



IN THE UNITED STATES DISTRICT COURT FOR THE
SOUTHERN DISTRICT OF ALABAMA
SOUTHERN DIVISION

CHARLES RIDLING and BETTY
RIDLING,

Plaintiffs,

VS.

ARMSTRONG WORLD INDUSTRIES,
INC., et al,

Defendants.

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84-1198-X

RESPONSE OF DEFENDANT, ARMSTRONG WORLD INDUSTRIES, INC.
TO PLAINTIFFS' FIRST SET OF INTERROGATORIES

Comes now the Defendant, Armstrong World Industries,
Inc., and responds to Plaintiff's First Set of Interrogatories
as follows:

PRELIMINARY STATEMENT

The following responses are based upon facts known to or
believed by this Defendant at the time of answer. Because
much of the information is sought from many years ago and is
therefore difficult or impossible to reconstruct or retrieve,
and because of the volume of discovery requests received daily
by us, this Defendant reserves the right to amend these
responses as and if new or better information becomes
available to it, or if errors are discovered. Unless
otherwise stated in a response to a specific interrogatory or
request, the responses set forth hereunder are limited in time

and place to Plaintiff's allegations of exposure to asbestos and to those asbestos-containing thermal insulation products to which Plaintiff alleges exposure and those that this Defendant manufactured and/or sold and the time period after 1940, when this Defendant expanded in to the thermal insulation contracting business, and before mid-1969, when this Defendant last sold or manufactured a thermal insulation product containing asbestos. The responses are from this Defendant's records and knowledge and not those of its former wholly-owned subsidiary, Armstrong Contracting & Supply Corporation, which operated independent of this Defendant. To the extent these interrogatories or requests call for information beyond the limitations stated above, an objection is made thereto as being irrelevant, immaterial, burdensome, oppressive, and/or not calculated to lead to the discovery of admissible evidence, and the answers thereto are privileged and/or protected. Where production of documents is requested, representative materials are produced where duplicate, similar or cumulative documents exist, unless otherwise indicated.

1. It is impossible for this Defendant to answer this interrogatory. This Defendant has been involved in the asbestos litigation for many years. During the course of said litigation, its legal representatives have reviewed voluminous records of itself and others, have conferred with many current and former employees of this Defendant and others, and have conferred with legal representatives of others. It has thus

become impossible to distinguish sources of information in an accurate and meaningful way.

2. This Defendant is Armstrong World, Inc., incorporated in Pennsylvania with its principal place of business at Liberty and Charlotte Streets, Lancaster, Pennsylvania.

3. This Defendant was registered to do business in the State of Texas on October 31, 1984.

4. See answer to Interrogatory No. 3.

5. Not to our knowledge. See Preliminary Statement.

6. See answer to Interrogatory No. 5.

7. No.

8. Not applicable. See answer to Interrogatory No. 7.

9. Yes.

10. No.

11. Yes.

12. (a)-(d) See Attachment A.

(e) See Attachment C regarding chemical composition.

(f) See Attachment B regarding physical appearance.

(g) See Attachment D regarding intended use.

(h) See Attachment A.

13. Yes, in regard to LT Cork Covering.

14. LT Cork Covering.

(a) Patent number: 2,766,231.

(b) Date of Patent: January 1, 1957.

(c) None to our knowledge.

15. Yes.

16. LT Cork Covering was first manufactured with a kraft paper cover. In 1956, asbestos paper was substituted for the kraft paper for the purpose of creating a more fire resistant surface. Armaspray originally contained a 6D5 chrysotile asbestos. In July, 1967, A. W. Amosite was substituted, and in January, 1968, S/33/65 asbestos was substituted. The initial asbestos change was due to the increased fiber length, greater wet strength and improved thermal-conductivity of the Amosite. The next change was a result of the discontinuation of supply of A.W. Amosite, the substitution being based upon the supplier's recommendation.

17. Research continues with regard to the persons involved in the design of LT Cork Covering. We believe that W.G. Owens, Senior Research Scientist, and W. H. Yeager, Senior Lab Technician, participated in the design of Armaspray. Owens is currently employed by Armstrong's Research & Development Center, Lancaster, Pennsylvania. Yeager is retired. We have neither records nor actual knowledge by which to answer this interrogatory for asbestos-containing products manufactured by others.

18. Process specifications for LT Cork Covering and Armaspray exist. Members of this company's Legal Department have copies.

19. See answer to Interrogatory No. 18.

20. This Defendant objects to the use of the term "to the public" since most sales of asbestos-containing insulation products were made in connections with this company's

insulation contracting services. Furthermore, at the time that we manufactured LT Cork Covering and Armaspray, we did not believe that they presented any unique health hazards which general, proper handling would not prevent. Therefore, no tests specific to asbestos were conducted.

21. See answer to Interrogatory No. 20.

22. See answer to Interrogatory No. 20.

23. See answer to Interrogatory No. 20.

24. See answer to Interrogatory No. 20.

25. See answer to Interrogatory No. 20.

26. See answer to Interrogatory No. 20.

27. See answer to Interrogatory No. 20.

28. See answer to Interrogatory No. 20.

29. See answer to Interrogatory No. 20.

30. See answer to Interrogatory No. 20.

31. See answer to Interrogatory No. 20.

32. See Attachment F regarding warnings and cautions.

33. See answer to Interrogatory No. 32.

34. This Defendant first received a lawsuit alleging personal injuries from asbestos-containing insulation productions manufactured and sold by it in 1970.

35. Not applicable. See answer to Interrogatory No. 34.

36. Not to our knowledge.

37. Not applicable. See answer to Interrogatory No. 36.

38. This Defendant objects to the discovery of such information gathered during the course of and in pursuit of pending litigation for the reason that such information is

protected by the attorney work product and attorney/client privileges.

39. See answer to Interrogatory No. 38.

40. Yes.

41. Our attorney, James H. Crosby, is in the process of investigating this claim. Any matters not subject to attorney/client privilege or which is not an attorney work product can be viewed in his office during business hours and upon reasonable notice.

42. Total environment dust level monitoring was tested on two occasions at a job site at Brunner Island, Pennsylvania. In November, 1968 and January, 1969, membrane filters were used to collect dust which was present during the application of Armaspray, a mineral wool insulation product containing asbestos manufactured by this Defendant. The samples were improperly taken and analyzed and the results were therefore inconclusive. Further tests were not pursued because of the decision having already been made to no longer manufacture the product being tested, Armaspray.

43. Not applicable. See answer to Interrogatory No. 42.

44. Both asbestos-containing insulation products manufactured by this Defendant were produced at the Beaver Falls Plant, Beaver Falls, Pennsylvania. LT Cork Covering was manufactured from 1956 to 1959, and Armaspray was manufactured from 1966 to 1968.

45. LT Cork Covering brochures and Armstrong Industrial Insulation brochures were prepared by us.

46. (a) We have neither records nor actual knowledge by which to answer this interrogatory.

(b) Members of this Defendant's Legal Department have copies.

(c) Although we have no records concerning dates of preparation, we believe the LT Cork Covering brochure was prepared around 1956 to 1959 and the Armstrong Industrial Insulations brochure was prepared at various times during the period when this Defendant had a contract insulation unit.

47. The LT Cork Covering brochure and Armstrong Industrial Insulation brochure contained instructions for use and maintenance.

48. See answer to Interrogatory No. 46.

49. At this time, investigation and discovery indicates possible improper use, however, this answer will have to be supplemented when sufficient information has been obtained.

50. See response to Interrogatory No. 49.

51. In late 1968, this Defendant first became aware of the likelihood of an ascertainable relationship between the inhalation of airborne asbestos fibers and adverse health consequences when George Nickel brought the article "The magic Mineral" in the New Yorker magazine to the attention of management employees of Armstrong Cork Company. Prior to that time, some information came to other employees at different times which alleged a relationship, but the first awareness of this Defendant was as stated above.

52. See answer to Interrogatory No. 51.

53. Objection. This interrogatory requires an expert medical opinion which this Defendant is not equipped to render.

54. Objection. This interrogatory requires an expert medical opinion which this Defendant is not equipped to render.

55. None to our knowledge.

56. During the period in which we manufactured and/or sold asbestos-containing insulation products, we did not employ an industrial hygienist. In 1972, Robert Kilgour was hired as the first industrial hygienist at Armstrong Cork Company, Liberty and Charlotte Street, Lancaster, Pennsylvania, a post which he holds today. The industrial hygienist monitors health and safety aspects of the manufacturing facility in order to assist in maintaining compliance with OSHA and other health regulations.

57. None to our knowledge.

58. Not applicable. See answer to Interrogatory No. 56. This Defendant has never employed a corporate medical officer or medical consultant.

59. During the period in which we manufactured and/or sold asbestos-containing insulation products, we did not, to our knowledge, subscribe to any such medical periodicals whose concern was asbestos.

60. This Defendant has a library in Lancaster, Pennsylvania which contains engineering and manufacturing

information. But, to its knowledge, there was no library established for industrial hygiene, medicine or safety.

(a) See attachment regarding librarians.

(b) Lancaster, Pennsylvania.

(c) See attachment regarding librarians.

(d) This Defendant, to our knowledge, did not subscribe to any such journals whose concern was asbestos.

61. This Defendant has not been a member of any trade association or organization whose concern was asbestos-containing insulation products during the period in which we manufactured and/or sold asbestos-containing insulation products.

62. Not applicable. See answer to Interrogatory NO. 61.

63. To our knowledge, this Defendant has never subscribed to trade association periodicals.

64. Not applicable. See answer to Interrogatory No. 63.

65. Not to our knowledge during the period when this Defendant manufactured and/or sold asbestos-containing insulation products.

66. This Defendant no longer manufactures and/or sells asbestos-containing insulation products and is, therefore, unaware of current technology in the field.

67. See answer to Interrogatory No. 66.

68. Not with regard to LT Cork Covering and Armaspray. To our knowledge, there was no effective substitute for the asbestos used in these two products. This Defendant has

neither records nor actual knowledge by which to answer this interrogatory regarding products manufactured by others.

69. We have neither records nor actual knowledge by which to answer the specifics of this interrogatory. We believed at the time of manufacture of our asbestos-containing insulation products that such were effective.

70. See Attachment E regarding packaging and labeling.

71. Yes.

72. (a) Unarco.

(b) Armabestos.

(c) 1954-1956.

(d) Unknown.

(e) Armstrong purchased these products for use in its contract installation services.

(a) Ehret Magnesia Manufacturing Company.

(b) 85% Magnesia Pipe Covering.

(c) 1957.

(d) Unknown.

(e) Armstrong purchased these products for use in its contract installation services. This name was later assigned to Armstrong Contracting & Supply Corporation.

(a) Ehret Magnesia Manufacturing Company.

(b) Calcium Silicate Pipe Covering.

(c) 1957.

(d) Unknown.

(e) Armstrong purchased these products for use in its contract installation services. This name was later assigned to Armstrong Contracting & Supply Corporation.

This Defendant also entered into relabeling agreements with manufacturers of insulation products on behalf of its subsidiary corporation, Armstrong Contracting & Supply Corporation. To this Defendant's knowledge, said products were purchased and used by the subsidiary corporation in insulation contracts.

73. Yes.

74. (a) Legal Department, Armstrong World Industries, Inc., Lancaster, Pennsylvania.

(b) Relabeling agreements.

75. No employee of this company's asbestos-containing insulation product manufacturing facility ever filed an asbestos-related worker's compensation claim. Prior to 1958, when this company operated an insulation contracting unit, we believe we had received a total of nine claims for alleged pulmonary illness, possibly related to alleged asbestos damage.

76. See Attachment K regarding worker's compensation claims.

77. This Defendant has not presently designated expert witnesses to be called at trial.

78. See response to Interrogatory No. 77.

79. Objection. This interrogatory is overly broad, unduly burdensome, seeks work product and privileged

information and seeks information not discoverable under the Federal Rules of Civil Procedure.

80. Presently this Defendant may offer all documents referred to in the answers to interrogatories and all relevant medicals, scientific and governmental documents, treatises or papers. Additionally, a pre-trial document, if required, will be provided at the appropriate time.

81. Service is a question of law for resolution by the courts.

82. To the best of our knowledge, this Defendant had no distributors or wholesalers for asbestos-containing insulation products. Most of these products were sold on an installed basis by Armstrong employees, with the exception of Armaspray, which was installed by employees of Armstrong Contracting & Supply Corporation.

83. This Defendant objects to this interrogatory with regard to the period of time during which this Defendant neither manufactured nor sold asbestos-containing insulation products on the grounds that it is irrelevant, immaterial and not calculated to lead to the discovery of admissible evidence. As to the periods during which this Defendant manufactured and/or sold asbestos-containing insulation products, not to our knowledge.

84. Unknown.

85. Under this Defendant's record retention schedule, documents and records reflecting sales of asbestos-containing insulation products no longer exist. We have no knowledge of

any sales being made to any of the companies listed.

Additionally, no such sales would have been made after 1959.

86. Under this Defendant's record retention schedule, documents and records reflecting sales of asbestos-containing insulation products no longer exist. We have no knowledge of any sales being made to any of the companies listed.

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87. Under this Defendant's record retention schedule, documents and records reflecting sales of asbestos-containing insulation products no longer exist. We have no knowledge of any sales being made to any of the companies listed.

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Additionally, no such sales would have been made after 1959.

90. Under this Defendant's record retention schedule, documents and records reflecting sales of asbestos-containing insulation products no longer exist. We have no knowledge of any sales being made to any of the companies listed.

Additionally, no such sales would have been made after 1959.

91. Not applicable. See answers to Interrogatory Nos.

87-9.

BROWN, HUDGENS, RICHARDSON, P.C.
Attorneys for Defendant,
Armstrong World Industries, Inc.

BY: James H. Crosby
JAMES H. CROSBY
Post Office Box 16816
Mobile, Alabama 36616-0818

CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing pleading on counsel to all parties in the above-styled cause by mailing a copy of same via United States Mail, postage prepaid, on this the 21st day of October, 1985.

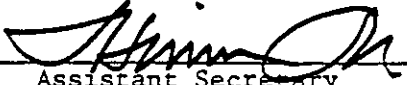
James H. Crosby
JAMES H. CROSBY

COMMONWEALTH OF PENNSYLVANIA:
: SS
COUNTY OF LANCASTER :

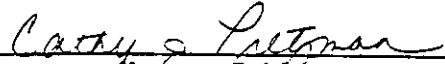
I, the undersigned, J. H. Miller, Jr., being first duly sworn according to law, depose and say that I am an Assistant Secretary of Armstrong World Industries, Inc. The information contained in the responses hereto was gathered pursuant to my overall guidance by employees of this Company. I have no personal knowledge of same but am informed and therefore believe the answers to be true and correct. The responses have been prepared by counsel. I am executing this affidavit solely for the purpose of affixing the Company's signature hereto.

DATED: September 17, 1985

ARMSTRONG WORLD INDUSTRIES, INC.
A Pennsylvania Corporation

BY: 
Assistant Secretary

On this 17th day of September, 1985 before me personally appeared J. H. Miller, Jr., to me known to be the person described herein, and who executed the foregoing instrument and who acknowledged that he voluntarily executed the same.


Notary Public

CATHY J. PRETZMAN, Notary Public
Lancaster, Lancaster County, PA
My Commission Expires August 10, 1987

I. CONTRACT OPERATIONS

Armstrong manufactured pure cork insulation products for low temperature applications, which were difficult to install. Therefore, Armstrong established a contract unit with skilled workers to ensure correct installation.

To provide full service to its customers, Armstrong's contract unit in about 1940 expanded into the installation of high temperature insulation products manufactured by other companies. These manufacturers imposed limits on Armstrong both as to customers and geographic locations in which Armstrong could install these products.

At the end of 1957, Armstrong contract unit activity ceased when a separate company, Armstrong Contracting & Supply Corporation, took over this business. That company is now known as AGandS, Inc.

II. PRODUCTS

The high temperature asbestos-containing insulation products used by Armstrong's contract unit, beginning in about 1940, were manufactured by the following companies:

KEASBEY & MATTISON (now Nicolet, Inc.)

BALDWIN-HILL COMPANY (now Keene Corporation)

EHRET MAGNESIA MANUFACTURING COMPANY (now Keene Corporation)

OWENS-ILLINOIS GLASS COMPANY (product distributed by Owens-Corning Fiberglas Company)

UNARCO (now in bankruptcy)

A low temperature product manufactured by Armstrong (LT Cork Covering) was used by its contract unit (1956-57), then by Armstrong Contracting & Supply Corporation (1958-59). Armstrong also manufactured Armaspray (1966-68), a test product sold only to Armstrong Contracting & Supply Corporation. The products manufactured by the other companies for Armstrong's contract operation were:

<u>Years</u>	<u>Manufacturer of Product</u>	<u>Name of Product</u>	<u>Label</u>
1940-1957 (Not all products in all years or in all geographic areas)	KEASBEY & MATTISON (now Nicolet)	Various insulation products: 85% Magnesia Hy-Temp Kaytherm Air Cell, Simplex, Duplex, Bestfelt, Mani-Ply Kamatt Amblerex No. 2 Cement, No. 152 Cement, K.P. Asbestos Floats	KEASBEY & MATTISON
Mid-1950's	BALDWIN-HILL (now Keene)	Mineral Wool Insulating Cement	BALDWIN-HILL
1954-1956	UNARCO	Armabestos	ARMSTRONG
1956-1957	OWENS-ILLINOIS (manufacturer) OWENS-CORNING FIBERGLAS (seller)	Kaylo	OWENS-CORNING FIBERGLAS
1957	EHRET MAGNESIA MANUFACTURING CO. (now Keene)	85% Magnesia Pipe Covering (occasionally used with an inner layer of calcium silicate)	ARMSTRONG

LT Cork Covering consisted of precision cut segments of cork board adhered to a backing of aluminum foil with a 16/1000" outer covering of nonfriable asbestos paper. This product has been determined not to be defective nor unreasonably dangerous: see attached Order of Judge Robert M. Parker in Gracedel vs. Fibreboard Corp., et al, No. B-80-658-CA, ED TX, June 13, 1982.

Armaspray, a spray-on insulation, was gray in color and granular.

85% Magnesia Pipe Covering & Block was molded. The pipe covering was furnished in 3' half sections (split horizontally) and furnished with a factory-applied canvas jacket, forming a hinge and lap. The block was furnished in 3' x 6" x 1-1/2" segments. 85% Magnesia Cement was sold in powder form.

Hy-Temp Pipe Covering & Block was molded. The pipe covering was furnished in 3' lengths or tubular half sections in thicknesses from 1" to 3" for pipe sizes 1/2" to 10" in diameter. The block was furnished in 3' lengths and 3", 6", 9" and 12" widths with thicknesses from 1" to 4". Hy-Temp Cement was sold in powder form.

Armabestos, a molded pipe covering and block, was a grayish, hard substance. The pipe covering was furnished in 3' lengths in thicknesses from 1" to 5" for pipe sizes 1/2" to 24" in diameter. The block was furnished in 3' lengths and 6", 12", 18" or 36" widths with thicknesses from 1" to 3". Kamatt, a molded pipe covering, was furnished in 3' lengths and thicknesses of 2", 2-1/2" or 3" for all pipe sizes over 12" in diameter.

Kaylo, a molded pipe covering and block, was rigid, preformed, and white in appearance. Kaylo-20 was colored pink with iron oxide for identification purposes. The pipe covering was furnished in 3' lengths and thicknesses from 1" to 3" for pipe sizes 1/2" to 39" in diameter. The block was furnished in 18" or 36" lengths and 3", 6", 12" or 18" widths with thicknesses from 1" to 3". Calcium Silicate Pipe Covering, a molded material, was available for pipes 2" or greater in diameter. Kaytherm Block was precision molded and gray colored. It was furnished in 3' lengths by 6" widths with thicknesses of 1-1/2" or 2".

Mani-Ply Insulation, a pipe covering, was furnished in 3' lengths in thicknesses of 1", 1-1/2" or 2". Bestfelt Pipe Covering was furnished in 3' lengths of 1" standard thicknesses for pipe sizes 1-1/2" to 24" in diameter. The Bestfelt Block and Sheets were furnished in 3' lengths and 6", 9", 18" or 36" widths with thicknesses from 1/2" to 4". Air Cell Insulations were available in pipe covering, sheet, or block form. The pipe covering was furnished in 3' lengths and thicknesses of 1/2" to 1", for pipe sizes 1/2" to 6" in diameter. The sheets and block were furnished in 6", 9", 12", 18", 36" or 72" lengths and 3" widths, with thicknesses from 1/2" to 4". Simplex Pipe Insulation was available only with 3 or 4 plies of felt per inch and 3' lengths for pipe sizes 1/2" to 8" in diameter. Duplex Wool Felt Pipe Insulation had a white covering. It was furnished in 3' lengths and thicknesses from 1/2" to 2".

Mineral Wool Cement was sold in powder form. #152 Cement was sold in powder form. This was a natural colored cement which dried to a very light gray shade. Amblerex No. 2 Cement was sold in powder form.

K. P. Asbestos Floats were sold in powder form.

FILED
U. S. DISTRICT COURT
EASTERN DISTRICT OF TEXAS

JUN 15 1982

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

MURRAY L. HARRIS, CLERK
BY DEPUTY *Matthew Saldana*

ANDREW GRACEDEL

VS.

FIBREBOARD CORPORATION,
ET AL

§
§
§
§
§
§

Civil Action No. B-80-658-CA

O R D E R

On this day came on to be considered Defendant Armstrong World Industries, Inc.'s Motion for Judgment Notwithstanding the Verdict of the jury in regard to one of its products submitted to the jury, to wit: LT Cork Covering, and it appearing to the Court that said Motion should be granted in that the jury's finding that LT Cork Covering was defectively designed and defectively marketed is against the great weight and preponderance of the evidence; it is therefore

ORDERED that said defendant's Motion is granted and the verdict of the jury concerning defendant Armstrong World Industries, Inc.'s product LT Cork Covering is hereby set aside and held for naught, and said defendant shall not be liable to the plaintiff for any exposure to plaintiff, if any, from LT Cork Covering.

SIGNED this 13th day of June, 1982.

[Signature]
UNITED STATES DISTRICT JUDGE

LT Cork Covering was a pipe covering which consisted of precision-cut segments of cork board adhered to a backing of aluminum foil with an asbestos paper laminate. The asbestos paper was purchased from a supplier; therefore, the type or percentage of asbestos contained therein is not known. However, the entire outer covering of this product was only .016" thick and, therefore, represented an extremely small percentage of the entire product.

Armaspray contained approximately 8% asbestos by weight, which was at various times amosite or chrysotile asbestos.

85% Magnesite Pipe Covering & Block and Cement contained approximately 10% asbestos. We have no knowledge as to the type.

Hy-Temp Pipe Covering & Block and Cement contained approximately 13% asbestos. We have no knowledge as to the type.

Armabestos Pipe Covering & Block contained approximately 50% amosite asbestos. Kamatt Pipe Covering contained amosite asbestos. We have no knowledge as to the percentage.

Kaylo Pipe Covering & Block contained approximately 15% amosite and chrysotile asbestos. We have no knowledge as to the type or percentage of asbestos contained in Kaytherm Block.

We have no knowledge as to the type or percentage of asbestos contained in Mani-Ply Insulation. We have no knowledge as to the type or percentage of asbestos contained in Bestfelt Pipe & Block & Sheet. Air Cell Insulations and Simplex Pipe Insulations consisted of layers of flat and

corrugated asbestos felt which was approximately 75% asbestos bonded together with a sodium silicate, in a special laminating process. We have no knowledge as to the type of asbestos. Duplex Wool Felt Pipe Insulation was composed of creped felt, waterproof felt binder, and a canvas jacket in addition to asbestos paper. We have no knowledge as to the type or percentage of asbestos.

We have no knowledge as to the type or percentage of asbestos in Mineral Wool Cement. We have no knowledge as to the type or percentage of asbestos in #152 Asbestos Cement. We have no knowledge as to the type or percentage of asbestos in Amblerex No. 2 Cement.

K. P. Asbestos Floats were asbestos; however, we have no knowledge as to the type of asbestos.

LT Cork Covering was used to insulate pipes and fittings with temperatures ranging from -120°F to 200°F.

Armaspray was used to insulate large, irregular surfaces such as tanks and vessels with temperatures up to 1600°F.

85% Magnesia Pipe Covering & Block and Cement were used to insulate pipes and surfaces with temperatures up to 600°F.

Hy-Temp Pipe Covering & Block and Cement were used to insulate heat lines and surfaces with temperatures ranging from 600°F to 1900°F.

Armabestos Pipe Covering & Block was used to insulate pipes with temperatures up to 750°F or 1200°F, or surfaces up to 1200°F. Kamatt Pipe Covering was used to insulate pipes with temperatures up to 750°F.

Kaylo Pipe Covering & Block was used to insulate pipes and surfaces with temperatures up to 1200°F. Kaylo-20 could be used on temperatures up to 1800°F. Calcium Silicate Pipe Covering was used as an inner layer material in combination with 85% Magnesia Pipe Covering for temperatures ranging from 600°F to 1200°F. Kaytherm Block was used to insulate surfaces with temperatures up to 1500°F.

Mani-Ply Insulations were used to insulate pipes with temperatures up to 500°F. Bestfelt Pipe & Block & Sheet was used to insulate temperatures up to 700°F. The pipe covering was used on lines subject to vibrations. Air Cell Insulations were used on lines or surfaces with temperatures up to 300°F. Simplex Pipe Insulations were used to insulate lines with temperatures up to 300°F where a water-repellant surface was needed. Duplex

Wool Felt Pipe Insulation was used to insulate hot or cold water lines 40°F to 210°F.

Mineral Wool Cement was used for plastic insulation on irregular surfaces up to 1800°F. #152 Asbestos Cement was a general utility cement which could also be used as an insulating cement on surfaces with temperatures up to 1000°F. Amblerex No. 2 Cement was used for insulation on surfaces with temperatures up to 1000°F.

K. P. Asbestos Floats were used to give a dense, tough, hard quality to the final asphalt plastic finish on walls of low temperature rooms.

Attachment E

To this Defendant's knowledge, all pipe covering, block and sheet was packaged in cartons; and cements and K. P. Asbestos Floats were packaged in bags.

LT Cork Covering was packaged in cardboard cartons. The corporate name and address were printed on the cartons, with our trademark which consisted of the word "Armstrong" with the letter "A" centered in a colored disc.

Armaspray was packaged in 50 lb. kraft paper bags on which Armstrong Contracting & Supply Corporation, Lancaster, Pennsylvania, was printed.

Armabestos was packaged in cartons with Armstrong's trademark and label in accordance with a rebranding agreement with Unarco.

85% Magnesia Pipe Covering, manufactured by Ehret Magnesia Manufacturing Company, was sold under the Armstrong trade name in 1957.

The balance of the products identified in Attachment A were labeled by their manufacturer with the exception of Kaylo which was labeled by its seller, Owens-Corning Fiberglas Company.

I. WARNINGS & CAUTIONS TO ARMSTRONG FROM SUPPLIERS

<u>COMPANY</u>	<u>PRODUCTS SUPPLIED</u>	<u>WARNINGS & CAUTIONS</u>
DOBECKMUN CO.	Asbestos Paper Laminate for LT Cork Covering	None
LAKE ASBESTOS CO.	Asbestos for Armaspray	None
NORTH AMERICAN ASBESTOS CO.	Asbestos for Armaspray	None
KEASBEY & MATTISON CO.	High Temperature Insulation	None
BALDWIN-HILL CO.	High Temperature Insulation	None
EHRET MAGNESIA MANUFACTURING CO.	High Temperature Insulation	None
OWENS-ILLINOIS GLASS CO./OWENS-CORNING FIBERGLAS CO.	High Temperature Insulation	None
UNARCO	High Temperature Insulation	None

II. WARNINGS & CAUTIONS REGARDING ARMSTRONG PRODUCTS

A. Armaspray

1. Users

Armstrong Contracting and Supply Corporation was the sole purchaser of Armaspray. In its Construction Manual, it published safety precautions to be followed in all applications of Armaspray. The Construction Manual was used in training and in actual application, and was in use during the entire period of Armaspray application. Only employees so trained applied the product. For applications of Armaspray with the A-200 spray equipment, the safety precaution read:

Always wear a U.S.-approved respirator when spraying. If tamping in the vicinity of the actual spray operation, the tamper should also wear a respirator.

For applications of Armaspray with the Armaspray Junior spray equipment, the safety precaution read:

7.1.4 The circular saw used for cutting the legs is always a possible hazard.

7.2 Means Used to Safeguard

7.2.1 There is a no smoking rule, except for certain small specified areas, throughout the plant. The spray booth used for this operation is built of fire resistant materials.

7.2.2 The spray booth is equipped with a 3 foot diameter ventilating fan to remove the adhesive fumes. This fan must be used when LT Cork Covering is being made and during clean-up operations.

7.2.3 All persons using the Toluol clean-up solvent must wear rubber gauntlet gloves.

7.2.4 The Oliver and railway saws are equipped with a guard for the exposed blade. The saw operator is provided with a wooden ram for pushing the various places of corkboard past the saw blade.

These were in effect during the entire period of manufacture, 1956-59.

The author is Dale H. Lockland.

WORKER'S COMPENSATION CLAIMS - ASBESTOS
1952 - 8/1/69

Key:

(A) CCo. - Armstrong Cork Company
(A) C&S - Armstrong Contracting & Sup

Claimant	First Receipt of Info Regarding Claim	Claimant's Attorney	Employee of (A) CCo. or (A) C&S	Forum	Disposition as to Armstrong
Boyer, Wayne 1122 Palm Street Las Vegas, NV	7/31/68	Eugene Marias 727 West 7th Street Los Angeles, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Calif. Workmen's Compensation Appeals Board, L.A. No. 68 LA 322 421	Status - Unknown
Brimmer, Lawrence 6800 N. Dort Hwy. Flint, MI	8/29/68	Rene J. Ortleib 706 Mott Foundation Bldg. Flint, MI	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Michigan Workmen's Compensation Dept., Lansing	Dismissed
Brodale, Irene (widow) and Frederick (deceased) 2344 Fulton Street Berkeley, CA	8/2/62	Minor J. Schmid 1322 Webster Street Oakland, CA	(A) CCo. empl. (Unconfirmed)	Calif. Industrial Accident Comm., Oakland No. 62 OAK 8566	Settled \$111
Campbell, Edward Woodtick Road Waterbury, CT	12/30/54	Norman Zolot 2607 Whitney Avenue Hamden, CT	(A) CCo. empl. (Unconfirmed)	Workmen's Comp. Commission of CT, Hartford	Status - Unknown
Chester, Marie (widow) and Charles (deceased) 816 Bertwood Avenue Gloucester, NJ	11/11/65	Vincent Corsetti 735 Philadelphia Saving Fund Bldg. Philadelphia, PA	(A) C&S empl. (Unconfirmed)	Penna. Workmen's Comp. Board, Phila. No. 191,555	Status - Unknown
Clark, Maurine (widow) and Dean (deceased) 13331 Lakewood Boulevard Downey, CA	2/22/67	Steve Roseman 1621 West 9th Street Los Angeles, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Calif. Workmen's Comp. Appeals Board, L.A., No. 66 LA 292 043	Settled Amount Unknown
Coates, John C.	5/20/65	Wilfred Boudreaux	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	New Orleans, LA	Status - Unknown

<u>Claimant</u>	<u>First Receipt of Info Regarding Claim</u>	<u>Claimant's Attorney</u>	<u>Employee of (A) CCo. or (A) C&S</u>	<u>Forum</u>	<u>Disposition as to Armstro</u>
Coll, Vincent P. 719 Cleveland Drive Cheektowaga, NY	7/25/57	---	(A) CCo. empl. (Unconfirmed)	New York Workmen's Comp. Appeals Board, Buffalo No. 85702510	Settled Amount Unknown
Crader, Lola J. (widow) and Willard (deceased) 10603 Valencia Street Bloomington, CA	6/27/66	Gerald Tiernan 436 West 4th Street Pomona, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Calif. Industrial Accident Comm., Pomona No. 64 POM 1939	Settled Amount Unknown
Curtis, Harvey E. 28312 Michigan Avenue Inkster, MI	8/1/60	Markle & Markle 1030 Buhl Building Detroit, MI	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Michigan Workmen's Comp. Dept., Detroit No. B 9384208	Settled No Payme
Cuthbertson, Jack H. 2284 Holbrook Drive Concord, CT	11/15/54	Smith & Parrish 1616 Financial Center Bldg. San Francisco, CA	(A) CCo. empl. (Confirmed)	Calif. Indus. Accident Comm., San Francisco No. 96 C 622198	Settled \$468.60
Cuthbertson, Robert F.	7/24/59	---	(A) CCo. empl. (Confirmed)	Calif. Indus. Accident Comm., Oakland No. 59 OAK 1053	Dismissed
Dean, Mary (widow) and William (deceased) 61-07 Woodside Avenue Woodside, NY	9/26/60	---	(A) C&S empl. (Confirmed)	New York Workmen's Comp. Board, N.Y.C. No. 06008650	File clc W.C. Boa No Payme
Everitt, Allen 449 - 22nd Street Richmond, CA	1/24/64	---	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Workmen's Comp. Appeals Bd., Oakland No. 63 OAK 11139	Dismissed

<u>Claimant</u>	<u>First Receipt of Info Regarding Claim</u>	<u>Claimant's Attorney</u>	<u>Employee of (A) CCo. or (A) C&S</u>	<u>Forum</u>	<u>Dispositio as to Armstrong</u>
Faulkner, John 12328 Carmenita Whittier, CA	5/28/63	Louis Berson 305-1/2 Avalon Blvd. Wilmington, CA	(A) CCo. empl. (Unconfirmed)	Calif. Indus. Accident Comm., Long Beach No. 63 LB 22467	Dismissed
Furla, Del 3004 Carvel Drive Santa Rosa, CA	2/11/65	McKenzie and Arata 421 Orchard Street Santa Rosa, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Indus. Accident Comm., Santa Rosa No. 65 SRO 34243	Settled - \$132.16
Gay, Irvin E. 4910 - 11th Avenue Sacramento, CA	12/9/68	--	(A) C&S empl. (Confirmed)	Calif. Workmen's Comp. Appeals Bd., Sacramento No. 68 SACO 29383	Status - Unknown
Gillivich, Steve 239 Georgia Avenue San Bruno, CA	8/29/62	Smith, Parrish, Paddock & Clancy 315 Financial Center Bldg. Oakland, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Calif. Indus. Accident Comm., Oakland No. 61 OAK 7152	Settled - Amount Unknown
Goans, Robert O. 4232 - 25th Street San Francisco, CA	8/8/63	Smith, Parrish, Paddock & Clancy 315 Financial Center Bldg. Oakland, CA	--	Calif. Indus. Accident Comm., Oakland No. 63 OAK 11052	Settled - \$175.00
Greifschar, Paul J. 151 LaVista Avenue Concord, CA	10/8/63	Smith, Parrish, Paddock & Clancy 315 Financial Center Bldg. Oakland, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Confirmed)	Calif. Indus. Accident Comm., Oakland No. 62 OAK 8188	Settled - Amount Unknown

Claimant	First Receipt of Info Regarding Claim	Claimant's Attorney	Employee of (A) CCo. or (A) C&S	Forum	Disposition as to Armstrong
Gronenthal, Lilly N. (widow) and John (deceased) 1116 Fifth Avenue Spokane, WA	8/10/61	Leo Frederickson 203 Rookery Bldg. Spokane, WA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Washington Bd. of Industrial Insurance Appeals No. C 753 051	Denied by order of S of Ind. In 6/7/61. R versed by of Ind. In Apps. 11/3 (A) CCo. not listed as on appeal.
Haake, Harry 33 Sunny Ridge Drive E. Hartford, CT	10/18/57	---	(A) CCo. empl. (Confirmed)	Workmen's Comp. Commission of Connecticut No. B8683974	Settled - \$124.45
Hagg, Pauline (widow) and Alvin (deceased) 14035 - 33rd Avenue, S. Seattle, WA	6/5/68	---	---	Washington Dept. of Labor and Industries, Seattle, No. F 541406	Status - Unknown
Hallmark, Stanley R. 36 Anchor Drive Pittsburg, CA	5/27/68	Stephen Chandler 220 Juana Avenue San Seandro, CA	(A) CCo. empl. (Unconfirmed) (A) C&S empl. (Unconfirmed)	Calif. Workmen's Comp. Appeals Bd., Oakland No. 68 OAK 26794	Settled - \$262.00
Harding, Clifford P. 1407 Howe Avenue Sacramento, CA	1/19/61	Smith, Parrish, Paddock & Clancy 501 Financial Center Bldg. Oakland, CA	(A) CCo. empl. (Confirmed)	Calif. Indus. Accident Comm., Oakland No. 60 SF 193 854	Settled - \$50.57

Claimant	First Receipt of Info Regarding Claim	Claimant's Attorney	Employee of (A) CCo. or (A) C&S	Forum	Disposition as to Armstrong
Hartwig, Henry 1917 N. 34th St. Milwaukee, WI	2/22/57	Hugh Hafer 511 Warner Theater Bldg. Milwaukee, WI	--	Wisconsin Industrial Commission, Madison No. E 2227 287	Dismissed
Herkel, Virginia (widow) and Frederick J., Jr. (deceased) 5331 Riverview Rd. Minneapolis, MN	3/07/67 (set for apportmt.)	E. Lee Armstrong 270 North Snelling St. Paul, MN	(A) CCo. empl. (Confirmed)	Industrial Commission of Minnesota, Dev. of Worker's Comp., St. Paul No. 374963	Status - Unknown
Hunt, Melvin L. 1126 Bainbridge Ave. West Covina, CA	1/17/66	Ed Silver Silver & McWilliams	(A) C&S empl. (Confirmed)	Calif. Workmen's Comp. Appeals Board, Long Beach No. 65 LB 29228	Settled - \$3,298.00
Hyatt, Floyd	9/11/53	Lucille Snowden 808 Seybold Bldg. Miami, FL	(A) CCo. empl. (Confirmed)	Florida Industrial Comm. Worker's Comp. Div. - Tallahassee No. S-85602	Order/Award Amount Unknown
Kingston, George A. 2617 W. 70th St. Minneapolis, MN	11/62	Robins, Davis & Lyons 1130 Minn. Bldg. St. Paul, MN	(A) CCo. empl. (Unconfirmed)	Minnesota Industrial Commission, St. Paul No. 112920	Settled - \$1,500.00
McCarrell, E. O. 12255 Hart St. N. Hollywood, CA	1958	--	(A) CCo. empl. (Confirmed)	Calif. Dept. of Industrial Relations, Los Angeles No. 56 LA 176 684	Settled - \$13,319
McCormick, William C. 3169 Live Oak Huntington Park, CA	11/11/68	Rose, Klein & Marias 727 West 7th Street Los Angeles, CA	--	Calif. Workmen's Comp. Appeals Board, Los Angeles No. 67 LA 317 548	Settled - Amount Unknown

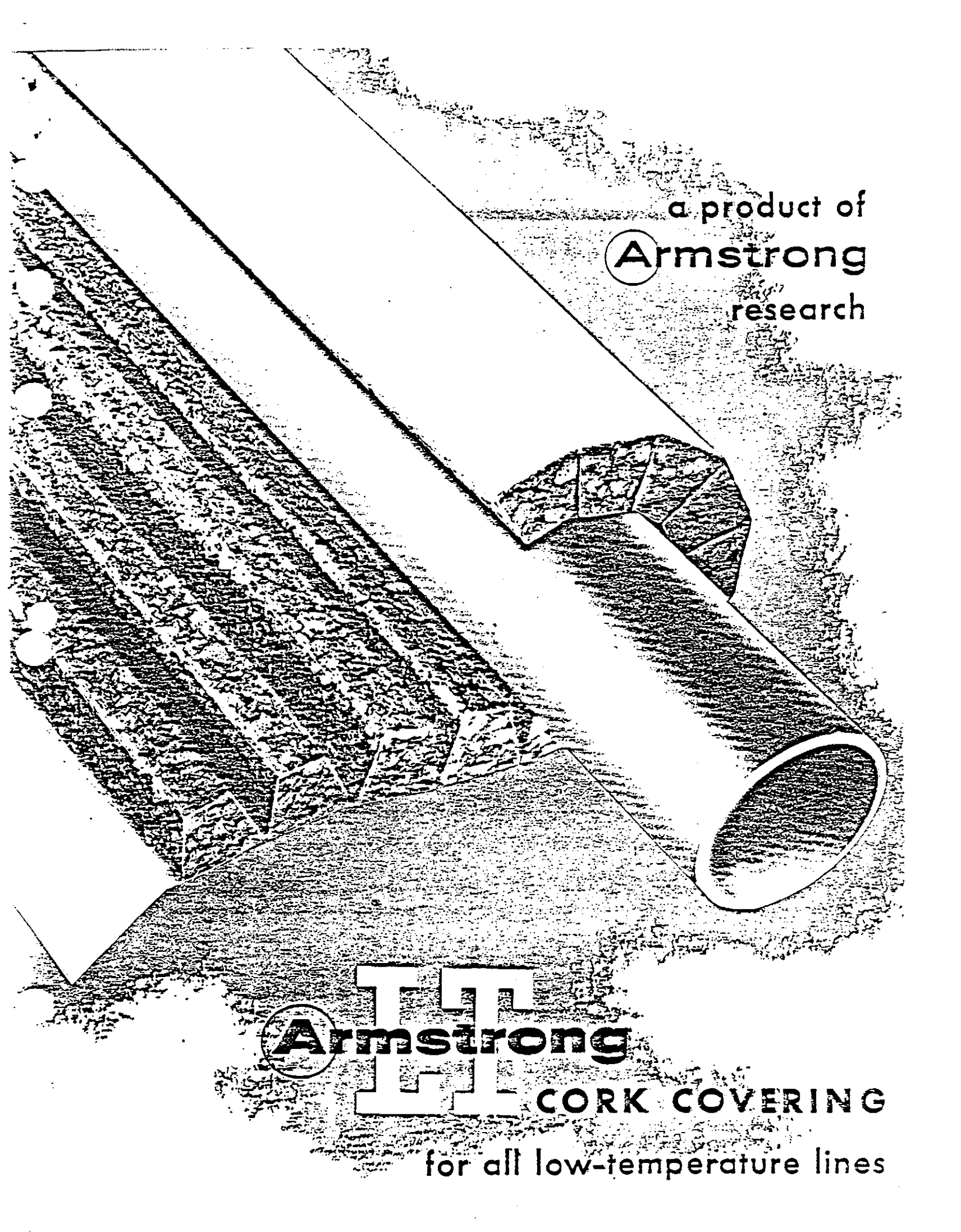
Claimant	First Receipt of Info Regarding Claim	Claimant's Attorney	Employee of (A) CCo. or (A) C&S	Forum	Disposition as to Armstrong
Miller, Arthur H. 3217 Castalia Ave. Los Angeles, CA	11/62	Brundage, Hackler & Roseman 1621 West 9th Street Los Angeles, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Industrial Accident Commission, Los Angeles No. 62 LA 235 371	Denial
Munger, Lewis M.	1954	—	(A) CCo. empl. (Confirmed)	Michigan Workmen's Compl. Appeals Board, Bay City No. B 72978349	Settled - \$8,134.52
Nicholson, Clyde 1808 E. Commonwealth Fullerton, CA	10/2/68	Howard A. Gebler 727 West 7th Street Los Angeles, CA	(A) C&S empl. (Unconfirmed)	Calif. Workmen's Comp. Appeals Board, Santa Ana No. 68 ANA 23276	Status - Unknown
Novak, Edward C. 1855 Riverton Ave. N. Hollywood, CA	9/11/64	William Hays 6331 Hollywood Blvd. Los Angeles, CA	(A) CCo. empl. (Confirmed)	Calif. Industrial Accident Commission, Los Angeles No. 63 LA 250 854	Settled - Amount Unknown
Pfleghaar, Edward L. 141 Monterey St. Brisbane, CA	10/68	Ott & Williams 126 Hyde San Francisco, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Workmen's Comp. Appeals Board, San Francisco No. 68 SF 223 867	Status - Unknown
Pond, Lowell M. 10989 Amery Ave. South Gate, CA	7/26/68	Eugene Marias 727 West 7th Street Los Angeles, CA	(A) CCo. empl. (Confirmed)	Calif. Workmen's Comp. Appeals Board, Los Angeles No. 67 LA 318 198	Status - Unknown

Claimant	First Receipt of Info Regarding Claim	Claimant's Attorney	Employee of (A) CCo. or (A) C&S	Forum	Disposition as to Armstrong
Stanley, John 10786 Stanley LA. Garden Grove, CA	2/10/69	Jerrold M. Wolf 727 West 7th Street Los Angeles, CA	(A) CCo. empl. (Confirmed)	Calif. Workmen's Comp. Appeals Board, Santa Ana No. 68 ANA 23456	Settled - \$221.87
Strelthorst, L. J. 2637 Lincoln Ave. Richmond, CA	5/10/60	Smith, Parrish, Padduck & Clancy 501 Financial Center Building Oakland, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Industrial Accident Commission No. 60 SF 192 145	Dismissed
Strickland, Fred E. 39 Ellsworth St. San Francisco, CA	8/8/58	Smith, Parrish, Padduck & Clancy 501 Financial Center Building Oakland, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Dept. of Industrial Rel., Ind. Accident Comm., San Francisco No. 57 SF 182-526	Settled - \$37.50
Swartout, John E. (then Bergit A.) 3000 Merrywood Dr. Sacramento, CA	7/6/56	Smith, Parrish, Padduck & Clancy 501 Financial Center Building Oakland, CA	(A) CCo. empl. (Confirmed)	Calif. Industrial Accident Commission, San Francisco No. 56 SF 169 171	Settled - No Payment
Thompson, Leslie A. 2535 Lyon St. Des Moines, IA	11/68	Lee Gaudineer, Jr. 312 Hubbell Bldg. Des Moines, IA	(A) C&S empl. (Confirmed)	Iowa Industrial Commission, Des Moines	Status - Unknown
Thorsted, Roy	6/19/59	--	(A) CCo. empl. (Confirmed)	Calif. Industrial Accident Commission, Oakland No. 59 OAK 1367	Denial - No Payment

<u>Claimant</u>	<u>First Receipt of Info Regarding Claim</u>	<u>Claimant's Attorney</u>	<u>Employee of (A) CCo. or (A) C&S</u>	<u>Forum</u>	<u>Dispositio as to Armstrong</u>
Tyler, John 6333 Dashwood Lakewood, CA	3/21/67	Howard Gebler 315 West 9th Street Los Angeles, CA	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Calif. Workmen's Comp. Appeals Board, Long Beach No. 68 LB 36087	Dismissed
Viall, Lloyd V. 5485 South 4270 W. Kearns, Utah	8/3/59	---	(A) CCo. empl. (Confirmed) (A) C&S empl. (Confirmed)	Nevada Industrial Commission No. OD 59 14826	Status - Unknown
Zini, Robert 3184 Turk St. San Francisco, CA	8/6/59	Smith, Parrish, Paddock & Clancy 405 14th Street Oakland, CA	(A) CCo. empl. (Confirmed)	Calif. Industrial Accident Commission No. 58 SF 186 653	Denial - No Payment

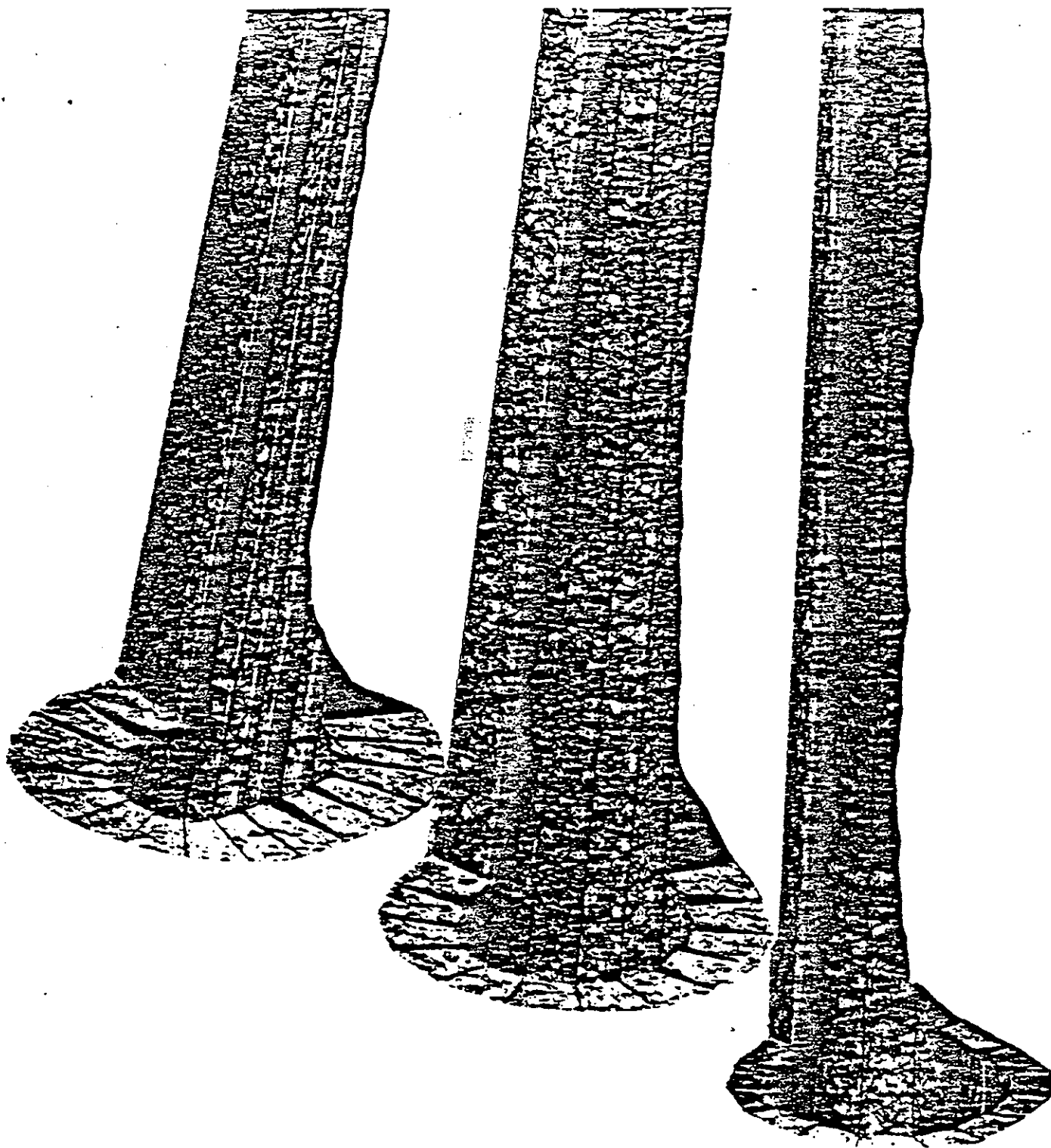
Armstrong Cork Company Librarians

<u>Years</u>	<u>Librarian</u>
1928	Miss Quigley (current address and telephone number unknown) No current position
1943	Betty Huber Cromwell (current address and telephone number unknown) No current position
1945	Kathleen Shenk (current address and telephone number unknown) No current position
1946-47	Sara Montgomery Long (current address and telephone number unknown) No current position
1949	Elsie Kirkgessner (current address and telephone number unknown) No current position
1933-62	Fred Daum (exact dates as librarian not known) (Current address and telephone number unknown) No current position
1962-80	Marianne Ditzler (Armstrong Cork Company, Liberty and Charlotte Streets, Lancaster, Pennsylvania 17604; telephone 717/397-0611)
1980 - present	Jean Immel (Armstrong World Industries, Inc., Liberty and Charlotte Streets, Lancaster, Pennsylvania 17604; telephone 717/397-0611)



a product of
Armstrong
research

Armstrong
IT CORK COVERING
for all low-temperature lines



*...for fast, low-cost application
plus the proved performance of cork*

Armstrong
CORK COVERING

LT-Thirty Cork Covering

LT-Zero Cork Covering

LT-Minus Thirty Cork Covering

Armstrong LT Cork Covering is a new type of pipe insulation, developed by Armstrong Research for use on all low-temperature lines. It gives you the high insulating value, rigid strength, and long life of molded type cork covering, yet can be bought and installed at much lower cost.

MADE OF HIGH-QUALITY CORK—LT Covering is made from precision-cut segments of Armstrong Corkboard, having a thermal conductivity of .28 Btu per square foot per hour per degree temperature difference per inch thickness at 60° F. mean temperature. Segments are adhered to a backing of asbestos paper and aluminum foil laminate.

FIRE- AND VAPOR-RESISTANT—The asbestos paper provides a highly fire-resistant finish and the aluminum foil seals out moisture vapor.

A THICKNESS FOR EVERY CONDITION—LT Covering is made in thicknesses calculated to prevent condensation when used indoors under normal design conditions and within recommended temperature ranges. On outdoor lines, under severe service conditions, additional thicknesses may be necessary.

LT-Thirty*—Made in .8" thickness, for use on lines operating at 30° F. or higher.

LT-Zero*—Made in 1½" thickness, for use on lines operating at temperatures as low as 0° F.

LT-Minus Thirty*—Made in 1½" thickness for pipes through 1¼" IPS, 2" thickness for pipes to 8" IPS, and 2¼" thickness for larger pipe sizes. For use on lines operating at temperatures as low as 30° below zero.

All three types are made in 36" lengths and will fit accurately all sizes of iron pipe or copper tubing from ½" up.

For temperatures below minus 30°, LT Cork Covering will be made in Minus Sixty, Minus Ninety, and Minus One-Hundred-Twenty Thicknesses on order.

APPLICATION IS FAST AND EASY—Armstrong LT Covering is manufactured with a lap of the asbestos-aluminum paper backing at the longitudinal joint. In application to straight piping, the lap is sealed in place with Armstrong 520 Adhesive, and

the end joints are sealed with Armstrong LT Sealing Tape. As no wiring, pointing, or painting is needed, LT Covering goes on the piping with remarkable speed and ease.

Fittings are insulated with pieces of LT Covering, fabricated right on the job, or with Armstrong Plasticork®. Plasticork is a cork-and-rubber composition material that is molded by hand over the fitting.

By using the proper size of LT Covering and making a few simple saw cuts, covers for any fitting can be fabricated easily and rapidly. Voids between fitting and fitting cover are filled with Armstrong Plasticork, and exposed ends are sealed with Armstrong LT Sealer and LT Sealing Tape for a vapor-tight installation.

Field fabrication of fitting covers speeds the job. Workmen can insulate the entire line as they go, with no waits for factory shipments of fitting covers.

VAPOR BARRIER UNBROKEN—As no nails or staples are needed to install LT Covering, the vapor seal formed by the paper backing is unbroken. There are no punctures where infiltrating vapor can cause condensation or frost formation within the insulation.

CAN BE REMOVED AND REUSED—When lines are relocated, or taken out of service, the asbestos-and-aluminum paper can be cut and LT Covering salvaged without damage to the cork. The covering can be applied again, using Armstrong LT Sealing Tape to hold it in place.

SAVES STORAGE SPACE—Inventories of LT Cork Covering take up no more storage space than board-form material, as the insulation comes in flat sheets rather than in curved sections.

FOR A DE LUXE FINISH—For a durable, easy-to-maintain finish, or where color identification of the line is desired, Armstrong Insulcolor® can be applied over the vaporproof paper backing on LT Covering. On outdoor installations, 4-oz. canvas must be applied over LT Sealing Tape at joints before finishing with Insulcolor. (For complete information on Armstrong Insulcolor, call or write for free booklet.)

SUNDRIES FOR APPLYING

Armstrong LT CORK COVERING

Armstrong 520 Adhesive—This all-purpose adhesive forms a strong, resilient bond between almost any clean, dry surfaces. The bond is an excellent vapor seal and grows stronger with time. Available in one-half pint, pint, quart, and gallon containers. Coverage is 25 to 30 lin. ft. per pint.

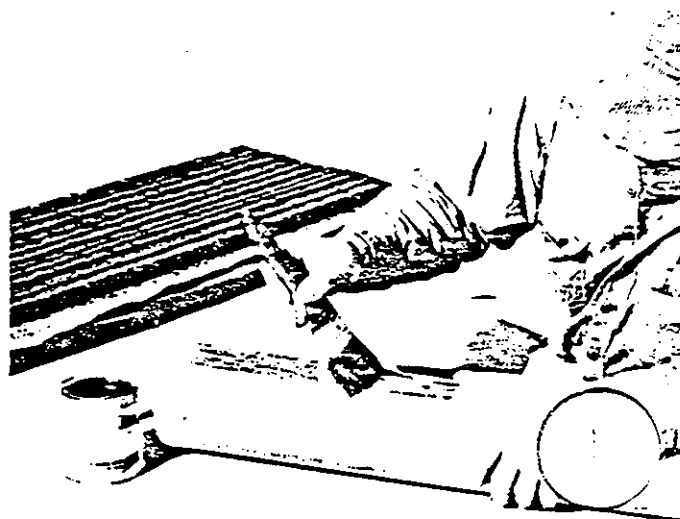
Armstrong Plasticork—For use in packing the space between LT Fitting Covers and pipe fittings, and for hand molding fitting covers. This is a granulated cork-and-rubber composition, supplied in sheets about one foot square and one-half inch thick. Packaged in cardboard cartons containing 5, 15, and 30 lbs.

Armstrong LT Sealer—For use in sealing joints and ends of LT Fitting Covers. This white sealer is the consistency of caulking compound. It is a vapor-barrier coating that meets the fire resistance requirements of U. S. Specification MIL-P-878A. Packaged in ½-pint, pint, quart, 1- and 5-gallon containers.

Armstrong LT Sealing Tape—Used to seal end joints of Armstrong LT Cork Covering. This is a vapor-barrier, pressure-sensitive adhesive tape. Supplied in rolls 2" wide, 3 and 36 yards long, white in color.

Lineal Feet of LT Sealing Tape per Lineal Foot of Covering
(Including Approximately a 2" Lap)

Pipe or Tubing Size	LT-Thirty	LT-Zero	LT-Minus Thirty
¼"	.3	.4	.4
⅜"	.3	.4	.4
½"	.3	.4	.4
¾"	.3	.4	.4
1"	.4	.5	.5
1¼"	.4	.5	.5
1½"	.4	.5	.6
2"	.4	.6	.7
2½"	.5	.6	.7
3"	.5	.7	.7
3½"	.6	.7	.8
4"	.6	.7	.8
5"	.7	.8	.9
6"	.8	.9	1.0
8"	1.0	1.1	1.2
10"	1.2	1.3	1.4
12"	1.4	1.5	1.6
14"	1.5	1.6	1.7
16"	1.6	1.8	1.9
18"	1.8	1.9	2.1
20"	2.0	2.1	2.2
22"	2.2	2.3	2.4
24"	2.3	2.4	2.6

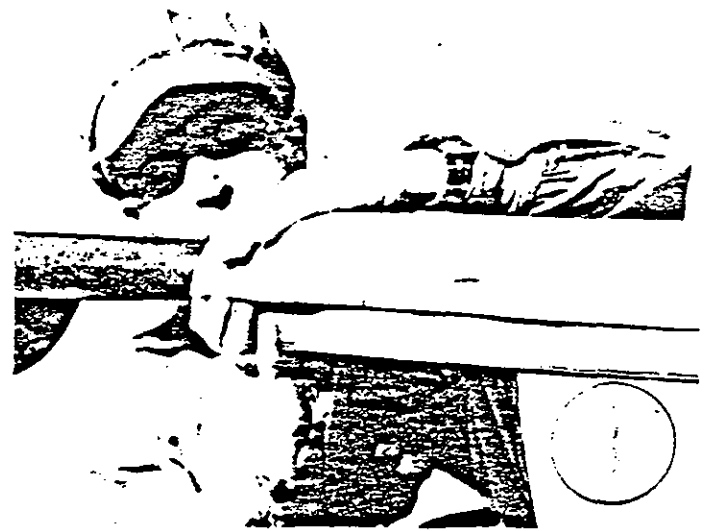
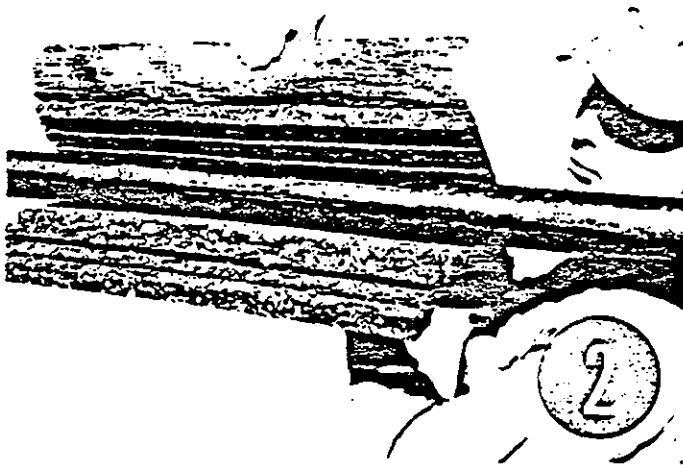


APPLICATION OF Armstrong LT CORK COVERING IS FAST AND EASY

The speed with which insulation mechanics can apply Armstrong LT Cork Covering results in substantial time and labor savings, compared with conventional application methods. With LT Covering there are no wires or bands to apply, no sealers or seam fillers are required, and no cloth, twine, or paper must be wrapped around the insulation. Indoors, no further finishing is necessary, except where desired for decoration or identification.

Fitting covers are fabricated on the job from sections of LT Covering or can be built up with Armstrong Plasticork. A brief description of fitting cover fabrication methods is contained on Pages 6 and 7. Complete details are available in a booklet entitled, "General Instructions for Fabrication of Fitting Covers of Armstrong LT Cork Covering," which is available from Armstrong on request.

Data on application of Plasticork fitting covers is contained on Pages 10 and 11.



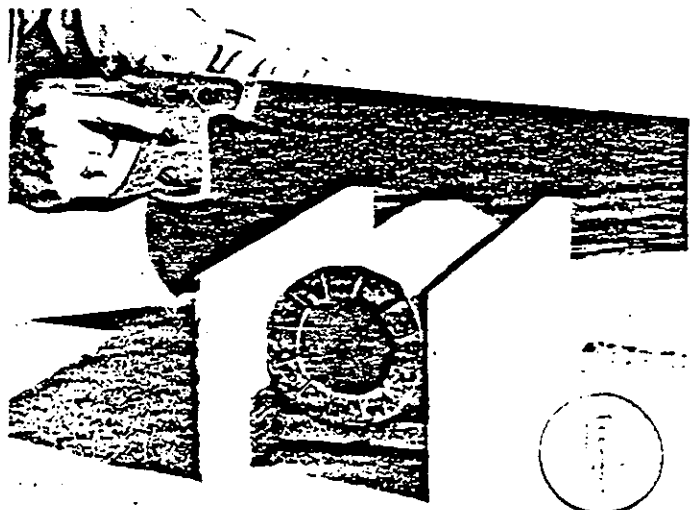
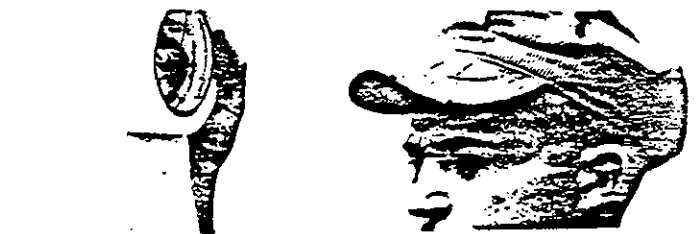
1 The surfaces of the backing paper that come in contact with each other are coated with Armstrong 520 Adhesive. In this picture, the adhesive has been applied to the underside of the longitudinal flap, and the workman is coating the area of the asbestos paper that will be covered by the flap.

2 After the 520 Adhesive has dried to the touch, Armstrong LT Covering is positioned on the pipe with the flap downward. When the covering is in place, the cork segments fit together without gaps or voids. No adhesive need be applied to them.

3 With the covering held firmly in place, the flap is sealed down by the workman running his thumb along the paper at the longitudinal joint. The rest of the flap is then sealed in place. Waterproof adhesive and vapor-barrier paper form a moisture-impervious outer wrap.

4 After the seams and cork segments have been aligned, end joints are sealed simply by wrapping them with Armstrong LT Sealing Tape. This vaporproof tape completes the vapor-barrier and provides a neat looking joint between lengths of Armstrong LT Cork Covering.

5 Cutting of short lengths, when required, should be done with a miter box or with a mechanical saw. End joints must be square cut for snug fit so that there is no danger of condensation and frost formation at those points. Both the cork segments and the paper cut cleanly.

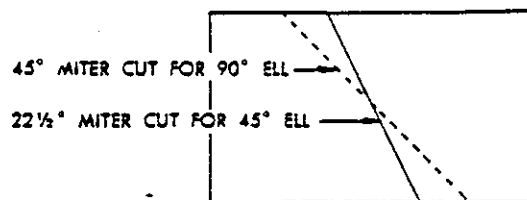


ON-THE-JOB FABRICATION OF FITTING COVERS SPEEDS APPLICATION of **Armstrong** LT CORK COVERING

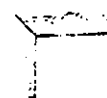
Fitting covers for LT Cork Covering installations are fabricated on the job. Lengths of LT Covering of a size that will encircle the fitting at its point of maximum diameter are used. By making a few simple cuts with a saw and miter box, any fitting can be easily and quickly insulated. Except for screwed fittings, space between the fitting and the cover is packed with Armstrong Plasticork, eliminating voids and increasing the efficiency of the installation. Armstrong LT Sealer is applied to the exposed ends of the LT Cork Covering and joints in the fitting cover are cemented with Armstrong 520 Adhesive for a completely vaporproof installation.

Field fabrication does away with the delay caused when covers for special fittings must be made up at the factory and shipped to the job site. In all cases, regardless of the fitting encountered, it can be insulated along with straight piping as the job progresses.

FABRICATION OF 90° AND 45° ELL COVERS



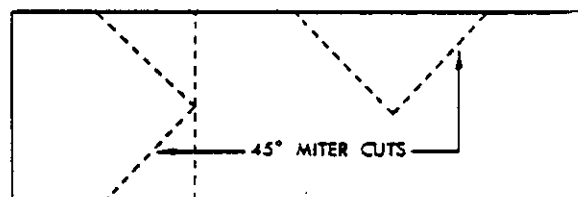
ASSEMBLED
FITTING
FOR 90° ELL



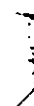
ASSEMBLED
FITTING
FOR 45° ELL



FABRICATION OF TEE AND VALVE COVERS

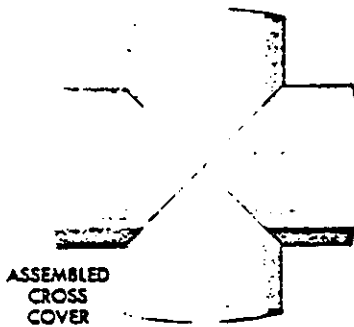
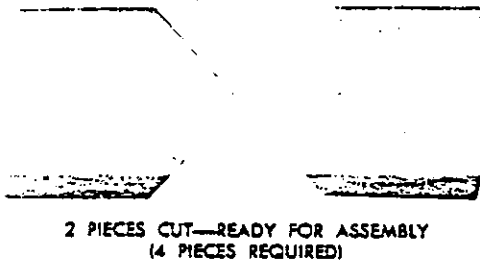
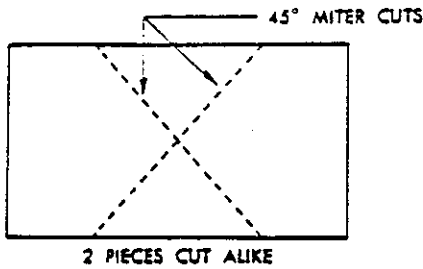


PIECES CUT—READY FOR ASSEMBLY

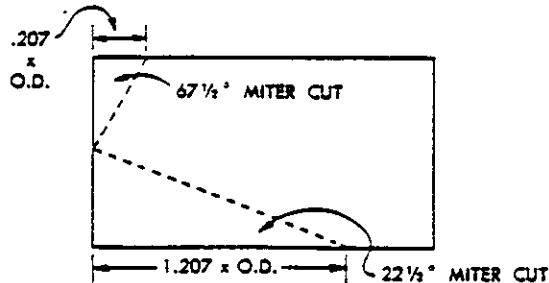
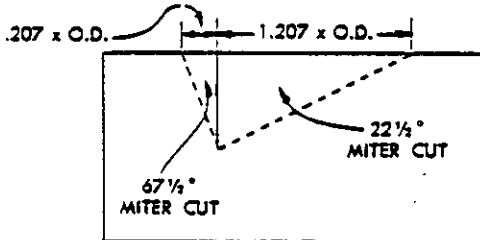


ASSEMBLED TEE OR VALVE COVER

FABRICATION OF CROSSES

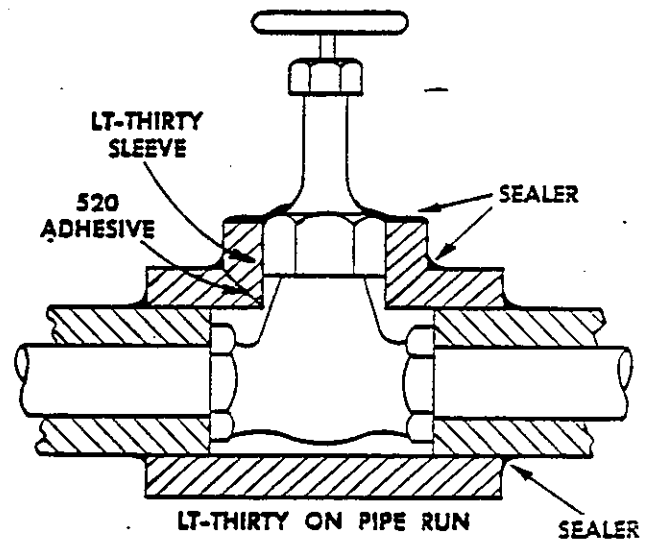


FABRICATION OF LATERAL Y COVER

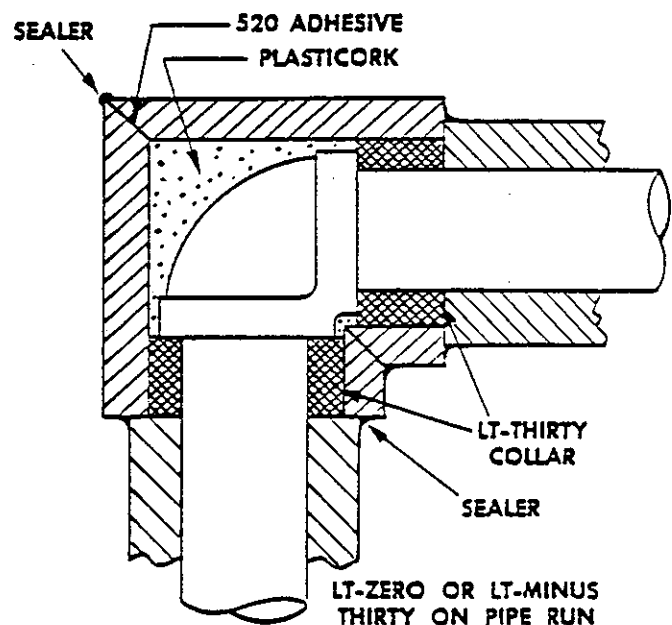


ASSEMBLED FITTING
FOR LATERAL Y

Cross Sections of Typical Fabricated Fitting Covers for Screwed Fittings



Without collar—When LT-Thirty Covering is used on the pipe run, no collars are required. Void between fitting and fitting cover need not be filled with Plasticork.



With collar—When LT-Zero or LT-Minus Thirty Coverings are used on pipe run, collars of LT-Thirty Covering are applied as shown in the drawing above. Space between fitting and fitting cover is filled with Armstrong Plasticork.

LINEAL FEET OF LT CORK COVERING AND QUANTITIES OF SUNDRY MATERIALS REQUIRED FOR FITTING COVERS

Notes:

1 Where two lengths are shown in the same column, use figure printed in black for standard fittings (125 lb.—150 lb.).
Use figure printed in color for extra heavy and ammonia fittings (250 lb.—300 lb.).

2 Armstrong 520 Adhesive quantities—estimate 1 pt. for each 25 lineal feet of pipe run. Count each fitting or valve as 1'6" of piping.

3 LT Sealing Tape required per lineal foot of LT Cork Covering is shown on table on Page 4.

4 Tables on these pages are for estimating quantities only. For fabrication details and dimensions, see booklet, "General Instructions for Fabrication of Fitting Covers from Armstrong LT Cork Covering."

5 On all valve bonnets, reinforce LT Sealer with white glass fabric, muslin or scrim cloth.

SCREWED FITTING AND VALVE COVERS—

* LINEAL FEET OF COVERING REQUIRED PER FITTING OR VALVE

PIPE SIZE (Inches)		Sleeve Size Cov'g. Req'd (Inches)	90° ELLS	
Iron	Copper		LT-Thirty LT-Zero	LT-Minus Thirty
—	¾	2½	.5	.5
¼	½	2	.5	.5
¾	¾	2	.5	.5
1½	7/8	2¾	.6	.6
¾	1¼	2½	.6	.6
1	1¾	3¼	.6	.6
1¼	1¾	3	.7	1.0
1½	—	3¾	.7	1.0
2	2½	4½	.7	1.0
2½	2¾	4	1.0	1.0
3	3¾	5½	1.0	1.5
3½	4½	6½	1.0	1.5
4	—	6	1.0	1.5
5	—	8½	1.5	1.5
6	—	8	1.5	1.5
8	—	10	1.5	3.0
10	—	12	3.0	3.0
12	—	14	3.0	3.0

NOTE: Weld and Sweat Fitting Covers—Fabricate covers from same size covering as used on pipe runs.
Tees and Crosses in all pipe sizes require no Plasticork.

FLANGED FITTING AND VALVE COVERS—

LINEAL FEET OF COVERING REQUIRED PER FITTING OR VALVE

Iron Pipe Size (Inches)	Sleeve Size Cov'g. Req'd (Inches)		90° ELL			90° ELL LONG RADIUS			45° ELL			TEE OR VALVE			CROSS			REDUCE		
	Std.	S.M. Ammon.	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty
1"	4	5½	1.0 1.5	1.5	1.5	1.5	1.5	1.5 3.0	.7 1.0	1.0	1.0 1.5	1.5 1.7	1.7 2.3	2.3	2.0 2.4	2.4 3.0	3.0	1.0	1.0 1.5	
1¼"	5¼	5	1.0 1.5	1.5	1.5	1.5	1.5	3.0	.7 1.0	1.0	1.5	1.5 1.7	1.7 2.3	2.3	2.0 2.4	2.4 3.0	3.0	1.0	1.0 1.5	
1½"	5½	6½	1.5	1.5	1.5	1.5	1.5 3.0	3.0	.7 1.0	1.0 1.5	1.5	1.7 1.8	1.7 2.3	2.3	2.4	3.0	3.0	1.0	1.0 1.5	
2"	6½	6	1.5	1.5	1.5 3.0	1.5	3.0	3.0	1.0	1.0 1.5	1.5	1.7 2.3	2.3	2.3 3.0	2.4 3.0	3.0	3.0 4.0	1.0	1.0 1.5	1.5
2½"	8½	8½	1.5	1.5 3.0	1.5 3.0	1.5 3.0	3.0	3.0	1.0 1.5	1.5	1.5	2.3	2.3	3.0	3.0	3.0 4.0	4.0	1.0	1.5	1.5
3"	8½	8	1.5	1.5 3.0	3.0	3.0	3.0	3.0	1.0 1.5	1.5	1.5	2.3	2.3 3.0	3.0	3.0	3.0 4.0	4.0	1.0	1.5	1.5
3½"	8	10	1.5	3.0	3.0	3.0	3.0	3.0	1.0 1.5	1.5	1.5	2.3 3.0	3.0	3.0	3.0 4.0	4.0	4.0	1.0 1.5	1.5	1.5
4"	10	10	1.5 3.0	3.0	3.0	3.0	3.0	3.0	1.5	1.5	1.5 2.0	3.0	3.0	3.0	4.0	4.0	4.0	1.5	1.5	1.5
5"	10	10	3.0	3.0	3.0	3.0	3.0	3.0	1.5	1.5	2.0	3.0	3.0	4.5	4.0	4.0	4.0 6.0	1.5	1.5	1.5
6"	10	12	3.0	3.0	3.0	3.0	3.0	3.0	1.5	1.5 2.0	2.0 3.0	3.0	3.0 4.5	4.5	4.0	4.0 6.0	6.0	1.5	1.5 2.0	2.0
8"	14	16	3.0	3.0	3.0	3.0	3.0 3.5	3.5	1.5 2.0	2.0	3.0	3.0 4.5	4.5	4.5	4.0 6.0	6.0	6.0	1.5	2.0	2.0
10"	16	18	3.0	3.0	3.0	3.5	4.0	4.0	2.0 3.0	2.0 3.0	3.0	4.5	4.5	4.5	6.0	6.0	6.0	1.5 2.0	2.0	2.0
12"	20	24	3.0	3.0	3.0	4.0	4.0 4.5	4.0 4.5	2.0 3.0	3.0	3.0	4.5	4.5	4.5 6.0	6.0	6.0	6.0 7.0	2.0	2.0 2.5	2.0
14"	24	24	3.0	3.0 4.0	4.0	4.5	4.0 4.5	4.5 5.0	3.0	3.0	3.0	4.5 6.0	4.5 6.0	6.0	6.0 7.0	6.0 7.0	7.0	2.0	2.0 2.5	2.5
16"	24	—	3.0 4.0	4.0	4.0	5.0	5.0	5.0	3.0	3.0	3.0	4.5 6.0	6.0	6.0	6.0 7.0	7.0	7.0	2.0	2.5	2.5

STANDARD, EXTRA HEAVY AND AMMONIA

SUNDRIES

45° ELLS		TEE OR VALVE		CROSS		45° LATERAL WYE		UNION		SUNDRIES—LT-THIRTY, ° LT-ZERO & LT-MINUS THIRTY				
LT-Thirty LT-Zero	LT-Minus Thirty	LT-Thirty LT-Zero	LT-Minus Thirty	LT-Thirty LT-Zero	LT-Minus Thirty	LT-Thirty LT-Zero	LT-Minus Thirty	LT-Thirty LT-Zero	LT-Minus Thirty	° Plasticore (As Fitted)—Lbs. Per Ftg. or Valve		Sealer—Gal. Per Ftg. or Valve		
										Ells	Unions	T's=Valves=Y's	Cross	All Fittings or Valves
.5	.5	.7	.7	1.0	1.0	—	—	.5	.5	.1	.1	.2	.2	.02
.5	.5	.7	.7	1.0	1.0	—	—	.5	.5	.2	.2	.2	.3	.02
.5	.5	.7 .8	.7 .8	1.0 1.1	1.0 1.1	2.0	2.0	.5	.5	.2	.2	.3	.3	.02
.5 .6	.5 .6	.8 .9	.8 .9	1.1 1.2	1.1 1.2	2.0	2.0	.6	.6	.2	.2	.4	.4	.02
.6	.6	.9	.9	1.2	1.2	2.0	3.0	.6	.6	.3	.3	.5	.5	.02
.6	.6	.9 1.0	.9 1.0	1.2 1.4	1.2 1.4	2.0	3.0	.6	.6	.3	.3	.5	.6	.02
.6	.7	1.0	1.3	1.4	1.8	2.0	3.0	.6	.6	.4	.3	.6	.9	.02
.6 .7	.7 1.0	1.0 1.2	1.3	1.4 1.5	1.8	2.0	3.0	.6	.6	.4	.3	.8	1.0	.02
.7	1.0	1.2 1.3	1.3 1.5	1.5	2.0	2.0	3.0	.7	.7	.5	.4	.9	1.0	.03
.7	1.0	1.3	1.5	1.8	2.0	2.0	3.0	.7	.7	.7	.7	1.0	1.5	.03
.7	1.0	1.3 1.5	1.8	1.8 2.0	2.4	3.0	3.0	.7	.7	1.0	.8	1.5	2.0	.03
.7 1.0	1.0	1.5	1.8	2.0	2.4	—	—	—	—	2.0	.8	2.5	3.0	.03
1.0	1.0	1.5 1.8	1.8	2.0 2.4	2.4	3.0	3.0	—	—	2.0	.9	4.0	4.0	.04
1.0	1.5	1.8	2.3	2.4	3.0	—	—	—	—	4.0	1.2	7.0	8.0	.04
1.0	1.5	2.3	2.3	2.4 3.0	3.0 4.0	—	—	—	—	6.0	1.5	9.0	10.0	.05
1.5	1.5	2.3 3.0	3.0	3.0	4.0	—	—	—	—	14.0	2.0	23.0	27.0	.06
1.5	1.5	3.0	3.0	4.0	4.0	—	—	—	—	23.0	2.5	39.0	48.0	.08
1.5	1.5	3.0	4.5	4.0	6.0	—	—	—	—	37.0	3.0	55.0	68.0	.10

* Collars are required for screwed fittings and valves only. Type covering used for fittings, etc., and number and length of collars follows:

Type Covering on Adjacent Pipes	Fitting Cover Fabricated From	Length of LT-Thirty Collar	No. Required		
			L's-Unions	T's-Valves-T's	Cross
LT-Thirty	LT-Thirty Comp.	None	None	None	None
LT-Zero	LT-Thirty Comp.	2" Each	2	3	4
LT-Minus Thirty	LT-Zero	2" Each	2	3	4

** Plasticore not required for LT-Thirty Screwed Fitting Covers.

STANDARD, EXTRA HEAVY AND AMMONIA

SUNDRIES

FLANGE			45° LATERAL WYE			TRUE WYE			PLASTICORE—LBS. PER FITTING OR VALVE				SEALER—GAL. PER FITTING OR VALVE	
LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	Ells	T's-Valves-T's	Cross	Reducer	Flange	All Fittings or Valves
LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	LT-Thirty	LT-Zero	LT-Minus Thirty	Ells	T's-Valves-T's	Cross	Reducer	Flange	All Fittings or Valves
.4	.6	.8	2.0	2.0 3.0	3.0	1.3	1.5	1.8	2.0	3.5	3.5	3.0	2.0	.03
.4	.6	.8	2.0	2.0 3.0	3.0	1.5	1.8	2.3	2.7	4.0	5.0	3.0	2.5	.04
.4	.6	.8	2.0 3.0	3.0	3.0	1.5	1.8	2.3	3.0	4.0	5.0	4.0	2.5	.04
.4 .5	.6	.8	3.0	3.0	3.0	1.8	1.8	2.3	4.0	5.0	7.5	5.2	4.0	.05
.4 .5	.6 .8	.8 1.0	3.0	3.0	3.0 6.0	1.8	2.3	2.3	7.5	11.0	15.0	6.0	4.3	.07
.4 .5	.6 .8	.8 1.0	3.0	3.0 6.0	3.0 6.0	1.8	2.3	3.0	7.5	11.0	16.0	7.0	5.0	.07
.5	.6 .8	.8 1.0	3.0 6.0	6.0	6.0	2.3	2.3	3.0	9.0	13.0	17.0 32.0	7.5	5.3	.08
.5	.8	1.0	3.0 6.0	6.0	6.0	2.3	3.0	3.0	17.0	26.0	34.0	9.0	6.0	.1
.5 .6	.8	1.0	6.0	6.0	6.0	2.3	3.0	3.0	17.0	26.0	34.0 43.0	10.0	7.0	.1
.5 .6	.8	1.0	6.0	6.0	6.0	3.0	3.0	3.0	17.5	26.0	40.0 51.0	12.0	9.0	.15
.5 .6	.8	1.0	6.0	6.0	6.0	3.0	3.0	4.5	34.0	50.0	68.0	15.0	11.0	.15
.5 .6	.8	1.0	6.0	6.0	6.0	3.0	4.5	4.5	55.0	65.0	75.0 90.0	18.0	13.0	.15
.5 .6	.8	1.0	6.0	6.0 7.0	6.0 7.0	4.5	4.5	4.5	68.0	80.0	80.0 107.0	21.0	15.0	.2
.5 .6	.8	1.0	6.0 7.0	6.0 8.0	7.0 8.0	4.5	4.5	4.5	74.0	90.0	90.0 117.0	22.0 27.0	16.0	.2
.6	.8	1.0	7.0	7.0	8.0	4.5	4.5	4.5	85.0	100.0	103.0 131.0	25.0 32.0	18.0	.2



HOW TO DETERMINE PLASTICORK USAGE

By using the data on these pages, you can determine the amount of Plasticork and sundries needed for insulation of all fittings. Insulation thicknesses are based on the "Table of Recommended Thicknesses" immediately below.

The three tables that follow indicate the number of pounds of Plasticork required to insulate cold line fittings on piping insulated with LT-Thirty, LT-Zero, and LT-Minus Thirty Cork Covering.

The areas shown in the three tables represent the number of square feet of Plasticork surface after the insulation has been applied and should be used in estimating Keene's Cement, Weatherproof Plastic, and Friction Tape or LT Sealing Tape requirements. When estimating primer requirements, (Armstrong 520 Adhesive) use only 50% of the total area shown.

In estimating sundry requirements, use the following coverage data:

Keene's Cement: $2\frac{1}{4}$ lbs. per sq. ft. ($\frac{1}{4}$ " thick)

Weatherproof Plastic: 45 sq. ft. per gal. (2 coats)

520 Adhesive (primer): 725 sq. ft. per gal.

Friction Tape or LT Sealing Tape:

1" width—for fittings through 2" IPS approx. 25 lin. ft. per sq. ft. surface, or 3.1 sq. ft. per 75-ft. roll

2" width—for fittings through 6" IPS approx. 8 lin. ft. per sq. ft. surface, or 9.4 sq. ft. per 75-ft. roll

Note: for valves add 10% for tape flashing seal

RECOMMENDED THICKNESSES OF **Armstrong** PLASTICORK

Nominal Pipe Size, inches	LT-Thirty	LT-Zero	LT-Minus Thirty
1 and under	1"	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ "
2	1"	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "
3	1"	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "
4	1"	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "
6	1"	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "
8	1"	1 $\frac{3}{4}$ "	2 $\frac{1}{2}$ "
10	1"	1 $\frac{3}{4}$ "	2 $\frac{3}{4}$ "
12	1"	1 $\frac{3}{4}$ "	2 $\frac{3}{4}$ "

NOTE: on lines operating at temperatures below minus 30°. use

APPLICATION OF **Armstrong** PLASTICORK TO FITTINGS

Insulation of cold line fittings is rapid and economical with Armstrong Plasticork. The fitting first is primed with a brush coat of Armstrong 520 Adhesive. Small pieces of Plasticork are used to fill out hollows and form an even contour. Sheets of Plasticork then are built up to the desired thickness around the fitting and held in place with twine. For a deluxe finish, a $\frac{1}{4}$ " coat of Keene's Cement is trowelled smoothly over the Plasticork followed by 2 coats of Armstrong Weatherproof Plastic or LT Sealer to provide a vapor barrier. Other finishes include white industrial tape and LT Sealer, friction tape and Weatherproof Plastic, or Armstrong LT Sealing Tape. This tape requires no further finish indoors.

I.P.S. Inches	SCREWED, WELD & SWEAT FITTINGS												FLANGED FITTINGS								
	Elts.—90° & 45° Unions				Tees				Valves				Elts.—90° & 45°			Tees & Valves			Flanges		
	Standard	Extra Heavy & Ammonia	Weld & Sweat	Area	Standard	Extra Heavy & Ammonia	Weld & Sweat	Area	Standard	Extra Heavy & Ammonia	Weld & Sweat	Area	Standard	Extra Heavy & Ammonia	Area	Standard	Extra Heavy & Ammonia	Area	Standard	Extra Heavy & Ammonia	Area
	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Pounds	Sq. Ft.	Pounds	Sq. Ft.	Pounds	Sq. Ft.
1/4	.1	.1	.1	.6	.1	.1	.1	.7	.3	.3	.2	.9	.8	.9	1.5	.8	1.0	2.3	.3	.3	1.2
3/8	.1	.2	.1	.6	.2	.2	.1	.7	.3	.4	.3	.9	1.0	1.2	1.5	1.0	1.2	2.3	.4	.4	1.2
1/2	.2	.3	.2	.6	.3	.3	.2	.7	.4	.5	.3	.9	1.3	1.5	1.5	1.0	1.3	2.3	.4	.5	1.2
3/4	.3	.4	.3	.8	.4	.5	.3	.8	.5	.7	.4	1.0	1.6	1.8	1.7	1.5	2.0	2.4	.5	.6	1.3
1	.4	.4	.3	.8	.5	.6	.4	.9	.8	1.0	.6	1.3	2.0	2.3	1.9	2.6	3.3	2.7	.8	.9	1.3
1 1/4	.5	.5	.4	.8	.6	.7	.5	1.0	.9	1.2	.7	1.4	2.5	2.9	2.1	3.5	4.4	2.9	.9	1.0	1.4
1 1/2	.5	.6	.4	1.0	.7	.8	.5	1.2	1.0	1.3	.8	1.8	3.0	3.5	2.3	4.0	5.0	3.2	1.0	1.2	1.4
2	.7	.8	.5	1.2	.9	1.0	.7	1.4	1.4	1.9	1.1	2.7	3.3	3.8	2.8	5.0	6.3	3.8	1.3	1.5	1.6
2 1/2	.9	1.0	.7	1.6	1.2	1.3	.9	1.8	1.9	2.4	1.5	3.1	3.8	4.3	3.7	6.0	7.5	4.8	1.5	1.8	2.5
3	1.2	1.3	.8	2.0	1.5	1.7	1.1	2.3	2.5	3.2	1.9	4.0	4.5	5.2	4.3	7.5	9.4	5.1	1.8	2.1	2.6
3 1/2	1.6	1.9	1.0	2.2	2.1	2.4	1.6	2.5	3.8	4.7	2.8	4.6	5.0	5.8	4.4	8.5	10.7	5.7	1.9	2.2	3.0
4	1.9	2.2	1.3	2.6	2.5	2.9	1.9	2.6	5.0	6.5	3.8	5.6	5.8	6.6	5.0	9.8	12.2	6.5	2.1	2.4	3.1
5	2.5	2.9	1.7	3.2	3.4	3.9	2.5	3.2	9.8	12.2	7.3	7.0	7.5	8.6	9.4	11.5	14.5	8.1	2.5	2.9	3.2
6	3.0	3.5	2.0	3.9	4.0	4.6	3.0	3.9	13.3	16.5	10.0	8.6	9.0	10.5	10.6	14.0	17.5	9.0	2.9	3.4	3.4
8													12.0	14.0	14.0	18.5	23.0	10.3	3.8	4.3	4.2
10													15.8	18.0	19.0	22.5	28.0	11.9	4.3	4.9	5.7
12													19.0	22.0	24.0	27.5	34.5	15.3	5.0	5.8	7.0

L
TH

1/4	.2	.2	.1	.7	.2	.2	.2	.8	.5	.6	.4	1.0	1.5	1.7	1.7	1.5	2.0	2.5	.5	.6	1.3
3/8	.2	.3	.2	.7	.3	.4	.2	.8	.6	.8	.5	1.0	2.0	2.3	1.7	2.0	2.3	2.5	.7	.8	1.3
1/2	.4	.5	.3	.7	.5	.6	.4	.8	.8	1.0	.6	1.0	2.5	2.9	1.7	2.0	2.5	2.5	.8	.9	1.3
3/4	.6	.7	.5	.8	.8	.9	.6	.9	1.0	1.3	.8	1.1	3.2	3.7	1.9	3.0	4.0	2.7	1.0	1.2	1.4
1	.8	.8	.6	.8	1.0	1.2	.8	1.0	1.5	1.9	1.1	1.4	4.0	4.6	2.1	5.2	6.5	3.0	1.5	1.7	1.4
1 1/4	.9	1.0	.7	.9	1.2	1.4	.9	1.1	1.8	2.3	1.4	1.6	5.0	5.8	2.3	7.0	8.8	3.2	1.8	2.0	1.6
1 1/2	1.0	1.1	.8	1.1	1.3	1.5	1.0	1.3	2.0	2.5	1.5	2.0	6.0	6.9	2.5	8.0	10.0	3.5	2.0	2.3	1.6
2	1.4	1.6	1.0	1.3	1.8	2.0	1.3	1.6	2.8	3.5	2.1	3.0	6.5	7.5	3.1	10.0	12.5	4.2	2.5	2.9	1.8
2 1/2	1.7	2.0	1.3	1.7	2.3	2.6	1.7	2.0	3.8	4.8	2.9	3.4	7.5	8.6	4.1	12.0	15.0	5.3	3.0	3.5	2.8
3	2.3	2.6	1.5	2.2	3.0	3.4	2.2	2.6	5.0	6.3	3.8	4.4	9.0	10.3	4.8	15.0	18.8	5.7	3.5	4.1	2.9
3 1/2	3.2	3.7	2.0	2.4	4.2	4.8	3.2	2.8	7.5	9.4	5.6	5.1	10.0	11.5	4.9	17.0	21.3	6.3	3.8	4.4	3.3
4	3.8	4.4	2.5	2.9	5.0	5.8	3.8	2.9	10.0	13.0	7.5	6.2	11.5	13.2	5.6	19.5	24.4	7.2	4.2	4.8	3.4
5	5.0	5.8	3.3	3.6	6.7	7.7	5.0	3.6	19.5	24.4	14.6	7.8	15.0	17.2	10.4	23.0	29.0	9.0	5.0	5.8	3.6
6	6.0	7.0	3.9	4.3	8.0	9.2	6.0	4.3	26.5	33.0	19.9	9.5	18.0	21.0	11.8	28.0	35.0	10.0	5.8	6.7	3.8
8													24.0	28.0	15.8	37.0	46.0	11.5	7.5	8.6	4.7
10													31.5	36.0	21.0	45.0	56.0	13.2	8.5	9.8	6.3
12													38.0	44.0	27.0	55.0	69.0	17.0	10.0	11.5	7.8

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1/4	.2	.2	.2	.8	.3	.3	.2	.9	.8	1.0	.6	1.1	2.0	2.3	1.8	1.5	1.9	3.5	.5	.6	2.0
3/8	.3	.3	.2	.8	.4	.4	.3	.9	1.0	1.3	.8	1.1	3.0	3.5	1.8	2.5	3.1	3.5	.8	.9	2.0
1/2	.4	.4	.3	.8	.5	.6	.4	.9	1.5	1.9	1.1	1.2	4.0	4.6	1.9	4.0	5.0	3.5	1.5	1.7	2.0
3/4	.8	.9	.6	1.0	1.0	1.2	.8	1.0	2.0	2.5	1.5	1.4	5.0	5.8	2.2	8.0	10.0	4.5	2.0	2.3	2.3
1	1.1	1.3	.8	1.1	1.5	1.7	1.1	1.1	2.5	3.1	1.9	1.7	6.5	7.5	2.5	10.0	12.5	5.0	2.5	2.9	2.5
1 1/4	1.3	1.5	1.0	1.2	1.8	2.0	1.3	1.3	3.0	3.8	2.3	2.1	8.0	9.2	3.0	11.5	14.4	5.5	3.0	3.5	3.3
1 1/2	1.7	2.0	1.3	1.3	2.3	2.6	1.7	1.5	3.5	4.4	2.6	2.6	9.5	10.9	3.5	13.0	16.3	6.5	3.5	4.0	3.6
2	2.3	2.6	1.7	1.5	3.0	3.5	2.3	1.8	4.5	5.6	3.4	4.0	12.0	13.8	4.0	18.0	22.5	7.0	4.5	5.2	3.8
2 1/2	2.8	3.2	2.0	1.8	3.8	4.3	2.8	2.3	6.0	7.5	4.5	4.3	14.0	16.0	4.5	22.0	27.5	9.0	5.5	6.3	4.0
3	3.4	3.9	2.6	2.7	4.5	5.2	3.4	3.3	7.5	9.4	5.6	6.5	16.5	18.9	5.5	27.5	34.4	9.5	6.0	6.9	4.8
3 1/2	4.5	5.0	3.4	2.8	6.0	7.0	4.5	5.5	10.5	13.0	7.9	7.5	19.0	22.0	6.0	31.5	39.4	10.0	7.0	8.0	5.1
4	5.8	6.7	4.4	3.2	7.8	9.0	5.8	4.0	14.0	17.5	10.5	8.7	21.0	24.0	6.5	35.0	43.8	10.5	8.0	9.2	5.1
5	8.2	9.4	6.2	4.0	11.0	13.0	8.3	5.0	25.0	31.0	18.8	10.0	25.0	28.7	7.5	43.5	54.3	13.5	9.0	10.4	6.7
6	10.0	11.5	7.5	5.0	13.5	16.0	10.0	5.8	32.0	40.0	24.0	12.2	29.5	34.0	9.0	52.0	65.0	14.5	11.0	12.7	7.4
8													40.0	46.0	12.5	66.5	83.0	22.0	13.5	15.5	8.0
10													56.0	64.0	16.0	85.0	106.0	28.0	16.0	18.4	9.0
12													67.0	77.0	19.0	100.0	125.0	30.0	18.0	20.7	10.0

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For further information on Armstrong Insulations, and for samples of these products, write Armstrong Cork Company, Lancaster, Pennsylvania, or get in touch with the Armstrong Office nearest you.

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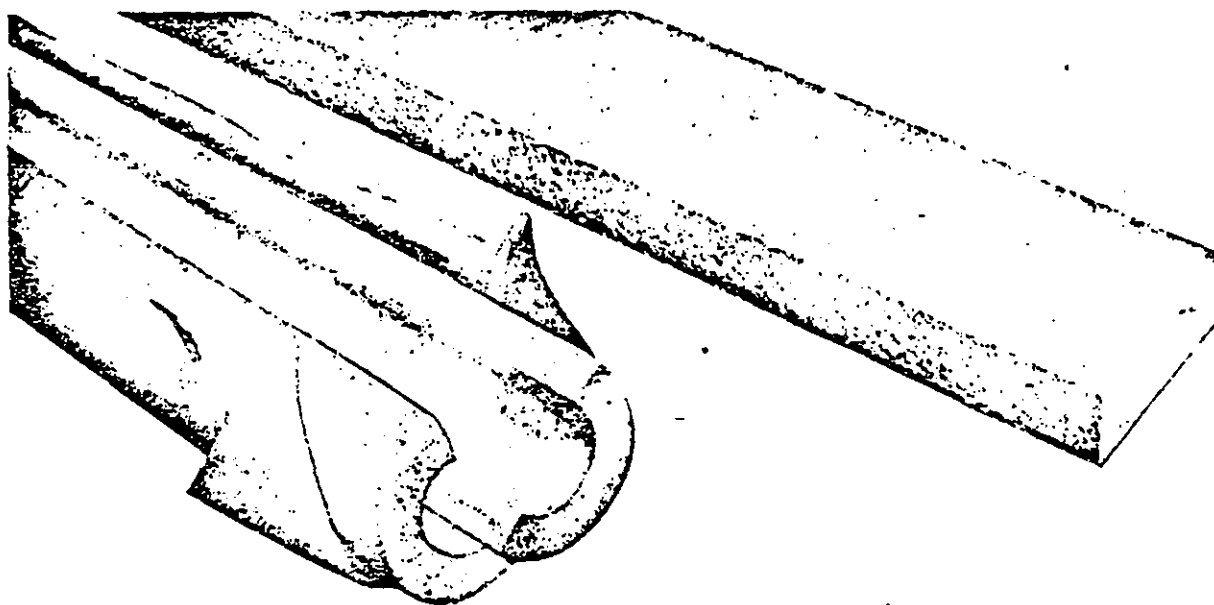


INSULATION DIVISION • LANCASTER, PENNSYLVANIA

ARMSTRONG'S INDUSTRIAL INSULATIONS

ARMSTRONG CORK COMPANY

LANCASTER  PENNSYLVANIA



85% Magnesia Pipe Covering and Block

The Armstrong Cork Company furnishes and installs the 85% Magnesia Pipe Covering and Block and other heat insulation products of the Keasbey and Mattison Company in most of the nation's leading industrial centers.

85% Magnesia insulation is the most widely used material in the heat insulation field for temperatures up to 600° F. This material combines the high insulating properties of basic carbonate of magnesia with the proper amount of clean asbestos fiber as a binding agent, resulting in an insulation that is exceptionally light and highly efficient. It consists of not less than 95% by weight of a mixture of hydrated basic carbonate of magnesia and long fiber asbestos. The magnesia and asbestos mixture is homogeneous and not less than 85% of the total is hydrated basic carbonate of magnesia and not less than 10% is asbestos fiber.

Through many years of dependable service, 85% Magnesia insulation has demonstrated that it is the most efficient and durable molded type heat insulation material manufactured today. In addition to its light weight and high insulating efficiency, it is absolutely fireproof and has the mechanical strength necessary to withstand all ordinary usage to which insulations of this type

are subjected. Water has no deteriorating effect on 85% Magnesia. It can become completely water soaked, and when dried out regains its original strength and efficiency characteristics. When properly applied and maintained, it will not crack, crumble, or fail mechanically. 85% Magnesia is manufactured in sectional or segmental forms for application to pipes, and in block form for flat surfaces.

85% Magnesia Pipe Insulation

85% Magnesia pipe insulation is manufactured in half sections and in sets of segmental blocks 3 feet long, in the following thicknesses:

Standard, 1½", 2"

Double Standard (supplied in two layers) and
Three Inch Thick (supplied in two layers)

(See table, "85% Magnesia Insulation Thicknesses" on Page 111.)

Half sections of pipe insulation are split horizontally and furnished with factory applied canvas jackets, forming hinge and lap. They are shipped with necessary brass lacquered bands for proper application. Segmental blocks for insulation of piping are supplied without jackets.

Physical Characteristics of 85% Magnesia Pipe Insulation

(All properties are on the bone dry basis with the exception of Shipping Density)	Mean Temperature 100° F.....0.36
Shipping Density, lbs./cu. ft., average.....13.3 plus or minus 10%	Mean Temperature 300° F.....0.42
Thermal Conductivity (k) BTU/hr./sq. ft./°F./in., average	Modulus of Rupture, psi., average.....50.0
	Heat Tests (6 hrs. at 500° F.)
	% linear shrinkage, average.....0.2
	% loss in weight, average.....14.0

Minimum Thicknesses for 85% Magnesia Pipe Insulation

Temperature in degrees F.	Pressure in lbs. per sq. in.	Pipe Sizes		
		1½" and smaller	2" to 4"	4½" and over
Hot Water and Up to 267	0-25	Standard	Standard	Standard
268 to 337	26-100	Standard	Standard	1½"
338 to 387	101-200	Standard	1½"	2"
388 to 499	Low Superheat	1½"	2"	Double Standard
500 to 600	Superheat	2"	Double Standard	3"

Where the insulation is to be applied on weather-exposed surfaces or extremely long lines, or where it is highly desirable to minimize steam condensation, increase thickness at least ½" greater than those shown in table.

85% Magnesia Pipe Insulation Thicknesses

Nominal Pipe Size Inches	Standard Thickness	1½" Thick	2" Thick	Double Standard Thick		3" Thick Broken Joint	
	Inches	Inches	Inches	1st Course Inches	2nd Course Inches	1st Course Inches	2nd Course Inches
½	a 7/8	a 1 1/8	a 2	a 7/8	a 1 1/8	a 7/8	a 2
¾	a 1 1/8	a 1 3/8	a 2	a 1 1/8	a 1 3/8	a 1 1/8	a 2
1	a 1 3/8	a 1 5/8	a 2	a 1 3/8	a 1 5/8	a 1 3/8	a 2
1 1/4	a 1 5/8	a 1 7/8	a 2	a 1 5/8	a 1 7/8	a 1 5/8	a 2
1 1/2	a 1 7/8	a 1 9/8	a 2	a 1 7/8	a 1 9/8	a 1 7/8	a 2
2	a 1 9/8	a 1 11/8	a 2	a 1 9/8	a 1 11/8	a 1 9/8	a 2
2 1/2	a 1 11/8	a 1 13/8	a 2	a 1 11/8	a 1 13/8	a 1 11/8	a 2
3	a 1 13/8	a 1 15/8	a 2	a 1 13/8	a 1 15/8	a 1 13/8	a 2
3 1/2	a 1 15/8	a 1 17/8	a 2	a 1 15/8	a 1 17/8	a 1 15/8	a 2
4	a 1 17/8	a 1 19/8	a 2	a 1 17/8	a 1 19/8	a 1 17/8	a 2
4 1/2	a 1 19/8	a 1 21/8	a 2	a 1 19/8	a 1 21/8	a 1 19/8	a 2
5	a 1 21/8	a 1 23/8	a 2	a 1 21/8	a 1 23/8	a 1 21/8	a 2
6	a 1 23/8	a 1 25/8	a 2	a 1 23/8	a 1 25/8	a 1 23/8	a 2
7	a 1 25/8	a 1 27/8	a 2	a 1 25/8	a 1 27/8	a 1 25/8	a 2
8	a 1 27/8	a 1 29/8	a 2	a 1 27/8	a 1 29/8	a 1 27/8	a 2
9	a 1 29/8	a 1 31/8	a 2	a 1 29/8	a 1 31/8	a 1 29/8	a 2
10	a 1 31/8	a 1 33/8	a 2	a 1 31/8	a 1 33/8	a 1 31/8	a 2
12	ab 1 33/8	ab 1 35/8	ab 2	ab 1 33/8	ab 1 35/8	ab 1 33/8	ab 2
14	b 1 35/8	b 1 37/8	b 2	b 1 35/8	b 1 37/8	b 1 35/8	b 2
16	b 1 37/8	b 1 39/8	b 2	b 1 37/8	b 1 39/8	b 1 37/8	b 2
18	b 1 39/8	b 1 41/8	b 2	b 1 39/8	b 1 41/8	b 1 39/8	b 2
20	b 1 41/8	b 1 43/8	b 2	b 1 41/8	b 1 43/8	b 1 41/8	b 2
24	b 1 43/8	b 1 45/8	b 2	b 1 43/8	b 1 45/8	b 1 43/8	b 2
30	b 1 45/8	b 1 47/8	b 2	b 1 45/8	b 1 47/8	b 1 45/8	b 2

Sections and Segments (curved block) are thirty-six inches in length.

a—Furnished standard in tubular half sections.

ab—Furnished standard in segments. Can be furnished in tubular half sections when specifically ordered.

b—Furnished standard in segments.

* These Sizes do not run exactly Three Inches of Thickness.

Heat Losses from Bare Pipes and Efficiencies of 85% Magnesia Pipe Insulation

Nominal Pipe Size, inches	Insulation Thickness, inches	Temperature difference between pipe and surrounding air, °F. 50° 100° 150° 200° 250° 300° 350° 400° 450° 500°										
		Temperature of pipe, °F. (Temperature of surrounding air, 75° F.) 125° 175° 225° 275° 325° 375° 425° 475° 525° 575°										
		Heat Losses per linear foot of bare pipe per hour and Efficiencies of insulation										
1	0	Bare pipe loss, B.t.u....	33.6	74.0	123.8	183.4	253.7	337.4	436.3	555.2	690.6	846.2
	Std.	Efficiency %.....	69.89	72.18	74.60	76.63	78.44	80.11	81.77	83.28	84.58	85.73
	1½	" %.....	75.88	77.84	79.78	81.48	82.99	84.37	85.73	86.96	88.02	88.94
	Dbl. Std.	" %.....	77.44	79.21	81.07	82.68	84.10	85.39	86.64	87.79	88.80	89.68
	2	" %.....	78.69	80.33	82.09	83.58	85.02	86.16	87.36	88.47	89.41	90.24
1½	0	Bare pipe loss, B.t.u....	48.7	107.2	179.3	265.4	367.3	487.0	631.8	803.8	999.7	1225.1
	Std.	Efficiency %.....	73.18	75.25	77.33	79.29	80.88	82.36	83.80	85.16	86.35	87.46
	1½	" %.....	79.38	81.01	82.67	84.16	85.46	86.59	87.75	88.75	89.69	90.46
	Dbl. Std.	" %.....	80.74	82.31	83.88	85.28	86.50	87.57	88.63	89.63	90.46	91.18
	2	" %.....	81.91	83.35	84.84	86.14	87.29	88.30	89.33	90.23	91.02	91.74
2	0	Bare pipe loss, B.t.u....	60.9	133.9	223.9	331.5	458.7	608.3	789.2	1003.9	1248.6	1530.1
	Std.	Efficiency %.....	77.14	79.93	80.65	82.22	83.62	84.88	86.12	87.26	88.46	89.33
	1½	" %.....	80.92	82.45	83.94	85.34	86.53	87.58	88.66	89.63	90.44	91.18
	2	" %.....	83.62	84.88	86.24	87.40	88.44	89.38	90.28	91.09	91.83	92.46
	Dbl. Std.	" %.....	83.75	85.10	86.38	87.58	88.60	89.50	90.39	91.18	91.93	92.54
2½	0	Bare pipe loss, B.t.u....	73.4	161.6	270.4	400.3	553.9	734.5	952.8	1212.1	1511.6	1852.4
	Std.	Efficiency %.....	78.23	79.93	81.64	83.17	84.48	85.64	86.85	87.94	88.88	89.73
	1½	" %.....	82.23	83.62	85.03	86.27	87.40	88.39	89.38	90.19	91.06	91.74
	2	" %.....	84.71	85.96	87.17	88.29	89.24	90.10	90.96	91.72	92.39	92.98
	Dbl. Std.	" %.....	84.91	86.14	87.33	88.43	89.38	90.20	91.06	91.81	92.48	93.07
3	0	Bare pipe loss, B.t.u....	89.6	197.3	330.1	488.8	676.3	898.8	1163.4	1480.0	1840.8	2255.8
	Std.	Efficiency %.....	79.27	80.92	82.48	83.90	85.19	86.32	87.46	88.48	89.38	90.19
	1½	" %.....	83.14	84.52	85.82	87.04	88.07	89.02	89.96	90.82	91.54	92.30
	2	" %.....	85.69	86.77	87.96	89.20	89.88	90.18	91.49	91.31	92.86	93.42
	Dbl. Std.	" %.....	85.96	87.08	88.22	89.23	90.00	90.88	91.66	92.35	92.96	93.52
3½	0	Bare pipe loss, B.t.u....	102.3	225.3	376.9	558.1	772.2	1024.0	1328.4	1689.9	2101.8	2575.6
	Std.	Efficiency %.....	79.85	81.46	83.01	84.47	85.60	86.68	87.84	88.84	89.74	90.54
	1½	" %.....	83.84	85.15	86.38	87.53	88.53	89.46	90.34	91.13	91.79	92.48
	2	" %.....	86.28	87.40	88.48	89.47	90.33	91.13	91.86	92.56	93.17	93.70
	Dbl. Std.	" %.....	86.74	87.80	88.85	89.78	90.60	91.36	92.08	92.76	93.34	93.86
4	0	Bare pipe loss, B.t.u....	115.1	253.5	424.2	627.9	868.8	1152.1	1494.6	1901.3	2364.8	2897.9
	Std.	Efficiency %.....	81.37	82.81	84.25	85.55	86.68	87.67	88.67	89.63	90.41	91.13
	1½	" %.....	84.29	85.51	86.80	87.89	88.87	89.74	90.62	91.40	92.07	92.70
	2	" %.....	86.74	87.85	88.88	89.84	90.70	91.45	92.16	92.82	93.40	93.92
	Dbl. Std.	" %.....	87.80	88.75	89.72	90.55	91.34	92.03	92.68	93.29	93.84	94.28
4½	0	Bare pipe loss, B.t.u....	127.9	281.5	470.9	697.2	964.7	1279.2	1659.5	2111.1	2627.8	3220.1
	Std.	Efficiency %.....	81.91	83.26	84.73	85.96	87.08	88.03	89.05	89.93	90.72	91.45
	1½	" %.....	84.68	85.87	87.08	88.20	89.11	89.96	90.82	91.59	92.27	92.86
	2	" %.....	87.12	88.16	89.20	90.14	90.94	91.67	92.38	93.02	93.59	94.10
	Dbl. Std.	" %.....	87.94	88.93	89.87	90.73	91.49	92.29	92.92	93.45	93.97	94.44

Physical Characteristics of 85% Magnesia Pipe Insulation

(All properties are on the bone dry basis with the exception of Shipping Density)	Mean Temperature 100° F.....0.36
Shipping Density, lbs./cu. ft., average.....13.3 plus or minus 10%	Mean Temperature 300° F.....0.42
Thermal Conductivity (k) BTU/hr./sq. ft./°F./in.), average	Modulus of Rupture, psi., average.....50.0
	Heat Tests (6 hrs. at 500° F.)
	% linear shrinkage, average.....0.2
	% loss in weight, average.....14.0

Minimum Thicknesses for 85% Magnesia Pipe Insulation

Temperature in degrees F.	Pressure in lbs. per sq. in.	Pipe Sizes		
		1½" and smaller	2" to 4"	4½" and over
Hot Water and Up to 267	0-25	Standard	Standard	Standard
268 to 337	26-100	Standard	Standard	1½"
338 to 387	101-200	Standard	1½"	2"
388 to 499	Low Superheat	1½"	2"	Double Standard
500 to 600	Superheat	2"	Double Standard	3"

Where the insulation is to be applied on weather-exposed surfaces or extremely long lines, or where it is highly desirable to minimize steam condensation, increase thickness at least ½" greater than those shown in table.

85% Magnesia Pipe Insulation Thicknesses

Nominal Pipe Size Inches	Standard Thickness	1½" Thick	2" Thick	Double Standard Thick		3" Thick Broken Joint	
	Inches	Inches	Inches	1st Course Inches	2nd Course Inches	1st Course Inches	2nd Course Inches
½	a ⅜	a 1½	a 2	a ⅜	a 1½	a ⅜	a 2
¾	a ⅞	a 1½	a 2	a ⅞	a 1½	a ⅞	a 2
1	a 1	a 1½	a 2	a 1	a 1½	a 1	a 1½
1¼	a 1¼	a 1½	a 2	a 1¼	a 1½	a 1¼	a 1½
1½	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
2	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
2½	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
3	a 1½	a 1½	a 2	a 1	a 1½	a 1½	a 1½
3½	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
4	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
4½	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
5	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
6	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
7	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
8	a 1½	a 1½	a 2	a 1½	a 1½	a 1½	a 1½
9	a 1½	a 1½	a 2	a 1½	b 1½	a 1½	ab 1½
10	a 1½	a 1½	a 2	a 1½	b 1½	a 1½	b 1½
12	ab 1½	ab 1½	ab 2	ab 1½	b 1½	ab 1½	b 1½
14	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½
16	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½
18	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½
20	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½
24	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½
30	b 1½	b 1½	b 2	b 1½	b 1½	b 1½	b 1½

Sections and Segments (curved block) are thirty-six inches in length.

a—Furnished standard in tubular half sections.

ab—Furnished standard in segments. Can be furnished in tubular half sections when specifically ordered.

b—Furnished standard in segments.

* These Sizes do not run exactly Three Inches of Thickness.

Nominal Pipe Size, inches	Insulation Thickness, inches	Temperature difference between pipe and surrounding air, °F.										
		50° 100° 150° 200° 250° 300° 350° 400° 450° 500°										
		Temperature of pipe, °F. (Temperature of surrounding air, 75° F.)										
		125° 175° 225° 275° 325° 375° 425° 475° 525° 575°										
Heat Losses per linear foot of bare pipe per hour and Efficiencies of insulation												
5	0	Bare pipe loss, B.t.u....	142.2	313.1	523.8	755.5	1073.0	1423.0	1846.0	2348.4	2922.9	3581.8
	Std.	Efficiency %.....	82.04	83.44	84.84	86.12	87.22	88.21	89.18	90.10	90.85	91.54
	1½	" %.....	85.04	86.23	87.40	88.43	89.38	90.20	91.04	91.80	92.45	93.02
	2	" %.....	87.44	88.48	89.46	90.37	91.16	91.90	92.57	93.20	93.75	94.24
	Dbl. Std. 3	" %.....	88.46	89.38	90.32	91.17	91.85	92.53	93.15	93.73	94.21	94.65
6	0	Bare pipe loss, B.t.u....	169.4	371.9	623.9	923.7	1278.1	1694.9	2198.7	2797.1	3480.9	4265.6
	Std.	Efficiency %.....	82.58	83.94	85.31	86.50	87.58	88.57	89.78	90.37	91.15	91.68
	1½	" %.....	85.46	86.59	87.76	88.84	89.73	90.50	91.64	92.03	92.60	93.24
	2	" %.....	87.98	88.96	89.94	90.82	91.54	92.23	92.07	92.99	94.00	94.48
	Dbl. Std. 3	" %.....	88.97	89.83	90.74	91.54	92.19	92.81	93.45	93.98	94.47	94.90
7	0	Bare pipe loss, B.t.u....	195.0	430.4	720.0	1066.0	1473.6	1956.0	2539.0	3228.0	4006.9	4910.2
	Std.	Efficiency %.....	84.29	85.48	86.72	87.80	88.75	89.61	90.46	91.12	91.91	92.53
	1½	" %.....	85.72	86.95	88.07	89.10	89.96	90.77	91.55	92.26	92.89	93.43
	2	" %.....	88.31	89.24	90.21	91.04	91.76	92.44	93.07	93.67	94.18	94.63
	Dbl. Std. 3	" %.....	89.92	90.73	91.55	92.30	92.92	93.47	94.04	94.55	94.97	95.36
8	0	Bare pipe loss, B.t.u....	220.6	485.7	812.5	1203.0	1664.5	2207.3	2863.6	3642.8	4530.8	5552.2
	Std.	Efficiency %.....	84.38	85.60	86.83	87.94	88.89	89.74	90.59	91.36	92.05	92.65
	1½	" %.....	86.18	87.28	88.37	89.38	90.21	91.00	91.76	92.47	93.08	93.65
	2	" %.....	88.64	89.55	90.45	91.28	92.00	92.65	93.26	93.84	94.35	94.78
	Dbl. Std. 3	" %.....	90.20	91.00	91.78	92.49	93.10	93.67	94.21	94.70	95.12	95.50
9	0	Bare pipe loss, B.t.u....	246.0	542.0	907.0	1343.0	1860.0	2465.0	3200.0	4070.0	5056.8	6196.7
	Std.	Efficiency %.....	84.61	85.82	87.02	88.12	89.27	89.91	90.74	91.49	92.17	92.77
	1½	" %.....	86.33	87.40	88.52	89.47	90.33	91.13	91.86	92.53	93.12	93.65
	2	" %.....	88.73	89.65	90.58	91.43	92.13	92.84	93.37	93.93	94.43	94.87
	Dbl. Std. 3	" %.....	91.44	91.22	92.01	92.71	93.29	93.83	94.36	94.82	95.23	95.60
10	0	Bare pipe loss, B.t.u....	275.4	606.2	1014.1	1501.5	2077.5	2775.0	3574.1	4546.6	5655.0	6929.8
	Std.	Efficiency %.....	84.75	85.96	87.13	88.21	89.14	90.01	90.83	91.59	92.26	92.84
	1½	" %.....	86.60	87.67	88.75	89.69	90.51	91.27	92.00	92.70	93.28	93.79
	2	" %.....	88.97	89.87	90.77	91.58	92.29	92.89	93.52	94.07	94.55	95.00
	Dbl. Std. 3	" %.....	90.63	91.51	92.17	92.84	93.44	93.97	94.49	94.96	95.37	95.73
12	0	Bare pipe loss, B.t.u....	326.0	719.0	1203.0	1780.0	2465.0	3266.0	4235.0	5390.0	6700.9	8211.5
	Std.	Efficiency %.....	86.84	87.86	88.93	89.84	90.70	91.45	92.17	92.84	93.43	93.94
	2	" %.....	89.24	90.10	91.00	91.81	92.47	93.09	93.70	94.24	94.69	95.11
	Dbl. Std.	" %.....	91.92	92.59	93.28	93.88	94.38	94.87	95.31	95.71	96.04	96.35
	14	0	Bare pipe loss, B.t.u....	377.0	786.0	1318.0	1950.0	2700.0	3580.0	4645.0	5905.0	7353.3
Std.		Efficiency %.....	86.93	88.03	89.05	90.02	90.82	91.58	92.26	92.93	93.48	94.01
2		" %.....	89.33	90.19	91.40	91.90	92.56	93.18	93.77	94.33	94.79	95.20
Dbl. Std.		" %.....	92.06	92.71	93.40	93.99	94.48	94.96	95.38	95.80	96.14	96.47
16		0	Bare pipe loss, B.t.u....	408.0	901.0	1510.0	2237.0	3095.0	4100.0	5320.0	6765.0	8407.2
	Std.	Efficiency %.....	87.07	88.12	89.15	90.10	90.91	91.63	92.35	93.00	93.57	94.08
	2	" %.....	89.56	90.41	91.67	92.00	92.74	93.34	93.91	94.46	94.92	95.32
	Dbl. Std.	" %.....	92.24	92.89	93.55	94.13	94.63	95.09	95.50	95.90	96.25	96.54

Packaging Data—85% Magnesia Pipe Insulation Carton Contents

Nominal Pipe Size Inches	Nominal Weight Per Section Lbs.	Sections Per Carton	Carton No.	Nominal Net Weight Per Carton Lbs.	Nominal Gross Weight Per Carton Lbs.
Table 1.—Standard Thick					
$\frac{1}{2}$	1.39	48	256	67	73
$\frac{3}{4}$	1.58	45	120	71	77
1	1.78	40	120	71	77
$1\frac{1}{4}$	2.07	32	120	66	72
$1\frac{1}{2}$	2.21	28	120	62	68
2	3.20	18	120	58	64
$2\frac{1}{2}$	3.66	15	120	55	61
3	4.23	15	258	63	70
$3\frac{1}{2}$	4.68	9	120	42	48
4	5.69	8	120	46	52
$4\frac{1}{2}$	6.19	8	258	50	57
5	6.75	6	120	41	47
6	7.27	4	202	32	38
7	10.02	4	259	40	47
8	11.08	2	248	22	27
9	12.32	2	256	25	31
10	13.43	2	120	27	33
Table 2.—1½ Inch Thick					
$\frac{1}{2}$	3.18	21	256	67	73
$\frac{3}{4}$	3.50	18	256	63	69
1	3.84	18	120	69	75
$1\frac{1}{4}$	4.34	16	120	69	75
$1\frac{1}{2}$	4.58	15	120	69	75
2	5.24	12	120	63	69
$2\frac{1}{2}$	5.91	9	120	53	59
3	6.72	8	120	54	60
$3\frac{1}{2}$	7.38	8	120	59	65
4	8.04	7	258	56	63
$4\frac{1}{2}$	8.70	6	120	52	58
5	9.45	4	202	38	44
6	10.94	4	259	44	51
7	12.26	4	260	49	57
8	13.59	2	248	27	32
9	15.08	2	256	30	36
10	16.39	2	257	33	39
Table 3.—2 Inch Thick					
$\frac{1}{2}$	5.10	10	248	51	56
$\frac{3}{4}$	5.54	10	248	55	60
1	5.98	12	120	72	78
$1\frac{1}{4}$	6.62	8	248	53	58
$1\frac{1}{2}$	6.97	9	120	63	69
2	7.85	8	120	63	69
$2\frac{1}{2}$	8.71	7	120	61	67
3	9.81	6	257	59	65
$3\frac{1}{2}$	10.69	6	120	64	70
4	11.57	4	202	46	52
$4\frac{1}{2}$	12.43	4	202	50	56
5	13.44	4	259	54	61
6	15.41	4	260	62	70
7	17.17	2	248	34	39
8	18.93	2	256	38	44
9	20.88	2	257	42	48
10	22.63	2	258	45	52

Nominal Pipe Size Inches	Nominal Weight Per Section Lbs.	Sections Per Carton	Carton No.	Nominal Net Weight Per Carton Lbs.	Nominal Gross Weight Per Carton Lbs.
Table 4.—Double Standard Thick					
1/2	5.22	12	256	63	69
3/4	5.18	12	256	62	68
1	6.40	9	256	58	64
1 1/4	6.22	9	256	56	62
1 1/2	7.14	9	120	64	70
2	8.78	8	120	70	76
2 1/2	9.74	7	120	68	74
3	10.70	6	120	64	70
3 1/2	13.82	4	258	55	62
4	13.05	4	258	52	59
4 1/2	17.02	4	202	68	74
5	15.93	4	202	64	70
6	19.19	2	248	38	43
7	22.62	2	256	45	51
8	24.80	2	257	50	56

Key Table to Carton Sizes

Carton No.	Inside Dimensions Inches	Outside Dimensions Inches	Tare Wt. Lbs.
248	11 3/4 x 23 3/4 x 36	12 1/4 x 24 1/4 x 36 1/2	5
256	13 x 26 x 36	13 1/2 x 26 1/2 x 36 1/2	6
257	14 x 28 x 36	14 1/2 x 28 1/2 x 36 1/2	6
120	14 1/2 x 27 1/4 x 36	15 x 27 3/4 x 36 1/2	6
258	15 x 30 1/2 x 36	15 1/2 x 31 x 36 1/2	7
202	18 x 18 x 36	18 1/2 x 18 1/2 x 36 1/2	6
259	20 3/4 x 20 3/4 x 36	21 1/4 x 21 1/4 x 36 1/2	7
260	22 x 22 x 36	22 1/2 x 22 1/2 x 36 1/2	8

85% Magnesia Blocks and Lagging

85% Magnesia Blocks and Lagging are light, efficient insulating materials for flat, curved, and irregular surfaces such as boilers, breechings, oil stills, tanks, and other heated equipment, where the temperature does not exceed 600° F. Where temperatures are in excess of 600° F., 85% Magnesia should be used in combination with Hy-Temp Blocks.

85% Magnesia Blocks are furnished in standard 36" lengths in 3", 6", 9", and 12" widths. Thicknesses range from 1" to 4" inclusive.

Physical Characteristics of 85% Magnesia Blocks and Lagging

(All properties are on the bone dry basis with exception of shipping density)

Shipping Density, lbs./cu. ft., average.....12.2
plus or minus 10%

Thermal Conductivity (k) BTU/hr./sq. ft./°F./in., average

Mean Temperature 100° F..... 0.36

Mean Temperature 300° F..... 0.42

Modulus of Rupture, psi., average.....150.0

Heat Tests—6 hrs. at 500° F.

% linear shrinkage, average..... 0.2

% loss in weight, average.....14.0

Recommended Minimum Thicknesses

Temperature °F.	85% Magnesia Blocks Thickness—inches
Hot Water	1"
212° to 266°	1 1/2"
267° to 337°	2"
338° to 387°	2 1/2"
388° to 499°	3"
500° to 600°	3 1/2"

NOTE: No thickness recommendation can apply to all conditions. These recommendations have been found to be satisfactory and economical for most cases.

Heat Losses and Efficiencies of 85% Magnesia Blocks and Lagging

Thickness of Insulation, inches	Bare Surface Loss —B.T.U.	Temperature* Difference between Hot Surface and Surrounding Air									
		50°F	100°F	150°F	200°F	250°F	300°F	350°F	400°F	450°F	500°F
		Temperature of Hot Surface									
		125°F	175°F	225°F	275°F	325°F	375°F	425°F	475°F	525°F	575°F
0		Heat losses per Sq. Ft. Bare Surfaces per Hour in B.T.U.									
		97.3	215.2	360.0	533.0	738.8	978.0	1269.4	1614.0	2007.5	2460.0
1	Efficiency %.....	79.2	81.0	82.8	84.4	85.8	87.0	88.2	89.3	90.2	91.0
1½	" %.....	86.2	87.3	88.6	89.6	90.5	91.3	92.1	92.8	93.5	94.0
2	" %.....	89.5	90.5	91.4	92.2	92.9	93.5	94.1	94.6	95.1	95.5
2½	" %.....	91.7	92.7	93.1	93.7	94.3	94.8	95.3	95.7	96.1	96.4
3	" %.....	93.0	93.7	94.3	94.8	95.2	95.7	96.1	96.4	96.7	97.1
3½	" %.....	94.1	94.6	95.1	95.5	95.9	96.3	96.6	96.9	97.2	97.5
4	" %.....	94.8	95.3	95.7	96.1	96.4	96.7	97.0	97.3	97.5	97.7

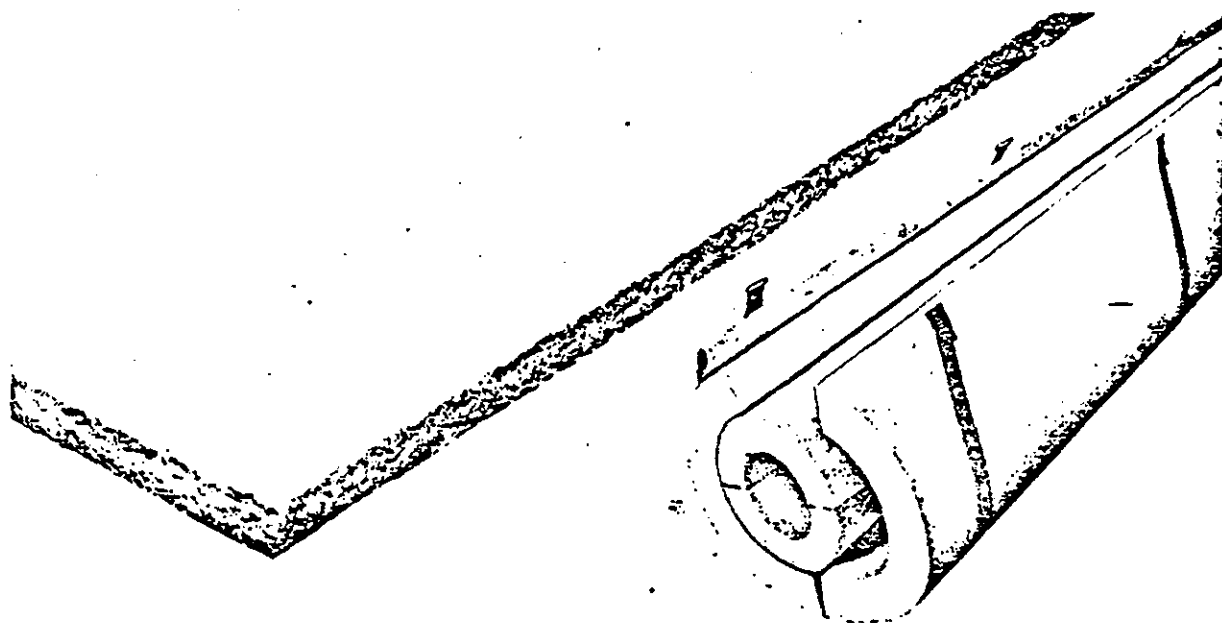
* Temperature of surrounding air taken as 75°F.

Packaging Information—85% Magnesia Blocks

Dimensions of Blocks	Weight per Block, lbs.	Carton or Crate No.	Blocks per Carton or Crate	Gross Wt. per Carton or Crate
1" x 3" x 36"	0.76	114	72	60
1¼" x 3" x 36"	0.95	114	58	60
1½" x 3" x 36"	1.14	114	48	60
1¾" x 3" x 36"	1.33	114	42	61
2" x 3" x 36"	1.53	114	36	60
2¼" x 3" x 36"	1.72	114	32	60
2½" x 3" x 36"	1.91	114	30	62
3" x 3" x 36"	2.29	114	24	60
3½" x 3" x 36"	2.67	114	18	60
4" x 3" x 36"	3.05	114	18	60
1" x 6" x 36"	1.32	114	36	60
1¼" x 6" x 36"	1.90	114	29	60
1½" x 6" x 36"	2.29	114	24	60
1¾" x 6" x 36"	2.67	114	21	61
2" x 6" x 36"	3.05	114	18	60
2¼" x 6" x 36"	3.43	114	16	60
2½" x 6" x 36"	3.81	114	15	62
3" x 6" x 36"	4.37	114	12	60
3½" x 6" x 36"	5.33	crate	28	174
4" x 6" x 36"	6.10	114	9	60
1" x 12" x 36"	3.05	114	18	60
1¼" x 12" x 36"	3.81	114	14	58
1½" x 12" x 36"	4.57	114	12	60
1¾" x 12" x 36"	5.33	114	10	58
2" x 12" x 36"	6.10	114	9	60
2¼" x 12" x 36"	6.86	114	8	60
2½" x 12" x 36"	7.62	114	7	58
3" x 12" x 36"	9.14	114	6	60
3½" x 12" x 36"	10.67	crate	14	174
4" x 12" x 36"	12.19	crate	12	171

Crate—I.D. 24" x 24½" x 36½"—Tare Weight 25 lbs.

Carton No. 114—I.D. 12½" x 18¾" x 36"—O.D. 13" x 19¾" x 36½"—Tare Weight 5 lbs.



Hy-Temp Pipe Covering and Block

Hy-temp insulation is recommended for heated lines and surfaces where temperatures range from above 600° F. to 1900° F. This material is made from calcined diatomaceous earth, asbestos fiber, magnesia carbonate, and binders.

Hy-temp insulation is generally used as an inner layer in combination with an outer layer of 85% Magnesia. The inner layer of Hy-Temp is used in a thickness sufficient to reduce the temperature at the 85% Magnesia to within safe limits for that product. Because hy-temp insulation will withstand higher temperatures than 85% Magnesia, but is not so efficient an insulator as 85% Magnesia, a combination of the two materials utilizes the high heat resistance of the high temperature insulation and the greater efficiency of 85% Magnesia to best advantage. Hy-temp insulation possesses sufficient strength so that it can be handled without breakage.

Physical Characteristics of Hy-Temp Pipe and Block Insulation

(All properties on bone dry basis
with exception of shipping density)
Shipping Density, lbs./cu. ft., average.... 23.6
plus or minus 10%

Thermal Conductivity (k).

BTU/hr./sq. ft./($^{\circ}$ F./in.) average	
Mean Temperature 350° F.....	0.72
Mean Temperature 800° F.....	0.80

Modulus of Rupture, psi, average..... 70

Heat Tests (6 hours at 1500° F.)

% linear shrinkage.....	1.0
% loss in weight.....	9.0

Hy-Temp Pipe Insulation

Hy-Temp Pipe Insulation is furnished in tubular half sections and sets of curved segmental blocks 3 ft. in length and in thicknesses from 1" to 3". Half sections are furnished for pipe sizes of 10" and smaller. Insulation for pipe sizes larger than 10" in single layer or inner layer only of double standard thick or 3" thick broken joint construction is furnished in segments. The 12" size can be furnished in sectional covering 1 $\frac{1}{16}$ " and 2 $\frac{1}{8}$ " thick on specific order.

In most applications Hy-Temp Pipe Insulation is wired on as an inner layer, in combination with an outer layer of 85% Magnesia. It is furnished without canvas jacket and bands.

**Recommended Minimum Thicknesses of Combination Hy-Temp and
85% Magnesia Pipe Insulation—Indoor Piping**

Temperature	600°--699° F.		700°--799° F.		800°--1000° F.	
Nominal Pipe Sizes, inches	Thickness of Insulation--inches					
	Hy-Temp	85% Mag- nesia	Hy-Temp	85% Mag- nesia	Hy-Temp	85% Mag- nesia
*1½ & smaller	Single layer only of Hy-Temp, 2" thick					
2	1¾	1½	1¾	2	1¾	1½
2½	1¾	1½	1¾	2	1¾	1½
3	1¾	1½	1¾	2	2¾	1½
3½	1¾	1½	1¾	2	1¾	1½
4	1¾	1½	1¾	2	2¾	1½
4½	1¾	1½	1¾	2	1¾	2
5 & larger	1¾	1½	1¾	2	2	2

*All insulation on pipes 1½" and smaller shall be single layer of Hy-Temp Pipe Insulation.

Where insulation is to be applied on weather-exposed surfaces or extremely long lines, or where it is desirable to minimize loss of superheat, increase thickness at least ½" greater than those shown in table.

**Heat Losses from Bare Pipes and Efficiencies of Hy-Temp Combination Pipe Insulation
(Hy-Temp Insulation with "Featherweight" 85% Magnesia as outer layer)**

Nominal Pipe Size, inches	Thick- ness Hy-Temp Insula- tion, inches	Pipe Size of 85% Magnesia, inches	Thick- ness of 85% Magne- sia, inches	Total Thick- ness of Com- bination Insula- tion, inches		Temperature Difference between pipe and surrounding air, Deg. F.			
						425°	525°	625°	725°
						Temperature of Pipe, Deg. F.			
						500°	600°	700°	800°
(Surrounding air temperature 75° F.)						Heat losses per linear foot of bare pipe per hour and Efficiencies of insulation			
½	0		0	0	Bare pipe loss, B.t.u.	395.3	593.3	837.5	1123.8
	1½ 2	(no outer layer) (no outer layer)		1½ 2	Efficiency % Efficiency %	81.05 82.96	84.00 85.66	86.15 87.60	87.72 89.02
¾	0		0	0	Bare pipe loss, B.t.u.	497.3	745.5	1043.8	1406.5
	1½ 2	(no outer layer) (no outer layer)		1½ 2	Efficiency % Efficiency %	83.09 84.95	85.66 87.30	87.55 89.00	88.94 90.22
1	0		0	0	Bare pipe loss, B.t.u.	620.5	929.3	1306.3	1754.5
	1½ 2	(no outer layer) (no outer layer)		1½ 2	Efficiency % Efficiency %	84.75 86.55	87.09 88.68	88.80 90.20	90.06 91.34
1¼	0		0	0	Bare pipe loss, B.t.u.	786.3	1176.0	1656.3	2218.5
	1½ 2	(no outer layer) (no outer layer)		1½ 2	Efficiency % Efficiency %	86.16 87.97	88.30 89.84	89.85 91.20	90.96 92.18
1½	0		0	0	Bare pipe loss, B.t.u.	896.8	1346.5	1893.8	2537.5
	1½ 2	(no outer layer) (no outer layer)		1½ 2	Efficiency % Efficiency %	86.85 88.60	88.90 90.38	90.36 91.68	91.44 92.60
2	0		0	0	Bare pipe loss, B.t.u.	1122.0	1680.0	2368.8	3175.5
	1½ 1½	4½ 4½	1½ 2	2½ 3¼	Efficiency % Efficiency %	91.57 92.30	92.90 93.50	93.84 94.36	94.52 95.00
2½	0		0	0	Bare pipe loss, B.t.u.	1360.0	2037.0	2862.5	3842.5
	1½ 1½	5 5	1½ 2	2½ 3½	Efficiency % Efficiency %	92.30 93.01	93.50 94.10	94.36 94.67	95.00 95.43
3	0		0	0	Bare pipe loss, B.t.u.	1653.3	2478.0	3487.5	4676.3
	1½ 1½	6 6	1½ 2	3½ 3½	Efficiency % Efficiency %	93.20 93.78	94.26 94.76	95.01 95.45	95.58 95.94

Heat Losses from Bare Pipes and Efficiencies of Hy-Temp Combination Pipe Insulation (con't)

(Hy-Temp Insulation with "Featherweight" 85% Magnesia as outer layer)

Nominal Pipe Size, inches	Thick- ness Hy-Temp Insulation, inches	Pipe Size of 85% Magnesia, inches	Thick- ness of 85% Magne- sia, inches	Total Thick- ness of Com- bination Insula- tion, inches		Temperature Difference between pipe and surrounding air, Deg. F.			
						425°	525°	625°	725°
						Temperature of Pipe, Deg. F.			
						500°	600°	700°	800°
(Surrounding air temperature 75° F.) Heat losses per linear foot of bare pipe per hour and Efficiencies of insulation									
3½	0		0	0	Bare pipe loss, B.t.u.	1891.3	2829.8	3981.3	5343.3
	1½ 1½	6 6	1½ 2	2½ 3½	Efficiency % Efficiency %	93.24 93.90	94.30 94.86	95.05 95.53	95.60 96.02
4	0		0	0	Bare pipe loss, B.t.u.	2125.0	3186.8	4481.3	6010.3
	1½ 1½	7 7	1½ 2	3½ 3½	Efficiency % Efficiency %	93.81 94.35	94.78 95.25	95.47 95.88	95.96 96.33
4½	0		0	0	Bare pipe loss, B.t.u.	2363.0	3538.5	4981.3	6677.3
	1½	7	2	3½	Efficiency %	94.38	95.25	95.86	96.31
5	0		0	0	Bare pipe loss, B.t.u.	2626.5	3937.5	5537.5	7431.3
	1½	8	2	3½	Efficiency %	94.74	95.56	96.14	96.57
6	0		0	0	Bare pipe loss, B.t.u.	3128.0	4688.3	6593.8	8845.0
	1½	9	2	3½	Efficiency %	95.03	95.79	96.34	96.73
7	0		0	0	Bare pipe loss, B.t.u.	3604.0	5397.0	7593.8	10186.3
	1½	10	2	3½	Efficiency %	95.22	95.96	96.50	96.89
8	0		0	0	Bare pipe loss, B.t.u.	4071.5	6100.5	8587.5	11513.0
	1½	11	2	3½	Efficiency %	95.39	96.10	96.62	96.99
9	0		0	0	Bare pipe loss, B.t.u.	4547.5	6809.3	9581.3	12854.3
	1½	12	2	3½	Efficiency %	95.52	96.22	96.72	97.07
10	0		0	0	Bare pipe loss, B.t.u.	5083.0	7617.8	10718.8	14369.5
	1½	14	2	3½	Efficiency %	95.72	96.37	96.84	97.19
12	0		0	0	Bare pipe loss, B.t.u.	6022.3	9024.8	12700.0	17030.3
	1½	16	2	3½	Efficiency %	95.85	96.49	96.95	97.28
14	0		0	0	Bare pipe loss, B.t.u.	6608.8	9901.5	13937.5	18690.5
	1½	17	2	3½	Efficiency %	95.85	96.51	96.97	97.30
16	0		0	0	Bare pipe loss, B.t.u.	7556.5	11324.3	15931.3	21365.8
	1½	19	2	3½	Efficiency %	95.95	96.59	97.02	97.36
18	0		0	0	Bare pipe loss, B.t.u.	8504.3	12741.8	17925.0	24041.0
	1½	21	2	3½	Efficiency %	96.04	96.66	97.10	97.42
20	0		0	0	Bare pipe loss, B.t.u.	9447.8	14159.3	19918.8	26716.3
	1½	23	2	3½	Efficiency %	96.09	96.70	97.12	97.45
24	0		0	0	Bare pipe loss, B.t.u.	11339.0	16989.0	23900.0	32052.3
	1½	27	2	3½	Efficiency %	96.18	96.78	97.22	97.53
30	0		0	0	Bare pipe loss, B.t.u.	14173.8	21236.3	29881.3	40070.8
	1½	33	2	3½	Efficiency %	96.28	96.86	97.27	97.58

Hy-Temp Combination Pipe Covering

Temperatures to 800° F.
Hy-Temp Approximately 1½" thick

	INNER LAYER Hy-Temp	OUTER LAYER (85% Magnesia)
Nominal Pipe Sizes Inches	Approx. Thickness Inches	Nominal Pipe Sizes Inches
½	1½	3
¾	1½	3½
1	1½	4
1¼	1½	4
1½	1½	4½
2	1½	4½
2½	1½	5
3	1½	6
3½	1½	6
4	1½	7
4½	1½	7
5	1½	8
6	1½	9
7	1½	10
8	1½	*11
9	1½	*12
10	1½	*14
*11	1½	*15
*12	1½	*16
*14 o.d.	1½	*17
*16 o.d.	1½	*19
*18 o.d.	1½	*21
*20 o.d.	1½	*23
*24 o.d.	1½	*27
*30 o.d.	1½	*33

Hy-Temp Combination Pipe Covering

Temperatures 800° to 1000° F.
Hy-Temp Approximately 2" thick

	INNER LAYER Hy-Temp	OUTER LAYER (85% Magnesia)
Nominal Pipe Sizes Inches	Approx. Thickness Inches	Nominal Pipe Sizes Inches
½	2	4½
¾	1¾	4½
1	2	5
1¼	1¾	5
1½	2¾	6
2	2	6
2½	1¾	6
3	2	7
3½	1¾	7
4	2	8
4½	2	8
5	2	9
6	2¾	10
7	2	*11
8	2	*12
9	2¾	*14
10	2¾	*15
*11	2	*16
*12	2¾	*17
*14 o.d.	2	*18
*16 o.d.	2	*20
*18 o.d.	2	*22

*Hy-Temp and Magnesia for pipe sizes larger than 10" is furnished in Segmental blocks.

Number and Sizes of Segments of 85% Magnesia and Hy-Temp Segmental Pipe Insulation

Nominal Pipe Size Inches	1½" Thick			2" Thick		Double Std. or 3" Thick B/J Method			
	O. D. of Iron Pipe	Segments per Course	Size of Segments Inches	Segments per Course	Size of Segments Inches	Segments per Course	1st Course Size of Segments	Segments per Course	2nd Course Size of Segments
12"	12.75"	8	5.06 x 6.24	8	5.06 x 6.63	8	5.06 x 6.24	9	5.59 x 6.64
14"	14"	8	5.55 x 6.73	8	5.55 x 7.12	8	5.55 x 6.73	10	5.42 x 6.37
15"	15"	9	5.28 x 6.33	9	5.28 x 6.68	9	5.28 x 6.33	10	5.74 x 6.68
16"	16"	9	5.63 x 6.68	9	5.63 x 7.03	9	5.63 x 6.68	11	5.50 x 6.36
17"	17"	10	5.39 x 6.33	10	5.39 x 6.64	10	5.39 x 6.33	11	5.79 x 6.65
18"	18"	10	5.70 x 6.64	10	5.70 x 6.96	10	5.70 x 6.64	12	5.57 x 6.35
19"	19"	11	5.47 x 6.32	11	5.47 x 6.61	11	5.47 x 6.32	12	5.83 x 6.62
20"	20"	11	5.75 x 6.61	11	5.75 x 6.90	11	5.75 x 6.61	13	5.58 x 6.31
21"	21"	12	5.54 x 6.32	12	5.54 x 6.58	12	5.54 x 6.32	13	5.87 x 6.59
22"	22"	12	5.80 x 6.58	12	5.80 x 6.84	12	5.80 x 6.58	14	5.63 x 6.30
23"	23"	13	5.58 x 6.31	13	5.58 x 6.55	13	5.58 x 6.31	14	5.92 x 6.55
24"	24"	13	5.83 x 6.56	13	5.83 x 6.80	13	5.83 x 6.56	14	6.08 x 6.75
26"	26"	14	5.90 x 6.52	14	5.87 x 6.77	14	5.90 x 6.52	15	6.10 x 6.72
28"	28"	15	5.90 x 6.52	15	5.90 x 6.73	15	5.90 x 6.52	16	6.11 x 6.70
30"	30"	16	5.91 x 6.50	16	5.91 x 6.70	16	5.91 x 6.50	18	5.78 x 6.30

Packaging Data—Hy-Temp and Combination Pipe Insulation

(Crate No. 71 is used unless otherwise noted)

Sections per crate—Jacketed Hy-Temp Pipe Insulation

Thickness of Insulation	Nominal Pipe Sizes															
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	10
1 1/2" Thick	58	50	46	38	38	28	24	20	16	14	14	11	9	6-#70	6-#70	6-#73
2" Thick	38	32	28	24	24	20	16	14	14	11	11	9	6-#70	6	6-#72	5-#201

Sections per crate—Hy-Temp Combination Pipe Insulation

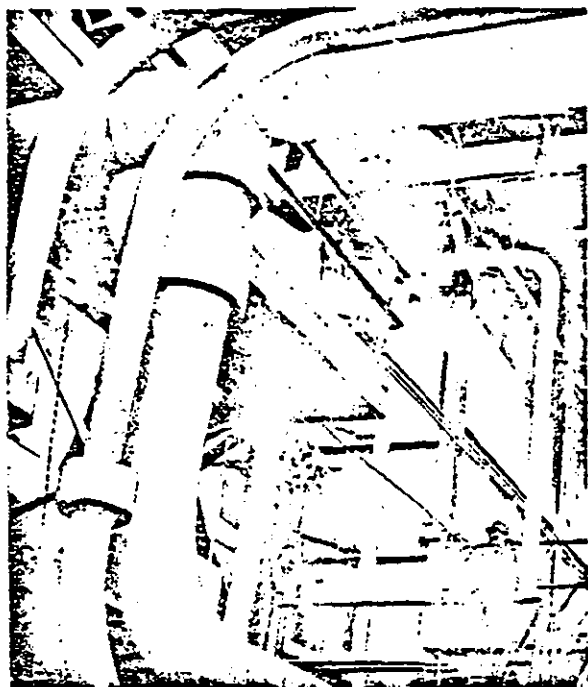
Thickness of Outer Layer	Nominal Pipe Size of Outer Layer As Shown on Data Page IN-67B									
	3	3 1/2	4	4 1/2	5	6	7	8	9	10
Standard	28	24	19	15	14	11	7	6-#70	6	10-#72
1 1/2"	20	16	14	14	11	9	6-#70	6-#70	6-#72	6-#73
2"	14	14	11	11	9	6-#70	6	6-#72	6-#73	5-#201
Dbl. Std.	14	11	11	7	7	6-#70	6-#72	6-#73	x	x
Dbl. 1 1/2"	9	6	6-#70	6-#70	6	6-#72	6-#73	x	x	x

Sections per crate—Hy-Temp Inner Layer of Combination Pipe Insulation (When Outer Layer Is Segmental Block)

Thickness of Inner Layer	Nominal Pipe Size of HY-TEMP Inner Layer				
	6	7	8	9	10
1 1/2"	12	9	8	10-#72	10-#72
2"	9	8	10-#72	10-#72	10-#72

Key to Crate Dimensions

Crate No.	Inside Dimensions (inches)	Outside Dimensions (inches)	Tare Weight (lbs.)
200	34 1/4 x 34 x 36 1/4	37 1/4 x 35 x 37 1/4	55
201	37 x 35 3/4 x 36 1/4	40 x 36 3/4 x 37 1/4	60
70	34 1/2 x 23 x 36 1/4	37 1/2 x 24 x 37 1/4	40
71	37 x 25 x 36 1/4	40 x 26 x 37 1/4	45
72	41 x 27 x 36 1/4	44 x 28 x 37 1/4	55
73	42 x 28 x 36 1/4	45 x 29 x 37 1/4	60



Hy-Temp Block Insulation

Hy-Temp Blocks are furnished in standard widths of 3", 6", 9", and 12" and in 36" lengths flat. Thicknesses range from 1" to 4". Curved blocks are furnished in standard 6" widths and 36" lengths. Thicknesses range from 1½" to 2".

Hy-Temp Blocks are usually used in combination with an outer layer of 85% Magnesia Blocks. The Hy-Temp Blocks are applied as an inner layer to bring the temperature at the magnesia down to the limits of that product.

This main steam header, carrying superheated steam at 400 pounds pressure from the boiler in the background to the power plant turbine, is insulated with 1½" thick Hy-Temp Covering and a similar thickness of 85% Magnesia Covering. Hy-Temp Block is used under the steel shell to reduce heat losses through the boiler walls.

Recommended Minimum Thickness of Combination Hy-Temp and 85% Magnesia Block Insulation

Maximum Temperature on Hy-Temp deg. F.	Thickness of Hy-Temp Inches	Thickness of Magnesia Inches	Total Thickness Inches
750	1½	2½	4
900	2½	2	4½
1000	3	2	5
1200	3½	1½	5

Where insulation is to be applied on weather-exposed surfaces, increase thicknesses at least ½" greater than those shown in table.

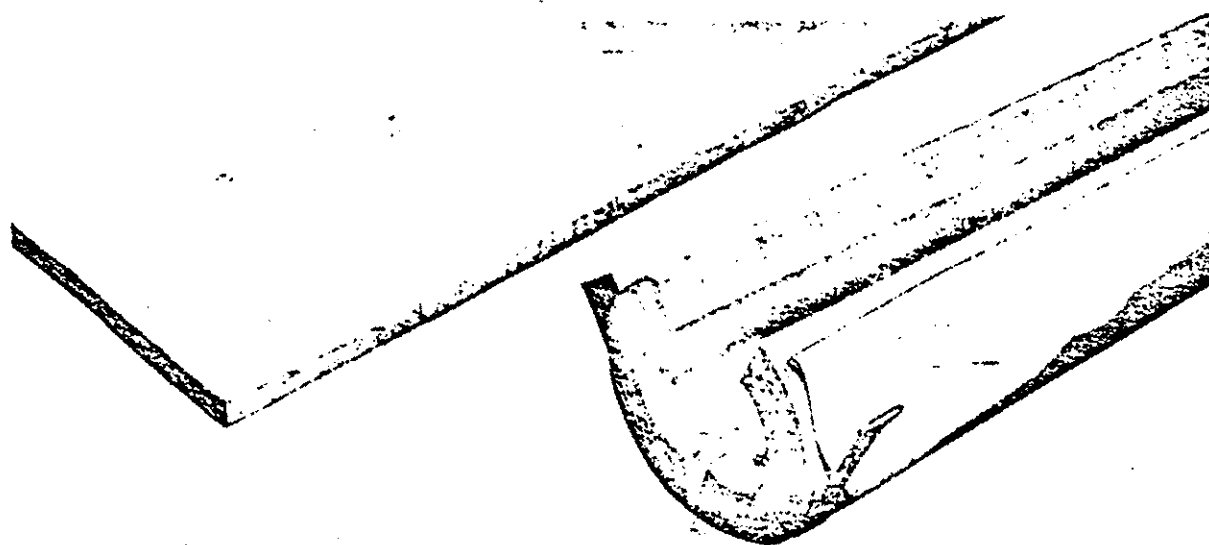
Hy-Temp Carton Contents

Empty carton weight—4 lbs.

Approximate gross weight—85 lbs. for Hy-Temp Blocks

Outside dimensions of carton—13" x 12½" x 37".

Size in Inches	Thickness in Inches									
	1	1¼	1½	1¾	2	2¼	2½	3	4	
3 x 36										
Blocks per Carton	48	38	32	28	24	20	20	16	12	
Sq. Ft. per Carton	36	28½	24	21	18	15	15	12	9	
6 x 36										
Blocks per Carton	24	19	16	14	12	10	10	8	6	
Sq. Ft. per Carton	36	28½	24	21	18	15	15	12	9	
12 x 36										
Blocks per Carton	12	9	8	7	6	5	5	4	3	
Sq. Ft. per Carton	36	27	24	21	18	15	15	12	9	



Bestfelt Pipe Covering and Block

Bestfelt Insulation is made in pipe covering and block form of built-up layers of crimped asbestos paper. There are approximately 33 layers of paper per inch of insulation thickness. The material is suitable for use on heated pipes and surfaces where temperatures do not exceed 700° F. It is often specified in place of 85% Magnesia for applications where the insulation is subjected to excessive conditions of vibration or where it must be removed and replaced frequently. For example, removable flange covers made of Bestfelt have the high strength necessary to resist damage that occurs to many insulations when the covers are removed and replaced.

For thermal conductivity of Bestfelt Insulation, see curve on Page 126.

Bestfelt Pipe Insulation

Bestfelt Pipe Covering is supplied in foot sections with canvas jackets and lugs for application. It is available for pipe sizes from ½" to 24".

Standard Thickness approximates thicknesses of 1", 1½", 2", and 2½" in single layer construction. A 3" thickness is also supplied with broken joint construction.

Recommended Minimum Thickness of Bestfelt Pipe Insulation—Indoor Conditions

Steam Pressure or condition	Temp. Deg. F.	Pipe Sizes	
		Up to 1½"	2" to 4"
Hot Water	—	1"	1"
0-25 lbs.	212 to 266	1"	1"
25-100 lbs.	267 to 337	1"	1"
100-200 lbs.	338 to 387	1"	1½"
Low Superheat	388 to 499	1½"	2"
	500 to 599	2"	2½"
	600 to 700	2"	3"

Heat Losses from Bare Pipes and Efficiencies of Bestfelt Insulation

Nominal Pipe Size, inches	Insulation thickness, inches		Temperature of pipe—deg. Fahr.									
			125	175	225	275	325	375	425	475	525	575
			Temperature difference between pipe and air—deg. Fahr.									
			50	100	150	200	250	300	350	400	450	500
$\frac{3}{4}$	1	Efficiency %	71.46	73.21	76.11	77.31	79.00	80.27	81.90	82.98	84.87	85.76
	$1\frac{1}{2}$	" "	73.91	75.70	77.60	79.30	80.71	82.17	83.40	84.69	85.80	86.91
	2	" "	76.80	78.43	80.10	81.60	83.00	84.10	85.40	86.41	87.50	88.60
	$2\frac{1}{2}$	" "	78.57	80.10	81.60	83.10	84.37	85.52	86.57	87.60	88.51	89.31
	3	" "	80.33	81.67	83.10	84.41	85.50	86.60	87.52	88.51	89.47	89.99
1	1	" "	74.00	75.70	77.61	79.50	80.70	82.00	83.57	84.79	85.92	86.91
	$1\frac{1}{2}$	" "	76.70	78.13	79.82	81.33	82.72	83.97	85.10	86.20	87.21	88.11
	2	" "	79.50	80.85	82.37	83.62	84.80	85.90	87.00	87.95	89.00	89.61
	$2\frac{1}{2}$	" "	81.12	82.40	83.80	85.07	86.13	87.12	88.15	89.12	89.91	90.63
	3	" "	82.62	83.82	85.14	86.20	87.17	88.10	89.00	89.82	90.62	91.22
$1\frac{1}{2}$	1	" "	77.25	78.82	80.50	82.00	83.09	84.30	85.51	86.67	87.50	88.39
	$1\frac{1}{2}$	" "	80.00	81.27	82.75	83.99	85.12	86.13	87.21	88.23	88.99	89.81
	2	" "	82.57	83.90	84.99	86.17	87.12	88.02	88.96	89.82	90.52	91.22
	$2\frac{1}{2}$	" "	84.30	85.41	86.52	87.51	88.42	89.21	90.02	90.82	91.43	92.03
	3	" "	85.70	86.72	87.69	88.62	89.43	90.12	90.90	91.61	92.25	92.67
2	1	" "	78.80	80.22	81.72	83.03	84.22	85.32	86.42	87.52	88.31	89.11
	$1\frac{1}{2}$	" "	81.51	82.81	84.03	85.23	86.29	87.19	88.13	89.05	89.79	90.51
	2	" "	84.02	85.13	86.32	87.31	88.20	89.05	89.90	90.70	91.31	91.93
	$2\frac{1}{2}$	" "	85.73	86.71	87.80	88.70	89.50	90.22	90.97	91.66	92.25	92.78
	3	" "	86.99	87.94	88.83	89.69	90.42	91.08	91.77	92.37	92.91	93.40
$2\frac{1}{2}$	1	" "	79.98	81.33	82.71	83.97	85.08	86.10	87.13	88.11	88.96	89.71
	$1\frac{1}{2}$	" "	82.65	83.83	85.03	86.14	87.12	88.00	88.91	89.77	90.47	91.13
	2	" "	85.10	86.16	87.20	88.17	89.01	89.78	90.55	91.30	91.88	92.50
	$2\frac{1}{2}$	" "	86.76	87.69	88.67	89.54	90.28	90.99	91.69	92.35	92.90	93.41
	3	" "	87.94	88.80	89.70	90.48	91.17	91.77	92.40	93.00	93.50	93.95
3	1	" "	80.97	82.24	83.60	84.80	85.90	86.83	87.90	88.80	89.60	90.30
	$1\frac{1}{2}$	" "	83.57	84.65	85.85	86.87	87.80	88.68	89.50	90.31	91.00	91.61
	2	" "	86.09	87.03	88.02	88.93	89.68	90.42	91.14	91.82	92.39	92.92
	$2\frac{1}{2}$	" "	87.79	88.59	89.50	90.27	90.95	91.59	92.22	92.84	93.35	93.80
	3	" "	88.90	89.67	90.43	91.16	91.79	92.39	92.96	93.50	93.95	94.37
$3\frac{1}{2}$	1	" "	81.55	82.29	84.16	85.24	86.28	87.20	88.13	89.05	89.80	90.50
	$1\frac{1}{2}$	" "	84.17	85.25	86.37	87.37	88.26	89.07	89.87	90.57	91.30	91.90
	2	" "	86.55	87.53	88.47	89.38	90.13	90.82	91.52	92.15	92.72	93.22
	$2\frac{1}{2}$	" "	88.32	89.11	89.93	90.68	91.35	91.95	92.55	93.15	93.61	94.04
	3	" "	89.56	90.25	91.02	91.69	92.26	92.82	93.35	93.86	94.26	94.66
4	1	" "	82.07	83.27	84.53	85.63	86.63	87.57	88.50	89.39	90.11	90.77
	$1\frac{1}{2}$	" "	84.63	85.67	86.73	87.73	88.57	89.39	90.19	90.93	91.57	92.16
	2	" "	87.10	87.98	88.90	89.74	90.47	91.13	91.81	92.45	92.97	93.47
	$2\frac{1}{2}$	" "	88.73	89.52	90.32	91.07	91.69	92.27	92.86	93.41	93.87	94.30
	3	" "	89.91	90.59	91.31	91.96	92.55	93.06	93.57	94.08	94.50	94.86
$4\frac{1}{2}$	1	" "	82.31	83.50	84.70	85.83	86.85	87.77	88.67	89.52	90.27	90.93
	$1\frac{1}{2}$	" "	85.10	86.10	87.15	88.09	88.91	89.68	90.45	91.18	91.78	92.36
	2	" "	87.47	88.32	89.19	90.00	90.72	91.38	92.02	92.67	93.20	93.67
	$2\frac{1}{2}$	" "	89.04	89.81	90.61	91.33	91.93	92.50	93.08	93.61	94.06	94.47
	3	" "	90.22	90.95	91.61	92.26	92.81	93.31	93.79	94.30	94.67	95.02
5	1	" "	82.75	83.91	85.11	86.21	87.18	88.07	88.97	89.84	90.52	91.19
	$1\frac{1}{2}$	" "	85.37	86.32	87.37	88.27	89.11	89.88	90.65	91.37	91.97	92.52
	2	" "	87.81	88.65	89.54	90.31	90.99	91.64	92.26	92.87	93.37	93.83
	$2\frac{1}{2}$	" "	89.41	90.13	90.90	91.59	92.18	92.76	93.27	93.81	94.25	94.65
	3	" "	90.53	91.21	91.87	92.50	93.01	93.50	94.02	94.50	94.86	95.21
6	1	" "	83.28	84.37	85.53	86.58	87.53	88.39	89.29	90.10	90.77	91.40
	$1\frac{1}{2}$	" "	85.77	86.79	87.77	88.67	89.50	90.21	90.93	91.64	92.21	92.72
	2	" "	88.34	89.11	89.95	90.68	91.36	91.97	92.60	93.16	93.65	94.10
	$2\frac{1}{2}$	" "	89.87	90.59	91.32	92.00	92.56	93.09	93.60	94.10	94.51	94.88
	3	" "	91.00	91.62	92.28	92.87	93.39	93.86	94.41	94.76	95.10	95.43

Nominal Pipe Size, inches	Insulation thickness, inches	Temperature of pipe—deg. Fahr.										
			125	175	225	275	325	375	425	475	525	575
			Temperature difference between pipe and air—deg. Fahr.									
			50	100	150	200	250	300	350	400	450	500
7	1	Efficiency %	83.50	84.63	85.78	86.85	87.73	88.60	89.72	90.24	90.92	91.53
	1½	" "	86.23	87.17	88.12	88.99	89.77	90.51	91.20	91.87	92.44	92.98
	2	" "	88.63	89.43	90.25	91.00	91.63	92.23	92.83	93.38	93.86	94.27
	2½	" "	90.24	90.93	91.62	92.27	92.81	93.32	93.85	94.32	94.71	95.08
	3	" "	91.37	91.96	92.58	93.15	93.63	94.09	94.53	94.95	95.31	95.62
8	1	" "	83.93	84.99	86.11	87.13	88.03	88.87	89.68	90.50	91.11	91.72
	1½	" "	86.47	87.40	88.37	89.23	89.97	90.67	91.37	92.03	92.57	93.10
	2	" "	88.91	89.67	90.45	91.17	91.81	92.41	92.97	93.52	93.97	94.37
	2½	" "	90.50	91.18	91.82	92.48	92.99	93.51	93.99	94.47	94.83	95.21
	3	" "	91.57	92.20	92.77	93.37	93.83	94.27	94.67	95.10	95.43	95.75
9	1	" "	84.05	85.12	86.25	87.23	88.10	88.93	89.75	90.52	91.18	91.76
	1½	" "	86.63	87.53	88.49	89.35	90.09	90.78	91.46	92.15	92.69	93.19
	2	" "	89.11	89.85	90.66	91.35	91.95	92.52	93.09	93.61	94.05	94.50
	2½	" "	90.69	91.36	92.04	92.65	93.16	93.67	94.13	94.58	94.95	95.30
	3	" "	91.77	92.37	92.95	93.51	93.97	94.39	94.82	95.22	95.55	95.87
10	1	" "	85.03	85.99	87.05	88.12	89.02	89.57	90.35	91.07	92.03	92.71
	1½	" "	86.95	87.81	88.72	89.55	90.30	90.99	91.64	92.30	92.83	93.35
	2	" "	89.31	90.05	90.82	91.51	92.11	92.69	93.21	93.77	94.20	94.61
	2½	" "	90.89	91.53	92.20	92.80	93.30	93.77	94.25	94.72	95.07	95.41
	3	" "	91.98	92.55	93.17	93.70	94.15	94.57	94.99	95.37	95.68	95.99
12	1½	" "	87.11	87.99	88.91	89.74	90.50	91.15	91.78	92.45	92.96	93.43
	2	" "	89.53	90.27	91.04	91.70	92.31	92.86	93.39	93.91	94.33	94.72
	2½	" "	91.17	91.77	92.39	92.97	93.51	93.95	94.41	94.86	95.22	95.55
	3	" "	92.23	92.79	93.37	93.87	94.31	94.72	95.11	95.52	95.85	96.13
14	1½	" "	87.25	88.13	89.05	89.87	90.58	91.25	91.89	92.55	93.04	93.52
	2	" "	89.67	90.41	91.16	91.85	92.46	92.99	93.53	94.03	94.46	94.85
	2½	" "	91.22	91.86	92.51	93.09	93.60	94.06	94.51	94.93	95.27	95.60
	3	" "	92.35	92.88	93.46	93.95	94.41	94.81	95.21	95.60	95.91	96.19
16	1½	" "	87.36	88.23	89.11	89.93	90.63	91.31	91.99	92.60	93.11	93.59
	2	" "	89.71	90.47	91.19	91.90	92.49	93.03	93.58	94.09	94.50	94.89
	2½	" "	91.31	91.95	92.58	93.16	93.68	94.10	94.57	94.99	95.35	95.67
	3	" "	92.39	92.97	93.54	94.06	94.52	94.90	95.30	95.67	95.97	96.25
18	1½	" "	87.46	88.33	89.23	90.06	90.76	91.40	92.06	92.66	93.17	93.65
	2	" "	89.76	90.52	91.30	91.98	92.56	93.09	93.64	94.13	94.55	94.93
	2½	" "	91.47	92.09	92.69	93.29	93.75	94.23	94.67	95.10	95.44	95.75
	3	" "	92.48	93.08	93.61	94.15	94.57	94.97	95.37	95.73	96.03	96.33

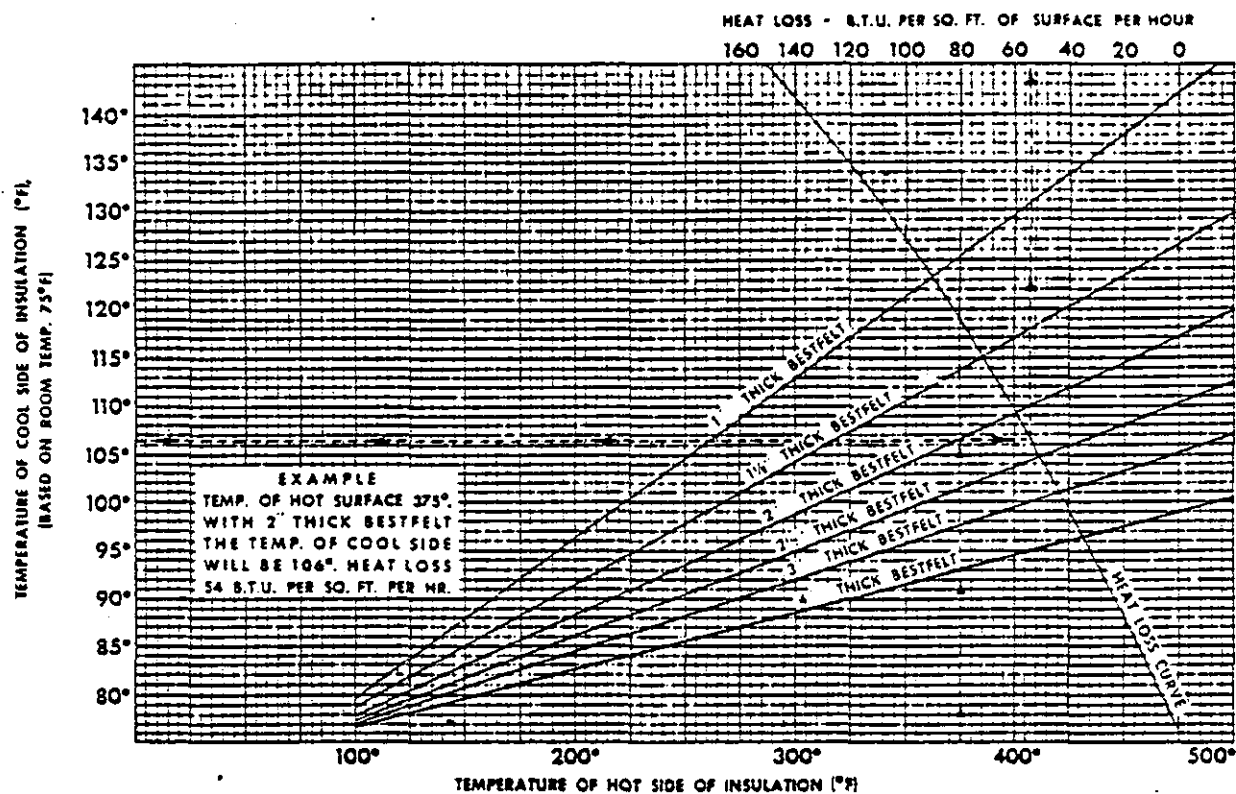
Packaging Information
Carton Contents of Bestfelt Pipe Insulation

Standard Thickness			
Nominal Pipe Size	Feet	Sections	Gross Wt. per Carton, Lbs.*
½"	81	27	124
¾"	72	24	124
1"	60	20	116
1¼"	51	17	113
1½"	45	15	108
2"	36	12	101
2½"	27	9	88
3"	21	7	80
3½"	18	6	76
4"	18	6	83
4½"	15	5	75
5"	12	4	67
6"	6	2	41

*Empty carton wt. 5 lbs.

Outside dimensions of carton 14" x 20½" x 37".

Bestfelt Sheets and Blocks—Heat Losses, Surface Temperature, and Conductivity

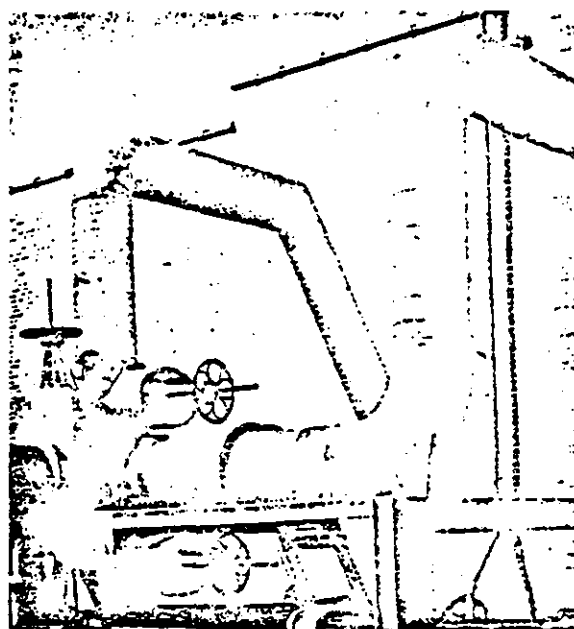


Bestfelt Sheets and Blocks

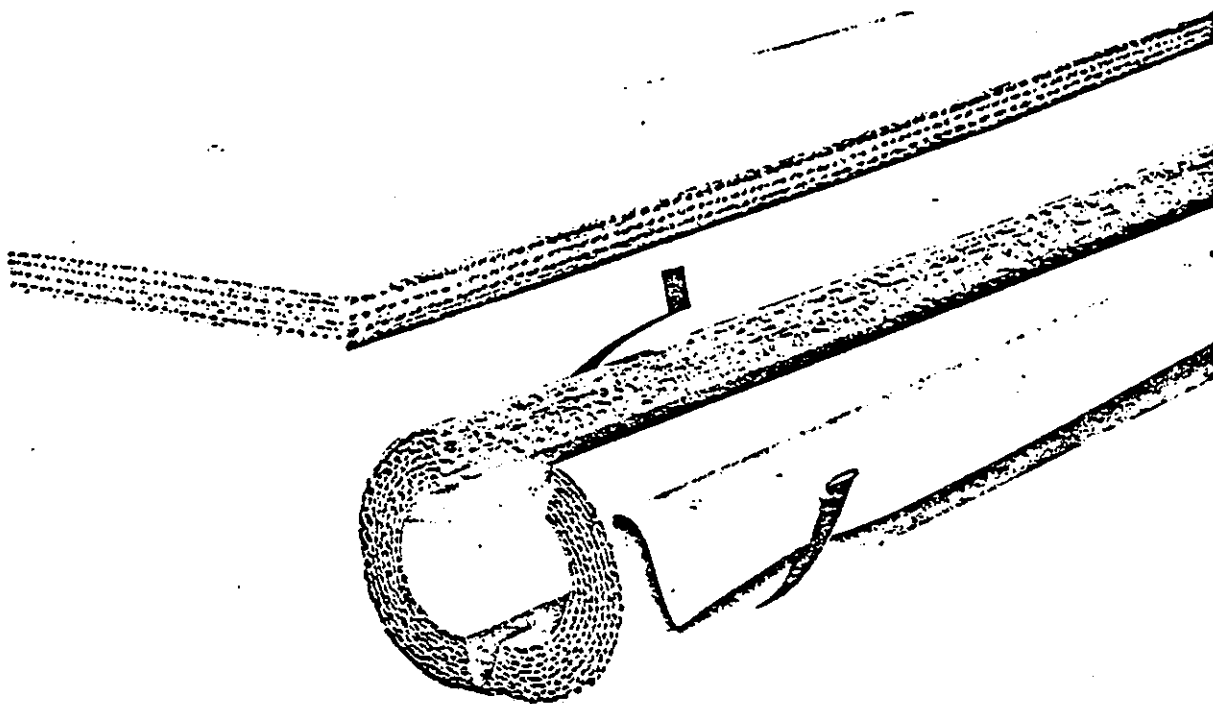
Bestfelt sheets and blocks, for the insulation of flat, curved and irregular surfaces, are available in standard widths of 6", 9", 12", 18", 24", and 36". All are 36" in length and thicknesses are 1/2", 1", 1 1/2", 2", 2 1/2", 3", 3 1/2", and 4". The laminations run the length of the block, allowing for greater flexibility and ease of application to curve surfaces. Weight of Bestfelt Block is approximately 3 lbs. per sq. ft. per inch of thickness.

Recommended Thicknesses—Bestfelt Sheets and Blocks

Steam Pressure or Condition	Temp. Degrees F.	Thickness
Hot Water		1"
0-25 lbs.	212 to 266	1"
25-100 lbs.	267 to 337	1 1/2"
100-200 lbs.	338 to 387	2"
Low Superheat	388 to 499	2 1/2"
Superheat	500 to 599	3"
High Superheat	600 to 700	3"



Two layers of 1 1/2" thick Bestfelt Pipe Covering, applied with joints staggered, were used to insulate these 16" and 20" steam lines. All laps in the asbestos roofing jacket were sealed with weatherproof cement.



Air Cell Insulations

Air cell insulations are recommended for use on steam, hot water lines, and other heated surfaces where temperatures do not exceed 300° F. Pipe covering and blocks are made of alternate layers of corrugated and flat asbestos felt bonded together by a special laminating process. In air cell block insulation, the corrugated layers are crossed at right angles to give the block greater rigidity and durability. Air cell insulation is light in weight, rigid, and sufficiently strong for applications where service conditions are not severe.

Air cell insulation is available in three types: air cell, fine corrugated air cell, and special fine air cell. The difference in the three types lies in

the number of layers of corrugated asbestos felt used per inch of thickness. The greater the number of corrugations per inch, the higher is the strength and insulating efficiency of the product.

Air Cell Pipe Insulation (Four Plies per Inch)

Air cell pipe insulation is furnished in standard thicknesses of 4 plies, each ply being approximately $\frac{1}{4}$ " thick. Greater thicknesses will be furnished when requested. Pipe covering sections are three feet long and are shipped complete with canvas jacket and lacquered bands for application to all standard sizes of pipes.

Recommended Thicknesses—Air Cell Pipe Insulation

Temperature Range	Description	1½" and smaller	2" to 4"	4½" and over
Up to 170	Hot water, condensate return lines, etc.	$\frac{3}{4}$ "-3 ply	$\frac{3}{4}$ "-3 ply	$\frac{3}{4}$ "-3 ply
Up to 212	Hot water, boiler feed water supply, etc.	$\frac{3}{4}$ "-3 ply	1"-3 ply	$\frac{3}{4}$ "-4 ply
212-300	Low pressure steam	1"-4 ply	1"-4 ply	1"-4 ply

Efficiencies of Air Cell Pipe Insulation

Nominal Pipe size, inches	Number of plies	Temperature difference between pipe and surrounding air, °F.						
		50° 100° 150° 200° 250° 300°						
		Temperature of Pipe, °F. (Temperature of surrounding air, 75°)						
			125°	175°	225°	275°	325°	375°
1/2	2	Efficiencies %.....	49.5	51.1	53.3	55.2	56.9	58.2
	3	" %.....	54.3	56.0	58.3	60.3	62.1	63.4
	4	" %.....	58.0	59.6	61.7	63.6	65.4	66.3
3/4	2	" %.....	53.6	54.9	57.1	58.5	60.1	61.9
	3	" %.....	58.2	59.6	61.9	63.7	65.0	67.0
	4	" %.....	62.0	63.4	65.1	66.9	68.4	69.8
1	2	" %.....	57.3	58.3	60.2	61.7	62.9	64.5
	3	" %.....	62.2	63.5	63.6	66.8	68.3	69.7
	4	" %.....	65.7	67.0	68.7	70.2	71.7	72.6
1 1/4	2	" %.....	59.9	61.1	62.9	64.0	64.2	66.0
	3	" %.....	64.0	66.2	67.9	69.5	70.8	72.2
	4	" %.....	68.6	69.9	71.4	72.8	73.9	75.1
1 1/2	2	" %.....	61.4	62.9	64.2	65.3	66.2	67.9
	3	" %.....	66.3	67.2	69.2	70.8	71.9	73.2
	4	" %.....	70.1	71.2	72.9	74.1	75.3	76.2
2	2	" %.....	63.4	64.4	65.9	67.0	67.9	69.8
	3	" %.....	68.6	69.6	71.1	72.4	73.6	75.1
	4	" %.....	72.1	73.2	74.5	75.7	76.9	78.2
2 1/2	2	" %.....	64.3	65.7	67.2	68.2	69.2	71.1
	3	" %.....	70.0	71.0	72.4	73.6	74.8	76.1
	4	" %.....	73.6	74.6	75.9	77.0	78.0	79.0
3	2	" %.....	66.0	66.8	68.1	69.3	70.3	72.1
	3	" %.....	71.3	72.3	73.6	74.8	75.7	77.1
	4	" %.....	74.9	75.9	77.0	78.2	79.1	80.2
3 1/2	2	" %.....	66.6	67.4	68.7	69.9	70.8	72.7
	3	" %.....	72.0	73.0	74.2	75.4	76.3	78.0
	4	" %.....	75.6	76.5	77.7	78.8	79.8	80.8
4	2	" %.....	67.1	67.9	69.2	70.3	71.3	73.2
	3	" %.....	72.7	73.5	74.8	75.9	76.8	78.4
	4	" %.....	76.2	77.1	78.2	79.3	80.2	81.3
4 1/2	2	" %.....	67.7	68.3	69.6	70.6	71.6	73.8
	3	" %.....	73.1	74.0	75.2	76.3	77.2	78.9
	4	" %.....	76.7	77.6	78.7	79.7	80.6	81.7
5	2	" %.....	68.0	68.7	70.0	71.0	72.0	74.2
	3	" %.....	73.5	74.4	75.6	76.7	77.6	79.2
	4	" %.....	77.2	78.0	79.1	80.1	81.1	82.1
6	2	" %.....	68.6	69.4	70.5	71.5	72.4	74.6
	3	" %.....	74.3	74.9	76.2	77.0	78.0	79.8
	4	" %.....	77.8	78.6	79.7	80.6	81.5	82.5
7	2	" %.....	69.1	69.7	70.9	71.8	72.7	74.9
	3	" %.....	74.6	75.4	76.6	77.5	78.4	80.3
	4	" %.....	78.3	79.0	80.1	81.0	81.9	83.0
8	2	" %.....	69.4	70.0	71.2	72.1	73.2	75.3
	3	" %.....	75.0	75.8	76.9	77.9	78.7	80.5
	4	" %.....	78.6	79.4	80.5	81.3	82.1	83.4
9	2	" %.....	69.7	70.2	71.3	72.3	73.6	75.6
	3	" %.....	75.2	75.9	77.0	78.0	79.0	80.9
	4	" %.....	78.9	79.7	80.7	81.6	82.3	83.7
10	2	" %.....	69.9	70.4	71.5	72.5	73.8	75.8
	3	" %.....	75.5	76.1	77.3	78.2	79.1	81.1
	4	" %.....	79.2	79.9	81.0	81.8	82.5	83.9

Packaging Information—Air Cell Pipe Insulation Carton Contents

Nominal Pipe Size	Three Ply (Per Carton)			Four Ply (Per Carton)		
	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.
1/2"	180	60	61	132	44	66
3/4"	165	55	64	120	40	65
1"	138	46	64	96	32	60
1 1/4"	108	36	59	81	27	57
1 1/2"	96	32	57	72	24	56
2"	72	24	50	54	18	50
2 1/2"	54	18	43	45	15	47
3"	45	15	43	36	12	44
** 3 1/2"	51	17	52	42	14	56
** 4"	45	15	52	33	11	49
** 5"	33	11	46	21	7	38
** 6"	21	7	36	18	6	39
** 8"	15	5	33	12	4	33
** 10"	12	4	33	9	3	31

**Shipped knocked down.
Empty carton weight—6 lbs.

Outside dimensions of carton 15" x 27 3/4" x 36 3/4".

Simplex "Super Shrunk" Pipe Insulation

This pipe insulation is identical to four-ply air cell, except that instead of a pasted canvas outer jacket it is supplied with an outer casing of white asbestos felt. This outer felt is specially processed to produce a water repellent surface. It can be readily painted and easily cleaned with

a damp cloth. Super shrunk pipe insulation is furnished in three-ply and four-ply only and is shipped complete with bands and fasteners.

Efficiencies for Simplex Pipe Insulation are the same as those given for Air Cell Pipe Insulation on Page 128.

Packaging Information—Simplex Pipe Insulation Carton Contents

Nominal Pipe Sizes	Three Ply (Per Carton)			Four Ply (Per Carton)		
	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.
1/2"	180	60	61	132	44	66
3/4"	165	55	64	120	40	65
1"	138	46	64	96	32	60
1 1/4"	108	36	59	81	27	57
1 1/2"	96	32	57	72	24	56
2"	72	24	49	54	18	50
2 1/2"	54	18	44	45	15	47
3"	45	15	44	36	12	44
3 1/2"	36	12	39	27	9	38
4"	27	9	33	24	8	37
5"	21	7	32	15	5	29
6"	18	6	32	15	5	33
8"	12	4	28	—	—	—

Empty carton weight—6 lbs.

Outside dimensions of carton 15" x 27 3/4" x 36 3/4".

Fine Corrugated Air Cell Pipe Insulation

The greater strength of fine corrugated air cell pipe covering makes it specially suited for insulating medium and low pressure steam and hot water lines subject to excessive vibration. This sturdy material is unaffected by rough usage and can be removed and replaced many times without damage or loss of insulating properties.

Fine corrugated air cell is furnished in standard thickness of 4 and 6 plies, and each ply is approximately $\frac{1}{8}$ " thick. Greater thicknesses will be furnished when requested. Pipe covering sections are 3 feet long complete with canvas jacket and brass lacquered bands for application on all standard sizes of pipe.

Photograph shows part of the steam heating system at the U. S. Veterans' Hospital at Ft. Custer, Michigan. Fine corrugated Air Cell Covering was applied, then finished with a 4-oz. rewrapped canvas jacket sized and painted with lead and oil paint. Metal bands were then applied.



Approx. Net Weights in Pounds per Standard 3 Foot Section

Thickness	Nominal Pipe Sizes, Inches											
	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
4 Ply	0.92	1.07	1.22	1.44	1.55	1.86	2.16	2.53	2.81	3.12	3.75	4.43
6 Ply	1.61	1.81	2.04	2.35	2.52	2.94	3.39	3.92	4.35	4.78	5.69	6.65

Special Fine Corrugated Air Cell Pipe Insulation

Special fine corrugated air cell insulation, constructed with 8 plies per inch, provides high mechanical strength, greater efficiency with minimum heat loss for temperatures up to 300° F. Because it will withstand rougher handling and more severe service conditions, this covering is widely used in place of regular air cell in industrial applications for insulation of medium and

low pressure steam and hot water lines.

Special fine corrugated air cell is furnished in thicknesses of 4, 6, and 8 plies. Each ply is approximately $\frac{1}{8}$ " thick. Greater thicknesses can be supplied on special order. Individual pipe covering sections are 3' long and are shipped complete with canvas jackets and brass lacquered bands, for application.

Air Cell Sheets and Blocks

Air cell sheets and blocks are used for the insulation of low pressure boilers, feed water heaters, dry kilns, warm air ducts, boiler room ceilings, partitions, ovens, and stoves operating at medium and low temperatures.

Sheets and blocks are furnished in standard

6", 9", 12", 18", 36", and 72" lengths. They are 36" wide and thicknesses range from $\frac{1}{2}$ " to 4". Other sizes and thicknesses can be specially ordered. Each corrugated ply of the material is a full $\frac{1}{4}$ " thick. Air cell sheets and blocks weigh approximately 1 lb. per sq. ft. per 1" thickness.

Heat Losses and Efficiencies of Air Cell Sheets and Blocks

Thickness of insulation, inches	Temperature difference between hot surface and surrounding air, Deg. F.					
	Temperature of hot surface (Temperature of surrounding air, 75° F.)					
	Heat losses per square foot of bare surface per hour; and Efficiencies of insulation					
		50°	100°	150°	200°	250°
		125°	175°	225°	275°	325°
0	Bare surface loss, B.t.u.	97.5	215.2	360.0	533.0	737.8
1	Efficiency %.....	79.95	80.89	81.13	81.37	81.80
1½	" %.....	85.62	86.21	86.40	86.55	86.80
2	" %.....	88.74	89.23	89.29	89.47	89.68
2½	" %.....	90.74	91.09	91.14	91.33	91.52
3	" %.....	92.17	92.41	92.50	92.66	92.74
3½	" %.....	93.19	93.40	93.49	93.62	93.71
4	" %.....	94.05	94.20	94.25	94.34	94.43

Fine Corrugated Air Cell Sheets and Blocks

These sheets and blocks are mechanically stronger and possess higher insulating efficiency than the ordinary four-ply air cell material.

They are furnished in standard 6", 9", 12", 18", 36", and 72" lengths and in 36" widths, in

thicknesses of ½", 1", 1½", 2", 2½", 3", 3½", and 4". Other sizes and thicknesses can be furnished on request. Each ply is a full ⅛" thick. Fine corrugated air cell sheets and blocks weigh approximately 1.3 lbs. per sq. ft. per 1" thickness.

Heat Losses and Efficiencies of Fine Corrugated Air Cell Sheets and Blocks

Thickness of insulation, inches	Temperature difference between hot surface and surrounding air, Deg. F.					
	Temperature of hot surface (Temperature of surrounding air, 75° F.)					
	Heat losses per square foot of bare surface per hour; and Efficiencies of insulation					
		50°	100°	150°	200°	250°
		125°	175°	225°	275°	325°
0	Bare surface loss, B.t.u.	97.5	215.2	360.0	533.0	737.8
1	Efficiency %.....	80.87	81.96	82.59	83.10	83.81
1½	" %.....	86.28	87.00	87.50	87.88	88.32
2	" %.....	89.29	89.84	90.19	90.54	90.88
2½	" %.....	91.19	91.63	91.94	92.21	92.51
3	" %.....	92.44	92.88	93.15	93.43	93.60
3½	" %.....	93.53	93.82	94.05	94.27	94.45
4	" %.....	94.44	94.56	94.75	94.93	95.08

Packaging Information—Carton Contents
Air Cell and Fine Corrugated Air Cell Sheets and Blocks

Size of Sheets and Blocks	Thickness inches—Ply						
	* $\frac{1}{2}$ "-2 ** $\frac{1}{2}$ "-3	* $\frac{3}{4}$ "-3	*1"-4 **1"-5	*1 $\frac{1}{4}$ "-5	*1 $\frac{1}{2}$ "-6 **1 $\frac{1}{2}$ "-9	*1 $\frac{3}{4}$ "-7	*2"-8 **2"-12
	Number of Sheets or Blocks per Carton						
36" x 36"	23	15	12	9	8	7	6
12" x 36"	69	45	36	27	24	21	18
6" x 36"	138	90	72	54	48	42	36
Sq. Feet per Carton	207	135	108	81	72	63	54

*Air Cell Sheets and Blocks.

**Fine Corrugated Air Cell Sheets and Blocks.

Gross Weight approx.—80 lbs. per carton for Air Cell Sheets and Blocks.

Gross Weight approx.—110 lbs. per carton for Fine Corrugated Air Cell Sheets and Blocks.

Empty Carton weight—5 lbs.

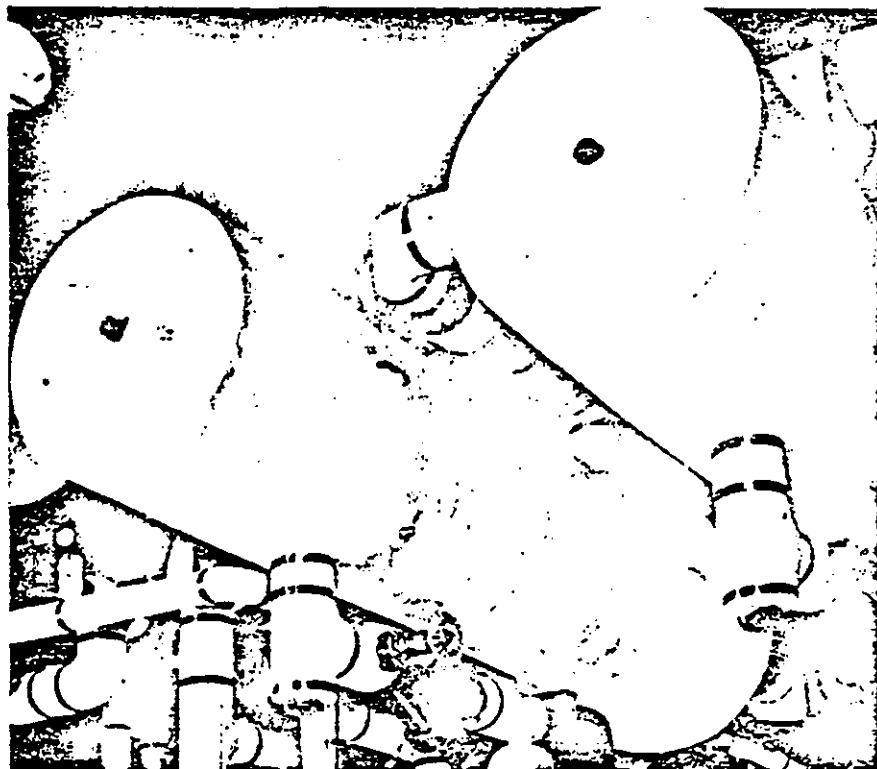
Outside Dimensions of Carton—36 $\frac{3}{4}$ " x 36 $\frac{3}{4}$ " x 13".

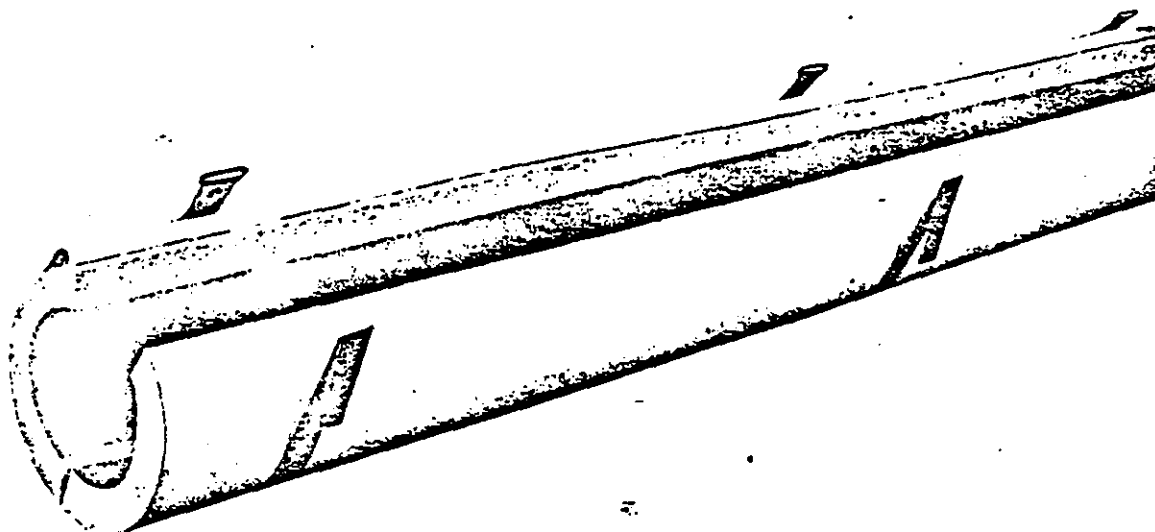
Special Fine Corrugated Air Cell Sheets and Blocks

Special fine corrugated air cell sheets and blocks possess high mechanical strength and insulating efficiency. They are furnished in standard thicknesses of 9, 12, 18, 36, and 72" lengths

and in 36" widths. Thicknesses are 4-ply, 6-ply, and 8-ply. Each ply is approximately $\frac{1}{8}$ " thick. Other sizes and thicknesses of Air Cell Sheets and Blocks can be supplied on special order.

Two layers of Air Cell Board, each 1" thick were used to insulate these hot water converters. Finishing cement then was trowelled on over hexagonal wire mesh.





Duplex Pipe Insulation

Duplex Pipe Insulation is adaptable for the insulation of either hot or cold water service lines. Its top temperature limit is 212° F. This material is composed of a special interliner of saturated felt impregnated with waterproofing compound, followed by a continuous wrapping of specially creped felt. An outer wrapping of asbestos paper is then applied over the felt and the covering is finished with a canvas jacket. When applied to the line, it has a white appearance similar to magnesia and air cell pipe covering. Single layer Duplex Pipe Insulation is manufactured in 3 feet long sections in thicknesses of $\frac{1}{2}$ ", $\frac{3}{4}$ ", and 1". It is supplied complete with canvas jacket and the necessary lacquered bands for application.

Double layer Duplex Pipe Insulation is manufactured in two layers of equal thickness to a total thickness of 1", 1 $\frac{1}{2}$ ", and 2".

Duplex Pipe Insulation is furnished with a canvas jacket and necessary bands for application.

Heat Transmission Through Duplex

BTU's per sq. ft. of pipe surface/hr./degree F.
temperature difference between pipe and surrounding air

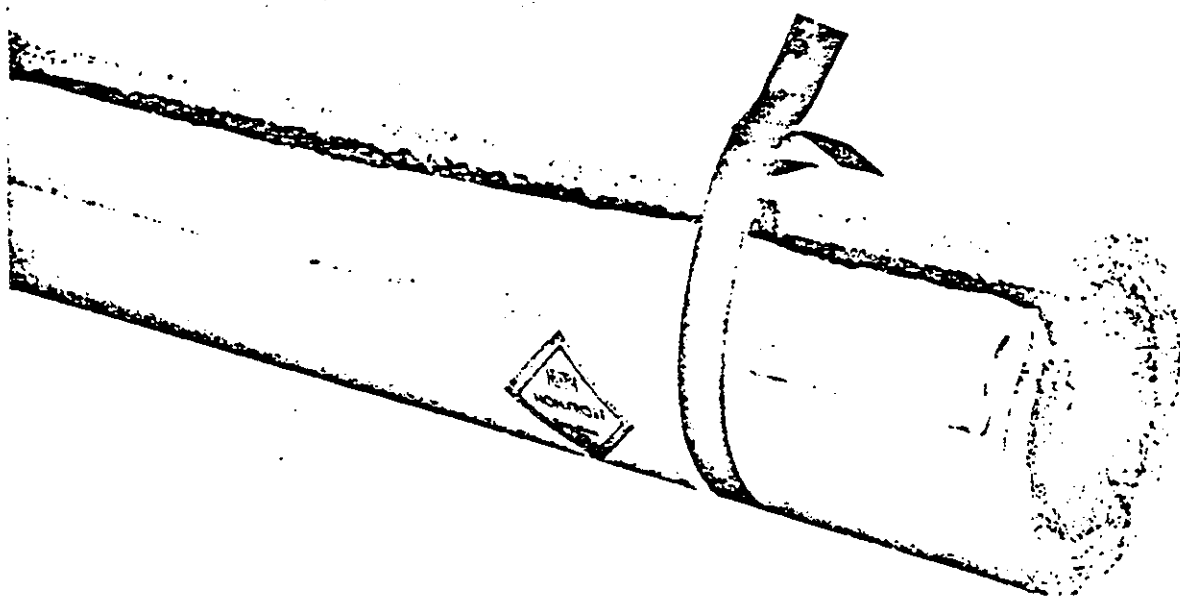
Pipe Size Inches	Thickness of Covering Inches			
	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$
$\frac{1}{2}$ "	.776	.658	.585	.495
$\frac{3}{4}$ "	.719	.605	.530	.444
1"	.670	.556	.483	.398
1 $\frac{1}{4}$ "	.633	.516	.446	.362
1 $\frac{1}{2}$ "	.610	.495	.424	.343
2"	.581	.469	.398	.316
2 $\frac{1}{2}$ "	.561	.448	.378	.298
3"	.545	.430	.361	.281
3 $\frac{1}{2}$ "	.535	.420	.350	.271
4"	.527	.412	.343	.264
4 $\frac{1}{2}$ "	.520	.405	.336	.257
5"	.514	.399	.331	.251
6"	.505	.389	.321	.243

Packaging Information—Carton Contents Duplex Pipe Insulation

Nominal Pipe Size	$\frac{1}{2}$ " Thick			$\frac{3}{4}$ " Thick*			1" & Double $\frac{1}{2}$ " Thick		
	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.
$\frac{1}{2}$ "	180	60	68	114	38	74	81	27	81
$\frac{3}{4}$ "	150	50	63	96	32	72	72	24	81
1"	123	41	63	84	28	73	60	20	76
1 $\frac{1}{4}$ "	96	32	59	69	23	70	51	17	75
1 $\frac{1}{2}$ "	84	28	56	60	20	66	45	15	71
2"	60	20	49	45	15	59	36	12	67
2 $\frac{1}{2}$ "	45	15	44	36	12	55	27	9	59
3"	36	12	42	27	9	49	21	7	53
3 $\frac{1}{2}$ "	27	9	36	21	7	43	18	6	51

*Note—Double $\frac{1}{2}$ " thickness not stocked. Shipped in crates.
Empty carton weight—5 lbs.

Outside dimensions of carton 14" x 20 $\frac{1}{2}$ " x 36 $\frac{1}{2}$ ".



Non-Frost Pipe Insulation

Non-Frost Pipe Insulation is applied to retard freezing in cold water and drain pipes in unheated rooms or where they are exposed to outside temperatures under normal conditions.

This insulation is constructed of layers of hair felt covered with several layers of paper felt and lined with a layer of specially treated paper felt to prevent the hair felt from coming in direct contact with the pipe surface. The hair felt because of its excellent insulating properties, is used to retard the escape of heat from the water in the pipes to the colder surrounding air. The paper felt jacket and the inner layer of treated paper felt protects the hair felt from infiltration of moisture that would impair its insulating efficiency.

Non-Frost Pipe Insulation should be used only on cold water pipes that are exposed to moderate rather than extremely low temperatures, or where the time that the surrounding air would be below the freezing point is of short duration. When Non-Frost Pipe Insulation is applied to outdoor piping, special provisions must be made for weatherproofing and protecting it.

Pipe covering is furnished in 3' sections, with canvas jacket and brass lacquered bands for application. It is manufactured in one thickness, 1 1/4", for all pipe sizes from 1/2" up.

Heat Transmission of Non-Frost Pipe Insulation

Heat Transmission of Non-Frost Pipe Covering (1 1/4" thick) in B. T. U. per hour, per deg. F. temperature difference between pipe and air. (Based on 50° temperature difference—between pipe and surrounding air.)

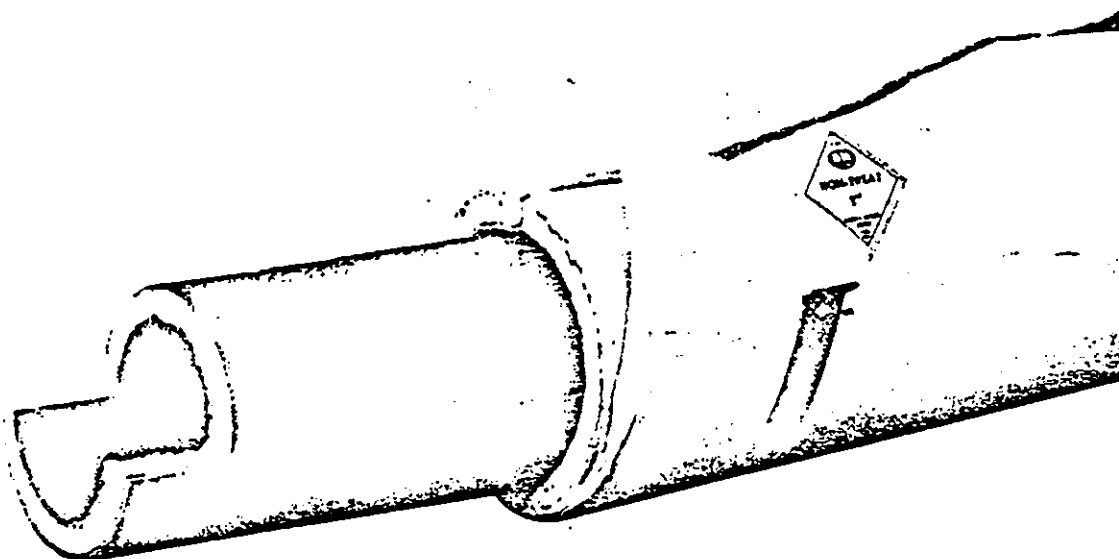
Pipe Size	Per lin. ft.
1/2"	.133
3/4"	.151
1"	.170
1 1/4"	.196
1 1/2"	.211
2"	.249
2 1/2"	.284
3"	.330
3 1/2"	.366
4"	.400
4 1/2"	.435
5"	.472
6"	.550

Packaging Information—Carton Contents

Nominal Pipe Size	Ft.	Sec.	Gross Wt. lbs.
1/2"	63	21	89
3/4"	54	18	85
1"	45	15	79
1 1/4"	42	14	84
1 1/2"	36	12	77
2"	33	11	82
2 1/2"	24	8	69
3"	18	6	59
3 1/2"	18	6	65
4"	12	4	49

Empty carton weight—5 lbs.

Outside dimensions of carton 14" x 20 1/2" x 36 1/2".



Non-Sweat Pipe Insulation

Non-Sweat Pipe Insulation is a combination of insulating and waterproofing felts used to prevent condensation on cold water lines. The insulating felts protect the flow of heat to the pipe. The waterproofing felt protects the insulation from the moisture in the air.

Non-Sweat Pipe Insulation is furnished in single and double layer construction. Single layer Non-Sweat is made in thicknesses of $\frac{1}{2}$ " and $\frac{3}{4}$ ". Double layer is made in thicknesses of 1", $1\frac{1}{2}$ ", 2". The illustration on this page shows double layer or broken joint construction used in thicknesses of 1" and over. This construc-

tion eliminates the longitudinal and abutting joints that in ordinary pipe covering extend from the outside of the covering to the pipe.

Recommended Thicknesses— Non-Sweat Pipe Insulation

Air Temperature under 100 deg. F.			
Pipe Temp. Deg. F.	Humidity Range, %	Thickness of Non-Sweat on Pipes	Thickness of Hair Felt on Fitting
Over 50	Under 75	$\frac{1}{2}$ "-1"	$\frac{1}{2}$ "-1"
Over 50	75 to 80	1"- $1\frac{1}{2}$ "	1"- $1\frac{1}{2}$ "
32 to 50	Under 75	$1\frac{1}{2}$ "-2"	$1\frac{1}{2}$ "-2"

Heat Transmission Through Non-Sweat Pipe Insulation

Rates of heat transmission are given in B.t.u. per hour, per deg. F. temperature difference, per linear foot and per square foot of pipe surface.

Insulation	$\frac{1}{2}$ " thick		$\frac{3}{4}$ " thick		1" thick		$1\frac{1}{2}$ " thick		2" thick	
	B.t.u. per lin. ft.	B.t.u. per sq. ft.	B.t.u. per lin. ft.	B.t.u. per sq. ft.	B.t.u. per lin. ft.	B.t.u. per sq. ft.	B.t.u. per lin. ft.	B.t.u. per sq. ft.	B.t.u. per lin. ft.	B.t.u. per sq. ft.
$\frac{1}{2}$	.212	.963	.185	.841	.167	.758	.143	.649	.128	.581
$\frac{3}{4}$	.245	.891	.212	.770	.189	.687	.160	.581	.142	.515
1	.286	.830	.243	.706	.215	.625	.180	.523	.158	.460
$1\frac{1}{4}$	.338	.777	.284	.653	.249	.572	.206	.473	.180	.413
$1\frac{1}{2}$	.374	.751	.312	.627	.272	.546	.223	.448	.194	.389
2	.443	.713	.367	.591	.318	.512	.257	.413	.221	.356
$2\frac{1}{2}$	.518	.688	.425	.564	.364	.484	.292	.388	.249	.331
3	.611	.666	.497	.542	.423	.462	.337	.367	.284	.310
$3\frac{1}{2}$	.685	.655	.553	.528	.468	.447	.369	.353	.311	.297
4	.757	.643	.611	.518	.515	.437	.404	.343	.338	.287

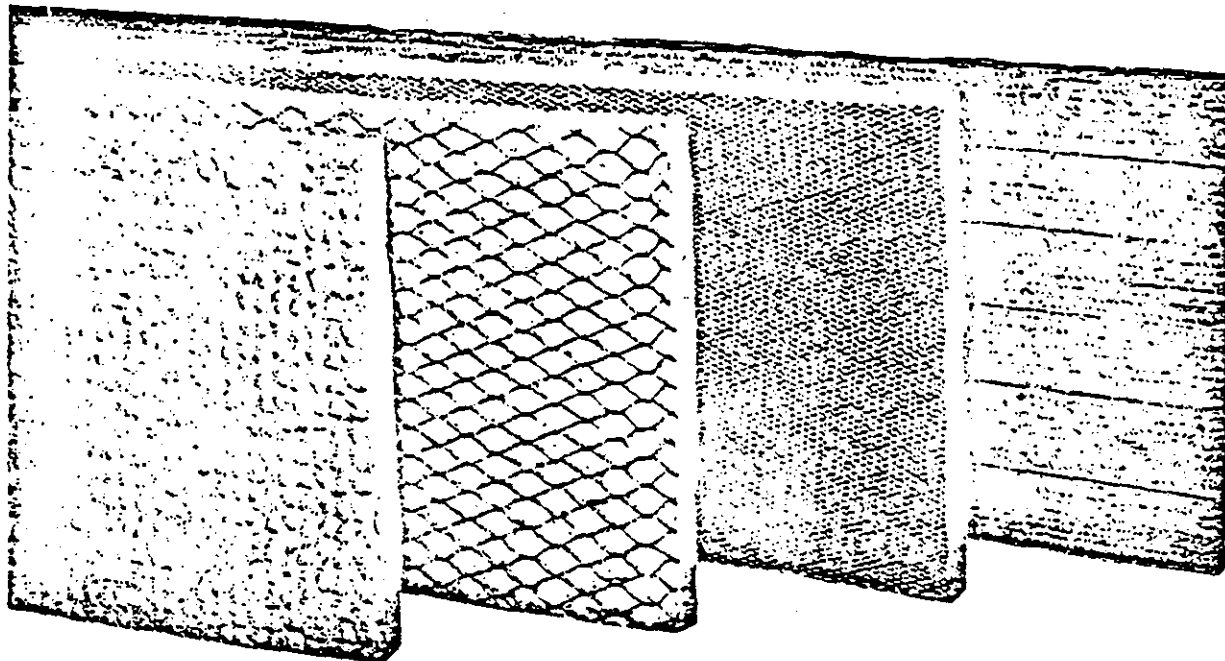
**Packaging Information—Non-Sweat Pipe Insulation
Carton Contents**

Nominal Pipe Size	½" Thick			¾" Thick*			1" & Double ½" Thick		
	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.	Ft.	Sec.	Gross Wt. lbs.
½"	180	60	68	114	38	74	81	27	81
¾"	150	50	63	96	32	72	72	24	81
1"	123	41	63	84	28	73	60	20	76
1¼"	96	32	59	69	23	70	51	17	75
1½"	84	28	56	60	20	66	45	15	71
2"	60	20	49	45	15	59	36	12	67
2½"	45	15	44	36	12	55	27	9	59
3"	36	12	42	27	9	49	21	7	53
3½"	27	9	36	21	7	43	18	6	51

*Note—Double ¾" thickness not stocked. Shipped in crates.

**Approximate Net Weights of Pipe Insulations
(Pounds Per Three Foot Section)**

Type of Insulation	Thick- ness Inches	Nominal Pipe Sizes, Inches																	
		½"	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	4½"	5"	6"	7"	8"	9"	10"	12"
85 % Magnesia	Std.	1.39	1.58	1.78	2.07	2.21	3.20	3.66	4.23	4.68	5.69	6.19	6.75	7.87	10.02	11.08	12.32	13.43	18.70
85 % Magnesia	1½	3.18	3.50	3.84	4.34	4.58	5.24	5.91	6.72	7.38	8.04	8.70	9.45	10.94	12.26	13.59	15.08	16.39	18.70
85 % Magnesia	2	5.10	5.54	5.98	6.62	6.97	7.85	8.71	9.81	10.69	11.57	12.43	13.44	15.41	17.17	18.93	20.88	22.63	25.80
85 % Magnesia	Dbl. Std.	5.22	5.18	6.40	6.22	7.14	8.78	9.74	10.70	13.83	13.05	17.02	15.93	19.19	22.62	24.80			
85 % Magnesia	3	10.34	10.04	12.02	13.43	13.30	14.86	14.28	17.69	16.88	20.34	19.31	22.85	25.81	28.92				
Hy-Temp	1½	5.61	6.17	6.78	7.65	8.09	9.65	8.61	12.04	10.57	14.40	12.54	16.51	19.13	21.45	23.77	25.20	30.00	
Hy-Temp	2	9.01	9.76	10.57	11.71	12.31	14.64	13.60	17.54	16.07	20.68	18.82	24.46	27.05	30.14	33.24	38.02	41.21	
Air Cell	3 Ply	.92	1.05	1.26	1.47	1.58	1.79	2.10	2.52	2.73	3.05	3.36	3.68	4.31	4.83	5.46	6.09	6.72	7.88
Air Cell	4 Ply	1.37	1.47	1.68	1.89	2.10	2.42	2.73	3.15	3.57	3.89	4.20	4.62	5.46	6.09	6.83	7.67	8.30	9.77
Fine Corrugated	4 Ply	.92	1.07	1.22	1.44	1.55	1.86	2.16	2.53	2.81	3.12	3.41	3.75	4.43					
Fine Corrugated	6 Ply	1.61	1.81	2.04	2.35	2.52	2.94	3.39	3.92	4.35	4.78	5.20	5.60	6.65					
Special Fine Corrugated	6 Ply	1.33	1.54	1.75	2.06	2.23	2.63	3.06	3.55	3.98	4.37	4.78	5.25	6.14	6.97	7.79	8.77	9.59	11.24
Special Fine Corrugated	8 Ply	1.97	2.31	2.60	3.02	3.21	3.76	4.34	5.00	5.54	6.12		7.25	8.53	10.71		13.07		
Bestfelt	1	4.39	4.94	5.54	6.38	6.85	8.04	9.22	10.67	11.80	12.98	14.07	15.44	18.14	20.43	22.74	25.49	28.60	32.55
Non-Sweat	½	1.55	1.84	2.11	2.56	2.77	3.32	3.93	4.60	5.19	5.73								
Non-Sweat	¾	2.73	3.17	3.61	4.24	4.60	5.44	6.30	7.31	8.19	9.07		10.83	12.75	14.39	16.17	18.10	19.80	
Non-Sweat	1	4.26	4.79	5.40	6.20	6.64	7.77	8.95	10.29	11.45	11.87		14.97	17.60	19.87	22.05	24.74	27.03	
Non-Sweat	1½	8.09	8.88	9.77	11.03	11.70	13.44	15.12	17.22	18.90	20.58		24.19	27.97	31.50	34.86	38.64	42.00	
Duplex	½	1.05	1.16	1.41	1.70	1.83	2.21	2.60	3.05	3.43	3.80	4.18	4.61	5.46		6.41			
Duplex	¾	1.81	2.10	2.42	2.81	3.05	3.59	4.17	4.86	5.43	6.01	6.56	7.25	8.48		10.72			
Duplex	1	2.81	3.17	3.57	4.13	4.43	5.17	5.95	6.86	7.62	8.37	9.07	10.02	11.72		14.73			
Duplex	1½	5.38	5.88	6.49	7.35	7.79	8.95	10.08	11.59	12.60	13.71		16.21	18.69					
Non-Frost	Std. (1½)	4.01	4.46	4.94	5.67	6.03	6.98	7.94	9.03	9.98	10.92								



Mineral Wool Blankets

Mineral Wool Blankets are suitable for insulation of hot surfaces up to 1200° F. These blankets are made by felting high temperature and moisture resistant insulating wool in large flat sheets between various styles of metal fabrics.

These blankets are flexible, and can be applied to equipment having curved or irregular surfaces at minimum cost.

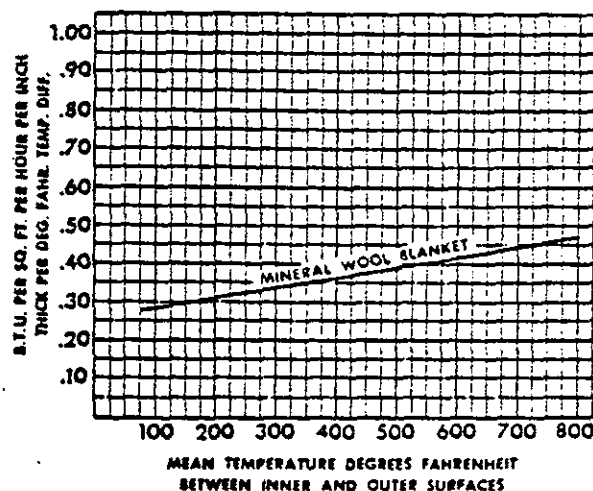
Mineral Wool Blankets are manufactured in standard sizes of 2 x 4 feet and 2 x 8 feet and in thicknesses of 1" to 8". Special sizes can be made upon request.

Standard styles of Mineral Wool Blankets are:

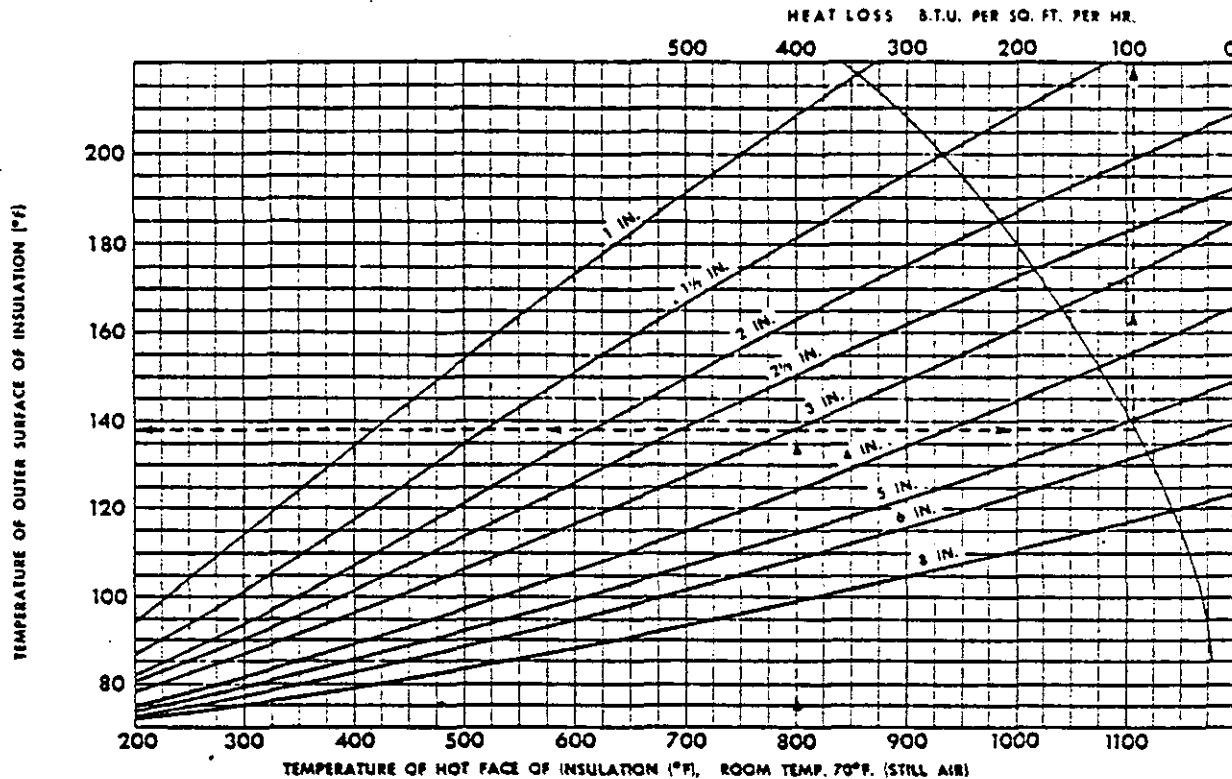
Style	Description
1	1" wire mesh both sides
2	1" wire mesh and stucco lath
2-A	1" wire mesh and expanded metal lath
3	Stucco lath both sides
3-A	Expanded metal lath both sides
3-B	Stucco lath one side—expanded metal lath other side
4	Stucco lath and $\frac{3}{8}$ " ribbed lath (rib turned in)
4-A	Stucco lath and $\frac{3}{8}$ " ribbed lath (rib turned out)

- 5 Stucco lath and $\frac{3}{4}$ " ribbed lath (rib turned in)
- 5-A Stucco lath and $\frac{3}{4}$ " ribbed lath (rib turned out)
- 6 $\frac{3}{8}$ " ribbed lath both sides (rib turned in)

Conductivity vs Mean Temperature
Mineral Wool Blanket



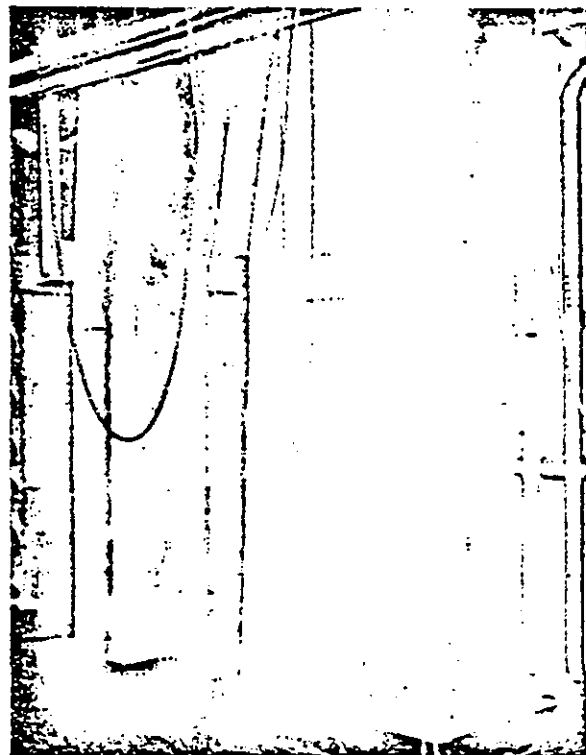
Surface Temperatures and Heat Loss for Mineral Wool Blanket Insulation

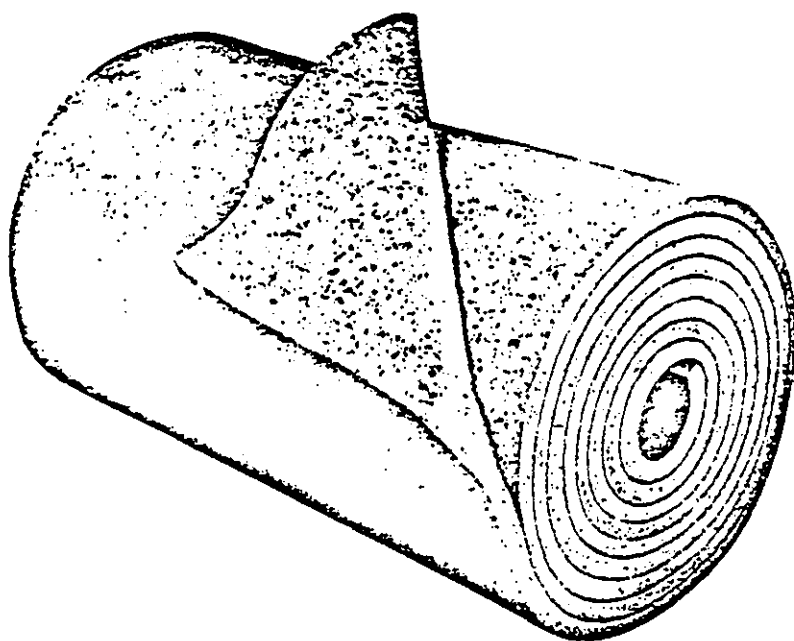


Heat Loss Chart—To determine the surface temperature of a given thickness of Blanket, read the chart as follows: Under table of recommended thicknesses, a 3-in. Blanket is suggested for equipment having a hot surface temperature of 800° F. Therefore follow vertically from the 800° F. point until that line intercepts the 3-in. curve. At that point, follow in a horizontal line to the left until it intercepts the margin, and it will be seen that at that point the figure is 138, which is the temperature in degrees Fahrenheit of the cold surface on the outside of the mineral wool blanket.

Similarly, to determine the heat loss for a given condition, refer again to the example on the chart:

Follow vertically from the 800° F. mark, to an intersection with the 3-in. curve. From that point, follow horizontally to the right until intercepting the heat loss curve. At this point, go vertically to the upper margin which is calibrated in terms of b.t.u. heat loss, and it will be seen that the heat loss for this particular condition is 95 b.t.u. per sq. ft. per hour.





Hair Felt Insulation (Navy Standard)

Hair Felt is composed of 100% selected cattle hair processed into roll blankets. The primary use of hair felt insulation is to prevent water pipes from freezing. This material is used in a specified number of built-up layers of 1" thicknesses, bound in place on the pipe with heavy jute twine and protected on the outer surface with a weatherproof jacket.

Hair Felt is furnished in standard rolls of 3' x 100', 3' x 50', 6' x 50', and 9' x 50' in the thicknesses and weights shown in the table below:

Thicknesses	Approx. weight per sq. ft.	Approx. weight per 300 sq. ft. roll
$\frac{1}{4}$ "	4 oz.	75 lbs.
$\frac{1}{2}$ "	6 $\frac{1}{4}$ oz.	120 lbs.
$\frac{3}{4}$ "	8 $\frac{1}{2}$ oz.	160 lbs.
1"	11 oz.	210 lbs.
1 $\frac{1}{4}$ "	13 $\frac{1}{2}$ oz.	255 lbs.
1 $\frac{1}{2}$ "	16 oz.	300 lbs.
2"	21 oz.	395 lbs.

It must be remembered that no insulation, regardless of thickness or effectiveness, will prevent water in pipes from freezing where insufficient circulation of water exists, or where the outside temperature remains sufficiently low for any appreciable length of time. Insulation will retard freezing of water in pipes if there is a

certain amount of circulation. With no circulation, if the air remains at low temperature for only a short period of time freezing can be prevented by the insulation.

The table on Page 140 gives rates of heat transmission through 2 layer, 3 layer, and 4 layer built-up hair felt insulation on pipes from $\frac{1}{2}$ " to 12" in diameter.



Fittings on the line supplying cold water to this hot water generator are insulated with built-up hair felt. Non-Sweat Pipe Covering was used on straight pipe run.

Data on Freezing of Water in Pipes

Nominal pipe size inches	Insulation, No. of layers each 1 in. thick	B.T.U. per deg. F. temp. diff. per hour per lin. ft.	Hours to cool to freezing point	Lb. water flow per hr. per lin. ft. to prevent freezing
$\frac{1}{2}$	2	.0895	.417	.537
	3	.0747	.500	.448
	4	.0660	.565	.396
1	2	.1125	.825	.675
	3	.0911	1.02	.548
	4	.0798	1.16	.480
$1\frac{1}{2}$	2	.1400	1.40	.840
	3	.1126	1.74	.676
	4	.0972	2.02	.583
2	2	.1586	1.94	.952
	3	.1244	2.48	.747
	4	.1063	2.90	.638
3	2	.2062	3.25	1.237
	3	.1572	4.27	.943
	4	.1322	5.08	.793
4	2	.2450	4.55	1.470
	3	.1850	6.02	1.110
	4	.1548	7.20	.929
5	2	.2887	5.92	1.733
	3	.2146	7.96	1.289
	4	.1764	9.69	1.059
6	2	.3302	7.35	1.981
	3	.2434	9.88	1.460
	4	.1984	12.20	1.191
8	2	.4100	10.05	2.460
	3	.2960	13.90	1.776
	4	.2390	17.25	1.434
10	2	.4930	13.00	2.960
	3	.3536	18.10	2.122
	4	.2830	22.70	1.698
12	2	.5720	15.80	3.432
	3	.4090	22.20	2.454
	4	.3222	28.10	1.933

Figures are given to show the time required for the water in a pipe to cool 10° F. from 42° to 32° F., but a difference in temperature between water and air at 60° F., which would correspond to an air temperature of 18° below zero. Water should not be allowed to remain in the pipes without circulation for longer than $\frac{1}{2}$ the time mentioned.

The last column of figures in the table indicates the minimum amount of water that should be supplied per hour at 42° F., per each lineal foot of pipe in order to prevent the temperature of the water from dropping to the freezing point. As a safety factor to provide against temporary reduction of flow due to lower pressure or other causes, the rate of flow should be at least double that given in the table. Figures on time and flow apply only to the given conditions.

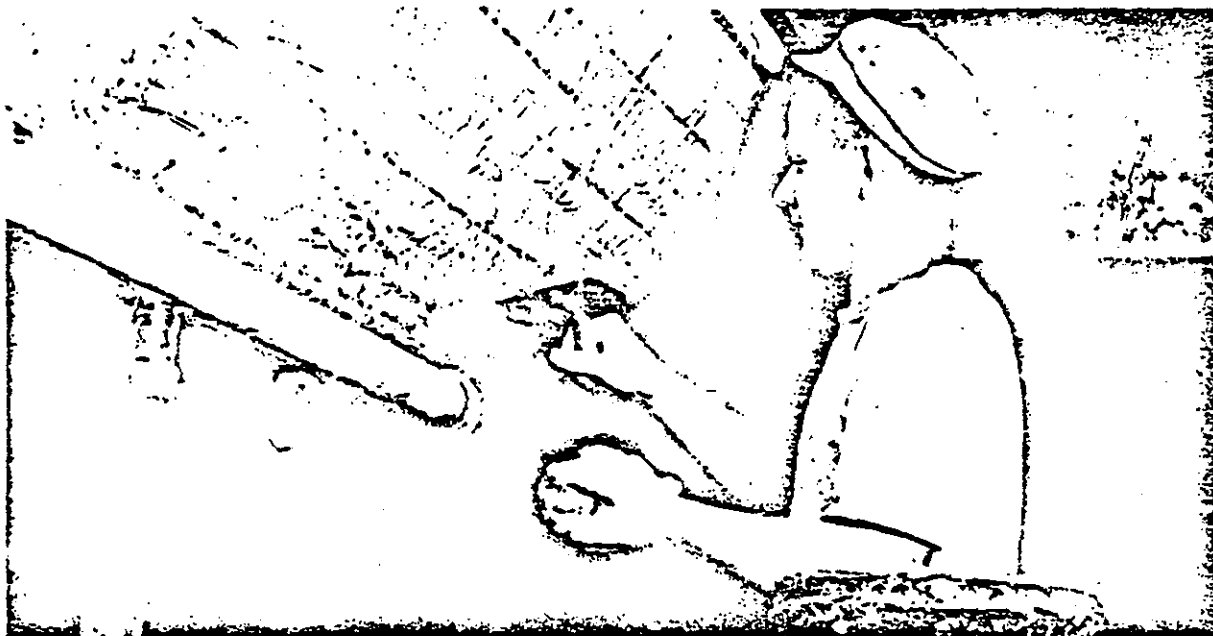
For example, if water enters the pipes at 52° F., instead of 42° F. it will take double the

given time to cool the water to the freezing point and only half the amount of water will be required to circulate to prevent freezing.

On the other hand, if water enters at 33° F. it will be cooled to 32° F. in $\frac{1}{10}$ the time given in the table and 10 times as much water will have to be circulated to prevent freezing.

The times shown in the table are those required to lower the water to the freezing point. Actually, longer times would be required to freeze all the water in the pipes, but once the water starts to freeze the danger point has been reached. If frozen at only one point, flow will be stopped and the entire line endangered.

If the water remains without circulation longer than the safe time indicated, the only positive way to protect the line is to provide a small steam or hot water line along side the cold water line and then apply insulation so that it entirely surrounds both lines.



Insulating Cements and Finishes

Insulating cements are used as insulation and as finishes. They are applied as insulation to fittings too small to be insulated with blocks, and on irregular surfaces or inaccessible surfaces that cannot be practically covered with pipe insulation or blocks. Insulating cements, like other heat insulating materials, have top temperature limits at which they may be expected to perform efficiently. Other important physical characteristics that must be considered in the choice of a cement are outlined under the descriptive material on each cement.

No. 152 Asbestos Cement

This is an inexpensive, high-grade insulating cement made of asbestos fibers and binding materials. It may be applied to hot surfaces up to 600° F. As a finishing cement, it produces a hard, durable and smooth finish. This is a natural colored cement which dries to a very light gray shade. Where extra hard finish is required, Portland Cement may be added to No. 152 Asbestos Cement, mixing three parts asbestos cement and one part Portland Cement by weight. No. 152 Asbestos Cement is also used for roughing in.

Hy-Temp Cement

This cement is similar in composition to Hy-temp insulation in powder form and can be used on surfaces up to temperatures of 1900° F. It is recommended for use on irregular or small surfaces where the application of Hy-temp blocks or pipe insulation is impractical, and for pointing up of Hy-temp block and pipe insulation applications. Because of its relatively porous nature, Hy-temp cement is not recommended as a finishing cement.

85% Magnesia Cement

This cement is similar in composition to 85% Magnesia Pipe Covering and Block Insulation but it is made in powder form. Efficiency of 85% Magnesia Cement is higher than that of any other plastic insulation. It is also extremely light in weight. The cement may be used on heated surfaces up to 600° F.

This cement is not ordinarily used as a finishing cement. Usually a layer of asbestos cement is used over 85% Magnesia Cement as a finish. When an extra hard finish is required, Portland

Cement is added to the asbestos cement. (See "No. 152 Asbestos Cement.")

Amblrex No. 2 Cement

This insulating cement is particularly recommended for roughing in. It is composed of asbestos fibers, 85% Magnesia, and binders. It is ideal for use on fittings, irregular surfaces, and other places where highly efficient insulation is desired at a cost that is considerably below that of 85% Magnesia Cement. It may be used for temperatures up to 1000° F.

Mineral Wool Cement

Mineral Wool Cement is a plastic insulation made of heat resisting mineral wool combined with asbestos fiber and special clays. It will withstand temperatures up to 1800° F. It can be reclaimed if the temperatures have not exceeded 1200° F. It is an ideal plastic insulation for insulating surfaces not suited to preformed types of insulation.

Power House Cement

Power House Cement is manufactured by the Baldwin Hill Company and is a hydraulic setting mineral wool cement. It is both a finishing and an insulating cement. It has exceptionally low shrinkage and can be applied in one coat without

cracking. Due to its high adhesive strength it can be installed without wire reinforcement.

Fibrous Adhesive

Fibrous Adhesive is a plastic material for use as an adhesive to temporarily hold in place insulation sheets, blocks, and segmental covering until permanent outer binding support is completed. This material is of thin trowelling consistency and is recommended for use where insulation is applied to brick, concrete, metal, or other surfaces. It is also used for binding insulating blocks together in multiple layer construction. Fibrous Adhesive is applied to the surface of the insulation and then pressed in place against the surface to be insulated. A spotting of the adhesive on the material is generally sufficient for this purpose.

It is necessary to remove all paint on surfaces to be insulated before applying insulation and fibrous adhesive. Otherwise the insulation will loosen after the adhesive dries out. The surface also must be clean, dry, and free of grease.

Fibrous Adhesive is furnished ready for use in 75 lb., 175 lb., 330 lb., and 600 lb. metal drums. Covering capacity is as follows:

1. Insulation against metal surfaces—50 lbs. per 100 sq. ft. of surface.
2. Insulation against masonry surfaces—75 lbs. per 100 sq. ft. of surface.

Insulating Cement Data

Product	Use	Type	Temperature Limit	Average Covering Capacity Sq. ft./100 lbs. One In. Thick	Mixing Proportions Gallons water per 100 lbs.	Lbs. per bag
152 Asbestos	Finishing	Asbestos	1000°	20	15½ gals.	100
Hy-Temp	Insulating	Diatomaceous Earth	1900°	45	28 gals.	75
85% Magnesia	Insulating	85% Magnesia	600°	67	42 gals.	50
Amblrex No. 2	Insulating	Asbestos-Magnesia	600°	20	14¼ gals.	50
Mineral Wool	Insulating	Mineral Wool Hydraulic Setting	1800°	50	24 gals.	50
Power House	Insulating and Finishing	Mineral Wool	1700°	25	16 gals.	50

Outdoor Finishes

Factory Applied Weatherproof Jackets For Pipe Insulations

Three types of weatherproof jackets applied at the factory on special order are available. They include Standard Weatherproof Jackets, Heavy Weight Weatherproof Jackets, and 50 lb. Asbestos Jackets. All three types include 6" wide strips or collars for covering the circumferential joints at the ends of the sectional covering. The weatherproof jackets are lapped along the longitudinal joints, but the lap is loose so that the insulation can be applied over the pipe in the usual manner.

Standard Weatherproof Jackets are made from a rag felt saturated and coated with asphalt. They weigh 35 lbs. per 108 sq. ft.

Heavy Weight Weatherproof Jackets are made from a rag felt saturated and coated with asphalt. They are almost twice as heavy as the Standard Weatherproof Jackets, weighing approximately 60 lbs. per 108 sq. ft.

50 lb. Asbestos Jackets are made from asbestos felt, saturated and coated on both sides with asphalt, and given a final coat of talc and mica on both sides. These jackets weigh approximately 58 lbs. per 108 sq. ft.

When specifying weatherproof jackets for pipe insulation, the exact type required should be mentioned. Unless this is done, all orders for pipe insulation calling for "roofing jackets" or "weatherproof jackets" without detailed specifications as

to weight and quality will be made up with Standard Weatherproof Jackets.

Where the specifications call for "roofing jackets" or "weatherproof jackets" weighing in excess of 35 lbs. per 108 sq. ft., orders will be made up with Heavy Weight Weatherproof Jackets.

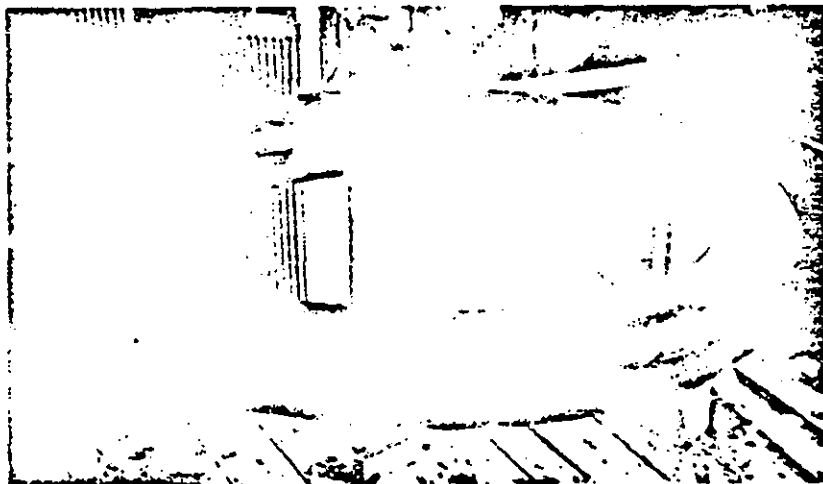
When factory applied weatherproof jackets are ordered, the necessary lap cement for sealing joints, and wire or bands, are furnished.

Armstrong's Insulmastic

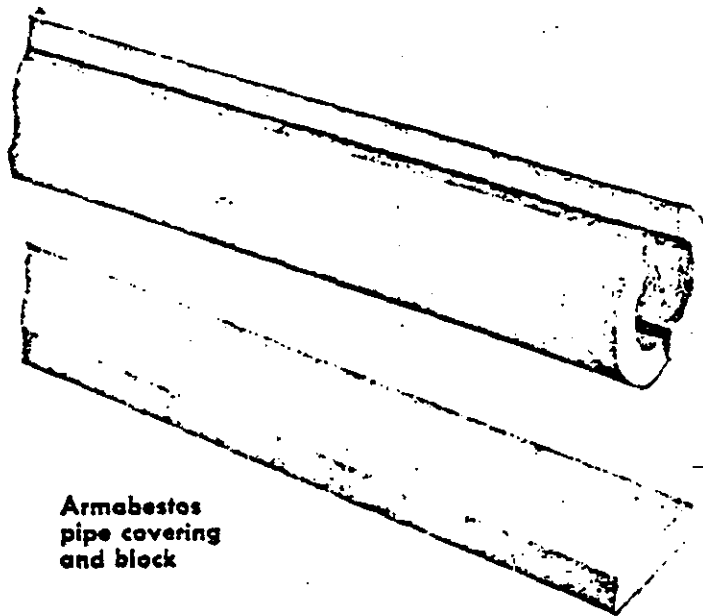
Insulmastic is a factory-mixed combination of Armstrong's Asphalt Emulsion with special fibers and fillers. It is recommended for use where a fire-resistant finish is required. Applied in two coats, each approximately $\frac{1}{8}$ " thick, Insulmastic is an excellent finishing material for low-temperature insulation exposed to the weather. On high towers, vessels, elevated lines, large ducts, breechings, etc., galvanized wire mesh should be applied directly to the insulation before Armstrong's Insulmastic is troweled on.

Armstrong's Insulmastic possesses the tensile strength necessary to withstand normal movement without cracking or rupturing, is not affected by temperature changes, does not slip or sag at high temperatures, and bonds well with the corkboard insulation surface.

When Insulmastic is applied in two coats, each about $\frac{1}{8}$ " thick, the two coats will dry to a final thickness of $\frac{1}{4}$ ".



Armstrong's Insulmastic is an excellent finish for expansion loops and fittings on outdoor steam lines. It will withstand movement without rupturing or cracking and does not slip or sag.



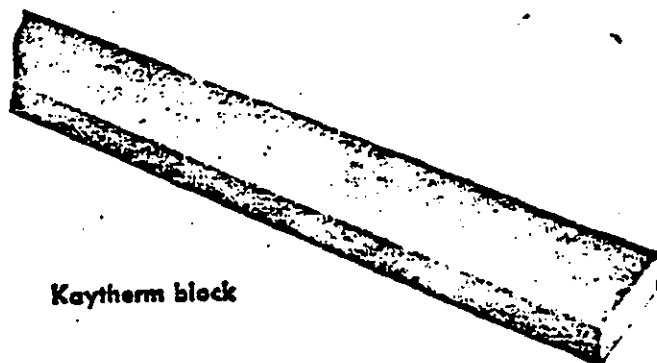
Armabestos
pipe covering
and block

Armabestos pipe covering and block

Made from long, tough Amosite asbestos fibers, pipe covering is available in two types: A-7, for temperatures to 750° F., and A-12, for temperatures to 1200° F. Block insulation is suitable for use to 1200° F. These insulations are inorganic and completely incombustible. They are applied in one layer. High insulating efficiency, great strength and durability, and physical and chemical stability make these materials well suited for heavy duty industrial applications.

Armabestos A-7 and A-12 pipe covering is made in 36" lengths for pipes $\frac{1}{2}$ " to 24" in diameter. Thicknesses are 1", $1\frac{1}{2}$ ", 2", $2\frac{1}{2}$ ", 3", $3\frac{1}{2}$ ", 4", $4\frac{1}{2}$ ", and 5".

Block insulation is manufactured in 6", 12", 18", and 36" widths. Length is 36", thicknesses are 1", $1\frac{1}{2}$ ", 2", $2\frac{1}{2}$ ", 3".

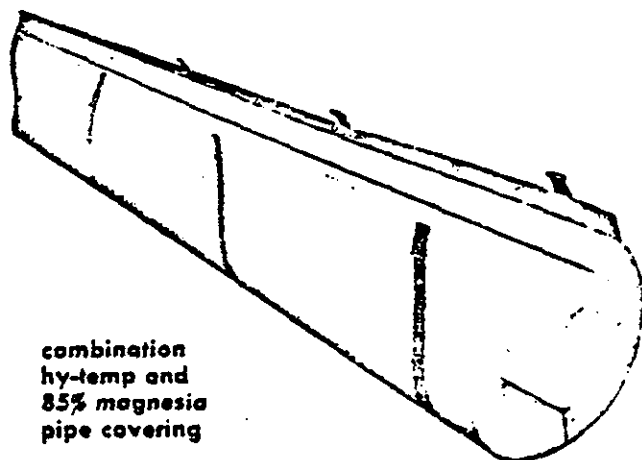


Kaytherm block

Kaytherm block

Kaytherm is a precision-molded calcium silicate insulation for applications where temperatures do not exceed 1500° F. It is recommended for high-temperature steam equipment such as boilers, breechings, hot air ducts, dryers, ovens, furnaces, and tanks. Even at temperatures up to 1500° F., Kaytherm shows very little shrinkage or loss in weight.

Kaytherm is available in block form only. It is 36" long and 6" wide. Thicknesses are 1", $1\frac{1}{2}$ ", and 2". Homogeneous blocks 6" and 12" wide, in thicknesses of 1" up to and including 6" in $\frac{1}{2}$ " increments available on special order.



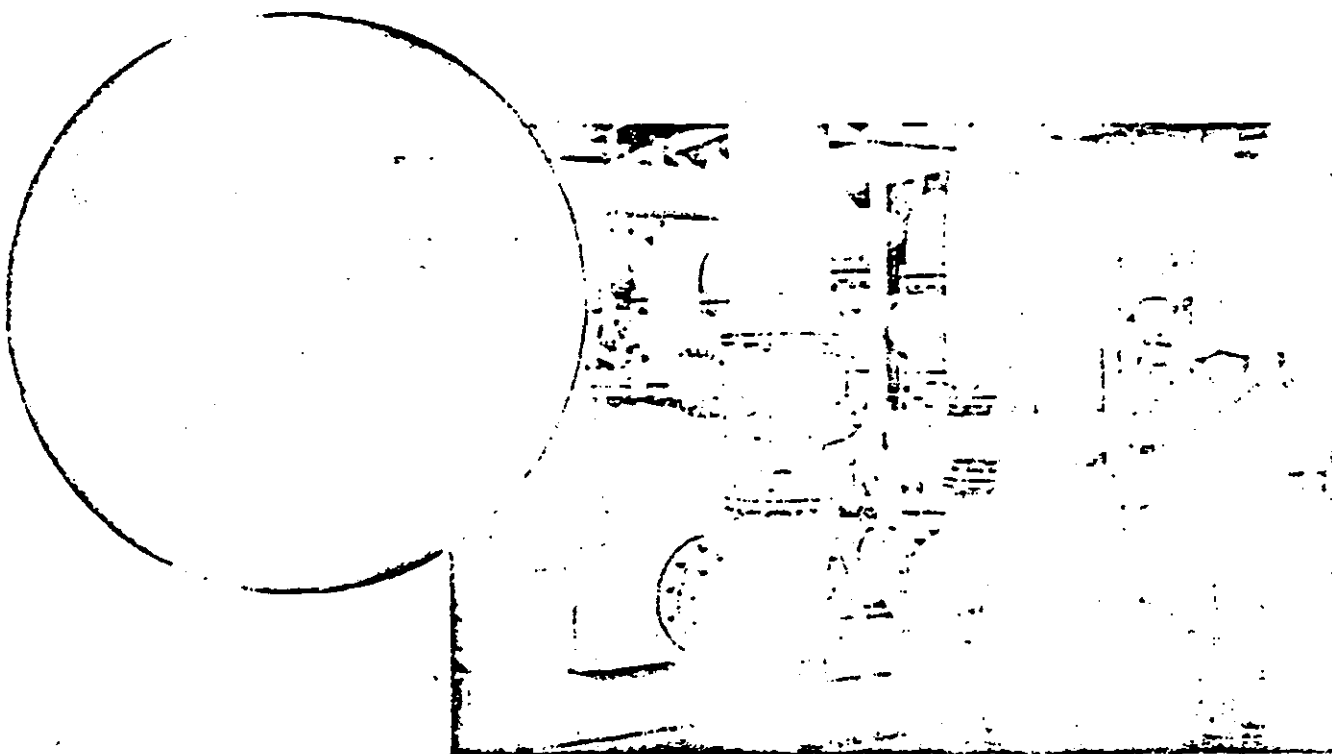
combination
hy-temp and
85% magnesia
pipe covering

Hy-Temp pipe covering and block

This material is composed of diatomaceous earth bonded together with asbestos fibers. It is suitable for temperatures to 1900° F. High-temperature pipe covering or block is used next to the hot surface in sufficient thickness to bring the temperature at its outer surface to 600° F. Then 85% Magnesia insulation is applied for additional insulating effect.

Pipe covering is manufactured in 3' long tubular half sections for pipe sizes from $\frac{1}{2}$ " to 10". For large pipe sizes, curved segments in 3' lengths are available. Thicknesses range from 1" to 4", inclusive, and conform to simplified thickness standards.

Hy-Temp Block is made in 36" lengths and 3", 6", 9", and 12" widths. Thicknesses are from 1" to 4"



DESCRIPTION

This is a molded type pipe covering made of basic magnesium carbonate, reinforced with long asbestos fibers. It is suitable for use at temperatures to 600° F. This covering is molded rather than machined, so inner and outer surfaces are tough, smooth, and dust-free.

ADVANTAGES

Efficient Insulation — Armstrong 85% Magnesia Pipe Covering has a low thermal conductivity of 0.35 Btu-in./sq.ft.-hr.-°F. at 100° F. mean.

Long Life — This insulation lasts indefinitely, when applied within recommended service limitations. It will not shrink, warp, crack, deteriorate, or lose its insulating value. It is not adversely affected by alternate heating and cooling, wetting and drying, or by normal vibration or reasonable compression.

Completely Fireproof — Armstrong 85% Magnesia is completely mineral and will neither burn nor support combustion. In tests subjecting this insulation to 2000° F. flame, 85% Magnesia remains intact and provides excellent protection for piping and equipment.

Easy to Handle — 85% Magnesia is easy to cut and fit. It has good structural strength and requires only normal precautions in shipping, storage, and application.

Accurately Sized — Armstrong 85% Magnesia Pipe Covering is molded to closely controlled dimensions for accurate fit and heat-tight joints. Simplified thickness standards make 85% Magnesia covering of every thickness and pipe size fit exactly over or inside another pipe size.

Sizes — Covering is available in sectional form for all pipe sizes up

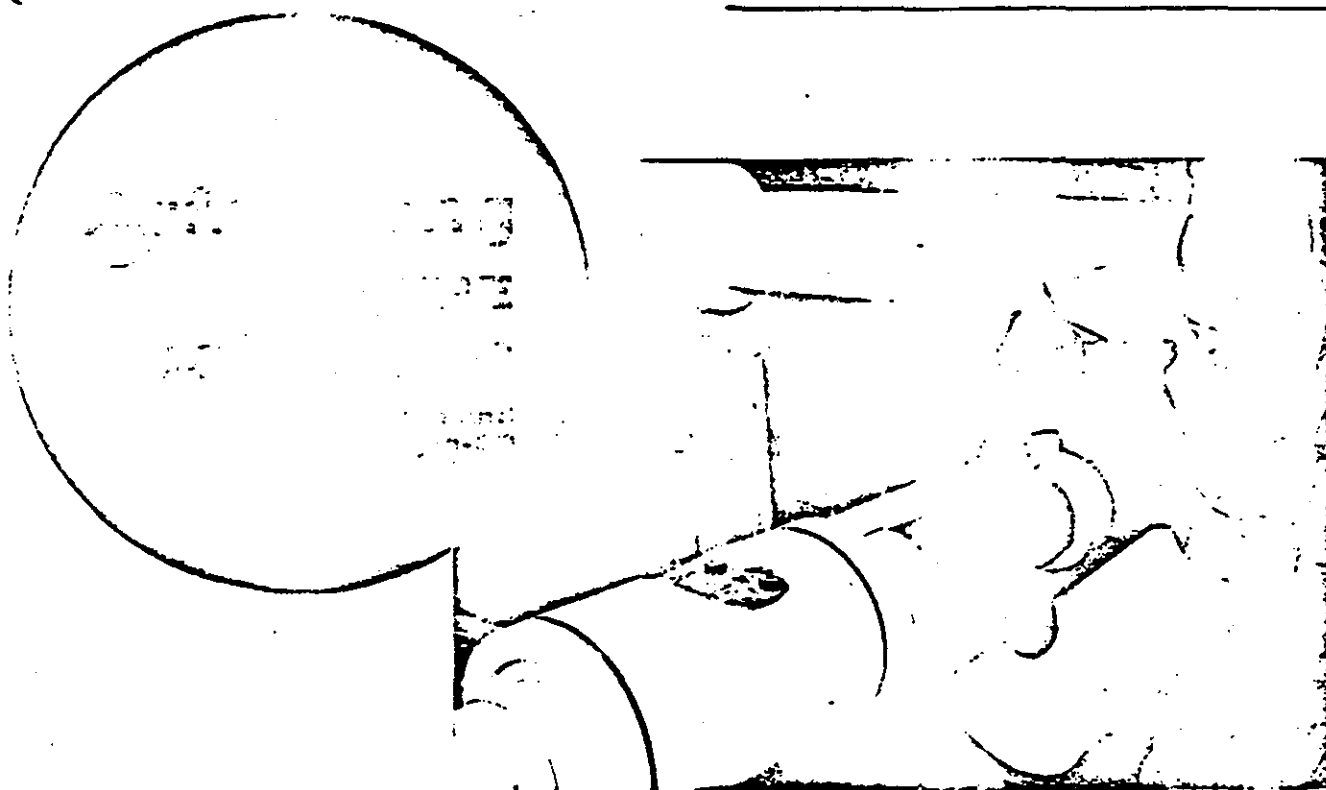
to 18". Segmental covering is supplied for larger sized pipes.

For temperatures from 600° to 1200°, where two-layer application is required, combination covering consisting of an inner layer of high-temperature pipe insulation, and an outer layer of 85% Magnesia is furnished.

For application information see page 25.

PHYSICAL PROPERTIES OF 85% MAGNESIA

Density (lbs./cu. ft.) average	11
Thermal Conductivity	
Btu-in./sq. ft.-hr.-°F.	
(100° F. mean temperature)	0.35
(300° F. mean temperature)	0.42
Modulus of Rupture (p.s.i.)	45
Load Compression, static	
(p.s.i. at 5% deformation)	60-65
Linear Shrinkage	
(% after 24 hrs. at 600° F.)	1.0
Water Absorption (% by volume	
after 6 hrs. in atmosphere of 120°	
F. and 90% Relative Humidity)	0.9



KAYLO PIPE COVERING

Kaylo Pipe Covering is a molded, white hydrous calcium silicate material, reinforced for extra strength with a small amount of asbestos fiber for insulation of heated lines at temperatures to 1200° F.

Light density gives this material a low k value of .50 at 400° F. mean temperature. High flexural strength far beyond normal requirements of heat insulation gives Kaylo unusual durability and reduces breakage during installation and in service.

Sizes—Kaylo Pipe Covering is manufactured in 3-foot lengths in sectional or segmental form, depending on pipe size, for all regular iron pipe sizes ½" to 39", and for copper tubing from ¾" to 3". It is available in single-layer form from 1" to 3" thick (nominal) and for multiple-layer construction in 2" to 5" thicknesses (nominal).

Simplified thickness standards make Kaylo Covering of every thickness and pipe size fit exactly over or inside another pipe size. Canvas jackets are furnished at no additional cost on thicknesses up to and including 2½". Bands or 6- and 8-oz. canvas jackets are furnished on special order.

KAYLO-20

Kaylo-20 is a high-temperature calcium silicate insulation for temperatures to 1800° F. An average density of 12 lbs. per cu. ft. results in excellent insulating efficiency. This insulation has the same high strength and workability of standard Kaylo Pipe Covering. It is available in the same thicknesses as standard Kaylo.

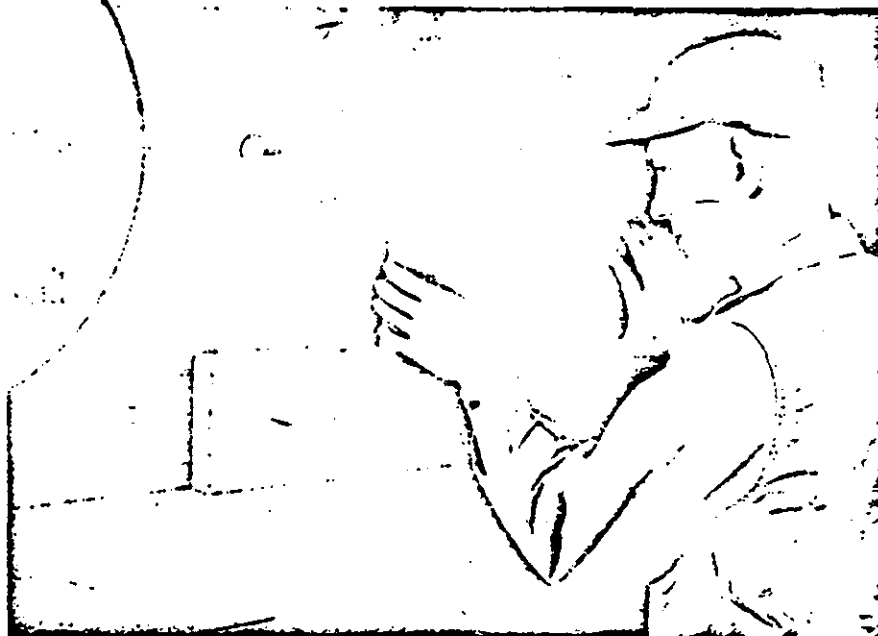
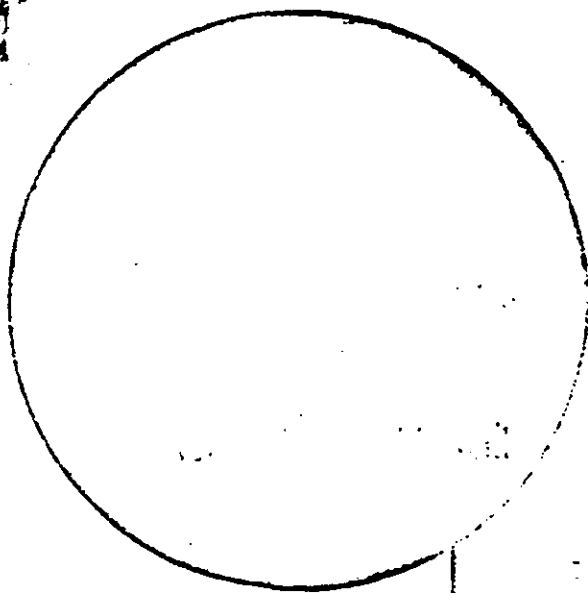
APPLICATION

Both Kaylo and Kaylo-20 Pipe Cov-

ering are applied according to standard specifications used in application of molded type pipe insulation with or without factory-applied canvas jackets. (Specifications for application are on Page 25.)

PHYSICAL PROPERTIES OF KAYLO

Density (lbs./cu. ft.) average	11
Thermal Conductivity	
Btu-in./sq.ft.-hr.-°F.	
100° F. mean temperature	0.50
700° F. mean temperature	0.66
Modulus of Rupture, lbs./sq. in.	50
Compressive Strength, lbs./sq. in.	
(at 5% deformation)	
Before heating	150
After heating for 24 hrs.	
at 750° F.	144
at 1000° F.	123
at 1200° F.	117
Linear Shrinkage, %	
After heating for 24 hrs.	
at 750° F.	0.8
at 1000° F.	0.9
at 1200° F.	1.5



ARMATEMP BLOCK

Armstrong Armatemp® Block is a board-form mineral wool insulation possessing unusually high strength for use on heated surfaces where temperatures do not exceed 1900° F. An average low density of 20 lbs. per cu. ft. makes Armatemp Block highly efficient insulation. Inorganic mineral wool composition makes this product completely incombustible.

Armatemp Block is made in 6" x 18", 6" x 36", 12" x 18", and 12" x 36" sizes, in thicknesses from 1" to 4" in ½" increments. Widths of 3" and 4" are available on special order, at no extra charge. Thicknesses of 4½" and 5" are available made to order.

KAYLO BLOCK

Kaylo® Block is a white, rigid hydrous calcium silicate insulation for heated surfaces operating at temperatures to 1200° F. Low density gives this insulation an efficient k value of .50 at 400° F. mean temperature. High flexural strength reduces breakage during installation and in service.

Sizes—Blocks are available in 3", 6", 12" and 18" widths and in 18" and 36" lengths. Thicknesses are 1", 1½", 2", 2½", 3", 3½" and 4".

KAYLO-20 BLOCK

This is a high-temperature calcium silicate block for insulation of heated equipment operating at temperatures to 1800° F. Light density of approximately 12 lbs. per cu. ft.

gives Kaylo-20 excellent insulating efficiency. This insulation has the same high strength and workability of Standard Kaylo Block. It is available in thicknesses and sizes identical to Standard Kaylo.

85% MAGNESIA BLOCK

This is a molded block insulation made of basic magnesium carbonate, reinforced with long asbestos fibers. It is suitable for use at temperatures to 600° F. Armstrong 85% Magnesia Block has a low thermal conductivity of 0.35 Btu-in./sq. ft.-hr. at 100° F. mean temperature.

Sizes—Block is manufactured in 6" x 36", 6" x 18", 3" x 18", 12" x 36", and 12" x 18" sizes. Thicknesses range from ½" to 4".