                   | —                                                     | 44                     | —                                                     | 1015 ± 6.0             | 15.0 ± 2.0  |           |

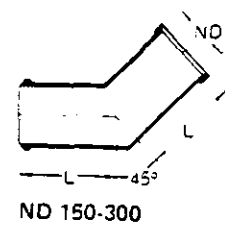
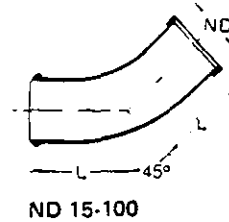
# KF PIPE SECTIONS



| ND | L<br>(mm) | Catalog ref. | ND  | L<br>(mm) | Catalog ref. | ND   | L<br>(mm) | Catalog ref.    |
|----|-----------|--------------|-----|-----------|--------------|------|-----------|-----------------|
| 15 | 100       | RO 15 0100   | 30  | 125       | RO 30 0125   | 30   | 500       | RO 30 0500/33   |
|    | 125       | RO 15 0125   |     | 150       | RO 30 0150   |      | 1000      | RO 30 1000/33   |
|    | 150       | RO 15 0150   |     | 175       | RO 30 0175   |      | 1500      | RO 30 1500/33   |
|    | 175       | RO 15 0175   |     | 200       | RO 30 0200   | 100  | 500       | RO 100 0500/33  |
|    | 200       | RO 15 0200   |     | 300       | RO 30 0300   |      | 1000      | RO 100 1000/33  |
|    | 300       | RO 15 0300   |     | 400       | RO 30 0400   |      | 1500      | RO 100 1500/33  |
|    | 400       | RO 15 0400   |     | 500       | RO 30 0500   | 150  | 500       | RO 150 0500/33  |
|    | 500       | RO 15 0500   |     | 700       | RO 30 0700   |      | 1000      | RO 150 1000/33  |
|    | 700       | RO 15 0700   |     | 1000      | RO 30 1000   |      | 1500      | RO 150 1500/33  |
|    | 1000      | RO 15 1000   |     | 1500      | RO 30 1500   | 200  | 500       | RO 200 0500/33  |
|    | 1500      | RO 15 1500   |     | 2000      | RO 30 2000   |      | 1000      | RO 200 1000/33  |
|    | 2000      | RO 15 2000   |     | 3000      | RO 30 3000   |      | 1500      | RO 200 1500/33  |
| 25 | 100       | RO 25 0100   | 100 | 125       | RO 100 0125  | 300  | 500       | RO 300 0500/33  |
|    | 125       | RO 25 0125   |     | 150       | RO 100 0150  |      | 1000      | RO 300 1000/33  |
|    | 150       | RO 25 0150   |     | 175       | RO 100 0175  |      | 1500      | RO 300 1500/33  |
|    | 175       | RO 25 0175   |     | 200       | RO 100 0200  | 400  | 500       | RO 400 0500/33  |
|    | 200       | RO 25 0200   |     | 300       | RO 100 0300  |      | 1000      | RO 400 1000/33  |
|    | 300       | RO 25 0300   |     | 400       | RO 100 0400  |      | 1500      | RO 400 1500/33  |
|    | 400       | RO 25 0400   |     | 500       | RO 100 0500  | 450  | 500       | RO 450 0500/33  |
|    | 500       | RO 25 0500   |     | 700       | RO 100 0700  |      | 1000      | RO 450 1000/33  |
|    | 700       | RO 25 0700   |     | 1000      | RO 100 1000  |      | 1500      | RO 450 1500/33  |
|    | 1000      | RO 25 1000   |     | 1500      | RO 100 1500  | 600  | 500       | RO 600 0500/33  |
|    | 1500      | RO 25 1500   |     | 2000      | RO 100 2000  |      | 1000      | RO 600 1000/33  |
|    | 2000      | RO 25 2000   |     | 3000      | RO 100 3000  |      | 1500      | RO 600 1500/33  |
| 40 | 100       | RO 40 0100   | 150 | 150       | RO 150 0150  | 800  | 1000      | RO 800 1000/33  |
|    | 125       | RO 40 0125   |     | 175       | RO 150 0175  |      | 1500      | RO 800 1500/33  |
|    | 150       | RO 40 0150   |     | 200       | RO 150 0200  | 1000 | 1000      | RO 1000 1000/33 |
|    | 175       | RO 40 0175   |     | 300       | RO 150 0300  |      | 1500      | RO 1000 1500/33 |
|    | 200       | RO 40 0200   |     | 400       | RO 150 0400  | 200  | 150       | RO 200 0150     |
|    | 300       | RO 40 0300   |     | 500       | RO 150 0500  |      | 175       | RO 200 0175     |
|    | 400       | RO 40 0400   |     | 700       | RO 150 0700  |      | 200       | RO 200 0200     |
|    | 500       | RO 40 0500   |     | 1000      | RO 150 1000  | 300  | 300       | RO 300 0300     |
|    | 700       | RO 40 0700   |     | 1500      | RO 150 1500  |      | 400       | RO 300 0400     |
|    | 1000      | RO 40 1000   |     | 2000      | RO 150 2000  |      | 500       | RO 300 0500     |
|    | 1500      | RO 40 1500   |     | 3000      | RO 150 3000  | 300  | 700       | RO 300 0700     |
| 50 | 2000      | RO 40 2000   | 200 | 150       | RO 200 0150  |      | 1000      | RO 300 1000     |
|    | 3000      | RO 40 3000   |     | 175       | RO 200 0175  |      | 1500      | RO 300 1500     |
|    | 100       | RO 50 0100   |     | 200       | RO 200 0200  |      | 2000      | RO 300 2000     |
|    | 125       | RO 50 0125   |     | 300       | RO 200 0300  | 300  | 200       | RO 300 0200     |
|    | 150       | RO 50 0150   |     | 400       | RO 200 0400  |      | 300       | RO 300 0300     |
|    | 175       | RO 50 0175   |     | 500       | RO 200 0500  |      | 400       | RO 300 0400     |
|    | 200       | RO 50 0200   |     | 700       | RO 200 0700  | 300  | 500       | RO 300 0500     |
|    | 300       | RO 50 0300   |     | 1000      | RO 200 1000  |      | 700       | RO 300 0700     |
|    | 400       | RO 50 0400   |     | 1500      | RO 200 1500  |      | 1000      | RO 300 1000     |
|    | 500       | RO 50 0500   |     | 2000      | RO 200 2000  |      | 1500      | RO 300 1500     |
|    | 700       | RO 50 0700   |     |           |              |      | 2000      | RO 300 2000     |
|    | 1000      | RO 50 1000   |     |           |              |      |           |                 |
|    | 1500      | RO 50 1500   |     |           |              |      |           |                 |
|    | 2000      | RO 50 2000   |     |           |              |      |           |                 |
|    | 3000      | RO 50 3000   |     |           |              |      |           |                 |

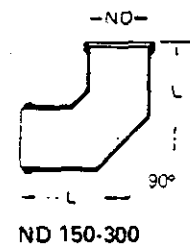
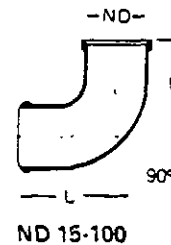
## KF ELBOWS 45°

| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 15  | 50        | 80 15/45     |
| 25  | 75        | 80 25/45     |
| 40  | 100       | 80 40/45     |
| 50  | 100       | 80 50/45     |
| 80  | 125       | 80 80/45     |
| 100 | 175       | 80 100/45    |
| 150 | 200       | 80 150/45    |
| 200 | 200       | 80 200/45    |
| 300 | 200       | 80 300/45    |



## KF ELBOWS 90°

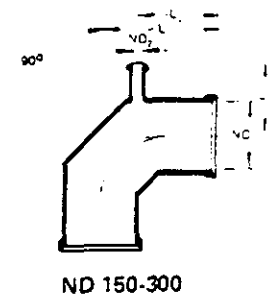
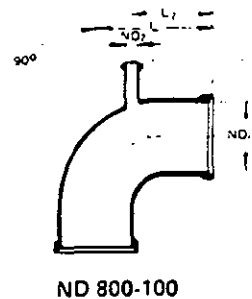
| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 15  | 50        | 80 15/90     |
| 25  | 100       | 80 25/90     |
| 40  | 150       | 80 40/90     |
| 50  | 150       | 80 50/90     |
| 80  | 200       | 80 80/90     |
| 100 | 250       | 80 100/90    |
| 150 | 250       | 80 150/90    |
| 200 | 300       | 80 200/90    |
| 300 | 400       | 80 300/90    |



LARGER DIA ELBOWS AVAILABLE ON SPECIAL ORDER.

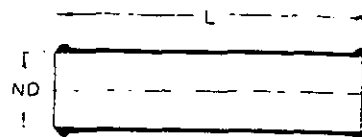
## 90°, WITH THERMOMETER BRANCH

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|
| 80              | 25              | 200       | 100                    | 100                    | APK 80       |
| 100             | 25              | 250       | 125                    | 100                    | APK 100      |
| 150             | 25              | 250       | 150                    | 150                    | APK 150      |
| 200             | 25              | 300       | 175                    | 150                    | APK 200      |
| 300             | 25              | 400       | 225                    | 225                    | APK 300      |





## KF PIPE ADAPTER



| ND  | L<br>(mm) |                |                |                |                |
|-----|-----------|----------------|----------------|----------------|----------------|
| 15  | 100       | RO 15 0100/11  | RO 15 0100/22  | RO 15 0100/13  | RO 15 0100/23  |
| 25  | 100       | RO 25 0100/11  | RO 25 0100/22  | RO 25 0100/13  | RO 25 0100/23  |
| 40  | 100       | RO 40 0100/11  | RO 40 0100/22  | RO 40 0100/13  | RO 40 0100/23  |
| 50  | 100       | RO 50 0100/11  | RO 50 0100/22  | RO 50 0100/13  | RO 50 0100/23  |
| 80  | 125       | RO 80 0125/11  | RO 80 0125/22  | RO 80 0125/13  | RO 80 0125/23  |
| 100 | 125       | RO 100 0125/11 | RO 100 0125/22 | RO 100 0125/13 | RO 100 0125/23 |
| 150 | 150       | RO 150 0150/11 | RO 150 0150/22 | RO 150 0150/13 | RO 150 0150/23 |
| 200 | 150       | RO 200 0150/11 | RO 200 0150/22 | RO 200 0150/13 | RO 200 0150/23 |
| 300 | 200       | RO 300 0200/11 | RO 300 0200/22 | RO 300 0200/13 | RO 300 0200/23 |
|     |           |                |                |                |                |
| 15  | 100       | RO 15 0100/15  | RO 15 0100/25  | RO 15 0100/35  |                |
| 25  | 100       | RO 25 0100/15  | RO 25 0100/25  | RO 25 0100/35  |                |
| 40  | 125       | RO 40 0125/15  | RO 40 0125/25  | RO 40 0125/35  |                |
| 50  | 125       | RO 50 0125/15  | RO 50 0125/25  | RO 50 0125/35  |                |
| 80  | 150       | RO 80 0150/15  | RO 80 0150/25  | RO 80 0150/35  |                |
| 100 | 150       | RO 100 0150/15 | RO 100 0150/25 | RO 100 0150/35 |                |
| 150 | 200       | RO 150 0200/15 | RO 150 0200/25 | RO 150 0200/35 |                |
|     |           |                |                |                |                |
| 25  | 100       | RO 25 0100/14  | RO 25 0100/24  | RO 25 0100/34  |                |
| 40  | 125       | RO 40 0125/14  | RO 40 0125/24  | RO 40 0125/34  |                |
| 50  | 125       | RO 50 0125/14  | RO 50 0125/24  | RO 50 0125/34  |                |
| 80  | 150       | RO 80 0150/14  | RO 80 0150/24  | RO 80 0150/34  |                |
| 100 | 150       | RO 100 0150/14 | RO 100 0150/24 | RO 100 0150/34 |                |
| 150 | 200       | RO 150 0200/14 | RO 150 0200/24 | RO 150 0200/34 |                |

## UNIVERSAL SPACERS, PTFE

For the nominal diameters of piping 15 to 150 the universal spacers can be used for connection to all types of joint faces and for the adjustment of lengths.

Permissible operating temperature:

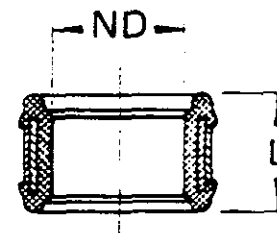
120°C

Permissible operation gage pressure:

corresponding to the maximum permissible pressure for the nominal diameter of the piping.

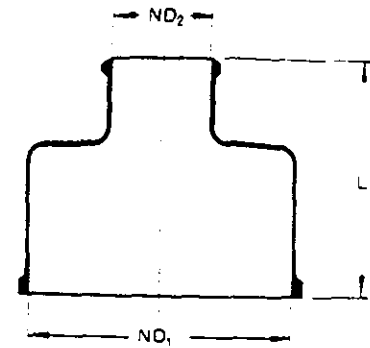
| ND | L<br>(mm) | Catalog ref. |
|----|-----------|--------------|
| 15 | 25        | RO 15 0025 U |
|    | 50        | RO 15 0050 U |
| 25 | 25        | RO 25 0025 U |
|    | 50        | RO 25 0050 U |
| 40 | 25        | RO 40 0025 U |
|    | 50        | RO 40 0050 U |
| 50 | 25        | RO 50 0025 U |
|    | 50        | RO 50 0050 U |

| ND  | L<br>(mm) | Catalog ref.  |
|-----|-----------|---------------|
| 80  | 50        | RO 80 0050 U  |
| 100 | 50        | RO 100 0050 U |
| 150 | 50        | RO 150 0050 U |



# KF PIPE REDUCERS

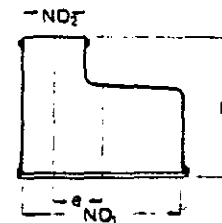
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) |               |               |               |
|-----------------|-----------------|-----------|---------------|---------------|---------------|
| 25              | 15              | 100       | RS 25/ 15/21  | -             | -             |
| 40              | 15              | 100       | RS 40/ 15/21  | -             | -             |
|                 | 25              | 100       | RS 40/ 25/21  | -             | -             |
| 50              | 15              | 100       | RS 50/ 15/21  | -             | -             |
|                 | 25              | 100       | RS 50/ 25/21  | -             | -             |
|                 | 40              | 100       | RS 50/ 40/21  | -             | -             |
| 80              | 25              | 125       | RS 80/ 25/21  | RS 80/ 25/31  | -             |
|                 | 40              | 125       | RS 80/ 40/21  | RS 80/ 40/31  | -             |
|                 | 50              | 125       | RS 80/ 50/21  | RS 80/ 50/31  | -             |
| 100             | 25              | 150       | RS 100/ 25/21 | RS 100/ 25/31 | -             |
|                 | 40              | 150       | RS 100/ 40/21 | RS 100/ 40/31 | -             |
|                 | 50              | 150       | RS 100/ 50/21 | RS 100/ 50/31 | -             |
|                 | 80              | 150       | RS 100/ 80/21 | RS 100/ 80/31 | RS 100/ 80/33 |
| 150             | 25              | 200       | RS 150/ 25/21 | RS 150/ 25/31 | -             |
|                 | 40              | 200       | RS 150/ 40/21 | RS 150/ 40/31 | -             |
|                 | 50              | 200       | RS 150/ 50/21 | RS 150/ 50/31 | -             |
|                 | 80              | 200       | RS 150/ 80/21 | RS 150/ 80/31 | -             |
|                 | 100             | 200       | RS 150/100/21 | RS 150/100/31 | RS 150/100/33 |
| 200             | 25              | 200       | RS 200/ 25/21 | RS 200/ 25/31 | -             |
|                 | 40              | 200       | RS 200/ 40/21 | RS 200/ 40/31 | -             |
|                 | 50              | 200       | RS 200/ 50/21 | RS 200/ 50/31 | -             |
|                 | 80              | 200       | RS 200/ 80/21 | RS 200/ 80/31 | -             |
|                 | 100             | 200       | RS 200/100/21 | RS 200/100/31 | RS 200/100/33 |
|                 | 150             | 225       | RS 200/150/21 | RS 200/150/31 | RS 200/150/33 |
| 300             | 25              | 275       | RS 300/ 25/21 | RS 300/ 25/31 | -             |
|                 | 40              | 275       | RS 300/ 40/21 | RS 300/ 40/31 | -             |
|                 | 50              | 275       | RS 300/ 50/21 | RS 300/ 50/31 | -             |
|                 | 80              | 275       | RS 300/ 80/21 | RS 300/ 80/31 | -             |
|                 | 100             | 300       | RS 300/100/21 | RS 300/100/31 | -             |
|                 | 150             | 300       | RS 300/150/21 | RS 300/150/31 | RS 300/150/33 |
|                 | 200             | 300       | RS 300/200/21 | RS 300/200/31 | RS 300/200/33 |
| 400             | 50              | 300       |               | RS 400/ 50/31 | -             |
|                 | 80              | 300       |               | RS 400/ 80/31 | -             |
|                 | 100             | 300       |               | RS 400/100/31 | -             |
|                 | 150             | 350       |               | RS 400/150/31 | -             |
|                 | 200             | 350       |               | -             | RS 400/200/33 |
|                 | 300             | 400       |               | -             | RS 400/300/33 |



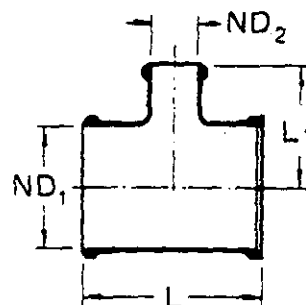
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) |                |                |
|-----------------|-----------------|-----------|----------------|----------------|
| 450             | 50              | 325       | RS 450/ 50/31  | -              |
|                 | 80              | 325       | RS 450/ 80/31  | -              |
|                 | 100             | 325       | RS 450/100/31  | -              |
|                 | 150             | 375       | RS 450/150/31  | -              |
|                 | 200             | 375       | -              | RS 450/200/33  |
|                 | 300             | 400       | -              | RS 450/300/33  |
| 600             | 50              | 325       | RS 600/ 50/31  | -              |
|                 | 80              | 325       | RS 600/ 80/31  | -              |
|                 | 100             | 325       | RS 600/100/31  | -              |
|                 | 150             | 375       | RS 600/150/31  | -              |
|                 | 200             | 375       | RS 600/200/31  | -              |
|                 | 300             | 425       | RS 600/300/31  | -              |
|                 | 400             | 450       | -              | RS 600/400/33  |
|                 | 450             | 450       | -              | RS 600/450/33  |
| 800             | 80              | 550       | RS 800/ 80/31  | -              |
|                 | 100             | 550       | RS 800/100/31  | -              |
|                 | 150             | 550       | RS 800/150/31  | -              |
|                 | 200             | 550       | RS 800/200/31  | -              |
|                 | 300             | 550       | RS 800/300/31  | -              |
|                 | 400             | 550       | -              | RS 800/400/33  |
|                 | 450             | 550       | -              | RS 800/450/33  |
|                 | 600             | 500       | -              | RS 800/600/33  |
| 1000            | 100             | 550       | RS 1000/100/31 | -              |
|                 | 150             | 600       | RS 1000/150/31 | -              |
|                 | 200             | 600       | RS 1000/200/31 | -              |
|                 | 300             | 600       | RS 1000/300/31 | -              |
|                 | 400             | 650       | -              | RS 1000/400/33 |
|                 | 450             | 650       | -              | RS 1000/450/33 |
|                 | 600             | 650       | -              | RS 1000/600/33 |

## KF PIPE REDUCERS, ECCENTRIC

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | e<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|-----------|--------------|
| 50              | 25              | 100       | 13        | RU 50/25/21  |
| 80              | 25              | 125       | 28        | RU 80/25/21  |
| 100             | 25              | 150       | 35        | RU 100/25/21 |



# KF UNEQUAL TEE PIECES



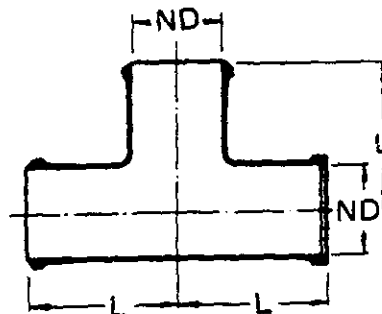
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.   |
|-----------------|-----------------|-----------|------------------------|----------------|
| 25              | 15              | 150       | 75                     | TS 25/ 15/121  |
| 40              | 25              | 200       | 100                    | TS 40/ 25/121  |
| 50              | 25              | 200       | 100                    | TS 50/ 25/121  |
|                 | 40              | 200       | 100                    | TS 50/ 40/121  |
| 80              | 25              | 200       | 100                    | TS 80/ 25/121  |
|                 | 40              | 250       | 100                    | TS 80/ 40/121  |
|                 | 50              | 250       | 100                    | TS 80/ 50/121  |
| 100             | 25              | 200       | 125                    | TS 100/ 25/121 |
|                 | 40              | 250       | 125                    | TS 100/ 40/121 |
|                 | 50              | 250       | 125                    | TS 100/ 50/121 |
|                 | 80              | 300       | 125                    | TS 100/ 80/121 |
| 150             | 25              | 200       | 150                    | TS 150/ 25/121 |
|                 | 40              | 250       | 150                    | TS 150/ 40/121 |
|                 | 50              | 250       | 150                    | TS 150/ 50/121 |
|                 | 80              | 300       | 150                    | TS 150/ 80/121 |
|                 | 100             | 300       | 150                    | TS 150/100/121 |
| 200             | 25              | 200       | 175                    | TS 200/ 25/121 |
|                 | 40              | 250       | 175                    | TS 200/ 40/121 |
|                 | 50              | 250       | 175                    | TS 200/ 50/121 |
|                 | 80              | 300       | 175                    | TS 200/ 80/121 |
|                 | 100             | 300       | 175                    | TS 200/100/121 |
|                 | 150             | 400       | 225                    | TS 200/150/121 |
| 300             | 25              | 300       | 225                    | TS 300/ 25/121 |
|                 | 40              | 400       | 225                    | TS 300/ 40/121 |
|                 | 50              | 400       | 225                    | TS 300/ 50/121 |
|                 | 80              | 400       | 225                    | TS 300/ 80/121 |
|                 | 100             | 400       | 225                    | TS 300/100/121 |
|                 | 150             | 500       | 275                    | TS 300/150/121 |
|                 | 200             | 600       | 275                    | TS 300/200/121 |

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.    |
|-----------------|-----------------|-----------|------------------------|-----------------|
| 80              | 25              | 200       | 100                    | TS 80/ 25/331   |
|                 | 50              | 250       | 100                    | TS 80/ 50/331   |
| 100             | 25              | 200       | 125                    | TS 100/ 25/331  |
|                 | 50              | 250       | 125                    | TS 100/ 50/331  |
| 150             | 50              | 250       | 150                    | TS 150/ 50/331  |
|                 | 80              | 300       | 150                    | TS 150/ 80/331  |
| 200             | 50              | 250       | 175                    | TS 200/ 50/331  |
|                 | 80              | 300       | 175                    | TS 200/ 80/331  |
|                 | 100             | 300       | 175                    | TS 200/100/331  |
| 300             | 50              | 400       | 225                    | TS 300/ 50/331  |
|                 | 80              | 400       | 225                    | TS 300/ 80/331  |
|                 | 100             | 400       | 225                    | TS 300/100/331  |
|                 | 150             | 500       | 275                    | TS 300/150/331  |
| 400             | 80              | 400       | 275                    | TS 400/ 80/331  |
|                 | 150             | 500       | 325                    | TS 400/150/331  |
| 450             | 80              | 400       | 300                    | TS 450/ 80/331  |
|                 | 150             | 500       | 350                    | TS 450/150/331  |
| 600             | 80              | 600       | 375                    | TS 600/ 80/331  |
|                 | 150             | 600       | 425                    | TS 600/150/331  |
|                 | 300             | 800       | 500                    | TS 600/300/331  |
| 800             | 100             | 700       | 575                    | TS 800/100/331  |
|                 | 200             | 800       | 575                    | TS 800/200/331  |
|                 | 300             | 800       | 650                    | TS 800/300/331  |
| 1000            | 100             | 700       | 625                    | TS 1000/100/331 |
|                 | 200             | 800       | 675                    | TS 1000/200/331 |
|                 | 300             | 800       | 750                    | TS 1000/300/331 |

## KF EQUAL TEE PIECES



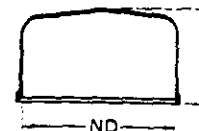
| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 15  | 50        | TS 15/121    |
| 25  | 100       | TS 25/121    |
| 40  | 150       | TS 40/121    |
| 50  | 150       | TS 50/121    |
| 80  | 200       | TS 80/121    |
| 100 | 250       | TS 100/121   |
| 150 | 250       | TS 150/121   |
| 200 | 300       | TS 200/121   |
| 300 | 400       | TS 300/121   |



Other flange types can be supplied on request.

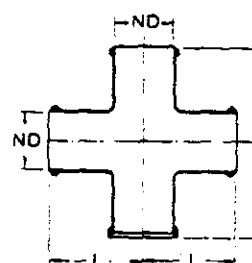
## KF PIPE CAPS

| ND  | L      | Catalog ref. |          |
|-----|--------|--------------|----------|
| 15  | 50- 85 | 8L 15/1      | 8L 15/2  |
| 25  | 50- 85 | 8L 25/1      | 8L 25/2  |
| 40  | 65-110 | 8L 40/1      | 8L 40/2  |
| 50  | 70-115 | 8L 50/1      | 8L 50/2  |
| 80  | 90     | 8L 80/1      | 8L 80/2  |
| 100 | 92     | 8L 100/1     | 8L 100/2 |
| 150 | 113    | 8L 150/1     | 8L 150/2 |
| 200 | 122    | 8L 200/1     | 8L 200/2 |
| 300 | 171    | 8L 300/1     | 8L 300/2 |



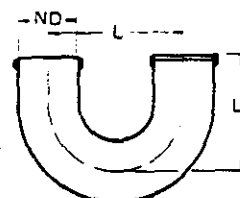
## KF EQUAL CROSSES

| ND  | L   | Catalog ref. |
|-----|-----|--------------|
| 15  | 50  | KR 15        |
| 25  | 100 | KR 25        |
| 40  | 150 | KR 40        |
| 50  | 150 | KR 50        |
| 80  | 200 | KR 80        |
| 100 | 250 | KR 100       |
| 150 | 250 | KR 150       |



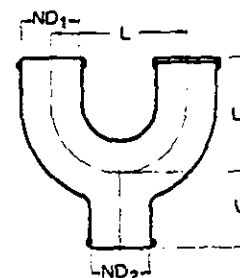
## KF U—BENDS

| ND  | L   | L <sub>1</sub> | Catalog ref. |
|-----|-----|----------------|--------------|
| 15  | 100 | 100            | UB 15        |
| 25  | 150 | 150            | UB 25        |
| 40  | 150 | 150            | UB 40        |
| 50  | 150 | 150            | UB 50        |
| 80  | 210 | 200            | UB 80        |
| 100 | 230 | 200            | UB 100       |



## KF U—BENDS WITH BOTTOM OUTLET

| ND <sub>1</sub> | ND <sub>2</sub> | L   | L <sub>1</sub> | L <sub>2</sub> | Catalog ref. |
|-----------------|-----------------|-----|----------------|----------------|--------------|
| 15              | 15              | 100 | 100            | 100            | HO 15/15     |
| 25              | 25              | 150 | 100            | 150            | HO 25/25     |
| 40              | 25              | 150 | 100            | 150            | HO 40/25     |
| 50              | 25              | 150 | 100            | 150            | HO 50/25     |





# VESSELS AND STIRRERS

THINK  
GLASS

O-I/SCHOTT vessels and covers are available to meet wide-ranging requirements as condensers, evaporators, and stirred reactors; spherical vessels with capacities from 10 to 500 liters; cylindrical vessels with capacities of 5 to 500 liters. The design and configuration of the all-important openings on these vessels have been carefully arrived at for ease of maintenance and replacement. In addition to the types of vessels mentioned, vertical cylindrical vessels can be made up by the use of standard components to capacities of up to 3000 liters. Horizontal cylindrical vessels can be made up for almost any desired capacity.

The maximum allowable operating pressure for the cylindrical vessels is one bar depending on the temperature and the nominal diameter.

In the case of the spherical vessels the allowable operating pressure is 0.5 bar for sizes up to 50 liters, 0.3 bar for the 100 liter, 200 liter and 500 liter sizes. For heat exchangers to complement these vessels for cooling, or heating, see our Heat Exchange catalog. This catalog shows in detail glass and metal immersion heaters, coil and bayonet types, and other heating equipment, such as heating mantles and heating baths.

Glass vessels are supported by means of support rings and cradles described in the Structure Section of this catalog.

For large-volume vessels of the vertical or horizontal type O-I/SCHOTT will design and recommend an appropriate support structure.

For increased safety, all vessels can be provided with a glass fiber/polyester protective armoring. This protective covering is tightly wrapped around the outside of the glass component, and cured in place. It serves to guard against the loss of valuable process liquids and to protect the glass surfaces against damage.

For such armored vessels and components the catalog number of these parts must be supplemented by code letter "A".

A complete line of stirrers is available from O-I/Schott for their corrosion-resistant mixing vessels and stirred reactors. This includes paddles, anchor and suction stirrers, steel/PTFE, covered turbine stirrers for larger vessels and more severe applications.

Solid PTFE turbine stirrers are used particularly for highly viscous fluids. The drive and the type of the bearing for this purpose must also be selected appropriately. Depending on the length of the stirrer, single or double bearings are used.

Either single or double acting mechanical seals in a combination of ceramic and PTFE for extremely corrosive fluids are available. Fixed or variable speed drives, with TEFC or completely explosion proof motors can be supplied.

All stirrers are designed to operate under full vacuum.

The following data can be used as a guide for the selection of an appropriate stirrers.

| Type of stirrer                                                            | DURAN®<br>stirrers<br>with shaft<br>diameters of |         | PTFE stirrers<br>with shaft<br>diameters of |         |
|----------------------------------------------------------------------------|--------------------------------------------------|---------|---------------------------------------------|---------|
|                                                                            | 32 mm                                            | 50 mm   | 32 mm                                       | 50 mm   |
| Maximum stirrer length<br>in pilot plant design<br>(Catalog ref. RTE. . .) | 850 mm                                           | —       | —                                           | —       |
| Maximum stirrer length<br>with single bearing<br>(Catalog ref. RE. . .)    | 850 mm                                           | 1300 mm | 850 mm                                      | 850 mm  |
| Maximum stirrer length<br>with double bearing<br>(Catalog ref. RD. . .)    | —*                                               | —*      | —*                                          | 1600 mm |

\*These stirrers are used almost exclusively with the single bearing which is adequate.

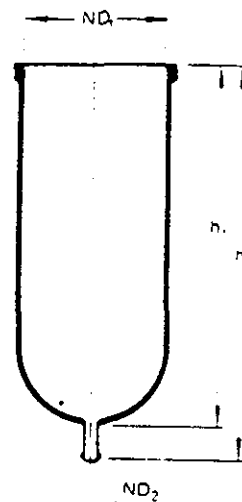
Glass vessels and components, coupled with corrosion-resistant stirrers constitute the major components of a versatile basic chemical reaction system. The addition of heat exchange equipment, packed columns, reflux splitters, measurement and control systems, broadens the applicability of such units for pilot plant, semi-works or production operations. Selection and investigation of the correct parameter(s) in an all-glass pilot plant can be an important adjunct for scaling-up to full-scale production operations.

# CYLINDRICAL VESSELS

These vessels can be supplied with graduations. The Catalog ref. must be supplemented by the Graduation ... liter or gal.



| Nominal capacity (l) | ND <sub>1</sub> | ND <sub>2</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | Graduation (l) | Catalog ref. |
|----------------------|-----------------|-----------------|-----------|------------------------|----------------|--------------|
| 5                    | 200             | 25              | 350       | 290                    | 0.2            | GER 5        |
| 10                   | 200             | 25              | 550       | 490                    | 0.2            | GER 10       |
| 30                   | 300             | 25              | 650       | 590                    | 0.5            | GER 30       |
| 50                   | 300             | 25              | 900       | 840                    | 0.5            | GER 50       |
| 100                  | 400             | 25              | 1000      | 940                    | 0.5            | GER 100      |
| 150                  | 400             | 25              | 1400      | 1340                   | 0.5            | GER 150      |
| 200                  | 450             | 25              | 1500      | 1440                   | 1.0            | GER 200      |
| 400                  | 600             | 50              | 1600      | 1540                   | 2.0            | GER 400      |
| 500                  | 800             | 80              | 1250      | 1129                   | 5.0            | GER 500      |



A special bulletin is available on portable cylindrical vessels.

# JACKETED VESSELS

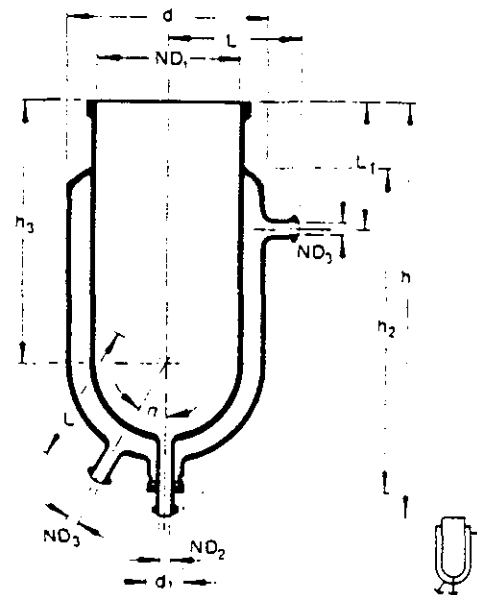
For heating or cooling, the cylindrical vessels may also be supplied with a heating or cooling jacket.

In the design of these vessels, which is adapted to the material used, the vessel and the jacket are fused or sealed with a permanently elastic silicone composition.

This leads to the following operating conditions:

- permissible temperature up to 150°C
- permissible gage pressure in the jacket 0.5 bar

The resistance of the silicone composition to chemicals permits the use of hot water and steam as well as the usual heat-carrier oils and cooling brines in the jacket space.



| Nominal capacity (l) | ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>2</sub><br>(mm) | Heat transfer area (m <sup>2</sup> ) | d<br>(mm) | d <sub>1</sub><br>(mm) | h <sub>3</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | α   | Catalog ref. |
|----------------------|-----------------|-----------------|-----------------|-----------|------------------------|--------------------------------------|-----------|------------------------|------------------------|-----------|------------------------|-----|--------------|
| 5                    | 150             | 25              | 25              | 625       | 473                    | 0.19                                 | 215       | 70                     | 380                    | 175       | 150                    | 45° | MGE 5        |
| 10                   | 200             | 25              | 25              | 675       | 518                    | 0.25                                 | 315       | 70                     | 380                    | 225       | 175                    | 30° | MGE 10       |
| 30                   | 300             | 25              | 25              | 775       | 560                    | 0.45                                 | 390       | 70                     | 430                    | 250       | 200                    | 30° | MGE 30       |
| 50                   | 300             | 25              | 25              | 1025      | 810                    | 0.69                                 | 390       | 70                     | 680                    | 250       | 200                    | 30° | MGE 50       |

# SPHERICAL VESSELS

The spherical vessel range offers a wide choice of side necks. They may be used for sprinklers, thermometers and inlet pipes, and for connecting vapor and evaporator circulation systems. All side necks have ball flanges.

When ordering, the desired nominal diameter should be added to the catalog number denoting the position of the side neck.

Ordering example:

GEK 50 NO<sub>1</sub> = 100 NO<sub>2</sub> = 25 NO<sub>3</sub> = 50 NO<sub>5</sub> = 25

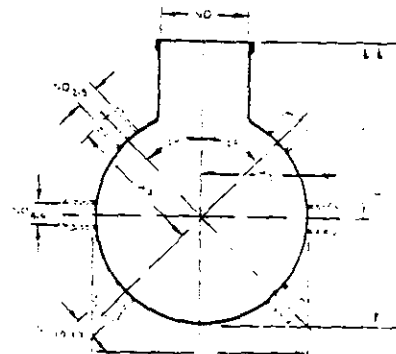
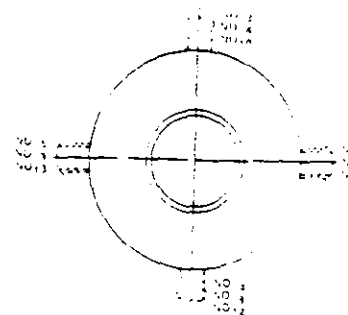
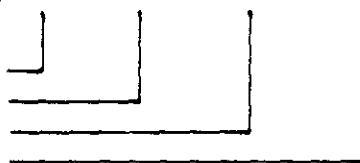
Spherical vessel 50 liters

Bottom neck ND<sub>1</sub> = 100 ball

Side neck ND<sub>2</sub> = 25 ball

Side neck ND<sub>3</sub> = 50 ball

Side neck ND<sub>5</sub> = 25 ball



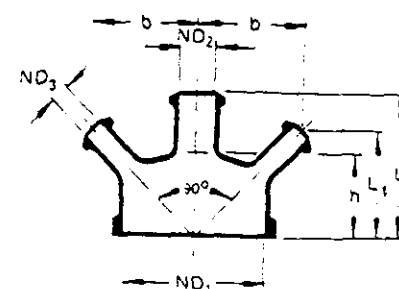
| Nominal Capacity (l) | ND (mm) | D (mm) | H    | H <sub>1</sub> | Catalog ref. |
|----------------------|---------|--------|------|----------------|--------------|
| 10                   | 100     | 280    | 390  | 250            | GEK 10       |
| 20                   | 100     | 350    | 475  | 300            | GEK 20       |
| 50                   | 200     | 490    | 645  | 400            | GEK 50       |
| 100                  | 200     | 610    | 755  | 450            | GEK 100      |
| 200                  | 300     | 750    | 925  | 550            | GEK 200      |
| 500                  | 400     | 1015   | 1208 | 700            | GEK 500      |

\*H<sub>2</sub> Dimension varies with Nozzle Diameter.

# COVERS



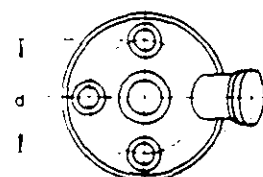
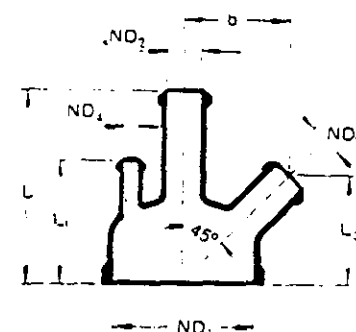
| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | h<br>(mm) | b<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|-----------|--------------|
| 100             | 50              | 2 x 25          | 150       | 121                    | 90        | 97        | HAU 100      |
| 150             | 50              | 2 x 25          | 175       | 122                    | 111       | 122       | HAU 150      |
| 200             | 50              | 2 x 25          | 175       | 146                    | 119       | 146       | HAU 200      |
| 300             | 50              | 2 x 25          | 225       | 197                    | 168       | 197       | HAU 300      |
| 400             | 50              | 2 x 25          | 300       | 247                    | 234       | 247       | HAU 400      |
| 450             | 50              | 2 x 25          | 325       | 247                    | 250       | 247       | HAU 450      |
| 600             | 50              | 2 x 25          | 325       | 222                    | 255       | 322       | HAU 600      |
| 800             | 80              | 2 x 80          | 550       | 387                    | 429       | 387       | HAU 800      |
| 1000            | 80              | 2 x 80          | 550       | 437                    | 440       | 512       | HAU 1000     |



## TOP COVERS

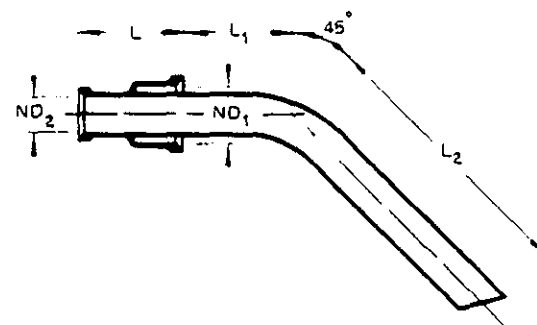


| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | ND <sub>4</sub> | d<br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | b<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------------|-----------|-----------|------------------------|------------------------|-----------|--------------|
| 200             | 50              | 50              | 3 x 25          | 150       | 275       | 175                    | 154                    | 154       | AHA 200/ 50  |
| 300             | 50              |                 |                 |           | 225       |                        |                        |           | AHA 300/ 50  |
|                 | 80              | 80              | 3 x 50          | 250       | 300       | 200                    | 187                    | 187       | AHA 300/ 80  |
|                 | 100             |                 |                 |           | 300       |                        |                        |           | AHA 300/100  |
| 400             | 50              |                 |                 |           | 300       |                        |                        |           | AHA 400/ 50  |
|                 | 80              | 100             | 3 x 50          | 300       | 300       | 275                    | 250                    | 250       | AHA 400/ 80  |
|                 | 100             |                 |                 |           | 300       |                        |                        |           | AHA 400/100  |
| 450             | 50              |                 |                 |           | 325       |                        |                        |           | AHA 450/ 50  |
|                 | 80              | 150             | 3 x 50          | 350       | 325       | 300                    | 284                    | 284       | AHA 450/ 80  |
|                 | 100             |                 |                 |           | 325       |                        |                        |           | AHA 450/100  |
| 600             | 50              |                 |                 |           | 325       |                        |                        |           | AHA 600/ 50  |
|                 | 80              | 150             | 3 x 50          | 400       | 325       | 300                    | 258                    | 358       | AHA 600/ 80  |
|                 | 100             |                 |                 |           | 325       |                        |                        |           | AHA 600/100  |



## INLET PIPES FOR SPHERICAL VESSELS

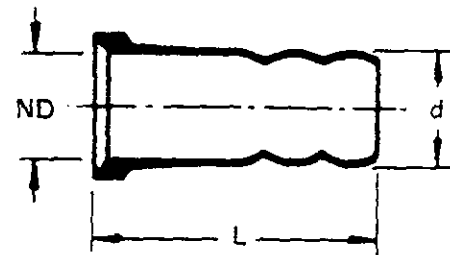
| ND <sub>1</sub> | ND <sub>2</sub> | Suitable for vessel | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|---------------------|-----------|------------------------|------------------------|--------------|
| 25              | 15              | GEK 10              | 100       | 115                    | 175                    | EIN 25/ 10K  |
| 50              | 25              | GEK 20              | 100       | 115                    | 225                    | EIN 50/ 20K  |
|                 |                 | GEK 50              | 100       | 135                    | 300                    | EIN 50/ 50K  |
|                 |                 | GEK 100             | 100       | 155                    | 400                    | EIN 50/100K  |
|                 |                 | GEK 200             | 100       | 175                    | 475                    | EIN 50/200K  |





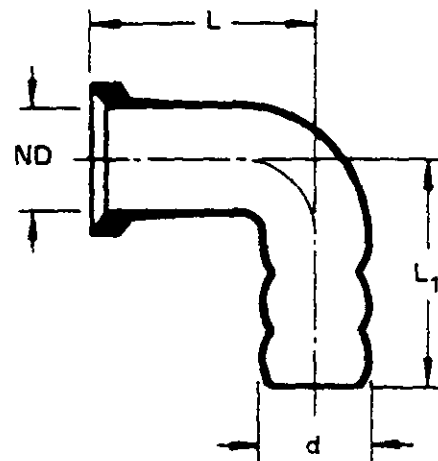
## KF HOSE CONNECTORS

| ND | d<br>(mm) | L<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 15 | 9         | 100       | OL 15/ 8     |
|    | 22        | 100       | OL 15/20     |
| 25 | 9         | 100       | OL 25/ 8     |
|    | 22        | 100       | OL 25/20     |
|    | 33        | 120       | OL 25/30     |
| 40 | 50        | 150       | OL 40/50     |
| 50 | 60        | 150       | OL 50/60     |



## KF HOSE CONNECTORS, ANGLED

| ND | d<br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|----|-----------|-----------|------------------------|--------------|
| 15 | 22        | 50        | 70                     | OL 15/20W    |
| 25 | 22        | 100       | 100                    | OL 25/20W    |
|    | 33        | 100       | 100                    | OL 25/30W    |



# HORIZONTAL PHASE SEPARATOR HEAD

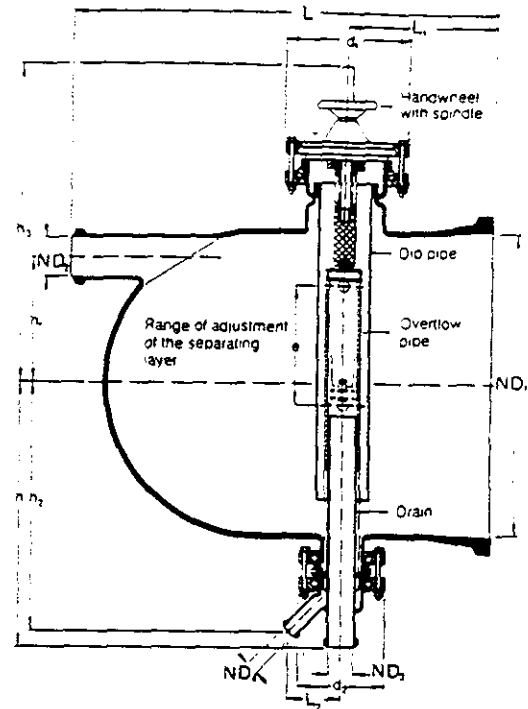
Continuous separation of immiscible liquids having different densities presupposes low flow velocities and the largest possible separating surface between the light and the heavy phases. These requirements are satisfied ideally by horizontal separating vessels.

The transparency of borosilicate glass ensures trouble-free operation by visual monitoring of the separation process.

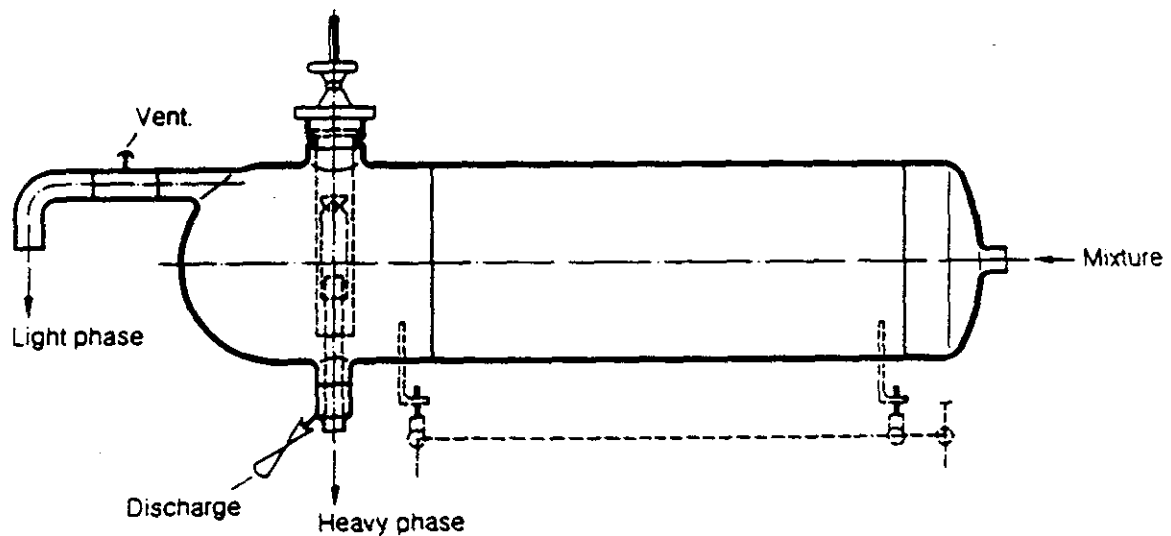
In order to be able to adjust the plane of separation continuously for different operating situations (variations in the amounts and densities), an adjusting device that can be operated from outside the vessel has been developed.

In a dip-pipe there is an adjustable overflow pipe with inlet openings for the heavy phase at the upper end. The overflow pipe slides on the discharge pipe in liquid-tight manner. Please specify the necessary total volumes so that we can submit a construction proposal for the complete separating vessel including supports.

Catalog reference TFK includes only separating head as shown on the right.



| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | ND <sub>4</sub> | a<br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | h <sub>3</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------------|-----------|-----------|------------------------|------------------------|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|--------------|
| 200             | 25              | 25              | 25              | 85        | 325       | 75                     | 322                    | 317                    | 375       | 150                    | 97                     | 172                    | 131                    | TFK 200      |
| 300             | 25              | 25              | 25              | 130       | 375       | 125                    | 372                    | 413                    | 475       | 200                    | 97                     | 172                    | 131                    | TFK 300      |
| 400             | 50              | 50              | 25              | 180       | 450       | 150                    | 422                    | 577                    | 625       | 250                    | 99                     | 247                    | 172                    | TFK 400      |
| 450             | 50              | 50              | 25              | 180       | 475       | 175                    | 447                    | 602                    | 650       | 300                    | 99                     | 247                    | 172                    | TFK 450      |
| 600             | 80              | 50              | 25              | 260       | 550       | 250                    | 522                    | 755                    | 850       | 300                    | 99                     | 247                    | 172                    | TFK 600      |



# STIRRERS, PILOT—PLANT TYPE

For stirring problems in the pilot-plant range this stirrer is made in a completely corrosion-resistant form for maximum stirrer lengths of up to 850 mm.

The O-I/SCHOTT paddle or suction stirrers are fixed directly to the driving shaft and are sealed by means of single-acting mechanical seals of PTFE/ceramic.

This construction also permits the stirrers to be used under vacuum.

Stirrer drives with variable speed are available.

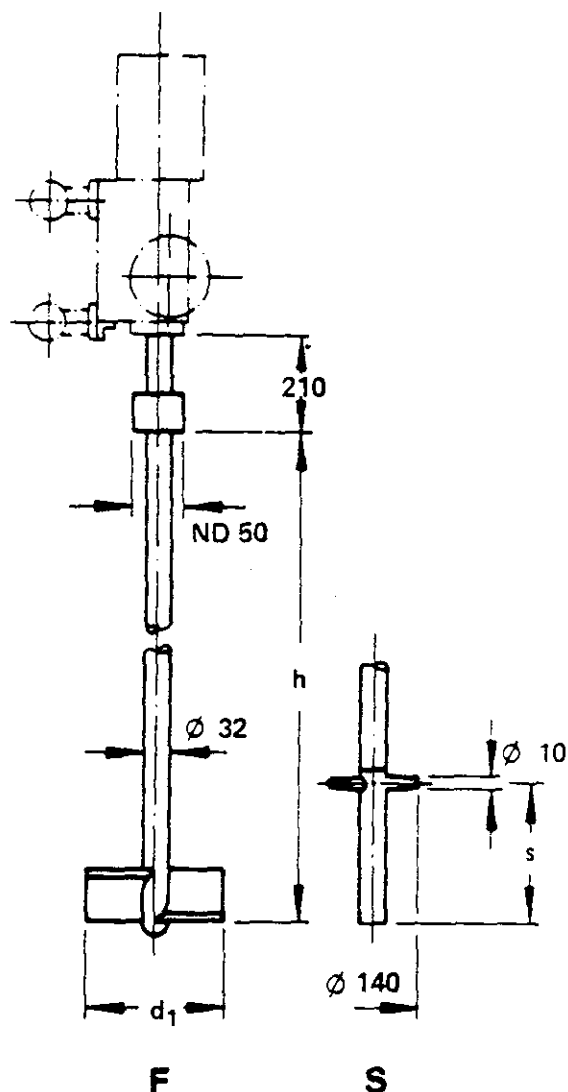
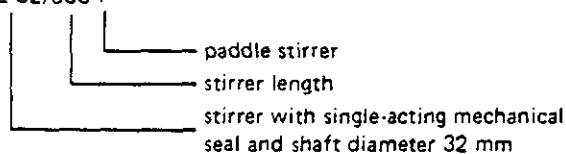
Connection is by KF necks ND 50mm (ball, socket, or plane).

| Catalog ref. |                        |                      |                |                 |
|--------------|------------------------|----------------------|----------------|-----------------|
| h<br>(mm)    | d <sub>1</sub><br>(mm) | s<br>(mm)            | Paddle stirrer | Suction stirrer |
| 450          | 90                     |                      | RTE 32/450 F   | —               |
| 500          | 90                     |                      | RTE 32/500 F   | —               |
| 550          | 140                    |                      | RTE 32/550 F   | RTE 32/550 S... |
| 600          | 140                    | min. 150<br>max. 350 | RTE 32/600 F   | RTE 32/600 S... |
| 650          | 140                    |                      | RTE 32/650 F   | RTE 32/650 S... |
| 700          | 140                    |                      | RTE 32/700 F   | RTE 32/700 S... |
| 750          | 140                    |                      | RTE 32/750 F   | RTE 32/750 S... |
| 800          | 140                    |                      | RTE 32/800 F   | RTE 32/800 S... |
| 850          | 140                    |                      | RTE 32/850 F   | RTE 32/850 S... |

In the case of a suction stirrer the Catalog ref. must be supplemented by the dimension "S".

Example of Catalog ref.:

RTE 32/600 F



# STIRRERS WITH SINGLE BEARING

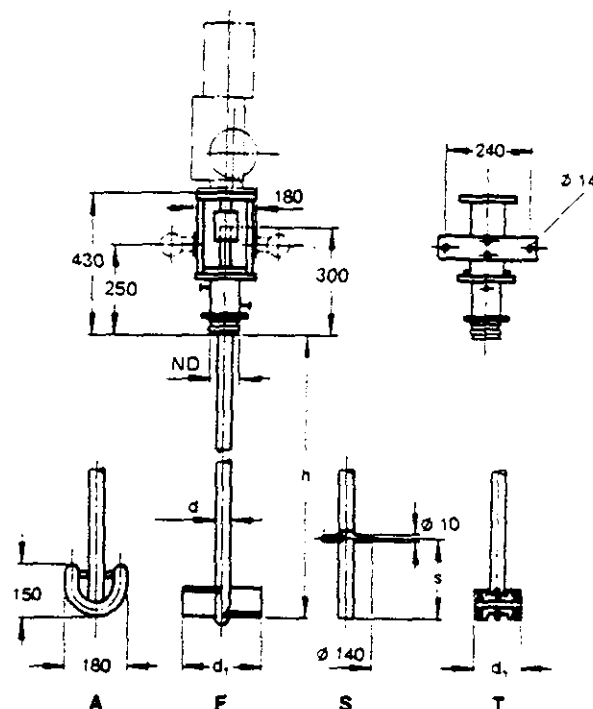
Safe construction of these stirrers makes it possible to work under normal pressure and vacuum conditions.

Above the seal, the stirrer shaft passes through a ball bearing and is rigidly connected with the motor shaft.

Connection to the KF 50 or 80 nozzles is made with PTFE universal bellows which are part of the stirrer assembly.



| d<br>(mm) | ND | d <sub>1</sub><br>(mm) | h<br>(mm)                                                          | s<br>(mm)            | Catalog ref.                                                 |
|-----------|----|------------------------|--------------------------------------------------------------------|----------------------|--------------------------------------------------------------|
| 32        | 50 | 140                    | max. 850                                                           | min. 150<br>max. 350 | RE...32/...F<br>RE...32/...S<br>RE...32/...A<br>RE...32/...T |
| 50        | 80 | 190                    | max. 1300 for<br>DURAN® stirrers<br>max. 1600 for<br>PTFE stirrers | min. 150<br>max. 500 | RE...50/...F<br>RE...50/...S<br>RE...50/...A<br>RE...50/...T |



# STIRRERS WITH DOUBLE BEARING

This stirrer system is provided with a stirrer having a shaft 50 mm in diameter and is therefore suitable for high stresses. Because of the double bearing (two ball bearings), high power can be transmitted even in the case of long stirrers. The motor is connected through a flexible coupling.

Connection to KF 80 mm nozzles is made with PTFE bellows.

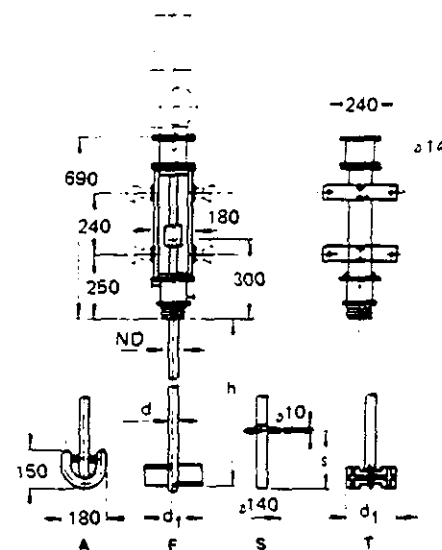
| d<br>(mm) | ND | d <sub>1</sub><br>(mm) | h<br>(mm)                                                          | s<br>(mm)            | Catalog ref.                                                 |
|-----------|----|------------------------|--------------------------------------------------------------------|----------------------|--------------------------------------------------------------|
| 50        | 80 | 190                    | max. 1300 for<br>DURAN® stirrers<br>max. 1600 for<br>PTFE stirrers | min. 150<br>max. 500 | RD...50/...F<br>RD...50/...S<br>RD...50/...A<br>RD...50/...T |

Symbol E: single-acting mechanical seal incorporated in a housing with injection nozzles and a level indicator for the lubricant

Symbol D: double-acting mechanical seal with housing and connections for the barrier liquid

The mechanical seals can be changed without removing the stirrer and without dismantling the drive.

PTFE paddle stirrers and stirrers with several sets of stirring members can be supplied on request.



Example of Catalog ref.:

RE D 32 / 800 S 350

dimension "S" = 350 mm  
suction stirrer  
stirrer length  
shaft diameter 32 mm  
double-acting mechanical seal  
stirrer with single bearing

# COLUMN COMPONENTS



The O-I/SCHOTT column component program contains all the necessary components in nominal diameters from 80 to 1000 mm. This permits complete and operationally safe solutions to designs both in the pilot plant and on the production scale.

The main advantages for users in the chemical and pharmaceutical industries are:

- the outstanding corrosion resistance of DURAN® and composite materials used
- the permanent fluid-tightness of the connecting flange system
- the consistent use of a modular construction system in a metric grid

The permissible temperatures and pressures of O-I/SCHOTT plant components are described in detail in the introductory section of the Catalog.

Because of the properties of borosilicate glass as a constructional material, DURAN® is particularly suitable for the solution of the following chemical-engineering tasks:

- distillation
- rectification
- extraction
- absorption
- reaction

The plant components necessary for this purpose are featured as standard items in the O-I/SCHOTT Program, which has been structured in a way that adaptation to a wide range of individual designs is possible by combining the individual components.

## COUPLINGS AND GASKETS

The section of the Catalog on "Couplings and Gaskets" contains the parts necessary for the construction and assembly of the equipment and the criteria for selecting them.

## PROTECTIVE COATING

O-I/SCHOTT offers a translucent polyester resin impregnated fiberglass protective covering which can be applied to the glass components.

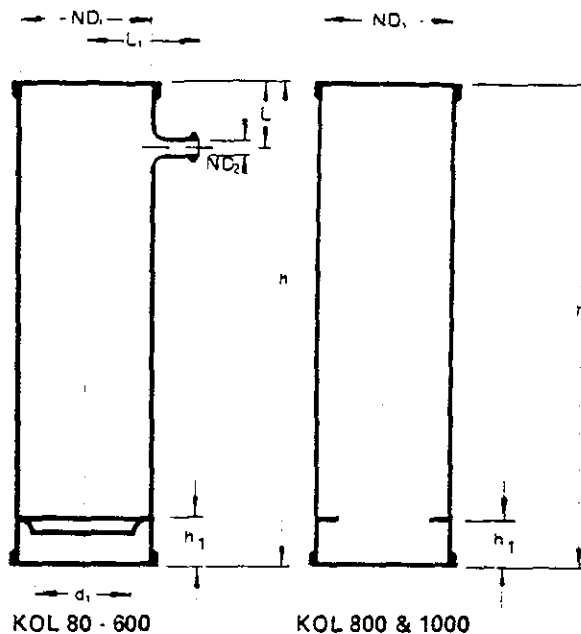
All components, even complicated ones, can be covered in this way. The maximum temperature is 120°C. This coating does not increase the operating pressure.

In ordering covered components, the catalog number must be supplemented by the symbol "A".

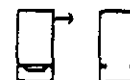
Combinations of the components into complete installations for various purposes are shown in O-I/SCHOTT process engineering information sheets. These show proven designs, for which detailed constructional drawings are available.

# COLUMN SECTIONS

Column sections are available in nominal diameters from 80 to 1000 mm. In all sections an internal packing support ring is fused to the glass which also serves as a redistributor.



Column section 1 m long



| ND <sub>1</sub> | ND <sub>2</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | Capacity |                 | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|-----------|------------------------|------------------------|----------|-----------------|--------------|
|                 |                 |           |                        |           |                        |                        | (l)      | ft <sup>3</sup> |              |
| 80              | 25              | 1000      | 55                     | 75        | 100                    | 45                     | 4        | 0.1             | KOL 80       |
| 100             | 25              | 1000      | 55                     | 75        | 125                    | 65                     | 7        | 0.2             | KOL 100      |
| 150             | 25              | 1000      | 75                     | 100       | 150                    | 105                    | 16       | 0.5             | KOL 150      |
| 200             | 25              | 1000      | 75                     | 100       | 175                    | 150                    | 29       | 1.0             | KOL 200      |
| 300             | 25              | 1000      | 105                    | 125       | 225                    | 200                    | 63       | 2.2             | KOL 300      |
| 400             | 25              | 1000      | 135                    | 150       | 275                    | 275                    | 113      | 4.0             | KOL 400      |
| 450             | 25              | 1000      | 135                    | 150       | 300                    | 300                    | 151      | 5.3             | KOL 450      |
| 600             | 25              | 1000      | 140                    | 150       | 375                    | 420                    | 240      | 8.5             | KOL 600      |

Column sections 1.5 m long

|      |    |      |     |     |     |     |     |      |                 |
|------|----|------|-----|-----|-----|-----|-----|------|-----------------|
| 150  | 25 | 1500 | 75  | 100 | 150 | 105 | 25  | 0.9  | KOL 150/1500    |
| 200  | 25 | 1500 | 75  | 100 | 175 | 150 | 45  | 1.6  | KOL 200/1500    |
| 300  | 25 | 1500 | 105 | 125 | 225 | 200 | 100 | 3.5  | KOL 300/1500    |
| 400  | 25 | 1500 | 135 | 150 | 275 | 275 | 175 | 6.2  | KOL 400/1500    |
| 450  | 25 | 1500 | 135 | 150 | 300 | 300 | 225 | 7.9  | KOL 450/1500    |
| 600  | 25 | 1500 | 140 | 150 | 375 | 420 | 380 | 13.4 | KOL 600/1500    |
| 800  | —  | 1500 | 250 | —   | —   | 700 | 600 | 21.2 | KOL 800/1500/L  |
| 1000 | —  | 1500 | 250 | —   | —   | 875 | 950 | 33.5 | KOL 1000/1500/L |

## JACKETED COLUMN SECTIONS

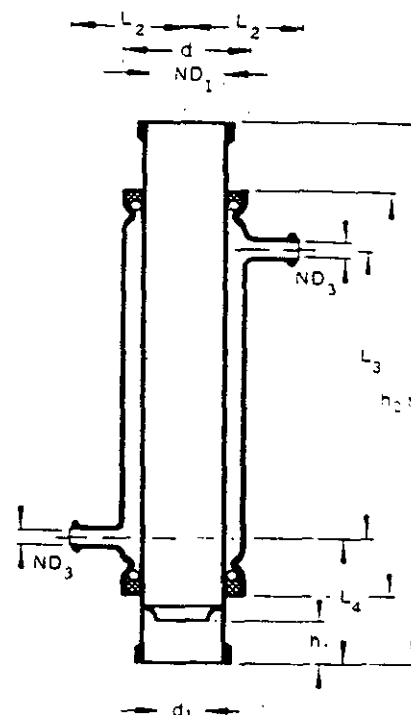
For controlling the temperature, the column sections may also be provided with a glass jacket.

in this design, adapted to the materials involved, the inner section and the jacket are fused together or are sealed with a permanently elastic silicone composition. This seal prevents impermissibly high stresses between the inner and the outer parts.

This leads to the following operating conditions:

- permissible temperature up to 150°C
- permissible gage pressure in the jacket:  
ND 80-ND 150 mm: 1.0 bar  
ND 200-ND 300 mm: 0.5 bar

The chemical resistance of the silicone composition permits the use of hot water, steam, and the usual heat-carrier oils and cooling brines in the jacket space.



Column sections 1 m long



| ND <sub>1</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | Heat transfer area |                    | d<br>(mm) | d <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | L <sub>3</sub><br>(mm) | L <sub>4</sub><br>(mm) | Capacity |                    | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------------|--------------------|-----------|------------------------|------------------------|------------------------|------------------------|----------|--------------------|--------------|
|                 |                 |           |                        |                        | (m <sup>2</sup> )  | (ft <sup>2</sup> ) |           |                        |                        |                        |                        | (l)      | (ft <sup>3</sup> ) |              |
| 80              | 25              | 1000      | 40                     | 860                    | 0,23               | 2.47               | 115       | 45                     | 125                    | 750                    | 125                    | 4        | 0.1                | MKO 30       |
| 100             | 25              | 1000      | 40                     | 860                    | 0,28               | 3.01               | 135       | 65                     | 125                    | 750                    | 125                    | 7        | 0.2                | MKO 100      |
| 150             | 25              | 1000      | 60                     | 840                    | 0,41               | 4.41               | 190       | 105                    | 150                    | 700                    | 150                    | 16       | 0.5                | MKO 150      |
| 200             | 25              | 1000      | 60                     | 840                    | 0,53               | 5.70               | 270       | 150                    | 200                    | 700                    | 150                    | 29       | 1.0                | MKO 200      |
| 300             | 25              | 1000      | 30                     | 800                    | 0,73               | 7.85               | 390       | 200                    | 250                    | 650                    | 175                    | 63       | 2.2                | MKO 300      |

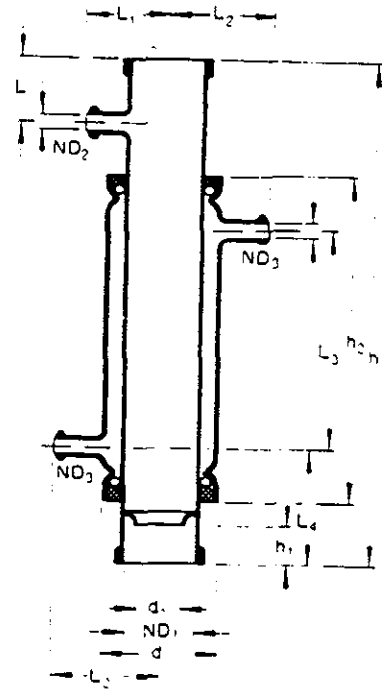
Column sections 1.5 m long

|     |    |      |    |      |      |       |     |     |     |      |     |     |     |              |
|-----|----|------|----|------|------|-------|-----|-----|-----|------|-----|-----|-----|--------------|
| 150 | 25 | 1500 | 60 | 1340 | 0.67 | 7.21  | 190 | 105 | 150 | 1200 | 150 | 25  | 0.9 | MKO 150 1500 |
| 200 | 25 | 1500 | 60 | 1340 | 0.87 | 9.36  | 270 | 150 | 200 | 1200 | 150 | 45  | 1.6 | MKO 200 1500 |
| 300 | 25 | 1500 | 30 | 1300 | 1.23 | 13.23 | 390 | 200 | 250 | 1150 | 175 | 100 | 3.5 | MKO 300 1500 |

# JACKETED COLUMN SECTIONS

## WITH SIDE ARM

This type is provided additionally with a thermometer side-arm  
ND 25 mm.



Column sections 1 m length

| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | Heat transfer area |                    | d<br>(mm) | d <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | L <sub>2</sub><br>(mm) | L <sub>3</sub><br>(mm) | L <sub>4</sub><br>(mm) | Capacity |                    | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|------------------------|--------------------|--------------------|-----------|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|----------|--------------------|--------------|
|                 |                 |                 |           |                        |                        | (m <sup>2</sup> )  | (ft <sup>2</sup> ) |           |                        |           |                        |                        |                        |                        | (l)      | (ft <sup>3</sup> ) |              |
| 80              | 25              | 25              | 1000      | 40                     | 800                    | 0.22               | 2.36               | 115       | 45                     | 75        | 100                    | 125                    | 700                    | 125                    | 4        | 0.1                | MKO 80 T     |
| 100             | 25              | 25              | 1000      | 40                     | 800                    | 0.27               | 2.90               | 135       | 65                     | 75        | 125                    | 125                    | 700                    | 125                    | 7        | 0.2                | MKO 100 T    |
| 150             | 25              | 25              | 1000      | 60                     | 750                    | 0.39               | 4.20               | 190       | 105                    | 100       | 150                    | 150                    | 650                    | 150                    | 16       | 0.5                | MKO 150 T    |
| 200             | 25              | 25              | 1000      | 60                     | 755                    | 0.49               | 5.27               | 270       | 150                    | 100       | 175                    | 200                    | 625                    | 150                    | 29       | 1.0                | MKO 200 T    |
| 300             | 25              | 25              | 1000      | 30                     | 750                    | 0.68               | 7.32               | 390       | 200                    | 125       | 225                    | 250                    | 575                    | 175                    | 63       | 2.2                | MKO 300 T    |

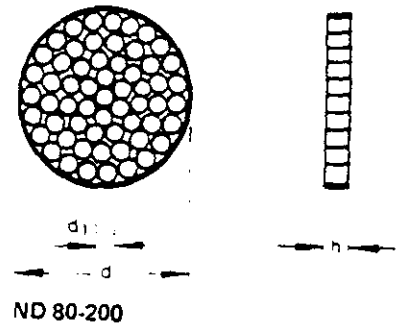
Column sections 1.5 m long

|     |    |    |      |    |      |      |       |     |     |     |     |     |      |     |     |     |                |
|-----|----|----|------|----|------|------|-------|-----|-----|-----|-----|-----|------|-----|-----|-----|----------------|
| 150 | 25 | 25 | 1500 | 60 | 1250 | 0.47 | 5.05  | 190 | 105 | 100 | 150 | 150 | 1150 | 150 | 25  | 0.9 | MKO 150/1500 T |
| 200 | 25 | 25 | 1500 | 60 | 1255 | 0.83 | 8.93  | 270 | 150 | 100 | 175 | 200 | 1125 | 150 | 45  | 1.6 | MKO 200/1500 T |
| 300 | 25 | 25 | 1500 | 30 | 1250 | 1.18 | 12.70 | 390 | 200 | 125 | 225 | 250 | 1075 | 175 | 100 | 3.5 | MKO 300/1500 T |

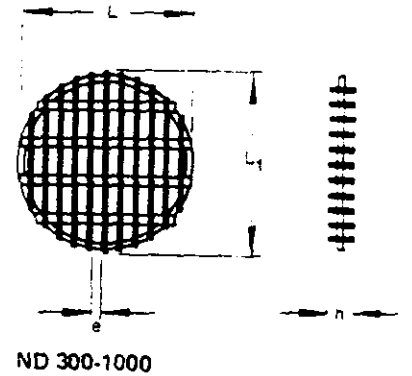


## SUPPORTING GRIDS

| Suitable for ND | d<br>(mm) | d <sub>1</sub><br>(mm) | h<br>(mm) | Load bearing cap. |       | Catalog ref. |
|-----------------|-----------|------------------------|-----------|-------------------|-------|--------------|
|                 |           |                        |           | (kg)              | (lbs) |              |
| 80              | 70        | 14                     | 25        | 15                | 33    | TRA 80       |
| 100             | 90        | 14                     | 30        | 20                | 44    | TRA 100      |
| 150             | 140       | 18                     | 35        | 45                | 100   | TRA 150      |
| 200             | 180       | 20                     | 50        | 80                | 176   | TRA 200      |



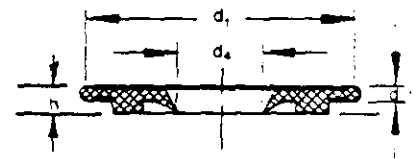
| Suitable for ND | L<br>(mm) | L <sub>1</sub><br>(mm) | e<br>(mm) | h<br>(mm) | Load bearing cap. |       | Catalog ref. |
|-----------------|-----------|------------------------|-----------|-----------|-------------------|-------|--------------|
|                 |           |                        |           |           | (kg)              | (lbs) |              |
| 300             | 265       | 275                    | 22        | 50        | 160               | 352   | TRR 300      |
| 400             | 363       | 370                    | 26        | 60        | 250               | 550   | TRR 400      |
| 450             | 390       | 430                    | 34        | 60        | 300               | 660   | TRR 450      |
| 600             | 570       | 575                    | 34        | 70        | 470               | 1034  | TRR 600      |
| 800             | 790       | 744                    | 39        | 130       | 1000              | 2200  | TRR 800      |
| 1000            | 960       | 960                    | 39        | 150       | 1200              | 2640  | TRR 1000     |



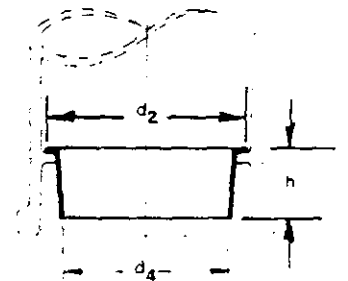
## GUIDING FUNNELS

PTFE guiding funnels are inserted without additional gaskets.

| For ND | d<br>(mm) | d <sub>1</sub><br>(mm) | d <sub>4</sub><br>(mm) | h<br>(mm) | Catalog ref. |
|--------|-----------|------------------------|------------------------|-----------|--------------|
| 80     | 3         | 96                     | 55                     | 6         | LTT 80       |
| 100    |           | 116                    | 75                     |           | LTT 100      |
| 150    |           | 169                    | 105                    |           | LTT 150      |
| 200    | 4         | 220                    | 150                    | 8         | LTT 200      |
| 300    |           | 320                    | 230                    |           | LTT 300      |
| 400    |           | 435                    | 310                    |           | LTT 400      |
| 450    | 5         | 492                    | 350                    | 10        | LTT 450      |
| 600    |           | 645                    | 460                    |           | LTT 600      |



| For ND | d <sub>2</sub><br>(mm) | d <sub>4</sub><br>(mm) | h<br>(mm) | Catalog ref. |
|--------|------------------------|------------------------|-----------|--------------|
| 800    | 790                    | 600                    | 80        | LTR 800      |
| 1000   | 960                    | 800                    | 80        | LTR 1000     |

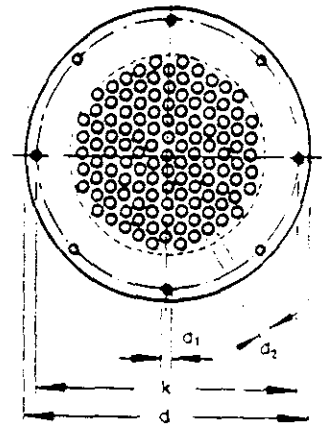


# PERFORATED RETENTION PLATES

The use of the PTFE retention plates is recommended particularly when working in vacuum in order to retain the packing bodies in the case of pressure surges. They are assembled by clamping between sections using collar gaskets (DICH. . . T).

Thickness = 1 mm

| Suitable for ND | d<br>(mm) | d <sub>2</sub><br>(mm) | No. of holes | d <sub>1</sub><br>(mm) | No. of holes | k<br>(mm) | Catalog ref. |
|-----------------|-----------|------------------------|--------------|------------------------|--------------|-----------|--------------|
|                 |           | d <sub>2</sub>         |              | d <sub>1</sub>         |              |           |              |
| 30              | 170       | 6                      | 109          | 9.5                    | 6            | 150       | FUL 80       |
| 100             | 190       | 6                      | 163          | 9.5                    | 6            | 170       | FUL 100      |
| 150             | 245       | 10                     | 151          | 9.5                    | 8            | 225       | FUL 150      |
| 200             | 300       | 15                     | 109          | 9.5                    | 8            | 280       | FUL 200      |
| 300             | 415       | 20                     | 151          | 9.5                    | 12           | 395       | FUL 300      |
| 400             | 515       | 20                     | 271          | 9.5                    | 16           | 495       | FUL 400      |
| 450             | 610       | 20                     | 361          | 9.5                    | 16           | 585       | FUL 450      |
| 600             | 735       | 25                     | 367          | 13.0                   | 20           | 710       | FUL 600      |



# RASCHIG RINGS

| Size<br>d x h<br>(mm) | Density (kg/m <sup>3</sup> ) |           | Surface area (m <sup>2</sup> /m <sup>3</sup> ) |           | Catalog ref. |
|-----------------------|------------------------------|-----------|------------------------------------------------|-----------|--------------|
|                       | in bulk                      | in layers | in bulk                                        | in layers |              |
| 8 x 8                 | 638                          | —         | 658                                            | —         | RAS 8        |
| 10 x 10               | 541                          | —         | 581                                            | —         | RAS 10       |
| 15 x 15               | 392                          | —         | 392                                            | —         | RAS 15       |
| 20 x 20               | 282                          | —         | 262                                            | —         | RAS 20       |
| 25 x 25               | 279                          | —         | 184                                            | —         | RAS 25       |
| 30 x 30               | 204                          | 225       | 131                                            | 142       | RAS 30       |
| 40 x 40               | 164                          | 199       | 93                                             | 111       | RAS 40       |
| 50 x 50               | 144                          | 178       | 83                                             | 90        | RAS 50       |



In addition to glass Raschig rings we supply packing bodies of all types and materials, depending on the design characteristics of the column.

# FILTER PLATES

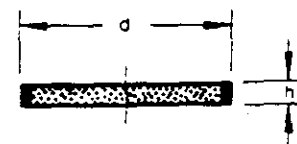
O-I/SCHOTT filter plates are edge-fused for clamping between two KF plane flanges.

They are assembled by clamping between sections using collar gaskets (DICH. . . T).

The Catalog ref. must include the symbol for porosity.

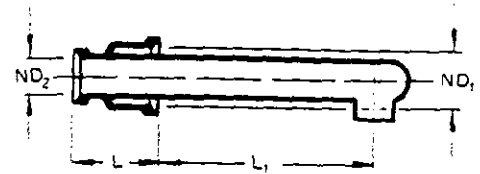
| Suitable for ND | d<br>(mm) | h<br>(mm) | Porosity | Catalog ref. |
|-----------------|-----------|-----------|----------|--------------|
| 80              | 110       | 11        | 0.2      | FIL 80/...   |
| 100             | 130       | 13        | 0.2      | FIL 100/...  |
| 150             | 185       | 16        | 0.2      | FIL 150/...  |
| 200             | 235       | 19        | 0.2      | FIL 200/...  |

| Porosity                                    | 0      | 1      | 2     |
|---------------------------------------------|--------|--------|-------|
| Nominal values for max. diam. of pores (μm) | 150    | 90     | 40    |
|                                             | to 200 | to 150 | to 90 |



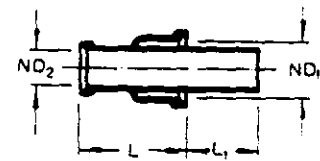
## INLET PIPES, ANGLED

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.    |
|-----------------|-----------------|-----------|------------------------|-----------------|
| 25              | 15              | 100       | 100                    | EIN 25/15/100 W |
|                 |                 | 100       | 100                    | EIN 50/25/100 W |
|                 |                 | 100       | 125                    | EIN 50/25/125 W |
| 50              | 25              | 100       | 150                    | EIN 50/25/150 W |
|                 |                 | 100       | 175                    | EIN 50/25/175 W |
|                 |                 | 100       | 225                    | EIN 50/25/225 W |
|                 |                 | 100       | 225                    | EIN 50/25/225 W |
| 80              | 50              | 150       | 275                    | EIN 80/50/275 W |
|                 |                 | 150       | 300                    | EIN 80/50/300 W |
|                 |                 | 150       | 375                    | EIN 80/50/375 W |



## INLET PIPES

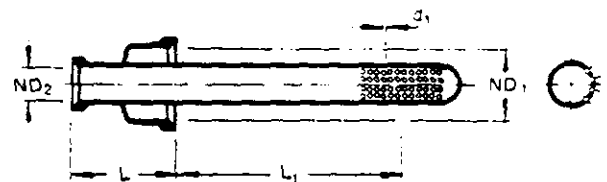
| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------|------------------------|--------------|
| 25              | 15              | 100       | 100                    | EIN 25/15    |
| 50              | 25              | 100       | 100                    | EIN 50/25    |
| 80              | 50              | 150       | 100                    | EIN 80/50    |
| 100             | 80              | 150       | 100                    | EIN 100/80   |



For special lengths, the Catalog ref. must be supplemented by the desired length L<sub>1</sub> in mm, e.g. EIN 50/25 L<sub>1</sub> = 300.

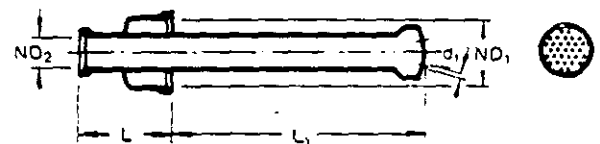
## SPRINKLERS FOR HORIZONTAL MOUNTINGS

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | No. of bores | Catalog ref.    |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|-----------------|
| 50              | 25              | 100       | 150                    |                        | 48           | BRA 50/25/150 W |
|                 |                 |           | 175                    | 2                      | 48           | BRA 50/25/175 W |
|                 |                 |           | 225                    |                        | 48           | BRA 50/25/225 W |
| 80              | 50              | 150       | 275                    |                        | 80           | BRA 80/50/275 W |
|                 |                 |           | 300                    | 2                      | 80           | BRA 80/50/300 W |
|                 |                 |           | 375                    |                        | 80           | BRA 80/50/375 W |



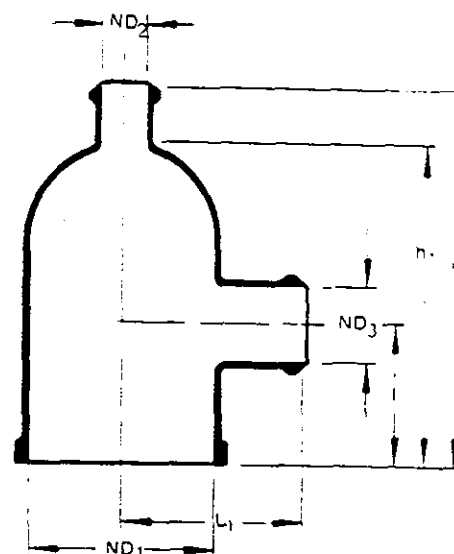
## SPRINKLERS FOR VERTICAL MOUNTING

| ND <sub>1</sub> | ND <sub>2</sub> | L<br>(mm) | L <sub>1</sub><br>(mm) | d <sub>1</sub><br>(mm) | No. of bores | Catalog ref.     |
|-----------------|-----------------|-----------|------------------------|------------------------|--------------|------------------|
| 50              | 25              | 100       | 300                    |                        |              | BRA 50/25/300 S  |
|                 |                 |           | 400                    | 2                      | 61           | BRA 50/25/400 S  |
|                 |                 |           | 500                    |                        |              | BRA 50/25/500 S  |
| 100             | 50              | 150       | 300                    |                        |              | BRA 100/50/300 S |
|                 |                 |           | 400                    | 3                      | 127          | BRA 100/50/400 S |
|                 |                 |           | 500                    |                        |              | BRA 100/50/500 S |



# CLOSING COVERS

| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|------------------------|--------------|
| 80              | 25              | 25              | 300       | 240                    | 100       | 100                    | ABS 80/ 25   |
|                 |                 | 50              | 300       | 240                    | 125       | 100                    | ABS 80/ 50   |
| 100             | 25              | 25              | 300       | 240                    | 150       | 125                    | ABS 100/ 25  |
|                 |                 | 50              | 300       | 240                    | 150       | 125                    | ABS 100/ 50  |
| 150             | 25              | 50              | 350       | 290                    | 150       | 150                    | ABS 150/ 50  |
|                 |                 | 80              | 350       | 290                    | 150       | 150                    | ABS 150/ 80  |
| 200             | 50              | 50              | 400       | 340                    | 150       | 175                    | ABS 200/ 50  |
|                 |                 | 80              | 400       | 340                    | 150       | 175                    | ABS 200/ 80  |
|                 |                 | 100             | 450       | 390                    | 200       | 175                    | ABS 200/ 100 |
| 300             | 50              | 50              | 500       | 440                    | 200       | 225                    | ABS 300/ 50  |
|                 |                 | 80              | 500       | 440                    | 200       | 225                    | ABS 300/ 80  |
|                 |                 | 100             | 500       | 440                    | 200       | 225                    | ABS 300/ 100 |
|                 |                 | 150             | 550       | 490                    | 250       | 275                    | ABS 300/ 150 |
| 400             | 50              | 80              | 550       | 490                    | 200       | 275                    | ABS 400/ 80  |
|                 |                 | 150             | 650       | 590                    | 250       | 325                    | ABS 400/ 150 |
|                 |                 | 200             | 750       | 690                    | 300       | 325                    | ABS 400/ 200 |
| 450             | 50              | 80              | 650       | 590                    | 300       | 300                    | ABS 450/ 80  |
|                 |                 | 150             | 700       | 640                    | 350       | 350                    | ABS 450/ 150 |
|                 |                 | 200             | 800       | 740                    | 400       | 350                    | ABS 450/ 200 |
| 600             | 50              | 80              | 850       | 790                    | 300       | 375                    | ABS 600/ 80  |
|                 |                 | 200             | 850       | 790                    | 300       | 425                    | ABS 600/ 200 |
|                 |                 | 300             | 850       | 790                    | 400       | 500                    | ABS 600/ 300 |

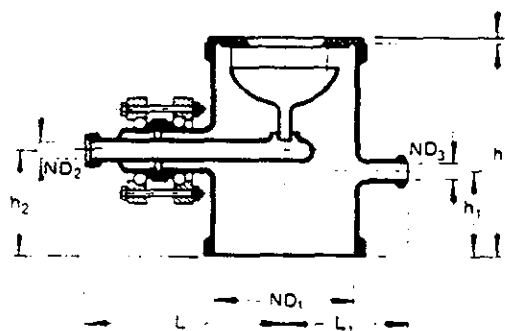


| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref.      |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|------------------------|-------------------|
| 800             | 80              | 200             | 1050      | 929                    | 400       | 575                    | ABS 800/ 80/ 200  |
|                 | 80              | 300             | 1050      | 929                    | 400       | 650                    | ABS 800/ 80/ 300  |
|                 | 150             | 200             | 1050      | 929                    | 400       | 575                    | ABS 800/ 150/ 200 |
|                 | 150             | 300             | 1050      | 929                    | 400       | 650                    | ABS 800/ 150/ 300 |

# DISTILLATE/TAKE-OFF

This component is used to take off the distillate in glass columns.

Branch ND<sub>3</sub> is used for the insertion of a thermometer.



| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | h <sub>2</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | d<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|------------------------|-----------|------------------------|-----------|--------------|
| 80              | 25              | 25              | 250       | 75                     | 125                    | 200       | 100                    | 3         | OAS 80       |
| 100             | 25              | 25              | 250       | 75                     | 125                    | 225       | 125                    | 3         | OAS 100      |
| 150             | 25              | 25              | 250       | 100                    | 125                    | 250       | 150                    | 4         | OAS 150      |
| 200             | 25              | 25              | 250       | 100                    | 125                    | 275       | 175                    | 4         | OAS 200      |
| 300             | 25              | 25              | 400       | 200                    | 200                    | 325       | 225                    | 5         | OAS 300      |
| 400             | 50              | 25              | 400       | 200                    | 200                    | 425       | 275                    | 5         | OAS 400      |
| 450             | 50              | 25              | 400       | 200                    | 200                    | 450       | 300                    | 5         | OAS 450      |
| 600             | 50              | 25              | 600       | 300                    | 300                    | 525       | 375                    | 5         | OAS 600      |

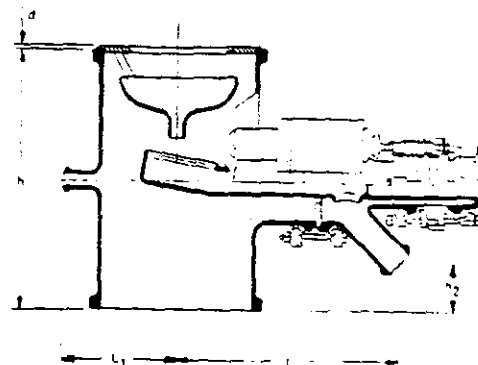
# REFLUX DIVIDERS

In distillation columns reflux dividers are used to divide the distillate into reflux and product.

The distillate is led through a PTFE guiding funnel into a run-off plate.

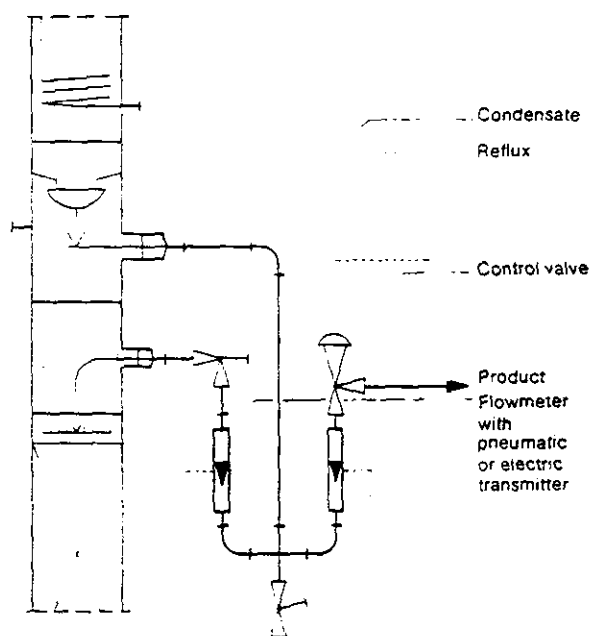
The pivot arm distributes the liquid into the take-off pipe or back to the column.

The movements of this pivot arm is controlled by an explosion-protected solenoid, (24 VDC). By connecting this to a timer any desired reflux ratio can be obtained.



| ND <sub>1</sub> | ND <sub>2</sub> | ND <sub>3</sub> | h<br>(mm) | h <sub>1</sub><br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | d<br>(mm) | Catalog ref. |
|-----------------|-----------------|-----------------|-----------|------------------------|-----------|------------------------|-----------|--------------|
| 100             | 25              | 25              | 300       | 54                     | 247       | 125                    | 3         | RLT 100      |
| 150             | 25              | 25              | 300       | 54                     | 272       | 150                    | 4         | RLT 150      |
| 200             | 25              | 25              | 300       | 54                     | 297       | 175                    | 4         | RLT 200      |
| 300             | 50              | 25              | 500       | 120                    | 428       | 225                    | 5         | RLT 300      |
| 400             | 50              | 25              | 500       | 120                    | 478       | 275                    | 5         | RLT 400      |
| 450             | 50              | 25              | 500       | 120                    | 503       | 300                    | 5         | RLT 450      |

For Pneumatic actuation, supplement Catalog ref. with "P".



## Reflux Ratio Control outside the Column

For large diameter glass columns reflux division outside the column is used.

The total condensate of the column is continuously divided into two partial flows which are measured by flowmeters with pneumatic or electric transmitters.

A control circuit compares the ratio of the partial flows. The selected ratio is kept constant by the control valve in the discharged line.

The reflux ratio is maintained even if the amount of condensate varies.

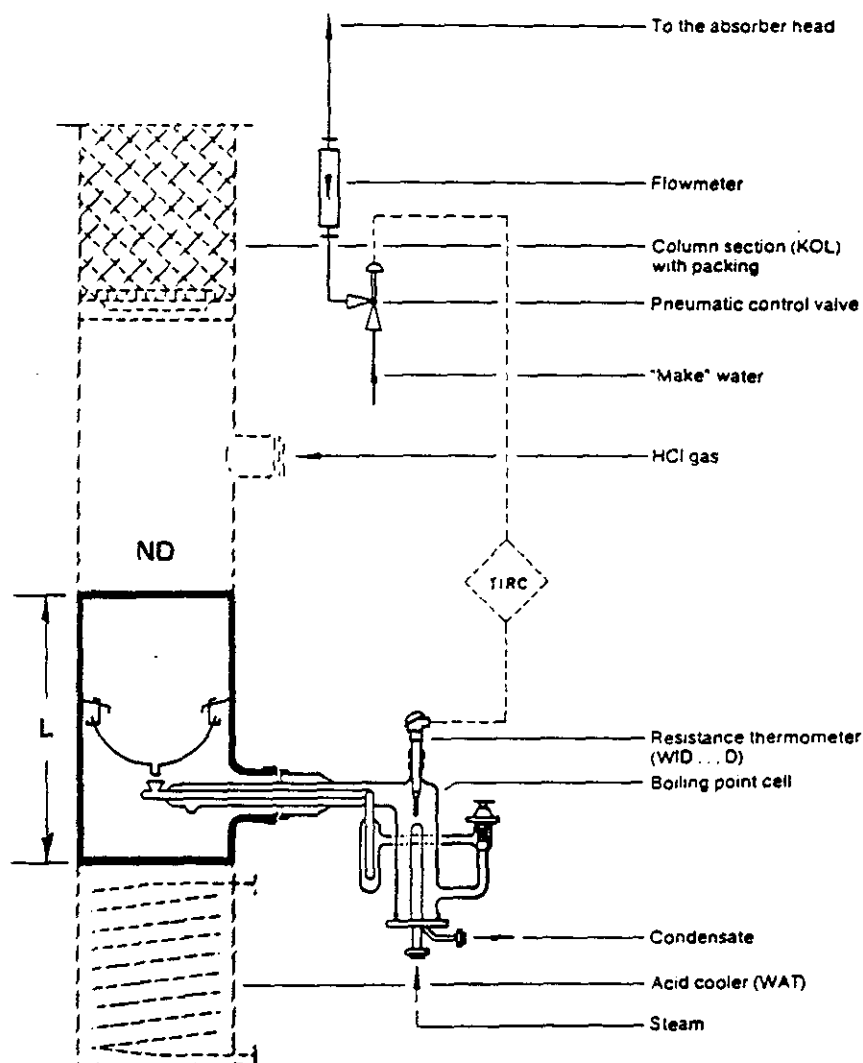
# BOILING POINT MEASURING CELL

To maintain a constant concentration of hydrochloric acid under varying HCL feed conditions.

The unit consists of a section which is installed as part of the column. This section will continuously take off a small amount of the HCL, bring it to boiling temperature with a tantalum bayonet heater and return it to the column. A resistance thermometer measures this boiling temperature. This electrical signal is taken to a transmitter which changes the signal to a pneumatic one which in turn regulates the make-water control-valve. Depending on the operating conditions, the HCL can be kept within 0.5% of the desired concentration.

| ND  | L   | Catalog ref. |
|-----|-----|--------------|
| 150 | 300 | MEZ 150/     |
| 200 | 300 | MEZ 200/     |
| 300 | 400 | MEZ 300/     |
| 400 | 400 | MEZ 400/     |
| 450 | 400 | MEZ 450/     |
| 600 | 600 | MEZ 600/     |

Supplement Catalog ref. with "E" for Electrical or "D" for Steam Heated or "E Ex" for Explosion Proof.



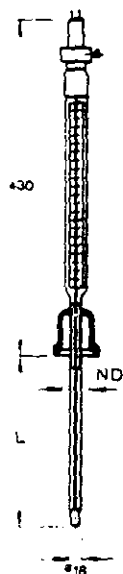
# CONTACT THERMOMETERS

Apart from standard range 0°C - 200°C these thermometers have contacts which can be adjusted by a rotary magnet.

This permits triggering of automatic switching operations when the preset temperature has been reached.

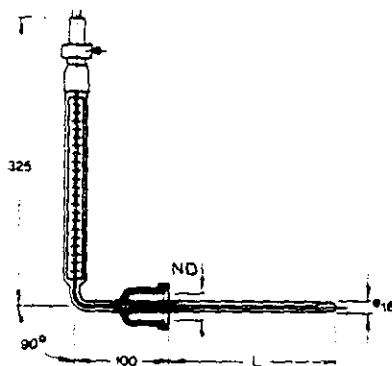
The maximum load is 30 mA. A protective relay should be used for higher switching outputs.

A two-core cable, 1.5 m long, is supplied for electrical connections.



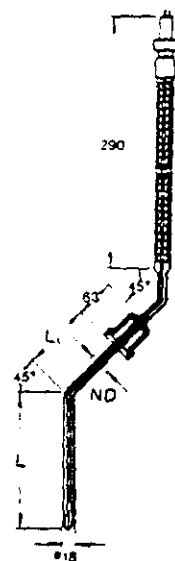
Contact Thermometer with straight stem

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THK 100      |
|    | 200    | THK 200      |
|    | 300    | THK 300      |



Contact Thermometer angled 90

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THK 100 W    |
|    | 150    | THK 150 W    |
|    | 200    | THK 200 W    |



Contact Thermometer for spherical vessels

| For spherical vessel | ND | L (mm) | L <sub>1</sub> (mm) | Catalog ref. |
|----------------------|----|--------|---------------------|--------------|
| GEK 10               | 25 | 175    | 115                 | THG 10 K     |
| GEK 20               |    | 225    | 125                 | THG 20 K     |
| GEK 50               |    | 300    | 250                 | THG 50 K     |
| GEK 100              |    | 400    | 135                 | THG 100 K    |
| GEK 200              |    | 475    | 155                 | THG 200 K    |

## ELECTRICAL LEVEL CONTROL

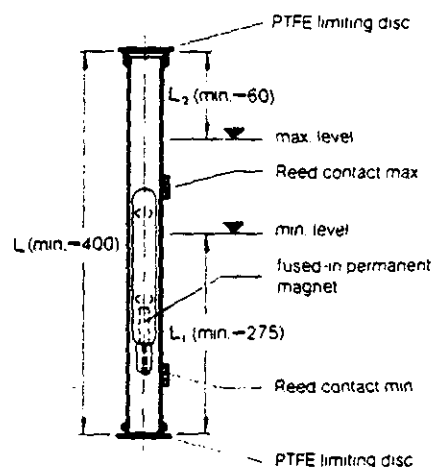
Contactless magnetic switches (Reed contacts) are used for the electric type of control and monitoring of liquid levels.

In parallel to the vessel to be controlled a vertical tube is set up, the length of which is governed by the possible level difference. The glass float with a fused-in permanent magnet moves in this tube. The number of switches attached to the vertical tube can be chosen at will.

The individual switch points are of the fail-safe type. The necessary switch boxes in the stock standard design (two switch points) are not explosion-proofed.

Please specify your requirements.

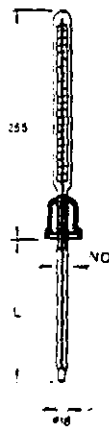
Catalog ref. FUST 25/R



# THERMOMETERS

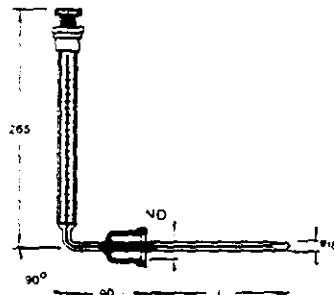
Thermometers are provided with ND 25 KF flanges of the socket type for easy insertion in thermometer branches. They are supplied with straight or angular stems. Thermometers with angles 45° and 90° are used in spherical vessels, covers and

columns and have a turning scale to give better reading. The standard model is designed for the temperature range 0° to ±200°C.



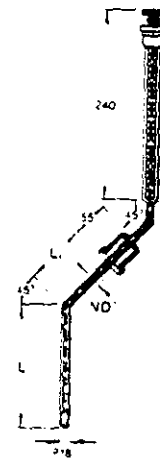
Thermometer with straight stem

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | THE 25/100   |
|    | 200    | THE 25/200   |
|    | 300    | THE 25/300   |



Thermometer angled 90°

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 50     | THE 50 W     |
|    | 100    | THE 100 W    |
|    | 150    | THE 150 W    |
|    | 200    | THE 200 W    |



Thermometer for spherical vessels

| For spherical | ND | L (mm) | L <sub>1</sub> (mm) | Catalog ref. |
|---------------|----|--------|---------------------|--------------|
| GEK 10        | 25 | 175    | 115                 | THG 10       |
| GEK 20        |    | 225    | 125                 | THG 20       |
| GEK 50        |    | 300    | 150                 | THG 50       |
| GEK 100       |    | 400    | 135                 | THG 100      |
| GEK 200       |    | 475    | 155                 | THG 200      |

## RESISTANCE THERMOMETERS

KF resistance thermometers are used for the telemetering, recording and control of temperatures in O-I/SCHOTT glass installation.

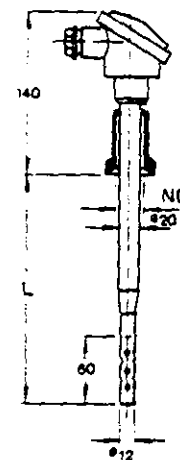
They ensure accurate, reproducible temperature measurements with short response times.

Glass resistance thermometers consist of two precision Pt 100 resistance coils, enclosed in a perforated guard tube, and of a plastic connecting head.

The KF flange is of the ND 25 socket type.

The measurement and control range lies between -200°C and +300°C.

| ND | L (mm) | Catalog ref. |
|----|--------|--------------|
| 25 | 100    | WID 25/100 Q |
|    | 150    | WID 25/150 Q |
|    | 200    | WID 25/200 Q |
|    | 300    | WID 25/300 Q |





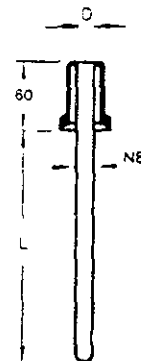
## THERMOMETER POCKET

This component is used as a guard for loosely inserted stem thermometers. When used vertically or at an angle, the sheath can be filled with liquid to ensure better heat conduction.

Pockets of nominal diameter 50 mm may also serve for the insertion of quartz lamps.

The flange is a K F socket. Special lengths are available.

| ND | d<br>(mm) | L<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 15 | 9         | 50        | THH 15/ 50   |
| 25 | 13        | 100       | THH 25/100   |
|    |           | 150       | THH 25/150   |
|    |           | 200       | THH 25/200   |
|    |           | 250       | THH 25/250   |
|    |           | 300       | THH 25/300   |
|    |           | 400       | THH 25/400   |
| 50 | 17        | 150       | THH 50/150   |
|    |           | 200       | THH 50/200   |
|    |           | 250       | THH 50/250   |
|    |           | 300       | THH 50/300   |
|    |           | 400       | THH 50/400   |



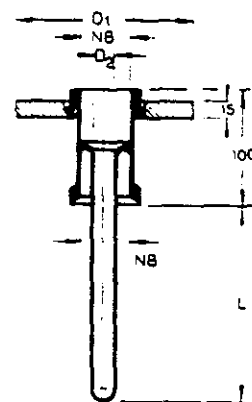
## THERMOMETER POCKET WITH PLANE FLANGE

With plane flange

This pocket can be filled with heat-conducting substances.

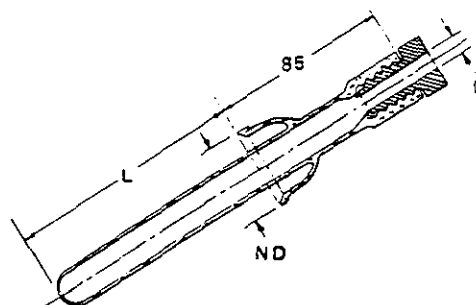
The adaptor coupling supplied with the thermometer is used to make a tight connection with thermometers made of other materials. A flat gasket should be used as a seal for the plane flange.

| ND | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | L<br>(mm) | Catalog ref. |
|----|------------------------|------------------------|-----------|--------------|
| 15 | 100                    | 9                      | 100       | THH 15/100 F |
| 25 | 125                    | 13                     | 150       | THH 25/150 F |
|    |                        |                        | 200       | THH 25/200 F |
| 50 | 175                    | 17                     | 200       | THH 50/200 F |



## THERMOCOUPLE POCKET

| ND | L<br>(mm) | D<br>(mm) | Catalog ref. |
|----|-----------|-----------|--------------|
| 25 | 150       | 6.3       | TP 25/150    |
| 40 | 175       | 6.3       | TP 40/175    |
| 50 | 200       | 6.3       | TP 50/200    |



# KF FLOW METERS

These instruments are based on the float principle and are suitable for the measurement of liquid and gas streams. The precision is  $\pm 2\%$  of the value read off at the upper edge of the float. KF flowmeters are installed vertically in pipelines and consist of a calibrated measuring tube 300 mm long. A single unit consists of the measuring tube, the float and screwed-in stops.

The flowmeter is graduated in mm and has a detachable scale held by clips. On the standard model this scale is calibrated for water at 20°C, but it can be calibrated for other media and operating conditions. Calculation data are supplied with the instruments.

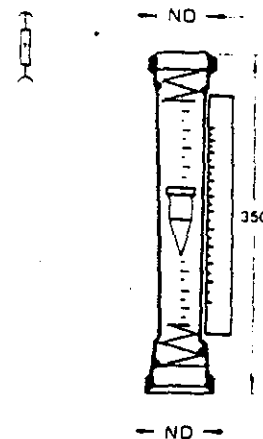
The lower flange (in the direction of flow) is socket type, the upper a ball type.

The following data are required when ordering flowmeters for other media and operating conditions:

1. Medium to be measured
2. Flow rate in l/min, l/h or m<sup>3</sup>/h
3. Density of substance to be measured at operating conditions in kg/litre or kg.Nm<sup>3</sup>
4. Viscosity of the substance to be measured at operating conditions in Pa s
5. Temperature at the measuring point, in °C
6. Operating pressure at the measuring point in bar
7. In the case of gases, state reference conditions, ie. temperature, pressure.

Measuring range

| ND | Float    | Water 20°C (l/h) | Air (l/h)      | Catalog ref. |
|----|----------|------------------|----------------|--------------|
| 15 | Corundum | 0.025 - 0.25     | 1 - 13         | L 0.25/14    |
|    |          | 0.063 - 0.63     | 3 - 30         | L 0.63/33    |
|    |          | 0.4 - 4          | 17 - 170       | L 4/160      |
|    |          | 1 - 10           | 38 - 380       | L 10/400     |
|    |          | 4 - 40           | 140 - 1400     | L 40/1600    |
| 25 | PTFE     | 6.3 - 63         | 220 - 2200     | L 63/2400    |
|    |          | 16 - 160         | 600 - 6000     | G 1.400      |
| 40 | PTFE     | 40 - 400         | 1500 - 15000   | G 1.1000     |
|    |          | 63 - 630         | 2400 - 24000   | G 2.1600     |
| 80 | PTFE     | 100 - 1000       | 4000 - 40000   | G 2.2500     |
|    |          | 160 - 1600       | 6000 - 60000   | G 4.4000     |
|    |          | 250 - 2500       | 10000 - 100000 | G 4.6300     |
|    |          | 400 - 4000       | 15000 - 150000 | G 4.10000    |
|    |          | 630 - 6300       | -              | G 5.16000    |



## PNEUMATIC LEVEL CONTROL

For liquid level control the above-described pneumatic transmitter (Rota system) is again used, but in combination with a glass float provided with a magnetic core. The transmitter is fixed by a support to a KF pipe ND 50 mm, 500 mm long.

Two fixed stops limit the range of movement of the magnetic float. The maximum change in the level that can be covered is 170 mm and is shown on a horizontal scale graduated from 0 to 10. A mechanical system converts the measured values into pressures and thereby, through a controller, actuates a pneumatic regulator mechanism.

Instrument air at a pressure of 1.4 bar is required to operate the transmitter. The consumption of compressed air is about 350 l/h (normal state). The apparatus is adjusted in such a way that output pressures of 0.28 to 1 bar correspond to measured values 1 to 10 (10 to 100%). Feed and control air connections (cutting ring bolt coupling for 6 x 1 mm tube) are indicated on the apparatus.

The permissible temperature of the housing is 70°C.



| Compl. unit | Catalog ref. |
|-------------|--------------|
| ND 50       | FURE 1 P     |



**THINK  
GLASS**

# FLANGES AND GASKETS

The choice correct flanges and gaskets is an important factor for safe operation of glass installations.

The selection criteria are as follows:

- nominal diameter of the components
- type of media to be processed
- external corrosion

The couplings consist of split or unsplit flanges which transfer the bolt forces to the glass flange via inserts (see Figs. 1 and 3).

Permissible operating temperature 200°C.

## FLANGES AND INSERTS

For nominal diameters ND 15 - ND 300

- Code letter "K"  
Material: plastic  
Inserts: plastic
- Code letter "S"  
Material: aluminum  
Insert: ND 15 - 100: plastic  
ND 150 - 300: aluminum

For special conditions the aluminum flanges may also be provided with a corrosion-resistant coating and/or the inserts can be made of stainless steel.

For nominal diameters ND 300 - ND 600

Grey cast iron flanges (symbol "G") in split form are used.

The inserts consist of adhesive-bonded rubber-asbestos strips.

For nominal diameters ND 800 and ND 1000

Sectional steel rings in split form with adhesively lined inserts.

## GASKETS

PTFE is used as the gasket material because of its universal chemical resistance.

## NUTS AND BOLTS

The couplings include standard cadmium-plated bolts. For extreme conditions stainless-steel bolts and nuts can be supplied.

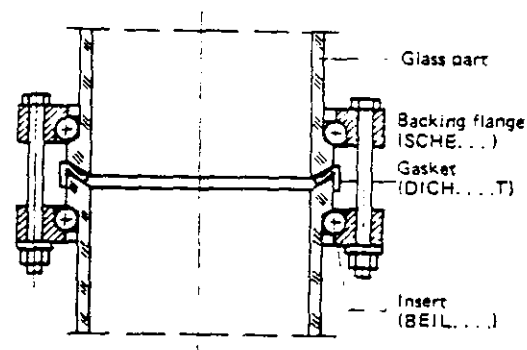


Fig. 1  
ND 15-300 mm "ball and socket" coupling

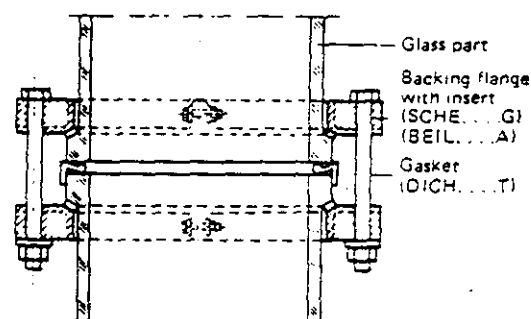


Fig. 2  
ND 300-600 mm "plane" coupling

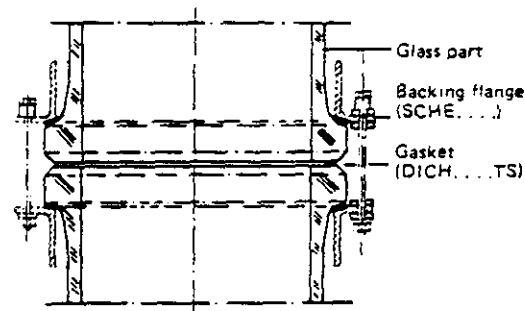


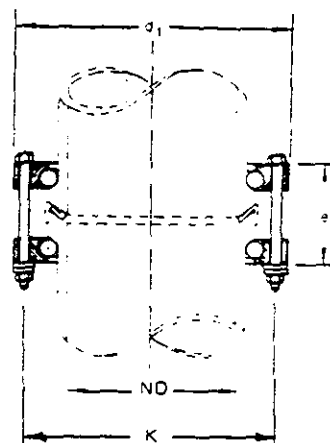
Fig. 3  
ND 800-1000 coupling

# FLANGE ASSEMBLIES ND 15 TO 300

For components ND 15 to 300 the flange assembly consists of two unsplit plastic or aluminium flanges, two inserts, and the required number of cadmium-plated steel bolts nuts and washers. The Catalog ref. of the coupling must include "K" for plastic or "S" for aluminum.

When KF spacers, filter plates, and supporting rings are incorporated, couplings with longer bolts must be used.

Gaskets must be ordered separately.



| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | K<br>(mm) | Flange         | Insert          | Bolt with nut and washer | Catalog ref. |
|-----|-----------|------------------------|-----------|----------------|-----------------|--------------------------|--------------|
| 15  | 44        | 64                     | 50        | 2 x SCHE 15/K  | 2 x BEIL 15/K   | 3 x M 6 x 55             | SVER 15/K    |
| 25  | 51        | 92                     | 75        | 2 x SCHE 25/K  | 2 x BEIL 25/K   | 3 x M 8 x 60             | SVER 25/K    |
| 40  | 65        | 118                    | 100       | 2 x SCHE 40/K  | 2 x BEIL 40/K   | 3 x M 8 x 80             | SVER 40/K    |
| 50  | 73        | 131                    | 110       | 2 x SCHE 50/K  | 2 x BEIL 50/K   | 3 x M 8 x 80             | SVER 50/K    |
| 80  | 92        | 172                    | 150       | 2 x SCHE 80/K  | 2 x BEIL 80/K   | 6 x M 8 x 110            | SVER 80/K    |
| 100 | 93        | 192                    | 170       | 2 x SCHE 100/K | 2 x BEIL 100/K  | 6 x M 8 x 110            | SVER 100/K   |
| 150 | 95        | 247                    | 225       | 2 x SCHE 150/K | 2 x BEIL 150/K  | 8 x M 8 x 120            | SVER 150/K   |
| 200 | 103       | 307                    | 280       | 2 x SCHE 200/K | 2 x BEIL 200/PK | 8 x M 8 x 120            | SVER 200/K   |
| 300 | 107       | 425                    | 395       | 2 x SCHE 300/K | 2 x BEIL 300/PK | 12 x M 8 x 120           | SVER 300/K   |
| 15  | 44        | 64                     | 50        | 2 x SCHE 15/S  | 2 x BEIL 15/K   | 3 x M 6 x 55             | SVER 15/S    |
| 25  | 51        | 92                     | 75        | 2 x SCHE 25/S  | 2 x BEIL 25/K   | 3 x M 8 x 65             | SVER 25/S    |
| 40  | 65        | 118                    | 100       | 2 x SCHE 40/S  | 2 x BEIL 40/K   | 3 x M 8 x 80             | SVER 40/S    |
| 50  | 69        | 131                    | 110       | 2 x SCHE 50/S  | 2 x BEIL 50/K   | 3 x M 8 x 80             | SVER 50/S    |
| 80  | 92        | 172                    | 150       | 2 x SCHE 80/S  | 2 x BEIL 80/K   | 6 x M 8 x 110            | SVER 80/S    |
| 100 | 93        | 192                    | 170       | 2 x SCHE 100/S | 2 x BEIL 100/K  | 6 x M 8 x 110            | SVER 100/S   |
| 150 | 100       | 247                    | 225       | 2 x SCHE 150/S | 2 x BEIL 150/AS | 8 x M 8 x 120            | SVER 150/S   |
| 200 | 103       | 307                    | 280       | 2 x SCHE 200/S | 2 x BEIL 200/AS | 8 x M 8 x 120            | SVER 200/S   |
| 300 | 107       | 429                    | 395       | 2 x SCHE 300/S | 2 x BEIL 300/AS | 12 x M 8 x 120           | SVER 300/S   |

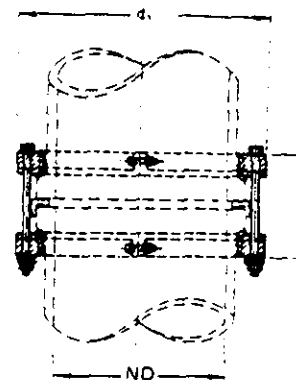
"S" type flange assemblies must be used in support rings.

# FLANGE ASSEMBLIES ND 300 TO 600

For components ND 300 to 600 the flange assembly consists of two split grey cast iron flanges and the required number of cadmium plated steel bolts. The adhesively bonded liner in the flange avoids direct contact of glass and metal parts.

When supporting rings are included, couplings with longer bolts must be used.

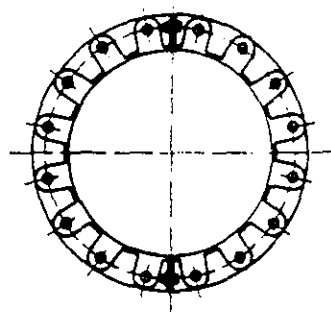
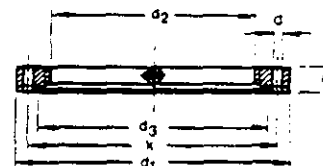
Gaskets must be ordered separately.



| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | flange         | Bolt with nut and washer          | Catalog ref. |
|-----|-----------|------------------------|----------------|-----------------------------------|--------------|
| 300 | 134       | 425                    | 2 x SCHE 300 G | 8 x M 8 x 150<br>4 x M 8 x 90     | SVER 300 G   |
| 400 | 134       | 525                    | 2 x SCHE 400 G | 12 x M 8 x 150<br>4 x M 8 x 90    | SVER 400 G   |
| 450 | 139       | 615                    | 2 x SCHE 450 G | 12 x M 8 x 150<br>4 x M 8 x 90    | SVER 450 G   |
| 600 | 172       | 755                    | 2 x SCHE 600 G | 16 x M 12 x 190<br>4 x M 12 x 120 | SVER 600 G   |

## FLANGES ND 300 TO 600

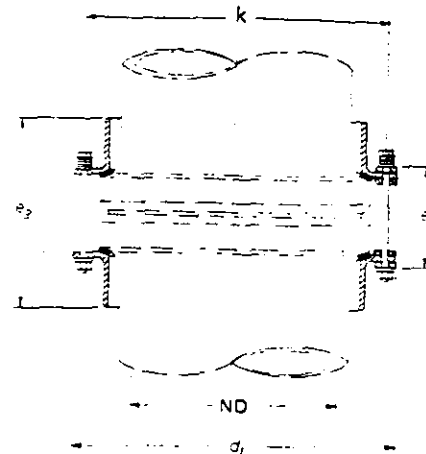
| ND  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | Number of holes | k<br>(mm) | d<br>(mm) | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|-----------------|-----------|-----------|--------------|
| 300 | 425                    | 326                    | 352                    | 40        | 12              | 395       | 9.5       | SCHE 300 G   |
| 400 | 525                    | 440                    | 464                    | 40        | 16              | 495       | 9.5       | SCHE 400 G   |
| 450 | 615                    | 501                    | 525                    | 40        | 16              | 585       | 9.5       | SCHE 450 G   |
| 600 | 755                    | 653                    | 685                    | 50        | 20              | 710       | 14.5      | SCHE 600 G   |



# FLANGE ASSEMBLIES ND 800/1000

For components ND 800 and 1000, the flange assembly consists of two split steel rings and the required amount of cadmium plated bolts, nuts, washers and springs.

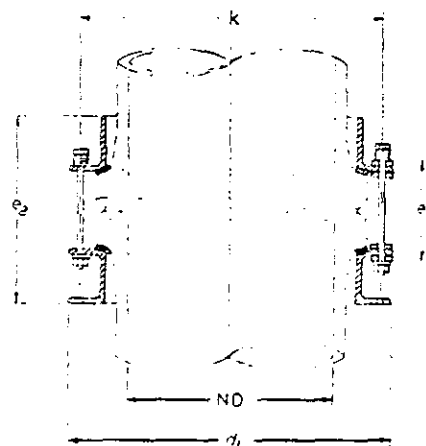
Gaskets must be ordered separately.



| ND   | e <sub>1</sub><br>(mm) | e <sub>2</sub><br>(mm) | d <sub>1</sub><br>(mm) | k<br>(mm) | Flange     | Bolt, nut<br>and washer | Spring          | Catalog ref. |
|------|------------------------|------------------------|------------------------|-----------|------------|-------------------------|-----------------|--------------|
| 800  | 115                    | 247                    | 986                    | 950       | 2xSCHE 800 | 8xM12x210<br>16xM12x180 | 24xDFED 7x15x45 | SVER 800     |
| 1000 | 117                    | 249                    | 1160                   | 1120      | 2xSCHE1000 | 8xM12x210<br>20xM12x180 | 28xDFED 6x15x45 | SVER1000     |

## FLANGE ASSEMBLIES/SUPPORT RINGS ND 800/1000

These assemblies are used at the fixed point and are used as support rings.



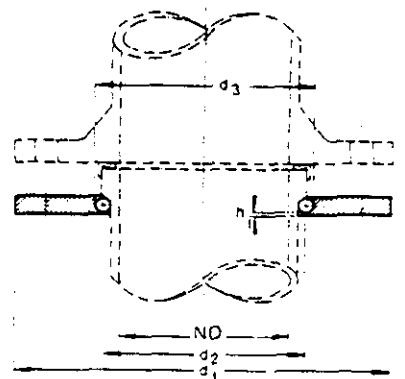
| ND   | e <sub>1</sub><br>(mm) | e <sub>2</sub><br>(mm) | d <sub>1</sub><br>(mm) | k<br>(mm) | Flange                     | Bolt, nut<br>and washer | Spring          | Tapered<br>Washer | Catalog ref. |
|------|------------------------|------------------------|------------------------|-----------|----------------------------|-------------------------|-----------------|-------------------|--------------|
| 800  | 114                    | 290                    | 986                    | 950       | 1xSCHE 800<br>1xSCHE 800ZU | 8xM12x210<br>16xM12x180 | 24xDFED 7x15x45 | 24x14/434/C       | SVER 800ZU   |
| 1000 | 115                    | 290                    | 1170                   | 1120      | 1xSCHE1000<br>1xSCHE1000ZU | 8xM12x210<br>20xM12x180 | 28xDFED 7x15x45 | 28x14/434/C       | SVER1000ZU   |

## ADAPTOR FLANGES

Undrilled Aluminum adaptor flanges with plastic inserts are used to connect KF glass components to flanges of other materials (such as metal, plastic, ceramic, graphite, and enamelled and clad components). These permit the drilling of holes corresponding to those already present in the facing flange.

Gaskets must be ordered separately.

These flanges can be ordered predrilled with an ANSI 150 lbs. hole pattern by adding "ASA 150" to the part number.

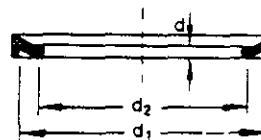


| ND  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | Adaptor flange | Insert          | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|------------------------|----------------|-----------------|--------------|
| 15  | 95                     | 31                     | 38                     | 10        | 4                      | 1 x ANSC 15    | 1 x BEIL 15 K   | AVER 15      |
| 25  | 115                    | 45                     | 56                     | 11        | 5                      | 1 x ANSC 25    | 1 x BEIL 25 K   | AVER 25      |
| 40  | 150                    | 63                     | 76                     | 13        | 7                      | 1 x ANSC 40    | 1 x BEIL 40 K   | AVER 40      |
| 50  | 165                    | 77                     | 90                     | 13        | 7                      | 1 x ANSC 50    | 1 x BEIL 50 K   | AVER 50      |
| 80  | 200                    | 111                    | 126                    | 17        | 9                      | 1 x ANSC 80    | 1 x BEIL 80 K   | AVER 80      |
| 100 | 220                    | 132                    | 148                    | 17        | 9                      | 1 x ANSC 100   | 1 x BEIL 100 K  | AVER 100     |
| 150 | 285                    | 187                    | 202                    | 17        | 8                      | 1 x ANSC 150   | 1 x BEIL 150 AS | AVER 150     |
| 200 | 340                    | 236                    | 254                    | 17        | 8                      | 1 x ANSC 200   | 1 x BEIL 200 AS | AVER 200     |
| 300 | 460                    | 341                    | 354                    | 22        | 8                      | 1 x ANSC 300   | 1 x BEIL 300 AS | AVER 300     |

## COLLAR GASKETS

PTFE collar gaskets are used in the construction of glass apparatus for temperatures up to 200°C. They consist of an O-ring with centering collar. This form is particularly suitable for glass because of the high specific contact pressure that can be achieved with small forces. For ND 800 and 1000 a special PTFE cord is used.

| ND   | d<br>(mm) | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | Catalog ref. |
|------|-----------|------------------------|------------------------|--------------|
| 15   | 2.0       | 29                     | 23                     | DICH 15 T    |
| 25   | 2.0       | 43                     | 34                     | DICH 25 T    |
| 40   | 2.5       | 60                     | 51                     | DICH 40 T    |
| 50   | 2.5       | 74                     | 63                     | DICH 50 T    |
| 80   | 2.5       | 108                    | 96                     | DICH 80 T    |
| 100  | 3.0       | 128                    | 116                    | DICH 100 T   |
| 150  | 3.0       | 184                    | 169                    | DICH 150 T   |
| 200  | 3.0       | 231                    | 220                    | DICH 200 T   |
| 300  | 3.0       | 337                    | 321                    | DICH 300 T   |
| 400  | 4.0       | 468                    | 435                    | DICH 400 T   |
| 450  | 5.0       | 529                    | 492                    | DICH 450 T   |
| 600  | 6.0       | 688                    | 646                    | DICH 600 T   |
| 800  | —         | —                      | —                      | DICH 800 TS  |
| 1000 | —         | —                      | —                      | DICH 1000 TS |

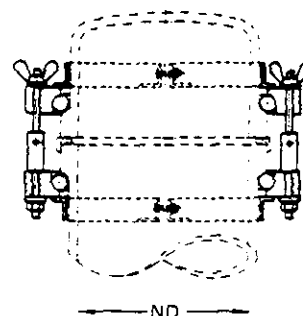


## QUICK—RELEASE COUPLINGS

Quick-release couplings are available for couplings that must frequently be opened (e. g. vessel closures, filling apertures, cleaning nozzles).

Hinged bolts and wing nuts in combination with split aluminum flanges permit easy handling. When the coupling is opened, the flanges are held on the glass parts by locking rings.

Gaskets must be ordered separately.



| ND  | Backing flange                   | Inserts         | Hinged bolts  | Locking rings | Catalog ref. |
|-----|----------------------------------|-----------------|---------------|---------------|--------------|
| 50  | 1 x SCHE 50 S<br>1 x SSCH 50 S   | 2 x BEIL 50 K   | 3 x SVGS 50   | 2 x SVSR 50   | SCHN 50      |
| 80  | 1 x SCHE 80 S<br>1 x SSCH 80 S   | 2 x BEIL 80 K   | 6 x SVGS 80   | 2 x SVSR 80   | SCHN 80      |
| 100 | 1 x SCHE 100 S<br>1 x SSCH 100 S | 2 x BEIL 100 K  | 6 x SVGS 80   | 2 x SVSR 100  | SCHN 100     |
| 150 | 1 x SCHE 150 S<br>1 x SSCH 150 S | 2 x BEIL 150 AS | 8 x SVGS 80   | 2 x SVSR 150  | SCHN 150     |
| 200 | 1 x SCHE 200 S<br>1 x SSCH 200 S | 2 x BEIL 300 AS | 8 x SVGS 200  | 2 x SVSR 200  | SCHN 200     |
| 300 | 1 x SCHE 300 S<br>1 x SSCH 300 S | 2 x BEIL 300 AS | 12 x SVGS 200 | 2 x SVSR 300  | SCHN 300     |

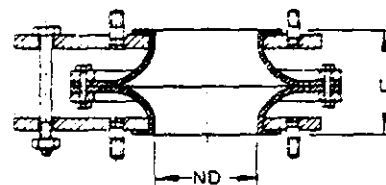
## VACUUM BELLOWS, PTFE

Because of their construction, these PTFE bellows are particularly suitable for apparatus and pipes operated at elevated temperatures under vacuum.

For connection to glass buttress ends, these must be provided with flat joint faces.

Range of use of the vacuum bellows:

- This design can be used at temperatures of up to 200°C both in vacuum and in the super-atmospheric pressure range (corresponding to the permissible operating pressures of the glass components).



| ND  | L<br>(mm) | Catalog ref. |
|-----|-----------|--------------|
| 25  | 45        | FAL 25 V     |
| 40  | 50        | FAL 40 V     |
| 50  | 70        | FAL 50 V     |
| 80  | 95        | FAL 80 V     |
| 100 | 95        | FAL 100 V    |
| 150 | 120       | FAL 150 V    |
| 200 | 130       | FAL 200 V    |
| 300 | 145       | FAL 300 V    |

The Catalog ref. must be supplemented by a statement of whether the bellows are to be used.

- for coupling to glass parts on both sides, or
- for coupling to glass on one side and on the other side to a metal flange (with a statement of the nominal pressure and the hole pattern).



# UNIVERSAL BELLOWS, PTFE

| ND  | d<br>(mm) | L<br>(mm) | L <sub>min.</sub><br>(mm) | L <sub>max.</sub><br>(mm) | Catalog ref. |
|-----|-----------|-----------|---------------------------|---------------------------|--------------|
| 15  | 30        | 75        | 70                        | 79                        | FALD 15 U    |
| 25  | 42        | 75        | 70                        | 79                        | FALD 25 U    |
| 40  | 62        | 100       | 95                        | 105                       | FALD 40 U    |
| 50  | 74        | 100       | 95                        | 105                       | FALD 50 U    |
| 80  | 110       | 100       | 95                        | 105                       | FALD 80 U    |
| 100 | 130       | 100       | 95                        | 105                       | FALD 100 U   |
| 150 | 182       | 125       | 120                       | 130                       | FALD 150 U   |

The universal PTFE bellows was specially designed to fit both flat and spherical end forms without the use of separate gaskets.

— At temperatures of up to 120°C, this pattern can be used for both vacuum and pressure application (corresponding with the permissible working pressures of the glass components and dependent on nominal diameter).

— at temperatures above 120°C up to max. 200°C the bellows can only be used at atmospheric pressure. For applications under higher stresses we recommend the use of vacuum bellows.

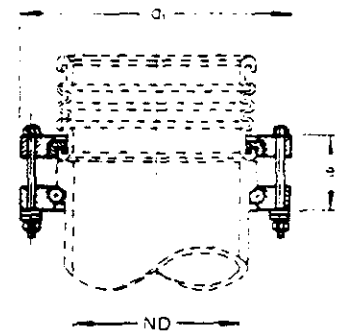
## FLANGE ASSEMBLIES FOR UNIVERSAL BELLOWS

These Flange Assemblies are used for connecting the universal bellows to KF components.

The Catalog ref. must include the letters:

K — plastic  
S — aluminum

| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | Flange    | Insert for<br>KF tube | Insert for<br>bellows | Bolt     | Catalog ref. |
|-----|-----------|------------------------|-----------|-----------------------|-----------------------|----------|--------------|
| 15  | 43        | 64                     | 2xSCHE 15 | 1xBEIL 15             | 1xBEIL 15FD           | 3xM6x 50 | FVER 15U.... |
| 25  | 50        | 92                     | 2xSCHE 25 | 1xBEIL 25             | 1xBEIL 25FD           | 3xM8x 60 | FVER 25U.... |
| 40  | 60        | 118                    | 2xSCHE 40 | 1xBEIL 40             | 1xBEIL 40FD           | 3xM8x 70 | FVER 40U.... |
| 50  | 65        | 131                    | 2xSCHE 50 | 1xBEIL 50             | 1xBEIL 50FD           | 3xM8x 75 | FVER 50U.... |
| 80  | 78        | 172                    | 2xSCHE 80 | 1xBEIL 80             | 1xBEIL 80FD           | 6xM8x 90 | FVER 80U.... |
| 100 | 78        | 192                    | 2xSCHE100 | 1xBEIL100             | 1xBEIL100FD           | 6xM8x 90 | FVER100U.... |
| 150 | 87        | 247                    | 2xSCHE150 | 1xBEIL150             | 1xBEIL100FD           | 8xM8x100 | FVER150U.... |

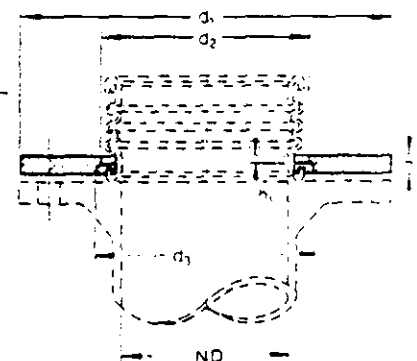


## ADAPTOR FLANGES FOR UNIVERSAL BELLOWS

Undrilled Aluminum adaptor flanges with special bellows inserts are used to connect universal bellows to flanges of other

materials. These flanges can be predrilled with an ANSI 150 lbs hole pattern by adding "ASA 150" to the part numbers.

| ND  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | flange    | Insert      | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|------------------------|-----------|-------------|--------------|
| 15  | 95                     | 31                     | 38                     | 10        | 4                      | 1xANSC 15 | 1xBEIL 15FD | AVER 15FU    |
| 25  | 115                    | 45                     | 56                     | 11        | 5                      | 1xANSC 25 | 1xBEIL 25FD | AVER 25FU    |
| 40  | 150                    | 63                     | 76                     | 13        | 7                      | 1xANSC 40 | 1xBEIL 40FD | AVER 40FU    |
| 50  | 165                    | 77                     | 90                     | 13        | 7                      | 1xANSC 50 | 1xBEIL 50FD | AVER 50FU    |
| 80  | 200                    | 111                    | 126                    | 17        | 9                      | 1xANSC 80 | 1xBEIL 80FD | AVER 80FU    |
| 100 | 220                    | 132                    | 148                    | 17        | 9                      | 1xANSC100 | 1xBEIL100FD | AVER100FU    |
| 150 | 285                    | 187                    | 202                    | 17        | 8                      | 1xANSC150 | 1xBEIL150FD | AVER150FU    |



# PLAIN END PTFE BELLOWS

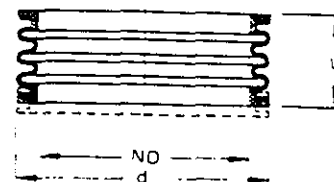
PTFE bellows are used to take up changes in length due to variations in temperature and to prevent the transmission of vibrations, such as those from stirred vessels or from pumps, to glass units.

This type of bellows can be used only with flat joint faces. For the necessary couplings, see below:

Range of use of the bellows:

- At temperatures up to 120°C this form can be used both in vacuum and also in the overpressure range (corresponding to the permissible operating pressures of the glass components).
- At temperatures above 120°C to a maximum of 200°C, the bellows can be used only at nominal pressure.

| ND  | d<br>(mm) | L<br>(mm) | L <sub>min</sub><br>(mm) | L <sub>max</sub><br>(mm) | Catalog ref. |
|-----|-----------|-----------|--------------------------|--------------------------|--------------|
| 15  | 30        | 50        | 45                       | 55                       | FAL 15       |
| 25  | 40        | 50        | 45                       | 55                       | FAL 25       |
| 40  | 62        | 50        | 45                       | 60                       | FAL 40       |
| 50  | 74        | 50        | 45                       | 60                       | FAL 50       |
| 80  | 100       | 50        | 45                       | 65                       | FAL 80       |
| 100 | 130       | 50        | 45                       | 65                       | FAL 100      |
| 150 | 182       | 75        | 70                       | 78                       | FAL 150      |
| 200 | 230       | 75        | 65                       | 90                       | FAL 200      |
| 300 | 338       | 100       | 85                       | 115                      | FAL 300      |

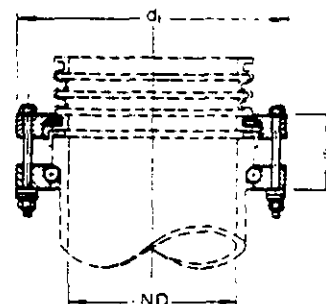


## FLANGE ASSEMBLIES FOR PLAIN END BELLOWS

These couplings are used to join bellows to KF components. They consist of two flanges, an insert (BEIL...), a special bellows insert (BEIL...F), and the appropriate number of cadmium-plated steel bolts, nuts and washers.

The Catalog ref. must include the code letters  
K – plastic  
S – aluminum

| ND  | e<br>(mm) | d <sub>1</sub><br>(mm) | flange    | Insert for<br>KF tube | Insert for<br>bellows | Bolt      | Catalog ref. |
|-----|-----------|------------------------|-----------|-----------------------|-----------------------|-----------|--------------|
| 15  | 41        | 64                     | 2xSCHE 15 | 1xBEIL 15             | 1xBEIL 15F            | 3xM6x 50  | FVER 15...   |
| 25  | 46        | 92                     | 2xSCHE 25 | 1xBEIL 25             | 1xBEIL 25F            | 3xM8x 55  | FVER 25...   |
| 40  | 52        | 118                    | 2xSCHE 40 | 1xBEIL 40             | 1xBEIL 40F            | 3xM8x 60  | FVER 40...   |
| 50  | 56        | 118                    | 2xSCHE 50 | 1xBEIL 50             | 1xBEIL 40F            | 3xM8x 65  | FVER 50...   |
| 80  | 70        | 172                    | 2xSCHE 80 | 1xBEIL 80             | 1xBEIL 80F            | 6xM8x 80  | FVER 80...   |
| 100 | 71        | 192                    | 2xSCHE100 | 1xBEIL100             | 1xBEIL100F            | 6xM8x 80  | FVER100...   |
| 150 | 72        | 247                    | 2xSCHE150 | 1xBEIL150             | 1xBEIL150F            | 8xM8x 90  | FVER150...   |
| 200 | 82        | 307                    | 2xSCHE200 | 1xBEIL200             | 1xBEIL200F            | 8xM8x100  | FVER200...   |
| 300 | 93        | 425                    | 2xSCHE300 | 1xBEIL300             | 1xBEIL300F            | 12xM8x110 | FVER300...   |

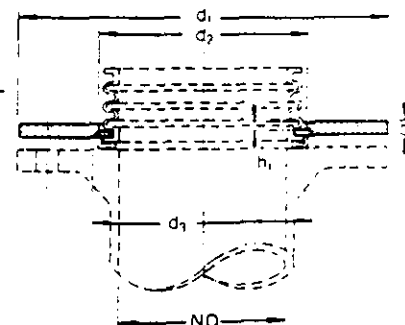


## ADAPTOR FLANGES FOR PLAIN END BELLOWS

To connect bellows to flanges of other materials, undrilled Aluminum adaptor flanges with special bellows inserts are used.

These flanges can be ordered predrilled with an ANSI 150lbs hole pattern by adding "ASA 150" to the part number.

| ND  | d <sub>1</sub><br>(mm) | d <sub>2</sub><br>(mm) | d <sub>3</sub><br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | Flange    | Insert     | Catalog ref. |
|-----|------------------------|------------------------|------------------------|-----------|------------------------|-----------|------------|--------------|
| 15  | 95                     | 31                     | 38                     | 10        | 4                      | 1xANSC 15 | 1xBEIL 15F | AVER 15F     |
| 25  | 115                    | 45                     | 56                     | 11        | 5                      | 1xANSC 25 | 1xBEIL 25F | AVER 25F     |
| 40  | 150                    | 63                     | 76                     | 13        | 7                      | 1xANSC 40 | 1xBEIL 40F | AVER 40F     |
| 50  | 165                    | 77                     | 90                     | 13        | 7                      | 1xANSC 50 | 1xBEIL 50F | AVER 50F     |
| 80  | 200                    | 111                    | 126                    | 17        | 9                      | 1xANSC 80 | 1xBEIL 80F | AVER 80F     |
| 100 | 220                    | 132                    | 148                    | 17        | 9                      | 1xANSC100 | 1xBEIL100F | AVER100F     |
| 150 | 285                    | 187                    | 202                    | 17        | 8                      | 1xANSC150 | 1xBEIL150F | AVER150F     |
| 200 | 340                    | 236                    | 254                    | 17        | 8                      | 1xANSC200 | 1xBEIL200F | AVER200F     |
| 300 | 460                    | 341                    | 354                    | 22        | 8                      | 1xANSC300 | 1xBEIL300F | AVER300F     |



# SUPPORT STRUCTURE CONSTRUCTION



The operational safety of glass piping in installations depends on the correct choice, arrangement and assembly of the support structure and the associated components. The physical limitation of stock glass and the thermal and chemical requirements of the process conditions must be considered and accommodated.

In most cases these requirements can be satisfied by the use of rigid tubular framework. For this purpose O-I/SCHOTT uses schedule 40 galvanized pipe and the necessary clamp connections in sizes 1", 1½", and 2".

The glass installations are fixed in the framework by means of support rings or support plates. The fixed points are normally located in the lower part of the installation in order to avoid tensile stresses caused by suspended loads.

Support plates are used to support vessels. Support rings take the weight of vertical installations always at the bottom flange. These supports are fixed in the tubular frameworks with threaded rods which also act as a leveling device.

In order to distribute the equipment weight counter-balances are available which are used particularly in the construction of tall columns. Lateral guides must also be provided.

In the design of this supporting construction for glass products care must always be taken to allow for thermal expansion. Thus two fixed points directly adjacent to one another must be avoided.

Piping running vertical is secured in the support rings and is laterally guided with clamps. Horizontal pipes are held with pipe clamps or pipe hangers. In most cases bellows are not required due to the very low coefficient of thermal expansion of glass in combination with the KF joint.

In the case of columns and vessels with nominal diameters of 800 to 1000 mm the fixed point supports are designed of structural steel members.

In all cases the operation of the process and the demands set by the properties of glass must be coordinated in designing the support structure. Thus platforms, stairs, ladders, hoists and central servicing positions can easily be incorporated at the design stage.

Because of the corrosive nature of fumes that may be involved, the framework can be additionally protected by means of epoxy paint. All frame parts and connecting elements are provided with a primer or with galvanized coating ready for such protective coating application, if deemed necessary.

# SUPPORT—STRUCTURE PIPE

The pipe used is SCHEDULE 40 in sizes of 1" 1/2", and 2", galvanized internally and externally. The pipe can be supplied in lengths of up to 21'.

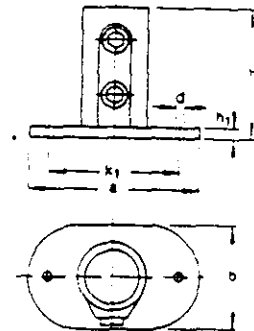
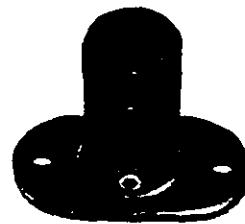
The Catalog ref. must include a statement of the desired length of the pipe in inches.

| ND<br>(inch) | External diam.<br>(mm) | Wall thickness<br>(mm) | Catalog ref. |
|--------------|------------------------|------------------------|--------------|
| 1"           | 33.7                   | 3.25                   | GEST...6     |
| 1 1/2"       | 48.3                   | 3.25                   | GEST...8     |
| 2"           | 60.3                   | 3.65                   | GEST...9     |

## PIPE BASES

Vertical pipe supports are provided with feet which can be supplied for the various sizes. The oval bottom-plate contains suitable bolt holes for anchoring.

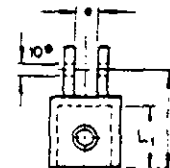
| Suitable for<br>Pipe Size | a<br>(mm) | b<br>(mm) | h<br>(mm) | h <sub>1</sub><br>(mm) | d<br>(mm) | k <sub>1</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|-----------|------------------------|-----------|------------------------|--------------|
| 1"                        | 127       | 76        | 89        | 9                      | 14        | 89                     | GEKK 62-6    |
| 1 1/2"                    | 152       | 89        | 114       | 9                      | 14        | 114                    | GEKK 62-8    |
| 2"                        | 165       | 102       | 127       | 9                      | 17.5      | 127                    | GEKK 62-9    |



## HINGED COUPLING TYPE 49

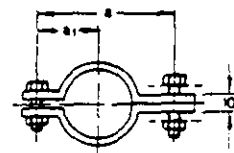
For diagonal bracing, hinged connectors of type 49 are used in combination with a diagonal clamp which can be put on later.

| Suitable for frame tube | L<br>(mm) | L <sub>1</sub><br>(mm) | e<br>(mm) | Catalog ref. |
|-------------------------|-----------|------------------------|-----------|--------------|
| 1"                      | 60        | 35                     | 12        | GEKK 49-6    |
| 1 1/2"                  | 76        | 51                     | 12        | GEKK 49-8    |
| 2"                      | 91        | 59                     | 12        | GEKK 49-9    |



## DIAGONAL CLAMP TYPE 49D

|        | a<br>(mm) | a <sub>1</sub><br>(mm) |            |
|--------|-----------|------------------------|------------|
| 1"     | 80        | 35                     | GEKK 49-6D |
| 1 1/2" | 100       | 45                     | GEKK 49-8D |
| 2"     | 110       | 50                     | GEKK 49-9D |

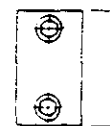


# PIPE COUPLINGS

| Suitable for<br>Pipe Size | L<br>(mm) | Catalog ref. |
|---------------------------|-----------|--------------|
|---------------------------|-----------|--------------|

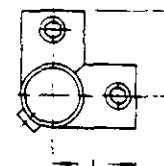
## COUPLING SLEEVE TYPE 14

|     |     |           |
|-----|-----|-----------|
| 1"  | 89  | GEKK 14-6 |
| 1½" | 102 | GEKK 14-8 |
| 2"  | 121 | GEKK 14-9 |



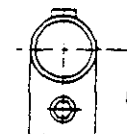
## CORNER COUPLING TYPE 21

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 21-6 |
| 1½" | 68 | GEKK 21-8 |
| 2"  | 84 | GEKK 21-9 |



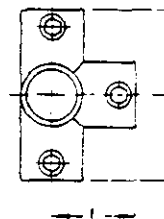
## T-COUPLING TYPE 10

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 10-6 |
| 1½" | 68 | GEKK 10-8 |
| 2"  | 84 | GEKK 10-9 |



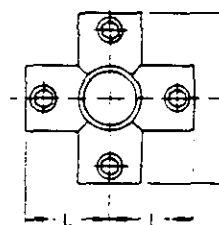
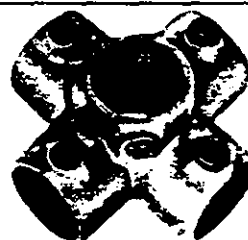
## T-COUPLING TYPE 35

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 35-6 |
| 1½" | 68 | GEKK 35-8 |
| 2"  | 84 | GEKK 35-9 |



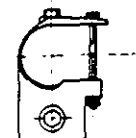
## FRAME CLAMP TYPE 40

|     |    |           |
|-----|----|-----------|
| 1"  | 46 | GEKK 40-6 |
| 1½" | 68 | GEKK 40-8 |
| 2"  | 84 | GEKK 40-9 |



## CROSS-COUPLING TYPE 16

|     |    |           |
|-----|----|-----------|
| 1"  | 53 | GEKK 16-6 |
| 1½" | 76 | GEKK 16-8 |
| 2"  | 90 | GEKK 16-9 |



## THREADED RODS

Threaded rods are used to fix components and bearing elements in the framework.

When supporting brackets and clamps are used, threaded rods serve for the lateral bracing of glass components. Pipes are fixed in combination with tube clamps and hangers.

The Catalog ref. must be completed by the length in inches.

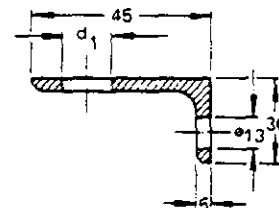
| Tie Rod | Catalog ref. |
|---------|--------------|
| M 8     | GEZU 8/      |
| M 12    | GEZU 12/     |
| M 16    | GEZU 16/     |

## SUPPORTING BRACKETS

Supporting brackets are fixed by means of a bolt of the KF coupling to glass components to be braced laterally.

In order to achieve satisfactory support, at least two brackets displaced by 90° must be applied. They are fixed to the frame by threaded rods and GEBE fixing clamps.

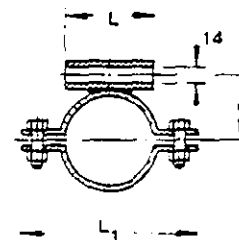
| For connection | d <sub>1</sub><br>(mm) | Catalog ref. |
|----------------|------------------------|--------------|
| 80 – 450       | 9                      | GEWI 8/12    |
| 600 – 1000     | 13                     | GEWI 12/12   |



## TIE ROD CLAMPS

These clamps are primarily used to connect tie rods to pipe frames for lateral supports.

| Suitable for<br>Pipe Size | e<br>(mm) | L<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|------------------------|--------------|
| 1"                        | 32        | 40        | 94                     | GEBE 6/12    |
| 1½"                       | 40        | 40        | 106                    | GEBE 8/12    |
| 2"                        | 46        | 40        | 126                    | GEBE 9/12    |



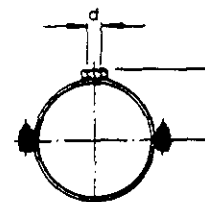
## TUBE CLAMPS

KF tubes with nominal diameters of 15 to 300 mm are fixed by tube clamps in combination with screwed-in threaded rods of appropriate length.

KF tubes with ND 300 mm are braced laterally with supporting brackets and threaded rods.

The weight of vertically mounted piping must be taken up by lower support rings.

| Suitable for<br>ND | d<br>(mm) | e<br>(mm) | Catalog ref. |
|--------------------|-----------|-----------|--------------|
| 15                 | M 12      | 26        | GERO 15 S    |
| 25                 | M 12      | 31        | GERO 25 S    |
| 40                 | M 12      | 40        | GERO 40 S    |
| 50                 | M 12      | 45        | GERO 50 S    |
| 80                 | M 12      | 60        | GERO 80 S    |
| 100                | M 12      | 70        | GERO 100 S   |
| 150                | M 12      | 98        | GERO 150 S   |
| 200                | M 12      | 123       | GERO 200 S   |
| 300                | M 12      | 173       | GERO 300 S   |

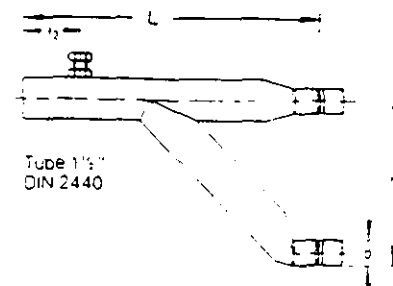


# CANTILEVER BRACKETS

These components can be supplied for attachment to frame pipes of all diameters.

The brackets are suitable for fixing of components and also for the application of frame clamps of size 1½", type 16. Appropriate forked brackets are inserted in the open pipe ends and are fixed by means of a bolt.

| Suitable for<br>Pipe Size | b<br>(mm) | h<br>(mm) | L<br>(mm) | L <sub>2</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|-----------|------------------------|--------------|
| 1"                        | 30        | 205       | 350       | 50                     | GEKO 6/350   |
| 1½"                       | 50        | 205       | 350       | 50                     | GEKO 8/350   |
| 2"                        | 50        | 205       | 350       | 50                     | GEKO 9/350   |



# FORKED BRACKETS

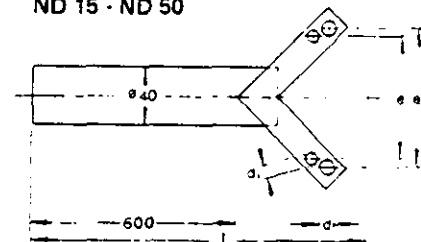
Forked brackets are provided for the fixing of components with nominal diameters of 15 to 200 mm in combination with cantilever brackets of cross-sleeves.

For ND 15 to 50 mm, two bolts of the coupling are used for fixing in each case. In the case of ND 80 to 200 mm, the two welded-on tube sockets are used to take M 8 threaded rods.

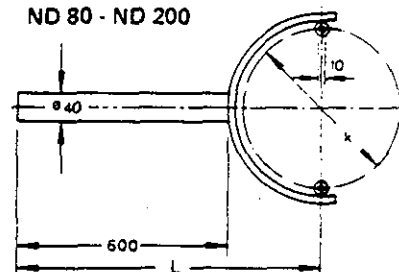
| Suitable<br>for ND | d<br>(mm) | d <sub>1</sub><br>(mm) | e<br>(mm) | e <sub>1</sub><br>(mm) | L<br>(mm) | Catalog ref. |
|--------------------|-----------|------------------------|-----------|------------------------|-----------|--------------|
| and 15             | 9.5       | 7                      | 44        | 65                     | 665       | GEGA 15/25   |
| 25                 | 9.5       | 7                      | 44        | 65                     | 675       |              |
| and 40             | 9.5       | 9.5                    | 78        | 95                     | 684       | GEGA 40/50   |
| 50                 | 9.5       | 9.5                    | 78        | 95                     | 695       |              |

| Suitable<br>for ND | k<br>(mm) | L<br>(mm) | Catalog ref. |
|--------------------|-----------|-----------|--------------|
| 80                 | 150       | 696       | GEGA 80      |
| 100                | 170       | 706       | GEGA 100     |
| 150                | 225       | 736       | GEGA 150     |
| 200                | 280       | 763       | GEGA 200     |

ND 15 - ND 50



ND 80 - ND 200



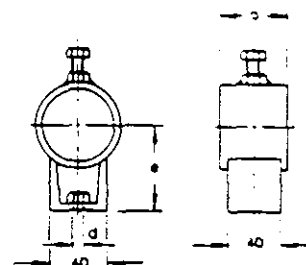
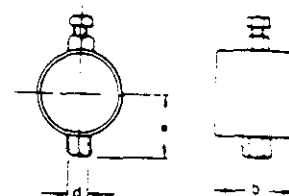
For the installation of support rings and support plates, and to fix pumps and stirrers, frame sleeves with threaded holes for threaded rods can be supplied.

Cross-sleeves are used for fixing transverse tubes. The split permits their subsequent application to existing frameworks.

| Suitable for<br>Pipe Size | b<br>(mm) | d<br>(mm) | e<br>(mm) | L <sub>1</sub><br>(mm) | Catalog ref. |
|---------------------------|-----------|-----------|-----------|------------------------|--------------|
|---------------------------|-----------|-----------|-----------|------------------------|--------------|

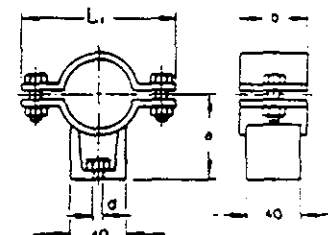
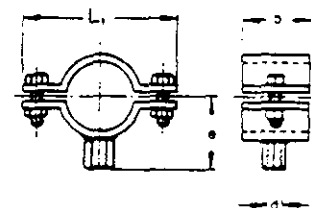
## CLOSED SLEEVES

|     |    |      |    |  |           |
|-----|----|------|----|--|-----------|
| 1"  | 30 | M 12 | 40 |  | GEHA 6/12 |
| 1½" | 50 | M 12 | 60 |  | GEHA 8/12 |
| 1½" | 50 | M 16 | 60 |  | GEHA 8/16 |
| 2"  | 50 | M 12 | 65 |  | GEHA 9/12 |
| 2"  | 50 | M 16 | 65 |  | GEHA 9/16 |



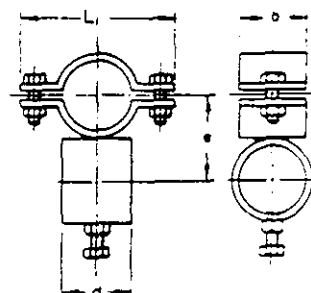
## SPLIT SLEEVES

|     |    |      |    |     |             |
|-----|----|------|----|-----|-------------|
| 1"  | 30 | M 12 | 40 |     | GEHA 6/12 G |
| 1½" | 50 | M 12 | 60 | 106 | GEHA 8/12 G |
| 1½" | 50 | M 16 | 60 | 106 | GEHA 8/16 G |
| 2"  | 50 | M 12 | 65 | 126 | GEHA 9/12 G |
| 2"  | 50 | M 16 | 65 | 126 | GEHA 9/16 G |



## CROSS-SLEEVES

|     |    |  |    |     |        |
|-----|----|--|----|-----|--------|
| 1"  | 30 |  | 42 | 94  | GEKR 6 |
| 1½" | 50 |  | 60 | 106 | GEKR 8 |
| 2"  | 50 |  | 70 | 126 | GEKR 9 |



Reduced cross-sleeves (for forked brackets)

|          |    |     |    |     |           |
|----------|----|-----|----|-----|-----------|
| 1" x 40  | 30 | 100 | 46 | 94  | GEKR 6/40 |
| 1½" x 40 | 50 | 100 | 54 | 106 | GEKR 8/40 |
| 2" x 40  | 50 | 100 | 60 | 126 | GEKR 9/40 |



## SUPPORT CRADLES

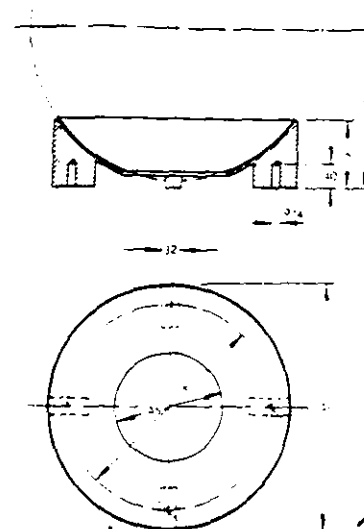
For satisfactory support, spherical vessels with a capacity of 50 l and more and cylindrical vessels with a capacity of 100 l and more are used in support. Cylindrical vessels up to a capacity of 50 l are fixed in the framework construction by means of "lower support rings".

The support cradles are provided with a felt insert and have a suitable bottom hole for the passage of bottom pipes up to ND 150 mm. The support cradles are fixed to the framework by means of four M 12 threaded rods in combination with GEHA pipe sleeves.

| For spherical vessels | $h_2$<br>(mm) | $d_2$<br>(mm) | $e$<br>(mm) | $d_3$<br>(mm) | $k_1$<br>(mm) | $h$<br>(mm) | Catalog ref. |
|-----------------------|---------------|---------------|-------------|---------------|---------------|-------------|--------------|
| GEK 50                | 270           | 440           | 255         | 280           | 360           | 126         | GETR 50 K    |
| GEK 100               | 330           | 500           | 299         | 340           | 422           | 122         | GETR 100 K   |
| GEK 200               | 360           | 620           | 385         | 460           | 544           | 118         | GETR 200 K   |
| GEK 500               | 510           | 980           | 566         | 450           | 800           | 280         | GETR 500 K   |

### For cylindrical vessels

|             |     |     |     |     |     |     |            |
|-------------|-----|-----|-----|-----|-----|-----|------------|
| GER 100-150 | 250 | 374 | 207 | 214 | 292 | 126 | GETR 100 Z |
| GER 200     | 250 | 528 | 300 | 220 | 424 | 208 | GETR 200 Z |
| GER 400     | 330 | 500 | 299 | 340 | 422 | 122 | GETR 100 K |
| GER 500     | 415 | —   | 500 | —   | 706 | 240 | GETR 500 Z |



## COUNTER BALANCES

If a glass installation exceeds 4 meters in height, a counterbalance may be required to relieve some of the excess weight from the fixed point. The O-I/Schott installation drawings show the positions of counterbalances when required including the amount of weights and the moment arm. (The maximum lever ratio is 1:10 - individual weights are 8.3 kg).

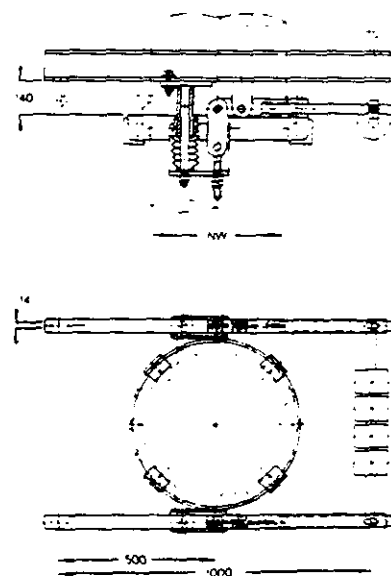
| Suitable for<br>ND | $e$<br>(mm) | Max<br>Weights | Catalog ref. |
|--------------------|-------------|----------------|--------------|
| 100                | 322         | 3              | GEGW 100     |
| 150                | 386         | 4              | GEGW 150     |
| 200                | 436         | 5              | GEGW 200     |
| 300                | 560         | 7              | GEGW 300     |
| 400                | 660         | 9              | GEGW 400     |
| 450                | 750         | 10             | GEGW 450     |
| 600                | 888         | 13             | GEGW 600     |
| 800                | 1110        | 20             | GEGW 800     |
| 1000               | 1290        | 20             | GEGW 1000    |

Counterweights GEGW 8.3

The necessary number of these weights must be given separately.

GEGW 800 and 1000 include flange assemblies.

For specific requirements contact O-I/Schott Engineering.



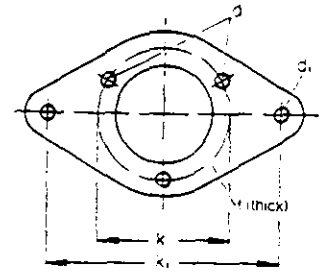
# LOWER SUPPORT RINGS

The weight of the glass installation and vertical pipes is carried by the lower support rings. The holes are adapted to the bolt diameter in the corresponding coupling flange. The support rings are fixed by threaded rods and pipe sleeves on the support structure.

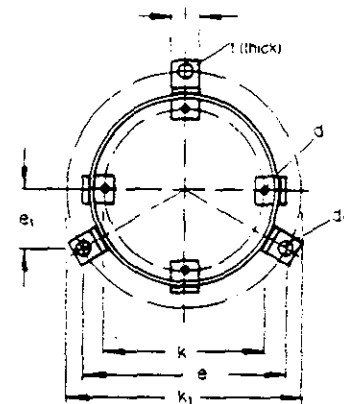
| Suitable for ND | d (mm) | d <sub>1</sub> (mm) | k (mm) | k <sub>1</sub> (mm) | L (mm) | t (mm) | e (mm) | e <sub>1</sub> (mm) | Catalog ref. |
|-----------------|--------|---------------------|--------|---------------------|--------|--------|--------|---------------------|--------------|
| 25              | 9.5    | 14                  | 75     | 150                 | —      | 5      | —      | —                   | GETR 25 U    |
| 40              | 9.5    | 14                  | 100    | 200                 | —      | 5      | —      | —                   | GETR 40 U    |
| 50              | 9.5    | 14                  | 110    | 200                 | —      | 5      | —      | —                   | GETR 50 U    |
| 80              | 10.0   | 14                  | 150    | 270                 | 25     | 5      | 234    | 68                  | GETR 80 U    |
| 100             | 10.0   | 14                  | 170    | 270                 | 25     | 5      | 234    | 68                  | GETR 100 U   |
| 150             | 10.0   | 14                  | 225    | 335                 | 35     | 5      | 290    | 84                  | GETR 150 U   |
| 200             | 10.0   | 14                  | 280    | 390                 | 35     | 5      | 338    | 98                  | GETR 200 U   |
| 300             | 10.0   | 18                  | 395    | 520                 | 55     | 7      | 450    | 130                 | GETR 300 U   |
| 400             | 10.0   | 18                  | 495    | 620                 | 55     | 7      | 537    | 155                 | GETR 400 U   |
| 450             | 10.0   | 18                  | 585    | 710                 | 55     | 7      | 615    | 178                 | GETR 450 U   |
| 600             | 15.0   | 18                  | 710    | 865                 | 80     | 9      | 749    | 216                 | GETR 600 U   |

NOTE — Supports can be used only in conjunction with S or G flange assemblies.

GETR 25–50 U



GETR 80–600 U



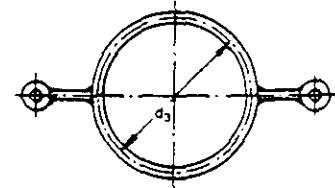
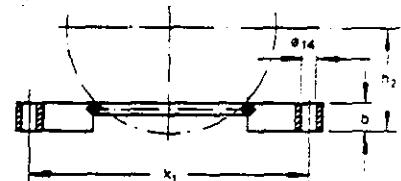
## SUPPORTING RINGS FOR SPHERICAL VESSELS AND PRODUCT CONDENSERS

Spherical vessels up to a capacity of 20 l and product condensers are installed with support rings. The support is covered. The framework is done with M 12 threaded rods using GEHA pipe sleeves.

| For spherical vessels | b (mm) | d <sub>3</sub> (mm) | h <sub>2</sub> (mm) | k <sub>1</sub> (mm) | Catalog ref. |
|-----------------------|--------|---------------------|---------------------|---------------------|--------------|
| GEK 10                | 25     | 200                 | 130                 | 320                 | GETR 10      |
| GEK 20                | 25     | 250                 | 155                 | 400                 | GETR 20      |

For product condensers

|       |    |     |   |     |        |
|-------|----|-----|---|-----|--------|
| PRO 2 | 20 | 78  | — | 200 | GETR 2 |
| PRO 4 | 20 | 118 | — | 200 | GETR 4 |



# ASSEMBLY AND START UP

Because of the increased use of glass in the chemical and pharmaceutical industries, many users are currently in a position to assemble the new installation correctly with their own personnel.

O-I/SCHOTT supports this development by holding training seminars at their Vineland, New Jersey facility.

In addition to this, service engineers are available to train or supervise your personnel, or assemble the entire plant.

O-I/SCHOTT has developed the reputation of not only standing behind their products but also behind their installations. Every customer is assured assistance and service as long as our glass is in service.

When performing your own installation remember that the safety of glass piping systems depend primarily on the correct assembly of the system.

In designing, a few basic points must be observed.

- in the case of vertical pipes on columns, determination of the fixed points at the lowest parts of the installation.
- absorption of temperature-induced changes in length, vibrations, and structure effects by bellows.
- location of pipe supports.

After the initial assembly of the piping system the following measures are necessary to ensure permanent fluid-tightness:

1. heating of the whole installation, if possible, to the max operating temperature anticipated.
2. tightening of the connections to specified torque in the cold state.

The purpose of this operation is to achieve a substantial settling of the PTFE seals, so that the cold flow that still takes place can be taken up by the elasticity of the joint.

The torques values for tightening KF joints should be taken from the following table:

The Engineering and Tech Service group of O-I/SCHOTT is always at your disposal to assist or answer any questions regarding the mechanical or chemical process design.

| Nominal Diameter | Torque in Nm and (in-lbs) for connections with flanges made from |               |              |
|------------------|------------------------------------------------------------------|---------------|--------------|
|                  | Plastic (k)                                                      | Cast Iron (G) | Aluminum (S) |
| ND 15            | 1.0 (9)                                                          | —             | 1.0 (9)      |
| ND 25            | 2.5 (22)                                                         | —             | 2.5 (22)     |
| ND 40            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 50            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 80            | 3.0 (27)                                                         | —             | 4.5 (40)     |
| ND 100           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 150           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 200           | 4.5 (40)                                                         | —             | 6.0 (53)     |
| ND 300           | 4.5 (40)                                                         | 6.0 (53)      | 6.0 (53)     |
| ND 400           | —                                                                | 9.0 (80)      | —            |
| ND 450           | —                                                                | 9.0 (80)      | —            |
| ND 600           | —                                                                | 15.0 (133)    | —            |
| ND 800           | —                                                                | 20.0 (177)    | —            |
| ND 1000          | —                                                                | 22.0 (195)    | —            |



# NOTES

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# COMMON CONVERSIONS

| Multiply                   | By                     | To Obtain                  |
|----------------------------|------------------------|----------------------------|
| kg                         | 2.205                  | lbs.                       |
| mm                         | $3.937 \times 10^{-2}$ | inches                     |
| mm <sup>2</sup>            | $1.6 \times 10^{-3}$   | in <sup>2</sup>            |
| mm <sup>3</sup>            | $6.1 \times 10^{-5}$   | in <sup>3</sup>            |
| m                          | 3.281                  | ft.                        |
| m <sup>2</sup>             | $1.076 \times 10$      | ft. <sup>2</sup>           |
| m <sup>3</sup>             | $3.532 \times 10$      | ft. <sup>3</sup>           |
| kcal                       | 3.968                  | BTU                        |
| kcal/m <sup>2</sup> /hr/°C | $2.049 \times 10^{-1}$ | BTU/ft <sup>2</sup> /hr/°F |
| liters                     | $3.531 \times 15^{-2}$ | ft. <sup>2</sup>           |
| liters                     | $2.642 \times 10^{-1}$ | gallons US                 |
| liters                     | $1.0 \times 10^{-3}$   | m <sup>3</sup>             |
| Nm                         | 8.85                   | in/lbs.                    |

**GLASS PRODUCTS BY  
O-I/SCHOTT PROCESS SYSTEMS, INC.**

1. DURAN<sup>®</sup> Coil Heat exchangers
2. DURAN<sup>®</sup> Shell and Tube heat exchangers
3. DURAN<sup>®</sup> Plug Valves
4. CLEAR-GARD<sup>®</sup> Beaded Process Pipe
5. KIMAX<sup>®</sup> Glass Drainline
6. Cer-Vit<sup>®</sup> Ball Valves
7. Complete Pre-Engineered Glass Plants and Piping Systems
8. Technical Service and Field installations supervision

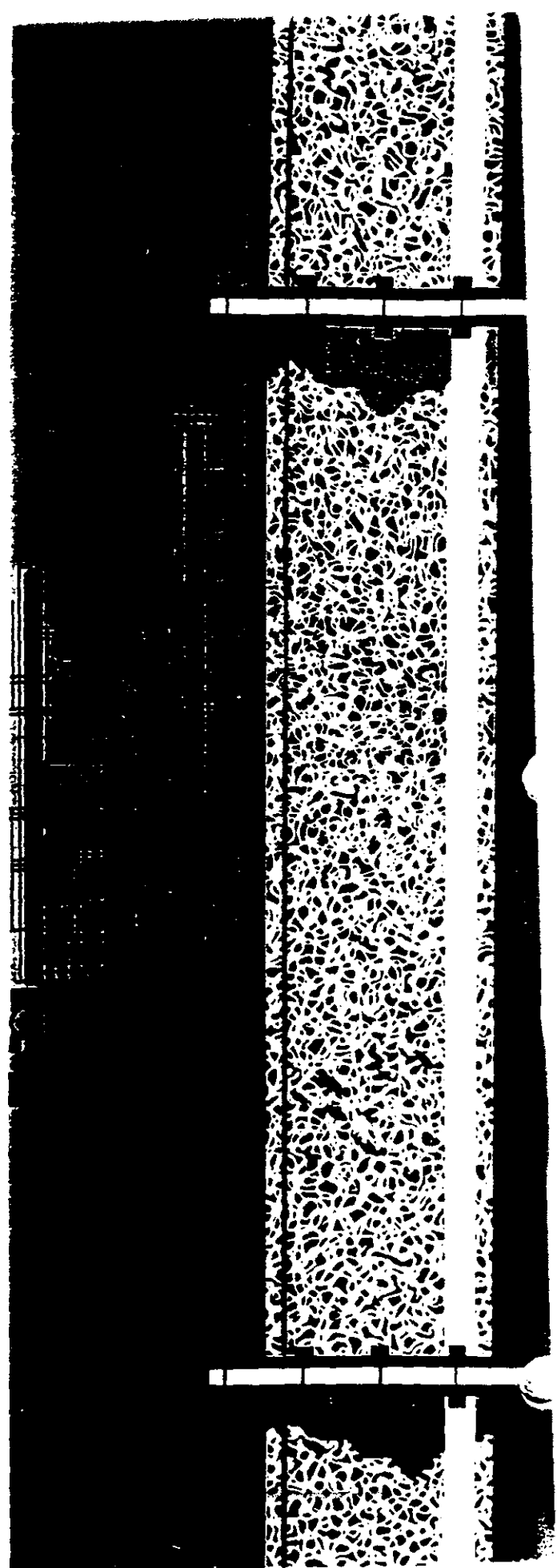
The products shown in this brochure are designed to be used in the chemical, pharmaceutical, and other process industries. They are made of high quality glass and are designed to meet the most demanding requirements of the process industries. O-I/Schott Process Systems, Inc. is a leader in the design, development, and manufacture of glass process equipment. Our products are used in a wide variety of applications, from laboratory research to large scale industrial production. For more information on our products and services, please contact us at the address below.

O-I/Schott Process Systems, Inc. reserves the right to modify or discontinue any of the products or illustrations or descriptions in this publication.

**O-I / SCHOTT**  
Process Systems, Inc.

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P.O. BOX T  
VINELAND, NEW JERSEY 08360-0100  
(609) 692-4700

GLASS COMPONENTS CATALOG, 1988  
OIS-400-0782



# KIMAX

GPD-1054  
Sept. 1970

## Beaded Process Pipe



**Catalog and  
Price List**

**OWENS-ILLINOIS**

Toledo, Ohio 43601 ①



# KIMAX BEADED PROCESS PIPE

Recommended for use in chemical, pharmaceutical, textile, food, dairy and other processing where highly corrosive, sensitive, high purity products are conveyed.

## **Unequaled — corrosion resistance —**

can handle the widest range of corrosives and reagents.

All pipe and fittings are made of the same chemically inert Owens-Illinois (KG-33) borosilicate glass used in the manufacture of KIMAX glass laboratory ware and KIMAX glass drainline. Compression couplings seal glass to TFE gaskets in a manner that the flow comes in contact only with glass or TEFLON.

## **450° F. to freezing point temperature capability.**

**7123 couplings** with VITON liners and TFE seals offer continuous service from 450°F. to freezing point.

**7126 couplings** with HYDRIN liners and TFE seals offer continuous service from 300°F. to freezing point.

## **100 to 30 PSI operating pressure —** depending on pipe I.D. See page 3.

**Stainless steel couplings (300 series SS) —**  
all glass beaded joints are made with single bolt, stainless steel band couplings containing a VITON or HYDRIN compression liner and TFE seal for maximum external and internal corrosion resistance.

## **Built-in-ruggedness —**

beaded pipe and fittings are manufactured from heavy schedule tubing, and tempered for extra strength.

## **Easy and low cost to install.**

- a. Joints are made in seconds with one bolt, stab couplings which seal even with line deflections and misalignment up to 4°.
- b. Pipe can be easily and quickly field cut and beaded where required without effecting pressure rating.

## **Safety — added:**

Translucent armoring of glass fiber cloth impregnated with polyester resin provides that extra protection in case of accidental rupture. See page 4 and GPD-1050 for details.

## **Assured Product Purity —**

All wetted parts of system are chemically inert borosilicate glass or TFE. Parts per million pick up for distilled water . . . SiO<sub>2</sub> (less than .08 ppm), Boron (less than .01 ppm), Na (less than .01 ppm).

## **System Versatility —**

Adaptable to other piping systems; can easily be disassembled and reassembled to meet future requirements.

## **Maintenance Free —**

Smooth inner walls prevent scale build-up and line stoppages.

## **Service —**

National network of stocking distributors; field engineering staff for start up service.

## GUIDE SPECIFICATIONS

### I. General

- A. Contractor shall furnish and install a complete piping system as indicated. This system shall be made of borosilicate glass (Type 1), conforming to Federal Specification DD-G-541B and as manufactured by Owens-Illinois under the trade name "KIMAX."
- B. This system shall include all glass piping and fittings in size 1/4, 1, 1 1/2, 2, 3, 4 and 6" I.D. as shown on the drawing along with the required couplings and padded supports.
- C. Coupling device shall be capable of maintaining a Teflon-to-glass seal with line deflections of at least 1/4" per foot of pipe length.
- D. The entire piping system shall be capable of withstanding working pressures as listed in GPD-1054.

### II. Installation

- A. The system shall be installed free of stress according to the manufacturer's recommended installation procedures.
- B. Padded pipe hangers shall be used on horizontal runs every 8 to 10 feet of pipe length, or more frequently when good piping practices indicate. The hanger should be located adjacent to a coupling wherever possible.
- C. Padded riser clamps shall be used to support vertical risers. Locate riser clamps at each floor, or at center distance not to exceed 12'.
- D. Connection to valves and faucets shall be made with KIMAX adapters or according to recommendation by Owens-Illinois.
- E. All valves, meters, pumps, faucets, and other heavy equipment must be supported independently.
- F. To keep contamination to a minimum, all pipe, fittings and couplings should remain in their sealed cartons till just prior to their use.
- G. After installation, all remaining openings shall be sealed close to avoid contamination of the line.

### III. Protection of Pipe

- A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum of 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with Fiberglas, glass wool and or with a non-hardening caulking material.
- B. Glass Pipe shall not be installed in direct contact with concrete or metal.
- C. Glass pipe shall be protected against all weld splatter.

### IV. Test

Test in accordance to manufacturer's recommendations. See page 19 of GPD-1054.

*Compressed air test method not recommended — consult manufacturer.*

KIMAX—Registered trademark of Owens-Illinois.  
TEFLON—Registered trademark of E. I. DuPont.

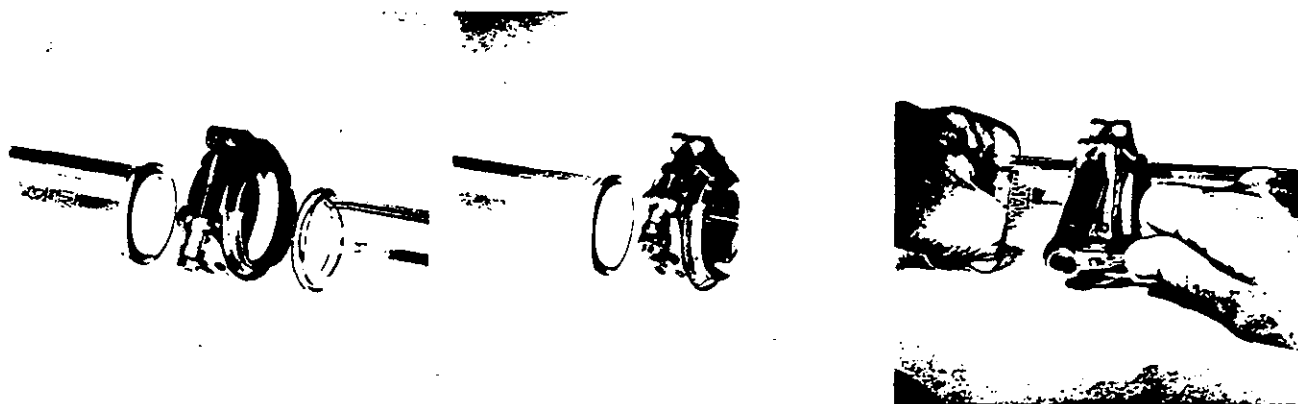
# PHYSICAL AND CHEMICAL PROPERTIES OF KIMAX PIPING SYSTEMS

| SYSTEM                                  | KIMAX BEADED<br>PROCESS PIPE<br>½" thru 6"              |                                       | KIMAX CONICAL END<br>PROCESS PIPE<br>1" thru 6"         |                            | KIMAX DRAINLINE<br>1½" thru 6"                          |                            |
|-----------------------------------------|---------------------------------------------------------|---------------------------------------|---------------------------------------------------------|----------------------------|---------------------------------------------------------|----------------------------|
| <b>PHYSICAL PROPERTIES:</b>             |                                                         |                                       |                                                         |                            |                                                         |                            |
| Working Pressure †                      | ½"-¾"-1"<br>1½"-2"-3"<br>4"<br>6"                       | 100 PSI<br>75 PSI<br>50 PSI<br>30 PSI | 1"-3"<br>4"<br>6"                                       | 50 PSI<br>35 PSI<br>20 PSI | Gravity Flow                                            |                            |
| Test Pressure †                         | 1½ Times Working Pressure                               |                                       | 1½ Times Working Pressure                               |                            | 22½ PSI                                                 |                            |
| Operating Temperature<br>(Maximum)      | Freezing Point to<br>450° F or 300° F                   |                                       | Freezing Point to<br>450° F                             |                            | Freezing Point of<br>Waste to 212° F                    |                            |
| Glass Therm. Expansion                  | 32 x 10 <sup>-7</sup>                                   |                                       | 32 x 10 <sup>-7</sup>                                   |                            | 32 x 10 <sup>-7</sup>                                   |                            |
| Glass Therm. Conductivity               | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F     |                                       | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F     |                            | 0.73 BTU/hr. /Ft. <sup>2</sup> /F°/Ft.<br>at 212° F     |                            |
| Glass Therm. Shock Diff.                | ½"—3"<br>4"<br>6"                                       | 200° F<br>175° F<br>160° F            | 1"—3"<br>4"<br>6"                                       | 200° F<br>175° F<br>160° F | 1½"—3"<br>4"<br>6"                                      | 200° F<br>175° F<br>160° F |
| Vacuum                                  | Full                                                    |                                       | Full                                                    |                            | Full                                                    |                            |
| <b>CHEMICAL PROPERTIES:</b>             |                                                         |                                       |                                                         |                            |                                                         |                            |
| Durability Acids                        | All Except Hydrofluoric or<br>Phosphoric with Fluorides |                                       | All Except Hydrofluoric or<br>Phosphoric with Fluorides |                            | All Except Hydrofluoric or<br>Phosphoric with Fluorides |                            |
| Durability Alkalies                     | Some attack<br>above 120° F                             |                                       | Some attack<br>above 120° F                             |                            | Some attack<br>above 120° F                             |                            |
| Coupling Outer Band                     | 1 bolt stainless<br>steel ½"—6"                         |                                       | Style I, II and<br>ASA Flange                           |                            | 1 bolt stainless<br>steel                               |                            |
| Coupling Compression<br>Liner/Seal Ring | Hydric/TFE Seal 300° F<br>Viton/TFE Seal 450° F         |                                       | Customer Selection                                      |                            | Buna-N/TFE Seal                                         |                            |
| <b>SYSTEM IDENTIFICATION:</b>           |                                                         |                                       |                                                         |                            |                                                         |                            |
|                                         | KIMAX<br>Yellow Label                                   |                                       | KIMAX<br>Yellow Label                                   |                            | KIMAX<br>Green Label                                    |                            |

† Note: Gas pressure should not exceed 5 PSI. Consult your Owens-Illinois Representative.

## MAKING JOINTS WITH KIMAX PROCESS PIPE COUPLINGS

1. Dip coupling in water or wipe beaded ends of glass with damp cloth.
2. Snap coupling over one end of pipe making certain TFE liner is behind bead . . . then stab other section of pipe into opposite side of coupling.
3. Tighten coupling bolt with 6" ratchet wrench.



# KIMAX ARMORED BEADED GLASS PROCESS PIPE

For transportation of valuable or corrosive fluids where accidental rupture may expose personnel and facilities to injury, damage or loss of product.

## ADVANTAGES

1. Armoring contains fluids—allows orderly shutdown. See chemical resistance below.
2. Keeps glass intact for safe removal from system.
3. Retains basic advantage of a KIMAX Glass Pipe System.
4. Translucency allows detection of stoppages or damage.
5. Pipe can be field cut, beaded, and re-armored.
6. Economical one bolt pressure rated coupling permits easy installation, removal, and modification of systems.



Translucency allows detection of stoppages or damage



KIMAX coupling design allows up to 4% deflection or misalignment.



Easy-to-use one-bolt couplings make field installation or removal simple.

## ARMORING CHEMICAL RESISTANCE

3-month direct exposure samples checked daily

|                             |                 |
|-----------------------------|-----------------|
| 1. H <sub>2</sub> O         | No effect       |
| 2. N-Amyl Alcohol           | No effect       |
| 3. Methyl Alcohol           | No effect       |
| 4. Ammonium Hydroxide       | Attacked—3 days |
| 5. Sodium Hydroxide         | Attacked—1 week |
| 6. N-Octane                 | No effect       |
| 7. Benzene                  | No effect       |
| 8. Toluene                  | No effect       |
| 9. JP-4 Fuel                | No effect       |
| 10. Acetone                 | Attack—2 days   |
| 11. Methyl Ethyl Ketone     | Attack—2 days   |
| 12. Hydrogen Peroxide       | No effect       |
| 13. N-Butyric Acid (100%)   | No effect       |
| 14. Nitric Acid (70%)       | Attack—4 hours  |
| 15. Hydrochloric Acid (38%) | Attack—2 weeks  |
| 16. Sulphuric Acid (98%)    | Attack—6 hours  |
| 17. Acetic Acid (100%)      | Attack—3 days   |
| 18. Phosphoric Acid         | Attack—2 months |
| 19. Nitrobenzene            | Attack—2 weeks  |
| 20. Benzaldehyde            | Attack—5 days   |
| 21. Carbon Disulfide        | No effect       |
| 22. Carbon Tetrachloride    | No effect       |
| 23. Chloroform              | Attack—3 days   |
| 24. Methylene Chloride      | Attack—2 days   |

## PHYSICAL PROPERTIES

(Armoring—"3M" Brand "SUNSET" Material)

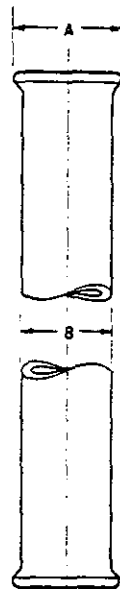
1. Color—translucent (light green tint).
2. Glass fiber cloth impregnated with polyester resin. (Non-toxic and contact not harmful).
3. Can endure a 10 ft./lb. impact without catastrophic failure.
4. Coverage—double wrap, total thickness .020.
5. Cured Properties—Environmental
  - a. Temperature Capability: 300°F. continuous, 350°F. intermittent operation.
  - b. Weathering Resistance:
    1. Weather-O-Meter 2500 hours. No adverse effects.
    2. Outdoor Aging (Minnesota-Florida-Colorado). No adverse effects—2 years.
    3. Not adversely affected by sunlight.
  - c. Salt Spray: 20% salt spray, 95°F. 1000 hours—No adverse effects.
  - d. UV Exposure: (Ford S-1 Oven) 160°F., 3 months. Slight yellowing.
  - e. Extended Cold Aging (—28°F): No adverse effects. No loss of adhesion upon shock test.
6. Heat Resistance

| Time-Minutes | Temperature | Change in Sample           |
|--------------|-------------|----------------------------|
| 10           | 300°F       | No change                  |
| 10           | 400°F       | Discoloration              |
| 10           | 520°F       | Discoloration—some smolder |

CONTACT YOUR NEAREST KIMAX REPRESENTATIVE FOR ADDITIONAL INFORMATION AND PRICES.

# PROCESS PIPE AND FITTINGS

## 6300 BEADED PIPE



All pipe is available from stock in lengths shown.

### SPECIAL LENGTHS:

*KIMAX Beaded Process Pipe is designed for "on the job" cutting and beading. Pipe is easily cut and beaded with a KIMAX 7310-56802 or 7310-56903 Portable cutter and 7310-56801 Beading Kit.*

*Your KIMAX distributor or manufacturer will also provide special lengths at a slightly higher cost per foot.*

### NOTE:

*Field fabrication does not reduce pressure or temperature capability.*

*KIMAX Armored pipe can also be field fabricated.*

### 1/2" I.D.

| Length | A"    | B"  | Article    | Price   |
|--------|-------|-----|------------|---------|
| 3"     | 57/64 | 3/4 | 6300-48003 | \$ 2.75 |
| 4"     | 57/64 | 3/4 | 48004      | 2.75    |
| 6"     | 57/64 | 3/4 | 48006      | 2.75    |
| 48"    | 57/64 | 3/4 | 48048      | 4.25    |
| 96"    | 57/64 | 3/4 | 48096      | 5.95    |

### 3/4" I.D.

|     |       |   |            |         |
|-----|-------|---|------------|---------|
| 3"  | 13/32 | 1 | 6300-68003 | \$ 3.60 |
| 4"  | 13/32 | 1 | 68004      | 3.60    |
| 6"  | 13/32 | 1 | 68006      | 3.60    |
| 48" | 13/32 | 1 | 68048      | 5.35    |
| 96" | 13/32 | 1 | 68096      | 7.35    |

### 1" I.D.

|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 3"   | 113/32 | 1 1/16 | 6300-10003 | \$ 5.40 |
| 4"   | 113/32 | 1 1/16 | 10004      | 5.40    |
| 6"   | 113/32 | 1 1/16 | 10006      | 5.40    |
| 48"  | 113/32 | 1 1/16 | 10048      | 9.05    |
| 96"  | 113/32 | 1 1/16 | 10096      | 13.25   |
| 120" | 113/32 | 1 1/16 | 10120      | 15.35   |

### 1 1/2" I.D.

|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 4"   | 2 1/16 | 1 7/32 | 6300-15004 | \$ 7.75 |
| 6"   | 2 1/16 | 1 7/32 | 15006      | 7.75    |
| 60"  | 2 1/16 | 1 7/32 | 15060      | 12.10   |
| 120" | 2 1/16 | 1 7/32 | 15120      | 24.20   |

### 2" I.D.

|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 4"   | 2 5/16 | 2 1/16 | 6300-20004 | \$10.30 |
| 6"   | 2 5/16 | 2 1/16 | 20006      | 10.30   |
| 60"  | 2 5/16 | 2 1/16 | 20060      | 16.50   |
| 120" | 2 5/16 | 2 1/16 | 20120      | 33.00   |

### 3" I.D.

|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 4"   | 3 1/16 | 3 1/16 | 6300-30004 | \$16.30 |
| 6"   | 3 1/16 | 3 1/16 | 30006      | 16.30   |
| 60"  | 3 1/16 | 3 1/16 | 30060      | 22.00   |
| 120" | 3 1/16 | 3 1/16 | 30120      | 44.00   |

### 4" I.D.

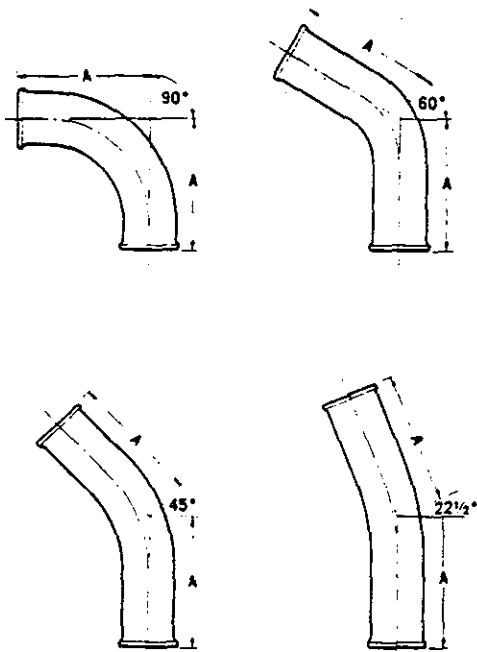
|      |        |        |            |         |
|------|--------|--------|------------|---------|
| 6"   | 4 1/16 | 4 1/16 | 6300-40006 | \$23.25 |
| 60"  | 4 1/16 | 4 1/16 | 40060      | 30.25   |
| 120" | 4 1/16 | 4 1/16 | 40120      | 60.50   |

### 6" I.D.

|      |   |        |            |         |
|------|---|--------|------------|---------|
| 6"   | 6 | 6 1/32 | 6300-60006 | \$34.85 |
| 60"  | 6 | 6 1/32 | 60060      | 48.40   |
| 120" | 6 | 6 1/32 | 60120      | 96.80   |

# PROCESS PIPE AND FITTINGS

## 6301 SWEEP ELBOW



### 90°

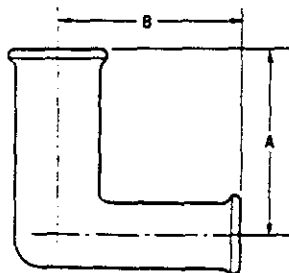
| Size         | A"    | Article   | Price   | Size         | A"    | Article   | Price   |
|--------------|-------|-----------|---------|--------------|-------|-----------|---------|
| 1/2" - 90°   | 2 1/4 | 6301-4890 | \$ 4.20 | 1/2" - 45°   | 2 1/4 | 6301-4845 | \$ 4.20 |
| 3/4" - 90°   | 2 1/2 | 6890      | 4.80    | 3/4" - 45°   | 2 1/2 | 6845      | 4.80    |
| 1" - 90°     | 2 3/4 | 1090      | 7.15    | 1" - 45°     | 2 3/4 | 1045      | 7.15    |
| 1 1/2" - 90° | 5     | 1590      | 7.50    | 1 1/2" - 45° | 3 1/2 | 1545      | 7.50    |
| 2" - 90°     | 6     | 2090      | 9.65    | 2" - 45°     | 4     | 2045      | 9.65    |
| 3" - 90°     | 7     | 3090      | 15.65   | 3" - 45°     | 5     | 3045      | 15.65   |
| 4" - 90°     | 10    | 4090      | 20.65   | 4" - 45°     | 7     | 4045      | 20.65   |
| 6" - 90°     | 12    | 6090      | 50.00   | 6" - 45°     | 9     | 6045      | 50.00   |

### 60°

| Size         | A"    | Article   | Price   | Size         | A"    | Article   | Price   |
|--------------|-------|-----------|---------|--------------|-------|-----------|---------|
| 1/2" - 60°   | 2 1/4 | 6301-4860 | \$ 4.20 | 1/2" - 22°   | 2 1/4 | 6301-4822 | \$ 4.20 |
| 3/4" - 60°   | 2 1/2 | 6860      | 4.80    | 3/4" - 22°   | 2 1/2 | 6822      | 4.80    |
| 1" - 60°     | 2 3/4 | 1060      | 7.15    | 1" - 22°     | 2 3/4 | 1022      | 7.15    |
| 1 1/2" - 60° | 3 1/2 | 1560      | 7.50    | 1 1/2" - 22° | 3 1/2 | 1522      | 7.50    |
| 2" - 60°     | 4     | 2060      | 9.65    | 2" - 22°     | 4     | 2022      | 9.65    |
| 3" - 60°     | 5     | 3060      | 15.65   | 3" - 22°     | 5     | 3022      | 15.65   |
| 4" - 60°     | 7     | 4060      | 20.65   | 4" - 22°     | 7     | 4022      | 20.65   |
| 6" - 60°     | 9     | 6060      | 50.00   | 6" - 22°     | 9     | 6022      | 50.00   |

### 22 1/2°

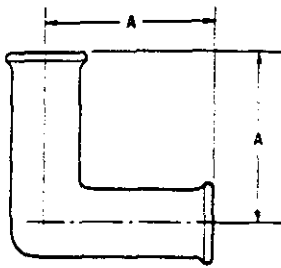
## 6302 REDUCER ELBOW



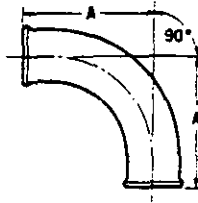
| Size          | A"    | B"    | Article   | Price   |
|---------------|-------|-------|-----------|---------|
| 1/2" x 1/2"   | 2 1/4 | 2 1/4 | 6302-6848 | \$ 7.80 |
| 1" x 1/2"     | 2 1/4 | 2 1/4 | 1048      | 9.60    |
| 1" x 3/4"     | 2 1/4 | 2 1/4 | 1068      | 9.60    |
| 1 1/2" x 1/2" | 3 1/2 | 3     | 1548      | 10.30   |
| 1 1/2" x 3/4" | 3 1/2 | 3     | 1568      | 10.30   |
| 1 1/2" x 1"   | 3 1/2 | 3     | 1510      | 10.30   |
| 2" x 1/2"     | 4     | 3     | 2048      | 13.80   |
| 2" x 3/4"     | 4     | 3     | 2068      | 13.80   |
| 2" x 1"       | 4     | 3     | 2010      | 13.80   |
| 2" x 1 1/2"   | 4     | 4     | 2015      | 13.80   |
| 3" x 1"       | 5     | 5     | 3010      | 21.65   |
| 3" x 1 1/2"   | 5     | 5     | 3015      | 21.65   |
| 3" x 2"       | 5     | 5     | 3020      | 21.65   |
| 4" x 1"       | 7     | 7     | 4010      | 30.90   |
| 4" x 1 1/2"   | 7     | 7     | 4015      | 30.90   |
| 4" x 2"       | 7     | 7     | 4020      | 30.90   |
| 4" x 3"       | 7     | 7     | 4030      | 30.90   |
| 6" x 1 1/2"   | 9     | 5 1/2 | 6015      | 58.70   |
| 6" x 2"       | 9     | 6     | 6020      | 58.70   |
| 6" x 3"       | 9     | 6 1/2 | 6030      | 58.70   |
| 6" x 4"       | 9     | 8     | 6040      | 58.70   |

# PROCESS PIPE AND FITTINGS

**6303 90°  
MITERED ELBOW**



**6304 90°  
SWEEP ELBOW**



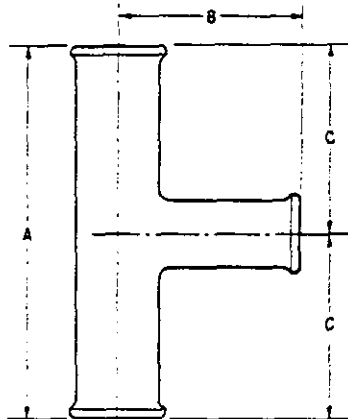
## 6303

| Size     | A" | Article   | Price   |
|----------|----|-----------|---------|
| 1½" -90° | 3½ | 6303-1590 | \$10.30 |
| 2" -90°  | 4  | 2090      | 13.80   |
| 3" -90°  | 5  | 3090      | 21.65   |
| 4" -90°  | 7  | 4090      | 30.90   |
| 6" -90°  | 9  | 6090      | 58.70   |

## 6304

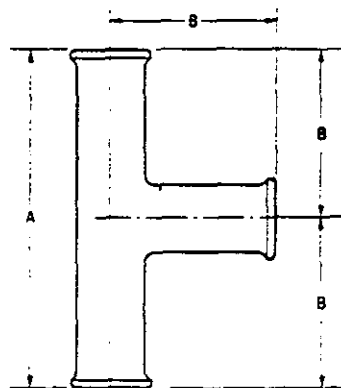
| Size                   | A" | Article   | Price   |
|------------------------|----|-----------|---------|
| 1½" -90°               | 3½ | 6304-1590 | \$ 7.50 |
| 2" -90°                | 4  | 2090      | 9.65    |
| 3" -90°                | 5  | 3090      | 15.65   |
| 4" -90°                | 7  | 4090      | 20.65   |
| Compatible with 6310-T |    |           |         |

**6310 STRAIGHT T**



| Size | A" | B" | Article   | Price   |
|------|----|----|-----------|---------|
| ½"   | 4½ | 2¼ | 6310-4848 | \$ 4.80 |
| ¾"   | 5  | 2½ | 6868      | 5.40    |
| 1"   | 5½ | 2¾ | 1010      | 8.70    |
| 1½"  | 7  | 3½ | 1515      | 12.80   |
| 2"   | 8  | 4  | 2020      | 15.00   |
| 3"   | 10 | 5  | 3030      | 20.00   |
| 4"   | 14 | 7  | 4040      | 33.75   |
| 6"   | 18 | 9  | 6060      | 60.00   |

**6311 REDUCING T (BRANCH)**

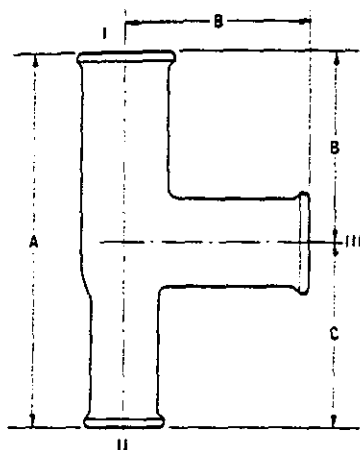


| Size<br>Run x Branch | A" | B" | C" | Article   | Price   |
|----------------------|----|----|----|-----------|---------|
| 1½" x ½"             | 5  | 2½ | 2½ | 6311-6848 | \$ 7.80 |
| 1" x ½"              | 5½ | 2¾ | 2¾ | 1048      | 9.60    |
| 1" x ¾"              | 5½ | 2¾ | 2¾ | 1068      | 9.60    |
| 1½" x ½"             | 7  | 3  | 3½ | 1548      | 12.80   |
| 1½" x ¾"             | 7  | 3  | 3½ | 1568      | 12.80   |
| 1½" x 1"             | 7  | 3  | 3½ | 1510      | 12.80   |
| 2" x ½"              | 8  | 3  | 4  | 2048      | 15.00   |
| 2" x ¾"              | 8  | 3  | 4  | 2068      | 15.00   |
| 2" x 1"              | 8  | 3  | 4  | 2010      | 15.00   |
| 2" x 1½"             | 8  | 3½ | 4  | 2015      | 15.00   |
| 3" x 1"              | 10 | 3½ | 5  | 3010      | 20.00   |
| 3" x 1½"             | 10 | 4  | 5  | 3015      | 20.00   |
| 3" x 2"              | 10 | 4½ | 5  | 3020      | 20.00   |
| 4" x 1"              | 14 | 4  | 7  | 4010      | 33.75   |
| 4" x 1½"             | 14 | 4½ | 7  | 4015      | 33.75   |
| 4" x 2"              | 14 | 5  | 7  | 4020      | 33.75   |
| 4" x 3"              | 14 | 5½ | 7  | 4030      | 33.75   |
| 6" x 1½"             | 18 | 5½ | 9  | 6015      | 60.00   |
| 6" x 2"              | 18 | 6  | 9  | 6020      | 60.00   |
| 6" x 3"              | 18 | 6½ | 9  | 6030      | 60.00   |
| 6" x 4"              | 18 | 8  | 9  | 6040      | 60.00   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.

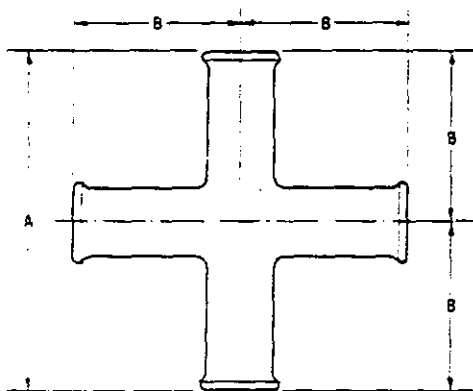
# PROCESS PIPE AND FITTINGS

## 6312 REDUCING T (RUN)



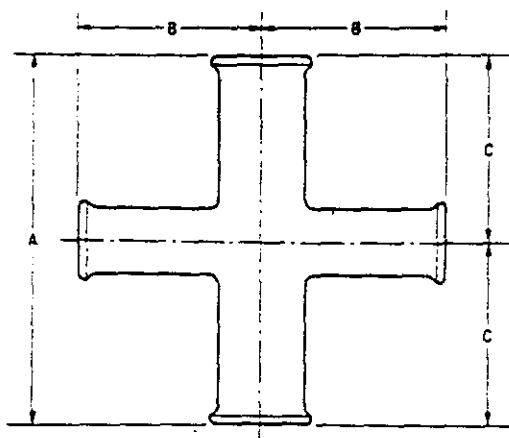
| Size           |    |     | A"  | B" | C" | Article   | Price   |
|----------------|----|-----|-----|----|----|-----------|---------|
| I              | II | III |     |    |    |           |         |
| ¾" x ½" x ¾"   |    |     | 5   | 2½ | 2½ | 6312-6848 | \$ 7.80 |
| 1" x ¾" x 1"   |    |     | 5½  | 2¾ | 2¾ | 1048      | 9.60    |
| 1" x ¾" x 1"   |    |     | 5½  | 2¾ | 2¾ | 1068      | 9.60    |
| 1½" x ½" x 1½" |    |     | 6½  | 3½ | 3  | 1548      | 12.80   |
| 1½" x ¾" x 1½" |    |     | 6½  | 3½ | 3  | 1568      | 12.80   |
| 1½" x 1" x 1½" |    |     | 6½  | 3½ | 3  | 1510      | 12.80   |
| 2" x ½" x 2"   |    |     | 7   | 4  | 3  | 2048      | 15.00   |
| 2" x ¾" x 2"   |    |     | 7   | 4  | 3  | 2068      | 15.00   |
| 2" x 1" x 2"   |    |     | 7   | 4  | 3  | 2010      | 15.00   |
| 2" x 1½" x 2"  |    |     | 7½  | 4  | 3½ | 2015      | 15.00   |
| 3" x 1" x 3"   |    |     | 8½  | 5  | 3½ | 3010      | 20.00   |
| 3" x 1½" x 3"  |    |     | 9   | 5  | 4  | 3015      | 20.00   |
| 3" x 2" x 3"   |    |     | 10  | 4½ | 5  | 3020      | 20.00   |
| 4" x 1" x 4"   |    |     | 14  | 4  | 7  | 4010      | 33.75   |
| 4" x 1½" x 4"  |    |     | 14  | 4½ | 7  | 4015      | 33.75   |
| 4" x 2" x 4"   |    |     | 14  | 5  | 7  | 4020      | 33.75   |
| 4" x 3" x 4"   |    |     | 14  | 5½ | 7  | 4030      | 33.75   |
| 6" x 1" x 6"   |    |     | 14  | 9  | 5  | 6010      | 60.00   |
| 6" x 1½" x 6"  |    |     | 14½ | 9  | 5½ | 6015      | 60.00   |
| 6" x 2" x 6"   |    |     | 15  | 9  | 6  | 6020      | 60.00   |
| 6" x 3" x 6"   |    |     | 15½ | 9  | 6½ | 6030      | 60.00   |
| 6" x 4" x 6"   |    |     | 17  | 9  | 8  | 6040      | 60.00   |

## 6320 STRAIGHT CROSS



| Size      | A" | B" | Article   | Price   |
|-----------|----|----|-----------|---------|
| ½" x ½"   | 4½ | 2¼ | 6320-4848 | \$ 5.70 |
| ¾" x ¾"   | 5  | 2½ | 6868      | 6.90    |
| 1" x 1"   | 5½ | 2¾ | 1010      | 11.10   |
| 1½" x 1½" | 7  | 3½ | 1515      | 16.00   |
| 2" x 2"   | 8  | 4  | 2020      | 21.40   |
| 3" x 3"   | 10 | 5  | 3030      | 33.60   |
| 4" x 4"   | 14 | 7  | 4040      | 48.00   |
| 6" x 6"   | 18 | 9  | 6060      | 84.50   |

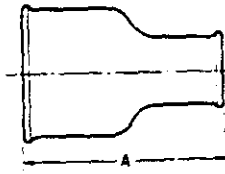
## 6350 REDUCER CROSS



| Size     | A" | B" | C" | Article   | Price   |
|----------|----|----|----|-----------|---------|
| ¾" x ½"  | 5  | 2½ | 2½ | 6350-6848 | \$ 9.60 |
| 1" x ¾"  | 5½ | 2¾ | 2¾ | 1048      | 13.10   |
| 1" x ¾"  | 5½ | 2¾ | 2¾ | 1068      | 13.10   |
| 1½" x ½" | 7  | 3  | 3½ | 1548      | 16.00   |
| 1½" x ¾" | 7  | 3  | 3½ | 1568      | 16.00   |
| 1½" x 1" | 7  | 3  | 3½ | 1510      | 16.00   |
| 2" x ½"  | 8  | 3  | 4  | 2048      | 21.40   |
| 2" x ¾"  | 8  | 3  | 4  | 2068      | 21.40   |
| 2" x 1"  | 8  | 3  | 4  | 2010      | 21.40   |
| 2" x 1½" | 8  | 3½ | 4  | 2015      | 21.40   |
| 3" x 1"  | 10 | 3½ | 5  | 3010      | 33.60   |
| 3" x 1½" | 10 | 4  | 5  | 3015      | 33.60   |
| 3" x 2"  | 10 | 4½ | 5  | 3020      | 33.60   |
| 4" x 1"  | 14 | 4  | 7  | 4010      | 48.00   |
| 4" x 1½" | 14 | 4½ | 7  | 4015      | 48.00   |
| 4" x 2"  | 14 | 5  | 7  | 4020      | 48.00   |
| 4" x 3"  | 14 | 5½ | 7  | 4030      | 48.00   |
| 6" x 1"  | 18 | 5  | 9  | 6010      | 82.10   |
| 6" x 1½" | 18 | 5½ | 9  | 6015      | 82.10   |
| 6" x 2"  | 18 | 6  | 9  | 6020      | 82.10   |
| 6" x 3"  | 18 | 6½ | 9  | 6030      | 82.10   |
| 6" x 4"  | 18 | 8  | 9  | 6040      | 82.10   |

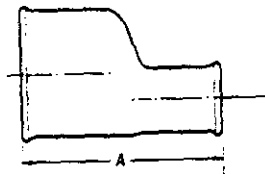
# PROCESS PIPE AND FITTINGS

## 6315 REDUCER (Straight)



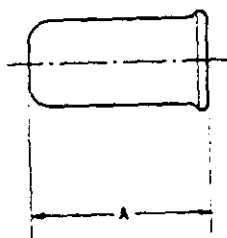
| Size          | A" | Article   | Price   | Size        | A" | Article   | Price   |
|---------------|----|-----------|---------|-------------|----|-----------|---------|
| 3/4" x 1/2"   | 4  | 6315-6848 | \$ 3.90 | 3" x 1 1/2" | 5  | 6315-3015 | \$ 9.40 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3020      | 10.65   |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      | 11.90   |
| 1 1/2" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      | 11.90   |
| 1 1/2" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      | 13.15   |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      | 15.65   |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 6" x 1"     | 9  | 6010      | 19.40   |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 6" x 1 1/2" | 9  | 6015      | 19.40   |
| 2" x 1"       | 4  | 2010      | 6.90    | 6" x 2"     | 9  | 6020      | 20.65   |
| 2" x 1 1/2"   | 4  | 2015      | 6.90    | 6" x 3"     | 9  | 6030      | 25.00   |
| 3" x 1"       | 5  | 3010      | 9.40    | 6" x 4"     | 9  | 6040      | 27.50   |

## 6340 REDUCER (Eccentric)



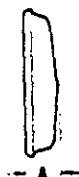
| Size          | A" | Article   | Price   | Size        | A" | Article   | Price   |
|---------------|----|-----------|---------|-------------|----|-----------|---------|
| 3/4" x 1/2"   | 4  | 6340-6848 | \$ 3.90 | 3" x 1 1/2" | 5  | 6340-3015 | \$ 9.40 |
| 1" x 1/2"     | 4  | 1048      | 4.70    | 3" x 2"     | 5  | 3020      | 10.65   |
| 1" x 3/4"     | 4  | 1068      | 4.70    | 4" x 1"     | 7  | 4010      | 11.90   |
| 1 1/2" x 1/2" | 4  | 1548      | 5.20    | 4" x 1 1/2" | 7  | 4015      | 11.90   |
| 1 1/2" x 3/4" | 4  | 1568      | 5.20    | 4" x 2"     | 7  | 4020      | 13.15   |
| 1 1/2" x 1"   | 4  | 1510      | 5.20    | 4" x 3"     | 7  | 4030      | 15.65   |
| 2" x 1/2"     | 4  | 2048      | 6.90    | 6" x 1"     | 9  | 6010      | 19.40   |
| 2" x 3/4"     | 4  | 2068      | 6.90    | 6" x 1 1/2" | 9  | 6015      | 19.40   |
| 2" x 1"       | 4  | 2010      | 6.90    | 6" x 2"     | 9  | 6020      | 20.65   |
| 2" x 1 1/2"   | 4  | 2015      | 6.90    | 6" x 3"     | 9  | 6030      | 25.00   |
| 3" x 1"       | 5  | 3010      | 9.40    | 6" x 4"     | 9  | 6040      | 27.50   |

## 6336 END CAP



| Size   | A"    | Article   | Price   |
|--------|-------|-----------|---------|
| 1/2"   | 2     | 6336-4800 | \$ 2.20 |
| 3/4"   | 2     | 6800      | 2.35    |
| 1"     | 2     | 1000      | 2.45    |
| 1 1/2" | 3     | 1500      | 3.50    |
| 2"     | 4     | 2000      | 4.70    |
| 3"     | 4 3/4 | 3000      | 7.35    |
| 4"     | 6     | 4000      | 10.50   |
| 6"     | 7     | 6000      | 14.20   |

## 6344 END PLUG



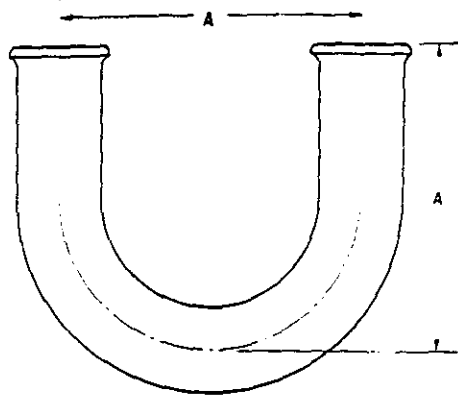
| Size   | A"    | Article   | Price  |
|--------|-------|-----------|--------|
| 1 1/2" | 3/4   | 6344-1500 | \$1.90 |
| 2"     | 1     | 2000      | 2.35   |
| 3"     | 1 1/4 | 3000      | 3.35   |
| 4"     | 1 1/4 | 4000      | 5.35   |
| 6"     | 1 1/2 | 6000      | 7.90   |

Use catalog dimensions for piping layout as gasket thickness allowance is included.



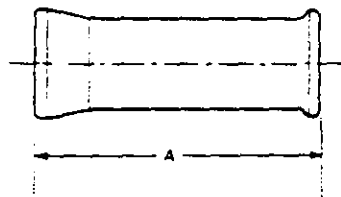
# PROCESS PIPE AND FITTINGS

## 6365 U BEND (Annealed)



| Size | A" | Article   | Price   |
|------|----|-----------|---------|
| ½"   | 2¼ | 6365-4800 | \$ 6.30 |
| ¾"   | 2½ | 6800      | 7.55    |
| 1"   | 5½ | 1000      | 11.80   |
| 1½"  | 7  | 1500      | 17.00   |
| 2"   | 7  | 2000      | 22.80   |
| 3"   | 9  | 3000      | 35.70   |
| 4"   | 12 | 4000      | 51.00   |

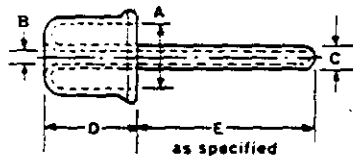
## 6366 ADAPTER Straight or Reducer (Conical to Beaded End Pipe)



| Size<br>Conical<br>x Bead | A" | Article   | Price  | Size<br>Conical<br>x Bead | A" | Article   | Price   |
|---------------------------|----|-----------|--------|---------------------------|----|-----------|---------|
| ½" x ½"                   | 4  | 6366-4848 | \$2.75 | 2" x 1½"                  | 4  | 6366-2015 | \$ 7.90 |
| ¾" x ½"                   | 4  | 6848      | 4.90   | 2" x 2"                   | 4  | 2020      | 7.90    |
| ¾" x ¾"                   | 4  | 6868      | 3.25   | 3" x 1"                   | 5  | 3010      | 10.40   |
| 1" x ½"                   | 4  | 1048      | 5.70   | 3" x 1½"                  | 5  | 3015      | 10.40   |
| 1" x ¾"                   | 4  | 1068      | 5.70   | 3" x 2"                   | 5  | 3020      | 10.40   |
| 1" x 1"                   | 4  | 1010      | 5.00   | 3" x 3"                   | 5  | 3030      | 10.40   |
| 1½" x ½"                  | 4  | 1548      | 6.20   | 4" x 1"                   | 7  | 4010      | 12.90   |
| 1½" x ¾"                  | 4  | 1568      | 6.20   | 4" x 1½"                  | 7  | 4015      | 12.90   |
| 1½" x 1"                  | 4  | 1510      | 6.20   | 4" x 2"                   | 7  | 4020      | 14.15   |
| 1½" x 1½"                 | 4  | 1515      | 5.95   | 4" x 3"                   | 7  | 4030      | 15.65   |
| 2" x ½"                   | 4  | 2048      | 7.90   | 4" x 4"                   | 7  | 4040      | 15.65   |
| 2" x ¾"                   | 4  | 2068      | 7.90   | 6" x 4"                   | 9  | 6040      | 28.50   |
| 2" x 1"                   | 4  | 2010      | 7.90   | 6" x 6"                   | 9  | 6060      | 28.50   |

## THERMOMETER WELLS—Made to Order 6392 Single End

Length "E" must be specified (from min. 6" to max. 36").

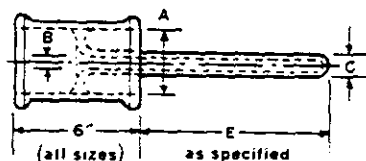


NOTE: All thermometer wells are annealed.

| A"<br>Pipe<br>Well<br>I.D. | B" | C" | D" | Article   | Price   |
|----------------------------|----|----|----|-----------|---------|
| 1½"                        | ¾  | ¾  | 2¼ | 6392-1538 | \$15.55 |
| 1½"                        | ½  | ¾  | 2¼ | 1540      | 15.80   |
| 1½"                        | ¾  | 1  | 2¼ | 1558      | 16.50   |
| 2"                         | ¾  | ¾  | 2¼ | 1538      | 16.95   |
| 2"                         | ½  | ¾  | 2¼ | 2050      | 17.10   |
| 2"                         | ¾  | 1  | 2¼ | 2058      | 17.90   |
| 3"                         | ¾  | ¾  | 3½ | 3038      | 19.30   |
| 3"                         | ½  | ¾  | 3½ | 3050      | 19.55   |
| 3"                         | ¾  | 1  | 3½ | 3058      | 20.25   |

## 6395 Double End

Length "E" must be specified (from min. 6" to max. 36").



NOTE: All thermometer wells are annealed.

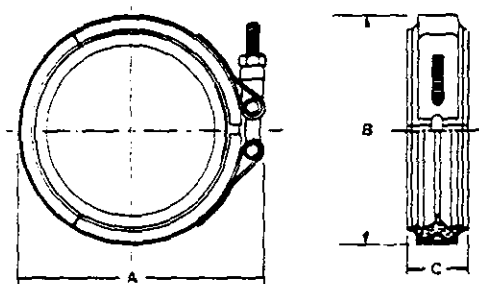
| A"<br>Pipe<br>Well<br>I.D. | B" | C" | D" | Article   | Price   |
|----------------------------|----|----|----|-----------|---------|
| 1½"                        | ¾  | ¾  | 6  | 6395-1538 | \$20.35 |
| 1½"                        | ½  | ¾  | 6  | 1550      | 20.60   |
| 1½"                        | ¾  | 1  | 6  | 1558      | 21.30   |
| 2"                         | ¾  | ¾  | 6  | 2038      | 23.30   |
| 2"                         | ½  | ¾  | 6  | 2050      | 23.45   |
| 2"                         | ¾  | 1  | 6  | 2058      | 24.75   |
| 3"                         | ¾  | ¾  | 6  | 3038      | 28.80   |
| 3"                         | ½  | ¾  | 6  | 3050      | 29.05   |
| 3"                         | ¾  | 1  | 6  | 3058      | 29.75   |

## ACCESSORIES AND HARDWARE

### PROCESS PIPE COUPLINGS (Bead to Bead)

Coupling assemblies consists of a 300 series stainless steel outer band with T-bolt and hex nut; either Viton or Hydrin liner and a TFE seal ring.

No. 7123 coupling is designed for temperature service up to 450° F. No. 7126 coupling for service up to 300° F.



NOTE: 7123 coupling is recommended for installations in corrosive atmosphere.

#### Consists of . . .

| Coupling No. | Liner Material | Max. Temp. | Band No. | Nut No. | Liner with Seal Ring |
|--------------|----------------|------------|----------|---------|----------------------|
| 7123         | Viton          | 450°       | 7125     | 6664    | 7124                 |
| 7126         | Hydrin         | 300°       | 7125     | 6664    | 7127                 |

### 7123 High Temp. — Viton Liner (450°)

| Size | A" | B" | C" | Article   | Price   |
|------|----|----|----|-----------|---------|
| ½"   | 1½ | 1½ | ¾  | 7123-4800 | \$ 7.00 |
| ¾"   | 1¾ | 1½ | ¾  | 6800      | 7.50    |
| 1"   | 2¾ | 1¾ | 1  | 1000      | 8.00    |
| 1½"  | 3  | 2¾ | 1½ | 1500      | 9.00    |
| 2"   | 3½ | 3¾ | 1¾ | 2000      | 10.00   |
| 3"   | 4¾ | 4¾ | 1¾ | 3000      | 14.00   |
| 4"   | 6  | 5½ | 1½ | 4000      | 20.00   |
| 6"   | 8¾ | 8  | 1½ | 6000      | 30.00   |

### 7126 Med. Temp. — Hydrin Liner (300°)

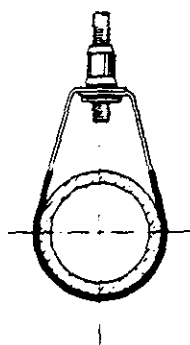
| Size | A" | B" | C" | Article   | Price   |
|------|----|----|----|-----------|---------|
| ½"   | 1½ | 1½ | ¾  | 7126-4800 | \$ 3.25 |
| ¾"   | 1¾ | 1½ | ¾  | 6800      | 3.95    |
| 1"   | 2¾ | 1¾ | 1  | 1000      | 4.00    |
| 1½"  | 3  | 2¾ | 1½ | 1500      | 5.00    |
| 2"   | 3½ | 3¾ | 1¾ | 2000      | 6.00    |
| 3"   | 4¾ | 4¾ | 1¾ | 3000      | 9.00    |
| 4"   | 6  | 5½ | 1½ | 4000      | 14.00   |
| 6"   | 8¾ | 8  | 1½ | 6000      | 21.00   |

### 7123-7126 COUPLING COMPONENTS

#### 7125 S.S. Band and Nut      7124 T.F.E. Seal and Viton Liner      7127 T.F.E. Seal and Viton Liner

| Size | Article   | Price  | Size | Article   | Price   | Size | Article   | Price   |
|------|-----------|--------|------|-----------|---------|------|-----------|---------|
| ½"   | 7125-4800 | \$1.90 | ½"   | 7124-4800 | \$ 5.75 | ½"   | 7127-4800 | \$ 2.05 |
| ¾"   | 6800      | 1.90   | ¾"   | 6800      | 6.25    | ¾"   | 6800      | 2.75    |
| 1"   | 1000      | 1.95   | 1"   | 1000      | 6.35    | 1"   | 1000      | 2.85    |
| 1½"  | 1500      | 2.30   | 1½"  | 1500      | 7.20    | 1½"  | 1500      | 3.40    |
| 2"   | 2000      | 2.80   | 2"   | 2000      | 8.30    | 2"   | 2000      | 4.00    |
| 3"   | 3000      | 4.00   | 3"   | 3000      | 12.20   | 3"   | 3000      | 6.05    |
| 4"   | 4000      | 5.60   | 4"   | 4000      | 18.10   | 4"   | 4000      | 9.50    |
| 6"   | 6000      | 8.00   | 6"   | 6000      | 25.00   | 6"   | 6000      | 15.00   |

### 7290 PADDED PIPE HANGER



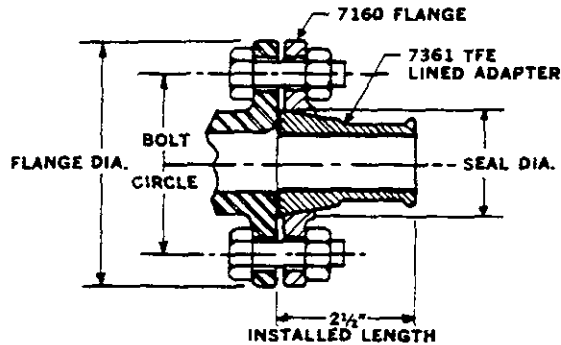
All hangers are zinc coated and have a factory applied plastic sleeve to prevent glass to metal contact. Use one hanger every 8 to 10 feet. Support all valves and meters individually.

| Size | Article   | Price  |
|------|-----------|--------|
| ½"   | 7290-4800 | \$ .45 |
| ¾"   | 6800      | .45    |
| 1"   | 1000      | .50    |
| 1½"  | 1500      | .50    |
| 2"   | 2000      | .60    |
| 3"   | 3000      | 2.00   |
| 4"   | 4000      | 2.20   |
| 6"   | 6000      | 7.20   |

## ACCESSORIES AND HARDWARE

### 7360 COUPLING KIT (125 lb. A.S.A. Flange to Beaded Pipe)

For maximum temperature and pressure applications.



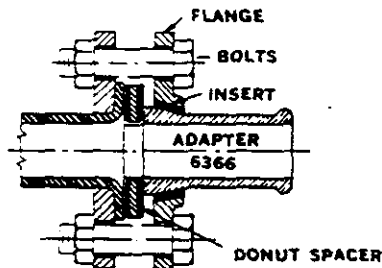
| Size   | Article   | Price   |
|--------|-----------|---------|
| 1"     | 7360-1000 | \$10.00 |
| 1 1/2" | 1500      | 15.00   |
| 2"     | 2000      | 20.00   |
| 3"     | 3000      | 30.00   |
| 4"     | 4000      | 40.00   |
| 6"     | 6000      | 50.00   |

#### Assembly Consists of . . .

| Size   | one<br>Flange | T.F.E.<br>Adapter | 7190<br>Nuts & Bolts | Qty. |
|--------|---------------|-------------------|----------------------|------|
| 1"     | 7160-1000     | 7361-1000         | 1/2" - 13x2 1/4"     | 4    |
| 1 1/2" | 1500          | 1500              | 1/2" - 13x2 1/2"     | 4    |
| 2"     | 2000          | 2000              | 3/4" - 11x2 1/2"     | 4    |
| 3"     | 3000          | 3000              | 3/4" - 11x2 1/2"     | 4    |
| 4"     | 4000          | 4000              | 3/4" - 11x3 1/2"     | 4    |
| 6"     | 6000          | 6000              | 3/4" - 10x3 1/2"     | 4    |

### 7121 COUPLING (ASA Flanged Metal to Beaded End Pipe)

To join beaded glass pipe to inside coated metal pipe.



Adapter 6366 not included.

| Size   | Article   | Price   |
|--------|-----------|---------|
| 1/2"   | 7121-4800 | \$ 6.50 |
| 3/4"   | 6800      | 7.50    |
| 1"     | 1000      | 9.75    |
| 1 1/2" | 1500      | 11.75   |
| 2"     | 2000      | 13.95   |
| 3"     | 3000      | 17.25   |
| 4"     | 4000      | 26.95   |
| 6"     | 6000      | 45.00   |

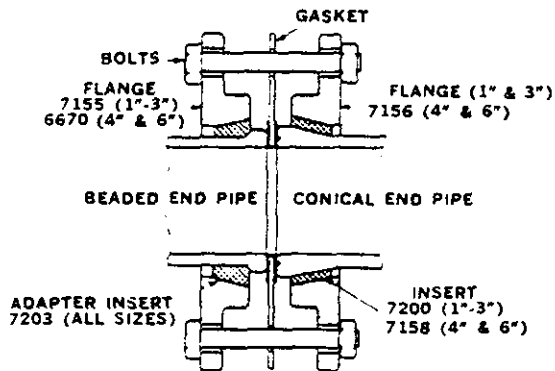
#### Assembly Consists of . . .

| Size   | Flange    | Insert    | Donut<br>Spacer | Adapter<br>Buttons | 7190<br>Nuts & Bolts | Qty. |
|--------|-----------|-----------|-----------------|--------------------|----------------------|------|
| 1/2"   | 7160-4800 | 7202-4800 | 7240-4800       | —                  | 1/2" - 13 x 2        | 4    |
| 3/4"   | 6800      | 6800      | 6800            | —                  | 1/2" - 13 x 2        | 4    |
| 1"     | 1000      | 7200-1000 | 1000            | —                  | 1/2" - 13 x 2        | 4    |
| 1 1/2" | 1500      | 1500      | 1500            | —                  | 1/2" - 13 x 2        | 4    |
| 2"     | 2000      | 2000      | 2000            | —                  | 3/4" - 11 x 2 1/2    | 4    |
| 3"     | 3000      | 3000      | 3000            | —                  | 3/4" - 11 x 3        | 4    |
| 4"     | 7156-4000 | 7158-4000 | 4000            | 7230-99            | 1/2" - 18 x 3        | 8    |
| 6"     | 6000      | 6000      | 6000            | 7230-99            | 3/4" - 16 x 3        | 8    |

## ACCESSORIES AND HARDWARE

### \*7110 COUPLING ASSEMBLY (Beaded to Conical End Pipe)

To join beaded end pipe to conical end pipe. Kit includes two flanges, inserts, bolts and TFE sheath gasket.



\*Pressure rating limited to that of Conical Pipe System. Not to be used with Beaded Armored Pipe.

| Size | Article   | Price   |
|------|-----------|---------|
| 1"   | 7110-1000 | \$ 4.00 |
| 1½"  | 1500      | 4.60    |
| 2"   | 2000      | 5.60    |
| 3"   | 3000      | 11.25   |
| 4"   | 4000      | 24.10   |
| 6"   | 6000      | 31.10   |

### Assembly Consists of . . .

| Size | Flange                 | Insert                 | Gasket    | 7190 Nuts & Bolts — Qty. |
|------|------------------------|------------------------|-----------|--------------------------|
| 1"   | 7155-1000              | 7200-1000<br>7203-1000 | 7276-1000 | ¾" — 18 x 2¼ 4           |
| 1½"  | 1500                   | 7200-1500<br>7203-1500 | 1500      | ¾" — 18 x 2¼ 4           |
| 2"   | 2000                   | 7200-2000<br>7203-2000 | 2000      | ¾" — 18 x 2¼ 4           |
| 3"   | 3000                   | 7200-3000<br>7203-3000 | 3000      | ¾" — 18 x 3 4            |
| 4"   | 7156-4000<br>6670-4000 | 7158-4000<br>7203-4000 | 4000      | ¾" — 18 x 3 8            |
| 6"   | 7156-6000<br>6670-6000 | 7158-6000<br>7203-6000 | 6000      | ¾" — 16 x 3 8            |

### 7360, 7121, 7110 COUPLING KIT COMPONENTS

| Flange for 7360 |           |         | Insert for 7121                |           |         | Flange for 7110 (Need 2)    |           |             |
|-----------------|-----------|---------|--------------------------------|-----------|---------|-----------------------------|-----------|-------------|
| 1"              | 7160-1000 | \$ 3.00 | ½"                             | 7202-4800 | \$ .30  | 1"                          | 7155-1000 | \$ 1.00 ea. |
| 1½"             | 1500      | 4.00    | ¾"                             | 6800      | .30     | 1½"                         | 1500      | 1.50 ea.    |
| 2"              | 2000      | 4.50    | 1"                             | 7200-1000 | .60     | 2"                          | 2000      | 2.00 ea.    |
| 3"              | 3000      | 5.50    | 1½"                            | 1500      | .70     | 3"                          | 3000      | 3.00 ea.    |
| 4"              | 4000      | 10.75   | 2"                             | 2000      | .90     | 4"                          | 7156-4000 | 5.30 ea.    |
| 6"              | 6000      | 11.50   | 3"                             | 3000      | 1.35    | 4"                          | 6670-4000 | 6.90 ea.    |
| Adapter 7360    |           |         | 4"                             | 7158-4000 | 5.05    | 6"                          | 7156-6000 | 10.60 ea.   |
| 1"              | 7361-1000 | \$ 7.50 | 6"                             | 6000      | 10.10   | 6"                          | 6670-6000 | 8.60 ea.    |
| 1½"             | 1500      | 11.50   | Donut Spacer for 7121          |           |         | Inserts for 7110 (one each) |           |             |
| 2"              | 2000      | 16.00   | ½"                             | 7240-4800 | \$ 4.00 | 1"                          | 7200-1000 | \$ .60 ea.  |
| 3"              | 3000      | 25.00   | ¾"                             | 6800      | 4.50    | 1½"                         | 7203-1000 | 1.35 ea.    |
| 4"              | 4000      | 30.00   | 1"                             | 1000      | 5.50    | 2"                          | 7200-1500 | .70 ea.     |
| 6"              | 6000      | 40.00   | 1½"                            | 1500      | 6.50    | 3"                          | 7203-1500 | 1.45 ea.    |
| Flange for 7121 |           |         | 2"                             | 2000      | 7.75    | 4"                          | 7200-2000 | .90 ea.     |
| ½"              | 7160-4800 | \$ 1.55 | 3"                             | 3000      | 10.00   | 5"                          | 7203-2000 | 1.55 ea.    |
| ¾"              | 6800      | 2.00    | 4"                             | 4000      | 16.00   | 6"                          | 7203-3000 | 2.20 ea.    |
| 1"              | 1000      | 3.00    | 6"                             | 6000      | 24.00   | 4"                          | 7158-4000 | 5.05 ea.    |
| 1½"             | 1500      | 4.00    | Adapter Button for 7121 (4-6") |           |         | 5"                          | 7203-4000 | 3.60 ea.    |
| 2"              | 2000      | 4.50    | 4"-6"                          | 7230-99   | \$ .10  | 6"                          | 7158-6000 | 10.70 ea.   |
| 3"              | 3000      | 5.50    |                                |           |         | 6"                          | 7203-6000 | 6.20 ea.    |
| 4"              | 7156-4000 | 5.30    |                                |           |         |                             |           |             |
| 6"              | 6000      | 10.60   |                                |           |         |                             |           |             |

### 7190 Bolts & Nuts

For all Coupling Kits & Assemblies

| Description   | Qty. | Article   | Price      |
|---------------|------|-----------|------------|
| ¾" - 18 x 2¼" | 4    | 7190-1822 | \$ .10 ea. |
| ¾" - 18 x 2½" | 4    | 1824      | .10 ea.    |
| ¾" - 18 x 3"  | 8    | 1830      | .10 ea.    |
| ¾" - 16 x 3"  | 8    | 1630      | .15 ea.    |
| ½" - 13 x 2"  | 4    | 1320      | .20 ea.    |
| ½" - 13 x 2¼" | 4    | 1322      | .20 ea.    |
| ½" - 13 x 2½" | 4    | 1324      | .20 ea.    |
| ¾" - 11 x 2½" | 4    | 1124      | .25 ea.    |
| ¾" - 11 x 3"  | 4    | 1130      | .25 ea.    |
| ¾" - 11 x 3½" | 4    | 1134      | .25 ea.    |
| ¾" - 10 x 3½" | 4    | 1034      | .30 ea.    |

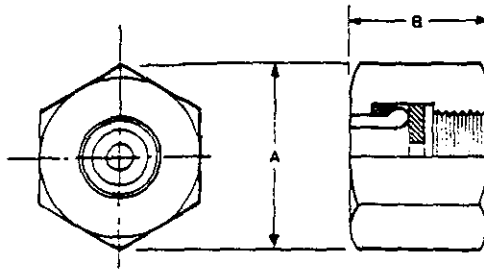
### Gasket for 7110

T.F.E. Machined (Full Flow) Gasket  
(Blue African Asbestos Filler)

| Description | Size | Article   | Price  |
|-------------|------|-----------|--------|
| Style II    | 1"   | 7276-1000 | \$ .85 |
| "           | 1½"  | 1500      | 1.10   |
| "           | 2"   | 2000      | 1.20   |
| "           | 3"   | 3000      | 2.40   |
| "           | 4"   | 4000      | 4.75   |
| "           | 6"   | 6000      | 7.30   |

## ACCESSORIES AND HARDWARE

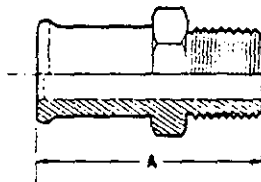
### 7340 FAUCET UNION—ALUMINUM (Beaded to 1/2" Metal IPS Threaded Pipe)



Replacement parts for No. 7340 assembly include No. 7343 gasket and No. 7344 cushion ring.

| Size               | A"    | B"    | Article   | Price  |
|--------------------|-------|-------|-----------|--------|
| 1/2" Assembly      | 1 1/4 | 1 1/4 | 7340-4800 | \$8.30 |
| 1/2" Gasket (TFE)  | —     | —     | 7343-4800 | .50    |
| 1/2" Cushion (TFE) | —     | —     | 7344-4800 | .60    |

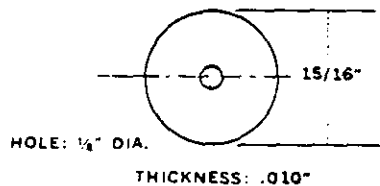
### 7350 Male Threaded ADAPTER (316 Stainless Steel)



Used to join threaded female fittings, valves and flanges to beaded pipe.

| Size   | A"     | Article   | Price   |
|--------|--------|-----------|---------|
| 1/4"   | 2 9/16 | 7350-6800 | \$12.35 |
| 1"     | 2 9/16 | 1000      | 14.85   |
| 1 1/2" | 2 9/16 | 1500      | 19.60   |

### 7348 Gasket — Flow Control (TFE)

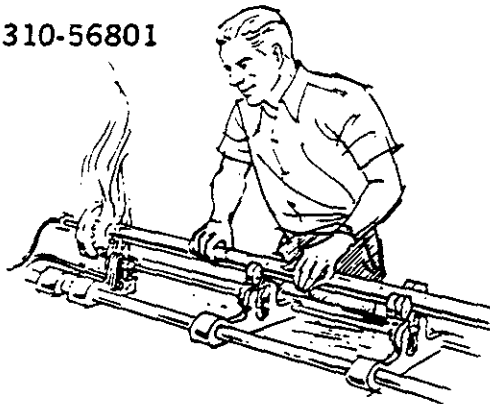


Place 7348 Flow Control Gasket into 7126 coupling — place at first horizontal joint from faucet.

| Size | Article   | Price  | Description |
|------|-----------|--------|-------------|
| 1/2" | 7348-4800 | \$ .50 | T.F.E.      |

Used to reduce surge and water hammer in distilled water systems.

### 7310-56801



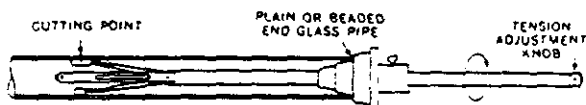
### BK-5 PORTABLE BEADING KIT

For fast, simplified field beading of glass pipe. Kit is designed so that operator can form a bead on 1/2" through 6" pipe that has same compatibility in coupling as factory beaded pipe. For operational details, consult KIMAX Cutting and Beading Manual TR-244 (February 1969).

PRICE ON REQUEST

### 7310-56802 Cutting 1 1/2", 2", 3", 4", 6" Pipe

### 7310-56803 Cutting 1/2", 3/4", 1" Pipe



### PORTABLE GLASS CUTTERS

For on-the-job scoring and cutting of special lengths of glass pipe. For operational details consult KIMAX Cutting and Beading Manual TR-244 (February 1969).

PRICE ON REQUEST

# ENGINEERING DATA

## COMPARATIVE WEIGHT

The following table indicates approximate weight of 2" diameter KIMAX Glass Pipe compared to the weight of other pipe material of the same diameter.

| Material                      | Approximate Weight<br>(lbs./ft./2" dia.) |
|-------------------------------|------------------------------------------|
| KIMAX Glass Pipe              | 1.10—1.20                                |
| PVC, Schedule 80              | Normal Impact<br>High Impact             |
|                               |                                          |
| Hard Rubber                   | 0.93                                     |
| Graphite (Impervious)         | 1.58                                     |
| Resin-Bonded Asbestos         | 1.70                                     |
| Stainless Steel (Schedule 40) | 2.88                                     |
| Lead, Ex. Light               | 3.65                                     |
| Porcelain                     | 4.80                                     |
| High Silicon Iron             | 7.35                                     |
|                               | 7.70                                     |

## OPERATING TEMPERATURES AND PRESSURES

KIMAX Glass Pipe will operate at temperatures up to 450° F. under normal conditions. Where operating temperatures exceed 250° F (up to 450° F), protect the pipe from sudden temperature changes. Insulation around the pipe is the usual means of providing this protection.

For operation above recommended temperatures and pressures consult Owens-Illinois, Glass Pipe Market Development, Toledo, Ohio 43601.

Maximum operating limits for KIMAX glass pipe under normal conditions are listed in the following table:

| Maximum Operating Limits         |            |             |      |      |  |
|----------------------------------|------------|-------------|------|------|--|
| PIPE SIZE                        | ½", ¾", 1" | 1½", 2", 3" | 4"   | 6"   |  |
| PRESSURE (psi)                   | 100        | 75          | 50   | 30   |  |
| MAX. TEMPERATURE (°F)            | 450        | 450         | 450  | 450  |  |
| MIN. TEMPERATURE (°F)            | -50*       | -50*        | -50* | -50* |  |
| SUDDEN THERMAL DIFFERENTIAL (°F) | 200        | 200         | 175  | 160  |  |

\*Freezing point of conveyed material should be taken into consideration.

Note: Gas pressure should not exceed 5 PSI.

It is recommended that suitable safeguards for equipment and personnel be provided in the unlikely event of system failure when glass pipe is used under a gas pressure. This safeguard is recommended due to the potential energy of gases under pressure or vacuum.

## THERMAL EXPANSION

When joining KIMAX Glass Pipe to other materials, rate of thermal expansion must be taken into consideration and allowances made for the variation.

KIMAX Glass Pipe has a thermal expansion of .22"/100 ft./100° F. With this factor as 1.00, relative expansion of other materials is:

| Material              | Relative Expansion           |
|-----------------------|------------------------------|
| KIMAX Glass Pipe      | 1.00                         |
| Porcelain             | 1.30                         |
| Graphite (Impervious) | 1.30                         |
| Steel                 | 3.50                         |
| High Silicon Iron     | 4.90                         |
| Stainless Steel       | 6.20                         |
| Resin-bonded Asbestos | 10.00                        |
| PVC, Schedule 80      | Normal Impact<br>High Impact |
|                       | 16.00<br>44.00               |

## FLOW CHARACTERISTICS — PRESSURE DROP

The surface of KIMAX Glass Pipe is ultra-smooth, resulting in lower pressure drop due to friction. Pressure reduction of KIMAX pipe is approximately 10 to 20% less than that of stainless steel. The percentage of difference increases as the steel becomes crusted with scale build-up.

Pressure drop increases as the number of fittings per run increases. The chart below states the equivalent length ratio for various fittings, based on water at 70°F.

| Fitting     | Equivalent Lengths (Feet) By Pipe Size |      |      |       |       |       |
|-------------|----------------------------------------|------|------|-------|-------|-------|
|             | 1"                                     | 1½"  | 2"   | 3"    | 4"    | 6"    |
| 22½° L      | .05                                    | .75  | 1.0  | 1.5   | 2.0   | 3.0   |
| 45° L       | 1.3                                    | 1.9  | 2.5  | 3.8   | 5.0   | 7.5   |
| 60° L       | 2.1                                    | 3.0  | 4.1  | 6.3   | 8.3   | 12.5  |
| 90° L       | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| Sweep L     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| Ret. Bend   | 4.2                                    | 6.3  | 8.3  | 12.5  | 16.7  | 25.0  |
| T (Run)     | 1.7                                    | 2.5  | 3.3  | 5.0   | 6.7   | 10.0  |
| T (S.O.)    | 5.0                                    | 7.5  | 10.0 | 15.0  | 20.0  | 30.0  |
| T (S.I.)    | 6.0                                    | 9.0  | 12.0 | 18.0  | 24.0  | 36.0  |
| Gate Valve  | 1.5                                    | 2.2  | 3.0  | 4.5   | 6.0   | 9.0   |
| Plug Valve  | 2.0                                    | 3.0  | 4.0  | 6.0   | 8.0   | 12.0  |
| Globe Valve | 36.00                                  | 54.0 | 72.0 | 108.0 | 144.0 | 215.0 |

| Flow Rate<br>(Gals./Min.) | Pressure Drop (PSI) Per 100 Ft. By Pipe Size |      |      |      |     |    |
|---------------------------|----------------------------------------------|------|------|------|-----|----|
|                           | 1"                                           | 1½"  | 2"   | 3"   | 4"  | 6" |
| 5 Glass                   | 2.6                                          | —    | —    | —    | —   | —  |
| Gals. Steel               | 4.0                                          | —    | —    | —    | —   | —  |
| 10 Glass                  | 5.5                                          | —    | —    | —    | —   | —  |
| Gals. Steel               | 7.7                                          | —    | —    | —    | —   | —  |
| 15 Glass                  | 8.4                                          | —    | —    | —    | —   | —  |
| Gals. Steel               | 11.7                                         | —    | —    | —    | —   | —  |
| 20 Glass                  | 11.3                                         | —    | —    | —    | —   | —  |
| Gals. Steel               | 15.5                                         | —    | —    | —    | —   | —  |
| 25 Glass                  | 14.0                                         | .3   | .9   | —    | —   | —  |
| Gals. Steel               | 19.5                                         | .4   | 1.0  | —    | —   | —  |
| 50 Glass                  | —                                            | 8.0  | 2.3  | .3   | —   | —  |
| Gals. Steel               | —                                            | 9.0  | 2.9  | .5   | —   | —  |
| 75 Glass                  | —                                            | 14.0 | 4.1  | .5   | —   | —  |
| Gals. Steel               | —                                            | 16.2 | 5.0  | .9   | —   | —  |
| 100 Glass                 | —                                            | —    | 6.2  | 1.0  | .4  | —  |
| Gals. Steel               | —                                            | —    | 8.0  | 1.3  | .5  | —  |
| 150 Glass                 | —                                            | —    | 14.5 | 2.0  | .9  | —  |
| Gals. Steel               | —                                            | —    | —    | 2.7  | 1.0 | —  |
| 200 Glass                 | —                                            | —    | —    | 3.5  | 1.2 | —  |
| Gals. Steel               | —                                            | —    | —    | 4.3  | 1.4 | —  |
| 300 Glass                 | —                                            | —    | —    | 6.7  | 2.0 | 25 |
| Gals. Steel               | —                                            | —    | —    | 9.7  | 2.3 | 40 |
| 400 Glass                 | —                                            | —    | —    | 12.7 | 3.0 | 55 |
| Gals. Steel               | —                                            | —    | —    | —    | 4.0 | 75 |

NOTE: Above pressure drops are only approximate. For more detailed data refer to equations for friction factors by Drew, Koo and McAdams, Trans. Am. Inst. Chem. Engrs. 26, 56 (1933), and Wilson, McAdams and Seltzer, Ind. Eng. Chem., 14, 105 (1922).

# ENGINEERING DATA

## LAYOUT

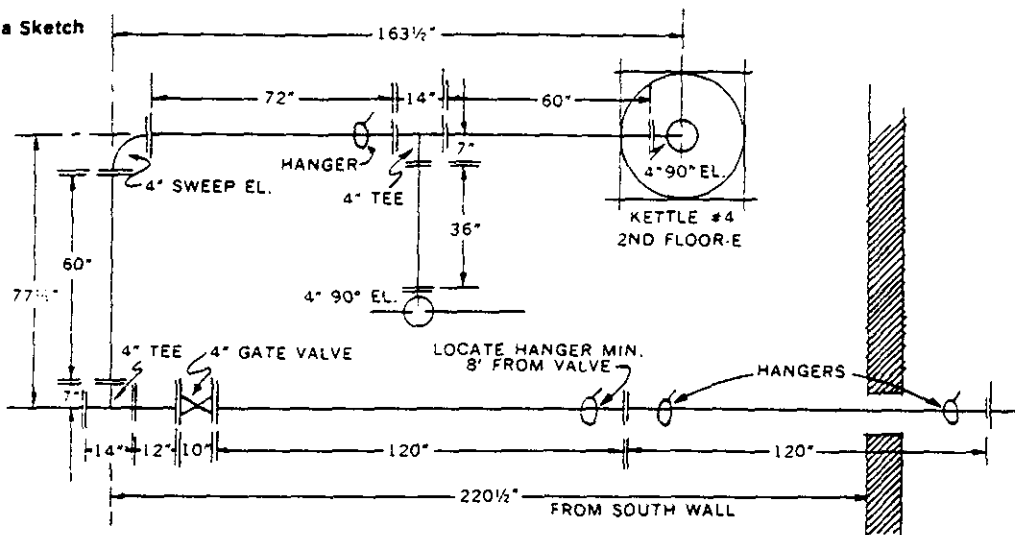
Layout of KIMAX Glass Pipe is similar to that of other materials.

In simple installations, a general arrangement drawing showing the location of reactors, tanks or machinery, and centerline dimensions for equipment and pipe, is adequate. Dimensions of glass parts are given in the KIMAX GLASS PIPE AND FITTINGS section.

If a piping installation print or general arrangement drawing is not available, make a sketch of the proposed line. All equipment, pipe and fittings should be identified. Pipe size, direction and pitch of lines should be included.

Consideration should be given to anchor-point locations and line flexibility. Line flexibility can be achieved by use of right-angle bends and elbows.

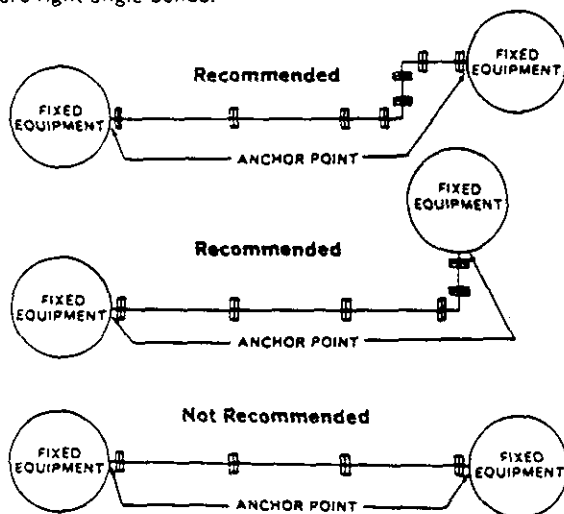
Typical Area Sketch



## ANCHOR POINTS

Anchor points result from rigid supports such as independently supported valves, and from inflexible connections to fixed equipment or structures such as reactors, tanks and pumps.

There should be only one anchor point in any straight run of pipe. Diagrams below show both correct and incorrect installation techniques. Note that flexibility is achieved by one or more right angle bends.



All valves, strainers, meters, or any heavy equipment installed in the line must be independently supported. This support prevents transmission of dead weight to the line and helps prevent line stresses.

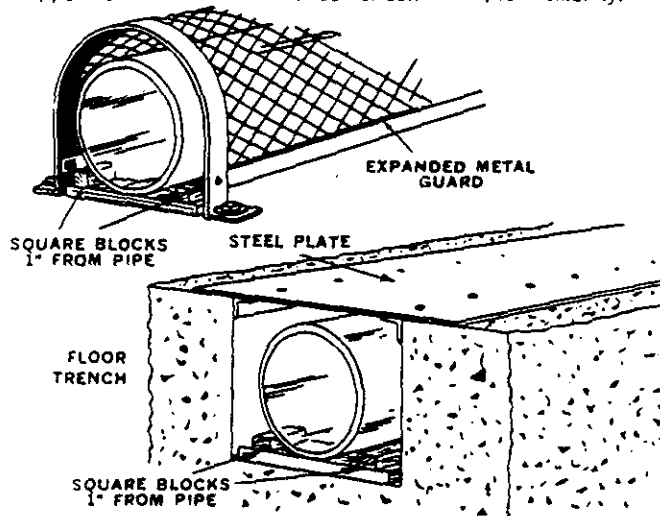
## HORIZONTAL LINE SUPPORT

Each 10-foot length of KIMAX pipe should be supported with at least one hanger, located about 1 foot from each end. See illustration of horizontal line support, page 17.

Glass pipeline at floor level, ground level, or below grade level, when exposed to traffic, should be protected. The pipe should be supported by padded pipe hangers, padded block with loose fitted side wedges, or any other loose lateral guide.

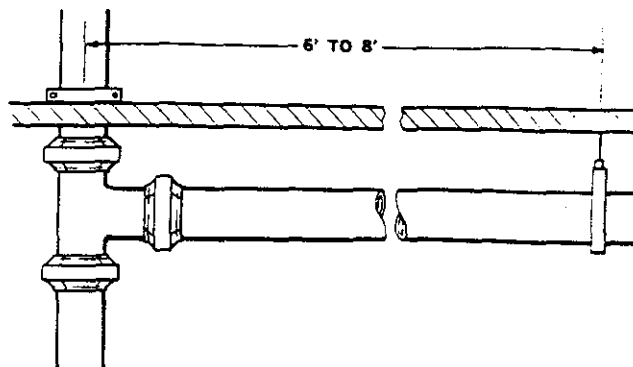
Do not use notched supports. The pipe must be free to move 1 to 2 inches sideways in order to prevent bending moments in other sections of the piping system.

Piping below grade level should not be surrounded by fill, but supported in a similar manner as horizontal run, for flexibility.

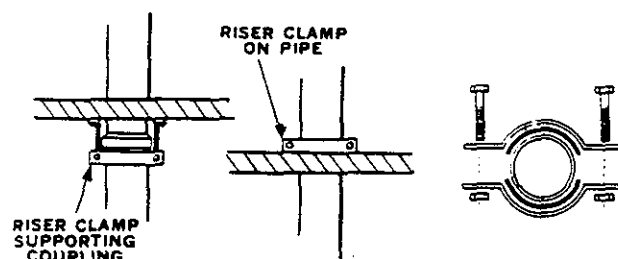


## INSTALLATION DATA

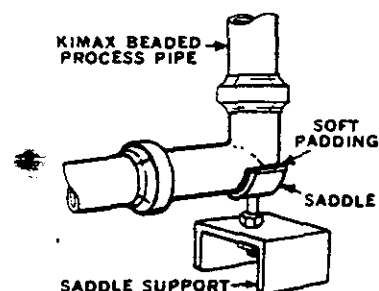
- Do not support vertical runs with horizontal lines. First hanger should be placed from 6 feet to 8 feet from column.



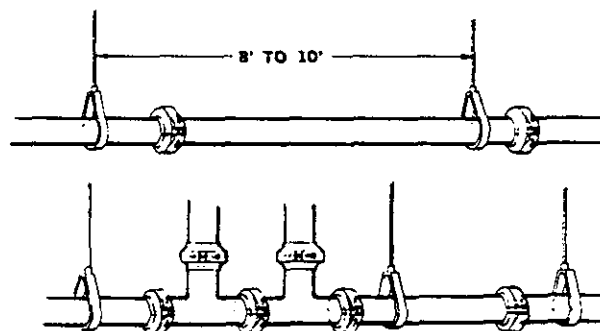
- Use KIMAX compression coupling without seal ring around O.D. of pipe and support to structure with a riser clamp or support ring.
- Clamps should be below coupling on riser where possible.
- Support need not be at joint.  
OR...
- Use riser clamp lined with  $\frac{1}{4}$ " thick neoprene.
- Locate riser clamps at each floor or at center distance not to exceed 12 feet.



- The padded saddle is used beneath 90-degree elbows at the bottom of a vertical riser. It is important that the center line of the saddle centers on the center line of the riser. **Do not support the vertical riser by more than one rigid support.**



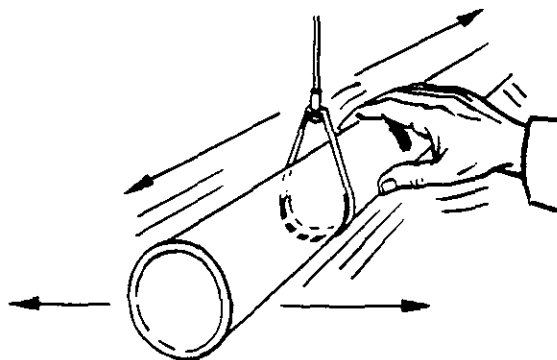
- Use padded hangers to prevent glass to metal contact. Space hangers to support lines every 8 feet to 10 feet.
- Use extra hanger when two or more couplings fall within hanger span.
- Independently support all valves, meters or any heavy equipment installed in line.





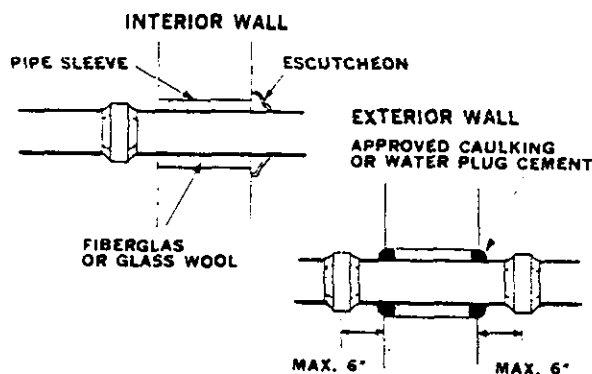
## INSTALLATION DATA

- Keep lines loose . . . when horizontal lines are hung they should be free to move sideways.
- Axial movement should be limited, but by no more than one (1) anchor point per 50' in any direction.



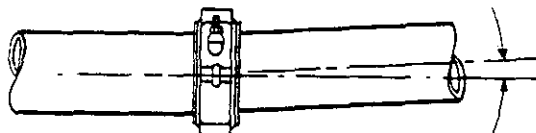
- Pipe passing through walls should be fitted with pipe sleeve at least two inches greater in diameter than pipe O.D.
- Pack space between pipe and sleeve with Fiberglas or glass wool.

Note: For fire, water or explosion-proof walls, pack ends of pipe sleeve with caulking material — and space couplings no more than 6" on either side of wall.



- To pitch a line, snug coupling, cock joint to pitch required and tighten coupling.
- Pitch should not exceed 4°.

Note: Retighten all couplings bolts 24 hours after original installation . . . then pressure test lines.



### Vibration

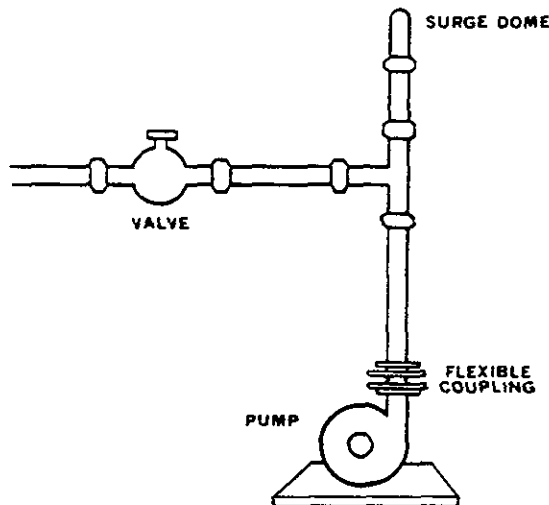
Connection to a pump or vibrating equipment is accomplished by using a flexible connection — either *expansion joints* or *flexible couplings*. The chemical properties, temperature and pressure of the transmitted material determine the type.

Vibration may also be dampened by use of a swing joint or by moving the pipe hanger away from the source of vibration.

### Pressure Surges Must Be Controlled To Prevent Excessive Pipe Movement

To reduce pressure surges, install a pressure dome on the discharge side of a pump, next to the valve, or at the top of the vertical rise of a discharge line.

For distilled water systems eliminate self closing "quick shut off" faucets or install No. 7348 flow restrictors.



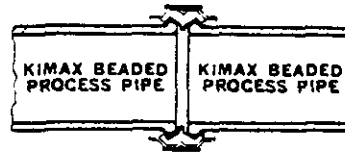
# TYPICAL JOINT REFERENCE CHART

KIMAX Beaded Process Pipe

Type of Joint

Material Needed

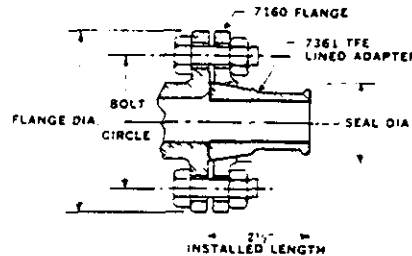
To:  
KIMAX Beaded Process Pipe  
(Factory or Field Beaded)



| KIMAX 7126 Process Pipe Coupling |               |           |               |
|----------------------------------|---------------|-----------|---------------|
| Pipe Size                        | Coupling Code | Pipe Size | Coupling Code |
| 1/2                              | 7126-4800     | 2         | 7126-2000     |
| 3/4                              | 7126-6800     | 3         | 7126-3000     |
| 1                                | 7126-1000     | 4         | 7126-4000     |
| 1 1/2                            | 7126-1500     | 6         | 7126-6000     |

See Page 11, GPD-1054

To:  
1", 1 1/2", 2", 3", 4" or 6"  
Beaded Pipe to A.S.A.  
Flanged Valves

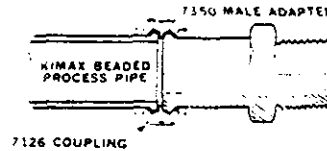


KIMAX 7360 Coupling Assembly

| Pipe Size | Coupling Code |
|-----------|---------------|
| 1         | 7360-1000     |
| 1 1/2     | 7360-1500     |
| 2         | 7360-2000     |
| 3         | 7360-3000     |
| 4         | 7360-4000     |
| 6         | 7360-6000     |

See Page 12, GPD-1054

To:  
3/4", 1" or 1 1/2" Metal  
IPS (female)  
Threaded Pipe  
7350 S.S. (316)

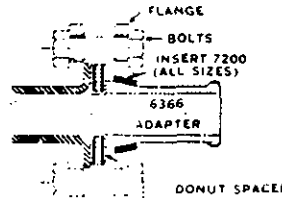


KIMAX 7350 Adapter

| Pipe Size | Codes     |
|-----------|-----------|
| 3/4       | 7350-6800 |
|           | 7126-6800 |
| 1         | 7350-1000 |
|           | 7126-1000 |
| 1 1/2     | 7350-1500 |
|           | 7126-1500 |

See Page 14, GPD-1054

To:  
ASA Flanged Metal  
(glass, rubber or plastic  
lined) Pipe, Tanks  
or Valves

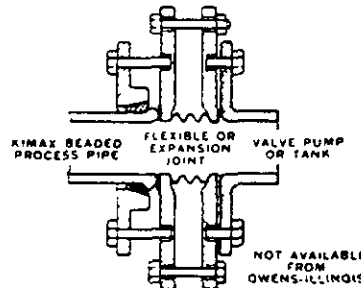


KIMAX 7121 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1/2       | 7121-4800     |           |               |
| 3/4       | 7121-6800     |           |               |
| 1         | 7121-1000     | 3         | 7121-3000     |
| 1 1/2     | 7121-1500     | 4         | 7121-4000     |
| 2         | 7121-2000     | 6         | 7121-6000     |

See Page 12, GPD-1054

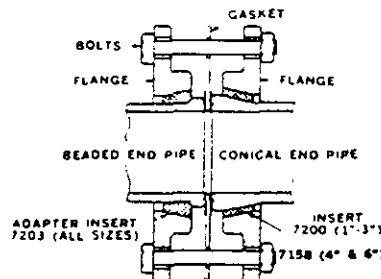
To:  
Valves, Pumps or Tanks  
(when vibration or expansion  
is a factor)



| Connect to            |                       |
|-----------------------|-----------------------|
| 1" 3" Pipe            | 4"-6" Pipe            |
| 1-7155 Flange         | 6366 Adapter          |
| 1-7200 Adapter Insert | 1-7156 Adapter Flange |
| 4-Bolts & Nuts*       | 1-7158 Adapter Insert |
|                       | 8-Bolts & Nuts*       |

\*Contractor supply 3/16" bolts to length  
See Page 13, GPD-1054

To:  
KIMAX Conical End  
Process Pipe  
**LIMITED TO CONICAL  
PIPE PRESSURES &  
TEMPERATURES**



KIMAX 7110 Coupling Assembly

| Pipe Size | Coupling Code | Pipe Size | Coupling Code |
|-----------|---------------|-----------|---------------|
| 1         | 7110-1000     | 3         | 7110-3000     |
| 1 1/2     | 7110-1500     | 4         | 7110-4000     |
| 2         | 7110-2000     | 6         | 7110-6000     |

See Page 13, GPD-1054

## TESTING AND CLEANING

In recognition of cold flow characteristics of plastics and elastomers, we recommend the following procedures:

- Tighten bolts on all couplings and flanges at time of installation.
- After 24 hours, retighten all bolts.
- Gently shake lines to make certain pipe is free of strain. There should be some limited movement in lines.
- Pressure test system with water at  $1\frac{1}{2}$  times specified working pressure. Do not test with air or gas.

If leaking occurs:

- Recheck couplings for loosened bolts.
- If leaking persists, remove coupling and check condition and positioning of compression liner and seal ring.

To clean system, flush lines with water, other cleaning fluids or atmospheric pressure steam (open drain). Do not use hydrofluoric acid, hot caustic solutions, abrasives or metallic tube cleaners.

# KIMAX<sup>®</sup> Beaded Process Pipe

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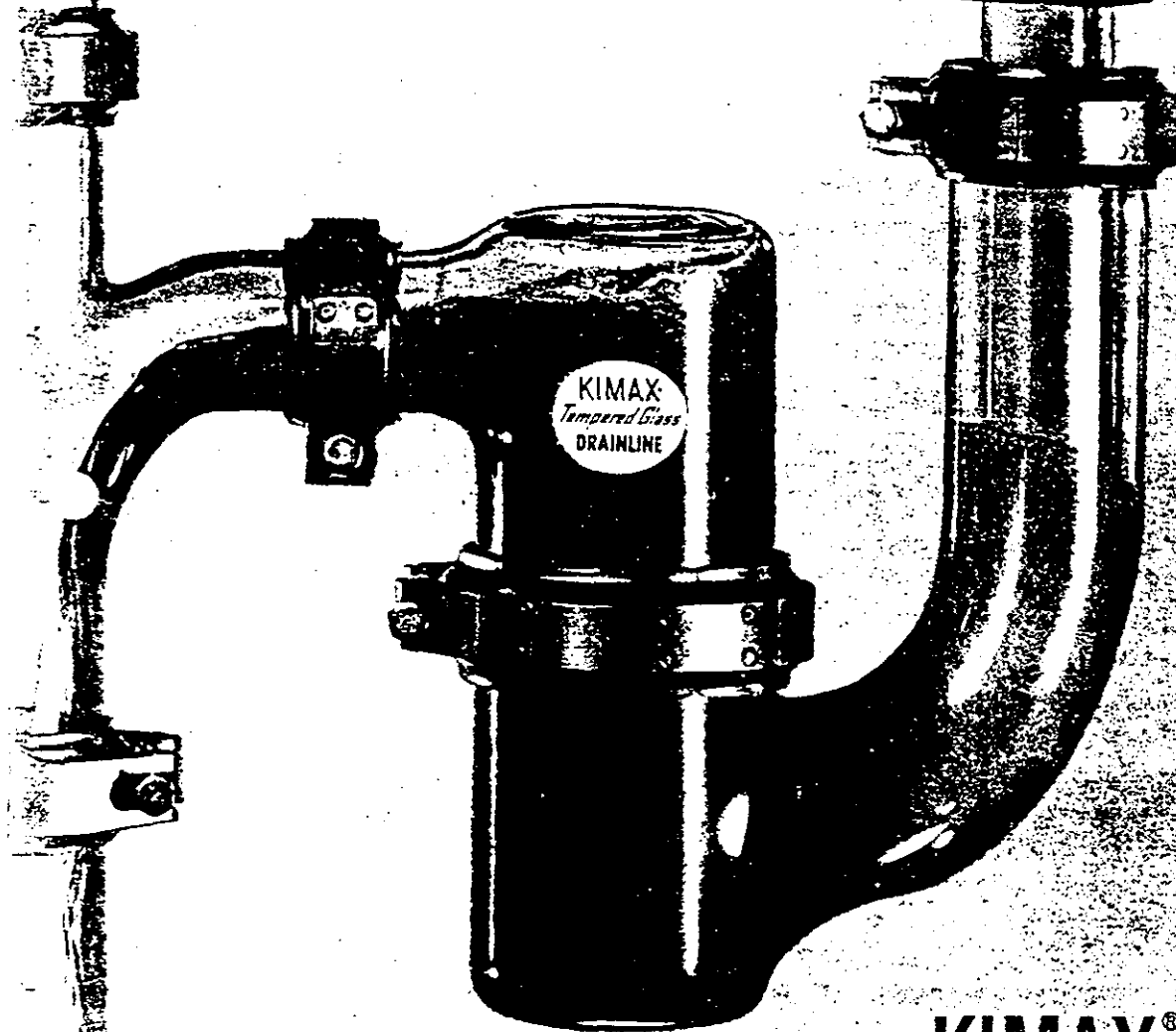
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February, 1968



OWENS-ILLINOIS

**KIMAX<sup>®</sup>**  
**TEMPERED**  
**GLASS**  
**DRAINLINE**

# KIMAX TEMPERED GLASS DRAINLINE

...assured maximum corrosion resistance  
for chemical waste disposal systems

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---

## KIMAX...the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for corrosion resistant waste disposal systems. To answer this need, Owens-Illinois has developed a Type I Borosilicate glass formula (KG-33) which is used in the manufacture of laboratory glassware, chemical process pipe and drainline. This KIMAX glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212 F continuously\*.

To make a drainline system truly corrosive resistant, all couplings and accessories must have similar corrosion resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

factured from 300 series stainless steel outer shell, Buna N rubber compression ring and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

### Building Owners

KIMAX glass drainline provides a most efficient low cost and maintenance free corrosive waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- Filled TFE sink outlets for maximum corrosion resistance at the sink connection.
- All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly corrosion and heat resistant drainline system.

\*\*TFE is the abbreviation given by the Society of Plastics Engineers to Tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today.  
KIMAX is a registered trademark of Owens-Illinois, Inc.

\*For continuous operating temperatures above 212 F see your KIMAX representative for recommendations

## Specifier

Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

- All wetted parts of the system are borosilicate glass or TFE Polymer, thus, the "total" system is highly corrosive resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires only  $\frac{1}{2}$  to  $\frac{3}{4}$  as many hangers as conventional high silica iron pipe.
- Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and corrosive resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

## INSTALLATION

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in the new KIMAX Drainline Installation Manual, TR-427. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX coupling assembly makes a unified TFE to glass seal for maximum corrosion resistance. After both ends of the glass pipe are inserted and properly seated in the wetted coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos at right). The coupling is not rigid and does permit flexibility.

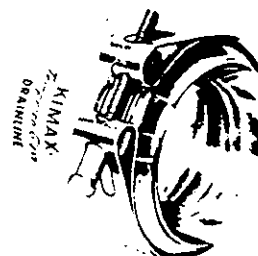
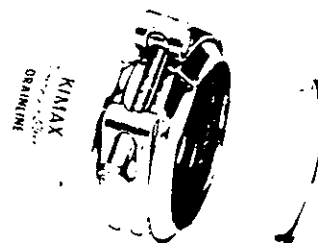
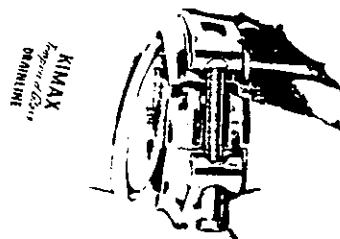
### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the KIMAX field "beading kit." Detailed printed instructions and trained personnel are available to instruct the beading kit operator in its proper use. A burner arrange-

ment gives maximum fire power for fast beading of all sizes. Also, the specially designed burner for the KIMAX beading kit assures fast and complete stress relief of the field beaded ends.

### ... Minimum Number of Hangers

Because KIMAX Glass Drainline is so light, fewer hangers are needed for proper installation ... up to 50% less than when other drainline materials are used. On horizontal runs, padded hangers are installed at 8 to 10 foot intervals. A padded clamp attached under the bottom coupling of vertical runs will control vertical and lateral movement while the remainder of the run can be supported at each floor (or in the case of 1½" and/or 2" runs ... every other floor) with padded clamps.



## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Drainline may be safely buried underground by following manufacturers' recommended procedures outlined in KIMAX Drainline Installation Procedures Bulletin No. TR-427.

### ... Adaption to Other Materials or Fittings

KIMAX Glass Drainline can be readily and effectively adapted to any other drainline material.

Recommended adapter materials and components are outlined on back pages of this catalog.

### ... Easily Handled

KIMAX Glass Drainline is usually delivered to job site in rugged shipper cartons. During construction, it is advisable to unpack only those sections needed for immediate fabrication or installation.

## Recommended KIMAX Drainline Uses

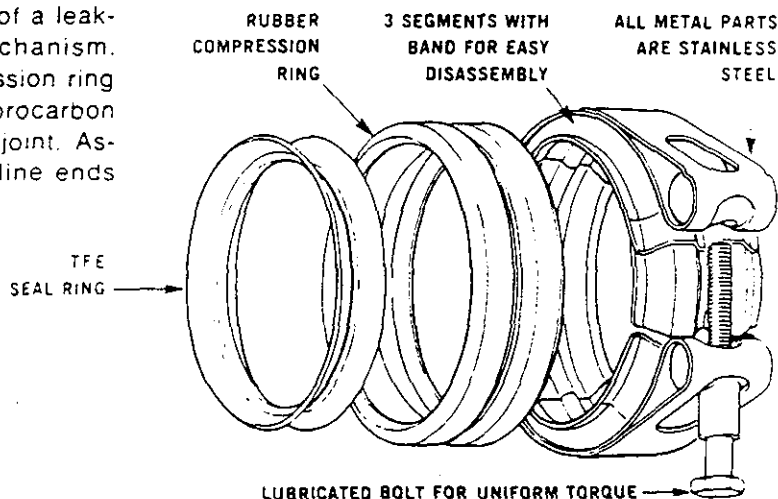
KIMAX Tempered Glass Drainline and Vent Systems are highly recommended as the specified medium of waste removal wherever corrosive chemical liquids present a disposal problem. It is particularly adaptable to drainline systems and underbench components in secondary school, college and university laboratories such as chemistry, biology, and bio-chemistry buildings; veterinary

medicine schools, research labs, and similar institutions of learning.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in: industrial laboratories, hospitals, institutional or research laboratories, food and chemical processing plants—wherever corrosive waste presents a disposal problem.

## KIMAX Coupling Assures Quick, Positive Seal Joints

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline couplings with compression ring of Buna-N rubber and seal ring of fluorocarbon polymer provide the required leak-free joint. Assembly of joint is simple...stab drainline ends into coupling and tighten one bolt.



# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed Borosilicate glass (Type II) conforming to Federal Specification DD-G-541A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B. This system shall include all glass straight lengths, fittings, traps, compression type fluorocarbon lined couplings and padded hanger supports. It shall also include factory protected heavy schedule pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.
- C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A. Glass-to-glass connections shall be made with KIMAX one-bolt compression type couplings fabricated from 300 series stainless steel, consisting of three (3) contoured 120° segments fastened to an outer band with integral barrel nut and three (3) contoured Buna-N resilient compression rings and a wide angle 30° fluorocarbon inner seal ring. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.
- B. Joints between glass and other types of piping material shall be made with KIMAX adapters and in accordance to manufacturer's recommendations.

### III. Protection of Pipe

- A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiberglass, glass wool and/or with a non-hardening approved caulking material.
- B. Glass pipe shall not be installed in direct contact with concrete. Fiberglass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C. Glass pipe shall be protected against all weld spatter.

### IV. Tests

Test in accordance to manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A. **Excavation**—shall conform to National Plumbing Code A 408 Section 2.7.
  - 1. Bottom of trench shall be properly compacted, graded and the pipe supported throughout its entire length.
  - 2. At least 4" of properly compacted sand shall be used directly under the pipe.
- B. **Buried Pipe**
  - 1. Straight lengths shall be heavy schedule 5' lengths and shall include a factory-applied protective coating.
  - 2. Fittings and couplings shall receive a field-applied protective coating prior to back-filling. This coating may be Behr Manning Undercoat, Scotch Wrap, J. M. Trans-Tex, 3M EC-1221, or approved equal.
- C. **Backfill**  
Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM:

### Specification for KIMAX Acid Waste Drainline and Vent System

This system shall be made of KIMAX tempered and annealed Borosilicate glass conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX one-bolt compression type stainless steel couplings with a fluorocarbon inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

**Note:** Where applicable

#### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 408 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock-free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX heavy schedule factory protected pipe, 5' lengths and either wrapped or coated fittings and couplings shall be installed in sand base and back fill in accordance with the manufacturer's instructions and governing plumbing code.



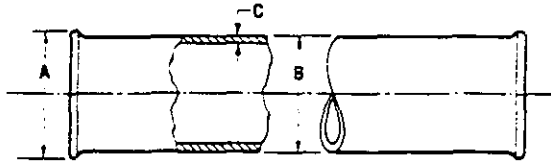
# PIPE AND FITTINGS

## Straight Lengths

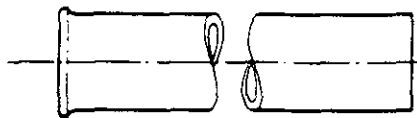
**6500** Regular Schedule 5-ft. lengths

**6501** Regular Schedule 10-ft. lengths

**6502** Heavy Schedule 5-ft. lengths



**6504** Nipple Stock



## Straight Lengths

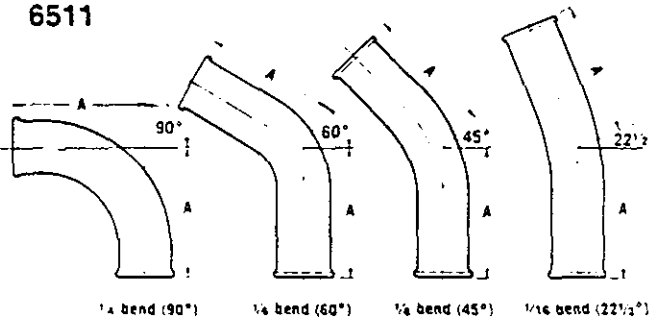
Standard lengths of KIMAX drainline are 5 and 10 feet. Special lengths (both ends beaded) to a maximum of 15 feet may be ordered as special items.

| Size | Regular Schedule<br>(6500, 6501) |          |          | Weight<br>lbs./ft. | Heavy Schedule<br>(6502) |  | Weight<br>lbs./ft. |
|------|----------------------------------|----------|----------|--------------------|--------------------------|--|--------------------|
|      | A                                | B (O.D.) | C (Wall) |                    | C (Wall)                 |  |                    |
| 1½   | 2.06                             | 1.84     | 0.12     | 0.64               | 0.17                     |  | 0.57               |
| 2    | 2.58                             | 2.34     | 0.14     | 0.94               | 0.17                     |  | 1.1                |
| 3    | 3.69                             | 3.41     | 0.17     | 1.6                | 0.20                     |  | 2.0                |
| 4    | 4.84                             | 4.53     | 0.20     | 2.6                | 0.26                     |  | 3.4                |
| 6    | 7.12                             | 6.66     | 0.24     | 4.7                | 0.33                     |  | 6.3                |

KIMAX 6502 heavy schedule drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 ft.

Standard nipple stock is beaded one end, and available in one foot increments up to 10 ft. All lengths are annealed.

**6511**

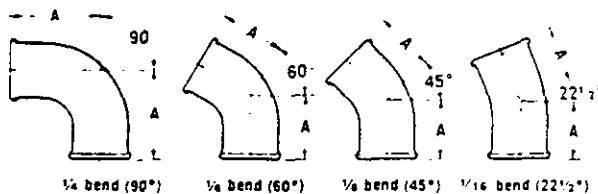


¼ bend (90°) ¼ bend (60°) ¼ bend (45°) ¼ bend (22½°)

## Bends

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |

**6513**

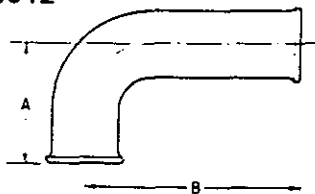


¼ bend (90°) ¼ bend (60°) ¼ bend (45°) ¼ bend (22½°)

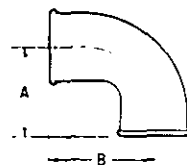
## Short Radius Bends

| Size | A 90° | A 60° | A 45° | A 22½° |
|------|-------|-------|-------|--------|
| 1½   | 3     | 2½    | 2     | 2      |
| 2    | 3½    | 2¾    | 2½    | 2½     |
| 3    | 5     | 3½    | 2¾    | 2¾     |
| 4    | 7     | 4½    | 3½    | 3½     |

**6512**

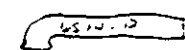
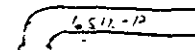


**6514**



## Special Purpose Bends

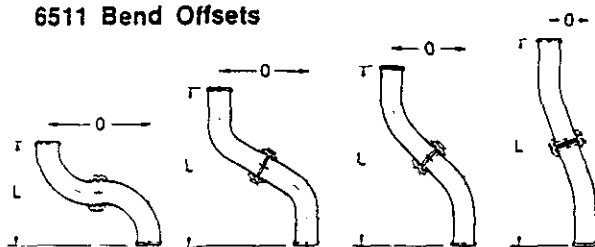
| Size | 6512 |    | 6514 |    |
|------|------|----|------|----|
|      | A    | B  | A    | B  |
| 1½   | 3¾   | 6  | 2½   | 3  |
| 2    | 3¾   | 7½ | 3    | 3¾ |
| 1½/2 |      |    |      |    |
| 2    |      |    |      |    |



# PIPE AND FITTINGS

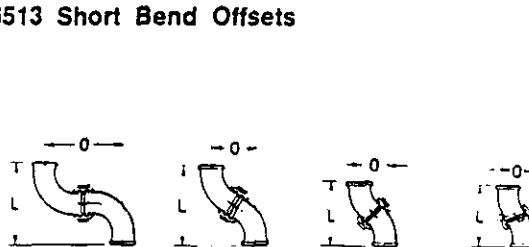
## Offset Made Using Standard Elbows

### 6511 Bend Offsets



| Size | $\frac{1}{4}$ |    | $\frac{1}{2}$ |     | $\frac{3}{4}$ |     | $\frac{1}{16}$ |     |
|------|---------------|----|---------------|-----|---------------|-----|----------------|-----|
|      | L             | O  | L             | O   | L             | O   | L              | O   |
| 1½   | 9             | 9  | 13½           | 77½ | 15½           | 6¾  | 17½            | 3¾  |
| 2    | 10            | 10 | 15            | 8¾  | 17½           | 7½  | 19½            | 37½ |
| 3    | 13            | 13 | 19½           | 11½ | 22½           | 9½  | 25             | 5   |
| 4    | 18            | 18 | 27            | 15½ | 30¾           | 12¾ | 34½            | 6¾  |
| 6    | 24            | 24 | 36            | 20¾ | 41            | 17  | 46½            | 9½  |

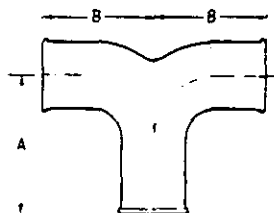
### 6513 Short Bend Offsets



| Size | $\frac{1}{4}$ |    | $\frac{1}{2}$ |    | $\frac{3}{4}$ |     | $\frac{1}{16}$ |    |
|------|---------------|----|---------------|----|---------------|-----|----------------|----|
|      | L             | O  | L             | O  | L             | O   | L              | O  |
| 1½   | 6             | 6  | 7½            | 4¾ | 67½           | 27½ | 7¾             | 1¾ |
| 2    | 6½            | 6½ | 8½            | 4¾ | 7¾            | 3¾  | 8¾             | 1¾ |
| 3    | 10            | 10 | 10½           | 6¾ | 9¾            | 37½ | 10½            | 2¾ |
| 4    | 14            | 14 | 13½           | 7¾ | 11¾           | 4¾  | 10½            | 2¾ |

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements.

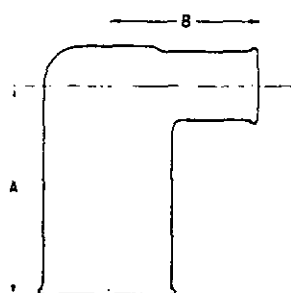
### 6533



### Double Quarter Bend

| Size | A   | B  |
|------|-----|----|
| 1½   | 3¾  | 3½ |
| 2    | 5   | 4½ |
| 3    | 7¾  | 6¾ |
| 4    | 8¾  | 8½ |
| 6    | 12¾ | 12 |

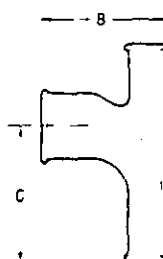
### 6518



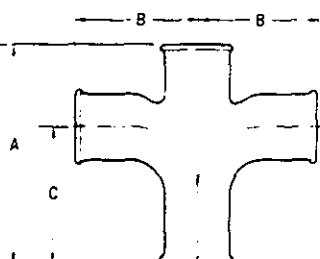
### Quarter Bend Reducer

| Size   | A | B  |
|--------|---|----|
| 2 x 1½ | 4 | 3½ |
| 3 x 1½ | 5 | 4  |
| 3 x 2  | 5 | 4½ |
| 4 x 1½ | 7 | 4½ |
| 4 x 2  | 7 | 5  |
| 4 x 3  | 7 | 5½ |
| 6 x 1½ | 9 | 5½ |
| 6 x 2  | 9 | 6  |
| 6 x 3  | 9 | 6½ |
| 6 x 4  | 9 | 8  |

### 6521 Single



### 6522 Double

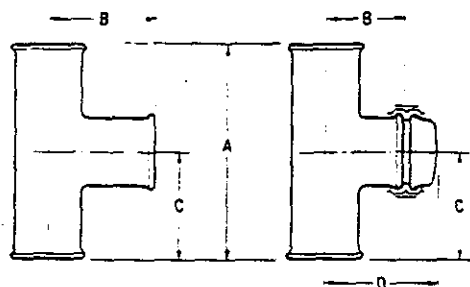


### T Branches

| Size    | A  | B   | C   |
|---------|----|-----|-----|
| 1½ x 1½ | 6  | 3½  | 3¾  |
| 2 x 1½  | 8  | 3¾  | 5   |
| 2 x 2   | 8  | 4½  | 5   |
| 3 x 1½  | 12 | 4½  | 7½  |
| 3 x 2   | 12 | 5   | 7½  |
| 3 x 3   | 12 | 6¾  | 7½  |
| 4 x 1½  | 14 | 47½ | 8¾  |
| 4 x 2   | 14 | 5¾  | 8¾  |
| 4 x 3   | 14 | 7   | 8¾  |
| 4 x 4   | 14 | 8½  | 8¾  |
| 6 x 2   | 20 | 6¾  | 12¾ |
| 6 x 3   | 20 | 8   | 12¾ |
| 6 x 4   | 20 | 9¾  | 12¾ |
| 6 x 5   | 20 | 12  | 12¾ |

# PIPE AND FITTINGS

**6523 Straight T**



**6524 Cleanout & Test T**

**Straight T**

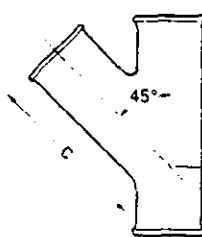
| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 2   | 12 | 4½ | 6  |
| 3 x 3   | 12 | 6  | 6  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7½ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

**Cleanout and Test T**

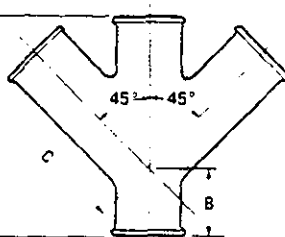
| Size    | A  | B  | C | D  |
|---------|----|----|---|----|
| 1½ x 1½ | 6  | 2½ | 3 | 3½ |
| 2 x 2   | 8  | 2½ | 4 | 3½ |
| 3 x 3   | 12 | 3½ | 6 | 4½ |
| 4 x 4   | 14 | 4½ | 7 | 5½ |

Test Tee and cleanout comes as complete assembly including cap and coupling

**6526 Single**



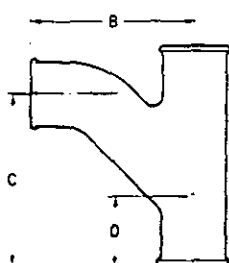
**6527 Double**



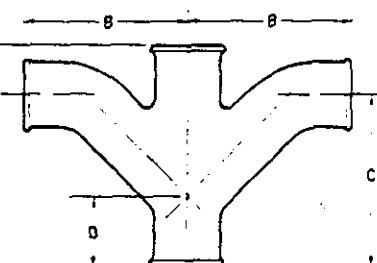
**Y Branches**

| Size    | A  | B   | C   |
|---------|----|-----|-----|
| 1½ x 1½ | 6  | 17½ | 4½  |
| 2 x 1½  | 8  | 21½ | 4½  |
| 2 x 2   | 8  | 21½ | 6   |
| 3 x 1½  | 12 | 33½ | 5½  |
| 3 x 2   | 12 | 33½ | 6½  |
| 3 x 3   | 12 | 33½ | 8   |
| 4 x 1½  | 14 | 41½ | 6½  |
| 4 x 2   | 14 | 41½ | 7½  |
| 4 x 3   | 14 | 41½ | 8½  |
| 4 x 4   | 14 | 41½ | 10  |
| 6 x 2   | 20 | 53½ | 9   |
| 6 x 3   | 20 | 53½ | 10¾ |
| 6 x 4   | 20 | 53½ | 11½ |
| 6 x 6   | 20 | 53½ | 14  |

**6528 Single**



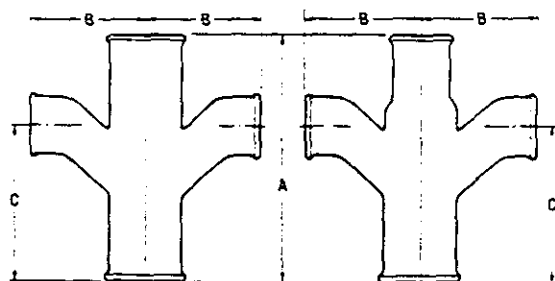
**6529 Double**



**Combination Y and 1/8 Bend**

| Size    | A  | B  | C   | D   |
|---------|----|----|-----|-----|
| 1½ x 1½ | 6  | 4½ | 4½  | 17½ |
| 2 x 1½  | 8  | 4½ | 5½  | 21½ |
| 2 x 2   | 8  | 6  | 6½  | 21½ |
| 3 x 1½  | 12 | 5¾ | 7½  | 33½ |
| 3 x 2   | 12 | 6½ | 8   | 33½ |
| 3 x 3   | 12 | 8½ | 9   | 33½ |
| 4 x 1½  | 14 | 6  | 8½  | 41½ |
| 4 x 2   | 14 | 7  | 9½  | 41½ |
| 4 x 3   | 14 | 9  | 10½ | 41½ |
| 4 x 4   | 14 | 11 | 11  | 41½ |
| 6 x 2   | 20 | 8½ | 11¾ | 53½ |
| 6 x 3   | 20 | 10 | 12½ | 53½ |
| 6 x 4   | 20 | 12 | 13½ | 53½ |
| 6 x 6   | 20 | 15 | 14½ | 53½ |

**6531**



**Partition Cross**

| Size             | A | B  | C |
|------------------|---|----|---|
| 2 x 1½           | 8 | 3¾ | 5 |
| 2 x 2            | 8 | 4½ | 5 |
| 2 x 1½ x 1½ x 1½ | 8 | 3¾ | 5 |

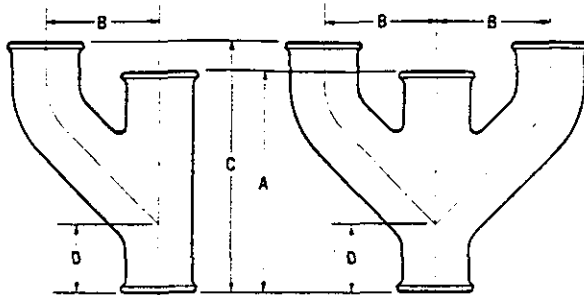
Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

# PIPE AND FITTINGS

6532 Single

6534 Double

Upright Y or H (vent branch)



| Size     | A  | B  | C** | D  |
|----------|----|----|-----|----|
| *1½ x 1½ | 6  | 3  | 6¾  | 1¾ |
| *2 x 1½  | 8  | 3½ | 7¾  | 2½ |
| *2 x 2   | 8  | 4  | 8¾  | 2½ |
| 3 x 1½   | 12 | 3¾ | 9½  | 3¾ |
| 3 x 2    | 12 | 4½ | 10¾ | 3¾ |
| 3 x 3    | 12 | 6  | 13  | 3¾ |
| 4 x 1½   | 14 | 4¾ | 10¾ | 4½ |
| 4 x 2    | 14 | 5  | 12  | 4½ |
| 4 x 3    | 14 | 6½ | 13½ | 4½ |
| 4 x 4    | 14 | 8  | 16¾ | 4½ |
| 6 x 3    | 20 | 7¾ | 16¾ | 5¾ |
| 6 x 4    | 20 | 9  | 19  | 5¾ |
| 6 x 6    | 20 | 12 | 24  | 5¾ |

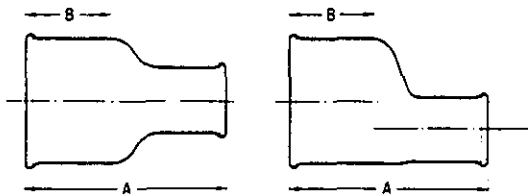
\* Double, available in these sizes only

\*\* "C" dimension may be longer or shorter than "A"

6536 Straight

6537 Eccentric

Reducers or Increaseers



| Size    | A | B (min.) |
|---------|---|----------|
| 2 x 1½  | 4 | 1¾       |
| *2½ x 2 | 5 | 3        |
| 3 x 1½  | 5 | 2¼       |
| 3 x 2   | 5 | 2¼       |
| 4 x 1½  | 7 | 3        |
| 4 x 2   | 7 | 3        |
| 4 x 3   | 7 | 3        |
| 6 x 1½  | 9 | 4        |
| 6 x 2   | 9 | 4        |
| 6 x 3   | 9 | 4        |
| 6 x 4   | 9 | 4        |

\* Used with adjustable joint (= 6650)

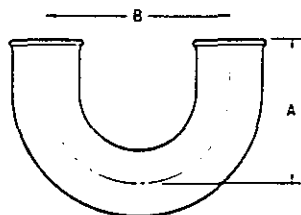
6544



Cleanout Plug

| Size | A*  |
|------|-----|
| 1½   | 7/8 |
| 2    | 1   |
| 3    | 1¼  |
| 4    | 1½  |
| 6    | 1¾  |

6550



U Bend (vent loop)

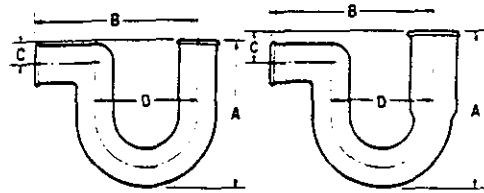
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

Note: U bends (annealed only) are often used for vent loops. Bottom sections of long S traps (= 6562) are also used as vent loops.

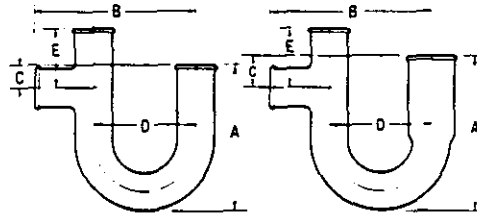
# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6718



6713



## Trap—P Style

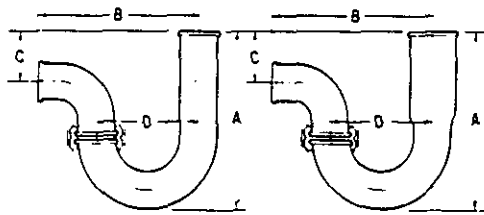
| Size     | Vent Size | A   | B   | C  | D  | E  | Seal Depth |
|----------|-----------|-----|-----|----|----|----|------------|
| 1½ x 1½  | 1½        | 7   | 8   | 1  | 5  | 3  | 3½         |
| * 2 x 1½ | 1½        | 7½  | 8   | 1½ | 5  | 3  | 3½         |
| 2 x 2    | 2         | 8½  | 8½  | 1½ | 5½ | 3½ | 3½         |
| **2½ x 2 | 2         | 8½  | 8½  | 2  | 5½ | 3½ | 3½         |
| 3 x 3    | 3         | 10½ | 10½ | 2  | 6½ | 4  | 3½         |
| 4 x 4    | 4         | 12½ | 12½ | 2½ | 7½ | 5  | 3½         |
| 6 x 6    | 4         | 16½ | 17  | 3½ | 10 | 7  | 3½         |

\*Use adapter coupling (#6655) for inlet joint

\*\*Use 2" adjustable joint, hardware assembly (#6660) for inlet joint

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6700

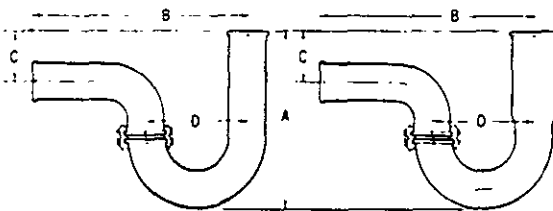


## Trap—P Style—Swivel

No. 6700 (short) Swivel "P" Trap Assembly consists of a No. 6705 inlet fitting with a No. 6514 Quarter Bend Outlet and a Standard KIMAX Coupling, No. 6650, at the swivel joint.

| Size    | A  | B  | C  | D  | Seal Depth |
|---------|----|----|----|----|------------|
| 1½ x 1½ | 8½ | 8  | 2½ | 5  | 3½         |
| 2 x 1½  | 8½ | 8  | 2½ | 5  | 3½         |
| 2 x 2   | 9½ | 8½ | 2½ | 5½ | 3½         |
| 2½ x 2  | 9½ | 8½ | 2½ | 5½ | 3½         |

6701

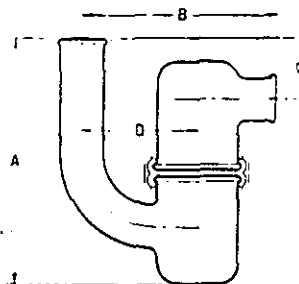


No. 6701 (long) Swivel "P" Trap Assembly consists of a No. 6705 inlet fitting with a No. 6512 Quarter Bend Outlet and a Standard KIMAX Coupling, No. 6650, at the swivel joint.

| SIZE    | A  | B  | C  | D  | Seal Depth |
|---------|----|----|----|----|------------|
| 1½ x 1½ | 8½ | 11 | 1½ | 5  | 4½         |
| 2 x 1½  | 8½ | 11 | 1½ | 5  | 4½         |
| 2 x 2   | 9½ | 13 | 1½ | 5½ | 5½         |
| 2½ x 2  | 9½ | 13 | 1½ | 5½ | 5½         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6710



## Trap—P Style—Swivel Drum

No. 6710 swivel drum P trap assembly consists of a No. 6710 inlet fitting with a No. 6716 outlet fitting, and a standard KIMAX coupling, No. 6650 at the swivel joint.

| Size    | A   | B  | C  | D  | Body I.D. | Seal Depth |
|---------|-----|----|----|----|-----------|------------|
| 1½ x 1½ | 10½ | 8  | 2½ | 4½ | 3         | 3½         |
| 2 x 1½  | 10½ | 8  | 2½ | 4½ | 3         | 3½         |
| 2 x 2   | 11  | 9½ | 3  | 5½ | 4         | 3½         |
| *2½ x 2 | 11  | 9½ | 3  | 5½ | 4         | 3½         |

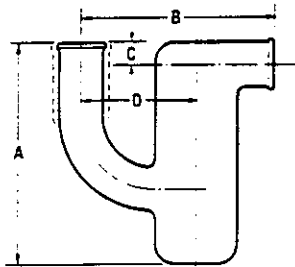
\*Has expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

## DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6707



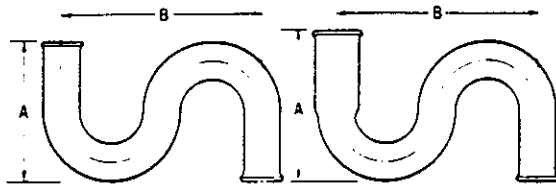
### Trap—P Style—Drum

| Size    | A  | B  | C  | D  | Body I.D. | Seal Depth |
|---------|----|----|----|----|-----------|------------|
| 1½ x 1½ | 9  | 8  | 1  | 4¾ | 3         | 3½         |
| 2 x 1½  | 9  | 8  | 1½ | 4¾ | 3         | 3½         |
| 2 x 2   | 9¾ | 9¼ | 2  | 5½ | 4         | 3½         |
| *2½ x 2 | 9¾ | 9¼ | 2  | 5½ | 4         | 3½         |

\*Has expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6719



### Trap—S Style

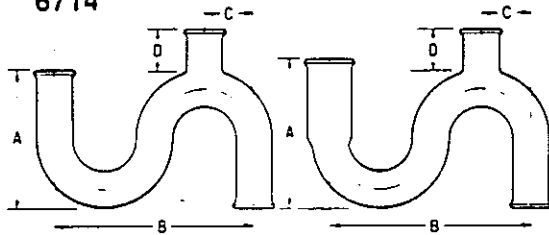
| Size     | Vent Size | A  | B  | C  | D  | Seal Depth |
|----------|-----------|----|----|----|----|------------|
| 1½ x 1½  | 1½        | 6¾ | 10 | 2½ | 2¼ | 3½         |
| *2 x 1½  | 1½        | 7¾ | 10 | 2½ | 1¾ | 3½         |
| 2 x 2    | 2         | 8¾ | 11 | 2¾ | 2½ | 3½         |
| **2½ x 2 | 2         | 8¾ | 11 | 2¾ | 2  | 3½         |

\*Use adapter coupling (≡6655) for top joint.

\*\*Use 2" adjustable joint, hardware assembly (≡6660) for top joint.

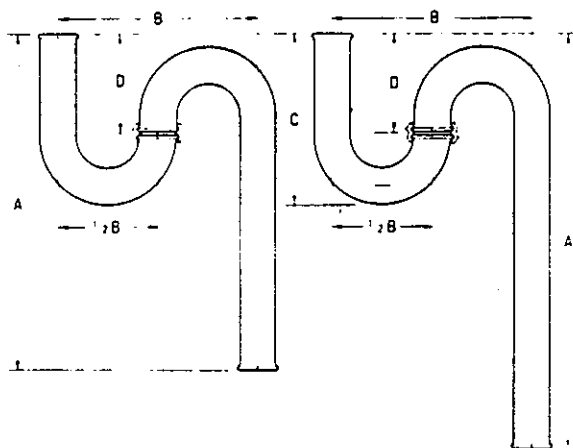
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6714



6702

6703



### Trap—S Style—Long

S trap No. 6702 consists of a No. 6705 inlet section, a No. 6562 outlet eq. and a standard KIMAX coupling No. 6650 at the swivel joint. See chart below for layout dimensions.

S trap No. 6703 consists of a No. 6705 inlet section, a No. 6562 outlet eq. and a standard KIMAX coupling No. 6650 at the swivel joint.

6702

| Size    | A   | B  | C  | D  | Seal Depth |
|---------|-----|----|----|----|------------|
| 1½ x 1½ | 16¾ | 10 | 8¾ | 5  | 4⅞         |
| *2 x 1½ | 16¾ | 10 | 8¾ | 5  | 4⅞         |
| 2 x 2   | 20½ | 11 | 9⅞ | 4⅞ | 5¼         |
| *2½ x 2 | 20½ | 11 | 9⅞ | 4⅞ | 5¼         |

6703

| Size    | A   | B  | C  | D | Seal Depth |
|---------|-----|----|----|---|------------|
| 1½ x 1½ | 20¾ | 10 | 8¾ | 5 | 4⅞         |
| *2 x 1½ | 20¾ | 10 | 8¾ | 5 | 4⅞         |

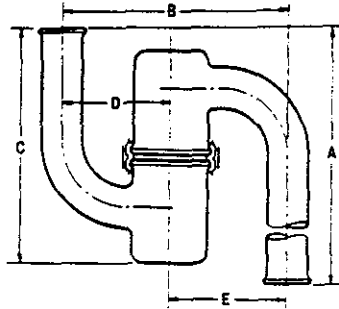
\*Have expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

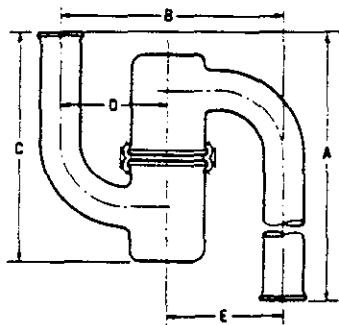
## DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6711



6712



### Trap—S Style—Swivel Drum

Swivel drum trap assemblies No. 6711 and No. 6712 consist of inlet section No. 6715, outlet section No. 6717, and a standard KIMAX coupling No. 6650 at the swivel joint. See charts below for layout dimensions.

6711

| Size    | A   | B   | C   | D  | E  | Body ID | Seal Depth |
|---------|-----|-----|-----|----|----|---------|------------|
| 1½ x 1½ | 16⅞ | 10  | 10¼ | 4¾ | 5¼ | 3       | 3½         |
| 2 x 1½  | 16⅞ | 10  | 10¼ | 4¾ | 5¼ | 3       | 3½         |
| 2 x 2   | 20½ | 11¼ | 11  | 5½ | 5¾ | 4       | 3½         |
| 2½ x 2  | 20½ | 11¼ | 11  | 5½ | 5¾ | 4       | 3½         |

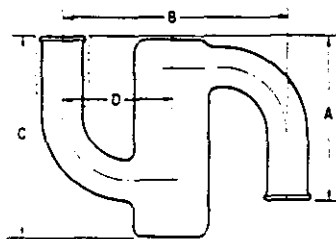
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6712

| Size    | A   | B  | C   | D  | E  | Body ID | Seal Depth |
|---------|-----|----|-----|----|----|---------|------------|
| 1½ x 1½ | 20⅞ | 10 | 10¼ | 4¾ | 5¼ | 3       | 3½         |
| 2 x 1½  | 20⅞ | 10 | 10¼ | 4¾ | 5¼ | 3       | 3½         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6708



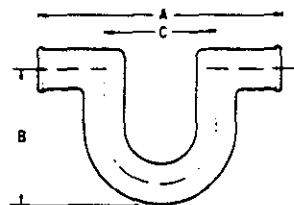
### Trap—S Style—Drum

| Size    | A  | B  | C  | D  | Body ID | Seal Depth |
|---------|----|----|----|----|---------|------------|
| 1½ x 1½ | 6⅞ | 10 | 9  | 4¾ | 3       | 3½         |
| 2 x 1½  | 7⅞ | 10 | 9  | 4¾ | 3       | 3½         |
| 2 x 2   | 8⅞ | 11 | 9¾ | 5½ | 4       | 3½         |
| *2½ x 2 | 8⅞ | 11 | 9¾ | 5½ | 4       | 3½         |

\*Has expanded inlet.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6770



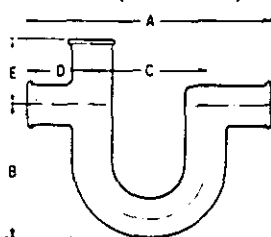
### Trap—Running

| Size    | Vent Size | A   | B   | C  | D  | E  | Seal Depth |
|---------|-----------|-----|-----|----|----|----|------------|
| 1½ x 1½ | 1½        | 11  | 6   | 5  | 3  | 3  | 3½         |
| 2 x 2   | 2         | 12  | 6⅞  | 5½ | 3½ | 3½ | 3½         |
| 3 x 3   | 3         | 14½ | 8¼  | 6½ | 4  | 4  | 3½         |
| 4 x 4   | 4         | 17½ | 9¾  | 7½ | 5  | 5  | 3½         |
| * 6 x 6 | 4         | 24  | 12⅞ | 10 | 7  | 7  | 3½         |

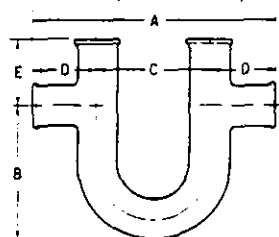
\*Special order only

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 13.

6771 (one vent)

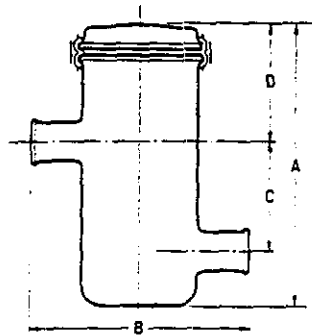


6772 (two vents)



## DRAINLINE TRAPS

6576



### Trap—Drum (top cleanout)

This trap assembly consists of the following components:

No. 6577, 6" glass body

No. 6544, short cleanout plug

No. 6650, 6" standard KIMAX coupling.

| Size    | A   | B   | C  | D  | Body ID | Seal Depth |
|---------|-----|-----|----|----|---------|------------|
| 1½ x 1½ | 13¾ | 10½ | 4½ | 5¾ | 6       | 3          |

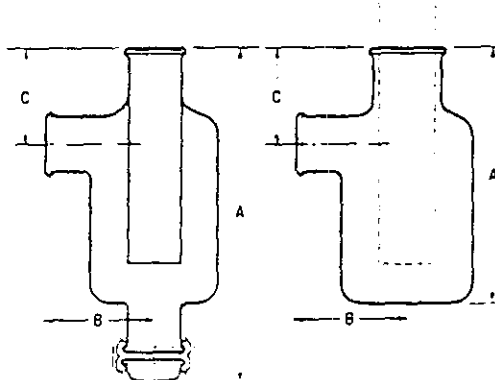
6612

6614

### Trap—Partition

No. 6612 partition trap with sealed-in partition is available in 1½" and 2" sizes only. Standard with B type cleanout.

No. 6614 partition trap is available in 1½" and 2" outlet sizes only. 1½" outlet trap has a 2" inlet to accept No. 6655 adapter coupling. 2" outlet trap has 2½" inlet to accept No. 6660 adjustable joint coupling.



6612

| Size Inlet x Outlet | A   | B  | C  | Seal Depth |
|---------------------|-----|----|----|------------|
| 1½ x 1½             | 11¼ | 3¾ | 3¼ | 3¼         |
| 2 x 2               | 12¼ | 5¼ | 4¼ | 3¼         |

Both traps are non-siphoning with partition always visible.

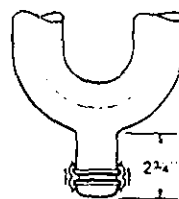
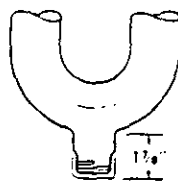
6614

| Size Inlet x Outlet | A  | B  | C  |
|---------------------|----|----|----|
| 2 x 1½              | 8½ | 3¾ | 3¼ |
| 2½ x 2              | 9½ | 5¼ | 4¼ |

Type A

Type B

### Standard Cleanouts



Standard drainline trap cleanout Type A is fitted with a phenolic screw type cap with TFE liner (No. 6675). Type B cleanout consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

To order standard traps with cleanouts use catalog number for proper style and add the letter A or B for desired cleanout style.

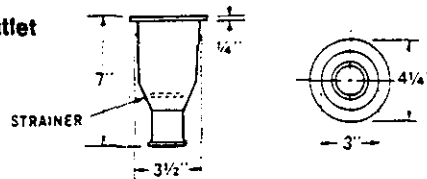
For correct layout dimensions add 1¾" to overall trap height for cleanout Type A, or 2¾" for cleanout Type B.



## CUP SINKS

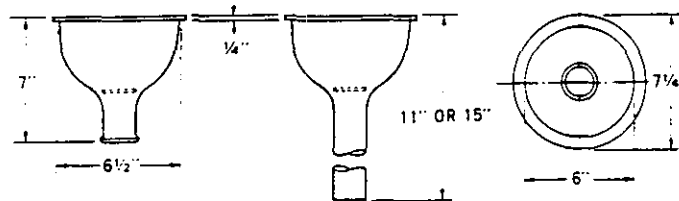
Outside surface of cupsink bodies has an opaque white surface. No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 7/8) on outlet to connect to 2" expanded end traps or fittings.

### 6616 Beaded Outlet



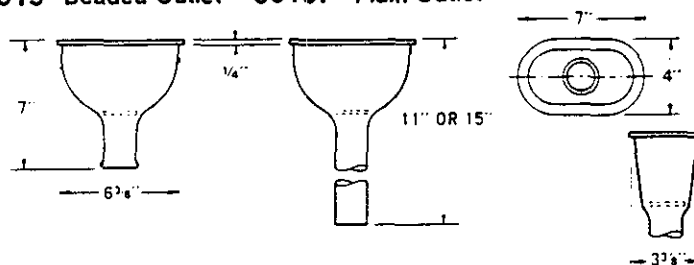
### 3" Hemispherical

### 6617 Beaded Outlet 6617P Plain Outlet



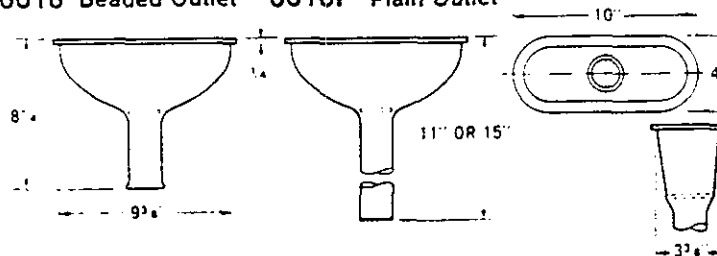
### 6" Hemispherical

### 6619 Beaded Outlet 6619P Plain Outlet



### 3" x 6" Oval

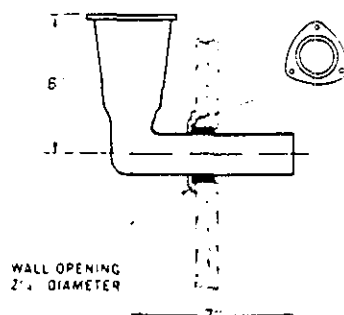
### 6618 Beaded Outlet 6618P Plain Outlet



### 3" x 9" Oval

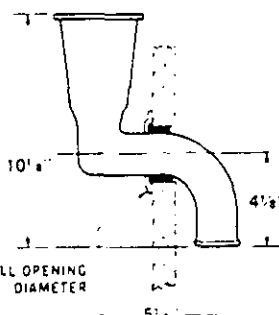
### 6627

3" x 6" Oval Horizontal, 1 1/2" Outlet



### 6628

3" x 6" Oval Vertical, 1 1/2" Outlet



### Wall Mounted Cup Sink

#### Horizontal Outlet

No. 6621 cup sink oval (3x6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert 2 x 1 1/2

#### Vertical Outlet

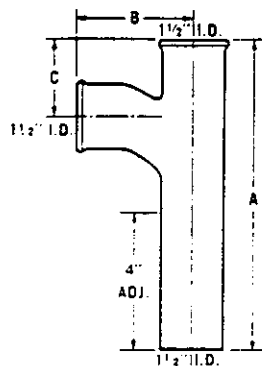
No. 6629 oval cup sink (3x6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert 2 x 1 1/2

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling 2 x 1 7/8 on outlet to connect to 2" expanded end traps or fittings. For No. 6628 assembly use No. 6650 1 1/2" size standard KIMAX coupling.

# ADJUSTABLE UNDERBENCH FITTINGS

Field adjustments up to 4" are possible using adapter coupling No. 6655, 2 x 1 7/8" size

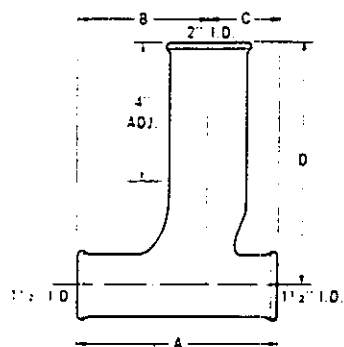
6525



Adjustable Sanitary T (Plain End)

| Size                  | A     | B     | C     |
|-----------------------|-------|-------|-------|
| 1 1/2 x 1 1/2 x 1 1/2 | 8 1/4 | 3 1/2 | 2 1/4 |

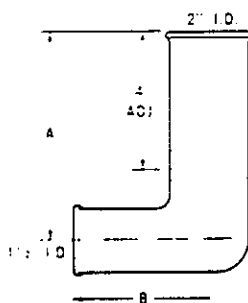
6520



Adjustable Sanitary T

| Size              | A | B     | C     | D |
|-------------------|---|-------|-------|---|
| 1 1/2 x 1 1/2 x 2 | 6 | 2 3/8 | 2 1/8 | 7 |

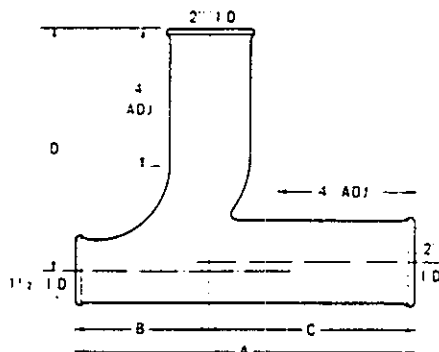
6517



Adjustable 1/4 Bend

| Size      | A | B |
|-----------|---|---|
| 2 x 1 1/2 | 6 | 4 |

6530

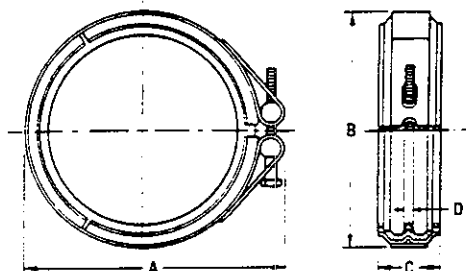


Adjustable Combination Y & 1/8 Bend

| Size          | A  | B | C | D |
|---------------|----|---|---|---|
| 1 1/2 x 2 x 2 | 10 | 4 | 6 | 7 |

## ACCESSORIES AND HARDWARE

### 6650



### Coupling

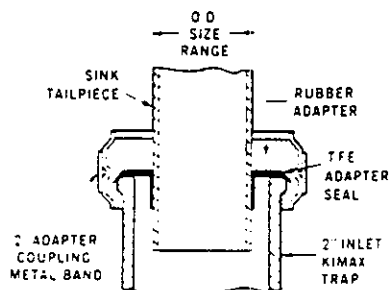
The patented KIMAX Standard Coupling, No. 6650 consists of the following components:

- No. 6651 segmented stainless steel outer band
- No. 6652 Buna N rubber compression ring with TFE liner
- No. 6653 stainless steel bolt

For more detailed construction features, advantages, and installation procedures, see Page 3 and 4 of this catalog, or KIMAX Drainline Installation Manual TR-427.

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2⅝ | 1⅞ | ⅞ | ¼—28 x 2⅜ |
| 2    | 3½ | 3⅝ | 1⅞ | ⅞ | ¼—28 x 2⅜ |
| 3    | 4⅜ | 4⅝ | 1⅞ | ⅞ | ¼—28 x 2⅜ |
| 4    | 6  | 5½ | 1½ | ⅞ | ¼—28 x 3⅜ |
| 6    | 8¼ | 7¾ | 1⅞ | ⅞ | ¼—28 x 3⅜ |

### 6655



### Adapter Coupling Patent Pending

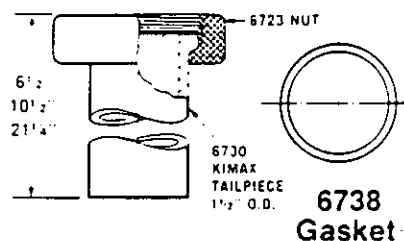
No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and or fittings to unthreaded sink tailpieces.

The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt

| Size   | Tailpiece Style                                                                                                                                                                              | OD Size Range |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 2 x 1½ | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                                        | 1.48 to 1.53  |
| 2 x 1¾ | Lead, Class D or XL tailpiece                                                                                                                                                                | 1.70 to 1.78  |
| 2 x 1⅞ | Plain end KIMAX Regular Schedule or Heavy Schedule 1½ glass pipe or fittings<br>Corrosion #14646<br>Durcon #S0-2<br>Duriron #11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½ IPS) | 1.82 to 1.90  |

### 6728



### 1½" Coupling Nut and Tailpiece Assembly

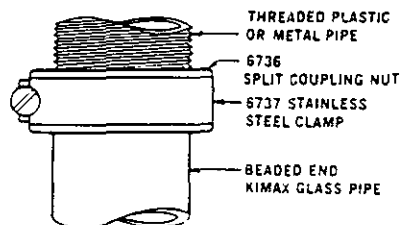
KIMAX tailpiece is available in 6½", 10½", 21¼" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length using No. 6729 cutter. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

**Note:** This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... **do not use pipe wrench.**

Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe

## ACCESSORIES AND HARDWARE

### 6735 (1½"—2" sizes)

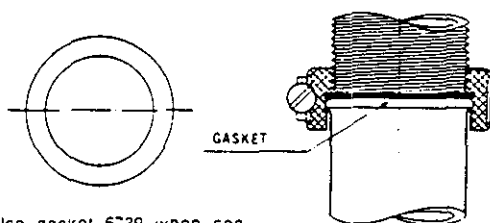


### Split Coupling Nut Assembly

No. 6735 split coupling nut assembly consists of a No. 6736 split coupling nut and a No. 6737 stainless steel clamp. To install: ... remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

Use to connect 1½" beaded glass pipe to a threaded 1½" metal pipe. Use a 6739 gasket.

### 6739 (1½"—2" sizes)

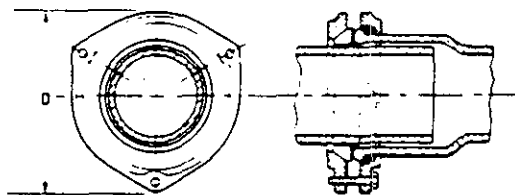


Use gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe.

### Gasket for Split Coupling Nut Assembly

When using KIMAX Split Coupling Nut No. 6735 to connect trap or beaded end pipe to threaded metal pipe, use Gasket No. 6739 as shown in drawing. Hand tighten nut No. 6735. **Do not use pipe wrench.**

### 6660



### Adjustable Joint

Adjustable joint permits space adjustment. Assembly No. 6660 consists of:

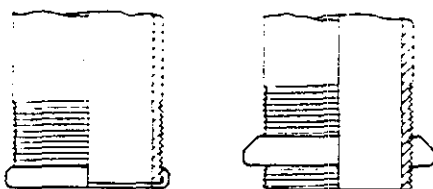
- No. 7206 aluminum inner flange
- No. 7150 aluminum outer flange
- No. 7227 TFE seal ring
- No. 7203 adapter insert (molded neoprene asbestos)
- No. 7226 rubber compression ring
- No. 7180 (3) aluminum (hex head 5/16—18x1¼)

| Size | D  |
|------|----|
| 2    | 5½ |

### 6680

### 6685—Adjustable

### Bead Adapters



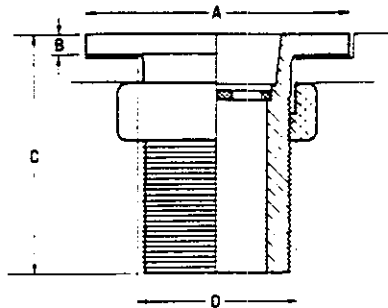
Threaded bead adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with standard coupling No. 6650. All TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.

## ACCESSORIES AND HARDWARE

### 6720 (1½", 2", 3" sizes)



### Sink Outlet Assembly

Consists of:

6724 sink strainer—black fluorocarbon plastic

6721 sink outlet—black fluorocarbon plastic

6725 gasket—neoprene

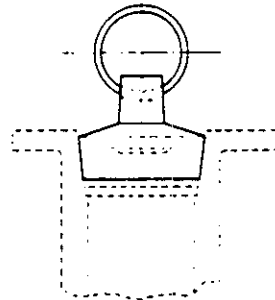
6722 locknut

Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

| Size | A  | B | C  | D  |
|------|----|---|----|----|
| 1½   | 3½ | ½ | 2½ | 2  |
| 2    | 4  | ¾ | 3  | 2½ |
| 3    | 5  | ¾ | 3  | 3½ |

For sink outlet tailpiece connections, see No. 6728 description, page 16, and No. 6735 description, page 17.

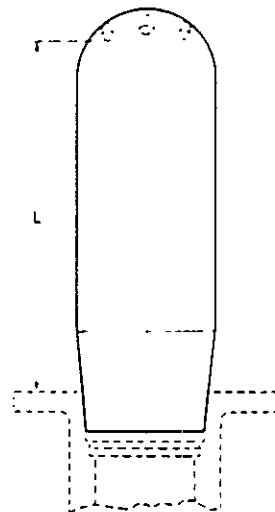
### 6726



### Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead; 3" size only in black fluorocarbon.

### 6727



### Sink Overflow—Beehive and Open Type

Sink overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" and 3" sink outlets only. 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
|                  | 4"                  | 6" | 8" | 4"               | 6" | 8" |
| 1½               | —                   | —  | —  | —                | —  | —  |
| 2                | —                   | —  | —  | 4"               | 6" | 8" |
| 3                | —                   | —  | —  | 4"               | 6" | 8" |

## ACCESSORIES AND HARDWARE

### 7310 KIMAX Portable Beading Kit

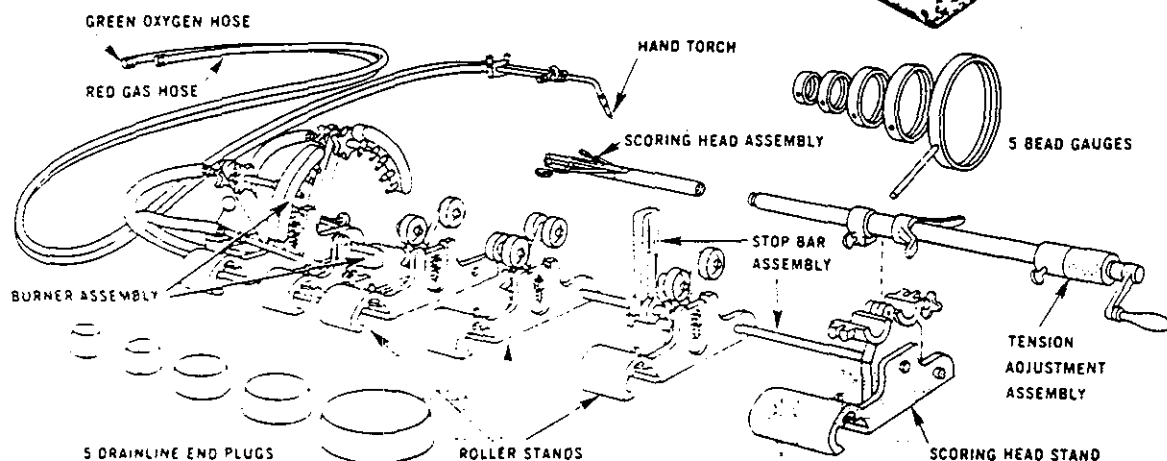
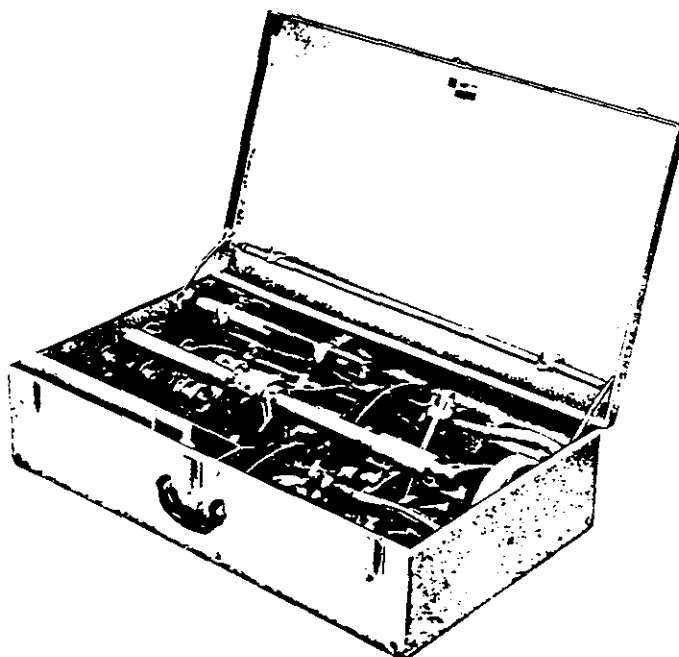
... for job-site

beading of

KIMAX Drainline

straight lengths

See Owens-Illinois Bulletin  
TR-244 for complete set-up  
and operating instructions.



Exploded view of KIMAX Portable Beading Kit components.

### 6729 Pipe Scoring Tool

For small field installations. No. 6729 tool can be used to trim ends of glass pipe to be inserted into KIMAX adapter coupling No. 6655 or adjustable joint No. 6660. After cut is completed ends of pipe are wiped with 150 grit emery cloth. This tool is recommended for use on 1 1/4" ID and 1 1/2" ID pipe only.

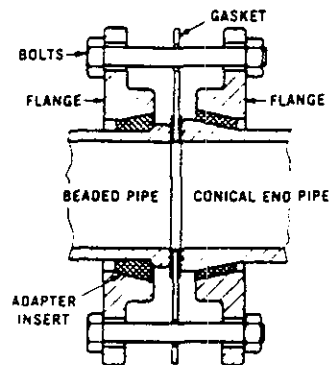
### 7290 Pipe Hangers (padded)

(1 1/2", 2", 3", 4", 6" sizes)

Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.

## ACCESSORIES AND HARDWARE

### 7110—Beaded Pipe to Conical End Pipe



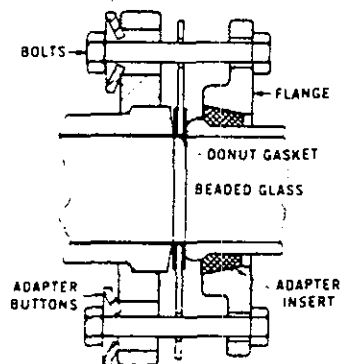
### Pipe Connection Assembly Kits

To join **beaded end pipe to conical end pipe**. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

| Pipe Size | Flange Qty. No.  | Insert Qty. No.  | Gasket No. | Bolts & Nuts Qty. Size |
|-----------|------------------|------------------|------------|------------------------|
| 1½        | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>¾—18 x 2½    |
| 2         | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>¾—18 x 2½    |
| 3         | 2-7155           | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>¾—18 x 3     |
| 4         | 1-6670<br>1-7156 | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>¾—18 x 2½    |
| 6         | 1-6670<br>1-7156 | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>¾—18 x 2½    |

### 7120—Beaded Pipe to U.S. Standard Flange (ASME Bolt Circle)

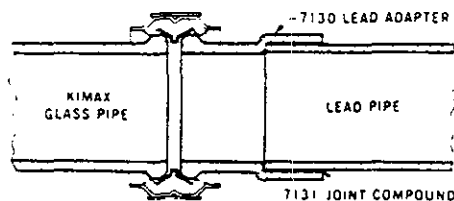


To join **beaded glass pipe to inside coated metal**. Kit includes all flanges, inserts, adapter inserts, bolts and adapter buttons.

Chart for parts included in kit.

| Size | Flange Qty. No. | Inserts Qty. No. | Adapter Buttons | Donut Gasket Qty. No. | Bolts & Nuts Qty. Size |
|------|-----------------|------------------|-----------------|-----------------------|------------------------|
| 1½   | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 4-7190<br>¾—18 x 2½    |
| 2    | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 4-7190<br>¾—18 x 2½    |
| 3    | 1-7155          | 1-7203           | 4-7230          | 1-7276                | 4-7190<br>¾—18 x 3     |
| 4    | 1-6670          | 1-7203           | 8-7230          | 1-7276                | 8-7190<br>¾—18 x 3     |
| 6    | 1-6670          | 1-7203           | 8-7230          | 1-7276                | 8-7190<br>¾—18 x 3     |

### 7130—Beaded Pipe to Lead Pipe



### Glass to Lead Pipe Adapter

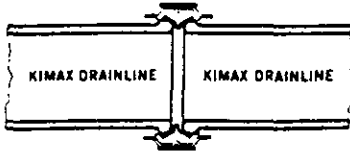
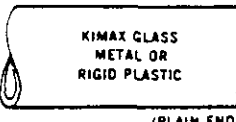
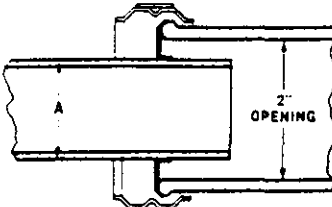
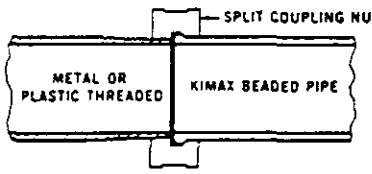
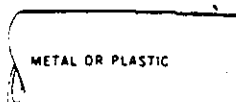
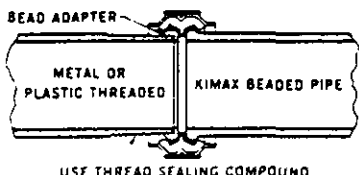
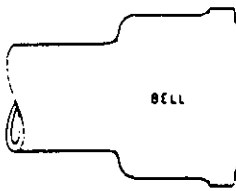
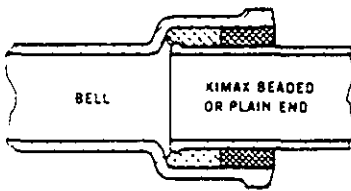
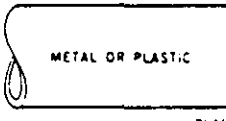
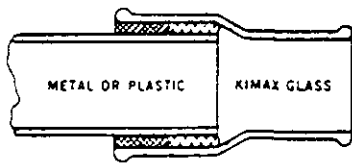
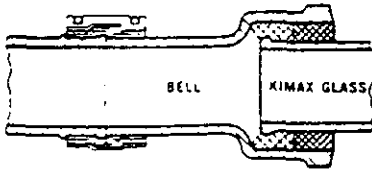
A lead adapter is available in 1½ and 2" size only. Adapter is cemented onto plain end lead pipe with a lead-epoxy joint compound. Mixing instructions are included with joint compound.

Adapter No. 7130

Joint Compound 7131

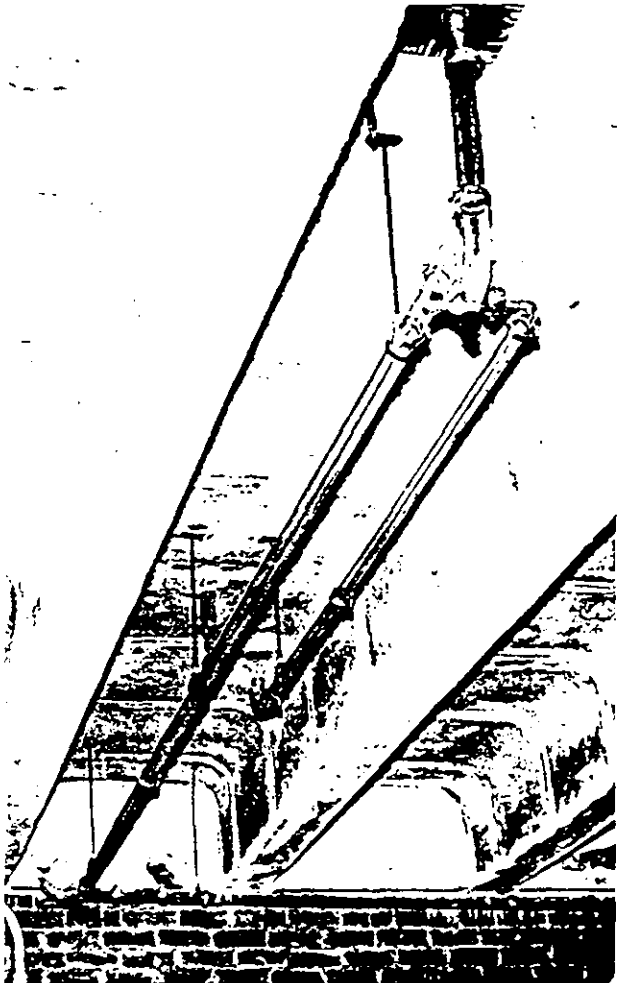
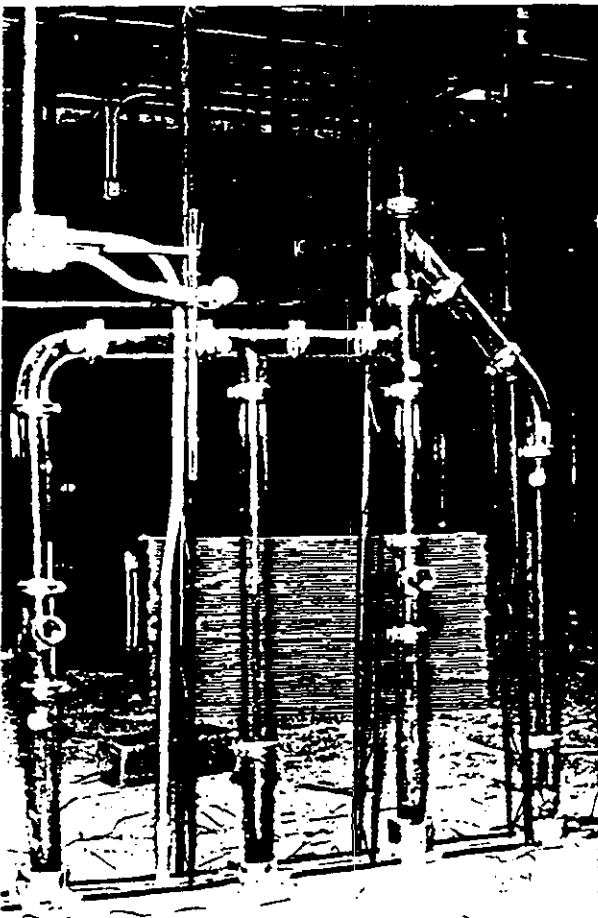
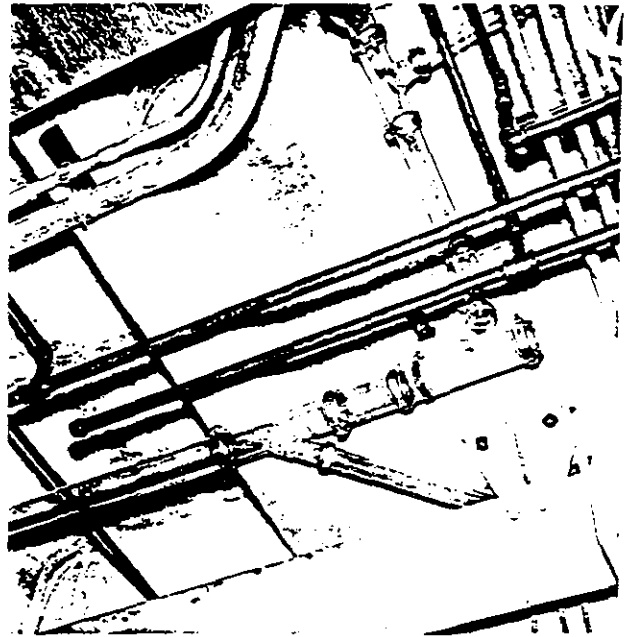
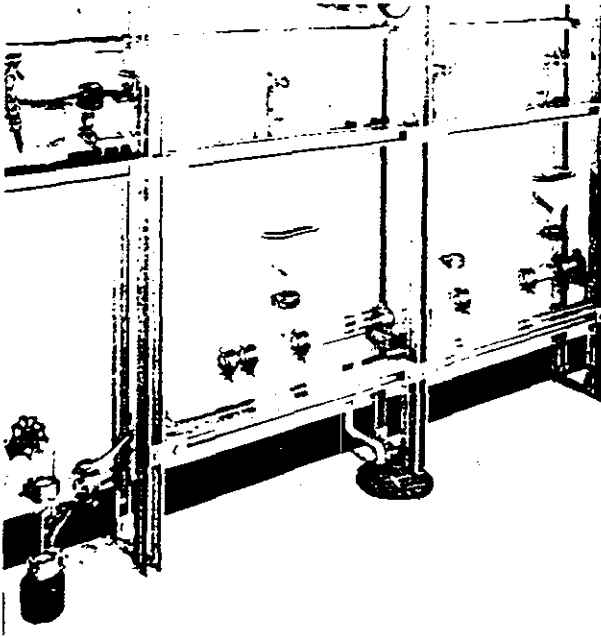
Use standard coupling No. 6650 to connect glass to lead adapter.

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                 | Type of Joint                                                                                                                                                                         | Material Needed                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------|----------------------|------|-----------|------|-----------|------|-------|------|------|------|---|------|------|---|------|------|
| <br>KIMAX DRAINLINE<br>BEADED                               | <br>KIMAX DRAINLINE KIMAX DRAINLINE                                                                 | <b>KIMAX Coupling</b> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650</td></tr><tr><td>2</td><td>6650</td></tr><tr><td>3</td><td>6650</td></tr><tr><td>4</td><td>6650</td></tr><tr><td>6</td><td>6650</td></tr></table>                                                                                                                                           | Size                       | Code No.            | 1½                   | 6650 | 2         | 6650 | 3         | 6650 | 4     | 6650 | 6    | 6650 |   |      |      |   |      |      |
| Size                                                                                                                                         | Code No.                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                           | 6650                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                            | 6650                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3                                                                                                                                            | 6650                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4                                                                                                                                            | 6650                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6                                                                                                                                            | 6650                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>KIMAX GLASS<br>METAL OR<br>RIGID PLASTIC<br>(PLAIN END) | <br>A 2" OPENING                                                                                    | <b>KIMAX Adapter Coupling</b> <table><tr><th>"A" Dimension<br/>Pipe O.D.</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>6655</td></tr><tr><td>1.70—1.78</td><td>6655</td></tr><tr><td>1.82—1.90</td><td>6655</td></tr></table>                                                                                                                                                     | "A" Dimension<br>Pipe O.D. | Code No.            | 1.48—1.53            | 6655 | 1.70—1.78 | 6655 | 1.82—1.90 | 6655 |       |      |      |      |   |      |      |   |      |      |
| "A" Dimension<br>Pipe O.D.                                                                                                                   | Code No.                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.48—1.53                                                                                                                                    | 6655                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.70—1.78                                                                                                                                    | 6655                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1.82—1.90                                                                                                                                    | 6655                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>IPS THREADED —<br>METAL OR PLASTIC                      | <br>— SPLIT COUPLING NUT<br>METAL OR<br>PLASTIC THREADED KIMAX BEADED PIPE                          | <b>KIMAX Split Coupling Nut and Gasket</b> <table><tr><th>Pipe Size</th><th>Nut<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635</td><td>6739</td></tr><tr><td>2</td><td>6635</td><td>6739</td></tr></table>                                                                                                                                                   | Pipe Size                  | Nut<br>Code No.     | Gasket<br>Code No.   | 1½   | 6635      | 6739 | 2         | 6635 | 6739  |      |      |      |   |      |      |   |      |      |
| Pipe Size                                                                                                                                    | Nut<br>Code No.                                                                                                                                                                       | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                      |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                           | 6635                                                                                                                                                                                  | 6739                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                            | 6635                                                                                                                                                                                  | 6739                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>IPS THREADED —<br>METAL OR PLASTIC                    | <br>BEAD ADAPTER<br>METAL OR<br>PLASTIC THREADED KIMAX BEADED PIPE<br>USE THREAD SEALING COMPOUND | <b>KIMAX Bead Adapter and Standard Coupling</b> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680</td><td>6650</td></tr><tr><td>2</td><td>6680</td><td>6650</td></tr><tr><td>3</td><td>6680</td><td>6650</td></tr><tr><td>4</td><td>6680</td><td>6650</td></tr><tr><td>6</td><td>6680</td><td>6650</td></tr></table> | Pipe Size                  | Adapter<br>Code No. | Coupling<br>Code No. | 1½   | 6680      | 6650 | 2         | 6680 | 6650  | 3    | 6680 | 6650 | 4 | 6680 | 6650 | 6 | 6680 | 6650 |
| Pipe Size                                                                                                                                    | Adapter<br>Code No.                                                                                                                                                                   | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 1½                                                                                                                                           | 6680                                                                                                                                                                                  | 6650                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2                                                                                                                                            | 6680                                                                                                                                                                                  | 6650                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3                                                                                                                                            | 6680                                                                                                                                                                                  | 6650                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4                                                                                                                                            | 6680                                                                                                                                                                                  | 6650                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6                                                                                                                                            | 6680                                                                                                                                                                                  | 6650                                                                                                                                                                                                                                                                                                                                                                                    |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>BELL                                                  | <br>BELL KIMAX BEADED<br>OR PLAIN END                                                             | <b>KIMAX Glass to Bell End Pipe</b><br>1. Pack hub half full with asbestos rope.<br>2. Caulk with hot lead, lead wool or acid proof cement.<br>For Detail, see TR-427                                                                                                                                                                                                                   |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>METAL OR PLASTIC<br>PLAIN                             | <br>METAL OR PLASTIC KIMAX GLASS                                                                  | <b>KIMAX Glass to Plain End Metal or Plastic</b><br>For Detail, see TR-427 <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536</td></tr><tr><td>3 x 2</td><td>6536</td></tr><tr><td>4 x 3</td><td>6536</td></tr><tr><td>6 x 4</td><td>6536</td></tr></table>                                                                                                      | Size                       | Code No.            | 2 x 1½               | 6536 | 3 x 2     | 6536 | 4 x 3     | 6536 | 6 x 4 | 6536 |      |      |   |      |      |   |      |      |
| Size                                                                                                                                         | Code No.                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 2 x 1½                                                                                                                                       | 6536                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 3 x 2                                                                                                                                        | 6536                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 4 x 3                                                                                                                                        | 6536                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| 6 x 4                                                                                                                                        | 6536                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                         |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |
| <br>HIGH SILICA<br>MECHANICAL JOINT                       | <br>BELL KIMAX GLASS                                                                              | <b>KIMAX Glass to Adapter Hub for High Silica Iron Mechanical Joint</b><br>For Detail, see TR-427                                                                                                                                                                                                                                                                                       |                            |                     |                      |      |           |      |           |      |       |      |      |      |   |      |      |   |      |      |



## TYPICAL KIMAX DRAINLINE INSTALLATIONS



## KIMAX DRAINLINE INSTALLATIONS

Over the past years there have been hundreds of KIMAX Glass Drainline installations, while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

### Schools and Universities

Rutgers University  
Tacoma High School  
Washington State University  
Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pamona College  
Sophia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami (Florida)  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Snohomish High School  
University of Washington  
City of Detroit  
University of Michigan  
University of Minnesota  
North Shore Junior College, Houston  
Boston College  
Florida State University

### Hospitals

Maynard Hospital, Seattle, Washington  
Beaumont Hospital, Detroit, Michigan  
Botsford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minnesota  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
Skin and Cancer Hospital, Philadelphia, Pennsylvania  
Germantown Hospital, Philadelphia, Pennsylvania  
Tyler Memorial Hospital, Meshoppen, Pennsylvania  
Emory University Hospital, Atlanta, Georgia

### Industrial

Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohn & Hass  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office Building, Boston  
B. F. Goodrich  
E. I. DuPont

### Research

A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Gilliam Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Reiter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
St. Hyacinthe Agricultural Institute  
Texaco Experiment, Inc.

... and many, many more!



**KIMBLE SALES OFFICES**

La Mirada, Calif. 90638

15052 Rosecrans Ave.

Suite 209

Phone: 941-0276

Montclair, N.J. 07042

22 S. Park St.

Phone: 746-6600

Toledo, Ohio 43601

P. O. Box 1035

Phone: 242-6543

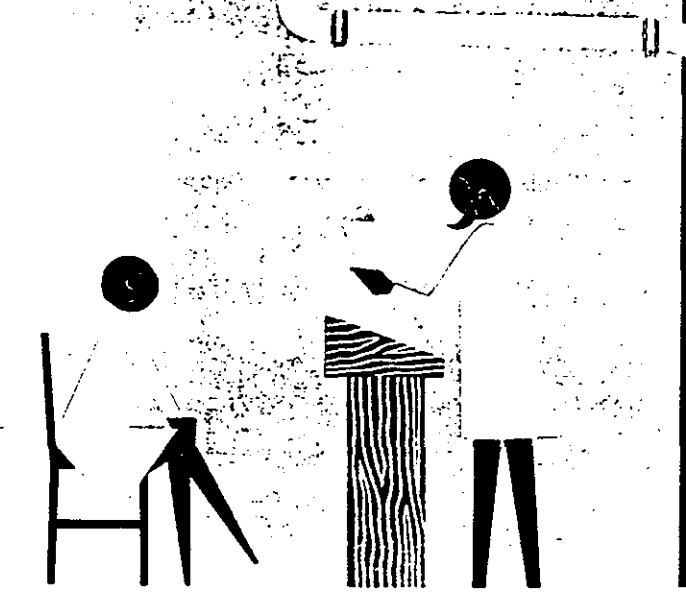
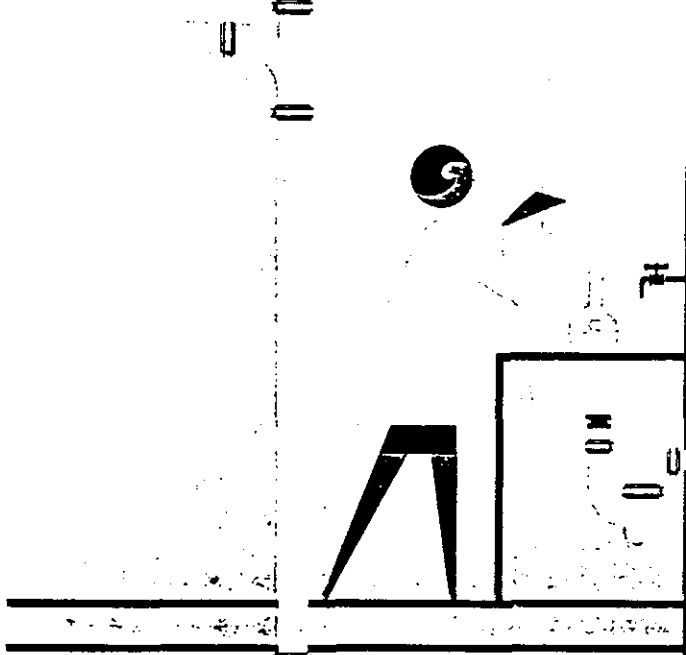
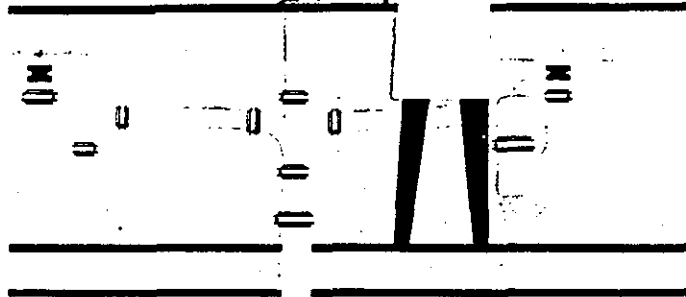
**OWENS-ILLINOIS**

maker of Kimble Products

Toledo, Ohio 43601

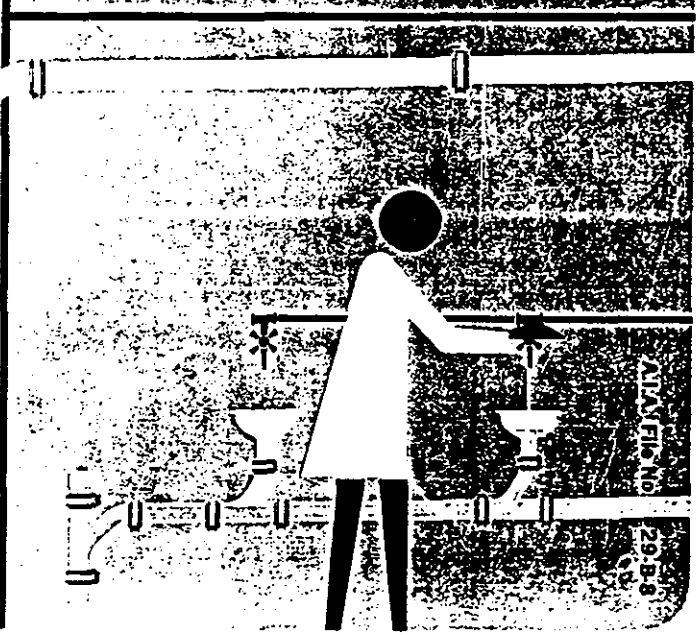
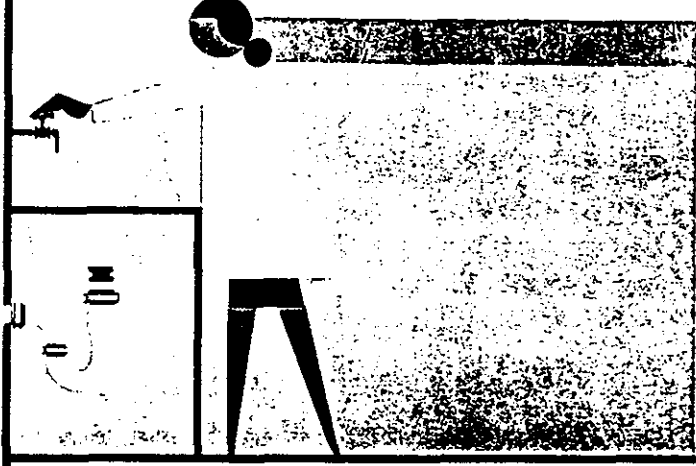


A.I.A. File No. 29-B-8



6334051 (Feb 1970)

OWENS-ILLINOIS  
**KIMAX**  
tempered  
glass  
DRAINLINE



A.I.A. File No. 29-B-8

# KIMAX TEMPERED GLASS DRAINLINE

**...assured maximum corrosion resistance  
for chemical waste disposal systems**

## Table of Contents

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## ...the most effective chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212°F continuously\*.

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

\*For continuous operating temperatures above 212°F see your KIMAX representative for recommendations.

factured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

## Building Owners

KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- *KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.*
- *Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.*
- *When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.*
- *All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.*

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- *Filled TFE sink outlets for maximum chemical resistance at the sink connection.*
- *All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.*

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today. KIMAX is a registered trademark of Owens-Illinois, Inc.

## Specifier

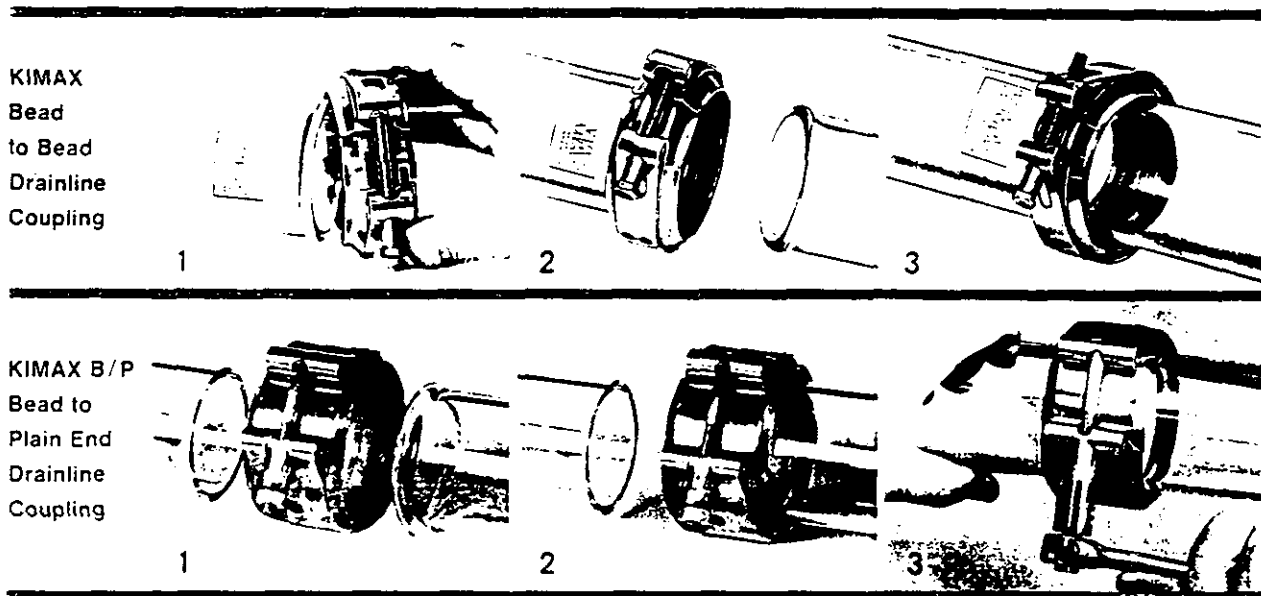
Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

- All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires

only  $\frac{1}{2}$  to  $\frac{1}{3}$  as many hangers as conventional high silica iron pipe.

- Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.



## INSTALLATION ADVANTAGES

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual TR-427R. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted

coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos above). The coupling permits the joint to be deflected up to 4°.

### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the new B/P (bead to plain end) coupling system.

### ... Minimum Number of Hangers

KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.

## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Tempered Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a factory applied protective casing of thick expanded polystyrene. For recommended installation procedures



of KIMAX Drainline see Installation Manual TR-427R. Shown here is an example of KIMAX Drainline as installed underground.

### ... Adaptation to Other Materials

KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 21.

### ... Easily Handled

KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

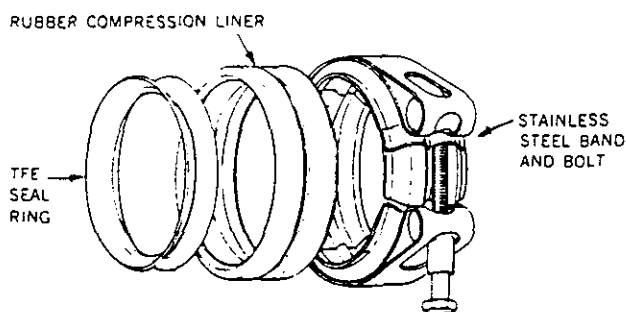
## Recommended KIMAX Drainline Uses

KIMAX Tempered Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem. It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and biochemistry laboratories; veterinary and medi-

cal colleges, research, and other institutional laboratories.

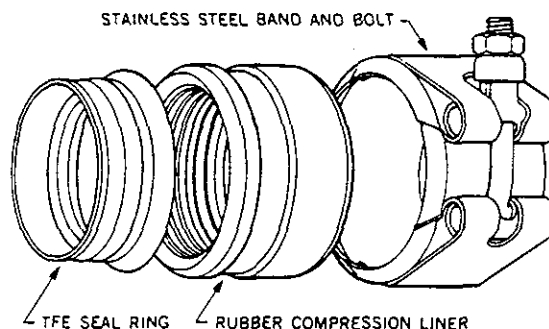
KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants... wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints



### KIMAX Drainline Coupling (Bead to Bead)

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoroethylene provide the required joint seal. Assembly of joint is simple... place drainline ends into coupling (Page 3) and tighten *one* bolt. Disassembly is likewise as simple.



### KIMAX B/P Drainline Coupling (Beaded to Plain End)

This newly designed KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut glass pipe or lead, Schedule 40 plastic or metal pipe). It eliminates field beading of certain sizes of KIMAX glass drainline straight lengths... saving up to 60% of all beading time on average installations. Consult KIMAX B/P Coupling Bulletin No. TR-93-A for further information.

# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed borosilicate glass conforming to Federal Specification DD-G-541A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include factory-protected heavy schedule pipe for underground burial, and recommended adapter couplings to connect to other piping material, where applicable.
- C. All pipe shall be installed free of strain, in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A. Glass-to-glass connections shall be made with KIMAX compression type couplings Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Seal ring gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations, they shall provide a leak-free joint when deflected up to 4°.
- B. Joints between glass and other types of piping material shall be made with KIMAX adapters and or according to manufacturer's recommendations.

### III. Protection of Pipe

- A. All glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and or with a non-hardening approved caulking material.
- B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C. Glass pipe shall be protected against all weld splatter.

### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A. **Excavation**—shall conform to National Plumbing Code A 40.8 Section 2.7.
  - 1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
  - 2. At least 4" of properly compacted sand shall be used directly under the pipe.
- B. **Buried Pipe**
  - 1. Straight lengths shall be heavy schedule 5' lengths protected in factory-applied expanded polystyrene casing.
  - 2. All underground fittings shall be protected prior to back-filling by wrapping in polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.

### C. Backfill

Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: Acid Waste Drainline

This system shall be made of KIMAX tempered and annealed borosilicate glass and conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings, Article Nos. 6650 or 6661, with a tetra-fluoro-ethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

Note: Where applicable

### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX factory-protected heavy schedule pipe, 5' lengths, and wrapped fittings shall be installed in sand base and back filled in accordance with the manufacturer's instructions and governing plumbing code.

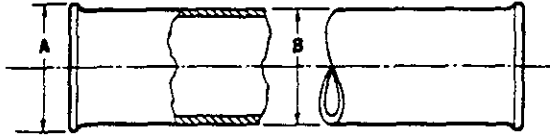


# PIPE AND FITTINGS

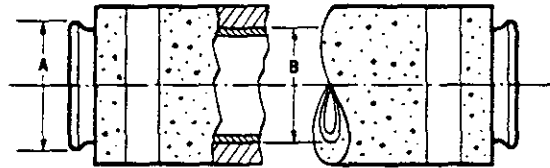
## Straight Lengths

**6500** 5-ft. lengths

**6501** 10-ft. lengths



**6502 EPS\* Covered** 5-ft. lengths (for underground use)



\* Expanded Polystyrene

**6504** Beaded one end only

## Pipe

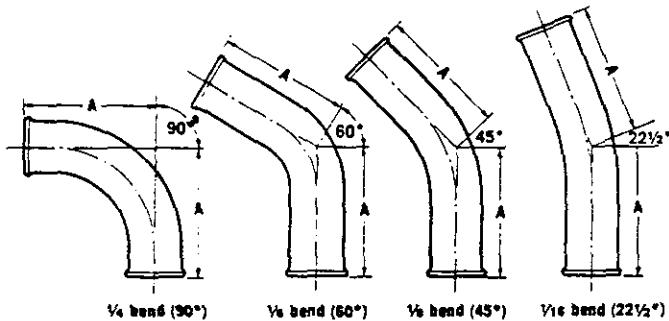
Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) may be ordered as special items.

| Size | Weight<br>lbs./ft. | A    | B (O.D.) |
|------|--------------------|------|----------|
| 1½   | 0.87               | 2.06 | 1.84     |
| 2    | 1.1                | 2.58 | 2.34     |
| 3    | 2.0                | 3.69 | 3.41     |
| 4    | 3.4                | 4.84 | 4.53     |
| 6    | 6.3                | 7.12 | 6.66     |

6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.

6504 pipe is beaded one end only and available in one foot increments up to 10 ft. All lengths can be field cut to within 7" of bead.

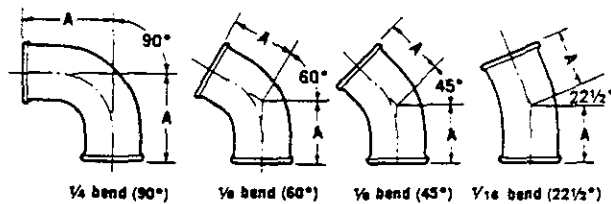
**6511**



## Sweeps

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |

**6513**



## Bends

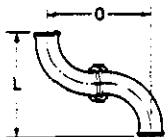
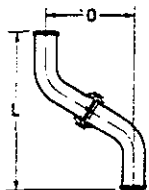
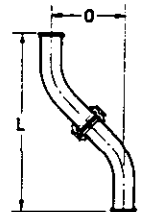
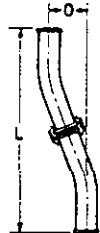
| Size | A<br>90° | A<br>60° | A<br>45° | A<br>22½° |
|------|----------|----------|----------|-----------|
| 1½   | 3        | 2½       | 2        | 2         |
| 2    | 3¾       | 2¾       | 2¼       | 2¼        |
| 3    | 5        | 3¾       | 2¾       | 2¾        |
| 4    | 7        | 4¾       | 3¾       | 3¾        |
| 6    | —        | —        | 7        | —         |

# PIPE AND FITTINGS

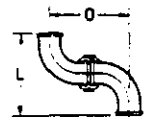
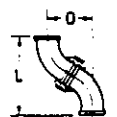
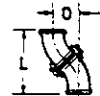
## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

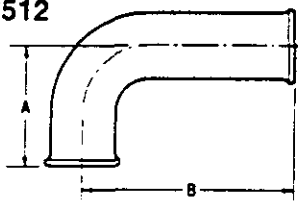
### 6511 Sweep Offsets

|       |  |    |  |        |  |        |  |       |
|-------|-----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------|
| Size  | L                                                                                 | O  | L                                                                                 | O      | L                                                                                   | O      | L                                                                                   | O     |
| 1 1/2 | 9                                                                                 | 9  | 13 1/2                                                                            | 7 1/2  | 15 3/4                                                                              | 6 3/4  | 17 3/4                                                                              | 3 3/4 |
| 2     | 10                                                                                | 10 | 15                                                                                | 8 3/4  | 17 1/2                                                                              | 7 1/2  | 19 1/2                                                                              | 3 1/2 |
| 3     | 13                                                                                | 13 | 19 1/2                                                                            | 11 1/4 | 22 1/2                                                                              | 9 1/4  | 25                                                                                  | 5     |
| 4     | 18                                                                                | 18 | 27                                                                                | 15 3/4 | 30 3/4                                                                              | 12 3/4 | 34 3/4                                                                              | 6 3/4 |
| 6     | 24                                                                                | 24 | 36                                                                                | 20 3/4 | 41                                                                                  | 17     | 46 1/2                                                                              | 9 1/2 |

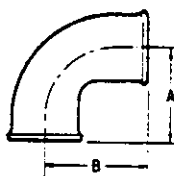
### 6513 Bend Offsets

|       |  |       |  |       |  |       |  |       |
|-------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|
| Size  | L                                                                                   | O     | L                                                                                   | O     | L                                                                                     | O     | L                                                                                     | O     |
| 1 1/2 | 6                                                                                   | 6     | 7 1/4                                                                               | 4 1/4 | 6 3/4                                                                                 | 2 3/4 | 7 3/4                                                                                 | 1 3/4 |
| 2     | 6 3/4                                                                               | 6 3/4 | 8 1/4                                                                               | 4 3/4 | 7 3/4                                                                                 | 3 1/4 | 8 3/4                                                                                 | 1 3/4 |
| 3     | 10                                                                                  | 10    | 10 3/4                                                                              | 6 3/4 | 9 3/4                                                                                 | 3 3/4 | 10 3/4                                                                                | 2 3/4 |
| 4     | 14                                                                                  | 14    | 13 1/4                                                                              | 7 3/4 | 11 3/4                                                                                | 4 3/4 | 10 3/4                                                                                | 2 3/4 |

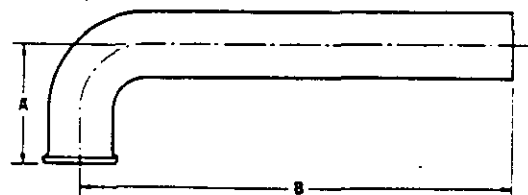
### 6512



### 6514



### 6512P (Annealed)\*



## Special Purpose Bends

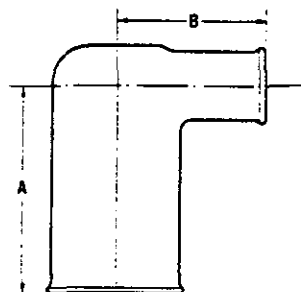
|       | 6512  |       | 6512P |    | 6514  |   |
|-------|-------|-------|-------|----|-------|---|
| Size  | A     | B     | A     | B  | A     | B |
| 1 1/2 | 3 3/4 | 6     | 3 3/4 | 12 | 2 1/2 | 3 |
| 2     | 3 3/4 | 7 1/2 | 3 3/4 | 12 | —     | — |

\*Can be field cut.

# PIPE AND FITTINGS

6518

## Quarter Bend Reducer

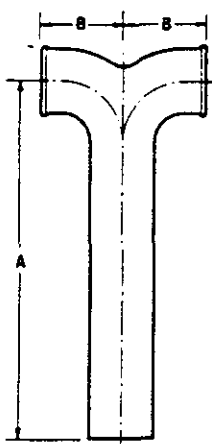
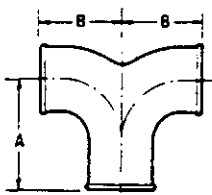


| Size   | A | B  |
|--------|---|----|
| 2 x 1½ | 4 | 3½ |
| 3 x 1½ | 5 | 4  |
| 3 x 2  | 5 | 4½ |
| 4 x 1½ | 7 | 4½ |
| 4 x 2  | 7 | 5  |
| 4 x 3  | 7 | 5½ |
| 6 x 1½ | 9 | 5½ |
| 6 x 2  | 9 | 6  |
| 6 x 3  | 9 | 6½ |
| 6 x 4  | 9 | 8  |

6519

6519P (Annealed)\*

## Double Quarter Bend



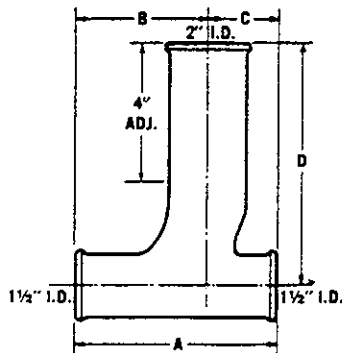
| Size       | 6519 |    | 6519P |    |
|------------|------|----|-------|----|
|            | A    | B  | A     | B  |
| 1½         | 3    | 2¼ | 10    | 2¼ |
| 2 x 2 x 1½ | 3¼   | 2¼ | 10    | 2¼ |
| 2          | 3½   | 2¼ | 10    | 2¼ |
| 3          | 5    | 4½ |       |    |
| 4          | 6½   | 5¾ |       |    |
| 6          | 8¼   | 7  |       |    |

\*Can be field cut.

\*\*Branch is 1½".

## PIPE AND FITTINGS

6520



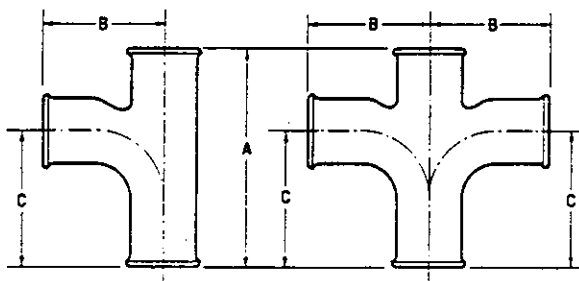
### Adjustable Sanitary T

(One Adjustable Inlet)

| Size        | A | B  | C  | D |
|-------------|---|----|----|---|
| 1½ x 1½ x 2 | 6 | 3¾ | 2½ | 7 |

6521 Single

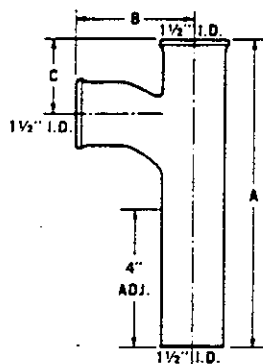
6522 Double



### Sanitary T

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 3½ | 3¾  |
| 2 x 1½  | 8  | 3¾ | 5   |
| 2 x 2   | 8  | 4½ | 5   |
| 3 x 1½  | 12 | 4¼ | 7¼  |
| 3 x 2   | 12 | 5  | 7¼  |
| 3 x 3   | 12 | 6¼ | 7¼  |
| 4 x 1½  | 14 | 4¾ | 8¾  |
| 4 x 2   | 14 | 5¾ | 8¾  |
| 4 x 3   | 14 | 7  | 8¾  |
| 4 x 4   | 14 | 8¼ | 8¾  |
| 6 x 2   | 20 | 6¼ | 12¾ |
| 6 x 3   | 20 | 8  | 12¾ |
| 6 x 4   | 20 | 9¼ | 12¾ |
| 6 x 6   | 20 | 12 | 12¾ |

6530 (Annealed)\*



### Adjustable Sanitary T

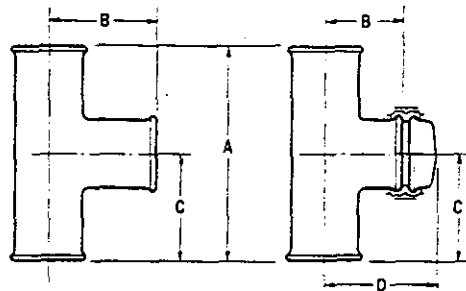
(Plain End Outlet)

| Size         | A  | B  | C  |
|--------------|----|----|----|
| 1½ x 1½ x 1½ | 8¾ | 3½ | 3½ |

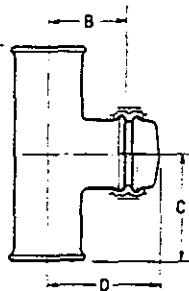
\*Can be field cut.

# PIPE AND FITTINGS

**6523 Straight T**



**6524 Test T with Cleanout**



**Straight T**

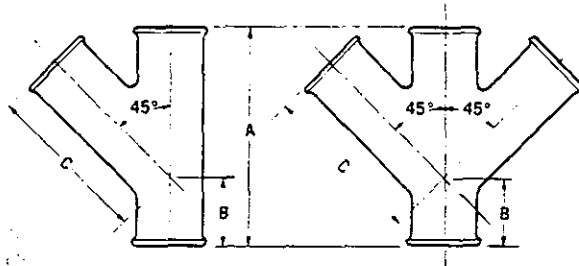
| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 1½  | 12 | 4½ | 6  |
| 3 x 2   | 12 | 4½ | 6  |
| 3 x 3   | 12 | 6  | 6  |
| 4 x 1½  | 14 | 5  | 7  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7½ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

**Test T with Cleanout**

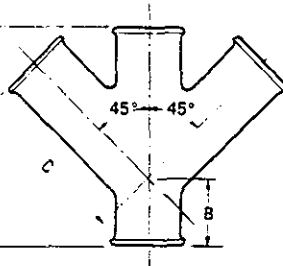
| Size    | A  | B  | C | D  |
|---------|----|----|---|----|
| 1½ x 1½ | 6  | 2½ | 3 | 3½ |
| 2 x 2   | 8  | 2½ | 4 | 3½ |
| 3 x 3   | 12 | 3½ | 6 | 4½ |
| 4 x 4   | 14 | 4½ | 7 | 5½ |

Test Tee and cleanout comes as complete assembly including cap and coupling.

**6526 Single**



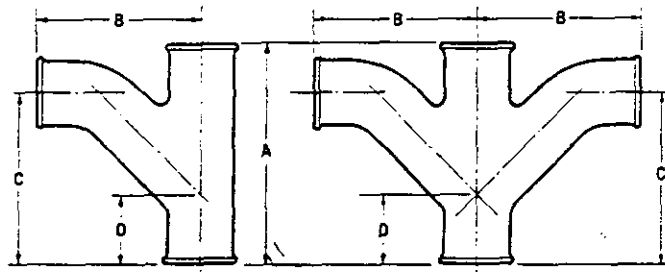
**6527 Double**



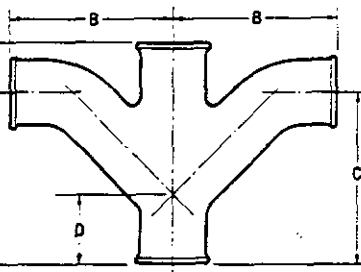
**Drainline Y**

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 1¾ | 4½  |
| 2 x 1½  | 8  | 2½ | 4¾  |
| 2 x 2   | 8  | 2½ | 6   |
| 3 x 1½  | 12 | 3¾ | 5½  |
| 3 x 2   | 12 | 3¾ | 6¾  |
| 3 x 3   | 12 | 3¾ | 8   |
| 4 x 1½  | 14 | 4½ | 6¾  |
| 4 x 2   | 14 | 4½ | 7½  |
| 4 x 3   | 14 | 4½ | 8¾  |
| 4 x 4   | 14 | 4½ | 10  |
| 6 x 2   | 20 | 5¾ | 9   |
| 6 x 3   | 20 | 5¾ | 10¾ |
| 6 x 4   | 20 | 5¾ | 11½ |
| 6 x 6   | 20 | 5¾ | 14  |

**6528 Single**



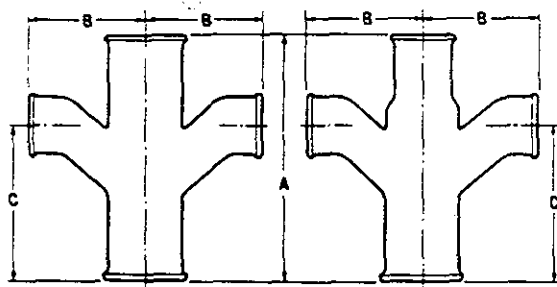
**6529 Double**



**Combination Y and 1/8 Bend**

| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 4½ | 4¾  | 1¾ |
| 2 x 1½  | 8  | 4¾ | 5½  | 2½ |
| 2 x 2   | 8  | 6  | 6¼  | 2½ |
| 3 x 1½  | 12 | 5¾ | 7¼  | 3¾ |
| 3 x 2   | 12 | 6½ | 8   | 3¾ |
| 3 x 3   | 12 | 8½ | 9   | 3¾ |
| 4 x 1½  | 14 | 6  | 8½  | 4½ |
| 4 x 2   | 14 | 7  | 9¼  | 4½ |
| 4 x 3   | 14 | 9  | 10¼ | 4½ |
| 4 x 4   | 14 | 11 | 11  | 4½ |
| 6 x 2   | 20 | 8¾ | 11¾ | 5¾ |
| 6 x 3   | 20 | 10 | 12½ | 5¾ |
| 6 x 4   | 20 | 12 | 13½ | 5¾ |
| 6 x 6   | 20 | 15 | 14½ | 5¾ |

**6531**



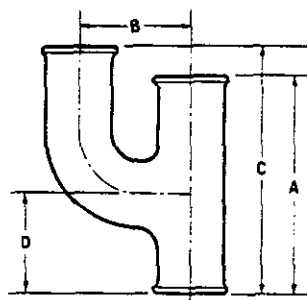
**Partition Cross (Compact)**

| Size             | A | B  | C |
|------------------|---|----|---|
| 2 x 1½           | 8 | 3¾ | 5 |
| 2 x 2            | 8 | 4½ | 5 |
| 2 x 1½ x 1½ x 1½ | 8 | 3¾ | 5 |

Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

# PIPE AND FITTINGS

## 6532 Single

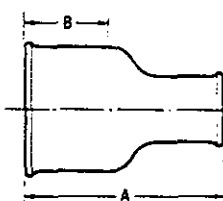


## Upright Y or H (vent branch)

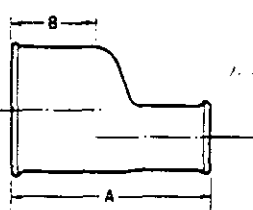
| Size    | A  | B  | C*  | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 3  | 6½  | 2½ |
| 2 x 1½  | 8  | 3½ | 7½  | 3½ |
| 2 x 2   | 8  | 4  | 8½  | 3½ |
| 3 x 1½  | 12 | 3½ | 9½  | 4½ |
| 3 x 2   | 12 | 4½ | 10½ | 4½ |
| 3 x 3   | 12 | 6  | 13  | 5½ |
| 4 x 1½  | 14 | 4½ | 10½ | 5½ |
| 4 x 2   | 14 | 5  | 12  | 5½ |
| 4 x 3   | 14 | 6½ | 14½ | 6½ |
| 4 x 4   | 14 | 8  | 16½ | 6½ |
| 6 x 3   | 20 | 7½ | 16½ | 7½ |
| 6 x 4   | 20 | 9  | 19  | 8  |
| 6 x 6   | 20 | 12 | 24  | 12 |

\*"C" dimension may be longer or shorter than "A"

## 6536 Straight



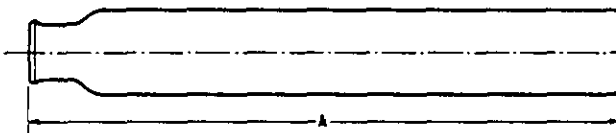
## 6537 Eccentric



## Reducers or Increasers

| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1¾       |
| 3 x 1½ | 5 | 2¼       |
| 3 x 2  | 5 | 2¼       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

## 6540



## Vent Increasers

| Size   | A  |
|--------|----|
| 1½ x 3 | 22 |
| 2 x 3  | 22 |
| 3 x 4  | 22 |

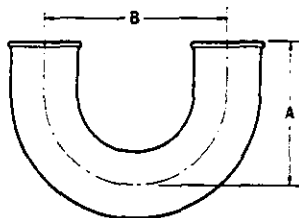
## 6544



## Cleanout Plug

| Size | A  |
|------|----|
| 1½   | ¾  |
| 2    | 1  |
| 3    | 1¼ |
| 4    | 1¼ |
| 6    | 1½ |

## 6550



## U Bend (vent loop)

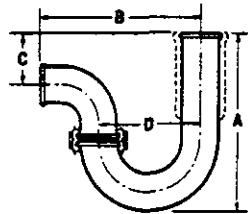
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |

Note: U bends (annealed only) are often used for vent loops. No. 6705 outlets on Swivel "S" Traps are also used as vent loops.

# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6700



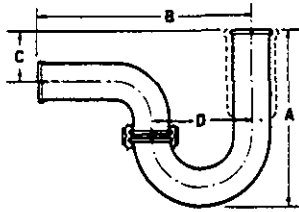
## Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6513 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 8¾ | 8  | 2  | 5  |
| 2 x 1½                 | 8¾ | 8  | 2  | 5  |
| 2 x 2                  | 9¼ | 8¾ | 1½ | 5½ |

See Standard Cleanout, Page 14.

6701



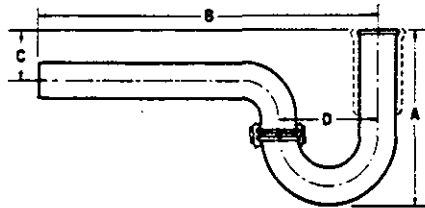
## Swivel Trap—P Style

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 8¾ | 11 | 1½ | 5  |
| 2 x 1½                 | 8¾ | 11 | 1½ | 5  |
| 2 x 2                  | 9¼ | 13 | 1½ | 5½ |

See Standard Cleanout, Page 14.

6704 (Plain End Outlet\*)



## Swivel Trap—P Style

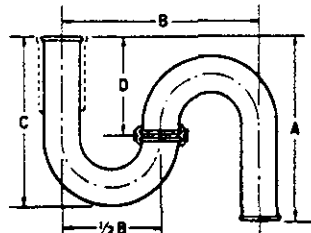
No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B   | C  | D  |
|------------------------|----|-----|----|----|
| 1½ x 1½                | 8¾ | 17  | 1½ | 5  |
| 2 x 1½                 | 8¾ | 17  | 1½ | 5  |
| 2 x 2                  | 9¼ | 17½ | 1½ | 5½ |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

\* Annealed outlet, can be field cut.

6706



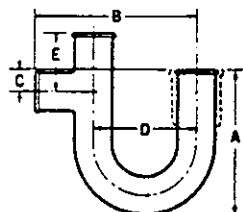
## Swivel Trap—S Style

No. 6706 Swivel "S" Trap consists of two No. 6705 inlets and a No. 6650 KIMAX coupling at the swivel joint.

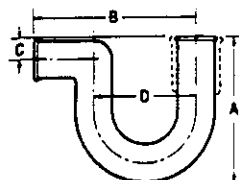
| Size<br>Inlet x Outlet | A  | B  | C  | D  |
|------------------------|----|----|----|----|
| 1½ x 1½                | 10 | 10 | 8¾ | 5  |
| 2 x 1½                 | 10 | 10 | 8¾ | 5  |
| 2 x 2                  | 9¾ | 11 | 9¼ | 4¾ |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

6713 (Vented)



6718



## Trap—P Style

| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                | 1½           | 7   | 8   | 1  | 5  | 3  |
| 2 x 1½                 | 1½           | 7¾  | 8   | 1½ | 5  | 3  |
| 2 x 2                  | 2            | 8¾  | 8¾  | 1½ | 5½ | 3½ |
| 3 x 3                  | 3            | 10¾ | 10¾ | 2  | 6½ | 4  |
| 4 x 4                  | 4            | 12¾ | 12¾ | 2½ | 7½ | 5  |
| 6 x 6                  | 4            | 16¾ | 31  | 2½ | 24 | 7  |

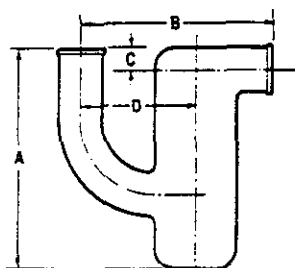
\* Has expanded inlet. Use No. 6655 adapter coupling for inlet joint. Traps available with B type cleanout. See Standard Cleanout, Page 14.

No cleanouts on 6 x 6 traps.

## DRAINLINE TRAPS

**Expanded inlets of traps have 4" minimum depth to permit adjustment.**

6707

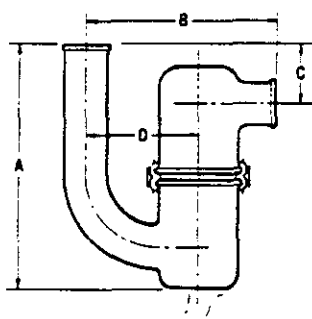


### Drum Trap—P Style

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Body<br>I.D. |
|------------------------|----|----|----|----|--------------|
| 1½ x 1½                | 9  | 8  | 1  | 4% | 3            |
| 2 x 1½                 | 9  | 8  | 1½ | 4% | 3            |
| 2 x 2                  | 9% | 9% | 2  | 5% | 4            |

Traps available with B type cleanout. See Standard Cleanout.  
Page 14.

6710



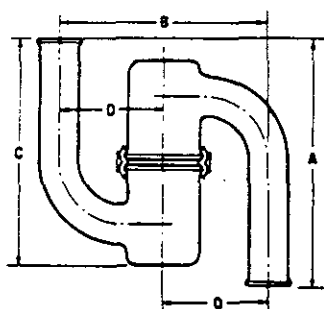
### Swivel Drum Trap—P Style

No. 6710 Swivel Drum Trap "P" assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A   | B  | C  | D  | Body<br>I.D. |
|------------------------|-----|----|----|----|--------------|
| 1½ x 1½                | 10% | 8  | 2½ | 4% | 3            |
| 2 x 1½                 | 10% | 8  | 2½ | 4% | 3            |
| 2 x 2                  | 11  | 9% | 3  | 5½ | 4            |

Traps available with B type cleanout. See Standard Cleanout.  
Page 14.

6714



### Swivel Drum Trap—S Style

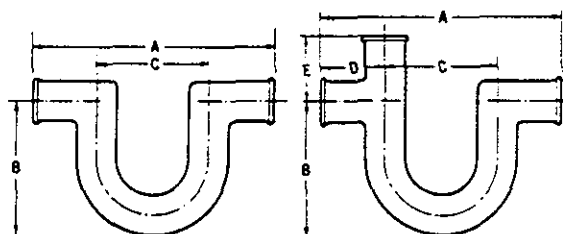
No. 6714 Swivel Drum Trap assembly consists of two No. 6715 inlets and one No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A   | B  | C   | D  | Body<br>I.D. |
|------------------------|-----|----|-----|----|--------------|
| 1½ x 1½                | 11½ | 9½ | 10½ | 4½ | 3            |
| 2 x 1½                 | 11½ | 9½ | 10½ | 4½ | 3            |
| 2 x 2                  | 11½ | 11 | 11  | 5½ | 4            |

Traps available with B type cleanout. See Standard Cleanout.  
Page 14.

**6770**

**6771 (Vented)**



## Running Trap

| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  |
|------------------------|--------------|-----|-----|----|----|----|
| 1½ x 1½                | 1½           | 11  | 6   | 5  | 3  | 3  |
| 2 x 2                  | 2            | 12  | 6½  | 5½ | 3½ | 3½ |
| 3 x 3                  | 3            | 14½ | 8½  | 6½ | 4  | 4  |
| 4 x 4                  | 4            | 17½ | 9½  | 7½ | 5  | 5  |
| * 6 x 6                | 4            | 38  | 12½ | 24 | 7  | 7  |

Traps available with B type cleanout. See Standard Cleanout, Page 14.

No cleanouts on 6 x 6 traps.

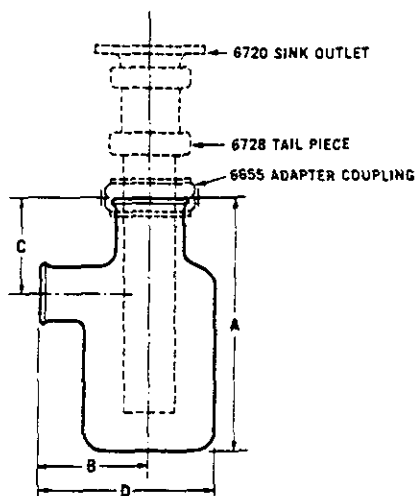


# DRAINLINE TRAPS

6614

## Partition Trap

(Consists of Trap Body Only)



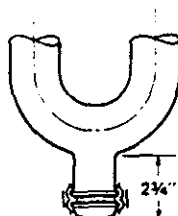
Available with 1½" and 2" outlets only. 1½" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

| Size<br>Inlet x Outlet | A  | B  | C  | D |
|------------------------|----|----|----|---|
| 2 x 1½                 | 8½ | 3½ | 3½ | 6 |
| 2 x 2                  | 8½ | 3½ | 4½ | 6 |

Traps are non-siphoning with partition always visible.  
Traps available with B type cleanout. See below.

## Type B

## Standard Cleanout



Standard drainline trap cleanout Type B consists of a No. 6650 standard KIMAX coupling (1½") and a No. 6544 short glass cap (1½").

### Ordering Information

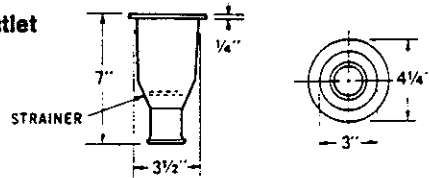
To order standard traps with cleanouts use catalog number for proper style and add the letter B.

For correct layout dimensions add 2¾" to overall trap height for cleanout Type B.

## CUP SINKS

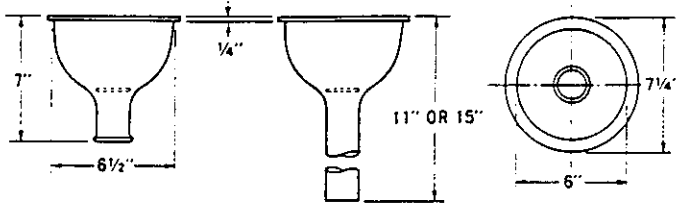
Outside surface of cupsink bodies has an opaque white surface. No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1½") on outlet to connect to 2" expanded end traps or fittings.

### 6616 Beaded Outlet



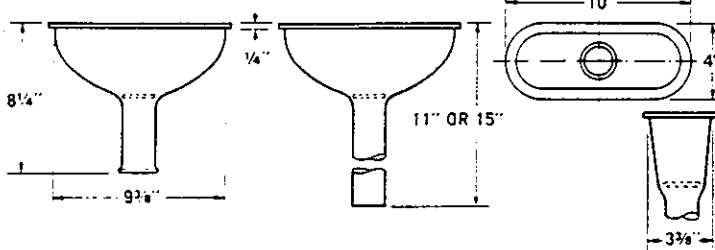
### 3" Hemispherical

### 6617 Beaded Outlet 6617P Plain End Outlet



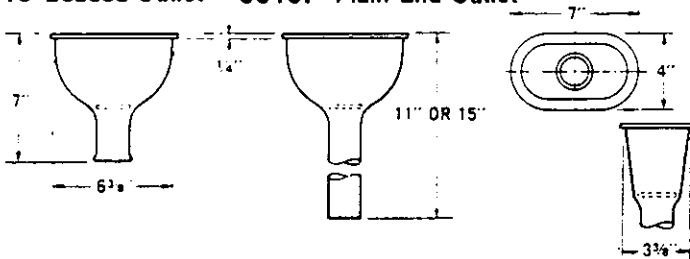
### 6" Hemispherical

### 6618 Beaded Outlet 6618P Plain End Outlet



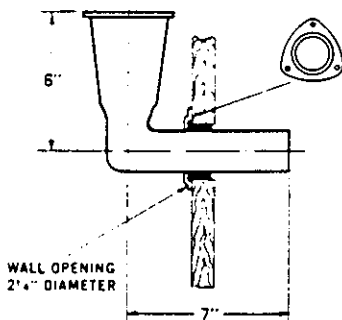
### 3" x 9" Oval

### 6619 Beaded Outlet 6619P Plain End Outlet

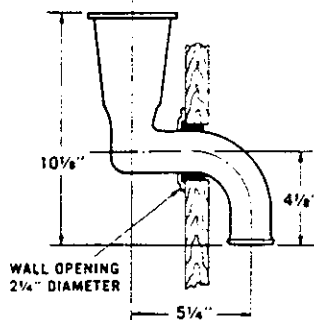


### 3" x 6" Oval

### 6627 3" x 6" Oval Horizontal, 1 1/2" Plain End Outlet



### 6628 3" x 6" Oval Vertical, 1 1/2" Outlet



### Wall Mounted Cup Sink

#### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1½")

#### Vertical Outlet

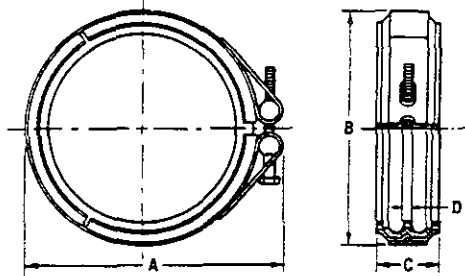
No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1½")

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1½") on outlet to connect to 2" expanded inlet. For No. 6628 assembly use No. 6650 1½" size KIMAX coupling.

## ACCESSORIES AND HARDWARE

**6650**

### Drainline Coupling (Bead to Bead)



No. 6650 Drainline Coupling is used for joining 1½", 2", 3" 4" and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

No. 6651 segmented stainless steel outer band

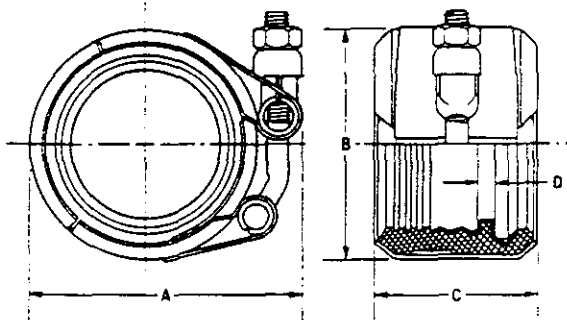
No. 6652 Buna-N rubber compression liner with TFE seal ring

No. 6653 stainless steel bolt

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28 x 2¾ |
| 2    | 3½ | 3⅛ | 1¾ | ¾ | ¼-28 x 2¾ |
| 3    | 4¾ | 4¼ | 1¾ | ¾ | ¼-28 x 2¾ |
| 4    | 6  | 5½ | 1½ | ¾ | ¼-28 x 3½ |
| 6    | 8¼ | 7¼ | 1¾ | ¾ | ¾-24 x 4  |

**6661**

### B/P\* Drainline Coupling (Bead to Plain End)



No. 6661 B/P Drainline Coupling is used for joining 1½", 2", 3" or 4" KIMAX beaded glass drainline to plain end (cut) glass pipe, lead, I.P.S. metal, or plastic pipe. This new exclusively designed KIMAX drainline coupling consists of the following components:

No. 6662 stainless steel band with bolt

No. 6663 Buna-N rubber compression liner with TFE seal ring

No. 6664 silver plated stainless steel hex nut

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2¾ | 1¾ | ¾ | ¼-28      |
| 2    | 3¾ | 3¼ | 1¾ | ¾ | ¼-28      |
| 3    | 4½ | 4¼ | 2¼ | ¾ | ¾-24      |
| 4    | 6  | 5¾ | 2¼ | ¾ | ¾-24      |

\*Patent Pending

## ACCESSORIES AND HARDWARE

6655

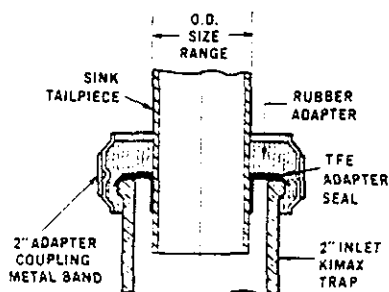
### Adapter Coupling

Patent Pending

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and/or fittings to plain end sink tailpieces.

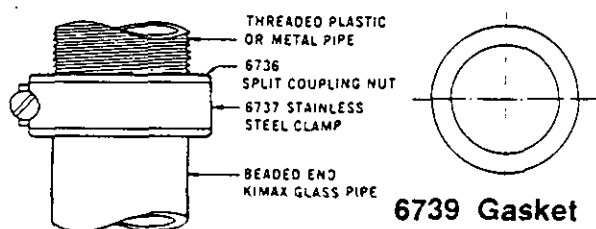
The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt,  $\frac{1}{4}$ " — 28 x  $2\frac{3}{4}$ "



| Size    | Tailpiece Style                                                                                                                                                            | O.D. Size Range |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2 x 1½" | KIMAX glass tail pipe Extension No. 6728, metal tubing, and lead tailpiece extensions                                                                                      | 1.48 to 1.53    |
| 2 x 1½" | Lead, Class D or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                              | 1.70 to 1.78    |
| 2 x 1½" | Plain end KIMAX Regular Schedule or Heavy Schedule 1½" glass pipe or fittings<br>Durcon *SO-2<br>Duriron *11713<br>Lead—Class C or L, B or M<br>Plastic or Steel (1½" IPS) | 1.82 to 1.90    |

6735



### 6739 Gasket

Use Gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe.

### 1½" Split Coupling (Threaded to Beaded Pipe)

No. 6735, 1½" Split Coupling is used to join 1½" beaded glass pipe to a threaded 1½" metal pipe.

The assembly consists of:

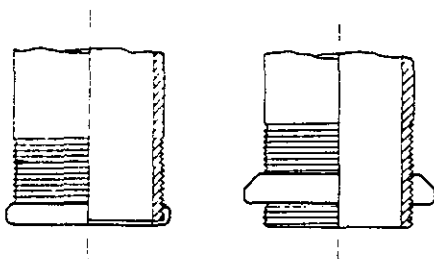
- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

To install, remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

6680

6685—Adjustable

### Thread Adapters (Threaded to Beaded Pipe)



Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6650 coupling. All TFE construction.

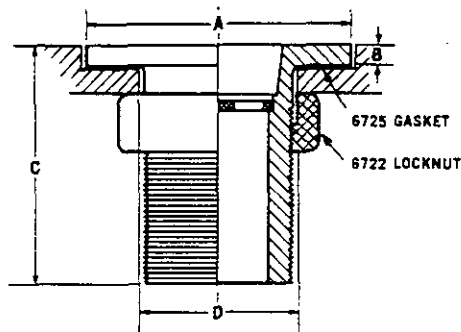
Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1½" metal to 1½" glass). Ideal for floor drain connections. In 1½", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1½" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1½" size only.

## ACCESSORIES AND HARDWARE

**6720** ( $1\frac{1}{2}$ " and 2" sizes)

**6720D** 2" —For Use With Sinks Having  $3\frac{1}{32}$ " Counterbore



### Sink Outlet Assembly

Consists of:

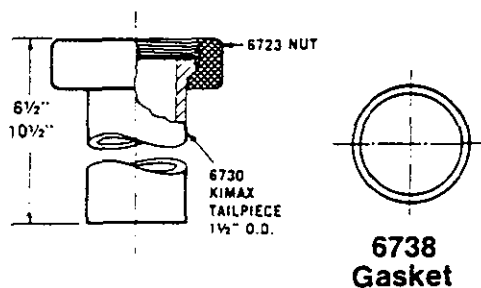
- 6724 sink strainer (black fluorocarbon plastic)
- 6721 and 6721D sink outlet (black fluorocarbon plastic)
- 6725 gasket—neoprene
- 6722 locknut

Note: Hand tighten 6722 locknut to sink. **DO NOT USE PIPE WRENCH.** To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent.  $1\frac{1}{2}$ " and 2" size sink outlets are designed to accept standard lead overflows.

|       | Size           | A              | B             | C              | D              |
|-------|----------------|----------------|---------------|----------------|----------------|
| 6720  | $1\frac{1}{2}$ | $3\frac{3}{4}$ | $\frac{1}{4}$ | $2\frac{3}{4}$ | 2              |
|       | 2              | $3\frac{1}{4}$ | $\frac{1}{4}$ | 3              | $2\frac{1}{4}$ |
| 6720D | 2              | $3\frac{3}{4}$ | $\frac{1}{4}$ | 3              | $2\frac{1}{4}$ |

For sink outlet tailpiece connections, see No. 6728 description below.

**6728**



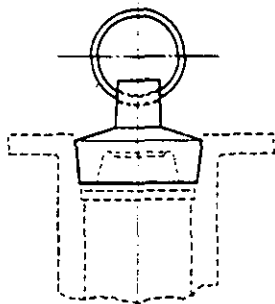
### $1\frac{1}{2}$ " Tailpiece Assembly

KIMAX tailpiece is available in  $6\frac{1}{2}$ " and  $10\frac{1}{2}$ " lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other  $1\frac{1}{2}$ " plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... **do not use pipe wrench.**

Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe.

**6726**

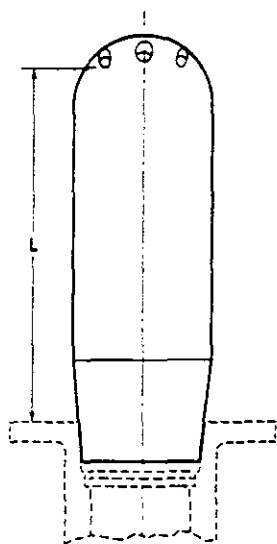


### Sink Stopper

No. 6726 Sink Stopper is available in  $1\frac{1}{2}$ " and 2" size in lead

## ACCESSORIES AND HARDWARE

6727

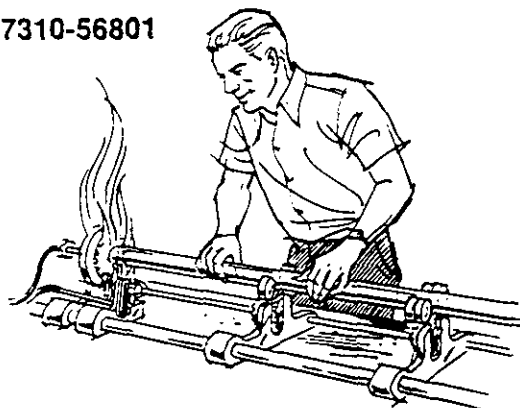


### Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" sink outlets only... 1½" beehive type can be modified by cutting off top beehive section.

| Sink Outlet<br>Size | Beehive Type<br>Length |    |    | Open Type<br>Length |    |    |
|---------------------|------------------------|----|----|---------------------|----|----|
|                     | 4"                     | 6" | 8" | 4"                  | 6" | 8" |
| 1½                  | —                      | —  | —  | —                   | —  | —  |
| 2                   | —                      | —  | —  | 4"                  | 6" | 8" |

7310-56801

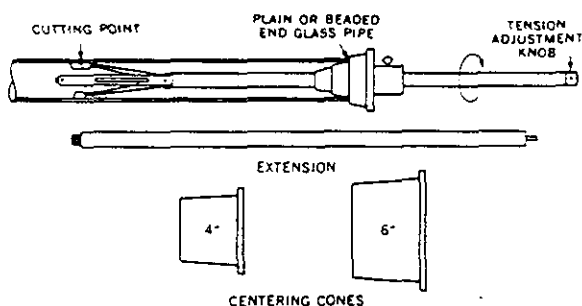


### KIMAX Portable Beading Kit

Used for field beading ½" through 6" glass pipe.

For more detailed information on the availability of the newest model kit (BK-5) and its operation, ask your KIMAX distributor or write the nearest O-I office listed on the back of this catalog.

7310-56802

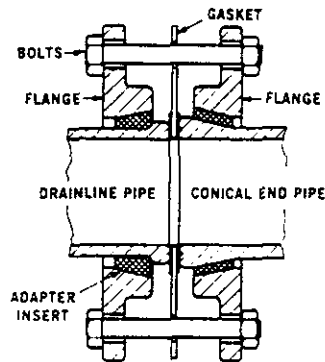


### KIMAX Portable Glass Pipe Cutter

With the KIMAX Portable Glass Pipe Cutter you can cut 1½" — 6" glass drainline anywhere on the job site. Complete cutter consists of a scoring head assembly, extension, tension arm sub-assembly and 1½" — 6" centering cones and ring stop as shown. Stocked and sold by your KIMAX Glass Drainline distributor.

## ACCESSORIES AND HARDWARE

7110



### Coupling Assembly

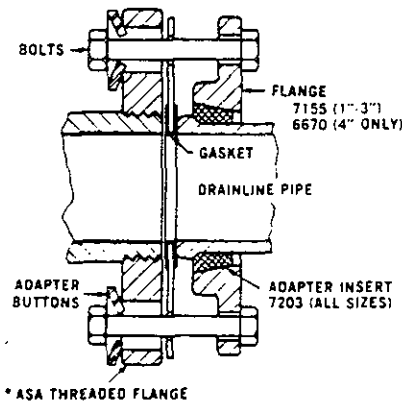
(Drainline to Conical End Pipe)

To join drainline glass pipe to conical end pipe. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

| Pipe Size | Style II Flanges Qty. No. | Adapter Insert Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size |
|-----------|---------------------------|-------------------------|-----------------|----------------------------|
| 1½        | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>⅝—18 x 2½        |
| 2         | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-1790<br>⅝—18 x 2½        |
| 3         | 2-7155                    | 1-7200<br>1-7203        | 1-7276          | 4-7190<br>⅝—18 x 3         |
| 4         | 1-6670<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>⅝—18 x 3         |
| 6         | 1-6670<br>1-7156          | 1-7203<br>1-7158        | 1-7276          | 8-7190<br>⅝—16 x 3         |

7120



### Coupling Assembly

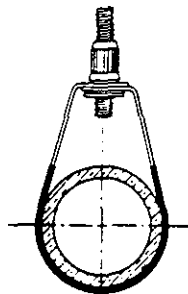
(Metal IPS to Beaded End Pipe)

To join drainline glass pipe to metal IPS threaded pipe. Kit includes flange, adapter insert, bolts, adapter buttons and TFE sheath gasket. ASA threaded flange not included.

| Pipe Size | Style II Flange Qty. No. | Adapter Insert Qty. No. | Adapter Buttons Qty. No. | Gasket Qty. No. | Bolts & Nuts Qty. No. Size |
|-----------|--------------------------|-------------------------|--------------------------|-----------------|----------------------------|
| 1         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>⅝—18 x 2½        |
| 1½        | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>⅝—18 x 2½        |
| 2         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>⅝—18 x 2½        |
| 3         | 1-7155                   | 1-7203                  | 4-7230                   | 1-7276          | 4-7190<br>⅝—18 x 3         |
| 4         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>⅝—18 x 3         |
| 6         | 1-6670                   | 1-7203                  | 8-7230                   | 1-7276          | 8-7190<br>⅝—18 x 3         |

\* Flange should be placed far enough on pipe to permit machining end of pipe to provide a flat bearing surface for beaded glass pipe

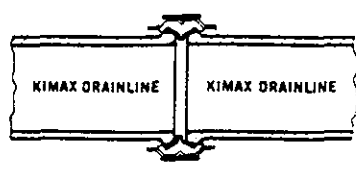
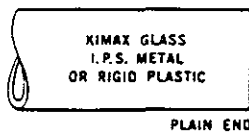
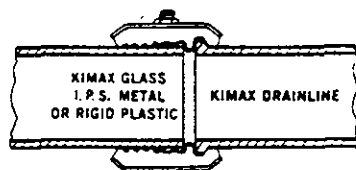
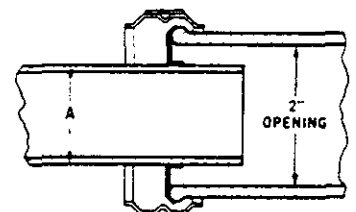
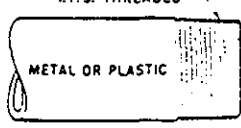
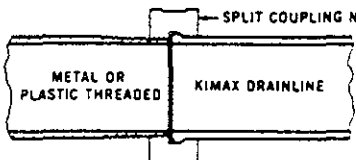
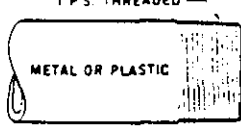
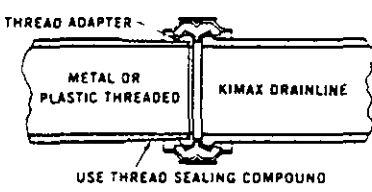
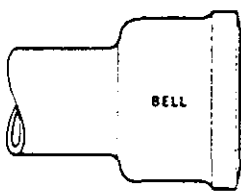
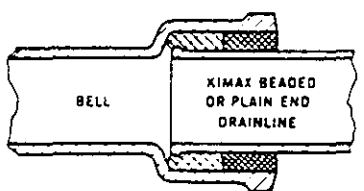
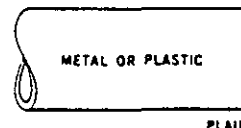
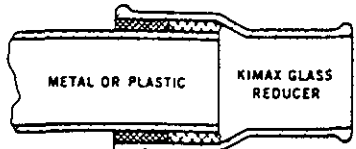
7290 (1½", 2", 3", 4", 6" sizes)



### Pipe Hangers (padded)

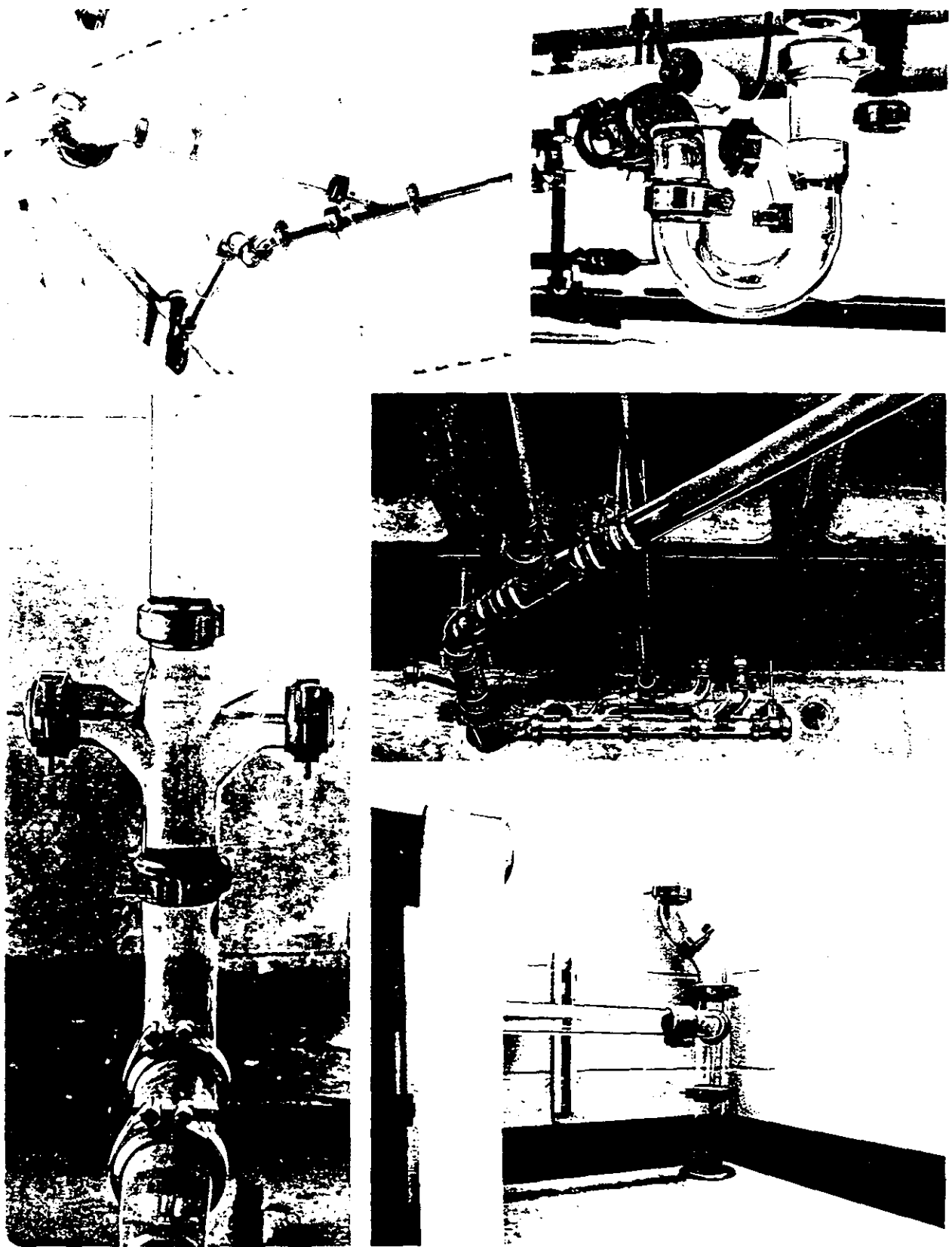
Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                             | Type of Joint                                                                                                                                                                               | Material Needed                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|-----------|-----------|---|-----------|-----------|
|  <p>KIMAX DRAINLINE<br/>BEADED</p>                                      |  <p>KIMAX DRAINLINE KIMAX DRAINLINE</p>                                                                    | <p><b>KIMAX Drainline Coupling 6650</b></p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650-1500</td></tr><tr><td>2</td><td>6650-2000</td></tr><tr><td>3</td><td>6650-3000</td></tr><tr><td>4</td><td>6650-4000</td></tr><tr><td>6</td><td>6650-6000</td></tr></table>                                                                                                                                                            | Size                       | Code No.             | 1½                   | 6650-1500 | 2         | 6650-2000 | 3         | 6650-3000 | 4         | 6650-4000 | 6         | 6650-6000 |   |           |           |   |           |           |
| Size                                                                                                                                                     | Code No.                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6650-1500                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6650-2000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6650-3000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6650-4000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6650-6000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC<br/>PLAIN END</p> |  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC KIMAX DRAINLINE</p>                                  | <p><b>KIMAX B/P Coupling 6661</b></p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6661-1500</td></tr><tr><td>2</td><td>6661-2000</td></tr><tr><td>3</td><td>6661-3000</td></tr><tr><td>4</td><td>6661-4000</td></tr></table>                                                                                                                                                                                                  | Pipe Size                  | Code No.             | 1½                   | 6661-1500 | 2         | 6661-2000 | 3         | 6661-3000 | 4         | 6661-4000 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6661-1500                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6661-2000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6661-3000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6661-4000                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>METAL OR<br/>RIGID PLASTIC<br/>PLAIN END</p>        |  <p>A 2" OPENING</p>                                                                                       | <p><b>KIMAX Adapter Coupling</b></p> <table><tr><th>'A' Dimension<br/>Pipe O.D.</th><th>Coupling<br/>Size</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>2 x 1½</td><td>6655-2015</td></tr><tr><td>1.70—1.78</td><td>2 x 1½</td><td>6655-2017</td></tr><tr><td>1.82—1.90</td><td>2 x 1½</td><td>6655-2018</td></tr></table>                                                                                                                        | 'A' Dimension<br>Pipe O.D. | Coupling<br>Size     | Code No.             | 1.48—1.53 | 2 x 1½    | 6655-2015 | 1.70—1.78 | 2 x 1½    | 6655-2017 | 1.82—1.90 | 2 x 1½    | 6655-2018 |   |           |           |   |           |           |
| 'A' Dimension<br>Pipe O.D.                                                                                                                               | Coupling<br>Size                                                                                                                                                                            | Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.48—1.53                                                                                                                                                | 2 x 1½                                                                                                                                                                                      | 6655-2015                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.70—1.78                                                                                                                                                | 2 x 1½                                                                                                                                                                                      | 6655-2017                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.82—1.90                                                                                                                                                | 2 x 1½                                                                                                                                                                                      | 6655-2018                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED<br/>METAL OR PLASTIC</p>                          |  <p>SPLIT COUPLING NUT<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE</p>                              | <p><b>KIMAX Split Coupling</b></p> <table><tr><th>Pipe Size</th><th>Coupling<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635-1500</td><td>6739-1500</td></tr></table>                                                                                                                                                                                                                                                         | Pipe Size                  | Coupling<br>Code No. | Gasket<br>Code No.   | 1½        | 6635-1500 | 6739-1500 |           |           |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Coupling<br>Code No.                                                                                                                                                                        | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6635-1500                                                                                                                                                                                   | 6739-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>I.P.S. THREADED<br/>METAL OR PLASTIC</p>                          |  <p>THREAD ADAPTER<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE<br/>USE THREAD SEALING COMPOUND</p> | <p><b>KIMAX Thread Adapter and<br/>Drainline Coupling</b></p> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680-1500</td><td>6650-1500</td></tr><tr><td>2</td><td>6680-2000</td><td>6650-2000</td></tr><tr><td>3</td><td>6680-3000</td><td>6650-3000</td></tr><tr><td>4</td><td>6680-4000</td><td>6650-4000</td></tr><tr><td>6</td><td>6680-6000</td><td>6650-6000</td></tr></table> | Pipe Size                  | Adapter<br>Code No.  | Coupling<br>Code No. | 1½        | 6680-1500 | 6650-1500 | 2         | 6680-2000 | 6650-2000 | 3         | 6680-3000 | 6650-3000 | 4 | 6680-4000 | 6650-4000 | 6 | 6680-6000 | 6650-6000 |
| Pipe Size                                                                                                                                                | Adapter<br>Code No.                                                                                                                                                                         | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6680-1500                                                                                                                                                                                   | 6650-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6680-2000                                                                                                                                                                                   | 6650-2000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6680-3000                                                                                                                                                                                   | 6650-3000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6680-4000                                                                                                                                                                                   | 6650-4000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6680-6000                                                                                                                                                                                   | 6650-6000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>BELL</p>                                                          |  <p>BELL KIMAX BEADED<br/>OR PLAIN END<br/>DRAINLINE</p>                                                 | <p><b>KIMAX Glass to Bell End Pipe</b></p> <ol style="list-style-type: none"><li>1. Pack hub half full with asbestos rope.</li><li>2. Caulk with hot lead, lead wool or acid proof cement.</li></ol> <p>For Detail, see Drainline Installation Manual.</p>                                                                                                                                                                                              |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>METAL OR PLASTIC<br/>PLAIN</p>                                    |  <p>METAL OR PLASTIC KIMAX GLASS<br/>REDUCER</p>                                                         | <p><b>KIMAX Glass to Plain End Metal<br/>or Plastic</b> For Detail, see Drainline<br/>Installation Manual.</p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536-2015</td></tr><tr><td>3 x 2</td><td>6536-3020</td></tr><tr><td>4 x 3</td><td>6536-4030</td></tr><tr><td>6 x 4</td><td>6536-6040</td></tr></table>                                                                                                         | Pipe Size                  | Code No.             | 2 x 1½               | 6536-2015 | 3 x 2     | 6536-3020 | 4 x 3     | 6536-4030 | 6 x 4     | 6536-6040 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2 x 1½                                                                                                                                                   | 6536-2015                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3 x 2                                                                                                                                                    | 6536-3020                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4 x 3                                                                                                                                                    | 6536-4030                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6 x 4                                                                                                                                                    | 6536-6040                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |



## TYPICAL KIMAX DRAINLINE INSTALLATIONS



# KIMAX DRAINLINE INSTALLATIONS

Over the past years, there have been hundreds of KIMAX Glass Drainline installations, while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

## SCHOOLS AND UNIVERSITIES

University of Louisville (Medical Complex)  
Stout State University (Wisconsin)  
Roanoke Virginia Community College  
University of Rochester  
Clemson University  
University of Southern California  
University of Utah  
University of New Mexico  
Northern Arizona State University  
Whittier College  
Colorado State University  
Central Washington State University  
University of Idaho  
California State College  
Western Reserve University  
University of Minnesota  
Southern Methodist  
Olivet College  
Toledo University  
Bay Village High School (Ohio)  
Washington University (St. Louis, Mo.)  
St. John High School (Indiana)  
Kansas State University  
Port Lavaca High School (Texas)  
University of Texas  
Brescia College  
Adrian College (Michigan)  
University of Nebraska  
Port Huron Community College  
Palmyra High School (Wisconsin)  
University of Florida  
University of Virginia  
Duke University  
North Carolina State University  
Florida State University  
Rutgers University

Tacoma High School  
Washington State University  
Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pomona College  
Sophia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami (Florida)  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Snohomish High School  
University of Washington  
City of Detroit  
University of Michigan  
North Shore Junior College, Houston  
Boston College

## INDUSTRIAL

3M Company  
General Aniline Film Corporation  
Abbott Laboratories  
Ling-Temco-Vought  
Armco Steel  
Monsanto Chemical  
General Electric  
Uni-Royal

Morton Salt  
Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohm & Haas  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office-Building, Boston  
B. F. Goodrich  
E. I. DuPont

## RESEARCH

Glidden-Durkee Research Center  
Upjohn Company  
Humble Oil Company  
Eli Lilly  
University of Wisconsin  
Miles Laboratories  
Parke-Davis  
A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Gilliam Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Reiter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
Texaco Experiment, Inc.

## HOSPITAL

Wesson Memorial Hospital (Massachusetts)  
University of Chicago (Illinois)  
Mayo Clinic (Minnesota)  
Houston Medical Center (Texas)  
St. Joseph's Hospital (Texas)  
Clarkston Hospital (Nebraska)  
Beaumont Hospital (Michigan)  
University of Louisville (Kentucky)  
Fairview Hospital (Minnesota)  
Columbia Hospital (Wisconsin)  
Lincoln Nebraska General Hospital  
Maynard Hospital, Seattle, Washington  
Boisford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minn.  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
Skin and Cancer Hospital, Philadelphia, Pennsylvania  
Germantown Hospital, Philadelphia, Pennsylvania  
Tyler Memorial Hospital, Meshoppen, Pennsylvania  
Emory University Hospital, Atlanta, Georgia  
Massachusetts General Hospital, Boston

## CANADIAN

Otto Mass Chemical Building,  
McGill University, Montreal  
Sherwin Williams, Montreal  
Smith, Kline & French Research Labs.  
University of Toronto Medical  
Science Building  
University of Alberta, Edmonton,  
Biological Sciences Building  
Department of Public Works Pathology  
Building, Halifax  
Ayerst, McKenna & Harrison, Montreal  
Moncton University, Moncton,  
New Brunswick  
Veterinary Diagnostic Laboratory, Regina  
Como Lake High School,  
Pt. Coquitlam, B.C.  
Tsawwassen School, Delta, B.C.  
St. Hyacinthe Agricultural Institute, Quebec

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One East Wacker Drive  
AC/312 321-0260

# OWENS-ILLINOIS

Toledo, Ohio 43601

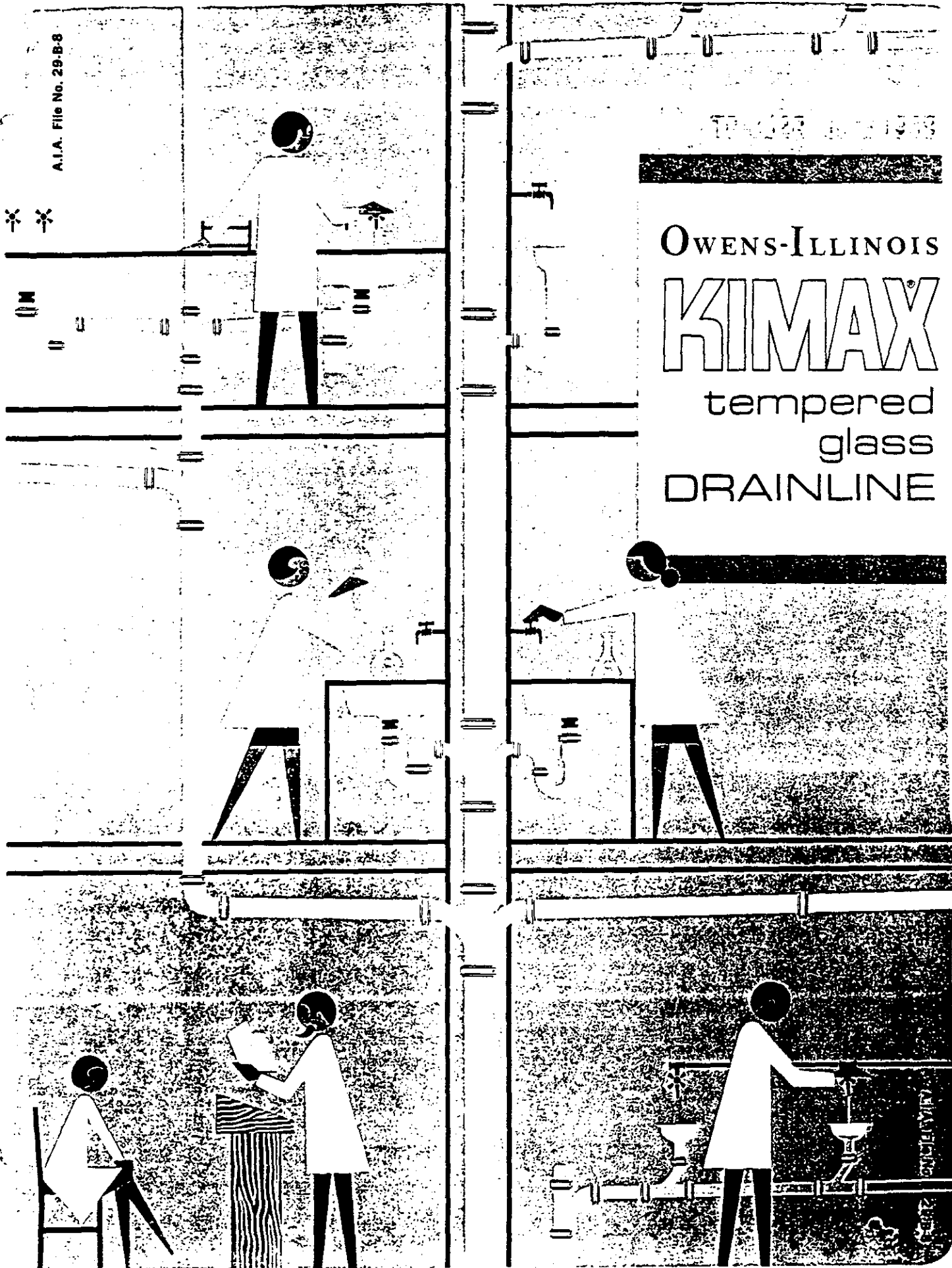


Distributed by



THURSDAY, 12-13-1953

OWENS-ILLINOIS  
**KIMAX®**  
tempered  
glass  
DRAINLINE



# KIMAX TEMPERED GLASS DRAINLINE

**...assured maximum corrosion resistance  
for chemical waste disposal systems**

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## KIMAX...the most efficient chemical waste and vent system

Research laboratories, teaching laboratories, and industrial processing plants have long had a need for chemical resistant waste disposal systems. To answer this need, Owens-Illinois has developed a borosilicate glass formula (KG-33) which is used in the manufacture of KIMAX drainline. This glass is rugged, resistant to chemical attack and can handle liquids from their freezing point up to 212 F continuously.\*

To make a drainline system truly chemically resistant, all couplings and accessories must have similar chemical resistant capabilities. KIMAX drainline couplings and accessories do have these features. The patented KIMAX coupling is manu-

\*For continuous operating temperatures above 212 F see your KIMAX representative for recommendations.

factured from 300 series stainless steel outer shell, Buna-N rubber compression liner and TFE\*\* seal ring. KIMAX sink outlets are manufactured from filled TFE fluorocarbon polymer, therefore, all wetted parts within a KIMAX drainline system are borosilicate glass or TFE.

## Building Owners

KIMAX glass drainline provides a most efficient low cost and maintenance free chemical waste disposal system. KIMAX drainline has a low initial installation cost and will assure the building owner many years of trouble-free service because:

- KIMAX drainline is manufactured from clear borosilicate glass so stoppages or lost articles can be detected by visual inspection.
- Low expansion borosilicate glass provides maximum protection against rapid temperature change when hot liquids are discharged into the pipe line.
- When laboratory layout changes must be made KIMAX drainline systems can be disassembled and reassembled to meet the new needs.
- All fittings and couplings are salvageable and straight lengths can be reused or cut to new dimensional requirements.

In addition to the borosilicate glass pipe and fittings, KIMAX drainline systems feature:

- Filled TFE sink outlets for maximum chemical resistance at the sink connection.
- All coupling joints are protected with TFE seal rings, therefore, all wetted surfaces of a KIMAX drainline system are made of either borosilicate glass or TFE plastic. This combination of material makes a truly chemical and heat resistant drainline system.

\*\*TFE is the abbreviation given by the Society of Plastic Industry to tetra-fluoro-ethylene resins or plastics—the most chemically and acid resistant plastic material in use today. KIMAX is a registered trademark of Owens-Illinois, Inc.

## Specifier

Architects and engineers are looking for new materials which will give new freedom in design with confidence in performance at reasonable installation costs. KIMAX tempered glass drainline offers this freedom, confidence and reasonable cost because:

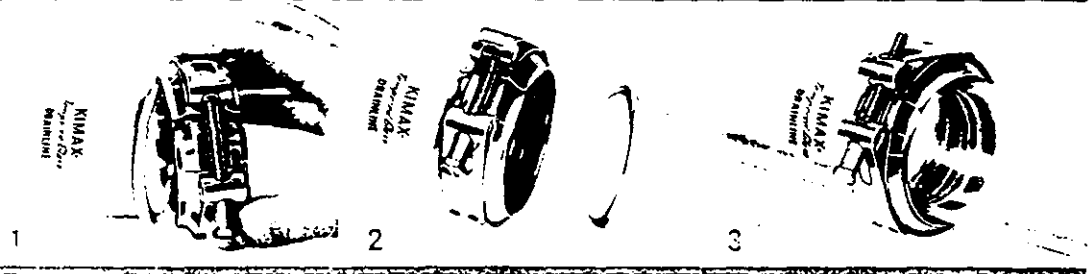
- All wetted parts of the system are borosilicate glass or TFE, thus, the "total" system is highly chemical resistant.
- The low expansion of KIMAX borosilicate glass eliminates the need for expansion joints.
- The light weight of the KIMAX systems requires

only 1/2 to 1/3 as many hangers as conventional high silica iron pipe.

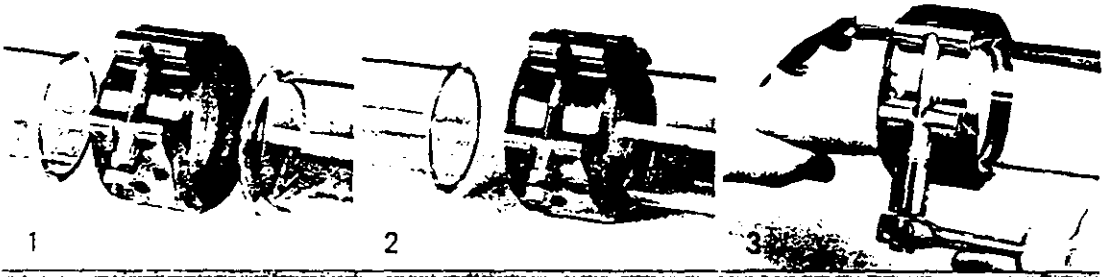
- Glass does not sag when exposed to boiling water, hangers can be placed up to 10' apart.
- Straight lengths of KIMAX pipe can be field cut to exact length.
- KIMAX pipe can be installed behind walls, over ceilings or underground with confidence.

With these design and chemical resistance features available to the architect and engineer, specification of KIMAX glass drainline can be made with confidence.

KIMAX  
Bead  
to Bead  
Drainline  
Coupling



KIMAX B/P  
Bead to  
Plain End  
Drainline  
Coupling



## INSTALLATION ADVANTAGES

Installation techniques for KIMAX Glass Drainline are simple, fast, and vary little from the standard procedures used in installing any drainline system. Detailed procedures and suggested installation practices of KIMAX Glass Drainline are found in KIMAX Drainline Installation Manual TR-427R. Owens-Illinois sales representatives and field engineers are specially trained to offer on-the-job aid and service for specific drainline system installations. KIMAX Drainline systems do provide certain installation advantages which are:

### ... Leak-Free Joint Assembly

The patented KIMAX Drainline coupling assembly makes a unified TFE to glass seal for maximum chemical resistance. After both ends of the glass pipe are inserted and properly seated in the wetted

coupling, a single bolt is tightened with a standard ratchet wrench or suitable tool (see photos above). The coupling permits the joint to be deflected up to 4°.

### ... Field Fabrication

KIMAX Glass Drainline can be easily fabricated to odd lengths at the job site with the use of a KIMAX field "beading kit," or by utilizing the new B/P (bead to plain end) coupling system.

### ... Minimum Number of Hangers

KIMAX Glass Drainline is so light and strong that comparatively fewer hangers are needed for proper installation. Consult KIMAX Drainline Installation Manual for recommended procedures.

## Other KIMAX installation advantages include:

### ... Below Ground Burial

KIMAX Tempered Glass Drainline may be safely specified and used for underground installations. Straight lengths are now available with a factory applied protective casing of thick expanded polystyrene. For recommended installation procedures



of KIMAX Drainline see Installation Manual. Shown here is an example of KIMAX Drainline as installed underground.

### ... Adaptation to Other Materials

KIMAX Glass Drainline can be readily and effectively adapted and joined to any other drainline material. Recommended adaptable materials and components are illustrated on Page 21.

### ... Easily Handled

KIMAX Glass Drainline is delivered to the job site in rugged shipper cartons. During installation, it is advisable to unpack only those sections and fittings needed for immediate fabrication or installation.

## Recommended KIMAX Drainline Uses

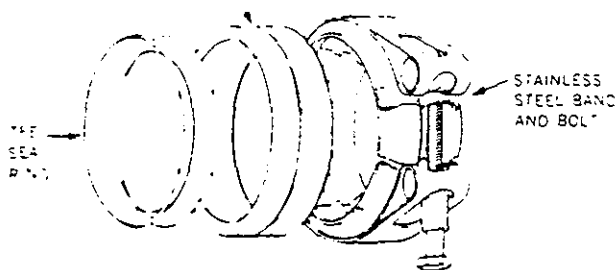
KIMAX Tempered Glass Drainline and vent systems are highly recommended as the specified medium of waste removal wherever chemical liquids present a disposal problem. It is particularly adaptable as drainline systems in secondary schools, and college and university buildings, where it is especially recommended for chemistry, biology, and biochemistry laboratories; veterinary and medi-

cal colleges, research, and other institutional laboratories.

KIMAX Glass Drainline has also found wide acceptance with efficient, low maintenance performance in industrial laboratories, hospitals, institutional or research laboratories, chemical or food processing plants ... wherever corrosive chemical or solvent wastes present a disposal problem.

## KIMAX Couplings Assure Quick, Positive Seal Joints

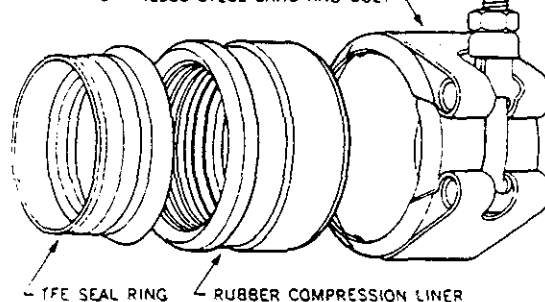
RUBBER COMPRESSION LINER



### KIMAX Drainline Coupling (Bead to Bead)

One of the most important components of a leak-free drainline system is the joint mechanism. KIMAX Drainline Coupling (No. 6650) with compression liner of Buna-N rubber and seal ring of tetra-fluoroethylene provide the required joint seal. Assembly of joint is simple ... place drainline ends into coupling (Page 3) and tighten one bolt. Disassembly is likewise as simple.

STAINLESS STEEL BAND AND BOLT



### KIMAX B/P Drainline Coupling (Beaded to Plain End)

This newly designed KIMAX Drainline Coupling (No. 6661) provides simplified assembly in the field of KIMAX (beaded) glass drainline to plain end (cut) glass pipe or lead, Schedule 40 plastic or metal pipe. It eliminates field beading of certain sizes of KIMAX glass drainline straight lengths ... saving up to 60% of all beading time on average installations. Consult KIMAX B/P Coupling Bulletin No. TR-93-A for further information.

# GUIDE SPECIFICATIONS

## LONG FORM: Acid Waste Drainline

### I. General

- A. Contractor shall furnish and install a complete acid-waste drainline and vent system as indicated. This system shall be made of tempered and annealed borosilicate glass conforming to Federal Specification DD-G-541A and as manufactured under the trade name "KIMAX" by Owens-Illinois.
- B. This system shall include all glass straight lengths, fittings and traps, compression type tetra-fluoro-ethylene lined couplings and padded hanger supports. It shall also include factory-protected heavy schedule pipe for underground burial and recommended adapter couplings to connect to other piping material where applicable.
- C. All pipe shall be installed free of strain in a manner to permit limited movement. Horizontal runs shall be supported by a padded hanger or hangers 8' to 10' on centers. Vertical risers shall be supported by padded riser clamps designed to restrict lateral and downward movement. Vertical risers up to 3" I.D. may be supported at every other floor level. Three inch I.D. and greater shall be supported at every floor level.

### II. Connections

- A. Glass-to-glass connections shall be made with KIMAX compression type couplings Article Nos. 6650 or 6661. Couplings outer shell, bolt and nut to be made from 300 series stainless steel. Coupling compression liner to be made from Buna-N Rubber. Sealing gasket to be made from tetra-fluoro-ethylene. When installed according to the manufacturer's recommendations they shall provide a leak-free joint when deflected up to 4°.
- B. Joints between glass and other types of piping material shall be made with KIMAX adapters and in accordance with manufacturer's recommendations.

### III. Protection of Pipe

- A. A glass pipe passing through walls or floor slabs shall be fitted with pipe sleeves a minimum 2" greater diameter than the pipe O.D. Space between pipe and sleeve shall be packed with fiber glass, glass wool and/or with a non-hardening approved caulking material.
- B. Glass pipe shall not be installed in direct contact with concrete. Fiber glass insulation or other type padding as approved by the pipe manufacturer shall be used to insulate between the two materials.
- C. Glass pipe shall be protected against all weld spatter.

### IV. Tests

Test in accordance with manufacturer's recommendations and local code requirements.

### V. Underground Pipe

- A. **Excavation**—shall conform to National Plumbing Code A 40.8 Section 2.7.
  - 1. Bottom of trench shall be properly compacted, graded, and the pipe supported throughout its entire length.
  - 2. At least 4" of properly compacted sand shall be used directly under the pipe.
- B. **Buried Pipe**
  - 1. Straight lengths shall be heavy schedule 5" lengths protected in factory-applied expanded polystyrene casing.
  - 2. All underground fittings shall be protected prior to back-filling by wrapping in factory supplied padded shipping bags, polyvinyl film (5 mil), Scotch Wrap or J. M. Trans-Tex or approved equal.
- C. **Backfill**  
Pipe trench shall be back-filled and tamped with sand or rock-free soil to 12" above top of pipe. Where space does not permit a minimum 12" cover, additional protection must be provided to protect pipe against crushing loads, except when buried under protective concrete slab.

### VI. Laboratory Sink Connection

Sink outlets, tailpieces, traps and cupsinks shall be KIMAX.

## SHORT FORM: Acid Waste Drainline

This system shall be made of KIMAX tempered and annealed borosilicate glass and conforming to Federal Specification DD-G-541-A and as manufactured by Owens-Illinois. Glass-to-glass connections shall be made with KIMAX compression type stainless steel couplings Article Nos. 6650 or 6661, with a tetra-fluoro-ethylene inner seal ring. This system shall be installed in accordance with the manufacturer's recommendations and the governing plumbing code.

Note: Where applicable

### Underground Glass Pipe

Excavation shall conform to National Plumbing Code A 40.8 Section 2.7. Bottom of trench shall consist of at least 4" of stone-free sand compacted and graded to provide uniform full length support. Back fill with rock free sand and/or soil to 12" above pipe. When the above conditions cannot be met, consult the manufacturer for his recommendation.

KIMAX factory-protected heavy schedule pipe, 5" lengths and wrapped fittings shall be installed in sand base and back filled in accordance with the manufacturer's instructions and governing plumbing code.



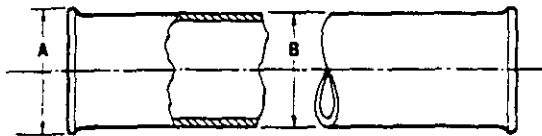
# PIPE AND FITTINGS

## Straight Lengths

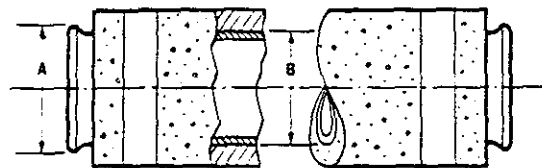
**6500** 5-ft. lengths

**6501** 10-ft. lengths

**6504** Nipple Stock (beaded one end only)



**6502 EPS\* Covered** 5-ft. lengths Heavy Schedule



\* Expanded Polystyrene

## Pipe

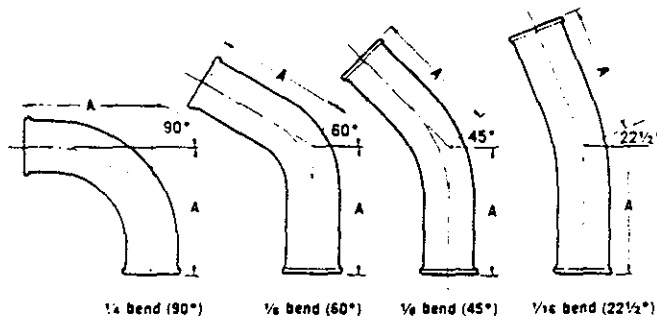
Standard lengths of KIMAX drainline pipe are 5 feet and 10 feet. Special lengths (both ends beaded) to a maximum of 15 feet may be ordered as special items.

| Size | Regular Schedule<br>(6500, 6501) |          | Heavy Schedule<br>(6502) |                    |
|------|----------------------------------|----------|--------------------------|--------------------|
|      | A                                | B (O.D.) | Weight<br>lbs./ft.       | Weight<br>lbs./ft. |
| 1½   | 2.06                             | 1.84     | 0.64                     | 0.87               |
| 2    | 2.58                             | 2.34     | 0.94                     | 1.1                |
| 3    | 3.69                             | 3.41     | 1.6                      | 2.0                |
| 4    | 4.84                             | 4.53     | 2.6                      | 3.4                |
| 6    | 7.12                             | 6.66     | 4.7                      | 6.3                |

KIMAX 6502 EPS covered drainline is designed and recommended for installation underground. Maximum length, for one piece, recommended for such installation is 5 feet.

Standard nipple stock is beaded one end and available in one foot increments up to 10 ft. All lengths are annealed and can be field cut.

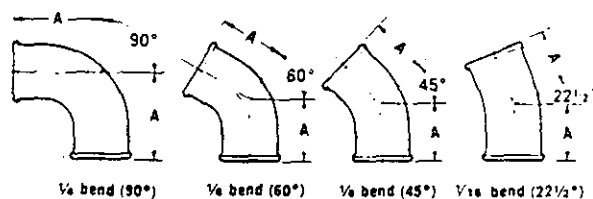
## 6511



## Sweeps

| Size | A  |
|------|----|
| 1½   | 4½ |
| 2    | 5  |
| 3    | 6½ |
| 4    | 9  |
| 6    | 12 |

## 6513



## Bends

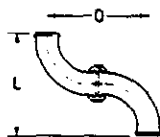
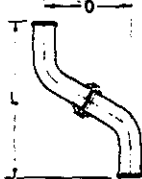
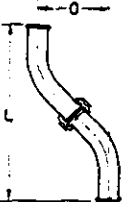
| Size | A<br>90° | A<br>60° | A<br>45° | A<br>22½° |
|------|----------|----------|----------|-----------|
| 1½   | 3        | 2½       | 2        | 2         |
| 2    | 3½       | 2¾       | 2¼       | 2¼        |
| 3    | 5        | 3½       | 2¾       | 2¾        |
| 4    | 7        | 4½       | 3¼       | 3¼        |

# PIPE AND FITTINGS

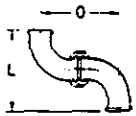
## Offsets Made Using Standard Sweeps and Bends

Because of a wide variety of offset requirements, use a combination of bends (6511 and/or 6513). Order quantity of bends and KIMAX couplings (No. 6650) to satisfy offset dimensional requirements. Combinations do not come equipped with couplings.

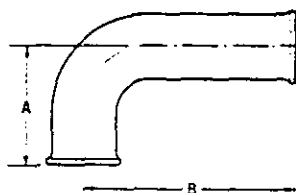
### 6511 Sweep Offsets

|       |  |    |  |        |  |        |  |       |
|-------|-----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|-------|
| Size  | L                                                                                 | O  | L                                                                                 | O      | L                                                                                   | O      | L                                                                                   | O     |
| 1 1/2 | 9                                                                                 | 9  | 13 1/2                                                                            | 7 1/2  | 15 1/2                                                                              | 6 1/2  | 17 1/2                                                                              | 3 1/2 |
| 2     | 10                                                                                | 10 | 15                                                                                | 8 1/2  | 17 1/2                                                                              | 7 1/2  | 19 1/2                                                                              | 3 1/2 |
| 3     | 13                                                                                | 13 | 19 1/2                                                                            | 11 1/2 | 22 1/2                                                                              | 9 1/2  | 25                                                                                  | 5     |
| 4     | 18                                                                                | 18 | 27                                                                                | 15 1/2 | 30 1/2                                                                              | 12 1/2 | 34 1/2                                                                              | 6 1/2 |
| 6     | 24                                                                                | 24 | 36                                                                                | 20 1/2 | 41                                                                                  | 17     | 46 1/2                                                                              | 9 1/2 |

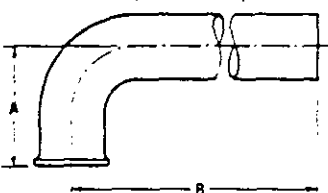
### 6513 Bend Offsets

|      |  |       |  |       |  |       |  |       |
|------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|-------|
| Size | L                                                                                   | O     | L                                                                                   | O     | L                                                                                     | O     | L                                                                                     | O     |
| 1    | 6                                                                                   | 6     | 7 1/2                                                                               | 4 1/2 | 6 1/2                                                                                 | 2 1/2 | 7 1/2                                                                                 | 1 1/2 |
| 2    | 5                                                                                   | 6 1/2 | 8 1/2                                                                               | 4 1/2 | 7 1/2                                                                                 | 3 1/2 | 8 1/2                                                                                 | 1 1/2 |
| 3    | 10                                                                                  | 10    | 10 1/2                                                                              | 6 1/2 | 9 1/2                                                                                 | 3 1/2 | 10 1/2                                                                                | 2 1/2 |
| 4    | 14                                                                                  | 14    | 13 1/2                                                                              | 7 1/2 | 11 1/2                                                                                | 4 1/2 | 10 1/2                                                                                | 2 1/2 |

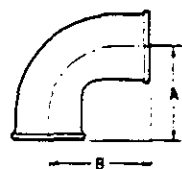
### 6512



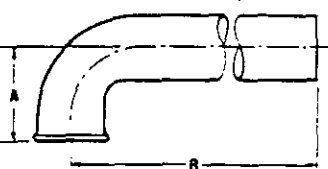
### 6512P (Annealed)\*



### 6514



### 6514P (Annealed)\*



## Special Purpose Bends

|      | 6512  |       | 6512P |    | 6514  |       | 6514P |    |
|------|-------|-------|-------|----|-------|-------|-------|----|
| Size | A     | B     | A     | B  | A     | B     | A     | B  |
| 1    | 3 1/2 | 6     | 3 1/2 | 12 | 2 1/2 | 3     | 2 1/2 | 12 |
| 2    | 3 1/2 | 7 1/2 | 3 1/2 | 12 | 3     | 3 1/2 | 3     | 12 |

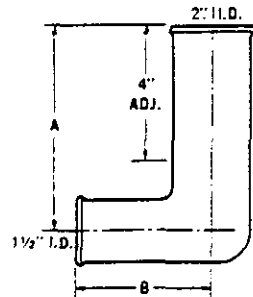
\*Can be field cut

Use catalog dimensions for piping layout as gasket thickness allowance is included.

## PIPE AND FITTINGS

6517

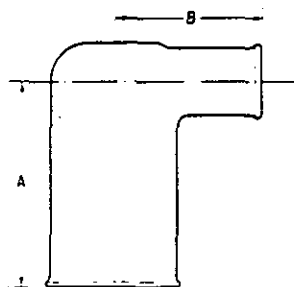
Adjustable 1/4 Bend



| Size      | A | B |
|-----------|---|---|
| 1 1/2 x 2 | 6 | 4 |

6518

Quarter Bend Reducer

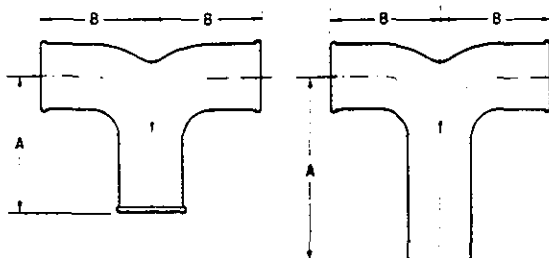


| Size      | A | B     |
|-----------|---|-------|
| 2 x 1 1/2 | 4 | 3 1/2 |
| 3 x 1 1/2 | 5 | 4     |
| 3 x 2     | 5 | 4 1/2 |
| 4 x 1 1/2 | 7 | 4 1/2 |
| 4 x 2     | 7 | 5     |
| 4 x 3     | 7 | 5 1/2 |
| 6 x 1 1/2 | 9 | 5 1/2 |
| 6 x 2     | 9 | 6     |
| 8 x 3     | 9 | 6 1/2 |
| 6 x 4     | 9 | 8     |

6533

6533P (Annealed)\*

Double Quarter Bend

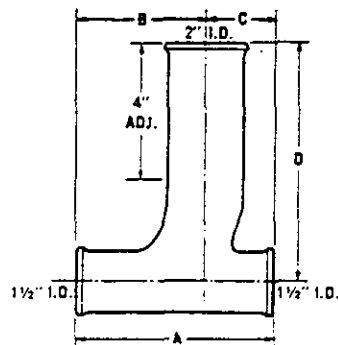


| Size  | 6533   |       | 6533P |       |
|-------|--------|-------|-------|-------|
|       | A      | B     | A     | B     |
| 1 1/2 | 3 3/4  | 3 1/2 | 10    | 3 1/2 |
| 2     | 5      | 4 1/2 | 10    | 4 1/2 |
| 3     | 7 1/4  | 6 3/4 |       |       |
| 4     | 8 3/4  | 8 1/4 |       |       |
| 6     | 12 3/4 | 12    |       |       |

\*Can be field cut

## PIPE AND FITTINGS

6520



**Adjustable Sanitary T**

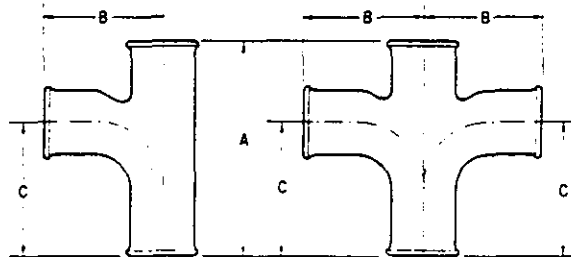
(One Adjustable Inlet)

| Size        | A | B  | C  | D |
|-------------|---|----|----|---|
| 1½ x 1½ x 2 | 6 | 3⅞ | 2⅞ | 7 |

6521 Single

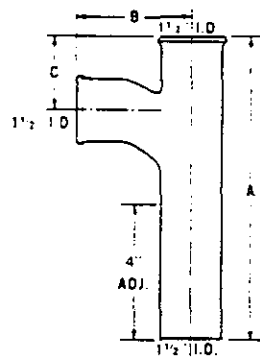
6522 Double

**Sanitary T**



| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 3½ | 3¾  |
| 2 x 1½  | 8  | 3¾ | 5   |
| 2 x 2   | 8  | 4½ | 5   |
| 3 x 1½  | 12 | 4¾ | 7¼  |
| 3 x 2   | 12 | 5  | 7¼  |
| 3 x 3   | 12 | 6¾ | 7¼  |
| 4 x 1½  | 14 | 4¾ | 8¾  |
| 4 x 2   | 14 | 5¾ | 8¾  |
| 4 x 3   | 14 | 7  | 8¾  |
| 4 x 4   | 14 | 8¼ | 8¾  |
| 6 x 2   | 20 | 6¾ | 12¾ |
| 6 x 3   | 20 | 8  | 12¾ |
| 6 x 4   | 20 | 9¾ | 12¾ |
| 6 x 6   | 20 | 12 | 12¾ |

6525 and 6525R\* (Annealed)‡



**Adjustable Sanitary T**

(Plain End Outlet)

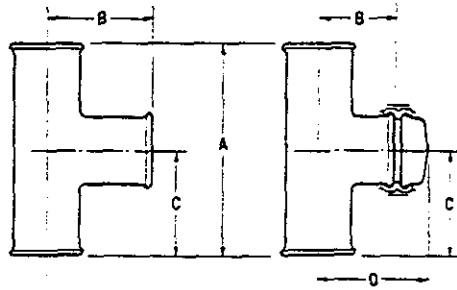
|       | Size         | A  | B  | C  |
|-------|--------------|----|----|----|
| 6525  | 1½ x 1½ x 1½ | 8¾ | 3½ | 2⅞ |
| 6525R | 1½ x 1½ x 1½ | 8¾ | 3½ | 3½ |

\*No. 6525R differs from No. 6525 in length of "C" dimension only

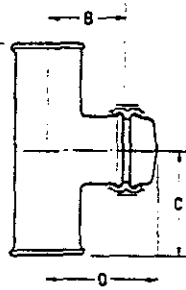
‡Can be field cut.

# PIPE AND FITTINGS

**6523 Straight T**



**6524 Test T with Cleanout**



**Straight T**

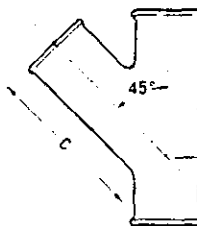
| Size    | A  | B  | C  |
|---------|----|----|----|
| 1½ x 1½ | 6  | 3  | 3  |
| 2 x 1½  | 8  | 3½ | 4  |
| 2 x 2   | 8  | 4  | 4  |
| 3 x 2   | 12 | 4½ | 6  |
| 3 x 3   | 12 | 6  | 6  |
| 4 x 2   | 14 | 5  | 7  |
| 4 x 3   | 14 | 6½ | 7  |
| 4 x 4   | 14 | 8  | 7  |
| 6 x 3   | 20 | 7¾ | 10 |
| 6 x 4   | 20 | 9  | 10 |
| 6 x 6   | 20 | 10 | 10 |

**Test T with Cleanout**

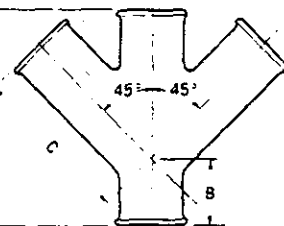
| Size    | A  | B  | C | D  |
|---------|----|----|---|----|
| 1½ x 1½ | 6  | 2½ | 3 | 3½ |
| 2 x 2   | 8  | 2½ | 4 | 3½ |
| 3 x 3   | 12 | 3½ | 6 | 4½ |
| 4 x 4   | 14 | 4½ | 7 | 5½ |

Test Tee and cleanout comes as complete assembly including cap and coupling.

**6526 Single**



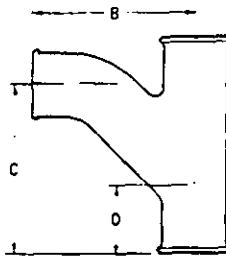
**6527 Double**



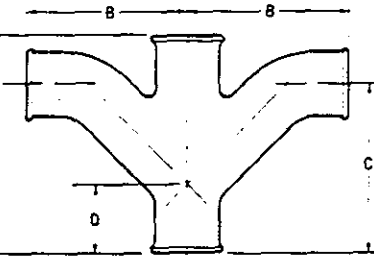
**Drainline Y**

| Size    | A  | B  | C   |
|---------|----|----|-----|
| 1½ x 1½ | 6  | 1¾ | 4½  |
| 2 x 1½  | 8  | 2½ | 4¾  |
| 2 x 2   | 8  | 2½ | 6   |
| 3 x 1½  | 12 | 3¾ | 5½  |
| 3 x 2   | 12 | 3¾ | 6¾  |
| 3 x 3   | 12 | 3¾ | 8   |
| 4 x 1½  | 14 | 4½ | 6¾  |
| 4 x 2   | 14 | 4½ | 7½  |
| 4 x 3   | 14 | 4½ | 8¾  |
| 4 x 4   | 14 | 4½ | 10  |
| 6 x 2   | 20 | 5¾ | 9   |
| 6 x 3   | 20 | 5¾ | 10¾ |
| 6 x 4   | 20 | 5¾ | 11½ |
| 6 x 6   | 20 | 5¾ | 14  |

**6528 Single**



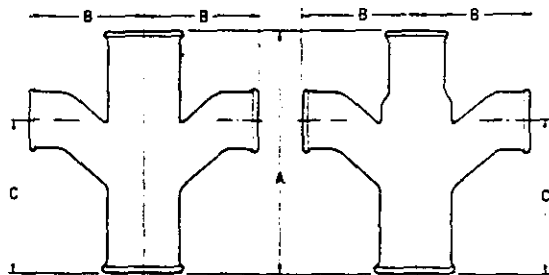
**6529 Double**



**Combination Y and 1/8 Bend**

| Size    | A  | B  | C   | D  |
|---------|----|----|-----|----|
| 1½ x 1½ | 6  | 4½ | 4¾  | 1¾ |
| 2 x 1½  | 8  | 4¾ | 5½  | 2½ |
| 2 x 2   | 8  | 6  | 6½  | 2½ |
| 3 x 1½  | 12 | 5¾ | 7½  | 3¾ |
| 3 x 2   | 12 | 6½ | 8   | 3¾ |
| 3 x 3   | 12 | 8½ | 9   | 3¾ |
| 4 x 1½  | 14 | 6  | 8½  | 4½ |
| 4 x 2   | 14 | 7  | 9½  | 4½ |
| 4 x 3   | 14 | 9  | 10½ | 4½ |
| 4 x 4   | 14 | 11 | 11  | 4½ |
| 6 x 2   | 20 | 8¾ | 11¾ | 5¾ |
| 6 x 3   | 20 | 10 | 12½ | 5¾ |
| 6 x 4   | 20 | 12 | 13½ | 5¾ |
| 6 x 6   | 20 | 15 | 14½ | 5¾ |

**6531**



**Partition Cross (Compact)**

| Size             | A | B  | C |
|------------------|---|----|---|
| 2 x 1½           | 8 | 3¾ | 5 |
| 2 x 2            | 8 | 4½ | 5 |
| 2 x 1½ x 1½ x 1½ | 8 | 3¾ | 5 |

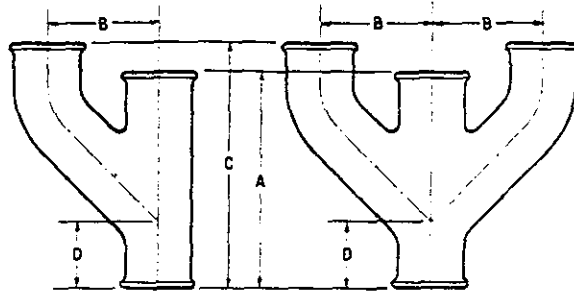
Partition crosses are designed to prevent cross-flow when sinks are connected back to back.

## PIPE AND FITTINGS

6532 Single

6534 Double

Upright Y or H (vent branch)



| Size     | A  | B  | C** | D   |
|----------|----|----|-----|-----|
| *1½ x 1½ | 6  | 3  | 6¾  | 17½ |
| *2 x 1½  | 8  | 3½ | 7¾  | 21½ |
| *2 x 2   | 8  | 4  | 8¾  | 21½ |
| 3 x 1½   | 12 | 3¾ | 9½  | 3¾  |
| 3 x 2    | 12 | 4½ | 10¾ | 3¾  |
| 3 x 3    | 12 | 6  | 13  | 3¾  |
| 4 x 1½   | 14 | 4¾ | 10¾ | 4½  |
| 4 x 2    | 14 | 5  | 12  | 4½  |
| 4 x 3    | 14 | 6½ | 14½ | 4½  |
| 4 x 4    | 14 | 8  | 16¾ | 4½  |
| 6 x 3    | 20 | 7¾ | 16¾ | 5¾  |
| 6 x 4    | 20 | 9  | 19  | 5¾  |
| 6 x 6    | 20 | 12 | 24  | 5¾  |

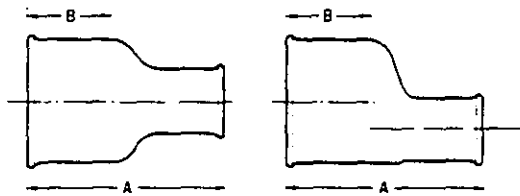
\* Double, available in these sizes only

\*\* "C" dimension may be longer or shorter than "A"

6536 Straight

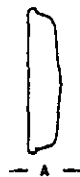
6537 Eccentric

Reducers or Increases



| Size   | A | B (min.) |
|--------|---|----------|
| 2 x 1½ | 4 | 1¾       |
| 3 x 1½ | 5 | 2½       |
| 3 x 2  | 5 | 2½       |
| 4 x 1½ | 7 | 3        |
| 4 x 2  | 7 | 3        |
| 4 x 3  | 7 | 3        |
| 6 x 1½ | 9 | 4        |
| 6 x 2  | 9 | 4        |
| 6 x 3  | 9 | 4        |
| 6 x 4  | 9 | 4        |

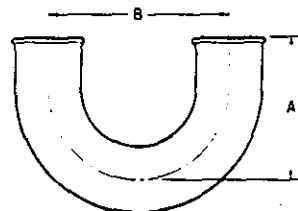
6544



Cleanout Plug

| Size | A   |
|------|-----|
| 1½   | 7/8 |
| 2    | 1   |
| 3    | 1½  |
| 4    | 1¾  |
| 6    | 1½  |

6550



U Bend (vent loop)

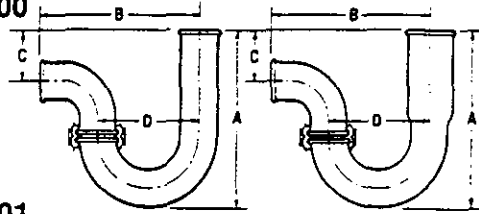
| Size | A  | B  |
|------|----|----|
| 1½   | 4  | 5  |
| 2    | 4½ | 5½ |
| 3    | 5½ | 6½ |
| 4    | 6½ | 7½ |
| 6    | 8½ | 10 |

Note: U bends (annealed only) are often used for vent loops. No 6562 outlets on Swivel "S" Traps are also used as vent loops

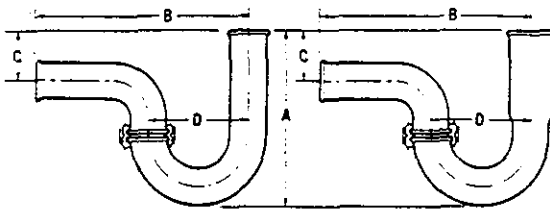
# DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

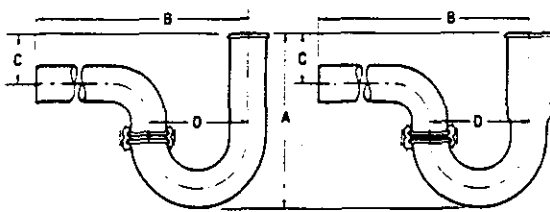
6700



6701



6704 (Plain End Outlet\*)



## Swivel Trap—P Style

No. 6700 (short outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 8  | 2½ | 5  | 3½            |
| 2 x 1½                 | 8¾ | 8  | 2½ | 5  | 3½            |
| 2 x 2                  | 9⅞ | 8½ | 1½ | 5½ | 4½            |

No. 6701 (long outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6512 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B  | C  | D  | Seal<br>Depth |
|------------------------|----|----|----|----|---------------|
| 1½ x 1½                | 8¾ | 11 | 1½ | 5  | 3½            |
| 2 x 1½                 | 8¾ | 11 | 1½ | 5  | 3½            |
| 2 x 2                  | 9⅞ | 13 | 1½ | 5½ | 5½            |

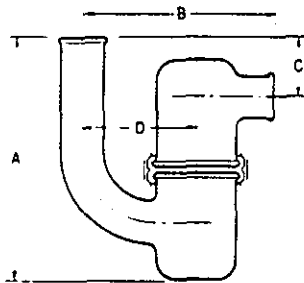
No. 6704 (plain end outlet) Swivel "P" Trap assembly consists of a No. 6705 inlet with a No. 6514 P plain end outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A  | B   | C  | D  | Seal<br>Depth |
|------------------------|----|-----|----|----|---------------|
| 1½ x 1½                | 8¾ | 17  | 2½ | 5  | 3½            |
| 2 x 1½                 | 8¾ | 17  | 2½ | 5  | 3½            |
| 2 x 2                  | 9⅞ | 17½ | 1½ | 5½ | 4½            |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

\* Annealed outlet, can be field cut.

6710



## Swivel Drum Trap—P Style

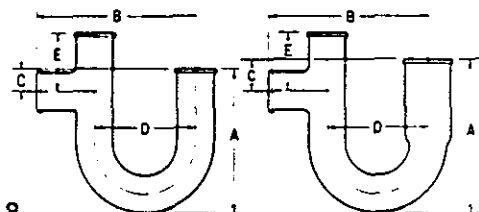
No. 6710 Swivel Drum "P" Trap assembly consists of a No. 6715 inlet with a No. 6716 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A   | B  | C  | D  | Body<br>I.D. | Seal<br>Depth |
|------------------------|-----|----|----|----|--------------|---------------|
| 1½ x 1½                | 10¾ | 8  | 2½ | 4½ | 3            | 3½            |
| 2 x 1½                 | 10¾ | 8  | 2½ | 4½ | 3            | 3½            |
| 2 x 2                  | 11  | 9¾ | 3  | 5½ | 4            | 3½            |

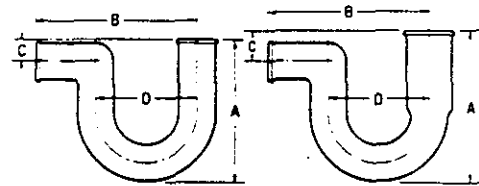
Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

No. 6709 Swivel Drum "P" Trap has a 4" body in the 1½ x 1½ and 2 x 1½ sizes only.

6713 (Vented)



6718



## Trap—P Style

| Size<br>Inlet x Outlet | Vent<br>Size | A   | B   | C  | D  | E  | Seal<br>Depth |
|------------------------|--------------|-----|-----|----|----|----|---------------|
| 1½ x 1½                | 1½           | 7   | 8   | 1  | 5  | 3  | 3½            |
| 2 x 1½                 | 1½           | 7½  | 8   | 1½ | 5  | 3  | 3½            |
| 2 x 2                  | 2            | 8¾  | 8½  | 1½ | 5½ | 3½ | 3½            |
| 3 x 3                  | 3            | 10¾ | 10½ | 2  | 6½ | 4  | 3½            |
| 4 x 4                  | 4            | 12¾ | 12½ | 2½ | 7½ | 5  | 3½            |
| 6 x 6                  | 4            | 16¾ | 17  | 3½ | 10 | 7  | 2½            |

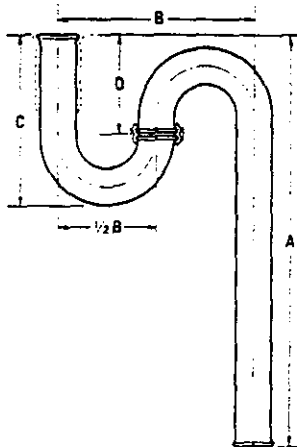
\* Has expanded inlet. Use No. 6655 adapter coupling for inlet joint.

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

## DRAINLINE TRAPS

Expanded inlets of traps have 4" minimum depth to permit adjustment.

6703



### Swivel Trap—S Style

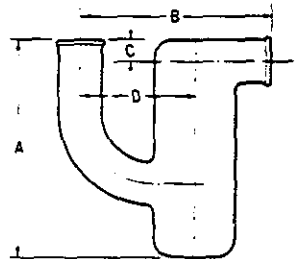
No. 6703 Swivel "S" Trap consists of a No. 6705 inlet with a No. 6562 outlet and a No. 6650 KIMAX coupling at the swivel joint.

| Size<br>Inlet x Outlet | A      | B  | C     | D     | Seal<br>Depth |
|------------------------|--------|----|-------|-------|---------------|
| 1 1/2 x 1 1/2          | 20 3/4 | 10 | 8 3/4 | 5     | 4 1/2         |
| 2 x 1 1/2              | 20 3/4 | 10 | 8 3/4 | 5     | 4 1/2         |
| 2 x 2                  | 20 3/4 | 11 | 9 1/4 | 4 3/4 | 5 1/2         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

Annealed outlet, can be field cut.

6707

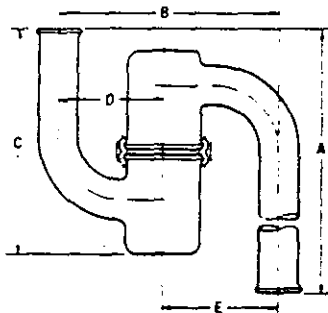


### Drum Trap—P Style

| Size<br>Inlet x Outlet | A     | B     | C     | D     | Body<br>I.D. | Seal<br>Depth |
|------------------------|-------|-------|-------|-------|--------------|---------------|
| 1 1/2 x 1 1/2          | 9     | 8     | 1     | 4 3/4 | 3            | 3 1/2         |
| 2 x 1 1/2              | 9     | 8     | 1 1/2 | 4 3/4 | 3            | 3 1/2         |
| 2 x 2                  | 9 3/4 | 9 1/4 | 2     | 5 1/2 | 4            | 3 1/2         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

6712



### Swivel Drum Trap—S Style

No. 6712 Swivel Drum Trap assembly consists of one No. 6715 inlet and one No. 6717 outlet with a No. 6650 KIMAX coupling at the swivel joint.

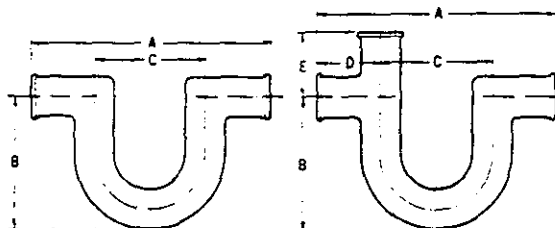
| Size<br>Inlet x Outlet | A      | B      | C      | D     | E     | Body<br>I.D. | Seal<br>Depth |
|------------------------|--------|--------|--------|-------|-------|--------------|---------------|
| 1 1/2 x 1 1/2          | 20 3/4 | 10     | 10 1/4 | 4 1/4 | 5 1/4 | 3            | 3 3/4         |
| 2 x 1 1/2              | 20 3/4 | 10     | 10 1/4 | 4 1/4 | 5 1/4 | 3            | 3 3/4         |
| 2 x 2                  | 20 3/4 | 11 1/4 | 11     | 5 1/2 | 5 3/4 | 4            | 3 3/4         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.

Annealed outlet, can be field cut.

6770

6771 (Vented)



### Running Trap

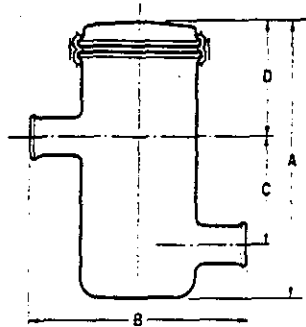
| Size<br>Inlet x Outlet | Vent<br>Size | A      | B      | C     | D     | E     | Seal<br>Depth |
|------------------------|--------------|--------|--------|-------|-------|-------|---------------|
| 1 1/2 x 1 1/2          | 1 1/2        | 11     | 6      | 5     | 3     | 3     | 3 1/2         |
| 2 x 2                  | 2            | 12     | 6 1/2  | 5 1/2 | 3 1/2 | 3 1/2 | 3 1/2         |
| 3 x 3                  | 3            | 14 1/2 | 8 1/4  | 6 1/2 | 4     | 4     | 3 1/2         |
| 4 x 4                  | 4            | 17 1/2 | 9 3/4  | 7 1/2 | 5     | 5     | 3 1/2         |
| 6 x 6                  | 6            | 24     | 12 3/4 | 10    | 7     | 7     | 3 1/2         |

Traps available with either A or B type cleanout. See Standard Cleanouts, Page 14.



## DRAINLINE TRAPS

6576



### Drum Trap (top cleanout)

No. 6576 Drum Trap assembly consists of a No. 6577, 6" glass body, a No. 6544 short cleanout plug and a 6", No. 6650 KIMAX coupling.

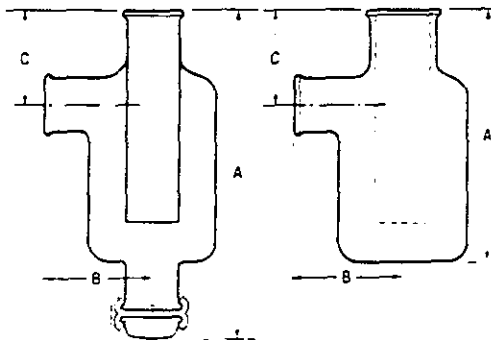
| Size<br>Inlet x Outlet | A      | B      | C     | D     | Body<br>ID | Seal<br>Depth |
|------------------------|--------|--------|-------|-------|------------|---------------|
| 1 1/2 x 1 1/2          | 13 3/4 | 10 1/2 | 4 1/2 | 5 7/8 | 6          | 3             |

\*Special order

6612

6614

### Partition Trap



No. 6612 Partition Trap with sealed-in partition is available in 1 1/2" and 2" sizes only. Standard with B type cleanout only.

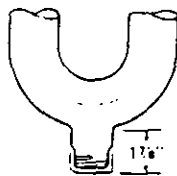
| Size<br>Inlet x Outlet | A      | B     | C     | Seal<br>Depth |
|------------------------|--------|-------|-------|---------------|
| 1 1/2 x 1 1/2          | 11 1/4 | 3 3/4 | 3 1/4 | 3 1/4         |
| 2 x 2                  | 12 1/4 | 5 1/4 | 4 1/4 | 3 1/4         |

No. 6614 Partition Trap is available with 1 1/2" and 2" outlets only. 1 1/2" outlet trap has 2" inlet to accept No. 6655 adapter coupling.

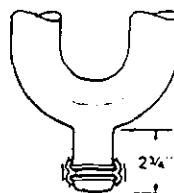
| Size<br>Inlet x Outlet | A     | B     | C     |
|------------------------|-------|-------|-------|
| 2 x 1 1/2              | 8 1/2 | 3 3/4 | 3 1/4 |

Both traps are non-siphoning with partition always visible.

### Type A



### Type B



### Standard Cleanouts

Standard drainline trap cleanout Type A is fitted with a phenolic screw type cap with TFE liner (No. 6675). Type B cleanout consists of a No. 6650 standard KIMAX coupling (1 1/2") and a No. 6544 short gasket cap (1 1/2").

### Ordering Information

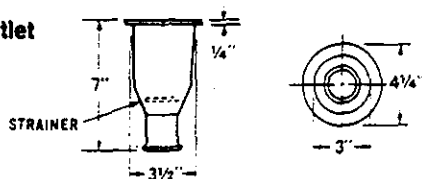
To order standard traps with cleanouts use catalog number for proper style and add the letter A or B for desired cleanout style.

For correct layout dimensions add 1 7/8" to overall trap height for cleanout Type A, or 2 3/4" for cleanout Type B.

## CUP SINKS

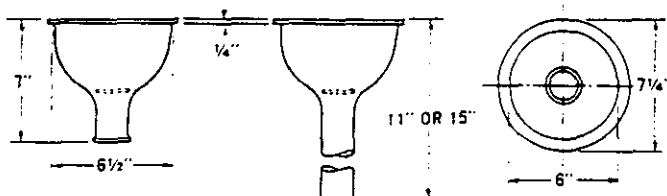
Outside surface of cupsink bodies has an opaque white surface. No. 6724, 2" sink strainer furnished with all cup sinks. Specify over-all desired length (either 11" or 15") when ordering cup sink with plain (or P designated) end outlet. Use No. 6655 adapter coupling (2 x 1 1/8") on outlet to connect to 2" expanded end traps or fittings

**6616 Beaded Outlet**



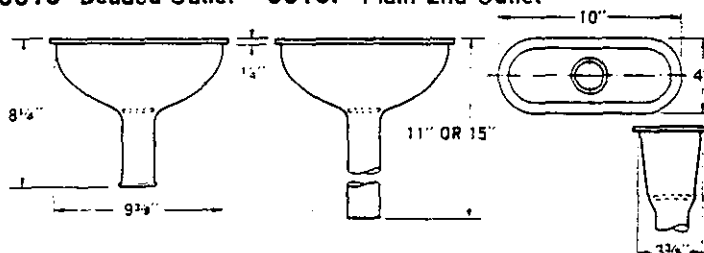
**3" Hemispherical**

**6617 Beaded Outlet 6617P Plain End Outlet**



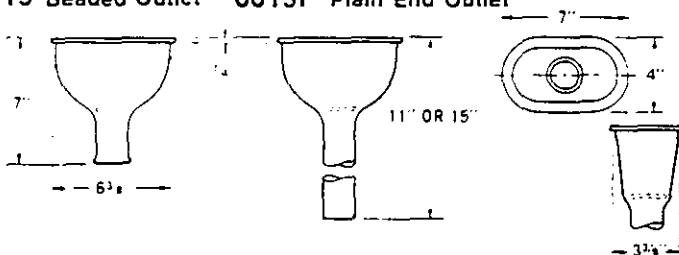
**6" Hemispherical**

**6618 Beaded Outlet 6618P Plain End Outlet**



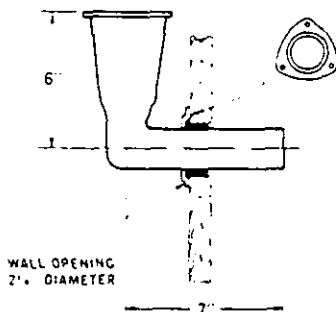
**3" x 9" Oval**

**6619 Beaded Outlet 6619P Plain End Outlet**

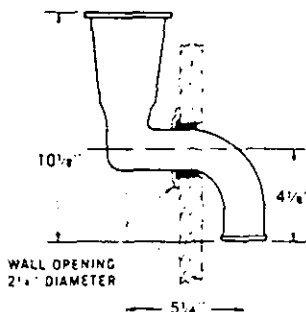


**3" x 6" Oval**

**6627 3" x 6" Oval Horizontal, 1 1/2" Plain End Outlet**



**6628 3" x 6" Oval Vertical, 1 1/2" Outlet**



### Wall Mounted Cup Sink

#### Horizontal Outlet

No. 6621 cup sink oval (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

#### Vertical Outlet

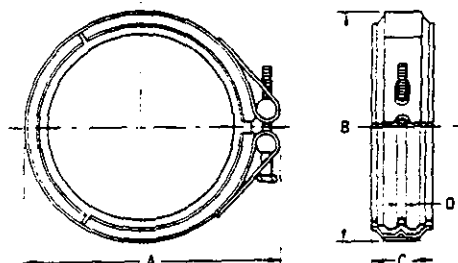
No. 6629 oval cup sink (3 x 6)  
No. 6724 2" sink strainer  
No. 7150 2" flange  
No. 7204 insert (2 x 1 1/2)

Mounting bolts or screws to be furnished by installer. For No. 6627 assembly use No. 6655 adapter coupling (2 x 1 1/8") on outlet to connect to 2" expanded inlet. For No. 6628 assembly use No. 6650 1 1/2" size KIMAX coupling.

## ACCESSORIES AND HARDWARE

6650

### Drainline Coupling (Bead to Bead)



No. 6650 Drainline Coupling is used for joining 1½", 2", 3", 4", and 6" KIMAX Glass Drainline pipe and fittings. No. 6650 KIMAX Coupling consists of:

No. 6651 segmented stainless steel outer band

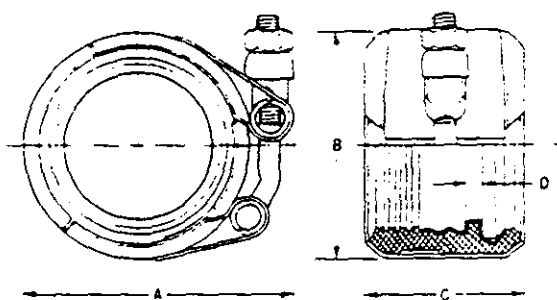
No. 6652 Buna-N rubber compression liner with TFE seal ring

No. 6653 stainless steel bolt

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2½ | 1½ | ¾ | ¾-28 x 2½ |
| 2    | 3½ | 3½ | 1½ | ¾ | ¾-28 x 2½ |
| 3    | 4½ | 4½ | 1½ | ¾ | ¾-28 x 2½ |
| 4    | 6  | 5½ | 1½ | ¾ | ¾-28 x 3½ |
| 6    | 8½ | 7½ | 1½ | ¾ | ¾-24 x 4  |

6661

### B/P\* Drainline Coupling (Bead to Plain End)



No. 6661 B/P Drainline Coupling is used for joining 1½", 2" or 3" KIMAX beaded glass drainline to plain end (cut) glass pipe, lead, P.S., metal or plastic pipe. This new exclusively designed KIMAX drainline coupling consists of the following components:

No. 6662 stainless steel band with bolt

No. 6663 Buna-N rubber compression liner with TFE seal ring

No. 6664 silver plated stainless steel hex nut

| Size | A  | B  | C  | D | Bolt Size |
|------|----|----|----|---|-----------|
| 1½   | 3  | 2½ | 1½ | ¾ | ¾-28      |
| 2    | 3½ | 3½ | 1½ | ¾ | ¾-28      |
| 3    | 4½ | 4½ | 1½ | ¾ | ¾-28      |

\*Patent Pending

## ACCESSORIES AND HARDWARE

6655

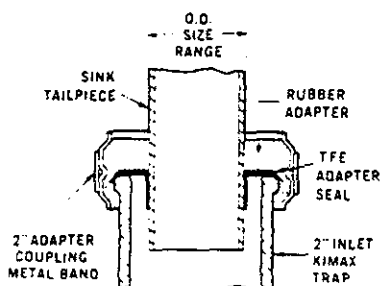
### Adapter Coupling

Patent Pending

No. 6655 Adapter Assembly is used to join KIMAX drainline pipe and or fittings to plain end sink tailpieces.

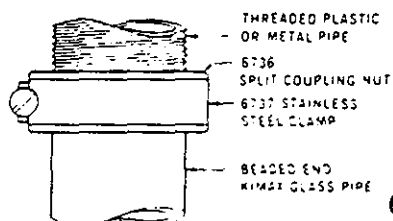
The assembly consists of:

- No. 6651 segmented stainless steel outer band
- No. 6657 Buna-N rubber adapter
- No. 6656 TFE adapter seal
- No. 6653 stainless steel bolt  $\frac{1}{4}$ " — 28 x 2 1/4"



| Size       | Tailpiece Style                                                                                                                                                                     | O.D. Size Range |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2 x 1 1/2" | KIMAX glass tail pipe Extension No. 6725, metal tubing, and lead tailpiece extensions                                                                                               | 1.48 to 1.53    |
| 2 x 1 1/2" | Lead, Class D or XL tailpiece<br>PYREX tailpiece and cup sink                                                                                                                       | 1.70 to 1.75    |
| 2 x 1 1/2" | Plain end KIMAX Regular Schedule or Heavy Schedule 1 1/2" glass pipe or fittings<br>Durcon - SO-2<br>Durcon - 11713<br>Lead — Class C or L, B or M<br>Plastic or Steel (1 1/2" IPS) | 1.82 to 1.90    |

6735



### 6739 Gasket

Use Gasket 6739 when connecting KIMAX glass pipe to threaded metal pipe

### 1 1/2" Split Coupling (Threaded to Beaded Pipe)

No. 6735 1 1/2" Split Coupling is used to join 1 1/2" beaded glass pipe to a threaded 1 1/2" metal pipe.

The assembly consists of:

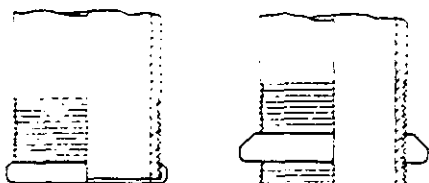
- No. 6736 split coupling nut
- No. 6737 stainless steel clamp

To install: Remove clamp from split nut. Place split nut over beaded glass end. Replace clamp and tighten with screw driver.

6680

6685—Adjustable

### Thread Adapters (Threaded to Beaded Pipe)



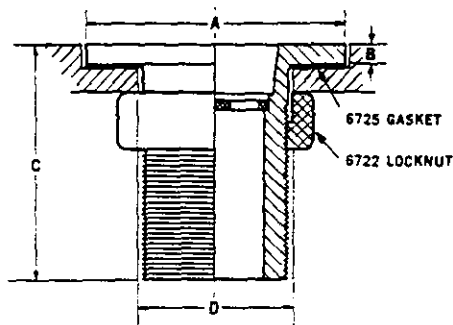
Thread adapters are used to provide beaded end on threaded pipe for connecting directly to KIMAX glass drainlines with No. 6655 coupling. A TFE construction.

Adapter No. 6680 will fit standard straight or tapered threads. Used for same size pipe (e.g. 1 1/2" metal to 1 1/2" glass). Ideal for floor drain connections in 1 1/2", 2", 3", 4", and 6" sizes.

Adapter No. 6685 is designed to mate 1 1/2" threaded tailpieces to 2" expanded inlets of KIMAX traps. Can be moved up and down on tailpiece for space adjustments. In 2 x 1 1/2" size only.

## ACCESSORIES AND HARDWARE

### 6720 (1½", 2", 3" sizes)



### Sink Outlet Assembly

Consists of:

6724 sink strainer (black fluorocarbon plastic)

6721 sink outlet (black fluorocarbon plastic)

6725 gasket—neoprene

6722 locknut

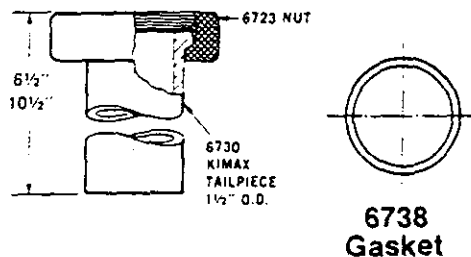
Note: Hand tighten 6722 locknut to sink. DO NOT USE PIPE WRENCH. To fill gap in sink counterbore, use 3M-EC-612 caulking compound or equivalent. 1½" and 2" size sink outlets are designed to accept standard lead overflows.

| Size | A  | B | C  | D  |
|------|----|---|----|----|
| 1½   | 3⅞ | ¼ | 2¼ | 2  |
| 2    | 3⅞ | ¼ | 3  | 2¼ |
| 3    | 4⅞ | ¾ | 3  | 3¼ |

Note: Can be ordered with stainless steel taper if degree of taper needed for stainless steel sink adaptation is furnished.

For sink outlet tailpiece connections, see No. 6728 description below.

### 6728



**6738  
Gasket**

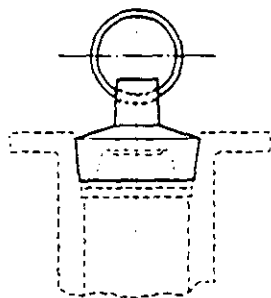
Use gasket No. 6738 when connecting glass tail pipe to threaded metal pipe.

### 1½" Tailpiece Assembly

KIMAX tailpiece is available in 6½" and 10½" lengths. Specify length when ordering. Glass is annealed and can be field cut to exact length. Assembly No. 6728 consists of a No. 6723 phenolic nut and a No. 6730 KIMAX tailpiece.

Note: This assembly can be used on other 1½" plastic or metal sink outlets having pipe threads. For metal outlet connections use gasket No. 6738 between metal and glass. Hand tighten coupling nut... do not use pipe wrench.

### 6726

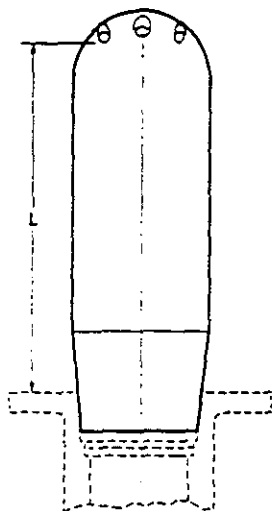


### Sink Stopper

No. 6726 Sink Stopper is available in 1½" and 2" size in lead. 3" size only in black fluorocarbon.

## ACCESSORIES AND HARDWARE

6727

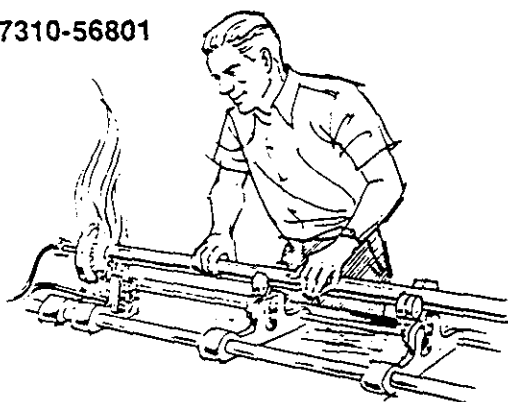


### Sink Overflow (Beehive and Open Type)

Sink Overflows are made of black fluorocarbon plastic. Open standing overflows are available for 2" and 3" sink outlets only. The 1 1/2" beehive type can be modified by cutting off top beehive section.

| Sink Outlet Size | Beehive Type Length |    |    | Open Type Length |    |    |
|------------------|---------------------|----|----|------------------|----|----|
| 1 1/2            | 4"                  | 6" | 8" | —                | —  | —  |
| 2                | —                   | —  | —  | 4"               | 6" | 8" |
| 3                | —                   | —  | —  | 4"               | 6" | 8" |

7310-56801



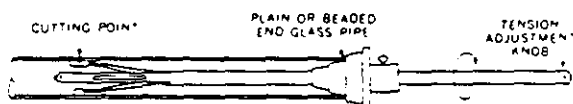
### KIMAX Portable Beading Kit

The KIMAX Portable Beading Kit is complete in every detail (except for bottled gas) for field beading of special lengths of KIMAX drainline.

For more detailed information on the availability of the newest model kit, BK-5, and its operation, ask your KIMAX distributor or write the nearest O-I Kimble office listed on the back of this catalog.

7310-56802

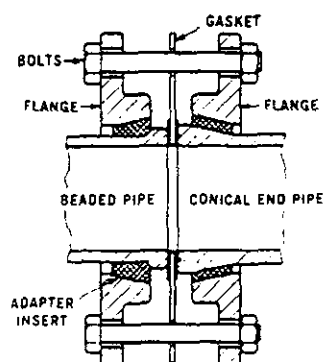
### KIMAX Portable Glass Pipe Cutter



With the KIMAX Portable Glass Pipe Cutter and KIMAX B/P Goodness you can cut and join 1 1/2", 2" and 3" glass drainline anywhere on the job site. Complete cutter consists of a scoring head assembly and extension or tension arm sub-assembly, as shown. Stocked and sold by your KIMAX Glass Drainline distributor.

## ACCESSORIES AND HARDWARE

7110



### Coupling Assembly

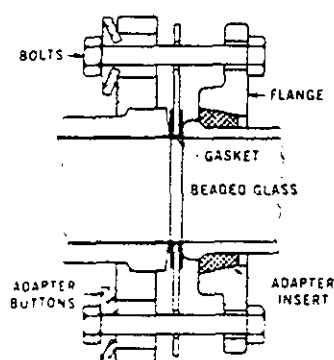
(Beaded to Conical End Pipe)

To join Beaded end pipe to conical end pipe. Kit includes all flanges, inserts, bolts and TFE sheath gasket.

Chart includes all quantities of kit components and individual article number for replacement of parts.

| Pipe Size | Style II Flanges Qty. No. | Insert Qty. No.  | Gasket No. | Bolts & Nuts Qty. Size   |
|-----------|---------------------------|------------------|------------|--------------------------|
| 1 1/2     | 2-7155                    | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>5/8-18 x 2 1/2 |
| 2         | 2-7155                    | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>5/8-18 x 2 1/2 |
| 3         | 2-7155                    | 1-7200<br>1-7203 | 1-7276     | 4-7190<br>5/8-18 x 3     |
| 4         | 1-6670<br>1-7156          | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>5/8-18 x 2 1/2 |
| 6         | 1-6670<br>1-7156          | 1-7203<br>1-7158 | 1-7276     | 8-7190<br>5/8-16 x 2 1/2 |

7120



### Coupling Assembly

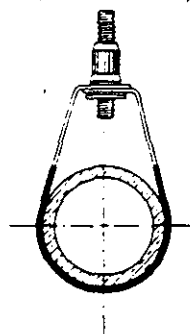
(ASME Flange to Beaded Pipe)

To join beaded glass pipe to inside coated metal. Kit includes all flanges, inserts, adapter inserts, bolts and adapter buttons.

Chart for parts included in kit.

| Size  | Style II Flanges Qty. No. | Inserts Qty. No. | Adapter Buttons | Gasket Qty. No. | Bolts & Nuts Qty. Size   |
|-------|---------------------------|------------------|-----------------|-----------------|--------------------------|
| 1 1/2 | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7190<br>5/8-18 x 2 1/2 |
| 2     | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7190<br>5/8-18 x 2 1/2 |
| 3     | 1-7155                    | 1-7203           | 4-7230          | 1-7276          | 4-7190<br>5/8-18 x 3     |
| 4     | 1-6670                    | 1-7203           | 8-7230          | 1-7276          | 8-7190<br>5/8-18 x 3     |
| 6     | 1-6670                    | 1-7203           | 8-7230          | 1-7276          | 8-7190<br>5/8-18 x 3     |

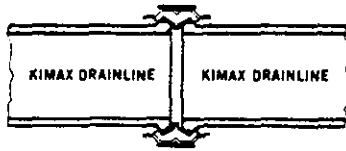
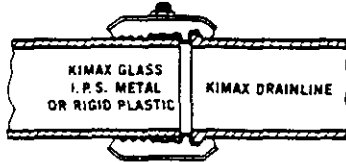
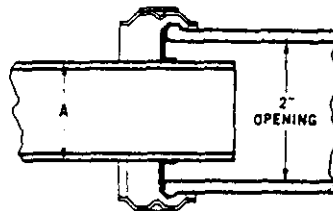
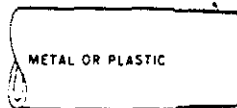
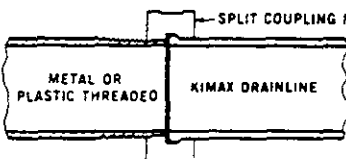
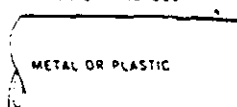
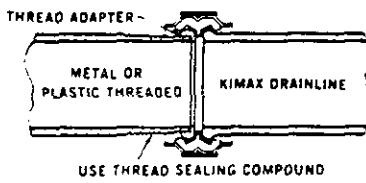
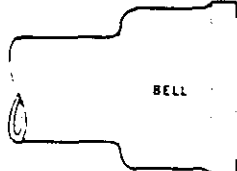
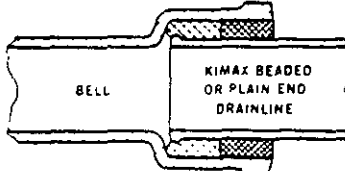
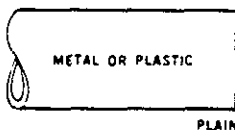
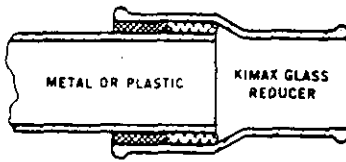
7290 (1 1/2", 2", 3", 4", 6" sizes)



### Pipe Hangers (padded)

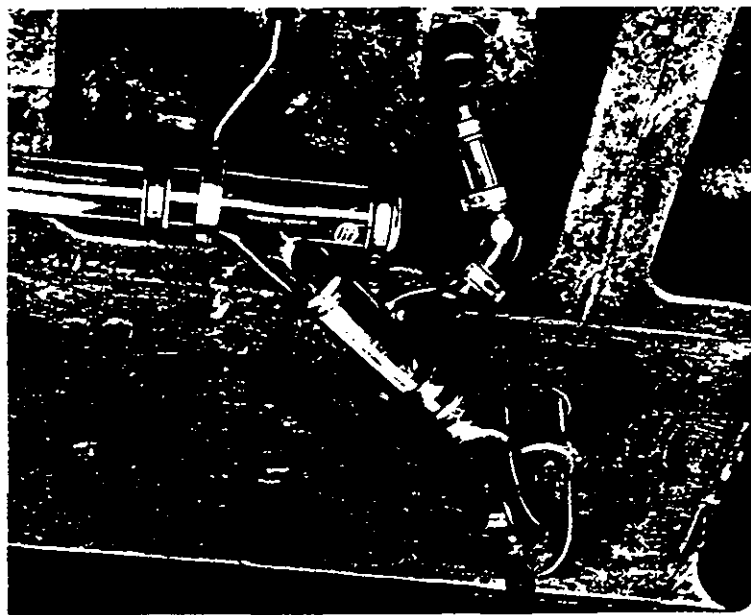
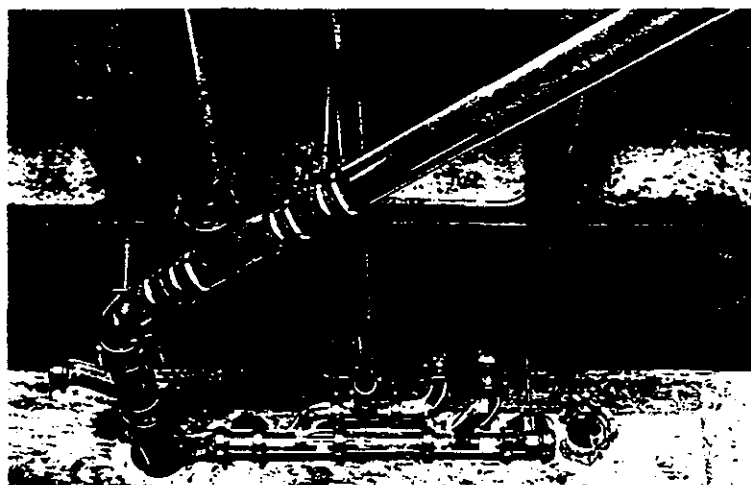
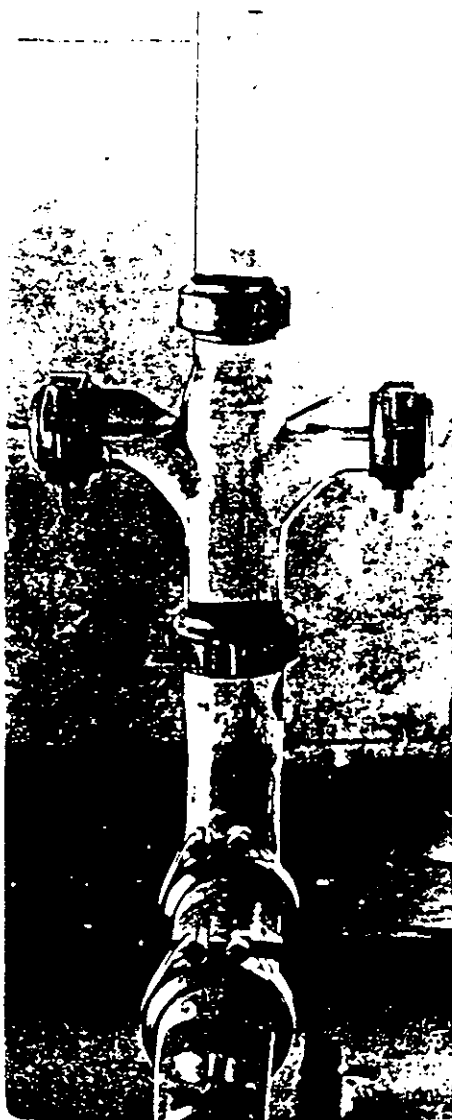
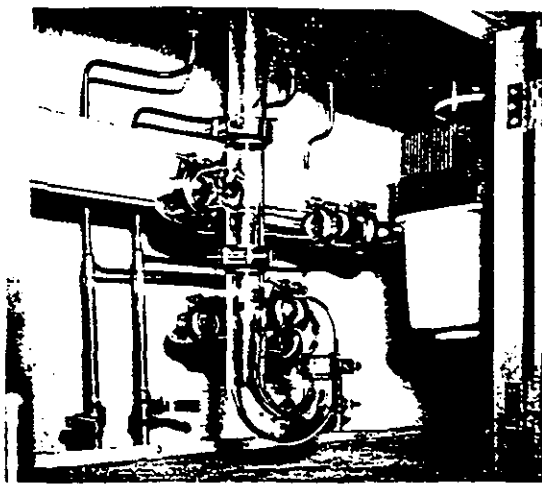
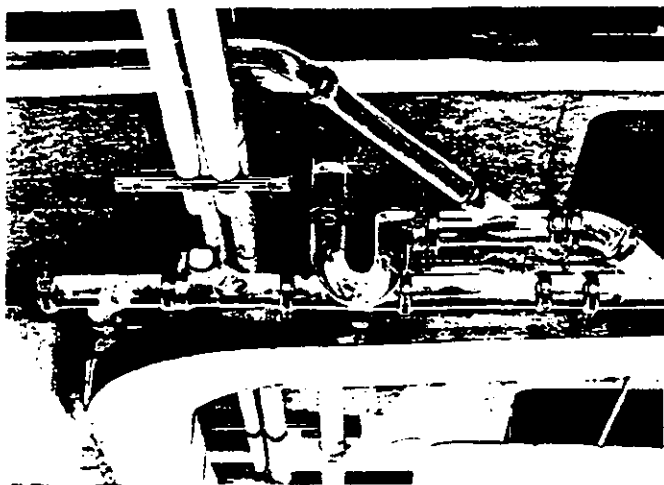
Recommended for horizontal runs. Hangers contain integral cushions. Standard finish on band is A.S.T.M. type L.S. Zinc coating.

# TYPICAL JOINT REFERENCE CHART

| Type of Pipe                                                                                                                                             | Type of Joint                                                                                                                                                                                  | Material Needed                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|-----------|-----------|---|-----------|-----------|
|  <p>KIMAX DRAINLINE<br/>BEADED</p>                                      |  <p>KIMAX DRAINLINE KIMAX DRAINLINE</p>                                                                      | <p><b>KIMAX Drainline Coupling 6650</b></p> <table><tr><th>Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6650-1500</td></tr><tr><td>2</td><td>6650-2000</td></tr><tr><td>3</td><td>6650-3000</td></tr><tr><td>4</td><td>6650-4000</td></tr><tr><td>6</td><td>6650-6000</td></tr></table>                                                                                                                                                            | Size                       | Code No.             | 1½                   | 6650-1500 | 2         | 6650-2000 | 3         | 6650-3000 | 4         | 6650-4000 | 6         | 6650-6000 |   |           |           |   |           |           |
| Size                                                                                                                                                     | Code No.                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6650-1500                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6650-2000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6650-3000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6650-4000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6650-6000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC<br/>PLAIN END</p> |  <p>KIMAX GLASS<br/>I.P.S. METAL<br/>OR RIGID PLASTIC KIMAX DRAINLINE</p>                                    | <p><b>KIMAX B/P Coupling 6661</b></p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>1½</td><td>6661-1500</td></tr><tr><td>2</td><td>6661-2000</td></tr><tr><td>3</td><td>6661-3000</td></tr></table>                                                                                                                                                                                                                                       | Pipe Size                  | Code No.             | 1½                   | 6661-1500 | 2         | 6661-2000 | 3         | 6661-3000 |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6661-1500                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6661-2000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6661-3000                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>KIMAX GLASS<br/>METAL OR<br/>RIGID PLASTIC<br/>PLAIN END</p>        |  <p>A 2" OPENING</p>                                                                                         | <p><b>KIMAX Adapter Coupling</b></p> <table><tr><th>'A' Dimension<br/>Pipe O.D.</th><th>Coupling<br/>Size</th><th>Code No.</th></tr><tr><td>1.48—1.53</td><td>2 x 1½</td><td>6655-2015</td></tr><tr><td>1.70—1.78</td><td>2 x 1½</td><td>6655-2017</td></tr><tr><td>1.82—1.90</td><td>2 x 1½</td><td>6655-2018</td></tr></table>                                                                                                                        | 'A' Dimension<br>Pipe O.D. | Coupling<br>Size     | Code No.             | 1.48—1.53 | 2 x 1½    | 6655-2015 | 1.70—1.78 | 2 x 1½    | 6655-2017 | 1.82—1.90 | 2 x 1½    | 6655-2018 |   |           |           |   |           |           |
| 'A' Dimension<br>Pipe O.D.                                                                                                                               | Coupling<br>Size                                                                                                                                                                               | Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.48—1.53                                                                                                                                                | 2 x 1½                                                                                                                                                                                         | 6655-2015                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.70—1.78                                                                                                                                                | 2 x 1½                                                                                                                                                                                         | 6655-2017                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1.82—1.90                                                                                                                                                | 2 x 1½                                                                                                                                                                                         | 6655-2018                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| <p>I.P.S. THREADED —</p>  <p>METAL OR PLASTIC</p>                     |  <p>SPLIT COUPLING NUT<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE</p>                               | <p><b>KIMAX Split Coupling</b></p> <table><tr><th>Pipe Size</th><th>Coupling<br/>Code No.</th><th>Gasket<br/>Code No.</th></tr><tr><td>1½</td><td>6635-1500</td><td>6739-1500</td></tr></table>                                                                                                                                                                                                                                                         | Pipe Size                  | Coupling<br>Code No. | Gasket<br>Code No.   | 1½        | 6635-1500 | 6739-1500 |           |           |           |           |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Coupling<br>Code No.                                                                                                                                                                           | Gasket<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                      |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6635-1500                                                                                                                                                                                      | 6739-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| <p>I.P.S. THREADED —</p>  <p>METAL OR PLASTIC</p>                     |  <p>THREAD ADAPTER —<br/>METAL OR<br/>PLASTIC THREADED KIMAX DRAINLINE<br/>USE THREAD SEALING COMPOUND</p> | <p><b>KIMAX Thread Adapter and<br/>Drainline Coupling</b></p> <table><tr><th>Pipe Size</th><th>Adapter<br/>Code No.</th><th>Coupling<br/>Code No.</th></tr><tr><td>1½</td><td>6680-1500</td><td>6650-1500</td></tr><tr><td>2</td><td>6680-2000</td><td>6650-2000</td></tr><tr><td>3</td><td>6680-3000</td><td>6650-3000</td></tr><tr><td>4</td><td>6680-4000</td><td>6650-4000</td></tr><tr><td>6</td><td>6680-6000</td><td>6650-6000</td></tr></table> | Pipe Size                  | Adapter<br>Code No.  | Coupling<br>Code No. | 1½        | 6680-1500 | 6650-1500 | 2         | 6680-2000 | 6650-2000 | 3         | 6680-3000 | 6650-3000 | 4 | 6680-4000 | 6650-4000 | 6 | 6680-6000 | 6650-6000 |
| Pipe Size                                                                                                                                                | Adapter<br>Code No.                                                                                                                                                                            | Coupling<br>Code No.                                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 1½                                                                                                                                                       | 6680-1500                                                                                                                                                                                      | 6650-1500                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2                                                                                                                                                        | 6680-2000                                                                                                                                                                                      | 6650-2000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3                                                                                                                                                        | 6680-3000                                                                                                                                                                                      | 6650-3000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4                                                                                                                                                        | 6680-4000                                                                                                                                                                                      | 6650-4000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6                                                                                                                                                        | 6680-6000                                                                                                                                                                                      | 6650-6000                                                                                                                                                                                                                                                                                                                                                                                                                                               |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>BELL</p>                                                          |  <p>BELL KIMAX BEADED<br/>OR PLAIN END<br/>DRAINLINE</p>                                                   | <p><b>KIMAX Glass to Bell End Pipe</b></p> <ol style="list-style-type: none"><li>1. Pack hub half full with asbestos rope.</li><li>2. Caulk with hot lead, lead wool or acid proof cement.</li></ol> <p>For Detail, see Drainline Installation Manual.</p>                                                                                                                                                                                              |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
|  <p>METAL OR PLASTIC<br/>PLAIN</p>                                    |  <p>METAL OR PLASTIC KIMAX GLASS<br/>REDUCER</p>                                                           | <p><b>KIMAX Glass to Plain End Metal<br/>or Plastic</b> For Detail, see Drainline<br/>Installation Manual.</p> <table><tr><th>Pipe Size</th><th>Code No.</th></tr><tr><td>2 x 1½</td><td>6536-2015</td></tr><tr><td>3 x 2</td><td>6536-3020</td></tr><tr><td>4 x 3</td><td>6536-4030</td></tr><tr><td>6 x 4</td><td>6536-6040</td></tr></table>                                                                                                         | Pipe Size                  | Code No.             | 2 x 1½               | 6536-2015 | 3 x 2     | 6536-3020 | 4 x 3     | 6536-4030 | 6 x 4     | 6536-6040 |           |           |   |           |           |   |           |           |
| Pipe Size                                                                                                                                                | Code No.                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 2 x 1½                                                                                                                                                   | 6536-2015                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 3 x 2                                                                                                                                                    | 6536-3020                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 4 x 3                                                                                                                                                    | 6536-4030                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |
| 6 x 4                                                                                                                                                    | 6536-6040                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                            |                      |                      |           |           |           |           |           |           |           |           |           |   |           |           |   |           |           |



## TYPICAL KIMAX DRAINLINE INSTALLATIONS



## KIMAX DRAINLINE INSTALLATIONS

Over the past years, there have been hundreds of KIMAX Glass Drainline installations, while hundreds of others are now in the planning stage or under construction. Just a few are listed below:

### SCHOOLS AND UNIVERSITIES

University of Southern California  
University of Utah  
University of New Mexico  
Northern Arizona State University  
Whittier College  
Colorado State University  
Central Washington State University  
University of Idaho  
California State College  
Western Reserve University  
University of Minnesota  
Southern Methodist  
Olivet College  
Toledo University  
Bay Village High School (Ohio)  
Washington University (St. Louis, Mo.)  
St. John High School (Indiana)  
Kansas State University  
Port Lavaca High School (Texas)  
University of Texas  
Brescia College  
Adrian College (Michigan)  
University of Nebraska  
Port Huron Community College  
Palmyra High School (Wisconsin)  
University of Florida  
University of Virginia  
Duke University  
North Carolina State  
Florida State University  
Rutgers University  
Tacoma High School  
Washington State University

Michigan State University  
University of California  
University of Pennsylvania  
Heidelberg College  
Cleveland Vocational School  
Central Michigan University  
Stanford University  
Pomona College  
Sophia High School, Beckley, W. Va.  
Michigan Technical University  
Pennsylvania Military College  
Our Lady of Angels College  
DuPont High School, Wilmington, Del.  
University of Miami (Florida)  
Loma Linda College  
Emory University  
St. Joseph College, Emmitsburg, Md.  
Cherry Hill (New Jersey) High School  
Iron Mountain (Michigan) High School  
Snohomish High School  
University of Washington  
City of Detroit  
University of Michigan  
North Shore Junior College, Houston  
Boston College

### INDUSTRIAL

Abbott Laboratories  
Ling-Temco-Vought  
Armco Steel  
Monsanto Chemical  
General Electric  
Uni-Royal  
Morton Salt

Motorola Company  
Narmco Materials  
Humko Oil Company  
Caterpillar Tractor Company  
City of Chicago Filtration Plant  
Hercules Powder Company  
Hoffman-LaRoche  
Rohm & Haas  
Allied Chemical Company  
Penn Salt  
Carolina Nitrogen Plant  
New State Office Building, Boston  
B. F. Goodrich  
E. I. DuPont

### RESEARCH

Humble Oil Company  
Eli Lilly  
University of Wisconsin  
Miles Laboratories  
Parke-Davis  
A.E.C.  
Stanford Research  
National Bureau of Standards  
Sylvania Electric Products Co.  
American Type Culture  
Air Products & Chemical Corp.  
William Gilliam Co.  
N.A.S.A.  
Texas City Jail (Crime Laboratory)  
Reiter Laboratories  
Smith, Kline & French  
Air Products & Chemical Corporation  
Texaco Experiment, Inc.

### HOSPITALS

University of Chicago (Illinois)  
Mayo Clinic (Minnesota)  
Houston Medical Center (Texas)  
St. Joseph's Hospital (Texas)  
Clarkston Hospital (Nebraska)  
Beaumont Hospital (Michigan)  
University of Louisville (Kentucky)  
Fairview Hospital (Minnesota)  
Columbia Hospital (Wisconsin)  
Lincoln Nebraska General Hospital  
Maynard Hospital, Seattle, Washington  
Botsford Hospital, Farmington, Michigan  
University of Minnesota Masonic Hospital, Minneapolis, Minn.  
Lower Bucks County Hospital, Bristol, Pennsylvania  
Einstein Medical Center, Philadelphia, Pennsylvania  
Fairview Hospital, St. Paul, Minnesota  
St. Vincent's Hospital, Toledo, Ohio  
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Emory University Hospital, Atlanta, Georgia  
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Biological Sciences Building  
Department of Public Works Pathology  
Building, Halifax  
Ayerst, McKenna & Harrison, Montreal  
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