

SEAMLESS ROLLED RINGS and Production Forgings for Heavy Industry

Many of the forged, rolled and extruded products turned out in large quantities by Taylor Forge are for use in the latest jet aircraft engines, missiles, rockets, etc., where elevated temperatures and extreme stresses due to high velocities demand the utmost in perfection of material quality. Taylor Forge achieves this required perfection by producing contours in which grain flow, grain size, homogeneity and consistent uniformity are highly controlled by proper forging, heating and heat treating techniques and the application of exact quality control methods.

Taylor Forge forged parts for all uses are characterized by unusual sharpness of details which in many cases reduces machining allowances.

You are invited to submit your forging problems to Taylor Forge for analysis and the development of properly designed, forged and heat treated parts as required for the service conditions. Pictured on this page are a few of the many unusual shapes and sections that are regularly produced.

JET ENGINE

MISSILE

ROCKET

GAS TURBINE

AIR FRAME

CHEMICAL

DIESEL LOCOMOTIVE

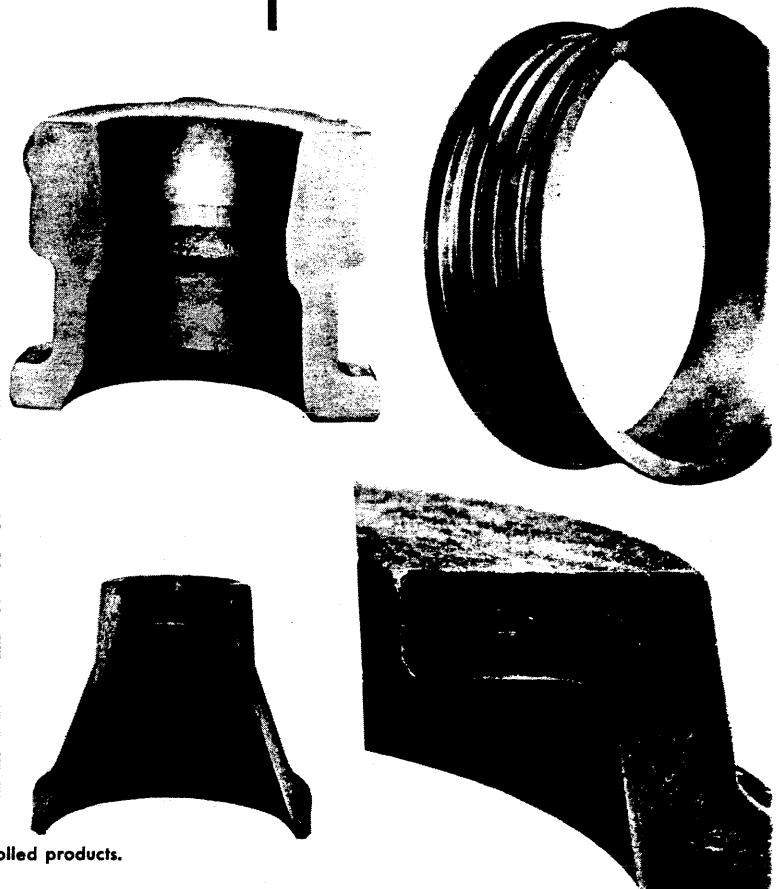
REFINING

ORDNANCE

ROAD MACHINERY

MINING

FARM EQUIPMENT



A small section of shipping dock showing an assortment of rolled products.

MANUFACTURING STANDARDS

for

TAYLOR FORGE PRODUCTS

All Taylor Forge Products are manufactured in strict accordance with current applicable Standards, Tentative Standards, Standard Practices or Recommendations as issued by such Regulatory Bodies as:—

American National Standards Institute (ANSI)
 American Society for Testing Materials (ASTM)
 American Society of Mechanical Engineers (ASME)
 American Water Works Association (AWWA)
 Tubular Exchanger Manufacturers Association (TEMA)
 Manufacturers Standardization Society (MSS)
 American Gas Association (AGA)
 Military and other Governmental Departments.

Throughout this catalog, applicable Standards are noted on the pages where products are listed. Material Specifications for all Products listed in this catalog are tabulated on Pages 55 and 56.

WELDING FITTINGS

ANSI B16.9 — This Standard covers dimensions, tolerances and marking of Steel Butt-Welding Fittings of the types and in the size ranges tabulated below.

ASTM A234, ASTM A403 and MSS SP-43 — These Standards also cover Welding Fittings and, through cross references, are closely related to ANSI B16.9. Wherever applicable, Taylor Forge Fittings meet all requirements of these Standards.

FORGED FLANGES

ANSI B16.5 — This Standard covers dimensions, tolerances and marking of Forged Flanges in carbon and alloy steels, stainless steels and non-ferrous materials in the range of types, sizes and pressure standards tabulated below.

AWWA C207 and MSS SP-44 — These Standards refer to carbon steels only. MSS SP-44 includes sizes 12" through 60". AWWA C207 includes sizes ½" through 96". A brief discussion of these Standards will be found on Page 27.

WELDING FITTINGS AND FORGED FLANGES COVERED
BY ANSI STANDARDS

WELDING FITTINGS —ANSI B16.9

90° Elbows, Long Radius	½" through 48"
45° Elbows	½" through 48"
180° Returns, Long Radius	½" through 24"
Tees*, Straight and Reducing	½" through 48"
Reducers*, Concentric and Eccentric	¾" through 48"
Caps	½" through 48"
Lap Joint Stub Ends	½" through 24"

*Reducing Tees are covered with branch reductions to one pipe size less than half the nominal run size. In sizes 14" and larger, however, the "center-to-end of outlet" dimension is not specified.

Reducers are covered in reductions to one pipe size less than half the nominal large end size.

For both Tees and Reducers the one exception is the 1" size where maximum reduction is to ½".

FORGED FLANGES —ANSI B16.5

Welding Neck, Lap Joint, Blind

150 lb., 300 lb., 400 lb., 600 lb., 900 lb., 1500 lb. }	½" through 24"
2500 lb.	½" through 12"

Threaded

150 lb., 300 lb., 400 lb., 600 lb., 900 lb. }	½" through 24"
1500 lb., 2500 lb.	½" through 12"

Slip-On

150 lb., 300 lb., 400 lb., 600 lb., 900 lb. }	½" through 24"
1500 lb.	½" through 2½"

Socket Welding

150 lb., 300 lb., 600 lb.	½" through 3"
1500 lb.	½" through 2½"

MANUFACTURING STANDARDS

for

TAYLOR FORGE PRODUCTS

All Taylor Forge Products are manufactured in strict accordance with current applicable Standards, Tentative Standards, Standard Practices or Recommendations as issued by such Regulatory Bodies as:—

- American National Standards Institute (ANSI)
- American Society for Testing Materials (ASTM)
- American Society of Mechanical Engineers (ASME)
- American Water Works Association (AWWA)
- Tubular Exchanger Manufacturers Association (TEMA)
- Manufacturers Standardization Society (MSS)
- American Gas Association (AGA)
- Military and other Governmental Departments.

Throughout this catalog, applicable Standards are noted on the pages where products are listed. Material Specifications for all Products listed in this catalog are tabulated on Pages 55 and 56.

WELDING FITTINGS

ANSI B16.9 — This Standard covers dimensions, tolerances and marking of Steel Butt-Welding Fittings of the types and in the size ranges tabulated below.

ASTM A234, ASTM A403 and MSS SP-43 — These Standards also cover Welding Fittings and, through cross references, are closely related to ANSI B16.9. Wherever applicable, Taylor Forge Fittings meet all requirements of these Standards.

FORGED FLANGES

ANSI B16.5 — This Standard covers dimensions, tolerances and marking of Forged Flanges in carbon and alloy steels, stainless steels and non-ferrous materials in the range of types, sizes and pressure standards tabulated below.

AWWA C207 and MSS SP-44 — These Standards refer to carbon steels only. MSS SP-44 includes sizes 12" through 60". AWWA C207 includes sizes ½" through 96". A brief discussion of these Standards will be found on Page 27.

WELDING FITTINGS AND FORGED FLANGES COVERED BY ANSI STANDARDS

WELDING FITTINGS —ANSI B16.9

90° Elbows, Long Radius	½" through 48"
45° Elbows	½" through 48"
180° Returns, Long Radius	½" through 24"
Tees*, Straight and Reducing	½" through 48"
Reducers*, Concentric and Eccentric	¾" through 48"
Caps	½" through 48"
Lap Joint Stub Ends	½" through 24"

*Reducing Tees are covered with branch reductions to one pipe size less than half the nominal run size. In sizes 14" and larger, however, the "center-to-end of outlet" dimension is not specified.

Reducers are covered in reductions to one pipe size less than half the nominal large end size.

For both Tees and Reducers the one exception is the 1" size where maximum reduction is to ½".

FORGED FLANGES —ANSI B16.5

Welding Neck, Lap Joint, Blind	
150 lb., 300 lb., 400 lb., 600 lb., 900 lb., 1500 lb. }	½" through 24"
2500 lb.	½" through 12"
Threaded	
150 lb., 300 lb., 400 lb., 600 lb., 900 lb. }	½" through 24"
1500 lb., 2500 lb.	½" through 12"
Slip-On	
150 lb., 300 lb., 400 lb., 600 lb., 900 lb. }	½" through 24"
1500 lb.	½" through 2½"
Socket Welding	
150 lb., 300 lb., 600 lb.	½" through 3"
1500 lb.	½" through 2½"

DIMENSIONAL TOLERANCES

For TAYLOR FORGE Welding Fittings

The tolerances listed below are those established by ANSI B16.9 for Steel Butt-Welding Fittings, of the types and in the size ranges covered by that Standard.

As a result of Taylor Forge production methods and meticulous inspection standards, dimensions of Taylor

Forge Welding Fittings normally run much closer to nominal than would be expected under permissible deviations. They are, in fact, so closely controlled that we are able to apply ANSI tolerances to sizes much larger than are contemplated in the Standard.

NOTE:—Tolerances for the Outside Diameter of Stainless Steel Fittings at the welding end are as follows:

Sizes thru 1 1/4"	+1/16"	-1/16"
Sizes 2" - 4"	+1/32"	-1/32"
Sizes 5" - 8"	+1/16"	-1/16"
Sizes 10" - 12"	+1/8"	-1/8"

ALL FITTINGS

Wall Thickness of fittings at any point shall not be less than 87 1/2% of the nominal thickness.

Outside Diameter of fittings at beginning of bevel:

For sizes up to and including 2 1/2"	+1/16"	-1/32"
For sizes 3" through 4"	+1/16"	-1/16"
For sizes 5" through 8"	+3/32"	-1/16"
For sizes 10" through 18"	+3/32"	-1/8"
For sizes 20" and larger	+1/4"	-3/16"

Inside Diameter of fittings at welding ends:

For sizes up to and including 2 1/2"	±1/32"
For sizes 3" through 8"	±1/16"
For sizes 10" through 18"	±1/8"
For sizes 20" and larger	±3/16"

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

90° ELBOWS, 45° ELBOWS and TEES

Center-to-End of bevel:

For sizes up to and including 8"	±1/16"
For sizes 10" through 24"	±3/32"
For sizes 26" through 30"	±1/8"
For sizes 32" and larger	±3/16"

180° RETURNS

Center-to-Center:

For sizes up to and including 8"	±1/4"
For sizes 10" and larger	±3/8"

Back-to-Face:

For all sizes	±1/4"
---------------	-------

Alignment of Ends:

For sizes up to and including 8"	±1/32"
For sizes 10" through 24"	±1/16"
For sizes 26" and larger	±3/32"

REDUCERS (Concentric and Eccentric)

End-to-End

For sizes up to and including 8"	±1/16"
For sizes 10" through 24"	±3/32"
For sizes 26" and larger	±3/16"

WELDING CAPS

Overall Length:

For sizes up to and including 4"	±1/8"
For sizes 5" through 24"	±1/4"
For sizes 26" and larger	±3/8"

LAP JOINT STUB ENDS

End-to-End:

For sizes up to and including 8"	±1/16"
For sizes 10" through 24"	±3/32"
For sizes 26" and larger	±3/16"

Fillet Radius:

For sizes up to and including 3 1/2"	+0"	-1/32"
For sizes 4" and larger	+0"	-1/16"

Thickness of Lap:

For all sizes	+1/16"	-0"
---------------	--------	-----

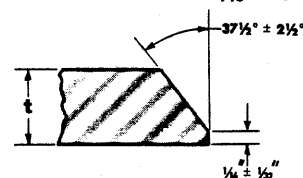
Outside Diameter of Lap:

For sizes up to and including 8"	+0"	-1/32"
For sizes 10" and larger	+0"	-1/16"

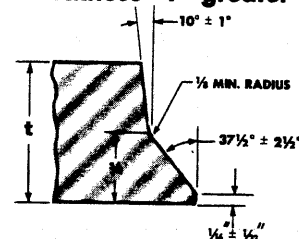
Nominal Pipe Size	Outside Diameter of Barrel		Nominal Pipe Size	Outside Diameter of Barrel	
	Max.	Min.		Max.	Min.
1/2	.896	.809	6	6.743	6.594
3/4	1.106	1.019	8	8.743	8.594
1	1.376	1.284	10	10.913	10.719
1 1/4	1.716	1.629	12	12.913	12.719
1 1/2	1.966	1.869	14	14.170	13.969
2	2.456	2.344	16	16.180	15.969
2 1/2	2.966	2.844	18	18.190	17.969
3	3.596	3.469	20	20.240	19.969
3 1/2	4.096	3.969	22	22.240	21.969
4	4.593	4.469	24	24.240	23.969
5	5.683	5.532			

WELDING BEVEL STANDARDS

For wall thickness "t" 3/16" to 7/8" max.



For wall thickness "t" greater than 7/8"



DIMENSIONAL TOLERANCES

For TAYLOR FORGE Flanges

The tolerances tabulated below apply to all ANSI Flanges, Taylor Forge Large Diameter Flanges, and the flanged ends of Welding Necks. Certain other tolerances apply to Orifice Flanges and those are as covered by American Gas Association recommendations.

Except where indicated, the tolerances are those established by ANSI B16.5, and the variations are maximum. In actual practice manufacturing and inspection procedures control dimensions so closely that variations are normally much less than those listed as permitted.

Threaded, Slip-On, Lap Joint and Blind Flanges

Outside Diameter*	When O.D. is 24" or less	$\pm \frac{1}{16}"$
	When O.D. is over 24"	$\pm \frac{1}{8}"$
Inside Diameter	Threaded	Within limits on boring gauge
	Slip-On and Lap Joint:	
	10" and smaller	$+\frac{1}{32}"$, $-0"$
	12" and larger	$+\frac{1}{16}"$, $-0"$
Diameter of Counterbore	Same as for Inside Diameter	
Diameter of Contact Face	$\frac{1}{16}"$ Raised Face	$\pm \frac{1}{32}"$
	$\frac{1}{4}"$ Raised Face Tongue and Groove, or Male and Female	$\pm \frac{1}{64}"$
Outside Diameter of Hub*	12" and smaller	$+\frac{3}{32}"$, $-\frac{1}{16}"$
	14" and larger	$\pm \frac{1}{8}"$
Drilling	Bolt Circle	$\pm \frac{1}{16}"$
	Bolt hole spacing	$\pm \frac{1}{32}"$
Eccentricity Bolt Circle & Facing (with Respect to Bore*)	2 1/2" and smaller	$\frac{1}{32}"$ max.
	3" and larger	$\frac{1}{16}"$ max.
Length Thru Hub*	18" and smaller	$+\frac{1}{8}"$, $-\frac{1}{32}"$
	20" and larger	$+\frac{3}{16}"$, $-\frac{1}{16}"$
Thickness	18" and smaller	$+\frac{1}{8}"$, $-0"$
	20" and larger	$+\frac{3}{16}"$, $-0"$
	Where allowance has been left on face for finish: All sizes*	$+\frac{1}{8}"$, $-\frac{1}{16}"$

Welding Neck Flanges

Outside Diameter*	When O.D. is 24" or less	$\pm \frac{1}{16}"$
	When O.D. is over 24"	$\pm \frac{1}{8}"$
Inside Diameter	10" and smaller	$\pm \frac{1}{32}"$
	12" through 18"	$\pm \frac{1}{16}"$
	20" and larger	$+\frac{1}{8}"$, $-\frac{1}{16}"$
Diameter of Contact Face	$\frac{1}{16}"$ Raised Face	$\pm \frac{1}{32}"$
	$\frac{1}{4}"$ Raised Face Tongue and Groove, or Male and Female	$\pm \frac{1}{64}"$
Diameter of Hub at Point of Welding	5" and smaller	$+\frac{3}{32}"$, $-\frac{1}{32}"$
	6" and larger	$+\frac{3}{32}"$, $-\frac{1}{32}"$
Welding Bevel Standards	see drawings on Page 149.	
Diameter of Hub at Base*	When Hub Base is 24" or less	$\pm \frac{1}{16}"$
	When Hub Base is over 24"	$\pm \frac{1}{8}"$
Drilling	Bolt Circle	$\pm \frac{1}{16}"$
	Bolt hole spacing	$\pm \frac{1}{32}"$
Eccentricity Bolt Circle & Facing (with Respect to Bore*)	2 1/2" and smaller	$\frac{1}{32}"$ max.
	3" and larger	$\frac{1}{16}"$ max.
Length Thru Hub	10" and smaller	$\pm \frac{1}{16}"$
	12" and larger	$\pm \frac{1}{8}"$
Thickness	18" and smaller	$+\frac{1}{8}"$, $-0"$
	20" and larger	$+\frac{3}{16}"$, $-0"$
	Where allowance has been left on face for finish: All sizes*	$+\frac{1}{8}"$, $-\frac{1}{16}"$

*Tolerance for these dimensions not covered by ANSI B16.5.

Gasket Surface Finishes

Taylor Forge Flanges, Welding Necks, Channel Sections and other products designed for bolted connection, when furnished with raised face (or flat faced) may have any type of gasket surface finish that is required. The more common finishes are described in the following paragraphs and it should be noted particularly that, unless otherwise specified by the purchaser, the STOCK FINISH will be furnished.

1 STOCK FINISH:

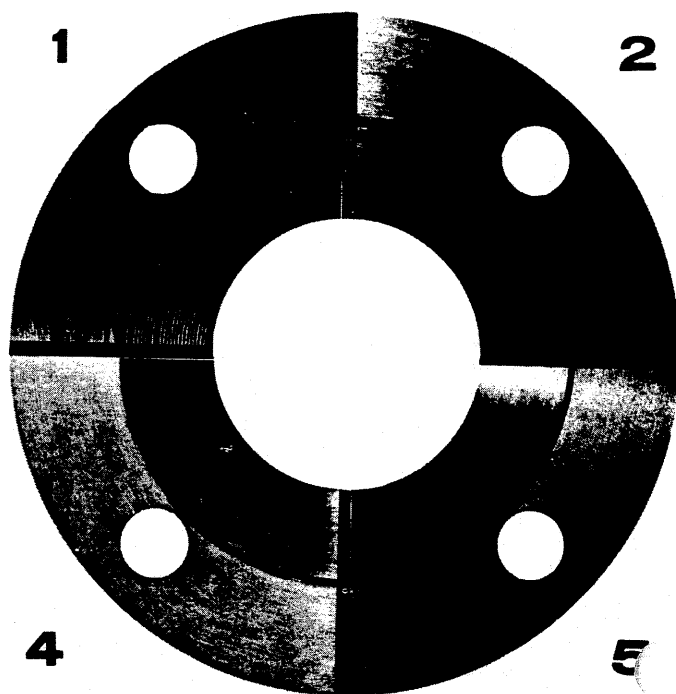
This is a continuous spiral groove generated by a $\frac{1}{16}$ " radius round-nosed tool at a feed of $\frac{1}{32}$ " per revolution.

2 SPIRAL SERRATED:

This too, is a continuous spiral groove, but it differs from the stock finish in that the groove is generated with a 90° included angle "V" tool. The groove is $\frac{1}{64}$ " deep and the feed is $\frac{1}{32}$ " for all sizes.

3 CONCENTRIC SERRATED:

As the name suggests this surface finish is made up of concentric grooves. A 90° included angle "V" tool is used and the grooves are $\frac{1}{64}$ " deep and $\frac{1}{32}$ " apart.



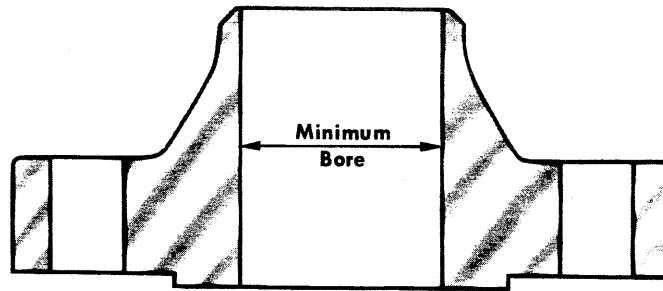
4 SMOOTH FINISH:

This finish, which can be produced by several shapes of tools, shows no definite tool markings apparent to the naked eye. In the past this finish was sometimes known as "Smooth Plane." This term, however, should be avoided because of a tendency to confuse it with "flat faced" which, applies to the flange facing and not to the gasket surface finish. This surface finish corresponds to 63-125 AA.

5 COLD WATER FINISH:

Produced by using a wide tool at high speeds, this finish is equivalent to that of a ground surface. It is mirrorlike in appearance and surfaces finished in this manner are usually expected to be used without gaskets. It corresponds to 32-62 AA.

MINIMUM FINISHED BORES



Welding Neck Flanges

Nominal Pipe Size	PIPE INSIDE DIAMETERS				MINIMUM FINISHED FLANGE BORES†						
	Standard Wall	Extra Strong	Schedule 160	Double Extra Strong	150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.	2500 Lb.
½	.622	.546	.464	.252	*	*	*	*	*	*	*
¾	.824	.742	.612	.434	*	*	*	*	*	*	*
1	1.049	.957	.815	.599	*	*	*	*	*	*	*
1¼	1.380	1.278	1.160	.896	*	*	*	*	*	*	*
1½	1.610	1.500	1.338	1.100	*	*	*	*	*	*	*
2	2.067	1.939	1.687	1.503	1.50	1.81	1.53	1.53	*	*	*
2½	2.469	2.323	2.125	1.771	2.21	2.21	2.21	2.21	*	*	*
3	3.068	2.900	2.624	2.300	2.80	2.80	2.21	2.21	2.21	2.15	2.13
3½	3.548	3.364	--	2.728	3.30	3.34	3.34	3.34	--	--	--
4	4.026	3.826	3.438	3.152	3.78	3.75	3.75	3.37	3.12	3.09	3.09
5	5.047	4.813	4.313	4.063	4.75	4.75	4.75	4.31	4.00	3.93	3.63
6	6.065	5.761	5.187	4.897	5.71	5.65	5.65	4.78	4.78	4.78	4.62
8	7.981	7.625	6.813	6.875	7.59	7.40	7.40	6.81	6.81	6.81	6.13
10	10.020	9.750	8.500	8.750	9.43	9.43	9.43	9.00	8.34	8.15	8.13
12	12.000	11.750	10.126	10.750	11.34	11.25	11.25	10.62	10.12	10.12	9.50
14	13.250	13.000	11.188	--	12.78	12.71	12.71	12.50	12.50	12.50	--
16	15.250	15.000	12.812	--	14.71	14.69	14.50	14.19	14.50	14.50	--
18	17.250	17.000	14.438	--	17.00	16.88	16.50	16.50	16.50	16.50	--
20	19.250	19.000	16.062	--	19.00	18.81	18.50	18.37	18.50	18.50	--
22	21.250	21.000	--	--	21.00	20.88	20.50	20.50	--	--	--
24	23.250	23.000	19.312	--	23.00	22.88	22.50	22.50	22.50	22.50	--

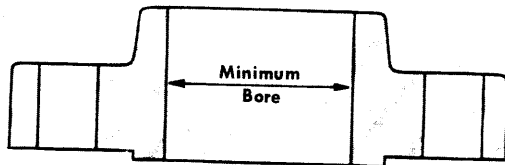
All dimensions are in inches.

* These sizes are forged solid. Any specified bore can be furnished.

† These are minimum dimensions to which stock forgings can be machined. Smaller bores can be furnished on special order.

MINIMUM FINISHED BORES

Slip-on and Lap Joint Flanges



All dimensions are in inches.

* These sizes are forged solid. Any specified bore can be furnished.

† These are minimum dimensions to which stock forgings can be machined. Smaller bores can be furnished on special order.

Nominal Pipe Size	Outside Pipe Diameter	MINIMUM FINISHED BORES†					
		150 Lb.	300 Lb.	400 Lb.	600 Lb.	900 Lb.	1500 Lb.
1/2	.840	*	*	*	*	*	*
3/4	1.050	*	*	*	*	*	*
1	1.315	*	*	*	*	*	*
1 1/4	1.660	1.34	1.40	1.40	1.40	1.40	1.40
1 1/2	1.900	1.68	1.68	1.68	1.68	1.68	1.68
2	2.375	2.18	2.18	2.18	2.18	1.87	1.87
2 1/2	2.875	2.62	2.65	2.65	2.65	2.21	2.21
3	3.500	3.18	3.18	3.18	3.18	2.96	3.00
3 1/2	4.000	3.68	3.68	3.43	3.68	--	--
4	4.500	4.18	4.18	4.18	3.87	3.93	4.00
5	5.563	5.25	5.21	5.21	5.25	5.25	4.71
6	6.625	6.28	6.31	6.31	6.31	6.31	6.46
8	8.625	8.31	8.00	8.00	8.37	8.56	8.37
10	10.750	10.40	10.40	10.40	10.40	9.00	9.00
12	12.750	12.46	12.40	12.40	12.43	11.00	11.00
14	14.000	13.53	13.62	13.00	13.00	13.00	13.00
16	16.000	15.62	15.00	15.00	15.00	15.00	15.00
18	18.000	17.00	17.00	17.00	17.00	17.00	17.00
20	20.000	19.00	19.00	19.00	19.00	19.00	19.00
22	22.000	21.00	21.00	21.00	21.00	--	--
24	24.000	23.00	23.00	23.00	23.00	23.00	23.00

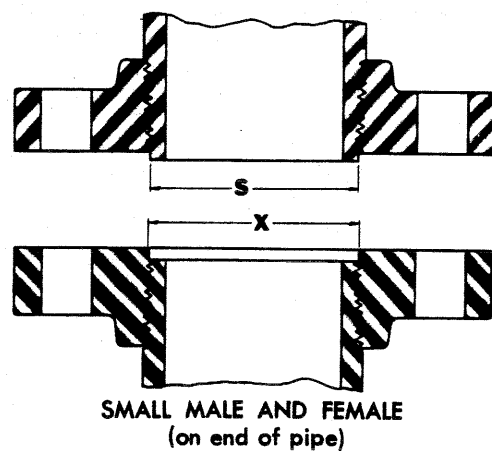
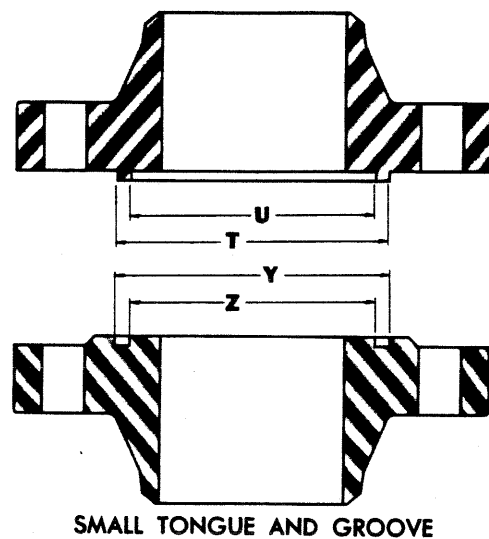
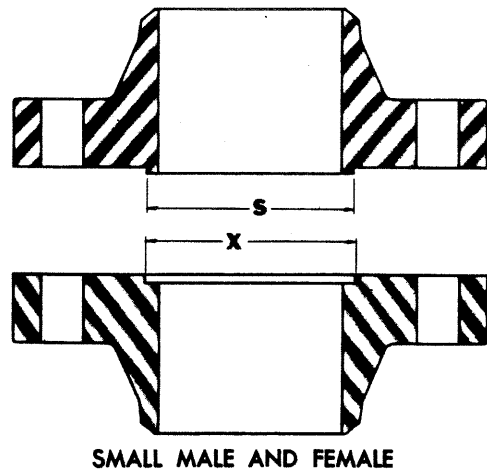
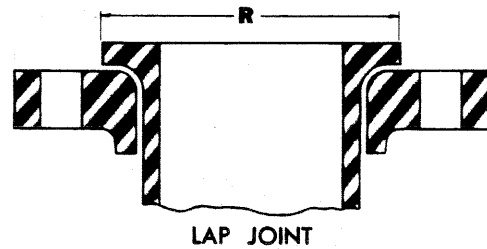
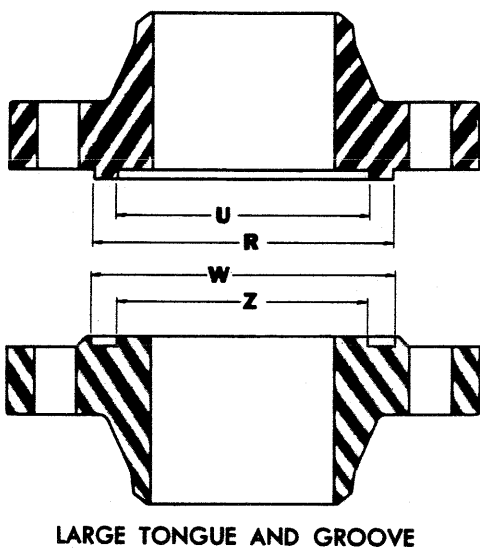
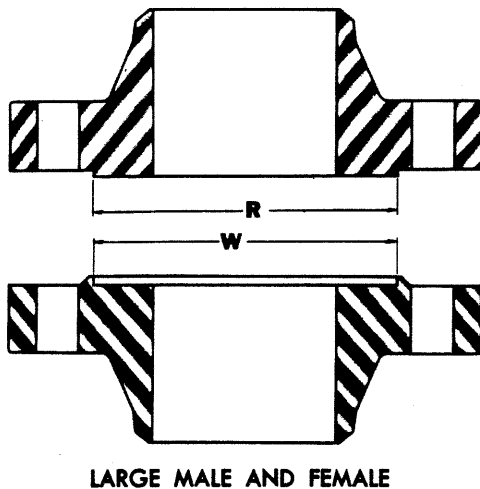
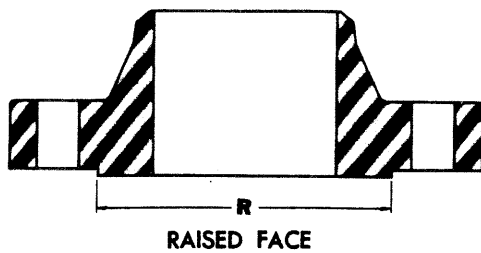
Dimensions of Gaskets (non-metallic—ANSI B16.21)

Nominal Pipe Size	INSIDE DIAMETER		OUTSIDE DIAMETER									
	Raised Face, Male and Female ^Δ	Tongue and Groove (Large and Small)	Raised Face							Small Male and Female	Small Tongue and Groove	Male and Female, Tongue and Groove (Large)
			150Lb.	300Lb.	400Lb.	600Lb.	900Lb.	1500 Lb.	2500 Lb.			
1	1 1/16	1 1/2	2 5/8	2 7/8	2 7/8	2 7/8	3 1/8	3 1/8	3 3/8	1 1/8	1 7/8	2
1 1/4	1 1/32	1 5/8	3	3 1/4	3 1/4	3 1/4	3 1/2	3 1/2	4 1/8	1 1/2	2 1/4	2 1/2
1 1/2	1 1/16	2 1/8	3 3/8	3 3/4	3 3/4	3 3/4	3 3/4	3 3/8	4 1/4	1 3/4	2 1/2	2 3/8
2	2 3/8	2 7/8	4 1/8	4 3/8	4 3/8	4 3/8	5 5/8	5 5/8	5 3/4	2 1/4	3 1/4	3 3/8
2 1/2	2 7/8	3 3/8	4 3/8	5 1/8	5 1/8	5 1/8	6 1/2	6 1/2	6 3/8	2 11/16	3 3/4	4 1/8
3	3 1/2	4 1/4	5 3/8	5 7/8	5 7/8	5 7/8	6 5/8	6 7/8	7 1/4	3 1/16	4 1/8	5
3 1/2	4	4 3/4	6 3/8	6 1/2	6 3/8	6 3/8	--	--	--	3 13/16	5 1/8	5 1/2
4	4 1/2	5 1/16	6 7/8	7 1/8	7	7 7/8	8 1/8	8 1/4	9 1/4	4 3/16	5 11/16	6 3/16
5	5 1/16	6 1/16	7 3/4	8 1/2	8 3/8	9 1/2	9 3/4	10	11	5 1/8		7 1/16
6	6 3/8	7 1/2	8 3/4	9 7/8	9 3/4	10 1/2	11 3/8	11 1/8	12 1/2	6 3/8	Larger Sizes not Covered by ANSI B16.21	8 1/2
8	8 3/8	9 3/8	11	12 1/8	12	12 1/2	14 1/4	13 3/8	15 1/4	8 3/8		10 3/4
10	10 3/4	11 1/4	13 3/8	14 1/4	14 1/8	15 3/4	17 1/8	17 1/8	18 3/4	10 1/2		12 3/4
12	12 3/4	13 1/2	16 1/8	16 3/8	16 1/2	18	19 3/8	20 1/2	21 3/8	12 1/2		15
14	14	14 3/4	17 3/4	19 1/8	19	19 3/8	20 1/2	22 3/4	--	13 3/4		16 1/4
16	16	16 3/4	20 1/4	21 1/4	21 1/8	22 1/4	22 3/8	25 1/4	--	15 3/4		18 1/2
18	18	19 1/4	21 3/8	23 1/2	23 3/8	24 1/8	25 1/8	27 3/4	--	17 3/4		21
20	20	21	23 3/8	25 3/4	25 1/2	26 3/8	27 1/2	29 3/4	--	19 3/4		23
22	22	23 1/4	26 1/4	28 1/2	28 1/4	29 1/8	31	33 1/2	--	21 3/4		25 1/4
24	24	25 1/4	28 1/4	30 1/2	30 1/4	31 1/8	33	35 1/2	--	23 3/4		27 1/4

All dimensions are in inches.

^ΔFor large male and female gaskets only. For small male and female gaskets purchaser must specify inside diameter of pipe.

AMERICAN STANDARD FLANGE FACINGS



AMERICAN STANDARD FLANGE FACINGS

For 150, 300, 400, 600, 900, 1500 and 2500 Lb. Flanges

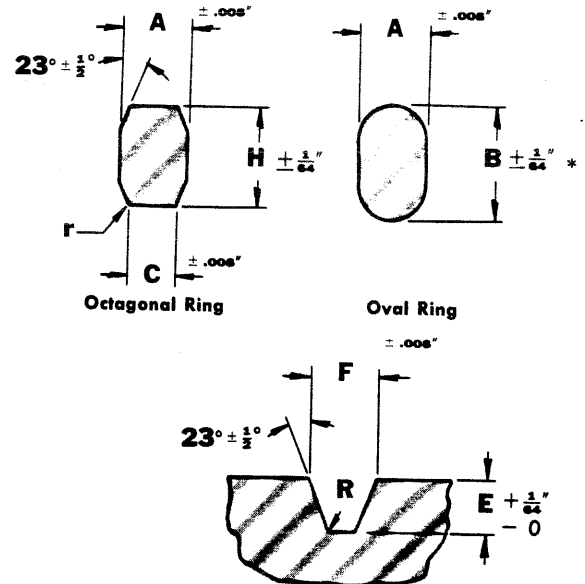
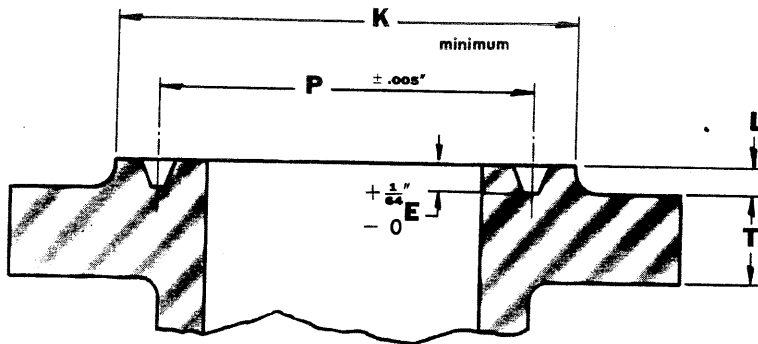
Nominal Pipe Size	Outside Diameter ²			I.D. of Large and Small Tongue ^{3,5}	Outside Diameter ²			I.D. of Large and Small Groove ^{3,5}	Height		Depth of Groove or Female
	Raised Face, Lap Joint, Large Male and Large Tongue ⁵	Small Male ^{4,5}	Small Tongue ⁵		Large Female and Large Groove ⁵	Small Female ^{4,5}	Small Groove ⁵		Raised Face 150 and 300-Pound Standards ¹	Raised Face, Large and Small Male and Tongue 400, 600, 900, 1500 and 2500- Pound Standards ²	
	R	S	T	U	W	X	Y	Z			
½	1⅜	2⅜	1⅜	1	1⅞	2⅜	1⅞	1⅞	⅞	¼	⅜
¾	1⅞	1⅞	1⅞	1⅞	1⅞	1	1⅞	1⅞	⅞	¼	⅜
1	2	1⅞	1⅞	1½	2⅞	1¼	1⅞	1⅞	⅞	¼	⅜
1¼	2½	1½	2¼	1⅞	2⅞	1⅞	2⅞	1⅞	⅞	¼	⅜
1½	2⅞	1¾	2½	2⅞	2⅞	1⅞	2⅞	2⅞	⅞	¼	⅜
2	3⅞	2¼	3¼	2⅞	3⅞	2⅞	3⅞	2⅞	⅞	¼	⅜
2½	4⅞	2⅞	3¾	3⅞	4⅞	2¾	3⅞	3⅞	⅞	¼	⅜
3	5	3⅞	4⅞	4¼	5⅞	3⅞	4⅞	4⅞	⅞	¼	⅜
3½	5½	3⅞	5⅞	4¾	5⅞	3⅞	5⅞	4⅞	⅞	¼	⅜
4	6⅞	4⅞	5⅞	5⅞	6¼	4⅞	5¾	5⅞	⅞	¼	⅜
5	7⅞	5⅞	6⅞	6⅞	7⅞	5⅞	6⅞	6¼	⅞	¼	⅜
6	8½	6⅞	8	7½	8⅞	6⅞	8⅞	7⅞	⅞	¼	⅜
8	10⅞	8⅞	10	9⅞	10⅞	8⅞	10⅞	9⅞	⅞	¼	⅜
10	12¾	10½	12	11¼	12⅞	10⅞	12⅞	11⅞	⅞	¼	⅜
12	15	12½	14¼	13½	15⅞	12⅞	14⅞	13⅞	⅞	¼	⅜
14	16¼	13¾	15½	14¾	16⅞	13⅞	15⅞	14⅞	⅞	¼	⅜
16	18½	15¾	17⅞	16¾	18⅞	15⅞	17⅞	16⅞	⅞	¼	⅜
18	21	17¾	20⅞	19¼	21⅞	17⅞	20⅞	19⅞	⅞	¼	⅜
20	23	19¾	22	21	23⅞	19⅞	22⅞	20⅞	⅞	¼	⅜
24	27¼	23¾	26¼	25¼	27⅞	23⅞	26⅞	25⅞	⅞	¼	⅜

All dimensions are in inches.

1. Regular facing for 150 and 300 Lb. steel flanged fittings and flange standards is a $\frac{1}{16}$ inch raised face included in the minimum flange thickness. A $\frac{1}{16}$ inch raised face is also permitted on the 400, 600, 900, 1500 and 2500 Lb. flange standards, but it must be added to the minimum flange thickness.
2. Regular facing for 400, 600, 900, 1500 and 2500 Lb. flange standards is a $\frac{1}{4}$ inch raised face not included in minimum flange thickness dimensions.
3. A tolerance of plus or minus 0.016 inch ($\frac{1}{64}$ inch) is allowed on the inside and outside diameters of all facings.

4. Care should be taken in the use of joints of these dimensions, (they apply particularly on lines where the joint is made on the end of pipe) to insure that pipe used is thick enough to permit sufficient bearing surface to prevent crushing the gasket. Threaded companion flanges are furnished with plain face and are threaded with American Standard Locknut Thread.
5. Gaskets for male-female and tongue-groove joints shall cover the bottom of the recess with minimum clearances taking into account the tolerances prescribed in Note 3.

FACING DIMENSIONS FOR RING JOINT FLANGES



150 LB. STANDARD

ANSI B16.5 and B16.20

Nominal Pipe Size	Pitch Diam. Ring & Groove	GROOVE DIMENSIONS			RING DIMENSIONS				Diam. Raised Face or Lap	Distance Between Flanges When Ring is Compressed	Ring and Groove Number
					Width	Height		Width of Flat			
		Depth	Radius	Width		Oval	Octagonal				
1	1 7/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	2 1/2	5/32	R 15
1 1/4	2 1/4	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	2 3/8	5/32	R 17
1 1/2	2 5/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	3 1/4	5/32	R 19
2	3 1/4	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	4	5/32	R 22
2 1/2	4	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	4 3/4	5/32	R 25
3	4 1/2	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	5 1/4	5/32	R 29
3 1/2	5 3/16	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	6 1/16	5/32	R 33
4	5 7/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	6 3/4	5/32	R 36
5	6 3/4	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	7 5/8	5/32	R 40
6	7 5/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	8 5/8	5/32	R 43
8	9 3/4	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	10 3/4	5/32	R 48
10	12	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	13	5/32	R 52
12	15	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	16	5/32	R 56
14	15 5/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	16 3/4	1/8	R 59
16	17 3/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	19	1/8	R 64
18	20 3/8	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	21 1/2	1/8	R 68
20	22	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	23 1/2	1/8	R 72
22	24 1/4	1 1/32	1/4	1/32	5/16	-	1/2	.206	25 1/2	1/8	R 80
24	26 1/2	1 1/32	1/4	1/32	5/16	9/16	1/2	.206	28	1/8	R 76

All dimensions are in inches.

Unless otherwise specified by the purchaser, Ring Type Joint Flanges will be furnished in accordance with these details.

The depth of groove is added to the minimum flange thickness. Raised face "L" is equal to groove dimension "E" but is not subject to tolerances for "E".

* A plus tolerance of 3/64 in. for heights B and H is permitted providing the variation in the height of any given ring does

not exceed 1/64 in. throughout its entire circumference. Dimension "R" is max.

Radius "r" is 1/16" for ring widths 7/8" and less and 3/32" for ring widths 1" and over.

† For Ring Joints with Lapped Flanges in the 300, 400 lb. standards, Ring and Groove Number R30 are used instead of R31. Dimensions of Ring R30 are identical to R31, except that the pitch diameter is 4 5/8".

300, 400 and 600 LB. STANDARDS

(Ring Joint Facing Dimensions—Continued)

ANSI B16.5 and B16.2

Nominal Pipe Size	Pitch Diam. Ring & Groove	GROOVE DIMENSIONS			RING DIMENSIONS				Diam. Raised Face or Lap	Distance Between Flanges When Ring is Compressed			Ring and Groove Number
					Width	Height		Width of Flat		300 lb. Std.	400 lb. Std.	600 lb. Std.	
		Depth	Radius	Oval		Octag- onal							
							Width						
P	F	E	R	A	B	H	C	K	300 lb. Std.	400 lb. Std.	600 lb. Std.	Ring and Groove Number	
1/2	1 11/32	9/32	7/32	1/32	1/4	7/16	3/8	.170	2	1/8	1/8	1/8	R 11
3/4	1 11/16	11/32	1/4	1/32	5/16	9/16	1/2	.206	2 1/2	5/32	5/32	5/32	R 13
1	2	11/32	1/4	1/32	5/16	9/16	1/2	.206	2 3/4	5/32	5/32	5/32	R 16
1 1/4	2 3/8	11/32	1/4	1/32	5/16	9/16	1/2	.206	3 1/8	5/32	5/32	5/32	R 18
1 1/2	2 11/16	11/32	1/4	1/32	5/16	9/16	1/2	.206	3 1/16	5/32	5/32	5/32	R 20
2	3 1/4	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	4 1/4	7/32	3/16	3/16	R 23
2 1/2	4	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	5	7/32	3/16	3/16	R 26
3 †	4 7/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	5 3/4	7/32	3/16	3/16	R 31
3 1/2	5 1/16	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	6 1/4	7/32	3/16	3/16	R 34
4	5 7/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	6 7/8	7/32	7/32	3/16	R 37
5	7 1/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	8 1/4	7/32	7/32	3/16	R 41
6	8 5/16	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	9 1/2	7/32	7/32	3/16	R 45
8	10 5/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	11 7/8	7/32	7/32	3/16	R 49
10	12 3/4	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	14	7/32	7/32	3/16	R 53
12	15	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	16 1/4	7/32	7/32	3/16	R 57
14	16 1/2	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	18	7/32	7/32	3/16	R 61
16	18 1/2	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	20	7/32	7/32	3/16	R 65
18	21	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	22 5/8	7/32	7/32	3/16	R 69
20	23	17/32	3/8	1/16	1/2	3/4	1 1/16	.341	25	7/32	7/32	3/16	R 71
22	25	19/32	7/16	1/16	9/16	- -	3/4	.377	27	- -	- -	- -	R 81
24	27 1/4	21/32	7/16	1/16	5/8	7/8	1 1/16	.413	29 1/2	1/4	1/4	7/32	R 77
MSS—SP44 Classes 300, 400 and 600 For further information on this Standard see Page													
26	29 1/2	23/32	1/2	1/16	3/4	- -	1 5/16	.485	31 7/8				R 93
28	31 1/2	23/32	1/2	1/16	3/4	- -	1 5/16	.485	33 7/8				R 94
30	33 3/4	23/32	1/2	1/16	3/4	- -	1 5/16	.485	36 1/8				R 95
32	36	29/32	9/16	1/16	7/8	- -	1 1/16	.583	38 3/4				R 96
34	38	29/32	9/16	1/16	7/8	- -	1 1/16	.583	40 3/4				R 97
36	40 1/4	29/32	9/16	1/16	7/8	- -	1 1/16	.583	43				R 98

900 LB. STANDARD

(for sizes 1/2" through 2 1/2", use 1500 lb. Standard dimensions)

3	4 7/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	6 1/8	- -	5/32	- -	R 31
4	5 7/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	7 1/8	- -	5/32	- -	R 37
5	7 1/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	8 1/2	- -	5/32	- -	R 41
6	8 3/16	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	9 1/2	- -	5/32	- -	R 45
8	10 5/8	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	12 1/8	- -	5/32	- -	R 49
10	12 3/4	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	14 1/4	- -	5/32	- -	R 53
12	15	15/32	5/16	1/32	7/16	1 1/16	5/8	.305	16 1/2	- -	5/32	- -	R 57
14	16 1/2	21/32	7/16	1/16	5/8	7/8	1 1/16	.413	18 3/8	- -	5/32	- -	R 62
16	18 1/2	21/32	7/16	1/16	5/8	7/8	1 1/16	.413	20 5/8	- -	5/32	- -	R 66
18	21	23/32	1/2	1/16	3/4	1	1 5/16	.485	23 3/8	- -	3/16	- -	R 70
20	23	23/32	1/2	1/16	3/4	1	1 5/16	.485	25 1/2	- -	3/16	- -	R 74
24	27 1/4	1 1/16	5/8	3/32	1	1 5/16	1 1/4	.681	30 3/8	- -	7/32	- -	R 78
MSS—SP44 Class 900 For further information on this Standard see Page 99													
26	29 1/2	1 1/16	1 1/16	3/32	1 1/8	- -	1 3/8	.780	32 3/4				R 100
28	31 1/2	1 1/16	1 1/16	3/32	1 1/4	- -	1 1/2	.879	35				R 101
30	33 3/4	1 1/16	1 1/16	3/32	1 1/4	- -	1 1/2	.879	37 1/4				R 102
32	36	1 5/16	1 1/16	3/32	1 1/4	- -	1 1/2	.879	39 1/2				R 103
34	38	1 7/16	1 3/16	3/32	1 3/8	- -	1 5/8	.977	42				R 104
	40 1/4	1 7/16	1 3/16	3/32	1 3/8	- -	1 5/8	.977	44 1/4				R 105

table footnotes see opposite page.

MATERIAL SPECIFICATIONS (continued)

Material	ASTM Specification		Nominal Composition	Minimum		Form
	Number	Grade		Tensile Strength	Yield Point	
STAINLESS STEELS	A182	F6	13% Cr, 1% Si max.	85,000	55,000	Forging
		F304	18% Cr, 8% Ni	75,000	30,000	
		F310	25% Cr, 20% Ni	75,000	30,000	
		F316	18% Cr, 12% Ni, 2–3% Mo	75,000	30,000	
		F321	18% Cr, 10% Ni, Ti stabilized	75,000	30,000	
		F347	18% Cr, 10% Ni, Cb stabilized	75,000	30,000	
	A268	TP410	11.50–13.50% Cr	60,000	30,000	Tubular
		TP430	16–18% Cr	60,000	35,000	
	A312	TP304	18% Cr, 8% Ni	75,000	30,000	Tubular
		TP309	23% Cr, 12% Ni	75,000	30,000	
		TP310	25% Cr, 20% Ni	75,000	30,000	
		TP316	18% Cr, 12% Ni, 2–3% Mo	75,000	30,000	
		TP317	18% Cr, 12% Ni, 3–4% Mo	75,000	30,000	
		TP321	18% Cr, 10% Ni, Ti stabilized	75,000	30,000	
		TP347	18% Cr, 10% Ni, Cb stabilized	75,000	30,000	
NICKEL	B160	Nickel	99% Ni min.	55,000	15,000	Forging
	B161	Nickel	99% Ni min.	55,000	15,000	Tubular
MONEL	B164	Class A	63–70% Ni, 24–31% Cu	70,000	25,000	Forging
	B165	—	63–70% Ni, 24–31% Cu	70,000	28,000	Tubular
INCONEL	B166	—	72% Ni min., 14–17% Cr, 6–10% Fe	80,000	35,000	Forging
	B167	—	72% Ni min., 14–17% Cr, 6–10% Fe	80,000	30,000	Tubular
INCONEL X	—	—	Nickel Base, 15% Cr, 7% Fe, 2.5% Ti, 1% (Cb + Ta), 0.7% Al	—	—	Forging
HASTELLOY B	—	—	Nickel Base, 28% Mo, 5.5% Fe	—	—	Forging

TABLE OF PROPERTIES OF PIPE

Tabulated below are the most generally required data used in piping design. This table is believed to be the most comprehensive published up to this time. Many thicknesses traditionally included in such tables have been omitted because of their having become obsolete through disuse and lack of coverage by any Standard.

Sizes and thicknesses listed herein are covered by the following Standards:—

- 1) American National Standard Institute B36.10
- 2) American National Standard Institute B36.19
- 3) American Petroleum Institute Standard API 5L
- 4) American Petroleum Institute Standard API 5LX
- 5) New United States Legal Standard for Steel Plate Gauges.

Sizes and thicknesses to which no Standard designation applies are largely the more commonly used dimensions to which Taylor Forge Electric Fusion Welded Pipe is produced for a wide variety of applications including river crossings, penstocks, power plant and other piping.

All data is computed from the *nominal* dimension listed and the effect of tolerances is not taken into account. Values are computed by application of the following formulas:

$$\text{Radius of Gyration: } R = .25\sqrt{D^2 + d^2}$$

$$\text{Moment of Inertia: } I = R^2 A$$

$$\text{Section Modulus: } Z = \frac{I}{0.5D}$$

ANSI American National Standards Institute

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam.								A	A	I	Z	
	D												
1/8	.405	10S Std.	.049	.307	.186	.0320	.106	.0804	.0740	.0548	.00090	.00440	.1270
		X-Stg.	.068	.269	.244	.0246	.106	.0705	.0568	.0720	.00106	.00530	.1215
			.095	.215	.314	.0157	.106	.0563	.0364	.0925	.00122	.00600	.1146
1/4	.540	10S Std.	.065	.410	.330	.0570	.141	.1073	.1320	.0970	.00280	.01030	.1695
		X-Stg.	.088	.364	.424	.0451	.141	.0955	.1041	.1250	.00331	.01230	.1628
			.119	.302	.535	.0310	.141	.0794	.0716	.1574	.00378	.01395	.1547
3/8	.675	10S Std.	.065	.545	.423	.1010	.177	.1427	.2333	.1245	.00590	.01740	.2160
		X-Stg.	.091	.493	.567	.0827	.177	.1295	.1910	.1670	.00730	.02160	.2090
			.126	.423	.738	.0609	.177	.1106	.1405	.2173	.00862	.02554	.1991
1/2	.840	10S Std.	.083	.670	.671	.1550	.220	.1764	.3568	.1974	.01430	.03410	.2692
			.109	.622	.850	.1316	.220	.1637	.3040	.2503	.01710	.04070	.2613
		X-Stg.	.147	.546	1.087	.1013	.220	.1433	.2340	.3200	.02010	.04780	.2505
		160	.138	.464	1.310	.0740	.220	.1220	.1706	.3836	.02213	.05269	.2402
3/4	1.050	XX-Stg.	.294	.252	1.714	.0216	.220	.0660	.0499	.5043	.02424	.05772	.2192
		10S Std.	.083	.884	.857	.2660	.275	.2314	.6138	.2522	.02970	.05660	.3430
			.113	.824	1.130	.2301	.275	.2168	.5330	.3326	.03704	.07055	.3337
		X-Stg.	.154	.742	1.473	.1875	.275	.1948	.4330	.4335	.04479	.08531	.3214
1	1.315	160	.219	.612	1.940	.1280	.275	.1607	.2961	.5698	.05270	.10038	.3041
		XX-Stg.	.308	.434	2.440	.0633	.275	.1137	.1479	.7180	.05792	.11030	.2840
		10S Std.	.109	1.097	1.404	.4090	.344	.2872	.9448	.4129	.07560	.1150	.4282
			.133	1.049	1.678	.3740	.344	.2740	.8640	.4939	.08734	.1328	.4205
1 1/4	1.660	X-Stg.	.179	.957	2.171	.3112	.344	.2520	.7190	.6388	.10560	.1606	.4066
		160	.250	.815	2.850	.2261	.344	.2134	.5217	.8364	.12516	.1903	.3868
		XX-Stg.	.358	.599	3.659	.1221	.344	.1570	.2818	1.0760	.14050	.2136	.3613
		10S Std.	.109	1.442	1.806	.7080	.434	.3775	1.633	.5314	.1606	.1934	.549
1 1/2	1.660		.140	1.380	2.272	.6471	.434	.3620	1.495	.6685	.1947	.2346	.5397
			.191	1.278	2.996	.5553	.434	.3356	1.283	.8815	.2418	.2913	.5237
			.250	1.160	3.764	.4575	.434	.3029	1.057	1.1070	.2833	.3421	.5063
			.382	.896	5.214	.2732	.434	.2331	.6305	1.5340	.3411	.4110	.4716

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam.	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam.												
	D			d					A	A	I	Z	R
1½	1.900	10S Std.	.109 .145	1.682 1.610	2.085 2.717	.9630 .8820	.497 .497	.4403 .4213	2.221 2.036	.613 .800	.2469 .3099	.2599 .3262	.6344 .6226
		X-Stg. 160	.200 .281	1.500 1.337	3.631 4.862	.7648 .6082	.497 .497	.3927 .3519	1.767 1.405	1.068 1.430	.3912 .4826	.4118 .5080	.6052 .5809
		XX-Stg.	.400	1.100	6.408	.4117	.497	.2903	.950	1.885	.5678	.5977	.5489
2	2.375	10S Std.	.109 .154	2.157 2.067	2.638 3.652	1.583 1.452	.622 .622	.5647 .5401	3.654 3.355	.775 1.075	.5003 .6657	.4213 .5606	.8034 .7871
		X-Stg.	.218	1.939	5.022	1.279	.622	.5074	2.953	1.477	.8679	.7309	.7665
		-- 160	.250 .344	1.875 1.687	5.673 7.450	1.196 .970	.622 .622	.4920 .4422	2.761 2.240	1.669 2.190	.9555 1.162	.8046 .9790	.7565 .7286
2½	2.875	XX-Stg.	.436	1.503	9.029	.769	.622	.3929	1.774	2.656	1.311	1.1040	.7027
		10S Std.	.120 .203	2.635 2.469	3.53 5.79	2.360 2.072	.753 .753	.6900 .6462	5.453 4.788	1.038 1.704	.9878 1.530	.6872 1.064	.9755 .9474
		X-Stg. 160	.276 .375	2.323 2.125	7.66 10.01	1.834 1.535	.753 .753	.6095 .5564	4.238 3.547	2.254 2.945	1.924 2.353	1.339 1.638	.9241 .8938
3	3.500	XX-Stg.	.552	1.771	13.69	1.067	.753	.4627	2.464	4.028	2.871	1.997	.8442
		10S API	.120 .125	3.260 3.250	4.33 4.52	3.62 3.60	.916 .916	.853 .851	8.346 8.300	1.272 1.329	1.821 1.900	1.041 1.086	1.196 1.195
		API	.156	3.188	5.58	3.46	.916	.835	7.982	1.639	2.298	1.313	1.184
3½	4.000	API Std.	.188 .216	3.125 3.068	6.65 7.57	3.34 3.20	.916 .916	.819 .802	7.700 7.393	1.958 2.228	2.700 3.017	1.545 1.724	1.175 1.164
		API	.250	3.000	8.68	3.06	.916	.785	7.184	2.553	3.388	1.936	1.152
		API X-Stg. 160	.281 .300	2.938 2.900	9.65 10.25	2.94 2.86	.916 .916	.769 .761	6.780 6.605	2.842 3.016	3.819 3.892	2.182 2.225	1.142 1.136
4	4.500	XX-Stg.	.438 .600	2.624 2.300	14.32 18.58	2.34 1.80	.916 .916	.687 .601	5.407 4.155	4.214 5.466	5.044 5.993	2.882 3.424	1.094 1.047
		10S API	.120 .125	3.760 3.750	4.97 5.18	4.81 4.79	1.047 1.047	.984 .982	11.10 11.04	1.46 1.52	2.754 2.859	1.377 1.430	1.372 1.371
		API	.156	3.688	6.41	4.63	1.047	.966	10.68	1.88	3.485	1.743	1.360
4½	5.000	API Std.	.188 .226	3.624 3.548	7.71 9.11	4.48 4.28	1.047 1.047	.950 .929	10.32 9.89	2.27 2.68	4.130 4.788	2.065 2.394	1.350 1.337
		API	.250	3.500	10.02	4.17	1.047	.916	9.62	2.94	5.201	2.601	1.329
		API X-Stg. 120	.281 .318	3.438 3.364	11.17 12.51	4.02 3.85	1.047 1.047	.900 .880	9.28 8.89	3.29 3.68	5.715 6.280	2.858 3.140	1.319 1.307
5	5.500	XX-Stg.	.636	2.728	22.85	2.53	1.047	.716	5.84	6.72	9.848	4.924	1.210
		10S API	.120 .125	4.260 4.250	5.61 5.84	6.18 6.15	1.178 1.178	1.115 1.113	14.25 14.19	1.65 1.72	3.97 4.12	1.761 1.829	1.550 1.548
		API	.156	4.188	7.24	5.97	1.178	1.096	13.77	2.13	5.03	2.235	1.537
6	6.000	API Std.	.188 .219	4.124 4.062	8.56 10.02	5.80 5.62	1.178 1.178	1.082 1.063	13.39 12.96	2.52 2.94	5.86 6.77	2.600 3.867	1.525 1.516
		API	.237	4.026	10.79	5.51	1.178	1.055	12.73	3.17	7.23	3.214	1.510
		API X-Stg. 120	.250 .281	4.000 3.938	11.35 12.67	5.45 5.27	1.178 1.178	1.049 1.031	12.57 12.17	3.34 3.73	7.56 8.33	3.360 3.703	1.505 1.495
7	6.500	API	.312	3.876	14.00	5.12	1.178	1.013	11.80	4.11	9.05	4.020	1.482
		X-Stg. 120	.337 .438	3.826 3.624	14.98 19.00	4.98 4.47	1.178 1.178	1.002 .949	11.50 10.32	4.41 5.59	9.61 11.65	4.271 5.177	1.477 1.444
		--	.500	3.500	21.36	4.16	1.178	.916	9.62	6.28	12.77	5.676	1.425
8	7.000	160 XX-Stg.	.531 .674	3.438 3.152	22.60 27.54	4.02 3.38	1.178 1.178	.900 .826	9.28 7.80	6.62 8.10	13.27 15.28	5.900 6.793	1.416 1.374

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam. D								A	A	I	Z	R
5	5.563	10S	.134	5.295	7.77	9.54	1.456	1.386	22.02	2.29	8.42	3.028	1.920
		API	.156	5.251	9.02	9.39	1.456	1.375	21.66	2.65	9.70	3.487	1.913
		API	.188	5.187	10.80	9.16	1.456	1.358	21.13	3.17	11.49	4.129	1.902
		API	.219	5.125	12.51	8.94	1.456	1.342	20.63	3.68	13.14	4.726	1.891
		Std.	.258	5.047	14.62	8.66	1.456	1.321	20.01	4.30	15.16	5.451	1.878
		API	.281	5.001	15.86	8.52	1.456	1.309	19.64	4.66	16.31	5.862	1.870
		API	.312	4.939	17.51	8.31	1.456	1.293	19.16	5.15	17.81	6.402	1.860
		API	.344	4.875	19.19	8.09	1.456	1.276	18.67	5.64	19.28	6.932	1.849
		X-Stg.	.375	4.813	20.78	7.87	1.456	1.260	18.19	6.11	20.67	7.431	1.839
		120	.500	4.563	27.10	7.08	1.456	1.195	16.35	7.95	25.74	9.253	1.799
		160	.625	4.313	32.96	6.32	1.456	1.129	14.61	9.70	30.03	10.800	1.760
		XX-Stg.	.750	4.063	38.55	5.62	1.456	1.064	12.97	11.34	33.63	12.090	1.722
6	6.625	12 Ga.	.104	6.417	7.25	14.02	1.734	1.680	32.34	2.13	11.33	3.42	2.31
		10S	.134	6.357	9.29	13.70	1.734	1.660	31.75	2.73	14.38	4.34	2.29
		8 Ga.	.164	6.297	11.33	13.50	1.734	1.649	31.14	3.33	17.38	5.25	2.28
		API	.188	6.249	12.93	13.31	1.734	1.639	30.70	3.80	19.71	5.95	2.28
		6 Ga.	.194	6.237	13.34	13.25	1.734	1.633	30.55	3.92	20.29	6.12	2.27
		API	.219	6.187	15.02	13.05	1.734	1.620	30.10	4.41	22.66	6.84	2.27
		API	.250	6.125	17.02	12.80	1.734	1.606	29.50	5.01	25.55	7.71	2.26
		API	.277	6.071	18.86	12.55	1.734	1.591	28.95	5.54	28.00	8.46	2.25
		Std.	.280	6.065	18.97	12.51	1.734	1.587	28.90	5.58	28.14	8.50	2.24
		API	.312	6.001	21.05	12.26	1.734	1.571	28.28	6.19	30.91	9.33	2.23
		API	.344	5.937	23.09	12.00	1.734	1.554	27.68	6.79	33.51	10.14	2.22
		API	.375	5.875	25.10	11.75	1.734	1.540	27.10	7.37	36.20	10.90	2.21
		X-Stg.	.432	5.761	28.57	11.29	1.734	1.510	26.07	8.40	40.49	12.22	2.19
		--	.500	5.625	32.79	10.85	1.734	1.475	24.85	9.63	45.60	13.78	2.16
		120	.562	5.501	36.40	10.30	1.734	1.470	23.77	10.74	49.91	15.07	2.15
		160	.719	5.187	45.30	9.16	1.734	1.359	21.15	13.36	58.99	17.81	2.10
		XX-Stg.	.864	4.897	53.16	8.14	1.734	1.280	18.83	15.64	66.33	20.02	2.06
8	8.625	12 Ga.	.104	8.417	9.47	24.1	2.26	2.204	55.6	2.78	25.3	5.86	3.01
		10 Ga.	.134	8.357	12.16	23.8	2.26	2.188	54.8	3.57	32.2	7.46	3.00
		10S	.148	8.329	13.40	23.6	2.26	2.180	54.5	3.94	35.4	8.22	3.00
		8 Ga.	.164	8.297	14.83	23.4	2.26	2.172	54.1	4.36	39.1	9.06	2.99
		API	.188	8.249	16.90	23.2	2.26	2.161	53.5	5.00	44.5	10.30	2.98
		6 Ga.	.194	8.237	17.48	23.1	2.26	2.156	53.3	5.14	45.7	10.60	2.98
		API	.203	8.219	18.30	23.1	2.26	2.152	53.1	5.38	47.7	11.05	2.98
		API	.219	8.187	19.64	22.9	2.26	2.148	52.7	5.80	51.3	11.90	2.97
		3 Ga.	.239	8.147	21.42	22.6	2.26	2.133	52.1	6.30	55.4	12.84	2.96
		20	.250	8.125	22.40	22.5	2.26	2.127	51.8	6.58	57.7	13.39	2.96
		30	.277	8.071	24.70	22.2	2.26	2.115	51.2	7.26	63.3	14.69	2.95
		API	.312	8.001	27.72	21.8	2.26	2.095	50.3	8.15	70.6	16.37	2.94
		Std.	.322	7.981	28.55	21.6	2.26	2.090	50.0	8.40	72.5	16.81	2.94
		API	.344	7.937	30.40	21.4	2.26	2.078	49.5	8.94	76.8	17.81	2.93
		API	.375	7.875	33.10	21.1	2.26	2.062	48.7	9.74	83.1	19.27	2.92
		60	.406	7.813	35.70	20.8	2.26	2.045	47.9	10.48	88.8	20.58	2.91
		API	.438	7.749	38.33	20.4	2.26	2.029	47.2	11.27	94.7	21.97	2.90
		X-Stg.	.500	7.625	43.39	19.8	2.26	2.006	45.6	12.76	105.7	24.51	2.88
		100	.594	7.437	50.90	18.8	2.26	1.947	43.5	14.96	121.4	28.14	2.85
		--	.625	7.375	53.40	18.5	2.26	1.931	42.7	15.71	126.5	29.33	2.84
		120	.719	7.187	60.70	17.6	2.26	1.882	40.6	17.84	140.6	32.61	2.81
		140	.812	7.001	67.80	16.7	2.26	1.833	38.5	19.93	153.8	35.65	2.78
		XX-Stg.	.875	6.875	72.42	16.1	2.26	1.800	37.1	21.30	162.0	37.56	2.76
		160	.906	6.813	74.70	15.8	2.26	1.784	36.4	21.97	165.9	38.48	2.76

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area	Area of Metal	Moment of Inertia	Section Modulus	Radius of Gyration
Pipe Size	Outside Diam. D								in. ² A	in. ² A	in. ⁴ I	in. ³ Z	in. R
10	10.750	12 Ga.	.104	10.542	11.83	37.8	2.81	2.76	87.3	3.48	49.3	9.16	3.76
		10 Ga.	.134	10.482	15.21	37.4	2.81	2.74	86.3	4.47	63.0	11.71	3.75
		8 Ga.	.164	10.422	18.56	37.0	2.81	2.73	85.3	5.45	76.4	14.22	3.74
		10S	.165	10.420	18.65	36.9	2.81	2.73	85.3	5.50	76.8	14.29	3.74
		API	.188	10.374	21.12	36.7	2.81	2.72	84.5	6.20	86.5	16.10	3.74
		6 Ga.	.194	10.362	21.89	36.6	2.81	2.71	84.3	6.43	89.7	16.68	3.73
		API	.203	10.344	22.86	36.5	2.81	2.71	84.0	6.71	93.3	17.35	3.73
		API	.219	10.310	24.60	36.2	2.81	2.70	83.4	7.24	100.5	18.70	3.72
		3 Ga.	.239	10.272	28.05	35.9	2.81	2.69	82.9	7.89	109.2	20.32	3.72
		20	.250	10.250	28.03	35.9	2.81	2.68	82.6	8.26	113.6	21.12	3.71
		API	.279	10.192	31.20	35.3	2.81	2.66	81.6	9.18	125.9	23.42	3.70
		30	.307	10.136	34.24	35.0	2.81	2.65	80.7	10.07	137.4	25.57	3.69
		API	.344	10.062	38.26	34.5	2.81	2.63	79.5	11.25	152.3	28.33	3.68
		Std.	.365	10.020	40.48	34.1	2.81	2.62	78.9	11.91	160.7	29.90	3.67
		API	.438	9.874	48.28	33.2	2.81	2.58	76.6	14.19	188.8	35.13	3.65
		X-Stg.	.500	9.750	54.74	32.3	2.81	2.55	74.7	16.10	212.0	39.43	3.63
		80	.594	9.562	64.40	31.1	2.81	2.50	71.8	18.91	244.9	45.56	3.60
		100	.719	9.312	77.00	29.5	2.81	2.44	68.1	22.62	286.2	53.25	3.56
		--	.750	9.250	80.10	29.1	2.81	2.42	67.2	23.56	296.2	55.10	3.54
		120	.844	9.062	89.20	27.9	2.81	2.37	64.5	26.23	324.3	60.34	3.51
		140	1.000	8.750	104.20	26.1	2.81	2.29	60.1	30.63	367.8	68.43	3.46
		160	1.125	8.500	116.00	24.6	2.81	2.22	56.7	34.01	399.4	74.31	3.43
12	12.750	12 Ga.	.104	12.542	14.1	53.6	3.34	3.28	123.5	4.13	82.6	12.9	4.47
		10 Ga.	.134	12.482	18.1	53.0	3.34	3.27	122.4	5.31	105.7	16.6	4.46
		8 Ga.	.164	12.422	22.1	52.5	3.34	3.25	121.2	6.48	128.4	20.1	4.45
		10S	.180	12.390	24.2	52.2	3.34	3.24	120.6	7.11	140.4	22.0	4.44
		6 Ga.	.194	12.362	26.0	52.0	3.34	3.23	120.0	7.65	150.9	23.7	4.44
		API	.203	12.344	27.2	52.0	3.34	3.23	119.9	7.99	157.2	24.7	4.43
		API	.219	12.312	29.3	51.7	3.34	3.22	119.1	8.52	167.6	26.3	4.43
		3 Ga.	.239	12.272	32.0	51.3	3.34	3.21	118.3	9.39	183.8	28.8	4.42
		20	.250	12.250	33.4	51.3	3.34	3.12	118.0	9.84	192.3	30.2	4.42
		API	.281	12.188	37.4	50.6	3.34	3.19	116.7	11.01	214.1	33.6	4.41
		API	.312	12.126	41.5	50.1	3.34	3.17	115.5	12.19	236.0	37.0	4.40
		30	.330	12.090	43.8	49.7	3.34	3.16	114.8	12.88	248.5	39.0	4.39
		API	.344	12.062	45.5	49.7	3.34	3.16	114.5	13.46	259.0	40.7	4.38
		Std.	.375	12.000	49.6	48.9	3.34	3.14	113.1	14.58	279.3	43.8	4.37
		40	.406	11.938	53.6	48.5	3.34	3.13	111.9	15.74	300.3	47.1	4.37
		API	.438	11.874	57.5	48.2	3.34	3.11	111.0	16.95	321.0	50.4	4.35
		X-Stg.	.500	11.750	65.4	46.9	3.34	3.08	108.4	19.24	361.5	56.7	4.33
		60	.562	11.626	73.2	46.0	3.34	3.04	106.2	21.52	400.5	62.8	4.31
		--	.625	11.500	80.9	44.9	3.34	3.01	103.8	23.81	438.7	68.8	4.29
		80	.688	11.374	88.6	44.0	3.34	2.98	101.6	26.03	475.2	74.6	4.27
		--	.750	11.250	96.2	43.1	3.34	2.94	99.4	28.27	510.7	80.1	4.25
		100	.844	11.062	108.0	41.6	3.34	2.90	96.1	31.53	561.8	88.1	4.22
		--	.875	11.000	110.9	41.1	3.34	2.88	95.0	32.64	578.5	90.7	4.21
		120	1.000	10.750	125.5	39.3	3.34	2.81	90.8	36.91	641.7	100.7	4.17
		140	1.125	10.500	140.0	37.5	3.34	2.75	86.6	41.08	700.7	109.9	4.13
		--	1.250	10.250	153.6	35.8	3.34	2.68	82.5	45.16	755.5	118.5	4.09
		160	1.312	10.126	161.0	34.9	3.34	2.65	80.5	47.14	781.3	122.6	4.07
		--	1.375	10.000	167.2	34.0	3.34	2.62	78.5	49.14	807.2	126.6	4.05
		--	1.500	9.750	180.4	32.4	3.34	2.55	74.7	53.01	853.8	133.9	4.01

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam.								A	A	I	Z	R
	D												
14	14.000	10 Ga.	.134	13.732	20	64.2	3.67	3.59	148.1	5.84	140.4	20.1	4.90
		8 Ga.	.164	13.672	24	63.6	3.67	3.58	146.8	7.13	170.7	24.4	4.89
		6 Ga.	.194	13.612	29	63.1	3.67	3.56	145.5	8.41	200.6	28.7	4.88
		API	.210	13.580	31	62.8	3.67	3.55	144.8	9.10	216.2	30.9	4.87
		API	.219	13.562	32	62.6	3.67	3.55	144.5	9.48	225.1	32.2	4.87
		3 Ga.	.239	13.522	35	62.3	3.67	3.54	143.6	10.33	244.9	35.0	4.87
		10	.250	13.500	37	62.1	3.67	3.54	143.0	10.82	256.0	36.6	4.86
		API	.281	13.438	41	61.5	3.67	3.52	141.8	12.11	285.2	40.7	4.85
		20	.312	13.375	46	60.8	3.67	3.50	140.5	13.44	314.9	45.0	4.84
		API	.344	13.312	50	60.3	3.67	3.48	139.2	14.76	344.3	49.2	4.83
		Std.	.375	13.250	55	59.7	3.67	3.47	137.9	16.05	372.8	53.2	4.82
		40	.438	13.124	63	58.5	3.67	3.44	135.3	18.66	429.6	61.4	4.80
		X-Stg.	.500	13.000	72	57.4	3.67	3.40	132.7	21.21	483.8	69.1	4.78
		60	.594	12.812	85	55.9	3.67	3.35	129.0	24.98	562.4	80.3	4.74
		--	.625	12.750	89	55.3	3.67	3.34	127.7	26.26	588.5	84.1	4.73
		80	.750	12.500	107	51.2	3.67	3.27	122.7	31.22	687.5	98.2	4.69
		--	.875	12.250	123	51.1	3.67	3.21	117.9	36.08	780.1	111.4	4.65
		100	.938	12.124	131	50.0	3.67	3.17	115.5	38.47	820.5	117.2	4.63
		--	1.000	12.000	139	49.0	3.67	3.14	113.1	40.84	868.0	124.0	4.61
		120	1.094	11.812	151	47.5	3.67	3.09	109.6	44.32	929.8	132.8	4.58
		--	1.125	11.750	155	47.0	3.67	3.08	108.4	45.50	950.3	135.8	4.57
		140	1.250	11.500	171	45.0	3.67	3.01	103.9	50.07	1027.5	146.8	4.53
		--	1.375	11.250	186	43.1	3.67	2.94	99.4	54.54	1099.5	157.1	4.49
		160	1.406	11.188	190	42.6	3.67	2.93	98.3	55.63	1116.9	159.6	4.48
		--	1.500	11.000	200	41.2	3.67	2.88	95.0	58.90	1166.5	166.6	4.45
16	16.000	10 Ga.	.134	15.732	23	84.3	4.19	4.12	194.4	6.68	210	26.3	5.61
		8 Ga.	.164	15.672	28	83.6	4.19	4.10	192.9	8.16	256	32.0	5.60
		--	.188	15.624	32	83.3	4.19	4.09	192.0	9.39	294	36.7	5.59
		6 Ga.	.194	15.612	33	83.0	4.19	4.09	191.4	9.63	301	37.6	5.59
		API	.219	15.562	37	82.5	4.19	4.07	190.2	10.86	338	42.3	5.58
		3 Ga.	.239	15.522	40	82.0	4.19	4.06	189.2	11.83	368	45.9	5.57
		10	.250	15.500	42	82.1	4.19	4.06	189.0	12.40	385	48.1	5.57
		API	.281	15.438	47	81.2	4.19	4.04	187.0	13.90	430	53.8	5.56
		20	.312	15.375	52	80.1	4.19	4.03	185.6	15.40	474	59.2	5.55
		API	.344	15.312	57	80.0	4.19	4.01	184.1	16.94	519	64.9	5.54
		Std.	.375	15.250	63	79.1	4.19	4.00	182.6	18.41	562	70.3	5.53
		API	.438	15.124	73	78.2	4.19	3.96	180.0	21.42	650	81.2	5.51
		X-Stg.	.500	15.000	83	76.5	4.19	3.93	176.7	24.35	732	91.5	5.48
		--	.625	14.750	103	74.1	4.19	3.86	170.9	30.19	893	111.7	5.44
		60	.656	14.688	108	73.4	4.19	3.85	169.4	31.62	933	116.6	5.43
		--	.750	14.500	122	71.5	4.19	3.80	165.1	35.93	1047	130.9	5.40
		80	.844	14.312	137	69.7	4.19	3.75	160.9	40.14	1157	144.6	5.37
		--	.875	14.250	141	69.1	4.19	3.73	159.5	41.58	1192	149.0	5.35
		--	1.000	14.000	160	66.7	4.19	3.66	153.9	47.12	1331	166.4	5.31
		100	1.031	13.938	165	66.0	4.19	3.65	152.6	48.49	1366	170.7	5.30
		--	1.125	13.750	179	64.4	4.19	3.60	148.5	52.57	1463	182.9	5.27
		120	1.219	13.562	193	62.6	4.19	3.55	144.5	56.56	1556	194.5	5.23
		--	1.250	13.500	197	62.1	4.19	3.53	143.1	57.92	1586	198.3	5.23
		--	1.375	13.250	215	59.8	4.19	3.47	137.9	63.17	1704	213.0	5.19
		140	1.438	13.124	224	58.6	4.19	3.44	135.3	65.79	1761	220.1	5.17
		--	1.500	13.000	232	57.4	4.19	3.40	132.7	68.33	1816	227.0	5.15
		160	1.594	12.812	245	55.9	4.19	3.35	129.0	72.10	1893	236.6	5.12

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam.								A	A	I	Z	R
	D												
18	18.000	10 Ga.	.134	17.732	26	107.1	4.71	4.64	246.9	7.52	300	33.4	6.32
		8 Ga.	.164	17.672	31	106.3	4.71	4.63	245.3	9.19	366	40.6	6.31
		6 Ga.	.194	17.612	37	105.6	4.71	4.61	243.6	10.85	430	47.8	6.29
		3 Ga.	.239	17.522	45	104.5	4.71	4.59	241.1	13.34	526	58.4	6.28
		10	.250	17.500	47	104.6	4.71	4.58	241.0	13.96	550	61.1	6.28
		API	.281	17.438	49	104.0	4.71	4.56	240.0	14.49	570	63.4	6.27
		20	.312	17.375	59	102.5	4.71	4.55	237.1	17.36	679	75.5	6.25
		API	.344	17.312	65	102.0	4.71	4.53	235.4	19.08	744	82.6	6.24
		Std.	.375	17.250	71	101.2	4.71	4.51	233.7	20.76	807	89.6	6.23
		API	.406	17.188	76	100.6	4.71	4.50	232.0	22.44	869	96.6	6.22
		30	.438	17.124	82	99.5	4.71	4.48	229.5	24.95	963	107.0	6.21
		X-Stg.	.500	17.000	93	98.2	4.71	4.45	227.0	27.49	1053	117.0	6.19
		40	.562	16.876	105	97.2	4.71	4.42	224.0	30.85	1177	130.9	6.17
		--	.625	16.750	116	95.8	4.71	4.39	220.5	34.15	1290	143.2	6.14
		60	.750	16.500	138	92.5	4.71	4.32	213.8	40.64	1515	168.3	6.10
		--	.875	16.250	160	89.9	4.71	4.25	207.4	47.07	1730	192.3	6.06
		80	.938	16.124	171	88.5	4.71	4.22	204.2	50.23	1834	203.8	6.04
		--	1.000	16.000	182	87.2	4.71	4.19	201.1	53.41	1935	215.0	6.02
		--	1.125	15.750	203	84.5	4.71	4.12	194.8	59.64	2133	237.0	5.98
		100	1.156	15.688	208	83.7	4.71	4.11	193.3	61.18	2182	242.3	5.97
		--	1.250	15.500	224	81.8	4.71	4.06	188.7	65.78	2319	257.7	5.94
		120	1.375	15.250	244	79.2	4.71	3.99	182.7	71.82	2498	277.5	5.90
		--	1.500	15.000	265	76.6	4.71	3.93	176.7	77.75	2668	296.5	5.86
		140	1.562	14.876	275	75.3	4.71	3.89	173.8	80.66	2750	305.5	5.84
		160	1.781	14.438	309	71.0	4.71	3.78	163.7	90.75	3020	335.5	5.77
20	20.000	10 Ga.	.134	19.732	28	132.6	5.24	5.17	305.8	8.36	413	41.3	7.02
		8 Ga.	.164	19.672	35	131.8	5.24	5.15	303.9	10.22	503	50.3	7.01
		6 Ga.	.194	19.612	41	131.0	5.24	5.13	302.1	12.07	592	59.2	7.00
		3 Ga.	.239	19.522	50	129.8	5.24	5.11	299.3	14.84	725	72.5	6.99
		10	.250	19.500	53	130.0	5.24	5.11	299.0	15.52	759	75.9	6.98
		API	.281	19.438	59	128.6	5.24	5.09	296.8	17.41	846	84.6	6.97
		API	.312	19.374	66	128.1	5.24	5.08	295.0	19.36	937	93.7	6.95
		API	.344	19.312	72	127.0	5.24	5.06	292.9	21.24	1026	102.6	6.95
		Std.	.375	19.250	79	126.0	5.24	5.04	291.1	23.12	1113	111.3	6.94
		API	.406	19.188	85	125.4	5.24	5.02	289.2	24.99	1200	120.0	6.93
		API	.438	19.124	92	125.1	5.24	5.01	288.0	26.95	1290	129.0	6.92
		X-Stg.	.500	19.000	105	122.8	5.24	4.97	283.5	30.63	1457	145.7	6.90
		40	.594	18.812	123	120.4	5.24	4.93	278.0	36.15	1704	170.4	6.86
		--	.625	18.750	129	119.5	5.24	4.91	276.1	38.04	1787	178.7	6.85
		60	.812	18.376	167	114.9	5.24	4.81	265.2	48.95	2257	225.7	6.79
		--	.875	18.250	179	113.2	5.24	4.78	261.6	52.57	2409	240.9	6.77
		--	1.000	18.000	203	110.3	5.24	4.71	254.5	59.69	2702	270.2	6.73
		80	1.031	17.938	209	109.4	5.24	4.80	252.7	61.44	2771	277.1	6.72
		--	1.125	17.750	227	107.3	5.24	4.65	247.4	66.71	2981	298.1	6.68
		--	1.250	17.500	250	104.3	5.24	4.58	240.5	73.63	3249	324.9	6.64
		100	1.281	17.438	256	103.4	5.24	4.56	238.8	75.34	3317	331.7	6.63
		--	1.375	17.250	274	101.3	5.24	4.52	233.7	80.45	3508	350.8	6.60
		120	1.500	17.000	297	98.3	5.24	4.45	227.0	87.18	3755	375.5	6.56
		140	1.750	16.500	342	92.6	5.24	4.32	213.8	100.33	4217	421.7	6.48
		160	1.969	16.062	379	87.9	5.24	4.21	202.7	111.49	4586	458.6	6.41

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam. D								A	A	I	Z	R
22	22.000	8 Ga.	.164	21.672	38	159.9	5.76	5.67	368.9	11.25	671	61.0	7.72
		6 Ga.	.194	21.612	45	159.0	5.76	5.66	366.8	13.29	790	71.8	7.71
		3 Ga.	.239	21.522	56	157.7	5.76	5.63	363.8	16.34	967	87.9	7.69
		API	.250	21.500	58	157.4	5.76	5.63	363.1	17.18	1010	91.8	7.69
		API	.281	21.438	65	156.5	5.76	5.61	361.0	19.17	1131	102.8	7.68
		API	.312	21.376	72	155.6	5.76	5.60	358.9	21.26	1250	113.6	7.67
		API	.344	21.312	80	154.7	5.76	5.58	356.7	23.40	1373	124.8	7.66
		API	.375	21.250	87	153.7	5.76	5.56	354.7	25.48	1490	135.4	7.65
		API	.406	21.188	94	152.9	5.76	5.55	352.6	27.54	1607	146.1	7.64
		API	.438	21.124	101	151.9	5.76	5.53	350.5	29.67	1725	156.8	7.62
		API	.500	21.000	115	150.2	5.76	5.50	346.4	33.77	1953	177.5	7.61
		--	.625	20.750	143	146.6	5.76	5.43	338.2	41.97	2400	218.2	7.56
		--	.750	20.500	170	143.1	5.76	5.37	330.1	50.07	2829	257.2	7.52
		--	.875	20.250	198	139.6	5.76	5.30	322.1	58.07	3245	295.0	7.47
		--	1.000	20.000	224	136.2	5.76	5.24	314.2	65.97	3645	331.4	7.43
		--	1.125	19.750	251	132.8	5.76	5.17	306.4	73.78	4029	366.3	7.39
		--	1.250	19.500	277	129.5	5.76	5.10	298.6	81.48	4400	400.0	7.35
		--	1.375	19.250	303	126.2	5.76	5.04	291.0	89.09	4758	432.6	7.31
		--	1.500	19.000	329	122.9	5.76	4.97	283.5	96.60	5103	463.9	7.27
24	24.000	8 Ga.	.164	23.672	42	190.8	6.28	6.20	440.1	12.28	872	72.7	8.43
		6 Ga.	.194	23.612	49	189.8	6.28	6.18	437.9	14.51	1028	85.7	8.4
		3 Ga.	.239	23.522	61	188.4	6.28	6.16	434.5	17.84	1260	105.0	8.4
		10	.250	23.500	63	189.0	6.28	6.15	435.0	18.67	1320	110.0	8.40
		API	.281	23.438	71	187.0	6.28	6.14	431.5	20.94	1472	122.7	8.38
		API	.312	23.376	79	186.9	6.28	6.12	430.0	23.20	1630	136.0	8.38
		API	.344	23.312	87	185.0	6.28	6.10	426.8	25.57	1789	149.1	8.36
		Std.	.375	23.250	95	183.8	6.28	6.09	424.6	27.83	1942	161.9	8.35
		API	.406	23.188	102	183.1	6.28	6.07	422.3	30.09	2095	174.6	8.34
		API	.438	23.124	110	182.1	6.28	6.05	420.0	32.42	2252	187.7	8.33
		X-Stg.	.500	23.000	125	181.0	6.28	6.02	416.0	36.90	2550	213.0	8.31
		30	.562	22.876	141	178.5	6.28	5.99	411.0	41.40	2840	237.0	8.28
		--	.625	22.750	156	175.9	6.28	5.96	406.5	45.90	3137	261.4	8.27
		40	.688	22.624	171	174.2	6.28	5.92	402.1	50.30	3422	285.2	8.25
		--	.750	22.500	186	172.1	6.28	5.89	397.6	54.78	3705	308.8	8.22
		--	.875	22.250	216	168.6	6.28	5.82	388.8	63.57	4257	354.7	8.18
		60	.969	22.062	238	165.8	6.28	5.78	382.3	70.04	4652	387.7	8.15
		--	1.000	22.000	246	164.8	6.28	5.76	380.1	72.26	4788	399.0	8.14
26	26.000	--	1.125	21.750	275	161.1	6.28	5.69	371.5	80.85	5302	441.8	8.10
		80	1.219	21.562	297	158.2	6.28	5.65	365.2	87.17	5673	472.8	8.07
		--	1.250	21.500	304	157.4	6.28	5.63	363.1	89.34	5797	483.0	8.05
		--	1.375	21.250	332	153.8	6.28	5.56	354.7	97.73	6275	522.9	8.01
		--	1.500	21.000	361	150.2	6.28	5.50	346.4	106.03	6740	561.7	7.97
		100	1.531	20.938	367	149.3	6.28	5.48	344.3	108.07	6847	570.6	7.96
		120	1.812	20.376	429	141.4	6.28	5.33	326.1	126.30	7823	651.9	7.87
		140	2.062	19.876	484	134.4	6.28	5.20	310.3	142.10	8627	718.9	7.79
		160	2.344	19.312	542	127.0	6.28	5.06	293.1	159.40	9457	788.1	7.70
		8 Ga.	.164	25.672	45	224.4	6.81	6.72	517.6	13.31	1111	85.4	9.13
		6 Ga.	.194	25.612	54	223.4	6.81	6.70	515.2	15.73	1310	100.7	9.1
		3 Ga.	.239	25.522	66	221.8	6.81	6.68	511.6	19.34	1605	123.4	9.1
		API	.250	25.500	67	221.4	6.81	6.68	510.7	19.85	1646	126.6	9.10
		API	.281	25.438	77	220.3	6.81	6.66	508.2	22.70	1877	144.4	9.09
		API	.312	25.376	84	219.2	6.81	6.64	505.8	25.18	2076	159.7	9.08

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Design- ation	Wall Thick- ness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Trans- verse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyr- ation in.
Pipe Size	Outside Diam.												
	D												
26 cont.	26.000	API	.344	25.312	94	218.2	6.81	6.63	503.2	27.73	2280	175.4	9.07
		API	.375	25.250	103	217.1	6.81	6.61	500.7	30.19	2478	190.6	9.06
		API	.406	25.188	111	216.0	6.81	6.59	498.3	32.64	2673	205.6	9.05
		API	.438	25.124	120	214.9	6.81	6.58	495.8	35.17	2874	221.1	9.04
		API	.500	25.000	136	212.8	6.81	6.54	490.9	40.06	3259	250.7	9.02
		--	.625	24.750	169	208.6	6.81	6.48	481.1	49.82	4013	308.7	8.98
		--	.750	24.500	202	204.4	6.81	6.41	471.4	59.49	4744	364.9	8.93
		--	.875	24.250	235	200.2	6.81	6.35	461.9	69.07	5458	419.9	8.89
		--	1.000	24.000	267	196.1	6.81	6.28	452.4	78.54	6149	473.0	8.85
		--	1.125	23.750	299	192.1	6.81	6.22	443.0	87.91	6813	524.1	8.80
		--	1.375	23.250	362	184.1	6.81	6.09	424.6	106.37	8088	622.2	8.72
		--	1.500	23.000	393	180.1	6.81	6.02	415.5	115.45	8695	668.8	8.68
30	30.000	8 Ga.	.164	29.672	52	299.9	7.85	7.77	691.4	15.37	1711	114.0	10.55
		6 Ga.	.194	29.612	62	298.6	7.85	7.75	688.6	18.17	2017	134.4	10.53
		3 Ga.	.239	29.522	76	296.7	7.85	7.73	684.4	22.35	2474	165.0	10.52
		API	.250	29.500	79	296.3	7.85	7.72	683.4	23.37	2585	172.3	10.52
		API	.281	29.438	89	295.1	7.85	7.70	680.5	26.24	2897	193.1	10.51
		10	.312	29.376	99	293.7	7.85	7.69	677.8	29.19	3201	213.4	10.50
		API	.344	29.312	109	292.6	7.85	7.67	674.8	32.04	3524	235.0	10.49
		API	.375	29.250	119	291.2	7.85	7.66	672.0	34.90	3823	254.8	10.48
		API	.406	29.188	130	290.7	7.85	7.64	669.0	37.75	4132	275.5	10.46
		API	.438	29.124	138	288.8	7.85	7.62	666.1	40.68	4442	296.2	10.45
		20	.500	29.000	158	286.2	7.85	7.59	660.5	46.34	5033	335.5	10.43
		30	.625	28.750	196	281.3	7.85	7.53	649.2	57.68	6213	414.2	10.39
		--	.750	28.500	234	276.6	7.85	7.46	637.9	68.92	7371	491.4	10.34
		--	.875	28.250	272	271.8	7.85	7.39	620.7	80.06	8494	566.2	10.30
		--	1.000	28.000	310	267.0	7.85	7.33	615.7	91.11	9591	639.4	10.26
		--	1.125	27.750	347	262.2	7.85	7.26	604.7	102.05	10653	710.2	10.22
32	32.000	--	1.250	27.500	384	257.5	7.85	7.20	593.9	112.90	11682	778.8	10.17
		--	1.375	27.250	421	252.9	7.85	7.13	583.1	123.65	12694	846.2	10.13
		--	1.500	27.000	457	248.2	7.85	7.07	572.5	134.30	13673	911.5	10.09
		API	.250	31.500	85	337.8	8.38	8.25	779.2	24.93	3141	196.3	11.22
		API	.281	31.438	95	336.5	8.38	8.23	776.2	28.04	3525	220.3	11.21
		API	.312	31.376	106	335.2	8.38	8.21	773.2	31.02	3891	243.2	11.20
		API	.344	31.312	116	333.8	8.38	8.20	770.0	34.24	4287	268.0	11.19
		API	.375	31.250	127	332.5	8.38	8.18	766.9	37.25	4656	291.0	11.18
		API	.406	31.188	137	331.2	8.38	8.16	764.0	40.29	5025	314.1	11.17
		API	.438	31.124	148	329.8	8.38	8.15	760.8	43.43	5407	337.9	11.16
		API	.500	31.000	168	327.2	8.38	8.11	754.7	49.48	6140	383.8	11.14
		--	.625	30.750	209	321.9	8.38	8.05	742.5	61.59	7578	473.6	11.09
		--	.750	30.500	250	316.7	8.38	7.98	730.5	73.63	8990	561.9	11.05
		--	.875	30.250	291	311.5	8.38	7.92	718.6	85.53	10368	648.0	11.01
		--	1.000	30.000	331	306.4	8.38	7.85	706.8	97.38	11680	730.0	10.95
		--	1.125	29.750	371	301.3	8.38	7.79	695.0	109.0	13003	812.7	10.92
		--	1.250	29.500	410	296.3	8.38	7.72	680.5	120.7	14398	899.9	10.88
		--	1.375	29.250	450	291.2	8.38	7.66	671.9	132.2	15526	970.4	10.84
		--	1.500	29.000	489	286.3	8.38	7.59	660.5	143.7	16752	1047.0	10.80

TABLE OF PROPERTIES OF PIPE (Continued)

Nominal		Designation	Wall Thickness	Inside Diam. d	Weight per Foot	Wt. of Water per Ft. of Pipe	Sq. Ft. Outside Surface per Ft.	Sq. Ft. Inside Surface per Ft.	Transverse Area in. ²	Area of Metal in. ²	Moment of Inertia in. ⁴	Section Modulus in. ³	Radius of Gyration in.
Pipe Size	Outside Diam. D								A	A	I	Z	R
34	34.000	API	.250	33.500	90	382.0	8.90	8.77	881.2	26.50	3773	221.9	11.93
		API	.281	33.438	101	380.7	8.90	8.75	878.2	29.77	4230	248.8	11.92
		API	.312	33.376	112	379.3	8.90	8.74	874.9	32.99	4680	275.3	11.91
		API	.344	33.312	124	377.8	8.90	8.72	871.6	36.36	5147	302.8	11.90
		API	.375	33.250	135	376.2	8.90	8.70	867.8	39.61	5597	329.2	11.89
		API	.406	33.188	146	375.0	8.90	8.69	865.0	42.88	6047	355.7	11.87
		API	.438	33.124	157	373.6	8.90	8.67	861.7	46.18	6501	382.4	11.86
		API	.500	33.000	179	370.8	8.90	8.64	855.3	52.62	7385	434.4	11.85
		--	.625	32.750	223	365.0	8.90	8.57	841.9	65.53	9124	536.7	11.80
		--	.750	32.500	266	359.5	8.90	8.51	829.3	78.34	10829	637.0	11.76
		--	.875	32.250	308	354.1	8.90	8.44	816.8	90.66	12442	731.9	11.71
		--	1.000	32.000	353	348.6	8.90	8.38	804.2	103.6	14114	830.2	11.67
		--	1.125	31.750	395	343.2	8.90	8.31	791.6	116.1	15703	923.7	11.63
		--	1.250	31.500	437	337.8	8.90	8.25	779.2	128.5	17246	1014.5	11.58
		--	1.375	31.250	479	332.4	8.90	8.18	766.9	140.9	18770	1104.1	11.54
		--	1.500	31.000	521	327.2	8.90	8.11	754.7	153.1	20247	1191.0	11.50
36	36.000	--	.164	35.672	63	433.2	9.42	9.34	999.3	18.53	2975	165.3	12.67
		--	.194	35.612	74	431.8	9.42	9.32	996.0	21.83	3499	194.4	12.67
		--	.239	35.522	91	429.6	9.42	9.30	991.0	26.86	4293	238.5	12.67
		API	.250	35.500	96	429.1	9.42	9.29	989.7	28.11	4491	249.5	12.64
		API	.281	35.438	107	427.6	9.42	9.28	986.4	31.49	5023	279.1	12.63
		API	.312	35.376	119	426.1	9.42	9.26	982.9	34.95	5565	309.1	12.62
		API	.344	35.312	131	424.6	9.42	9.24	979.3	38.56	6127	340.4	12.60
		API	.375	35.250	143	423.1	9.42	9.23	975.8	42.01	6664	370.2	12.59
		API	.406	35.188	154	421.6	9.42	9.21	972.5	45.40	7191	399.5	12.58
		API	.438	35.124	166	420.1	9.42	9.19	968.9	48.93	7737	429.9	12.57
		API	.500	35.000	190	417.1	9.42	9.16	962.1	55.76	8785	488.1	12.55
		--	.625	34.750	236	411.1	9.42	9.10	948.3	69.50	10872	604.0	12.51
		--	.750	34.500	282	405.3	9.42	9.03	934.7	83.01	12898	716.5	12.46
		--	.875	34.250	329	399.4	9.42	8.97	921.2	96.60	14906	828.1	12.42
		--	1.000	34.000	374	393.6	9.42	8.90	907.9	109.9	16851	936.2	12.38
		--	1.125	33.750	419	387.8	9.42	8.83	894.5	123.3	18766	1042.6	12.34
		--	1.250	33.500	464	382.1	9.42	8.77	881.3	136.5	20624	1145.8	12.29
		--	1.375	33.250	509	376.4	9.42	8.70	868.2	149.6	22451	1247.3	12.25
		--	1.500	33.000	553	370.8	9.42	8.64	855.3	162.6	24237	1346.5	12.21
42	42.000	--	.250	41.500	112	586.4	10.99	10.86	1352.6	32.82	7126	339.3	14.73
		--	.375	41.250	167	579.3	10.99	10.80	1336.3	49.08	10627	506.1	14.71
		--	.500	41.000	222	572.3	10.99	10.73	1320.2	65.18	14037	668.4	14.67
		--	.625	40.750	276	565.4	10.99	10.67	1304.1	81.28	17373	827.3	14.62
		--	.750	40.500	331	558.4	10.99	10.60	1288.2	97.23	20689	985.2	14.59
		--	.875	40.250	385	551.6	10.99	10.54	1272.3	113.0	23896	1137.9	14.54
		--	1.000	40.000	438	544.8	10.99	10.47	1256.6	128.8	27080	1289.5	14.49
		--	1.125	39.750	492	537.9	10.99	10.41	1240.9	144.5	30193	1437.8	14.44
		--	1.250	39.500	544	531.2	10.99	10.34	1225.3	160.0	33233	1582.5	14.41
		--	1.375	39.250	597	524.4	10.99	10.27	1209.9	175.5	36240	1725.7	14.37
		--	1.500	39.000	649	517.9	10.99	10.21	1194.5	190.8	39181	1865.7	14.33

WEIGHTS OF RINGS AND DISCS

The table below provides a convenient means for determining the weights of rectangular section rings and discs in diameters from $\frac{1}{2}$ " up to and including 150" by size increments of $\frac{1}{8}$ ".

The column at the left gives the "even-inch" diameters and columns across to the right give weights of that diameter and of added fractional diameters.

Computed weights are based on steel weighing .283 lbs per cu. in. Thus, for other materials, weights may be readily calculated merely by application of the proper factor.

For determining rectangular ring weights, proceed as in the following example:

Ring size 96" O.D. x 80" I.D. x 6" thickness.

Weight of 96" disc 2051 lbs.

Weight of 80" disc 1424 lbs.

Ring weight per 1" thickness 627 lbs.

Times 6" thickness 6

Weight of ring 3762 lbs.

Diameter Inches	WEIGHTS OF STEEL DISCS PER INCH OF THICKNESS							
	Added Fractional Increments 0"	$\frac{1}{8}$ "	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{3}{4}$ "	$\frac{7}{8}$ "
0	--	--	--	--	.05	.09	.13	.17
1	.22	.28	.35	.42	.50	.59	.68	.78
2	.89	1.01	1.13	1.26	1.39	1.54	1.69	1.84
3	2.01	2.17	2.35	2.53	2.72	2.92	3.13	3.34
4	3.56	3.78	4.01	4.25	4.50	4.75	5.02	5.28
5	5.56	5.84	6.13	6.42	6.72	7.03	7.35	7.67
6	8.00	8.35	8.69	9.04	9.40	9.77	10.14	10.52
7	10.90	11.30	11.70	12.10	12.52	12.94	13.36	13.80
8	14.24	14.69	15.14	15.61	16.08	16.55	17.04	17.53
9	18.02	18.53	19.04	19.56	20.08	20.61	21.15	21.70
10	22.25	22.81	23.38	23.95	24.53	25.12	25.71	26.32
11	26.92	27.54	28.16	28.79	29.43	30.07	30.72	31.38
12	32.04	32.71	33.39	34.08	34.77	35.47	36.17	36.88
13	37.60	38.33	39.06	39.80	40.55	41.31	42.07	42.84
14	43.62	44.39	45.18	45.98	46.78	47.59	48.41	49.23
15	50.06	50.90	51.75	52.60	53.46	54.32	55.20	56.08
16	56.96	57.86	58.76	59.66	60.58	61.50	62.43	63.36
17	64.30	65.25	66.21	67.17	68.14	69.12	70.10	71.09
18	72.09	73.10	74.11	75.13	76.15	77.19	78.22	79.27
19	80.32	81.39	82.45	83.53	84.61	85.70	86.79	87.89
20	89.00	90.12	91.24	92.37	93.51	94.65	95.80	96.96
21	98.13	99.30	100.48	101.66	102.85	104.05	105.26	106.47
22	107.69	108.92	110.15	111.40	112.64	113.90	115.16	116.43
23	117.71	118.99	120.28	121.58	122.88	124.19	125.51	126.83
24	128.16	129.50	130.85	132.20	133.57	134.93	136.30	137.68
25	139.07	140.46	141.86	143.27	144.68	146.11	147.54	148.97
26	150.41	151.86	153.32	154.78	156.25	157.73	159.22	160.71
27	162.21	163.71	165.22	166.74	168.27	169.80	171.34	172.89
28	174.44	176.01	177.57	179.15	180.73	182.32	183.91	185.52
29	187.13	188.74	190.37	192.00	193.64	195.28	196.93	198.59
30	200.25	201.93	203.61	205.29	206.99	208.69	210.39	212.11
31	213.83	215.56	217.29	219.03	220.78	222.54	224.30	226.07
32	227.85	229.63	231.42	233.22	235.02	236.83	238.65	240.48
33	242.31	244.15	245.99	247.85	249.71	251.57	253.45	255.33
34	257.22	259.11	261.01	262.92	264.84	266.76	268.69	270.63
35	272.57	274.52	276.48	278.44	280.41	282.39	284.38	286.37
36	288.37	290.38	292.39	294.41	296.42	298.46	300.50	302.55
37	304.60	306.67	308.74	310.81	312.90	314.97	317.07	319.19
38	321.29	323.42	325.54	327.66	329.82	331.94	334.10	336.25

WEIGHTS OF RINGS AND DISCS (Continued)

Diameter Inches	WEIGHTS OF STEEL DISCS PER INCH OF THICKNESS							
	Added Fractional Increments							
	0"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"
39	338.4	340.6	342.8	345.0	347.2	349.4	351.6	353.8
40	356.0	358.2	360.5	362.7	365.0	367.2	369.5	371.7
41	374.0	376.3	378.6	380.9	383.2	385.5	387.8	390.2
42	392.5	394.8	397.2	399.5	401.9	404.3	406.6	409.0
43	411.4	413.8	416.2	418.6	421.0	423.2	425.9	428.3
44	430.8	433.2	435.7	438.1	440.6	443.1	445.6	448.1
45	450.6	453.1	455.6	458.1	460.6	463.2	465.7	468.3
46	470.8	473.4	475.9	478.5	481.1	483.7	486.3	488.9
47	491.5	494.1	496.8	499.4	502.0	504.7	507.3	510.0
48	512.7	515.3	518.0	520.7	523.4	526.1	528.8	531.5
49	534.2	537.0	539.7	542.4	545.2	548.0	550.7	553.5
50	556.3	559.0	561.8	564.7	567.4	570.2	573.1	575.9
51	578.7	581.6	584.4	587.3	590.1	593.0	595.9	598.7
52	601.6	604.5	607.4	610.4	613.3	616.2	619.1	622.1
53	625.0	628.0	630.9	633.9	636.9	639.8	642.8	645.8
54	648.8	651.8	654.8	657.8	660.9	663.9	667.0	670.0
55	673.1	676.1	679.2	682.3	685.4	688.4	691.6	694.6
56	697.8	700.9	704.0	707.1	710.3	713.4	716.6	719.7
57	722.9	726.1	729.3	732.4	735.6	738.8	742.1	745.3
58	748.5	751.7	755.0	758.2	761.4	764.7	768.0	771.3
59	774.5	777.8	781.1	784.4	787.7	791.0	794.3	797.7
60	801.0	804.3	807.7	811.1	814.4	817.8	821.2	824.5
61	827.9	831.3	834.7	838.1	841.6	845.0	848.4	851.8
62	855.3	858.8	862.2	865.7	869.2	872.6	876.1	879.6
63	883.1	886.6	890.1	893.7	897.2	900.7	904.3	907.8
64	911.4	914.9	918.5	922.1	925.7	929.2	932.8	936.5
65	940.1	943.7	947.3	950.9	954.6	958.2	961.9	965.5
66	969.2	972.9	976.6	980.3	984.0	987.7	991.4	995.1
67	998.8	1002.5	1006.3	1010.0	1013.8	1017.5	1021.3	1025.1
68	1028.9	1032.6	1036.4	1040.2	1044.0	1047.8	1051.7	1055.5
69	1059.3	1063.2	1067.0	1070.9	1074.7	1078.6	1082.5	1086.4
70	1090.3	1094.2	1098.1	1102.0	1105.9	1109.8	1113.8	1117.7
71	1121.6	1125.6	1129.5	1133.5	1137.5	1141.5	1145.5	1149.5
72	1153.5	1157.5	1161.5	1165.5	1169.5	1173.6	1177.6	1181.7
73	1185.7	1189.8	1193.8	1197.9	1202.0	1206.1	1210.2	1214.3
74	1218.4	1222.5	1226.7	1230.8	1235.0	1239.1	1243.3	1247.4
75	1251.6	1255.8	1259.9	1264.1	1268.3	1272.5	1276.7	1280.9
76	1285.2	1289.4	1293.7	1297.9	1302.1	1306.4	1310.7	1314.9
77	1319.2	1323.5	1327.8	1332.1	1336.4	1340.7	1345.0	1349.4
78	1353.7	1358.1	1362.4	1366.7	1371.1	1375.5	1379.9	1384.3
79	1388.6	1393.0	1397.4	1401.8	1406.3	1410.7	1415.1	1419.6
80	1424.0	1428.5	1432.9	1437.4	1441.9	1446.4	1450.8	1455.3
81	1459.8	1464.3	1468.9	1473.4	1477.9	1482.4	1487.0	1491.5
82	1496.1	1500.7	1505.3	1509.8	1514.4	1519.0	1523.6	1528.2
83	1532.8	1537.4	1542.1	1546.7	1551.3	1556.0	1560.6	1565.3
84	1570.0	1574.7	1579.3	1584.0	1588.7	1593.4	1598.1	1602.8
85	1607.6	1612.3	1617.0	1621.8	1626.6	1631.3	1636.1	1640.8
86	1645.6	1650.4	1655.2	1660.0	1664.8	1669.6	1674.5	1679.3
87	1684.1	1689.0	1693.8	1698.7	1703.5	1708.4	1713.3	1718.2
88	1723.1	1728.0	1732.9	1737.8	1742.7	1747.6	1752.5	1757.5
89	1762.4	1767.4	1772.3	1777.3	1782.3	1787.3	1792.3	1797.3
90	1802.3	1807.3	1812.3	1817.3	1822.4	1827.4	1832.4	1837.5
91	1842.5	1847.6	1852.7	1857.8	1862.8	1867.9	1873.0	1878.2
92	1883.3	1888.4	1893.5	1898.6	1903.8	1908.9	1914.1	1919.3

WEIGHTS OF RINGS AND DISCS (Continued)

Diameter Inches	WEIGHTS OF STEEL DISCS PER INCH OF THICKNESS							
	Added Fractional Increments							
	0"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"
93	1924	1930	1935	1940	1945	1950	1956	1961
94	1966	1971	1976	1982	1987	1992	1998	2003
95	2008	2013	2019	2024	2029	2035	2040	2045
96	2051	2056	2061	2067	2072	2077	2083	2088
97	2094	2099	2104	2110	2115	2121	2126	2131
98	2137	2142	2148	2153	2159	2164	2170	2175
99	2181	2186	2192	2197	2203	2208	2214	2219
100	2225	2231	2236	2242	2248	2253	2259	2264
101	2270	2276	2281	2287	2293	2298	2304	2309
102	2315	2321	2327	2332	2338	2344	2349	2355
103	2361	2367	2372	2378	2384	2390	2395	2401
104	2407	2413	2418	2424	2430	2436	2442	2448
105	2453	2459	2465	2471	2477	2483	2489	2494
106	2500	2506	2512	2518	2524	2530	2536	2542
107	2548	2554	2560	2566	2572	2578	2584	2590
108	2596	2602	2608	2614	2620	2626	2632	2638
109	2644	2650	2656	2662	2668	2674	2680	2686
110	2692	2698	2704	2711	2717	2723	2729	2735
111	2741	2748	2757	2760	2766	2772	2779	2785
112	2791	2797	2804	2810	2816	2822	2829	2835
113	2841	2847	2854	2860	2866	2873	2879	2885
114	2892	2898	2904	2911	2917	2923	2930	2936
115	2943	2949	2955	2962	2968	2975	2981	2988
116	2994	3000	3007	3013	3020	3026	3033	3039
117	3046	3052	3059	3065	3072	3078	3085	3092
118	3098	3105	3111	3118	3124	3131	3138	3144
119	3151	3158	3164	3171	3177	3184	3191	3197
120	3204	3211	3217	3226	3231	3238	3244	3251
121	3258	3264	3271	3278	3285	3291	3298	3305
122	3312	3319	3325	3332	3339	3346	3353	3359
123	3366	3373	3380	3387	3394	3401	3407	3414
124	3421	3428	3435	3442	3449	3456	3463	3470
125	3477	3484	3491	3498	3505	3511	3518	3525
126	3532	3539	3546	3554	3561	3568	3575	3582
127	3589	3596	3603	3610	3617	3624	3631	3638
128	3646	3653	3660	3667	3674	3681	3688	3696
129	3703	3710	3717	3724	3731	3739	3746	3753
130	3760	3768	3775	3782	3789	3797	3804	3811
131	3818	3826	3833	3840	3848	3855	3862	3870
132	3877	3884	3892	3899	3906	3914	3921	3928
133	3936	3943	3951	3958	3966	3973	3980	3988
134	3995	4003	4010	4018	4025	4033	4040	4048
135	4055	4063	4070	4078	4085	4093	4100	4108
136	4115	4123	4131	4138	4146	4153	4161	4169
137	4176	4184	4191	4199	4207	4214	4222	4230
138	4237	4245	4253	4260	4268	4276	4283	4291
139	4299	4307	4314	4322	4330	4338	4345	4353
140	4361	4369	4377	4384	4392	4400	4408	4416
141	4424	4431	4439	4447	4455	4463	4471	4479
142	4487	4494	4502	4510	4518	4526	4534	4542
143	4550	4558	4566	4574	4582	4590	4598	4606
144	4614	4622	4630	4638	4646	4654	4662	4670
145	4678	4686	4694	4702	4710	4719	4727	4735
146	4743	4751	4759	4767	4775	4784	4792	4800
147	4808	4816	4824	4833	4841	4849	4857	4865
148	4874	4882	4890	4898	4907	4915	4923	4932
149	4940	4948	4956	4965	4973	4981	4990	4998
150	5006	5015	5023	5031	5040	5048	5057	5065

HEAT, POWER and WORK

1 Btu	=	$\begin{cases} 778.3 \text{ ft-lb} \\ 0.2930 \text{ Int. whr} \\ 252.0 \text{ I.T. calorie} \end{cases}$
$\begin{cases} 1000 \text{ I.T. calories} \\ 1 \text{ I.T. Kilocalorie} \end{cases}$	=	$\begin{cases} 3.968 \text{ Btu} \\ 3088 \text{ ft-lb} \\ 1.1628 \text{ Int. whr} \end{cases}$
1 horsepower	=	$\begin{cases} 0.7455 \text{ Int. kw} \\ 42.40 \text{ Btu per minute} \\ 33,000 \text{ ft-lb per minute} \\ 550 \text{ ft-lb per second} \end{cases}$
1 boiler horsepower	=	$\begin{cases} 33,475 \text{ Btu per hour} \\ 9.809 \text{ Int. kw} \end{cases}$
1 Int. watthour	=	$\begin{cases} 2656 \text{ ft-lb} \\ 3.413 \text{ Btu} \\ 3600 \text{ Int. joules} \\ 860 \text{ I.T. calories} \end{cases}$
1 Int. kilowatt (1000 watts)	=	$\begin{cases} 1.341 \text{ hp} \\ 56.88 \text{ Btu per minute} \\ 44,267 \text{ ft-lb per minute} \end{cases}$
1 Int. kilowatthour	=	$\begin{cases} 3,413 \text{ Btu} \\ 3.517 \text{ lb water evaporated from} \\ \text{and at } 212 \text{ F} \end{cases}$
1 ton refrigeration	=	$\begin{cases} 12,000 \text{ Btu per hour} \\ 200 \text{ Btu per minute} \end{cases}$
Latent heat of ice	=	143.4 Btu per pound

WEIGHT and VOLUME

1 cu ft	=	$\begin{cases} 7.481 \text{ gal} \\ 1728 \text{ cu in.} \end{cases}$
1 gallon (U. S.)	=	$\begin{cases} 231 \text{ cu in.} \\ 0.1337 \text{ cu ft} \end{cases}$
1 gallon (British or Imperial)	=	277.42 cu in.
1 cu ft water at 60 F	=	62.37 lb
1 cu ft water at 212 F	=	59.83 lb
1 gal water at 60 F	=	8.338 lb
1 gal water at 212 F	=	7.998 lb

PRESSURE

1 lb per square inch	=	$\begin{cases} 144 \text{ lb per square foot} \\ 2.0360 \text{ in. mercury at } 32 \text{ F} \\ 2.0422 \text{ in. mercury at } 62 \text{ F} \\ 2.309 \text{ ft water at } 62 \text{ F} \\ 27.71 \text{ in. water at } 62 \text{ F} \end{cases}$
1 oz per square inch	=	$\begin{cases} 0.1276 \text{ in. mercury at } 62 \text{ F} \\ 1.732 \text{ in. water at } 62 \text{ F} \end{cases}$
1 atmosphere	=	$\begin{cases} 14.696 \text{ lb per square inch} \\ 2116 \text{ lb per square foot} \\ 33.94 \text{ ft water at } 62 \text{ F} \\ 30.01 \text{ in. mercury at } 62 \text{ F} \\ 29.921 \text{ in. mercury at } 32 \text{ F} \end{cases}$
1 in. water at 62 F	=	$\begin{cases} 0.03609 \text{ lb per square inch} \\ 0.5774 \text{ oz per square inch} \\ 5.197 \text{ lb per square foot} \end{cases}$

PRESSURE

continued

1 ft. water at 62 F	= { 0.4330 lb per square inch 62.37 lb per square foot
1 in. mercury at 62 F	= { 0.4897 lb per square inch 7.835 oz per square inch 1.131 ft water at 62 F 13.57 in. water at 62 F
1 in. mercury at 32 F	= 0.49115 lb per square inch

METRIC UNITS

REFER TO PAGES 78-81
FOR METRIC CONVERSION
TABLES

1 cm	= 0.3937 in. = 0.0328 ft
1 in.	= 2.540 cm
1 m	= 3.281 ft
1 ft	= 0.3048 m
1 sq cm	= 0.1550 sq in.
1 sq in.	= 6.452 sq cm
1 sq m	= 10.76 sq ft
1 sq ft	= 0.09290 sq m
1 cu cm	= 0.06102 cu in.
1 cu in.	= 16.39 cu cm
1 cu m	= 35.31 cu ft
1 cu ft	= 0.02832 cu m
1 liter	= 1000 cu cm = 0.2642 gal
1 kg	= 2.205 lb (avdp)
1 lb	= 0.4536 kg
1 metric ton	= 2205 lb (avdp)
1 gram	= 0.002205 lb (avdp)
1 kilometer per hour	= 0.6214 mph
1 gram per square centimeter	= { 0.02905 in. mercury at 62 F 0.3942 in. water at 62 F
1 kg per sq cm (metric atmosphere)	= 14.22 lb per square inch
1 gram per cubic centimeter	= { 0.03613 lb per cubic inch 62.43 lb per cubic foot
1 dyne	= 0.00007233 poundals
1 absolute joule	= { 10,000,000 ergs 0.7376 ft-lb
1 Int. joule	= 0.7378 ft-lb
1 metric horsepower	= { 75 kg-m per second 0.986 hp (U. S.)
1 I.T. kilocalorie per kilogram	= 1.8 Btu per pound
1 I.T. calorie per square centimeter	= 3.687 Btu per square foot
1 I.T. calorie per (second) (square centimeter) for a temperature gradient of 1 C	= { 2903 BTU per (hour) (square foot) for a temperature gradient of 1 F deg per inch of thickness.

Abbreviations Int. and I.T. refer to International and International (Steam) Table, respectively.

Weights and pressures given are in vacuo.

INCHES/MILLIMETERS • FEET/METERS

Milli- meters	Inches			Milli- meters	Inches		
	Nearest $\frac{1}{16}$ "	Nearest $\frac{1}{64}$ "	Decimals		Nearest $\frac{1}{16}$ "	Nearest $\frac{1}{64}$ "	Decimals
1	$\frac{1}{16}$	$\frac{3}{64}$	0.03937	51	2	$2\frac{1}{64}$	2.00787
2	$\frac{1}{16}$	$\frac{5}{64}$	0.07874	52	$2\frac{1}{16}$	$2\frac{3}{64}$	2.04724
3	$\frac{1}{8}$	$\frac{1}{8}$	0.11811	53	$2\frac{1}{16}$	$2\frac{5}{32}$	2.08661
4	$\frac{3}{16}$	$\frac{5}{32}$	0.15748	54	$2\frac{1}{8}$	$2\frac{1}{8}$	2.12598
5	$\frac{3}{16}$	$\frac{13}{64}$	0.19685	55	$2\frac{3}{16}$	$2\frac{11}{64}$	2.16535
6	$\frac{1}{4}$	$\frac{15}{64}$	0.23622	56	$2\frac{3}{16}$	$2\frac{13}{64}$	2.20472
7	$\frac{1}{4}$	$\frac{9}{32}$	0.27559	57	$2\frac{1}{4}$	$2\frac{1}{4}$	2.24409
8	$\frac{5}{16}$	$\frac{5}{16}$	0.31496	58	$2\frac{5}{16}$	$2\frac{9}{32}$	2.28346
9	$\frac{3}{8}$	$\frac{23}{64}$	0.35433	59	$2\frac{3}{8}$	$2\frac{27}{64}$	2.32283
10	$\frac{3}{8}$	$\frac{25}{64}$	0.39370	60	$2\frac{3}{8}$	$2\frac{29}{64}$	2.36220
11	$\frac{7}{16}$	$\frac{7}{16}$	0.43307	61	$2\frac{7}{8}$	$2\frac{13}{32}$	2.40157
12	$\frac{1}{2}$	$\frac{15}{32}$	0.47244	62	$2\frac{7}{16}$	$2\frac{7}{16}$	2.44094
13	$\frac{1}{2}$	$\frac{33}{64}$	0.51181	63	$2\frac{1}{2}$	$2\frac{31}{64}$	2.48031
14	$\frac{9}{16}$	$\frac{35}{64}$	0.55118	64	$2\frac{1}{2}$	$2\frac{33}{64}$	2.51969
15	$\frac{9}{16}$	$\frac{19}{32}$	0.59055	65	$2\frac{9}{16}$	$2\frac{9}{16}$	2.55906
16	$\frac{5}{8}$	$\frac{5}{8}$	0.62992	66	$2\frac{5}{8}$	$2\frac{19}{32}$	2.59843
17	$\frac{11}{16}$	$\frac{43}{64}$	0.66929	67	$2\frac{5}{8}$	$2\frac{41}{64}$	2.63780
18	$\frac{11}{16}$	$\frac{45}{64}$	0.70866	68	$2\frac{11}{16}$	$2\frac{43}{64}$	2.67717
19	$\frac{3}{4}$	$\frac{3}{4}$	0.74803	69	$2\frac{11}{16}$	$2\frac{45}{32}$	2.71654
20	$\frac{13}{16}$	$\frac{25}{32}$	0.78740	70	$2\frac{3}{4}$	$2\frac{3}{4}$	2.75591
21	$\frac{13}{16}$	$\frac{53}{64}$	0.82677	71	$2\frac{13}{16}$	$2\frac{51}{64}$	2.79528
22	$\frac{7}{8}$	$\frac{55}{64}$	0.86614	72	$2\frac{13}{16}$	$2\frac{53}{64}$	2.83465
23	$\frac{7}{8}$	$\frac{29}{32}$	0.90551	73	$2\frac{7}{8}$	$2\frac{7}{8}$	2.87402
24	$\frac{15}{16}$	$\frac{15}{16}$	0.94488	74	$2\frac{15}{16}$	$2\frac{29}{32}$	2.91339
25	1	$\frac{63}{64}$	0.98425	75	$2\frac{15}{16}$	$2\frac{61}{64}$	2.95276
26	1	$1\frac{1}{32}$	1.02362	76	3	$2\frac{63}{64}$	2.99213
27	$1\frac{1}{16}$	$1\frac{1}{16}$	1.06299	77	$3\frac{1}{16}$	$3\frac{1}{32}$	3.03150
28	$1\frac{1}{8}$	$1\frac{1}{64}$	1.10236	78	$3\frac{1}{16}$	$3\frac{3}{64}$	3.07087
29	$1\frac{1}{8}$	$1\frac{9}{64}$	1.14173	79	$3\frac{1}{8}$	$3\frac{7}{64}$	3.11024
30	$1\frac{1}{8}$	$1\frac{11}{64}$	1.18110	80	$3\frac{1}{8}$	$3\frac{9}{32}$	3.14961
31	$1\frac{1}{4}$	$1\frac{7}{32}$	1.22047	81	$3\frac{3}{16}$	$3\frac{3}{16}$	3.18898
32	$1\frac{1}{4}$	$1\frac{17}{64}$	1.25984	82	$3\frac{3}{16}$	$3\frac{15}{64}$	3.22835
33	$1\frac{5}{16}$	$1\frac{19}{64}$	1.29921	83	$3\frac{3}{16}$	$3\frac{17}{64}$	3.26772
34	$1\frac{5}{16}$	$1\frac{11}{32}$	1.33858	84	$3\frac{5}{16}$	$3\frac{35}{64}$	3.30709
35	$1\frac{3}{8}$	$1\frac{13}{8}$	1.37795	85	$3\frac{3}{8}$	$3\frac{11}{32}$	3.34646
36	$1\frac{7}{16}$	$1\frac{27}{64}$	1.41732	86	$3\frac{3}{8}$	$3\frac{25}{64}$	3.38583
37	$1\frac{7}{16}$	$1\frac{29}{64}$	1.45669	87	$3\frac{7}{16}$	$3\frac{27}{64}$	3.42520
38	$1\frac{1}{2}$	$1\frac{1}{2}$	1.49606	88	$3\frac{7}{16}$	$3\frac{15}{32}$	3.46457
39	$1\frac{9}{16}$	$1\frac{17}{32}$	1.53543	89	$3\frac{1}{2}$	$3\frac{1}{2}$	3.50394
40	$1\frac{9}{16}$	$1\frac{37}{64}$	1.57480	90	$3\frac{1}{2}$	$3\frac{39}{64}$	3.54331
41	$1\frac{5}{8}$	$1\frac{39}{64}$	1.61417	91	$3\frac{5}{8}$	$3\frac{37}{64}$	3.58268
42	$1\frac{5}{8}$	$1\frac{21}{32}$	1.65354	92	$3\frac{5}{8}$	$3\frac{39}{64}$	3.62205
43	$1\frac{11}{16}$	$1\frac{11}{16}$	1.69291	93	$3\frac{11}{16}$	$3\frac{21}{32}$	3.66142
44	$1\frac{3}{4}$	$1\frac{47}{64}$	1.73228	94	$3\frac{11}{16}$	$3\frac{45}{64}$	3.70079
45	$1\frac{3}{4}$	$1\frac{49}{64}$	1.77165	95	$3\frac{3}{4}$	$3\frac{47}{64}$	3.74016
46	$1\frac{13}{16}$	$1\frac{13}{16}$	1.81102	96	$3\frac{3}{4}$	$3\frac{25}{32}$	3.77953
47	$1\frac{7}{8}$	$1\frac{27}{32}$	1.85039	97	$3\frac{13}{16}$	$3\frac{13}{16}$	3.81890
48	$1\frac{7}{8}$	$1\frac{57}{64}$	1.88976	98	$3\frac{7}{8}$	$3\frac{55}{64}$	3.85827
49	$1\frac{15}{16}$	$1\frac{59}{64}$	1.92913	99	$3\frac{7}{8}$	$3\frac{57}{64}$	3.89764
50	$1\frac{15}{16}$	$1\frac{31}{32}$	1.96850	100	$3\frac{15}{16}$	$3\frac{15}{16}$	3.93701

Milli- meters	Feet - Inches		Decimal Inches
	Nearest $\frac{1}{16}$ "	Nearest $\frac{1}{64}$ "	
100	0-3 $\frac{15}{16}$	0-3 $\frac{15}{16}$	3.93701
200	0-7 $\frac{7}{8}$	0-7 $\frac{7}{8}$	7.87402
300	0-11 $\frac{13}{16}$	0-11 $\frac{13}{16}$	11.81102
400	1-3 $\frac{3}{4}$	1-3 $\frac{3}{4}$	15.74803
500	1-7 $\frac{11}{16}$	1-7 $\frac{11}{16}$	19.68504
600	1-11 $\frac{3}{8}$	1-11 $\frac{3}{8}$	23.62205
700	2-3 $\frac{3}{16}$	2-3 $\frac{3}{16}$	27.55906
800	2-7 $\frac{1}{2}$	2-7 $\frac{1}{2}$	31.49606
900	2-11 $\frac{1}{16}$	2-11 $\frac{1}{16}$	35.43307
1000	3-3 $\frac{3}{8}$	3-3 $\frac{3}{8}$	39.37008

Meters	Feet – Inches	Decimal Feet
	Nearest $\frac{1}{16}$ "	
1	3- $3\frac{3}{8}$	3.2808
2	6- $6\frac{3}{4}$	6.5617
3	9- $10\frac{1}{8}$	9.8425
4	13- $1\frac{1}{2}$	13.1234
5	16- $4\frac{1}{4}$	16.4042
6	19- $8\frac{1}{4}$	19.6850
7	22- $11\frac{1}{16}$	22.9659
8	26- $2\frac{15}{16}$	26.2467
9	29- $6\frac{5}{16}$	29.5276
10	32- $9\frac{1}{16}$	32.8084
11	36- $1\frac{1}{8}$	36.0892
12	39- $4\frac{7}{16}$	39.3701
13	42- $7\frac{3}{16}$	42.6509
14	45- $11\frac{3}{16}$	45.9318
15	49- $2\frac{9}{16}$	49.2126
16	52- $5\frac{15}{16}$	52.4934
17	55- $9\frac{5}{16}$	55.7743
18	59- $0\frac{11}{16}$	59.0551
19	62- $4\frac{1}{16}$	62.3360
20	65- $7\frac{3}{8}$	65.6168
21	68- $10\frac{3}{4}$	68.8976
22	72- $2\frac{1}{8}$	72.1785
23	75- $5\frac{1}{2}$	75.4593
24	78- $8\frac{1}{8}$	78.7402
25	82- $0\frac{1}{4}$	82.0210
26	85- $3\frac{3}{8}$	85.3018
27	88- 7	88.5827
28	91- $10\frac{3}{8}$	91.8635
29	95- $1\frac{3}{4}$	95.1444
30	98- $5\frac{1}{4}$	98.4252
31	101- $8\frac{1}{2}$	101.7060
32	104- $11\frac{13}{16}$	104.9869
33	108- $3\frac{3}{16}$	108.2677
34	111- $6\frac{1}{16}$	111.5486
35	114- $9\frac{15}{16}$	114.8294

MILLIMETERS / INCHES • METERS / FEET

Inches							Milli- meters	Inches							Milli- meters
1/2s	1/4s	1/8s	1/16s	1/32s	1/64s	Decimals ^a		1/2s	1/4s	1/8s	1/16s	1/32s	1/64s	Decimals ^a	
				1	2	0.0156 25	0.397						33	0.515 625	13.097
				1	2	0.031 25	0.794					17	34	0.531 25	13.494
					3	0.046 875	1.191						35	0.546 875	13.891
			1	2	4	0.062 5	1.588				9	18	36	0.562 5	14.288
					5	0.078 125	1.984						37	0.578 125	14.684
				3	6	0.093 75	2.381					19	38	0.593 75	15.081
					7	0.109 375	2.778						39	0.609 375	15.478
		1	2	4	8	0.125 0	3.175 ^a			5	10	20	40	0.625 0	15.875 ^a
					9	0.140 625	3.572						41	0.640 625	16.272
				5	10	0.156 25	3.969					21	42	0.656 25	16.669
					11	0.171 875	4.366						43	0.671 875	17.066
			3	6	12	0.187 5	4.762				11	22	44	0.687 5	17.462
					13	0.203 125	5.159						45	0.703 125	17.859
				7	14	0.218 75	5.556					23	46	0.718 75	18.256
					15	0.234 375	5.953						47	0.734 375	18.653
	1	2	4	8	16	0.250 0	6.350 ^a		3	6	12	24	48	0.750 0	19.050 ^a
					17	0.265 625	6.747						49	0.765 625	19.447
				9	18	0.281 25	7.144					25	50	0.781 25	19.844
					19	0.296 875	7.541						51	0.796 875	20.241
			5	10	20	0.312 5	7.938				13	26	52	0.812 5	20.638
					21	0.328 125	8.334						53	0.828 125	21.034
				11	22	0.343 75	8.731					27	54	0.843 75	21.431
					23	0.359 375	9.128						55	0.859 375	21.828
		3	6	12	24	0.3750	9.525 ^a			7	14	28	56	0.875 0	22.225 ^a
					25	0.390 625	9.922						57	0.890 625	22.622
				13	26	0.406 25	10.319					29	58	0.906 25	23.019
					27	0.421 875	10.716						59	0.921 875	23.416
			7	14	28	0.437 5	11.112				15	30	60	0.937 5	23.812
					29	0.453 125	11.509						61	0.953 125	24.209
				15	30	0.468 75	11.906					31	62	0.968 75	24.606
					31	0.484 375	12.303						63	0.984 375	25.003
1	2	4	8	16	32	0.500 0	12.700 ^a	2	4	8	16	32	64	1.000 0	25.400 ^a

Inches ↓	0	1	2	3	4	5	6	7	8	9
	Millimeters ^a									
0	—	25.4	50.8	76.2	101.6	127.0	152.4	177.8	203.2	228.6
10	254.0	279.4	304.8	330.2	355.6	381.0	406.4	431.8	457.2	482.6
20	508.0	533.4	558.8	584.2	609.6	635.0	660.4	685.8	711.2	736.6
30	762.0	787.4	812.8	838.2	863.6	889.0	914.4	939.8	965.2	990.6
40	1016.0	1041.4	1066.8	1092.2	1117.6	1143.0	1168.4	1193.8	1219.2	1244.6
50	1270.0	1295.4	1320.8	1346.2	1371.6	1397.0	1422.4	1447.8	1473.2	1498.6
60	1524.0	1549.4	1574.8	1600.2	1625.6	1651.0	1676.4	1701.8	1727.2	1752.6
70	1778.0	1803.4	1828.8	1854.2	1879.6	1905.0	1930.4	1955.8	1981.2	2006.6
80	2032.0	2057.4	2082.8	2108.2	2133.6	2159.0	2184.4	2209.8	2235.2	2260.6
90	2286.0	2311.4	2336.8	2362.2	2387.6	2413.0	2438.4	2463.8	2489.2	2514.6
100	2540.0	—	—	—	—	—	—	—	—	—

Feet ↓	0	1	2	3	4	5	6	7	8	9
	Meters ^a									
0	—	0.3048	0.6096	0.9144	1.2192	1.5240	1.8288	2.1336	2.4384	2.7432
10	3.0480	3.3528	3.6576	3.9624	4.2672	4.5720	4.8768	5.1816	5.4864	5.7912
20	6.0960	6.4008	6.7056	7.0104	7.3152	7.6200	7.9248	8.2296	8.5344	8.8392
30	9.1440	9.4488	9.7536	10.0584	10.3632	10.6680	10.9728	11.2776	11.5824	11.8872
40	12.1920	12.4968	12.8016	13.1064	13.4112	13.7160	14.0208	14.3256	14.6304	14.9352
50	15.2400	15.5448	15.8496	16.1544	16.4592	16.7640	17.0688	17.3736	17.6784	17.9832
60	18.2880	18.5928	18.8976	19.2024	19.5072	19.8120	20.1168	20.4216	20.7264	21.0312
70	21.3360	21.6408	21.9456	22.2504	22.5552	22.8600	23.1648	23.4696	23.7744	24.0792
80	24.3840	24.6888	24.9936	25.2984	25.6032	25.9080	26.2128	26.5176	26.8224	27.1272
90	27.4320	27.7368	28.0416	28.3464	28.6512	28.9560	29.2608	29.5656	29.8704	30.1752
100	30.4800	—	—	—	—	—	—	—	—	—

^aExact figure

WROUGHT STEEL PIPE DIMENSIONS

NOMINAL PIPE SIZE		NOMINAL OUTSIDE DIAMETER		NOMINAL WALL THICKNESS											
				IRON PIPE SIZES											
				Standard		Extra Strong		Dbl. Ex. Stg.		10		20		30	
in.	mm ^a	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.
1/8	3.175	0.405	10.287 ^a	0.068	1.727	0.095	2.413 ^a	—	—	—	—	—	—	—	—
1/4	6.350	0.540	13.716 ^a	0.088	2.235	0.119	3.023	—	—	—	—	—	—	—	—
3/8	9.525	0.675	17.145 ^a	0.091	2.311	0.126	3.200	—	—	—	—	—	—	—	—
1/2	12.700	0.840	21.336 ^a	0.109	2.769	0.147	3.734	0.294	7.468	—	—	—	—	—	—
3/4	19.050	1.050	26.670 ^a	0.113	2.870	0.154	3.912	0.308	7.823	—	—	—	—	—	—
1	25.400	1.315	33.401 ^a	0.133	3.378	0.179	4.547	0.358	9.093	—	—	—	—	—	—
1 1/4	31.750	1.660	42.164 ^a	0.140	3.556 ^a	0.191	4.851	0.382	9.703	—	—	—	—	—	—
1 1/2	38.100	1.900	48.260 ^a	0.145	3.683 ^a	0.200	5.080 ^a	0.400	10.160 ^a	—	—	—	—	—	—
2	50.800	2.375	60.325 ^a	0.154	3.912	0.218	5.537	0.436	11.074	—	—	—	—	—	—
2 1/2	63.500	2.875	73.025 ^a	0.203	5.156	0.276	7.010	0.552	14.021	—	—	—	—	—	—
3	76.200	3.500	88.900 ^a	0.216	5.486	0.300	7.620 ^a	0.600	15.240 ^a	—	—	—	—	—	—
3 1/2	88.900	4.000	101.600 ^a	0.226	5.740	0.318	8.077	0.636 ^b	16.154	—	—	—	—	—	—
4	101.600	4.500	114.300 ^a	0.237	6.020	0.337	8.560	0.674	17.120	—	—	—	—	—	—
5	127.000	5.563	141.300	0.258	6.553	0.375	9.525 ^a	0.750	19.050 ^a	—	—	—	—	—	—
6	152.400	6.625	168.275 ^a	0.280	7.112 ^a	0.432	10.973	0.864	21.946	—	—	—	—	—	—
8	203.200	8.625	219.075 ^a	0.322	8.179	0.500	12.700 ^a	0.875	22.225 ^a	—	—	0.250	6.350 ^a	0.277	7.036
10	254.000	10.750	273.050 ^a	0.365	9.271 ^a	0.500	12.700 ^a	1.000	25.400 ^a	—	—	0.250	6.350 ^a	0.307	7.798
12	304.800	12.750	323.850 ^a	0.375	9.525 ^a	0.500	12.700 ^a	1.000	25.400 ^a	—	—	0.250	6.350 ^a	0.330	8.382
14	355.600	14.000	355.600 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.312	7.925	0.375	9.525 ^a
16	406.400	16.000	406.400 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.312	7.925	0.375	9.525 ^a
18	457.200	18.000	457.200 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.312	7.925	0.438	11.125
20	508.000	20.000	508.000 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.375	9.525 ^a	0.500	12.700 ^a
22	558.800	22.000	558.800 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.375	9.525 ^a	0.500	12.700 ^a
24	609.600	24.000	609.600 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.250	6.350 ^a	0.375	9.525 ^a	0.562	14.275
26	660.400	26.000	660.400 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	—	—
28	711.200	28.000	711.200 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	0.625	15.875 ^a
30	762.000	30.000	762.000 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	0.625	15.875 ^a
32	812.800	32.000	812.800 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	0.625	15.875 ^a
34	863.600	34.000	863.600 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	0.625	15.875 ^a
36	914.400	36.000	914.400 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	0.312	7.925	0.500	12.700 ^a	0.625	15.875 ^a
40 ^b	1016.000	40.000	1016.000 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	—	—	—	—	—	—
42 ^b	1066.800	42.000	1066.800 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	—	—	—	—	—	—
48 ^b	1219.200	48.000	1219.200 ^a	0.375	9.525 ^a	0.500	12.700 ^a	—	—	—	—	—	—	—	—
NOM. SIZE		NOM. O.D.		NOMINAL INSIDE DIAMETER											
1/8	3.175	0.405	10.287 ^a	0.269	6.833	0.215	5.461 ^a	—	—	—	—	—	—	—	—
1/4	6.350	0.540	13.716 ^a	0.364	9.246	0.302	7.671	—	—	—	—	—	—	—	—
3/8	9.525	0.675	17.145 ^a	0.493	12.522	0.423	10.744	—	—	—	—	—	—	—	—
1/2	12.700	0.840	21.336 ^a	0.622	15.799	0.546	13.868	0.252	6.401	—	—	—	—	—	—
3/4	19.050	1.050	26.670 ^a	0.824	20.930	0.742	18.847	0.434	11.024	—	—	—	—	—	—
1	25.400	1.315	33.401 ^a	1.049	26.645	0.957	24.308	0.599	15.215	—	—	—	—	—	—
1 1/4	31.750	1.660	42.164 ^a	1.380	35.052 ^a	1.278	32.461	0.896	22.758	—	—	—	—	—	—
1 1/2	38.100	1.900	48.260 ^a	1.610	40.894 ^a	1.500	38.100 ^a	1.100	27.940 ^a	—	—	—	—	—	—
2	50.800	2.375	60.325 ^a	2.067	52.502	1.939	49.251	1.503	38.176	—	—	—	—	—	—
2 1/2	63.500	2.875	73.025 ^a	2.469	62.713	2.323	59.004	1.771	44.983	—	—	—	—	—	—
3	76.200	3.500	88.900 ^a	3.068	77.927	2.900	73.660 ^a	2.300	58.420 ^a	—	—	—	—	—	—
3 1/2	88.900	4.000	101.600 ^a	3.548	90.119	3.364	85.446	2.728 ^b	69.291	—	—	—	—	—	—
4	101.600	4.500	114.300 ^a	4.026	102.260	3.826	97.180	3.152	80.061	—	—	—	—	—	—
5	127.000	5.563	141.300	5.047	128.194	4.813	122.250	4.063	103.200	—	—	—	—	—	—
6	152.400	6.625	168.275 ^a	6.065	154.051 ^a	5.761	146.329	4.897	124.384	—	—	—	—	—	—
8	203.200	8.625	219.075 ^a	7.981	202.717	7.625	193.675 ^a	6.875	174.625 ^a	—	—	8.125	206.375 ^a	8.071	205.003
10	254.000	10.750	273.050 ^a	10.020	254.508 ^a	9.750	247.650 ^a	8.750	222.250 ^a	—	—	10.250	206.350 ^a	10.136	257.454
12	304.800	12.750	323.850 ^a	12.000	304.800 ^a	11.750	273.050 ^a	10.750	273.050 ^a	—	—	12.250	311.150 ^a	12.090	307.086 ^a
14	355.600	14.000	355.600 ^a	13.250	336.550 ^a	13.000	330.200 ^a	—	—	13.500	342.900 ^a	13.376	339.750	13.250	336.550 ^a
16	406.400	16.000	406.400 ^a	15.250	387.350 ^a	15.000	381.000 ^a	—	—	15.500	393.700 ^a	15.376	390.550	15.250	387.350 ^a
18	457.200	18.000	457.200 ^a	17.250	438.150 ^a	17.000	431.800 ^a	—	—	17.500	444.500 ^a	17.376	441.350	17.124	434.950
20	508.000	20.000	508.000 ^a	19.250	488.950 ^a	19.000	482.600 ^a	—	—	19.500	495.300 ^a	19.250	488.950 ^a	19.000	482.600 ^a
22	558.800	22.000	558.800 ^a	21.250	539.750 ^a	21.000	533.400 ^a	—	—	21.500	546.100 ^a	21.250	539.750 ^a	21.000	533.400 ^a
24	609.600	24.000	609.600 ^a	23.250	590.550 ^a	23.000	584.200 ^a	—	—	23.500	596.900 ^a	23.250	590.550 ^a	22.876	581.050
26	660.400	26.000	660.400 ^a	25.250	641.350 ^a	25.000	635.000 ^a	—	—	25.376	644.550	25.000	635.000 ^a	—	—
28	711.200	28.000	711.200 ^a	27.250	692.150 ^a	27.000	685.800 ^a	—	—	27.376	695.350	27.000	685.800 ^a	26.750	679.450 ^a
30	762.000	30.000	762.000 ^a	29.250	742.950 ^a	29.000	736.600 ^a	—	—	29.376	746.150	29.000	736.600 ^a	28.750	730.250 ^a
32	812.800	32.000	812.800 ^a	31.250	793.750 ^a	31.000	787.400 ^a	—	—	31.376	796.950	31.000	787.400 ^a	30.750	781.000 ^a
34	863.600	34.000	863.600 ^a	33.250	844.550 ^a	33.000	838.200 ^a	—	—	33.376	847.750	33.000	838.200 ^a	32.750	831.000 ^a
36	914.400	36.000	914.400 ^a	35.250	895.350 ^a	35.000	889.000 ^a	—	—	35.376	898.550	35.000	889.000 ^a	34.750	882.650 ^a
40 ^b	1016.000	40.000	1016.000 ^a	39.250	996.950 ^a	39.000	990.600 ^a	—	—	—	—	—	—	—	—
42 ^b	1066.800	42.000	1066.800 ^a	41.250	1047.750 ^a	41.000	1041.400 ^a	—	—	—	—	—	—	—	—
48 ^b	1219.200	48.000	1219.200 ^a	47.250	1200.150 ^a	47.000	1193.800 ^a	—	—	—	—	—	—	—	—

^aExact figure ^bNot given in ANSI B36.10

METRIC CONVERSIONS

WROUGHT STEEL PIPE DIMENSIONS

A.N.S.I. STANDARD B36.10														NOMINAL PIPE SIZE	
PIPE SCHEDULE NUMBER															
40		60		80		100		120		140		160			
in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm.	in.	mm. ^a
0.068	1.727	—	—	0.095	2.413 ^a	—	—	—	—	—	—	—	—	1/8	3.175
0.088	2.235	—	—	0.119	3.023	—	—	—	—	—	—	—	—	3/16	6.350
0.091	2.311	—	—	0.126	3.200	—	—	—	—	—	—	—	—	3/8	9.525
0.109	2.769	—	—	0.147	3.734	—	—	—	—	—	—	0.188	4.775	1/2	12.700
0.113	2.870	—	—	0.154	3.912	—	—	—	—	—	—	0.219	5.563	3/4	19.050
0.133	3.378	—	—	0.179	4.547	—	—	—	—	—	—	0.250	6.350 ^a	1	25.400
0.140	3.556 ^a	—	—	0.191	4.851	—	—	—	—	—	—	0.250	6.350 ^a	1 1/4	31.750
0.145	3.683 ^a	—	—	0.200	5.080 ^a	—	—	—	—	—	—	0.281	7.137	1 1/2	38.100
0.154	3.912	—	—	0.218	5.537	—	—	—	—	—	—	0.344	8.738	2	50.800
0.203	5.156	—	—	0.276	7.010	—	—	—	—	—	—	0.375	9.525 ^a	2 1/2	63.500
0.216	5.486	—	—	0.300	7.620 ^a	—	—	—	—	—	—	0.438	11.125	3	76.200
0.226	5.740	—	—	0.318	8.077	—	—	—	—	—	—	—	—	3 1/2	88.900
0.237	6.020	—	—	0.337	8.560	—	—	0.438	11.125	—	—	0.531	13.487	4	101.600
0.258	6.553	—	—	0.375	9.525 ^a	—	—	0.500	12.700 ^a	—	—	0.625	15.875 ^a	5	127.000
0.280	7.112 ^a	—	—	0.432	10.973	—	—	0.562	14.275	—	—	0.719	18.263	6	152.400
0.322	8.179	0.406	10.312	0.500	12.700 ^a	0.594	15.088	0.719	18.263	0.812	20.625	0.906	23.012	8	203.200
0.365	9.271 ^a	0.500	12.700 ^a	0.594	15.088	0.719	18.263	0.844	21.438	1.000	25.400 ^a	1.125	28.575 ^a	10	254.000
0.406	10.312	0.562	14.275	0.688	17.475	0.844	21.438	1.000	25.400 ^a	1.125	28.575 ^a	1.312	33.325	12	304.800
0.438	11.125	0.594	15.088	0.750	19.050 ^a	0.938	23.825	1.094	27.788	1.250	31.750 ^a	1.406	35.712	14	355.600
0.500	12.700 ^a	0.656	16.662	0.844	21.438	1.031	26.187	1.219	30.963	1.438	36.525	1.594	40.488	16	406.400
0.562	14.275	0.750	19.050 ^a	0.938	23.825	1.156	29.362	1.375	34.925 ^a	1.562	39.675	1.781	45.237	18	457.200
0.594	15.088	0.812	20.625	1.031	26.187	1.281	32.537	1.500	38.100 ^a	1.750	44.450 ^a	1.969	50.013	20	508.000
—	—	0.875	22.225 ^a	1.125	28.575 ^a	1.375	34.925 ^a	1.625	41.275 ^a	1.875	47.625 ^a	2.125	53.975 ^a	22	558.800
0.688	17.475	0.969	24.613	1.219	30.963	1.531	38.887	1.812	46.025	2.062	52.375	2.344	59.538	24	609.600
—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	660.400
—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	711.200
—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	762.000
0.688	17.475	—	—	—	—	—	—	—	—	—	—	—	—	32	812.800
0.688	17.475	—	—	—	—	—	—	—	—	—	—	—	—	34	863.600
0.750	19.050 ^a	—	—	—	—	—	—	—	—	—	—	—	—	36	914.400
—	—	—	—	—	—	—	—	—	—	—	—	—	—	40 ^b	1016.000
—	—	—	—	—	—	—	—	—	—	—	—	—	—	42 ^b	1066.800
—	—	—	—	—	—	—	—	—	—	—	—	—	—	48 ^b	1219.200

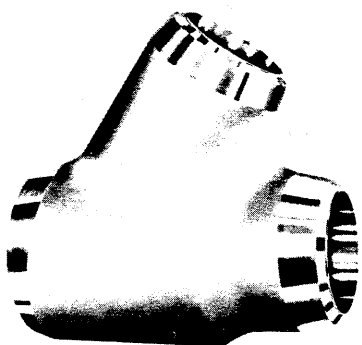
A.N.S.I. STANDARD B36.10														NOM. SIZE	
0.269	6.833	—	—	0.215	5.461 ^a	—	—	—	—	—	—	—	—	1/8	3.175
0.364	9.246	—	—	0.302	7.671	—	—	—	—	—	—	—	—	3/16	6.350
0.493	12.522	—	—	0.423	10.744	—	—	—	—	—	—	—	—	3/8	9.525
0.622	15.799	—	—	0.546	13.868	—	—	—	—	—	—	0.464	11.786	1/2	12.700
0.824	20.930	—	—	0.742	18.847	—	—	—	—	—	—	0.612	15.545	3/4	19.050
1.049	26.645	—	—	0.957	24.308	—	—	—	—	—	—	0.815	20.701 ^a	1	25.400
1.380	35.052 ^a	—	—	1.278	32.461	—	—	—	—	—	—	1.160	29.464 ^a	1 1/4	31.750
1.610	40.894 ^a	—	—	1.500	38.100 ^a	—	—	—	—	—	—	1.337	33.960	1 1/2	38.100
2.067	52.502	—	—	1.939	49.251	—	—	—	—	—	—	1.687	42.850	2	50.800
2.469	62.713	—	—	2.323	59.004	—	—	—	—	—	—	2.125	53.975 ^a	2 1/2	63.500
3.068	77.927	—	—	2.900	73.660 ^a	—	—	—	—	—	—	2.624	66.650	3	76.200
3.548	90.119	—	—	3.364	85.446	—	—	—	—	—	—	—	—	3 1/2	88.900
4.026	102.260	—	—	3.826	97.180	—	—	3.624	92.050	—	—	3.438	87.325	4	101.600
5.047	128.194	—	—	4.813	122.250	—	—	4.563	115.900	—	—	4.313	109.550	5	127.000
6.065	154.051 ^a	—	—	5.761	146.329	—	—	5.501	139.725	—	—	5.187	131.750	6	152.400
7.981	202.717	7.813	198.450	7.625	193.675 ^a	7.437	188.900	7.187	182.550	7.001	177.825	6.813	173.050	8	203.200
10.020	254.508 ^a	9.750	247.650 ^a	9.562	242.875	9.312	236.525	9.062	230.175	8.750	222.250 ^a	8.500	215.900 ^a	10	254.000
11.938	303.225	11.626	295.300	11.374	288.900	11.062	280.975	10.750	273.050 ^a	10.500	266.700 ^a	10.126	257.200	12	304.800
13.124	333.350	12.812	325.425	12.500	317.500 ^a	12.124	307.950	11.812	300.025	11.500	292.100 ^a	11.188	284.175	14	355.600
15.000	381.000 ^a	14.688	373.075	14.312	363.525	13.938	354.025	13.562	344.475	13.124	333.350	12.812	325.425	16	406.400
16.876	428.650	16.500	419.100 ^a	16.124	409.550	15.688	398.475	15.250	387.350 ^a	14.876	377.850	14.438	366.725	18	457.200
18.812	477.825	18.376	466.750	17.938	455.625	17.438	445.625	17.000	431.800 ^a	16.500	419.100 ^a	16.062	407.975	20	508.000
—	—	20.250	514.350 ^a	19.750	501.650 ^a	19.250	488.950 ^a	18.750	476.250 ^a	18.250	463.550 ^a	17.750	450.850	22	558.800
22.624	574.650	22.062	560.375	21.562	547.675	20.938	531.825	20.376	517.550	19.876	504.850	19.312	490.525	24	609.600
—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	660.400
—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	711.200
—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	762.000
30.624	777.850	—	—	—	—	—	—	—	—	—	—	—	—	32	812.800
32.624	828.650	—	—	—	—	—	—	—	—	—	—	—	—	34	863.600
34.500	876.300 ^a	—	—	—	—	—	—	—	—	—	—	—	—	36	914.400
—	—	—	—	—	—	—	—	—	—	—	—	—	—	40 ^b	1016.000
—	—	—	—	—	—	—	—	—	—	—	—	—	—	42 ^b	1066.800
—	—	—	—	—	—	—	—	—	—	—	—	—	—	48 ^b	1219.200

^aExact figure^bNot given in ANSI B36.10

WELDING FITTINGS, FLANGES, PIPE AND FORGED PIPING SPECIALT...

Taylor Forge is a recognized leading manufacturer of components for high quality piping systems. In addition to standard products, we also furnish special piping components of every type, size, wall thickness and pressure standard for both low pressure and critical high pressure-high temperature applications. This know-how is strengthened by constant participa-

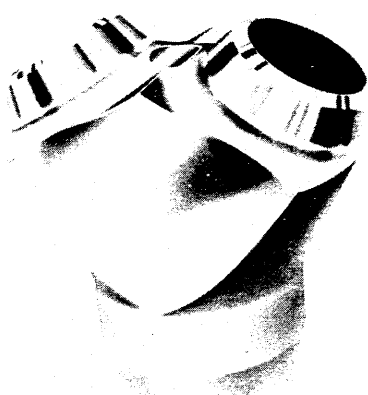
tion in engineering society work where codes, material specifications and standards are formulated. As a result, our engineers are able to provide unique solutions to problems involving unusual designs, thicknesses, reinforcements and special materials. Our highly qualified staff is ready to serve you and we welcome your inquiry.



Stainless Steel Welding Laterals of several sizes are used in reactor coolant piping. This is 14" x 10" x 10" size, with lateral at 50° 30' angle. Design conditions are 2500 psi at 650F



There are almost no limitations as to size and wall thickness ratios in which WeldELLS can be produced. This 18" OD x 3.90" wall chrome moly fitting is designed for fossil fuel power plant service.



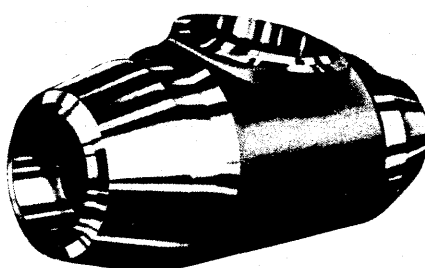
12" x 10" Schedule 160 Stainless Steel Concentric Reducer with square ends. Furnished for classified atomic research facility.

Electric Fusion Welded Stainless Steel Pipe is available in sizes thru 96" O.D. and 60 foot lengths. Pipe shown is 22" O.D. Stainless Steel, manufactured to extremely stringent specifications, and furnished in 20' lengths for primary coolant piping in the Commonwealth Edison Company's Dresden #1 nuclear power steam generating plant.

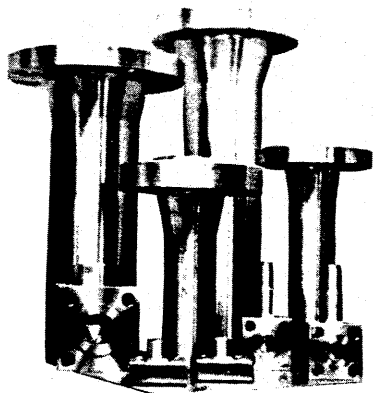


Manganese moly alloy Inconel Nozzle for nuclear reactor head. This nozzle, which is 25 1/4" long, is bored throughout to an ID of 13 3/4". Outside diameters are 21 1/4" and 18 3/4".

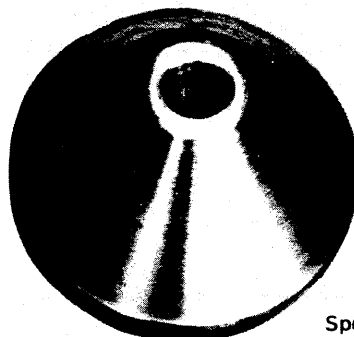
This 10" x 8" x 8" Schedule 160 Stainless Steel Wye is typical of special designs produced by Taylor Forge over the years for high pressure-temperature service.



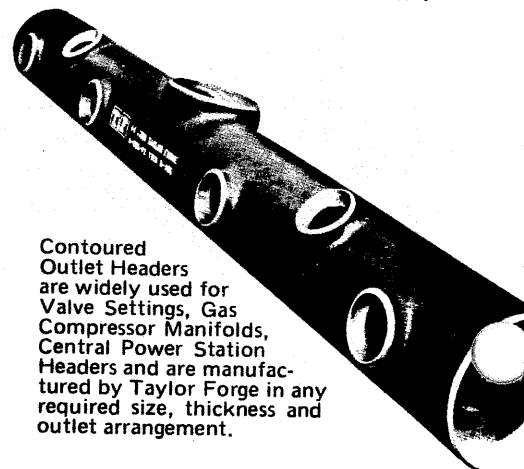
Bull Head Tees, such as the 8" x 8" x 12" Schedule 160 fitting pictured here, can often improve designs in high pressure-temperature oil refinery and power plant piping.



Special long Weld Neck Flanges, Monel and Stainless Angle Flange, for use in nuclear applications.



Contoured Outlet Headers are widely used for Valve Settings, Gas Compressor Manifolds, Central Power Station Headers and are manufactured by Taylor Forge in any required size, thickness and outlet arrangement.



Special Incoloy 800 Nozzle to code case 1325-4 for operating at 2000° F.

PRODUCT BRAND - NAMES

manufacturers of

**TAYLOR
FORGE**

products

manufacturers of

**BONNEY
FORGE**

products

manufacturers of

**epg
fluid
systems**

manufacturers of

**BUCKEYE
FORGE**

products

manufacturers of

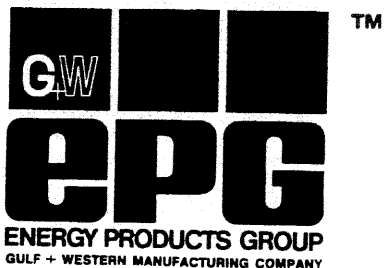
**LENAPE
FORGE**

products

manufacturers of

**FORGED
PRODUCTS**

**YOU CAN DEPEND ON THESE RELIABLE PRODUCTS
FOR ALL YOUR ENERGY NEEDS.**



2222 Kensington Court
Oak Brook, Illinois 60521

EXECUTIVE OFFICES

Oak Brook, Illinois

EPG SALES CENTERS

Atlanta, Georgia; Chicago, Illinois; Houston, Texas; Los Angeles, California;
New York, New York; Edmonton, Alta., Canada and Hamilton, Ont., Canada.

OVERSEAS OFFICES

Brussels, Belgium; London, England

MANUFACTURING PLANTS

USA

Ackerman, Mississippi
Allentown, Pennsylvania
Carlinville, Illinois
Cicero, Illinois
Cleveland, Ohio
Greeley, Kansas
Houston, Texas (4 plants)
Huntingdon, Pennsylvania
Long Island City, New York
Memphis, Tennessee
Osawatomie, Kansas
Oxford, Nebraska
Paola, Kansas
Pearland, Texas
Roselle, New Jersey
Somerville, New Jersey
Warwick, Rhode Island
West Chester, Pennsylvania

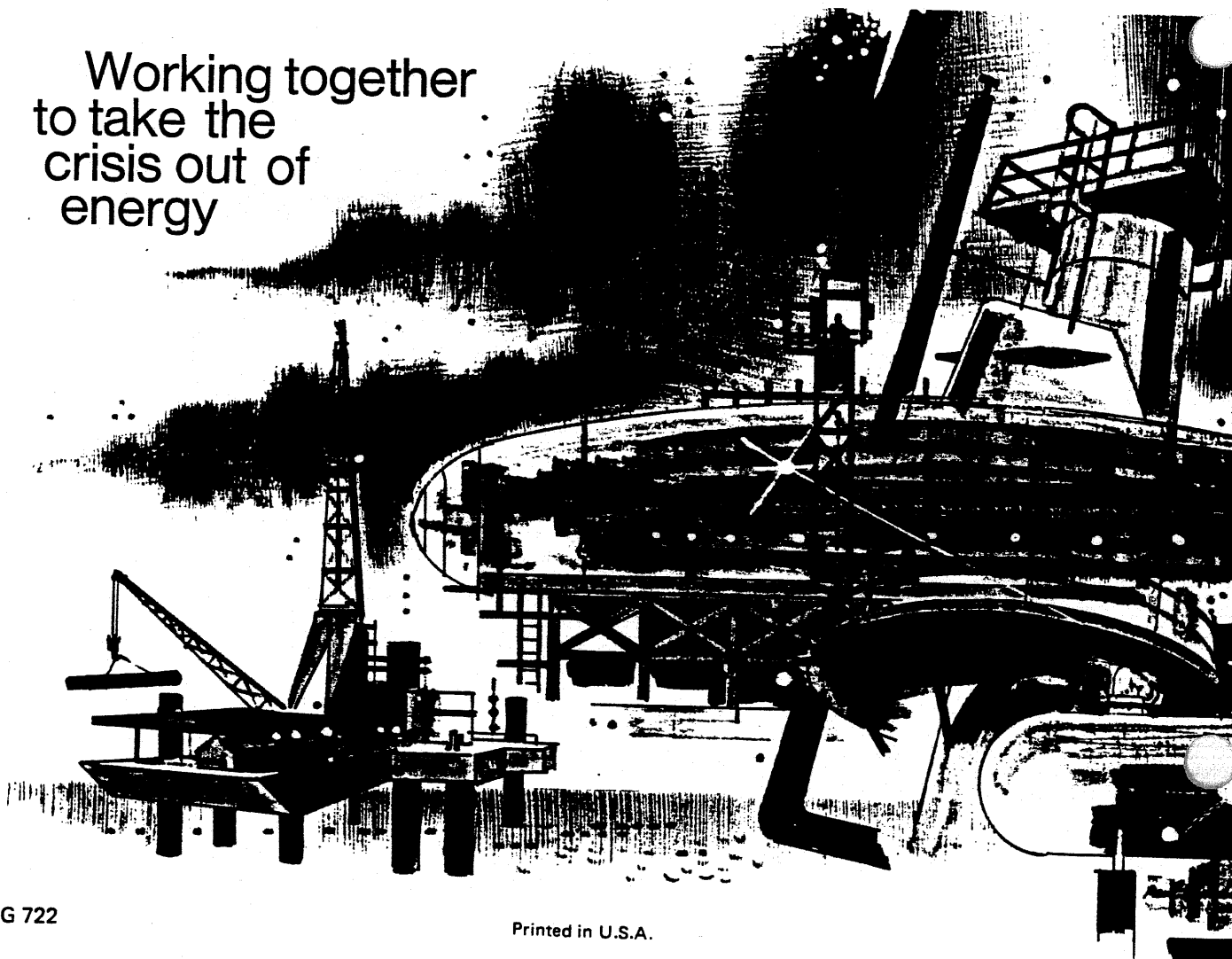
CANADA

Cambridge, Ont., Canada
Edmonton, Alta., Canada
Hamilton, Ont., Canada
Sarnia, Ont., Canada

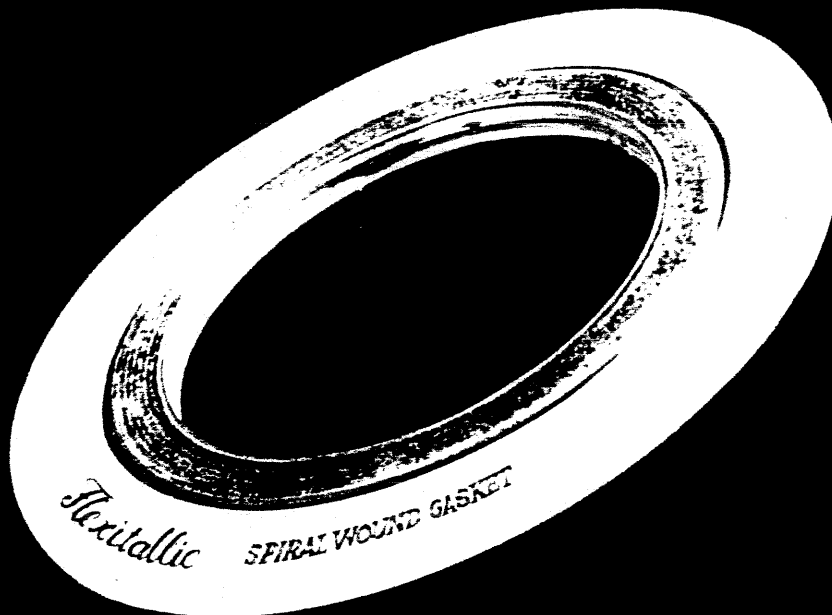
OVERSEAS

Albano S. Alessandro, Italy
Arceniega, Spain
Boën-sur-Lignon, France
Bosisio Parini, Italy
Cavaria, Italy
Ciudad Guayana, Venezuela
Irvine, Scotland (2 plants)
Kilmarnock, Scotland
Mexico City, Mexico
Smithfield, Australia
Veracruz, Mexico

Working together
to take the
crisis out of
energy



The World's Premier Static Seal.



A. L. Crump & Co., Inc.
4936 NORTH LINCOLN AVENUE
CHICAGO, IL 60625
(312) 769-2345

WARRANTY

Flexitallic Inc. guarantees that any product of its manufacture, which, upon examination by a Flexitallic representative, is found to be defective in either workmanship or material whereby it is not suitable under proper usage and service for the purpose for which it was designed, will be replaced or repaired free of charge including transportation charges but not cost of installation or, at our option, the purchase price will be refunded. The products are not guaranteed as to performance under any specific service nor for any specific period of time. The sale of our products under any other warranty or guarantee express or implied is not authorized by the company.

Flexitallic Inc.

Texas Plant:

P.O. Box 760, 6915 LaPorte Rd., Deer Park, TX 77536
Phone: (713) 479-3491 • Fax: (713) 479-6298

New Jersey Plant:

P.O. Box 286, 8440 Remington Ave., Pennsauken, NJ 08110
Phone: (609) 486-4400 • Fax: (609) 931-5471

Canadian Plant:

1337 Lougar Ave., Sarnia, Ont. N7S-5N5
Phone: (519) 332-8300 • Fax: (519) 332-8303

California Licensee:

Industrial Gasket & Supply Company, Inc.
23018 Normandie Ave., Torrance, CA 90502
Phone: 213/530-1771 • Fax: 213/530-9572

2025 Rumrill Blvd., Suite 7, San Pablo, CA 94806
Phone: 415/232-4900 • Fax: 415/232-0869

Main European Office & Factory:

Flexitallic Gaskets Limited
Cleckheaton, Yorkshire, England
Phone: 274-851273 • Fax: 274-851386

OTHER AFFILIATED COMPANIES in Burscheid, West Germany;
Madrid, Spain; Valencia, Venezuela; Guadalajara, Mexico; 6 Worldwide
Licensees



"A Member of the T & N Group"

JP-391-5M PRINTED IN USA

HELP FROM FLEXITALLIC is as near as your telephone. Flexitallic offers Bulletin 171 on design criteria involved in the construction of a spiral-wound gasket. It discusses the design and use of spiral-wound gaskets from a design engineer's and user's point of view. A copy will be sent to you on request. Flexitallic also provides Gasket Engineering Data Forms to help you in specifying the right gasket for the right flange to provide the right seal. Also available on request is Bulletin #278 which includes data on Flexitallic Metallic/Non-Metallic Gaskets and Washers.

Flexitallic also provides engineering assistance whenever required. Call on the world's most experienced manufacturer of spiral-wound gaskets to help you determine the type of gasket that will provide the most dependable seal for your application. Gasketed joints require attention in the earliest stages of flanged joint design and the sealing engineers at Flexitallic will be happy to work with you.

ALSO CALL

Flexitallic

FOR THE FOLLOWING:

FLEXICARB® FLEXIBLE GRAPHITE PRODUCTS

ROLLS

CUT GASKETS

GASKET TAPE

SHEETS

TAPE PACKING

REINFORCED SHEETS

DIE FORMED RINGS

FLEXITALLIC SERVICES, INCORPORATED

BOLT TIGHTENING SERVICE

ULTRASONIC BOLT STRESS

HYDRAULIC TORQUE

MONITORING

WRENCHES

BOILER SUPPORT ROD

HYDRAULIC STUD TENSIONERS

ANALYSIS

HYDRAULIC BOLTS AND NUTS

PIPE HANGER ANALYSIS

JOINT LEAKAGE ANALYSIS

TOOLS, SALES, RENTAL

LASER CUTTING

LONG RUN, SHORT RUN, PROTOTYPES

SIMPLE AND INTRICATE SHAPES

WIDE VARIETY OF MATERIALS UP TO 3/16" THICK

HEAT EXCHANGER AND METALLIC JACKETED GASKETS

AVAILABLE IN A WIDE RANGE OF STYLES AND MATERIALS

RING JOINT GASKETS

MANUFACTURED TO ANSI B16.20 SPECIFICATIONS

PERMANITE SEALING MATERIALS, INC.

COMPRESSED SHEET

PACKINGS

MILLBOARD

PTFE TAPES

FLUOROSEAL PTFE JOINT SEALANT

TORQUE REQUIRED TO PRODUCE BOLT STRESS

The torque or turning effort required to produce a certain stress in bolting is dependent upon a number of conditions, some of which are:

1. Diameter of bolt.
2. Type and number of threads on bolt.
3. Material of bolt.
4. Condition of nut bearing surfaces.
5. Lubrication of bolt threads and nut bearing surfaces.

The tables below reflect the results of many tests to determine the relation between torque and bolt stress. Values are based on steel bolting well lubricated with a heavy graphite and oil mixture.

It was found that a non-lubricated bolt has an efficiency of about 50 percent of a well lubricated bolt and also that different lubricants produce results varying between the limits of 50 and 100 percent of the tabulated stress figures.

TORQUE DATA FOR USE WITH ALLOY STEEL STUD BOLTS Load in Pounds on Stud Bolts when Torque Loads are Applied

NOMINAL DIAMETER OF BOLT (Inches)	NUMBER OF THREADS (Per Inch)	DIAMETER AT ROOT OF THREAD (Inches)	AREA AT ROOT OF THREAD Sq. Inch	STRESS					
				30,000 PSI		45,000 PSI		60,000 PSI	
				Torque Ft/Lbs	Compression Lbs.	Torque Ft/Lbs	Compression Lbs.	Torque Ft/Lbs	Compression Lbs.
1/4	20	.185	.027	4	810	6	1215	8	1620
5/16	18	.240	.045	8	1350	12	2025	16	2700
3/8	16	.294	.068	12	2040	18	3060	24	4080
7/16	14	.345	.093	20	2790	30	4185	40	5580
1/2	13	.400	.126	30	3780	45	5670	60	7560
9/16	12	.454	.162	45	4860	68	7290	90	9720
5/8	11	.507	.202	60	6060	90	9090	120	12120
3/4	10	.620	.302	100	9060	150	13590	200	18120
7/8	9	.731	.419	160	12570	240	18855	320	25140
1	8	.838	.551	245	16530	368	24795	490	33060
1-1/8	8	.963	.728	355	21840	533	32760	710	43680
1-1/4	8	1.088	.929	500	27870	750	41805	1000	55740
1-3/8	8	1.213	1.155	680	34650	1020	51975	1360	69300
1-1/2	8	1.338	1.405	800	42150	1200	63225	1600	84300
1-5/8	8	1.463	1.680	1100	50400	1650	75600	2200	100800
1-3/4	8	1.588	1.980	1500	59400	2250	89100	3000	118800
1-7/8	8	1.713	2.304	2000	69120	3000	103680	4000	138240
2	8	1.838	2.652	2200	79560	3300	119340	4400	159120
2-1/4	8	2.088	3.423	3180	102690	4770	154035	6360	205380
2-1/2	8	2.338	4.292	4400	128760	6600	193140	8800	257520
2-3/4	8	2.588	5.259	5920	157770	8880	236655	11840	315540
3	8	2.838	6.324	7720	189720	11580	284580	15440	379440

Reprinted with permission of Crane Co. (Page 383, Crane No. 60 Valve Catalog.)

COLOR CODING FOR THE GASKETS YOU NEED.

Style CG Gaskets are color coded to provide easy identification in inventory and during installation. The Flexitallic color code meets the industry standard for metal

and filler materials which has been adopted by API 601 and the Metallic Gasket division of the Fluid Sealing Association.

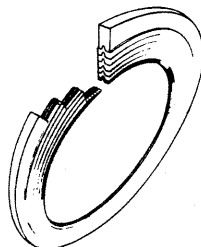
WINDING MATERIAL				FILLER MATERIAL	
Carbon Steel	Silver	Titanium	Purple	Flexite Super	Pink
304SS	Yellow	Alloy 20	Black	Flexicarb (Graphite)	Gray
316LSS	Green	Hast. B	Brown	Blue Dyed Asb	None
347SS	Blue	Hast. C	Beige	PTFE	White
321SS	Turquoise	Inc 600	Gold	Ceramic	Light Green
Monel	Orange	Incoloy	White		
Nickel 200	Red				

BOLTING DATA FOR ANSI B16.5 FLANGES

NOMINAL PIPE SIZE (Inches)	CLASS 150				CLASS 300				CLASS 400				CLASS 600			
	FLANGE DIAM. (Inches)	NO. OF BOLTS	BOLT DIAM. (Inches)	B.C. DIAM. (Inches)	FLANGE DIAM. (Inches)	NO. OF BOLTS	BOLT DIAM. (Inches)	B.C. DIAM. (Inches)	FLANGE DIAM. (Inches)	NO. OF BOLTS	BOLT DIAM. (Inches)	B.C. DIAM. (Inches)	FLANGE DIAM. (Inches)	NO. OF BOLTS	BOLT DIAM. (Inches)	B.C. DIAM. (Inches)
1/4	3-3/8	4	1/2	2-1/4	3-3/8	4	1/2	2-1/4	3-3/8	4	1/2	2-1/4	3-3/8	4	1/2	2-1/4
1/2	3-1/2	4	1/2	2-3/8	3-3/4	4	1/2	2-5/8	3-3/4	4	1/2	2-5/8	3-3/4	4	1/2	2-5/8
3/4	3-7/8	4	1/2	2-3/4	4-5/8	4	5/8	3-1/4	4-5/8	4	5/8	3-1/4	4-5/8	4	5/8	3-1/4
1	4-1/4	4	1/2	3-1/8	4-7/8	4	5/8	3-1/2	4-7/8	4	5/8	3-1/2	4-7/8	4	5/8	3-1/2
1-1/4	4-5/8	4	1/2	3-1/2	5-1/4	4	5/8	3-7/8	5-1/4	4	5/8	3-7/8	5-1/4	4	5/8	3-7/8
1-1/2	5	4	1/2	3-7/8	6-1/8	4	3/4	4-1/2	6-1/8	4	3/4	4-1/2	6-1/8	4	3/4	4-1/2
2	6	4	5/8	4-3/4	6-1/2	8	5/8	5	6-1/2	8	5/8	5	6-1/2	8	5/8	5
2-1/2	7	4	5/8	5-1/2	7-1/2	8	3/4	5-7/8	7-1/2	8	3/4	5-7/8	7-1/2	8	3/4	5-7/8
3	7-1/2	4	5/8	6	8-1/4	8	3/4	6-5/8	8-1/4	8	3/4	6-5/8	8-1/4	8	3/4	6-5/8
3-1/2	8-1/2	8	5/8	7	9	8	3/4	7-1/4	9	8	7/8	7-1/4	9	8	7/8	7-1/4
4	9	8	5/8	7-1/2	10	8	3/4	7-7/8	10	8	7/8	7-7/8	10-3/4	8	7/8	8-1/2
5	10	8	3/4	8-1/2	11	8	3/4	9-1/4	11	8	7/8	9-1/4	13	8	1	10-1/2
6	11	8	3/4	9-1/2	12-1/2	12	3/4	10-5/8	12-1/2	12	7/8	10-5/8	14	12	1	11-1/2
8	13-1/2	8	3/4	11-3/4	15	12	7/8	13	15	12	1	13	16-1/2	12	1-1/8	13-3/4
10	16	12	7/8	14-1/4	17-1/2	16	1	15-1/4	17-1/2	16	1-1/8	15-1/4	20	16	1-1/4	17
12	19	12	7/8	17	20-1/2	16	1-1/8	17-3/4	20-1/2	16	1-1/4	17-3/4	22	20	1-1/4	19-1/4
14	21	12	1	18-3/4	23	20	1-1/8	20-1/4	23	20	1-1/4	20-1/4	23-3/4	20	1-3/8	20-3/4
16	23-1/2	16	1	21-1/4	25-1/2	20	1-1/4	22-1/2	25-1/2	20	1-3/8	22-1/2	27	20	1-1/2	23-3/4
18	25	16	1-1/8	22-3/4	28	24	1-1/4	24-3/4	28	24	1-3/8	24-3/4	29-1/4	20	1-5/8	25-3/4
20	27-1/2	20	1-1/8	25	30-1/2	24	1-1/4	27	30-1/2	24	1-1/2	27	32	24	1-5/8	28-1/2
24	32	20	1-1/4	29-1/2	36	24	1-1/2	32	36	24	1-3/4	32	37	24	1-7/8	33

NOMINAL PIPE SIZE (Inches)	CLASS 900				CLASS 1500				CLASS 2500			
	FLANGE DIAMETER (Inches)	NO. OF BOLTS	BOLT DIAMETER (Inches)	B.C. DIAMETER (Inches)	FLANGE DIAMETER (Inches)	NO. OF BOLTS	BOLT DIAMETER (Inches)	B.C. DIAMETER (Inches)	FLANGE DIAMETER (Inches)	NO. OF BOLTS	BOLT DIAMETER (Inches)	B.C. DIAMETER (Inches)
1/2	4-3/4	4	3/4	3-1/4	4-3/4	4	3/4	3-1/4	5-1/4	4	3/4	3-1/2
3/4	5-1/8	4	3/4	3-1/2	5-1/8	4	3/4	3-1/2	5-1/2	4	3/4	3-3/4
1	5-7/8	4	7/8	4	5-7/8	4	7/8	4	6-1/4	4	7/8	4-1/4
1-1/4	6-1/4	4	7/8	4-3/8	6-1/4	4	7/8	4-3/8	7-1/4	4	1	5-1/8
1-1/2	7	4	1	4-7/8	7	4	1	4-7/8	8	4	1-1/8	5-3/4
2	8-1/2	8	7/8	6-1/2	8-1/2	8	7/8	6-1/2	9-1/4	8	1	6-3/4
2-1/2	9-5/8	8	1	7-1/2	9-5/8	8	1	7-1/2	10-1/2	8	1-1/8	7-3/4
3	9-1/2	8	7/8	7-1/2	10-1/2	8	1-1/8	8	12	8	1-1/4	9
4	11-1/2	8	1-1/8	9-1/4	12-1/4	8	1-1/4	9-1/2	14	8	1-1/2	10-3/4
5	13-3/4	8	1-1/4	11	14-3/4	8	1-1/2	11-1/2	16-1/2	8	1-3/4	12-3/4
6	15	12	1-1/8	12-1/2	15-1/2	12	1-3/8	12-1/2	19	8	2	14-1/2
8	18-1/2	12	1-3/8	15-1/2	19	12	1-5/8	15-1/2	21-3/4	12	2	17-1/4
10	21-1/2	16	1-3/8	18-1/2	23	12	1-7/8	19	26-1/2	12	2-1/2	21-1/4
12	24	20	1-3/8	21	26-1/2	16	2	22-1/2	30	12	2-3/4	24-3/8
14	25-1/4	20	1-1/2	22	29-1/2	16	2-1/4	25	—	—	—	—
16	27-3/4	20	1-5/8	24-1/4	32-1/2	16	2-1/2	27-3/4	—	—	—	—
18	31	20	1-7/8	27	36	16	2-3/4	30-1/2	—	—	—	—
20	33-3/4	20	2	29-1/2	38-3/4	16	3	32-3/4	—	—	—	—
24	41	20	2-1/2	35-1/2	46	16	3-1/2	39	—	—	—	—

When Gaskets



Must Not Fail!

FACING DIMENSIONS FOR ANSI B16.5 FLANGES

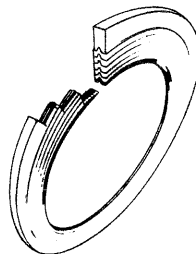
CLASS 150, 300, 400, 600, 900, 1500 AND 2500

NOMINAL PIPE SIZE (Inches)	OUTSIDE DIAMETER (Inches) See Note 3			I.D. OF LARGE & SMALL TONGUE See Notes 3 & 5	OUTSIDE DIAMETER (Inches) See Note 3			I.D. OF LARGE & SMALL GROOVE See Note 3 See Note 5	HEIGHT (Inches)		DEPTH OF GROOVE OR FEMALE
	RAISED FACE, LAPPED, LARGE MALE & LARGE TONGUES See Note 5	SMALL MALE See Notes 4 & 5	SMALL TONGUE See Note 5		LARGE FEMALE & LARGE GROOVE See Note 5	SMALL FEMALE See Note 4 See Note 5	SMALL GROOVE See Note 5		RAISED FACE 150 & 300 PSI See Note 1	RAISED FACE LARGE & SMALL MALE & TONGUE 400, 600, 900 1500 & 2500 PSI See Note 2	
	R	S	T		W	X	Y		Z		
1/2	1-3/8	23/32	1-3/8	1	1-7/16	25/32	1-7/16	15/16	1/16	1/4	3/16
3/4	1-11/16	15/16	1-11/16	1-5/16	1-3/4	1	1-3/4	1-1/4	1/16	1/4	3/16
1	2	1-3/16	1-7/8	1-1/2	2-1/16	1-1/4	1-15/16	1-7/16	1/16	1/4	3/16
1-1/4	2-1/2	1-1/2	2-1/4	1-7/8	2-9/16	1-9/16	2-5/16	1-13/16	1/16	1/4	3/16
1-1/2	2-7/8	1-3/4	2-1/2	2-1/8	2-15/16	1-13/16	2-9/16	2-1/16	1/16	1/4	3/16
2	3-5/8	2-1/4	3-1/4	2-7/8	3-11/16	2-5/16	3-5/16	2-13/16	1/16	1/4	3/16
2-1/2	4-1/8	2-11/16	3-3/4	3-3/8	4-3/16	2-3/4	3-13/16	3-5/16	1/16	1/4	3/16
3	5	3-5/16	4-5/8	4-1/4	5-1/16	3-3/8	4-11/16	4-3/16	1/16	1/4	3/16
3-1/2	5-1/2	3-13/16	5-1/8	4-3/4	5-9/16	3-7/8	5-3/16	4-11/16	1/16	1/4	3/16
4	6-3/16	4-5/16	5-11/16	5-3/16	6-1/4	4-3/8	5-3/4	5-1/8	1/16	1/4	3/16
5	7-5/16	5-3/8	6-13/16	6-5/16	7-3/8	5-7/16	6-7/8	6-1/4	1/16	1/4	3/16
6	8-1/2	6-3/8	8	7-1/2	8-9/16	6-7/16	8-1/16	7-7/16	1/16	1/4	3/16
8	10-5/8	8-3/8	10	9-3/8	10-11/16	8-7/16	10-1/16	9-5/16	1/16	1/4	3/16
10	12-3/4	10-1/2	12	11-1/4	12-13/16	10-9/16	12-1/16	11-3/16	1/16	1/4	3/16
12	15	12-1/2	14-1/4	13-1/2	15-1/16	12-9/16	14-5/16	13-7/16	1/16	1/4	3/16
14	16-1/4	13-3/4	15-1/2	14-3/4	16-5/16	13-13/16	15-9/16	14-11/16	1/16	1/4	3/16
16	18-1/2	15-3/4	17-5/8	16-3/4	18-9/16	15-13/16	17-11/16	16-11/16	1/16	1/4	3/16
18	21	17-3/4	20-1/8	19-1/4	21-1/16	17-13/16	20-3/16	19-3/16	1/16	1/4	3/16
20	23	19-3/4	22	21	23-1/16	19-13/16	22-1/16	20-15/16	1/16	1/4	3/16
24	27-1/4	23-3/4	26-1/4	25-1/4	27-5/16	23-13/16	26-5/16	25-3/16	1/16	1/4	3/16

NOTES

- Regular facing for 150 and 300 PSI steel flanged fittings and companion flange standards is a 1/16" raised face included in the minimum flange thickness dimensions. A 1/16" raised face may be supplied also on the 400, 600, 900, 1500, and 2500 PSI flange standards, but it must be added to the minimum flange thickness.
- Regular facing for 400, 600, 900, 1500, and 2500 PSI flange standards is a 1/4" raised face not included in minimum flange thickness dimensions.
- Tolerance of plus or minus 0.016 in. (1/64") is allowed on the inside and outside diameters of all facings.
- For small male and female joints care should be taken in the use of these dimensions to insure that pipe used is thick enough to permit sufficient bearing surface to prevent the crushing of the gasket. The dimensions apply particularly on lines where the joint is made on the end of the pipe. Screwed companion flanges for small male and female joints are furnished with plain face and are threaded with American Standard Locknut Thread.
- Gaskets for male-female and tongue-groove joints shall cover the bottom of the recess with minimum clearances taking into account the tolerances prescribed in Note 3.

When Gaskets

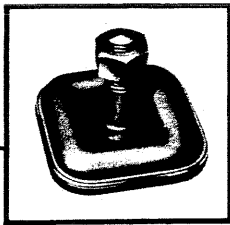


Must Not Fail!

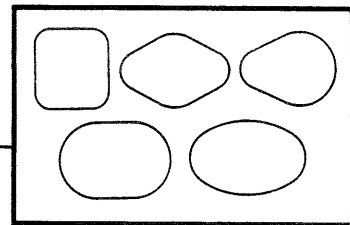
Flexitallic® STYLE T FOR BOILER HANDHOLE AND TUBECAP ASSEMBLIES

0-499 Lbs. 0-999 Lbs. 1000 Lbs. and Above ☐ Specify operating temperature, pressure, and type of steel

IDENTIFICATION	SHAPE	NOMINAL I.D. (Inches)	FLANGE WIDTH (Inches)	IDENTIFICATION	SHAPE	NOMINAL I.D. (Inches)	FLANGE WIDTH (Inches)
American Engineering	Obround Round	3-5/16 x 3-11/16 3-5/16	3/16 3/16	Foster Wheeler (Con't.)	Round Rect.	4-1/8 or 4-1/16 4-15/16 x 5-3/16	3/8 7/32
Babcock and Wilcox				Geary			
No. 41	Obround	2-9/64 x 2-33/64	5/32	3-1/2"	Obround	3-13/16 x 4-5/8	3/8
No. 40	Diamond	3-3/8 x 3-3/4	3/16	4"	Obround	4-1/4 x 5-1/4	7/16
No. 48	Oval	3-13/16 x 4-3/4	7/32	4" (.285" Thick)	Obround	4-1/4 x 5-1/4	7/16
No. 79	Obround	4-5/32 x 4-25/32	1/4	Heine	Obround Round	3-5/8 x 4-5/8	3/8 3/8
No. 24	Oval	4-1/2 x 5-1/2	7/32	International	Oval	2-19/32 x 3-19/32	7/16
No. 76	Oval	5-1/32 x 5-31/32	1/4	Keeler	Diamond Round	4-1/4 x 5-1/4	3/8
2" Econ.	Round	1-5/8	1/4	Obround	3 x 4	3/8	3/8
No. 47	Round	2-1/32	3/16	Murray	Obround	3-5/8 x 4-9/16	3/8
No. 32	Round	3	1/4	Obround	3-5/8 x 4-9/16	7/16	3/8
No. 70	Round	3-9/32	3/16	Obround	4-1/32 x 4-29/32	3/8	
No. 89	Round	3-7/16	5/32	Oil Field	Obround	2-1/2 x 3-1/2	3/8
No. 92	Round	4-1/32	1/4	Oval	3 x 4	3/8	3/8
No. 28	Rect.	4-13/16 x 5	7/32	Oval	3-1/2 x 4-1/2	3/8	7/16
Badenhausen (See Riley Stoker)				Orr & Sembower	Oval	2-23/32 x 3-21/32	3/8
Bros				Oval	3-13/32 x 4-13/32	3/8	
HB-5 and HB-10	Round	2-1/4	1/4	Pacific	Round	1-1/2	1/2
HB-6 and HB-11	Round	3-3/8	1/4	Round	2	1/2	
HB-12	Round	4-1/4	1/4	Round	2-1/2	1/2	
HB-8 and HB-13	Obround	3-3/8 x 4-1/4	1/4	Page			
HB-14	Obround	4-1/4 x 5	1/4	Larrabee	Oval	2-27/32 x 3-29/32	3/8
Bucyrus-Erie				Junior	Oval	3-1/8 x 4-1/8	3/8
Q227	Obround	3 x 4-1/2	3/8	Page	Oval	3-1/8 x 4-1/4	3/8
Q260	Oval	4 x 6	7/16	P-B	Oval	3-5/16 x 4-5/16	3/8
Q208	Round	2-1/2	1/4	Drum	Oval	3-25/32 x 5-13/32	5/8
Casey-Hedges	Obround	4-1/4 x 5-1/8	3/8	Consol	Round	2-3/16	3/8
Cleaver-Brooks				Riley Stoker			
	Obround	2-27/32 x 3-19/32	5/16	W-C22	Oval	3-17/32 x 4-17/32	5/16
	Obround	3-9/32 x 4-17/32	3/8	W-C2	Obround	3-23/32 x 5-23/32	11/32
	Obround	4 x 6	3/8	W-C16	Round	1-31/32	3/8
Combustion Engineering				W-C6	Round	3-9/32	5/16
24N-L1206	Diamond	3 x 3-7/8	1/4	W-C6	Square	4 x 4	11/32
29N-L839	Diamond	3-3/8 x 4-1/4	1/4	W-C9	Square	5-1/2 x 5-1/2	3/8
30N-L866	Diamond	3-5/8 x 4-1/2	1/4	Springfield	Oval	3-17/32 x 4-17/32	5/16
33N-L1205	Diamond	3-3/4 x 4-5/8	1/4	Oval	4-1/16 x 5-1/16	3/8	
31N-L579	Diamond	4-1/4 x 5-1/8	1/4	Square	5-1/2 x 5-1/2	3/8	
21N-L1291	Obround	2-1/8 x 2-1/2	5/32	Square	7-3/8 x 7-3/8	5/8	
22N	Oval	2-1/8 x 2-5/8	7/32	Superheater	Obround	2-21/32 x 3-9/32	15/64
23N	Obround	2-25/32 x 3-13/32	7/32	Obround	3-3/32 x 4-3/32	1/4	
25N-L1278	Obround	3-1/8 x 4-1/8	3/16	Obround	3-11/32 x 3-23/32	3/16	
27N	Diamond	3-3/8 x 3-3/4	3/16	Obround	3-3/8 x 3-7/8	1/4	
28N-L1277	Obround	3-3/8 x 3-7/8	3/16	Round	15/16	3/16	
32N	Oval	4-1/2 x 5-1/2	7/32	Round	3-3/32	1/4	
1N-L1272	Round	1-1/2	3/16	Union			
7N-L1131	Round	1-3/4	3/16	3-1/4"	Pear	3-7/16 x 4-7/16	3/8
3N-L1274	Round	2-5/8	7/32	Pear	3-1/2 x 4-1/2	3/8	
4N-L740	Round	3-1/8	1/4	Pear	4-1/4 x 5-1/4	3/8	
L741	Round	3-3/8	1/4	Pear	4-1/4 x 5-1/4	3/8	
5N-L902	Round	3-5/8	1/4	Oval	3-1/2 x 4-1/2	3/8	
6N-L744	Round	4-1/8	1/4	Oval	3 x 4	3/8	
51N	Rect.	4-13/16 x 5	7/32	Vogt			
52N-L1117	Rect.	4-7/8 x 5-3/16	7/32	Oval	3 x 4	5/16	
PB9474	Obround	4-1/8 x 4-7/8	3/16	Oval	3-3/8 x 4-1/4	7/32	
PB9474	Round	3-1/2	3/16	Oval	3-1/2 x 4-1/2	5/16	
Connelly	Obround	3 x 3-15/16	3/8	Oval	3-1/2 x 4-1/2	3/8	
Edge Moor				Oval	3-3/4 x 5	3/8	
	Oval	4-1/8 x 5-1/4	3/8	Oval	4 x 5	5/16	
	Round	2-1/2	1/2	Oval	4 x 6	3/8	
	Round	4-1/16	15/32	Oval	4-1/4 x 5-1/8	7/32 (new)	
Erie City				Oval	4-1/4 x 5-1/8	5/16 (old)	
	Pear	3-1/2 x 4-5/8	3/8	Oval	4-9/32 x 5-5/32	7/32	
	Obround	3 x 4-1/2	3/8	Round	3-19/32	3/8	
	Oval	3-1/32 x 4-1/32	5/16	Round	4-1/8	3/8	
	Oval	3-17/32 x 4-17/32	5/16	Ward	Square	4-7/8 x 4-7/8	1/4
	Oval	4-1/32 x 5-1/32	5/16	Wickes			
	Oval	4-1/32 x 6-1/32	3/8	Pear	4-1/8 x 5-1/8	9/32	
	Round	3-1/2	3/8	Pear	4-1/4 x 5-1/8	3/8	
Foster Wheeler				Oval	3 x 4	5/16	
2-3/4"	Diamond	4 x 5	3/8	Oval	3-1/2 x 4-1/2	5/16	
	Obround	2-25/32 x 3-13/32	7/32	Oval	4 x 5	5/16	
	Obround	3 x 4	3/8	Oval	4 x 6	5/16	
	Obround	3-11/32 x 3-31/32	7/32	Round	4-1/8	3/8	
	Oval	4-3/16 x 5-3/16	5/16	Round	4-1/4	3/8	
	Round	15/16	5/32				
	Round	2-1/32	13/64				
	Round	2-1/32	15/64				
	Round	2-1/8 or 2-1/16	3/8				
	Round	3-1/8 or 3-1/16	3/8				



Flexitallic STYLE T GASKETS



FOR BOILER HANDHOLE AND TUBECAP ASSEMBLIES

Style T Gaskets for boiler handhole and tubecap assemblies have been recognized for their superiority since 1912. The quality and safety of Flexitallic Style T Gaskets are the result of unceasing effort to develop a series of gaskets which will maintain a perfect seal at a minimum maintenance cost.

Style T Gaskets require no compounds and can frequently be reused if not removed from cover assemblies during outage. This economy is due to the exclusive feature of spiral-wound construction and resiliency which permit the gaskets to rebound when they are not under compression. The consistently high standard of performance in Style T Gaskets is the direct result of Flexitallic engineering vision in anticipating design improvements of modern steam generating equipment.

Style T Gaskets, in thicknesses of .125" and .175", are recognized for the following design factors:

- High safety factor in keeping with specific operating conditions.
- Compression values and bonding loads proportioned to safe stresses of cover assemblies.
- Resiliency under concentrated and fluctuating loads.
- Exceptionally long and sustained service.
- Reduction of seat cleaning time.

Style T Gasket yield values are calculated for specific ranges of operating pressure to compensate for highly concentrated gasket loads. The compression characteristics are related to the gasket constructions which vary with the ranges of operating pressure for practically all makes of boilers and auxiliary equipment:

- 0-499 lbs.
- 0-999 lbs.
- 1000 lbs. and above.

Installation: See instruction tags attached to each bundle of gaskets supplied.

Style T Gaskets are manufactured from any combination of materials shown on page 3.

Low carbon plated steel continues to serve well in a majority of applications where saturated temperatures are not in excess of 500° F. Although this type of steel is subject to a normal rate of corrosion it does not in any way affect the sealing qualities of the gasket.

Type 304 stainless steel possesses ideal corrosion resistant qualities and is recommended for superheat temperature. The extremely long service life and resistance to corrosion warrant the slightly higher cost of Type 304 stainless steel for use in boilers operating at less than 500° F. The use of stainless steel gaskets also reduces the time required for cleaning gasket seat surfaces.

Style T Gaskets are also manufactured with other types of stainless steel and alloys and are recommended when corrosive acid, alkaline or other conditions warrant their use. Gasket fillers other than Canadian asbestos can be furnished in combination with any metal according to specifications for chemical processes where the use of such materials is indicated. See page 3 for listing of metals and fillers.

Standard Style T Gaskets are manufactured to nominal original thicknesses of .175" and .125". Each thickness possesses design characteristics compatible to the design of handhole and tubecap assemblies. Special gaskets having a thickness of .250" are recommended for use in assemblies having relatively broad seating surfaces and where bonding loads are low. Gaskets having a thickness of .125" are designed for use with assemblies having extremely narrow seating surfaces and where high bonding loads are encountered. Several handhole and tubecap assembly designs permit the use of either thickness.

Standard Style T Gaskets can be ordered from the table on the facing page. To order standard gaskets give the boiler manufacturer's name and code number listed in the *Identification* column on the facing page, pressure service rating, operating temperature and type of steel desired. When boiler manufacturer's code number is not listed, furnish the following information on inquiries and purchase orders:

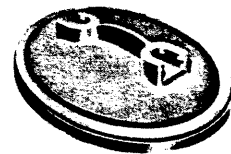
- Name of boiler or equipment manufacturer.
- Gasket shape.
- Inside dimensions of gaskets.
- Flange width of gasket.
- Gasket thickness.
- Pressure service rating.
- Operating temperature.
- Type of steel desired.

Style T Gaskets are also available for non-standard handhole and tubecap assemblies and can be designed and manufactured for high and low temperature and pressure services and severe corrosive conditions. When ordering Style T Gaskets not listed in the following tables, or for special cover assemblies, furnish the following data:

- Rough sketch, blueprint or accurate template of cover assembly with necessary dimensions.
- Width of available seating surface.
- Pressure service rating.
- Operating temperature.
- Name of boiler or equipment manufacturer.

To expedite the processing of inquiries or orders for special cover assemblies, care should be exercised in furnishing complete and accurate data.

Flexitallic[®] STYLE M AND STYLE MC GASKETS



FOR BOILER MANHOLE COVER ASSEMBLIES

Styles M and MC Gaskets are specifically designed for standard manhole cover assemblies. Selection of required design is made in accordance with service conditions. The widespread use of Styles M and MC Gaskets as original equipment and replacement parts is the result of coordinated Flexitallic design and research with equipment engineering and design to meet specific requirements.

Style M Oval Gaskets are manufactured with thicknesses of .175" and .250" and with flange widths shown in table in the next column. Style M Round Gaskets are manufactured with a thickness of .175" only. Gaskets having a thickness of .250" are recommended for gasket seating surfaces which have become pitted or warped.

Style MC Gaskets, an exclusive Flexitallic design, are manufactured with a thickness of .250" and flange width of 13/16". A preformed spiral-wound centering ring, having a thickness of .175", is snapped into the inner groove of the gasket proper. The centering guide permits the gasket proper to assume its correct position and to compensate for inequality in plate contours and fillets in cold-pressed plates. Shouldering and pinching caused by radial misplacement are also eliminated.

Standard Styles M and MC Gaskets are available in the following three ranges of operating pressure for practically all makes of boilers and auxiliary equipment:

- a) 0-499 lbs.
- b) 0-999 lbs.
- c) 1,000 lbs. and more

ORDERING MANHOLE GASKETS

Standard Styles M and MC Gaskets can be ordered from the table in the next column. Order standard gaskets by furnishing the following information:

- a) Name of boiler or equipment manufacturer
- b) Gasket style
- c) Dimensions of gasket
- d) Gasket thickness
- e) Flange width of gasket
- f) Pressure service rating
- g) Type of steel desired

Minor variations in the contour of cover assemblies can be compensated for by flexing the gasket. For cover assemblies in a satisfactory condition, specify .175" thickness, and for pitted, rough or warped conditions, specify .250" thickness. Styles M and MC Gaskets are also available for non-standard manhole cover assemblies and can be designed and manufactured for high and low temperature service and abnormal corrosive conditions. For special applications several combinations of ferrous and non-ferrous alloys and fillers are available. See page 3 for listing of metals and fillers. When ordering Styles M and MC Gaskets for special cover assemblies furnish the following:

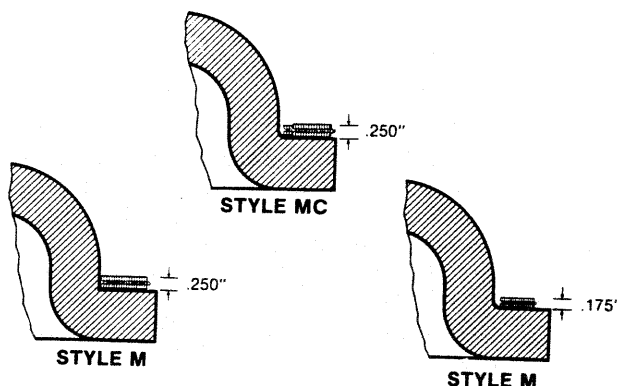
- a) Rough sketch or blueprint of cover assembly and mating surfaces with dimensions.
- b) Pressure service rating.
- c) Type of steel desired.
- d) Name of boiler or equipment manufacturer.
- e) Width of available seating surface.

Data for "e" is most important for special gasket design in order to insure total confinement of the gasket between flat surfaces. To expedite the processing of orders for special cover assemblies, it is recommended that a sample gasket or template accompany the orders.

FOR MANHOLE COVER ASSEMBLIES

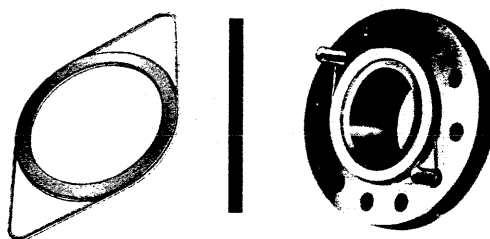
STYLE	NOMINAL I.D. DIMENSIONS (Inches)	THICKNESS (Inches)	FLANGE WIDTH (Inches)
M-Oval	10 x 15	.250	15/16
M-Oval	10 x 16	.250	15/16
M-Oval	11 x 15	.250	15/16
MC-Oval	11 x 15	.250	13/16
M-Oval	11 x 15	.175	3/4
M-Oval	11 x 15	.175	15/16
M-Oval	11 x 15	.175	1/2
M-Oval	11 x 15	.175	1-1/4
M-Oval	11 x 15	.250	1-1/4
M-Obround	11-1/16 x 14-7/8	.250	15/16
M-Obround	11-7/16 x 15-1/16	.250	15/16
M-Oval	12 x 16	.250	15/16
MC-Oval	12 x 16	.250	13/16
M-Oval	12 x 16	.175	1/2
M-Oval	12 x 16	.175	3/4
M-Oval	12 x 16	.175	15/16
M-Oval	12 x 16	.175	1-1/4
M-Oval	12 x 16	.250	1-1/4
M-Obround	12 x 16	.250	15/16
M-Obround	12 x 16	.250	1-1/4
MC-Oval	12-1/8 x 16-1/8	.250	13/16
M-Obround	14 x 16	.175	3/4
M-Round	14	.175	3/4
M-Round	16-1/16	.175	3/4

NOTE: When ordering gaskets specify operating pressure and temperature and type of steel desired.



Flexitallic

STYLE D "SELF-CENTERING" GASKETS (NON-STOCK ITEM)



FOR ANSI B16.5 RAISED FACE AND PLAIN OR FLAT FACE FLANGES

Style D Gaskets, another *original* Flexitallic design, are constructed with an integral centering guide to facilitate assembly. The guide is placed over diametrically opposite bolts to center the gasket properly. Style D Gaskets prevent eccentric assembly.

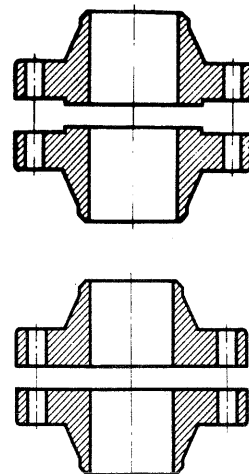
Style D Gaskets are manufactured to nominal original thickness of .175". Optimum compression is in the range of .125" to .135" (dependent on test pressures). Compression

in this range provides ample bonding load within stress limits for specified bolting. Style D Gaskets should be used in the lower pressure/temperature ranges. For more stringent service conditions, Style CG or CGI Gaskets with their greater safety features are recommended.

Style D Gaskets are recommended for all pipe sizes up to and including 24" for 150, 300, and 400 psi fittings, and up to and including 8" for 600 psi fittings.

STYLE D SELF-CENTERING GASKETS

NOMINAL PIPE SIZE (Inches)	ALL CLASSES		FLEXITALLIC GASKET IDENTIFICATION NUMBERS			
	GASKET I.D. (Inches)	GASKET O.D. (Inches)	CLASS 150	CLASS 300	CLASS 400	CLASS 600
1/4	1/2	7/8	D-1A	D-3A	D-4A	D-6A
1/2	3/4	1-1/4	D-1B	D-3B	D-4B	D-6B
3/4	1	1-9/16	D-1C	D-3C	D-4C	D-6C
1	1-1/4	1-7/8	D-1D	D-3D	D-4D	D-6D
1-1/4	1-11/16	2-3/8	D-1E	D-3E	D-4E	D-6E
1-1/2	2	2-3/4	D-1F	D-3F	D-4F	D-6F
2	2-9/16	3-3/8	D-1G	D-3G	D-4G	D-6G
2-1/2	3-1/16	3-7/8	D-1H	D-3H	D-4H	D-6H
3	3-3/4	4-3/4	D-1J	D-3J	D-4J	D-6J
3-1/2	4-1/8	5-1/4	D-1K	D-3K	D-4K	D-6K
4	4-3/4	5-7/8	D-1L	D-3L	D-4L	D-6L
4-1/2	5-5/16	6-1/2	D-1M	D-3M	D-4M	D-6M
5	5-13/16	7	D-1N	D-3N	D-4N	D-6N
6	6-7/8	8-1/4	D-1P	D-3P	D-4P	D-6P
8	8-7/8	10-3/8	D-1Q	D-3Q	D-4Q	D-6Q
10	10-13/16	12-1/2	D-1R	D-3R	D-4R	—
12	12-7/8	14-3/4	D-1S	D-3S	D-4S	—
14	14-1/4	16	D-1T	D-3T	D-4T	—
16	16-1/4	18-1/4	D-1U	D-3U	D-4U	—
18	18-1/2	20-3/4	D-1V	D-3V	D-4V	—
20	20-1/2	22-3/4	D-1W	D-3W	D-4W	—
24	24-3/4	27	D-1X	D-3X	D-4X	—



Flexitallic

STYLE R-1 AND STYLE R-3 GASKETS

FOR MALE & FEMALE AND LARGE TONGUE & GROOVE FLANGES

NOMINAL PIPE SIZE (Inches)	150 PSI THRU 1500 PSI		FLEXITALLIC GASKET IDENTIFICATION NUMBERS				NOMINAL PIPE SIZE (Inches)	R1 ONLY - CLASS 2500		
	GASKET I.D. (Inches)	GASKET O.D. (Inches)	R1-R3 CLASS 150	R1-R3 CLASS 300, 400, 600	R1-R3 CLASS 900 - 1500	R3 ONLY CLASS 2500		GASKET I.D. (Inches)	GASKET O.D. (Inches)	R1 GASKET NUMBER
1/4	1/2	1	R1-R3-1A	R1-R3-3A-4A-6A	—	—	1/2	13/16	1-3/8	R1-25B
1/2	1	1-3/8	R1-R3-1B	R1-R3-3B-4B-6B	R1-R3-9B-15B	R3-25B	3/4	1-1/16	1-11/16	R1-25C
3/4	1-5/16	1-11/16	R1-R3-1C	R1-R3-3C-4C-6C	R1-R3-9C-15C	R3-25C	1	1-1/4	2	R1-25D
1	1-1/2	2	R1-R3-1D	R1-R3-3D-4D-6D	R1-R3-9D-15D	R3-25D	1-1/4	1-5/8	2-1/2	R1-25E
1-1/4	1-7/8	2-1/2	R1-R3-1E	R1-R3-3E-4E-6E	R1-R3-9E-15E	R3-25E	1-1/2	1-7/8	2-7/8	R1-25F
1-1/2	2-1/8	2-7/8	R1-R3-1F	R1-R3-3F-4F-6F	R1-R3-9F-15F	R3-25F	2	2-3/8	3-5/8	R1-25G
2	2-7/8	3-5/8	R1-R3-1G	R1-R3-3G-4G-6G	R1-R3-9G-15G	R3-25G	2-1/2	3	4-1/8	R1-25H
2-1/2	3-3/8	4-1/8	R1-R3-1H	R1-R3-3H-4H-6H	R1-R3-9H-15H	R3-25H	3	3-3/4	5	R1-25J
3	4-1/4	5	R1-R3-1J	R1-R3-3J-4J-6J	R1-R3-9J-15J	R3-25J	4	4-3/4	6-3/16	R1-25L
3-1/2	4-3/4	5-1/2	R1-R3-1K	R1-R3-3K-4K-6K	R1-R3-9K—	—	5	5-3/4	7-5/16	R1-25N
4	5-3/16	6-3/16	R1-R3-1L	R1-R3-3L-4L-6L	R1-R3-9L-15L	R3-25L	6	6-3/4	8-1/2	R1-25P
4-1/2	5-11/16	6-3/4	R1-R3-1M	R1-R3-3M-4M-6M	R1-R3-9M—	—	8	8-3/4	10-5/8	R1-25Q
5	6-5/16	7-5/16	R1-R3-1N	R1-R3-3N-4N-6N	R1-R3-9N-15N	R3-25N	10	10-3/4	12-3/4	R1-25R
6	7-1/2	8-1/2	R1-R3-1P	R1-R3-3P-4P-6P	R1-R3-9P-15P	R3-25P	12	13	15	R1-25S
8	9-3/8	10-5/8	R1-R3-1Q	R1-R3-3Q-4Q-6Q	R1-R3-9Q-15Q	R3-25Q	—	—	—	—
10	11-1/4	12-3/4	R1-R3-1R	R1-R3-3R-4R-6R	R1-R3-9R-15R	R3-25R	—	—	—	—
12	13-1/2	15	R1-R3-1S	R1-R3-3S-4S-6S	R1-R3-9S-15S	R3-25S	—	—	—	—
14	14-3/4	16-1/4	R1-R3-1T	R1-R3-3T-4T-6T	R1-R3-9T-15T	—	—	—	—	—
16	17	18-1/2	R1-R3-1U	R1-R3-3U-4U-6U	R1-R3-9U-15U	—	—	—	—	—
18	19-1/4	21	R1-R3-1V	R1-R3-3V-4V-6V	R1-R3-9V-15V	—	—	—	—	—
20	21	23	R1-R3-1W	R1-R3-3W-4W-6W	R1-R3-9W-15W	—	—	—	—	—
24	25-1/4	27-1/4	R1-R3-1X	R1-R3-3X-4X-6X	R1-R3-9X-15X	—	—	—	—	—

Flexitallic

STYLE R-4 GASKETS

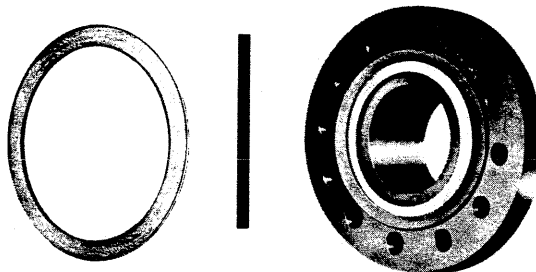
FOR SMALL TONGUE & GROOVE FLANGES

NOMINAL PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	FLEXITALLIC GASKET IDENTIFICATION NUMBERS 150-300-400-600-900-1500-2500 PSI
1/2	1	1-3/8	R4-1B-3B-4B-6B-9B-15B-25B
3/4	1-5/16	1-11/16	R4-1C-3C-4C-6C-9C-15C-25C
1	1-1/2	1-7/8	R4-1D-3D-4D-6D-9D-15D-25D
1-1/4	1-7/8	2-1/4	R4-1E-3E-4E-6E-9E-15E-25E
1-1/2	2-1/8	2-1/2	R4-1F-3F-4F-6F-9F-15F-25F
2	2-7/8	3-1/4	R4-1G-3G-4G-6G-9G-15G-25G
2-1/2	3-3/8	3-3/4	R4-1H-3H-4H-6H-9H-15H-25H
3	4-1/4	4-5/8	R4-1J-3J-4J-6J-9J-15J-25J
3-1/2	4-3/4	5-1/8	R4-1K-3K-4K-6K-9K-15K-25K
4	5-3/16	5-11/16	R4-1L-3L-4L-6L-9L-15L-25L
5	6-5/16	6-13/16	R4-1N-3N-4N-6N-9N-15N-25N
6	7-1/2	8	R4-1P-3P-4P-6P-9P-15P-25P
8	9-3/8	10	R4-1Q-3Q-4Q-6Q-9Q-15Q-25Q
10	11-1/4	12	R4-1R-3R-4R-6R-9R-15R-25R
12	13-1/2	14-1/4	R4-1S-3S-4S-6S-9S-15S-25S
14	14-3/4	15-1/2	R4-1T-3T-4T-6T-9T-15T-25T
16	16-3/4	17-5/8	R4-1U-3U-4U-6U-9U-15U-25U
18	19-1/4	20-1/8	R4-1V-3V-4V-6V-9V-15V-25V
20	21	22	R4-1W-3W-4W-6W-9W-15W-25W
24	25-1/4	26-1/4	R4-1X-3X-4X-6X-9X-15X-25X

Style R-4 Gaskets

- 1/2" sizes - interchangeable with all 1/2" R-1 and R-3 Gaskets within the same pressure rating.
- 3/4" - interchangeable with all 3/4" R-1 and R-3 Gaskets within the same pressure rating.
- All R-4 Gaskets in Classes 300 through 2500 are interchangeable within their size category.

Flexitallic STYLE R GASKETS



FOR ANSI B16.5 MALE & FEMALE AND TONGUE & GROOVE FLANGES

Standard Style R Gaskets embody all the exclusive features of Flexitallic design for keeping compression values in balance with bolting and providing adequate resiliency to compensate for variable stresses encountered in service. Standard Style R Gaskets are manufactured to a nominal thickness of .125". Optimum compression is in the range of .090" to .100" compressed thickness (dependent on test pressures).

There are three types of Style R Gaskets:

- a) Style R-1 indicates gaskets designed for use with large male & female flanges.*
- b) Style R-3 indicates those designed for use with large tongue & groove flanges.
- c) Style R-4 indicates gaskets designed for use with small tongue & groove flanges.

*As a general rule, the use of Flexitallic Spiral-Wound Gaskets with small male & female flange facings is not recommended.

Dimensional limitations established by the proportions of the small tongue & groove facings limit the possibility of increasing gasket dimensions to improve the load carrying capacity in the higher pressure series. For this reason, it is suggested that large tongue & groove facings be selected for new construction when 900, 1500, and 2500 psi flanges are to be used. Style R-4 Gaskets may be compressed an additional amount when exposed to the higher bolt loads, but not to the degree that the gasket will be crushed due to the radial support provided by the confining groove.

Special Style R Gaskets are adaptable to non-standard fittings and can be designed and manufactured according to specifications for high and low pressure applications and for severe corrosive conditions.

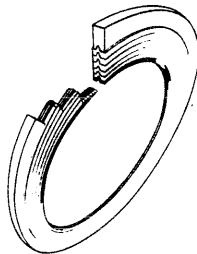
When ordering special Style R Gaskets for non-standard fittings and for special applications, furnish complete data on *Flexitallic Gasket Engineering Data Form*.

NOTE — The following Style R Gaskets are interchangeable:

Style R-1 and R-3 Gaskets

- 1/4" sizes - Classes 150, 300, 400 and 600 are interchangeable.
- 1/2" sizes - Classes 150, 300, 400, 600, 900, 1500 and 2500 (R-3 only) are interchangeable.
- All R-1 and R-3 Gaskets in Classes 300, 400 and 600 are interchangeable within their size category.
- All R-1 and R-3 Gaskets in Classes 900 and 1500 are interchangeable within their size category.

When Gaskets



Must Not Fail!

Flexitallic

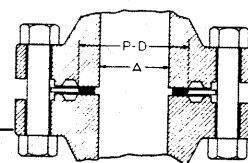
STYLE CG-RJ FOR RING-TYPE JOINTS (NON-STOCK ITEM)

Nom. Pipe Size	150 PSI			300 PSI			400 PSI			600 PSI			900 PSI			1500 PSI		
	Gasket I.D.	Gasket O.D.	Ring O.D.	Gasket I.D.	Gasket O.D.	Ring O.D.	Gasket I.D.	Gasket O.D.	Ring O.D.	Gasket I.D.	Gasket O.D.	Ring O.D.	Gasket I.D.	Gasket O.D.	Ring O.D.	Gasket I.D.	Gasket O.D.	Ring O.D.
1/2	—	—	—	9/16	1-1/16	2-1/8	9/16	1-1/16	2-1/8	9/16	1-1/16	2-1/8	9/16	1-1/16	2-1/2	9/16	1-1/16	2-1/2
3/4	—	—	—	13/16	1-5/16	2-5/8	13/16	1-5/16	2-5/8	13/16	1-5/16	2-5/8	13/16	1-3/8	2-3/4	13/16	1-3/8	2-3/4
1	1-1/8	1-5/8	2-5/8	1-1/16	1-5/8	2-7/8	1-1/16	1-5/8	2-7/8	1-1/16	1-5/8	2-7/8	1-1/16	1-5/8	3-1/8	1-1/16	1-5/8	3-1/8
1-1/4	1-3/8	1-7/8	3	1-5/16	2	3-1/4	1-5/16	2	3-1/4	1-5/16	2	3-1/4	1-5/16	2	3-1/2	1-5/16	2	3-1/2
1-1/2	1-5/8	2-1/4	3-3/8	1-9/16	2-3/8	3-3/4	1-9/16	2-3/8	3-3/4	1-9/16	2-3/8	3-3/4	1-9/16	2-3/8	3-7/8	1-9/16	2-3/8	3-7/8
2	2-1/8	2-7/8	4-1/8	2-1/8	2-3/4	4-3/8	2-1/8	2-3/4	4-3/8	2-1/8	2-3/4	4-3/8	2-1/4	3-1/4	5-5/8	2-1/4	3-1/4	5-5/8
2-1/2	2-3/4	3-5/16	4-7/8	2-3/4	3-5/16	5-1/8	2-3/4	3-5/16	5-1/8	2-3/4	3-5/16	5-1/8	2-9/16	3-5/8	6-1/2	2-9/16	3-5/8	6-1/2
3	3-5/16	3-15/16	5-3/8	3-5/16	3-15/16	5-7/8	3-5/16	3-15/16	5-7/8	3-5/16	3-15/16	5-7/8	3-3/16	4-3/16	6-5/8	3-3/16	4-11/16	6-7/8
4	4-5/16	5-3/16	6-7/8	4-5/16	5-3/16	7-1/8	4-5/16	5-3/16	7	4-5/16	5-3/16	7-5/8	4-1/16	5-3/16	8-1/8	4-1/16	5-11/16	8-1/4
5	5-5/16	6-3/16	7-3/4	5-5/16	6-7/16	8-1/2	5-5/16	6-7/16	8-3/8	5-5/16	6-7/16	9-1/2	5-5/16	6-7/16	9-3/4	5-1/16	6-15/16	10
6	6-5/16	7-3/16	8-3/4	6-7/16	7-5/8	9-7/8	6-7/16	7-5/8	9-3/4	6-7/16	7-5/8	10-1/2	6-5/16	7-5/8	11-3/8	6	7-9/16	11-1/8
8	8-1/4	9-3/16	11	8-1/4	9-15/16	12-1/8	8-1/4	9-15/16	12	8-1/4	9-15/16	12-5/8	8-1/4	9-15/16	14-1/8	7-7/8	9-3/4	13-7/8
10	10-5/16	11-7/16	13-3/8	10-5/16	12	14-1/4	10-5/16	12	14-1/8	10-5/16	12	15-3/4	10-5/16	12	17-1/8	9-13/16	11-7/8	17-1/8
12	12-3/16	13-9/16	16-1/8	12-7/8	14-1/4	16-5/8	12-7/8	14-1/4	16-1/2	12-7/8	14-1/4	18	12-7/8	14-1/4	19-5/8	11-15/16	13-13/16	20-1/2
14	13-7/16	14-15/16	17-3/4	14-1/4	15-3/4	19-1/8	14-1/4	15-3/4	19	14-1/4	15-3/4	19-3/8	13-13/16	15-9/16	20-1/2	13-7/16	15-3/16	22-3/4
16	15-5/16	16-15/16	20-1/4	16-1/4	17-3/4	21-1/4	16-1/4	17-3/4	21-1/8	16-1/4	17-3/4	22-1/4	15-9/16	17-9/16	22-5/8	15	17	25-1/4
18	17-1/4	19	21-5/8	18-1/4	20-1/4	23-1/2	18-1/4	20-1/4	23-3/8	18-1/4	20-1/4	24-1/8	17-11/16	19-15/16	25-1/8	17-1/4	19-1/2	27-3/4
20	19-1/8	21-1/8	23-7/8	20-1/4	22-3/16	25-3/4	20-1/4	22-3/16	25-1/2	20-1/4	22-3/16	26-7/8	19-11/16	21-15/16	27-1/2	19-3/16	21-7/16	29-3/4
24	23	25-1/4	28-1/4	24-1/4	26-5/16	30-1/2	24-1/4	26-5/16	30-1/4	24-1/4	26-5/16	31-1/8	23-3/16	25-15/16	33	20	25-1/2	35-1/2

NOTES

- Style CG-RJ gaskets are intended for use as a replacement maintenance item. If spiral-wound gaskets are to be used on new applications, it is advisable to use standard raised face flanges and style CG Gaskets.
- It is the users responsibility to ensure that there is sufficient clearance between the flange bore and ring groove for proper seating of the gasket.
- Clearance dimensions between flange faces should be checked on close-coupled pipe prior to installation of Style CG-RJ Gaskets to insure optimum compression can be achieved without over-stressing bolts and flanges.

Typical positioning of Style CG-RJ Gasket is shown. Dimension A and P-D are controlling factors in the application of Style CG-RJ Gaskets. The maximum available gasket seating surface is the area between the flange bore and the inside dimension of the groove. Use of this full space is not always necessary.



Flexitallic

STYLE 625 GASKETS

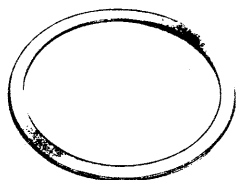
FOR CLAMP-TYPE AND OTHER NON-STANDARD FLANGE ASSEMBLIES

Style 625 Gaskets were originally designed by Flexitallic Gasket Company for clamp-type closures in aircraft, but are now widely used wherever space limitations indicate the need for a wafer-thin or narrow flange spiral-wound gasket.

Style 625 Gaskets are manufactured to nominal thickness of .0625", with compression to .050" — .055".

Style 625 Gaskets embody all of the exclusive features of Flexitallic design for keeping compression values in balance with bolting and providing correct resiliency to compensate for variable stresses encountered in service.

Style 625 Gaskets can be manufactured from any combination of materials shown on page 3. Please check with Flexitallic for manufacturing limitations on Style 625 gaskets larger than 8" I.D. or 3/8" radial width.



GASKET I.D. (Inches)	GASKET O.D. (Inches)	GASKET IDENTIFICATION NUMBER	ORIGINAL PART NUMBER
1-1/8	1-5/8	VC-06-1.00	750244-3
1-3/8	1-7/8	VC-06-1.25	750244-4
1-5/8	2-1/8	VC-06-1.50	750244-5
1-7/8	2-3/8	VC-06-1.75	750244-6
2-1/8	2-5/8	VC-06-2.00	750244-7
2-3/8	2-7/8	VC-06-2.25	750244-8
2-5/8	3-1/8	VC-06-2.50	750244-9
2-7/8	3-3/8	VC-06-2.75	750244-10
3-1/8	3-5/8	VC-06-3.00	750244-11
3-1/4	3-3/4	VC-06-3.15	750244-12
3-3/8	3-7/8	VC-06-3.25	750244-13
3-5/8	4-1/8	VC-06-3.50	750244-14
3-7/8	4-3/8	VC-06-3.75	750244-15
4-1/8	4-5/8	VC-06-4.00	750244-16
4-5/8	5-1/8	VC-06-4.50	750244-17
5-1/8	5-5/8	VC-06-5.00	750244-18
5-5/8	6-1/8	VC-06-5.50	750244-19
6-1/8	6-5/8	VC-06-6.00	750244-20

FLEXITALLIC STYLE CG GASKETS FOR LARGE DIAMETER FLANGES

API 605 FLANGES...CLASS 75						
PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
26	26-1/4	27	27-7/8	36	5/8	28-1/2
28	28-1/4	29-1/8	29-7/8	40	5/8	30-1/2
30	30-1/4	31-1/8	31-7/8	44	5/8	32-1/2
32	32-1/4	33-1/8	33-7/8	48	5/8	34-1/2
34	34-1/4	35-1/8	35-7/8	52	5/8	36-1/2
36	36-1/4	37-1/4	38-5/16	40	3/4	39-1/16
38	—	—	—	—	—	—
40	—	—	—	—	—	—
42	42-1/4	43-1/4	44-5/16	48	3/4	45-1/16
44	—	—	—	—	—	—
46	—	—	—	—	—	—
48	48-3/8	49-1/2	50-1/2	44	7/8	51-3/8
50	—	—	—	—	—	—
52	—	—	—	—	—	—
54	54-3/8	55-5/8	56-5/8	48	7/8	57-1/2
56	—	—	—	—	—	—
58	—	—	—	—	—	—
60	60-1/2	61-3/4	62-7/8	44	1	63-7/8

API 605 FLANGES...CLASS 150						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
26-1/2	27-1/2	28-9/16	36	3/4	29-5/16	
28-1/2	29-1/2	30-9/16	40	3/4	31-5/16	
30-1/2	31-1/2	32-9/16	44	3/4	33-5/16	
32-1/2	33-1/2	34-11/16	48	3/4	35-7/16	
34-1/2	35-3/4	36-13/16	40	7/8	37-11/16	
36-1/2	37-3/4	38-7/8	44	7/8	39-3/4	
38-3/8	39-3/4	41-1/8	40	1	42-1/8	
40-1/4	41-7/8	43-1/8	44	1	44-1/8	
42-1/2	43-7/8	45-1/8	48	1	46-1/8	
44-1/4	45-7/8	47-1/8	52	1	48-1/8	
46-1/2	48-3/8	49-7/16	40	1-1/8	50-9/16	
48-1/2	50	51-7/16	44	1-1/8	52-9/16	
50-1/2	52-3/16	53-7/16	48	1-1/8	54-9/16	
52-1/2	54-3/16	55-7/16	52	1-1/8	56-9/16	
54-1/2	56	57-5/8	56	1-1/8	58-3/4	
56-1/2	57-7/8	59-5/8	60	1-1/8	60-3/4	
58-1/2	59-15/16	62-3/16	48	1-1/4	63-7/16	
60-1/2	61-15/16	64-3/16	52	1-1/4	65-7/16	

API 605 FLANGES...CLASS 300						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
26-1/2	28	30-3/8	32	1-1/4	31-5/8	
28-1/2	30	32-1/2	36	1-1/4	33-3/4	
30-1/2	32	34-7/8	36	1-3/8	36-1/4	
32-1/2	34	37	32	1-1/2	38-1/2	
34-1/2	36	39-1/8	36	1-1/2	40-5/8	
36-1/2	38	41-1/4	32	1-5/8	42-7/8	
39-3/4	41-1/4	43-1/4	36	1-5/8	44-7/8	
41-3/4	43-1/4	45-1/4	40	1-5/8	46-7/8	
42-1/2	44	47-1/4	36	1-3/4	49	
45-3/4	47-1/4	49-1/4	40	1-3/4	51	
47-7/8	49-3/8	51-7/8	36	1-7/8	53-3/4	
48-1/2	50	53-7/8	40	1-7/8	55-3/4	
51-7/8	53-3/8	55-7/8	44	1-7/8	57-3/4	
53-7/8	55-3/8	57-7/8	48	1-7/8	59-3/4	
54-1/2	56	60-1/4	48	1-7/8	62-1/8	
58-1/4	60	62-3/4	36	2-1/4	65	
60-7/16	61-15/16	65-3/16	40	2-1/4	67-7/16	
60-1/2	62	67-3/16	40	2-1/4	69-7/16	

API 605 FLANGES...CLASS 400						
PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
26	26-1/4	27-1/2	29-3/8	28	1-3/8	30-3/4
28	28-1/4	29-1/2	31-1/2	24	1-1/2	33
30	30-1/8	31-3/4	33-3/4	28	1-1/2	35-1/4
32	32	33-7/8	35-7/8	28	1-5/8	37-1/2
34	34-1/8	35-7/8	37-7/8	32	1-5/8	39-1/2
36	36-1/8	38	40-1/4	28	1-3/4	42
38	38-1/4	40-1/4	42-1/4	32	1-3/4	44
40	40-3/8	42-3/8	44-3/8	32	1-7/8	46-1/4
42	42-3/8	44-3/8	46-3/8	32	1-7/8	48-1/4
44	44-1/2	46-1/2	48-1/2	32	2	50-1/2
46	47	49	50-3/4	36	2	52-3/4
48	49	51	53	28	2-1/4	55-1/4
50	51	53	55-1/4	32	2-1/4	57-1/2
52	53	55	57-1/4	32	2-1/4	59-1/2
54	55-1/4	57-1/4	59-3/4	28	2-1/2	62-1/4
56	57-1/4	59-1/4	61-3/4	32	2-1/2	64-1/4
58	59-1/4	61-1/4	63-3/4	32	2-1/2	66-1/4
60	61-3/4	63-3/4	66-1/4	32	2-3/4	69

API 605 FLANGES...CLASS 600						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
26-1/8	28-1/8	30-1/8	28	1-5/8	31-3/4	
27-3/4	29-3/4	32-1/4	28	1-3/4	34	
30-5/8	32-5/8	34-5/8	28	1-7/8	36-1/2	
32-3/4	34-3/4	36-3/4	28	2	38-3/4	
35	37	39-1/4	24	2-1/4	41-1/2	
37	39	41-1/4	28	2-1/4	43-1/2	
39	41	43-1/2	32	2-1/4	45-3/4	
41-1/4	43-1/4	45-1/2	32	2-1/4	47-3/4	
43-1/2	45-1/2	48	28	2-1/2	50-1/2	
45-3/4	47-3/4	50	32	2-1/2	52-1/2	
47-3/4	49-3/4	52-1/4	32	2-1/2	54-3/4	
50	52	54-3/4	32	2-3/4	57-1/2	
52	54	57	28	3	60	
54	56	59	32	3	62	
56-1/4	58-1/4	61-1/4	32	3	64-1/4	
58-1/4	60-1/4	63-1/2	32	3-1/4	66-3/4	
60-1/2	62-1/2	65-1/2	32	3-1/4	68-3/4	
62-3/4	64-3/4	68-1/4	28	3-1/2	71-3/4	

API 605 FLANGES...CLASS 900 (SEE NOTE 4)						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
27-1/4	29-1/2	33	20	2-1/2	35-1/2	
29-1/4	31-1/2	35-1/2	20	2-3/4	38-1/4	
31-3/4	33-3/4	37-3/4	20	3	40-3/4	
34	36	40	20	3	43	
36-1/4	38-1/4	42-1/4	20	3-1/4	45-1/2	
37-1/4	39-1/4	44-1/4	24	3	47-1/4	
40-3/4	42-3/4	47-1/4	20	3-1/2	50-3/4	
43-1/4	45-1/4	49-1/4	24	3-1/2	52-3/4	
45-1/4	47-1/4	51-1/4	24	3-1/2	54-3/4	
47-1/2	49-1/2	53-7/8	24	3-3/4	57-5/8	
50	52	56-1/2	24	4	60-1/2	
52	54	58-1/2	24	4	62-1/2	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	
Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	

M.S.S. SP-44 FLANGES...CLASS 150						
PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
22	22-3/4	24	26	20	1-1/4	27-1/4
26	26-1/2	27-3/4	30-1/2	24	1-1/4	31-3/4
28	28-1/2	29-3/4	32-3/4	28	1-1/4	34
30	30-1/2	31-3/4	34-3/4	28	1-1/4	36
32	32-1/2	33-7/8	37	28	1-1/2	38-1/2
34	34-1/2	35-7/8	39	32	1-1/2	40-1/2
36	36-1/2	38-1/8	41-1/4	32	1-1/2	42-3/4
38	38-1/2	40-1/8	43-3/4	32	1-1/2	45-1/4
40	40-1/2	42-1/8	45-3/4	36	1-1/2	47-1/4
42	42-1/2	44-1/4	48	36	1-1/2	49-1/2
44	44-1/2	46-3/8	50-1/4	40	1-1/2	51-3/4
46	46-1/2	48-3/8	52-1/4	40	1-1/2	53-3/4
48	48-1/2	50-3/8	54-1/2	44	1-1/2	56
50	50-1/2	52-1/2	56-1/2	44	1-3/4	58-1/4
52	52-1/2	54-1/2	58-3/4	44	1-3/4	60-1/2
54	54-1/2	56-1/2	61	44	1-3/4	62-3/4
56	56-1/2	58-1/2	63-1/4	48	1-3/4	65
58	58-1/2	60-1/2	65-1/2	48	1-3/4	67-1/4
60	60-1/2	62-1/2	67-1/2	52	1-3/4	69-1/4

M.S.S. SP-44 FLANGES...CLASS 300						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
22-3/4	24-3/4	27-3/4	24	1-1/2	29-1/4	
27	29	32-7/8	28	1-5/8	34-1/2	
29	31	35-3/8	28	1-5/8	37	
31-1/4	33-1/4	37-1/2	28	1-3/4	39-1/4	
33-1/2	35-1/2	39-5/8	28	1-7/8	41-1/2	
35-1/2	37-1/2	41-5/8	28	1-7/8	43-1/2	
37-5/8	39-5/8	44	32	2	46	
38-1/2	40	41-1/2	32	1-1/2	43	
40-1/4	42-1/8	43-7/8	32	1-5/8	45-1/2	
42-1/4	44-1/8	45-7/8	32	1-5/8	47-1/2	
44-1/2	46-1/2	48	32	1-3/4	49-3/4	
46-3/8	48-3/8	50-1/8	28	1-7/8	52	
48-5/8	50-5/8	52-1/8	32	1-7/8	54	
51	53	54-1/4	32	2	56-1/4	
53	55	56-1/4	32	2	58-1/4	
55-1/4	57-1/4	58-3/4	28	2-1/4	61	
57-1/4	59-1/4	60-3/4	28	2-1/4	63	
59-1/2	61-1/2	62-3/4	32	2-1/4	65	
61-1/2	63-1/2	64-3/4	32	2-1/4	67	

M.S.S. SP-44 FLANGES...CLASS 400						
GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	
22-3/4	24-3/4	27-5/8	24	1-5/8	29-1/4	
27	29	32-3/4	28	1-3/4	34-1/2	
29	31	35-1/8	28	1-7/8	37	
31-1/4	33-1/4	37-1/4	28	2	39-1/4	
33-1/2	35-1/2	39-1/2	28	2	41-1/2	
35-1/2	37-1/2	41-1/2	28	2	43-1/2	
37-5/8	39-5/8	44	32	2	46	
38-1/4	40-1/4	42-1/4	32	1-3/4	44	
40-3/8	42-3/8	44-3/8	32	1-7/8	46-1/4	
42-3/8	44-3/8	46-3/8	32	1-7/8	48-1/4	
44-1/2	46-1/2	48-1/2	32	2	50-1/2	
47	49	50-3/4	36	2	52-3/4	
49	51	53	28	2-1/4	55-1/4	
51	53	55-1/4	32	2-1/4	57-1/2	
53	55	57-1/4	32	2-1/4	59-1/2	
55-1/4	57-1/4	59-3/4	28	2-1/8	62-1/4	
57-1/4	59-1/4	61-3/4	32	2-1/8	64-1/4	
59-1/4	61-1/4	63-3/4	32	2-1/8	66-1/4	
61-3/4	63-3/4	66-1/4	32	2-3/4	69	

FLEXITALLIC STYLE CG GASKETS

FOR USE ON ANSI B16.5 RAISED AND FLAT FACE FLANGES (Dimensions based on API Standard 601, Latest Edition)

NOMINAL PIPE SIZE (Inches)	ALL SERIES GASKET O.D. (Inches)	CLASS 150			CLASS 300			CLASS 400			CLASS 600		
		GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER	GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER	GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER	GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER
1/4	7/8	1/2	1-3/4	CG-1A	1/2	1-3/4	CG-3A	1/2	1-3/4	CG-4A	1/2	1-3/4	CG-6A
1/2	1-1/4	3/4	1-7/8	CG-1B	3/4	2-1/8	CG-3B	3/4	2-1/8	CG-4B	3/4	2-1/8	CG-6B
3/4	1-9/16	1	2-1/4	CG-1C	1	2-5/8	CG-3C	1	2-5/8	CG-4C	1	2-5/8	CG-6C
1	1-7/8	1-1/4	2-5/8	CG-1D	1-1/4	2-7/8	CG-3D	1-1/4	2-7/8	CG-4D	1-1/4	2-7/8	CG-6D
1-1/4	2-3/8	1-7/8	3	CG-1E	1-7/8	3-1/4	CG-3E	1-7/8	3-1/4	CG-4E	1-7/8	3-1/4	CG-6E
1-1/2	2-3/4	2-1/8	3-3/8	CG-1F	2-1/8	3-3/4	CG-3F	2-1/8	3-3/4	CG-4F	2-1/8	3-3/4	CG-6F
2	3-3/8	2-3/4	4-1/8	CG-1G	2-3/4	4-3/8	CG-3G	2-3/4	4-3/8	CG-4G	2-3/4	4-3/8	CG-6G
2-1/2	3-7/8	3-1/4	4-7/8	CG-1H	3-1/4	5-1/8	CG-3H	3-1/4	5-1/8	CG-4H	3-1/4	5-1/8	CG-6H
3	4-3/4	4	5-3/8	CG-1J	4	5-7/8	CG-3J	4	5-7/8	CG-4J	4	5-7/8	CG-6J
3-1/2	5-1/4	4-1/2	6-3/8	CG-1K	4-1/2	6-1/2	CG-3K	4-1/8	6-3/8	CG-4K	4-1/8	6-3/8	CG-6K
4	5-7/8	5	6-7/8	CG-1L	5	7-1/8	CG-3L	4-3/4	7	CG-4L	4-3/4	7-5/8	CG-6L
4-1/2	6-1/2	5-1/2	7	CG-1M	5-1/2	7-3/4	CG-3M	5-5/16	7-5/8	CG-4M	5-5/16	8-1/4	CG-6M
5	7	6-1/8	7-3/4	CG-1N	6-1/8	8-1/2	CG-3N	5-13/16	8-3/8	CG-4N	5-13/16	9-1/2	CG-6N
6	8-1/4	7-3/16	8-3/4	CG-1P	7-3/16	9-7/8	CG-3P	6-7/8	9-3/4	CG-4P	6-7/8	10-1/2	CG-6P
8	10-3/8	9-3/16	11	CG-1Q	9-3/16	12-1/8	CG-3Q	8-7/8	12	CG-4Q	8-7/8	12-5/8	CG-6Q
10	12-1/2	11-5/16	13-3/8	CG-1R	11-5/16	14-1/4	CG-3R	10-13/16	14-1/8	CG-4R	10-13/16	15-3/4	CG-6R
12	14-3/4	13-3/8	16-1/8	CG-1S	13-3/8	16-5/8	CG-3S	12-7/8	16-1/2	CG-4S	12-7/8	18	CG-6S
14	16	14-5/8	17-3/4	CG-1T	14-5/8	19-1/8	CG-3T	14-1/4	19	CG-4T	14-1/4	19-3/8	CG-6T
16	18-1/4	16-5/8	20-1/4	CG-1U	16-5/8	21-1/4	CG-3U	16-1/4	21-1/8	CG-4U	16-1/4	22-1/4	CG-6U
18	20-3/4	18-11/16	21-5/8	CG-1V	18-11/16	23-1/2	CG-3V	18-1/2	23-3/8	CG-4V	18-1/2	24-1/8	CG-6V
20	22-3/4	20-11/16	23-7/8	CG-1W	20-11/16	25-3/4	CG-3W	20-1/2	25-1/2	CG-4W	20-1/2	26-7/8	CG-6W
24	27	24-3/4	28-1/4	CG-1X	24-3/4	30-1/2	CG-3X	24-3/4	30-1/4	CG-4X	24-3/4	31-1/8	CG-6X

N.B. — Per API Std 601, inner rings are mandatory on the following sizes: Class 900, NPS 24 to 48;
Class 1500, NPS 12 to 24; Class 2500, NPS 4 to 12. Refer to page 8 for inner ring dimensions.

NOMINAL PIPE SIZE (Inches)	ALL SERIES GASKET O.D. (Inches)	CLASS 900			CLASS 1500			CLASS 2500		
		GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER	GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER	GASKET I.D. (Inches)	RING O.D. (Inches)	CATALOG NUMBER
1/2	1-1/4	3/4	2-1/2	CG-9B	3/4	2-1/2	CG-15B	3/4	2-3/4	CG-25B
3/4	1-9/16	1	2-3/4	CG-9C	1	2-3/4	CG-15C	1	3	CG-25C
1	1-7/8	1-1/4	3-1/8	CG-9D	1-1/4	3-1/8	CG-15D	1-1/4	3-3/8	CG-25D
1-1/4	2-3/8	1-9/16	3-1/2	CG-9E	1-9/16	3-1/2	CG-15E	1-9/16	4-1/8	CG-25E
1-1/2	2-3/4	1-7/8	3-7/8	CG-9F	1-7/8	3-7/8	CG-15F	1-7/8	4-5/8	CG-25F
2	3-3/8	2-5/16	5-5/8	CG-9G	2-5/16	5-5/8	CG-15G	2-5/16	5-3/4	CG-25G
2-1/2	3-7/8	2-3/4	6-1/2	CG-9H	2-3/4	6-1/2	CG-15H	2-3/4	6-5/8	CG-25H
3	4-3/4	3-3/4	6-5/8	CG-9J	3-5/8	6-7/8	CG-15J	3-5/8	7-3/4	CG-25J
3-1/2	5-1/4	4-1/8	7-1/2	CG-9K	4-1/8	7-3/8	CG-15K	—	—	—
4	5-7/8	4-3/4	8-1/8	CG-9L	4-5/8	8-1/4	CG-15L	4-5/8	9-1/4	CG-25L
4-1/2	6-1/2	5-5/16	9-3/8	CG-9M	5-5/16	9-1/8	CG-15M	—	—	—
5	7	5-13/16	9-3/4	CG-9N	5-5/8	10	CG-15N	5-5/8	11	CG-25N
6	8-1/4	6-7/8	11-3/8	CG-9P	6-3/4	11-1/8	CG-15P	6-3/4	12-1/2	CG-25P
8	10-1/8	8-3/4	14-1/8	CG-9Q	8-1/2	13-7/8	CG-15Q	8-1/2	15-1/4	CG-25Q
10	12-1/4	10-7/8	17-1/8	CG-9R	10-1/2	17-1/8	CG-15R	10-5/8	18-3/4	CG-25R
12	14-1/2	12-3/4	19-5/8	CG-9S	12-3/4	20-1/2	CG-15S	12-1/2	21-5/8	CG-25S
14	15-3/4	14	20-1/2	CG-9T	14-1/4	22-3/4	CG-15T	—	—	—
16	18	16-1/4	22-5/8	CG-9U	16	25-1/4	CG-15U	—	—	—
18	20-1/2	18-1/4	25-1/8	CG-9V	18-1/4	27-3/4	CG-15V	—	—	—
20	22-1/2	20-1/2	27-1/2	CG-9W	20-1/4	29-3/4	CG-15W	—	—	—
24	26-3/4	24-3/4	33	CG-9X	24-1/4	35-1/2	CG-15X	—	—	—

NOTES

- A.P.I. Standard 601 does not include dimensions for 1/4", 3-1/2", or 4-1/2" nominal pipe size.
 - Gasket O.D. dimensions shown are "overall".
 - 1/4" nominal pipe size in Class 150, 300, 400 and 600 are identical gaskets. Stocks of gaskets need not be duplicated.
 - There are no 400 psi flanges up to 3" nominal pipe size nor 900 psi up to 2-1/2" nominal pipe size. These items are listed for convenience.
 - Within screened area above are gaskets which are installed with identical bolting. Stocks of gaskets in each area need not be duplicated because the gaskets are identical.
- For limitations on recommended usage for particular flange type or bore, see the table below.
- Flexitallic Style CG Gaskets are available with special I.D. dimensions on special order. Advise pipe size, pressure class and required I.D. dimension.

APPLICATION INFORMATION FOR STYLE CG GASKETS

FLANGE TYPE	150 PSI	300 PSI	400 PSI	600 PSI	900 PSI	1500 PSI	2500 PSI
WN-SW	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes
Nozzles	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes	All Sizes
WN-10-10S	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"
Slip-on	1-1/4"—24"	1-1/4"—24"	1-1/4"—24"	1-1/4"—3"	1-1/4"—3"	None	None

WN-SW — Welding Neck Flange bored for standard weight or heavier pipe.

Nozzle — Bore equals nominal size.

WN-10-10S — Welding Neck Flange bored for schedule 10S pipe through 12" and bored for schedule 10 pipe over 12". Slip-on — Bore is essentially O.D. of pipe.

It is the users responsibility to determine whether a gasket is satisfactory for a flange of any larger bore.

FLEXITALLIC STYLE CGI GASKETS WITH INNER METAL RING

Flexitallic Style CGI Gaskets are the same as Style CG Gaskets with the addition of an inner metal ring. The use of the inner metal ring provides the following advantages in addition to the basic characteristics of the Style CG Gasket:

- a) Minimizes build-up of process material between spiral-wound component and flange bore.
- b) Reduces turbulence in process fluid flow.
- c) Minimizes erosion and corrosion of flange faces.
- d) Shields spiral-wound component from excessive heat.

- e) Restricts lateral flow of spiral-wound component inward toward the flange bore.
- f) Offers additional compression stop and essentially provides totally contained gasket without costly machining.

When Flexitallic Style CGI Gaskets are required, inner ring I.D. must be specified. Standard practice is to utilize inner rings with an I.D. that is 1/8" greater than the flange bore. The table below gives standard inside dimensions of inner rings for use in Style CGI Gaskets.

TABLE 1—STANDARD INSIDE DIMENSIONS OF INNER RINGS FOR STYLE CGI GASKETS

Flange Size (NPS)	Class						
	150	300	400	600	900 ^a	1500 ^a	2500 ^a
1/2	.56	.56	Note 5	.56	Note 5	.56	.56
3/4	.81	.81	Note 5	.81	Note 5	.81	.81
1	1.06	1.06	Note 5	1.06	Note 5	1.06	1.06
1-1/4	1.50	1.50	Note 5	1.50	Note 5	1.31	1.31
1-1/2	1.75	1.75	Note 5	1.75	Note 5	1.63	1.63
2	2.19	2.19	Note 5	2.19	Note 5	2.06	2.06
2-1/2	2.63	2.63	Note 5	2.63	Note 5	2.50	2.50
3	3.19	3.19	Note 5	3.19	3.19	3.19	3.19
4	4.19	4.19	4.19	4.19	4.19	4.19	4.19
5	5.19	5.19	5.19	5.19	5.19	5.19	5.19
6	6.19	6.19	6.19	6.19	6.19	6.19	6.19
8	8.50	8.50	8.25	8.25	8.25	8.12	7.88
10	10.56	10.56	10.25	10.25	10.25	10.15	9.75
12	12.50	12.50	12.50	12.50	12.38	12.38	11.50
14	13.75	13.75	13.75	13.75	13.50	13.38	Note 5
16	15.75	15.75	15.75	15.75	15.50	15.25	Note 5
18	17.69	17.69	17.69	17.69	17.50	17.25	Note 5
20	19.69	19.69	19.69	19.69	19.50	19.25	Note 5
24	23.75	23.75	23.75	23.75	23.75	22.75	Note 5
26 and larger	—	—	—	—	see Table 2	—	—

NOTES

- The inner ring thickness shall be 0.112 to .131 inch.
- For sizes NPS 1/2 through 3, the inside diameter tolerance is ± 0.03 inches; for sizes NPS 4 and larger, ± 0.06 inches.
- All sizes are suitable for flange bores equivalent to Schedule 40 pipe or smaller, except NPS 1-1/4, Class 1500 and 2500, and NPS 12, Class 2500, which require Schedule 80; and NPS 8 and 10 Class 2500, which require Schedule 60.
- Per API STD 601, inner rings are required for Class 900 gaskets,

NPS 24 and larger; Class 1500 gaskets, NPS 12 to NPS 24 inclusive; and Class 2500 gaskets, NPS 4 to NPS 12 inclusive. These inner rings may protrude into the pipe bore a maximum of 1/16 inch under the worst combination of maximum flange bore, eccentric installation, and additive tolerances.

- There are no Class 400 flanges in NPS 1/2 through 3 (use Class 600); nor Class 900 flanges in NPS 1/2 through 2-1/2 (use Class 1500); nor Class 2500 flanges NPS 14 and larger.

Table 2—STANDARD INNER RING INSIDE DIAMETERS FOR SPIRAL-WOUND GASKETS IN CLASS 900 FOR MSS SP-44 OR API STANDARD 605 DESIGNATIONS

Flange Size (NPS)	MSS SP-44	API 605	Flange Size (NPS)	MSS SP-44	API 605
26	26.25	26.50	38	39.75	39.75
28	28.00	28.50	40	41.75	41.75
30	30.50	31.00	42	43.75	43.75
32	32.00	33.00	44	45.50	45.50
34	34.00	35.25	46	48.00	48.00
36	36.25	36.50	48	50.00	50.00

FLEXITALLIC STYLE CG GASKETS FOR LARGE DIAMETER FLANGES

CLASS 75 SLIP-ON AND BLIND FLANGES

PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
26	27	28-1/4	30-1/8	32	7/8	31
28	29	30-1/4	32-1/8	36	7/8	33
30	31	32-1/4	34-1/8	36	7/8	35
32	33-1/8	34-3/8	36-3/8	40	1	37-3/8
34	35-1/8	36-1/2	38-3/8	40	1	39-3/8
36	37-1/8	38-1/2	40-3/8	44	1	41-3/8
42	43-1/4	44-3/4	46-5/8	48	1-1/8	47-3/4
48	49-1/4	50-7/8	52-5/8	56	1-1/8	53-3/4
54	55-3/8	57-3/4	59-1/8	68	1-1/8	60-1/4
60	61-3/8	63-3/8	65-1/8	72	1-1/8	66-1/4
66	67-1/2	69-1/2	71-3/4	72	1-1/4	73
72	73-1/2	75-1/2	77-3/4	80	1-1/4	79

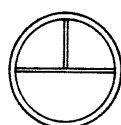
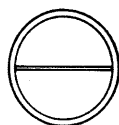
CLASS 75 (WELDING NECK)

PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
26	26-1/2	27-3/4	28-3/4	32	7/8	29-5/8
28	28-1/2	29-3/4	30-3/4	36	7/8	31-5/8
30	30-1/2	31-3/4	32-3/4	36	7/8	33-5/8
32	32-1/2	33-3/4	35-1/8	36	1	36-1/8
34	34-1/2	35-7/8	37-1/8	40	1	38-1/8
36	36-1/2	37-7/8	39-1/8	40	1	40-1/8
42	42-1/2	44	45-5/8	48	1-1/8	46-3/4
48	48-1/2	50-1/8	51-5/8	52	1-1/8	52-3/4
54	54-1/2	56-3/8	57-7/8	64	1-1/8	59
60	60-1/2	62-1/2	63-7/8	72	1-1/8	65
66	66-1/2	68-1/2	70-1/4	72	1-1/4	71-1/2
72	72-1/2	74-1/2	76-1/4	80	1-1/4	77-1/2

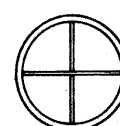
ALL CLASSES		CLASS 175					CLASS 250					CLASS 350				
PIPE SIZE (Inches)	GASKET I.D. (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)	GASKET O.D. (Inches)	RING O.D. (Inches)	NO. OF BOLTS	BOLT SIZE (Inches)	B.C. DIAMETER (Inches)
26	26-1/2	27-3/4	29-1/8	28	3/4	29-7/8	27-3/4	32-3/4	28	1-3/4	34-1/2	27-3/4	29-5/8	28	1	30-5/8
28	28-1/2	29-3/4	31-1/8	28	3/4	31-7/8	29-3/4	35-1/4	28	1-3/4	37	29-3/4	31-5/8	28	1	32-5/8
30	30-1/2	31-3/4	33-3/8	36	3/4	34-1/8	31-3/4	37-1/2	28	1-3/4	39-1/4	31-3/4	33-7/8	32	1	34-7/8
32	32-1/2	33-3/4	35-3/8	36	3/4	36-1/8	33-7/8	39-3/4	28	1-3/4	41-1/2	33-7/8	35-7/8	36	1	36-7/8
34	34-1/2	35-7/8	37-1/2	36	7/8	38-3/8	35-7/8	41-3/4	28	1-3/4	43-1/2	35-7/8	37-7/8	40	1	38-7/8
36	36-1/2	37-7/8	39-1/2	36	7/8	40-3/8	38-1/8	44	32	2	46	38-1/8	40-3/8	40	1-1/8	41-1/2
38	38-1/2	39-7/8	41-1/2	36	7/8	42-3/8	40-1/8	46	32	2	48	40-1/8	42-3/8	40	1-1/8	43-1/2
40	40-1/2	42	43-1/2	40	7/8	44-3/8	42-1/8	48-1/4	36	2	50-1/4	42-1/8	44-3/8	44	1-1/8	45-1/2
42	42-1/2	44	45-7/8	40	1	46-7/8	44-1/4	50-3/4	36	2	52-3/4	44-1/4	46-5/8	48	1-1/8	47-3/4
44	44-1/2	46	47-7/8	40	1	48-7/8	46-3/8	53	36	2	55	46-3/8	49	44	1-1/4	50-1/4
46	46-1/2	48	49-7/8	40	1	50-7/8	48-3/8	55-1/4	40	2	57-1/4	48-3/8	51	48	1-1/4	52-1/4
48	48-1/2	50-1/8	51-7/8	44	1	52-7/8	50-3/8	58-3/4	40	2	60-3/4	50-3/8	53	48	1-1/4	54-1/4
50	50-1/2	52-1/4	53-7/8	44	1-1/8	54-7/8	—	—	—	—	—	—	—	—	—	—
52	52-1/2	54-3/8	56-1/8	44	1-1/8	57-1/4	—	—	—	—	—	54-1/2	57-3/8	52	1-3/8	58-3/4
54	54-1/2	56-3/8	58-1/8	44	1-1/8	59-1/4	—	—	—	—	—	56-1/2	59-3/8	52	1-3/8	60-3/4
60	60-1/2	62-1/2	64-1/8	48	1-1/8	65-1/4	—	—	—	—	—	62-1/2	65-3/8	60	1-3/8	66-3/4
66	66-1/2	—	—	—	—	—	—	—	—	—	—	68-1/2	72-1/2	60	1-1/2	74

For **Class 125**, refer to chart on Page 6 for M.S.S. SP-44 for Class 150.

Flexitallic® STYLE HE AND STYLE HE-CG GASKETS



FOR MULTI-PASS HEAT EXCHANGERS



Styles HE and HE-CG (with compression-gauge centering ring) Gaskets are designed for the sealing of multi-pass heat exchangers. The peripheral seal uses the Flexitallic spiral-wound construction. The fixed insert, designed to tube sheet configurations, consists of a single or double jacketed metal rib, or ribs, filled with soft compressible Canadian asbestos, PTFE, or a variety of other materials. The gasket is designed so that the joining of the fixed insert of the peripheral seal will not interfere with normal compression of the gasket.

The peripheral seal embodies all of the exclusive features of Flexitallic design for keeping compression values in balance with bolting and providing resiliency to compensate for variable stresses encountered in service. It is manufactured to normal original thickness of .125" up to

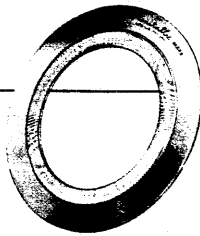
40" I.D., .175" up to 75" I.D., and .250" or .285" for the largest heat exchangers now in use. These size limits can be exceeded in certain situations—consult Flexitallic on these applications.

Optimum compression is in the following range: .125" thick to .095" ± .005"; .175" thick to .130" ± .005"; .250" thick to .190" ± .010"; .285" to .210" ± .010".

The fixed insert with accurately positioned compressible ribs, restricts flow between heat exchanger passes. The configurations shown are some of the variations that can be made.

Flexitallic Gasket Engineering Data Form should accompany each request for quotation along with a sketch indicating exact location of required ribs.

Flexitallic STYLE CG "COMPRESSION-GAUGE" GASKETS



FOR ANSI B16.5 RAISED FACE AND PLAIN OR FLAT FACE FLANGES

Style CG Gaskets combine all the recognized advantages of spiral-wound construction with an integral metal gauge ring. The metal gauge ring serves the following purposes:

- Facilitates accurate centering of the gasket in the flange assembly.
- Provides additional radial strength and prevents possibility of gasket blow-out.
- Serves as a compression stop and prevents possibility of spiral-wound component being crushed.

Standard CG Gaskets for ANSI and other standard flanges are manufactured to a nominal thickness of .175". Optimum compression is in the range of .125" to .135" (dependent on test pressures). Standard Style CG Gaskets are furnished with carbon steel gauge rings that are 1/8" thick.

Style CG Gaskets are available on special order in any combination of materials listed on page 3 and with "compression-gauge" centering rings in metals other than carbon steel. Style CG Gaskets can be supplied on special order with special I.D. dimensions if required. Inquiries are invited.

ANSI B16.5 FLANGES

Standard Style CG Gaskets are carried in stock for all sizes and pressures covered in ANSI B16.5. These standard gaskets conform to the requirements of API Standard 601, Latest Edition.

STYLE CG GASKETS FOR LARGE DIAMETER FLANGES

Large diameter Style CG Gaskets that are being used more frequently in recent years are also available. The large diameter gaskets are covered by API Standard 601-for API Standard 605 and M.S.S.-SP-44 flanges. To aid in selecting the proper gasket for these flanges, bolting details for each size and pressure series are indicated.

API 605 Flanges

These gaskets are covered by API Standard 601, Latest Edition, and cover flanges for Classes 75, 150, 300, 400, 600, and 900.

M.S.S.-SP-44 Flanges

This standard covers large diameter flanges for Classes 150, 300, 400, 600 and 900. Standard M.S.S. SP-44 does not include limiting dimensions for spiral-wound gaskets for use with these flanges. Dimensions listed are in accordance with API 601, Latest Edition.

Commercial Standard Large Diameter Flanges

The manufacturers of large diameter flanges have assigned different catalog numbers to the various classes of flanges. Reference to the number and size of bolts and bolt circle diameter will assure the selection of the proper gasket for each size and pressure series flange. Dimensions listed are commercial standards that have proven successful with these flanges.

API RING-JOINT FLANGES

Flexitallic has developed a series of special Style CG Gaskets designed to replace standard oval or octagonal API ring-joint gaskets. The designation for these gaskets is Style CG-RJ. Style CG-RJ Gaskets are intended for use as a replacement maintenance item. If spiral-wound gaskets are to be used in new applications, regular Style CG Gaskets and raised face flanges are recommended.

Converting from API ring-joint gaskets to Style CG-RJ Spiral-Wound Gaskets means greater economy through lower gasket costs, less downtime of equipment, and reduced labor costs for replacement. Only 1/16" break-away is required as compared with 1/2" to 3/4" with conventional API ring-joint gaskets.

Style CG-RJ Gaskets are not available for all nominal pipe sizes. Available sizes are listed along with notes on applications.

Caution: Clearance dimensions between flange faces should be checked on close-coupled pipe prior to installation of Style CG-RJ Gaskets to insure optimum compression can be achieved without over-stressing bolts and flanges.

FLEXITE™ SUPER* and FLEXICARB® NON-ASBESTOS FILLER MATERIAL

FLEXITE SUPER and FLEXICARB have been carefully researched and developed by Flexitallic to meet industry's demand for alternatives to asbestos filled spiral wound gaskets. Both FLEXITE SUPER and FLEXICARB provide performance that is superior to asbestos, and have been field proven through years of actual service in critical applications throughout the world.

FLEXITE SUPER is a further development of Flexite, Flexitallic's chlorite mineral paper developed for the U.S. Navy. Its composition and method of manufacture is based on a complex chlorite mineral with graphite, and acrylic binder. The result is a material with temperature and

chemical resistance equivalent to asbestos filler when used in spiral-wound gaskets.

Flexitallic spiral wound gaskets with FLEXICARB FLEXIBLE GRAPHITE filler are the state-of-the-art static seal and are specified throughout industry for the most critical as well as routine applications. FLEXICARB is the top-of-the-line alternative to asbestos filler in spiral wound gaskets.

For specific details on FLEXITE SUPER and FLEXICARB fillers, please contact our engineering department.

INFORMATION FOR ORDERING FLEXITALLIC GASKETS

MATERIALS

Standard materials for Flexitallic Spiral-Wound Gaskets are 304 stainless steel with Flexicarb or Flexite Super Filler. The following materials are available on order:

Metals

Carpenter 20 Alloy	Stainless Steels:
Copper	AISI Types--
Hastelloy B and C	304, 304L,
Inconel 600, 625	309, 310,
Inconel X750	316L, 321,
Incoloy 800, 825	347
Low Carbon Steel, Zinc Plated	
Monel	
Nickel	
Phosphor Bronze	Other metals
Titanium	on request.

Fillers

Flexite™ Super Non-Asbestos Chlorite/
Graphite Paper*
Flexicarb™ Flexible Graphite
Blue-Dyed Canadian Asbestos Paper (Chrysotile)
White Canadian Asbestos Paper (Chrysotile)
Canadian Asbestos Sheet Packing with Neoprene,
Buna S, and Buna N Binders
Polytetrafluoroethylene (PTFE)
Glass-Filled PTFE
Ceramic

*U.S. Patent Number 4,529,662

SPECIFYING FLEXITALLIC GASKETS

Pipe Flange Applications

Flexitallic Spiral-Wound Pipe Flange Gaskets are manu-

factured in ten basic designs identified as Styles CG, CGI, CG-RJ, D, HE, HE-CG, 625, R-1, R-3, and R-4. Each Style is described in detail on subsequent pages. These gasket descriptions and previous experience will dictate the selection and ordering of the proper Flexitallic Gasket.

All Flexitallic Gasket Styles for standard flange fittings can be ordered from this catalog. Purchase orders or inquiries for standard flange gaskets should include the following for each item:

1. Nominal Pipe Size
2. Pressure Series of Flange
3. Flexitallic Gasket Identification Number
4. Materials of Construction
5. Inside Diameter and Material for Inner Ring if Style CGI Gaskets are ordered.

Special Gaskets

Gaskets of special design can be engineered and fabricated using the same basic fundamentals of Flexitallic Spiral-Wound Gasket design and construction to cover a wide range of applications in installations for which there are no industry-wide equipment standards. Special gaskets have been designed for valves, pumps, compressors, turbines, boilers, heat exchangers, etc. Consult with Flexitallic engineers as early in the design stage as possible.

Government Specifications

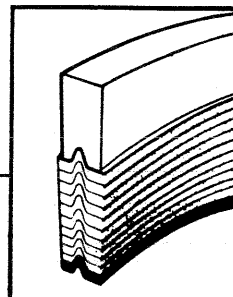
Flexitallic Spiral-Wound Gaskets are available in accordance with Military Specifications MIL-G-24716, MIL-G-16265, MIL-G-21032 and MIL-G-15342, latest revisions. When making inquiry, please refer to the proper Government Specification number.

Flexitallic SPIRAL-WOUND GASKETS

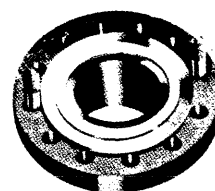
Page

INDEX

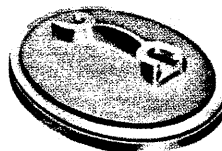
2	FOREWORD
3	Advantages of Flexite Super Non-Asbestos Filler
3	Metals and Filler Materials
3	Ordering Information
3	Special Gaskets
3	Government Specifications



FLANGE GASKETS	
4-5	Compression Gauge Gaskets, Standard Flanges, Style CG
6-7	Compression Gauge Gaskets, Large Diameter, Style CG
7	Heat Exchanger Gaskets, Styles HE and HE-CG
8	Style CGI Gaskets with Inner Ring
9	Style CG-RJ for Ring Type Joints
9	Clamp Type Style 625
10-11	Large Male & Female Flange Gaskets, Style R-1
10-11	Large Tongue & Groove Flange Gaskets, Style R-3
10-11	Small Tongue & Groove Flange Gaskets, Style R-4
12	Self Centering Style D



BOILER GASKETS	
13	Boiler Manhole Cover Gaskets, Style M and MC
14-15	Boiler Handhole and Tubecap Gaskets, Style T



USEFUL TABLES AND TECHNICAL DATA	
16	Facing Dimensions for ANSI B16.5 Flanges
17	Bolting Data for ANSI B16.5 Flanges
18	Torque Data
18	Color Coding
19	Engineering Assistance and Other Products

FOREWORD

In 1912, Flexitallic pioneered and developed the Spiral-Wound Gasket—an engineered static seal with innate resilience that permits it to adjust automatically to changes in operating conditions, such as line pressure and thermal shocks, frequent or sudden vibration, and minor flange separation.

Today, Flexitallic is recognized as the world's leading producer of spiral-wound gaskets. The name Flexitallic has become the signature of a safe, dependable, reliable seal with superior sealing qualities. What has brought Flexitallic to this recognized position of leadership?

Engineered Performance... Flexitallic's engineers continually advance the "state-of-the-art" in gasket design where the density is critical to sealing performance. They have designed more spiral-wound gaskets than all other gasket producers combined.

Metals/Filler Inventory... An extensive inventory of various metals in strip and sheet form as well as a variety of filler materials is maintained at all plants.

Winding Mandrels... The most extensive inventory of winding mandrels in the world is maintained by Flexitallic. What would be a special order to other gasket producers is normally a conventional gasket to Flexitallic.

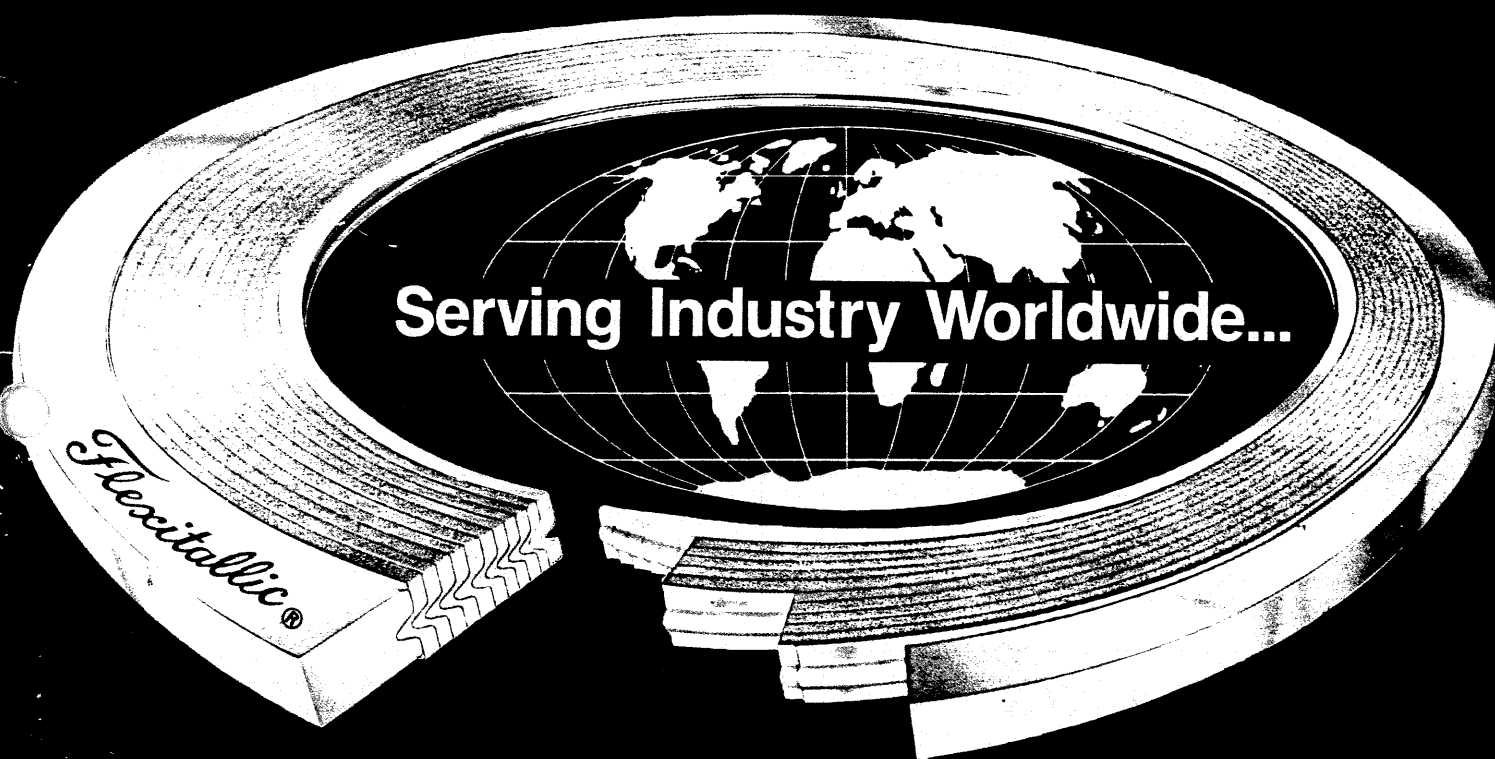
Production Capability... Flexitallic has developed their own unique winding system and equipment to ensure uniform construction and quality of each gasket. Lasers, punch presses and grooving equipment are used to produce centering guide rings that assure a proper gasket fit.

Quality Control

Because Flexitallic is aware of the cost of gasket failure, the most exacting quality control standards in the gasket industry have been established by the company. Flexitallic quality control procedures meet or exceed the latest government requirements under MIL-I-45208. Whether military specifications are involved or not, Flexitallic subjects its entire production to in-process inspection procedures, visual inspection and final compression testing on a statistical sampling basis.

Flexitallic has the most demanding quality assurance procedures in the industry in order to produce the right gasket for the right flange to make the right seal.

A.L. Crump & Co., Inc.
4936 NORTH LINCOLN AVENUE
CHICAGO, IL 60625
(312) 769-2345



Flexitallic®

SPIRAL-WOUND GASKETS

General Catalog