PLAINTIFF'S EXHIBIT
G-416

FOR LOWER OPERATING COSTS UNDER

SEVERE SERVICE CONDITIONS USE

GARLOCK

Guardian

SPIRAL-WOUND

METAL GASKETS

ASBESTOS FILLED

OR

TEFLON FILLED



The Advantages to you when using Guardian Gaskets



Guardians of Safety

GUARDIAN Gaskets provide maximum protection to plant personnel from the danger of escaping steam, gases or liquids due to gasket blowouts. These are the safety factors you enjoy when you use GUARDIAN Gaskets:

1. They are unaffected by temperatures up to 1000° F.
2. They seal tightly and for long periods of time at extremely high pressures.
3. They resist effectively the destructive action of liquids and gases, and are protected on their inner and outer edges by a double thickness of electrically-welded metal.

Guardians of Operating Costs

The unique "rolling M" construction of the GUARDIAN Gasket provides compression and rebound greatly in excess of that found in any ordinary gasket. These qualities permit a GUARDIAN Gasket to compress under increasing flange pressure and expand or rebound when flange pressure is decreased. The use of GUARDIAN Gaskets, therefore, lowers operating costs because:

1. They maintain tight joints under changing temperature conditions which cause expansion and contraction in the pipe line or equipment in which the GUARDIAN Gasket is installed. The need for retightening joints, therefore, is greatly reduced or eliminated.
2. They last longer. To prevent leakage with an ordinary gasket in high pressure service it frequently is necessary to compress the gasket to the point where it no longer provides proper sealing contact. The compression and rebound of a GUARDIAN Gasket—which functions somewhat as a small expansion joint—provide proper leak-proof flange pressure on the gasket at all times.
3. They frequently can be reused. On many high-pressure and high-temperature applications the ability of an ordinary gasket to seal properly depends upon adhesion of the gasket to the flanges so that when a joint is broken the gasket is destroyed. When GUARDIAN Gaskets are used, the compression and rebound inherent in the gasket provide a tight joint without adhering to the flanges so the gasket is not destroyed when the joint is broken.
4. Time required to clean flanges is reduced. When regasketing is required—as on boiler tube plates or pipe flanges—the metal flanges must be clean before new gaskets are applied. GUARDIAN Gaskets do not adhere to the flanges thus reducing greatly the amount of time necessary to clean the flanges.

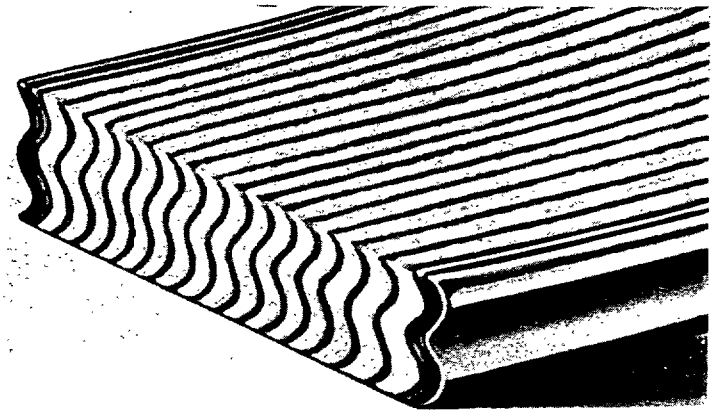
How and of what Guardian Gaskets are made

Construction

GUARDIAN Gaskets are constructed of spirally wound strips of metal—either zinc coated rustproof steel or stainless steel—alternated with layers of either asbestos or Teflon. The metal strip is formed into a cross-sectional shape resembling the letter M but with rounded angles.
The metal strip and the filler (asbestos or Teflon) are wound in alternating layers, continuous strips of each being used to build up the gasket to the required size. The inner and outer edges of the gasket are reinforced with double layers of metal which, for added strength, are electrically welded together.
The unique "rolling M" design imparts unusual resiliency and rebound to the GUARDIAN Gasket.

Shapes and Sizes

GUARDIAN Gaskets are made in round, oval, square, flat-side, diamond and pear shapes in practically any size. The standard thickness is $\frac{3}{16}$".
Standard sizes for boilers and pipe flanges are shown on the following pages. When ordering GUARDIAN Gaskets for recessed grooves, other than shown in this pamphlet.



specify a gasket size $\frac{1}{16}$" larger than the inside diameter of the groove and $\frac{1}{16}$" smaller than the outside diameter of the groove to allow for gasket compression.

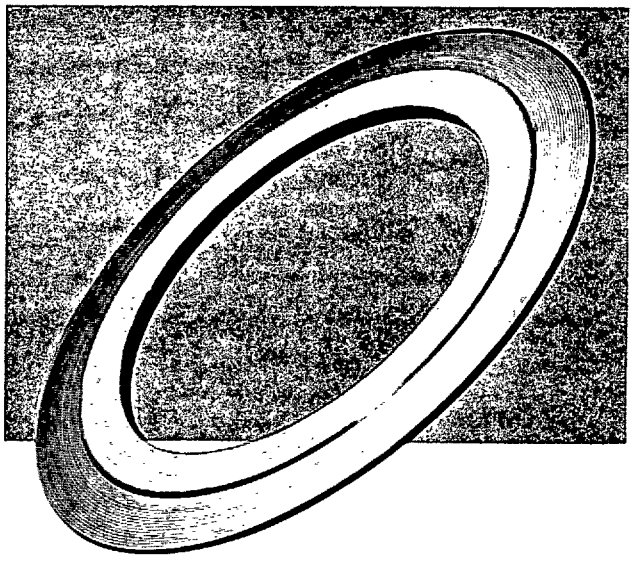
Materials and Recommended Uses

The standard GUARDIAN Gasket, Garlock style No. 555, is made of zinc-coated rustproof steel with Canadian chrysotile asbestos filler. It is recommended for use against steam, oils, gases or liquids (other than strong chemicals) at the highest pressures and at temperatures up to 1000° F. When conditions warrant, stainless steel will be substituted for zinc-coated steel.

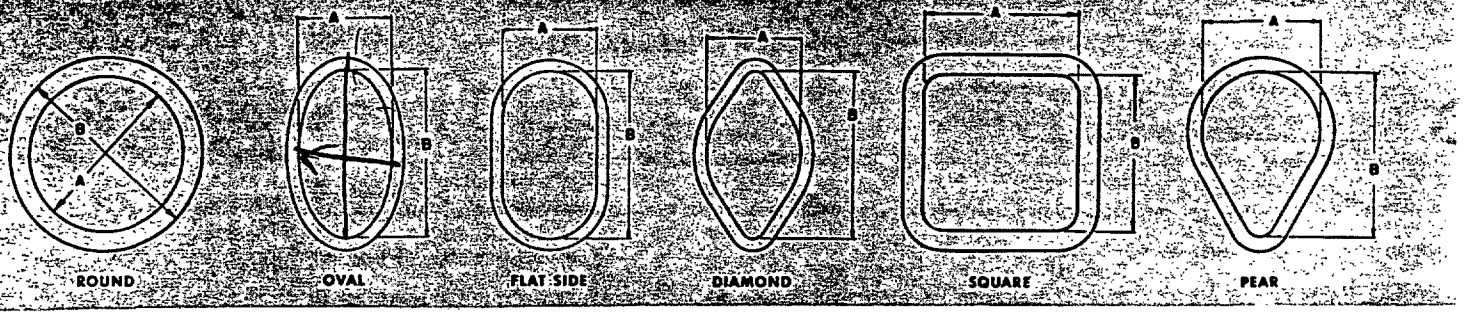
The special GUARDIAN Gasket, Garlock style No. 9078, is made of stainless steel with Teflon filler. Teflon is chemically inert to all materials including the strongest acids, except molten alkali metals. This special GUARDIAN Gasket is recommended particularly for use against acids and other chemicals that would readily attack the chrysotile asbestos used in the standard GUARDIAN Gasket.

Centering Devices

Because of their great strength and unusual compressibility which insure constant pressure-contact on the flanges, GUARDIAN Gaskets usually are made with a narrower rind or flange width than an ordinary gasket. For accurate positioning of the gasket between the pipe flanges, GUARDIAN Gaskets frequently are furnished with centering devices.
The centering device normally is made integral with the gasket itself and is a continuation of the spirally wound metal strip, without the filler, used in making the gasket. This all-metal centering device is then flattened under heavy pressure so that it is thinner than the GUARDIAN Gasket.
The Garlock spiral wound centering device is purposely made resilient, and also thinner than the gasket, to permit proper gasket compression, eliminate necessity of very fine flange adjustments and to prevent over-stressing of studs. The device is intended solely to position the gasket and not to strengthen it. The GUARDIAN Gasket needs no reinforcement. It is strong, compressible and resilient whether used with or without a centering device.
For standard GUARDIAN Gaskets of very large diameter and for all sizes of stainless steel GUARDIAN Gaskets the centering device is normally of spoke-type metal construction.



GUARDIAN GASKETS FOR BOILER TUBE PLATES



Make of Boiler	Shape	Sizes		
		A	B	Flange Width
ATLAS	Diamond	4 1/8	5 1/8	9/32
B. & W.	Round	2	2 3/8	
	Square	4 13/16	5	7/32
	Oval	4 9/16	5 1/2	3/16
	Oval	4 7/16	5 3/8	9/32
	Oval	4 1/2	5 7/16	7/32
	Diamond	3 3/8	3 3/4	1/8
B. & W. STERLING	Round	3 5/16	3 15/16	
BIGELOW	Pear	4 1/8	5 1/16	5/16
BRUNSWICK-KROESCHELL	Flat Side	3 11/16	4 5/8	5/16
COATSVILLE	Oval	3 1/16	4 1/16	1/2
COMBUSTION ENG. CORP. (Water Wall)	Round	4 1/16	4 11/16	
	Round	3 5/16	3 15/16	
CONNELLY	Oval	3 7/8	5	7/16
	Flat Side	4 1/8	5 1/8	5/16
EDGEMOOR	Oval	4 1/16	5 1/4	5/16
	Oval	4 1/8	5 5/16	5/16
ERIE CITY	Pear	3 3/8	4 9/16	5/16
	Flat Side	4 1/4	9	1/2
FOSTER WHEELER	Round	2 1/16	2 9/16	
	Round	2 1/8	2 9/16	
	Round	3 1/16	3 9/16	
	Round	3 1/8	3 5/8	
	Flat Side	2 3/4	3 3/8	1/4
	Flat Side	3 5/16	3 15/16	1/4
	Flat Side	3	4	5/16
	Flat Side	3 5/16	3 11/16	5/32
	Diamond	3 7/8	5 1/16	5/16
	Diamond	4	5 3/16	5/16
FRANKLIN	Round	3 5/8	4 1/4	
	Round	3 23/32	4 9/32	
	Flat Side	3 9/16	4 9/16	15/32
	Flat Side	3 11/16	4 11/16	1/4
GOLDIE McCULLOUGH	Oval	4 3/16	4 7/8	7/32
	Oval	4 1/8	4 3/4	7/32
	Oval	4 3/16	4 15/16	7/32

Make of Boiler	Shape	Sizes		
		A	B	Flange Width
GEARY	Oval	4	5	7/16
	Flat Side	3 3/4	4 5/8	5/16
	Flat Side	4 1/4	5 1/4	5/16
HEDGES-WALSH-WEIDENER	Round	3 1/8	3 7/16	
	Round	3 5/16	3 15/16	
	Round	3 3/8	3 11/16	
	Round	3 5/8	4 1/16	
	Round	4 3/16	5 1/16	
	Oval	3 7/16	4 1/4	3/8
	Oval	4 1/4	5 1/8	7/32
	Flat Side	4 3/16	5 1/16	7/16
	Flat Side	4 1/4	5	5/16
	Diamond	3 3/8	4 1/4	1/4
	Diamond	3 1/2	4 3/8	5/16
	Diamond	4 1/16	5 1/16	1/4
	Diamond	4 1/4	5 1/8	5/16
	Diamond	3 5/8	4 1/2	3/16
	Diamond	3 9/16	4 3/8	5/16
HEINE	Round	3 1/8	3 7/16	
	Round	3 5/8	4 1/4	
	Oval	3 1/2	4 1/2	5/16
	Flat Side	3 11/16	4 5/8	5/16
	Diamond	3 11/16	4 1/2	7/32
INTERNATIONAL ENGINEER (ECONOMY)	Oval	2 15/16	4 3/8	5/16
KEELER	Round	3 11/16	4 5/16	
	Round	4 1/4	4 7/8	
	Diamond	3 11/16	4 9/16	5/16
	Diamond	4 1/4	5 5/16	5/16
LYONS	Round	3 7/8	4 3/4	
	Pear	3 7/8	4 3/4	7/16
KEWANEE	Oval	2 3/4	4	1/2
	Flat Side	2 11/16	3 13/16	5/16
McNEIL	Round	4 1/4	4 7/8	
	Oval	4 1/4	5 1/2	7/16
	Pear	4 1/4	5 1/4	5/16
	Pear	4 1/4	5 1/4	3/8
MURRAY	Flat Side	3 5/8	4 9/16	7/16
OIL CITY	Flat Side	4 3/16	5 3/16	5/16

Make of Boiler	Shape	Sizes		
		A	B	Flange Width
OIL WELL	Oval	2 7/8	4	5/16
	Flat Side	3 1/8	4 7/8	5/16
OSWEGO	Round	3 5/16	3 15/16	
PAGE	Oval	2 13/16	3 7/8	5/16
	Oval	2 27/32	3 29/32	5/16
REUMMLE & DAWELY	Round	2 3/16	2 11/16	
	Flat Side	2 3/8	5	1/4
SPRINGFIELD	Square	5 9/16	5 9/16	7/16
	Square	7 1/2	7 1/2	1/2
	Square	7 3/8	7 1/2	1/2
	Square	7 3/8	7 3/8	1/2
	Oval	4 1/8	5 1/8	7/16
UNION	Pear	3 1/2	4 1/2	1/4
	Pear	4 1/4	5 1/4	5/16
	Flat Side	3	4 1/2	1/2

Make of Boiler	Shape	Sizes		
		A	B	Flange Width
VOGT	Oval	4 1/4	5	5/16
WARD	Square	5	5	1/4
	Square	4 7/8	4 7/8	1/4
WICKES	Round	3 1/8	3 9/16	
	Round	4 1/8	4 5/8	
	Round	3 3/4	4 1/4	
	Pear	3 1/8	4	9/32
	Pear	4 1/16	5 1/16	1/4
	Pear	4 1/4	5 1/8	5/16
	Pear	3 3/4	4 3/8	5/16
WORTHINGTON WATER TUBE	Oval	3 9/16	4 13/16	7/16
	Oval	4 3/4	7 9/16	3/4
	Oval	3 3/8	5	7/16
	Oval	5 1/2	7 3/8	7/16
	Oval	3 3/8	4 13/16	5/16
	Flat Side	3	4 7/8	7/16

BOILER, MANHOLE, HANDHOLE AND DRUM GASKETS

Boiler Manhole Gaskets

Representative Sizes

Shape	A	B	Flange Width
Oval	9	14	1
Oval	10	14	1
	10	15	1
	10	15 1/2	1
	10	16	1
Oval	10 1/2	14	1
	10 1/2	15	1
Oval	11	14	1
	11	14 1/2	1
	11	15	1
	11	15 1/2	1
	11	16	1
Oval	11 1/2	16	1
Oval	12	15	1
	12	15 1/2	1
	12	16	1

Boiler Handhole and Mud Drum Gaskets

Representative Sizes

Shape	A	B	Flange Width
Oval	2 3/4	3 1/2	1/2
Oval	3	4	1/2
	3	4 1/2	1/2
Oval	3 1/4	4 1/2	1/2
	3 1/8	4 3/8	1/2
	3 1/2	4 1/2	1/2
	3 1/2	5	1/2
Oval	4	5 1/4	1/2
	4	6	1/2
Oval	5	7	3/4
	5	8	3/4
Oval	6	8	3/4

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Standard and Extra Heavy Pipe Flanges

American Standard

Pipe Size Inches	For Standard and Low Pressure Flanges — Gasket Sizes		For Medium and Extra Heavy Flanges — Gasket Sizes	
	I. D.	O. D.	I. D.	O. D.
1	1¾	2½	1¾	2⅝
1¼	2⅛	2⅞	2⅛	3⅛
1½	2½	3¼	2¾	3¾
2	3⅛	3⅞	3¼	4¼
2½	4	4¾	3⅞	4⅞
3	4¼	5¼	4⅞	5⅞
3½	5¼	6¼	5¼	6½
4	5⅝	6⅝	5⅝	6⅞
4½	5⅝	6⅞	5⅝	7⅝
5	6⅜	7⅝	6⅜	8⅜
6	7⅛	8⅝	7¾	9¾
7	8⅜	9⅞	8⅞	10⅞
8	9⅛	10⅞	9½	11⅞
9	10⅝	12⅜	10⅝	13
10	11¼	13¼	11¾	14⅛
12	14	16	14	16½
14	15¾	17¾	16½	19
15	17⅜	19	17⅜	19⅞
16	17⅝	20⅛	18⅜	21⅜
18	19	21½	20⅜	23⅜
20	20¾	23¾	22½	25½

For Flange Unions — American Standard

Pipe Size Inches	For Standard and Low Pressure Flanges — Gasket Sizes		For Medium and Extra Heavy Flanges — Gasket Sizes	
	I. D.	O. D.	I. D.	O. D.
1	1¼	1⅞	1⅜	2
1¼	1½	2 5/16	1⅝	2 7/16
1½	2	2¾	2	2¾
2	2½	3¼	2¾	3½
2½	3⅛	3 15/16	3⅛	3⅞
3	3⅝	4½	3⅝	4½
3½	4⅛	5⅛	4⅛	5⅛
4	4½	5⅝	4⅝	5¾
4½	5¼	6⅜	5⅛	6¼
5	5¾	7	5¾	7
6	6¾	8⅛	6¾	8⅛
7	7⅞	9½	7½	9
8	8⅞	10½	8½	10⅛
9	9¾	11½		
10	10¾	12¾	10 9/16	12 9/16
12	13⅛	15⅛	12⅞	14⅞

For Cast Iron Plain Face Flanges — American Standard

Pipe Size Inches	Standard—Class 125 — Gasket Sizes			Extra Heavy—Class 250 — Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.
1	1 5/16	1¾	2⅝	1 5/16	1 15/16	2⅞
1¼	1⅝	2⅛	3	1⅝	2⅜	3¼
1½	1⅞	2⅜	3⅜	1⅞	2¾	3¾
2	2⅜	3⅛	4⅛	2⅜	3½	4⅜
2½	2⅞	3⅝	4⅞	2⅞	4	5⅛
3	3½	4¼	5⅜	3½	4¾	5⅞
3½	4	4⅞	6⅜	4	5⅜	6½
4	4½	5⅜	6⅞	4½	5⅞	7⅛
5	5 9/16	6 9/16	7¾	5 9/16	6 15/16	8½
6	6⅝	7⅝	8¾	6⅝	8⅛	9⅞
8	8⅝	9⅝	11	8⅝	10¼	12⅛
10	10¾	12	13⅜	10¾	12⅜	14¼
12	12¾	14	16⅛	12¾	14½	16⅝
14 O.D.	14	15½	17¾	14	15¾	19⅛
16 O.D.	16	17½	20¼	16	18	21¼
18 O.D.	18	19½	21⅝	18	20½	23½
20 O.D.	20	21½	23⅞	20	22½	25¾
24 O.D.	24	25½	28¼	24	26¾	30½
30 O.D.	30	32	34¾	30	32¾	37½
36 O.D.	36	38	41¼	36	39	44

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Steel Raised Face and Vanstone Type Flanges — American Standard

Pipe Size Inches	SERIES 15—150 LB. Gasket Sizes			SERIES 30—300 LB. Gasket Sizes			SERIES 40—400 LB. Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.
½	⅞	1¼	1⅞	⅞	1¼	2⅛	⅞	1¼	2⅛
¾	1⅛	1 9/16	2¼	1⅛	1 9/16	2⅝	1⅛	1 9/16	2⅝
1	1 5/16	1¾	2⅝	1 5/16	1 5/16	2⅞	1 5/16	1 5/16	2⅞
1¼	1⅝	2⅛	3	1⅝	2⅜	3¼	1⅝	2⅜	3¼
1½	1⅞	2⅜	3⅜	1⅞	2¾	3¾	1⅞	2¾	3¾
2	2⅜	3⅛	4⅛	2⅜	3½	4⅜	2⅜	3½	4⅜
2½	2⅞	3⅝	4⅞	2⅞	4	5⅛	2⅞	4	5⅛
3	3½	4¼	5⅜	3½	4¾	5⅞	3½	4¾	5⅞
3½	4	4⅞	6⅜	4	5⅜	6½	4	5⅜	6⅜
4	4½	5⅜	6⅞	4½	5⅞	7⅛	4½	5⅞	7
5	5 9/16	6 9/16	7¾	5 9/16	6 5/16	8½	5 9/16	6 5/16	8⅜
6	6⅝	7⅝	8¾	6⅝	8⅛	9⅞	6⅝	8⅛	9¾
8	8⅝	9⅝	11	8⅝	10¼	12⅛	8⅝	10¼	12
10	10¾	12	13⅜	10¾	12⅜	14¼	10¾	12⅜	14⅛
12	12¾	14	16⅛	12¾	14½	16⅝	12¾	14½	16½
14 O.D.	14	15½	17¾	14	15¾	19⅛	14	15¾	19
16 O.D.	16	17½	20¼	16	18	21¼	16	18	21⅛
18 O.D.	18	19½	21⅝	18	20½	23½	18	20½	23⅜
20 O.D.	20	21½	23⅞	20	22½	25¾	20	22½	25½
24 O.D.	24	25½	28¼	24	26¾	30½	24	26¾	30¼

Pipe Size Inches	SERIES 60—600 LB. Gasket Sizes			SERIES 90—900 LB. Gasket Sizes			SERIES 150—1500 LB. Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.
½	⅞	1¼	2⅛	⅞	1¼	2½	⅞	1¼	2½
¾	1⅛	1 9/16	2⅝	1⅛	1 9/16	2¾	1⅛	1 9/16	2¾
1	1 5/16	1 5/16	2⅞	1 1/16	1 5/16	3⅛	1	1 5/16	3⅛
1¼	1⅝	2⅜	3¼	1 9/16	2⅜	3½	1 9/16	2⅜	3½
1½	1⅞	2¾	3¾	1¾	2¾	3⅞	1¾	2¾	3⅞
2	2⅜	3½	4⅜	2⅜	3½	5⅝	2⅜	3½	5⅝
2½	2⅞	4	5⅛	2⅝	4	6½	2⅝	4	6½
3	3½	4¾	5⅞	3½	4¾	6⅝	3 3/16	4¾	6⅞
3½	4	5⅜	6⅜						
4	4½	5⅞	7⅝	4½	5⅞	8⅛	4⅜	5⅞	8¼
5	5 9/16	6 5/16	9½	5 9/16	6 5/16	9¾	5 5/16	6 5/16	10
6	6⅝	8⅛	10½	6⅝	8⅛	11⅜	6⅜	8⅛	11⅛
8	8⅝	10¼	12⅝	8⅝	10¼	14⅛	8⅜	10¼	13⅞
10	10¾	12⅜	15¾	10¾	12⅜	17⅛	10¼	12⅜	17⅛
12	12¾	14½	18	12¾	14½	19⅝	12⅛	14½	19⅝
14 O.D.	14	15¾	19⅜	14	15¾	20½	14	15¾	22¾
16 O.D.	16	18	22¼	16	18	22⅝	16	18	25¼
18 O.D.	18	20½	24⅛	18	20½	25⅛	18	20½	27¾
20 O.D.	20	22½	26⅞	20	22½	27½	20	22½	29¾
24 O.D.	24	26¾	31⅛	24	26¾	33	24	26¾	35½

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Steel Raised Face and Vanstone Type Flanges

American Standard

Pipe Size Inches	Series 250—2500 Lb. Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.
½	⅞	1¼	2¾
¾	1⅛	1⁹⁄₁₆	3
1	1	1¹⁵⁄₁₆	3⅜
1¼	1⁹⁄₁₆	2⅜	4⅛
1½	1¾	2¾	4⅝
2	2⅜	3½	5¾
2½	2⅝	4	6⅝
3	3⁷⁄₁₆	4¾	7¾
4	4⅜	5⅞	9¼
5	5⁵⁄₁₆	6¹⁵⁄₁₆	11
6	6⅜	8⅛	12½
8	8⅜	10¼	15¼
10	10¼	12⅜	18¾
12	12⅛	14½	21⅝

For Jarecki Flange Unions

Pipe Size Inches	125 Lb.—Standard Gasket Sizes			250 Lb.—Extra Heavy Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.	Centering Ring Dia.
1	1⁵⁄₁₆	2¹⁄₁₆		1⁵⁄₁₆	2½	
1¼	1⅝	2⅜		1⅝	2⅜	
1½	1⅞	3		1⅞	2¾	
2	2⅜	3¼		2⅜	3½	
2½	2⅞	3¹⁵⁄₁₆		2⅞	4³⁄₁₆	
3	3½	4¹¹⁄₁₆		3½	4¹⁵⁄₁₆	
3½	4	4¹⁵⁄₁₆				
4	4½	5⅝		4½	6⅛	
5	5⁹⁄₁₆	6⅞		5⁹⁄₁₆	7½	
6	6⅝	8⅛		6⅝	8⅝	
6⅝	7⅛	8⅛				
7	7⅝	9⅜				
8	8⅝	10⅜				
10	10¾	12	13	10¾	12⅜	14⅝
12	12¾	14	15½			

For Large Tongue and Groove Type Steel Flanges

American Standard

Pipe Size Inches	150-300-400-600-900 and 1500 Lb. Gasket Sizes	
	I. D.	O. D.
½	1	1⅜
¾	1⅝	1¹¹⁄₁₆
1	1½	2
1¼	1⅞	2½
1½	2⅛	2⅞
2	2⅞	3⅝
2½	3⅜	4⅛
3	4¼	5
3½	4¾	5½
4	5³⁄₁₆	6³⁄₁₆
5	6⅝	7⅝
6	7½	8½
8	9⅜	10⅝
10	11¼	12¾
12	13½	15
14 O.D.	14¾	16¼
16 O.D.	16¾	18½
18 O.D.	19¼	21
20 O.D.	21	23
24 O.D.	25¼	27¼

Pipe Size Inches	2500 Lb. Gasket Sizes	
	I. D.	O. D.
½	1	1⅜
¾	1⅝	1¹¹⁄₁₆
1	1½	2
1¼	1⅞	2½
1½	2⅛	2⅞
2	2⅞	3⅝
2½	3⅜	4⅛
3	4¼	5
4	5³⁄₁₆	6³⁄₁₆
5	6⅝	7⅝
6	7½	8½
8	9⅜	10⅝
10	11¼	12¾
12	13½	15

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Small Tongue and Groove Type Steel Flanges American Standard

Pipe Size Inches	150-300-400 and 600 Lb. Gasket Sizes		900 and 1500 Lb. Gasket Sizes		2500 Lb. Gasket Sizes	
	I. D.	O. D.	I. D.	O. D.	I. D.	O. D.
½	1	1⅜	1	1⅜	1	1⅜
¾	1 5/16	1 11/16	1 5/16	1 11/16	1 5/16	1 11/16
1	1½	1⅞	1½	1⅞	1½	1⅞
1¼	1⅞	2¼	1⅞	2¼	1⅞	2¼
1½	2⅛	2½	2⅛	2½	2⅛	2½
2	2⅞	3¼	2⅞	3¼	2⅞	3¼
2½	3⅜	3¾	3⅜	3¾	3⅜	3¾
3	4¼	4⅝	4¼	4⅝	4¼	4⅝
3½	4¾	5⅛				
4	5 3/16	5 11/16	5 3/16	5 11/16	5 3/16	5 11/16
5	6 5/16	6 13/16	6 5/16	6 13/16	6 5/16	6 13/16
6	7½	8	7½	8	7½	8
8	9⅜	10	9⅜	10	9⅜	10
10	11¼	12	11¼	12	11¼	12
12	13½	14¼	13½	14¼	13½	14¼
14 O.D.	14¾	15½	14¾	15½		
16 O.D.	16¾	17⅝	16¾	17⅝		
18 O.D.	19¼	20⅛	19¼	20⅛		
20 O.D.	21	22	21	22		
24 O.D.	25¼	26¼	25¼	26¼		

For Large Male and Female Type Steel Flanges — American Standard

Pipe Size Inches	150-300-400 and 600 Lb. Gasket Sizes		900 Lb. Gasket Sizes		1500 Lb. Gasket Sizes		2500 Lb. Gasket Sizes	
	I. D.	O. D.	I. D.	O. D.	I. D.	O. D.	I. D.	O. D.
½	1	1⅜	1	1⅜	1	1⅜	1	1⅜
¾	1¼	1 11/16	1¼	1 11/16	1¼	1 11/16	1¼	1 11/16
1	1½	2	1⅛	2	1 1/16	2	1 1/16	2
1¼	2	2½	1⅝	2½	1 11/16	2½	1 11/16	2½
1½	2⅜	2⅞	1 15/16	2⅞	1 15/16	2⅞	1 15/16	2⅞
2	3	3⅝	2½	3⅝	2½	3⅝	2½	3⅝
2½	3⅜	4⅛	2 13/16	4⅛	2¾	4⅛	2¾	4⅛
3	4¼	5	3 11/16	5	3¾	5	3¾	5
3½	4⅝	5½						
4	5¼	6 3/16	4⅞	6 3/16	4¾	6 3/16	4¾	6 3/16
5	6⅜	7 5/16	6	7 5/16	5¾	7 5/16	5¾	7 5/16
6	7½	8½	7	8½	6¾	8½	6¾	8½
8	9⅝	10⅝	9	10⅝	8¾	10⅝	8¾	10⅝
10	11½	12¾	11⅛	12¾	10⅝	12¾	10⅝	12¾
12	13¾	15	13¼	15	12¾	15	12¾	15
14 O.D.	14¾	16¼	14½	16¼	14	16¼		
16 O.D.	17	18½	16½	18½	16¼	18½		
18 O.D.	19½	21	18½	21	18½	21		
20 O.D.	21½	23	20½	23	20½	23		
24 O.D.	25¾	27¼	24½	27¼	24½	27¼		

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Crane Cast Iron Flange Unions

Pipe Size Inches	125 Lb.—Standard Gasket Sizes			250 Lb.—Extra Heavy Gasket Sizes	
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.
1	1 5/16	2 3/16		1 5/16	2 3/16
1 1/4	1 5/8	2 11/16		1 5/8	2 5/8
1 1/2	1 7/8	2 7/8		1 7/8	3
2	2 3/8	3 1/2		2 3/8	3 11/16
2 1/2	2 7/8	3 7/8		2 7/8	4
3	3 1/2	4 5/8		3 1/2	4 3/4
3 1/2	4	5 1/4		4	5 3/8
4	4 1/2	5 3/4		4 1/2	5 7/8
4 1/2	5	6 3/8		5	6 1/2
5	5 5/16	7 1/8		5 5/16	7
6	6 5/8	8 1/4		6 5/8	8 3/8
7	7 5/8	9 1/2		7 5/8	9 1/2
8	8 5/8	9 5/8	10 5/8	8 5/8	10 1/2
9	9 5/8	10 5/8	11 3/4	9 5/8	11 5/8
10	10 3/4	12	13	10 3/4	12 13/16
12	12 3/4	14	15 3/8	12 3/4	15 1/16
14 O.D.	14	15 1/2	18	14	16 5/8
15 O.D.	15	16 1/2	18		
16 O.D.	16	17 1/2	19 1/8		

For Crane A. G. A. Flanges

Pipe Size Inches	Gasket Sizes	
	I. D.	O. D.
4	5 1/8	6 3/8
6	7 1/8	8 3/8
8	9 1/8	10 3/8
10	11	13
12	13	15
16	16 5/8	19 1/8
20	21 1/8	23 5/8
24	24 5/8	27 5/8

For Crane Malleable Iron Flange Unions

Pipe Size Inches	125 Lb.—Standard Gasket Sizes		
	I. D.	O. D.	Centering Ring Dia.
1	1 5/16	1 15/16	
1 1/4	1 5/8	2 3/8	
1 1/2	1 7/8	2 7/8	
2	2 3/8	3 1/2	
2 1/2	2 7/8	4	
3	3 1/2	4 5/8	
3 1/2	4	5 3/8	
4	4 1/2	5 3/4	
4 1/2	5	6 3/8	
5	5 5/16	7 1/8	
6	6 5/8	8 1/4	
8	8 5/8	9 5/8	10 5/8
10	10 3/4	12	13
12	12 3/4	14	15 3/8

GUARDIAN GASKET SIZES

Furnished with metal centering ring where centering ring diameter is shown.

For Grinnell Cast Iron Flange Unions

Pipe Size Inches	125 Lb.—Standard Gasket Sizes			250 Lb.—Extra Heavy Gasket Sizes	
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.
1	1 5/16	2 1/16		1 5/16	2 1/4
1 1/4	1 5/8	2 1/2		1 5/8	2 11/16
1 1/2	1 7/8	2 13/16		1 7/8	3
2	2 3/8	3 1/4		2 3/8	3 11/16
2 1/2	2 7/8	3 13/16		2 7/8	4
3	3 1/2	4 7/16		3 1/2	4 3/4
3 1/2	4	4 15/16		4	5 7/16
4	4 1/2	5 9/16		4 1/2	6
4 1/2	5	6 3/16		5	6 1/2
5	5 9/16	6 11/16		5 9/16	7
6	6 5/8	8		6 5/8	8 3/8
7	7 5/8	9 3/8		7 5/8	9 3/8
8	8 5/8	9 5/8	10 9/16	8 5/8	10 1/2
9	9 5/8	11 13/16		9 5/8	11 7/8
10	10 3/4	12 13/16		10 3/4	12 7/8
12	12 3/4	14	15 3/16	12 3/4	15 1/4

For Walworth Standard Cast Iron Flange Unions

Pipe Size Inches	125 Lb. Gasket Sizes			250 Lb.—Heavy Gasket Sizes	
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.
1	1 5/16	1 13/16	2 3/8	1 5/16	2 3/8
1 1/4	1 5/8	2 1/8	2 7/8	1 5/8	2 7/8
1 1/2	1 7/8	2 3/8	3	1 7/8	3 1/16
2	2 3/8	3 1/16	3 9/16	2 3/8	3 5/8
2 1/2	2 7/8	3 5/8	4 1/16	2 7/8	4 1/4
3	3 1/2	4 1/4	4 13/16	3 1/2	4 7/8
3 1/2	4	5 3/8		4	5 1/2
4	4 1/2	5 1/2	6	4 1/2	6
4 1/2	5	6 5/8			
5	5 9/16	7 1/4		5 9/16	7 1/4
6	6 5/8	7 7/8	8 3/8	6 5/8	8 1/2
7	7 5/8	8 5/8	9 7/8		
8	8 5/8	9 5/8	10 7/8	8 5/8	10 7/8
10	10 3/4	12	13 1/8	10 3/4	13 5/16
12	12 3/4	14	15 9/16	12 3/4	14 5/8

For Stockham Pipe & Fitting Co. Cast Iron Flange Unions

Pipe Size Inches	125 Lb. Gasket Sizes			250 Lb. Gasket Sizes	
	I. D.	O. D.	Centering Ring Dia.	I. D.	O. D.
1	1 5/16	2 3/16		1 5/16	2 3/16
1 1/4	1 5/8	2 11/16		1 5/8	2 1/2
1 1/2	1 7/8	2 7/8		1 7/8	3
2	2 3/8	3 1/2		2 3/8	3 5/8
2 1/2	2 7/8	4		2 7/8	4 1/8
3	3 1/2	4 5/8		3 1/2	4 7/8
3 1/2	4	5 1/4		4	5 1/2
4	4 1/2	5 3/4		4 1/2	5 7/8
4 1/2	5	6 1/2		5	6 5/8
5	5 9/16	7 1/8		5 9/16	7 1/8
6	6 5/8	8 3/8		6 5/8	8 1/2
7	7 5/8	8 5/8	9 5/8	7 5/8	9 5/8
8	8 5/8	9 5/8	10 5/8	8 5/8	10 3/4
9				9 5/8	11 5/8
10	10 3/4	12	13	10 3/8	12 7/8
12	12 3/4	14 3/4		12 3/4	15
14	14	15 1/2	17 1/8		
15				15	17 1/4
16	16	17 1/2	19		

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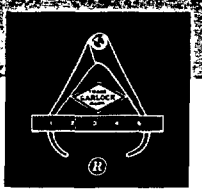

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