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Based in Alberta, Canada, Trans Am has been a distributor of high quality carbon steel piping components since 1975. With sales centers in Calgary and Edmonton, Trans Am offers the most complete inventory of Pipe, Butt weld Fittings, Forged Fittings, Forged Flanges and related piping components available in western Canada, with an experienced staff to support your needs.

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The dimensions provided in this catalogue are expressed in imperial units. It is also available in metric units. If you have any comments or suggestions regarding this catalogue, please contact us at:

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Note: While we have taken great care to ensure that the information provided in this catalogue is correct, we assume no responsibility for any errors or omissions.

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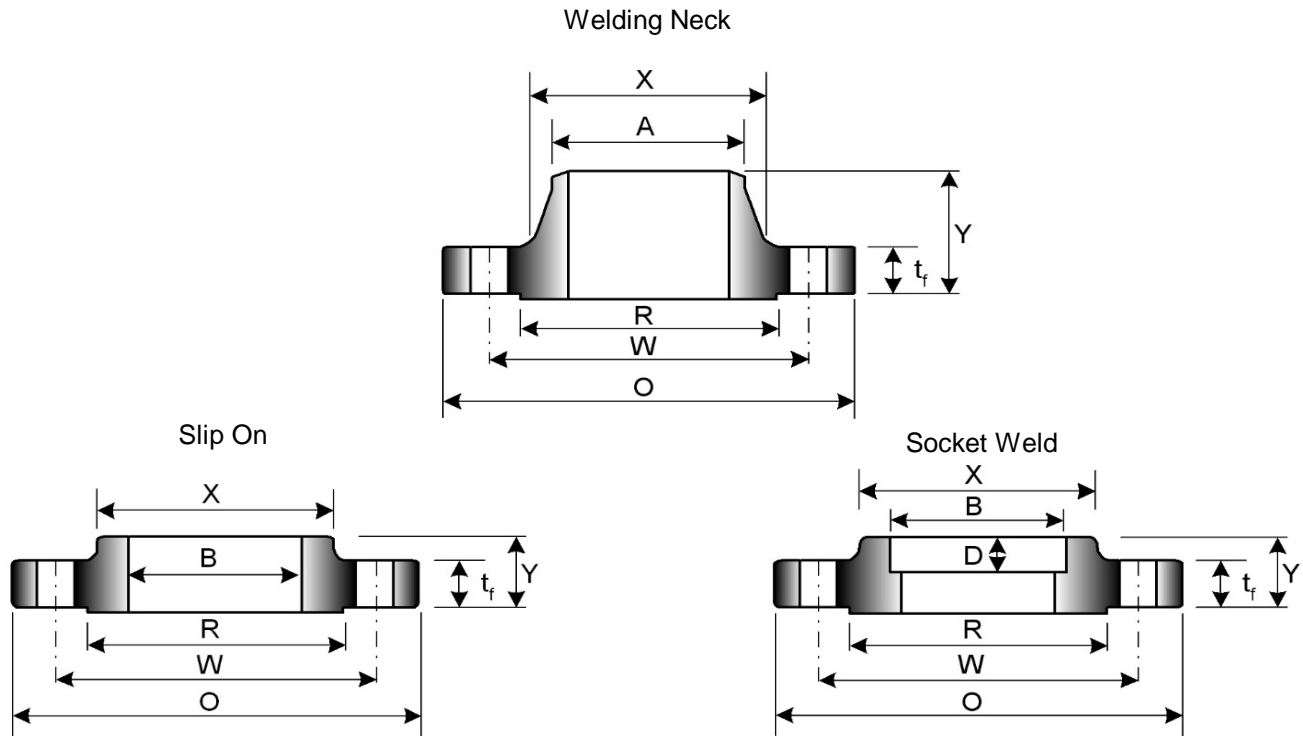
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ASME B16.5 Flanges

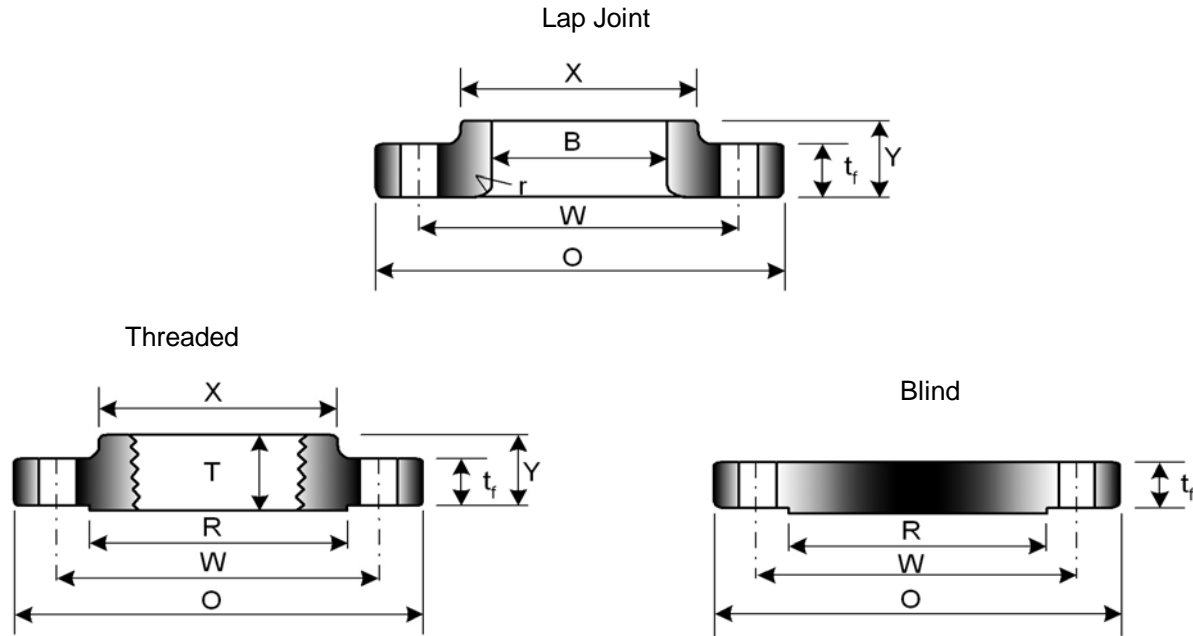
ASME B16.5 covers flanges in Classes 150 through 1500 in sizes NPS 1/2 through NPS 24, and Class 2500 in sizes NPS 1/2 through NPS 12. In the 2013 edition of ASME B16.5, the primary tables report pressure-temperature ratings and dimensions in metric units with the bolt diameters and flange bolt holes expressed in inch units. The requirements in U.S. Customary units are reported in Mandatory Appendix II. All dimensions in this catalogue are reported in inch units. The pressure-temperature ratings for A105 and A350-LF2 flanges (Group 1.1 materials) can be found on Page 69.

<u>Tolerances</u>	
Outside Diameter of Raised Face (R) (For Ring Joint tolerances please see page19):	+/- 0.03" (0.06" RF) +/- 0.02" (0.25" RF)
Flange Thickness (t) (the plus tolerance is applicable to bolting bearing surfaces):	+ 0.12, - 0.0" (NPS 18 and smaller) + 0.19, - 0.0" (NPS 20 and larger)
Outside Diameter at Bevel (A) of Welding Neck:	+ 0.09, - 0.03" (NPS 5 and smaller) + 0.16, - 0.03" (NPS 6 and larger)
Inside Diameter (Welding Neck and small bore of Socket Weld):	+/- 0.03" (NPS 10 and smaller) +/- 0.06" (NPS 12 through 18) + 0.12, - 0.06" (NPS 20 and larger)
Wall Thickness at Bevel:	not less than 87.5% of the nominal pipe thickness.
Length Through Hub (W/N Flange):	+/- 0.06" (NPS 4 and smaller) + 0.06, - 0.12" (NPS 5 through 10) + 0.12, - 0.18" (NPS 12 and larger)
Flange Bore (Socket Weld):	+/- 0.01"
Flange Bore (Slip On, Lap Joint and counterbore of Threaded):	+ 0.03, - 0.0" (NPS 10 and smaller) + 0.06, - 0.0" (NPS 12 and larger)
Bolt Circle Diameter:	+/- 0.06"
Spacing of adjacent bolt holes (centre-to-centre):	+/- 0.03"
Concentricity between Bolt Circle Diameter and machined facing diameter:	0.03" max. (NPS 2 1/2 and smaller) 0.06" max. (NPS 3 and larger)



Nominal Pipe Size NPS	O.D. of Flange O	Thickness		Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾		Thread Length ⁽³⁾ T (min)	Depth of Socket D
		Flange ⁽¹⁾ t_f (min)	Lap Joint t_f (min)			W/N $Y^{(1)}$	S/O, Thrd. S/W $Y^{(1)}$	Lap Joint $Y^{(1)}$	S/O, S/W B (min)	Lap Joint B (min)		
1/2	3.50	0.38	0.44	1.19	0.84	1.81	0.56	0.62	0.88	0.90	0.62	0.38
3/4	3.88	0.44	0.50	1.50	1.05	2.00	0.56	0.62	1.09	1.11	0.62	0.44
1	4.25	0.50	0.56	1.94	1.32	2.12	0.62	0.69	1.36	1.38	0.69	0.50
1 1/4	4.62	0.56	0.62	2.31	1.66	2.19	0.75	0.81	1.70	1.72	0.81	0.56
1 1/2	5.00	0.62	0.69	2.56	1.90	2.38	0.81	0.88	1.95	1.97	0.88	0.62
2	6.00	0.69	0.75	3.06	2.38	2.44	0.94	1.00	2.44	2.46	1.00	0.69
2 1/2	7.00	0.81	0.88	3.56	2.88	2.69	1.06	1.12	2.94	2.97	1.12	0.75
3	7.50	0.88	0.94	4.25	3.50	2.69	1.12	1.19	3.57	3.60	1.19	0.81
3 1/2	8.50	0.88	0.94	4.81	4.00	2.75	1.19	1.25	4.07	4.10	1.25	...
4	9.00	0.88	0.94	5.31	4.50	2.94	1.25	1.31	4.57	4.60	1.31	...
5	10.00	0.88	0.94	6.44	5.56	3.44	1.38	1.44	5.66	5.69	1.44	...
6	11.00	0.94	1.00	7.56	6.63	3.44	1.50	1.56	6.72	6.75	1.56	...
8	13.50	1.06	1.12	9.69	8.63	3.94	1.69	1.75	8.72	8.75	1.75	...
10	16.00	1.12	1.19	12.00	10.75	3.94	1.88	1.94	10.88	10.92	1.94	...
12	19.00	1.19	1.25	14.38	12.75	4.44	2.12	2.19	12.88	12.92	2.19	...
14	21.00	1.31	1.38	15.75	14.00	4.94	2.19	3.12	14.14	14.18	2.25	...
16	23.50	1.38	1.44	18.00	16.00	4.94	2.44	3.44	16.16	16.19	2.50	...
18	25.00	1.50	1.56	19.88	18.00	5.44	2.62	3.81	18.18	18.20	2.69	...
20	27.50	1.62	1.69	22.00	20.00	5.62	2.81	4.06	20.20	20.25	2.88	...
24	32.00	1.81	1.88	26.12	24.00	5.94	3.19	4.38	24.25	24.25	3.25	...

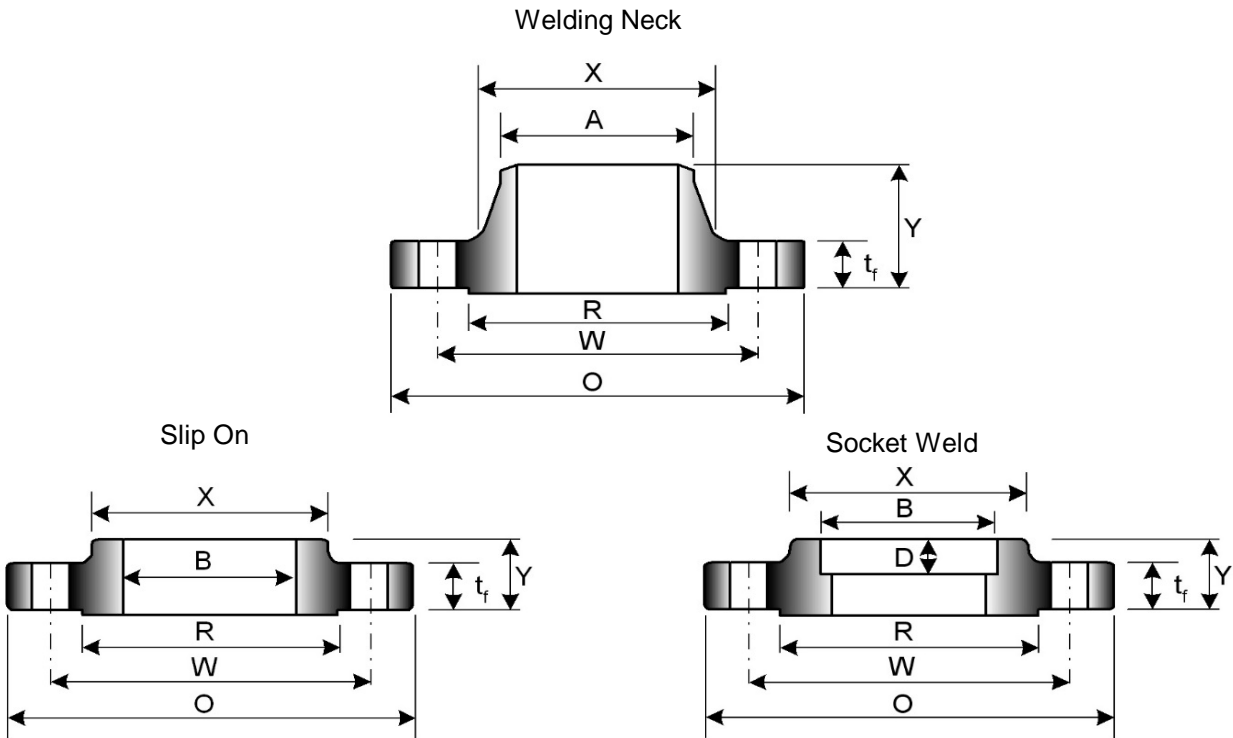
All dimensions are given in inches.



Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.06" RF	Ring Joint	Welding Neck	S/O, S/W, Threaded	Lap Joint	Blind	
0.12	1.38	2.38	4	0.62	1/2	2.25	...	2	1	1	1	1/2
0.12	1.69	2.75	4	0.62	1/2	2.50	...	2	2	2	2	3/4
0.12	2.00	3.12	4	0.62	1/2	2.50	3.00	3	2	2	2	1
0.19	2.50	3.50	4	0.62	1/2	2.75	3.25	3	3	3	3	1 1/4
0.25	2.88	3.88	4	0.62	1/2	2.75	3.25	4	3	3	4	1 1/2
0.31	3.62	4.75	4	0.75	5/8	3.25	3.75	6	5	5	5	2
0.31	4.12	5.50	4	0.75	5/8	3.50	4.00	8	7	7	7	2 1/2
0.38	5.00	6.00	4	0.75	5/8	3.50	4.00	10	8	8	9	3
0.38	5.50	7.00	8	0.75	5/8	3.50	4.00	12	11	11	13	3 1/2
0.44	6.19	7.50	8	0.75	5/8	3.50	4.00	15	13	13	17	4
0.44	7.31	8.50	8	0.88	3/4	3.75	4.25	19	15	15	20	5
0.50	8.50	9.50	8	0.88	3/4	4.00	4.50	24	19	19	26	6
0.50	10.62	11.75	8	0.88	3/4	4.25	4.75	39	30	30	45	8
0.50	12.75	14.25	12	1.00	7/8	4.50	5.00	52	43	43	70	10
0.50	15.00	17.00	12	1.00	7/8	4.75	5.25	80	64	64	110	12
0.50	16.25	18.75	12	1.12	1	5.25	5.75	110	90	105	140	14
0.50	18.50	21.25	16	1.12	1	5.25	5.75	140	98	140	180	16
0.50	21.00	22.75	16	1.25	1 1/8	5.75	6.25	150	130	160	220	18
0.50	23.00	25.00	20	1.25	1 1/8	6.25	6.75	180	165	195	285	20
0.50	27.25	29.50	20	1.38	1 1/4	6.75	7.25	260	220	275	430	24

Notes:

- (1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange and small bore of Socket Weld Flange to be specified by purchaser.
- (3) Class 150 Threaded Flanges are made without a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.

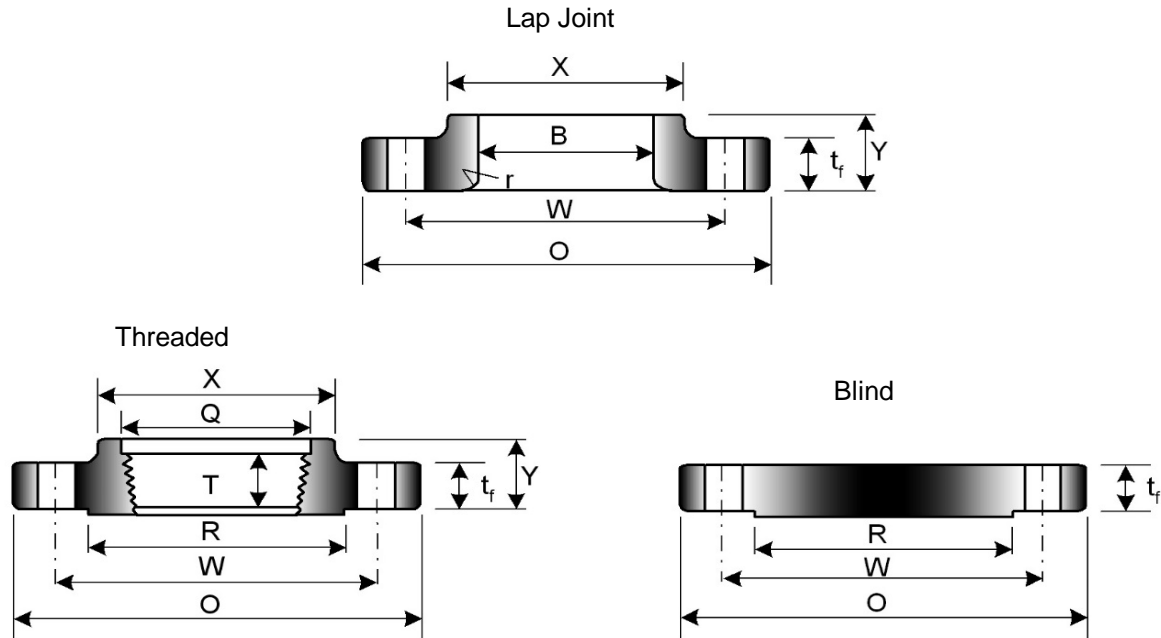


Nominal Pipe Size NPS	O.D. of Flange O	Thickness		Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾			Thread Length ⁽³⁾ T (min)	Depth of Socket D
		Flange ⁽¹⁾ t _f (min)	Lap Joint t _f (min)			W/N Y ⁽¹⁾	S/O, Thrd. S/W Y ⁽¹⁾	Lap Joint Y ⁽¹⁾	S/O, S/W B (min)	Lap Joint B (min)	Counter-bore Q (min)		
1/2	3.75	0.50	0.56	1.50	0.84	2.00	0.81	0.88	0.88	0.90	0.93	0.62	0.38
3/4	4.62	0.56	0.62	1.88	1.05	2.19	0.94	1.00	1.09	1.11	1.14	0.62	0.44
1	4.88	0.62	0.69	2.12	1.32	2.38	1.00	1.06	1.36	1.38	1.41	0.69	0.50
1 1/4	5.25	0.69	0.75	2.50	1.66	2.50	1.00	1.06	1.70	1.72	1.75	0.81	0.56
1 1/2	6.12	0.75	0.81	2.75	1.90	2.63	1.13	1.19	1.95	1.97	1.98	0.88	0.62
2	6.50	0.81	0.88	3.31	2.38	2.69	1.25	1.31	2.44	2.46	2.50	1.12	0.69
2 1/2	7.50	0.94	1.00	3.94	2.88	2.94	1.44	1.50	2.94	2.97	3.00	1.25	0.75
3	8.25	1.06	1.12	4.62	3.50	3.06	1.63	1.69	3.57	3.60	3.63	1.25	0.81
3 1/2	9.00	1.12	1.19	5.25	4.00	3.13	1.69	1.75	4.07	4.10	4.13	1.44	...
4	10.00	1.19	1.25	5.75	4.50	3.32	1.82	1.88	4.57	4.60	4.63	1.44	...
5	11.00	1.31	1.38	7.00	5.56	3.82	1.94	2.00	5.66	5.69	5.69	1.69	...
6	12.50	1.38	1.44	8.12	6.63	3.82	2.00	2.06	6.72	6.75	6.75	1.81	...
8	15.00	1.56	1.62	10.25	8.63	4.32	2.38	2.44	8.72	8.75	8.75	2.00	...
10	17.50	1.81	1.88	12.62	10.75	4.56	2.56	3.75	10.88	10.92	10.88	2.19	...
12	20.50	1.94	2.00	14.75	12.75	5.06	2.82	4.00	12.88	12.92	12.94	2.38	...
14	23.00	2.06	2.12	16.75	14.00	5.56	2.94	4.38	14.14	14.18	14.19	2.50	...
16	25.50	2.19	2.25	19.00	16.00	5.69	3.19	4.75	16.16	16.19	16.19	2.69	...
18	28.00	2.31	2.38	21.00	18.00	6.19	3.44	5.12	18.18	18.20	18.19	2.75	...
20	30.50	2.44	2.50	23.12	20.00	6.38	3.69	5.50	20.20	20.25	20.19	2.88	...
24	36.00	2.69	2.75	27.62	24.00	6.56	4.13	6.00	24.25	24.25	24.19	3.25	...

All dimensions are given in inches.

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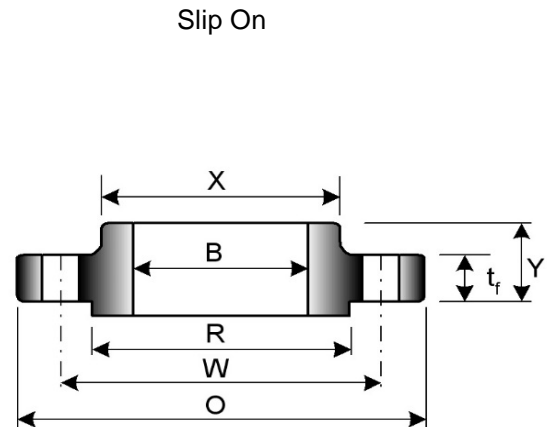
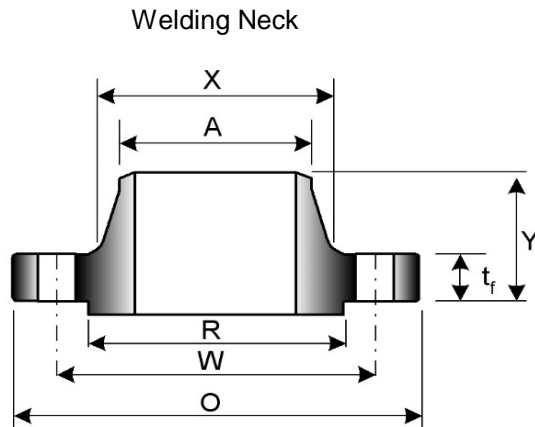
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Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.06" RF	Ring Joint	Welding Neck	S/O, S/W, Threaded	Lap Joint	Blind	
0.12	1.38	2.62	4	0.62	1/2	2.50	3.00	2	2	2	2	1/2
0.12	1.69	3.25	4	0.75	5/8	3.00	3.50	3	3	3	3	3/4
0.12	2.00	3.50	4	0.75	5/8	3.00	3.50	4	3	3	3	1
0.19	2.50	3.88	4	0.75	5/8	3.25	3.75	5	4	4	4	1 1/4
0.25	2.88	4.50	4	0.88	3/4	3.50	4.00	7	6	6	6	1 1/2
0.31	3.62	5.00	8	0.75	5/8	3.50	4.00	9	7	7	8	2
0.31	4.12	5.88	8	0.88	3/4	4.00	4.50	12	10	10	12	2 1/2
0.38	5.00	6.62	8	0.88	3/4	4.25	4.75	15	13	13	16	3
0.38	5.50	7.25	8	0.88	3/4	4.25	5.00	18	17	17	21	3 1/2
0.44	6.19	7.88	8	0.88	3/4	4.50	5.00	25	22	22	27	4
0.44	7.31	9.25	8	0.88	3/4	4.75	5.25	32	28	28	35	5
0.50	8.50	10.62	12	0.88	3/4	4.75	5.50	42	39	39	50	6
0.50	10.62	13.00	12	1.00	7/8	5.50	6.00	67	58	58	81	8
0.50	12.75	15.25	16	1.12	1	6.25	6.75	91	81	91	125	10
0.50	15.00	17.75	16	1.25	1 1/8	6.75	7.25	140	115	140	185	12
0.50	16.25	20.25	20	1.25	1 1/8	7.00	7.50	180	165	190	250	14
0.50	18.50	22.50	20	1.38	1 1/4	7.50	8.00	250	190	250	295	16
0.50	21.00	24.75	24	1.38	1 1/4	7.75	8.25	320	250	295	395	18
0.50	23.00	27.00	24	1.38	1 1/4	8.00	8.75	400	315	370	505	20
0.50	27.25	32.00	24	1.62	1 1/2	9.00	10.00	580	475	550	790	24

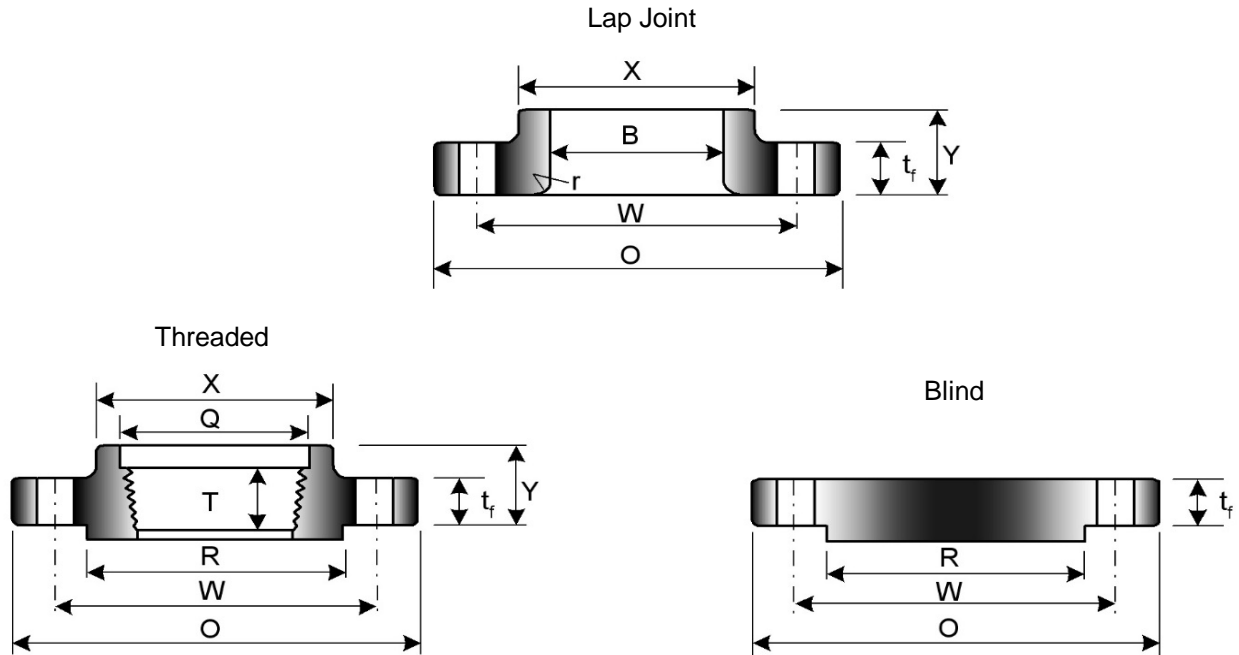
Notes:

- (1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange and small bore of Socket Weld Flange to be specified by purchaser.
- (3) Class 300 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness of Flange ⁽¹⁾ t _f (min)	Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾			Thread Length ⁽³⁾ T (min)
					W/N Y ⁽¹⁾	S/O, Threaded Y ⁽¹⁾	Lap Joint Y ⁽¹⁾	S/O B (min)	Lap Joint B (min)	Counter-bore Q (min)	
1/2 3/4 1 1 1/4 1 1/2 2 2 1/2 3 3 1/2	Use Class 600 dimensions in these sizes										
4	10.00	1.38	5.75	4.50	3.50	2.00	2.00	4.57	4.60	4.63	1.44
5	11.00	1.50	7.00	5.56	4.00	2.12	2.12	5.66	5.69	5.69	1.69
6	12.50	1.62	8.12	6.63	4.06	2.25	2.25	6.72	6.75	6.75	1.81
8	15.00	1.88	10.25	8.63	4.62	2.69	2.69	8.72	8.75	8.75	2.00
10	17.50	2.12	12.62	10.75	4.88	2.88	4.00	10.88	10.92	10.88	2.19
12	20.50	2.25	14.75	12.75	5.38	3.12	4.25	12.88	12.92	12.94	2.38
14	23.00	2.38	16.75	14.00	5.88	3.31	4.62	14.14	14.18	14.19	2.50
16	25.50	2.50	19.00	16.00	6.00	3.69	5.00	16.16	16.19	16.19	2.69
18	28.00	2.62	21.00	18.00	6.50	3.88	5.38	18.18	18.20	18.19	2.75
20	30.50	2.75	23.12	20.00	6.62	4.00	5.75	20.20	20.25	20.19	2.88
24	36.00	3.00	27.62	24.00	6.88	4.50	6.25	24.25	24.25	24.19	3.25

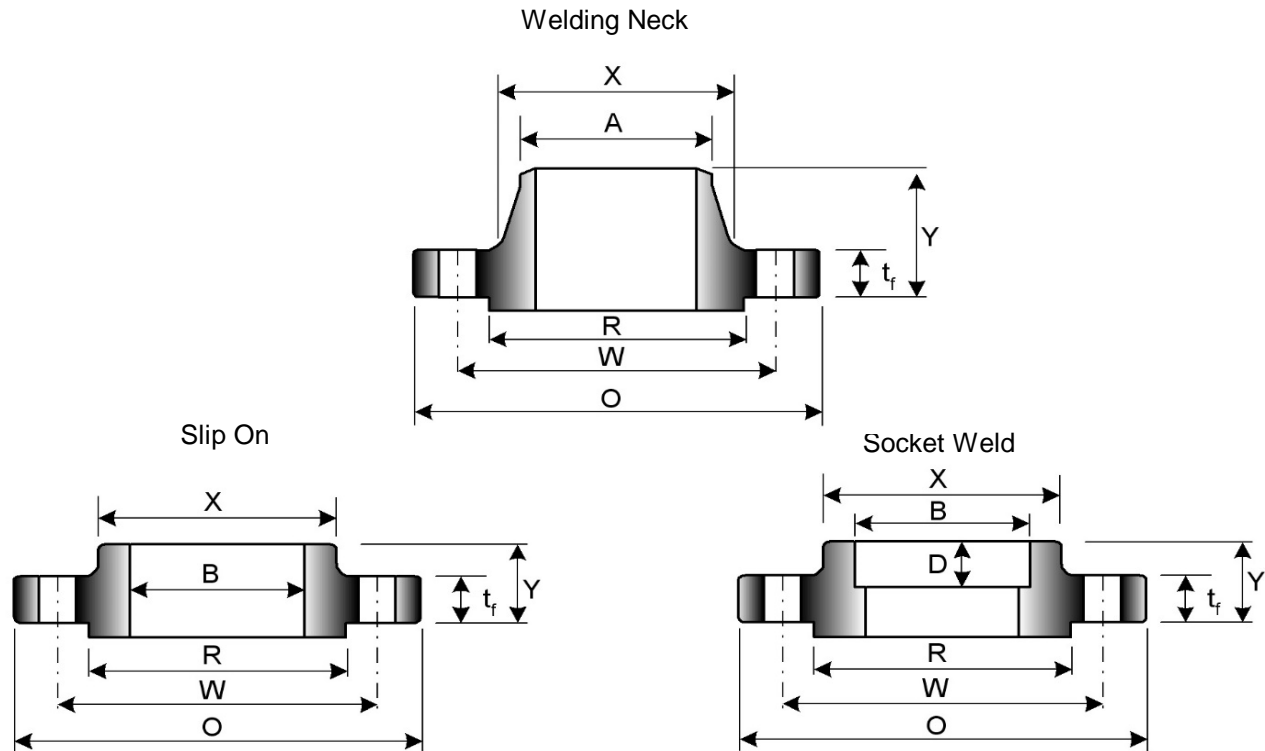
All dimensions are given in inches.



Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.25" RF	Ring Joint	Welding Neck	S/O, Threaded	Lap Joint	Blind	
Use Class 600 dimensions in these sizes												1/2
Use Class 600 dimensions in these sizes												3/4
Use Class 600 dimensions in these sizes												1
Use Class 600 dimensions in these sizes												1 1/4
Use Class 600 dimensions in these sizes												1 1/2
Use Class 600 dimensions in these sizes												2
Use Class 600 dimensions in these sizes												2 1/2
Use Class 600 dimensions in these sizes												3
Use Class 600 dimensions in these sizes												3 1/2
0.44	6.19	7.88	8	1.00	7/8	5.50	5.50	35	26	25	33	4
0.44	7.31	9.25	8	1.00	7/8	5.75	5.75	43	31	29	44	5
0.50	8.50	10.62	12	1.00	7/8	6.00	6.00	57	44	42	61	6
0.50	10.62	13.00	12	1.12	1	6.75	6.75	89	67	64	100	8
0.50	12.75	15.25	16	1.25	1 1/8	7.50	7.50	125	91	110	155	10
0.50	15.00	17.75	16	1.38	1 1/4	8.00	8.00	175	130	150	225	12
0.50	16.25	20.25	20	1.38	1 1/4	8.25	8.25	230	180	205	290	14
0.50	18.50	22.50	20	1.50	1 3/8	8.75	8.75	295	235	260	370	16
0.50	21.00	24.75	24	1.50	1 3/8	9.00	9.00	350	285	315	455	18
0.50	23.00	27.00	24	1.62	1 1/2	9.50	9.75	425	345	385	585	20
0.50	27.25	32.00	24	1.88	1 3/4	10.50	11.00	620	510	570	890	24

Notes:

- (1) 1/4" RF not included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange to be specified by purchaser.
- (3) Class 400 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.

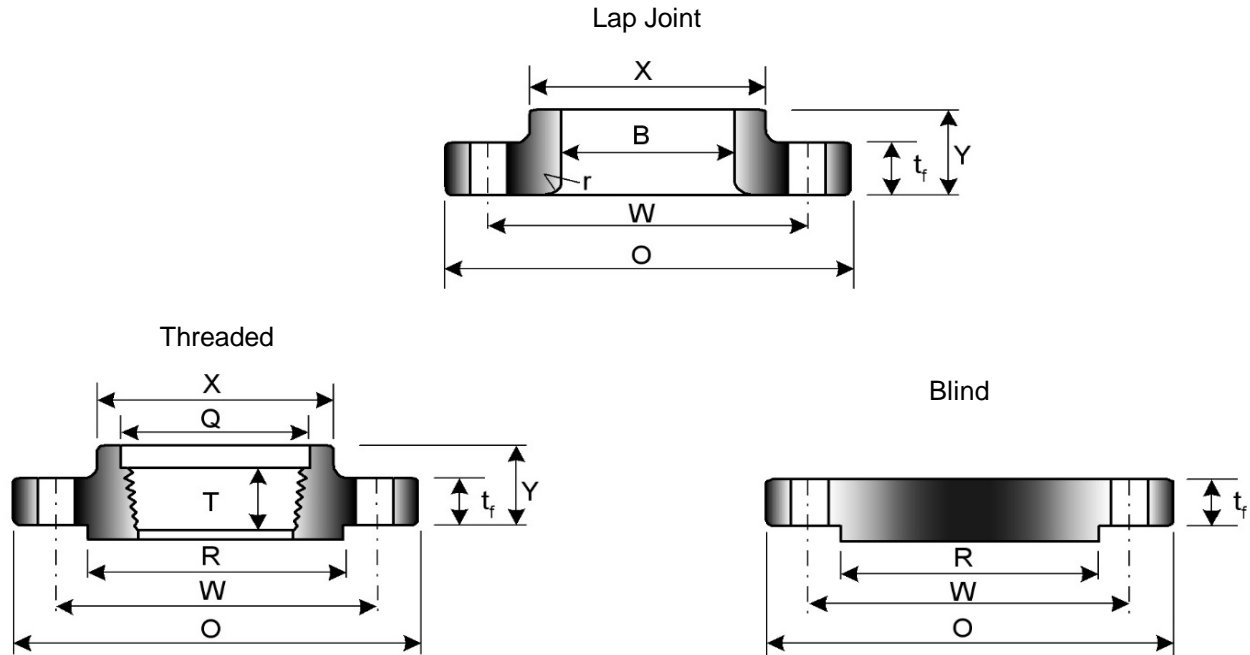


Nominal Pipe Size NPS	O.D. of Flange O	Thickness of Flange t_f (min)	Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾			Thread Length ⁽³⁾ T (min)	Depth of Socket D
					W/N	S/O, Thrd.	Lap Joint	S/O, S/W	Lap Joint	Counter-bore		
					Y ⁽¹⁾	Y ⁽¹⁾	Y ⁽¹⁾	B (min)	B (min)	Q (min)		
1/2	3.75	0.56	1.50	0.84	2.06	0.88	0.88	0.88	0.90	0.93	0.62	0.38
3/4	4.62	0.62	1.88	1.05	2.25	1.00	1.00	1.09	1.11	1.14	0.62	0.44
1	4.88	0.69	2.12	1.32	2.44	1.06	1.06	1.36	1.38	1.41	0.69	0.50
1 1/4	5.25	0.81	2.50	1.66	2.62	1.12	1.12	1.70	1.72	1.75	0.81	0.56
1 1/2	6.12	0.88	2.75	1.90	2.75	1.25	1.25	1.95	1.97	1.99	0.88	0.62
2	6.50	1.00	3.31	2.38	2.88	1.44	1.44	2.44	2.46	2.50	1.12	0.69
2 1/2	7.50	1.12	3.94	2.88	3.12	1.62	1.62	2.94	2.97	3.00	1.25	0.75
3	8.25	1.25	4.62	3.50	3.25	1.81	1.81	3.57	3.60	3.63	1.38	0.81
3 1/2	9.00	1.38	5.25	4.00	3.38	1.94	1.94	4.07	4.10	4.13	1.56	...
4	10.75	1.50	6.00	4.50	4.00	2.12	2.12	4.57	4.60	4.63	1.62	...
5	13.00	1.75	7.44	5.56	4.50	2.38	2.38	5.66	5.69	5.69	1.88	...
6	14.00	1.88	8.75	6.63	4.62	2.62	2.62	6.72	6.75	6.75	2.00	...
8	16.50	2.19	10.75	8.63	5.25	3.00	3.00	8.72	8.75	8.75	2.25	...
10	20.00	2.50	13.50	10.75	6.00	3.38	4.38	10.88	10.92	10.88	2.56	...
12	22.00	2.62	15.75	12.75	6.12	3.62	4.62	12.88	12.92	12.94	2.75	...
14	23.75	2.75	17.00	14.00	6.50	3.69	5.00	14.14	14.18	14.19	2.88	...
16	27.00	3.00	19.50	16.00	7.00	4.19	5.50	16.16	16.19	16.19	3.06	...
18	29.25	3.25	21.50	18.00	7.25	4.62	6.00	18.18	18.20	18.19	3.12	...
20	32.00	3.50	24.00	20.00	7.50	5.00	6.50	20.20	20.25	20.19	3.25	...
24	37.00	4.00	28.25	24.00	8.00	5.50	7.25	24.25	24.25	24.19	3.62	...

All dimensions are given in inches.

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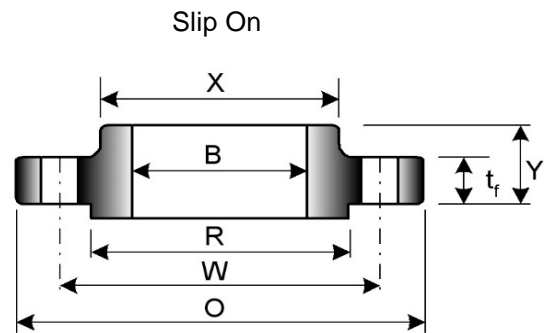
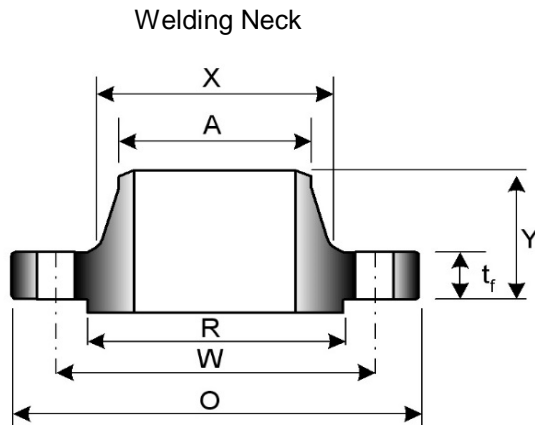
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Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.25" RF	Ring Joint	Welding Neck	S/O, S/W, Threaded	Lap Joint	Blind	
0.12	1.38	2.62	4	0.62	1/2	3.00	3.00	2	2	2	2	1/2
0.12	1.69	3.25	4	0.75	5/8	3.50	3.50	4	3	3	3	3/4
0.12	2.00	3.50	4	0.75	5/8	3.50	3.50	4	4	4	4	1
0.19	2.50	3.88	4	0.75	5/8	3.75	3.75	6	5	5	5	1 1/4
0.25	2.88	4.50	4	0.88	3/4	4.25	4.25	8	7	7	8	1 1/2
0.31	3.62	5.00	8	0.75	5/8	4.25	4.25	12	9	9	10	2
0.31	4.12	5.88	8	0.88	3/4	4.75	4.75	18	13	12	15	2 1/2
0.38	5.00	6.62	8	0.88	3/4	5.00	5.00	23	16	15	20	3
0.38	5.50	7.25	8	1.00	7/8	5.50	5.50	26	21	20	29	3 1/2
0.44	6.19	8.50	8	1.00	7/8	5.75	5.75	42	37	36	41	4
0.44	7.31	10.50	8	1.12	1	6.50	6.50	68	63	61	68	5
0.50	8.50	11.50	12	1.12	1	6.75	6.75	81	80	78	86	6
0.50	10.62	13.75	12	1.25	1 1/8	7.50	7.75	120	115	110	140	8
0.50	12.75	17.00	16	1.38	1 1/4	8.50	8.50	190	170	170	230	10
0.50	15.00	19.25	20	1.38	1 1/4	8.75	8.75	225	200	200	295	12
0.50	16.25	20.75	20	1.50	1 3/8	9.25	9.25	280	230	250	355	14
0.50	18.50	23.75	20	1.62	1 1/2	10.00	10.00	390	330	365	495	16
0.50	21.00	25.75	20	1.75	1 5/8	10.75	10.75	475	400	435	630	18
0.50	23.00	28.50	24	1.75	1 5/8	11.25	11.50	590	510	570	810	20
0.50	27.25	33.00	24	2.00	1 7/8	13.00	13.25	830	730	810	1250	24

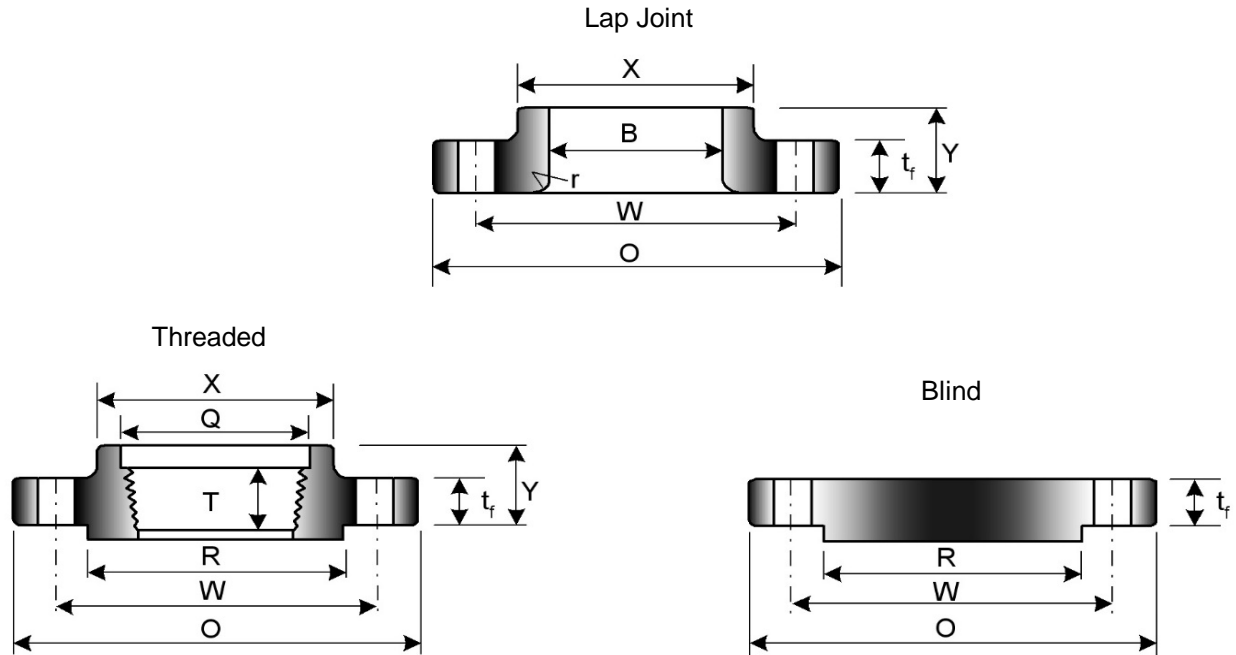
Notes:

- (1) 1/4" RF not included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange and small bore of Socket Weld Flange to be specified by purchaser.
- (3) Class 600 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness of Flange ⁽¹⁾ t _f (min)	Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾			Thread Length ⁽³⁾ T (min)
					W/N Y ⁽¹⁾	S/O, Threaded Y ⁽¹⁾	Lap Joint Y ⁽¹⁾	S/O B (min)	Lap Joint B (min)	Counter-bore Q (min)	
1/2 3/4 1 1 1/4 1 1/2 2 2 1/2	Use Class 1500 dimensions in these sizes										
3	9.50	1.50	5.00	3.50	4.00	2.12	2.12	3.57	3.60	3.63	1.62
4	11.50	1.75	6.25	4.50	4.50	2.75	2.75	4.57	4.60	4.63	1.88
5	13.75	2.00	7.50	5.56	5.00	3.12	3.12	5.66	5.69	5.69	2.12
6	15.00	2.19	9.25	6.63	5.50	3.38	3.38	6.72	6.75	6.75	2.25
8	18.50	2.50	11.75	8.63	6.38	4.00	4.50	8.72	8.75	8.75	2.50
10	21.50	2.75	14.50	10.75	7.25	4.25	5.00	10.88	10.92	10.88	2.81
12	24.00	3.12	16.50	12.75	7.88	4.62	5.62	12.88	12.92	12.94	3.00
14	25.25	3.38	17.75	14.00	8.38	5.12	6.12	14.14	14.18	14.19	3.25
16	27.75	3.50	20.00	16.00	8.50	5.25	6.50	16.16	16.19	16.19	3.38
18	31.00	4.00	22.25	18.00	9.00	6.00	7.50	18.18	18.20	18.19	3.50
20	33.75	4.25	24.50	20.00	9.75	6.25	8.25	20.20	20.25	20.19	3.62
24	41.00	5.50	29.50	24.00	11.50	8.00	10.50	24.25	24.25	24.19	4.00

All dimensions are given in inches.



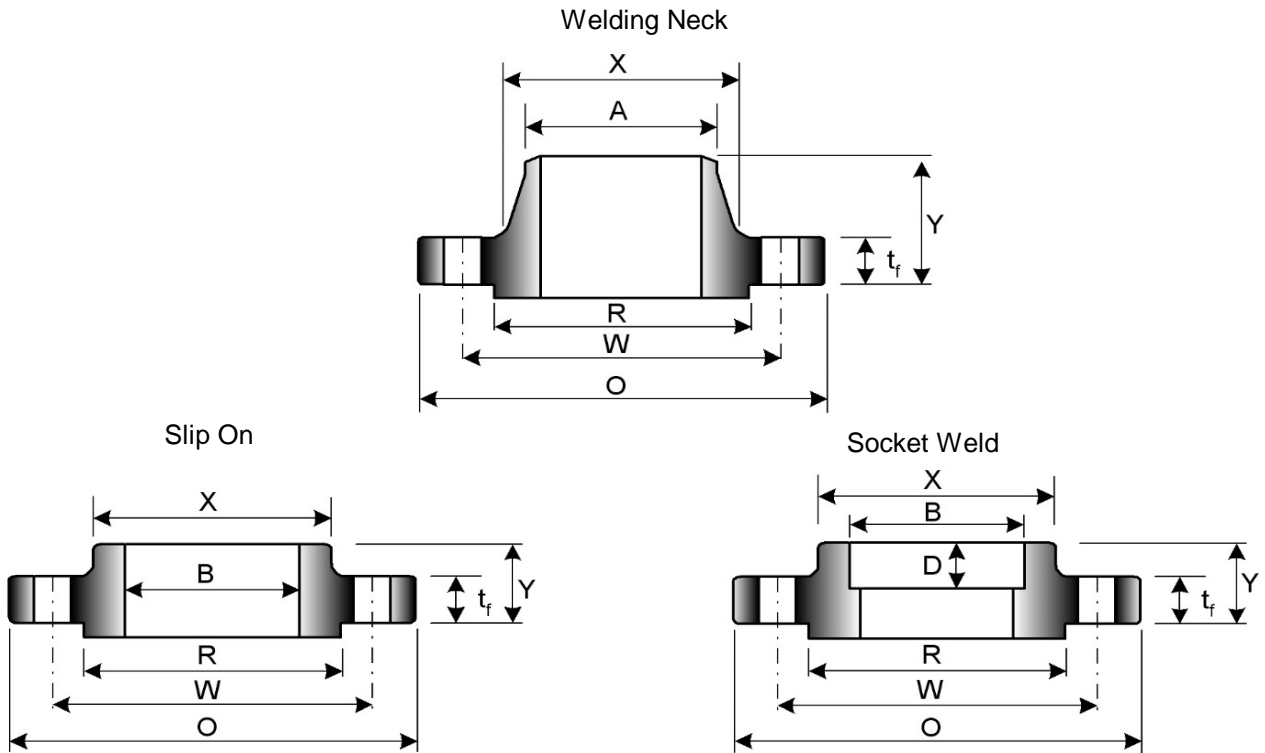
Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.25" RF	Ring Joint	Welding Neck	S/O, Threaded	Lap Joint	Blind	
Use Class 1500 dimensions in these sizes											1/2	
Use Class 1500 dimensions in these sizes											3/4	
Use Class 1500 dimensions in these sizes											1	
Use Class 1500 dimensions in these sizes											1 1/4	
Use Class 1500 dimensions in these sizes											1 1/2	
Use Class 1500 dimensions in these sizes											2	
Use Class 1500 dimensions in these sizes											2 1/2	
0.38	5.00	7.50	8	1.00	7/8	5.75	5.75	31	26	25	29	3
0.44	6.19	9.25	8	1.25	1 1/8	6.75	6.75	51	53	51	54	4
0.44	7.31	11.00	8	1.38	1 1/4	7.50	7.50	86	83	81	87	5
0.50	8.50	12.50	12	1.25	1 1/8	7.50	7.75	110	110	105	115	6
0.50	10.62	15.50	12	1.50	1 3/8	8.75	8.75	175	170	190	200	8
0.50	12.75	18.50	16	1.50	1 3/8	9.25	9.25	260	245	275	290	10
0.50	15.00	21.00	20	1.50	1 3/8	10.00	10.00	325	325	370	415	12
0.50	16.25	22.00	20	1.62	1 1/2	10.75	11.00	400	400	415	520	14
0.50	18.50	24.25	20	1.75	1 5/8	11.25	11.50	495	425	465	600	16
0.50	21.00	27.00	20	2.00	1 7/8	12.75	13.25	680	600	650	850	18
0.50	23.00	29.50	20	2.12	2	13.75	14.25	830	730	810	1075	20
0.50	27.25	35.50	20	2.62	2 1/2	17.25	18.00	1500	1400	1550	2025	24

Notes:

- (1) 1/4" RF not included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange to be specified by purchaser.
- (3) Class 900 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.

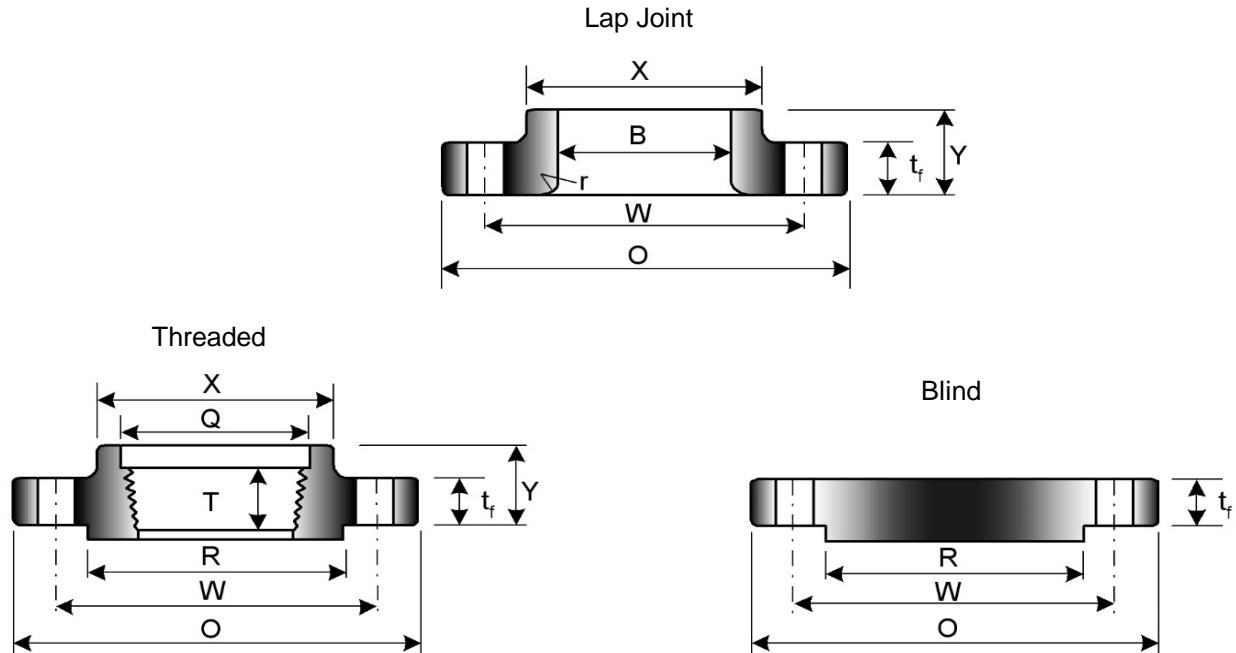
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Nominal Pipe Size NPS	O.D. of Flange O	Thickness of Flange ⁽¹⁾ t _f (min)	Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾			Thread Length ⁽³⁾ T (min)	Depth of Socket D
					W/N	S/O, Thrd.	Lap Joint	S/O, S/W	Lap Joint	Counter-bore		
					Y ⁽¹⁾	Y ⁽¹⁾	Y ⁽¹⁾	B (min)	B (min)	Q (min)		
1/2	4.75	0.88	1.50	0.84	2.38	1.25	1.25	0.88	0.90	0.93	0.88	0.38
3/4	5.12	1.00	1.75	1.05	2.75	1.38	1.38	1.09	1.11	1.14	1.00	0.44
1	5.88	1.12	2.06	1.32	2.88	1.62	1.62	1.36	1.38	1.41	1.12	0.50
1 1/4	6.25	1.12	2.50	1.66	2.88	1.62	1.62	1.70	1.72	1.75	1.19	0.56
1 1/2	7.00	1.25	2.75	1.90	3.25	1.75	1.75	1.95	1.97	1.99	1.25	0.62
2	8.50	1.50	4.12	2.38	4.00	2.25	2.25	2.44	2.46	2.50	1.50	0.69
2 1/2	9.62	1.62	4.88	2.88	4.12	2.50	2.50	2.94	2.97	3.00	1.88	0.75
3	10.50	1.88	5.25	3.50	4.62	...	2.88	...	3.60	...	...	...
4	12.25	2.12	6.38	4.50	4.88	...	3.56	...	4.60	...	...	...
5	14.75	2.88	7.75	5.56	6.12	...	4.12	...	5.69	...	...	...
6	15.50	3.25	9.00	6.63	6.75	...	4.69	...	6.75	...	...	...
8	19.00	3.62	11.50	8.63	8.38	...	5.62	...	8.75	...	...	...
10	23.00	4.25	14.50	10.75	10.00	...	7.00	...	10.92	...	...	...
12	26.50	4.88	17.75	12.75	11.12	...	8.62	...	12.92	...	...	...
14	29.50	5.25	19.50	14.00	11.75	...	9.50	...	14.18	...	...	...
16	32.50	5.75	21.75	16.00	12.25	...	10.25	...	16.19	...	...	...
18	36.00	6.38	23.50	18.00	12.88	...	10.88	...	18.20	...	...	...
20	38.75	7.00	25.25	20.00	14.00	...	11.50	...	20.25	...	...	...
24	46.00	8.00	30.00	24.00	16.00	...	13.00	...	24.25	...	...	...

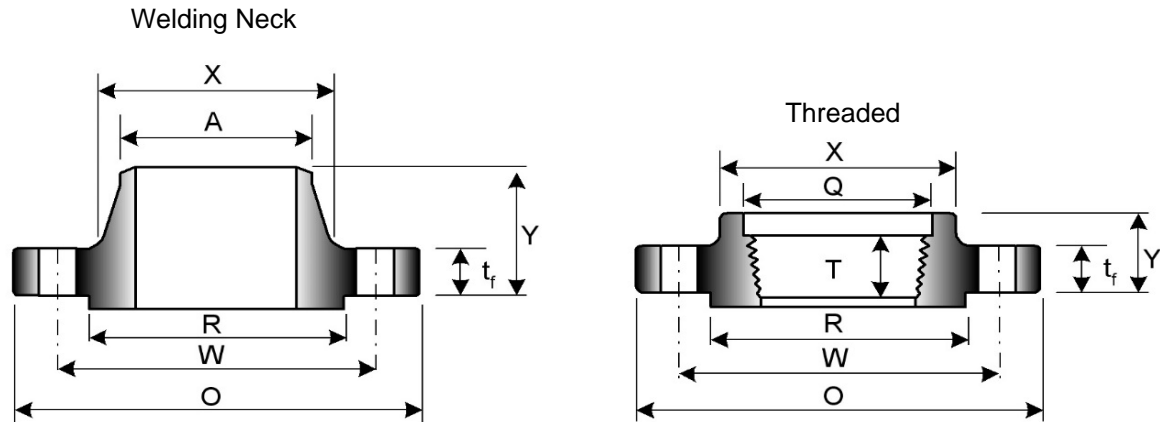
All dimensions are given in inches.



Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.25" RF	Ring Joint	Welding Neck	S/O, S/W, Threaded	Lap Joint	Blind	
0.12	1.38	3.25	4	0.88	3/4	4.25	4.25	5	4	4	4	1/2
0.12	1.69	3.50	4	0.88	3/4	4.50	4.50	6	5	5	6	3/4
0.12	2.00	4.00	4	1.00	7/8	5.00	5.00	9	8	8	8	1
0.19	2.50	4.38	4	1.00	7/8	5.00	5.00	10	9	9	9	1 1/4
0.25	2.88	4.88	4	1.12	1	5.50	5.50	13	12	12	13	1 1/2
0.31	3.62	6.50	8	1.00	7/8	5.75	5.75	25	25	25	25	2
0.31	4.12	7.50	8	1.12	1	6.25	6.25	36	36	35	35	2 1/2
0.38	5.00	8.00	8	1.25	1 1/8	7.00	7.00	48	...	47	48	3
0.44	6.19	9.50	8	1.38	1 1/4	7.75	7.75	73	...	75	73	4
0.44	7.31	11.50	8	1.62	1 1/2	9.75	9.75	130	...	140	140	5
0.50	8.50	12.50	12	1.50	1 3/8	10.25	10.50	165	...	170	160	6
0.50	10.62	15.50	12	1.75	1 5/8	11.50	11.75	275	...	285	300	8
0.50	12.75	19.00	12	2.00	1 7/8	13.25	13.50	455	...	485	510	10
0.50	15.00	22.50	16	2.12	2	14.75	15.25	690	...	630	690	12
0.50	16.25	25.00	16	2.38	2 1/4	16.00	16.75	940	...	890	975	14
0.50	18.50	27.75	16	2.62	2 1/2	17.50	18.50	1250	...	1150	1300	16
0.50	21.00	30.50	16	2.88	2 3/4	19.50	20.75	1625	...	1475	1750	18
0.50	23.00	32.75	16	3.12	3	21.25	22.25	2050	...	1775	2225	20
0.50	27.25	39.00	16	3.62	3 1/2	24.25	25.50	3325	...	2825	3625	24

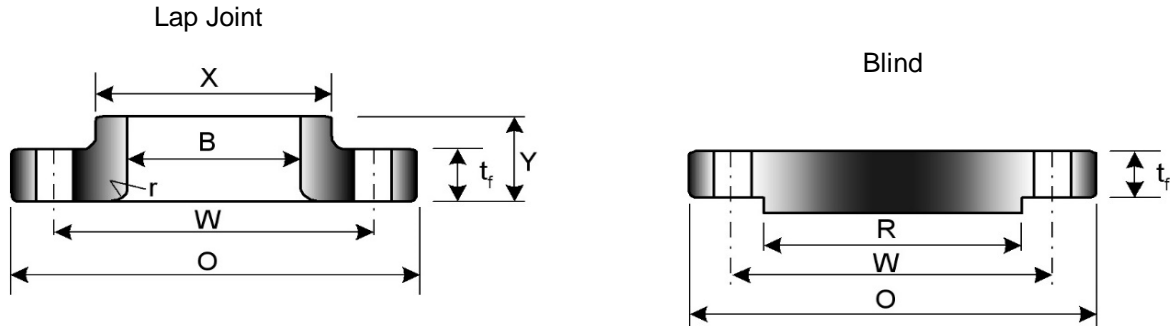
Notes:

- (1) 1/4" RF not included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange and small bore of Socket Weld Flange to be specified by purchaser.
- (3) Class 1500 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness of Flange ⁽¹⁾ t _f (min)	Diameter of Hub X	Diameter at Bevel A	Length Through Hub			Diameter of Bore ⁽²⁾		Thread Length ⁽³⁾ T (min)
					W/N Y ⁽¹⁾	Threaded Y ⁽¹⁾	Lap Joint Y ⁽¹⁾	Lap Joint B (min)	Counter-bore Q (min)	
1/2	5.25	1.19	1.69	0.84	2.88	1.56	1.56	0.90	0.93	1.12
3/4	5.50	1.25	2.00	1.05	3.12	1.69	1.69	1.11	1.14	1.25
1	6.25	1.38	2.25	1.32	3.50	1.88	1.88	1.38	1.41	1.38
1 1/4	7.25	1.50	2.88	1.66	3.75	2.06	2.06	1.72	1.75	1.50
1 1/2	8.00	1.75	3.12	1.90	4.38	2.38	2.38	1.97	1.99	1.75
2	9.25	2.00	3.75	2.38	5.00	2.75	2.75	2.46	2.50	2.00
2 1/2	10.50	2.25	4.50	2.88	5.62	3.12	3.12	2.97	3.00	2.25
3	12.00	2.62	5.25	3.50	6.62	...	3.62	3.60	...	...
4	14.00	3.00	6.50	4.50	7.50	...	4.25	4.60	...	...
5	16.50	3.62	8.00	5.56	9.00	...	5.12	5.69	...	...
6	19.00	4.25	9.25	6.63	10.75	...	6.00	6.75	...	...
8	21.75	5.00	12.00	8.63	12.50	...	7.00	8.75	...	...
10	26.50	6.50	14.75	10.75	16.50	...	9.00	10.92	...	...
12	30.00	7.25	17.38	12.75	18.25	...	10.00	12.92	...	...

All dimensions are given in inches.

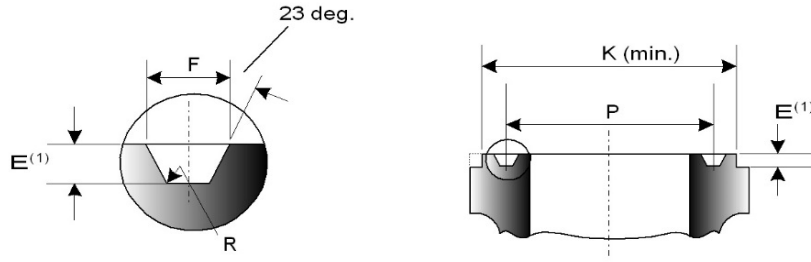


Corner Radius of Bore r	Diameter of RF R	Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Length of Studs ⁽⁴⁾		Approximate Weight Each in Pounds				Nominal Pipe Size NPS
						0.25" RF	Ring Joint	Welding Neck	Threaded	Lap Joint	Blind	
0.12	1.38	3.50	4	0.88	3/4	4.75	4.75	7	7	7	7	1/2
0.12	1.69	3.75	4	0.88	3/4	5.00	5.00	8	8	8	8	3/4
0.12	2.00	4.25	4	1.00	7/8	5.50	5.50	12	11	11	11	1
0.19	2.50	5.12	4	1.12	1	6.00	6.00	17	16	16	17	1 1/4
0.25	2.88	5.75	4	1.25	1 1/8	6.75	6.75	25	22	22	23	1 1/2
0.31	3.62	6.75	8	1.12	1	7.00	7.00	42	38	37	39	2
0.31	4.12	7.75	8	1.25	1 1/8	7.75	8.00	52	55	53	56	2 1/2
0.38	5.00	9.00	8	1.38	1 1/4	8.75	9.00	94	...	80	86	3
0.44	6.19	10.75	8	1.62	1 1/2	10.00	10.25	145	...	120	135	4
0.44	7.31	12.75	8	1.88	1 3/4	11.75	12.25	245	...	205	225	5
0.50	8.50	14.50	8	2.12	2	13.50	14.00	380	...	315	345	6
0.50	10.62	17.25	12	2.12	2	15.00	15.50	580	...	470	530	8
0.50	12.75	21.25	12	2.62	2 1/2	19.25	20.00	1075	...	900	1025	10
0.50	15.00	24.38	12	2.88	2 3/4	21.25	22.00	1525	...	1100	1300	12

Notes:

- (1) 1/4" RF not included in Flange Thickness (t_f) and Length Through Hub (Y).
- (2) Bore diameter of Welding Neck Flange to be specified by purchaser.
- (3) Class 2500 Threaded Flanges are made with a counterbore. Threads are per ASME B1.20.1.
- (4) Stud lengths noted are thread to thread, and assume a 1/8" gasket thickness.

Dimensions of Ring Joint Facings to ASME B16.5



Groove Number	Nominal Pipe Size NPS / Diameter of Raised Portion, K						Groove Dimensions							
	Class 150		Classes 300/400/600		Class 900 ⁽²⁾		Class 1500		Class 2500		Pitch Diameter P	Groove Depth E ⁽¹⁾	Groove Width F	Radius at Bottom R
R11	...	...	1/2	2.00	...	...	...	...	...	...	1.344	0.219	0.281	0.03
R12	...	...	...	...	...	...	1/2	2.38	...	...	1.562	0.250	0.344	0.03
R13	...	...	3/4	2.50	...	...	...	...	1/2	2.56	1.688	0.250	0.344	0.03
R14	...	...	...	...	...	...	3/4	2.62	...	...	1.750	0.250	0.344	0.03
R15	1	2.50	...	...	...	...	...	...	...	...	1.875	0.250	0.344	0.03
R16	...	...	1	2.75	...	...	1	2.81	3/4	2.88	2.000	0.250	0.344	0.03
R17	1 1/4	2.88	...	...	...	...	...	...	...	...	2.250	0.250	0.344	0.03
R18	...	...	1 1/4	3.12	...	...	1 1/4	3.19	1	3.25	2.375	0.250	0.344	0.03
R19	1 1/2	3.25	...	...	...	...	...	...	...	...	2.562	0.250	0.344	0.03
R20	...	...	1 1/2	3.56	...	...	1 1/2	3.62	...	...	2.688	0.250	0.344	0.03
R21	...	...	...	...	...	...	...	...	1 1/4	4.00	2.844	0.312	0.469	0.03
R22	2	4.00	...	...	...	...	...	...	...	...	3.250	0.250	0.344	0.03
R23	...	...	2	4.25	...	...	...	...	1 1/2	4.50	3.250	0.312	0.469	0.03
R24	...	...	...	...	...	...	2	4.88	...	...	3.750	0.312	0.469	0.03
R25	2 1/2	4.75	...	...	...	...	...	...	...	...	4.000	0.250	0.344	0.03
R26	...	...	2 1/2	5.00	...	...	...	...	2	5.25	4.000	0.312	0.469	0.03
R27	...	...	...	...	...	...	2 1/2	5.38	...	...	4.250	0.312	0.469	0.03
R28	...	...	...	...	...	...	...	...	2 1/2	5.88	4.375	0.375	0.531	0.06
R29	3	5.25	...	...	...	...	...	...	...	...	4.500	0.250	0.344	0.03
R30	...	...	(3)	...	...	...	...	...	...	...	4.625	0.312	0.469	0.03
R31	...	...	3 ⁽³⁾	5.75	3	6.12	...	...	...	...	4.875	0.312	0.469	0.03
R32	...	...	...	...	...	...	...	...	3	6.62	5.000	0.375	0.531	0.06
R33	3 1/2	6.06	...	...	...	...	...	...	...	...	5.188	0.250	0.344	0.03
R34	...	...	3 1/2	6.25	...	...	...	...	...	...	5.188	0.312	0.469	0.03
R35	...	...	...	...	...	...	3	6.62	...	...	5.375	0.312	0.469	0.03
R36	4	6.75	...	...	...	...	...	...	...	...	5.875	0.250	0.344	0.03
R37	...	...	4	6.88	4	7.12	...	...	...	...	5.875	0.312	0.469	0.03
R38	...	...	...	...	...	...	...	...	4	8.00	6.188	0.438	0.656	0.06
R39	...	...	...	...	...	...	4	7.62	...	...	6.375	0.312	0.469	0.03
R40	5	7.62	...	...	...	...	...	...	...	...	6.750	0.250	0.344	0.03
R41	...	...	5	8.25	5	8.50	...	...	...	...	7.125	0.312	0.469	0.03
R42	...	...	...	...	...	...	...	...	5	9.50	7.500	0.500	0.781	0.06
R43	6	8.62	...	...	...	...	...	...	...	...	7.625	0.250	0.344	0.03
R44	...	...	...	...	...	...	5	9.00	...	...	7.625	0.312	0.469	0.03
R45	...	...	6	9.50	6	9.50	...	...	...	...	8.312	0.312	0.469	0.03

All dimensions are given in inches.

Notes:

(1) Height of raised portion is equal to the Groove Depth, Dimension E, but is not subject to the tolerances for E.

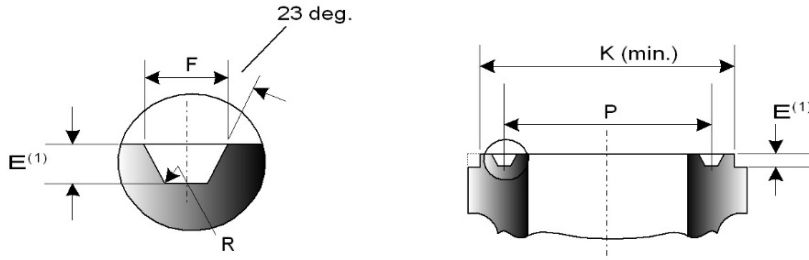
(2) Use Class 1500 dimensions for sizes NPS 1/2 through NPS 21/2 Class 900

(3) Groove Number R30 used for NPS 3 Classes 300 and 600 Lap Joints instead of R31

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Dimensions of Ring Joint Facings to ASME B16.5



Groove Number	Nominal Pipe Size NPS/ Diameter of Raised Portion, K					Groove Dimensions							
	Class 150		Classes 300/400/600		Class 900 ⁽²⁾	Class 1500		Class 2500		Pitch Diameter P	Groove Depth E ⁽¹⁾	Groove Width F	Radius at Bottom R
R46	...	...	...	...	...	6	9.75	...	...	8.312	0.375	0.531	0.06
R47	...	...	...	...	...	...	...	6	11.00	9.000	0.500	0.781	0.06
R48	8	10.75	...	...	...	...	...	...	...	9.750	0.250	0.344	0.03
R49	...	...	8	11.88	8	12.12	...	...	...	10.625	0.312	0.469	0.03
R50	...	...	...	...	...	8	12.50	...	...	10.625	0.438	0.656	0.06
R51	...	...	...	...	...	...	...	8	13.38	11.000	0.562	0.906	0.06
R52	10	13.00	...	...	...	...	...	...	...	12.000	0.250	0.344	0.03
R53	...	...	10	14.00	10	14.25	...	...	...	12.750	0.312	0.469	0.03
R54	...	...	...	...	...	10	14.62	...	...	12.750	0.438	0.656	0.06
R55	...	...	...	...	...	...	...	10	16.75	13.500	0.688	1.188	0.09
R56	12	16.00	...	...	...	...	...	...	...	15.000	0.250	0.344	0.03
R57	...	...	12	16.25	12	16.50	...	...	...	15.000	0.312	0.469	0.03
R58	...	...	...	...	...	12	17.25	...	...	15.000	0.562	0.906	0.06
R59	14	16.75	...	...	...	...	...	...	...	15.625	0.250	0.344	0.03
R60	...	...	...	...	...	...	...	12	19.50	16.000	0.688	1.312	0.09
R61	...	...	14	18.00	...	...	...	...	...	16.500	0.312	0.469	0.03
R62	...	...	...	...	14	18.38	...	...	...	16.500	0.438	0.656	0.06
R63	...	...	...	...	...	14	19.25	...	...	16.500	0.625	1.062	0.09
R64	16	19.00	...	...	...	...	...	...	...	17.875	0.250	0.344	0.03
R65	...	...	16	20.00	...	...	...	...	...	18.500	0.312	0.469	0.03
R66	...	...	...	...	16	20.62	...	...	...	18.500	0.438	0.656	0.06
R67	...	...	...	...	...	16	21.50	...	...	18.500	0.688	1.188	0.09
R68	18	21.50	...	...	...	...	...	...	...	20.375	0.250	0.344	0.03
R69	...	...	18	22.62	...	...	...	...	...	21.000	0.312	0.469	0.03
R70	...	...	...	...	18	23.38	...	...	...	21.000	0.500	0.781	0.06
R71	...	...	...	...	...	18	24.12	...	...	21.000	0.688	1.188	0.09
R72	20	23.50	...	...	...	...	...	...	...	22.000	0.250	0.344	0.03
R73	...	...	20	25.00	...	...	...	...	...	23.000	0.375	0.531	0.06
R74	...	...	...	...	20	25.50	...	...	...	23.000	0.500	0.781	0.06
R75	...	...	...	...	...	20	26.50	...	...	23.000	0.688	1.312	0.09
R76	24	28.00	...	...	...	...	...	...	...	26.500	0.250	0.344	0.03
R77	...	...	24	29.50	...	...	...	...	...	27.250	0.438	0.656	0.06
R78	...	...	...	...	24	30.38	...	...	...	27.250	0.625	1.062	0.09
R79	...	...	...	...	...	24	31.25	...	...	27.250	0.812	1.438	0.09

Tolerances:

E (Groove Depth): +0.016, -0.0

F (Groove Width): +/- 0.008

P (Pitch Diameter): +/- 0.005

R (Radius at Bottom): R<= 0.06: +0.03, -0.0; R> 0.06: +/- 0.03

23 deg. angle: +/- 1/2 deg.

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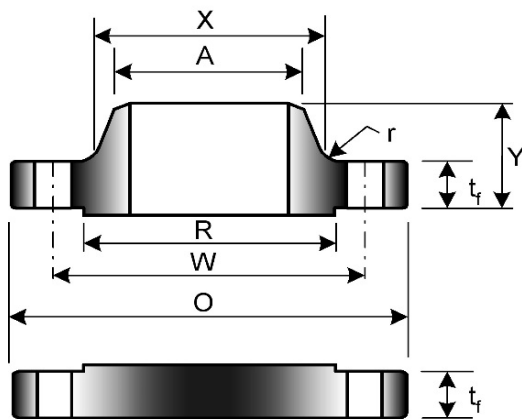
ASME B16.47 Large Diameter Flanges

ASME B16.47 covers welding neck and blind flanges NPS 26 through NPS 60, Classes 150, 300, 400, 600 and 900 in Series A, and Classes 75 through 900 in Series B. Series A dimensions- flanges for general use- are based on MSS SP-44, while Series B flanges are more compact and conform to the dimensions of API Standard 605.

Classes 75, 150 and 300 flanges are normally furnished with a 0.06 (1/16) in. raised face. Classes 400, 600 and 900 are normally furnished with a 0.25 (1/4) in. raised face. The required serrated face-finish is 125-250 Ra. Additionally, ring joint faces are available in Series A flanges in Classes 300 and higher.

Ring joint dimensions and tolerances for Series A flanges can be found on page 32. For pressure- temperature ratings for ASME B16.47 flanges, please refer to Page 69.

<u>Tolerances</u>	
Outside Diameter of Raised Face (R):	+/- 0.08"
Height of Raised Face:	+/- 0.02" (1/16" Raised Face)
	+/- 0.08" (1/4" Raised Face)
Flange Thickness (t_f):	+ 0.12, - 0.0" (to 1.0" thickness)
	+ 0.19, - 0.0" (1.0-2.0" thickness)
	+ 0.31, - 0.0" (2.0-3.0" thickness)
	+ 0.38, - 0.0" (over 3.0" thickness)
Outside Diameter at Welding End (A):	+ 0.19, - 0.06"
Inside Diameter:	+ 0.12, - 0.06"
Wall Thickness at Welding End:	not less than 87.5% of the nominal pipe thickness.
Length Through Hub (W/N Flange) (Y):	+ 0.12, - 0.19"
Bolt Circle Diameter (W):	+/- 0.06"
Spacing of adjacent bolt holes (centre-to-centre):	+/- 0.03"
Concentricity between Bolt Circle Diameter and machined facing diameter:	0.06" max.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
		26	34.25					2.63	2.63	4.69			26.62	26.00	29.50	31.75	24	1 3/8	1 1/4	0.38	314	671
28	36.50	2.75	2.75	4.88	28.62	28.00	31.50	34.00	28	1 3/8	1 1/4	0.44	356	795
30	38.75	2.88	2.88	5.32	30.75	30.00	33.75	36.00	28	1 3/8	1 1/4	0.44	415	941
32	41.75	3.13	3.13	5.63	32.75	32.00	36.00	38.50	28	1 5/8	1 1/2	0.44	520	1178
34	43.75	3.19	3.19	5.82	34.75	34.00	38.00	40.50	32	1 5/8	1 1/2	0.50	556	1316
36	46.00	3.50	3.50	6.13	36.75	36.00	40.25	42.75	32	1 5/8	1 1/2	0.50	659	1600
38	48.75	3.38	3.38	6.13	39.00	38.00	42.25	45.25	32	1 5/8	1 1/2	0.50	730	1744
40	50.75	3.50	3.50	6.38	41.00	40.00	44.25	47.25	36	1 5/8	1 1/2	0.50	771	1954
42	53.00	3.75	3.75	6.69	43.00	42.00	47.00	49.50	36	1 5/8	1 1/2	0.50	902	2287
44	55.25	3.94	3.94	6.94	45.00	44.00	49.00	51.75	40	1 5/8	1 1/2	0.50	1006	2608
46	57.25	4.00	4.00	7.25	47.12	46.00	51.00	53.75	40	1 5/8	1 1/2	0.50	1069	2849
48	59.50	4.19	4.19	7.50	49.12	48.00	53.50	56.00	44	1 5/8	1 1/2	0.50	1183	3218
50	61.75	4.32	4.32	7.94	51.25	50.00	55.50	58.25	44	1 7/8	1 3/4	0.50	1265	3543
52	64.00	4.50	4.50	8.19	53.25	52.00	57.50	60.50	44	1 7/8	1 3/4	0.50	1402	3974
54	66.25	4.69	4.69	8.44	55.25	54.00	59.50	62.75	44	1 7/8	1 3/4	0.50	1549	4448
56	68.75	4.82	4.82	8.94	57.38	56.00	62.00	65.00	48	1 7/8	1 3/4	0.50	1715	4919
58	71.00	5.00	5.00	9.19	59.38	58.00	64.00	67.25	48	1 7/8	1 3/4	0.50	1881	5452
60	73.00	5.13	5.13	9.38	61.38	60.00	66.00	69.25	52	1 7/8	1 3/4	0.50	1968	5897

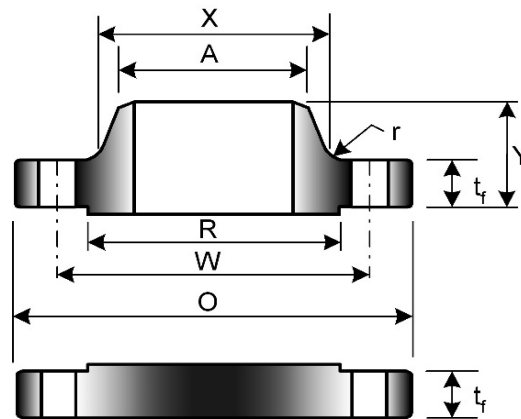
All dimensions are given in inches.

Notes:

(1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

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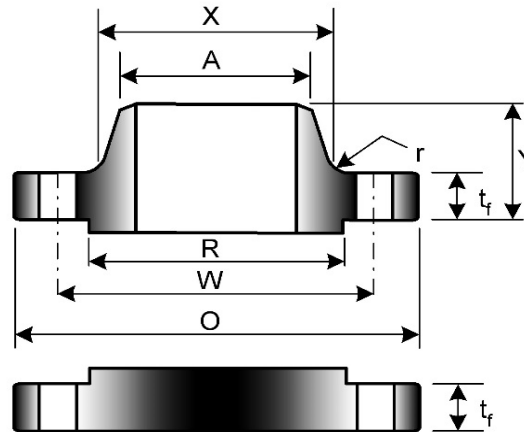
Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face ⁽²⁾ R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	38.25	3.07	3.25	7.19	28.38	26.00	29.50	34.50	28	1 3/4	1 5/8	0.38	603	951
28	40.75	3.32	3.50	7.69	30.50	28.00	31.50	37.00	28	1 3/4	1 5/8	0.44	731	1271
30	43.00	3.57	3.69	8.19	32.56	30.00	33.75	39.25	28	1 7/8	1 3/4	0.44	842	1455
32	45.25	3.82	3.88	8.69	34.69	32.00	36.00	41.50	28	2	1 7/8	0.44	945	1688
34	47.50	3.94	4.07	9.07	36.88	34.00	38.00	43.50	28	2	1 7/8	0.50	1092	1957
36	50.00	4.07	4.32	9.44	39.00	36.00	40.25	46.00	32	2 1/8	2	0.50	1230	2291
38	46.00	4.19	4.19	7.06	39.12	38.00	40.50	43.00	32	1 5/8	1 1/2	0.50	665	1910
40	48.75	4.44	4.44	7.56	41.25	40.00	42.75	45.50	32	1 3/4	1 5/8	0.50	812	2267
42	50.75	4.63	4.63	7.82	43.25	42.00	44.75	47.50	32	1 3/4	1 5/8	0.50	888	2570
44	53.25	4.82	4.82	8.06	45.25	44.00	47.00	49.75	32	1 7/8	1 3/4	0.50	1008	2939
46	55.75	5.00	5.00	8.44	47.38	46.00	49.00	52.00	28	2	1 7/8	0.50	1151	3353
48	57.75	5.19	5.19	8.75	49.38	48.00	51.25	54.00	32	2	1 7/8	0.50	1254	3724
50	60.25	5.44	5.44	9.07	51.38	50.00	53.50	56.25	32	2 1/8	2	0.50	1382	4241
52	62.25	5.63	5.63	9.32	53.38	52.00	55.50	58.25	32	2 1/8	2	0.50	1495	4696
54	65.25	5.94	5.94	9.88	55.50	54.00	57.75	61.00	28	2 3/8	2 1/4	0.50	1828	5439
56	67.25	6.00	6.00	10.19	57.62	56.00	59.75	63.00	28	2 3/8	2 1/4	0.50	1934	5849
58	69.25	6.19	6.19	10.44	59.62	58.00	62.00	65.00	32	2 3/8	2 1/4	0.50	1993	6378
60	71.25	6.38	6.38	10.69	61.62	60.00	64.00	67.00	32	2 3/8	2 1/4	0.50	2138	6973

All dimensions are given in inches.

Notes:

(1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

(2) Class 300 Series A Flanges are also available in Ring Joint. Please see Page 32.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. at Welding End A	Diameter of Raised Face ⁽²⁾ R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
		26	38.25					3.50	3.88	7.62			28.62	26.00	29.50	34.50	28	1 7/8	1 3/4	0.44	664	1227
28	40.75	3.75	4.12	8.12	30.81	28.00	31.50	37.00	28	2	1 7/8	0.50	792	1475
30	43.00	4.00	4.38	8.62	32.94	30.00	33.75	39.25	28	2 1/8	2	0.50	912	1743
32	45.25	4.25	4.56	9.12	35.00	32.00	36.00	41.50	28	2 1/8	2	0.50	1055	2019
34	47.50	4.38	4.81	9.50	37.19	34.00	38.00	43.50	28	2 1/8	2	0.56	1187	2358
36	50.00	4.50	5.06	9.88	39.38	36.00	40.25	46.00	32	2 1/8	2	0.56	1343	2753
38	47.50	4.88	4.88	8.12	39.50	38.00	40.75	44.00	32	1 7/8	1 3/4	0.56	886	2405
40	50.00	5.12	5.12	8.50	41.50	40.00	43.00	46.25	32	2	1 7/8	0.56	1020	2788
42	52.00	5.25	5.25	8.81	43.62	42.00	45.00	48.25	32	2	1 7/8	0.56	1122	3103
44	54.50	5.50	5.50	9.18	45.62	44.00	47.25	50.50	32	2 1/8	2	0.56	1277	3561
46	56.75	5.75	5.75	9.62	47.75	46.00	49.50	52.75	36	2 1/8	2	0.56	1422	4025
48	59.50	6.00	6.00	10.12	49.88	48.00	51.50	55.25	28	2 3/8	2 1/4	0.56	1685	4635
50	61.75	6.19	6.25	10.56	52.00	50.00	53.62	57.50	32	2 3/8	2 1/4	0.56	1840	5183
52	63.75	6.38	6.44	10.88	54.00	52.00	55.62	59.50	32	2 3/8	2 1/4	0.56	1996	5704
54	67.00	6.69	6.75	11.38	56.12	54.00	57.88	62.25	28	2 5/8	2 1/2	0.56	2418	6603
56	69.00	6.88	6.94	11.75	58.25	56.00	60.12	64.25	32	2 5/8	2 1/2	0.56	2537	7174
58	71.00	7.00	7.12	12.06	60.25	58.00	62.12	66.25	32	2 5/8	2 1/2	0.56	2685	7812
60	74.25	7.31	7.44	12.56	62.38	60.00	64.38	69.00	32	2 7/8	2 3/4	0.56	3141	8872

All dimensions are given in inches.

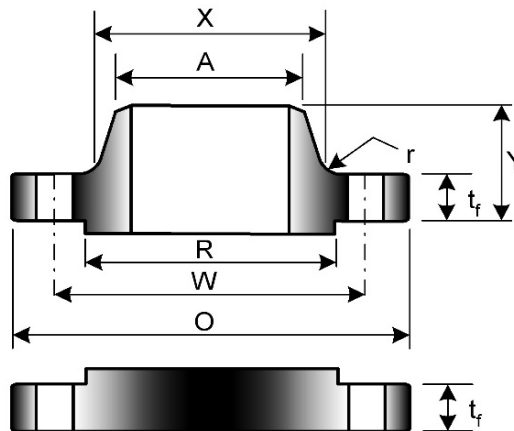
Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

(2) Class 400 Series A Flanges are also available in Ring Joint. Please see Page 32.

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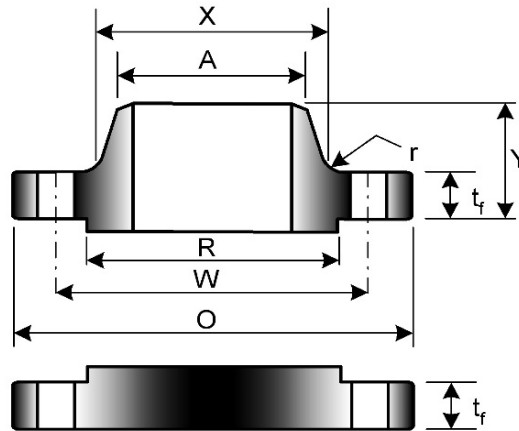
Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face ⁽²⁾ R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each.lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	40.00	4.25	4.94	8.75	29.44	26.00	29.50	36.00	28	2	1 7/8	0.50	930	1674
28	42.25	4.38	5.19	9.25	31.62	28.00	31.50	38.00	28	2 1/8	2	0.50	1057	1968
30	44.50	4.50	5.50	9.75	33.94	30.00	33.75	40.25	28	2 1/8	2	0.50	1191	2328
32	47.00	4.62	5.81	10.25	36.12	32.00	36.00	42.50	28	2 3/8	2 1/4	0.50	1331	2707
34	49.00	4.75	6.06	10.62	38.31	34.00	38.00	44.50	28	2 3/8	2 1/4	0.56	1487	3085
36	51.75	4.88	6.38	11.12	40.62	36.00	40.25	47.00	28	2 5/8	2 1/2	0.56	1666	3597
38	50.00	6.00	6.12	10.00	40.25	38.00	41.50	45.75	28	2 3/8	2 1/4	0.56	1381	3264
40	52.00	6.25	6.38	10.38	42.25	40.00	43.75	47.75	32	2 3/8	2 1/4	0.56	1494	3665
42	55.25	6.62	6.75	11.00	44.38	42.00	46.00	50.50	28	2 5/8	2 1/2	0.56	1884	4388
44	57.25	6.81	7.00	11.38	46.50	44.00	48.25	52.50	32	2 5/8	2 1/2	0.56	1971	4863
46	59.50	7.06	7.31	11.81	48.62	46.00	50.25	54.75	32	2 5/8	2 1/2	0.56	2210	5509
48	62.75	7.44	7.69	12.44	50.75	48.00	52.50	57.50	32	2 7/8	2 3/4	0.56	2604	6397
50	65.75	7.75	8.00	12.94	52.88	50.00	54.50	60.00	28	3 1/8	3	0.56	3050	7331
52	67.75	8.00	8.25	13.25	54.88	52.00	56.50	62.00	32	3 1/8	3	0.56	3200	7983
54	70.00	8.25	8.56	13.75	57.00	54.00	58.75	64.25	32	3 1/8	3	0.56	3536	8878
56	73.00	8.56	8.88	14.25	59.12	56.00	60.75	66.75	32	3 3/8	3 1/4	0.62	3991	9950
58	75.00	8.75	9.12	14.56	61.12	58.00	63.00	68.75	32	3 3/8	3 1/4	0.62	4340	10829
60	78.50	9.19	9.56	15.31	63.38	60.00	65.25	71.75	28	3 5/8	3 1/2	0.69	5255	12488

All dimensions are given in inches.

Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

(2) Class 600 Series A Flanges are also available in Ring Joint. Please see Page 32.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face ⁽²⁾ R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	42.75	5.50	6.31	11.25	30.50	26.00	29.50	37.50	20	2 7/8	2 3/4	0.44	1512	2397
28	46.00	5.62	6.75	11.75	32.75	28.00	31.50	40.25	20	3 1/8	3	0.50	1783	2923
30	48.50	5.88	7.18	12.25	35.00	30.00	33.75	42.75	20	3 1/8	3	0.50	2062	3490
32	51.75	6.25	7.62	13.00	37.25	32.00	36.00	45.50	20	3 3/8	3 1/4	0.50	2512	4201
34	55.00	6.50	8.06	13.75	39.62	34.00	38.00	48.25	20	3 5/8	3 1/2	0.56	2949	5008
36	57.50	6.75	8.44	14.25	41.88	36.00	40.25	50.75	20	3 5/8	3 1/2	0.56	3434	5773
38	57.50	7.50	8.50	13.88	42.25	38.00	43.25	50.75	20	3 5/8	3 1/2	0.75	3390	5825
40	59.50	7.75	8.81	14.31	44.38	40.00	45.75	52.75	24	3 5/8	3 1/2	0.81	3587	6402
42	61.50	8.12	9.12	14.62	46.31	42.00	47.75	54.75	24	3 5/8	3 1/2	0.81	3901	7121
44	64.88	8.44	9.56	15.38	48.62	44.00	50.00	57.62	24	3 7/8	3 3/4	0.88	4209	8275
46	68.25	8.88	10.06	16.18	50.88	46.00	52.50	60.50	24	4 1/8	4	0.88	5224	9611
48	70.25	9.19	10.38	16.50	52.88	48.00	54.50	62.50	24	4 1/8	4	0.94	5606	10559
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All dimensions are given in inches

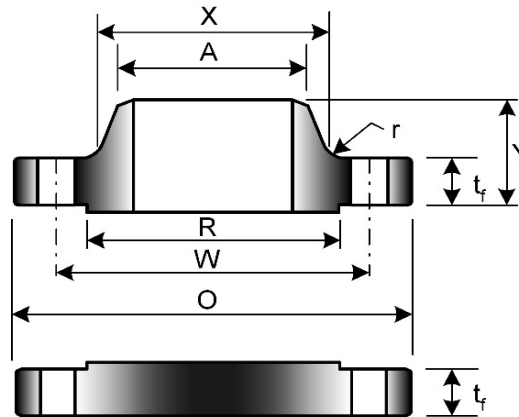
Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

(2) Class 900 Series A Flanges are also available in Ring Joint. Please see Page 32.

Trans Am

Piping Products Ltd.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	30.00	1.25	1.25	2.25	26.62	26.06	27.75	28.50	36	3/4	5/8	0.31	80	254
28	32.00	1.25	1.25	2.38	28.62	28.06	29.75	30.50	40	3/4	5/8	0.31	86	290
30	34.00	1.25	1.25	2.50	30.62	30.06	31.75	32.50	44	3/4	5/8	0.31	91	327
32	36.00	1.32	1.38	2.69	32.62	32.06	33.75	34.50	48	3/4	5/8	0.31	103	403
34	38.00	1.32	1.44	2.82	34.62	34.06	35.75	36.50	52	3/4	5/8	0.31	113	470
36	40.69	1.38	1.61	3.32	36.81	36.06	38.00	39.06	40	7/8	3/4	0.38	157	600
38	42.69	1.44	1.69	3.44	38.81	38.06	40.00	41.06	40	7/8	3/4	0.38	162	693
40	44.69	1.44	1.69	3.57	40.81	40.06	42.00	43.06	44	7/8	3/4	0.38	171	760
42	46.69	1.50	1.82	3.69	42.81	42.06	44.00	45.06	48	7/8	3/4	0.38	190	891
44	49.25	1.63	1.88	4.07	44.88	44.06	46.25	47.38	36	1	7/8	0.38	233	1038
46	51.25	1.69	1.94	4.19	46.88	46.06	48.25	49.38	40	1	7/8	0.38	250	1146
48	53.25	1.75	2.07	4.32	48.88	48.06	50.25	51.38	44	1	7/8	0.38	264	1312
50	55.25	1.82	2.13	4.50	50.94	50.06	52.25	53.38	44	1	7/8	0.38	290	1454
52	57.38	1.82	2.19	4.69	52.94	52.06	54.25	55.50	48	1	7/8	0.38	310	1618
54	59.38	1.88	2.32	4.88	55.00	54.06	56.25	57.50	48	1	7/8	0.38	335	1835
56	62.00	1.94	2.38	5.25	57.12	56.06	58.50	59.88	40	1 1/8	1	0.44	394	2052
58	64.00	2.00	2.44	5.38	59.12	58.06	60.50	61.88	44	1 1/8	1	0.44	418	2240
60	66.00	2.13	2.57	5.63	61.12	60.06	62.50	63.88	44	1 1/8	1	0.44	457	2497

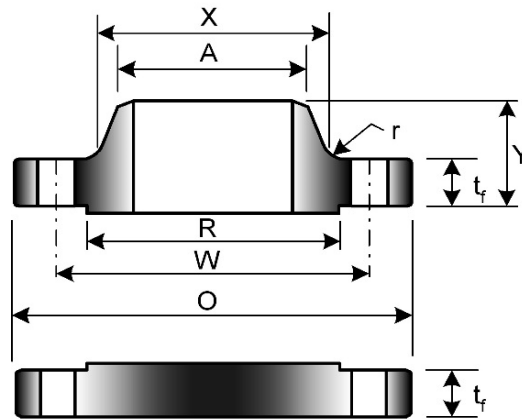
All dimensions are given in inches

Notes:

(1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

Trans Am

Piping Products Ltd.



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	30.94	1.57	1.69	3.44	26.94	26.06	28.00	29.31	36	7/8	3/4	0.38	126	360
28	32.94	1.69	1.82	3.69	28.94	28.06	30.00	31.31	40	7/8	3/4	0.38	146	439
30	34.94	1.69	1.94	3.88	31.00	30.06	32.00	33.31	44	7/8	3/4	0.38	159	527
32	37.06	1.75	2.07	4.19	33.06	32.06	34.00	35.44	48	7/8	3/4	0.38	179	629
34	39.56	1.88	2.19	4.28	35.12	34.06	36.25	37.69	40	1	7/8	0.38	217	761
36	41.62	2.00	2.25	4.57	37.19	36.06	38.25	39.75	44	1	7/8	0.38	243	865
38	44.25	2.07	2.44	4.82	39.25	38.12	40.25	42.12	40	1 1/8	1	0.38	293	1059
40	46.25	2.13	2.57	5.00	41.31	40.12	42.50	44.12	44	1 1/8	1	0.38	318	1213
42	48.25	2.25	2.63	5.19	43.38	42.12	44.50	46.12	48	1 1/8	1	0.44	348	1354
44	50.25	2.32	2.75	5.32	45.38	44.12	46.50	48.12	52	1 1/8	1	0.44	374	1535
46	52.81	2.38	2.88	5.63	47.44	46.12	48.62	50.56	40	1 1/4	1 1/8	0.44	437	1780
48	54.81	2.50	3.00	5.82	49.50	48.12	50.75	52.56	44	1 1/4	1 1/8	0.44	474	1994
50	56.81	2.63	3.13	6.00	51.50	50.12	52.75	54.56	48	1 1/4	1 1/8	0.44	512	2225
52	58.81	2.69	3.25	6.13	53.56	52.12	54.75	56.56	52	1 1/4	1 1/8	0.44	543	2483
54	61.00	2.75	3.38	6.32	55.62	54.12	56.75	58.75	56	1 1/4	1 1/8	0.44	590	2777
56	63.00	2.82	3.50	6.50	57.69	56.12	58.75	60.75	60	1 1/4	1 1/8	0.56	622	3065
58	65.94	2.88	3.62	6.82	59.69	58.12	60.75	63.44	48	1 3/8	1 1/4	0.56	747	3480
60	67.94	2.94	3.75	7.00	61.81	60.12	63.00	65.44	52	1 3/8	1 1/4	0.56	786	3824

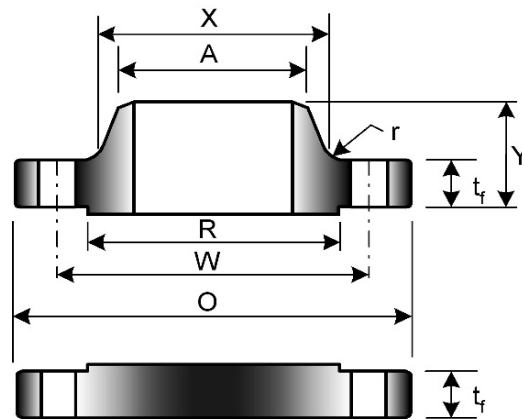
All dimensions are given in inches

Notes:

(1) 1/16" RF NOT included in Flange Thickness (t) and Length Through Hub (Y).

Trans Am

Piping Products Ltd.

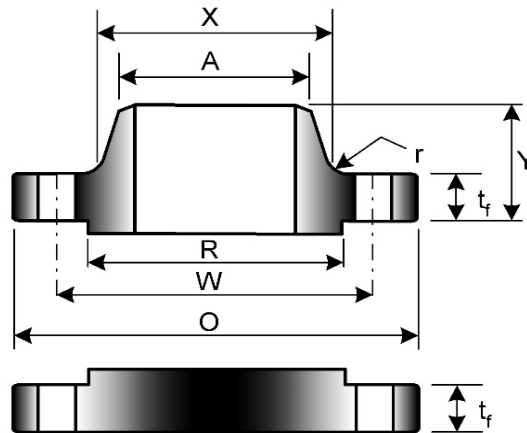


Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
		26	34.12					3.44	3.44	5.63			27.62	26.19	29.00	31.62	32	1 3/8	1 1/4	0.56	406	854
28	36.25	3.44	3.44	5.81	29.75	28.19	31.00	33.75	36	1 3/8	1 1/4	0.56	445	964
30	39.00	3.63	3.63	6.16	32.00	30.25	33.25	36.25	36	1 1/2	1 3/8	0.56	548	1175
32	41.50	4.00	4.00	6.56	34.00	32.25	35.50	38.50	32	1 5/8	1 1/2	0.62	672	1472
34	43.62	4.00	4.00	6.75	36.12	34.25	37.50	40.62	36	1 5/8	1 1/2	0.62	723	1624
36	46.12	4.00	4.00	7.06	38.00	36.25	39.75	42.88	32	1 3/4	1 5/8	0.62	808	1822
38	48.12	4.31	4.31	7.50	40.00	38.25	41.75	44.88	36	1 3/4	1 5/8	0.62	904	2136
40	50.12	4.50	4.50	7.75	42.00	40.25	43.88	46.88	40	1 3/4	1 5/8	0.62	977	2410
42	52.50	4.63	4.63	8.00	44.00	42.31	46.00	49.00	36	1 7/8	1 3/4	0.62	1093	2727
44	54.50	4.94	4.94	8.38	46.19	44.31	48.00	51.00	40	1 7/8	1 3/4	0.62	1210	3129
46	57.50	5.00	5.06	8.69	48.38	46.31	50.00	53.75	36	2	1 7/8	0.62	1426	3583
48	59.50	5.00	5.25	8.75	50.31	48.31	52.25	55.75	40	2	1 7/8	0.62	1469	3979
50	61.50	5.38	5.44	9.19	52.38	50.31	54.25	57.75	44	2	1 7/8	0.62	1621	4389
52	63.50	5.56	5.61	9.50	54.44	52.31	56.25	59.75	48	2	1 7/8	0.62	1729	4826
54	65.88	5.32	5.81	9.38	56.50	54.31	58.25	62.12	48	2	1 7/8	0.62	1804	5427
56	69.50	6.00	6.12	10.50	58.81	56.31	60.50	65.00	36	2 3/8	2 1/4	0.69	2412	6330
58	71.94	6.00	6.31	10.75	60.94	58.31	62.75	67.44	40	2 3/8	2 1/4	0.69	2584	7000
60	73.94	5.88	6.50	10.63	62.94	60.31	65.00	69.44	40	2 3/8	2 1/4	0.69	2629	7635

All dimensions are given in inches

Notes:

(1) 1/16" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. at Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	33.50	3.50	3.50	5.88	27.12	26.00	28.00	30.75	28	1 1/2	1 3/8	0.44	373	863
28	36.00	3.75	3.75	6.25	29.12	28.00	30.00	33.00	24	1 5/8	1 1/2	0.50	460	1073
30	38.25	4.00	4.00	6.69	31.25	30.00	32.25	35.25	28	1 5/8	1 1/2	0.50	537	1278
32	40.75	4.25	4.25	7.06	33.25	32.00	34.38	37.50	28	1 3/4	1 5/8	0.50	634	1545
34	42.75	4.38	4.38	7.38	35.38	34.00	36.50	39.50	32	1 3/4	1 5/8	0.56	691	1750
36	45.50	4.69	4.69	7.88	37.50	36.00	38.62	42.00	28	1 7/8	1 3/4	0.56	855	2127
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Sizes NPS 38 through 60 are identical to Series A flanges in Class 400														
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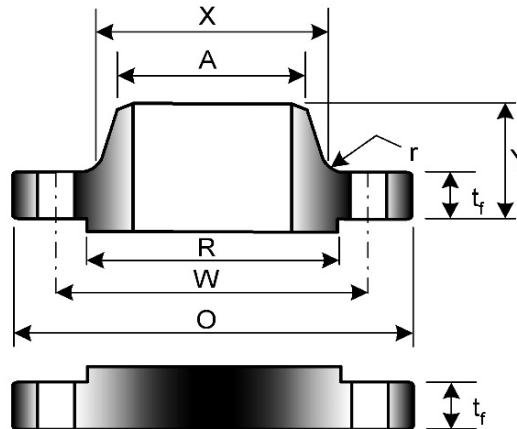
All dimensions are given in inches

Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

Trans Am

Piping Products Ltd.

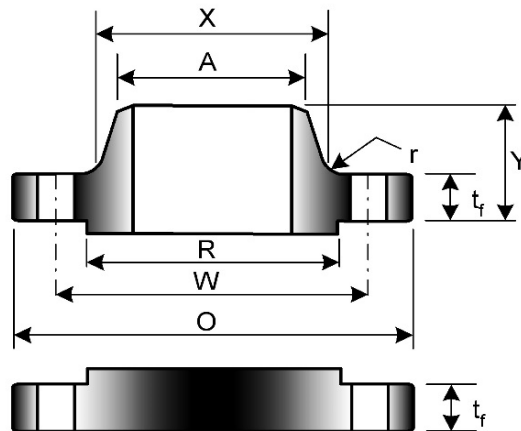


Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	35.00	4.38	4.38	7.12	27.50	26.00	28.62	31.75	28	1 3/4	1 5/8	0.50	550	1149
28	37.50	4.56	4.56	7.50	29.62	28.00	30.88	34.00	28	1 7/8	1 3/4	0.50	646	1370
30	40.25	4.94	5.00	8.06	31.75	30.00	33.12	36.50	28	2	1 7/8	0.50	807	1730
32	42.75	5.12	5.31	8.50	33.88	32.00	35.25	38.75	28	2 1/8	2	0.50	932	2072
34	45.75	5.56	5.68	9.19	36.00	34.00	37.50	41.50	24	2 3/8	2 1/4	0.56	1179	2541
36	47.75	5.75	5.94	9.56	38.12	36.00	39.75	43.50	28	2 3/8	2 1/4	0.56	1270	2880
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Sizes NPS 38 through 60 are identical to Series A flanges in Class 600														
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All dimensions are given in inches

Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).



Nominal Pipe Size NPS	O.D. of Flange O	Thickness ⁽¹⁾		Length Through Hub ⁽¹⁾ Y	Hub Dia. at Base X	Hub Dia. at Welding End A	Diameter of Raised Face R	Drilling			Diameter of Bolts	Radius of Fillet r	Approximate Weight each/lbs.	
		W/N t _f (min)	Blind t _f (min)					Diameter of Bolt Circle W	Number of Bolt Holes	Diameter of Bolt Holes			W/N	Blind
26	40.25	5.31	6.06	10.19	29.25	26.00	30.00	35.50	20	2 5/8	2 1/2	0.44	1184	2037
28	43.50	5.81	6.56	10.88	31.38	28.00	32.25	38.25	20	2 7/8	2 3/4	0.50	1485	2563
30	46.50	6.12	6.93	11.38	33.50	30.00	34.50	40.75	20	3 1/8	3	0.50	1757	3082
32	48.75	6.31	7.31	11.94	35.75	32.00	36.50	43.00	20	3 1/8	3	0.50	1984	3602
34	51.75	6.75	7.68	12.56	37.88	34.00	39.00	45.50	20	3 3/8	3 1/4	0.56	2346	4245
36	53.00	6.81	7.94	12.81	40.00	36.00	40.50	47.25	24	3 1/8	3	0.56	2385	4614
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Sizes NPS 38 through 48 are identical to Series A flanges in Class 900														
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All dimensions are given in inches

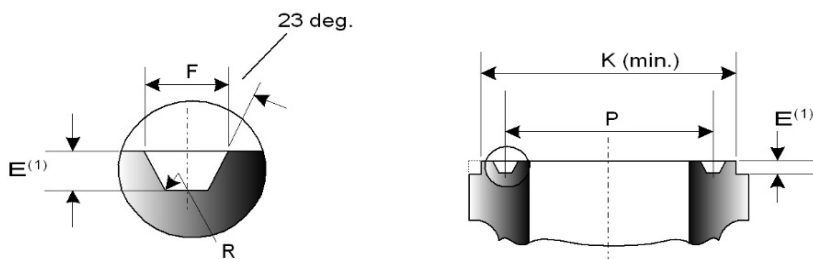
Notes:

(1) 1/4" RF NOT included in Flange Thickness (t_f) and Length Through Hub (Y).

Trans Am

Piping Products Ltd.

Dimensions of Ring Joint Facings to ASME B16.47 Series A



Groove Number	Nominal Pipe Size NPS		Diameter of Raised Portion K	Groove Dimensions			
	Classes 3/4/600	Class 900		Pitch Diameter P	Groove Depth E ⁽¹⁾	Groove Width F	Radius at Bottom R
				P	E ⁽¹⁾	F	R
R93	26	...	31.88	29.500	0.500	0.781	0.06
R94	28	...	33.88	31.500	0.500	0.781	0.06
R95	30	...	36.12	33.750	0.500	0.781	0.06
R96	32	...	38.75	36.000	0.562	0.906	0.06
R97	34	...	40.75	38.000	0.562	0.906	0.06
R98	36	...	43.00	40.250	0.562	0.906	0.06
R100	...	26	32.75	29.500	0.688	1.188	0.09
R101	...	28	35.00	31.500	0.688	1.312	0.09
R102	...	30	37.25	33.750	0.688	1.312	0.09
R103	...	32	39.50	36.000	0.688	1.312	0.09
R104	...	34	42.00	38.000	0.812	1.438	0.09
R105	...	36	44.25	40.250	0.812	1.438	0.09

All dimensions are given in inches.

Notes:

(1) Height of raised portion is equal to the Groove Depth, Dimension E, but is not subject to the tolerances for E.

Tolerances:

E (Groove Depth): + 0.016, -0

F (Groove Width): +/- 0.008

P (Pitch Diameter): +/- 0.005

R (Radius at Bottom): R 0.06: +0.03, -0.0; R 0.09: +/- 0.03

23 deg. angle: +/- 1/2 deg.

Trans Am

Piping Products Ltd.

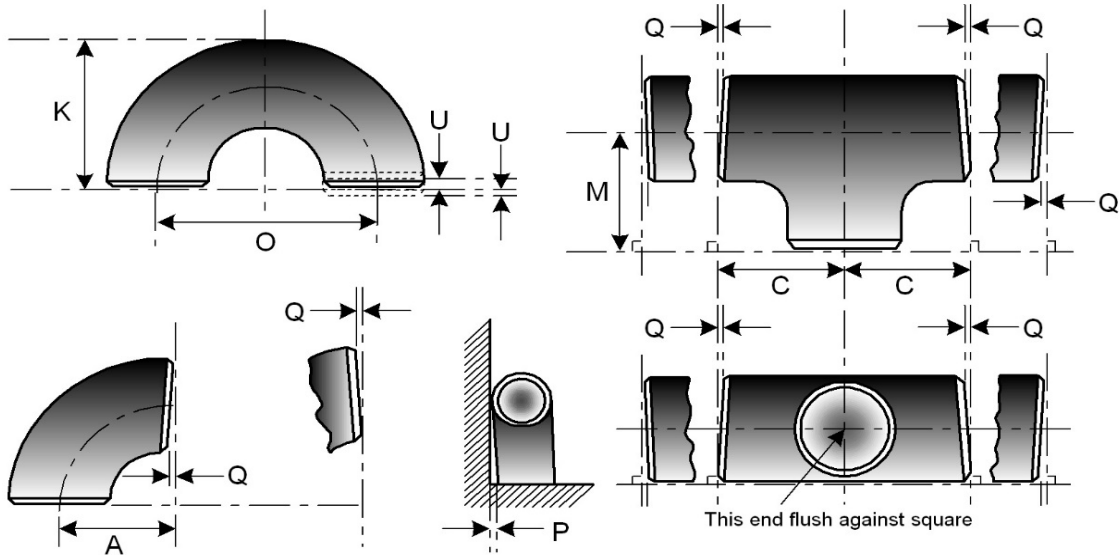
ASME B16.9 Buttwelding Fittings

ASME B16.9 covers overall dimensions and characteristics of factory-made wrought buttwelding fittings in sizes NPS 1/2 through NPS 48. The primary dimensional tables report values in metric units, while inch unit tables appear in Mandatory Appendix 1.

The 2001 edition added the dimensions and tolerances for short radius elbows and return bends from ASME B16.28-1994. The 2003 edition dropped the alternate dimensions for NPS 3/4 long radius elbows, however, they remained for NPS 3/4 return bends until the 2007 edition. The 2007 edition also added requirements for segmental elbows and dimensions for 3D elbows.

The tolerances for buttwelding fittings are shown in the tables on page 34.

Tolerances of BW Fittings to ASME B16.9



These drawings are for illustration purposes. Please also refer to the drawings with each dimensional chart.

Nominal Pipe Size NPS	All Fittings			LR and SR Elbows and Tees Centre-to-End A,B,C,M	3D Elbows Centre-to-End A,B	180 Deg Return Bends			Reducers Overall Length H	Caps Overall Length E
	O.D. at Bevel ^{(1), (2)}	I.D. at End ^{(1), (3), (4)}	Wall Thickness ⁽³⁾			Centre-to-Centre O	Back-to-Face K	Alignment of Ends U		
1/2 to 2 1/2	+0.06 -0.03	0.03	Not less than 87.5% of nominal thickness	0.06	0.09	0.25	0.25	0.03	0.06	0.12
3 to 3 1/2	0.06	0.06		0.06	0.09	0.25	0.25	0.03	0.06	0.12
4	0.06	0.06		0.06	0.09	0.25	0.25	0.03	0.06	0.12
5 to 8	+0.09 -0.06	0.06		0.06	0.09	0.25	0.25	0.03	0.06	0.25
10 to 18	+0.16 -0.12	0.12		0.09	0.12	0.38	0.25	0.06	0.09	0.25
20 to 24	+0.25 -0.19	0.19		0.09	0.12	0.38	0.25	0.06	0.09	0.25
26 to 30	+0.25 -0.19	0.19		0.12	0.25	...	...	...	0.19	0.38
32 to 48	+0.25 -0.19	0.19		0.19	0.38	...	...	...	0.19	0.38

All dimensions are given in inches. Tolerances are equal plus and minus except as noted.

Notes:

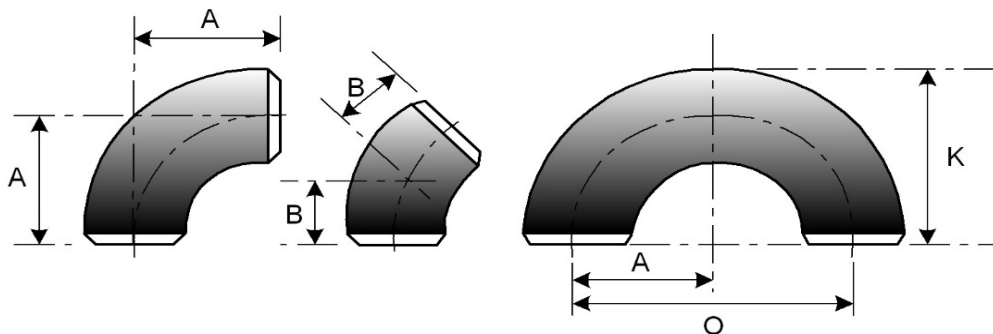
- (1) Out-of-round is the sum of absolute values of plus and minus tolerance.
- (2) This tolerance may not apply in localized areas of formed fittings where increased wall thickness is required to meet design requirements of ASME B16.9.
- (3) The inside diameter and the nominal wall thicknesses at ends are to be specified by the purchaser.
- (4) Unless otherwise specified by the purchaser, these tolerances apply to the nominal inside diameter, which equals the difference between the nominal outside diameter and twice the nominal wall thickness.

Nominal Pipe Size NPS	Angularity Tolerances	
	Off Angle Q	Off Plane P
1/2 to 4	0.03	0.06
5 to 8	0.06	0.12
10 to 12	0.09	0.19
14 to 16	0.09	0.25
18 to 24	0.12	0.38
26 to 30	0.19	0.38
32 to 42	0.19	0.50
44 to 48	0.19	0.75

Trans Am

Piping Products Ltd.

Dimensions of Elbows and Return Bends to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel	Centre-to-End					Centre-to-Centre		Back-to-Face	
		90 Deg Elbows			45 Deg Elbows		180 Deg Return Bends		180 Deg Return Bends	
		LR A	SR A	3D A	LR B	3D B	LR O ⁽¹⁾	SR O ⁽¹⁾	LR K	SR K
1/2	0.84	1.50	...	...	0.62	...	3.00	...	1.88	...
3/4	1.05	1.50	...	2.25	0.75	0.94	3.00	...	2.00	...
1	1.32	1.50	1.00	3.00	0.88	1.25	3.00	2.00	2.19	1.62
1 1/4	1.66	1.88	1.25	3.75	1.00	1.56	3.75	2.50	2.75	2.06
1 1/2	1.90	2.25	1.50	4.50	1.12	1.88	4.50	3.00	3.25	2.44
2	2.38	3.00	2.00	6.00	1.38	2.50	6.00	4.00	4.19	3.19
2 1/2	2.88	3.75	2.50	7.50	1.75	3.12	7.50	5.00	5.19	3.94
3	3.50	4.50	3.00	9.00	2.00	3.75	9.00	6.00	6.25	4.75
3 1/2	4.00	5.25	3.50	10.50	2.25	4.38	10.50	7.00	7.25	5.50
4	4.50	6.00	4.00	12.00	2.50	5.00	12.00	8.00	8.25	6.25
5	5.56	7.50	5.00	15.00	3.12	6.19	15.00	10.00	10.31	7.75
6	6.62	9.00	6.00	18.00	3.75	7.44	18.00	12.00	12.31	9.31
8	8.62	12.00	8.00	24.00	5.00	9.94	24.00	16.00	16.31	12.31
10	10.75	15.00	10.00	30.00	6.25	12.44	30.00	20.00	20.38	15.38
12	12.75	18.00	12.00	36.00	7.50	14.88	36.00	24.00	24.38	18.38
14	14.00	21.00	14.00	42.00	8.75	17.38	42.00	28.00	28.00	21.00
16	16.00	24.00	16.00	48.00	10.00	19.88	48.00	32.00	32.00	24.00
18	18.00	27.00	18.00	54.00	11.25	22.38	54.00	36.00	36.00	27.00
20	20.00	30.00	20.00	60.00	12.50	24.88	60.00	40.00	40.00	30.00
22	22.00	33.00	22.00	66.00	13.50	27.31	66.00	44.00	44.00	33.00
24	24.00	36.00	24.00	72.00	15.00	29.81	72.00	48.00	48.00	36.00
26	26.00	39.00	...	78.00	16.00	32.31	...	...	...	...
28	28.00	42.00	...	84.00	17.25	34.75	...	...	...	...
30	30.00	45.00	...	90.00	18.50	37.25	...	...	...	...
32	32.00	48.00	...	96.00	19.75	39.75	...	...	...	...
34	34.00	51.00	...	102.00	21.00	42.25	...	...	...	...
36	36.00	54.00	...	108.00	22.25	44.69	...	...	...	...
38	38.00	57.00	...	114.00	23.62	47.25	...	...	...	...
40	40.00	60.00	...	120.00	24.88	49.75	...	...	...	...
42	42.00	63.00	...	126.00	26.00	52.19	...	...	...	...
44	44.00	66.00	...	132.00	27.38	54.69	...	...	...	...
46	46.00	69.00	...	138.00	28.62	57.19	...	...	...	...
48	48.00	72.00	...	144.00	29.88	59.69	...	...	...	...

All dimensions are given in inches

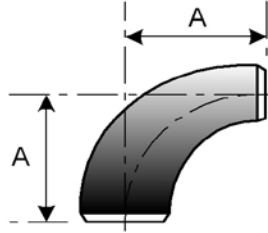
Notes:

(1) Dimension "A" is equal to one half dimension "O".

Trans Am

Piping Products Ltd.

Dimensions of Reducing Elbows to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre to End A
	Large End	Small End	
2 x 1 1/2	2.38	1.90	3.00
2 x 1 1/4	2.38	1.66	3.00
2 x 1	2.38	1.32	3.00
2 1/2 x 2	2.88	2.38	3.75
2 1/2 x 1 1/2	2.88	1.90	3.75
2 1/2 x 1 1/4	2.88	1.66	3.75
3 x 2 1/2	3.50	2.88	4.50
3 x 2	3.50	2.38	4.50
3 x 1 1/2	3.50	1.90	4.50
3 1/2 x 3	4.00	3.50	5.25
3 1/2 x 2 1/2	4.00	2.88	5.25
3 1/2 x 2	4.00	2.38	5.25
4 x 3 1/2	4.50	4.00	6.00
4 x 3	4.50	3.50	6.00
4 x 2 1/2	4.50	2.88	6.00
4 x 2	4.50	2.38	6.00
5 x 4	5.56	4.50	7.50
5 x 3 1/2	5.56	4.00	7.50
5 x 3	5.56	3.50	7.50
5 x 2 1/2	5.56	2.88	7.50
6 x 5	6.62	5.56	9.00
6 x 4	6.62	4.50	9.00
6 x 3 1/2	6.62	4.00	9.00
6 x 3	6.62	3.50	9.00
8 x 6	8.62	6.62	12.00
8 x 5	8.62	5.56	12.00
8 x 4	8.62	4.50	12.00

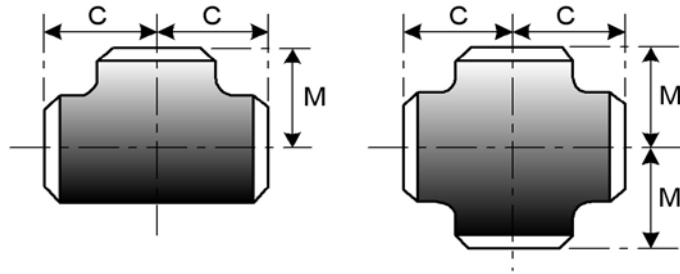
Nominal Pipe Size NPS	O.D. at Bevel		Centre to End A
	Large End	Small End	
10 x 8	10.75	8.62	15.00
10 x 6	10.75	6.62	15.00
10 x 5	10.75	5.56	15.00
12 x 10	12.75	10.75	18.00
12 x 8	12.75	8.62	18.00
12 x 6	12.75	6.62	18.00
14 x 12	14.00	12.75	21.00
14 x 10	14.00	10.75	21.00
14 x 8	14.00	8.62	21.00
16 x 14	16.00	14.00	24.00
16 x 12	16.00	12.75	24.00
16 x 10	16.00	10.75	24.00
18 x 16	18.00	16.00	27.00
18 x 14	18.00	14.00	27.00
18 x 12	18.00	12.75	27.00
18 x 10	18.00	10.75	27.00
20 x 18	20.00	18.00	30.00
20 x 16	20.00	16.00	30.00
20 x 14	20.00	14.00	30.00
20 x 12	20.00	12.75	30.00
20 x 10	20.00	10.75	30.00
24 x 22	24.00	22.00	36.00
24 x 20	24.00	20.00	36.00
24 x 18	24.00	18.00	36.00
24 x 16	24.00	16.00	36.00
24 x 14	24.00	14.00	36.00
24 x 12	24.00	12.75	36.00

All dimensions are given in inches

Trans Am

Piping Products Ltd.

Dimensions of Straight Tees and Crosses to ASME B16.9



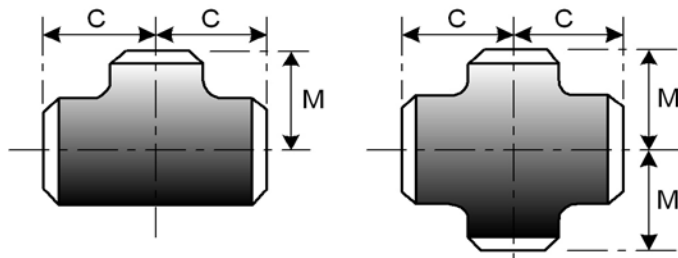
Nominal Pipe Size NPS	O.D. at Bevel	Centre-to-End	
		Run C	Outlet M ^{(1) (2)}
1/2	0.84	1.00	1.00
3/4	1.05	1.12	1.12
1	1.32	1.50	1.50
1 1/4	1.66	1.88	1.88
1 1/2	1.90	2.25	2.25
2	2.38	2.50	2.50
2 1/2	2.88	3.00	3.00
3	3.50	3.38	3.38
3 1/2	4.00	3.75	3.75
4	4.50	4.12	4.12
5	5.56	4.88	4.88
6	6.62	5.62	5.62
8	8.62	7.00	7.00
10	10.75	8.50	8.50
12	12.75	10.00	10.00
14	14.00	11.00	11.00
16	16.00	12.00	12.00
18	18.00	13.50	13.50
20	20.00	15.00	15.00
22	22.00	16.50	16.50
24	24.00	17.00	17.00
26	26.00	19.50	19.50
28	28.00	20.50	20.50
30	30.00	22.00	22.00
32	32.00	23.50	23.50
34	34.00	25.00	25.00
36	36.00	26.50	26.50
38	38.00	28.00	28.00
40	40.00	29.50	29.50
42	42.00	30.00	28.00
44	44.00	32.00	30.00
46	46.00	33.50	31.50
48	48.00	35.00	33.00

All dimensions are given in inches.

Notes:

- (1) Outlet dimension "M" for NPS 26 and larger is recommended but not required.
- (2) Dimensions are applicable to crosses NPS 24 and smaller.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
1/2 x 1/2 x 3/8	0.84	0.68	1.00	1.00
1/2 x 1/2 x 1/4	0.84	0.54	1.00	1.00
3/4 x 3/4 x 1/2	1.05	0.84	1.12	1.12
3/4 x 3/4 x 3/8	1.05	0.68	1.12	1.12
1 x 1 x 3/4	1.32	1.05	1.50	1.50
1 x 1 x 1/2	1.32	0.84	1.50	1.50
1 1/4 x 1 1/4 x 1	1.66	1.32	1.88	1.88
1 1/4 x 1 1/4 x 3/4	1.66	1.05	1.88	1.88
1 1/4 x 1 1/4 x 1/2	1.66	0.84	1.88	1.88
1 1/2 x 1 1/2 x 1 1/4	1.90	1.66	2.25	2.25
1 1/2 x 1 1/2 x 1	1.90	1.32	2.25	2.25
1 1/2 x 1 1/2 x 3/4	1.90	1.05	2.25	2.25
1 1/2 x 1 1/2 x 1/2	1.90	0.84	2.25	2.25
2 x 2 x 1 1/2	2.38	1.90	2.50	2.38
2 x 2 x 1 1/4	2.38	1.66	2.50	2.25
2 x 2 x 1	2.38	1.32	2.50	2.00
2 x 2 x 3/4	2.38	1.05	2.50	1.75
2 1/2 x 2 1/2 x 2	2.88	2.38	3.00	2.75
2 1/2 x 2 1/2 x 1 1/2	2.88	1.90	3.00	2.62
2 1/2 x 2 1/2 x 1 1/4	2.88	1.66	3.00	2.50
2 1/2 x 2 1/2 x 1	2.88	1.32	3.00	2.25
3 x 3 x 2 1/2	3.50	2.88	3.38	3.25
3 x 3 x 2	3.50	2.38	3.38	3.00
3 x 3 x 1 1/2	3.50	1.90	3.38	2.88
3 x 3 x 1 1/4	3.50	1.66	3.38	2.75
3 1/2 x 3 1/2 x 3	4.00	3.50	3.75	3.62
3 1/2 x 3 1/2 x 2 1/2	4.00	2.88	3.75	3.50
3 1/2 x 3 1/2 x 2	4.00	2.38	3.75	3.25
3 1/2 x 3 1/2 x 1 1/2	4.00	1.90	3.75	3.12
4 x 4 x 3 1/2	4.50	4.00	4.12	4.00
4 x 4 x 3	4.50	3.50	4.12	3.88
4 x 4 x 2 1/2	4.50	2.88	4.12	3.75
4 x 4 x 2	4.50	2.38	4.12	3.50
4 x 4 x 1 1/2	4.50	1.90	4.12	3.38

All dimensions are given in inches.

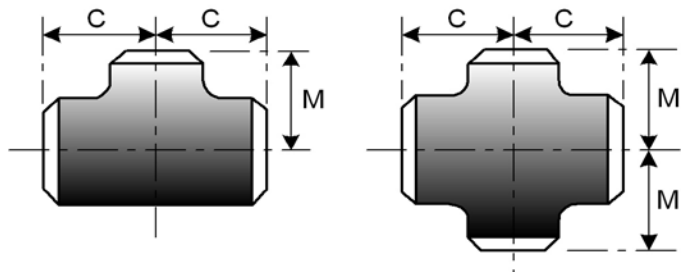
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
5 x 5 x 4	5.56	4.50	4.88	4.62
5 x 5 x 3 1/2	5.56	4.00	4.88	4.50
5 x 5 x 3	5.56	3.50	4.88	4.38
5 x 5 x 2 1/2	5.56	2.88	4.88	4.25
5 x 5 x 2	5.56	2.38	4.88	4.12
6 x 6 x 5	6.62	5.56	5.62	5.38
6 x 6 x 4	6.62	4.50	5.62	5.12
6 x 6 x 3 1/2	6.62	4.00	5.62	5.00
6 x 6 x 3	6.62	3.50	5.62	4.88
6 x 6 x 2 1/2	6.62	2.88	5.62	4.75
8 x 8 x 6	8.62	6.62	7.00	6.62
8 x 8 x 5	8.62	5.56	7.00	6.38
8 x 8 x 4	8.62	4.50	7.00	6.12
8 x 8 x 3 1/2	8.62	4.00	7.00	6.00
10 x 10 x 8	10.75	8.62	8.50	8.00
10 x 10 x 6	10.75	6.62	8.50	7.62
10 x 10 x 5	10.75	5.56	8.50	7.50
10 x 10 x 4	10.75	4.50	8.50	7.25
12 x 12 x 10	12.75	10.75	10.00	9.50
12 x 12 x 8	12.75	8.62	10.00	9.00
12 x 12 x 6	12.75	6.62	10.00	8.62
12 x 12 x 5	12.75	5.56	10.00	8.50
14 x 14 x 12	14.00	12.75	11.00	10.62
14 x 14 x 10	14.00	10.75	11.00	10.12
14 x 14 x 8	14.00	8.62	11.00	9.75
14 x 14 x 6	14.00	6.62	11.00	9.38
16 x 16 x 14	16.00	14.00	12.00	12.00
16 x 16 x 12	16.00	12.75	12.00	11.62
16 x 16 x 10	16.00	10.75	12.00	11.12
16 x 16 x 8	16.00	8.62	12.00	10.75
16 x 16 x 6	16.00	6.62	12.00	10.38
18 x 18 x 16	18.00	16.00	13.50	13.00
18 x 18 x 14	18.00	14.00	13.50	13.00
18 x 18 x 12	18.00	12.75	13.50	12.62
18 x 18 x 10	18.00	10.75	13.50	12.12
18 x 18 x 8	18.00	8.62	13.50	11.75

All dimensions are given in inches.

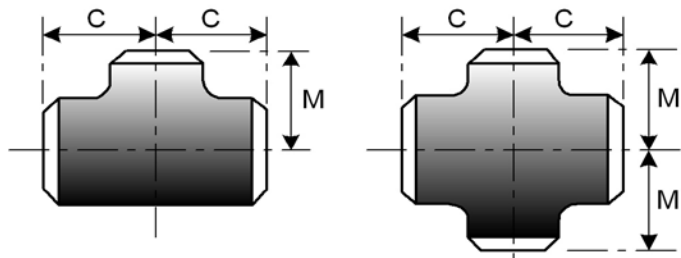
Note:

- (1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
20 x 20 x 18	20.00	18.00	15.00	14.50
20 x 20 x 16	20.00	16.00	15.00	14.00
20 x 20 x 14	20.00	14.00	15.00	14.00
20 x 20 x 12	20.00	12.75	15.00	13.62
20 x 20 x 10	20.00	10.75	15.00	13.12
20 x 20 x 8	20.00	8.62	15.00	12.75
22 x 22 x 20	22.00	20.00	16.50	16.00
22 x 22 x 18	22.00	18.00	16.50	15.50
22 x 22 x 16	22.00	16.00	16.50	15.00
22 x 22 x 14	22.00	14.00	16.50	15.00
22 x 22 x 12	22.00	12.75	16.50	14.62
22 x 22 x 10	22.00	10.75	16.50	14.12
24 x 24 x 22	24.00	22.00	17.00	17.00
24 x 24 x 20	24.00	20.00	17.00	17.00
24 x 24 x 18	24.00	18.00	17.00	16.50
24 x 24 x 16	24.00	16.00	17.00	16.00
24 x 24 x 14	24.00	14.00	17.00	16.00
24 x 24 x 12	24.00	12.75	17.00	15.62
24 x 24 x 10	24.00	10.75	17.00	15.12
26 x 26 x 24	26.00	24.00	19.50	19.00
26 x 26 x 22	26.00	22.00	19.50	18.50
26 x 26 x 20	26.00	20.00	19.50	18.00
26 x 26 x 18	26.00	18.00	19.50	17.50
26 x 26 x 16	26.00	16.00	19.50	17.00
26 x 26 x 14	26.00	14.00	19.50	17.00
26 x 26 x 12	26.00	12.75	19.50	16.62
28 x 28 x 26	28.00	26.00	20.50	20.50
28 x 28 x 24	28.00	24.00	20.50	20.00
28 x 28 x 22	28.00	22.00	20.50	19.50
28 x 28 x 20	28.00	20.00	20.50	19.00
28 x 28 x 18	28.00	18.00	20.50	18.50
28 x 28 x 16	28.00	16.00	20.50	18.00
28 x 28 x 14	28.00	14.00	20.50	18.00
28 x 28 x 12	28.00	12.75	20.50	17.62

All dimensions are given in inches.

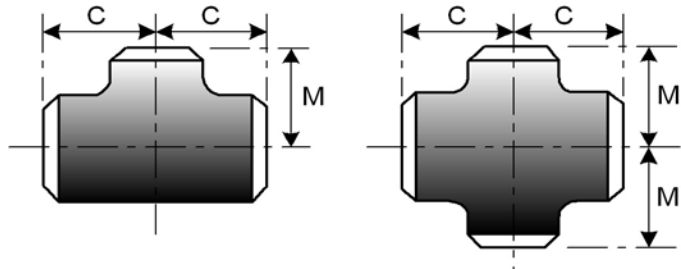
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
	30 x 30 x 28	30.00	28.00	22.00	21.50
30 x 30 x 26	30.00	26.00	22.00	21.50
30 x 30 x 24	30.00	24.00	22.00	21.00
30 x 30 x 22	30.00	22.00	22.00	20.50
30 x 30 x 20	30.00	20.00	22.00	20.00
30 x 30 x 18	30.00	18.00	22.00	19.50
30 x 30 x 16	30.00	16.00	22.00	19.00
30 x 30 x 14	30.00	14.00	22.00	19.00
30 x 30 x 12	30.00	12.75	22.00	18.62
30 x 30 x 10	30.00	10.75	22.00	18.12
32 x 32 x 30	32.00	30.00	23.50	23.00
32 x 32 x 28	32.00	28.00	23.50	22.50
32 x 32 x 26	32.00	26.00	23.50	22.50
32 x 32 x 24	32.00	24.00	23.50	22.00
32 x 32 x 22	32.00	22.00	23.50	21.50
32 x 32 x 20	32.00	20.00	23.50	21.00
32 x 32 x 18	32.00	18.00	23.50	20.50
32 x 32 x 16	32.00	16.00	23.50	20.00
32 x 32 x 14	32.00	14.00	23.50	20.00
34 x 34 x 32	34.00	32.00	25.00	24.50
34 x 34 x 30	34.00	30.00	25.00	24.00
34 x 34 x 28	34.00	28.00	25.00	23.50
34 x 34 x 26	34.00	26.00	25.00	23.50
34 x 34 x 24	34.00	24.00	25.00	23.00
34 x 34 x 22	34.00	22.00	25.00	22.50
34 x 34 x 20	34.00	20.00	25.00	22.00
34 x 34 x 18	34.00	18.00	25.00	21.50
34 x 34 x 16	34.00	16.00	25.00	21.00

All dimensions are given in inches.

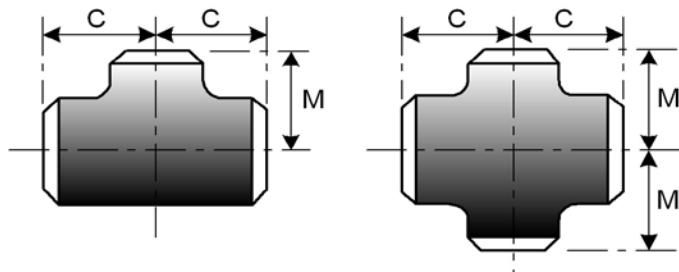
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
36 x 36 x 34	36.00	34.00	26.50	26.00
36 x 36 x 32	36.00	32.00	26.50	25.50
36 x 36 x 30	36.00	30.00	26.50	25.00
36 x 36 x 28	36.00	28.00	26.50	24.50
36 x 36 x 26	36.00	26.00	26.50	24.50
36 x 36 x 24	36.00	24.00	26.50	24.00
36 x 36 x 22	36.00	22.00	26.50	23.50
36 x 36 x 20	36.00	20.00	26.50	23.00
36 x 36 x 18	36.00	18.00	26.50	22.50
36 x 36 x 16	36.00	16.00	26.50	22.00
38 x 38 x 36	38.00	36.00	28.00	28.00
38 x 38 x 34	38.00	34.00	28.00	27.50
38 x 38 x 32	38.00	32.00	28.00	27.00
38 x 38 x 30	38.00	30.00	28.00	26.50
38 x 38 x 28	38.00	28.00	28.00	25.50
38 x 38 x 26	38.00	26.00	28.00	25.50
38 x 38 x 24	38.00	24.00	28.00	25.00
38 x 38 x 22	38.00	22.00	28.00	24.50
38 x 38 x 20	38.00	20.00	28.00	24.00
38 x 38 x 18	38.00	18.00	28.00	23.50
40 x 40 x 38	40.00	38.00	29.50	29.50
40 x 40 x 36	40.00	36.00	29.50	29.00
40 x 40 x 34	40.00	34.00	29.50	28.50
40 x 40 x 32	40.00	32.00	29.50	28.00
40 x 40 x 30	40.00	30.00	29.50	27.50
40 x 40 x 28	40.00	28.00	29.50	26.50
40 x 40 x 26	40.00	26.00	29.50	26.50
40 x 40 x 24	40.00	24.00	29.50	26.00
40 x 40 x 22	40.00	22.00	29.50	25.50
40 x 40 x 20	40.00	20.00	29.50	25.00
40 x 40 x 18	40.00	18.00	29.50	24.50

All dimensions are given in inches.

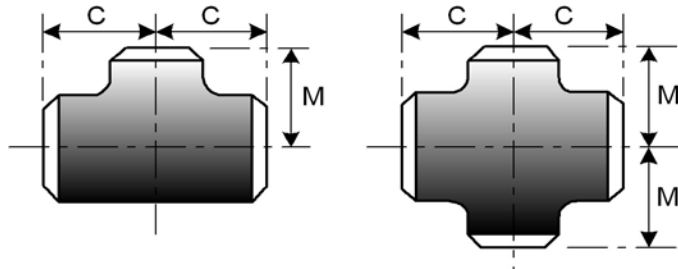
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
42 x 42 x 40	42.00	40.00	30.00	28.00
42 x 42 x 38	42.00	38.00	30.00	28.00
42 x 42 x 36	42.00	36.00	30.00	28.00
42 x 42 x 34	42.00	34.00	30.00	28.00
42 x 42 x 32	42.00	32.00	30.00	28.00
42 x 42 x 30	42.00	30.00	30.00	28.00
42 x 42 x 28	42.00	28.00	30.00	27.50
42 x 42 x 26	42.00	26.00	30.00	27.50
42 x 42 x 24	42.00	24.00	30.00	26.00
42 x 42 x 22	42.00	22.00	30.00	26.00
42 x 42 x 20	42.00	20.00	30.00	26.00
42 x 42 x 18	42.00	18.00	30.00	25.50
42 x 42 x 16	42.00	16.00	30.00	25.00
44 x 44 x 42	44.00	42.00	32.00	30.00
44 x 44 x 40	44.00	40.00	32.00	29.50
44 x 44 x 38	44.00	38.00	32.00	29.00
44 x 44 x 36	44.00	36.00	32.00	28.50
44 x 44 x 34	44.00	34.00	32.00	28.50
44 x 44 x 32	44.00	32.00	32.00	28.00
44 x 44 x 30	44.00	30.00	32.00	28.00
44 x 44 x 28	44.00	28.00	32.00	27.50
44 x 44 x 26	44.00	26.00	32.00	27.50
44 x 44 x 24	44.00	24.00	32.00	27.50
44 x 44 x 22	44.00	22.00	32.00	27.00
44 x 44 x 20	44.00	20.00	32.00	27.00

All dimensions are given in inches.

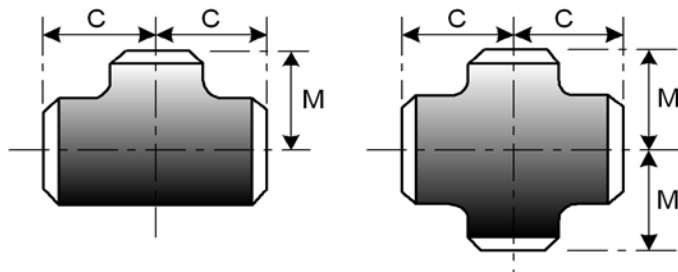
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Reducing Tees and Crosses to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		Centre-to-End	
	Run	Outlet	Run C	Outlet M ⁽¹⁾
46 x 46 x 44	46.00	44.00	33.50	31.50
46 x 46 x 42	46.00	42.00	33.50	31.00
46 x 46 x 40	46.00	40.00	33.50	30.50
46 x 46 x 38	46.00	38.00	33.50	30.00
46 x 46 x 36	46.00	36.00	33.50	30.00
46 x 46 x 34	46.00	34.00	33.50	29.50
46 x 46 x 32	46.00	32.00	33.50	29.50
46 x 46 x 30	46.00	30.00	33.50	29.00
46 x 46 x 28	46.00	28.00	33.50	29.00
46 x 46 x 26	46.00	26.00	33.50	29.00
46 x 46 x 24	46.00	24.00	33.50	28.50
46 x 46 x 22	46.00	22.00	33.50	28.50
48 x 48 x 46	48.00	46.00	35.00	33.00
48 x 48 x 44	48.00	44.00	35.00	33.00
48 x 48 x 42	48.00	42.00	35.00	32.00
48 x 48 x 40	48.00	40.00	35.00	32.00
48 x 48 x 38	48.00	38.00	35.00	32.00
48 x 48 x 36	48.00	36.00	35.00	31.00
48 x 48 x 34	48.00	34.00	35.00	31.00
48 x 48 x 32	48.00	32.00	35.00	31.00
48 x 48 x 30	48.00	30.00	35.00	30.00
48 x 48 x 28	48.00	28.00	35.00	30.00
48 x 48 x 26	48.00	26.00	35.00	30.00
48 x 48 x 24	48.00	24.00	35.00	29.00
48 x 48 x 22	48.00	22.00	35.00	29.00

All dimensions are given in inches.

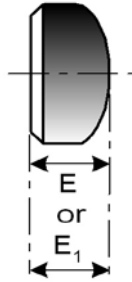
Note:

(1) Outlet dimension M for run sizes NPS 14 and larger is recommended but not required.

Trans Am

Piping Products Ltd.

Dimensions of Caps to ASME B16.9



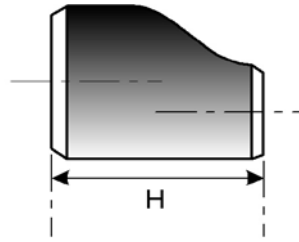
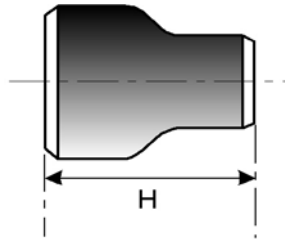
Nominal Pipe Size NPS	O.D. at Bevel	Length E ⁽¹⁾	Limiting WT for Length E	Length E ₁ ⁽²⁾
1/2	0.84	1.00	0.18	1.00
3/4	1.05	1.00	0.15	1.00
1	1.32	1.50	0.18	1.50
1 1/4	1.66	1.50	0.19	1.50
1 1/2	1.90	1.50	0.20	1.50
2	2.38	1.50	0.22	1.75
2 1/2	2.88	1.50	0.28	2.00
3	3.50	2.00	0.30	2.50
3 1/2	4.00	2.50	0.32	3.00
4	4.50	2.50	0.34	3.00
5	5.56	3.00	0.38	3.50
6	6.62	3.50	0.43	4.00
8	8.62	4.00	0.50	5.00
10	10.75	5.00	0.50	6.00
12	12.75	6.00	0.50	7.00
14	14.00	6.50	0.50	7.50
16	16.00	7.00	0.50	8.00
18	18.00	8.00	0.50	9.00
20	20.00	9.00	0.50	10.00
22	22.00	10.00	0.50	10.00
24	24.00	10.50	0.50	12.00
26	26.00	10.50	...	...
28	28.00	10.50	...	...
30	30.00	10.50	...	...
32	32.00	10.50	...	...
34	34.00	10.50	...	...
36	36.00	10.50	...	...
38	38.00	12.00	...	...
40	40.00	12.00	...	...
42	42.00	12.00	...	...
44	44.00	13.50	...	...
46	46.00	13.50	...	...
48	48.00	13.50	...	...

All dimensions are given in inches.

Notes:

- (1) Length "E" applies for thickness not exceeding that given in column "Limiting WT for Length E".
- (2) Length "E₁" applies for thickness greater than that given in column "Limiting WT" for NPS 24 and smaller. For NPS 26 and larger, length "E₁" shall be by agreement between the manufacturer and purchaser.

Dimensions of Reducers to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		End to End H
	Large End	Small End	
3/4 x 1/2	1.05	0.84	1.50
3/4 x 3/8	1.05	0.68	1.50
1 x 3/4	1.32	1.05	2.00
1 x 1/2	1.32	0.84	2.00
1 1/4 x 1	1.66	1.32	2.00
1 1/4 x 3/4	1.66	1.05	2.00
1 1/4 x 1/2	1.66	0.84	2.00
1 1/2 x 1 1/4	1.90	1.66	2.50
1 1/2 x 1	1.90	1.32	2.50
1 1/2 x 3/4	1.90	1.05	2.50
1 1/2 x 1/2	1.90	0.84	2.50
2 x 1 1/2	2.38	1.90	3.00
2 x 1 1/4	2.38	1.66	3.00
2 x 1	2.38	1.32	3.00
2 x 3/4	2.38	1.05	3.00
2 1/2 x 2	2.88	2.38	3.50
2 1/2 x 1 1/2	2.88	1.90	3.50
2 1/2 x 1 1/4	2.88	1.66	3.50
2 1/2 x 1	2.88	1.32	3.50
3 x 2 1/2	3.50	2.88	3.50
3 x 2	3.50	2.38	3.50
3 x 1 1/2	3.50	1.90	3.50
3 x 1 1/4	3.50	1.66	3.50
3 1/2 x 3	4.00	3.50	4.00
3 1/2 x 2 1/2	4.00	2.88	4.00
3 1/2 x 2	4.00	2.38	4.00
3 1/2 x 1 1/2	4.00	1.90	4.00
3 1/2 x 1 1/4	4.00	1.66	4.00
4 x 3 1/2	4.50	4.00	4.00
4 x 3	4.50	3.50	4.00
4 x 2 1/2	4.50	2.88	4.00
4 x 2	4.50	2.38	4.00
4 x 1 1/2	4.50	1.90	4.00

All dimensions are given in inches.

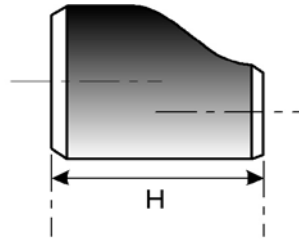
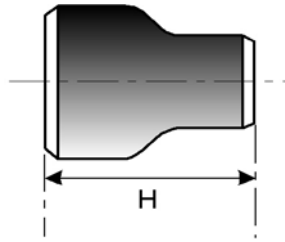
Nominal Pipe Size NPS	O.D. at Bevel		End to End H
	Large End	Small End	
5 x 4	5.56	4.50	5.00
5 x 3 1/2	5.56	4.00	5.00
5 x 3	5.56	3.50	5.00
5 x 2 1/2	5.56	2.88	5.00
5 x 2	5.56	2.38	5.00
6 x 5	6.62	5.56	5.50
6 x 4	6.62	4.50	5.50
6 x 3 1/2	6.62	4.00	5.50
6 x 3	6.62	3.50	5.50
6 x 2 1/2	6.62	2.88	5.50
8 x 6	8.62	6.62	6.00
8 x 5	8.62	5.56	6.00
8 x 4	8.62	4.50	6.00
8 x 3 1/2	8.62	4.00	6.00
10 x 8	10.75	8.62	7.00
10 x 6	10.75	6.62	7.00
10 x 5	10.75	5.56	7.00
10 x 4	10.75	4.50	7.00
12 x 10	12.75	10.75	8.00
12 x 8	12.75	8.62	8.00
12 x 6	12.75	6.62	8.00
12 x 5	12.75	5.56	8.00
14 x 12	14.00	12.75	13.00
14 x 10	14.00	10.75	13.00
14 x 8	14.00	8.62	13.00
14 x 6	14.00	6.62	13.00
16 x 14	16.00	14.00	14.00
16 x 12	16.00	12.75	14.00
16 x 10	16.00	10.75	14.00
16 x 8	16.00	8.62	14.00
18 x 16	18.00	16.00	15.00
18 x 14	18.00	14.00	15.00
18 x 12	18.00	12.75	15.00
18 x 10	18.00	10.75	15.00

While the illustration shows "bell shaped" reducers, the use of conical reducers is not prohibited.

Trans Am

Piping Products Ltd.

Dimensions of Reducers to ASME B16.9



Nominal Pipe Size NPS	O.D. at Bevel		End to End H
	Large End	Small End	
20 x 18	20.00	18.00	20.00
20 x 16	20.00	16.00	20.00
20 x 14	20.00	14.00	20.00
20 x 12	20.00	12.75	20.00
22 x 20	22.00	20.00	20.00
22 x 18	22.00	18.00	20.00
22 x 16	22.00	16.00	20.00
22 x 14	22.00	14.00	20.00
24 x 22	24.00	22.00	20.00
24 x 20	24.00	20.00	20.00
24 x 18	24.00	18.00	20.00
24 x 16	24.00	16.00	20.00
26 x 24	26.00	24.00	24.00
26 x 22	26.00	22.00	24.00
26 x 20	26.00	20.00	24.00
26 x 18	26.00	18.00	24.00
28 x 26	28.00	26.00	24.00
28 x 24	28.00	24.00	24.00
28 x 20	28.00	20.00	24.00
28 x 18	28.00	18.00	24.00
30 x 28	30.00	28.00	24.00
30 x 26	30.00	26.00	24.00
30 x 24	30.00	24.00	24.00
30 x 20	30.00	20.00	24.00
32 x 30	32.00	30.00	24.00
32 x 28	32.00	28.00	24.00
32 x 26	32.00	26.00	24.00
32 x 24	32.00	24.00	24.00
34 x 32	34.00	32.00	24.00
34 x 30	34.00	30.00	24.00
34 x 26	34.00	26.00	24.00
34 x 24	34.00	24.00	24.00

While the illustration shows "bell shaped" reducers, the use of conical reducers is not prohibited.

Nominal Pipe Size NPS	O.D. at Bevel		End to End H
	Large End	Small End	
36 x 34	36.00	34.00	24.00
36 x 32	36.00	32.00	24.00
36 x 30	36.00	30.00	24.00
36 x 26	36.00	26.00	24.00
36 x 24	36.00	24.00	24.00
38 x 36	38.00	36.00	24.00
38 x 34	38.00	34.00	24.00
38 x 32	38.00	32.00	24.00
38 x 30	38.00	30.00	24.00
38 x 28	38.00	28.00	24.00
38 x 26	38.00	26.00	24.00
40 x 38	40.00	38.00	24.00
40 x 36	40.00	36.00	24.00
40 x 34	40.00	34.00	24.00
40 x 32	40.00	32.00	24.00
40 x 30	40.00	30.00	24.00
42 x 40	42.00	40.00	24.00
42 x 38	42.00	38.00	24.00
42 x 36	42.00	36.00	24.00
42 x 34	42.00	34.00	24.00
42 x 32	42.00	32.00	24.00
42 x 30	42.00	30.00	24.00
44 x 42	44.00	42.00	24.00
44 x 40	44.00	40.00	24.00
44 x 38	44.00	38.00	24.00
44 x 36	44.00	36.00	24.00
46 x 44	46.00	44.00	28.00
46 x 42	46.00	42.00	28.00
46 x 40	46.00	40.00	28.00
46 x 38	46.00	38.00	28.00
48 x 46	48.00	46.00	28.00
48 x 44	48.00	44.00	28.00
48 x 42	48.00	42.00	28.00
48 x 40	48.00	40.00	28.00

All dimensions are given in inches.

Trans Am

Piping Products Ltd.

ASME B16.11 Forged Fittings

ASME B16.11 covers the requirements for forged socket-welding fittings, NPS 1/8 through 4 in Class 3000, NPS 1/8 through 2 in Classes 6000 and 9000; and forged threaded fittings NPS 1/8 through 4 in Classes 2000, 3000 and 6000. Included are 90° and 45° elbows, tees, crosses, full and half couplings, caps, plugs and bushings. Street elbows are covered in Classes 3000 and 6000 only, NPS 1/8 through 2. ASME B16.11 does not include unions, which are covered by MSS SP-83 (see pages 54-56).

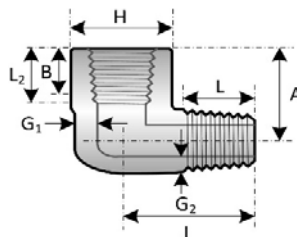
Tolerances

In addition to the tolerances shown in the tables, the following applies:

Concentricity of Bores: the socket and fitting bores shall be concentric within a tolerance of 0.03" for all sizes. Opposite socket bores shall be concentric within a tolerance of 0.06" for all sizes.

Coincidence of Axes: the maximum allowable variation in the alignment of the fitting bore and socket bore axes shall be 0.06" in 1 ft. The maximum allowable variation in alignment of threads shall be 0.06" in 1 ft.

Dimensions of Forged Threaded Fittings- ASME B16.11



Street Elbow

Nominal Pipe Size NPS	Centre-to-End				Outside Diameter of Band H ⁽²⁾		Minimum Wall Thickness G ₁		Minimum Wall Thickness G ₂ ⁽³⁾		Minimum Length Internal Thread ⁽⁴⁾		Minimum Thread Length L
	Female End A ⁽¹⁾		Male End J		3000	6000	3000	6000	3000	6000	B	L ₂	
	3000	6000	3000	6000									
1/8	0.75	0.88	1.00	1.25	0.75	1.00	0.125	0.200	0.108	0.166	0.25	0.2639	0.38
1/4	0.88	1.00	1.25	1.50	1.00	1.25	0.130	0.223	0.127	0.208	0.32	0.4018	0.44
3/8	1.00	1.12	1.50	1.62	1.25	1.50	0.138	0.275	0.138	0.220	0.36	0.4078	0.50
1/2	1.12	1.38	1.62	1.88	1.50	1.75	0.161	0.321	0.164	0.257	0.43	0.5337	0.56
3/4	1.38	1.75	1.88	2.25	1.75	2.00	0.170	0.336	0.192	0.270	0.50	0.5457	0.62
1	1.75	2.00	2.25	2.62	2.00	2.44	0.196	0.391	0.219	0.313	0.58	0.6828	0.75
1 1/4	2.00	2.12	2.62	2.81	2.44	2.75	0.208	0.417	0.219	0.334	0.67	0.7068	0.81
1 1/2	2.12	2.50	2.81	3.31	2.75	3.31	0.219	0.436	0.246	0.350	0.70	0.7235	0.81
2	2.50	3.25	3.31	4.13	3.31	4.00	0.281	0.476	0.301	0.382	0.75	0.7565	0.88

All dimensions are given in inches.

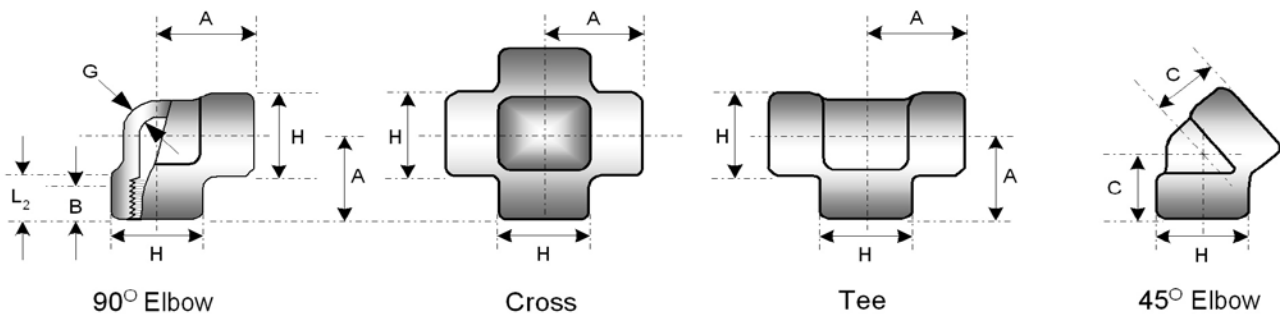
Notes:

- (1) Dimension A of the table on Page 49 for the appropriate fitting size may also be used at the option of the manufacturer.
- (2) Dimension H of the table on Page 49 for the appropriate fitting size may also be used at the option of the manufacturer.
- (3) Wall thickness before threading.
- (4) Dimension B is the minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1)

Trans Am

Piping Products Ltd.

Dimensions of Forged Threaded Fittings- ASME B16.11



Nominal Pipe Size NPS	Centre-to-End						Outside Diameter of Band- H			Minimum Wall Thickness- G			Minimum Thread Length ⁽¹⁾	
	90 Deg Elbows, Tees, and Crosses- A			45 Deg Elbows- C										
	2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L ₂
1/8	0.81	0.81	0.97	0.69	0.69	0.75	0.88	0.88	1.00	0.125	0.125	0.250	0.25	0.2639
1/4	0.81	0.97	1.12	0.69	0.75	0.88	0.88	1.00	1.31	0.125	0.130	0.260	0.32	0.4018
3/8	0.97	1.12	1.31	0.75	0.88	1.00	1.00	1.31	1.50	0.125	0.138	0.275	0.36	0.4078
1/2	1.12	1.31	1.50	0.88	1.00	1.12	1.31	1.50	1.81	0.125	0.161	0.321	0.43	0.5337
3/4	1.31	1.50	1.75	1.00	1.12	1.31	1.50	1.81	2.19	0.125	0.170	0.336	0.50	0.5457
1	1.50	1.75	2.00	1.12	1.31	1.38	1.81	2.19	2.44	0.145	0.196	0.391	0.58	0.6828
1 1/4	1.75	2.00	2.38	1.31	1.38	1.69	2.19	2.44	2.97	0.153	0.208	0.417	0.67	0.7068
1 1/2	2.00	2.38	2.50	1.38	1.69	1.72	2.44	2.97	3.31	0.158	0.219	0.436	0.70	0.7235
2	2.38	2.50	3.25	1.69	1.72	2.06	2.97	3.31	4.00	0.168	0.281	0.476	0.75	0.7565
2 1/2	3.00	3.25	3.75	2.06	2.06	2.50	3.62	4.00	4.75	0.221	0.301	0.602	0.93	1.138
3	3.38	3.75	4.19	2.50	2.50	3.12	4.31	4.75	5.75	0.236	0.348	0.655	1.02	1.200
4	4.19	4.50	4.50	3.12	3.12	3.12	5.75	6.00	6.00	0.258	0.440	0.735	1.09	1.300

All dimensions are given in inches.

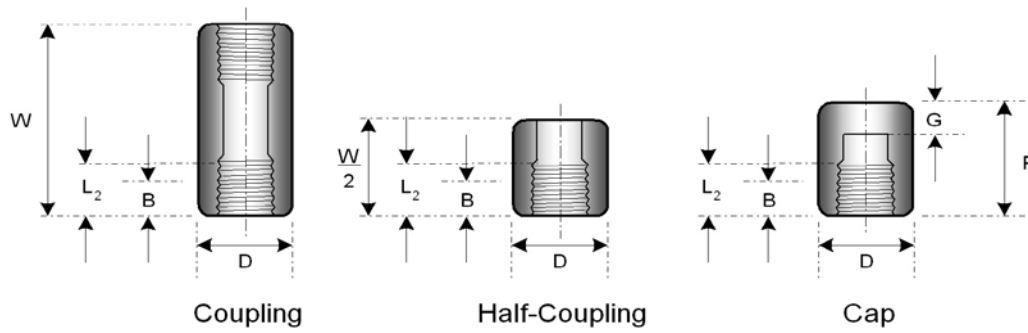
Notes:

(1) Dimension B is the minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe threads (ANSI/ASME B1.20.1).

Trans Am

Piping Products Ltd.

Dimensions of Forged Threaded Fittings- ASME B16.11



Nominal Pipe Size NPS	End-to-End			Outside Diameter D		End Wall Thickness (min) G		Minimum Thread Length ⁽¹⁾	
	Couplings W	Caps P							
	3000 and 6000	3000	6000	3000	6000	3000	6000	B	L ₂
1/8	1.25	0.75	...	0.62	0.88	0.19	...	0.25	0.2639
1/4	1.38	1.00	1.06	0.75	1.00	0.19	0.25	0.32	0.4018
3/8	1.50	1.00	1.06	0.88	1.25	0.19	0.25	0.36	0.4078
1/2	1.88	1.25	1.31	1.12	1.50	0.25	0.31	0.43	0.5337
3/4	2.00	1.44	1.50	1.38	1.75	0.25	0.31	0.50	0.5457
1	2.38	1.62	1.69	1.75	2.25	0.38	0.44	0.58	0.6828
1 1/4	2.62	1.75	1.81	2.25	2.50	0.38	0.44	0.67	0.7068
1 1/2	3.12	1.75	1.88	2.50	3.00	0.44	0.50	0.70	0.7235
2	3.38	1.88	2.00	3.00	3.62	0.50	0.62	0.75	0.7565
2 1/2	3.62	2.38	2.50	3.62	4.25	0.62	0.75	0.93	1.138
3	4.25	2.56	2.69	4.25	5.00	0.75	0.88	1.02	1.200
4	4.75	2.69	2.94	5.50	6.25	0.88	1.12	1.09	1.300

All dimensions are given in inches.

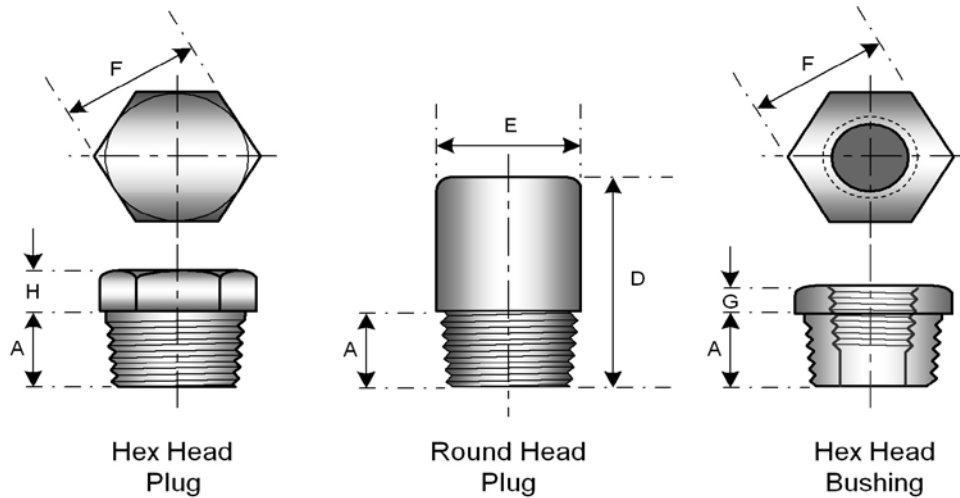
Notes:

- (1) Dimension B is the minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ANSI/ASME B1.20.1).

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Dimensions of Plugs and Bushings- ASME B16.11



Nominal Pipe Size NPS	Length (Minimum) A	Hex Plugs and Bushings ⁽¹⁾			Round Head Plugs	
		Width of Flats (Nominal) F	Hex Head Height (Min.)		Head Diameter (Nominal) E	Overall Length (Min.) D
			Bushing G	Plug H		
1/8	0.38	0.44	...	0.25	0.41	1.38
1/4	0.44	0.62	0.12	0.25	0.53	1.62
3/8	0.50	0.69	0.16	0.31	0.69	1.62
1/2	0.56	0.88	0.19	0.31	0.84	1.75
3/4	0.62	1.06	0.22	0.38	1.06	1.75
1	0.75	1.38	0.25	0.38	1.31	2.00
1 1/4	0.81	1.75	0.28	0.56	1.69	2.00
1 1/2	0.81	2.00	0.31	0.62	1.91	2.00
2	0.88	2.50	0.34	0.69	2.38	2.50
2 1/2	1.06	3.00	0.38	0.75	2.88	2.75
3	1.12	3.50	0.41	0.81	3.50	2.75
4	1.25	4.62	0.50	1.00	4.50	3.00

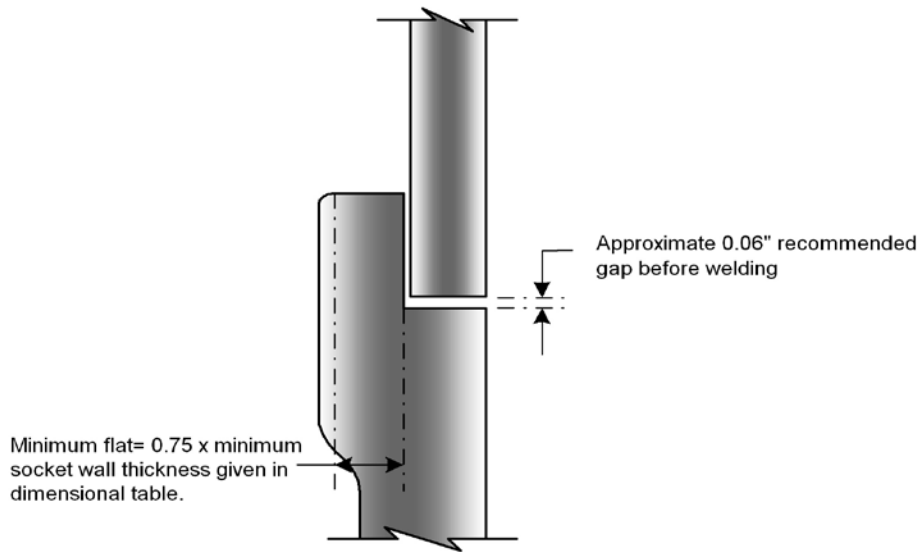
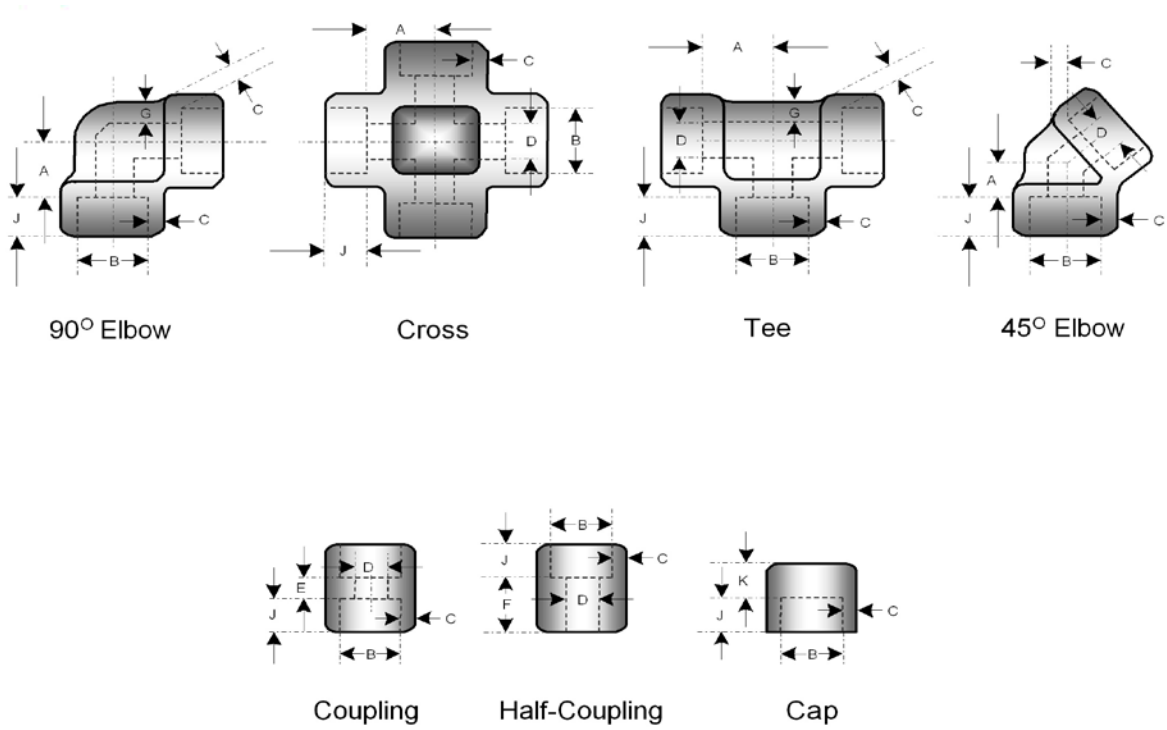
All dimensions are given in inches.

Notes:

(1) ASME B16.11 provides the following cautionary note:

Hex Bushings of one-size reduction should not be used in services wherein they might be subject to harmful loads and forces other than internal pressures.

Dimensions of Forged Socket-Welding Fittings to ASME B16.11



Welding Gap and Minimum Flat Dimensions for Socket-Welding Fittings

Trans Am

Piping Products Ltd.
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Dimensions of Forged Socket-Welding Fittings to ASME B16.11

Nominal Pipe Size NPS	Diameter of Socket B ⁽¹⁾	Depth of Socket (min) J	Socket Wall Thickness- C ⁽²⁾						Body Wall Thickness- G			Diameter of Bore D ⁽¹⁾		
			3000		6000		9000		3000	6000	9000	3000	6000	9000
			Ave.	Min.	Ave.	Min.	Ave.	Min.	Min.	Min.	Min.	3000	6000	9000
1/8	0.440	0.38	0.125	0.125	0.156	0.135	...	...	0.095	0.124	...	0.299	0.189	...
	0.420											0.239	0.126	...
1/4	0.575	0.38	0.149	0.130	0.181	0.158	...	...	0.119	0.145	...	0.394	0.280	...
	0.555											0.334	0.220	...
3/8	0.710	0.38	0.158	0.138	0.198	0.172	...	...	0.126	0.158	...	0.523	0.389	...
	0.690											0.463	0.329	...
1/2	0.875	0.38	0.184	0.161	0.235	0.204	0.368	0.322	0.147	0.188	0.294	0.652	0.494	0.282
	0.855											0.592	0.434	0.222
3/4	1.085	0.50	0.193	0.168	0.274	0.238	0.385	0.337	0.154	0.219	0.308	0.854	0.642	0.464
	1.065											0.794	0.582	0.404
1	1.350	0.50	0.224	0.196	0.312	0.273	0.448	0.392	0.179	0.250	0.358	1.079	0.845	0.629
	1.330											1.019	0.785	0.569
1 1/4	1.695	0.50	0.239	0.208	0.312	0.273	0.478	0.418	0.191	0.250	0.382	1.410	1.190	0.926
	1.675											1.350	1.130	0.866
1 1/2	1.935	0.50	0.250	0.218	0.351	0.307	0.500	0.438	0.200	0.281	0.400	1.640	1.368	1.130
	1.915											1.580	1.308	1.070
2	2.426	0.62	0.273	0.238	0.430	0.374	0.545	0.477	0.218	0.344	0.436	2.097	1.717	1.533
	2.406											2.037	1.657	1.473
2 1/2	2.931	0.62	0.345	0.302	...	...	...	...	0.276	...	...	2.529	...	...
	2.906											2.409	...	...
3	3.560	0.62	0.375	0.327	...	...	...	...	0.300	...	...	3.128	...	...
	3.535											3.008	...	...
4	4.570	0.75	0.421	0.368	...	...	...	...	0.337	...	...	4.086	...	...
	4.545											3.966	...	...

Nominal Pipe Size NPS	Centre-to-Bottom of Socket A						Laying Lengths E, F		End Wall Thickness Caps (min) K			Tolerances +/-		
	90 Deg Elbows, Tees, and Crosses			45 Deg Elbows			Couplings E	Half Couplings F	3000	6000	9000	A	E	F
	3000	6000	9000	3000	6000	9000								
1/8	0.44	0.44	...	0.31	0.31	...	0.25	0.62	0.19	0.25	...	0.03	0.06	0.03
1/4	0.44	0.53	...	0.31	0.31	...	0.25	0.62	0.19	0.25	...	0.03	0.06	0.03
3/8	0.53	0.62	...	0.31	0.44	...	0.25	0.69	0.19	0.25	...	0.06	0.12	0.06
1/2	0.62	0.75	1.00	0.44	0.50	0.62	0.38	0.88	0.25	0.31	0.44	0.06	0.12	0.06
3/4	0.75	0.88	1.12	0.50	0.56	0.75	0.38	0.94	0.25	0.31	0.50	0.06	0.12	0.06
1	0.88	1.06	1.25	0.56	0.69	0.81	0.50	1.12	0.38	0.44	0.56	0.08	0.16	0.08
1 1/4	1.06	1.25	1.38	0.69	0.81	0.88	0.50	1.19	0.38	0.44	0.56	0.08	0.16	0.08
1 1/2	1.25	1.50	1.50	0.81	1.00	1.00	0.50	1.25	0.44	0.50	0.62	0.08	0.16	0.08
2	1.50	1.62	2.12	1.00	1.12	1.12	0.75	1.62	0.50	0.62	0.75	0.08	0.16	0.08
2 1/2	1.62	...	...	1.12	...	...	0.75	1.69	0.62	0.75	...	0.10	0.20	0.10
3	2.25	...	...	1.25	...	...	0.75	1.75	0.75	0.88	...	0.10	0.20	0.10
4	1.62	...	...	1.62	...	...	0.75	1.88	0.88	1.12	...	0.10	0.20	0.10

All dimensions are given in inches.

Notes:

- (1) Upper and lower values for each size are the respective maximum and minimum dimensions.
- (2) Average of Socket Wall Thickness around periphery shall be no less than the listed values. The minimum values are permitted in localized areas.

Trans Am

Piping Products Ltd.

MSS SP-83 Forged Unions

The Manufacturers Standardization Society Standard Practice 83 covers the requirements for forged pipe unions, socket-welding and threaded ends. The 2014 edition added the requirements and dimensions for Class 6000 unions, which were not previously included. Class 3000 threaded and socket-welding and Class 6000 threaded unions are covered in NPS 1/8 through 3 while Class 6000 socket-welding unions are covered in NPS 1/8 through 2-1/2.

MSS SP-83 advises that union parts from different manufacturers are not functionally interchangeable and does not recommend the combining of parts from different manufacturers.

Tolerances

In addition to the tolerances shown in the tables, the following applies:

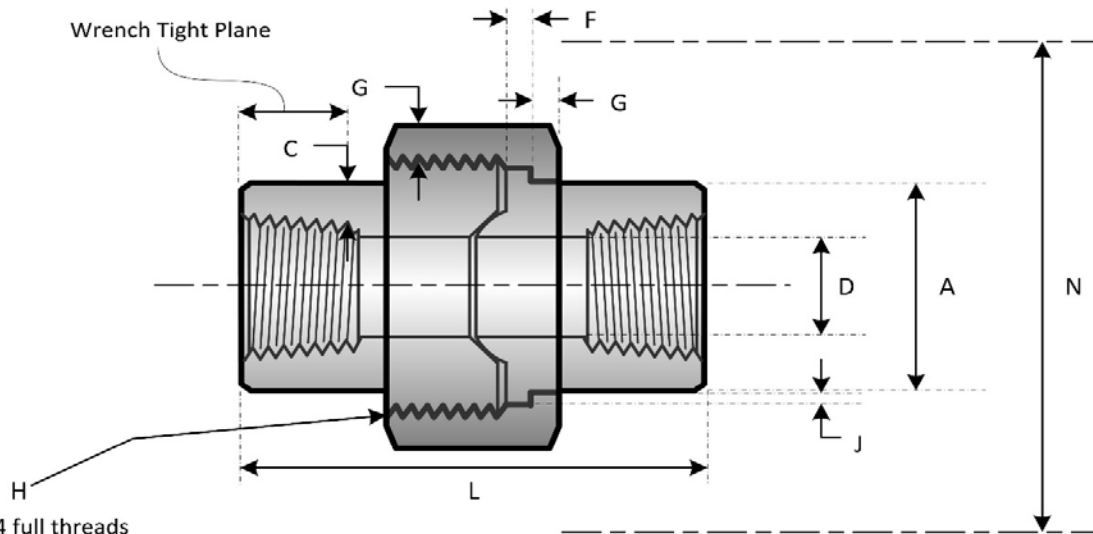
Concentricity of Bores: the socket shall be concentric with the waterway bore within a tolerance of +/- 0.03" for all sizes.

Coincidence of Axes: the maximum allowable variation in the alignment of one threaded pipe end of the assembled union to the axis of the opposite threaded pipe end shall not exceed 0.19" in 1 ft.

**Recommended Nut
Tightening Torque**

NPS	Foot Pounds (min)
1/8	85
1/4	85
3/8	100
1/2	100
3/4	120
1	120
1 1/4	130
1 1/2	130
2	130
2 1/2	150
3	150

Dimensions of Class 3000 Threaded Unions- MSS SP-83



Minimum 4 full threads
engagement Class 2A/2B fit
ASME B1.1

Nominal Pipe Size NPS	Pipe End Min. A	Wall Thickness Min. C	Waterway Bore Max/Min ⁽¹⁾ D	Male Flange Min. E	Nut Thickness Min. G	Threads Per Inch H	Bearing Surface Min. I	Assem. Length Nominal L	Clear Assem. Nut N
1/8	0.58	0.095	0.332 0.253	0.125	0.125	16	0.049	1.63	2.0
1/4	0.75	0.119	0.438 0.372	0.125	0.125	16	0.049	1.63	2.0
3/8	0.90	0.126	0.562 0.532	0.135	0.135	14	0.054	1.81	2.2
1/2	1.09	0.147	0.703 0.672	0.145	0.145	14	0.059	1.93	2.3
3/4	1.32	0.154	0.906 0.842	0.160	0.160	11	0.066	2.24	2.6
1	1.63	0.179	1.141 1.092	0.180	0.175	11	0.073	2.44	3.1
1 1/4	1.99	0.191	1.484 1.392	0.210	0.205	10	0.084	2.80	3.7
1 1/2	2.25	0.200	1.714 1.622	0.230	0.220	10	0.091	3.01	4.4
2	2.76	0.218	2.188 2.052	0.260	0.250	10	0.106	3.39	5.2
2 1/2	3.36	0.276	2.609 2.532	0.295	0.280	8	0.121	4.03	5.9
3	4.03	0.300	3.250 3.042	0.325	0.315	8	0.139	4.29	6.9

All dimensions are given in inches.

Threaded ends per ASME B1.20.1

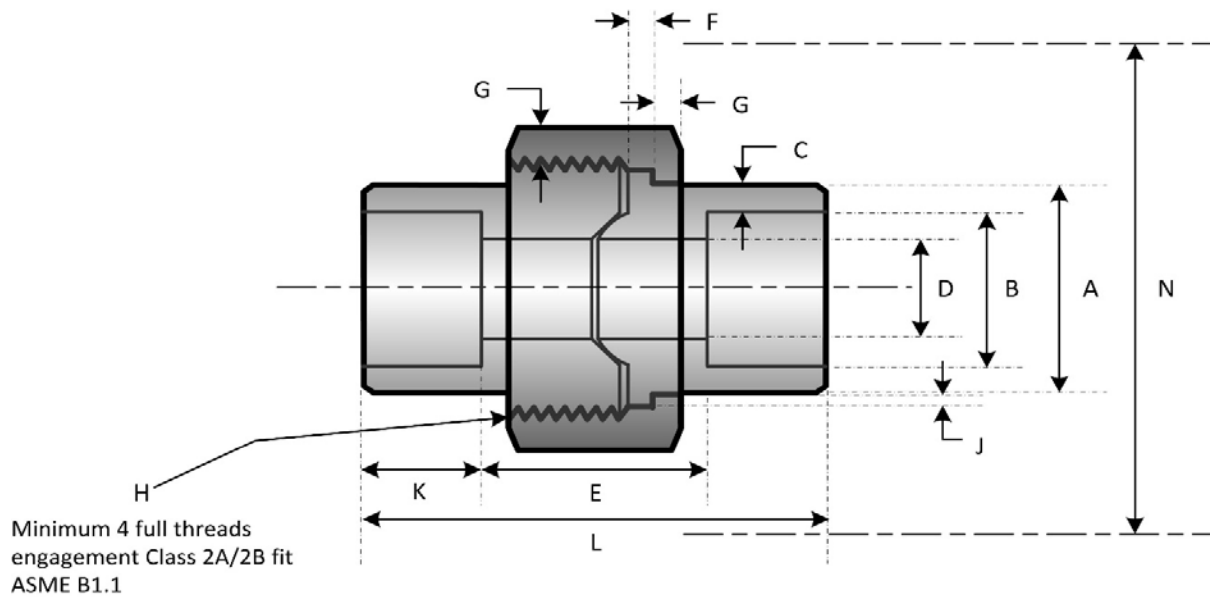
Notes:

(1) The contact diameter of the male/female tailpiece is affected by the waterway bore (D).

Trans Am

Piping Products Ltd.

Dimensions of Class 3000 Socket Weld Unions- MSS SP-83



Nominal Pipe Size NPS	Pipe End Min. A	Socket Diameter Max/Min B	W.T. of Socket C	Waterway Bore Max/Min ⁽¹⁾ D	Laying Length Max/Min E	Male Flange Min. F	Nut Thickness Min. G	Threads Per Inch H	Bearing Surface Min. J	Socket Depth Min. K	Assem. Length Nominal L	Clear Assem. Nut N
1/8	0.86	0.440 0.420	0.125	0.299 0.239	0.88 0.75	0.125	0.125	16	0.049	0.38	1.63	2.0
1/4	0.86	0.575 0.555	0.130	0.394 0.334	0.88 0.75	0.125	0.125	16	0.049	0.38	1.63	2.0
3/8	1.02	0.710 0.690	0.138	0.523 0.463	1.06 0.81	0.135	0.135	14	0.054	0.38	1.81	2.2
1/2	1.23	0.875 0.855	0.161	0.652 0.592	1.06 0.81	0.145	0.145	14	0.059	0.38	1.93	2.3
3/4	1.46	1.085 1.065	0.168	0.854 0.794	1.25 1.00	0.160	0.160	11	0.066	0.50	2.24	2.6
1	1.79	1.350 1.330	0.196	1.079 1.019	1.35 1.03	0.180	0.175	11	0.073	0.50	2.44	3.1
1 1/4	2.16	1.695 1.675	0.208	1.410 1.350	1.60 1.28	0.210	0.205	10	0.084	0.50	2.80	3.7
1 1/2	2.42	1.935 1.915	0.218	1.640 1.580	1.66 1.34	0.230	0.220	10	0.091	0.50	3.01	4.4
2	2.96	2.426 2.406	0.238	2.097 2.037	1.79 1.47	0.260	0.250	10	0.106	0.62	3.39	5.2
2 1/2	3.61	2.931 2.906	0.302	2.529 2.409	2.43 2.05	0.295	0.280	8	0.121	0.62	4.03	5.9
3	4.30	3.560 3.535	0.327	3.128 3.008	2.51 2.11	0.325	0.315	8	0.139	0.62	4.29	6.9

All dimensions are given in inches.

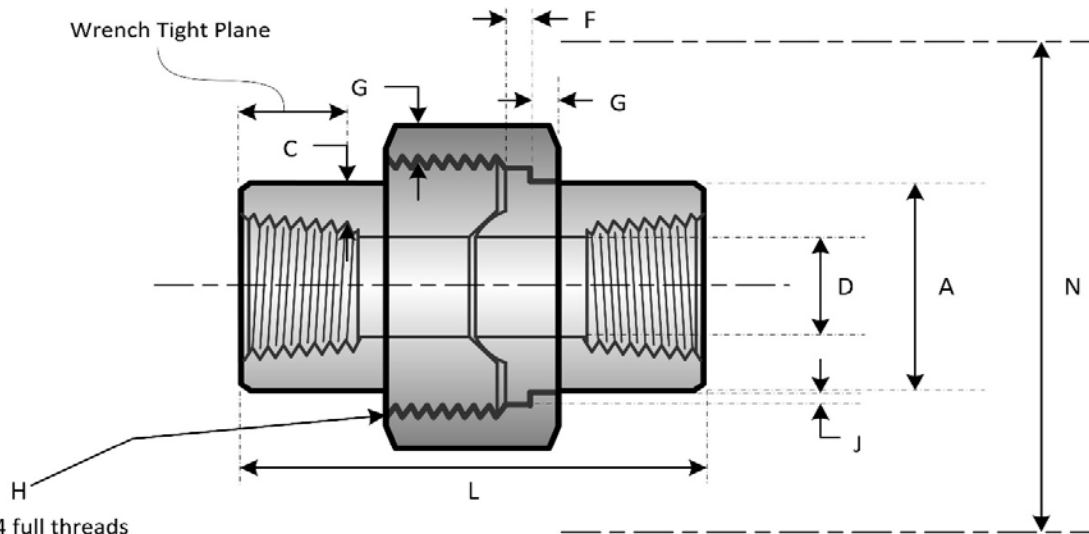
Notes:

(1) The contact diameter of the male/female tailpiece is affected by the waterway bore (D).

Trans Am

Piping Products Ltd.

Dimensions of Class 6000 Threaded Unions- MSS SP-83



Minimum 4 full threads
engagement Class 2A/2B fit
ASME B1.1

Nominal Pipe Size NPS	Pipe End Min. A	Wall Thickness Min. C	Waterway Bore Max/Min ⁽¹⁾ D	Male Flange Min. E	Nut Thickness Min. F	Threads Per Inch G	Bearing Surface Min. I	Assem. Length Nominal K	Clear Assem. Nut N
1/8	0.65	0.124	0.332 0.126	0.125	0.125	16	0.049	1.63	2.0
1/4	0.83	0.145	0.438 0.220	0.135	0.135	14	0.054	1.81	2.2
3/8	0.99	0.158	0.562 0.329	0.145	0.145	14	0.059	1.93	2.3
1/2	1.22	0.188	0.703 0.434	0.160	0.160	11	0.066	2.24	2.6
3/4	1.49	0.219	0.906 0.582	0.180	0.175	11	0.073	2.44	3.1
1	1.82	0.250	1.141 0.785	0.210	0.205	10	0.084	2.80	3.7
1 1/4	2.16	0.250	1.484 1.130	0.230	0.220	10	0.091	3.01	4.4
1 1/2	2.46	0.281	1.714 1.308	0.260	0.250	10	0.106	3.39	5.2
2	3.06	0.344	2.188 1.657	0.295	0.280	8	0.121	4.03	5.9
2 1/2	3.63	0.375	2.609 2.095	0.325	0.315	8	0.139	4.29	6.9
3	4.38	0.438	3.250 2.594	0.401	0.401	8	0.160	7.50	7.9

All dimensions are given in inches.

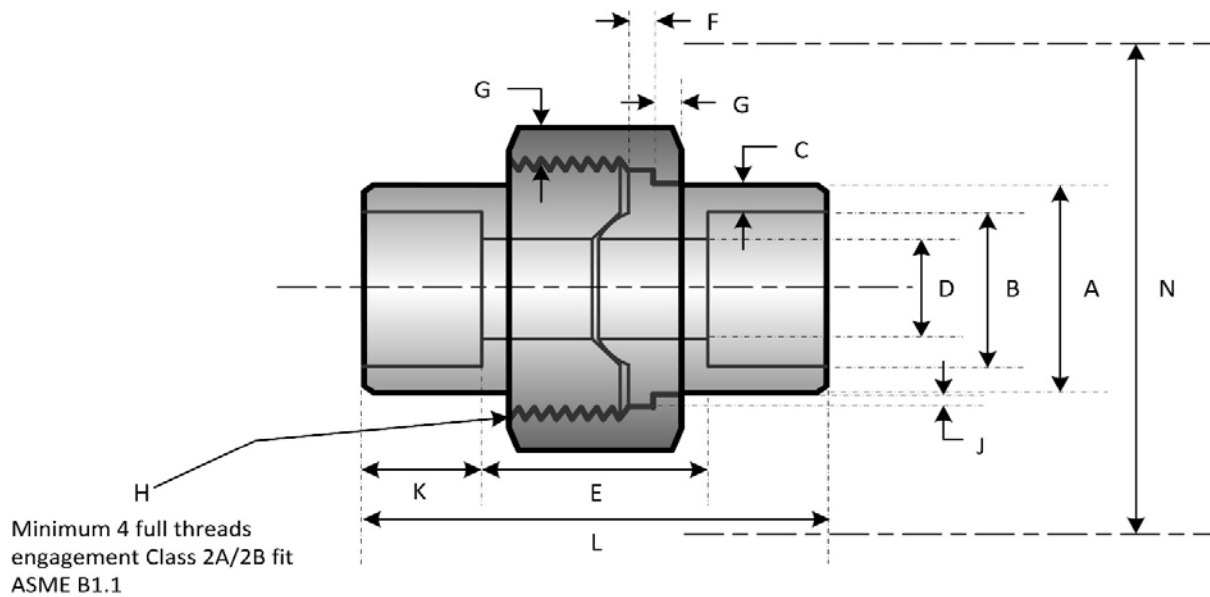
Threaded ends per ASME B1.20.1

Notes:

(1) The contact diameter of the male/female tailpiece is affected by the waterway bore (D).

Trans Am
Piping Products Ltd.

Dimensions of Class 6000 Socket Weld Unions- MSS SP-83



Nominal Pipe Size NPS	Pipe End Min. A	Socket Diameter Max/Min B	W.T. of Socket C	Waterway Bore Max/Min ⁽¹⁾ D	Laying Length Max/Min E	Male Flange Min. F	Nut Thickness Min. G	Threads Per Inch H	Bearing Surface Min. J	Socket Depth Min. K	Assem. Length Nominal L	Clear Assem. Nut N
1/8	0.86	0.440 0.420	0.135	0.189 0.126	0.88 0.75	0.125	0.125	16	0.049	0.38	1.63	2.0
1/4	1.02	0.575 0.555	0.158	0.280 0.220	1.06 0.81	0.135	0.135	14	0.054	0.38	1.81	2.2
3/8	1.23	0.710 0.690	0.172	0.389 0.329	1.06 0.81	0.145	0.145	14	0.059	0.38	1.93	2.3
1/2	1.46	0.875 0.855	0.204	0.494 0.434	1.25 1.00	0.160	0.160	11	0.066	0.38	2.24	2.6
3/4	1.79	1.085 1.065	0.238	0.642 0.582	1.35 1.03	0.180	0.175	11	0.073	0.50	2.44	3.1
1	2.16	1.350 1.330	0.273	0.845 0.785	1.60 1.28	0.210	0.205	10	0.084	0.50	2.80	3.7
1 1/4	2.42	1.695 1.675	0.273	1.190 1.130	1.66 1.34	0.230	0.220	10	0.091	0.50	3.01	4.4
1 1/2	2.96	1.935 1.915	0.307	1.368 1.308	1.79 1.47	0.260	0.250	10	0.106	0.50	3.39	5.2
2	3.61	2.426 2.406	0.374	1.717 1.657	2.43 2.05	0.295	0.280	8	0.121	0.62	4.03	5.9
2 1/2	4.30	2.931 2.906	0.409	2.155 2.095	2.51 2.11	0.325	0.315	8	0.139	0.62	4.29	6.9

All dimensions are given in inches.

Notes:

(1) The contact diameter of the male/female tailpiece is affected by the waterway bore (D).

Trans Am

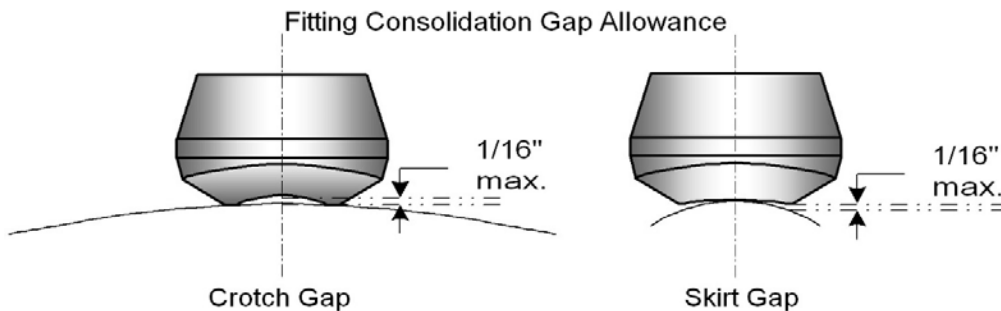
Piping Products Ltd.

MSS SP-97 Integrally Reinforced Branch Outlet Fittings

The Manufacturers Standardization Society Standard Practice 97 covers the requirements for 90° and 45° integrally forged branch outlet fittings in buttwelding, socket-welding and threaded types. The fittings are attached to a run pipe by means of a full penetration weld, and are designed to make a fully reinforced branch connection. The buttwelding types are classified as Standard, Extra Strong and Schedule 160, while the threaded and socket-welding types are rated as Class 3000 and Class 6000.

Buttwelding ends are bevelled in accordance with ASME B16.25. Threads in threaded fittings comply with the NPT requirements of ASME B1.20.1. Socket-welding dimensions for socket depth, minimum socket wall thickness and socket diameter are in accordance with ASME B16.11 of the appropriate class.

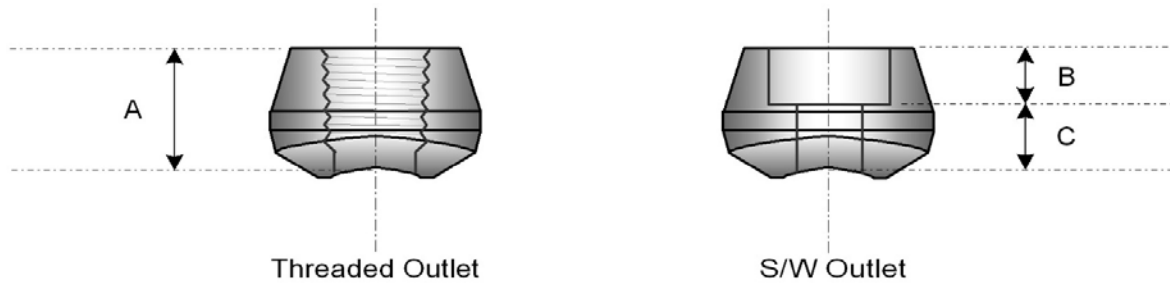
Run sizes for a given branch size may be consolidated at the manufacturer's option. The consolidation gap distance between the radius of the run pipe and the contoured radius of the fitting inlet must not exceed 1/16". This is applicable to both 90° and 45° branch outlets.



Trans Am

Piping Products Ltd.

Height Dimensions of Threaded & S/W Branch Outlets- MSS SP-97



Outlet Size NPS	Threaded Outlets		Socket Weld Outlets		
	Face of Fitting to Crotch- A ⁽¹⁾		Depth of Socket B (min) ⁽²⁾	Bottom of Socket to Crotch- C (max)	
	3000	6000		3000	6000
1/8	0.75	...	0.38	0.41	...
1/4	0.75	...	0.38	0.41	...
3/8	0.81	...	0.38	0.50	...
1/2	1.00	1.25	0.38	0.63	0.94
3/4	1.06	1.44	0.50	0.63	1.00
1	1.31	1.56	0.50	0.88	1.13
1 1/4	1.31	1.62	0.50	0.88	1.19
1 1/2	1.38	1.69	0.50	0.94	1.25
2	1.50	2.06	0.62	0.94	1.44
2 1/2	1.81	...	0.62	1.00	...
3	2.00	...	0.62	1.19	...
4	2.25	...	0.75	1.19	...

All dimensions are given in inches.

Notes:

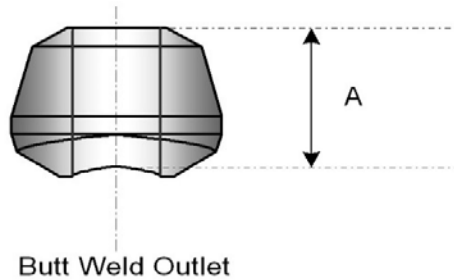
(1) Tolerances: NPS 1/8 - 3/4 +/- .03"
NPS 1 - 4 +/- .06"

(2) Minimum socket depth per ASME B16.11

Trans Am

Piping Products Ltd.

Height Dimensions of Butt Weld Outlets- MSS SP-97



Outlet Size NPS	Face of Fitting to Crotch- A ⁽¹⁾					
	Standard		Extra Heavy		Schedule 160	
	Reducing	Full	Reducing	Full	Reducing	Full
1/8	0.62	...	0.62	...	...	...
1/4	0.62	...	0.62	...	...	...
3/8	0.75	...	0.75	...	...	...
1/2	0.75	0.75	0.75	0.75	1.12	1.12
3/4	0.88	0.88	0.88	0.88	1.25	1.25
1	1.06	1.06	1.06	1.06	1.50	1.50
1 1/4	1.25	1.25	1.25	1.25	1.75	1.75
1 1/2	1.31	1.31	1.31	1.31	2.00	2.00
2	1.50	1.50	1.50	1.50	2.18	2.18
2 1/2	1.62	1.62	1.62	1.62	2.44	2.44
3	1.75	1.75	1.75	1.75	2.88	2.88
3 1/2	1.88	2.00	1.88	2.00	...	...
4	2.00	2.00	2.00	2.00	3.31	3.31
5	2.25	2.25	2.25	2.25	3.69	3.69
6	2.38	2.38	3.06	3.06	4.12	4.12
8	2.75	2.75	3.88	3.88	...	...
10	3.06	3.06	3.69	3.50	...	...
12	3.38	3.38	4.06	3.94	...	...
14	3.50	3.50	3.94	4.12	...	...
16	3.69	3.69	4.18	4.44	...	...
18	3.81	4.06	4.38	4.69	...	...
20	4.00	4.62	4.69	5.00	...	...
24	4.56	5.38	5.50	5.50	...	...

All dimensions are given in inches.

Notes:

(1) Tolerances: NPS 1/8 - 3/4 +/- .03"

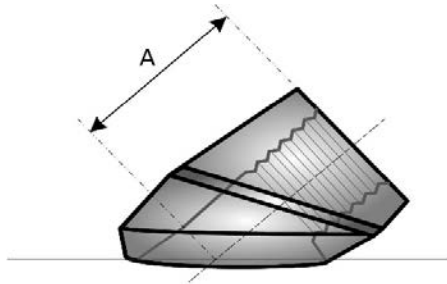
NPS 1 - 4 +/- 0.6"

NPS 5 - 12 +/- .12"

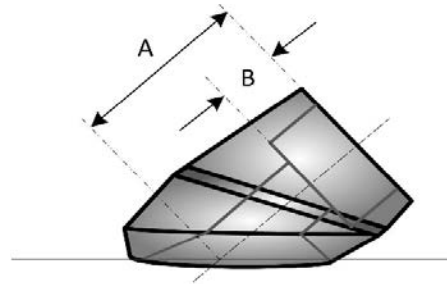
NPS 14 - 24 +/- .19"

Trans Am
Piping Products Ltd.

Height Dimensions of 45° Threaded & S/W Branch Outlets- MSS SP-97



Threaded 45° Outlet



S/W 45° Outlet

Outlet Size NPS	Depth of Socket B (min) ⁽¹⁾	Top of Fitting to Run Pipe- A			
		3000		6000	
		A (min)	A (max)	A (min)	A (max)
1/4	0.38	1.500	1.688	1.531	1.875
3/8	0.38	1.500	1.688	1.531	1.875
1/2	0.38	1.500	1.750	1.812	2.188
3/4	0.50	1.812	2.000	2.125	2.500
1	0.50	2.125	2.500	2.406	2.875
1 1/4	0.50	2.406	3.000	2.563	3.062
1 1/2	0.50	2.500	3.000	3.094	3.375
2	0.62	3.000	3.312	3.094	4.125

All dimensions are given in inches.

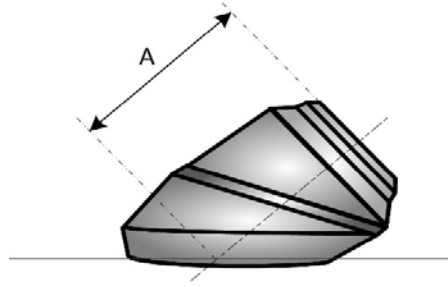
Notes:

(1) Minimum socket depth per ASME B16.11

Trans Am

Piping Products Ltd.

Height Dimensions of 45° Butt Weld Branch Outlets- MSS SP-97



Butt Weld 45° Outlet

Outlet Size NPS	Top of Fitting to Run Pipe- A	
	Standard and Extra Heavy	
	A (min)	A (max)
1/4	1.500	1.688
3/8	1.500	1.688
1/2	1.500	1.688
3/4	1.750	2.000
1	2.125	2.563
1 1/4	2.125	2.563
1 1/2	2.500	2.750
2	2.875	3.500

All dimensions are given in inches.

Pipe Dimensions and Materials Specifications

The dimensions and weights of welded and seamless wrought steel pipe used in pipeline and piping systems are covered by ASME B36.10.

Pages 66 and 67 list the nominal wall thicknesses and weights according to pipe schedule, page 65 provides the nominal inside diameters.

The nominal weights of steel pipe, in pounds per foot, can be calculated as follows:

$$W_{pe} = 10.69(D-t)t$$

where W_{pe} = nominal plain end weight rounded to the nearest 0.01 lb/ft
 D = outside diameter to the nearest 0.001 in.
 t = specified wall thickness rounded to the nearest 0.001"

The nominal masses of steel pipe, in kilograms per meter, can be calculated as follows:

$$W_{pe} = 0.0246615(D-t)t$$

where W_{pe} = nominal plain end weight rounded to the nearest 0.01 kg/m
 D = outside diameter to the nearest 0.1 mm for outside diameters which are 16" and smaller and to the nearest 1.0 mm for outside diameters larger than 16"
 t = specified wall thickness rounded to the nearest 0.01 mm

Nominal Inside Diameters of Steel Pipe

Pipe Size NPS	Outside Diameter	Pipe Schedules												
		10	20	30	40	Std	60	80	XS	100	120	140	160	XXS
1/8	0.405	0.307	...	0.291	0.269	0.269	...	0.215	0.215	...	...	...	...	...
1/4	0.540	0.410	...	0.394	0.364	0.364	...	0.302	0.302	...	...	...	...	...
3/8	0.675	0.545	...	0.529	0.493	0.493	...	0.423	0.423	...	...	...	...	...
1/2	0.840	0.674	...	0.650	0.622	0.622	...	0.546	0.546	...	...	...	0.464	0.252
3/4	1.050	0.884	...	0.860	0.824	0.824	...	0.742	0.742	...	...	...	0.612	0.434
1	1.315	1.097	...	1.087	1.049	1.049	...	0.957	0.957	...	...	...	0.815	0.599
1 1/4	1.660	1.442	...	1.426	1.380	1.380	...	1.278	1.278	...	...	...	1.160	0.896
1 1/2	1.900	1.682	...	1.650	1.610	1.610	...	1.500	1.500	...	...	...	1.338	1.100
2	2.375	2.157	...	2.125	2.067	2.067	...	1.939	1.939	...	...	...	1.687	1.503
2 1/2	2.875	2.635	...	2.499	2.469	2.469	...	2.323	2.323	...	...	...	2.125	1.771
3	3.500	3.260	...	3.124	3.068	3.068	...	2.900	2.900	...	...	...	2.624	2.300
3 1/2	4.000	3.760	...	3.624	3.548	3.548	...	3.364	3.364	...	...	...	...	...
4	4.500	4.260	...	4.124	4.026	4.026	...	3.826	3.826	...	3.624	...	3.438	3.152
5	5.563	5.295	...	...	5.047	5.047	...	4.813	4.813	...	4.563	...	4.313	4.063
6	6.625	6.357	...	...	6.065	6.065	...	5.761	5.761	...	5.501	...	5.187	4.897
8	8.625	8.329	8.125	8.071	7.981	7.981	7.813	7.625	7.625	7.437	7.187	7.001	6.813	6.875
10	10.750	10.420	10.250	10.136	10.020	10.020	9.750	9.562	9.750	9.312	9.062	8.750	8.500	8.750
12	12.750	12.390	12.250	12.090	11.938	12.000	11.626	11.374	11.750	11.062	10.750	10.500	10.126	10.750
Pipe Size NPS	Outside Diameter	Pipe Schedules												
		10	20	30	40	Std	60	80	XS	100	120	140	160	XXS
14	14.000	13.500	13.376	13.250	13.124	13.250	12.812	12.500	13.000	12.124	11.812	11.500	11.188	...
16	16.000	15.500	15.376	15.250	15.000	15.250	14.688	14.312	15.000	13.938	13.562	13.124	12.812	...
18	18.000	17.500	17.376	17.124	16.876	17.250	16.500	16.124	17.000	15.688	15.250	14.876	14.438	...
20	20.000	19.500	19.250	19.000	18.812	19.250	18.376	17.938	19.000	17.438	17.000	16.500	16.062	...
22	22.000	21.500	21.250	21.000	...	21.250	20.250	19.750	21.000	19.250	18.750	18.250	17.750	...
24	24.000	23.500	23.250	22.876	22.624	23.250	22.062	21.564	23.000	20.938	20.376	19.876	19.312	...
26	26.000	25.376	25.000	...	...	25.250	...	...	25.000	...	...	...	...	...
28	28.000	27.376	27.000	26.750	...	27.250	...	...	27.000	...	...	...	...	...
30	30.000	29.376	29.000	28.750	...	29.250	...	...	29.000	...	...	...	...	...
32	32.000	31.376	31.000	30.750	30.624	31.250	...	...	31.000	...	...	...	...	...
34	34.000	33.376	33.000	32.750	32.624	33.250	...	...	33.000	...	...	...	...	...
36	36.000	35.376	35.000	34.750	34.500	35.250	...	...	35.000	...	...	...	...	...
38	38.000	...	...	...	...	37.250	...	...	37.000	...	...	...	...	...
40	40.000	...	...	...	...	39.250	...	...	39.000	...	...	...	...	...
42	42.000	...	...	...	...	41.250	...	...	41.000	...	...	...	...	...
44	44.000	...	...	...	...	43.250	...	...	43.000	...	...	...	...	...
46	46.000	...	...	...	...	45.250	...	...	45.000	...	...	...	...	...
48	48.000	...	...	...	...	47.250	...	...	47.000	...	...	...	...	...

All dimensions are given in inches.

Trans Am

Piping Products Ltd.

Nominal Wall Thickness and Weight of Steel Pipe

According to ASME B36.10M-2004

NPS	O.D.	Sch 10		Sch 20		Sch 30		Sch 40		Standard		Sch 60	
		wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft
1/8	0.405	0.049	0.19	...	...	0.057	0.21	0.068	0.24	0.068	0.24	...	...
1/4	0.540	0.065	0.33	...	...	0.073	0.36	0.088	0.43	0.088	0.43	...	...
3/8	0.675	0.065	0.42	...	...	0.073	0.47	0.091	0.57	0.091	0.57	...	...
1/2	0.840	0.083	0.67	...	...	0.095	0.76	0.109	0.85	0.109	0.85	...	...
3/4	1.050	0.083	0.86	...	...	0.095	0.97	0.113	1.13	0.113	1.13	...	...
1	1.315	0.109	1.41	...	...	0.114	1.46	0.133	1.68	0.133	1.68	...	...
1 1/4	1.660	0.109	1.81	...	...	0.117	1.93	0.140	2.27	0.140	2.27	...	...
1 1/2	1.900	0.109	2.09	...	...	0.125	2.37	0.145	2.72	0.145	2.72	...	...
2	2.375	0.109	2.64	...	...	0.125	3.01	0.154	3.66	0.154	3.66	...	...
2 1/2	2.875	0.120	3.53	...	...	0.188	5.40	0.203	5.80	0.203	5.80	...	...
3	3.500	0.120	4.34	...	...	0.188	6.66	0.216	7.58	0.216	7.58	...	...
3 1/2	4.000	0.120	4.98	...	...	0.188	7.66	0.226	9.12	0.226	9.12	...	...
4	4.500	0.120	5.62	...	...	0.188	8.67	0.237	10.80	0.237	10.80	...	...
5	5.563	0.134	7.78	...	...	...	...	0.258	14.63	0.258	14.63	...	...
6	6.625	0.134	9.30	...	...	...	...	0.280	18.99	0.280	18.99	...	...
8	8.625	0.148	13.41	0.250	22.38	0.277	24.72	0.322	28.58	0.322	28.58	0.406	35.67
10	10.750	0.165	18.67	0.250	28.06	0.307	34.27	0.365	40.52	0.365	40.52	0.500	54.79
12	12.750	0.180	24.19	0.250	33.41	0.330	43.81	0.406	53.57	0.375	49.61	0.562	73.22
14	14.000	0.250	36.75	0.312	45.65	0.375	54.62	0.438	63.50	0.375	54.62	0.594	85.13
16	16.000	0.250	42.09	0.312	52.32	0.375	62.64	0.500	82.85	0.375	62.64	0.656	107.60
18	18.000	0.250	47.44	0.312	58.99	0.438	82.23	0.562	104.76	0.375	70.65	0.750	138.30
20	20.000	0.250	52.78	0.375	78.67	0.500	104.23	0.594	123.23	0.375	78.67	0.812	166.56
22	22.000	0.250	58.13	0.375	86.69	0.500	114.92	...	...	0.375	86.69	0.875	197.60
24	24.000	0.250	63.47	0.375	94.71	0.562	140.81	0.688	171.45	0.375	94.71	0.969	238.57
26	26.000	0.312	85.68	0.500	136.30	...	...	...	...	0.375	102.72	...	...
28	28.000	0.312	92.35	0.500	146.99	0.625	182.90	...	...	0.375	110.74	...	...
30	30.000	0.312	99.02	0.500	157.68	0.625	196.26	...	...	0.375	118.76	...	...
32	32.000	0.312	105.69	0.500	168.37	0.625	209.62	0.688	230.29	0.375	126.78	...	...
34	34.000	0.312	112.36	0.500	179.06	0.625	222.99	0.688	245.00	0.375	134.79	...	...
36	36.000	0.312	119.03	0.500	189.75	0.625	236.35	0.750	282.62	0.375	142.81	...	...
38	38.000	...	...	...	...	...	...	...	...	0.375	150.83	...	...
40	40.000	...	...	...	...	...	...	...	...	0.375	158.85	...	...
42	42.000	...	...	...	...	...	...	...	...	0.375	166.86	...	...
44	44.000	...	...	...	...	...	...	...	...	0.375	174.88	...	...
46	46.000	...	...	...	...	...	...	...	...	0.375	182.90	...	...
48	48.000	...	...	...	...	...	...	...	...	0.375	190.92	...	...

All dimensions are given in inches, all weights are given in lbs. per foot

Trans Am

Piping Products Ltd.

Nominal Wall Thickness and Weight of Steel Pipe

According to ASME B36.10M-2004

Sch 80		Extra Strong		Sch 100		Sch 120		Sch 140		Sch 160		Dble. Ex. Strg.		O.D.	NPS
wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft	wt	lb/ft		
0.095	0.31	0.095	0.31	...	...	...	...	...	...	...	...	...	...	0.405	1/8
0.119	0.54	0.119	0.54	...	...	...	...	...	...	...	...	...	...	0.540	1/4
0.126	0.74	0.126	0.74	...	...	...	...	...	...	...	...	...	...	0.675	3/8
0.147	1.09	0.147	1.09	...	...	...	...	...	...	0.188	1.31	0.294	1.72	0.840	1/2
0.154	1.48	0.154	1.48	...	...	...	...	...	...	0.219	1.95	0.308	2.44	1.050	3/4
0.179	2.17	0.179	2.17	...	...	...	...	...	...	0.250	2.85	0.358	3.66	1.315	1
0.191	3.00	0.191	3.00	...	...	...	...	...	...	0.250	3.77	0.382	5.22	1.660	1 1/4
0.200	3.63	0.200	3.63	...	...	...	...	...	...	0.281	4.86	0.400	6.41	1.900	1 1/2
0.218	5.03	0.218	5.03	...	...	...	...	...	...	0.344	7.47	0.436	9.04	2.375	2
0.276	7.67	0.276	7.67	...	...	...	...	...	...	0.375	10.02	0.552	13.71	2.875	2 1/2
0.300	10.26	0.300	10.26	...	...	...	...	...	...	0.438	14.34	0.600	18.60	3.500	3
0.318	12.52	0.318	12.52	...	...	...	...	...	...	...	...	...	...	4.000	3 1/2
0.337	15.00	0.337	15.00	...	...	0.438	19.02	...	...	0.531	22.53	0.674	27.57	4.500	4
0.375	20.80	0.375	20.80	...	...	0.500	27.06	...	...	0.625	32.99	0.750	38.59	5.563	5
0.432	28.60	0.432	28.60	...	...	0.562	36.43	...	...	0.719	45.39	0.864	53.21	6.625	6
0.500	43.43	0.500	43.43	0.594	51.00	0.719	60.77	0.812	67.82	0.906	74.76	0.875	72.49	8.625	8
0.594	64.49	0.500	54.79	0.719	77.10	0.844	89.38	1.000	104.23	1.125	115.75	1.000	104.23	10.750	10
0.688	88.71	0.500	65.48	0.844	107.42	1.000	125.61	1.125	139.81	1.312	160.42	1.000	125.61	12.750	12
0.750	106.23	0.500	72.16	0.938	130.98	1.094	150.93	1.250	170.37	1.406	189.29	...	...	14.000	14
0.844	136.74	0.500	82.85	1.031	164.98	1.219	192.61	1.438	223.85	1.594	245.48	...	...	16.000	16
0.938	171.08	0.500	93.54	1.156	208.15	1.375	244.37	1.562	274.48	1.781	308.79	...	...	18.000	18
1.031	209.06	0.500	104.23	1.281	256.34	1.500	296.65	1.750	341.41	1.969	379.53	...	...	20.000	20
1.125	251.05	0.500	114.92	1.375	303.16	1.625	353.94	1.875	403.38	2.125	451.49	...	...	22.000	22
1.219	296.86	0.500	125.61	1.531	367.74	1.812	429.79	2.062	483.57	2.344	542.64	...	...	24.000	24
...	...	0.500	136.30	...	...	...	...	...	...	...	...	...	...	26.000	26
...	...	0.500	146.99	...	...	...	...	...	...	...	...	...	...	28.000	28
...	...	0.500	157.68	...	...	...	...	...	...	...	...	...	...	30.000	30
...	...	0.500	168.37	...	...	...	...	...	...	...	...	...	...	32.000	32
...	...	0.500	179.06	...	...	...	...	...	...	...	...	...	...	34.000	34
...	...	0.500	189.75	...	...	...	...	...	...	...	...	...	...	36.000	36
...	...	0.500	200.44	...	...	...	...	...	...	...	...	...	...	38.000	38
...	...	0.500	211.13	...	...	...	...	...	...	...	...	...	...	40.000	40
...	...	0.500	221.82	...	...	...	...	...	...	...	...	...	...	42.000	42
...	...	0.500	232.51	...	...	...	...	...	...	...	...	...	...	44.000	44
...	...	0.500	243.20	...	...	...	...	...	...	...	...	...	...	46.000	46
...	...	0.500	253.89	...	...	...	...	...	...	...	...	...	...	48.000	48

All dimensions are given in inches, all weights are given in lbs. per foot

Trans Am

Piping Products Ltd.

ASTM Materials Specifications for Carbon Steels

Specified Elements % by weight (max. unless indicated)	Flanges, Forged Fittings, Branch Outlets		Butt Welding Fittings, Swage Nipples		Pipe, Pipe Nipples	
	A105-13 ^{(1) (2)}	A350-LF2-13 ^{(1) (2)}	A234-WPB-13 ⁽³⁾	A420-WPL6-13	A106-B-13 ⁽¹⁾	A333-6-13
Carbon (C)	0.35	0.30	0.30	0.30	0.30	0.30
Manganese (Mn)	0.60-1.05**	0.60-1.35	0.29-1.06**	0.50-1.35	0.29-1.06**	0.29-1.06*
Phosphorus (P)	0.035	0.035	0.050	0.035	0.035	0.025
Sulfur (S)	0.040	0.040	0.058	0.040	0.035	0.025
Silicon (Si)	0.10-0.35	0.15-0.30	0.10 min	0.15-0.40	0.10 min	0.10 min
Copper (Cu)	0.40	0.40	0.40	0.40	0.40	0.40
Nickel (Ni)	0.40	0.40	0.40	0.40	0.40	0.40
Chromium (Cr)	0.30	0.30	0.40	0.30	0.40	0.30
Molybdenum (Mo)	0.12	0.12	0.15	0.12	0.15	0.12
Vanadium (V)	0.08	0.08	0.08	0.08	0.08	0.08
Columbium/ Niobium (Cb/Nb)	...	0.02	...	0.02	...	0.02

*For each reduction of 0.01% below the specified C maximum, an increase of 0.05% Mn above the specified maximum is permitted, up to a maximum of 1.35%

Notes:

1) $Cu+Ni+Cr+Mo+V \leq 1.00\%$

2) $Cr+Mo \leq 0.32\%$

3) $Cu+Ni+Cr+Mo \leq 1.00\%$

**For each reduction of 0.01% below the specified C maximum, an increase of 0.06% Mn above the specified maximum is permitted, up to a maximum of 1.65%

Mechanical Requirements	A105	A350-LF2	A234-WPB	A420-WPL6	A106-B	A333-6
Yield (Y) (min., MPa)	250	250	240	240	240	240
Tensile (T) (min., MPa)	485	485-655	415	415-655	415	415
Elongation (% min.)	22 ⁽¹⁾	22 ⁽¹⁾	22 ^{(1) (2)}	22 ^{(1) (2)}	22 ^{(1) (2)}	22 ^{(1) (2)}
Red. of Area (% min.)	30	30	...	...	...	...
Hardness (max., HBW)	197	197	197	...	...	...

Notes:

1) Standard round specimen, 4 D gauge length

2) Longitudinal specimen

Impact Requirements (Std. 10x10mm specimens)	A105	A350-LF2 (Class 1)	A234-WPB	A420-WPL6	A106-B	A333-6
Test Temperature	...	-46C	...	-45C	...	-45C
Min. average of 3 pieces (J)	...	20.00	...	17.6	...	18
Min. value for 1 piece (J)	...	16.00	...	13.6	...	14

Trans Am

Piping Products Ltd.

ASME B16.5-2013:

Class Temperature °F	Working Pressures by Classes, psig						
	150	300	400	600	900	1500	2500
-20 to 100	285	740	985	1480	2220	3705	6170
200	260	680	905	1360	2035	3395	5655
300	230	655	870	1310	1965	3270	5450
400	200	635	845	1265	1900	3170	5280
500	170	605	805	1205	1810	3015	5025
600	140	570	755	1135	1705	2840	4730
650	125	550	730	1100	1650	2745	4575
700	110	530	710	1060	1590	2655	4425
750	95	505	675	1015	1520	2535	4230
800	80	410	550	825	1235	2055	3430
850	65	320	425	640	955	1595	2655
900	50	230	305	460	690	1150	1915
950	35	135	185	275	410	685	1145
1000	20	85	115	170	255	430	715

ASME B16.47-2011:

Class Temperature °F	Working Pressures by Classes, psig					
	75	150	300	400	600	900
-20 to 100	140	285	740	985	1480	2220
200	130	260	680	905	1360	2035
300	115	230	655	870	1310	1965
400	100	200	635	845	1265	1900
500	85	170	605	805	1205	1810
600	70	140	570	755	1135	1705
650	60	125	550	730	1100	1650
700	...	110	530	710	1060	1590
750	...	95	505	675	1015	1520
800	...	80	410	550	825	1235
850	...	65	320	425	640	955
900	...	50	230	305	460	690
950	...	35	135	185	275	410
1000	...	20	85	115	170	255

Notes:

(1) ASME B16.5 and B16.47 provide the following note: Upon prolonged exposure to temperatures above 800 °F, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged use above 800 °F

Notes