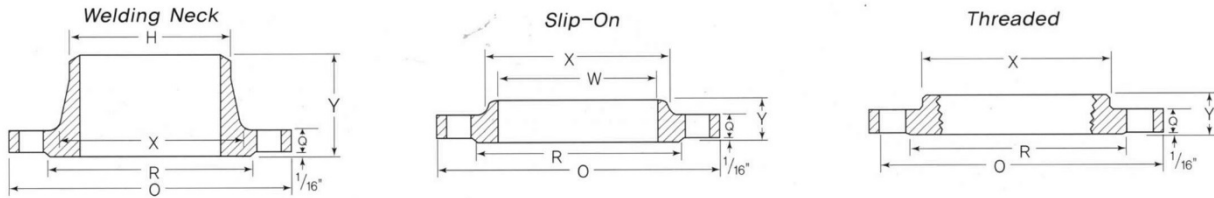


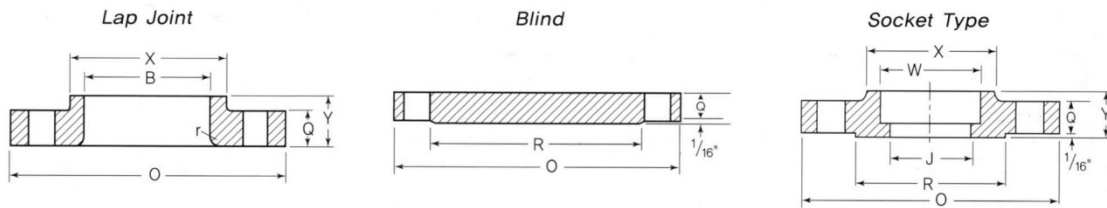
## B16.5 150# FLANGE



Nominal Pipe Size	Outside Diameter of Flange O	Thickness of Flange Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H	Radius of Fillet r	Depth of Socket Z
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket W	Lap Joint B			
1/2	3-1/2	7/16	1-3/8	1-3/16	1-7/8	5/8	5/8	.88	.90	.84	1/8	3/8
3/4	3-7/8	1/2	1-11/16	1-1/2	2-1/16	5/8	5/8	1.09	1.11	1.05	1/8	7/16
1	4-1/4	9/16	2	1-15/16	2-3/16	11/16	11/16	1.36	1.38	1.32	1/8	1/2
1-1/4	4-5/8	5/8	2-1/2	2-5/16	2-1/4	13/16	13/16	1.70	1.72	1.66	3/16	9/16
1-1/2	5	11/16	2-7/8	2-9/16	2-7/16	7/8	7/8	1.95	1.97	1.90	1/4	5/8
2	6	3/4	3-5/8	3-1/16	2-1/2	1	1	2.44	2.46	2.38	5/16	11/16
2-1/2	7	7/8	4-1/8	3-9/16	2-3/4	1-1/8	1-1/8	2.94	2.97	2.88	5/16	3/4
3	7-1/2	15/16	5	4-1/4	2-3/4	1-3/16	1-3/16	3.57	3.60	3.50	3/8	13/16
3-1/2	8-1/2	15/16	5-1/2	4-13/16	2-13/16	1-1/4	1/4	4.07	4.10	4.00	3/8	
4	9	15/16	6-3/16	5-5/16	3	1-5/16	1-5/16	4.57	4.60	4.50	7/16	
5	10	15/16	7-5/16	6-7/16	3-1/2	1-7/16	1-7/16	5.66	5.69	5.56	7/16	
6	11	1	8-1/2	7-9/16	3-1/2	1-9/16	1-9/16	6.72	6.75	6.63	1/2	
8	13-1/2	1-1/8	10-5/8	9-11/16	4	1-3/4	1-3/4	8.72	8.75	8.63	1/2	
10	16	1-3/16	12-3/4	12	4	1-15/16	1-15/16	10.88	10.92	10.75	1/2	
12	19	1-1/4	15	14-3/8	4-1/2	2-3/16	2-3/16	12.88	12.92	12.75	1/2	
14	21	1-3/8	16-1/4	15-3/4	5	2-1/4	3-1/8	14.14	14.18	14.00	1/2	
16	23-1/2	1-7/16	18-1/2	18	5	2-1/2	3-7/16	16.16	16.19	16.00	1/2	
18	25	1-9/16	21	19-7/8	5-1/2	2-11/16	3-13/16	18.18	18.20	18.00	1/2	
20	27-1/2	1-11/16	23	22	5-11/16	2-7/8	4-1/16	20.20	20.25	20.00	1/2	
24	32	1-7/8	27-1/4	26-1/8	6	3-1/4	4-3/8	24.25	24.25	24.00	1/2	

All dimensions are in inches.

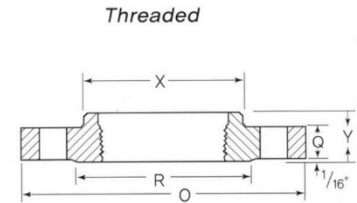
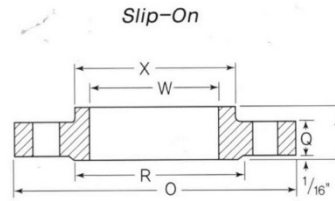
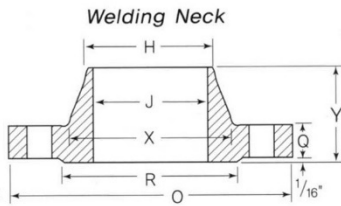
## B16.5 150# FLANGE



Nominal Pipe Size	Drilling				Length of Bolts			Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	Stud Bolts		Machine Bolts	Welding Neck	Slip-on Threaded Socket	Lap Joint	Blind
					1/16" Raised Face	Ring Joint					
1/2	2-3/8	4	1/2	5/8	2-1/4		1-3/4	2	2	2	2
3/4	2-3/4	4	1/2	5/8	2-1/4		2	2	2	2	2
1	3-1/8	4	1/2	5/8	2-1/2	3	2	2	2	2	2
1-1/4	3-1/2	4	1/2	5/8	2-1/2	3	2-1/4	4	3	3	3
1-1/2	3-7/8	4	1/2	5/8	2-3/4	3-1/4	2-1/4	5	3	3	4
2	4-3/4	4	5/8	3/4	3	3-1/2	2-3/4	9	5	5	4
2-1/2	5-1/2	4	5/8	3/4	3-1/4	3-3/4	3	11	7	7	11
3	6	4	5/8	3/4	3-1/2	4	3	14	8	8	14
3-1/2	7	8	5/8	3/4	3-1/2	4	3	15	11	11	13
4	7-1/2	8	5/8	3/4	3-1/2	4	3	16	13	13	19
5	8-1/2	8	3/4	7/8	3-3/4	4-1/4	3-1/4	21	15	15	21
6	9-1/2	8	3/4	7/8	3-3/4	4-1/4	3-1/4	25	19	19	28
8	11-3/4	8	3/4	7/8	4	4-1/2	3-1/2	40	30	30	48
10	14-1/4	12	7/8	1	4-1/2	5	3-3/4	56	42	42	70
12	17	12	7/8	1	4-1/2	5	4	86	64	64	105
14	18-3/4	12	1	1-1/8	5	5-1/2	4-1/4	111	85	99	135
16	21-1/4	16	1	1-1/8	5-1/4	5-3/4	4-1/2	141	94	128	176
18	22-3/4	16	1-1/8	1-1/4	5-3/4	6-1/4	4-3/4	153	120	146	214
20	25	20	1-1/8	1-1/4	6	6-1/2	5-1/4	188	155	185	284
24	29-1/2	20	1-1/4	1-3/8	6-3/4	7-1/4	5-3/4	270	210	260	398

All dimensions are in inches.

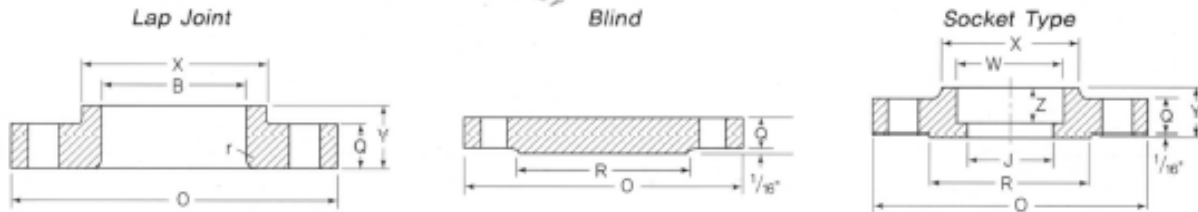
## B16.5 300# FLANGE



Nominal Pipe Size	Outside Diameter of Flange O	Thickness of Flange Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H	Radius of Fillet r	Depth of Socket Z
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket W	Lap Joint B			
1/2	3-3/4	9/16	1-3/8	1-1/2	2-1/16	7/8	7/8	.88	.90	.84	1/8	3/8
3/4	4-5/8	5/8	1-11/16	1-7/8	2-1/4	1	1	1.09	1.11	1.05	1/8	7/16
1	4-7/8	11/16	2	2-1/8	2-7/16	1-1/16	1-1/16	1.36	1.38	1.32	1/8	1/2
1-1/4	5-1/4	3/4	2-1/2	2-1/2	2-9/16	1-1/16	1-1/16	1.70	1.72	1.66	3/16	9/16
1-1/2	6-1/8	13/16	2-7/8	2-3/4	2-11/16	1-3/16	1-3/16	1.95	1.97	1.90	1/4	5/8
2	6-1/2	7/8	3-5/8	3-5/16	2-3/4	1-5/16	1-5/16	2.44	2.46	2.38	5/16	11/16
2-1/2	7-1/2	1	4-1/8	3-15/16	3	1-1/2	1-1/2	2.94	2.97	2.88	5/16	3/4
3	8-1/4	1-1/8	5	4-5/8	3-1/8	1-11/16	1-11/16	3.57	3.60	3.50	3/8	13/16
3-1/2	9	1-3/16	5-1/2	5-1/4	3-3/16	1-3/4	1-3/4	4.07	4.10	4.00	3/8	
4	10	1-1/4	6-3/16	5-3/4	3-3/8	1-7/8	1-7/8	4.57	4.60	4.50	7/16	
5	11	1-3/8	7-5/16	7	3-7/8	2	2	5.66	5.69	5.56	7/16	
6	12-1/2	1-7/16	8-1/2	8-1/8	3-7/8	2-1/16	2-1/16	6.72	6.75	6.63	1/2	
8	15	1-5/8	10-5/8	10-1/4	4-3/8	2-7/16	2-7/16	8.72	8.75	8.63	1/2	
10	17-1/2	1-7/8	12-3/4	12-5/8	4-5/8	2-5/8	3-3/4	10.88	10.92	10.75	1/2	
12	20-1/2	2	15	14-3/4	5-1/8	2-7/8	4	12.88	12.92	12.75	1/2	
14	23	2-1/8	16-1/4	16-3/4	5-5/8	3	4-3/8	14.14	14.18	14.00	1/2	
16	25-1/2	2-1/4	18-1/2	19	5-3/4	3-1/4	4-3/4	16.16	16.19	16.00	1/2	
18	28	2-3/8	21	21	6-1/4	3-1/2	5-1/8	18.18	18.20	18.00	1/2	
20	30-1/2	2-1/2	23	23-1/8	6-3/8	3-3/4	5-1/2	20.20	20.25	20.00	1/2	
24	36	2-3/4	27-1/4	27-5/8	6-5/8	4-3/16	6	24.25	24.25	24.00	1/2	

All dimensions are in inches.

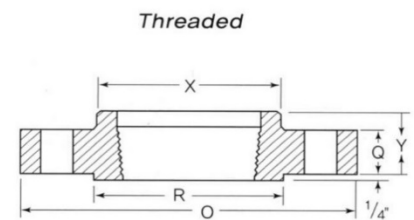
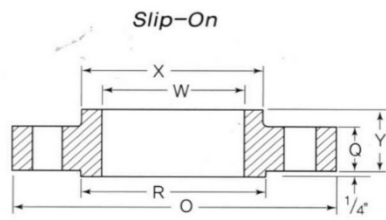
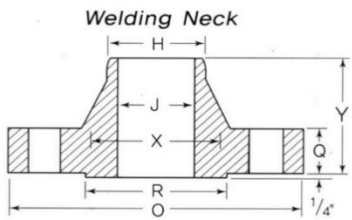
## B16.5 300# FLANGE



Nominal Pipe Size	Drilling				Length of Bolts			Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	Stud Bolts		Machine Bolts	Welding Neck	Slip-on Threaded Socket	Lap Joint	Blind
					1/16" Raised Face	Ring Joint	1/16" R. F.				
1/2	2-5/8	4	1/2	5/8	2-1/2	3	2	4	3	3	2
3/4	3-1/4	4	5/8	3/4	2-3/4	3-1/4	2-1/2	4	3	3	3
1	3-1/2	4	5/8	3/4	3	3-1/2	2-1/2	5	3	3	4
1-1/4	3-7/8	4	5/8	3/4	3	3-1/2	2-3/4	6	4	4	6
1-1/2	4-1/2	4	3/4	7/8	3-1/2	4	3	9	6	6	7
2	5	8	5/8	3/4	3-1/4	4	3	10	7	7	8
2-1/2	5-7/8	8	3/4	7/8	3-3/4	4-1/2	3-1/4	13	10	10	15
3	6-5/8	8	3/4	7/8	4	4-3/4	3-1/2	16	13	13	16
3-1/2	7-1/4	8	3/4	7/8	4-1/4	5	3-3/4	19	17	17	20
4	7-7/8	8	3/4	7/8	4-1/4	5	3-3/4	26	22	22	27
5	9-1/4	8	3/4	7/8	4-1/2	5-1/4	4	35	28	28	41
6	10-5/8	12	3/4	7/8	4-3/4	5-1/2	4-1/4	45	39	39	50
8	13	12	7/8	1	5-1/4	6	4-3/4	70	58	58	80
10	15-1/4	16	1	1-1/8	6	6-3/4	5-1/4	94	82	91	120
12	17-3/4	16	1-1/8	1-1/4	6-1/2	7-1/4	5-3/4	140	115	139	184
14	20-1/4	20	1-1/8	1-1/4	6-3/4	7-1/2	6	190	163	189	249
16	22-1/2	20	1-1/4	1-3/8	7-1/4	8	6-1/2	250	220	240	324
18	24-3/4	24	1-1/4	1-3/8	7-1/2	8-1/4	6-3/4	305	280	305	416
20	27	24	1-1/4	1-3/8	8	8-3/4	7	380	325	375	516
24	32	24	1-1/2	1-5/8	9	10	7-3/4	540	492	530	763

All dimensions are in inches.

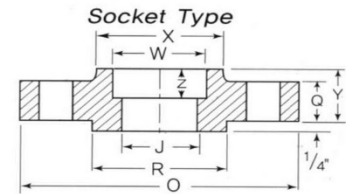
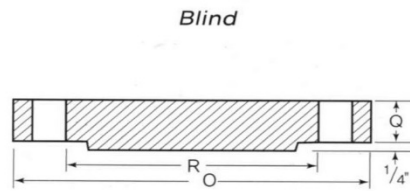
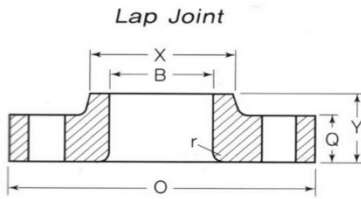
## B16.5 600# FLANGE



Nominal Pipe Size	Outside Diameter of Flange O	Thickness of Flange Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H	Radius of Fillet r	Depth of Socket Z
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket W	Lap Joint B			
1/2	3-3/4	9/16	1-3/8	1-1/2	2-1/16	7/8	7/8	.88	.90	.84	1/8	3/8
3/4	4-5/8	5/8	1-11/16	1-7/8	2-1/4	1	1	1.09	1.11	1.05	1/8	7/16
1	4-7/8	11/16	2	2-1/8	2-7/16	1-1/16	1-1/16	1.36	1.38	1.32	1/8	1/2
1-1/4	5-1/4	13/16	2-1/2	2-1/2	2-5/8	1-1/8	1-1/8	1.70	1.72	1.66	3/16	9/16
1-1/2	6-1/8	7/8	2-7/8	2-3/4	2-3/4	1-1/4	1-1/4	1.95	1.97	1.90	1/4	5/8
2	6-1/2	1	3-5/8	3-5/16	2-7/8	1-7/16	1-7/16	2.44	2.46	2.38	5/16	11/16
2-1/2	7-1/2	1-1/8	4-1/8	3-15/16	3-1/8	1-5/8	1-5/8	2.94	2.97	2.88	5/16	3/4
3	8-1/4	1-1/4	5	4-5/8	3-1/4	1-13/16	1-13/16	3.57	3.60	3.50	3/8	13/16
3-1/2	9	1-3/8	5-1/2	5-1/4	3-3/8	1-15/16	1-15/16	4.07	4.10	4.00	3/8	7/8
4	10-3/4	1-1/2	6-3/16	6	4	2-1/8	2-1/8	4.57	4.60	4.50	7/16	
5	13	1-3/4	7-5/16	7-7/16	4-1/2	2-3/8	2-3/8	5.66	5.69	5.56	7/16	
6	14	1-7/8	8-1/2	8-3/4	4-5/8	2-5/8	2-5/8	6.72	6.75	6.63	1/2	
8	16-1/2	2-3/16	10-5/8	10-3/4	5-1/4	3	3	8.72	8.75	8.63	1/2	
10	20	2-1/2	12-3/4	13-1/2	6	3-3/8	4-3/8	10.88	10.92	10.75	1/2	
12	22	2-5/8	15	15-3/4	6-1/8	3-5/8	4-5/8	12.88	12.92	12.75	1/2	
14	23-3/4	2-3/4	16-1/4	17	6-1/2	3-11/16	5	14.14	14.18	14.00	1/2	
16	27	3	18-1/2	19-1-2	7	4-3/16	5-1/2	16.16	16.19	16.00	1/2	
18	29-1/4	3-1/4	21	21-1/2	7-1/4	4-5/8	6	18.18	18.20	18.00	1/2	
20	32	3-1/2	23	24	7-1/2	5	6-1/2	20.20	20.25	20.00	1/2	
24	37	4	27-1/4	28-1/4	8	5-1/2	7-1/4	24.25	24.25	24.00	1/2	

All dimensions are in inches.

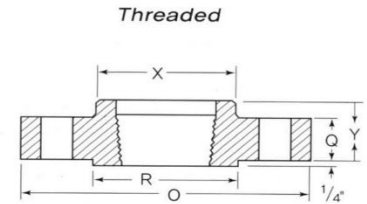
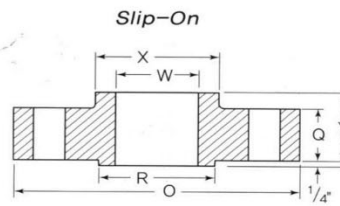
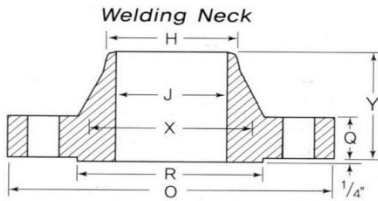
## B16.5 600# FLANGE



Nominal Pipe Size	Drilling				Length of Bolts		Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	1/4" Raised Face	Ring Joint	Welding Neck	Slip-on Threaded Socket	Lap Joint	Blind
1/2	2-5/8	4	1/2	5/8	3	3	4	3	3	2
3/4	3-1/4	4	5/8	3/4	3-1/4	3-1/4	6	3	3	3
1	3-1/2	4	5/8	3/4	3-1/2	3-1/2	6	4	4	4
1-1/4	3-7/8	4	5/8	3/4	3-3/4	3-3/4	8	6	6	6
1-1/2	4-1/2	4	3/4	7/8	4	4	10	7	7	8
2	5	8	5/8	3/4	4	4-1/4	12	9	9	10
2-1/2	5-7/8	8	3/4	7/8	4-1/2	4-3/4	18	13	13	15
3	6-5/8	8	3/4	7/8	4-3/4	5	20	16	16	20
3-1/2	7-1/4	8	7/8	1	5-1/4	5-1/2	25	21	21	29
4	8-1/2	8	7/8	1	5-1/2	5-3/4	41	36	36	41
5	10-1/2	8	1	1-1/8	6-1/4	6-1/2	66	63	63	68
6	11-1/2	12	1	1-1/8	6-1/2	6-3/4	77	83	83	86
8	13-3/4	12	1-1/8	1-1/4	7-1/2	7-3/4	111	114	114	140
10	17	16	1-1/4	1-3/8	8-1/4	8-1/2	180	170	195	230
12	19-1/4	20	1-1/4	1-3/8	8-1/2	8-3/4	226	210	240	295
14	20-3/4	20	1-3/8	1-1/2	9	9-1/4	334	264	290	378
16	23-3/4	20	1-1/2	1-5/8	9-3/4	10	462	366	400	527
18	25-3/4	20	1-5/8	1-3/4	10-1/2	10-3/4	531	476	469	665
20	28-1/2	24	1-5/8	1-3/4	11-1/4	11-1/2	678	612	604	855
24	33	24	1-7/8	2	12-3/4	13-1/4	959	876	866	1175

All dimensions are in inches.

## B16.5 900# FLANGE

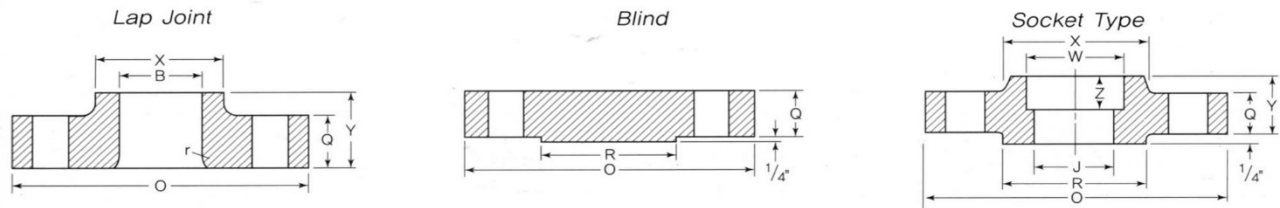


Nominal Pipe Size	Outside Diameter of Flange O	Flange Thickness* Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H	Radius of Fillet r	Depth of Socket Z
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket Welding W	Lap Joint B			
1/2	4-3/4	7/8	1-3/8	1-1/2	2-3/8	1-1/4	1-1/4	.88	.90	.84	1/8	3/8
3/4	5-1/8	1	1-11/16	1-3/4	2-3/4	1-3/8	1-3/8	1.09	1.11	1.05	1/8	7/16
1	5-7/8	1-1/8	2	2-1/16	2-7/8	1-5/8	1-5/8	1.36	1.38	1.32	1/8	1/2
1-1/4	6-1/4	1-1/8	2-1/2	2-1/2	2-7/8	1-5/8	1-5/8	1.70	1.72	1.66	3/16	9/16
1-1/2	7	1-1/4	2-7/8	2-3/4	3-1/4	1-3/4	1-3/4	1.95	1.97	1.90	1/4	5/8
2	8-1/2	1-1/2	3-5/8	4-1/8	4	2-1/4	2-1/4	2.44	2.46	2.38	5/16	11/16
2-1/2	9-5/8	1-5/8	4-1/8	4-7/8	4-1/8	2-1/2	2-1/2	2.94	2.97	2.88	5/16	3/4
3	9-1/2	1-1/2	5	5	4	2-1/8	2-1/8	3.57	3.60	3.50	3/8	
4	11-1/2	1-3/4	6-3/16	6-1/4	4-1/2	2-3/4	2-3/4	4.57	4.60	4.50	7/16	
5	13-3/4	2	7-5/16	7-1/2	5	3-1/8	3-1/8	5.66	5.69	5.56	7/16	
6	15	2-3/16	8-1/2	9-1/4	5-1/2	3-3/8	3-3/8	6.72	6.75	6.63	1/2	
8	18-1/2	2-1/2	10-5/8	11-3/4	6-3/8	4	4-1/2	8.72	8.75	8.63	1/2	
10	21-1/2	2-3/4	12-3/4	14-1/2	7-1/4	4-1/4	5	10.88	10.92	10.75	1/2	
12	24	3-1/8	15	16-1/2	7-7/8	4-5/8	5-5/8	12.88	12.92	12.75	1/2	
14	25-1/4	3-3/8	16-1/4	17-3/4	8-3/8	5-1/8	6-1/8	14.14	14.18	14.00	1/2	
16	27-3/4	3-1/2	18-1/2	20	8-1/2	5-1/4	6-1/2	16.16	16.19	16.00	1/2	
18	31	4	21	22-1/4	9	6	7-1/2	18.18	18.20	18.00	1/2	
20	33-3/4	4-1/4	23	24-1/2	9-3/4	6-1/4	8-1/4	20.20	20.25	20.00	1/2	
24	41	5-1/2	27-1/4	29-1/2	11-1/2	8	10-1/2	24.25	24.25	24.00	1/2	

\* Dimensions do not include 1/4" raised face

All dimensions are in inches.

## B16.5 900# FLANGE

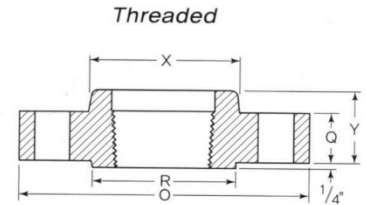
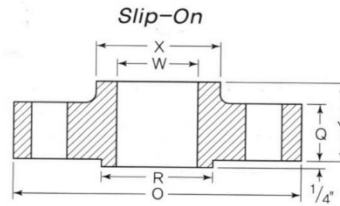
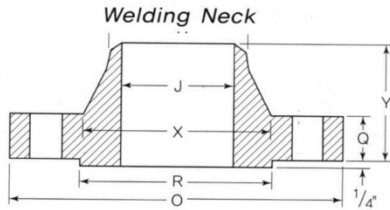


Nominal Pipe Size	Drilling				Length of Studs		Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	1/4" Raised Face	Ring Joint	Welding Neck	Slip-on Threaded Socket	Lap Joint	Blind
1/2	3-1/4	4	3/4	7/8	4	4	9	9	9	4
3/4	3-1/2	4	3/4	7/8	4-1/4	4-1/4	7	9	9	6
1	4	4	7/8	1	4-3/4	4-3/4	9	9	9	9
1-1/4	4-3/8	4	7/8	1	4-3/4	4-3/4	10	10	10	10
1-1/2	4-7/8	4	1	1-1/8	5-1/4	5-1/4	14	14	14	14
2	6-1/2	8	7/8	1	5-1/2	5-3/4	25	25	25	25
2-1/2	7-1/2	8	1	1-1/8	6	6-1/4	36	36	36	35
3	8	8	1-1/8	1-1/4	6-3/4	7	48	48	48	48
4	9-1/2	8	1-1/4	1-3/8	7-1/2	7-3/4	73	73	73	73
5	11-1/2	8	1-1/2	1-5/8	9-1/2	9-3/4	132	132	132	142
6	12-1/2	12	1-3/8	1-1/2	10	10-1/4	164	164	164	159
8	15-1/2	12	1-5/8	1-3/4	11-1/4	11-3/4	273	258	258	302
10	19	12	1-7/8	2	13-1/4	13-1/2	454	436	485	507
12	22-1/2	16	2	2-1/8	14-3/4	15-1/4	690	667	749	775
14	25	16	2-1/4	2-3/8	16	16-3/4	940		890	975
16	27-3/4	16	2-1/2	2-5/8	17-1/2	18-1/2	1250		1150	1800
18	30-1/2	16	2-3/4	2-7/8	19-1/4	20-1/4	1625		1475	1750
20	32-3/4	16	3	3-1/8	21	22-1/4	2050		1775	2225
24	39	16	3-1/2	3-5/8	24	25-1/2	3325		2825	3625

All dimensions are in inches.



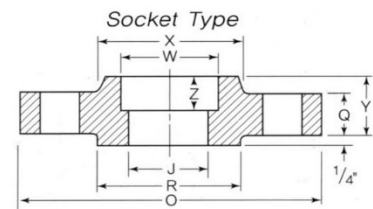
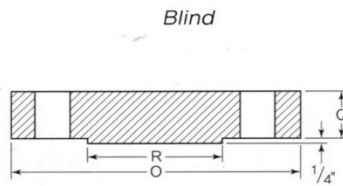
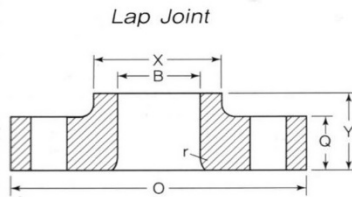
## B16.5 1500# FLANGE



Nominal Pipe Size	Outside Diameter of Flange O	Thickness of Flange Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H	Radius of Fillet r	Depth of Socket Z
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket W	Lap Joint B			
1/2	4-3/4	7/8	1-3/8	1-1/2	2-3/8	1-1/4	1-1/4	.88	.90	.84	1/8	3/8
3/4	5-1/8	1	1-11/16	1-3/4	2-3/4	1-3/8	1-3/8	1.09	1.11	1.05	1/8	7/16
1	5-7/8	1-1/8	2	2-1/16	2-7/8	1-5/8	1-5/8	1.36	1.38	1.32	1/8	1/2
1-1/4	6-1/4	1-1/8	2-1/2	2-1/2	2-7/8	1-5/8	1-5/8	1.70	1.72	1.66	3/16	9/16
1-1/2	7	1-1/4	2-7/8	2-3/4	3-1/4	1-3/4	1-3/4	1.95	1.97	1.90	1/4	5/8
2	8-1/2	1-1/2	3-5/8	4-1/8	4	2-1/4	2-1/4	2.44	2.46	2.38	5/16	11/16
2-1/2	9-5/8	1-5/8	4-1/8	4-7/8	4-1/8	2-1/2	2-1/2	2.94	2.97	2.88	5/16	3/4
3	10-1/2	1-7/8	5	5-1/4	4-5/8	2-7/8	2-7/8	3.57	3.60	3.50	3/8	
4	12-1/4	2-1/8	6-3/16	6-3/8	4-7/8	3-9/16	3-9/16	4.57	4.60	4.50	7/16	
5	14-3/4	2-7/8	7-5/16	7-3/4	6-1/8	4-1/8	4-1/8	5.66	5.69	5.56	7/16	
6	15-1/2	3-1/4	8-1/2	9	6-3/4	4-11/16	4-11/16	6.72	6.75	6.63	1/2	
8	19	3-5/8	10-5/8	11-1/2	8-3/8	5-5/8	5-5/8	8.72	8.75	8.63	1/2	
10	23	4-1/4	12-3/4	14-1/2	10	6-1/4	7	10.88	10.92	10.75	1/2	
12	26-1/2	4-7/8	15	17-3/4	11-1/8	7-1/8	8-5/8	12.88	12.92	12.75	1/2	
14	29-1/2	5-1/4	16-1/4	19-1/2	11-3/4		9-1/2	14.14	14.18	14.00	1/2	
16	32-1/2	5-3/4	18-1/2	21-3/4	12-1/4		10-1/4	16.16	16.19	16.00	1/2	
18	36	6-3/8	21	23-1/2	12-7/8		10-7/8	18.18	18.20	18.00	1/2	
20	38-3/4	7	23	25-1/4	14		11-1/2	20.20	20.25	20.00	1/2	
24	46	8	27-1/4	30	16		13	24.25	24.25	24.00	1/2	

All dimensions are in inches.

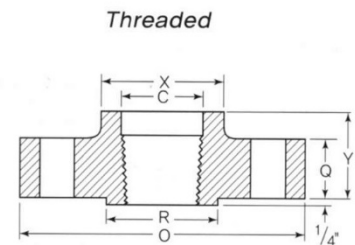
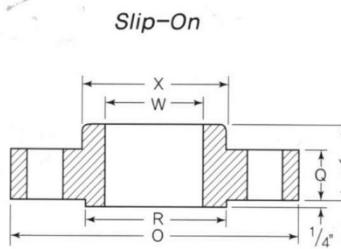
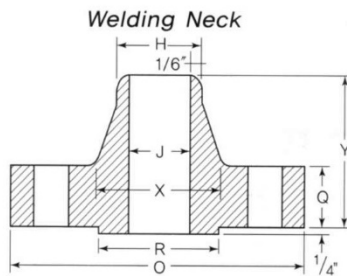
## B16.5 1500# FLANGE



Nominal Pipe Size	Drilling				Length of Studs		Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	1/4" Raised Face	Ring Joint	Welding Neck	Slip-on Threaded Socket	Lap Joint	Blind
1/2	3-1/4	4	3/4	7/8	4	4	9	9	9	4
3/4	3-1/2	4	3/4	7/8	4-1/4	4-1/4	7	9	9	6
1	4	4	7/8	1	4-3/4	4-3/4	9	9	9	9
1-1/4	4-3/8	4	7/8	1	4-3/4	4-3/4	10	10	10	10
1-1/2	4-7/8	4	1	1-1/8	5-1/4	5-1/4	14	14	14	14
2	6-1/2	8	7/8	1	5-1/2	5-3/4	25	25	25	25
2-1/2	7-1/2	8	1	1-1/8	6	6-1/4	36	36	36	35
3	8	8	1-1/8	1-1/4	6-3/4	7	48	48	48	48
4	9-1/2	8	1-1/4	1-3/8	7-1/2	7-3/4	73	73	73	73
5	11-1/2	8	1-1/2	1-5/8	9-1/2	9-3/4	132	132	132	142
6	12-1/2	12	1-3/8	1-1/2	10	10-1/4	164	164	164	159
8	15-1/2	12	1-5/8	1-3/4	11-1/4	11-3/4	273	258	258	302
10	19	12	1-7/8	2	13-1/4	13-1/2	454	436	485	507
12	22-1/2	16	2	2-1/8	14-3/4	15-1/4	690	667	749	775
14	25	16	2-1/4	2-3/8	16	16-3/4	940		890	975
16	27-3/4	16	2-1/2	2-5/8	17-1/2	18-1/2	1250		1150	1800
18	30-1/2	16	2-3/4	2-7/8	19-1/4	20-1/4	1625		1475	1750
20	32-3/4	16	3	3-1/8	21	22-1/4	2050		1775	2225
24	39	16	3-1/2	3-5/8	24	25-1/2	3325		2825	3625

All dimensions are in inches.

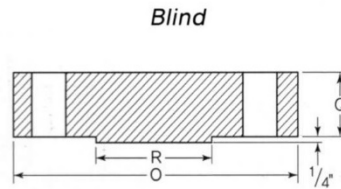
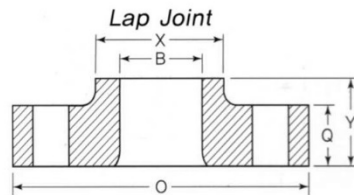
## B16.5 2500# FLANGE



Nominal Pipe Size	Outside Diameter of Flange O	Thickness of Flange Q	Diameter of Raised Face R	Diameter of Hub at Base X	Length Thru Hub			Diameter or Bore		Diameter of Hub at Bevel H
					Welding Neck Y	Slip-On, Threaded Socket Y	Lap Joint Y	Slip-On, Socket W	Lap Joint B	
1/2	5-1/4	1-3/16	1-3/8	1-11/16	2-7/8	1-9/16	1-9/16	.88	.90	.84
3/4	5-1/2	1-1/4	1-11/16	2	3-1/8	1-11/16	1-11/16	1.09	1.11	1.05
1	6-1/4	1-3/8	2	2-1/4	3-1/2	1-7/8	1-7/8	1.36	1.38	1.32
1-1/4	7-1/4	1-1/2	2-1/2	2-7/8	3-3/4	2-1/16	2-1/16	1.70	1.72	1.66
1-1/2	8	1-3/4	2-7/8	3-1/8	4-3/8	2-3/8	2-3/8	1.95	1.97	1.90
2	9-1/4	2	3-5/8	3-3/4	5	2-3/4	2-3/4	2.44	2.46	2.38
2-1/2	10-1/2	2-1/4	4-1/8	4-1/2	5-5/8	3-1/8	3-1/8	2.94	2.97	2.88
3	12	2-5/8	5	5-1/4	6-5/8	3-5/8	3-5/8	3.57	3.60	3.50
4	14	3	6-3/16	6-1/2	7-1/2	4-1/4	4-1/4	4.57	4.60	4.50
5	16-1/2	3-5/8	7-5/16	8	9	5-1/8	5-1/8	5.66	5.69	5.56
6	19	4-1/4	8-1/2	9-1/4	10-3/4	6	6	6.72	6.75	6.63
8	21-3/4	5	10-5/8	12	12-1/2	7	7	8.72	8.75	8.63
10	26-1/2	6-1/2	12-3/4	14-3/4	16-1/2	9	9	10.88	10.92	10.75
12	30	7-1/4	15	17-3/8	18-1/4	10	10	12.88	12.92	12.75

All dimensions are in inches.

**B16.5 2500# FLANGE**



Nominal Pipe Size	Drilling				Length of Studs		Approximate Weight in Pounds			
	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Holes	1/4" Raised Face	Ring Joint	Welding Neck	Slip-on and Threaded	Lap Joint	Blind
1/2	3-1/2	4	3/4	7/8	4-3/4	4-3/4	8	7	7	7
3/4	3-3/4	4	3/4	7/8	4-3/4	4-3/4	9	9	9	10
1	4-1/4	4	7/8	1	5-1/4	5-1/4	13	12	12	12
1-1/4	5-1/8	4	1	1-1/8	5-3/4	6	20	18	18	18
1-1/2	5-3/4	4	1-1/8	1-1/4	6-1/2	6-3/4	28	25	25	25
2	6-3/4	8	1	1-1/8	6-3/4	7	42	38	38	39
2-1/2	7-3/4	8	1-1/8	1-1/4	7-1/2	7-3/4	52	52	52	56
3	9	8	1-1/4	1-3/8	8-1/2	8-3/4	94	83	83	86
4	10-3/4	8	1-1/2	1-5/8	9-3/4	10-1/4	146	127	127	133
5	12-3/4	8	1-3/4	1-7/8	11-1/2	12-1/4	244	210	210	223
6	14-1/2	8	2	2-1/8	13-1/2	14	378	323	323	345
8	17-1/4	12	2	2-1/8	15	15-1/2	576	485	485	533
10	21-1/4	12	2-1/2	2-5/8	19	20	1068	925	925	1025
12	24-3/8	12	2-3/4	2-7/8	21	22	1608	1300	1300	1464

All dimensions are in inches.

# KS MANUFACTURING ENTERPRISES LTD.

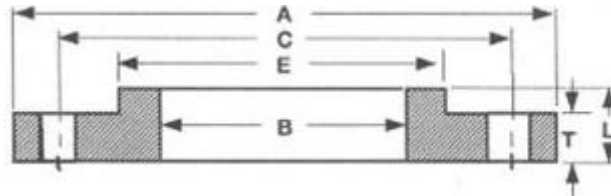
5203 - 76TH AVE  
EDMONTON, AB  
T6B 0A7

## DIMENSIONS OF WELD NECK FLANGE BORED

Nominal Pipe Size	Outside Diame ter	Nominal Bore Diameter														
		Sch. 5S	Sch. 10S	Sch. 10	Sch. 20	Sch. 30	Sch. 40S (STD)	Sch. 40	Sch. 60S	Sch. 80S (XH)	Sch. 80	Sch. 100	Sch. 120	Sch. 140	Sch. 160	XX Strong
1/2	.840	.710	.674	-	-	-	.622	.622	-	.546	.546	-	-	-	.464	.252
3/4	1.050	.920	.884	-	-	-	.824	.824	-	.742	.742	-	-	-	.612	.434
1	1.315	1.185	1.097	-	-	-	1.049	1.049	-	.957	.957	-	-	-	.815	.599
1-1/4	1.660	1.530	1.442	-	-	-	1.380	1.380	-	1.278	1.278	-	-	-	1.160	.896
1-1/2	1.900	1.770	1.682	-	-	-	1.610	1.610	-	1.500	1.500	-	-	-	1.338	1.100
2	2.375	2.245	2.157	-	-	-	2.067	2.067	-	1.939	1.939	-	-	-	1.687	1.503
2-1/2	2.875	2.709	2.635	-	-	-	2.469	2.469	-	2.323	2.323	-	-	-	2.125	1.771
3	3.500	3.334	3.260	-	-	-	3.068	3.068	-	2.900	2.900	-	-	-	2.624	2.300
3-1/2	4.000	3.834	3.760	-	-	-	3.548	3.548	-	3.364	3.364	-	-	-	-	-
4	4.500	4.334	4.260	-	-	-	4.026	4.026	-	3.826	3.826	-	3.624	-	3.438	3.152
5	5.563	5.345	5.295	-	-	-	5.047	5.047	-	4.813	4.813	-	4.563	-	4.313	4.063
6	6.625	6.407	6.357	-	-	-	6.065	6.065	-	5.761	5.761	-	5.501	-	5.187	4.897
8	8.625	8.407	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	10.482	10.420	-	10.250	10.136	10.020	10.020	9.750	9.750	9.564	9.312	9.062	8.750	8.500	-
12	12.750	12.438	12.390	-	12.250	12.090	12.000	11.938	11.626	11.750	11.374	11.062	10.750	10.500	10.126	-
14	14.000	13.688	13.625	13.500	13.375	13.250	13.250	13.124	12.812	13.000	12.500	12.124	11.814	11.500	11.188	-
16	16.000	15.670	15.625	15.500	15.375	15.150	15.250	15.000	14.688	15.000	14.312	13.938	13.564	13.124	12.812	-
18	18.000	17.670	17.625	17.500	17.375	17.124	17.250	16.876	16.500	17.000	16.124	15.688	15.250	14.876	14.438	-
20	20.000	19.625	19.564	19.500	19.250	19.000	19.250	18.814	18.376	19.000	17.938	17.438	17.000	16.500	16.062	-
24	24.000	23.564	23.500	23.500	23.250	22.876	23.250	22.624	22.062	23.000	21.562	20.938	20.376	19.876	19.312	-

All dimensions are in inches.

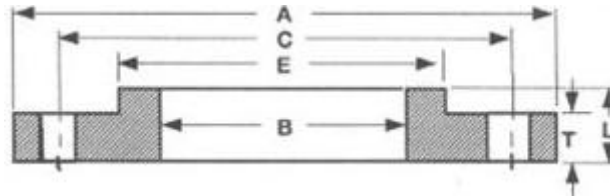
## CLASS 125LW SO FLANGES



Class 125LW (175-150 psi\*)

Nom Size	OD	Thickness	Dia at Base	Bore	LTH	Drilling				Weight
						Bolt Circle	Bolt Length	Hole Dia	# of Holes	
	A	T	E	B	L	C				
4	9	0.5	5.312	4.57	0.875	7.5	2.75	0.75	8	7
5	10	0.562	6.438	5.66	1.25	8.5	3.25	0.875	8	9
6	11	0.562	7.562	6.72	1.25	9.5	3.25	0.875	8	11
8	13.5	0.562	9.688	8.72	1.25	11.75	3.25	0.875	8	15
10	16	0.688	12	10.88	1.25	14.25	3.75	1	12	22
12	19	0.688	14.375	12.88	1.25	17	3.75	1	12	33
14	21	0.75	15.75	14.19	1.25	18.75	4	1.125	12	43
16	23.5	0.75	18	16.19	1.25	21.25	4	1.125	16	52
18	25	0.75	19.875	18.19	1.25	22.75	4.25	1.25	16	52
20	27.5	0.75	22	20.19	1.25	25	4.25	1.25	20	61
22	29.5	1	24	22.19	1.75	27.25	5	1.375	20	92
24	32	1	26.125	24.19	1.75	29.5	5	1.375	20	105
26	34.25	1	28.5	26.19	1.75	31.75	5	1.375	24	119
28	36.5	1	30.5	28.19	1.75	34	5	1.375	28	130
30	38.75	1	32.5	30.19	1.75	36	5	1.375	28	144
32	41.75	1.125	34.75	32.19	1.75	38.5	6	1.625	28	182

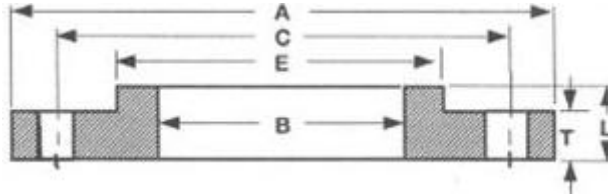
**CLASS 125LW SLIP-ON FLANGES**



Class 125LW (175-150 psi\*)

Nom Size	OD	Thickness	Dia at Base	Bore	LTH	Drilling				Weight
						Bolt Circle	Bolt Length	Hole Dia	# of Holes	
	A	T	E	B	L	C				
34	43.75	1.125	36.75	34.19	1.75	40.5	6	1.625	32	191
36	46	1.125	38.75	36.19	1.75	42.75	6	1.625	32	207
38	48.75	1.125	40.75	38.19	1.75	45.25	6	1.625	32	237
40	50.75	1.125	43	40.19	1.75	47.25	6	1.625	36	249
42	53	1.25	45	42.19	1.75	49.5	6.25	1.625	36	287
44	55.25	1.25	47	44.19	2.25	51.75	6.25	1.625	40	334
46	57.25	1.25	49	46.19	2.25	53.75	6.25	1.625	40	348
48	59.5	1.375	51	48.19	2.5	56	6.5	1.625	44	407
50	61.75	1.375	53	50.19	2.5	58.25	7	1.875	44	421
52	64	1.375	55	52.19	2.5	60.5	7	1.875	44	448
54	66.25	1.375	57	54.19	2.5	62.75	7	1.875	44	475
60	73	1.5	63	60.19	2.75	69.25	7.25	1.875	52	605
66	80	1.5	69	66.19	2.75	76	7.25	1.875	52	718
72	86.5	1.5	75	72.19	2.75	82.5	7.25	1.875	60	803
78	93	1.75	81.25	78.19	3	89	8.25	2.125	64	1010
84	99.75	1.75	87.5	84.19	3	95.5	8.25	2.125	64	1160
90	106.5	2	93.75	90.19	3.25	102	9.5	2.438	68	1430
96	113.25	2	100	96.19	3.25	108.5	9.5	2.438	68	1618

## CLASS 125 SO FLANGES

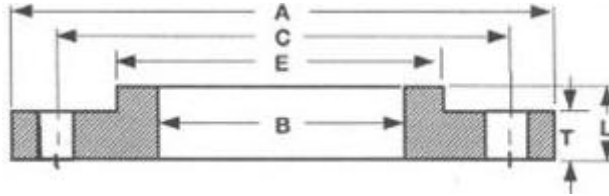


Class 125 SO (275 psi\*)

Nom Size	OD	T	Dia at Base	Bore	LTH	Drilling				
						Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weight
	A	T	E	B	L	C				
4	9	0.938	5.312	4.57	1.312	7.5	3.75	0.75	8	13
5	10	0.938	6.438	5.66	1.438	8.5	4	0.875	8	14
6	11	1	7.562	6.72	1.562	9.5	4	0.875	8	17
8	13.5	1.125	9.688	8.72	1.75	11.75	4.5	0.875	8	28
10	16	1.188	12	10.88	1.938	14.25	5	1	12	37
12	19	1.25	14.375	12.88	2.188	17	5	1	12	59
14	21	1.375	15.75	14.19	2.25	18.75	5.5	1.125	12	78
16	23.5	1.438	18	16.19	2.5	21.25	5.75	1.125	16	101
18	25	1.562	19.875	18.19	2.688	22.75	6	1.25	16	110
20	27.5	1.688	22	20.19	2.875	25	6.5	1.25	20	139
22	29.5	1.812	24	22.19	3.125	27.25	6.75	1.375	20	162
24	32	1.875	26.125	24.19	3.25	29.5	7	1.375	20	197
26	34.25	2	28.5	26.19	3.375	31.75	7.25	1.375	24	235
28	36.5	2.062	30.75	28.19	3.438	34	7.5	1.375	28	269
30	38.75	2.125	32.75	30.19	3.5	36	7.75	1.375	28	303



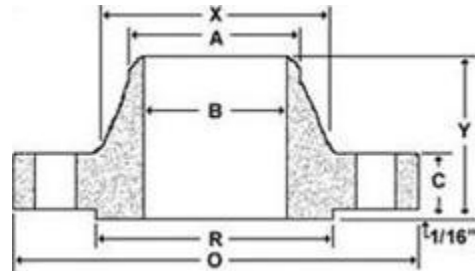
## CLASS 125 SO FLANGES



Class 125 SO (275 psi\*)

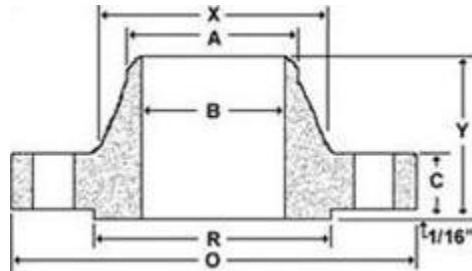
Nom Size						Drilling				
	OD		Dia at Base	Bore	LTH	Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weight
	A	T	E	B	L	C				
32	41.75	2.25	35	32.19	3.625	38.5	8.5	1.625	28	375
34	43.75	2.312	37	34.19	3.688	40.5	8.5	1.625	32	401
36	46	2.375	39.25	36.19	3.75	42.75	8.75	1.625	32	452
38	48.75	2.375	41.75	38.19	3.75	45.25	8.75	1.625	32	528
40	50.75	2.5	43.75	40.19	3.875	47.25	9	1.625	36	573
42	53	2.625	46	42.19	4	49.5	9.25	1.625	36	648
44	55.25	2.625	48	44.19	4	51.75	9.25	1.625	40	688
46	57.25	2.688	50	46.19	4.062	53.75	9.25	1.625	40	733
48	59.5	2.75	52.25	48.19	4.125	56	9.5	1.625	44	799
50	61.75	2.75	54.25	50.19	4.125	58.25	10	1.875	44	827
52	64	2.875	56.5	52.19	4.25	60.5	10.25	1.875	44	922
54	66.25	3	58.75	54.19	4.375	62.75	10.5	1.875	44	1024
60	73	3.125	65.25	60.19	4.5	69.25	11	1.875	52	1253
66	80	3.375	71.5	66.19	4.875	76	11.5	1.875	52	1623
72	86.5	3.5	78.5	72.19	5	82.5	11.75	1.875	60	1922
78	93	3.875	84.5	78.19	5.375	89	13	2.125	64	2279
84	99.75	3.875	90.5	84.19	5.375	95.5	13	2.125	64	2586
90	106.5	4.25	96.75	90.19	5.75	102	14.25	2.438	68	3061
96	113.25	4.25	102.75	96.19	5.75	108.5	14.25	2.438	68	3432

***CLASS 125WN FLANGES***



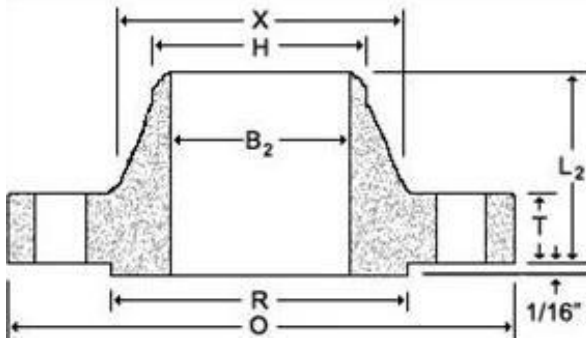
Nom Size	OD	Thickness	OD of RF	Dia at Base	Bore	Dia Bevel	LTH	Drilling				Weight
								Bolt Circle	Bolt Length	Hole Dia	# of Holes	
	O	C	R	X	B	A	Y					
6	11	1	8.5	7.56		6.63	3.5	9.5	4	0.88	8	24
8	13.5	1.13	10.63	9.69		8.63	4	11.75	4.5	0.88	8	39
10	16	1.19	12.75	12		10.75	4	14.25	5	1	12	52
12	19	1.25	15	14.38		12.75	4.5	17	5	1	12	80
14	21	1.38	16.25	15.75		14	5	18.75	5.5	1.13	12	110
16	23.5	1.44	18.5	18		16	5	21.25	5.75	1.13	16	140
18	25	1.56	21	19.88		18	5.5	22.75	6	1.25	16	150
20	27.5	1.69	23	22		20	5.69	25	6.5	1.25	20	180
22	29.5	1.81	25.25	24.25		22	5.88	27.25	6.75	1.38	20	225
24	32	1.88	27.25	26.13		24	6	29.5	7	1.38	20	255
26	34.25	2	29.5	28.5		26	5	31.75	7.25	1.38	24	265
28	36.5	2.06	31.5	30.75		28	5.06	34	7.5	1.38	28	295
30	38.75	2.13	33.75	32.75		30	5.13	36	7.75	1.38	28	340
32	41.75	2.25	36	35		32	5.25	38.5	8.5	1.63	28	410
34	43.75	2.31	38	37		34	5.31	40.5	8.5	1.63	32	440

***CLASS 125WN FLANGES***

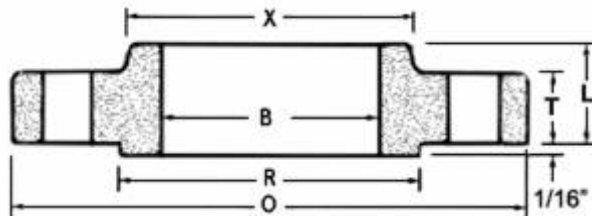


Nom Size	OD	Thickness	OD of RF	Dia at Base	Bore	Dia Bevel	LTH	Drilling				Weight
								Bolt Circle	Bolt Length	Hole Dia	# of Holes	
	O	C	R	X	B	A	Y					
36	46	2.38	40.25	39.25		36	5.38	42.75	8.75	1.63	32	495
38	48.75	2.38	42.25	41.75		38	5.38	45.25	8.75	1.63	32	570
40	50.75	2.5	44.25	43.75		40	5.5	47.25	9	1.63	36	620
42	53	2.63	47	46		42	5.63	49.5	9.25	1.63	36	710
44	55.25	2.63	49	48		44	5.63	51.75	9.25	1.63	40	750
46	57.25	2.69	51	50		46	5.68	53.75	9.25	1.63	40	800
48	59.5	2.75	53.5	52.25		48	5.75	56	9.5	1.63	44	870
50	61.75	2.75	55.5	54.25		50	5.75	58.25	10	1.88	44	900
52	64	2.88	57.5	56.5		52	5.88	60.5	10.25	1.88	44	1000
54	66.25	3	59.75	58.75		54	6	62.75	10.5	1.88	44	1100
60	73	3.13	66	65.25		60	6.13	69.25	11	1.88	52	1350
66	80	3.38	-	71.5		66	6.38	76	11.5	1.88	52	1775
72	86.5	3.5	-	78.5		72	6.5	82.5	11.75	1.88	60	2100
84	99.75	3.88	-	90.5		84	6.88	95.5	13	2.13	64	2825
96	113.25	4.25	-	102.75		96	7.25	108.5	14.25	2.44	68	3800

## CLASS 250 FLANGES (300 PSI\*)



Weld Neck

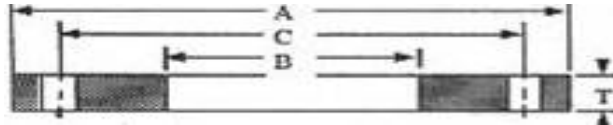


Slip On

Nom. Size	OD	Thickness	OD of RF	Dia at Base	Bore		LTH		Drilling				Weights		
					WN	SO	Weld Neck	SO	Bolt Circle	Bolt Length	Hole Dia	# Holes	Weld Neck	Slip-on	Blind
					B <sub>2</sub>	B	L <sub>2</sub>	L							
26	38.25	2.81	32.44	30.5	26.25	5.81	4.75	34.5	10	1.88	28	534	531	916	
28	40.75	2.94	34.94	33	28.25	5.94	5	37	10.25	1.88	28	629	637	1095	
30	43	3	37.19	35.25	30.25	6	5	39.25	10.5	1.88	28	702	707	1236	
32	45.25	3.12	39.44	37.5	32.25	6.12	5.12	41.5	10.75	1.88	28	793	801	1424	
34	47.5	3.25	41.44	39.5	34.25	6.25	5.25	43.5	11.25	1.88	28	882	889	1649	
36	50	3.38	43.69	41.5	36.25	6.38	5.38	46	12	2.13	32	969	970	1884	
38	52.25	3.44	45.69	43.5	38.25	6.44	5.5	48	12	2.13	32	1057	1062	2094	
40	54.25	3.56	47.94	45.75	40.25	6.56	5.5	50.25	12.25	2.13	36	1158	1172	2336	
42	57	3.69	50.44	47.75	42.25	6.94	5.62	52.75	12.5	2.125	36	1318	1288	2673	
44	59.25	3.75	52.69	49.75	44.25	7	5.75	55	12.75	2.13	36	1423	1397	2935	
46	61.5	3.88	54.94	51.75	46.25	7.12	5.88	57.25	13	2.13	40	1536	1510	3272	
48	65	4	58.44	54	48.25	7.25	6	60.75	13.25	2.13	40	1824	1797	3768	

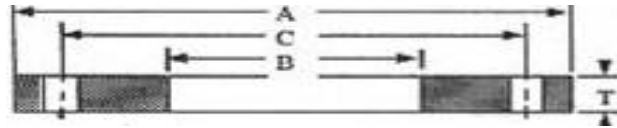
To Be Specified By Purchaser

***AWWA CLASS B STEEL-RING FLANGE (86 PSI\*)***



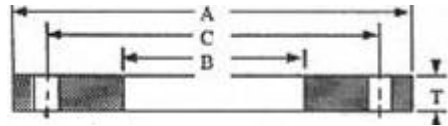
Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
4	9	0.625	0.625	4.57	7.5	0.75	8	8	11
5	10	0.625	0.625	5.66	8.5	0.875	8	9	14
6	11	0.688	0.688	6.72	9.5	0.875	8	11	19
8	13.5	0.688	0.688	8.72	11.75	0.875	8	15	28
10	16	0.688	0.688	10.88	14.25	1	12	19	39
12	19	0.688	0.719	12.88	17	1	12	28	58
14	21	0.688	0.791	14.19	18.75	1.125	12	34	78
16	23.5	0.688	0.892	16.19	21.25	1.125	16	41	110
18	25	0.688	0.95	18.19	22.75	1.25	16	41	132
20	27.5	0.688	1.04	20.19	25	1.25	20	49	175
22	29.5	0.75	1.132	22.19	27.25	1.375	20	57	219
24	32	0.75	1.216	24.19	29.5	1.375	20	67	277
26	34.25	0.812	1.307	26.19	31.75	1.375	24	80	341
28	36.5	0.875	1.398	28.19	34	1.375	28	94	414
30	38.75	0.875	1.477	30.19	36	1.375	28	105	493
32	41.75	0.936	1.581	32.19	38.5	1.625	28	132	613
34	43.75	0.938	1.661	34.19	40.5	1.625	32	137	707
36	46	1	1.751	36.19	42.75	1.625	32	161	824

**AWWA CLASS B STEEL-RING FLANGE (86 PSI\*)**



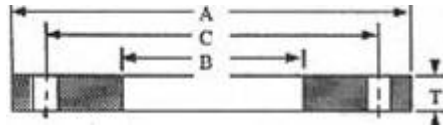
Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
		T	T		C				
38	48.75	1	1.853	38.19	45.25	1.625	32	185	980
40	50.75	1	1.933	40.19	47.25	1.625	36	193	1108
42	53	1.125	2.023	42.19	49.5	1.625	36	234	1264
44	55.25	1.125	2.114	44.19	51.75	1.625	40	249	1436
46	57.25	1.125	2.194	46.19	53.75	1.625	40	260	1600
48	59.5	1.25	2.285	48.19	56	1.625	44	306	1800
50	61.75	1.25	2.377	50.19	58.25	1.875	44	317	2017
52	64	1.25	2.468	52.19	60.5	1.875	44	339	2249
54	66.25	1.375	2.559	54.19	62.75	1.875	44	397	2499
60	73	1.5	2.82	60.19	69.25	1.875	52	508	3344
66	80	1.625	3.092	66.19	76	1.875	52	664	4403
72	86.5	1.75	3.353	72.19	82.5	1.875	60	802	5582
78	93	2	.....	78.19	89	2.125	64	1000	.....
84	99.75	2	.....	84.19	95.5	2.125	64	1145	.....
90	106.5	2.25	.....	90.19	102	2.438	68	1404	.....
96	113.25	2.25	.....	96.19	108.5	2.438	68	1586	.....

**AWWA CLASS D STEEL-RING FLANGE (175-150 PSI\*)**



Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
4	9	0.625	0.625	4.57	7.5	0.75	8	8	11
5	10	0.625	0.65	5.66	8.5	0.875	8	9	14
6	11	0.688	0.693	6.72	9.5	0.875	8	11	19
8	13.5	0.688	0.812	8.72	11.75	0.875	8	15	33
10	16	0.688	0.953	10.88	14.25	1	12	19	54
12	19	0.812	1.117	12.88	17	1	12	33	90
14	21	0.938	1.133	14.19	18.75	1.125	12	47	111
16	23.5	1	1.265	16.19	21.25	1.125	16	60	155
18	25	1.062	1.331	18.19	22.75	1.25	16	64	185
20	27.5	1.125	1.448	20.19	25	1.25	20	79	244
22	29.5	1.188	1.568	22.19	27.25	1.375	20	90	304
24	32	1.25	1.661	24.19	29.5	1.375	20	112	378
26	34.25	1.312	1.786	26.19	31.75	1.375	24	129	466
28	36.5	1.312	1.906	28.19	34	1.375	28	141	565
30	38.75	1.375	2.008	30.19	36	1.375	28	164	671
32	41.75	1.5	2.15	32.19	38.5	1.625	28	211	834
34	43.75	1.5	2.252	34.19	40.5	1.625	32	220	959
36	46	1.625	2.37	36.19	42.75	1.625	32	261	1116

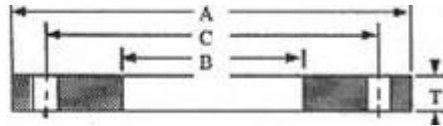
**AWWA CLASS D STEEL-RING FLANGE (175-150 PSI\*)**



Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
38	48.75	1.625	2.506	38.19	45.25	1.625	32	301	1325
40	50.75	1.625	2.609	40.19	47.25	1.625	36	313	1438
42	53	1.75	2.729	42.19	49.5	1.625	36	364	1706
44	55.25	1.75	2.849	44.19	51.75	1.625	40	387	1935
46	57.25	1.75	2.952	46.19	53.75	1.625	40	404	2153
48	59.5	1.875	3.072	48.19	56	1.625	44	460	2420
50	61.75	2	3.196	50.19	58.25	1.875	44	507	2712
52	64	2	3.315	52.19	60.5	1.875	44	542	3021
54	66.25	2.125	3.435	54.19	62.75	1.875	44	614	3355
60	73	2.25	3.779	60.19	69.25	1.875	52	763	4481
66	80	2.5	4.136	66.19	76	1.875	52	1021	5890
72	86.5	2.625	4.48	72.19	82.5	1.875	60	1203	7458
78	93	2.75	.....	78.19	89	2.125	64	1374	.....
84	99.75	2.875	.....	84.19	95.5	2.125	64	1646	.....
90	106.5	3	.....	90.19	102	2.438	68	1872	.....
96	113.25	3.25	.....	96.19	108.5	2.438	68	2291	.....

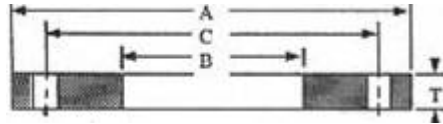


**AWWA CLASS D STEEL-HUB FLANGE (175-150 PSI\*)**



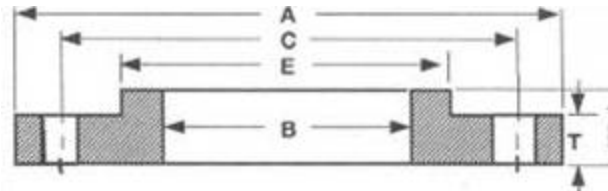
Nom Size	OD	Thickness	Overall Thickness	Dia at Base	Bore	Drilling			Weight
						Bolt Circle	Hole Dia	# of Holes	
	A	T	L	E	B	C			
4	9	0.5	0.875	5.312	4.57	7.5	0.75	8	7
5	10	0.562	1.25	6.312	5.66	8.5	0.875	8	9
6	11	0.562	1.25	7.562	6.72	9.5	0.875	8	11
8	13.5	0.562	1.25	9.688	8.72	11.75	0.875	8	15
10	16	0.688	1.25	12	10.88	14.25	1	12	22
12	19	0.688	1.25	14.375	12.88	17	1	12	33
14	21	0.75	1.25	15.75	14.19	18.75	1.125	12	43
16	23.5	0.75	1.25	18	16.19	21.25	1.125	16	52
18	25	0.75	1.25	19.875	18.19	22.75	1.25	16	52
20	27.5	0.75	1.25	22	20.19	25	1.25	20	61
22	29.5	1	1.75	24.25	22.19	27.25	1.375	20	92
24	32	1	1.75	26.125	24.19	29.5	1.375	20	105
26	34.25	1	1.75	28.5	26.19	31.75	1.375	24	119
28	36.5	1	1.75	30.5	28.19	34	1.375	28	130
30	38.75	1	1.75	32.5	30.19	36	1.375	28	144
32	41.75	1.125	1.75	34.75	32.19	38.5	1.625	28	182
34	43.75	1.125	1.75	36.75	34.19	40.5	1.625	32	191
36	46	1.125	1.75	38.75	36.19	42.75	1.625	32	207

**AWWA CLASS D STEEL-HUB FLANGE (175-150 PSI\*)**



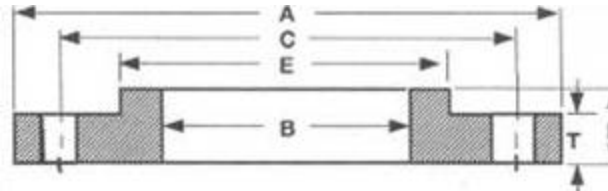
Nom Size	OD	Thickness	Overall Thickness	Dia at Base	Bore	Drilling			Weight
						Bolt Circle	Hole Dia	# of Holes	
	A	T	L	E	B	C			
38	48.75	1.125	1.75	40.75	38.19	45.25	1.625	32	237
40	50.75	1.125	1.75	43	40.19	47.25	1.625	36	249
42	53	1.25	1.75	45	42.19	49.5	1.625	36	287
44	55.25	1.25	2.25	47	44.19	51.75	1.625	40	334
46	57.25	1.25	2.25	49	46.19	53.75	1.625	40	348
48	59.5	1.375	2.5	51	48.19	56	1.625	44	407
50	61.75	1.375	2.5	53	50.19	58.25	1.875	44	421
52	64	1.375	2.5	55	52.19	60.5	1.875	44	448
54	66.25	1.375	2.5	57	54.19	62.75	1.875	44	475
60	73	1.5	2.75	63	60.19	69.25	1.875	52	605
66	80	1.5	2.75	69	66.19	76	1.875	52	718
72	86.5	1.5	2.75	75	72.19	82.5	1.875	60	803
78	93	1.75	3	81.25	78.19	89	2.125	64	1010
84	99.75	1.75	3	87.5	84.19	95.5	2.125	64	1160
90	106.5	2	3.25	93.75	90.19	102	2.438	68	1430
96	113.25	2	3.25	100	96.19	108.5	2.438	68	1618

**AWWA CLASS E STEEL-HUB FLANGE (275 PSI\*)**



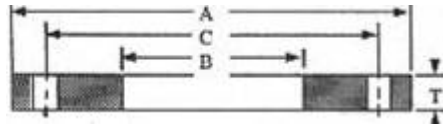
Nom Size	OD	Thickness	Overall Thickness	Dia at Base	Bore	Drilling			Weight
						Bolt Circle	Hole Dia	# of Holes	
	A	T	L	E	B	C			
4	9	0.938	1.312	5.312	4.57	7.5	0.75	8	13
5	10	0.938	1.438	6.438	5.66	8.5	0.875	8	14
6	11	1	1.562	7.562	6.72	9.5	0.875	8	17
8	13.5	1.125	1.75	9.688	8.72	11.75	0.875	8	28
10	16	1.188	1.938	12	10.88	14.25	1	12	37
12	19	1.25	2.188	14.375	12.88	17	1	12	59
14	21	1.375	2.25	15.75	14.19	18.75	1.125	12	78
16	23.5	1.438	2.5	18	16.19	21.25	1.125	16	101
18	25	1.562	2.688	19.875	18.19	22.75	1.25	16	110
20	27.5	1.688	2.875	22	20.19	25	1.25	20	139
22	29.5	1.812	3.125	24	22.19	27.25	1.375	20	162
24	32	1.875	3.25	26.125	24.19	29.5	1.375	20	197
26	34.25	2	3.375	28.5	26.19	31.75	1.375	24	235
28	36.5	2.062	3.438	30.75	28.19	34	1.375	28	269
30	38.75	2.125	3.5	32.75	30.19	36	1.375	28	303

**AWWA CLASS E STEEL-HUB FLANGE (275 PSI\*)**



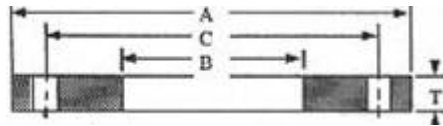
Nom Size	OD	Thickness	Overall Thickness	Dia at Base	Bore	Drilling			Weight
						Bolt Circle	Hole Dia	# of Holes	
	A	T	L	E	B	C			
32	41.75	2.25	3.625	35	32.19	38.5	1.625	28	375
34	43.75	2.312	3.688	37	34.19	40.5	1.625	32	401
36	46	2.375	3.75	39.25	36.19	42.75	1.625	32	452
38	48.75	2.375	3.75	41.75	38.19	45.25	1.625	32	528
40	50.75	2.5	3.875	43.75	40.19	47.25	1.625	36	573
42	53	2.625	4	46	42.19	49.5	1.625	36	648
44	55.25	2.625	4	48	44.19	51.75	1.625	40	688
46	57.25	2.688	4.062	50	46.19	53.75	1.625	40	733
48	59.5	2.75	4.125	52.25	48.19	56	1.625	44	799
50	61.75	2.75	4.125	54.25	50.19	58.25	1.875	44	827
52	64	2.875	4.25	56.5	52.19	60.5	1.875	44	922
54	66.25	3	4.375	58.75	54.19	62.75	1.875	44	1024
60	73	3.125	4.5	65.25	60.19	69.25	1.875	52	1253
66	80	3.375	4.875	71.5	66.19	76	1.875	52	1623
72	86.5	3.5	5	78.5	72.19	82.5	1.875	60	1922
78	93	3.875	5.375	84.5	78.19	89	2.125	64	2279
84	99.75	3.875	5.375	90.5	84.19	95.5	2.125	64	2586
90	106.5	4.25	5.75	96.75	90.19	102	2.438	68	3061
96	113.25	4.25	5.75	102.75	96.19	108.5	2.438	68	3432

**AWWA CLASS E STEEL-RING FLANGE (275 PSI\*)**



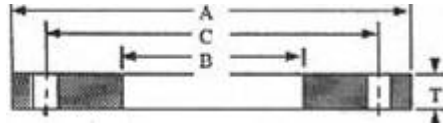
Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
4	9	1.125	1.125	4.57	7.5	0.75	8	14	20
5	10	1.188	1.188	5.66	8.5	0.875	8	16	26
6	11	1.313	1.313	6.72	9.5	0.875	8	20	35
8	13.5	1.5	1.5	8.72	11.75	0.875	8	33	61
10	16	1.563	1.563	10.88	14.25	1	12	44	89
12	19	1.75	1.75	12.88	17	1	12	71	141
14	21	1.875	1.875	14.19	18.75	1.125	12	94	184
16	23.5	2	2	16.19	21.25	1.125	16	120	246
18	25	2.125	2.125	18.19	22.75	1.25	16	127	296
20	27.5	2.375	2.375	20.19	25	1.25	20	168	400
22	29.5	2.5	2.5	22.19	27.25	1.375	20	189	484
24	32	2.625	2.625	24.19	29.5	1.375	20	234	598
26	34.25	2.75	2.75	26.19	31.75	1.375	24	270	718
28	36.5	2.75	2.75	28.19	34	1.375	28	297	815
30	38.75	2.875	2.875	30.19	36	1.375	28	344	961
32	41.75	3	3	32.19	38.5	1.625	28	422	1163
34	43.75	3	3.05	34.19	40.5	1.625	32	441	1299

**AWWA CLASS E STEEL-RING FLANGE (275 PSI\*)**



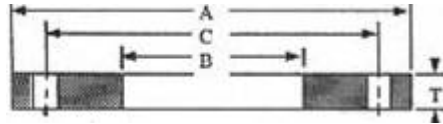
Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
36	46	3.125	3.209	36.19	42.75	1.625	32	502	1511
38	48.75	3.125	3.394	38.19	45.25	1.625	32	580	1795
40	50.75	3.25	3.533	40.19	47.25	1.625	36	626	2025
42	53	3.375	3.695	42.19	49.5	1.625	36	701	2309
44	55.25	3.375	3.857	44.19	51.75	1.625	40	747	2715
46	57.25	3.438	3.997	46.19	53.75	1.625	40	794	2813
48	59.5	3.5	4.159	48.19	56	1.625	44	858	3276
50	61.75	3.5	4.327	50.19	58.25	1.875	44	887	3671
52	64	3.625	4.489	52.19	60.5	1.875	44	982	4091
54	66.25	3.75	4.651	54.19	62.75	1.875	44	1083	4542
60	73	3.875	5.116	60.19	69.25	1.875	52	1313	6066
66	80	4.25	5.601	66.19	76	1.875	52	1736	7976
72	86.5	4.375	6.066	72.19	82.5	1.875	60	2005	10099
78	93	4.75	.....	78.19	89	2.125	64	2374	.....
84	99.75	4.75	.....	84.19	95.5	2.125	64	2719	.....
90	106.5	5.125	.....	90.19	102	2.438	68	3197	.....
96	113.25	5.125	.....	96.19	108.5	2.438	68	3613	.....

**AWWA CLASS F STEEL-RING FLANGE (300 PSI\*)**



Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
4	10	1.13	1.13	4.57	7.88	0.875	8	18	25
5	11	1.21	1.21	5.66	9.25	0.875	8	22	33
6	12.5	1.31	1.31	6.73	10.62	0.875	12	30	46
8	15	1.31	1.31	8.73	13	1	12	40	66
10	17.5	1.5	1.5	10.88	15.25	1.125	16	56	102
12	20.5	1.63	1.63	12.88	17.75	1.25	16	83	152
14	23	1.94	1.94	14.19	20.25	1.25	20	128	228
16	25.5	2.14	2.14	16.19	22.5	1.375	20	167	310
18	28	2.25	2.25	18.19	24.75	1.375	24	204	392
20	30.5	2.33	2.33	20.19	27	1.375	24	247	482
22	33	2.5	2.5	22.19	29.25	1.375	24	307	606
24	36	2.69	2.69	24.19	32	1.625	24	388	776
26	38.25	3	3	26.19	34.5	1.875	28	451	977
28	40.75	3.13	3.13	28.19	37	1.875	28	532	1156
30	43	3.15	3.166	30.19	39.25	1.875	28	586	1303
32	45.25	3.25	3.332	32.19	41.5	1.875	28	657	1518
34	47.5	3.38	3.475	34.19	43.5	1.875	28	741	1745
36	50	3.46	3.671	36.19	46	2.125	32	802	2042

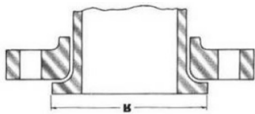
**AWWA CLASS F STEEL-RING FLANGE (300 PSI\*)**



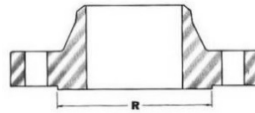
Nom Size	OD	Thickness		Bore	Drilling			Weight	
		Slip-On	Blind		Bolt Circle	Hole Dia	# of Holes	Slip-on	Blind
	A	T	T	B	C				
38	52.25	3.5	3.815	38.19	48	2.125	32	874	2317
40	54.25	3.63	3.982	40.19	50.25	2.125	36	937	2608
42	57	3.81	4.171	42.19	52.75	2.125	36	1103	3015
44	59.25	4	4.338	44.19	55	2.125	36	1237	3388
46	61.5	4.13	4.505	46.19	57.25	2.125	40	1344	3791
48	65	4.5	4.781	48.19	60.75	2.125	40	1718	4494



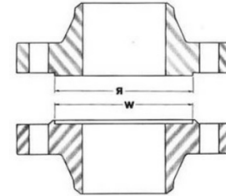
## ALTERNATE FLANGE FACINGS



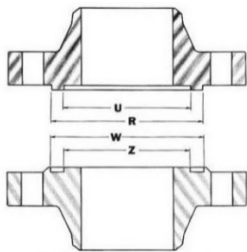
**Lap Joint**



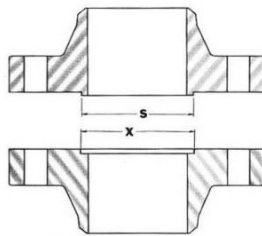
**Raised Face**



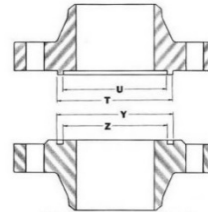
**Large Male and Female**



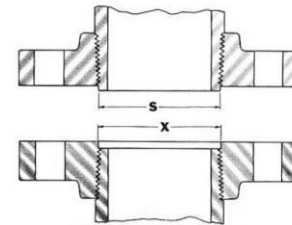
**Large Tongue and Groove**



**Small Male and Female**



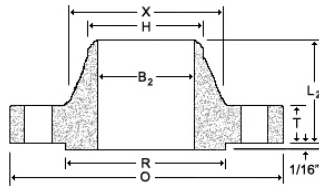
**Small Tongue and Groove**



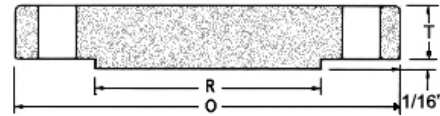
**Small Male and Female (on end of pipe)**

Nominal Size (in.)	RF, LJ, Large Male & Large Tongue	Small Male (3)	Small Tongue	ID of Large & Small Tongue	Large Female & Large Groove	Small Female (3)	Small Groove	ID of Large & Small Groove	Raised Face 150 and 300 Pound Standards (2)	RF, Large & Small Male & Tongue 400, 600, 900, 1500, & 2500 lb. Standards (2)	Depth of Groove or Female
	R	S	T	U	W	X	Y	Z			
1/2	1.38	0.72	1.38	1	1.44	0.78	1.44	0.94	0.06	0.25	0.19
3/4	1.69	0.94	1.69	1.31	1.75	1	1.75	1.25	0.06	0.25	0.19
1	2	1.19	1.88	1.5	2.06	1.25	1.94	1.44	0.06	0.25	0.19
1 1/4	2.5	1.5	2.25	1.88	2.56	1.56	2.31	1.81	0.06	0.25	0.19
1 1/2	2.88	1.75	2.5	2.12	2.94	1.81	2.56	2.06	0.06	0.25	0.19
2	3.62	2.25	3.25	2.88	3.69	2.31	3.31	2.81	0.06	0.25	0.19
2 1/2	4.12	2.69	3.75	3.38	4.19	2.75	3.81	3.31	0.06	0.25	0.19
3	5	3.31	4.62	4.25	5.06	3.38	4.69	4.19	0.06	0.25	0.19
3 1/2	5.5	3.81	5.12	4.75	5.56	3.88	5.19	4.69	0.06	0.25	0.19
4	6.19	4.31	5.69	5.19	6.25	4.38	5.75	5.12	0.06	0.25	0.19
5	7.31	5.38	6.81	6.31	7.38	5.44	6.88	6.25	0.06	0.25	0.19
6	8.5	6.38	8	7.5	8.56	6.44	8.06	7.44	0.06	0.25	0.19
8	10.62	8.38	10	9.38	10.69	8.44	10.06	9.31	0.06	0.25	0.19
10	12.75	10.5	12	11.25	12.81	10.56	12.06	11.19	0.06	0.25	0.19
12	15	12.5	14.25	13.5	15.06	12.56	14.31	13.44	0.06	0.25	0.19
14	16.25	13.75	15.5	14.75	16.31	13.81	15.56	14.69	0.06	0.25	0.19
16	18.5	15.75	17.62	16.75	18.56	15.81	17.69	16.69	0.06	0.25	0.19
18	21	17.75	20.12	19.25	21.06	17.81	20.19	19.19	0.06	0.25	0.19
20	23	19.75	22	21	23.06	19.81	22.06	20.94	0.06	0.25	0.19
24	27.25	23.75	26.25	25.25	27.31	23.81	26.31	25.19	0.06	0.25	0.19

## B16.47 SERIES A CLASS 150 FLANGES



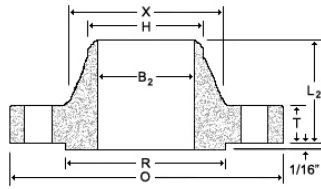
Weld Neck Flange



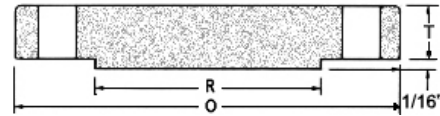
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck Weight	Blind Weight
	O	C	C	R	X	B	Y	A		-1	-2		Weight	Weight
26	34.25	2.63	2.63	29.5	26.62	To Be Specified By Purchaser	4.69	26	31.75	8.75	1.38	24	300	702
28	36.5	2.75	2.75	31.5	28.62		4.88	28	34	9	1.38	28	345	833
30	38.75	2.88	2.88	33.75	30.75		5.32	30	36	9.25	1.38	28	400	982
32	41.75	3.13	3.13	36	32.75		5.63	32	38.5	10.5	1.62	28	505	1237
34	43.75	3.19	3.19	38	34.75		5.82	34	40.5	10.5	1.62	32	540	1384
36	46	3.5	3.5	40.25	36.75		6.13	36	42.75	11	1.62	32	640	1676
38	48.75	3.38	3.38	42.25	39		6.13	38	45.25	11	1.62	32	720	1819
40	50.75	3.5	3.5	44.25	41		6.38	40	47.25	11	1.62	36	775	2040
42	53	3.75	3.75	47	43		6.69	42	49.5	11.5	1.62	36	890	2381
44	55.25	3.94	3.94	49	45		6.94	44	51.75	12	1.62	40	990	2717
46	57.25	4	4	51	47.12		7.25	46	53.75	12	1.62	40	1060	2961
48	59.5	4.19	4.19	53.5	49.12		7.5	48	56	12.5	1.62	44	1185	3348
50	61.75	4.32	4.32	55.5	51.25		7.94	50	58.25	13.25	1.88	44	1270	3716
52	64	4.5	4.5	57.5	53.25		8.19	52	60.5	13.75	1.88	44	1410	4156
54	66.25	4.69	4.69	59.5	55.25		8.44	54	62.75	14	1.88	44	1585	4639
56	68.75	4.82	4.82	62	57.38		8.94	56	65	14.25	1.88	48	1760	5132
58	71	5	5	64	59.38		9.19	58	67.25	14.75	1.88	48	1915	5675
60	73	5.13	5.13	66	61.38		9.38	60	69.25	15	1.88	52	2045	6154

## B16.47 SERIES A CLASS 300 FLANGES



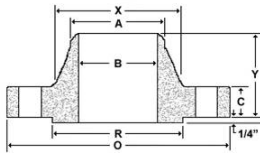
Weld Neck Flange



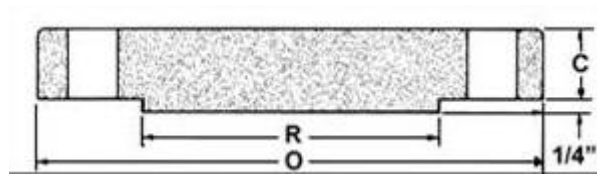
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Weight	Weight
26	38.25	3.07	3.25	29.5	28.38	To Be Specified By Purchaser	7.19	26	34.5	10.75	1.75	28	605	1078
28	40.75	3.32	3.5	31.5	30.5		7.69	28	37	11.25	1.75	28	745	1315
30	43	3.57	3.69	33.75	32.56		8.19	30	39.25	12	1.88	28	870	1543
32	45.25	3.82	3.88	36	34.69		8.69	32	41.5	12.5	2	28	1005	1795
34	47.5	3.94	4.07	38	36.88		9.07	34	43.5	13	2	28	1145	2068
36	50	4.07	4.32	40.25	39		9.44	36	46	13.5	2.12	32	1275	2436
38	46	4.19	4.19	40.5	39.12		7.06	38	43	12.5	1.62	32	695	2001
40	48.75	4.44	4.44	42.75	41.25		7.56	40	45.5	13.25	1.75	32	840	2380
42	50.75	4.63	4.63	44.75	43.25		7.82	42	47.5	13.75	1.75	32	950	2688
44	53.25	4.82	4.82	47	45.25		8.06	44	49.75	14.25	1.88	32	1055	3079
46	55.75	5	5	49	47.38		8.44	46	52	15	2	28	1235	3499
48	57.75	5.19	5.19	51.25	49.38		8.75	48	54	15.25	2	32	1380	3896
50	60.25	5.44	5.44	53.5	51.38		9.07	50	56.25	16	2.12	32	1530	4442
52	62.25	5.63	5.63	55.5	53.38		9.32	52	58.25	16.5	2.12	32	1660	4906
54	65.25	5.94	5.94	57.75	55.5		9.88	54	61	17.5	2.38	28	2050	5684
56	67.25	6	6	59.75	57.62		10.19	56	63	17.75	2.38	28	2155	6098
58	69.25	6.19	6.19	62	59.62		10.44	58	65	18	2.38	32	2270	6669
60	71.25	6.38	6.38	64	61.62		10.69	60	67	18.5	2.38	32	2470	7274

## B16.47 SERIES A CLASS 400 FLANGES



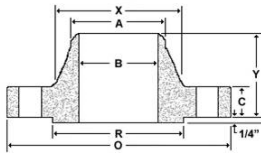
Weld Neck Flange



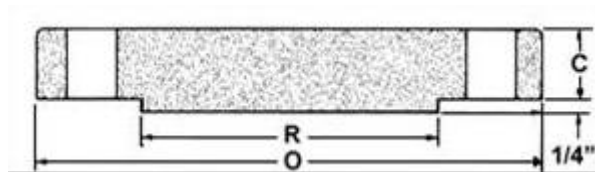
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Weight	Weight
26	38.25	3.5	3.88	29.5	28.62	To Be Specified By Purchaser	7.62	26	34.5	12.5	1.88	28	650	1263
28	40.75	3.75	4.12	31.5	30.81		8.12	28	37	13.25	2	28	785	1522
30	43	4	4.38	33.75	32.94		8.62	30	39.25	14	2.12	28	905	1802
32	45.25	4.25	4.56	36	35		9.12	32	41.5	14.25	2.12	28	1065	2077
34	47.5	4.38	4.81	38	37.19		9.5	34	43.5	14.75	2.12	28	1200	2415
36	50	4.5	5.06	40.25	39.38		9.88	36	46	15	2.12	32	1340	2815
38	47.5	4.88	4.88	40.75	39.5		8.12	38	44	14.75	1.88	32	935	2450
40	50	5.12	5.12	43	41.5		8.5	40	46.25	15.5	2	32	1090	2848
42	52	5.25	5.25	45	43.62		8.81	42	48.25	15.75	2	32	1190	3159
44	54.5	5.5	5.5	47.25	45.62		9.18	44	50.5	16.5	2.12	32	1375	3635
46	56.75	5.75	5.75	49.5	47.75		9.62	46	52.75	17	2.12	36	1525	4120
48	59.5	6	6	51.5	49.88		10.12	48	55.25	18	2.38	28	1790	4726
50	61.75	6.19	6.25	53.62	52		10.56	50	57.5	18.5	2.38	32	1950	5303
52	63.75	6.38	6.44	55.62	54		10.88	52	59.5	18.75	2.38	32	2125	5823
54	67	6.69	6.75	57.88	56.12		11.38	54	62.25	20	2.62	28	2565	6742
56	69	6.88	6.94	60.12	58.25		11.75	56	64.25	20.25	2.62	32	2710	7352
58	71	7	7.12	62.12	60.25		12.06	58	66.25	20.5	2.62	32	3230	7986
60	74.25	7.31	7.44	64.38	62.38		12.56	60	69	21.75	2.88	32	3820	9126

## B16.47 SERIES A CLASS 600 FLANGES



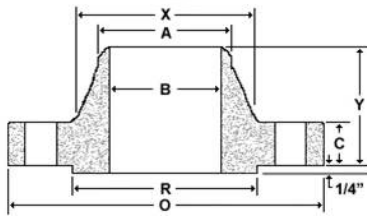
Weld Neck Flange



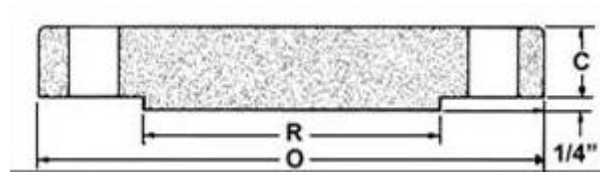
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Weight	Weight
26	40	4.25	4.94	29.5	29.44	To Be Specified By Purchaser	8.75	26	36	14.5	2	28	940	1759
28	42.25	4.38	5.19	31.5	31.62		9.25	28	38	15	2.12	28	1060	2061
30	44.5	4.5	5.5	33.75	33.94		9.75	30	40.25	15.5	2.12	28	1210	2423
32	47	4.62	5.81	36	36.12		10.25	32	42.5	16.5	2.38	28	1375	2856
34	49	4.75	6.06	38	38.31		10.62	34	44.5	16.75	2.38	28	1540	3237
36	51.75	4.88	6.38	40.25	40.62		11.12	36	47	17.75	2.62	28	1705	3802
38	50	6	6.12	41.5	40.25		10	38	45.75	18.25	2.38	28	1470	3404
40	52	6.25	6.38	43.75	42.25		10.38	40	47.75	18.75	2.38	32	1630	3838
42	55.25	6.62	6.75	46	44.38		11	42	50.5	19.75	2.62	28	2030	4585
44	57.25	6.81	7	48.25	46.5		11.38	44	52.5	20.25	2.62	32	2160	5105
46	59.5	7.06	7.31	50.25	48.62		11.81	46	54.75	20.75	2.62	32	2410	5758
48	62.75	7.44	7.69	52.5	50.75		12.44	48	57.5	22.25	2.88	32	2855	6737
50	65.75	7.75	8	54.5	52.88		12.94	50	60	23.25	3.12	28	3330	7695
52	67.75	8	8.25	56.5	54.88		13.25	52	62	23.75	3.12	32	3560	8426
54	70	8.25	8.56	58.75	57		13.75	54	64.25	24.25	3.12	32	3920	9333
56	73	8.56	8.88	60.75	59.12		14.25	56	66.75	25.5	3.38	32	4280	10529
58	75	8.75	9.12	63	61.12		14.56	58	68.75	26	3.38	32	4640	11414
60	78.5	9.19	9.56	65.25	63.38		15.31	60	71.75	27.25	3.62	28	5000	13108

## B16.47 SERIES A CLASS 900 FLANGES



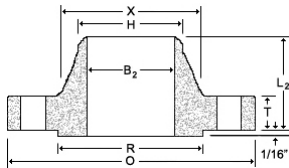
Weld Neck Flange



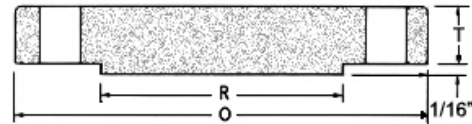
Blind Flange

Nom Size	OD	Thickness		OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weight	
		Weld Neck	Blind										Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Weight	Weight
26	42.75	5.5	6.31	29.5	30.5	<b>To Be Specified By Purchaser</b>	11.25	26	37.5	18.75	2.88	20	1525	2566
28	46	5.62	6.75	31.5	32.75		11.75	28	40.25	19.75	3.12	20	1810	3178
30	48.5	5.88	7.18	33.75	35		12.25	30	42.75	20.5	3.12	20	2120	3758
32	51.75	6.25	7.62	36	37.25		13	32	45.5	22	3.38	20	2545	4541
34	55	6.5	8.06	38	39.62		13.75	34	48.25	23	3.62	20	2970	5425
36	57.5	6.75	8.44	40.25	41.88		14.25	36	50.75	23.75	3.62	20	3395	6209
38	57.5	7.5	8.5	43.25	42.25		13.88	38	50.75	24.5	3.62	20	3385	6253
40	59.5	7.75	8.81	45.75	44.38		14.31	40	52.75	25	3.62	24	3620	6940
42	61.5	8.12	9.12	47.75	46.31		14.62	42	54.75	25.75	3.62	24	3960	7675
44	64.88	8.44	9.56	50	48.62		15.38	44	57.62	27	3.88	24	4300	8954
46	68.25	8.88	10.06	52.5	50.88		16.18	46	60.5	28.5	4.12	24	4640	10426
48	70.25	9.19	10.38	54.5	52.88		16.5	48	62.5	29	4.12	24	4980	11398

## B16.47 SER. B CLASS 75 FLANGES



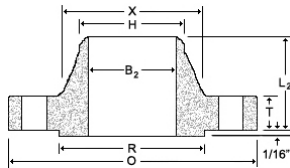
Weld Neck Flange



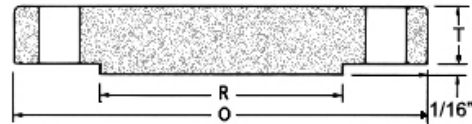
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Wgt	Wgt
26	30	1.25	1.25	27.75	26.62	<b>To Be Specified By Purchaser</b>	2.25	26.06	28.5	4.5	0.75	36	80	255
28	32	1.25	1.25	29.75	28.62		2.38	28.06	30.5	4.5	0.75	40	85	290
30	34	1.25	1.25	31.75	30.62		2.5	30.06	32.5	4.5	0.75	44	90	330
32	36	1.32	1.38	33.75	32.62		2.69	32.06	34.5	4.75	0.75	48	105	390
34	38	1.32	1.44	35.75	34.62		2.82	34.06	36.5	4.75	0.75	52	110	430
36	40.69	1.38	1.61	38	36.81		3.32	36.06	39.06	5.25	0.88	40	145	518
38	42.69	1.44	1.69	40	38.81		3.44	38.06	41.06	5.5	0.88	40	160	595
40	44.69	1.44	1.69	42	40.81		3.57	40.06	43.06	5.5	0.88	44	170	760
42	46.69	1.5	1.82	44	42.81		3.69	42.06	45.06	5.5	0.88	48	185	895
44	49.25	1.63	1.88	46.25	44.88		4.07	44.06	47.38	6	1	36	230	1065
46	51.25	1.69	1.94	48.25	46.88		4.19	46.06	49.38	6.25	1	40	245	1185
48	53.25	1.75	2.07	50.25	48.88		4.32	48.06	51.38	6.5	1	44	270	1315
50	55.25	1.82	2.13	52.25	50.94		4.5	50.06	53.38	6.5	1	44	290	1505
52	57.38	1.82	2.19	54.25	52.94		4.69	52.06	55.5	6.75	1	48	310	1665
54	59.38	1.88	2.32	56.25	55		4.88	54.06	57.5	6.75	1	48	340	1840
56	62	1.94	2.38	58.5	57.12		5.25	56.06	59.88	7.25	1.12	40	400	2110
58	64	2	2.44	60.5	59.12		5.38	58.06	61.88	7.25	1.12	44	430	2300
60	66	2.13	2.57	62.5	61.12		5.63	60.06	63.88	7.75	1.12	44	475	2500

## B16.47 SER. B CLASS 150 FLANGES



*Weld Neck Flange*

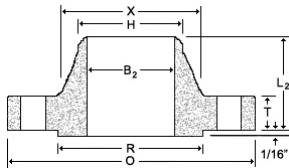


*Blind Flange*

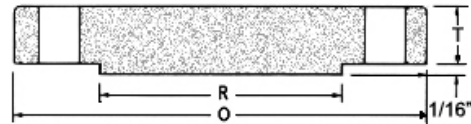
Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Wgt	Wgt
26	30.94	1.57	1.69	28	26.94	<b>To Be Specified By Purchaser</b>	3.44	26.06	29.31	5.5	0.88	36	120	373
28	32.94	1.69	1.82	30	28.94		3.69	28.06	31.31	5.75	0.88	40	140	454
30	34.94	1.69	1.94	32	31		3.88	30.06	33.31	6	0.88	44	150	543
32	37.06	1.75	2.07	34	33.06		4.19	32.06	35.44	6.25	0.88	48	170	648
34	39.56	1.88	2.19	36.25	35.12		4.28	34.06	37.69	6.75	1	40	210	783
36	41.62	2	2.25	38.25	37.19		4.57	36.06	39.75	6.75	1	44	240	890
38	44.25	2.07	2.44	40.25	39.25		4.82	38.12	42.12	7.5	1.12	40	290	1089
40	46.25	2.13	2.57	42.5	41.31		5	40.12	44.12	7.75	1.12	44	310	1247
42	48.25	2.25	2.63	44.5	43.38		5.19	42.12	46.12	7.75	1.12	48	345	1393
44	50.25	2.32	2.75	46.5	45.38		5.32	44.12	48.12	8	1.12	52	370	1579
46	52.81	2.38	2.88	48.62	47.44		5.63	46.12	50.56	8.5	1.25	40	435	1824
48	54.81	2.5	3	50.75	49.5		5.82	48.12	52.56	8.75	1.25	44	480	2045
50	56.81	2.63	3.13	52.75	51.5		6	50.12	54.56	9	1.25	48	520	2284
52	58.81	2.69	3.25	54.75	53.56		6.13	52.12	56.56	9.25	1.25	52	550	2547
54	61	2.75	3.38	56.75	55.62		6.32	54.12	58.75	9.5	1.25	56	620	2848
56	63	2.82	3.5	58.75	57.69		6.5	56.12	60.75	9.75	1.25	60	650	3144
58	65.94	2.88	3.62	60.75	59.69		6.82	58.12	63.44	10	1.38	48	780	3560
60	67.94	2.94	3.75	63	61.81		7	60.12	65.44	10.25	1.38	52	850	3913



## B16.47 SER. B CLASS 300 FLANGES



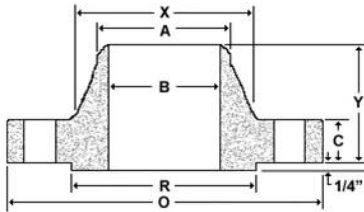
Weld Neck Flange



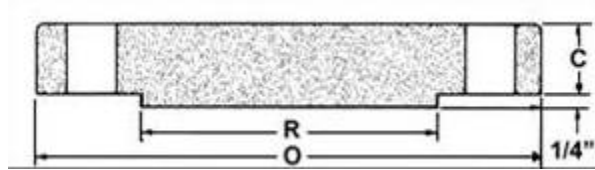
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Wgt	Wgt
26	34.12	3.44	3.44	29	27.62	<b>To Be Specified By Purchaser</b>	5.63	26.19	31.62	10.5	1.38	32	400	907
28	36.25	3.44	3.44	31	29.75		5.81	28.19	33.75	10.5	1.38	36	450	1023
30	39	3.63	3.63	33.25	32		6.16	30.25	36.25	11.25	1.5	36	550	1249
32	41.5	4	4	35.5	34		6.56	32.25	38.5	12	1.62	32	685	1556
34	43.62	4	4	37.5	36.12		6.75	34.25	40.62	12	1.62	36	750	1719
36	46.12	4	4	39.75	38		7.06	36.25	42.88	12.5	1.75	32	840	1921
38	48.12	4.31	4.31	41.75	40		7.5	38.25	44.88	13	1.75	36	915	2257
40	50.12	4.5	4.5	43.88	42		7.75	40.25	46.88	13.5	1.75	40	990	2549
42	52.5	4.63	4.63	46	44		8	42.31	49	14	1.88	36	1135	2876
44	54.5	4.94	4.94	48	46.19		8.38	44.31	51	14.5	1.88	40	1235	3304
46	57.5	5	5.06	50	48.38		8.69	46.31	53.75	15	2	36	1470	3766
48	59.5	5	5.25	52.25	50.31		8.75	48.31	55.75	15.25	2	40	1575	4183
50	61.5	5.38	5.44	54.25	52.38		9.19	50.31	57.75	15.75	2	44	1710	4629
52	63.5	5.56	5.61	56.25	54.44		9.5	52.31	59.75	16	2	48	1840	5096
54	65.88	5.32	5.81	58.25	56.5		9.38	54.31	62.12	16	2	48	1980	5678
56	69.5	6	6.12	60.5	58.81		10.5	56.31	65	17.75	2.38	36	2595	6642
58	71.94	6	6.31	62.75	60.94	10.75	58.31	67.44	18	2.38	40	2770	7347	
60	73.94	5.88	6.5	65	62.94	10.63	60.31	69.44	18	2.38	40	2870	7980	

## B16.47 SER. B CLASS 400 FLANGES



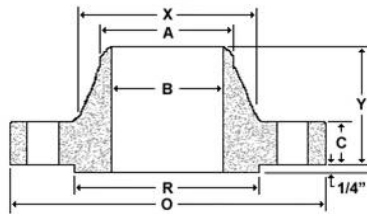
Weld Neck Flange



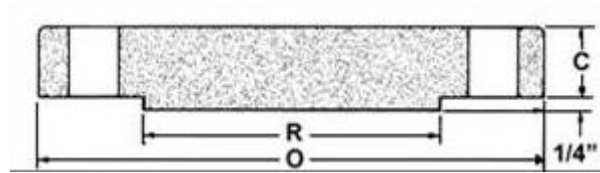
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	Hole Dia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Wgt	Wgt
26	33.5	3.5	3.5	28	27.12	<b>To Be Specified By Purchaser</b>	5.88	26	30.75	11.25	1.5	28	360	874
28	36	3.75	3.75	30	29.12		6.25	28	33	12	1.62	24	450	1081
30	38.25	4	4	32.25	31.25		6.69	30	35.25	12.5	1.62	28	530	1302
32	40.75	4.25	4.25	34.38	33.25		7.06	32	37.5	13.25	1.75	28	635	1570
34	42.75	4.38	4.38	36.5	35.38		7.38	34	39.5	13.5	1.75	32	690	1781
36	45.5	4.69	4.69	38.62	37.5		7.88	36	42	14.5	1.88	28	855	2160
38	47.5	4.88	4.88	40.75	39.5		8.12	38	44	14.75	1.88	32	935	2450
40	50	5.12	5.12	43	41.5		8.5	40	46.25	15.5	2	32	1090	2848
42	52	5.25	5.25	45	43.62		8.81	42	48.25	15.75	2	32	1190	3159
44	54.5	5.5	5.5	47.25	45.62		9.18	44	50.5	16.5	2.12	32	1375	3635
46	56.75	5.75	5.75	49.5	47.75		9.62	46	52.75	17	2.12	36	1525	4120
48	59.5	6	6	51.5	49.88		10.12	48	55.25	18	2.38	28	1790	4726
50	61.75	6.19	6.25	53.62	52		10.56	50	57.5	18.5	2.38	32	1950	5303
52	63.75	6.38	6.44	55.62	54		10.88	52	59.5	18.75	2.38	32	2125	5823
54	67	6.69	6.75	57.88	56.12		11.38	54	62.25	20	2.62	28	2565	6742
56	69	6.88	6.94	60.12	58.25		11.75	56	64.25	20.25	2.62	32	2710	7352
58	71	7	7.12	62.12	60.25	12.06	58	66.25	20.5	2.62	32	3230	7986	
60	74.25	7.31	7.44	64.38	62.38	12.56	60	69	21.75	2.88	32	3820	9126	

## B16.47 SER. B CLASS 600 FLANGES



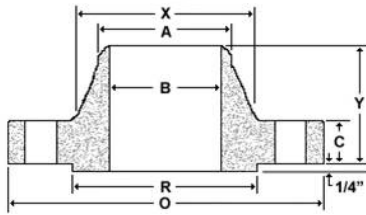
Weld Neck Flange



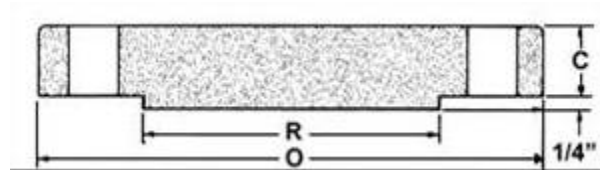
Blind Flange

Nom Size	OD	Weld Neck	Blind	OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Bolt Circle	Bolt Length	HoleDia	# of Holes	Weld Neck	Blind
	O	C	C	R	X	B	Y	A		-1	-2		Wgt	Wgt
26	35	4.38	4.38	28.62	27.5	<b>To Be Specified By Purchaser</b>	7.12	26	31.75	13.5	1.75	28	550	1194
28	37.5	4.56	4.56	30.88	29.62		7.5	28	34	14.25	1.88	28	650	1427
30	40.25	4.94	5	33.12	31.75		8.06	30	36.5	15.25	2	28	810	1802
32	42.75	5.12	5.31	35.25	33.88		8.5	32	38.75	16	2.12	28	950	2159
34	45.75	5.56	5.68	37.5	36		9.19	34	41.5	17.25	2.38	24	1205	2645
36	47.75	5.75	5.94	39.75	38.12		9.56	36	43.5	17.75	2.38	28	1340	3013
38	50	6	6.12	41.5	40.25		10	38	45.75	18.25	2.38	28	1470	3404
40	52	6.25	6.38	43.75	42.25		10.38	40	47.75	18.75	2.38	32	1630	3838
42	55.25	6.62	6.75	46	44.38		11	42	50.5	19.75	2.62	28	2030	4585
44	57.25	6.81	7	48.25	46.5		11.38	44	52.5	20.25	2.62	32	2160	5105
46	59.5	7.06	7.31	50.25	48.62		11.81	46	54.75	20.75	2.62	32	2410	5758
48	62.75	7.44	7.69	52.5	50.75		12.44	48	57.5	22.25	2.88	32	2855	6737
50	65.75	7.75	8	54.5	52.88		12.94	50	60	23.25	3.12	28	3330	7695
52	67.75	8	8.25	56.5	54.88		13.25	52	62	23.75	3.12	32	3560	8426
54	70	8.25	8.56	58.75	57		13.75	54	64.25	24.25	3.12	32	3920	9333
56	73	8.56	8.88	60.75	59.12		14.25	56	66.75	25.5	3.38	32	4280	10,529
58	75	8.75	9.12	63	61.12	14.56	58	68.75	26	3.38	32	4640	11,414	
60	78.5	9.19	9.56	65.25	63.38	15.31	60	71.75	27.25	3.62	28	5000	13,108	

## B16.47 SER. B CLASS 900 FLANGES



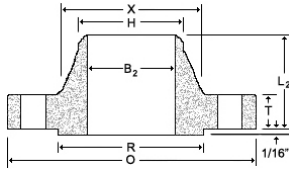
Weld Neck Flange



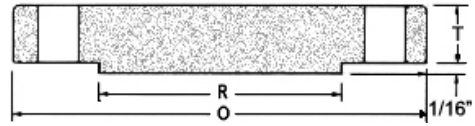
Blind Flange

Nom Size	O	Weld Neck C	Blind C	OD of RF R	Dia at Base X	Bore B	LTH Y	Dia Bevel A	Bolt Circle	Bolt Length	HoleDia -2	# of Holes	Weld Neck Wgt	Blind Wgt
26	40.25	5.31	6.06	30	29.25	B	10.19	26	35.5	17.75	2.62	20	1050	2184
28	43.5	5.81	6.56	32.25	31.38		10.88	28	38.25	19.5	2.88	20	1520	2762
30	46.5	6.12	6.93	34.5	33.5		11.38	30	40.75	20.5	3.12	20	1820	3334
32	48.75	6.31	7.31	36.5	35.75		11.94	32	43	21	3.12	20	2065	3865
34	51.75	6.75	7.68	39	37.88		12.56	34	45.5	22.5	3.38	20	2450	4576
36	53	6.81	7.94	40.5	40		12.81	36	47.25	22.25	3.12	24	2520	4963
38	57.5	7.5	8.5	43.25	42.25		13.88	38	50.75	24.5	3.62	20	3385	6253
40	59.5	7.75	8.81	45.75	44.38		14.31	40	52.75	25	3.62	24	3620	6940
42	61.5	8.12	9.12	47.75	46.31		14.62	42	54.75	25.75	3.62	24	3960	7675
44	64.88	8.44	9.56	50	48.62		15.38	44	57.62	27	3.88	24	4300	8954
46	68.25	8.88	10.06	52.5	50.88		16.18	46	60.5	28.5	4.12	24	4640	10,426
48	70.25	9.19	10.38	54.5	52.88		16.5	48	62.5	29	4.12	24	4980	11,398

## CLASS 75WN FLANGES



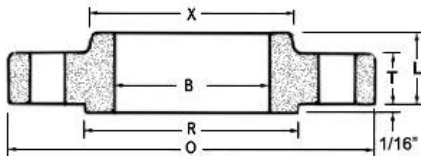
Weld Neck Flange



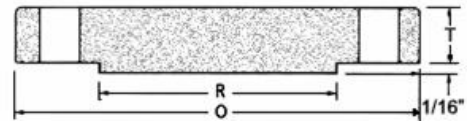
Blind Flange

Nom Size	OD	Thickness		OD of RF	Dia at Base	Bore	LTH	Dia Bevel	Drilling				Weight	
		Weld Neck	Blind						Bolt Circle	Bolt Length	Hole Diab	# of Holes	Weld Neck	Blind
	O	T	T	R	X	B	L	A						
26	31.5	1.15	1.25	28.63	27.13	To Be Specified By Purchaser	3	To Be Determined by Design Requirements	29.63	5	1	32	98	265
28	33.5	1.25	1.25	30.63	29.13		3		31.63	5	1	36	105	300
30	35.5	1.25	1.38	32.63	31.13		3		33.63	5.25	1	36	110	370
32	38.3	1.25	1.5	35	33.38		3.25		36.16	5.5	1.13	36	140	470
34	40.3	1.25	1.5	37	35.38		3.25		38.13	5.5	1.13	40	150	520
36	42.3	1.25	1.63	39	37.38		3.25		40.13	5.75	1.13	40	160	620
42	49	1.25	1.88	45.5	43.75		3.5		46.75	6.25	1.25	48	210	970
48	55	1.25	2.13	51.5	49.75		3.75		52.75	6.5	1.25	52	240	1375
54	61.3	1.38	2.38	57.75	56		4		59	6.75	1.25	64	310	1925
60	67.3	1.63	2.63	63.75	62		4.38		65	7.25	1.25	72	400	2575
66	74	1.88	2.88	70.13	68		4.88		71.5	8	1.38	72	560	3400
72	80	2.25	3.13	76.13	74		5.25		77.5	8.75	1.38	80	700	4350

## CLASS 75 SO FLANGES



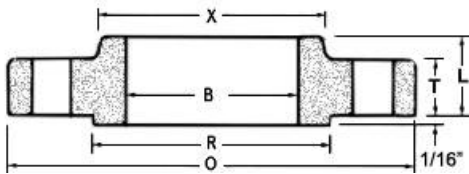
*Slip On*



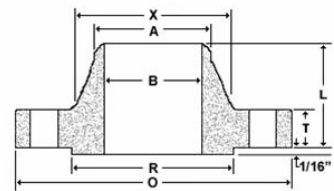
*Blind*

Nom Size	OD	Thickness		OD of RF	Dia at Base	Borea	LTH	Drilling Bolt Circle	Bolt Lengthb	Hole Diac	# of Holes	Weight	
		Slip On	Blind									Slip On	Blind
		O	T									C	R
26	33	1.25	1.25	30	28.5	26.25	2.25	31	5	1	32	120	290
28	35	1.25	1.38	32	30.5	28.25	2.25	33	5.25	1	36	140	360
30	37	1.25	1.38	34	32.5	30.25	2.25	35	5.25	1	36	150	405
32	39.5	1.25	1.5	36.25	34.63	32.25	2.5	37.38	5.5	1.13	40	170	500
34	41.5	1.25	1.63	38.25	36.63	34.25	2.5	39.38	5.75	1.13	40	180	600
36	43.5	1.25	1.63	40.25	38.63	36.25	2.5	41.38	5.75	1.13	44	190	660
42	50	1.25	1.88	46.5	44.75	42.25	2.75	47.75	6.25	1.25	48	235	1000
48	56	1.25	2.13	52.5	50.75	48.25	2.88	53.75	6.5	1.25	56	270	1450
54	62.5	1.38	2.38	59	57.25	54.25	3.13	60.25	6.75	1.25	68	335	2000
60	68.5	1.63	2.63	65	63.25	60.25	3.63	66.25	7.25	1.25	72	450	2675
66	75.5	1.75	2.88	71.63	69.5	66.25	4	73	8	1.38	72	590	3550
72	81.5	2	3.13	77.63	75.5	72.25	4.5	79	8.5	1.38	80	730	4500

## CLASS 175 FLANGES



*Slip On*

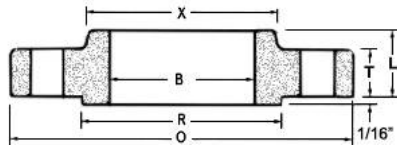


*Blind*

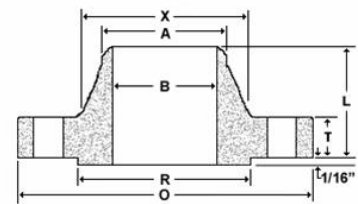
Nom Size	OD	Thickness		Slip-On	Blind	OD of RF	Dia at Base	Bore	LTH		Dia Bevel
		Weld Neck						Weld Neck	Slip-On		
	O	T	T		R	X	B	B	L	L	A
26	32	1.38	1.38	1.78	29	27.63	<b>To Be Determined by Design Requirements</b>	26.25	3.38	2.75	<b>To Be Specified By Purchaser</b>
28	34	1.38	1.38	2	31	29.63		28.25	3.38	2.75	
30	36	1.38	1.38	2.13	33.25	31.88		30.25	3.63	2.75	
32	38	1.38	1.38	2.25	35.25	33.88		32.25	3.63	2.75	
34	40	1.5	1.75	2.38	37.38	35.88		34.25	3.75	3.38	
36	42	1.5	1.75	2.5	39.38	37.88		36.25	3.75	3.38	
38	44	1.75	2	2.63	41.38	39.88		38.25	4.13	3.75	
40	46	1.75	2	2.75	43.38	41.88		40.25	4.13	4	
42	49	2	2.38	2.88	45.75	44.13		42.25	4.5	4.38	
44	51	2	2.38	3	47.75	46.13		44.25	4.5	4.38	
46	53	2	2.38	3.13	49.75	48.13		46.25	4.5	4.63	
48	55	2.25	2.63	3.38	51.75	50.13		48.25	4.88	4.88	
50	57	2.25	2.63	3.38	53.75	52.13		50.25	4.88	4.88	
52	60	2.63	3	3.63	56	54.25		52.25	5.38	5.38	
54	62	2.63	3	3.63	58	56.25		54.25	5.38	5.38	
60	68	2.75	3.13	4	64	62.25		60.25	5.75	5.88	
66	74	3.13	4	4.38	70	68.5		66.25	6.13	6.88	
72	80	3.63	5	4.75	76.5	74.5		72.25	6.63	8	
84	94	3	5	5.5	90.13	88	84.25	7	8.5		
96	106	3.5	5	6.12	102.13	100	96.25	7.5	9		

## CLASS 350 FLANGES

### 1/2



*Slip On*



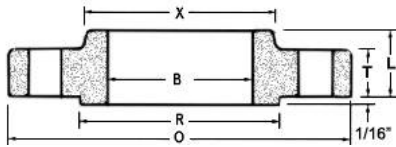
*Blind*

Nom Size	OD	Thickness			OD of RF	Dia at Base	Bore	Weld Neck	LTH			Dia Bevel
		Weld Neck	Slip-On	Blind					Slip-On	Weld Neck	Slip-On	
	O	T	T		R	X	B	B	L	L	A	
26	32.75	2.5	2.5	2.75	29.5	27.88	<b>To Be Determined by Design Requirements</b>	26.25	5	4.5	<b>To Be Specified By Purchaser</b>	
28	34.75	2.5	2.5	2.88	31.50	29.88		28.25	5	4.5		
30	37	2.63	2.63	3	33.75	32.13		30.25	5.25	4.75		
32	39	2.75	2.75	3.25	35.75	34.13		32.25	5.5	5		
34	41	2.88	2.88	3.38	37.75	36.13		34.25	5.75	5.13		
36	43.75	3.13	3.13	3.63	40.25	38.5		36.25	6.13	5.63		
38	45.75	3.13	3.13	3.75	42.25	40.5		38.25	6.13	5.63		
40	47.75	3.25	3.25	4	44.25	42.5		40.25	6.25	5.88		
42	50	3.5	3.5	4.13	46.5	44.75		42.25	6.5	6.13		
44	52.75	3.75	3.75	4.38	48.88	46.75		44.25	6.75	6.75		
46	54.75	4.25	4.25	4.75	50.88	48.75		46.25	7.25	7.25		
48	56.75	4.25	4.25	4.75	52.88	50.75		48.25	7.25	7.25		
52	61.5	4.25	-	-	57.25	55		52.25	7.5	-		
54	63.5	4.5	4.75	-	59.25	57		54.25	7.75	8.25		
60	69.5	4.5	5	-	65.25	63		60.25	8	8.5		
66	77	4	-	-	72.38	70		66.25	8.5	-		
72	83	4	-	-	78.38	76		72.25	9	-		

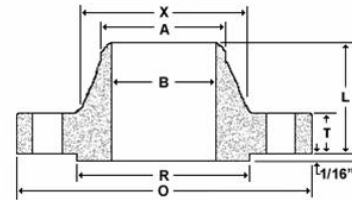


**CLASS 350 FLANGES**

**2/2**



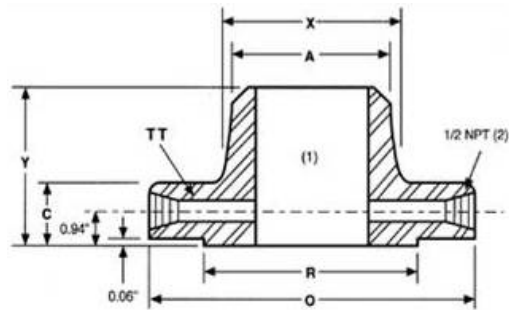
*Slip On*



*Blind*

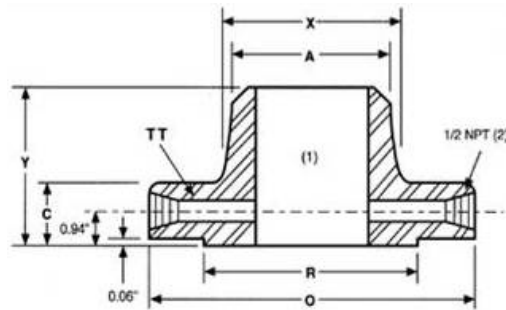
Nom Size	Drilling				Weight	Slip On	Blind
	Bolt Circle	Bolt Length	Hole Diab	# of Holes			
26	30.63	8	1.13	28	245	225	580
28	32.63	8.25	1.13	28	260	250	750
30	34.88	8.5	1.13	32	305	295	890
32	36.88	8.75	1.13	36	340	325	1050
34	38.88	9	1.13	40	375	355	1225
36	41.5	9.75	1.25	40	480	465	1500
38	43.5	10	1.25	40	510	490	1700
40	45.5	10.25	1.25	44	540	530	1975
42	47.75	10.75	1.25	48	640	620	2225
44	50.25	11.5	1.38	44	760	760	2625
46	52.25	12.25	1.38	48	880	880	2950
48	54.25	12.25	1.38	48	920	920	3300
52	58.75	-	1.5	52	1075	-	-
54	60.75	-	1.5	52	1200	1150	-
60	66.75	-	1.5	60	1325	1450	-
66	74	-	1.63	60	1675	-	-
72	80	-	1.63	72	1850	-	-

## B16.5 WELDING NECK ORIFICE CLASS 300 FLANGES



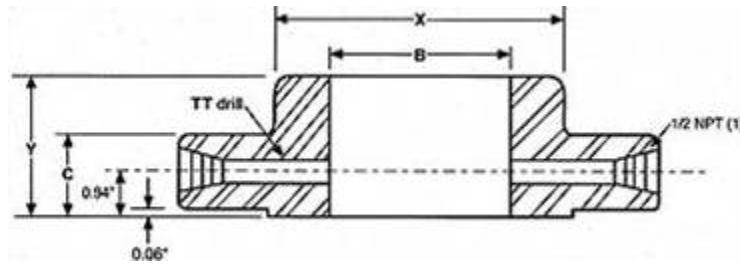
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH	Dia of Pressure Connection	Drilling Bolt Circle	Hole Dia	# of Holes	Bolt Dia
		O	C	R	X	A	Y	TT				
in	1	4.88	1.5	2	2.12	1.32	3.25	1/4	3.5	0.69	4	5/8
mm		124	38.1	50.8	53.8	33.5	82.6	6.4	88.9	17.5		15.9
in	1 1/2	6.12	1.5	2.88	2.75	1.9	3.38	1/4	4.5	0.81	4	3/4
mm		155.4	38.1	73.2	69.9	48.3	85.9	6.4	114.3	20.6		19.1
in	2	6.5	1.5	3.62	3.31	2.38	3.38	1/4	5	0.69	8	5/8
mm		165.1	38.1	91.9	84.1	60.5	85.9	6.4	127	17.5		15.9
in	2 1/2	7.5	1.5	4.12	3.94	2.88	3.5	1/4	5.88	0.81	8	3/4
mm		190.5	38.1	104.6	100.1	73.2	88.9	6.4	149.4	20.6		19.1
in	3	8.25	1.5	5	4.62	3.5	3.5	3/8	6.62	0.81	8	3/4
mm		209.6	38.1	127	117.3	88.9	88.9	9.5	168.1	20.6		19.1
in	4	10	1.5	6.19	5.75	4.5	3.62	1/2	7.88	0.81	8	3/4
mm		254	38.1	157.2	146.1	114.3	91.9	12.7	200.2	20.6		19.1
in	6	12.5	1.5	8.5	8.12	6.63	3.94	1/2	10.62	0.88	12	3/4
mm		317.5	38.1	215.9	206.2	168.4	100.1	12.7	269.7	22.4		19.1
in	8	15	1.62	10.62	10.25	8.63	4.38	1/2	13	1	12	7/8
mm		381	41.1	269.7	260.4	219.2	111.3	12.7	330.2	25.4		22.2

**B16.5 WELDING NECK ORIFICE CLASS 300 FLANGES**



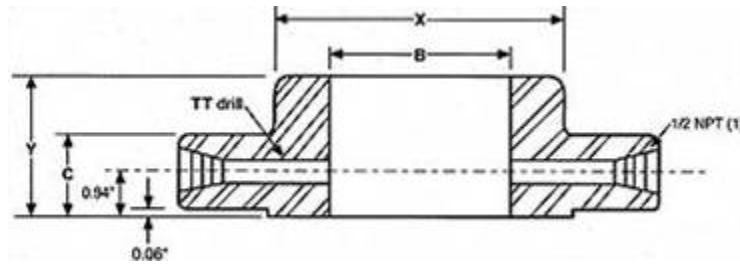
									Drilling				
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH		Dia of Pressure Connection	Bolt Circle	Hole Dia	# of Holes	Bolt Dia
		O	C	R	X	A	Y		TT				
in	10	17.5	1.88	12.75	12.62	10.75	4.62		1/2	15.25	1.12	16	1
mm		444.5	47.8	323.9	320.5	273.1	117.3		12.7	387.4	28.4		25.4
in	12	20.5	2	15	14.75	12.75	5.12		1/2	17.75	1.25	16	1 1/8
mm		520.7	50.8	381	374.7	323.9	130		12.7	450.9	31.8		28.6
in	14	23	2.12	16.25	16.75	14	5.62		1/2	20.25	1.25	20	1 1/8
mm		584.2	53.8	412.8	425.5	355.6	142.7		12.7	514.4	31.8		28.6
in	16	25.5	2.25	18.5	19	16	5.75		1/2	22.5	1.38	20	1 1/4
mm		647.7	57.2	469.9	482.6	406.4	146.1		12.7	571.5	35.1		31.8
in	18	28	2.38	21	21	18	6.25		1/2	24.75	1.38	24	1 1/4
mm		711.2	60.5	533.4	533.4	457.2	158.8		12.7	628.7	35.1		31.8
in	20	30.5	2.5	23	23.12	20	6.38		1/2	27	1.38	24	1 1/4
mm		774.7	63.5	584.2	587.2	508	162.1		12.7	685.8	35.1		31.8
in	24	36	2.75	27.25	27.62	24	6.62		1/2	32	1.62	24	1 1/2
mm		914.4	69.9	692.2	701.5	609.6	168.1		12.7	812.8	41.1		38.1

## B16.5 WELDING NECK ORIFICE CLASS 300 SO FLANGES



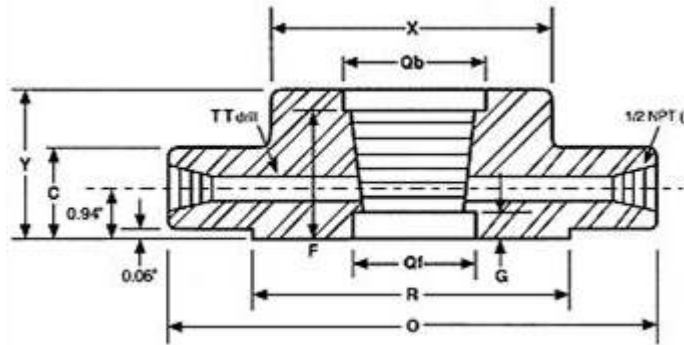
									Drilling				
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH		Dia of Pressure Connection	Bolt Circle	Hole Dia	# of Holes	Bolt Dia
		O	C	R	X	B	Y		TT				
in	1	4.88	1.5	2	2.12	1.36	1.88		1/4	3.5	0.69	4	5/8
mm		124	38.1	50.8	53.8	34.5	47.8		6.4	88.9	17.5		15.9
in	1 1/2	6.12	1.5	2.88	2.75	1.95	1.88		1/4	4.5	0.81	4	3/4
mm		155.4	38.1	73.2	69.9	49.5	47.8		6.4	114.3	20.6		19.1
in	2	6.5	1.5	3.62	3.31	2.44	1.94		1/4	5	0.69	8	5/8
mm		165.1	38.1	91.9	84.1	62	49.3		6.4	127	17.5		15.9
in	2 1/2	7.5	1.5	4.12	3.94	2.94	2		1/4	5.88	0.81	8	3/4
mm		190.5	38.1	104.6	100.1	74.7	50.8		6.4	149.4	20.6		19.1
in	3	8.25	1.5	5	4.62	3.57	2.06		3/8	6.62	0.81	8	3/4
mm		209.6	38.1	127	117.3	90.7	52.3		9.5	168.1	20.6		19.1
in	4	10	1.5	6.19	5.75	4.57	2.12		1/2	7.88	0.81	8	3/4
mm		254	38.1	157.2	146.1	116.1	53.8		12.7	200.2	20.6		19.1
in	6	12.5	1.5	8.5	8.12	6.72	2.12		1/2	10.62	0.88	12	3/4
mm		317.5	38.1	215.9	206.2	170.7	53.8		12.7	269.7	22.4		19.1
in	8	15	1.62	10.62	10.25	8.72	2.44		1/2	13	1	12	7/8
mm		381	41.1	269.7	260.4	221.5	62		12.7	330.2	25.4		22.2

## B16.5 WELDING NECK ORIFICE CLASS 300 SO FLANGES



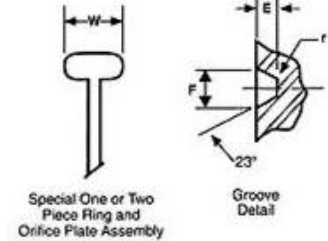
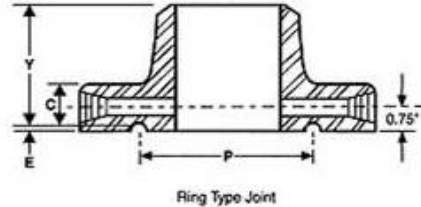
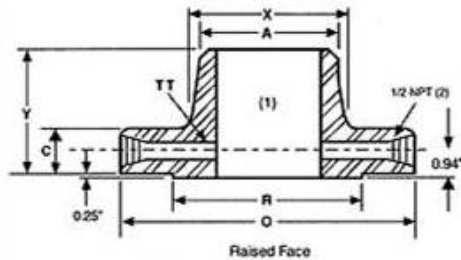
									Drilling				
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH		Dia of Pressure Connection	Bolt Circle	Hole Dia	# of Holes	Bolt Dia
		O	C	R	X	B	Y		TT				
in	10	17.5	1.88	12.75	12.62	10.88	2.62		1/2	15.25	1.12	16	1
mm		444.5	47.8	323.9	320.5	276.4	66.5		12.7	387.4	28.4		25.4
in	12	20.5	2	15	14.75	12.88	2.88		1/2	17.75	1.25	16	1 1/8
mm		520.7	50.8	381	374.7	327.2	73.2		12.7	450.9	31.8		28.6
in	14	23	2.12	16.25	16.75	14.14	3		1/2	20.25	1.25	20	1 1/8
mm		584.2	53.8	412.8	425.5	359.2	76.2		12.7	514.4	31.8		28.6
in	16	25.5	2.25	18.5	19	16.16	3.25		1/2	22.5	1.38	20	1 1/4
mm		647.7	57.2	469.9	482.6	410.5	82.6		12.7	571.5	35.1		31.8
in	18	28	2.38	21	21	18.18	3.5		1/2	24.75	1.38	24	1 1/4
mm		711.2	60.5	533.4	533.4	461.8	88.9		12.7	628.7	35.1		31.8
in	20	30.5	2.5	23	23.12	20.2	3.75		1/2	27	1.38	24	1 1/4
mm		774.7	63.5	584.2	587.2	513.1	95.3		12.7	685.8	35.1		31.8
in	24	36	2.75	27.25	27.62	24.25	4.19		1/2	32	1.62	24	1 1/2
mm		914.4	69.9	692.2	701.5	616	106.4		12.7	812.8	41.1		38.1

## B16.5 WELDING NECK ORIFICE CLASS 300 THREADED FLANGES



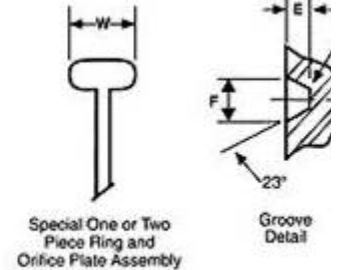
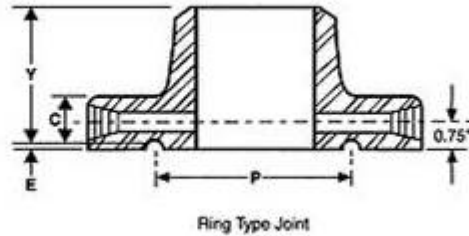
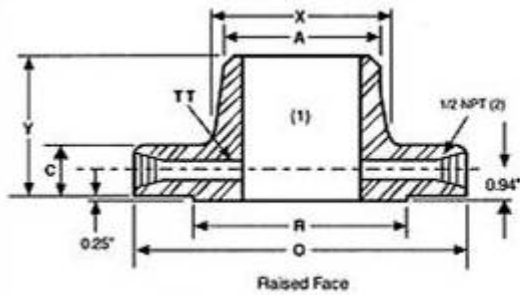
												Drilling			
Nom Size		OD	Thickness	OD of RF	Dia at Base	LTH	OD of Counter Bore		Counter Bore Depth (from face)		Diameter of Pressure Connection	Bolt Circle	Hole Dia	# of Holes	Bolt Dia
		O	C	R	X	Y	Qb <sup>(2)</sup>	Qf <sup>(3)</sup>	F	G	TT				
in.	1	4.88	1.5	2	2.12	1.88	1.41	1.3	1.44	0.75	1/4	3.5	0.69	4	5/8
mm.		124	38.1	50.8	53.8	47.8	35.8	33	36.6	19.1	6.4	88.9	17.5		15.9
in.	1 1/2	6.12	1.5	2.88	2.75	1.88	1.99	1.89	1.47	0.72	1/4	4.5	0.81	4	3/4
mm.		155.4	38.1	73.2	69.9	47.8	50.5	48	37.3	18.3	6.4	114.3	20.6		19.1
in.	2	6.5	1.5	3.62	3.31	1.94	2.5	2.36	1.5	0.69	1/4	5	0.69	8	5/8
mm.		165.1	38.1	91.9	84.1	49.3	63.5	59.9	38.1	17.5	6.4	127	17.5		15.9
in.	2 1/2	7.5	1.5	4.12	3.94	2	3	2.84	1.75	0.56	1/4	5.88	0.81	8	3/4
mm.		190.5	38.1	104.6	100.1	50.8	76.2	72.1	44.5	14.2	6.4	149.4	20.6		19.1
in.	3	8.25	1.5	5	4.62	2.06	3.63	3.46	1.81	0.56	3/8	6.62	0.81	8	3/4
mm.		209.6	38.1	127	117.3	52.3	92.2	87.9	46	14.2	9.5	168.1	20.6		19.1
in.	4	10	1.5	6.19	5.75	2.12	4.63	4.45	1.88	0.56	1/2	7.88	0.81	8	3/4
mm.		254	38.1	157.2	146.1	53.8	117.6	113	47.8	14.2	12.7	200.2	20.6		19.1
in.	6	12.5	1.5	8.5	8.12	2.12	6.75	6.57	1.88	0.31	1/2	10.62	0.88	12	3/4
mm.		317.5	38.1	215.9	206.2	53.8	171.5	166.9	47.8	7.9	12.7	269.7	22.4		19.1
in.	8	15	1.62	10.62	10.25	2.44	8.75	8.55	2.19	0.44	1/2	13	1	12	7/8
mm.		381	41.1	269.7	260.4	62	222.3	217.2	55.6	11.2	12.7	330.2	25.4		22.2

## B16.5 WELDING NECK ORIFICE CLASS 400 FLANGES



								Drilling					Ring Type Joint					
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia	# of holes	Bolt Dia	Groove	Pitch Dia	Groove Depth	Groove width	Rad at Bottom	Spec Oval RH
		O	C	R	X	A	Y	TT						P	E	F	r max	W
in	4	10	1.5	6.19	5.75	4.5	3.5	1/2	7.88	1	8	7/8	R37	5.875	0.312	0.469	0.03	1.06
mm		254	38.1	157	146	114.3	88.9	12.7	200.2	25.4		22.2		149.225	7.925	11.913	0.8	26.9
in	6	12.5	1.62	8.5	8.12	6.63	4.06	1/2	10.62	1	12	7/8	R45	8.312	0.312	0.469	0.03	1.06
mm		317.5	41.1	216	206	168.4	103	12.7	269.7	25.4		22.2		211.125	7.925	11.913	0.8	26.9
in	8	15	1.88	10.62	10.25	8.63	4.62	1/2	13	1.12	12	1	R49	10.625	0.312	0.469	0.03	1.06
mm		381	47.8	270	260	219.2	117	12.7	330.2	28.4		25.4		269.875	7.925	11.913	0.8	26.9
in	10	17.5	2.12	12.75	12.62	10.75	4.88	1/2	15.25	1.25	16	1 1/8	R53	12.75	0.312	0.469	0.03	1.06
mm		444.5	53.8	324	321	273.1	124	12.7	387.4	31.8		28.6		323.85	7.925	11.913	0.8	26.9
in	12	20.5	2.25	15	14.75	12.75	5.38	1/2	17.75	1.38	16	1 1/4	R57	15	0.312	0.469	0.03	1.06
mm		520.7	57.2	381	375	323.9	137	12.7	450.9	35.1		31.8		381	7.925	11.913	0.8	26.9
in	14	23	2.39	16.25	16.75	14	5.88	1/2	20.25	1.38	20	1 1/4	R61	16.5	0.312	0.469	0.03	1.06
mm		584.2	60.7	413	426	355.6	149	12.7	514.4	35.1		31.8		419.1	7.925	11.913	0.8	26.9
in	16	25.5	2.5	18.5	19	16	6	1/2	22.5	1.5	20	1 3/8	R65	18.5	0.312	0.469	0.03	1.19
mm		647.7	63.5	470	483	406.4	152	12.7	571.5	38.1		34.9		469.9	7.925	11.913	0.8	30.2
in	18	28	2.62	21	21	18	6.5	1/2	24.75	1.5	24	1 3/8	R69	21	0.312	0.469	0.03	1.19
mm		711.2	66.5	533	533	457.2	165	12.7	628.7	38.1		34.9		533.4	7.925	11.913	0.8	30.2
in	20	30.5	2.75	23	23.12	20	6.62	1/2	27	1.62	24	1 1/2	R73	23	0.375	0.531	0.06	1.25
mm		774.7	69.9	584	587	508	168	12.7	685.8	41.1		38.1		584.2	9.525	13.487	1.5	31.8
in	24	36	3	27.25	27.62	24	6.88	1/2	32	1.89	24	1 3/4	R77	27.25	0.438	0.656	0.06	1.44
mm		914.4	76.2	692.2	702	609.6	174.8	12.7	812.8	48		44.5		692.15	23.82	16.66	1.52	36.57

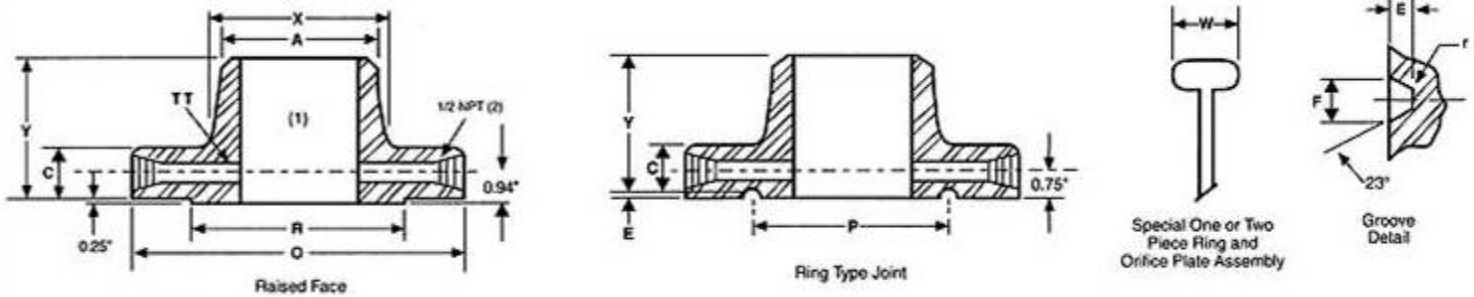
## B16.5 WELDING NECK ORIFICE CLASS 600 FLANGES



	Nom Size	OD	Thickness	OD of RF	Dia at base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia		# of holes	Bolt Dia	Groove #	Pitch Dia	Groove Depth	Groove Width	Rad at Bottom	Spec Oval RH
		O	C	R	X	A	Y	TT		RF	RJ				P	E	F	r max	W
in	1	4.88	1.5	2	2.12	1.32	3.25	1/4	3.5	0.69	0.75	4	5/8	R16	2	0.25	0.344	0.03	1
mm		124	38.1	50.8	53.8	33.5	82.6	6.4	88.9	17.5	19.1		15.9		50.8	6.35	8.738	0.8	25.4
in	1 1/2	6.12	1.5	2.88	2.75	1.9	3.38	1/4	4.5	0.81	0.88	4	3/4	R20	2.688	0.25	0.344	0.03	1
mm		155.4	38.1	73.2	69.9	48.3	85.9	6.4	114.3	20.6	22.4		19.1		68.275	6.35	8.738	0.8	25.4
in	2	6.5	1.5	3.62	3.31	2.38	3.38	1/4	5	0.69	0.75	8	5/8	R23	3.25	0.312	0.469	0.03	1.06
mm		165.1	38.1	91.9	84.1	60.5	85.9	6.4	127	17.5	19.1		15.9		82.55	7.925	11.913	0.8	26.9
in	2 1/2	7.5	1.5	4.12	3.94	2.88	3.5	1/4	5.88	0.81	0.88	8	3/4	R26	4	0.312	0.469	0.03	1.06
mm		190.5	38.1	104.6	100.1	73.2	88.9	6.4	149.4	20.6	22.4		19.1		101.6	7.925	11.913	0.8	26.9
in	3	8.25	1.5	5	4.62	3.5	3.5	3/8	6.62	0.81	0.88	8	3/4	R31	4.875	0.312	0.469	0.03	1.06
mm		209.6	38.1	127	117.3	88.9	88.9	9.5	168.2	20.6	22.4		19.1		123.825	7.925	11.913	0.8	26.9
in	4	10.75	1.5	6.19	6	4.5	4	1/2	8.5	1	1	8	7/8	R37	5.875	0.312	0.469	0.03	1.06
mm		273.1	38.1	157.2	152.4	114.3	101.6	12.7	215.9	25.4	25.4		22.2		149.225	7.925	11.913	0.8	26.9
in	6	14	1.88	8.5	8.75	6.63	4.62	1/2	11.5	1.12	1.12	12	1	R45	8.312	0.312	0.469	0.03	1.06
mm		355.6	47.8	215.9	222.3	168.4	117	12.7	292.1	28.4	28.4		25.4		211.125	7.925	11.913	0.8	26.9
in	8	16.5	2.19	10.62	10.75	8.63	5.25	1/2	13.75	1.25	1.25	12	1 1/8	R49	10.625	0.312	0.469	0.03	1.06
mm		419.1	55.6	269.7	273.1	219.2	133	12.7	349.3	31.8	31.8		28.6		269.875	7.925	11.913	0.8	26.9

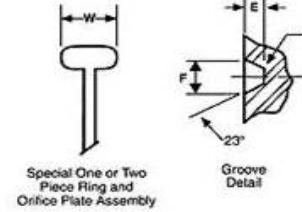
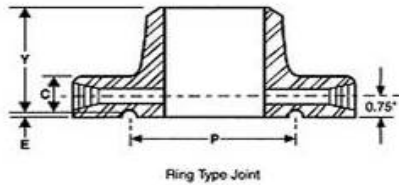
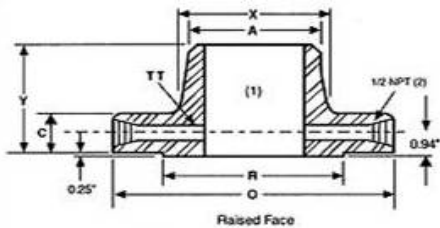


## B16.5 WELDING NECK ORIFICE CLASS 600 FLANGES



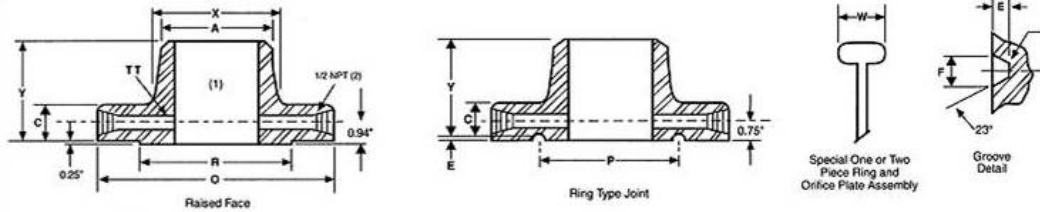
									Drilling							Ring Type Joint		
	Nom Size	OD	Thickness	OD of RF	Dia at base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia		# of holes	Bolt Dia	Groove #	Pitch Dia	Groove Depth	Groove Width	Rad at Bottom
		O	C	R	X	A	Y	TT		RF	RJ				P	E	F	r max
in	10	20	2.5	12.75	13.5	10.75	6	1/2	17	1.38	1.38	16	1 1/4	R53	12.75	0.312	0.469	0.03
mm		508	63.5	323.9	342.9	273.1	152	12.7	431.8	35.1	35.1		31.8		323.85	7.925	11.913	0.8
in	12	22	2.62	15	15.75	12.75	6.12	1/2	19.25	1.38	1.38	20	1 1/4	R57	15	0.312	0.469	0.03
mm		558.8	66.5	381	400.1	323.9	155.4	12.7	489	35.1	35.1		31.8		381	7.925	11.913	0.8
in	14	23.75	2.75	16.25	17	14	6.5	1/2	20.75	1.5	1.5	20	1 3/8	R61	16.5	0.312	0.469	0.03
mm		603.3	69.9	412.8	431.8	355.6	165	12.7	527.1	38.1	38.1		35.1		419.1	7.925	11.913	0.8
in	16	27	3	18.5	19.5	16	7	1/2	23.75	1.6	1.6	20	1 1/2	R65	18.5	0.312	0.469	0.03
mm		685.8	76.2	469.9	495.3	406.4	178	12.7	603.3	41.1	41.1		38.1		469.9	7.925	11.913	0.8
in	18	29.25	3.25	21	21.5	18	7.25	1/2	25.75	1.75	1.75	20	1 5/8	R69	21	0.312	0.469	0.03
mm		743	82.6	533.4	546.1	457.2	184	12.7	654.1	44.5	44.5		41.3		533.4	7.925	11.913	0.8
in	20	32	3.5	23	24	20	7.5	1/2	28.5	1.75	1.75	24	1 5/8	R73	23	0.375	0.531	0.06
mm		812.8	88.9	584.2	609.6	508	191	12.7	723.9	44.5	44.5		41.3		584.2	9.525	13.487	1.5
in	24	37	4	27.25	28.25	24	8	1/2	33	2	2	24	1 7/8	R77	27.25	0.438	0.656	0.06
mm		939.8	101.6	692.2	717.6	609.6	203	12.7	838.2	50.8	50.8		47.6		692.15	23.82	16.66	1.52

## B16.5 WELDING NECK ORIFICE CLASS 900 FLANGES



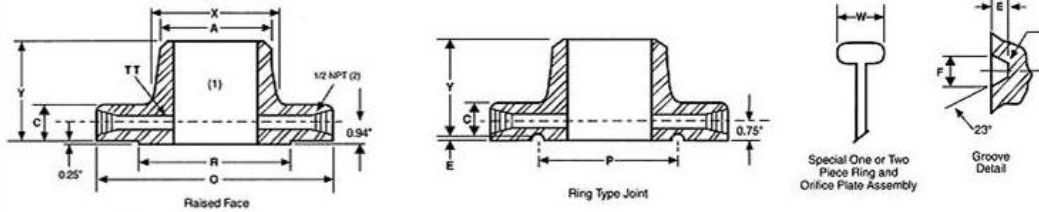
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia	# of holes	Bolt Dia	Groove #	Pitch Dia	Groove Depth	Groove Width	Rad at Bottom	Spec Oval RH
		O	C	R	X	A	Y	TT					P	E	F	r max	W	
in	3	9.5	1.5	5	5	3.5	4	3/8	7.5	1	8	7/8	R31	4.875	0.312	0.469	0.03	1.06
mm		241.3	38.1	127	127	88.9	101.6	9.5	190.5	25.4		22.2		123.825	7.925	11.913	0.8	26.9
in	4	11.5	1.75	6.19	6.25	4.5	4.5	1/2	9.25	1.25	8	1 1/8	R37	5.875	0.312	0.469	0.03	1.06
mm		292.1	44.5	157.2	158.8	114.3	114.3	12.7	235	31.8		28.6		149.225	7.925	11.913	0.8	26.9
in	6	15	2.19	8.5	9.25	6.63	5.5	1/2	12.5	1.25	12	1 1/8	R45	8.312	0.312	0.469	0.03	1.06
mm		381	55.6	215.9	235	168.4	139.7	12.7	317.5	31.8		28.6		211.125	7.925	11.913	0.8	26.9
in	8	18.5	2.5	10.62	11.75	8.63	6.38	1/2	15.5	1.5	12	1 3/8	R49	10.625	0.312	0.469	0.03	1.06
mm		469.9	63.5	269.7	298.5	219.2	162.1	12.7	393.7	38.1		34.9		269.875	7.925	11.913	0.8	26.9
in	10	21.5	2.75	12.75	14.5	10.75	7.25	1/2	18.5	1.5	16	1 3/8	R53	12.75	0.312	0.469	0.03	1.06
mm		546.1	69.9	323.9	368.3	273.1	184.2	12.7	469.9	38.1		34.9		323.85	7.925	11.913	0.8	26.9
in	12	24	3.12	15	16.5	12.75	7.88	1/2	21	1.5	20	1 3/8	R57	15	0.312	0.469	0.03	1.06
mm		609.6	79.2	381	419.1	323.9	200.2	12.7	533.4	38.1		34.9		381	7.925	11.913	0.8	26.9
in	14	25.25	3.38	16.25	17.75	14	8.38	1/2	22	1.62	20	1 1/2	R62	16.5	0.438	0.656	0.06	1.31
mm		641.4	85.9	412.8	450.9	355.6	212.9	12.7	558.8	41.1		38.1		419.1	11.12	16.66	1.5	33.27
in	16	27.75	3.5	18.5	20	16	8.5	1/2	24.3	1.75	20	1 5/8	R66	18.5	0.438	0.656	0.06	1.44
mm		704.9	88.9	469.9	508	406.4	215.9	12.7	616	44.5		41.3		469.9	11.12	16.66	1.5	36.57
in	18	31	4	21	22.25	18	9	1/2	27	2	20	1 7/8	R70	21	0.5	0.781	0.06	1.56
mm		787.4	101.6	533.4	565.2	457.2	228.6	12.7	685.8	50.8		47.6		533.4	12.7	19.83	1.5	39.62
in	20	33.75	4.25	23	24.5	20	9.75	1/2	29.5	2.12	20	2	R74	23	0.5	0.781	0.06	1.56
mm		857.3	108	584.2	622.3	508	247.7	12.7	749.3	53.8		50.8		584.2	12.7	19.83	1.5	39.62
in	24	41	5.5	27.25	29.5	24	11.5	1/2	35.5	2.62	20	2 1/2	R78	27.25	0.625	1.062	0.09	1.88
mm		1041.4	139.7	692.2	749.3	609.6	292.1	12.7	901.7	66.5		63.5		692.15	15.87	26.97	2.28	47.75

## B16.5 WELDING NECK ORIFICE CLASS 1500 FLANGES



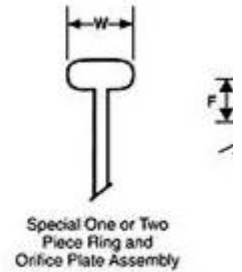
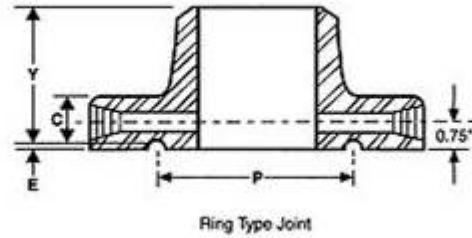
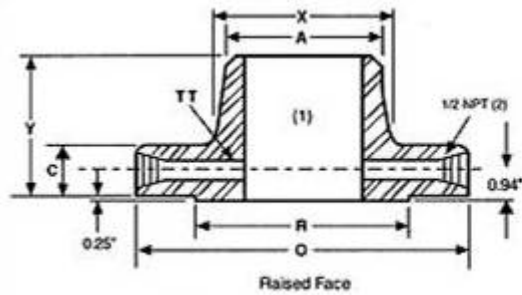
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia	# of holes	Bolt Dia	Groove #	Pitch Dia	Groove Depth	Groove Width	Rad at Bottom	Spec Oval RH
		O	C	R	X	A	Y	TT						P	E	F	r max	W
in.	1"	5.88	1.5	2	2.06	1.32	3.25	04-Jan	4	1	08-Jul	4	R16	2	0.25	0.344	0.03	1
mm.		149.4	38.1	50.8	52.3	33.5	82.6	6.4		25.4	22.2	101.6		50.8	6.35	8.738	0.8	25.4
in.	1 1/2"	7	1.5	2.88	2.75	1.9	3.5	04-Jan	4	1.12	1	4.88	R20	2.688	0.25	0.344	0.03	1
mm.		177.8	38.1	73.2	69.9	48.3	88.9	6.4		28.4	25.4	124		68.275	6.35	8.738	0.8	25.4
in.	2"	8.5	1.5	3.62	4.12	2.38	4	04-Jan	8	1	08-Jul	6.5	R24	3.75	0.312	0.469	0.03	1.06
mm.		215.9	38.1	91.9	104.6	60.5	101.6	6.4		25.4	22.2	165.1		95.25	7.925	11.913	0.8	26.9
in.	2 1/2"	9.62	1.62	4.12	4.88	2.88	4.12	04-Jan	8	1.12	1	7.5	R27	4.25	0.312	0.469	0.03	1.06
mm.		244.3	41.1	104.6	124	73.2	104.6	6.4		28.4	25.4	190.5		107.95	7.925	11.913	0.8	26.9
in.	3"	10.5	1.88	5	5.25	3.5	4.62	08-Mar	8	1.25	1 1/8	8	R35	5.375	0.312	0.469	0.03	1.06
mm.		266.7	47.8	127	133.4	88.9	117.3	9.5		31.8	28.6	203.2		136.525	7.925	11.913	0.8	26.9
in.	4"	12.25	2.12	6.19	6.38	4.5	4.88	02-Jan	8	1.38	1 1/4	9.5	R39	6.375	0.312	0.469	0.03	1.06
mm.		311.2	53.8	157.2	162.1	114.3	124	12.7		35.1	31.8	241.3		161.925	7.925	11.913	0.8	26.9
in.	6"	15.5	3.25	8.5	9	6.63	6.75	02-Jan	12	1.5	1 3/8	12.5	R46	8.312	0.375	0.531	0.06	1.12
mm.		393.7	82.6	215.9	228.6	168.4	171.5	12.7		38.1	34.9	317.5		211.125	9.525	13.487	1.5	28.4
in.	8"	19	3.62	10.62	11.5	8.63	8.38	02-Jan	12	1.75	1 5/8	15.5	R50	10.625	0.438	0.656	0.06	1.31
mm.		482.6	91.9	269.7	292.1	219.2	212.9	12.7		44.5	41.3	393.7		269.87	11.12	16.66	1.5	33.27

## B16.5 WELDING NECK ORIFICE CLASS 1500 FLANGES



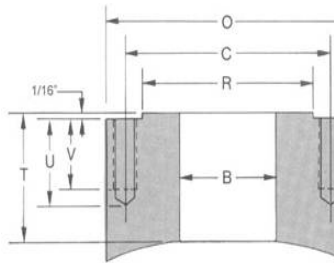
	Nom Size	OD	Thickness	OD of RF	Dia at Base	Dia Bevel	LTH	Dia of Pressure Connection	Bolt Circle	Hole Dia	# of holes	Bolt Dia	Groove #	Pitch Dia	Groove Depth	Groove Width	Rad at Bottom	Spec Oval RH
		O	C	R	X	A	Y	TT						P	E	F	r max	W
in.	10"	23	4.25	12.75	14.5	10.75	10	02-Jan	12	2	1 7/8	19	R54	12.75	0.438	0.656	0.06	1.31
mm.		584.2	108	323.9	368.3	273.1	254	12.7		50.8	47.6	482.6		323.85	11.12	16.66	1.5	33.27
in.	12"	26.5	4.88	15	17.75	12.75	11.12	02-Jan	16	2.12	2	22.5	R58	15	0.562	0.806	0.06	1.56
mm.		673.1	124	381	450.9	323.9	282.4	12.7		53.8	50.8	571.5		381	14.27	20.47	1.5	39.62
in.	14"	29.5	5.25	16.25	19.5	14	11.75	02-Jan	16	2.38	2 1/4	25	R63	16.5	0.625	1.062	0.09	1.75
mm.		749.3	133.4	412.8	495.3	355.6	298.5	12.7		60.5	57.2	635		419.1	15.87	26.97	2.28	44.45
in.	16"	32.5	5.75	18.5	21.75	16	12.25	02-Jan	16	2.62	2 1/2	27.75	R67	18.5	0.688	1.188	0.09	2
mm.		825.5	146.1	469.9	552.5	406.4	311.2	12.7		66.5	63.5	704.9		469.9	17.47	30.17	2.28	50.8
in.	18"	36	6.38	21	23.5	18	12.88	02-Jan	16	2.88	2 3/4	30.5	R71	21	0.688	1.188	0.09	2
mm.		914.4	162.1	533.4	596.9	457.2	327.2	12.7		73.2	69.9	774.7		533.4	17.47	30.17	2.28	50.8
in.	20"	38.75	7	23	25.25	20	14	02-Jan	16	3.12	3	32.75	R75	23	0.688	1.312	0.09	2.12
mm.		984.3	177.8	584.2	641.4	508	355.6	12.7		79.2	76.2	831.9		584.2	17.47	33.32	2.28	53.84
in.	24"	46	8	27.25	30	24	16	02-Jan	16	3.62	3 1/2	39	R79	27.25	0.812	1.438	0.09	2.31
mm.		1168.4	203.2	692.2	762	609.6	406.4	12.7		91.9	88.9	990.6		692.15	20.62	36.52	2.28	58.67

## B16.5 WELDING NECK ORIFICE CLASS 2500 FLANGES

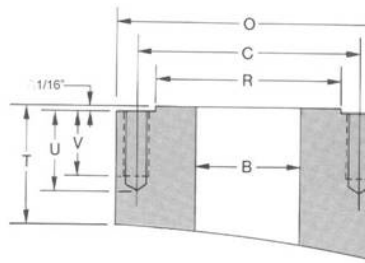


Nominal size		Outside dia of flange	Thick. Of flange	Diam. of raised face	Diam of hub at base	Diam. of hub at point of welding	Length thru hub	Diam. of pressure connection	No. of holes	Diam. of holes	Diam. of bolts	Diam. of bolt circle	Groove #	Pitch dia	Groove depth	Groove width	Rad at bott.	Spec. oval R. H.
		O	C	R	X	A	Y	TT						P	E	F	r max.	W
in.	1"	6.25	1.5	2	2.25	1.32	3.62	0.25	4	1	08-Jul	4.25	R18	2.375	0.25	0.344	0.03	1
mm.		158.8	38.1	50.8	57.2	33.5	91.9	6.40		25.4	22.2	108		60.325	6.35	8.738	0.8	25.4
in.	1 1/2"	8	1.75	2.88	3.12	1.9	4.38	0.25	4	1.25	1 1/8	5.75	R23	3.25	0.312	0.469	0.03	1.06
mm.		203.2	44.5	73.2	79.2	48.3	111.3	6.40		31.8	28.6	146.1		82.55	7.925	11.913	0.8	26.9
in.	2"	9.25	2	3.62	3.75	2.38	5	0.25	8	1.12	1	6.75	R26	4	0.312	0.469	0.03	1.06
mm.		235	50.8	91.9	95.3	60.5	127	6.40		28.4	25.4	171.5		101.6	7.925	11.913	0.8	26.9
in.	2 1/2"	10.5	2.25	4.12	4.5	2.88	5.62	0.25	8	1.25	1 1/8	7.75	R28	4.375	0.375	0.531	0.06	1.19
mm.		266.7	57.2	104.6	114.3	73.2	142.7	6.40		31.8	28.6	196.9		111.125	9.525	13.487	1.5	30.2
in.	3"	12	2.62	5	5.25	3.5	6.62	0.38	8	1.38	1 1/4	9	R32	5	0.375	0.531	0.06	1.19
mm.		304.8	66.5	127	133.4	88.9	168.1	9.50		35.1	31.8	228.6		127	9.525	13.487	1.5	30.2
in.	4"	14	3	6.19	6.5	4.5	7.5	0.50	8	1.62	1 1/2	10.75	R38	6.188	0.438	0.656	0.06	1.31
mm.		355.6	76.2	157.2	165.1	114.3	190.5	12.70		41.1	38.1	273.1		157.17	11.12	16.66	1.5	33.27
in.	6"	19	4.25	8.5	9.25	6.63	10.75	0.50	8	2.12	2	14.5	R47	9	0.5	0.781	0.06	1.44
mm.		482.6	108	215.9	235	168.4	273.1	12.70		53.8	50.8	368.3		228.6	12.7	19.83	1.5	36.57
in.	8"	21.75	5	10.62	12	8.63	12.5	0.50	12	2.12	2	17.25	R51	11	0.562	0.906	0.06	1.56
mm.		552.5	127	269.7	304.8	219.2	317.5	12.70		53.8	50.8	438.2		279.4	14.27	23.01	1.5	39.62
in.	10"	26.5	6.5	12.75	14.75	10.75	16.5	0.50	12	2.62	2 1/2	21.25	R55	13.5	0.688	1.188	0.09	1.88
mm.		673.1	165.1	323.9	374.7	273.1	419.1	12.70		66.5	63.5	539.8		342.9	17.47	30.17	2.28	47.75
in.	12"	30	7.25	15	17.38	12.75	18.25	0.50	12	2.88	2 3/4	24.38	R60	16	0.688	1.312	0.09	2
mm.		762	184.2	381	441.5	323.9	463.6	12.70		73.2	69.9	619.3		406.4	17.47	33.32	2.28	50.8

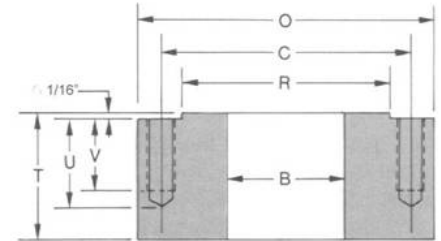
## CLASS 150 STUDDING OUTLETS



Shell Mount



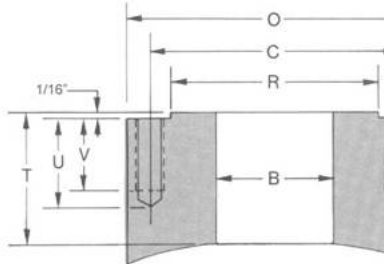
Tangential Mount



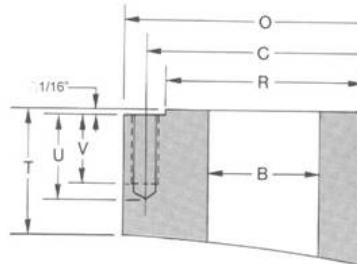
Flat Bottom

Bore	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	3.5	1.25	1.38	2.38	27/64	4	0.88	1/2	13	0.56	3	2.7
3/4	3.88	1.25	1.69	2.75	27/64	4	0.88	1/2	13	0.56	3.7	3.2
1	4.25	1.25	2	3.12	27/64	4	0.88	1/2	13	0.56	4.3	3.8
1 1/4	4.62	1.25	2.5	3.5	27/64	4	0.88	1/2	13	0.56	5.1	4.4
1 1/2	5	1.25	2.88	3.88	27/64	4	0.88	1/2	13	0.56	5.9	5.1
2	6	1.5	3.62	4.75	17/32	4	1.12	5/8	11	0.75	10.2	7.1
2 1/2	7	1.5	4.12	5.5	17/32	4	1.12	5/8	11	0.75	14	9.5
3	7.5	1.5	5	6	17/32	4	1.12	5/8	11	0.75	15	11
3 1/2	8.5	1.5	5.5	7	17/32	8	1.12	5/8	11	0.75	19	13
4	9	1.5	6.19	7.5	17/32	8	1.12	5/8	11	0.75	20	14
5	10	1.75	7.31	8.5	21/32	8	1.31	3/4	10	0.88	28	17
6	11	1.75	8.5	9.5	21/32	8	1.31	3/4	10	0.88	31	19
8	13.5	1.75	10.62	11.75	21/32	8	1.31	3/4	10	0.88	46	26
10	16	1.81	12.75	14.25	49/64	12	1.44	7/8	9	1	58	35
12	19	1.81	15	17	49/64	12	1.44	7/8	9	1	83	48
14	21	2	16.25	18.75	7/8	12	1.56	1	8	1.12	102	55
16	23.5	2	18.5	21.25	7/8	16	1.56	1	8	1.12	123	66
18	25	2.25	21	22.75	1	16	1.81	1 1/8	8	1.25	140	67
20	27.5	2.25	23	25	1	20	1.81	1 1/8	8	1.25	166	79
24	32	2.5	27.25	29.5	1 1/8	20	2.12	1 1/4	8	1.44	231	100

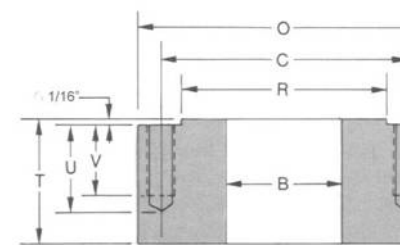
## CLASS 300 STUDDING OUTLETS



Shell Mount



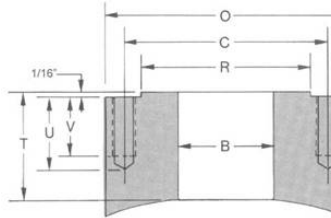
Tangential Mount



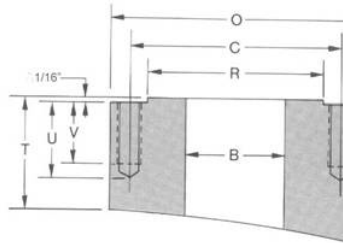
Flat Bottom

Bore	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	3.75	1.25	1.38	2.62	27/64	4	0.88	1/2	13	0.56	3.5	3.1
3/4	4.62	1.5	1.69	3.25	17/32	4	1.12	5/8	11	0.75	6.4	4.6
1	4.88	1.5	2	3.5	17/32	4	1.12	5/8	11	0.75	7	5.1
1 1/4	5.25	1.5	2.5	3.88	17/32	4	1.12	5/8	11	0.75	8	5.8
1 1/2	6.12	1.75	2.88	4.5	21/32	4	1.31	3/4	10	0.88	13	7.8
2	6.5	1.5	3.62	5	17/32	8	1.12	5/8	11	0.75	12	8.5
2 1/2	7.5	1.75	4.12	5.88	21/32	8	1.31	3/4	10	0.88	18	11
3	8.25	1.75	5	6.62	21/32	8	1.31	3/4	10	0.88	22	14
3 1/2	9	1.75	5.5	7.25	21/32	8	1.31	3/4	10	0.88	25	15
4	10	1.75	6.19	7.88	21/32	8	1.31	3/4	10	0.88	30	19
5	11	1.75	7.31	9.25	21/32	8	1.31	3/4	10	0.88	36	21
6	12.5	1.75	8.5	10.62	21/32	12	1.31	3/4	10	0.88	44	27
8	15	1.88	10.62	13	49/64	12	1.44	7/8	9	1	63	36
10	17.5	2.12	12.75	15.25	7/8	16	1.56	1	8	1.12	90	46
12	20.5	2.25	15	17.75	1	16	1.81	1 1/8	8	1.25	127	61
14	23	2.25	16.25	20.25	1	20	1.81	1 1/8	8	1.25	153	74
16	25.5	2.5	18.5	22.5	1 1/8	20	2.12	1 1/4	8	1.44	201	88
18	28	2.5	21	24.75	1 1/8	24	2.12	1 1/4	8	1.44	235	102
20	30.5	2.5	23	27	1 1/8	24	2.12	1 1/4	8	1.44	273	118
24	36	2.88	27.25	32	1 3/8	24	2.38	1 1/2	8	1.69	425	160

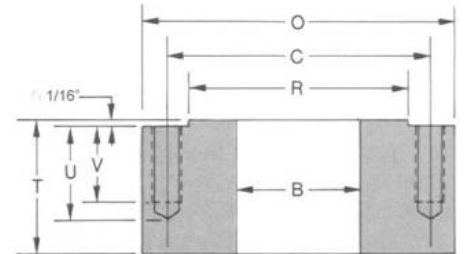
## CLASS 600 STUDDING OUTLETS



Shell Mount



Tangential Mount

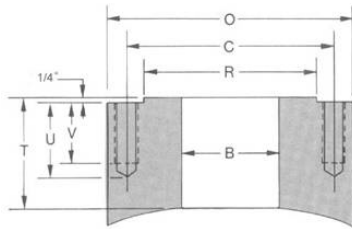


Flat Bottom

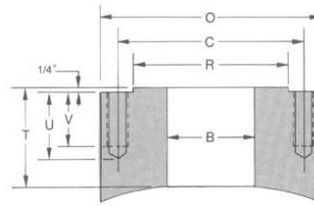
Bore	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	3.75	1.5	1.38	2.62	27/64	4	0.88	1/2	13	0.56	3.8	3.1
3/4	4.62	1.75	1.69	3.25	17/32	4	1.12	5/8	11	0.75	6.7	4.6
1	4.88	1.75	2	3.5	17/32	4	1.12	5/8	11	0.75	7.4	5.1
1 1/4	5.25	1.75	2.5	3.88	17/32	4	1.12	5/8	11	0.75	8.6	5.8
1 1/2	6.12	1.94	2.88	4.5	21/32	4	1.31	3/4	10	0.88	13	7.8
2	6.5	1.75	3.62	5	17/32	8	1.12	5/8	11	0.75	12	8.5
2 1/2	7.5	2	4.12	5.88	21/32	8	1.31	3/4	10	0.88	19	11
3	8.25	2	5	6.62	21/32	8	1.31	3/4	10	0.88	23	13
3 1/2	9	2.12	5.5	7.25	49/64	8	1.44	7/8	9	1	28	15
4	10.75	2.12	6.19	8.5	49/64	8	1.44	7/8	9	1	41	22
5	13	1.25	7.31	10.5	08-Jul	8	1.56	1	8	1.12	63	32
6	14	2.25	8.5	11.5	08-Jul	12	1.56	1	8	1.12	68	36
8	16.5	2.5	10.62	13.75	1	12	1.81	1 1/8	8	1.25	101	46
10	20	2.75	12.75	17	1 1/8	16	2.12	1 1/4	8	1.44	160	67
12	22	2.75	15	19.25	1 1/8	20	2.12	1 1/4	8	1.44	180	76
14	23.75	2.88	16.25	20.75	1 1/4	20	2.25	1 3/8	8	1.56	201	82
16	27	3	18.5	23.75	1 3/8	20	2.38	1 1/2	8	1.69	271	105
18	29.25	3.25	21	25.75	1 1/2	24	2.56	1 5/8	8	1.88	331	118
20	32	3.25	23	28.5	1 1/2	24	2.56	1 5/8	8	1.88	387	139
24	37	3.75	27.25	33	1 3/4	24	3	1 7/8	8	2.12	571	176



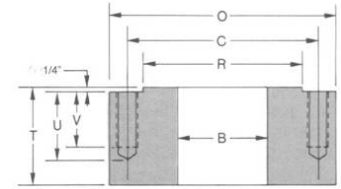
## CLASS 900 STUDDING OUTLETS



Shell Mount



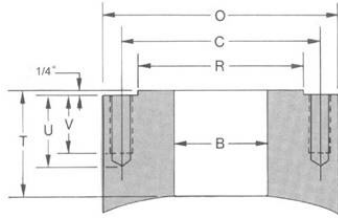
Tangential Mount



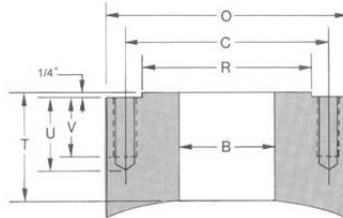
Flat Bottom

Bore	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	4.75	2	1.38	3.25	21/32	4	1.31	3/4	10	0.88	8.2	5
3/4	5.12	2	1.69	3.5	21/32	4	1.31	3/4	10	0.88	10	5.7
1	5.88	2.12	2	4	49/64	4	1.44	7/8	9	1	14	7.5
1 1/4	6.25	2.12	2.5	4.38	49/64	4	1.44	7/8	9	1	15	8.3
1 1/2	7	2.25	2.88	4.88	7/8	4	1.56	1	8	1.12	20	10
2	8.5	2.12	3.62	6.5	49/64	8	1.44	7/8	9	1	27	15
2 1/2	9.62	2.25	4.12	7.5	7/8	8	1.56	1	8	1.12	37	19
3	9.5	2.12	5	7.5	49/64	8	1.44	7/8	9	1	33	18
4	11.5	2.5	6.19	9.25	1	8	1.81	1 1/8	8	1.25	56	26
5	13.75	2.75	7.31	11	1 1/8	8	2.12	1 1/4	8	1.44	87	37
6	15	2.5	8.5	12.5	1	12	1.81	1 1/8	8	1.25	91	42
8	18.5	3	10.62	15.5	1 1/4	12	2.25	1 3/8	8	1.56	162	62
10	21.5	3	12.75	18.5	1 1/4	16	2.25	1 3/8	8	1.56	210	81
12	24	3.5	15	21	1 1/4	20	2.25	1 3/8	8	1.56	251	96
14	25.25	3.25	16.25	22	1 3/8	20	2.38	1 1/2	8	1.69	275	98
16	27.75	3.5	18.5	24.25	1 1/2	20	2.56	1 5/8	8	1.88	348	114
18	31	3.88	21	27	1 3/4	20	3	1 7/8	8	2.12	473	142
20	33.75	4.25	23	29.5	1 7/8	20	3.31	2	8	2.25	608	164
24	41	5.12	27.25	35.5	2 3/8	20	4	2 1/2	8	2.81	1096	246

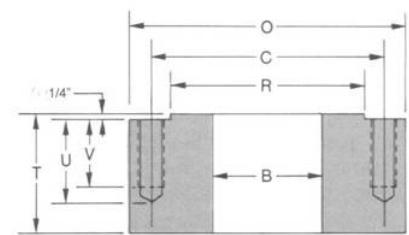
## CLASS 1500 STUDDING OUTLETS



Shell Mount



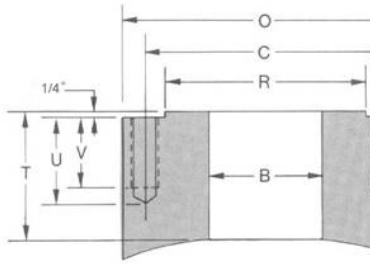
Tangential Mount



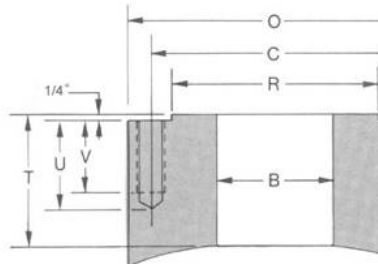
Flat Bottom

Bore Size	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	4.75	2	1.38	3.25	21/32	4	1.31	3/4	10	0.88	8.2	5
3/4	5.12	2	1.69	3.5	21/32	4	1.31	3/4	10	0.88	10	5.7
1	5.88	2.12	2	4	49/64	4	1.44	7/8	9	1.00	14	7.5
1 1/4	6.25	2.12	2.5	4.38	49/64	4	1.44	7/8	9	1	15	8.3
1 1/2	7	2.25	2.88	4.88	7/8	4	1.56	1	8	1.12	20	10
2	8.5	2.12	3.62	6.5	49/64	8	1.44	7/8	9	1	27	15
2 1/2	9.62	2.25	4.12	7.5	7/8	8	1.56	1	8	1.12	37	19
3	10.5	2.5	5	8	1	8	1.81	1 1/8	8	1.25	48	23
4	12.25	2.75	6.19	9.5	1 1/8	8	2.12	1 1/4	8	1.44	70	30
5	14.75	3.12	7.31	11.5	1 3/8	8	2.38	1 1/2	8	1.69	114	43
6	15.5	3	8.5	12.5	1 1/4	12	2.25	1 3/8	8	1.56	116	45
8	19	3.5	10.62	15.5	1 1/2	12	2.56	1 5/8	8	1.88	224	66
10	23	3.88	12.75	19	1 3/4	12	3	1 7/8	8	2.12	345	95
12	26.5	4.12	15	22.5	1 7/8	16	3.31	2	8	2.25	456	124
14	29.5	4.25	16.25	25	2 1/8	16	3.56	2 1/4	8	2.56	540	150
16	32.5	5	18.5	27.75	2 3/8	16	4	2 1/2	8	2.81	762	178
18	36	5.5	21	30.5	2 5/8	16	4.38	2 3/4	8	3.12	1024	216
20	38.75	5.88	23	32.75	2 7/8	16	4.62	3	8	3.44	1234	245
24	46	6.75	27.25	39	3 3/8	16	5.38	3 1/2	8	4	1992	343

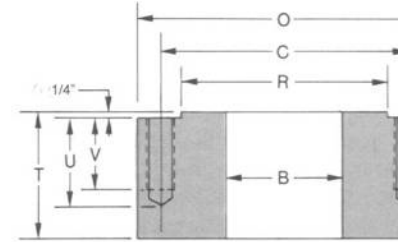
## CLASS 2500 STUDDING OUTLETS



Shell Mount



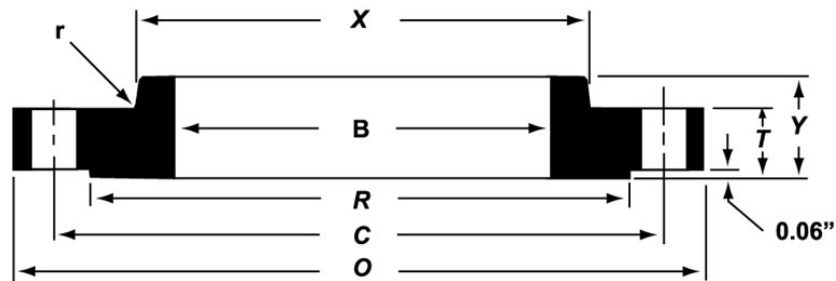
Tangential Mount



Flat Bottom

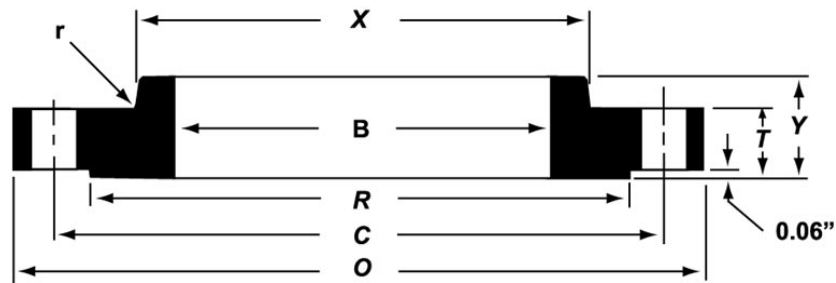
Bore Size	OD	Thickness	OD of RF	Stud Circle	Hole Dia	# of Holes	Hole Depth	Tap Size	T.P.I.	Tap Depth	Flat Bottom Weight	
B	O	T	R	C			U			V	Base	per 1"
1/2	5.25	2	1.38	3.5	21/32	4	1.31	3/4	10	0.88	10	6.1
3/4	5.5	2	1.69	3.75	21/32	4	1.31	3/4	10	0.88	11	6.6
1	6.25	2.12	2	4.25	49/64	4	1.44	7/8	9	1	15	8.5
1 1/4	7.25	2.25	2.5	5.12	7/8	4	1.56	1	8	1.12	22	11
1 1/2	8	2.5	2.88	5.75	1	4	1.81	1 1/8	8	1.25	29	14
2	9.25	2.25	3.62	6.75	7/8	8	1.56	1	8	1.12	34	18
2 1/2	10.5	2.5	4.12	7.75	1	8	1.81	1 1/8	8	1.25	49	23
3	12	2.75	5	9	1 1/8	8	2.12	1 1/4	8	1.44	71	30
4	14	3.25	6.19	10.75	1 3/8	8	2.38	1 1/2	8	1.69	112	40
5	16.5	3.75	7.31	12.75	1 5/8	8	2.81	1 3/4	8	2	179	55
6	19	4.12	8.5	14.5	1 7/8	8	3.31	2	8	2.25	259	72
8	21.75	4.38	10.62	17.25	1 7/8	12	3.31	2	8	2.25	345	91
10	26.5	5.12	12.75	21.25	2 3/8	12	4	2 1/2	8	2.81	590	134
12	30	5.5	15	24.38	2 5/8	12	4.38	2 3/4	8	3.12	799	168

**150# "SERIES 'A'" KS SLIP ON  
(TUBE-TURN)**



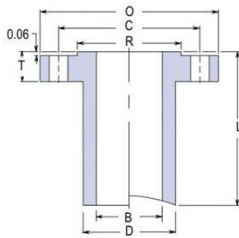
Bore Size	OD	Thickness	OD of RF	Length Thru Hub	Hub Dia.	Min Fillet Radius	Bore	Bolt Circle	# Holes	Dia of Holes	Weight
B	O	T	R	Y	X	R	B	C			
26	34.25	2.69	29.5	3.69	28.25	0.38	26.25	31.75	24	1.38	289
28	36.5	3.06	31.5	3.81	30.5	0.44	28.25	34	28	1.38	352
30	38.75	3.31	33.75	3.94	32.5	0.44	30.25	36	28	1.38	416
32	41.75	3.41	36	4.18	34.5	0.44	32.25	38.5	28	1.62	506
34	43.75	3.68	38	4.25	36.5	0.5	34.25	40 1/2	32	1.62	561
36	46	3.96	40.25	4.56	38.75	0.5	36.25	42.75	32	1.62	661
38	48.75	4.06	42.25	4.56	41.25	0.5	38.25	45 1/4	32	1.62	780
40	50.75	4.18	44.25	4.81	43 1/4	0.5	40.25	47 1/4	36	1.62	840
42	53	4.43	47	5.06	45 1/2	0.5	42.25	49 1/2	36	1.62	961
44	55.25	4.68	49	5.18	47 3/4	0.5	44.25	51 3/4	40	1.62	1071
46	57.25	4.86	51	5.31	49 3/4	0.5	46.25	53 3/4	40	1.62	1156
48	59.5	5.06	53.5	5.56	52	12	48.25	56	44	1.62	1282

**300# "SERIES 'A'" KS SLIP ON  
(TUBE-TURN)**

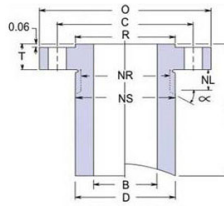


Bore Size	OD	Thickness	OD of RF	Length Thru Hub	Hub Dia.	Min Fillet Radius	Bore	Bolt Circle	# Holes	Dia of Holes	Weight
B	O	T	R	Y	X	R	B	C			
26	38.25	3.12	29.5	5.37	30.25	0.38	26.25	34.5	28	1.75	595
28	40.75	3.38	31.5	5.68	32.75	0.44	28.25	37	28	1.75	729
30	43	3.62	33.75	6.12	34.75	0.44	30.25	39.25	28	1.88	840
32	45.25	3.88	36	6.56	36.75	0.44	32.25	41.5	28	2	964
34	47.5	4	38	6.81	38.75	0.5	34.25	43.5	28	2	1076
36	50	4.12	40.25	7.06	41	0.5	36.25	46	32	2.12	1202
38	46	5.31	40.5	6.06	39	0.5	38.25	43	32	1.62	687
40	48.75	5.56	42.75	6.56	41 1/4	0.5	40.25	45.5	32	1.75	840
42	50.75	5.81	44.75	6.81	43 1/4	0.5	42.25	47.5	32	1.75	922
44	53.25	6.06	47	6.86	45 1/4	0.5	44.25	49.75	32	1.88	1055
46	55.75	6.31	49	7.06	47 1/4	0.5	46.25	52	28	2	1205
48	57.75	6.56	51.25	7.18	49 1/4	0.5	48.25	54	32	2	1306

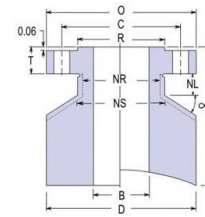
## B16.5 CLASS 150 LWN FLANGES



Long Weld Neck "LWN"



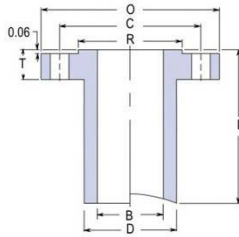
Heavy Barrel "HB"



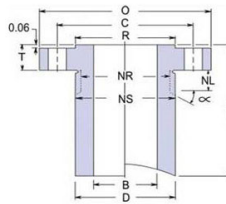
Equal Barrel

Size	Flange		Barrel OD		Bolting		Nut		Stud Bolt		Weights		Length											
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1" Base	HB Base	Per 1" Base	E	Per 1" E	Base L
1/2	0.5	0.55	3.5	0.44	1.38	1.25	1.5	3.5	4	0.62	2.38	1.5	1.25	0.75	1/2	2 1/4	2 3/4	3	0.3	5	0.4	21	2.7	9
3/4	0.75	0.74	3.88	0.5	1.69	1.62	1.9	3.9	4	0.62	2.75	1.88	1.62	0.75	1/2	2 1/2	3	5	0.5	7	0.7	27	3.2	9
1	1	0.96	4.25	0.56	2	2	2.3	4.3	4	0.62	3.12	2.25	2	0.75	1/2	2 1/2	3	7	0.7	10	0.9	30	3.8	9
1 1/4	1.25	1.28	4.62	0.62	2.5	2.38	2.6	4.6	4	0.62	3.5	2.62	2.38	0.75	1/2	2 3/4	3 1/4	10	0.9	12	1.2	36	4.4	9
1 1/2	1.5	1.5	5	0.69	2.88	2.62	3	5	4	0.62	3.88	3	2.62	0.75	1/2	2 3/4	3 1/4	12	1	16	1.5	41	5.1	9
2	2	1.94	6	0.75	3.62	3.06	3.7	6	4	0.75	4.75	3.69	3.06	0.88	5/8	3 1/4	3 3/4	15	1.2	23	2.2	57	7.1	9
2 1/2	2.5	2.32	7	0.88	4.12	3.75	4.4	7	4	0.75	5.5	4.44	3.75	0.88	5/8	3 1/2	4	22	1.7	34	3.2	79	10	9
3	3	2.9	7.5	0.94	5	4.25	4.9	7.5	4	0.75	6	4.94	4.25	0.88	5/8	3 1/2	4 1/4	25	2	38	3.6	86	11	9
3 1/2	3.5	3.36	8.5	0.94	5.5	4.88	5.9	8.5	8	0.75	7	5.94	4.88	0.88	5/8	3 1/2	4 1/4	32	2.6	55	5.3	110	13	9
4	4	3.83	9	0.94	6.19	5.5	6.4	9	8	0.75	7.5	6.44	5.5	0.88	5/8	3 1/2	4 1/4	47	3.2	78	6	164	14	12
5	5	4.81	10	0.94	7.31	6.5	7.3	10	8	0.88	8.5	7.25	6.5	1	3/4	3 3/4	4 1/2	57	3.8	87	6.5	189	17	12
6	6	5.76	11	1	8.5	7.75	8.3	11	8	0.88	9.5	8.25	7.75	1	3/4	4	4 1/2	75	5.4	103	7.8	216	19	12
8	8	7.62	13.5	1.12	10.62	9.75	11	14	8	0.88	11.75	10.5	9.75	1	3/4	4 1/4	4 3/4	102	6.9	157	11	292	26	12
10	10	9.56	16	1.2	12.75	12	13	16	12	1	14.25	12.81	12	1.12	7/8	4 3/4	5 1/4	143	9.8	214	16	382	35	12
12	12	11.38	19	1.3	15	14.38	16	19	12	1	17	15.56	14.38	1.12	7/8	4 3/4	5 1/2	205	14	329	25	535	48	12
14	14	14	21	1.4	16.25	16	17	21	12	1.12	18.75	17.12	16	1.25	1	5 1/4	6	211	13	296	22	585	55	12
16	16	16	23.5	1.4	18.5	18	20	24	16	1.12	21.25	19.62	18	1.25	1	5 1/2	6	246	15	388	29	714	66	12
18	18	18	25	1.6	21	20	21	25	16	1.25	22.75	20.94	20	1.38	1 1/8	6	6 1/2	270	17	362	25	711	67	12
20	20	20	27.5	1.7	23	22	23	28	20	1.25	25	23.19	22	1.38	1 1/8	6 1/4	7	311	19	434	31	840	79	12
24	24	24	32	1.9	27.25	26.25	28	32	20	1.38	29.5	27.5	26.25	1.5	1 1/4	7	7 3/4	423	25	574	40	1046	100	12

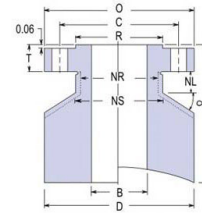
## B16.5 CLASS 300 LWN FLANGES



Long Weld Neck "LWN"



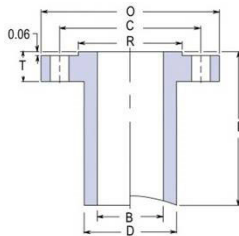
Heavy Barrel "HB"



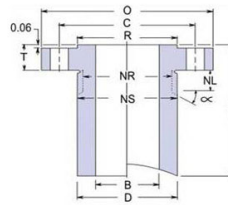
Equal Barrel

Size	Flange		Barrel OD			Bolting			Nut			Stud Bolt			Weights		HB		E		Base		Length			
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E D	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	L
1/2	0.5	0.55	3.75	0.56	1.38	1.5	1.8	3.8	4	0.62	2.62	1.75	1.5	0.75	1/2	2 1/2	3	5	0.4	7	0.6	24	3.1	9		
3/4	0.75	0.74	4.62	0.62	1.69	1.88	2.2	4.6	4	0.75	3.25	2.19	1.88	0.88	5/8	3	3 1/2	9	0.7	11	0.9	37	4.6	9		
1	1	0.96	4.88	0.69	2	2.12	2.4	4.9	4	0.75	3.5	2.44	2.12	0.88	5/8	3 1/4	3 1/2	9	0.8	12	1.1	40	5.1	9		
1 1/4	1.25	1.28	5.25	0.75	2.5	2.5	2.8	5.3	4	0.75	3.88	2.81	2.5	0.88	5/8	3 1/4	3 3/4	13	1	15	1.4	45	5.8	9		
1 1/2	1.5	1.5	6.12	0.81	2.88	2.75	3.3	6.1	4	0.88	4.5	3.25	2.75	1	3/4	3 1/2	4	15	1.2	21	1.9	61	7.8	9		
2	2	1.94	6.5	0.88	3.62	3.31	3.9	6.5	8	0.75	5	3.94	3.31	0.88	5/8	3 1/2	4 1/4	20	1.5	28	2.6	68	8.5	9		
2 1/2	2.5	2.32	7.5	1	4.12	3.94	4.6	7.5	8	0.88	5.88	4.62	3.94	1	3/4	4	4 1/2	25	2.1	38	3.6	89	11	9		
3	3	2.9	8.25	1.12	5	4.62	5.4	8.3	8	0.88	6.62	5.38	4.62	1	3/4	4 1/4	5	35	2.7	49	4.6	106	13	9		
3 1/2	3.5	3.36	9	1.19	5.5	5.25	6	9	8	0.88	7.25	6	5.25	1	3/4	4 1/4	5	42	3.4	59	5.5	122	15	9		
4	4	3.83	10	1.25	6.19	5.75	6.6	10	8	0.88	7.88	6.62	5.75	1	3/4	4 1/2	5 1/4	62	3.8	91	6.5	207	19	12		
5	5	4.81	11	1.38	7.31	7	8	11	8	0.88	9.25	8	7	1	3/4	4 3/4	5 1/4	84	5.3	124	9.1	241	21	12		
6	6	5.76	12.5	1.44	8.5	8.12	9.4	13	12	0.88	10.62	9.38	8.12	1	3/4	4 3/4	5 3/4	105	6.7	165	12	303	27	12		
8	8	7.62	15	1.62	10.62	10.25	12	15	12	1	13	11.56	10.25	1.12	7/8	5 1/2	6 1/4	148	9.1	228	17	405	36	12		
10	10	9.56	17.5	1.9	12.75	12.62	14	18	16	1.12	15.25	13.62	12.62	1.25	1	6 1/4	7 1/4	210	13	291	21	499	46	12		
12	12	11.38	20.5	2	15	14.75	16	20.5	16	1.25	17.75	15.94	14.75	1.38	1 1/8	6 3/4	7 1/2	275	16	392	28	651	61	12		
14	14	14	23	2.1	16.25	16.75	18	23	20	1.25	20.25	18.44	16.75	1.38	1 1/8	7	7 3/4	324	19	456	32	785	74	12		
16	16	16	25.5	2.3	18.5	19	21	26	20	1.38	22.5	20.5	19	1.5	1 1/4	7 1/2	8 1/2	404	23	529	37	914	88	12		
18	18	18	28	2.4	21	21	23	28	24	1.38	24.75	22.75	21	1.5	1 1/4	7 3/4	8 1/4	465	26	630	43	1066	102	12		
20	20	20	30.5	2.5	23	23.12	25	31	24	1.38	27	25	23.12	1.5	1 1/4	8 1/4	9 1/4	549	30	741	50	1228	118	12		
24	24	24	36	2.8	27.25	27.62	30	36	24	1.62	32	29.62	27.62	1.75	1 1/2	9 1/4	10 1/4	778	42	1016	67	1627	160	12		

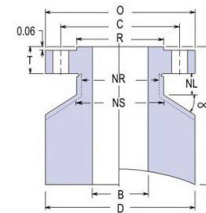
## B16.5 CLASS 400 LWN FLANGES



Long Weld Neck "LWN"



Heavy Barrel "HB"

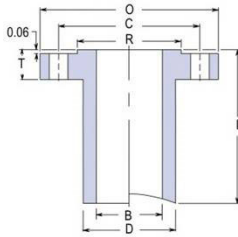


Equal Barrel

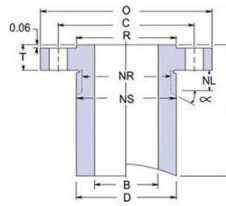
Size	Flange		Barrel OD		Bolting		Nut		Stud Bolt		Weights		Length											
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E D	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1" Base	HB Base	Per 1" Base	E Base	Per 1" Base	Base L
1/2	0.5	0.55	3.75	0.56	1.38	1.5	1.8	3.8	4	0.62	2.62	1.75	1.5	0.75	1/2	3	3	5	0.4	7	0.6	24	3.1	9
3/4	0.75	0.74	4.62	0.62	1.69	1.88	2.2	4.6	4	0.75	3.25	2.19	1.88	0.88	5/8	3 1/2	3 1/2	8	0.7	11	0.9	37	4.6	9
1	1	0.96	4.88	0.69	2	2.12	2.4	4.9	4	0.75	3.5	2.44	2.12	0.88	5/8	3 1/2	3 1/2	9	0.8	12	1.1	40	5.1	9
1 1/4	1.25	1.28	5.25	0.81	2.5	2.5	2.8	5.3	4	0.75	3.88	2.81	2.5	0.88	5/8	3 3/4	3 3/4	13	1	15	1.4	45	5.8	9
1 1/2	1.5	1.5	6.12	0.88	2.88	2.75	3.3	6.1	4	0.88	4.5	3.25	2.75	1	3/4	4 1/4	4 1/4	16	1.2	21	1.9	61	7.8	9
2	2	1.94	6.5	1	3.62	3.31	3.9	6.5	8	0.75	5	3.94	3.31	0.88	5/8	4 1/4	4 1/4	20	1.5	29	2.6	68	8.5	9
2 1/2	2.5	2.32	7.5	1.12	4.12	3.94	4.6	7.5	8	0.88	5.88	4.63	3.94	1	3/4	4 3/4	4 3/4	27	2.1	39	3.6	88	11	9
3	3	2.9	8.25	1.25	5	4.62	5.4	8.3	8	0.88	6.62	5.38	4.62	1	3/4	5	5	36	2.7	50	4.6	104	13	9
3 1/2	3.5	3.36	9	1.38	5.5	5.25	5.8	9	8	1	7.25	5.81	5.25	1.12	7/8	5 1/2	5 1/2	45	3.4	61	5.5	116	15	9
4	4	3.83	10	1.38	6.19	5.75	6.4	10	8	1	7.88	6.44	5.75	1.12	7/8	5 1/2	5 1/2	65	3.8	93	6.5	197	19	12
5	5	4.81	11	1.5	7.31	7	7.8	11	8	1	9.25	7.81	7	1.12	7/8	5 3/4	5 3/4	88	5.3	127	9.1	229	22	12
6	6	5.76	12.5	1.62	8.5	8.12	9.2	13	12	1	10.62	9.19	8.12	1.12	7/8	6	6	110	6.7	169	12	286	27	12
8	8	7.62	15	1.88	10.62	10.25	11	15	12	1.12	13	11.38	10.25	1.25	1	6 3/4	6 3/4	154	9.1	233	17	379	36	12
10	10	9.56	17.5	2.1	12.75	12.62	13	18	16	1.25	15.25	13.44	12.62	1.38	1 1/8	7 1/2	7 1/2	218	13	298	21	475	46	12
12	12	11.38	20.5	2.3	15	14.75	16	21	16	1.38	17.75	15.75	14.75	1.5	1 1/4	8	8	285	16	401	28	627	62	12
14	14	14	23	2.4	16.25	16.75	18	23	20	1.38	20.25	18.25	16.75	1.5	1 1/4	8 1/4	8 1/4	336	19	467	32	758	74	12
16	16	16	25.5	2.5	18.5	19	20	26	20	1.5	22.5	20.31	19	1.62	1 3/8	8 3/4	8 3/4	418	23	542	37	884	88	12
18	18	18	28	2.6	21	21	23	28	24	1.5	24.75	22.56	21	1.62	1 3/8	9	9	482	26	645	43	1033	102	12
20	20	20	30.5	2.8	23	23.12	25	31	24	1.62	27	24.63	23.12	1.75	1 1/2	9 1/2	9 3/4	568	30	759	50	1165	118	12
24	24	24	36	3	27.62	27.62	29	36	24	1.88	32	29.25	27.62	2	1 3/4	10 1/2	11	804	42	1040	67	1540	160	12



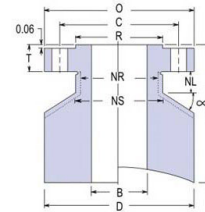
## B16.5 CLASS 600 LWN FLANGES



Long Weld Neck "LWN"



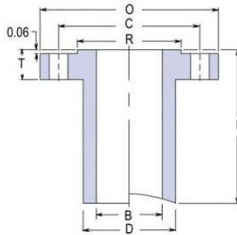
Heavy Barrel "HB"



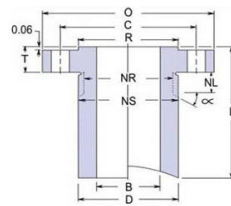
Equal Barrel

Size	Flange		Barrel OD		Bolting		Nut		Stud Bolt		Weights		Length											
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E D	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1" Base	HB Base	Per 1" Base	E Base	Per 1" Base	Base L
1/2	0.5	0.55	3.75	0.56	1.38	1.5	1.8	3.8	4	0.62	2.62	1.75	1.5	0.75	1/2	3	3	5	0.4	7	0.6	24	3.1	9
3/4	0.75	0.74	4.62	0.62	1.69	1.88	2.2	4.6	4	0.75	3.25	2.19	1.88	0.88	5/8	3 1/2	3 1/2	8	0.7	11	0.9	36	4.6	9
1	1	0.96	4.88	0.69	2	2.12	2.4	4.9	4	0.75	3.5	2.44	2.12	0.88	5/8	3 1/2	3 1/2	9	0.8	12	1.1	39	5.1	9
1 1/4	1.25	1.28	5.25	0.81	2.5	2.5	2.8	5.3	4	0.75	3.88	2.81	2.5	0.88	5/8	3 3/4	3 3/4	13	1	15	1.4	44	5.8	9
1 1/2	1.5	1.5	6.12	0.88	2.88	2.75	3.3	6.1	4	0.88	4.5	3.25	2.75	1	3/4	4 1/4	4 1/4	16	1.2	21	1.9	59	7.8	9
2	2	1.94	6.5	1	3.62	3.31	3.9	6.5	8	0.75	5	3.94	3.31	0.88	3/4	4 1/4	4 1/4	20	1.5	29	2.6	67	8.5	9
2 1/2	2.5	2.32	7.5	1.12	4.12	3.94	4.6	7.5	8	0.88	5.88	4.62	3.94	1	3/4	5	4 3/4	27	2.1	39	3.6	85	11	9
3	3	2.9	8.25	1.25	5	4.62	5.4	8.3	8	0.88	6.62	5.38	4.62	1	3/4	5	5 1/4	36	2.7	50	4.6	104	13	9
3 1/2	3.5	3.36	9	1.38	5.5	5.25	5.8	9	8	1	7.25	5.81	5.25	1.12	7/8	5 1/2	5 1/2	45	3.4	57	5	116	15	9
4	4	3.83	10.75	1.5	6.19	6	7.1	11	8	1	8.5	7.06	6	1.12	7/8	5 3/4	6	77	4.5	113	7.8	238	22	12
5	5	4.81	13	1.75	7.31	7.5	8.9	13	8	1.12	10.5	8.88	7.5	1.25	1	6 1/2	6 1/2	123	7	180	12	336	32	12
6	6	5.76	14	1.88	8.5	8.75	9.9	14	12	1.12	11.5	9.88	8.75	1.25	1	6 3/4	7	152	9	207	14	373	36	12
8	8	7.62	16.5	2.19	10.62	10.75	12	17	12	1.25	13.75	11.94	10.75	1.38	1 1/8	7 3/4	8	207	11	277	19	478	46	12
10	10	9.56	20	2.5	12.75	13.5	15	20	16	1.38	17	15	13.5	1.5	1 1/4	8 1/2	8 3/4	324	18	433	30	683	67	12
12	12	11.38	22	2.6	15	15.75	17	22	20	1.38	19.25	17.25	15.75	1.5	1 1/4	8 3/4	9	393	23	533	37	779	76	12
14	14	14	23.75	2.8	16.25	17	19	24	20	1.5	20.75	18.56	17	1.62	1 3/8	9 1/4	9 1/2	471	21	631	33	1149	82	16
16	16	16	27	3	18.5	19.5	21	27	20	1.62	23.75	21.38	19.5	1.75	1 1/2	10	10 1/4	638	28	856	45	1471	105	16
18	18	18	29.25	3.3	21	21.5	23	29	20	1.75	25.75	23.19	21.5	1.88	1 5/8	10 3/4	11	731	31	941	48	1628	118	16
20	20	20	32	3.5	23	24	26	32	24	1.75	28.5	25.94	24	1.88	1 5/8	11 1/2	11 3/4	916	39	1180	61	1920	139	16
24	24	24	37	4	27.25	28.25	30	37	24	2	33	30.06	28.25	2.12	1 7/8	13	13 1/2	1210	49	1486	73	2376	176	16

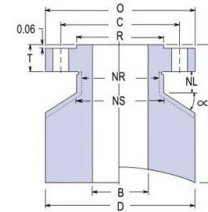
## B16.5 CLASS 900 LWN FLANGES



Long Weld Neck "LWN"



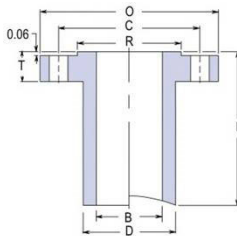
Heavy Barrel "HB"



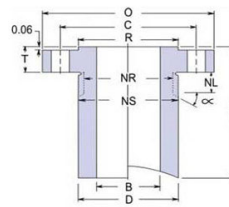
Equal Barrel

Size	Flange		Barrel OD		Bolting		Nut		Stud Bolt		Weights		Length											
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1"	HB Base	Per 1"	E Base	Per 1"	Base L
1/2	0.5	0.55	4.75	0.88	1.38	1.56	2	4.8	4	0.88	3.25	2	1.56	1	3/4	4 1/4	4 1/4	8	0.5	10	0.8	37	5	9
3/4	0.75	0.74	5.12	1	1.69	1.81	2.3	5.1	4	0.88	3.5	2.25	1.81	1	3/4	4 1/2	4 1/2	10	0.6	13	1	42	5.7	9
1	1	0.96	5.88	1.12	2	2.12	2.6	5.9	4	1	4	2.56	2.12	1.12	7/8	5	5	13	0.8	17	1.3	54	7.5	9
1 1/4	1.25	1.28	6.25	1.12	2.5	2.5	2.9	6.3	4	1	4.38	2.94	2.5	1.12	7/8	5	5	17	1	20	1.6	61	8.3	9
1 1/2	1.5	1.5	7	1.25	2.88	2.75	3.3	7	4	1.12	4.88	3.25	2.75	1.25	1	5 1/2	5 1/2	21	1.2	26	1.9	77	10	9
2	2	1.94	8.5	1.5	3.62	4.12	5.1	8.5	8	1	6.5	5.06	4.12	1.12	7/8	5 3/4	5 3/4	42	2.9	56	4.9	115	15	9
2 1/2	2.5	2.32	9.62	1.62	4.12	4.88	5.9	9.6	8	1.12	7.5	5.88	4.88	1.25	1	6 1/4	6 1/4	56	3.9	75	6.5	144	19	9
3	3	2.9	9.5	1.5	5	5	6.1	9.5	8	1	7.5	6.06	5	1.12	7/8	5 3/4	5 3/4	51	3.6	71	6.3	139	18	9
4	4	3.83	11.5	1.75	6.19	6.25	7.4	12	8	1.25	9.25	7.44	6.25	1.38	1 1/8	6 3/4	6 3/4	93	5.1	133	9.1	270	26	12
5	5	4.81	13.75	2	7.31	7.5	9	14	8	1.38	11	9	7.5	1.5	1 1/4	7 1/2	7 1/2	135	7	194	13	376	37	12
6	6	5.76	15	2.19	8.5	9.25	11	15	12	1.25	12.5	10.69	9.25	1.38	1 1/8	7 1/2	7 3/4	191	11	259	18	436	42	12
8	8	7.62	18.5	2.5	10.62	11.75	13	19	12	1.5	15.5	13.31	11.75	1.62	1 3/8	8 3/4	8 3/4	297	16	389	27	626	62	12
10	10	9.56	21.5	2.8	12.75	14.5	16	22	16	1.5	18.5	16.31	14.5	1.62	1 3/8	9 1/4	9 1/4	422	25	558	39	824	81	12
12	12	11.38	24	3.1	15	16.5	19	24	20	1.5	21	18.81	16.5	1.62	1 3/8	10	10	518	29	715	50	984	96	12
14	14	14	25.25	3.4	16.25	17.75	20	25	20	1.62	22	19.62	17.75	1.75	1 1/2	10 3/4	11	624	26	817	42	1368	98	16
16	16	16	27.75	3.5	18.5	20	22	28	20	1.75	24.25	21.69	20	1.88	1 5/8	11 1/4	11 1/2	750	32	942	48	1573	114	16
18	18	18	31	4	21	22.25	24	31	20	2	27	24.06	22.25	2.12	1 7/8	12 3/4	13 1/4	950	38	1169	57	1898	142	16
20	20	20	33.75	4.3	23	24.5	26	34	20	2.12	29.5	26.38	24.5	2.25	2	13 3/4	14 1/4	1121	43	1378	66	2182	164	16
24	24	24	41	5.5	27.25	29.5	32	41	20	2.62	35.5	31.62	29.5	2.75	2 1/2	17 1/4	18	1865	65	2160	94	3084	246	16

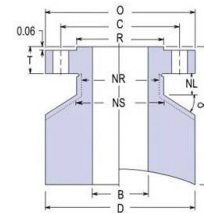
## B16.5 CLASS 1500 LWN FLANGES



Long Weld Neck "LWN"



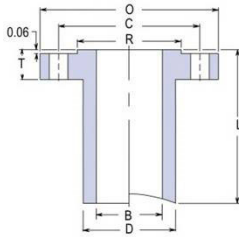
Heavy Barrel "HB"



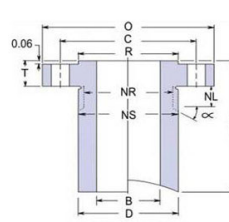
Equal Barrel

Size	Flange		Barrel OD			Bolting			Nut			Stud Bolt			Weights		Length							
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E D	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1"	HB Base	Per 1"	E Base	Per 1"	Base L
1/2	0.5	0.55	4.75	0.88	1.38	1.56	2	4.8	4	0.88	3.25	2	1.56	1	3/4	4 1/4	4 1/4	8	0.5	10	0.8	37	5	9
3/4	0.75	0.74	5.12	1	1.69	1.81	2.3	5.1	4	0.88	3.5	2.25	1.81	1	3/4	4 1/2	4 1/2	10	0.6	13	1	42	5.7	9
1	1	0.96	5.88	1.12	2	2.12	2.6	5.9	4	1	4	2.56	2.12	1.12	7/8	5	5	13	0.8	17	1.3	54	7.5	9
1 1/4	1.25	1.28	6.25	1.12	2.5	2.5	2.9	6.3	4	1	4.38	2.94	2.5	1.12	7/8	5	5	17	1	20	1.6	61	8.3	9
1 1/2	1.5	1.5	7	1.25	2.88	2.75	3.3	7	4	1.12	4.88	3.25	2.75	1.25	1	5 1/2	5 1/2	21	1.2	26	1.9	77	10	9
2	2	1.94	8.5	1.5	3.62	4.12	5.1	8.5	8	1	6.5	5.06	4.12	1.12	7/8	5 3/4	5 3/4	42	2.9	56	4.9	115	15	9
2 1/2	2.5	2.32	9.62	1.62	4.12	4.88	5.9	9.6	8	1.12	7.5	5.88	4.88	1.25	1	6 1/4	6 1/4	56	3.9	75	6.5	144	19	9
3	3	2.9	10.5	1.88	5	5.25	6.2	11	8	1.25	8	6.19	5.25	1.38	1 1/8	7	7	67	4.1	84	6.7	161	23	9
4	4	3.83	12.25	2.12	6.19	6.38	7.5	12	8	1.38	9.5	7.5	6.38	1.5	1 1/4	7 3/4	7 3/4	110	5.5	147	9.3	302	30	12
5	5	4.81	14.75	2.88	7.31	7.75	9.1	15	8	1.62	11.5	9.12	7.75	1.75	1 1/2	9 3/4	9 3/4	181	7.8	233	13	414	43	12
6	6	5.76	15.5	3.25	8.5	9	10	16	12	1.5	12.5	10.31	9	1.62	1 3/8	10 1/4	10 1/2	215	10	272	16	445	46	12
8	8	7.62	19	3.62	10.62	11.5	13	19	12	1.75	15.5	12.94	11.5	1.88	1 5/8	11 1/2	12 3/4	337	15	417	24	629	67	12
10	10	9.56	23	4.3	12.75	14.5	16	23	12	2	19	16.06	14.5	2.12	1 7/8	13 1/4	13 1/2	546	25	651	37	888	97	12
12	12	11.38	26.5	4.9	15	17.75	19	27	16	2.12	22.5	19.38	17.75	2.25	2	14 3/4	15 1/4	946	38	1148	55	1683	127	16
14	14	14	29.5	5.3	16.25	19.5	22	30	16	2.38	25	21.5	19.5	2.5	2 1/4	16	16 3/4	1116	41	1308	59	1929	150	16
16	16	16	32.5	5.8	18.5	21.75	24	33	16	2.62	27.75	23.88	21.75	2.75	2 1/2	17 1/2	18 1/2	1371	48	1588	70	2238	178	16
18	18	18	36	6.4	21	23.5	26	36	16	2.88	30.5	26.25	23.5	3	2 3/4	19 1/2	20 3/4	1674	51	1959	81	2629	216	16
20	20	20	38.75	7	23	25.25	28	39	16	3.12	32.75	28.12	25.25	3.25	3	21 1/4	22 1/4	1943	53	2241	87	2868	245	16
24	24	24	46	8	27.25	30	34	46	16	3.62	39	33.62	30	3.75	3 1/2	24 1/4	25 1/2	2936	72	3334	123	3819	343	16

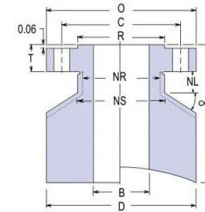
## B16.5 CLASS 2500 LWN FLANGES



Long Weld Neck "LWN"



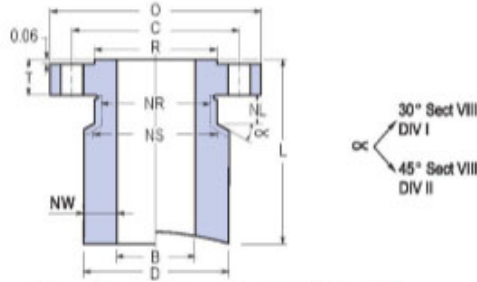
Heavy Barrel "HB"



Equal Barrel

Size	Flange		Barrel OD		Bolting		Nut		Stud Bolt		Weights		Length											
Nom	Bore LWN & Equal B	Bore HB B	OD O	Thk. T	RF of OD R	LWN D	HB D	E	# of Holes	Hole Size	Bolt Circle C	Stop Dia NS	Relief Dia NR	Relief Length NL	Size	RF Length	RTJ Length	LWN Base	Per 1"	HB Base	Per 1"	E Base	Per 1"	Base L
1/2	0.5	0.55	5.25	1.19	1.38	1.81	2.3	5.3	4	0.88	3.5	2.25	1.81	1	3/4	4 3/4	4 3/4	11	0.7	14	1.1	45	6.1	9
3/4	0.75	0.74	5.5	1.25	1.69	2.06	2.5	5.5	4	0.88	3.75	2.5	2.06	1	3/4	5	5	13	0.8	17	1.3	49	6.6	9
1	1	0.96	6.25	1.38	2	2.25	2.8	6.3	4	1	4.25	2.81	2.25	1.12	7/8	5 1/2	5 1/2	18	0.9	22	1.6	62	8.5	9
1 1/4	1.25	1.28	7.25	1.5	2.5	2.88	3.5	7.3	4	1.12	5.12	3.5	2.88	1.25	1	6	6	27	1.5	32	2.4	84	11	9
1 1/2	1.5	1.5	8	1.75	2.88	3.12	3.9	8	4	1.25	5.75	3.94	3.12	1.38	1 1/8	6 3/4	6 3/4	33	1.7	42	3	94	14	9
2	2	1.94	9.25	2	3.62	3.75	5.1	9.3	8	1.12	6.75	5.12	3.75	1.25	1	7	7	48	2.2	66	5	131	18	9
2 1/2	2.5	2.32	10.5	2.25	4.12	4.5	5.9	11	8	1.25	7.75	5.94	4.5	1.38	1 1/8	7 3/4	8	66	3.1	90	6.7	165	23	9
3	3	2.9	12	2.62	5	5.25	7	12	8	1.38	9	7	5.25	1.5	1 1/4	8 3/4	9	97	4.1	127	9	210	30	9
4	4	3.83	14	3	6.19	6.5	8.4	14	8	1.62	10.75	8.38	6.5	1.75	1 1/2	10	10 1/4	159	5.8	218	12	391	40	12
5	5	4.81	16.5	3.62	7.31	8	10	17	8	1.88	12.75	10	8	2	1 3/4	11 3/4	12 1/4	248	8.7	319	17	518	55	12
6	6	5.76	19	4.25	8.5	9.25	11	19	8	2.12	14.5	11.38	9.25	2.25	2	13 1/2	14	358	11	441	21	641	73	12
8	8	7.62	21.75	5	10.62	12	14	22	12	2.12	17.25	14.12	12	2.25	2	15	15 1/2	589	18	743	31	1167	92	16
10	10	9.56	26.5	6.5	12.75	14.75	17	27	12	2.62	21.25	17.38	14.75	2.75	2 1/2	19 1/4	20	997	26	1202	47	1625	134	16
12	12	11.38	30	7.3	15	17.38	20	30	12	2.88	24.38	20.12	17.38	3	2 3/4	21 1/4	22	1363	35	1609	61	1995	168	16

## CLASS 150 NORTHERN CONNECTION LWN FLANGES

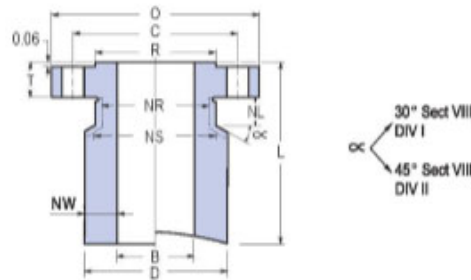


Northern Barrel - N1, N2, N3

Size		Flange				Barrel OD			Wall Thickness			Bolting			Nut			Stud Bolt			Weights						Length	
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Boit Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base		
	B	O	T	R	D	D	D	NW	NW	NW			C	NS	NR	NL				Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	L
1	0.96	4.25	0.56	2.00	2.75	3.25	4.00	0.90	1.15	1.52	4	0.62	3.12	2.25	2.00	0.75	1/2	2 1/2	3	19	1.5	26	2.2	38	3.4	12		
1 1/2	1.50	5.00	0.69	2.88	3.25	4.00	4.62	0.88	1.25	1.56	4	0.62	3.88	3.00	2.62	0.75	1/2	2 3/4	3 1/4	25	1.9	37	3.1	49	4.3	12		
2	1.94	6.00	0.75	3.62	4.00	4.62	5.50	1.03	1.34	1.78	4	0.75	4.75	3.69	3.06	0.88	5/8	3 1/4	3 3/4	35	2.7	48	3.9	67	5.9	12		
2 1/2	2.32	7.00	0.88	4.12	4.62	5.75	6.00	1.15	1.72	1.84	4	0.75	5.50	4.44	3.75	0.88	5/8	3 1/2	4	48	3.5	73	6	81	7	12		
3	2.90	7.50	0.94	5.00	5.75	6.00	6.38	1.43	1.55	1.74	4	0.75	6.00	4.94	4.25	0.88	5/8	3 1/2	4 1/4	69	5.5	75	6	85	7	12		
3 1/2	3.36	8.50	0.94	5.50	6.38	7.00	7.75	1.51	1.82	2.20	6	0.75	7.00	5.94	4.88	0.88	5/8	3 1/2	4 1/4	83	7	102	8	126	11	12		
4	3.83	9.00	0.94	6.19	7.00	7.75	8.25	1.59	1.96	2.21	6	0.75	7.50	6.44	5.50	0.88	5/8	3 1/2	4 1/4	95	8	119	10	137	12	12		
5	4.81	10.00	0.94	7.31	7.75	8.25	8.88	1.47	1.72	2.04	8	0.88	8.50	7.25	6.50	1.00	3/4	3 3/4	4 1/2	104	8	121	10	144	12	12		
6	5.76	11.00	1.00	8.50	8.88	9.88	10.38	1.56	2.06	2.31	8	0.88	9.50	8.25	7.75	1.00	3/4	4	4 1/2	126	10	167	14	188	17	12		
8	7.62	13.50	1.12	10.62	11.00	11.50	12.12	1.69	1.94	2.25	8	0.88	11.75	10.50	9.75	1.00	3/4	4 1/4	4 3/4	180	14	205	17	236	20	12		
10	9.56	16.00	1.19	12.75	13.50	14.25	15.12	1.97	2.35	2.78	12	1.00	14.25	12.81	12.00	1.12	7/8	4 3/4	5 1/4	337	20	399	25	474	31	16		
12	11.38	19.00	1.25	15.00	16.25	17.38	18.25	2.44	3.00	3.44	12	1.00	17.00	15.56	14.38	1.12	7/8	4 3/4	5 1/2	494	30	606	38	696	45	16		
14	14.00	21.00	1.38	16.25	18.25	19.38	20.12	2.13	2.69	3.06	12	1.12	18.75	17.12	16.00	1.25	1	5 1/4	6	501	31	622	40	705	47	16		
16	16.00	23.50	1.44	18.50	20.12	21.00	22.25	2.06	2.50	3.13	16	1.12	21.25	19.62	18.00	1.25	1	5 1/2	6	562	33	666	41	820	53	16		
18	18.00	25.00	1.56	21.00	22.25	23.25	24.12	2.13	2.63	3.06	16	1.25	22.75	20.94	20.00	1.38	1 1/8	6	6 1/2	624	38	751	48	864	67	16		
20	20.00	27.50	1.69	23.00	24.12	25.00	26.25	2.06	2.50	3.13	20	1.25	25.00	23.19	22.00	1.38	1 1/8	6 1/4	7	684	41	804	50	978	64	16		
24	24.00	32.00	1.88	27.25	27.75	29.25	30.75	1.88	2.63	3.38	20	1.38	29.50	27.50	26.25	1.50	1 1/4	7	7 3/4	772	43	1007	62	1246	82	16		

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

## CLASS 300 NORTHERN CONNECTION LWN FLANGES

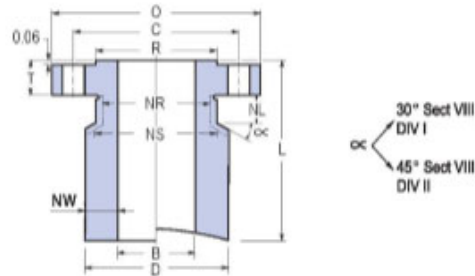


Northern Barrel - N1, N2, N3

Size		Flange				Barrel OD			Wall Thickness			Boiling			Nut				Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base		
B	O	T	R	D	D	D	NW	NW	NW	C	NS	NR	NL	Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	L				
1	0.96	4.88	0.69	2.00	2.75	3.75	4.00	0.90	1.40	1.52	4	0.75	3.50	2.44	2.12	0.88	5/8	3 1/4	3 1/2	20	1.5	34	2.9	39	3.4	12		
1 1/2	1.50	6.12	0.81	2.88	4.00	4.62	5.50	1.25	1.56	2.00	4	0.88	4.50	3.25	2.75	1.00	3/4	3 1/2	4	39	3.1	51	4.3	70	6.2	12		
2	1.94	6.50	0.88	3.62	4.62	5.50	6.00	1.34	1.78	2.03	8	0.75	5.00	3.94	3.31	0.88	5/8	3 1/2	4 1/4	49	3.9	69	5.9	81	7.2	12		
2 1/2	2.32	7.50	1.00	4.12	5.75	6.00	6.38	1.72	1.84	2.03	8	0.88	5.88	4.62	3.94	1.00	3/4	4	4 1/2	72	6.2	80	6.8	90	7.8	12		
3	2.90	8.25	1.12	5.00	6.00	6.38	7.00	1.55	1.74	2.06	8	0.88	6.62	5.38	4.62	1.00	3/4	4 1/4	5	78	6.1	88	7.2	106	9	12		
3 1/2	3.36	9.00	1.19	5.50	7.00	7.75	8.25	1.82	2.20	2.45	8	0.88	7.25	6.00	5.25	1.00	3/4	4 1/4	5	104	8.4	127	11	144	13	12		
4	3.83	10.00	1.25	6.19	7.00	7.75	8.88	1.59	1.96	2.53	8	0.88	7.88	6.62	5.75	1.00	3/4	4 1/2	5 1/4	102	7.6	125	10	164	14	12		
5	4.81	11.00	1.38	7.31	8.25	8.88	9.88	1.72	2.04	2.54	8	0.88	9.25	8.00	7.00	1.00	3/4	4 3/4	5 1/4	133	10	155	12	194	17	12		
6	5.75	12.50	1.44	8.50	9.88	10.38	11.00	2.06	2.31	2.62	12	0.88	10.62	9.38	8.12	1.00	3/4	4 3/4	5 3/4	185	14	206	17	233	20	12		
8	7.62	15.00	1.62	10.62	12.12	13.50	14.25	2.25	2.94	3.32	12	1.00	13.00	11.56	10.25	1.12	7/8	5 1/2	6 1/4	255	20	324	28	364	32	12		
10	9.56	17.50	1.88	12.75	14.25	15.12	16.25	2.35	2.78	3.36	16	1.12	15.25	13.62	12.62	1.25	1	6 1/4	7 1/4	425	25	498	31	591	38	16		
12	11.38	20.50	2.00	15.00	16.25	17.38	18.25	2.44	3.00	3.44	16	1.25	17.75	15.94	14.75	1.38	1 1/8	6 3/4	7 1/2	532	30	636	38	720	45	16		
14	14.00	23.00	2.12	16.25	19.38	20.12	22.25	2.69	3.06	4.13	20	1.25	20.25	18.44	16.75	1.38	1 1/8	7	7 3/4	681	40	761	47	996	67	16		
16	16.00	25.50	2.26	18.50	22.25	23.25	24.12	3.13	3.63	4.06	20	1.38	22.50	20.50	19.00	1.50	1 1/4	7 1/2	8 1/2	877	53	988	63	1099	73	16		
18	18.00	28.00	2.38	21.00	24.12	25.12	26.75	3.06	3.56	4.38	24	1.38	24.75	22.75	21.00	1.50	1 1/4	7 3/4	8 1/4	982	57	1102	68	1314	87	16		
20	20.00	30.50	2.50	23.00	26.75	27.75	29.25	3.38	3.88	4.63	24	1.38	27.00	25.00	23.12	1.50	1 1/4	8 1/4	9 1/4	1176	70	1316	82	1525	101	16		
24	24.00	36.00	2.75	27.25	30.75	32.00	33.62	3.38	4.00	4.81	24	1.62	32.00	29.62	27.62	1.75	1 1/2	9 1/4	10 1/4	1465	82	1647	100	1899	123	16		

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

## CLASS 400 NORTHERN CONNECTION LWN FLANGES

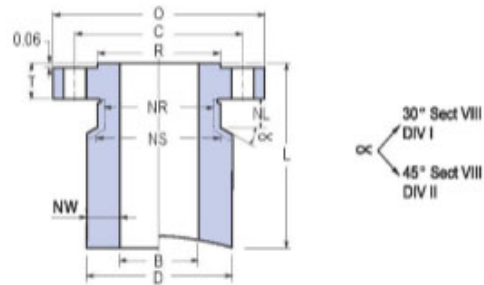


Northern Barrel - N1, N2, N3

Size		Flange			Barrel OD			Wall Thickness			Bolting			Nut			Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base
	B	O	T	R	D	D	D	NW	NW	NW			C	NS	NR	NL				Base	Per 1"	Base	Per 1"	Base	Per 1"	L
1	0.96	4.88	0.69	2.00	2.75	3.25	4.00	0.90	1.15	1.52	4	0.75	3.50	2.44	2.12	0.88	5/8	3 1/2	3 1/2	20	1.5	27	2.2	39	3.4	12
1 1/2	1.50	6.12	0.88	2.88	4.00	4.62	5.50	1.25	1.56	2.00	4	0.88	4.50	3.25	2.75	1.00	3/4	4 1/4	4 1/4	39	3.1	51	4.3	69	6.2	12
2	1.94	6.50	1.00	3.62	4.62	5.50	6.60	1.34	1.78	2.03	8	0.75	5.00	3.94	3.31	0.88	5/8	4 1/4	4 1/4	49	3.9	69	5.9	95	8.9	12
2 1/2	2.32	7.50	1.12	4.12	5.75	6.00	6.38	1.72	1.84	2.03	8	0.88	5.88	4.62	3.94	1.00	3/4	4 3/4	4 3/4	73	6.2	81	6.8	90	7.8	12
3	2.90	8.25	1.25	5.00	6.00	6.38	7.00	1.55	1.74	2.05	8	0.88	6.62	5.38	4.62	1.00	3/4	5	5	79	6.1	89	7.2	106	9	12
3 1/2	3.36	9.00	1.38	5.50	7.00	7.75	8.25	1.82	2.20	2.45	8	1.00	7.25	5.81	5.25	1.12	7/8	5 1/2	5 1/2	106	8.4	128	11	145	13	12
4	3.83	10.00	1.38	6.19	7.00	7.75	8.88	1.59	1.96	2.53	8	1.00	7.88	6.44	5.75	1.12	7/8	5 1/2	5 1/2	104	7.6	126	10	165	14	12
5	4.81	11.00	1.50	7.31	8.25	8.88	9.88	1.72	2.04	2.54	8	1.00	9.25	7.81	7.00	1.12	7/8	5 3/4	5 3/4	135	10	157	12	195	17	12
6	5.76	12.50	1.62	8.50	9.88	10.38	11.00	2.06	2.31	2.62	12	1.00	10.62	9.19	8.12	1.12	7/8	6	6	188	14	208	17	235	20	12
8	7.62	15.00	1.88	10.62	12.12	13.50	14.25	2.25	2.94	3.32	12	1.12	13.00	11.38	10.25	1.25	1	6 3/4	6 3/4	259	20	327	28	366	32	12
10	9.56	17.50	2.12	12.75	14.25	15.12	16.25	2.35	2.78	3.35	16	1.25	15.25	13.44	12.62	1.38	1 1/8	7 1/2	7 1/2	431	25	502	31	594	38	16
12	11.38	20.50	2.25	15.00	16.25	17.38	18.25	2.44	3.00	3.44	16	1.38	17.75	15.75	14.75	1.50	1 1/4	8	8	539	30	641	38	724	45	16
14	14.00	23.00	2.38	16.25	19.38	20.12	22.25	2.69	3.06	4.13	20	1.38	20.25	18.25	16.75	1.50	1 1/4	8 1/4	8 1/4	690	40	768	47	974	67	16
16	16.00	25.50	2.50	18.50	22.25	23.25	24.12	3.13	3.63	4.06	20	1.50	22.50	20.31	19.00	1.62	1 3/8	8 3/4	8 3/4	887	53	980	63	1078	73	16
18	18.00	28.00	2.62	21.00	24.12	25.12	26.75	3.06	3.56	4.38	24	1.50	24.75	22.56	21.00	1.62	1 3/8	9	9	982	57	1102	68	1284	87	16
20	20.00	30.50	2.75	23.00	26.75	27.75	29.25	3.38	3.88	4.63	24	1.62	27.00	24.63	23.12	1.75	1 1/2	9 1/2	9 3/4	1176	70	1283	82	1476	101	16
24	24.00	36.00	3.00	27.25	30.75	32.00	33.62	3.38	4.00	4.81	24	1.88	32.00	29.25	27.62	2.00	1 3/4	10 1/2	11	1437	82	1614	100	1844	123	16

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

## CLASS 600 NORTHERN CONNECTION LWN FLANGES



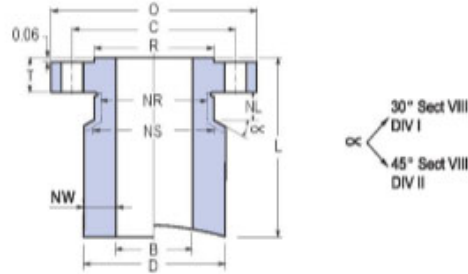
Northern Barrel - N1, N2, N3

Size		Flange			Barrel OD			Wall Thickness			Boring			Nut			Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base
B	O	T	R	D	D	D	NW	NW	NW	C	NS	NR	NL	Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	Base	Per 1"	L		
1	0.95	4.88	0.69	2.00	3.25	4.00	4.62	1.15	1.52	1.84	4	0.75	3.50	2.44	2.12	0.88	5/8	3 1/2	3 1/2	26	2.2	38	3.4	50	4.6	12
1 1/2	1.50	6.12	0.88	2.88	4.00	4.62	5.50	1.25	1.56	2.00	4	0.88	4.50	3.25	2.75	1.00	3/4	4 1/4	4 1/4	39	3.1	50	4.3	69	6.2	12
2	1.94	6.50	1.50	3.62	4.62	5.50	6.00	1.34	1.78	2.03	8	0.75	5.00	3.94	3.31	0.88	5/8	4 1/4	4 1/2	50	3.9	69	5.9	81	7.2	12
2 1/2	2.32	7.50	1.12	4.12	5.75	6.38	7.00	1.72	2.03	2.34	8	0.88	5.88	4.62	3.94	1.00	3/4	5	4 3/4	83	6.2	98	7.9	105	9.7	12
3	2.90	8.25	1.25	5.00	6.38	7.00	7.75	1.74	2.05	2.43	8	0.88	6.62	5.38	4.62	1.00	3/4	5	5 1/4	88	7.2	105	9.0	127	11.5	12
3 1/2	3.36	9.00	1.38	5.50	7.00	7.75	8.25	1.82	2.20	2.45	8	1.00	7.25	5.81	5.25	1.12	7/8	5 1/2	5 1/2	103	8.4	124	10.9	140	12.6	12
4	3.83	10.75	1.50	6.19	7.75	8.88	9.88	1.96	2.53	3.03	8	1.00	8.50	7.06	6.00	1.12	7/8	5 3/4	6	132	10.1	169	14.2	205	18.4	12
5	4.81	13.00	1.75	7.31	9.88	11.00	12.12	2.54	3.10	3.66	8	1.12	10.50	8.88	7.50	1.25	1	6 1/2	6 1/2	216	16.5	259	21.8	305	27.5	12
6	5.76	14.00	1.88	8.50	11.00	12.12	13.25	2.62	3.18	3.75	12	1.12	11.50	9.88	8.75	1.25	1	6 3/4	7	235	20	300	25	350	32	12
8	7.62	16.50	2.19	10.62	13.25	15.12	16.00	2.82	3.75	4.19	12	1.25	13.75	11.94	10.75	1.38	1 1/8	7 3/4	8	335	26	427	38	478	44	12
10	9.56	20.00	2.50	12.75	16.25	17.38	18.25	3.35	3.91	4.35	16	1.38	17.00	15.00	13.50	1.50	1 1/4	8 1/2	8 3/4	650	38	747	47	824	54	16
12	11.30	22.00	2.62	15.00	18.25	19.38	20.12	3.44	4.00	4.37	20	1.38	19.25	17.25	15.75	1.50	1 1/4	8 3/4	9	771	45	877	55	949	61	16
14	14.00	23.75	2.75	16.25	19.38	20.12	22.25	2.69	3.06	4.13	20	1.50	20.75	18.56	17.00	1.62	1 3/8	9 1/4	9 1/2	708	40	781	47	994	67	16
16	16.00	27.00	3.00	18.50	23.25	24.12	25.00	3.63	4.06	4.50	20	1.62	23.75	21.38	19.50	1.75	1 1/2	10	10 1/4	1055	63	1151	73	1248	82	16
18	18.00	29.25	3.25	21.00	24.12	26.25	27.75	3.06	4.13	4.88	20	1.75	25.75	23.19	21.50	1.88	1 5/8	10 3/4	11	1044	57	1283	81	1456	99	16
20	20.00	32.00	3.50	23.00	27.75	29.25	30.75	3.88	4.63	5.38	24	1.75	28.50	25.94	24.00	1.88	1 5/8	11 1/2	11 3/4	1398	82	1582	101	1767	121	16
24	24.00	37.00	4.00	27.25	30.75	32.00	33.62	3.38	4.00	4.81	24	2.00	33.00	30.06	28.25	2.12	1 7/8	13	13 1/2	1574	82	1736	100	1946	123	16

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE



## CLASS 900 NORTHERN CONNECTION LWN FLANGES



Northern Barrel - N1, N2, N3

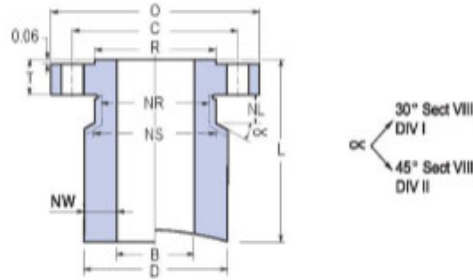
Size		Flange				Barrel OD			Wall Thickness			Boring			Nut			Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base	
	B	O	T	R	D	D	D	NW	NW	NW			C	NS	NR	NL				Base	Per 1"	Base	Per 1"	Base	Per 1"	L	
1	0.96	5.88	1.12	2.00	3.25	4.00	4.62	1.15	1.52	1.83	4	1.00	4.00	2.56	2.12	1.12	7/8	5	5	29	2.2	41	3.4	51	4.6	12	
1 1/2	1.50	7.00	1.25	2.88	4.00	5.50	6.00	1.25	2.00	2.25	4	1.12	4.88	3.25	2.75	1.25	1	5 1/2	5 1/2	43	3.1	71	6.2	82	7.5	12	
2	1.94	8.50	1.50	3.62	5.50	6.00	7.00	1.78	2.03	2.53	8	1.00	6.50	5.06	4.12	1.12	7/8	5 3/4	5 3/4	80	5.9	92	7.2	117	10.1	12	
2 1/2	2.32	9.62	1.62	4.12	6.38	7.00	8.25	2.03	2.34	2.97	8	1.12	7.50	5.88	4.68	1.25	1	6 1/4	6 1/4	107	8.0	123	10	158	14	12	
3	2.90	9.50	1.50	5.00	7.00	7.75	8.25	2.05	2.43	2.68	8	1.00	7.50	6.06	5.00	1.12	7/8	5 3/4	5 3/4	114	9.0	136	12	151	13	12	
4	3.83	11.50	1.75	6.19	8.88	9.68	10.38	2.53	3.03	3.28	8	1.25	9.25	7.44	6.25	1.38	1 1/8	6 3/4	6 3/4	177	14	211	18	228	21	12	
5	4.81	13.75	2.00	7.31	10.38	11.00	12.12	2.79	3.10	3.66	8	1.38	11.00	9.00	7.50	1.50	1 1/4	7 1/2	7 1/2	242	19	265	22	309	28	12	
6	5.76	15.00	2.19	8.50	11.00	12.12	13.50	2.62	3.18	3.87	12	1.25	12.50	10.69	9.25	1.38	1 1/8	7 1/2	7 3/4	271	20	317	25	377	33	12	
8	7.62	18.50	2.50	10.62	15.12	16.25	17.38	3.75	4.32	4.88	12	1.50	15.50	13.31	11.75	1.62	1 3/8	8 3/4	8 3/4	474	38	528	46	584	54	12	
10	9.56	21.50	2.75	12.75	17.38	18.25	20.12	3.91	4.35	5.28	16	1.50	18.50	16.31	14.50	1.62	1 3/8	9 1/4	9 1/4	804	47	880	54	1049	70	16	
12	11.38	24.00	3.12	15.00	20.12	22.25	23.25	4.37	5.44	5.94	20	1.50	21.00	18.81	16.50	1.62	1 3/8	10	10	1038	61	1245	81	1345	92	16	
14	14.00	25.25	3.38	16.25	22.25	23.25	24.12	4.13	4.63	5.06	20	1.62	22.00	19.62	17.75	1.75	1 1/2	10 3/4	11	1068	67	1166	77	1254	86	16	
16	16.00	27.75	3.50	18.50	23.25	25.00	26.50	3.63	4.50	5.25	20	1.75	24.25	21.69	20.00	1.88	1 5/8	11 1/4	11 1/2	1100	63	1282	82	1451	99	16	
18	18.00	31.00	4.00	21.00	26.00	27.75	29.25	4.00	4.88	5.63	20	2.00	27.00	24.06	22.25	2.12	1 7/8	12 3/4	13 1/4	1365	78	1555	99	1715	118	16	
20	20.00	33.75	4.25	23.00	27.75	30.75	32.00	3.88	5.38	6.00	20	2.12	29.50	26.38	24.50	2.25	2	13 3/4	14 1/4	1525	82	1857	121	1994	139	16	
24	24.00	41.00	5.50	27.25	33.62	35.00	36.00	4.81	5.50	6.00	20	2.62	35.50	31.62	29.50	2.75	2 1/2	17 1/4	18	2360	123	2515	144	2625	160	16	

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

# KS MANUFACTURING ENTERPRISES LTD.

5203 - 76TH AVE  
EDMONTON, AB  
T6B 0A7

## CLASS 1500 NORTHERN CONNECTION LWN FLANGES

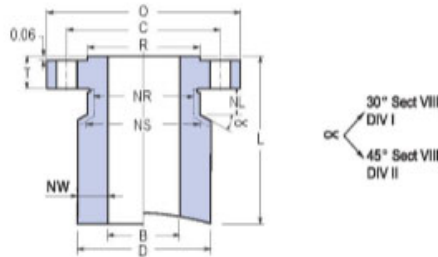


Northern Barrel - N1, N2, N3

Size		Flange			Barrel OD			Wall Thickness			Bolting			Nut			Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base
	B	O	T	R	D	D	D	NW	NW	NW			C	NS	NR	NL				Base	Per 1"	Base	Per 1"	Base	Per 1"	L
1	0.96	5.88	1.12	2.00	3.25	4.00	4.62	1.15	1.52	1.83	4	1.00	4.00	2.56	2.12	1.12	7/8	5	5	29	2.2	41	3.4	51	4.6	12
1 1/2	1.50	7.00	1.25	2.88	4.62	5.50	6.00	1.56	2.00	2.25	4	1.12	4.88	3.25	2.75	1.25	1	5 1/2	5 1/2	54	4.3	71	6.2	82	7.5	12
2	1.94	8.50	1.50	3.62	5.50	6.00	7.00	1.78	2.03	2.53	8	1.00	6.50	5.06	4.12	1.12	7/8	5 3/4	5 3/4	80	5.9	92	7.2	117	10.1	12
2 1/2	2.32	9.62	1.62	4.12	6.38	7.00	8.25	2.03	2.34	2.97	8	1.12	7.50	5.88	4.88	1.25	1	6 1/4	6 1/4	107	8	123	10	158	14	12
3	2.90	10.50	1.88	5.00	7.00	7.75	8.88	2.05	2.43	2.99	8	1.25	8.00	6.19	5.25	1.38	1 1/8	7	7	124	9	144	12	177	16	12
4	3.83	12.25	2.12	6.19	8.88	9.88	11.00	2.53	3.03	3.59	8	1.38	9.50	7.50	6.38	1.50	1 1/4	7 3/4	7 3/4	187	14	218	18	257	24	12
5	4.81	14.75	2.88	7.31	10.38	12.12	13.50	2.79	3.66	4.35	8	1.62	11.50	9.12	7.75	1.75	1 1/2	9 3/4	9 3/4	271	19	328	28	376	35	12
6	5.76	15.50	3.25	8.50	12.12	13.50	14.25	3.18	3.87	4.25	12	1.50	12.50	10.31	9.00	1.62	1 3/8	10 1/4	10 1/2	332	25	380	33	408	38	12
8	7.62	19.00	3.62	10.62	15.12	16.25	17.38	3.75	4.32	4.88	12	1.75	15.50	12.94	11.50	1.88	1 5/8	11 1/2	12 3/4	498	38	541	46	585	54	12
10	9.56	23.00	4.25	12.75	17.38	20.12	22.25	3.91	5.28	6.35	12	2.00	19.00	16.06	14.50	2.12	1 7/8	13 1/4	13 1/2	889	47	1088	70	1243	90	16
12	11.38	26.50	4.88	15.00	22.25	23.25	24.12	5.44	5.94	6.37	16	2.12	22.50	19.38	17.75	2.25	2	14 3/4	15 1/4	1348	81	1426	92	1495	101	16
14	14.00	29.50	5.25	16.25	23.25	25.00	27.75	4.63	5.50	6.88	16	2.38	25.00	21.50	19.50	2.50	2 1/4	16	16 3/4	1443	77	1579	95	1794	128	16
16	16.00	32.50	5.75	18.50	26.25	29.25	30.75	5.13	6.63	7.38	16	2.62	27.75	23.88	21.75	2.75	2 1/2	17 1/2	18 1/2	1771	96	1999	133	2111	153	16
18	18.00	36.00	6.38	21.00	27.75	30.75	33.62	4.88	6.38	7.81	16	2.88	30.50	26.25	23.50	3.00	2 3/4	19 1/2	20 3/4	2070	99	2285	138	2481	180	16
20	20.00	38.75	7.00	23.00	30.75	33.00	36.00	5.38	6.50	8.00	16	3.12	32.75	28.12	25.25	3.25	3	21 1/4	22 1/4	2417	121	2558	153	2727	200	16
24	24.00	46.00	8.00	27.25	36.00	37.50	40.50	6.00	6.75	8.25	16	3.62	39.00	33.62	30.00	3.75	3 1/2	24 1/4	25 1/2	3470	160	3545	185	3675	237	16

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

## CLASS 2500 NORTHERN CONNECTION LWN FLANGES

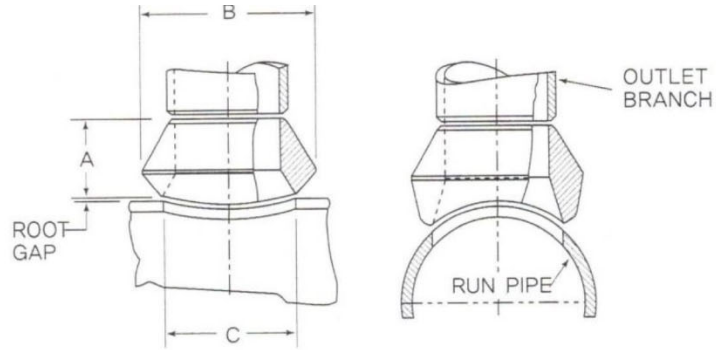


Northern Barrel - N1, N2, N3

Size		Flange			Barrel OD			Wall Thickness			Bolting			Nut			Stud Bolt			Weights						Length
Nom	Bore	OD	Thk	RF OD	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	No Of Holes	Hole Size	Bolt Circle	Stop Dia	Relief Dia	Relief Length	Size	RF Length	RTJ Length	N <sub>1</sub>		N <sub>2</sub>		N <sub>3</sub>		Base
	B	O	T	R	D	D	D	NW	NW	NW			C	NS	NR	NL				Base	Per 1"	Base	Per 1"	Base	Per 1"	L
1	0.96	6.25	1.38	2.00	4.00	4.62	5.50	1.52	1.83	2.27	4	1.00	4.25	2.81	2.25	1.12	7/8	5 1/2	5 1/2	43	3.4	54	4.6	71	6.5	12
1 1/2	1.50	8.00	1.75	2.88	5.50	6.00	7.00	2.00	2.25	2.75	4	1.25	5.75	3.94	3.12	1.38	1 1/8	6 3/4	6 3/4	79	6.2	89	7.5	112	10.4	12
2	1.94	9.25	2.00	3.62	6.00	7.00	8.00	2.03	2.53	3.03	8	1.12	6.75	6.12	3.75	1.25	1	7	7	99	7.2	123	10	149	13.4	12
2 1/2	2.32	10.50	2.25	4.12	7.00	7.75	8.88	2.34	2.72	3.28	8	1.25	7.75	6.94	4.50	1.38	1 1/8	7 3/4	8	135	10	153	12	184	16	12
3	2.90	12.00	2.62	5.00	8.25	9.88	11.00	2.68	3.49	4.05	8	1.38	9.00	7.00	5.25	1.50	1 1/4	8 3/4	9	186	13	232	20	267	25	12
4	3.83	14.00	3.00	6.19	9.88	11.00	12.12	3.03	3.59	4.15	8	1.62	10.75	8.38	6.50	1.75	1 1/2	10	10 1/4	259	18	293	24	328	29	12
5	4.81	16.50	3.62	7.31	11.00	13.50	15.25	3.10	4.35	5.22	8	1.88	12.75	10.00	8.00	2.00	1 3/4	11 3/4	12 1/4	347	22	422	35	477	47	12
6	5.76	19.00	4.25	8.50	13.50	15.12	17.38	3.07	4.60	5.81	8	2.12	14.50	11.38	9.25	2.25	2	13 1/2	14	499	33	545	44	609	60	12
8	7.62	21.75	5.00	10.62	15.12	18.25	20.12	3.75	5.32	6.25	12	2.12	17.25	14.12	12.00	2.25	2	15	15 1/2	647	38	735	61	785	77	12
10	9.56	26.50	6.50	12.75	20.12	22.25	24.12	5.28	6.35	7.28	12	2.62	21.25	17.38	14.75	2.75	2 1/2	19 1/4	20	1342	70	1451	90	1545	109	16
12	11.38	30.00	7.25	15.00	22.25	25.00	27.75	5.44	6.81	8.19	12	2.88	24.38	20.12	17.38	3.00	2 3/4	21 1/4	22	1713	81	1844	110	1956	143	16

LWN MAY BE STAMPED N1, N2, N3 OR T1, T2, T3 TO DENOTE TYPE OF FLANGE

**MSS SP-97 WOL REDUCING SIZES STD-S40**



Outlet Size Inches	Dimensions			Appx. Weight Pounds
	A	B	C	
1/8	5/8	1	5/8	.10
1/4	5/8	1	5/8	.10
3/8	3/4	1-1/4	3/4	.15
1/2	3/4	1-3/8	15/16	.20
3/4	7/8	1-3/4	1-3/16	.25
1	1-1/16	2-1/8	1-7/16	.50
1-1/4	1-1/4	2-9/16	1-3/4	.80
1-1/2	1-5/16	2-7/8	2	1.00
2	1-1/2	3-1/2	2-9/16	1.75
2-1/2	1-5/8	4-1/16	3	2.50
3	1-3/4	4-13/16	3-11/16	4.00
3-1/2	1-7/8	5-5/8	4	5.50
4	2	6	4-3/4	6.30
5	2-1/4	7-1/16	5-9/16	10.25
6	2-3/8	8-1/2	6-11/16	12.00
8	2-3/4	10-3/8	8-11/16	23.00
10	3-1/16	12-11/16	10-13/16	36.00
12	3-3/8	14-7/8	12-13/16	59.00
14	3-1/2	16-1/8	14-1/16	66.00
16	3-11/16	18-1/4	16-1/16	75.00
18	3-13/16	20-1/2	18-1/16	97.00
20	4	22-1/2	20	118.00
24	4-9/16	27-1/8	24-3/16	220.00
26	4-11/16	29-1/16	26-1/4	265.00
30	5-3/8	34-1/16	30-7/16	430.00
36	5-3/8	34-1/16	36-1/2	900.00

Dimensions are in Inches

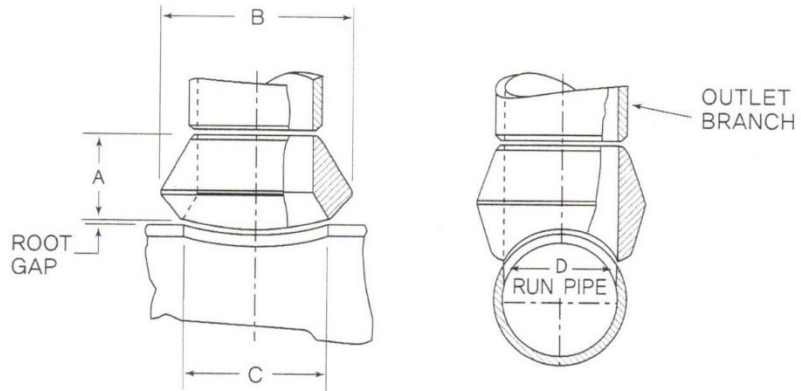
Tolerances : 1/8 - 3/4 ± .03 in

1 - 4 ± .06 in

5 - 12 ± .12 in

14 - 36 ± .19 in

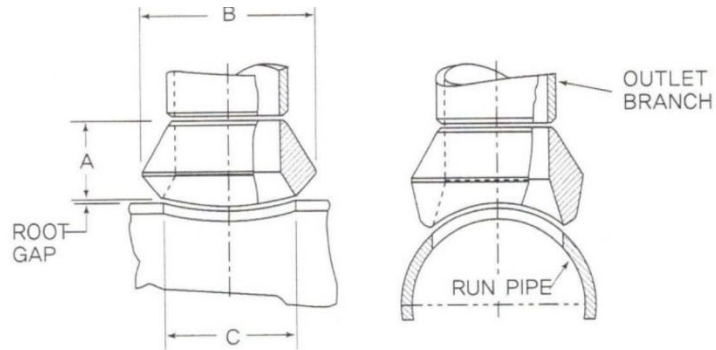
**MSS SP-97 WOL FULL SIZE STD-S40**



Outlet Size Inches	Dimensions				Appx. Weight Pounds
	A	B	C	D	
1/2	3/4	1-3/8	15/16	5/8	.15
3/4	7/8	1-5/8	1-3/16	13/16	.25
1	1-1/16	2	1-7/16	1-1/32	.40
1-1/4	1-1/4	2-3/8	1-3/4	1-3/8	.70
1-1/2	1-5/16	2-7/8	2	1-5/8	.80
2	1-1/2	3-1/2	2-9/16	2-1/16	1.50
2-1/2	1-5/8	4-1/16	3	2-7/16	2.25
3	1-3/4	4-13/16	3-11/16	3-1/16	3.75
3-1/2	2	5-3/8	3-7/8	3-9/16	5.00
4	2	6	4-3/4	4	6.70
5	2-1/4	7-1/8	5-9/16	5-1/16	8.50
6	2-3/8	8-1/2	6-11/16	6-1/16	14.00
8	2-3/4	10-3/8	8-11/16	7-15/16	28.00
10	3-1/16	12-9/16	10-13/16	10	39.00
12	3-3/8	14-7/8	12-13/16	12	65.00
14	3-1/2	16-1/8	14-1/16	13-1/4	70.00
16	3-11/16	18-1/4	16-1/16	15-1/4	92.00
18	4-1/16	20-3/4	18-5/8	17-1/4	125.0
20	4-5/8	23-1/16	20-1/16	19-1/4	175.00
24	5-3/8	27-7/8	25-1/8	23-1/4	280.00
30	5-3/8	34-1/16	30-7/16	29-1/4	440.00
36	5-3/8	34-1/16	36-1/2	35-1/4	1180.00

Design per MSS-SP-97, BW ends per B16.9 and B16.25.

**MSS SP-97 WOL REDUCING SIZE XH-S80**



Outlet Size Inches	Dimensions			Appx. Weight Pounds
	A	B	C	
1/8	5/8	1	5/8	.10
1/4	5/8	1	5/8	.10
3/8	3/4	1-1/4	3/4	.15
1/2	3/4	1-3/8	15/16	.20
3/4	7/8	1-3/4	1-3/16	.25
1	1-1/16	2-1/8	1-7/16	.50
1-1/4	1-1/4	2-9/16	1-3/4	.80
1-1/2	1-5/16	2-7/8	2	1.00
2	1-1/2	3-1/2	2-9/16	1.75
2-1/2	1-5/8	4-1/16	3	2.50
3	1-3/4	4-13/16	3-11/16	4.00
3-1/2	1-7/8	5-5/8	4	5.50
4	2	6	4-3/4	6.30
5	2-1/4	7-1/16	5-9/16	10.25
6	2-3/8	8-1/2	6-11/16	12.00
8	2-3/4	10-3/8	8-11/16	23.00
10	3-1/16	12-11/16	10-13/16	36.00
12	3-3/8	14-7/8	12-13/16	59.00
14	3-1/2	16-1/8	14-1/16	66.00
16	3-11/16	18-1/4	16-1/16	75.00
18	3-13/16	20-1/2	18-1/16	97.00
20	4	22-1/2	20	118.00
24	4-9/16	27-1/8	24-3/16	220.00
26	4-11/16	29-1/16	26-1/4	265.00
30	5-3/8	34-1/16	30-7/16	430.00
36	5-3/8	34-1/16	36-1/2	900.00

Dimensions are in Inches

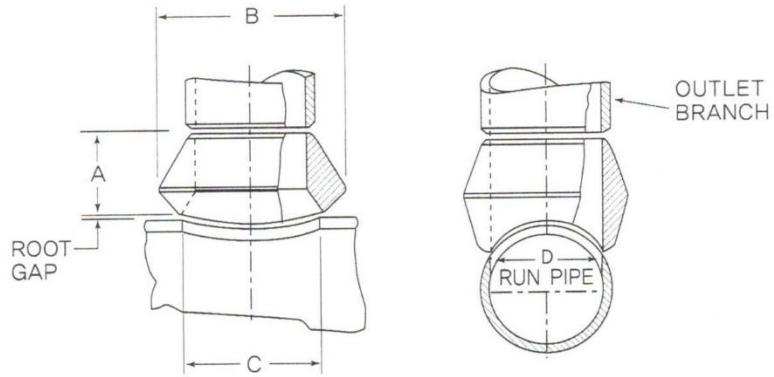
Tolerances : 1/8 - 3/4 ± .03 in

1 - 4 ± .06 in

5 - 12 ± .12 in

14 - 36 ± .19 in

**MSS SP-97 WOL FULL SIZE XH-S80**

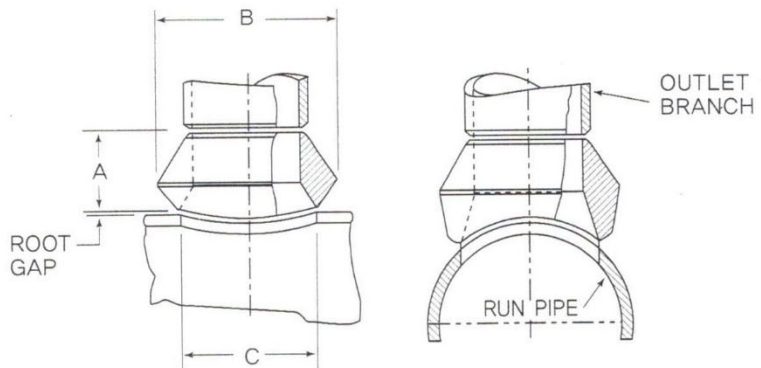


Outlet Size Inches	Dimensions				Appx. Weight Pounds
	A	B	C	D	
1/2	3/4	1-3/8	15/16	5/8	.15
3/4	7/8	1-5/8	1-3/16	13/16	.25
1	1-1/16	2	1-7/16	1-1/32	.40
1-1/4	1-1/4	2-7/16	1-3/4	1-3/8	.70
1-1/2	1-5/16	2-7/8	2	1-5/8	.90
2	1-1/2	3-1/2	2-9/16	2-1/16	1.60
2-1/2	1-5/8	4-1/16	3	2-7/16	2.50
3	1-3/4	4-13/16	3-11/16	3-1/16	4.10
3-1/2	2	5-3/8	3-7/8	3-9/16	5.10
4	2	6	4-3/4	4	7.50
5	2-1/4	7-1/8	5-9/16	5-1/16	9.50
6	3-1/16	8-7/8	6-11/16	6-1/16	15.00
8	3-7/8	10-5/8	8-11/16	7-5/8	32.00
10	3-1/2	12-7/8	10-7/16	9-3/4	46.00
12	3-15/16	15-3/16	13	11-3/4	61.00
14	4-1/8	16-11/16	14-5/16	13	75.00
16	4-7/16	18-7/8	16-1/2	15	115.00
18	4-11/16	21-1/8	18-5/8	17	130.00
20	5	23-3/8	20-13/16	19	187.00
24	5-1/2	27-7/8	25-1/8	23	316.00
26	5-3/4	30-1/8	27-1/4	25	370.00

30, 36 and larger sizes available on application.

Design per MSS-SP-97, BW ends per B16.9 and B16.25.

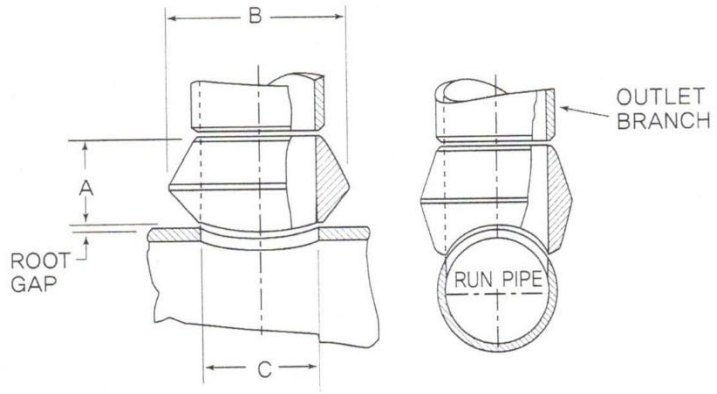
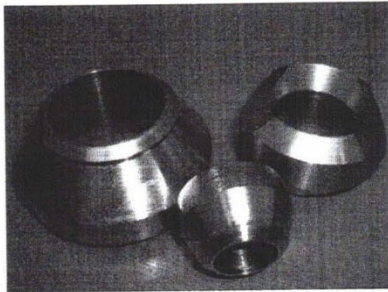
**MSS SP-97 WOL REDUCING SIZE S160-XXH**



Outlet Size Inches	Dimensions			Appx. Weight Pounds
	A	B	C	
1/2	1-1/8	1-3/8	9/16	.25
3/4	1-1/4	1-3/4	3/4	.70
1	1-1/2	2	1	.85
1-1/4	1-3/4	2-7/16	1-5/16	1.25
1-1/2	2	2-3/4	1-1/2	1.75
2	2-3/16	3-3/16	1-11/16	2.15
2-1/2	2-7/16	3-13/16	2-1/8	3.40
3	2-7/8	4-3/4	2-7/8	6.30
4	3-5/16	6	3-7/8	10.50
5	3-11/16	7-3/8	4-13/16	14.25
6	4-1/8	8-11/16	5-3/4	28.00
8	Larger outlet sizes available on application.			
10				
12				
14				
16				
18				
24				



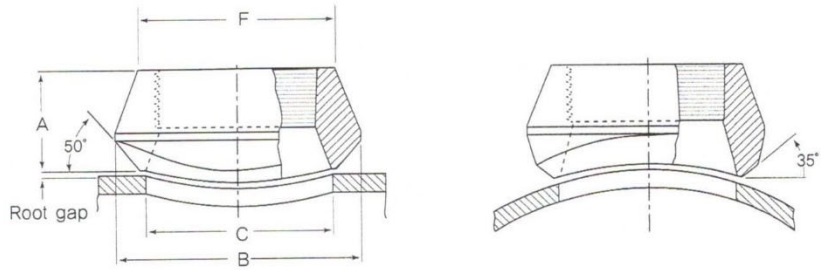
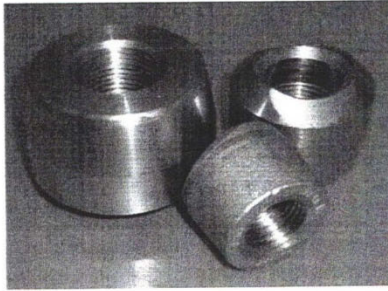
**MSS SP-97 WOL FULL SIZES S160-XXH**



Outlet Size Inches	Dimensions			Appx. Weight Pounds
	A	B	C	
1/2	1-1/8	1-3/8	9/16	.25
3/4	1-1/4	1-3/4	3/4	.70
1	1-1/2	2	1	.80
1-1/4	1-3/4	2-7/16	1-5/16	1.25
1-1/2	2	2-3/4	1-1/2	1.75
2	2-3/16	3-3/16	1-11/16	2.15
2-1/2	2-7/16	3-13/16	2-1/8	3.40
3	2-7/8	4-3/4	2-7/8	6.35
4	3-5/16	6	3-7/8	10.50
5	3-11/16	7-3/8	4-13/16	14.25
6	4-1/8	8-11/16	5-3/4	30.25
8 10 12 14 16 18 20 24	Larger outlet sizes available on application.			

Design per MSS-SP-97, BW ends per B16.9 and B16.25

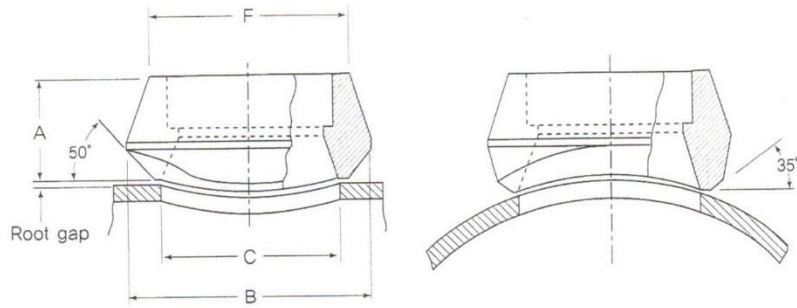
## MSS SP-97 TOL 3000# 6000#



OUTLET SIZE	A		B		C		F		APP Weight(kg)	
	3000# in	6000# in	3000# in	6000# in	3000# in	6000# in	3000# in	6000# in	3000# lbs	6000# lbs
1/8	3/4	-	1	-	5/8	-	7/8	-	.10	-
1/4	3/4	1-1/8	1	1-3/8	5/8	9/16	7/8	1-1/4	.10	.30
3/8	13/16	1-1/8	1-1/4	1-3/8	3/4	9/16	1	1-1/4	.20	.30
1/2	1	1-1/4	1-3/8	1-3/4	15/16	3/4	1-1/4	1-9/16	.25	.45
3/4	1-1/16	1-7/16	1-3/4	2	1-3/16	1	1-7/16	1-13/16	.35	.75
1	1-5/16	1-9/16	2-1/8	2-7/16	1-7/16	1-5/16	1-13/16	2-1/4	.60	1.25
1-1/4	1-5/16	1-5/8	2-9/16	2-3/4	1-3/4	1-1/2	2-3/16	2-9/16	.90	1.60
1-1/2	1-3/8	1-11/16	2-7/8	3-1/4	2	1-15/16	2-7/16	3	1.00	1.95
2	1-1/2	2-1/16	3-1/2	4-1/16	2-9/16	2-3/4	2-15/16	3-5/8	1.75	5.00
2-1/2	1-13/16	-	4-1/16	-	3	-	3-7/16	-	3.00	-
3	2	-	4-13/16	-	3-11/16	-	4-1/8	-	4.35	-
3-1/2	2-1/8	-	5-1/4	-	4	-	4-13/16	-	6.00	-
4	2-1/4	-	6	-	4-3/4	-	5-1/8	-	7.10	-

- Applicable Run Pipe Sizes are from Out-let Size to 36"
- Design per MSS-SP-97, BW ends per B16.9 and B16.25
- Dimensions are in Inches.
- Tolerances : 1/8 - 1/4 ± .03 in  
1 - 4 ± .06 in

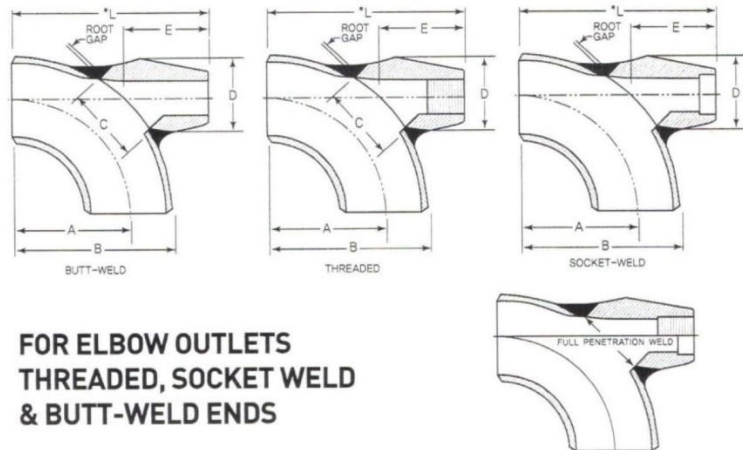
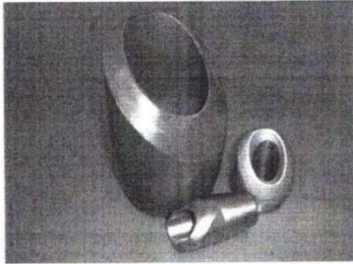
## MSS SP-97 SOL 3000# 6000#



OUTLET SIZE	A		B		C		F		APP Weight(kg)	
	3000# in	6000# in	3000# in	6000# in	3000# in	6000# in	3000# in	6000# in	3000# lbs	6000# lbs
1/8	3/4	-	1	-	5/8	-	7/8	-	.10	-
1/4	3/4	1-1/8	1	1-3/8	5/8	9/16	7/8	1-1/4	.10	.13
3/8	13/16	1-1/8	1-1/4	1-3/8	3/4	9/16	1	1-1/4	.20	.18
1/2	1	1-1/4	1-3/8	1-3/4	15/16	3/4	1-1/4	1-9/16	.30	.50
3/4	1-1/16	1-7/16	1-3/4	2	1-3/16	1	1-7/16	1-13/16	.35	.80
1	1-5/16	1-9/16	2-1/8	2-7/16	1-7/16	1-5/16	1-13/16	2-1/4	.60	1.30
1-1/4	1-5/16	1-5/8	2-9/16	2-3/4	1-3/4	1-1/2	2-3/16	2-9/16	.85	1.60
1-1/2	1-3/8	1-11/16	2-7/8	3-1/4	2	1-15/16	2-7/16	3	1.00	2.00
2	1-1/2	2-1/16	3-1/2	4-1/16	2-9/16	2-3/4	2-15/16	3-5/8	1.60	5.20
2-1/2	1-13/16	-	4-1/16	-	3	-	3-7/16	-	2.75	-
3	2	-	4-13/16	-	3-11/16	-	4-1/8	-	3.80	-
3-1/2	2-1/8	-	5-1/4	-	4	-	4-13/16	-	6.00	-
4	2-1/4	-	6	-	4-3/4	-	5-1/8	-	7.25	-

- Applicable Run Pipe Sizes are from Out-let Size to 36"
- Design per MSS-SP-97, BW ends per B16.9 and B16.25

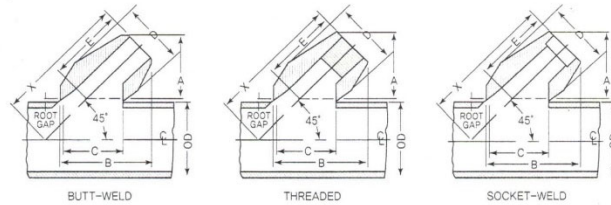
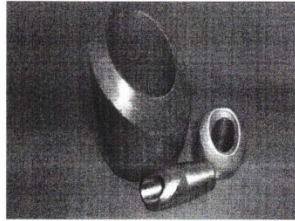
## MSS SP-97 EOL 3000# (STD, XH) / 6000# (S160, XXH)



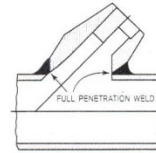
DIMENSIONS							
	NOMINAL RUN PIPE SIZE-IN.	OUTLET SIZE-IN.	C	D	E	F	APPROX. WEIGHT-LBS
3000# THREADED AND SOCKETWELD Std and XS Butt-Weld	36 - 1 1/4	1/4	1-1/2	1-1/8	1-19/32	1	.50
	36 - 1 1/4	3/8	1-1/2	1-3/8	1-19/32	1-1/4	.50
	36 - 1 1/4	1/2	1-1/2	1-1/2	1-19/32	1-3/8	.65
	36 - 1 1/4	3/4	1-23/32	2	1-7/8	1-3/4	.75
	36 - 2	1	2-1/8	2-1/4	2-3/16	2	1.15
	36 - 2	1-1/4	2-21/32	2-9/16	2-3/8	2-1/4	1.90
	36 - 3	1-1/2	3	3	2-5/8	2-9/16	2.65
	36 - 3	2	4-1/8	3-1/2	3-3/16	3	5.25
	ORDER TO SPECIFIC ELBOW SIZES	**2-1/2	4-3/16		3-1/4	3-1/2	5.5
		**3	4-15/16		3-13/16	4	6.25
		**4	6-7/16		4-1/2	5-1/4	11.75
		**6	9		6-3/16	8-7/8	28.00
**8		12-3/16		7-3/16	11-1/2	55.00	
**10		17-1/32		11-3/8	12-3/4	94.00	
6000# THREADED AND SOCKETWELD Sch 160 and XXS Butt-Weld	36 - 1 1/4	1/4	1-3/8	1-3/8	1-19/32	1	.75
	36 - 1 1/4	3/8	1-3/8	1-1/2	1-19/32	1-1/4	.75
	36 - 1 1/4	1/2	1-23/32	2	1-7/8	1-3/8	.85
	36 - 2	3/4	2-1/8	2-1/4	2-3/16	1-1/2	1.25
	36 - 2	1	2-21/32	2-9/16	2-3/8	1-3/4	2.20
	36 - 2	1-1/4	3	3	2-5/8	2-1/8	3.90
	36 - 3	1-1/2	4-1/8	3-1/2	3-3/16	2-3/8	6.15

- Socket dimensions to ASME B16.11
- Thread dimensions to ANSI/ASME B1.20.1
- Butt-Welding end dimensions to ASME B16.9&B16.25

## MSS SP-97 LOL 3000# (STD, XH) / 6000# (S160, XXH)

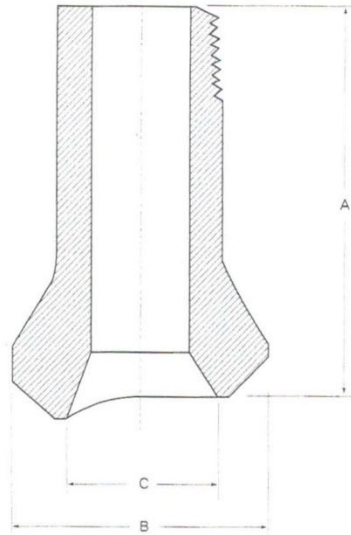


**45° BRANCH CONNECTIONS  
THREADED, SOCKET WELD  
AND BUTT-WELD ENDS**



DIMENSIONS									
	NOMINAL RUN PIPE SIZE-IN.	OUTLET SIZE-IN.	A	B	C	D	E	F	APPROX. WEIGHT-LBS
3000# THREADED AND SOCKETWELD Std and XS Butt-Weld	2 1/2 - 1 1/4 12 - 3	1/4	1-9/16	2-1/4	1-7/16	1-1/8	1-9/16	1	.50
	2 1/2 - 1 1/4 12 - 3	3/8	1-9/16	2-1/4	1-7/16	1-3/8	1-9/16	1-1/4	.50
	2 1/2 - 1 1/4 12 - 3	1/2	1-9/16	2-1/4	1-7/16	1-1/2	1-9/16	1-3/8	.65
	1 1/2 - 1 1/4 5 - 2 12 - 6	3/4	1-7/8	2-3/4	1-23/32	2	1-29/32	1-3/4	.75
	2 1/2 - 2 5 - 3 12 - 6	1	2-3/16	3-1/4	2-1/8	2-1/4	2-3/16	2	1.15
	2 1/2 - 2 5 - 3 12 - 6	1-1/4	2-9/16	3-13/16	2-21/32	2-9/16	2-15/16	2-1/4	1.90
	2 1/2 - 2 5 - 3 12 - 6	1-1/2	2-3/4	4-1/4	3	3	2-5/8	2-9/16	2.65
	5 - 4 8 - 6 12 - 10	2	3-3/8	5-3/8	4-1/8	3-1/2	3-3/32	3	5.25
	ORDER TO SPECIFIC RUN PIPE SIZES	**2-1/2 **3 **4 **6 **8 **10 **12	3-1/2 3-11/16 4-3/4 6-1/2 8 10 11-3/8	5-1/4 6-1/4 7-7/8 10-11/16 13-7/8 17-11/16 20-9/16	4-3/16 4-15/16 6-7/16 9 12-3/16 15-1/2 18-1/4		3-1/4 3-13/16 4-1/2 6-3/16 7-3/16 11-3/8 12-1/16	3-1/2 4 5-1/4 8-7/8 11-1/2 12-3/4 14-15/16	5.5 6.25 11.75 28.00 55.00 94.00 150.00
	6000# THREADED AND SOCKETWELD Sch 160 and XXS Butt-Weld	2 1/2 - 1 1/4 12 - 3	1/4 3/8	1-9/16 1-9/16	2-1/4 2-1/4	1-7/16 1-7/16	1-3/8 1-1/2	1-9/16 1-9/16	1 1-1/4
1 1/2 - 1 1/4 5 - 2 12 - 6		1/2	1-7/8	2-3/4	1-3/4	2	1-29/32	1-3/8	.85
2 1/2 - 2 5 - 3 12 - 6		3/4	2-3/16	3-1/4	2-1/8	2-1/4	2-3/16	1-1/2	1.25
2 1/2 - 2 5 - 3 12 - 6		1	2-1/2	3-13/16	2-21/32	2-9/16	2-15/32	1-3/4	2.20
2 1/2 - 2 5 - 3 12 - 6		1-1/4	2-3/4	4-1/4	3	3	2-5/8	2-1/8	2.90
5 - 4 8 - 6 12 - 10		1-1/2	3-3/8	5-3/8	4-1/8	3-1/2	3-5/32	2-3/8	6.15

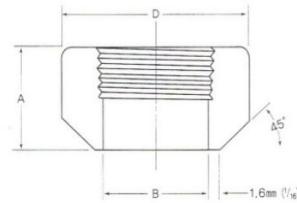
**MSS SP-97 NOL**



	PLAIN END AND THREADED						
	SIZE	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
STD XH	A	3-1/2	3-1/2	3-1/2	3-1/2	3-1/2	3-1/2
	B	1-3/8	1-3/4	2-1/8	2-9/16	2-7/8	3-1/2
	C	15/16	1-3/16	1-7/16	1-3/4	2	2-9/16
S160 XXH	A	3-1/2	3-1/2	3-1/2	3-1/2	3-1/2	3-1/2
	B	1-3/8	1-3/4	2-1/8	2-9/16	2-7/8	3-1/2
	C	9/16	3/4	1	1-5/16	1-1/2	1-11/16

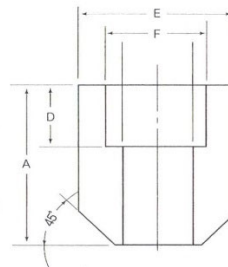
- Threaded or plain end
- Available in outlet sizes 1/2" thru 2"
- Available in 3-1/2", 4-1/2", 5-1/2", and 6-1/2" standard lengths. Other lengths available on request.
- XS and XXS ratings represent the schedule of the nipple portion of the Nipolet fitting

## B16.11 BOSS 3000# 6000# THREADED



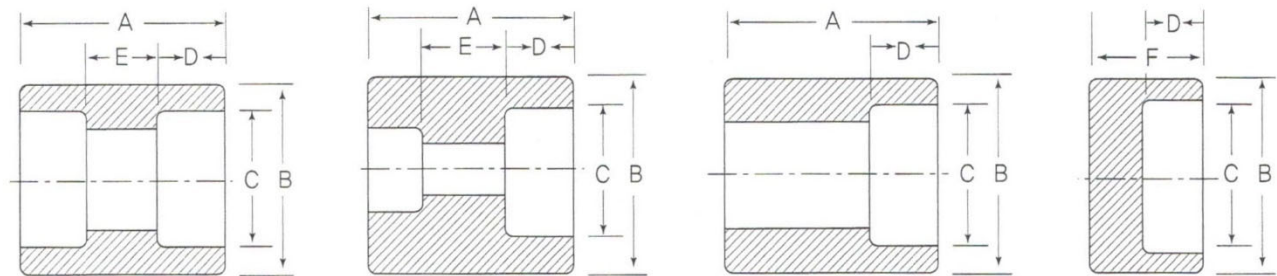
NOMINAL SIZE		LENGTH A		BORE DIA. B		OUTSIDE DIA. D			
in	mm	mm	in	mm	in	3000		6000	
						mm	in	mm	in
1/8	6	38	1-1/2	8,4	.343	19	3/4	22	7/8
1/4	8	41	1-5/8	11,1	.437	19	3/4	26	1
3/8	10	45	1-3/4	14,2	.578	22	7/8	32	1-1/4
1/2	15	51	2	18,0	.718	29	1-1/8	38	1-1/2
3/4	20	51	2	23,0	.921	35	1-3/8	45	1-3/4
1	25	51	2	29,0	1,156	45	1-3/4	60	2-3/8
1-1/2	40	51	2	44,0	1,734	64	2-1/2	76	3
2	50	51	2	56,0	2,218	76	3	95	3-5/8
2-1/2	65	51	2	67,0	2,625	95	3-5/8	-	-
3	80	57	2-1/4	82,0	3,250	110	4-1/4	-	-
4	100	64	2-1/2	107,1	4,250	140	5-1/2	-	-

## B16.11 BOSS 3000# 6000# SOCKETWELD



NOM. SIZE	A		E				D		F		UNIT WEIGHT	
			3000		6000							
	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
1/4	30	1-3/16	23	7/8	27	1-1/16	11	7/16	14,3	.555	0,09	.20
3/8	30	1-3/16	27	1-1/16	34	1-5/16	11	7/16	17,8	.690	0,11	.24
1/2	33	1-5/16	32	1-1/4	39	1-1/2	13	1/2	22,2	.588	0,14	.31
3/4	35	1-3/8	39	1-1/2	45	1-3/4	15	9/16	27,7	1,065	0,20	.44
1	43	1-11/16	46	1-13/16	58	2-1/4	16	5/8	34,5	1,330	0,43	.95
1-1/4	46	1-13/16	58	2-1/4	64	2-1/2	17	11/16	43,2	1,675	0,72	1,58
1-1/2	50	2	64	2-1/2	77	3	19	3/4	49,1	1,915	0,85	.187
2	57	2-1/4	77	3	92	3-5/8	22	7/8	61,1	2,406	1,36	3,00

**B16.11 SOCKET WELD  
COUPLINGS, REDUCERS AND CAPS**

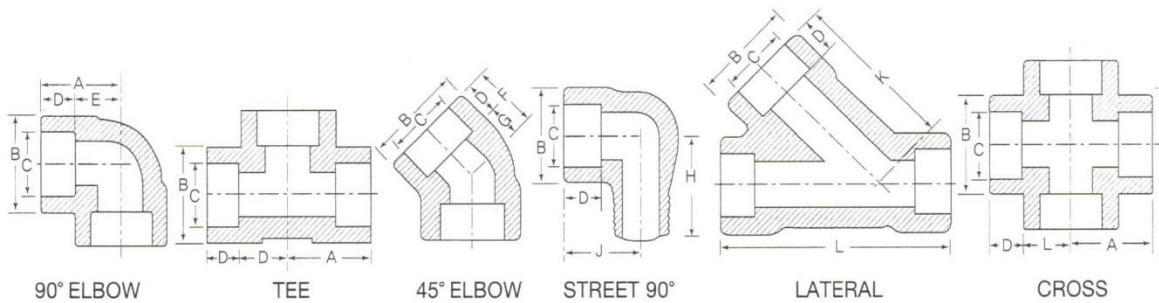


**DIMENSIONS (Inches)**

NOMINAL PIPE SIZE		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
3000#	A	1-1/8	1-1/8	1-1/8	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/2	2-1/2	2-3/4	3
	B	3/4	7/8	1-1/16	1-1/4	1-1/2	1-13/16	2-1/4	2-1/2	3	3-5/8	4-5/16	5-1/2
	C	.420	.555	.690	.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
	D	7/16	7/16	7/16	1/2	9/16	5/8	11/16	3/4	7/8	7/8	1	1-1/8
	E	1/4	1/4	1/4	3/8	3/8	1/2	1/2	1/2	3/4	3/4	3/4	3/4
	F	11/16	3/4	3/4	7/8	1	1-1/16	1-3/16	1-1/4	1-1/2	1-1/2	1-3/4	1-7/8
6000#	A		1-1/8	1-1/8	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/2	2-1/2	2-3/4	3
	B		1-1/16	1-5/16	1-1/2	1-3/4	2-1/4	2-1/2	3	3-5/8	4-1/4	5	6-1/4
	C		.555	.690	.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
	D		7/16	7/16	1/2	9/16	5/8	11/16	3/4	7/8	7/8	1	1-1/8
	E		1/4	1/4	3/8	3/8	1/2	1/2	1/2	3/4	3/4	3/4	3/4
	F			15/16	1	1-1/16	1-1/4	1-5/16	1-3/8	1-5/8	1-5/8	1-7/8	2-1/8



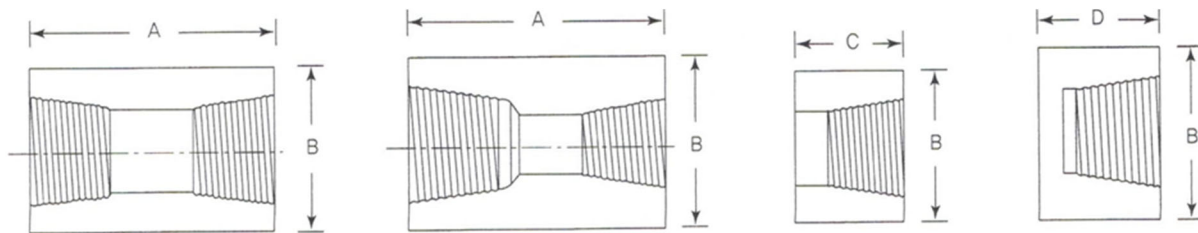
## B16.11 SOCKET WELD FITTINGS



DIMENSIONS (Inches)

NOMINAL PIPE SIZE	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4		
3000#	A	13/16	13/16	31/32	1-1/8	1-5/16	1-1/2	1-3/4	2	2-3/4	3	3-3/8	4-1/2	
	B	7/8	7/8	1-1/16	1-5/16	1-1/2	1-13/16	2-1/16	2-7/16	2-31/32	3-5/8	4-5/16	6	
	D	3/8	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1-3/8	1-1/8	1-7/8	
	E	7/16	7/16	17/32	5/8	3/4	7/8	1-1/16	1-1/4	1-1/2	1-5/8	2-1/4	2-5/8	
	F	11/16	11/16	3/4	7/8	1	1-1/8	1-5/16	1-11/12	1-11/16	2-1/16	2-1/2	3-1/8	
	G	5/16	5/16	5/16	7/16	1/2	9/16	11/16	13/16	1	1-1/8	1-1/4	1-5/8	
	H	1-1/4	1-1/4	1-1/2	1-5/8	1-7/8	2-1/4	2-5/8	2-15/16	3-5/16				
	J	7/8	7/8	1	1-1/8	1-3/8	1-3/4	2	2-1/8	2-1/2				
	K		1-5/8	1-7/8	2-1/8	2-9/16	3	3-1/2	3-15/16	4-3/4				
	L		2-5/16	2-11/16	3	3-9/16	4-1/8	4-13/16	5-3/8	6-7/15				
	6000#	A			1-1/8	1-5/16	1-1/2	1-3/4	2	2-3/8	2-1/2	3-1/4	3-3/4	4-1/2
		B			1-5/16	1-1/2	1-13/16	2-3/16	2-7/16	2-31/32	3-5/16	4	4-3/4	6
D				19/32	9/16	5/8	11/16	3/4	7/8	7/8	1	1-1/4	1-7/8	
E				17/32	3/4	7/8	1-1/16	1-1/4	1-1/2	1-5/8	2-1/4	2-1/2	2-5/8	
F				7/8	1	1-1/8	1-5/16	1-11/32	1-11/16	1-23/32	2-1/16	2-1/2	3-1/5	
G				3/8	1/2	9/16	11/16	13/16	1	1-1/8	1-1/4	1-3/8	1-5/8	
H			1-1/2	1-5/8	1-7/8	2-1/4	2-5/8	2-15/16	3-5/16					
J			1	1-1/8	1-3/8	1-3/4	2	2-1/8	2-1/2					
K		-		2-1/8	2-9/16	3	3-1/2	3-15/16	4-3/4					
L				3	3-9/16	4-1/8	4-13/16	5-3/8	6-7/16					
Dimension C (Common to all fittings)		.420	.555	.690	.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545	

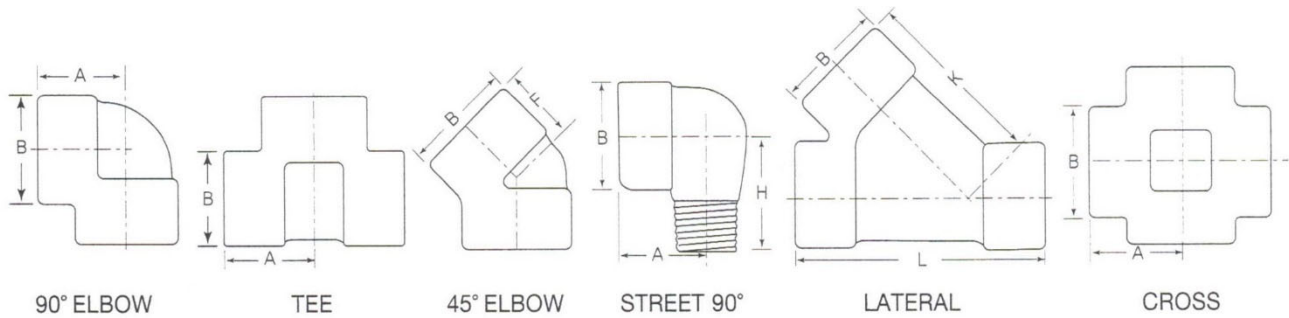
**B16.11 THREADED  
COUPLINGS, REDUCING AND CAPS**



**DIMENSIONS (Inches)**

NOMINAL PIPE SIZE		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
3000#	A	1-1/4	1-3/8	1-1/2	1-7/8	2	2-3/8	2-5/8	3-1/8	3-3/8	3-5/8	4-1/4	4-3/4
	B	3/4	3/4	7/8	1-1/8	1-3/8	1-3/4	2-1/4	2-1/2	3	3-5/8	4-1/4	5-1/2
	C	5/8	1-11/16	3/4	15/16	1	1-3/16	1-5/16	1-9/16	1-11/16	1-13/16	2-1/8	2-3/8
	D	15-16	1	1	1-1/4	1-7/16	1-5/8	1-3/4	1-3/4	1-7/8	2-3/8	2-9/16	2-11/16
6000#	A	1-1/4	1-3/8	1-1/2	1-7/8	2	2-3/8	2-5/8	3-1/8	3-3/8	3-3/8	4-1/4	4-3/4
	B	7/8	1	1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3	3-5/8	4-1/4	5	6-1/4
	C	5/8	11/16	3/4	15/16	1	1-3/16	1-5/16	1-9/16	1-11/16	1-13/16	2-1/8	2-3/8
	D	1	1-1/16	1-1/16	1-5/16	1-1/2	1-11/16	1-13/16	1-7/8	2	2-1/2	2-11/16	2-15/16

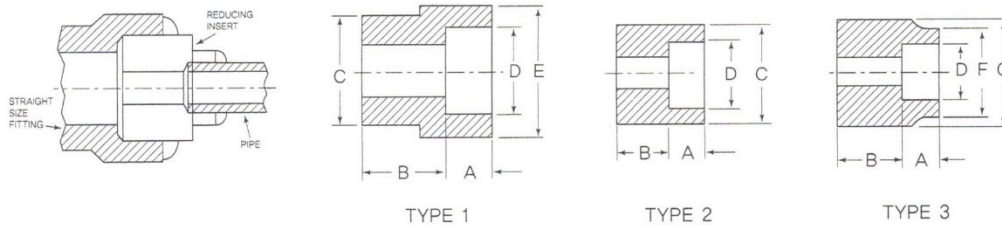
## B16.11 THREADED B16.11 FITTINGS



DIMENSIONS (Inches)

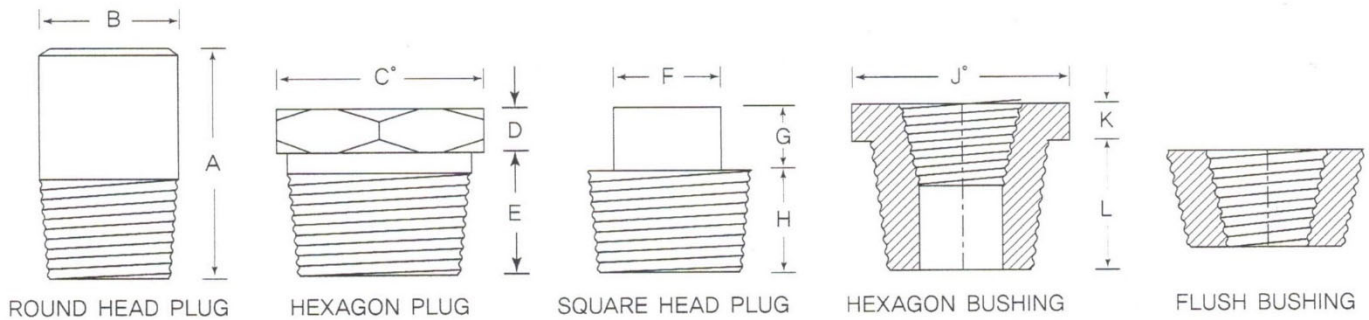
NOMINAL PIPE SIZE		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
3000#	A	13/16	31/32	1-1/8	1-5/16	1-1/2	1-3/4	2	2-3/8	2-1/2	3-1/4	3-3/4	4-1/2
	B	7/8	1-1/16	1-5/16	1-1/2	1-13/16	2-3/16	2-7/16	2-31/32	3-5/16	4	4-3/4	6
	F	3/4	3/4	7/8	1	1-1/8	1-5/16	1-3/8	1-11/16	1-23/32	2-1/16	2-1/2	3-1/8
	H	1-1/4	1-1/4	1-1/2	1-5/8	1-7/8	2-1/4	2-5/8	2-15/16	3-5/16			
	J	7/8	7/8	1	1-1/8	1-3/8	1-3/4	2	2-1/8	2-1/2			
	K		1-7/8	2-1/8	2-9/16	3	3-1/2	3-15/16	4-3/4				
	L		2-11/16	3	3-9/16	4-1/8	4-13/16	5-3/8	6-7/16				
6000#	A	31/32	1-1/8	1-5/16	1-1/2	1-3/4	2	2-3/8	2-1/2	3-1/4	3-3/4	4-1/2	4-1/2
	B	1-1/16	1-5/16	1-1/2	1-13/16	2-3/16	2-7/16	2-31/32	3-5/16	4	4-3/4	6	6
	F	3/4	7/8	1	1-1/8	1-5/16	1-3/8	1-11/16	1-23/32	2-1/16	2-1/2	3-1/8	3-1/8
	H		1-1/2	1-5/8	1-7/8	2-1/4	2-5/8	2-15/16	3-5/16				
	J		1	1-1/8	1-3/8	1-3/4	2	2-1/8	2-1/2				
	K			2-9/16	3	3-1/2	3-15/16	4-3/4					
	L			3-9/16	4-1/8	4-13/16	5-3/8	6-7/16					

## B16.11 SOCKET WELDING MSS SP-79 REDUCING INSERT



Size (In.)	Dia. C	Dia. D	Insert Type	For use with Sch. 40 and 80 Pipe				Insert Type	For use with Sch. 160 Pipe			
				Dimensions					Dimensions			
				A	B	E	F		A	B	E	F
1/2 x 3/8	.850	.690	1	7/16	5/16	1		1	1/2	1-1/16	1-1/8	
1/2 x 1/4	.850	.555	2	3/8	5/8			2	7/16	11/16		
1/2 x 1/8	.850	.420	3	3/8	5/8		11/16	3	7/16	11/16		3/4
3/4 x 1/2	1.060	.855	1	1/2	1	1-1/4		1	9/16	1-3/16	1-3/8	
3/4 x 3/8	1.060	.690	2	7/16	9/16			2	1/2	3/4		
3/4 x 1/4	1.060	.555	3	3/8	5/8		7/8	2	7/16	13/16		
3/4 x 1/8	1.060	.420	3	3/8	5/8		7/8	3	7/16	13/16		7/8
1 x 3/4	1.325	1.065	1	9/16	15/16	1-1/2		1	5/8	1-1/2	1-5/8	
1 x 1/2	1.325	.855	2	1/2	13/16			2	9/16	1-1/4		
1 x 3/8	1.325	.690	3	7/16	7/8		1	3	1/2	1		1-1/8
1 x 1/4	1.325	.555	3	3/8	15/16		1	3	7/16	1-1/16		1-1/8
1-1/4 x 1	1.670	1.330	1	5/8	1-1/16	1-3/4		1	11/16	1-9/16	2	
1-1/4 x 3/4	1.670	1.065	2	9/16	13/16			2	5/8	1-1/4		
1-1/4 x 1/2	1.670	.855	3	1/2	7/8		1-1/4	3	9/16	1-3/16		1-3/8
1-1/2 x 1-1/4	1.910	1.675	1	11/16	1-3/16	2-1/8		1	3/4	1-13/16	2-5/16	
1-1/2 x 1	1.910	1.330	2	5/8	13/16			2	11/16	1-7/16		
1-1/2 x 3/4	1.910	1.065	3	9/16	7/8		1-1/2	3	5/8	1-3/8		1-5/8
1-1/2 x 1/2	1.910	.855	3	1/2	15/16		1-1/4	3	9/16	1-7/16		1-3/8
2 x 1-1/2	2.400	1.915	2	3/4	13/16			1	7/8	1-5/8	2-5/8	
2 x 1-1/4	2.400	1.675	3	11/16	7/8		2-1/8	2	3/4	1-5/16		
2 x 1	2.400	1.330	3	5/8	15/16		1-3/4	3	11/16	1-5/16		2
2 x 3/4	2.400	1.065	3	9/16	1		1-1/2	3	5/8	1-3/8		1-5/8
2 x 1/2	2.400	.855	3	1/2	1-1/16		1-1/4	3	9/16	1-7/16		1-3/8
2-1/2 x 2	2.900	2.406	1	7/8	1-15/16	3		1	7/8	1-15/16	3-1/8	
2-1/2 x 1-1/2	2.900	1.915	3	3/4	1-3/4		2-1/2	3	7/8	1-9/16		2-5/8
2-1/2 x 1-1/4	2.900	1.675	3	11/16	1-13/16		2-1/8	3	3/4	1-9/16		2-5/16
2-1/2 x 1	2.900	1.330	3	5/8	1-3/4		1-3/4	3	11/16	1-5/8		2
3 x 2-1/2	3.530	2.906	1	7/8	1-13/16	3-5/8		1	7/8	2-1/4	3-7/8	
3 x 2	3.530	2.406	3	7/8	1-5/8		3	3	7/8	1-7/8		3-5/16
3 x 1-1/2	3.530	1.915	3	3/4	1-9/16		2-1/2	3	7/8	1-7/8		2-5/8
3 x 1-1/4	3.530	1.675	3	11-1/16	1-9/16		2-1/8	3	3/4	1-7/8		2-5/16
3 x 1	3.530	1.330	3	5/8	1-1/2		1-3/4	3	11/16	1-13/16		2
4 x 3	4.530	3.535	3	1-1/8	2-1/8		4-5/16	1	1-1/8	2-1/2	4-5/8	
4 x 2-1/2	4.530	2.906	3	15/16	2-1/16		3-5/8	3	7/8	2-1/16		3-7/8
4 x 2	4.530	2.406	3	7/8	2-1/8		3	3	7/8	2-1/16		3-5/16
4 x 1-1/2	4.530	1.915	3	3/4	2-1/8		2-1/2	3	7/8	1-7/8		2-5/8
4 x 1-1/4	4.530	1.675	3	11/16	2-1/16		2-1/8	3	3/4	2		2-5/16
4 x 1	4.530	1.330	3	5/8	1-7/8		1-3/4	3	11/16	1-7/8		2

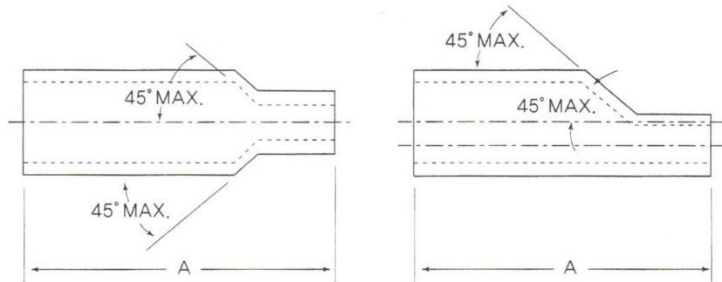
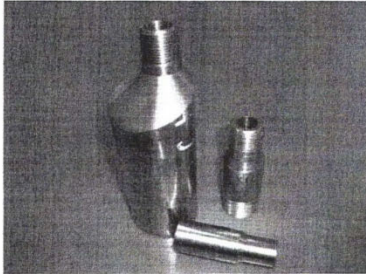
**B16.11 THREADED  
PLUGS AND BUSHINGS**



**DIMENSIONS (Inches)**

NOMINAL PIPE SIZE	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
A	1-3/8	1-5/8	1-5/8	1-3/4	1-3/4	2	2	2	2-1/2	2-3/4	2-3/4	3
B	13/32	17/32	11/16	21/32	1-1/16	1-5/16	1-11/16	1-27/32	1-3/8	2-7/8	3-1/2	4-1/2
C	1/16	5/8	11/16	7/8	1-1/16	1-3/8	1-3/4	2	2-1/2	3	3-1/2	4-5/8
D	1/4	1/4	5/16	5/16	3/8	3/8	9/16	5/8	11/16	3/4	13/16	1-1/4
E	3/8	7/16	1/2	8/16	5/8	3/4	13/16	13/16	7/8	1-1/16	1-1/8	1-1/4
F	9/32	3/8	7/16	9/16	5/8	13/16	15/16	1-1/8	1-5/16	1-1/2	1-11/16	2-1/2
G	1/4	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	1-1/4
H	3/8	7/16	1/2	9/16	5/8	3/4	13/16	13/16	7/8	1-1/16	1-1/8	1-1/4
J	7/16	5/8	11/16	7/8	1-1/16	1-3/8	1-3/4	2	2-2/1	3	3-1/2	4-5/8
K		1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	13/32	1/2
L	3/8	7/16	1/2	9/16	5/8	3/4	13/16	15/16	7/8	1-1/16	1-1/8	1-1/4
M	3/8	7/16	1/2	9/16	5/8	3/4	13/16	13/16	7/8	1-1/16	1-1/8	1-1/4
N	3/8	7/16	1/2	9/16	5/8	3/4	13/16	13/16	7/8	1-1/16	1-1/8	1-1/4

## MSS-SP-95 SWAGED NIPPLES (PAGE 1)



Dimensions in Inches

Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"
	Large End	Small End	
1-4 x 1/8	0,540	0,405	2,25
3/8 x 1/8	0,675	0,405	2,50
3/8 x 1/4	0,675	0,540	2,50
1/2 x 1/8	0,840	0,405	2,75
1/2 x 1/4	0,840	0,540	2,75
1/2 x 3/8	0,840	0,675	2,75
3/4 x 1/8	1,050	0,405	3,00
3/4 x 1/4	1,050	0,540	3,00
3/4 x 3/8	1,050	0,675	3,00
3/4 x 1/2	1,050	0,840	3,00
1 x 1/8	1,315	0,405	3,50
1 x 1/4	1,315	0,540	3,50
1 x 3/8	1,315	0,675	3,50
1 x 1/2	1,315	0,840	3,50
1 x 3/4	1,315	1,050	3,50
1-1/4 x 1/8	1,660	0,405	4,00
1-1/4 x 1/4	1,660	0,540	4,00
1-1/4 x 3/8	1,660	0,675	4,00
1-1/4 x 1/2	1,660	0,840	4,00
1-1/4 x 3/4	1,660	1,050	4,00
1-1/4 x 1	1,660	1,315	4,00
1-1/2 x 1/8	1,900	0,405	4,50
1-1/2 x 1/4	1,900	0,540	4,50
1-1/2 x 3/8	1,900	0,675	4,50
1-1/2 x 1/2	1,900	0,840	4,50
1-1/2 x 3/4	1,900	1,050	4,50

Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"
	Large End	Small End	
1-1/2 x 1	1,900	1,315	4,50
1-1/2 x 1-1/4	1,900	1,660	4,50
2 x 1/8	2,375	0,405	6,50
2 x 1/4	2,375	0,540	6,50
2 x 3/8	2,375	0,675	6,50
2 x 1/2	2,375	0,840	6,50
2 x 3/4	2,375	1,050	6,50
2 x 1	2,375	1,315	6,50
2 x 1-1/4	2,375	1,660	6,50
2 x 1-1/2	2,375	1,900	6,50
2-1/2 x 1/8	2,875	0,405	7,00
2-1/2 x 1/4	2,875	0,540	7,00
2-1/2 x 3/8	2,875	0,675	7,00
2-1/2 x 1/2	2,875	0,840	7,00
2-1/2 x 3/4	2,875	1,050	7,00
2-1/2 x 1	2,875	1,315	7,00
2-1/2 x 1-1/4	2,875	1,660	7,00
2-1/2 x 1-1/2	2,875	1,900	7,00
2-1/2 x 2	2,875	2,375	7,00
3 x 1/8	3,500	0,405	8,00
3 x 1/4	3,500	0,540	8,00
3 x 3/8	3,500	0,675	8,00
3 x 1/2	3,500	0,840	8,00
3 x 3/4	3,500	1,050	8,00
3 x 1	3,500	1,315	8,00
3 x 1-1/4	3,500	1,660	8,00

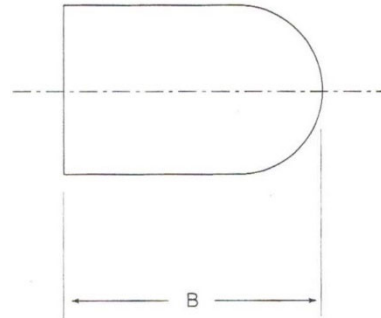
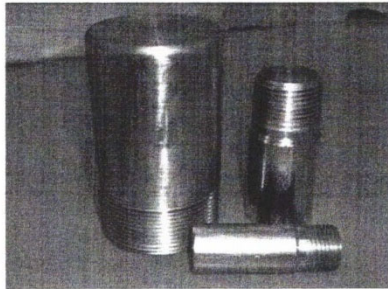
## MSS-SP-95 SWAGED NIPPLES (PAGE 2)

Dimensions in Inches

Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"
	Large End	Small End	
3 × 1-1/2	3,500	1,900	8,00
3 × 2	3,500	2,375	8,00
3 × 2-1/2	3,500	2,875	8,00
3-1/2 × 1/8	4,000	0,405	8,00
3-1/2 × 1/4	4,000	0,540	8,00
3-1/2 × 3/8	4,000	0,675	8,00
3-1/2 × 1/2	4,000	0,840	8,00
3-1/2 × 3/4	4,000	1,050	8,00
3-1/2 × 1	4,000	1,315	8,00
3-1/2 × 1-1/4	4,000	1,660	8,00
3-1/2 × 1-1/2	4,000	1,900	8,00
3-1/2 × 2	4,000	2,375	8,00
3-1/2 × 2-1/2	4,000	2,875	8,00
3-1/2 × 3	4,000	3,500	8,00
4 × 1/4	4,500	0,540	9,00
4 × 3/8	4,500	0,675	9,00
4 × 1/2	4,500	0,840	9,00
4 × 3/4	4,500	1,050	9,00
4 × 1	4,500	1,315	9,00
4 × 1-1/4	4,500	1,660	9,00
4 × 1-1/2	4,500	1,900	9,00
4 × 2	4,500	2,375	9,00
4 × 2-1/2	4,500	2,875	9,00
4 × 3	4,500	3,500	9,00
4 × 3-1/2	4,500	4,000	9,00
5 × 1/4	5,563	0,540	11,00
5 × 3/8	5,563	0,675	11,00
5 × 1/2	5,563	0,840	11,00
5 × 3/4	5,563	1,050	11,00
5 × 1	5,563	1,315	11,00
5 × 1-1/4	5,563	1,660	11,00
5 × 1-1/2	5,563	1,900	11,00
5 × 2	5,563	2,375	11,00
5 × 2-1/2	5,563	2,875	11,00
5 × 3	5,563	3,500	11,00
5 × 3-1/2	5,563	4,000	11,00
5 × 4	5,563	4,500	11,00
6 × 1/2	6,625	0,840	12,00

Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"
	Large End	Small End	
6 × 3/4	6,625	1,050	12,00
6 × 1	6,625	1,315	12,00
6 × 1-1/4	6,625	1,660	12,00
6 × 1-1/2	6,625	1,900	12,00
6 × 2	6,625	2,375	12,00
6 × 2-1/2	6,625	2,875	12,00
6 × 3	6,625	3,500	12,00
6 × 3-1/2	6,625	4,000	12,00
6 × 4	6,625	4,500	12,00
6 × 5	6,625	5,563	12,00
8 × 1	8,625	1,315	13,00
8 × 1-1/4	8,625	1,660	13,00
8 × 1-1/2	8,625	1,900	13,00
8 × 2	8,625	2,375	13,00
8 × 2-1/2	8,625	2,875	13,00
8 × 3	8,625	3,500	13,00
8 × 3-1/2	8,625	4,000	13,00
8 × 4	8,625	4,500	13,00
8 × 5	8,625	5,563	13,00
8 × 6	8,625	6,625	13,00
10 × 2	10,750	2,375	15,00
10 × 2-1/2	10,750	2,875	15,00
10 × 3	10,750	3,500	15,00
10 × 3-1/2	10,750	4,000	15,00
10 × 4	10,750	4,500	15,00
10 × 5	10,750	5,563	15,00
10 × 6	10,750	6,625	15,00
10 × 8	10,750	8,625	15,00
12 × 2	12,750	2,375	16,00
12 × 2-1/2	12,750	2,875	16,00
12 × 3	12,750	3,500	16,00
12 × 3-1/2	12,750	4,000	16,00
12 × 4	12,750	4,500	16,00
12 × 5	12,750	5,563	16,00
12 × 6	12,750	6,625	16,00
12 × 8	12,750	8,625	16,00
12 × 10	12,750	10,750	16,00

**MSS-SP-95 BULL PLUGS**

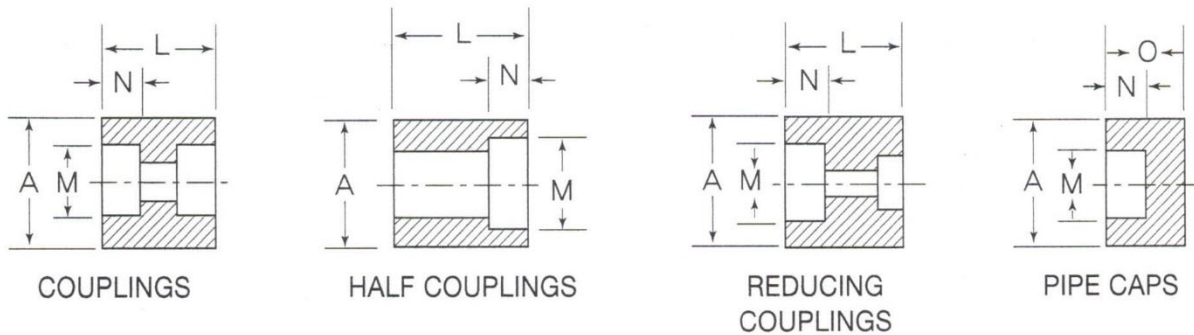


Dimensions in inches

Nominal Pipe Size (NPS)	Outside Diameter	End To End "B"
1/8	0,405	2,00
1/4	0,540	2,00
3/8	0,675	2,25
1/2	0,840	2,50
3/4	1,050	2,75
1	1,315	3,00
1-1/4	1,660	3,25
1-1/2	1,900	3,50
2	2,375	4,00
2-1/2	2,875	5,00
3	3,500	6,00
3-1/2	4,000	6,50
4	4,500	7,00
5	5,563	8,50
6	6,625	10,00
8	8,625	11,00
10	10,750	13,00
12	12,750	14,00

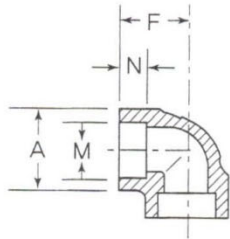


**B16.11 9000 LB FORGED STEEL  
SOCKET WELDING FITTINGS**

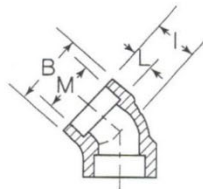


Nominal Pipe Size		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
COUPLINGS	Dimension N		3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-1/8	1-3/8	1-3/4	2-1/4	2-1/2	3	3-1/4	4-1/4
	Dimension L		1-1/8	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/2	2-1/2
HALF COUPLINGS	Dimension N		3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-1/8	1-3/8	1-3/4	2-1/4	2-1/2	3	3-1/4	4-1/4
	Dimension L		1-1/8	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/2	2-1/2
REDUCING COUPLINGS	Dimension N		3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-1/8	1-3/8	1-3/4	2-1/4	2-1/2	3	3-1/4	4-1/4
	Dimension L		1-1/8	1-3/8	1-1/2	1-3/4	1-7/8	2	2-1/2	2-1/2
PIPE CAPS	Dimension N		3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-1/8	1-3/8	1-3/4	2-1/4	2-1/2	3	3-1/4	4-1/4
	Dimension O		15/16	1	1-1/16	1-1/4	1-5/16	1-3/8	1-5/8	1-7/8

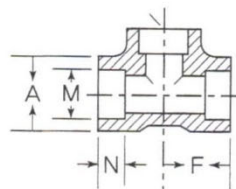
**B16.11 9000 LB FORGED STEEL  
SOCKET WELDING FITTINGS**



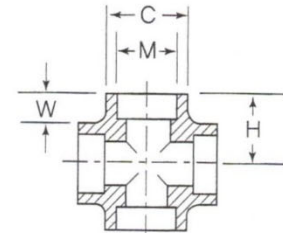
90° ELBOWS



45° ELBOWS



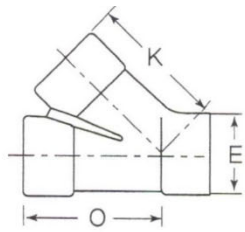
TEES



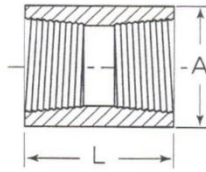
CROSSES

Nominal Pipe Size		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
90° ELBOWS	Dimension N		7/16	7/16	1/2	9/16	11/16	15/16	7/8	1-1/16
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	3	3-5/16	4
	Dimension F		1-1/8	1-5/16	1-1/2	1-11/16	1-15/16	2-5/16	2-3/8	3-3/16
45° ELBOWS	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension B		1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	3	3-5/16	4
	Dimension I		7/8	1	1-1/8	1-1/4	1-9/32	1-5/8	1-21/32	2
	Dimension X		7/16	7/16	1/2	1/2	15/32	3/4	21/32	7/8
TEES	Dimension N		7/16	7/16	1/2	9/16	11/16	15/16	7/8	1-1/16
	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension A		1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	3	3-5/16	4
	Dimension F		1-1/8	1-5/16	1-1/2	1-11/16	1-15/16	2-5/16	2-3/8	3-3/16
CROSSES	Dimension M		.555	.690	.855	1.065	1.330	1.675	1.915	2.406
	Dimension C		1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	3	3-5/16	4
	Dimension H		1-1/8	1-5/16	1-1/2	1-11/16	1-15/16	2-5/16	2-3/8	3-1/4
	Dimension W		7/16	7/16	1/2	9/16	11/16	15/16	7/8	1-1/8

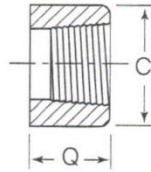
## B16.11 9000 LB FORGED STEEL THREADED FITTINGS



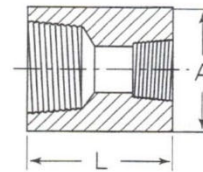
LATERALS



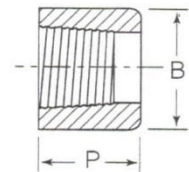
COUPLINGS



HALF  
COUPLINGS



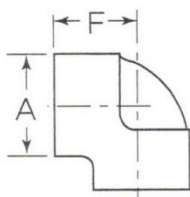
REDUCING  
COUPLINGS



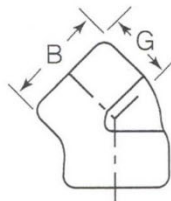
PIPE CAPS

Nominal Pipe Size		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
LATERALS	Dimension K		1-3/4	2-1/8	2-1/2	2-13/16	3-3/16	4-7/16		
	Dimension E		1-1/2	1-3/4	2	2-7/16	2-3/4	3-5/16		
	Dimension O		2-1/2	3	3-1/2	4-1/8	4-5/8	6-1/8		
COUPLINGS	Dimension A	1	1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3	3-5/8	4-1/4
	Dimension L	1-3/8	1-1/2	1-7/8	2	2-3/8	2-5/8	3-1/8	3-3/8	3-5/8
HALF COUPLINGS	Dimension C		1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3	3-1/2	4-1/4
	Dimension Q		11/16	3/4	15/16	1	1-3/16	1-5/16	1-9/16	1-11/16
REDUCING COUPLINGS	Dimension A		1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3	3-5/8	4-1/4
	Dimension L		1-1/2	1-7/8	2	2-3/8	2-5/8	3-1/8	3-3/8	3-5/8
PIPE CAPS	Dimension B		1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3	3-1/2	4-1/4
	Dimension P		1-3/16	1-3/8	1-1/2	1-13/16	1-7/8	1-7/8	2	2-1/2

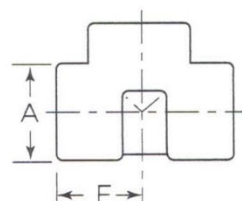
**B16.11 9000 LB FORGED STEEL  
THREADED FITTINGS**



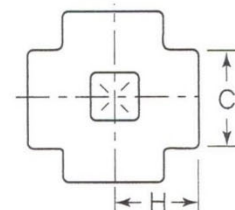
90° ELBOWS



45° ELBOWS



TEES



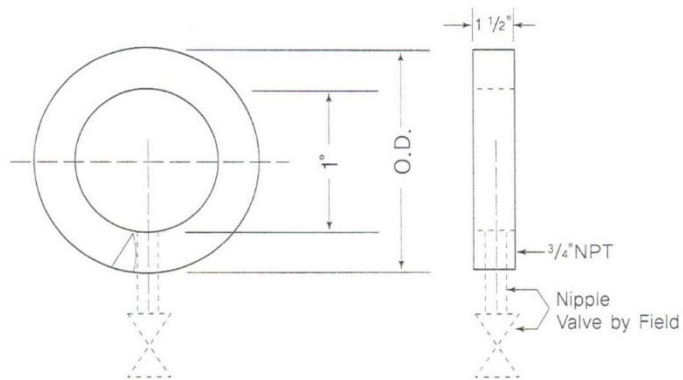
CROSSES

Nominal Pipe Size		1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2
90° ELBOWS	Dimension F	1-3/16	1-3/8	1-9/16	1-13/16	2-1/16	2-13/32	2-1/2	3-5/16	3-3/4
	Dimension A	1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	2-31/32	3-5/16	4	4-3/4
45° ELBOWS	Dimension G	15/16	1-1/16	1-3/16	1-3/8	1-13/16	1-3/4	1-25/32	2-1/8	2-9/16
	Dimension B	1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	2-31/32	3-5/16	4	4-3/4
TEES	Dimension F	1-3/16	1-3/8	1-9/16	1-13/16	2-1/16	2-13/32	2-1/2	3-5/16	3-3/4
	Dimension A	1-21/64	1-17/32	1-27/32	2-13/64	2-15/32	2-31/32	3-5/16	4	4-3/4
CROSSES	Dimension H	1-1/8	1-5/16	1-1/2	1-3/4	2	2-3/8	2-1/2	3-1/4	3-3/8
	Dimension C	1-5/16	1-1/8	1-13/16	2-3/16	2-15/32	2-31/32	3-5/16	4	4-5/8

**BLEED RING**

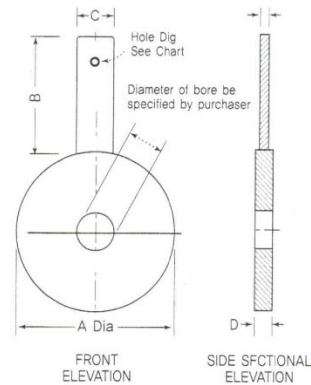
**150#, 300#, 400#, 600#, 900#, 1500#(RF)**

**125#,250#(FF)**



SIZE	ID	OD					
		125FF 150RF	250FF 300RF	400RF	600RF	900RF	1500RF
1	1-1/8	2-1/2	2-3/4	2-3/4	2-3/4	3	3
1-1/4	1-3/8	2-7/8	3-1/8	3-1/8	3-1/8	3-3/8	3-3/8
1-1/2	1-3/4	3-1/4	3-5/8	3-5/8	3-5/8	3-3/4	3-3/4
2	2-1/4	4	4-1/4	4-1/4	4-1/4	5-1/2	5-1/2
2-1/2	2-5/8	4-3/4	5	5	5	6-3/8	6-3/8
3	3-1/4	5-1/4	5-3/4	5-3/4	5-3/4	6-1/2	6-3/4
4	4-1/4	6-3/5	7	6-7/8	7-1/2	8	8-1/8
5	5-1/4	7-5/8	8-3/8	8-1/4	9-3/8	9-5/8	9-7/8
6	6-1/4	8-5/8	9-3/5	9-5/8	10-3/8	11-1/4	11
8	8-1/4	10-7/8	12	11-7/8	12-1/2	14	13-3/4
10	10-1/4	13-1/4	14-1/8	14	15-5/8	17	17
12	12-1/4	16	16-1/2	16-3/8	17-7/8	19-1/2	20-3/8

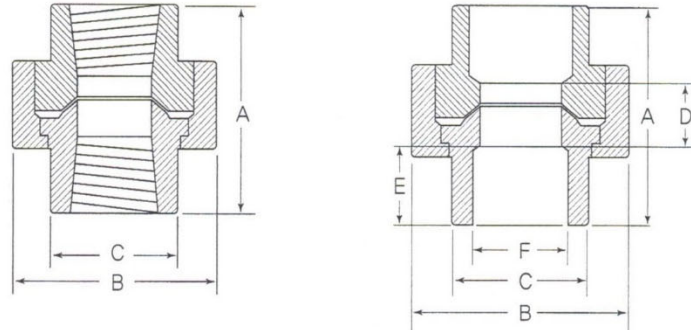
## ORIFACE PLATE PADDLE-TYPE



DIMENSIONS (IN Inches)

Line Size	125 Lbs. and 150 Lbs. ANSI	250 Lbs. and 300 Lbs. ANSI	400 Lbs. ANSI	600 Lbs. ANSI	900 Lbs. ANSI	1500 Lbs. ANSI	2500 Lbs. ANSI	For all pressure Ratings 125-2500 Lbs. ANSI		
	A	A	A	A	A	A	A	B	C	D
1/2	1-7/8	2-1/8	2-1/8	2-1/8	2-1/2	2-1/2	2-3/4	4	1	1/8
3/4	2-1/4	2-5/8	2-5/8	2-5/8	2-3/4	2-3/4	3	4	1	1/8
1	2-5/8	2-7/8	2-7/8	2-7/8	3-1/8	3-1/8	3-3/8	4	1	1/8
1-1/4	3	3-1/4	3-1/4	3-1/4	3-1/2	3-1/2	4-1/8	4	1	1/8
1-1/2	3-3/8	3-3/4	3-3/4	3-3/4	3-7/8	3-7/8	4-5/8	4	1	1/8
2	4-1/8	4-3/8	4-3/8	4-3/8	5-5/8	5-5/8	5-3/4	4	1	1/8
2-1/2	4-7/8	5-1/8	5-1/8	5-1/8	6-1/2	6-1/2	6-5/8	4	1-1/4	1/8
3	5-3/8	5-7/8	5-7/8	5-7/8	6-5/8	6-7/8	7-3/4	4	1-1/4	1/8
4	6-7/8	7-1/8	7	7-5/8	8-1/8	8-1/4	9-1/4	4	1-1/4	1/8
5	7-3/4	8-1/2	8-3/8	9-1/2	9-3/4	10	11	5	1-1/2	1/8
6	8-3/4	9-7/8	9-3/4	10-1/2	11-3/8	11-1/8	12-1/2	5	1-1/2	1/8
8	11	12-1/8	12	12-5/8	14-1/8	13-7/8	15-1/4	5	1-1/2	1/8
10	13-3/8	14-1/4	14-1/8	15-3/4	17-1/8	17-1/8	18-3/4	6	1-1/2	1/4
12	16-1/8	16-5/8	16-1/2	18	19-5/8	20-1/2	21-5/8	6	1-1/2	1/4
14	17-3/4	19-1/8	19	19-3/8	20-1/2	22-3/4	-	6	1-1/2	1/4
16	20-1/4	21-1/4	21-1/8	22-1/4	22-5/8	25-1/4	-	6	1-1/2	3/8
18	21-1/2	23-3/8	23-1/4	24	25	27-5/8	-	6	1-1/2	3/8
20	23-3/4	25-5/8	25-3/8	26-3/4	27-3/8	29-5/8	-	6	1-1/2	3/8
22	26	27-3/4	27-1/2	28-7/8	-	-	-	6	1-1/2	3/8
24	28-1/8	30-3/8	30-1/8	31	32-7/8	35-1/2	-	6	1-1/2	3/8
30	34-5/8	37-3/8	37-1/4	38-1/8	-	-	-	6	1-1/2	1/2
36	41-1/8	43-7/8	43-7/8	44-3/8	-	-	-	6	1-1/2	1/2

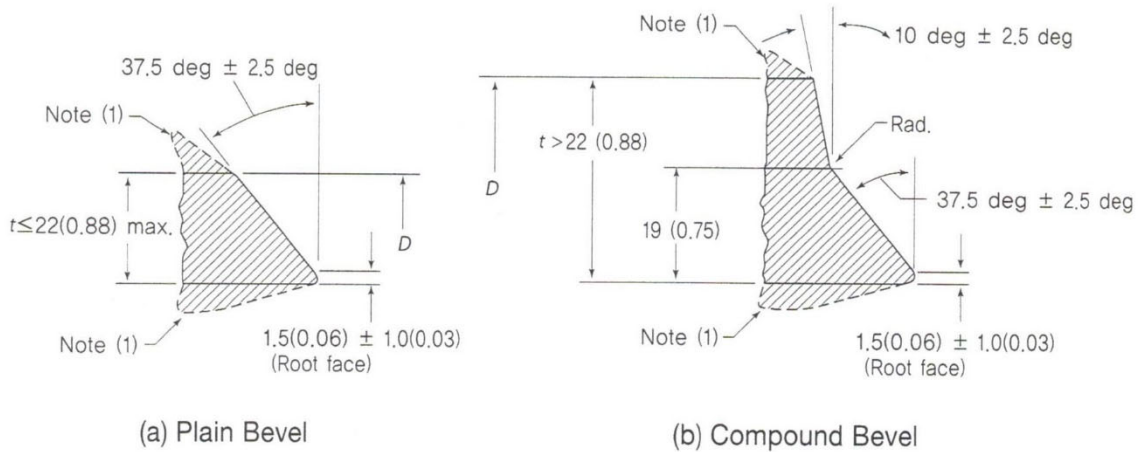
**MSS SP-83 UNIONS  
THREADED AND SOCKET WELD**



Pipe Size	3000 Pound AAR						6000 Pound AAR					
	A	B	C	D	E	F	A	B	C	D	E	F
1/8	1-21/32	1-31/64	53/64	25/32	7/16	.420 .430	1-21/32	1-31/64	53/64	25/32	7/16	.420 .430
1/4	1-21/32	1-31/64	53/64	25/32	7/16	.555 .565	1-27/32	1-11/16	1	31/32	7/16	.555 .565
3/8	1-27/32	1-11/16	1	31/32	7/16	.690 .700	1-31/32	1-15/16	1-3/16	1-3/32	7/16	.690 .700
1/2	1-31/32	1-15/16	1-3/16	1-3/32	7/16	.855 .865	2-9/32	2-3/8	1-15/32	1-5/32	9/16	.855 .865
3/4	2-9/32	2-3/8	1-15/32	1-5/32	9/16	1.065 1.075	2-1/2	2-25/32	1-25/32	1-3/8	9/16	1.065 1.075
1	2-1/2	2-25/32	1-25/32	1-3/8	9/16	1.330 1.340	2-53/64	3-23/64	2-7/32	1-45/64	9/16	1.330 1.340
1-1/4	2-53/64	3-23/64	2-7/32	1-45/64	9/16	1.675 1.685	3	3-23/32	2-35/64	1-7/8	9/16	1.675 1.685
1-1/2	3	3-23/32	2-35/64	1-7/8	9/16	1.915 1.925	3-7/16	4-27/64	3-1/16	2-1/16	11/16	1.915 1.925
2	3-7/16	4-27/64	3-1/16	2-1/16	11/16	2.406 2.416	4-1/8	5-15/64	3-9/16	2-3/8	7/8	2.406 2.416
2-1/2	4-1/8	5-15/64	3-9/16	2-3/8	7/8	2.906 2.921						
3	4-7/16	6-5/32	4-9/32	2-7/16	1	3.535 3.550						

**B16.9 WELDING BEVELS**

**WELDING BEVELS AND ROOT FACE**

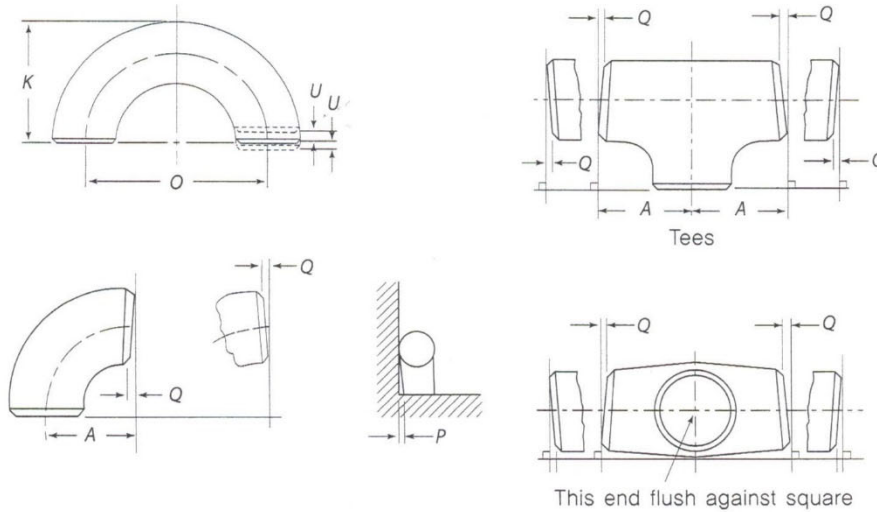


Nominal Wall Thickness, <i>t</i>	End Preparation
Less than $\times$ [Note (2)]	Cut square or slightly chamfer, at manufacturer's option (not illustrated) Plain bevel as in illustration (a) above Compound bevel as in illustration (b) above
$\times$ to 22 (0.88), inclusive	
More than 22 (0.88)	

GENERAL NOTES:  
 (a) Dimensions in parentheses are in inches.  
 (b) Other dimensions are in millimeters.



## B16.9 TOLERANCES

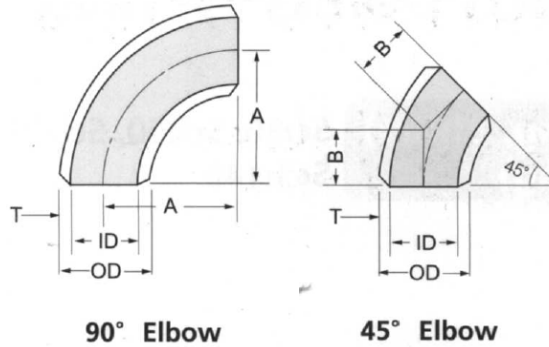


All Fittings [Notes (1) and (2)]		Center-to-End Dimensions			Overall Length of Reducers and Lap Joint Stub Ends, F, H	Overall Length of Caps, E	180-deg Returns			Lap Joint Stub Ends [Note (6)]			Angularity Tolerances		
Nominal Pipe Size (NPS)	Outside Diameter at Bevel, D [Notes (3) and (4)]	Inside Diameter at End [Notes (3) and (5)]	90-deg and 45-deg Long and Short Radius Elbows and Tees, A, B, C, M	3D Radius Elbows, A, B			Center-to-Center Dimension, O	Back-to-Face Dimension, K	Align-ment of Ends, U	Outside Diameter of Lap, G	Fillet Radius of Lap, R	Lap Thick-ness, T	Nominal Pipe Size (NPS)	Off Angle, Q	Off Plane, P
1/2 to 2-1/2	+0,06, -0,03	0,03	0,06	0,09	0,06	0,12	0,25	0,25	0,03	+0, -0,03	+0, -0,03	+0,06, -0	1/2 to 4	0,03	0,06
3 to 3-1/2	0,06	0,06	0,06	0,09	0,06	0,12	0,25	0,25	0,03	+0, -0,03	+0, -0,03	+0,06, -0	5 to 8	0,06	0,12
4	0,06	0,06	0,06	0,09	0,06	0,12	0,25	0,25	0,03	+0, -0,03	+0, -0,06	+0,06, -0	10 to 12	0,09	0,19
5 to 8	+0,09, -0,06	0,06	0,06	0,09	0,06	0,25	0,25	0,25	0,03	+0, -0,03	+0, -0,06	+0,06, -0	14 to 16	0,09	0,25
10 to 18	+0,16, -0,12	0,12	0,09	0,12	0,09	0,25	0,38	0,25	0,06	+0, -0,06	+0, -0,06	+0,12, -0	18 to 24	0,12	0,38
20 to 24	+0,25, -0,19	0,19	0,09	0,12	0,09	0,25	0,38	0,25	0,06	+0, -0,06	+0, -0,06	+0,12, -0	26 to 30	0,19	0,38
26 to 30	+0,25, -0,19	0,19	0,12	0,25	0,19	0,38	...	...	...	...	...	...	32 to 42	0,19	0,50
32 to 48	+0,25, -0,19	0,19	0,19	0,38	0,19	0,38	...	...	...	...	...	...	44 to 48	0,19	0,75

GENERAL NOTES:

- (a) All dimensions are in inches.
- (b) Tolerances are equal plus and minus except as noted.

## B16.9 / MSS-SP-75 ELBOWS



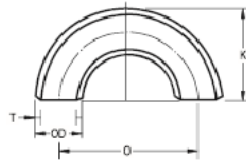
90° Elbow

45° Elbow

ASME B16.9

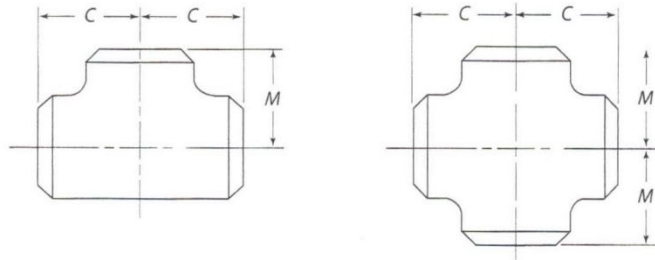
Nominal Pipe Size	Outside Diameter O.D.	Center to End		
		Long		Short
		A	B	A
1/2	0.840	1.50	0.62	-
3/4	1.050	1.50	0.75	-
1	1.315	1.50	0.88	1.00
1 1/4	1.660	1.88	1.00	1.25
1 1/2	1.900	2.25	1.12	1.50
2	2.375	3.00	1.38	2.00
2 1/2	2.875	3.75	1.75	2.50
3	3.500	4.50	2.00	3.00
3 1/2	4.000	5.25	2.25	3.50
4	4.500	6.00	2.50	4.00
5	5.563	7.50	3.12	5.00
6	6.625	9.00	3.75	6.00
8	8.625	12.00	5.00	8.00
10	10.750	15.00	6.25	10.00
12	12.750	18.00	7.50	12.00
14	14.000	21.00	8.75	14.00
16	16.000	24.00	10.00	16.00
18	18.000	27.00	11.25	18.00
20	20.000	30.00	12.50	20.00
22	22.000	33.00	13.50	22.00
24	24.000	36.00	15.00	24.00
26	26.000	39.00	16.00	*26.00
28	28.000	42.00	17.25	*28.00
30	30.000	45.00	18.50	*30.00
32	32.000	48.00	19.75	*32.00
34	34.000	51.00	21.00	*34.00
36	36.000	54.00	22.25	*36.00
38	38.000	57.00	23.62	*38.00
40	40.000	60.00	24.88	*40.00
42	42.000	63.00	26.00	*42.00
44	44.000	66.00	27.38	*44.00
46	46.000	69.00	28.62	*46.00
48	48.000	72.00	29.88	*48.00

**B16.9 180 ELBOWS**



Nominal Pipe Size	Limiting Wall Thickness for Length E	Length E1	180° Elbow			
			Long		Short	
			O	K	O	K
1/2	0.18	1.00		1.88		
3/4	0.15	1.00		1.69		
1	0.18	1.50		2.19	2.00	1.62
1-1/4	0.19	1.50	3.75	2.75	2.50	2.06
1-1/2	0.20	1.50	4.50	3.25	3.00	2.44
2	0.22	1.75	6.00	4.19	4.00	3.19
2-1/2	0.28	2.00	7.50	5.19	5.00	3.94
3	0.30	2.50	9.00	6.25	6.00	4.75
3-1/2	0.32	3.00	10.50	7.25	7.00	5.50
4	0.34	3.00	12.00	8.25	8.00	6.25
5	0.38	3.50	15.00	10.31	10.00	7.75
6	0.43	4.00	18.00	12.31	12.00	9.31
8	0.50	5.00	24.00	16.31	16.00	12.31
10	0.50	6.00	30.00	20.38	20.00	15.38
12	0.50	7.00	36.00	24.38	24.00	18.38
14	0.50	7.50	42.00	28.00	28.00	21.00
16	0.50	8.00	48.00	32.00	32.00	24.00
18	0.50	9.00	54.00	36.00	36.00	27.00
20	0.50	10.00	60.00	40.00	40.00	30.00
22	0.50	10.00	66.00	44.00	44.00	33.00
24	0.50	12.00	72.00	48.00	48.00	36.00

**B16.9 / MSS-SP-75 STRAIGHT TEES AND CROSSES**



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center-to-End	
		Run, C	Outlet, M [Notes (1) and (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

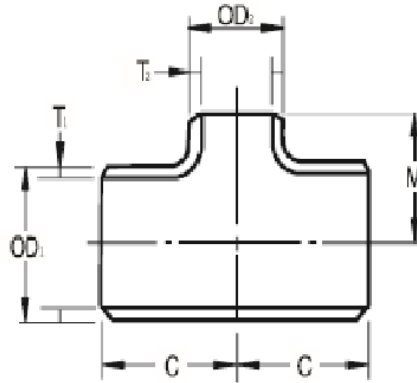
GENERAL NOTE: All dimensions are in inches.

NOTES:

(1) Outlet dimension M for NPS 26 and larger is recommended but not required

(2) Dimensions applicable to crosses NPS 24 and smaller.

## B16.9 / MSS-SP-75 REDUCING TEES AND CROSSES



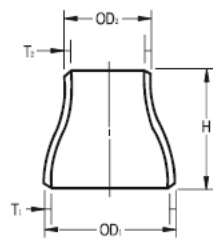
Nominal Pipe Size	Outside Diameter		Center to End	
	OD1	OD2	Run C	Outlet M
3/4 X 3/4 X 1/2	1.050	0.840	1.12	1.12
1 X 1 X 3/4	1.315	1.050	1.50	1.50
1 X 1 X 1/2	1.315	0.840	1.50	1.50
1-1/4 X 1-1/4 X 1	1.660	1.315	1.88	1.88
1-1/4 X 1-1/4 X 3/4	1.660	1.050	1.88	1.88
1-1/2 X 1-1/2 X 1-1/4	1.900	1.660	2.25	2.25
1-1/2 X 1-1/2 X 1	1.900	1.315	2.25	2.25
1-1/2 X 1-1/2 X 3/4	1.900	1.050	2.25	2.25
2 X 2 X 1-1/2	2.375	1.900	2.50	2.38
2 X 2 X 1-1/4	2.375	1.660	2.50	2.25
2 X 2 X 1	2.375	1.315	2.50	2.00
2-1/2 X 2-1/2 X 2	2.875	2.375	3.00	2.75
2-1/2 X 2-1/2 X 1-1/2	2.875	1.900	3.00	2.62
2-1/2 X 2-1/2 X 1-1/4	2.875	1.660	3.00	2.50
3 X 3 X 2-1/2	3.500	2.875	3.38	3.25
3 X 3 X 2	3.500	2.375	3.38	3.00
3 X 3 X 1-1/2	3.500	1.900	3.38	2.88
3-1/2 X 3-1/2 X 3	4.000	3.500	3.75	3.62
3-1/2 X 3-1/2 X 2-1/2	4.000	2.875	3.75	3.50
3-1/2 X 3-1/2 X 2	4.000	2.375	3.75	3.25
3-1/2 X 3-1/2 X 1-1/2	4.000	1.900	3.75	3.12
4 X 4 X 3-1/2	4.500	4.000	4.12	4.00
4 X 4 X 3	4.500	3.500	4.12	3.88
4 X 4 X 2-1/2	4.500	2.875	4.12	3.75
4 X 4 X 2	4.500	2.375	4.12	3.50
5 X 5 X 4	5.563	4.500	4.88	4.62

Nominal Pipe Size	Outside Diameter		Center to End	
	OD1	OD2	Run C	Outlet M
5 X 5 X 3-1/2	5.563	4.000	4.88	4.50
5 X 5 X 3	5.563	3.500	4.88	4.38
5 X 5 X 2-1/2	5.563	2.875	4.88	4.25
6 X 6 X 5	6.625	5.563	5.62	5.38
6 X 6 X 4	6.625	4.500	5.62	5.12
6 X 6 X 3-1/2	6.625	4.000	5.62	5.00
6 X 6 X 3	6.625	3.500	5.62	4.88
8 X 8 X 6	8.625	6.625	7.00	6.62
8 X 8 X 5	8.625	5.563	7.00	6.38
8 X 8 X 4	8.625	4.500	7.00	6.12
10 X 10 X 8	10.750	8.625	8.50	8.00
10 X 10 X 6	10.750	6.625	8.50	7.62
10 X 10 X 5	10.750	5.563	8.50	7.50
12 X 12 X 10	12.750	10.750	10.00	9.50
12 X 12 X 8	12.750	8.625	10.00	9.00
12 X 12 X 6	12.750	6.625	10.00	8.62
14 X 14 X 12	14.000	12.750	11.00	10.62
14 X 14 X 10	14.000	10.750	11.00	10.12
14 X 14 X 8	14.000	8.625	11.00	9.75
16 X 16 X 14	16.000	14.000	12.00	12.00
16 X 16 X 12	16.000	12.750	12.00	11.62
16 X 16 X 10	16.000	10.750	12.00	11.12
18 X 18 X 16	18.000	16.000	13.50	13.00
18 X 18 X 14	18.000	14.000	13.50	13.00
18 X 18 X 12	18.000	12.750	13.50	12.62
20 X 20 X 18	20.000	18.000	15.00	14.50

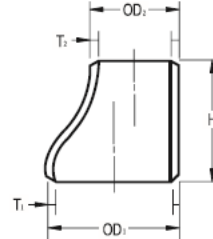
Nominal Pipe Size	Outside Diameter		Center to End	
	OD1	OD2	Run C	Outlet M
20 X 20 X 16	20.000	16.000	15.00	14.00
20 X 20 X 14	20.000	14.000	15.00	14.00
22 X 22 X 20	22.000	20.000	16.50	16.00
22 X 22 X 18	22.000	18.000	16.50	15.50
22 X 22 X 16	22.000	16.000	16.50	15.00
24 X 24 X 22	24.000	22.000	17.00	17.00
24 X 24 X 20	24.000	20.000	17.00	17.00
24 X 24 X 18	24.000	18.000	17.00	16.50
26 X 26 X 22	26.000	22.000	19.50	18.50
26 X 26 X 18	26.000	18.000	19.50	17.50
26 X 26 X 16	26.000	16.000	19.50	17.00
28 X 28 X 24	28.000	24.000	20.50	20.00
28 X 28 X 20	28.000	20.000	20.50	19.00
28 X 28 X 18	28.000	18.000	20.50	18.50
30 X 30 X 26	30.000	26.000	22.00	21.50
30 X 30 X 22	30.000	22.000	22.00	20.50
30 X 30 X 20	30.000	20.000	22.00	20.00
32 X 32 X 28	32.000	28.000	23.50	22.50
32 X 32 X 24	32.000	24.000	23.50	22.00
32 X 32 X 22	32.000	22.000	23.50	21.50
34 X 34 X 30	34.000	30.000	25.00	24.00
34 X 34 X 26	34.000	26.000	25.00	23.50
34 X 34 X 22	34.000	22.000	25.00	22.50
36 X 36 X 32	36.000	32.000	26.50	25.50
36 X 36 X 28	36.000	28.000	26.50	24.50
36 X 36 X 24	36.000	24.000	26.50	24.00

Nominal Pipe Size	Outside Diameter		Center to End	
	OD1	OD2	Run C	Outlet M
38 X 38 X 34	38.000	34.000	28.00	27.50
38 X 38 X 30	38.000	30.000	28.00	26.50
38 X 38 X 26	38.000	26.000	28.00	25.50
40 X 40 X 36	40.000	36.000	29.50	29.00
40 X 40 X 32	40.000	32.000	29.50	28.00
40 X 40 X 28	40.000	28.000	29.50	26.50
42 X 42 X 38	42.000	38.000	30.00	28.00
42 X 42 X 34	42.000	34.000	30.00	28.00
42 X 42 X 30	42.000	30.000	30.00	28.00
44 X 44 X 40	44.000	40.000	32.00	29.50
44 X 44 X 36	44.000	36.000	32.00	28.50
44 X 44 X 32	44.000	32.000	32.00	28.00
46 X 46 X 42	46.000	42.000	33.50	31.00
46 X 46 X 38	46.000	38.000	33.50	30.00
46 X 46 X 34	46.000	34.000	33.50	29.50
48 X 48 X 44	48.000	44.000	35.00	33.00
48 X 48 X 40	48.000	40.000	35.00	32.00
48 X 48 X 36	48.000	36.000	35.00	31.00

## B16.9 / MSS-SP-75 REDUCERS



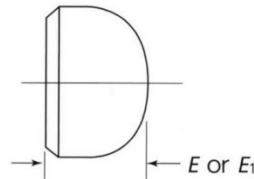
Concentric



Eccentric

Nominal Pipe Size	Outside Diameter		End to End	Nominal Pipe Size	Outside Diameter		End to End	Nominal Pipe Size	Outside Diameter		End to End	Nominal Pipe Size	Outside Diameter		End to End
	OD1	OD2	H		OD1	OD2	H		OD1	OD2	H		OD1	OD2	H
3/4 X 1/2	1.050	0.840	1.50	4 X 3	4.500	3.500	4.00	14 X 8	14.000	8.620	13.00	32 X 24	32.000	24.000	24.00
1 X 3/4	1.315	1.050	2.00	4 X 2-1/2	4.500	2.880	4.00	16 X 14	16.000	14.000	14.00	32 X 22	32.000	22.000	
1 X 1/2	1.315	0.840	2.00	4 X 2	4.500	2.380	4.00	16 X 12	16.000	12.750	14.00	34 X 30	34.000	30.000	24.00
1-1/4 X 1	1.660	1.315	2.00	5 X 4	5.560	4.500	5.00	16 X 10	16.000	10.750	14.00	34 X 26	34.000	26.000	24.00
1-1/4 X 3/4	1.660	1.050	2.00	5 X 3-1/2	5.560	4.000	5.00	18 X 16	18.000	16.000	15.00	34 X 22	34.000	22.000	
1-1/4 X 1/2	1.660	0.840	2.00	5 X 3	5.560	3.500	5.00	18 X 14	18.000	14.000	15.00	36 X 32	36.000	32.000	24.00
1-1/2 X 1-1/4	1.900	1.660	2.50	5 X 2-1/2	5.560	2.875	5.00	18 X 12	18.000	12.750	15.00	36 X 28	36.000	28.000	
1-1/2 X 1	1.900	1.315	2.50	6 X 5	6.620	5.560	5.50	20 X 18	20.000	18.000	20.00	36 X 24	36.000	24.000	24.00
1-1/2 X 3/4	1.900	1.050	2.50	6 X 4	6.620	4.500	5.50	20 X 16	20.000	16.000	20.00	38 X 34	38.000	34.000	24.00
2 X 1-1/2	2.375	1.900	3.00	6 X 3-1/2	6.620	4.000	5.50	20 X 14	20.000	14.000	20.00	38 X 30	38.000	30.000	24.00
2 X 1-1/4	2.375	1.660	3.00	6 X 3	6.620	3.500	5.50	22 X 20	22.000	20.000	20.00	38 X 26	38.000	26.000	24.00
2 X 1	2.375	1.315	3.00	6 X 2-1/2	6.620	2.880	5.50	22 X 18	22.000	18.000	20.00	40 X 36	40.000	36.000	24.00
2 X 3/4	2.375	1.050	3.00	8 X 6	8.620	6.620	6.00	22 X 16	22.000	16.000	20.00	40 X 32	40.000	32.000	24.00
2-1/2 X 2	2.875	2.375	3.50	8 X 5	8.620	5.560	6.00	24 X 22	24.000	22.000	20.00	40 X 28	40.000	28.000	
2-1/2 X 1-1/2	2.875	1.900	3.50	8 X 4	8.620	4.500	6.00	24 X 20	24.000	20.000	20.00	42 X 38	42.000	38.000	24.00
2-1/2 X 1-1/4	2.875	1.660	3.50	8 X 3-1/2	8.620	4.000	6.00	24 X 18	24.000	18.000	20.00	42 X 34	42.000	34.000	24.00
2-1/2 X 1	2.875	1.315	3.50	10 X 8	10.750	8.620	7.00	26 X 22	26.000	22.000	24.00	42 X 30	42.000	30.000	24.00
3 X 2-1/2	3.500	2.875	3.50	10 X 6	10.750	6.620	7.00	26 X 18	26.000	18.000	24.00	44 X 40	44.000	40.000	24.00
3 X 2	3.500	2.375	3.50	10 X 5	10.750	5.560	7.00	26 X 16	26.000	16.000		44 X 36	44.000	36.000	24.00
3 X 1-1/2	3.500	1.900	3.50	10 X 4	10.750	4.500	7.00	28 X 24	28.000	24.000	24.00	44 X 32	44.000	32.000	
3 X 1-1/4	3.500	1.660	3.50	12 X 10	12.750	10.750	8.00	28 X 20	28.000	20.000	24.00	46 X 42	46.000	42.000	28.00
3-1/2 X 3	4.000	3.500	4.00	12 X 8	12.750	8.620	8.00	28 X 18	28.000	18.000	24.00	46 X 38	46.000	38.000	28.00
3-1/2 X 2-1/2	4.000	2.875	4.00	12 X 6	12.750	6.620	8.00	30 X 26	30.000	26.000	24.00	46 X 34	46.000	34.000	
3-1/2 X 2	4.000	2.375	4.00	12 X 5	12.750	5.560	8.00	30 X 22	30.000	22.000		48 X 44	48.000	44.000	28.00
3-1/2 X 1-1/2	4.000	1.900	4.00	14 X 12	14.000	12.750	13.00	30 X 20	30.000	20.000	24.00	48 X 40	48.000	40.000	28.00
4 X 3-1/2	4.500	4.000	4.00	14 X 10	14.000	10.750	13.00	32 X 28	32.000	28.000	24.00	48 X 36	48.000	36.000	

**B16.9 / MSS-SP-75 CAPS**



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Length, $E$ [Notes (1)]	Limiting Wall Thickness for Length, $E$	Length, $E_1$ [Notes (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	...	...

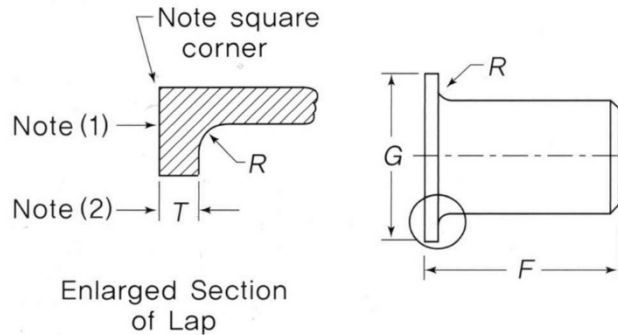
GENERAL NOTES:

- (a) All dimensions are in inches.
- (b) The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in the ASME Boiler and Pressure Vessel Code.

NOTES:

- (1) Length  $E$  applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length  $E$ ."
- (2) Length  $E_1$  applies for thickness greater than that given in column "Limiting Wall Thickness" for NPS 24 and smaller. For NPS 26 and larger, length  $E_1$  shall be by agreement between the manufacturer and purchaser.

**B16.9 LAP JOINT STUB ENDS**



Nominal Pipe Size (NPS)	Outside Diameter at Bevel		Long Pattern Length, F [Notes (3), (4)]	Short Pattern Length, F [Notes (3), (4)]	Radius of Fillet, R [Notes (5)]	Diameter of Lap, G [Notes (6)]
	Max.	Min.				
1/2	0.896	0.809	3.00	2.00	0.12	1.38
3/4	1.106	1.019	3.00	2.00	0.12	1.69
1	1.376	1.284	4.00	2.00	0.12	2.00
1-1/4	1.716	1.629	4.00	2.00	0.19	2.50
1-1/2	1.965	1.869	4.00	2.00	0.25	2.88
2	2.456	2.344	6.00	2.50	0.31	3.62
2-1/2	2.966	2.844	6.00	2.50	0.31	4.12
3	3.596	3.469	6.00	2.50	0.38	5.00
3-1/2	4.096	3.969	6.00	3.00	0.38	5.50
4	4.593	4.469	6.00	3.00	0.44	6.19
5	5.683	5.532	8.00	3.00	0.44	7.31
6	6.743	6.594	8.00	3.50	0.50	8.50
8	8.743	8.594	8.00	4.00	0.50	10.62
10	10.913	10.719	10.00	5.00	0.50	12.75
12	12.913	12.719	10.00	6.00	0.50	15.00
14	14.170	13.969	12.00	6.00	0.50	16.25
16	16.180	15.969	12.00	6.00	0.50	18.50
18	18.190	17.969	12.00	6.00	0.50	21.00
20	20.240	19.969	12.00	6.00	0.50	23.00
22	22.240	21.969	12.00	6.00	0.50	25.25
24	24.240	23.969	12.00	6.00	0.50	27.25

GENERAL NOTES:

- (a) All dimensions are in inches.
- (b) Service conditions and joint construction often dictate stub end length requirements. Therefore, the purchaser must specify long or short pattern fitting when ordering.



**GRADES**

<b>CARBON</b>	A105N / CSA GR 248	WPB / CSA GR 241
	LF2 / CSA GR 248	WPL6 / CSA GR 241
	LF3	WPL3
	F42 / Y42	CSA GR 290
	F52 / Y52	CSA GR 359
	F60 / Y60	CSA GR 414
	F65 / Y65	CSA GR 448
<b>STAINLESS</b>	F70 / Y70	CSA GR 483
	304/304L	AL6XN(N08367)
	316/316L	254SMO
	309	405
	310	410
	317L	F6A
	321/H	A904L (N08904)
<b>CHROME</b>	347/H	ALLOY 20 (N08020)
		F5
		F9
		F11
		F22
		F91
<b>DUPLEX</b>		F92
		S31803
<b>NICKEL ALLOYS</b>		S32205
		MONEL 400 (N04400)
		ALLOY 800 (N08800)
		ALLOY 825 (N08825)
		ALLOY 625 (N06625)
		ALLOY 600 (N06600)
<b>TITANIUM</b>		ALLOY 925
		HASTELLOY C276 (N10276)
		GRADE 1
		GRADE 2
<b>ALUMINIUM</b>		GRADE 3
		GRADE 4
		6061
<b>COPPER NICKEL</b>		5083
		5086
		70/30
	90/10	

## **SPECIFICATIONS**

**B16.5 - FORGED FLANGES**

**B16.9 - BUTT WELD FITTINGS**

**B16.11 - FORGED FITTINGS**

**MSS SP 79 – FORGED INSERTS**

**MSS SP 83 – UNIONS**

**MSS SP 95 – BULL PLUGS & SWAGES**

**MSS SP 97 – FORGED OUTLETS**

**AWWA – WATERWORKS FLANGES**

**CSA Z245.12 HIGH YIELD FLANGES**

**CSA Z245.11 HIGH YIELD FITTINGS**

**MSS SP 75 - HIGH YIELD FITTINGS**