HYUP SUNG METAL CO., LTD.
HEAD OFFICE : 1160-28 Jurye Sam-dong, Sasang-gu, Busan, South Korea
Tel. : (051) 328-2825 **Fax.** : (051) 328-2826
Email : Info@hyupsung-metal.com
Web. : https://hyupsung-metal.com

FLANGES & FITTINGS







English version

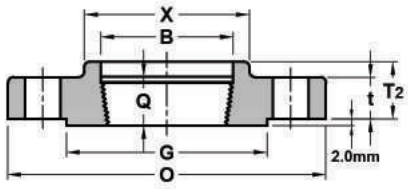
Product Catalogue

CLASS 150 FLANGES B16.5 RAISE FACE

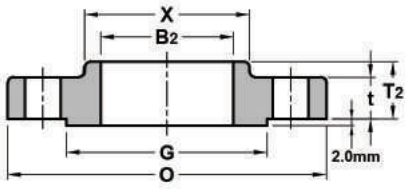




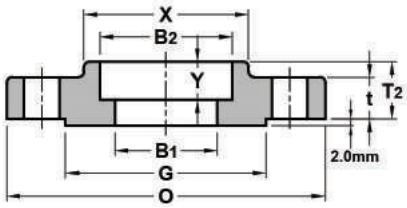




THREADED



SLIP-ON



SOCKET WELDING

Unit : mm

Nominal Pipe Size	Out-side Diam.	Min. Thickness	Min. Thickness Lap Joint	Diam. Of Hub	O.D of Raised Face	Diam. Of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore		
							Welding Neck	Slip-on Threaded Socket Welding	Lap Joint		Welding Neck / Socket Welding	Slip-on / Socket Welding Min.	Min. Lap Joint
	O	t	t	X	G	A	T1	T2	T3	Q	B1	B2	B3
1/2	90	9.6	11.2	30	35.1	21.3	46	14	16	16	15.8	22.2	22.9
3/4	100	11.2	12.7	38	42.9	26.7	51	14	16	16	20.9	27.7	28.2
1	110	12.7	14.3	49	50.8	33.4	54	16	17	17	26.6	34.5	34.9
1 1/4	115	14.3	15.9	59	63.5	42.2	56	19	21	21	35.1	43.2	43.7
1 1/2	125	15.9	17.5	65	73.2	48.3	60	21	22	22	40.9	49.5	50
2	150	17.5	19.1	78	91.9	60.3	62	24	25	25	52.5	61.9	62.5
2 1/2	180	20.7	22.3	90	104.6	73	68	27	29	29	62.7	74.6	75.4
3	190	22.3	23.9	108	127	88.9	68	29	30	30	77.9	90.7	91.4
3 1/2	215	22.3	23.9	122	139.7	101.6	70	30	32	32	90.1	103.4	104.1
4	230	22.3	23.9	135	157.2	114.3	75	32	33	33	102.3	116.1	116.8
5	255	22.3	23.9	164	185.7	141.3	87	35	36	36	128.2	143.8	144.4
6	280	23.9	25.4	192	215.9	168.3	87	38	40	40	154.1	170.7	171.4
8	345	27	28.6	246	269.7	219.1	100	43	44	44	202.7	221.5	222.2
10	405	28.6	30.2	305	323.9	273	100	48	49	49	254.6	276.2	277.4
12	485	30.2	31.8	365	381	323.8	113	54	56	56	304.8	327	328.2
14	535	33.4	35	400	412.8	355.6	125	56	79	57	To be Specified by Purchaser	359.2	360.2
16	595	35	36.6	457	469.9	406.4	125	62	87	64		410.5	411.2
18	635	38.1	39.7	505	533.4	457	138	67	97	68		461.8	462.3
20	700	41.3	42.9	559	584.2	508	143	71	103	73		513.1	514.4
24	815	46.1	47.7	663	692.2	610	151	81	111	83		616	616

HYUP SUNG METAL

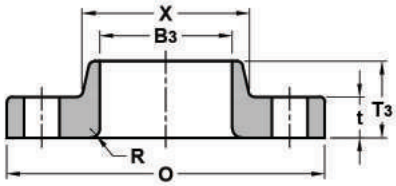
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CLASS 150 FLANGES B16.5 RAISE FACE

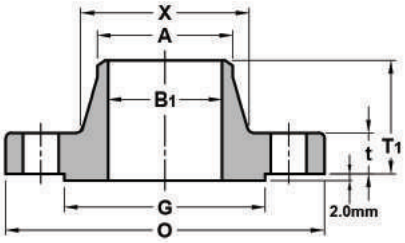




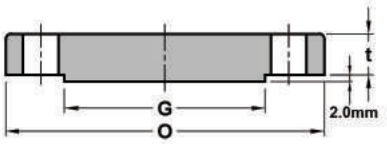




LAP JOINT



WELDING NECK



BLIND

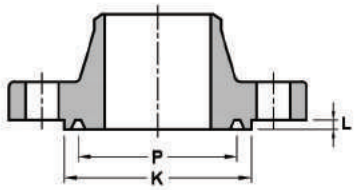
Unit : mm

Nominal Pipe Size	Radius of Lap-Joint	Depth of Socket	Drilling			Bolting				Approximate Weight(Kg)				
			Bolt Circle Diam.	Number of Holes	Diam. Of Holes	Diam. Of Bolt (inch)	Machine Bolt Length (Raised Face)	Stud Bolt Length		Welding Neck	Slip on / Threaded	Lap Joint	Blind	Socket Welding
								2mm Raised Face	Ring Joint					
	R	Y												
1/2	3	10	60.3	4	15.9	1/2	50	55	-	0.51	0.47	0.51	0.47	0.47
3/4	3	11	69.9	4	15.9	1/2	50	65	-	0.73	0.58	0.64	0.63	0.59
1	3	13	79.4	4	15.9	1/2	55	65	75	1.07	0.86	0.93	0.94	0.87
1 1/4	5	14	88.9	4	15.9	1/2	55	70	85	1.4	1.08	1.16	1.23	1.11
1 1/2	6	16	98.4	4	15.9	1/2	65	70	85	1.81	1.41	1.51	1.62	1.45
2	8	17	120.7	4	19.1	5/8	70	85	95	2.59	2.26	2.38	2.64	2.33
2 1/2	8	19	139.7	4	19.1	5/8	75	90	100	4.28	3.43	3.6	4.06	3.55
3	10	21	152.4	4	19.1	5/8	75	90	100	5.18	3.87	4.04	4.9	4.02
3 1/2	10	22.4	177.8	8	19.1	5/8	75	90	100	5.45	4.99	4.99	5.9	4.99
4	11	24.1	190.5	8	19.1	5/8	75	90	100	7.32	5.75	5.96	7.41	5.99
5	11	23.9	215.9	8	22.2	3/4	85	95	110	8.91	6.22	6.44	8.76	6.68
6	13	26.9	241.3	8	22.2	3/4	85	100	115	11.26	7.38	7.59	11.31	7.99
8	13	31.8	298.5	8	22.2	3/4	90	110	120	17.68	12.36	12.66	19.92	13.29
10	13	33.3	362	12	25.4	7/8	100	115	125	24.79	17.1	16.78	29.39	19.5
12	13	39.6	431.8	12	25.4	7/8	100	120	135	38.98	27.68	28.3	43.7	29.03
14	13	41.4	476.3	12	28.6	1	115	135	145	51.71	35.2	41.5	59.42	38.56
16	13	44.5	539.8	16	28.6	1	115	135	145	64.41	42.18	52.98	77.11	44.49
18	13	49.3	577.9	16	31.8	1 1/8	125	145	160	74.84	49.71	59	94.8	54.43
20	13	54.1	635	20	31.8	1 1/8	140	160	170	89.36	65.5	72.12	123.38	70.31
24	13	63.5	749.3	20	34.9	1 1/4	150	170	185	119.66	90.5	99.02	188.24	95.25

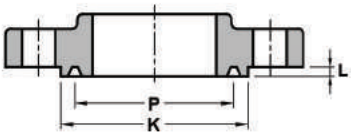
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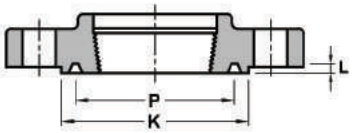
CLASS 150 FLANGES B16.5 RTJ



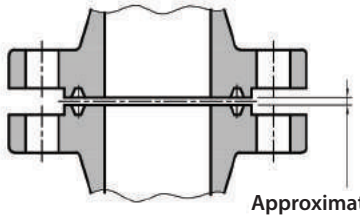
WELDING NECK



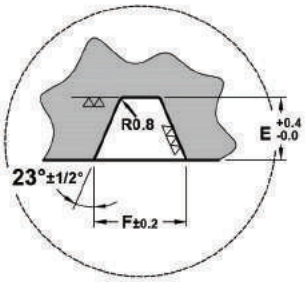
SLIP-ON

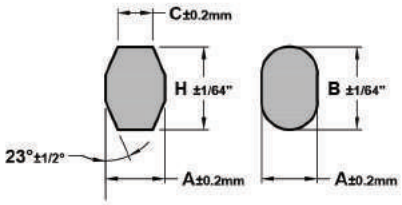


THREADED



Approximate Distance between Flanges





Octagonal Ring Oval Ring

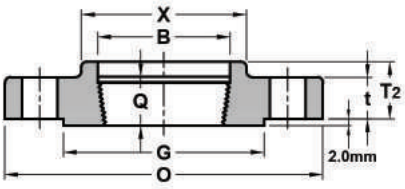
Unit : mm

Nominal Pipe Size	Pitch Diam. Ring & Groove	Width of Ring	Height of Ring		Width Flat on Octa. Ring	Width of Groove	Depth of Groove	Diam. of R.F. for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges
			Oval	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min.)		
1	47.6	8	14.3	12.7	5.2	8.7	6.4	63.5	R15	4
1 1/4	57.2	8	14.3	12.7	5.2	8.7	6.4	73	R17	4
1 1/2	65.1	8	14.3	12.7	5.2	8.7	6.4	82.5	R19	4
2	82.6	8	14.3	12.7	5.2	8.7	6.4	102	R22	4
2 1/2	101.6	8	14.3	12.7	5.2	8.7	6.4	121	R25	4
3	114.3	8	14.3	12.7	5.2	8.7	6.4	133	R29	4
3 1/2	131.8	8	14.3	12.7	5.2	8.7	6.4	154	R33	4
4	149.2	8	14.3	12.7	5.2	8.7	6.4	171	R36	4
5	171.5	8	14.3	12.7	5.2	8.7	6.4	194	R40	4
6	193.7	8	14.3	12.7	5.2	8.7	6.4	219	R43	4
8	247.7	8	14.3	12.7	5.2	8.7	6.4	273	R48	4
10	304.8	8	14.3	12.7	5.2	8.7	6.4	330	R52	4
12	381	8	14.3	12.7	5.2	8.7	6.4	406	R56	4
14	396.9	8	14.3	12.7	5.2	8.7	6.4	425	R59	3
16	454	8	14.3	12.7	5.2	8.7	6.4	483	R64	3
18	517.5	8	14.3	12.7	5.2	8.7	6.4	546	R68	3
20	558.8	8	14.3	12.7	5.2	8.7	6.4	597	R72	3
24	673.1	8	14.3	12.7	5.2	8.7	6.4	711	R76	3

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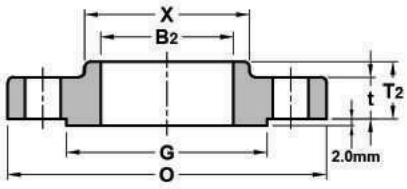
CLASS 300 FLANGES B16.5 RAISE FACE





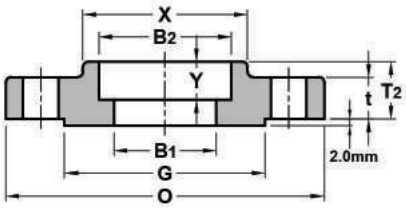
THREADED





SLIP-ON





SOCKET WELDING

Unit : mm

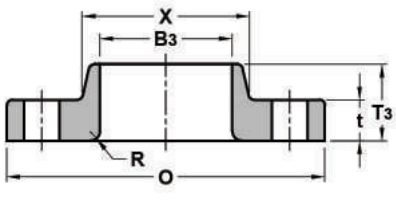
Nominal Pipe Size	Out-side Diam.	Min. Thickness	Min. Thickness of Lap Joint	Diam. of Hub	O.D of Rasied Face	Diam. of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore			
							Welding Neck	Slip-on Threaded Sockect Welding	Lap Joint		Welding Nect / Socket Welding	Min. Slip-on / Socket Welding	Min. Lap Joint	Counter Bore Min. Threaded
	O	t	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	95	12.7	14.3	38	35.1	21.3	51	21	22	16	15.8	22.2	22.9	23.6
3/4	115	14.3	15.9	48	42.9	26.7	56	24	25	16	20.9	27.7	28.2	29
1	125	15.9	17.5	54	50.8	33.4	60	25	27	18	26.6	34.5	34.9	35.8
1 1/4	135	17.5	19.1	64	63.5	42.2	64	25	27	21	35.1	43.2	43.7	44.4
1 1/2	155	19.1	20.7	70	73.2	48.3	67	29	30	23	40.9	49.5	50	50.3
2	165	20.7	22.3	84	91.9	60.3	68	32	33	29	52.5	61.9	62.5	63.5
2 1/2	190	23.9	25.4	100	104.6	73	75	37	38	32	62.7	74.6	75.4	76.2
3	210	27	28.6	117	127	88.9	78	41	43	32	77.9	90.7	91.4	92.2
3 1/2	230	28.6	30.2	133	139.7	101.6	79	43	44	37	90.1	103.4	104.1	104.9
4	255	30.2	31.8	146	157.2	114.3	84	46	48	37	102.3	116.1	116.8	117.6
5	280	33.4	35	178	185.7	141.3	97	49	51	43	128.2	143.8	144.4	144.4
6	320	35	36.6	206	215.9	168.3	97	51	52	47	154.1	170.7	171.4	171.4
8	380	39.7	41.3	260	269.7	219.1	110	60	62	51	202.7	221.5	222.2	222.2
10	445	46.1	47.7	321	323.9	273	116	65	95	56	254.6	276.2	277.4	276.2
12	520	49.3	50.8	375	381	323.8	129	71	102	61	304.8	327	328.2	328.6
14	585	52.4	54	425	412.8	355.6	141	75	111	64	To be Specified by Purchaser	359.2	360.2	360.4
16	650	55.6	57.2	483	469.9	406.4	144	81	121	69		410.5	411.2	411.2
18	710	58.8	60.4	533	533.4	457	157	87	130	70		461.8	462.3	462
20	775	62	63.5	587	584.2	508	160	94	140	74		513.1	514.4	512.8
24	915	68.3	69.9	702	692.2	610	167	105	152	83		616	616	614.4

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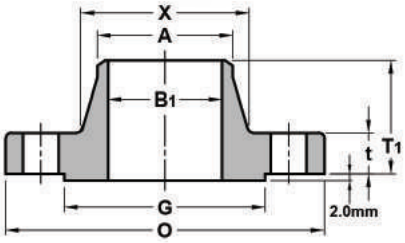
CLASS 300 FLANGES B16.5 RAISE FACE





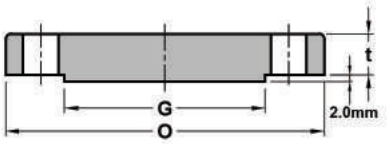
LAP JOINT





WELDING NECK





BLIND

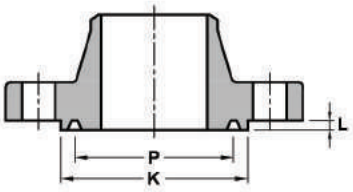
Unit : mm

Nominal Pipe Size	Radius of Lap-Joint	Depth of Socket	Drilling			Bolting				Approximate Weight(Kg)				
			Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Machine Bolt Length (Raised Face)	Stud Bolt Length		Welding Neck	Slip-on / Threaded	Lap Joint	Blind	Socket Welding
								2mm Raised Face	Ring Joint					
	R	Y												
1/2	3	10	66.7	4	15.9	1/2	55	65	75	0.78	0.62	0.61	0.62	0.62
3/4	3	11	82.6	4	19.1	5/8	65	75	90	1.34	1.15	1.15	1.16	1.19
1	3	13	88.9	4	19.1	5/8	65	75	90	1.64	1.39	1.38	1.42	1.44
1 1/4	5	14	98.4	4	19.1	5/8	70	85	95	2.06	1.67	1.66	1.79	1.73
1 1/2	6	16	114.3	4	22.2	3/4	75	90	100	3.06	2.53	2.52	2.68	2.62
2	8	17	127	8	19.1	5/8	75	90	100	3.4	2.8	2.79	3.09	2.94
2 1/2	8	19	149.2	8	22.2	3/4	85	100	115	5.31	4.25	4.22	4.75	4.49
3	10	21	168.3	8	22.2	3/4	90	110	120	7.32	5.81	5.78	6.79	6.2
3 1/2	10	22.4	184.2	8	22.2	3/4	95	110	125	8.17	7.72	7.72	9.53	
4	11	23.9	200	8	22.2	3/4	95	115	125	11.3	10.13	10.07	12	
5	11	23.9	235	8	22.2	3/4	110	120	135	15.12	12.58	12.52	15.96	
6	13	26.9	269.9	12	22.2	3/4	110	120	140	19.68	16.04	15.95	21.2	
8	13	31.8	330.2	12	25.4	7/8	120	140	150	30.48	24.5	24.37	34.6	
10	13	33.3	387.4	16	28.6	1	140	160	170	43.74	34.16	39.92	55.34	
12	13	39.6	450.8	16	31.8	1 1/8	145	170	185	64.41	51.26	58.7	78.9	
14	13	41.4	514.4	20	31.8	1 1/8	160	180	190	88.3	72.12	83.46	107.05	
16	13	44.5	571.5	20	34.9	1 1/4	165	190	205	112.94	90.4	106.14	139.25	
18	13	49.3	628.6	24	34.9	1 1/4	170	195	210	138.34	109	133.95	176.9	
20	13	54.1	685.8	24	34.9	1 1/4	185	205	220	167.37	136	157.65	223.17	
24	13	63.5	812.8	24	41.3	1 1/2	205	230	255	235.41	204	240.4	342	

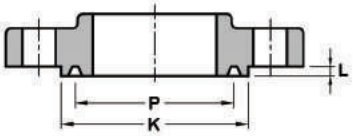
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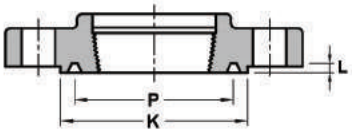
CLASS 300 AND 600 FLANGES B16.5 RTJ



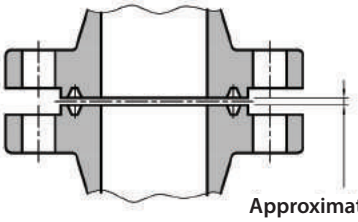
WELDING NECK



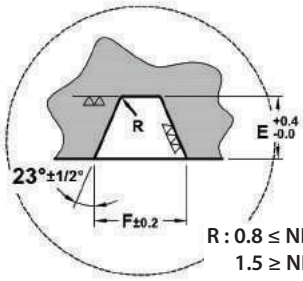
SLIP-ON



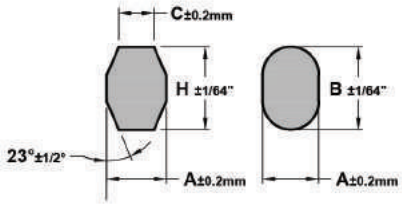
THREADED



Approximate Distance between Flanges



R : 0.8 ≤ NPS 18"
1.5 ≥ NPS 20"



Octagonal Ring Oval Ring

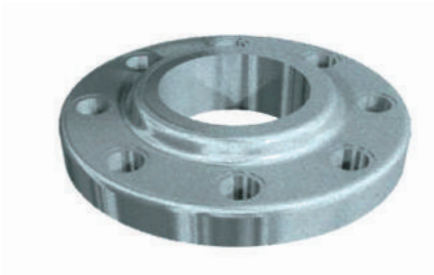
Unit : mm

Nominal Pipe Size	Pitch Diam. Ring & Groove	Width of Ring	Height of Ring		Width Flat on Octa. Ring	Width of Groove	Depth of Groove	Diam. of R.F. for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges		
			Oval	Octagonal						CLASS 300	CLASS 400	CLASS 600
	P	A	B	H	C	F	E(L*)	K(Min.)				
1/2	34.1	6.4	11.1	9.5	4.3	7.1	5.5	51	R11	3		3
3/4	42.9	8	14.3	12.7	5.2	8.7	6.4	63.5	R13	4		4
1	50.8	8	14.3	12.7	5.2	8.7	6.4	70	R16	4		4
1 1/4	60.3	8	14.3	12.7	5.2	8.7	6.4	79.2	R18	4		4
1 1/2	68.3	8	14.3	12.7	5.2	8.7	6.4	90.5	R20	4		4
2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	108	R23	6		5
2 1/2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	127	R26	6		5
3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	146	R31	6		5
3 1/2	131.8	11.1	17.5	15.9	7.7	11.9	7.9	159	R34	6		5
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	175	R37	6	6	5
5	181	11.1	17.5	15.9	7.7	11.9	7.9	210	R41	6	6	5
6	211.1	11.1	17.5	15.9	7.7	11.9	7.9	241	R45	6	6	5
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	302	R49	6	6	5
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	356	R53	6	6	5
12	381	11.1	17.5	15.9	7.7	11.9	7.9	413	R57	6	6	5
14	419.1	11.1	17.5	15.9	7.7	11.9	7.9	457	R61	6	6	5
16	469.9	11.1	17.5	15.9	7.7	11.9	7.9	508	R65	6	6	5
18	533.4	11.1	17.5	15.9	7.7	11.9	7.9	575	R69	6	6	5
20	584.2	12.7	19.1	17.5	8.7	13.5	9.5	635	R73	6	6	5
24	692.2	15.9	22.2	20.7	10.5	16.7	11.1	749	R77	6	6	6

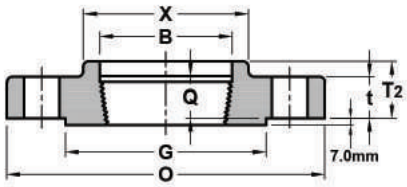
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CLASS 600 FLANGES B16.5 RAISE FACE

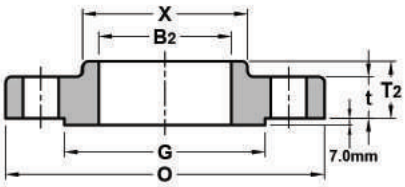




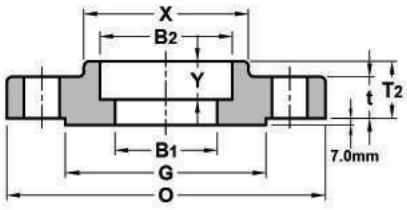




THREADED



SLIP-ON



SOCKET WELDING

Unit : mm

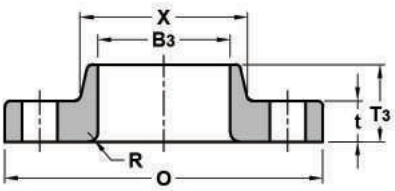
Nominal Pipe Size	Out-side Diam.	Min. Thickness	Diam. of Hub	O.D of Rasied Face	Diam. of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore			
						Welding Neck	Slip-on Threaded Sockect Welding	Lap Joint		Welding Nect / Socket Welding	Min. Slip-on / Socket Welding	Min. Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	95	14.3	38	35.1	21.3	52	22	22	16	To be Specified by Purchaser	22.2	22.9	23.6
3/4	115	15.9	48	42.9	26.7	57	25	25	16		27.7	28.2	29
1	125	17.5	54	50.8	33.4	62	27	27	18		34.5	34.9	35.8
1 1/4	135	20.7	64	63.5	42.2	67	29	29	21		43.2	43.7	44.4
1 1/2	155	22.3	70	73.2	48.3	70	32	32	23		49.5	50	50.6
2	165	25.4	84	91.9	60.3	73	37	37	29		61.9	62.5	63.5
2 1/2	190	28.6	100	104.6	73	79	41	41	32		74.6	75.4	76.2
3	210	31.8	117	127	88.9	83	46	46	35		90.7	91.4	92.2
3 1/2	230	35	133	139.7	101.6	86	49	49	40		103.4	104.1	104.9
4	275	38.1	152	157.2	114.3	102	54	54	42		116.1	116.8	117.6
5	330	44.5	189	185.7	141.3	114	60	60	48		143.8	144.4	144.4
6	355	47.7	222	215.9	168.3	117	67	67	51		170.7	171.4	171.4
8	420	55.6	273	269.7	219.1	133	76	76	58		221.5	222.2	222.2
10	510	63.5	343	323.9	273	152	86	111	66		276.2	277.4	276.2
12	560	66.7	400	381	323.8	156	92	117	70		327	328.2	328.6
14	605	69.9	432	412.8	355.6	165	94	127	74		359.2	360.2	360.4
16	685	76.2	495	469.9	406.4	178	106	140	78		410.5	411.2	411.2
18	745	82.6	546	533.4	457	184	117	152	80		461.8	462.3	462
20	815	88.9	610	584.2	508	190	127	165	83		513.1	514.4	512.8
24	940	101.6	718	692.2	610	203	140	184	93		616	616	614.4

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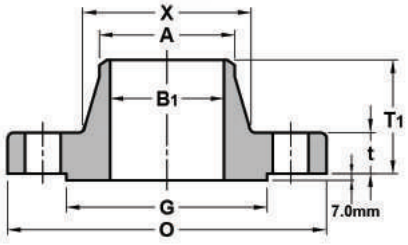
CLASS 600 FLANGES B16.5 RAISE FACE





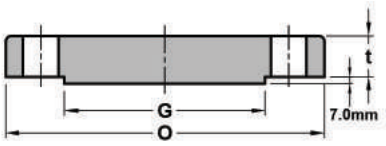
LAP JOINT





WELDING NECK





BLIND

Unit : mm

Nominal Pipe Size	Radius of Lap-Joint	Depth of Socket	Drilling			Bolting				Approximate Weight(Kg)				
			Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Male Female Tongue Groove	Stud Bolt Length		Welding Neck	Slip-on / Threaded	Lap Joint	Blind	Socket Welding
								7mm Raised Face	Ring Joint					
	R	Y												
1/2	3	10	66.7	4	15.9	1/2	70	75	75	0.9	0.91	0.8	0.91	0.91
3/4	3	11	82.6	4	19.1	5/8	85	90	90	1.59	1.4	1.36	1.4	1.36
1	3	13	88.9	4	19.1	5/8	85	90	90	1.9	1.7	1.59	1.81	1.81
1 1/4	5	14	98.4	4	19.1	5/8	90	95	95	2.49	2.27	2.04	2.4	2.6
1 1/2	6	16	114.3	4	22.2	3/4	100	110	110	3.63	3.1	2.95	3.4	3.18
2	8	17	127	8	19.1	5/8	100	110	110	4.54	3.63	3.63	4.4	3.9
2 1/2	8	19	149.2	8	22.2	3/4	115	120	120	6.35	5.44	4.99	6.8	5.9
3	10	21	168.3	8	22.2	3/4	120	125	125	8.16	7.26	6.35	8.9	7.4
3 1/2	10	22.4	184.2	8	25.4	7/8	135	140	140	11.8	9.53	9.08	13.17	
4	11	23.9	215.9	8	25.4	7/8	140	145	145	16.78	14.97	14.06	18.6	
5	11	23.9	266.7	8	28.6	1	160	165	165	30.87	28.5	27.5	30.84	
6	13	26.9	292.1	12	28.6	1	165	170	170	36.77	36.32	35.38	38	
8	13	31.8	349.2	12	31.8	1 1/8	185	190	195	50.8	44	50.8	62.2	
10	13	33.3	431.8	16	34.9	1 1/4	210	215	215	86.26	76.2	74	102	
12	13	39.6	489	20	34.9	1 1/4	215	220	220	102.51	97.52	108.86	132	
14	13	41.4	527	20	38.1	1 3/8	230	235	235	121.56	102	111	158	
16	13	44.5	603.2	20	41.3	1 1/2	250	255	255	177.06	149.82	165.71	224.73	
18	13	49.3	654	20	44.5	1 5/8	265	275	275	215.65	180.1	194	285	
20	13	54.1	723.9	24	44.5	1 5/8	280	285	290	267.86	231.54	258.78	365	
24	13	63.5	838.2	24	50.8	1 7/8	325	330	335	372	330	362	533.45	

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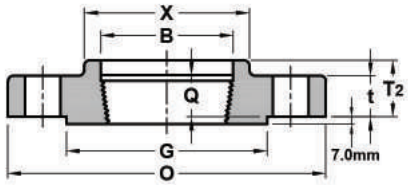
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CLASS 900 FLANGES B16.5 RAISE FACE

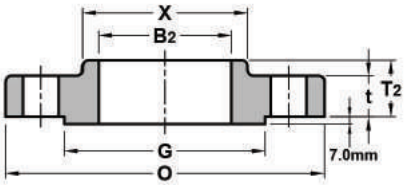




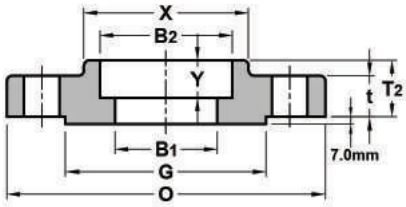




THREADED



SLIP-ON



SOCKET WELDING

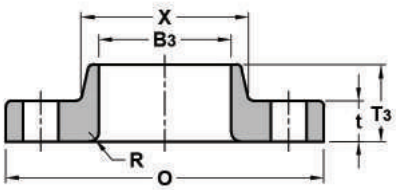
Unit : mm

Nominal Pipe Size	Out-side Diam.	Min. Thickness	Diam. of Hub	O.D of Rasied Face	Diam. of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore			
						Welding Neck	Slip-on Threaded Sockect Welding	Lap Joint		Welding Nect / Socket Welding	Min. Slip-on / Socket Welding	Min. Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	120	22.3	38	35.1	21.3	60	32	32	23	To be Specified by Purchaser	22.2	22.9	23.6
3/4	130	25.4	44	42.9	26.7	70	35	35	26		27.7	28.2	29
1	150	28.6	52	50.8	33.4	73	41	41	29		34.5	34.9	35.8
1 1/4	160	28.6	64	63.5	42.2	73	41	41	31		43.2	43.7	44.4
1 1/2	180	31.8	70	73.2	48.3	83	44	44	32		49.5	50	50.6
2	215	38.1	105	91.9	60.3	102	57	57	39		61.9	62.5	63.5
2 1/2	245	41.3	124	104.6	73	105	64	64	48		74.6	75.4	76.2
3	240	38.1	127	127	88.9	102	54	54	42		90.7	91.4	92.2
4	290	44.5	159	157.2	114.3	114	70	70	48		116.1	116.8	117.6
5	350	50.8	190	185.7	141.3	127	79	79	54		143.8	144.4	144.4
6	380	55.6	235	215.9	168.3	140	86	86	58		170.7	171.4	171.4
8	470	63.5	298	269.7	219.1	162	102	114	64		221.5	222.2	222.2
10	545	69.9	368	323.9	273	184	108	127	72		276.2	277.4	276.2
12	610	79.4	419	381	323.8	200	117	143	77		327	328.2	328.6
14	640	85.8	451	412.8	355.6	213	130	156	83		359.2	360.2	360.4
16	705	88.9	508	469.9	406.4	216	133	165	86		410.5	411.2	411.2
18	785	101.6	565	533.4	457	229	152	190	89		461.8	462.3	462
20	855	108	622	584.2	508	248	159	210	93		513.1	514.4	512.8
24	1040	139.7	749	692.2	610	292	203	267	102		616	616	614.4

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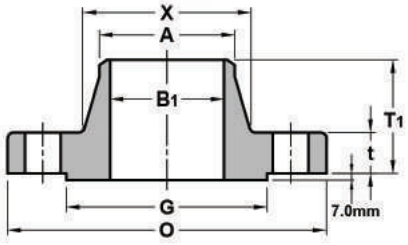
CLASS 900 FLANGES B16.5 RAISE FACE





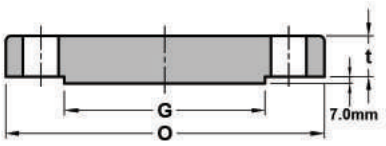
LAP JOINT





WELDING NECK





BLIND

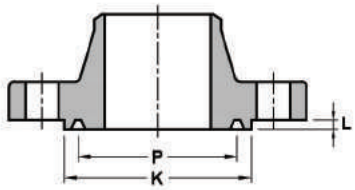
Unit : mm

Nominal Pipe Size	Radius of Lap-Joint	Drilling			Bolting				Approximate Weight(Kg)			
							Stud Bolt Length					
	R	Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Male Female Tongue Groove	7mm Raised Face	Ring Joint	Welding Neck	Slip-on / Threaded	Lap Joint	Blind
1/2	3	82.6	4	22.2	3/4	100	110	110	2.1	1.81	1.81	1.9
3/4	3	88.9	4	22.2	3/4	110	115	115	2.72	2.4	2.3	2.7
1	3	101.6	4	25.4	7/8	120	125	125	3.86	3.41	3.4	4.09
1 1/4	5	111.1	4	25.4	7/8	120	125	125	4.54	4.1	4.09	4.54
1 1/2	6	123.8	4	28.6	1	135	140	140	5.9	5.45	5.4	5.9
2	8	165.1	8	25.4	7/8	140	145	145	10.89	9.98	953	11.34
2 1/2	8	190.5	8	28.6	1	150	160	160	16.33	15.8	13.15	16
3	10	190.5	8	25.4	7/8	140	145	145	15	11.8	11.34	13.17
4	11	235	8	31.8	1 1/8	165	170	170	23.13	23.2	22.6	24.5
5	11	279.4	8	34.9	1 1/4	185	190	190	38.5	37.65	36.74	39.46
6	13	317.5	12	31.8	1 1/8	185	190	195	49.89	48.3	47.5	51.5
8	13	393.7	12	38.1	1 3/8	215	220	220	79.45	75	86	89
10	13	469.9	16	38.1	1 3/8	230	235	235	118.04	111.13	125.64	131.54
12	13	533.4	20	38.1	1 3/8	250	255	255	157	146	167	187
14	13	558.8	20	41.3	1 1/2	265	275	280	181.6	172.36	180.07	224.07
16	13	616	20	44.5	1 5/8	280	285	290	224.73	192.95	211.11	272.4
18	13	685.8	20	50.8	1 7/8	320	325	335	308.72	272.4	295.1	385.9
20	13	749.3	20	54	2	345	350	360	376.82	331.42	367.74	488
24	13	901.7	20	66.7	2 1/2	430	440	455	685	632	700	905

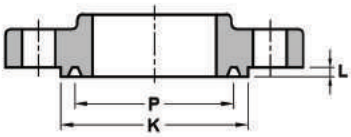
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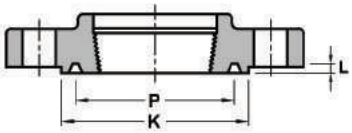
CLASS 900 FLANGES B16.5 RTJ



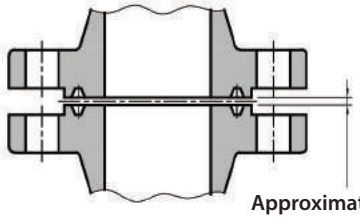
WELDING NECK



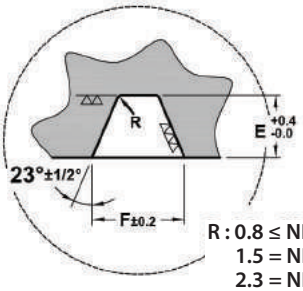
SLIP-ON



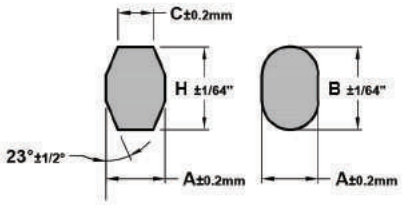
THREADED



Approximate Distance between Flanges



R : 0.8 ≤ NPS 12"
1.5 = NPS 14"~20"
2.3 = NPS 24"



Octagonal Ring Oval Ring

Unit : mm

Nominal Pipe Size	Pitch Diam. Ring & Groove	Width of Ring	Height of Ring		Width Flat on Octa. Ring	Width of Groove	Depth of Groove	Diam. of R.F. for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges
			Oval	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min.)		
1/2	39.7	8	14.3	12.7	5.2	8.74	6.35	60.5	R12	4
3/4	44.5	8	14.3	12.7	5.2	8.74	6.35	66.5	R14	4
1	50.8	8	14.3	12.7	5.2	8.74	6.35	71.5	R16	4
1 1/4	60.3	8	14.3	12.7	5.2	8.74	6.35	81	R18	4
1 1/2	68.3	8	14.3	12.7	5.2	8.74	6.35	92	R20	4
2	95.3	11.1	17.5	15.9	7.7	11.91	7.92	124	R24	3
2 1/2	108	11.1	17.5	15.9	7.7	11.91	7.92	136.7	R27	3
3	123.8	11.1	17.5	15.9	7.7	11.9	7.9	156	R31	4
4	149.2	11.1	17.5	15.9	7.7	11.9	7.9	181	R37	4
5	181	11.1	17.5	15.9	7.7	11.9	7.9	216	R41	4
6	211.1	11.1	17.5	15.9	7.7	11.9	7.9	241	R45	4
8	269.9	11.1	17.5	15.9	7.7	11.9	7.9	308	R49	4
10	323.9	11.1	17.5	15.9	7.7	11.9	7.9	362	R53	4
12	381	11.1	17.5	15.9	7.7	11.9	7.9	419	R57	4
14	419.1	15.9	22.2	20.7	10.5	16.7	11.1	467	R62	4
16	469.9	15.9	22.2	20.7	10.5	16.7	11.1	524	R66	4
18	533.4	19.1	25.4	23.8	11.1	19.8	12.7	594	R70	5
20	584.2	19.1	25.4	23.8	12.3	19.8	12.7	648	R74	5
24	692.2	25.4	33.4	31.8	17.3	27	15.9	772	R78	6

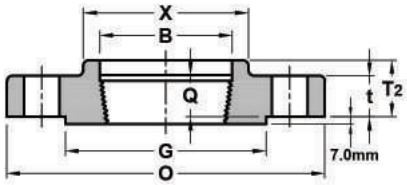
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CLASS 1500 FLANGES B16.5 RAISE FACE

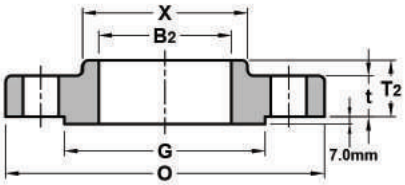




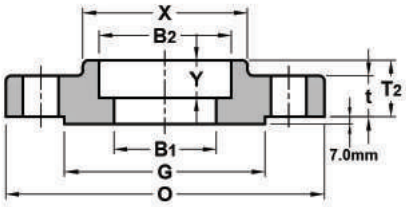




THREADED



SLIP-ON



SOCKET WELDING

Unit : mm

Nominal Pipe Size	Out-side Diam.	Min. Thickness	Diam. of Hub	O.D of Rasied Face	Diam. of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore			
						Welding Neck	Slip-on Threaded Sockect Welding	Lap Joint		Welding Nect / Socket Welding	Min. Slip-on / Socket Welding	Min. Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B2	B3	B
1/2	120	22.3	38	35.1	21.3	60	32	32	23	To be Specified by Purchaser	22.2	22.9	23.6
3/4	130	25.4	44	42.9	26.7	70	35	35	26		27.7	28.2	29
1	150	28.6	52	50.8	33.4	73	41	41	29		34.5	34.9	35.8
1 1/4	160	28.6	64	63.5	42.2	73	41	41	31		43.2	43.7	44.4
1 1/2	180	31.8	70	73.2	48.3	85	44	44	32		49.5	50	50.6
2	215	38.1	105	91.9	60.3	102	57	57	39		61.9	62.5	63.5
2 1/2	245	41.3	124	104.6	73	105	64	64	48		74.6	75.4	76.2
3	265	47.7	133	127	88.9	117	73.2	73	50.8		90.7	91.4	92.2
4	310	54	162	157.2	114.3	124	90.4	90	57.2		116.1	116.8	117.6
5	375	73.1	197	185.7	141.3	156	104.6	105	57.2		143.8	144.4	144.5
6	395	82.6	229	215.9	168.3	171	119.1	119	69.9		170.7	171.4	171.5
8	485	92.1	292	269.7	219.1	213	142.7	143	76.2		221.5	222.2	222.3
10	585	108	368	323.9	273	254	158.8	178	84.1		276.4	277.4	276.4
12	675	123.9	451	381	323.8	283	180.8	219	91.9		327.2	328.2	328.7
14	750	133.4	495	412.8	355.6	298		241			359.2	360.2	360.4
16	825	146.1	552	469.9	406.4	311		260			410.5	411.2	411.2
18	915	162	597	533.4	457	327		276			461.8	462.3	462
20	985	177.8	641	584.2	508	356		292			513.1	514.4	512.8
24	1170	203.2	762	692.2	610	406		330			616	616	614.4

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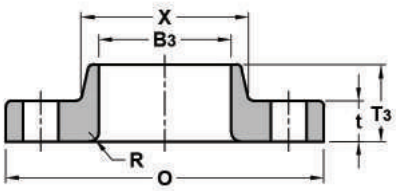
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CLASS 1500 FLANGES B16.5 RAISE FACE

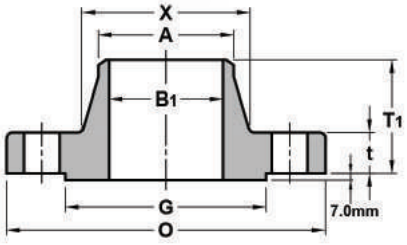




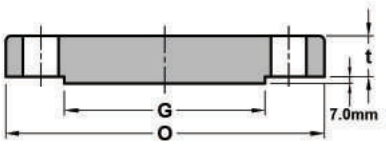




LAP JOINT



WELDING NECK



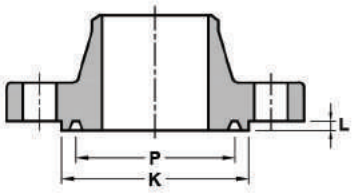
BLIND

Unit : mm

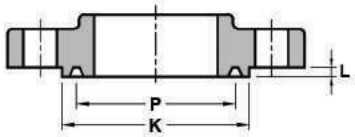
Nominal Pipe Size	Radius of Lap-Joint	Depth of Socket	Drilling			Bolting				Approximate Weight(Kg)				
			Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Male Female Tongue Groove	Stud Bolt Length		Welding Neck	Slip-on / Threaded	Lap Joint	Blind	Socket Welding
								7mm Raised Face	Ring Joint					
	R	Y												
1/2	3	10	82.6	4	22.2	3/4	100	110	110	2.1	1.8	1.8	1.9	1.81
3/4	3	11	88.9	4	22.2	3/4	110	115	115	2.72	2.27	2.27	2.72	2.81
1	3	13	101.6	4	25.4	7/8	120	125	125	3.86	3.4	3.4	4.08	3.61
1 1/4	5	14	111.1	4	25.4	7/8	120	125	125	4.54	4.1	4.09	4.3	4.99
1 1/2	6	16	123.8	4	28.6	1	135	140	140	5.9	5.45	5.4	5.9	6.76
2	8	17	165.1	8	25.4	7/8	140	145	145	10.89	10.5	9.53	11.3	10.89
2 1/2	8	19	190.5	8	28.6	1	150	160	160	16.34	15.8	13.15	16	16.34
3	10	20.6	203.2	8	31.8	1 1/8	170	180	180	21.79	21.77	17.24	21.79	
4	11	23.9	241.3	8	34.9	1 1/4	190	195	195	31.3	31	29	33.11	
5	11	23.9	292.1	8	41.3	1 1/2	240	250	250	59.02	58.8	54	60	
6	13	26.9	317.5	12	38.1	1 3/8	255	260	265	74.91	74	62	75	
8	13	31.8	393.7	12	44.5	1 5/8	285	290	325	123.83	117.73	129.73	136.98	
10	13	33.3	482.6	12	50.8	1 7/8	330	335	345	205.93	197.49	220.19	229.97	
12	13	39.6	571.5	16	54	2	370	375	385	306	264	286.02	316	
14	13	41.4	635	16	60.3	2 1/4	400	405	425	416		404.06	421	
16	13	44.5	704.8	16	66.7	2 1/2	440	445	470	567.5		522.1	559	
18	13	49.3	774.7	16	73	2 3/4	490	495	525	736		669.65	761	
20	13	54.1	831.8	16	79.4	3	535	540	565	929		805.85	967	
24	13	63.5	990.6	16	92.1	3 1/2	610	615	650	1504		1285.55	1568	

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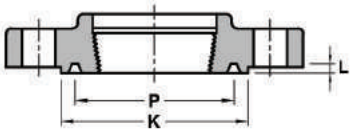
CLASS 1500 FLANGES B16.5 RTJ



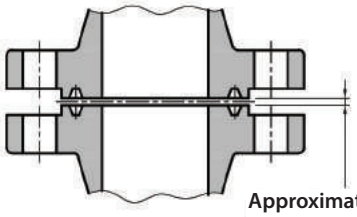
WELDING NECK



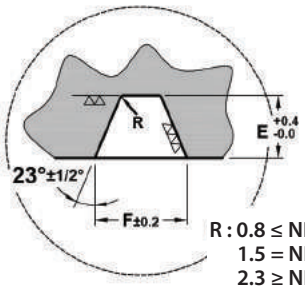
SLIP-ON



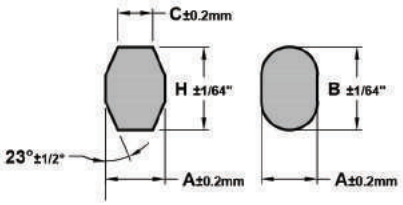
THREADED



Approximate Distance between Flanges



R : 0.8 ≤ NPS 5"
1.5 = NPS 6"~12"
2.3 ≥ NPS 14"



Octagonal Ring Oval Ring

Unit : mm

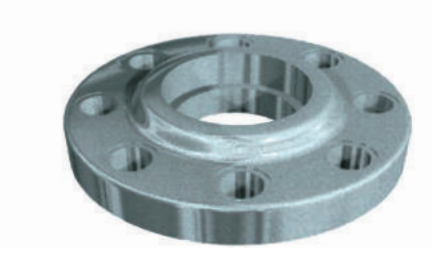
Nominal Pipe Size	Pitch Diam. Ring & Groove	Width of Ring	Height of Ring		Width Flat on Octa. Ring	Width of Groove	Depth of Groove	Diam. of R.F. for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges
			Oval	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min.)		
1/2	39.7	8	14.3	12.7	5.2	8.74	6.35	60.5	R12	4
3/4	44.5	8	14.3	12.7	5.2	8.74	6.35	66.5	R14	4
1	50.8	8	14.3	12.7	5.2	8.74	6.35	71.5	R16	4
1 1/4	60.3	8	14.3	12.7	5.2	8.74	6.35	81	R18	4
1 1/2	68.3	8	14.3	12.7	5.2	8.74	6.35	92	R20	4
2	95.3	11.1	17.5	15.9	7.7	11.91	7.92	124	R24	3
2 1/2	108	11.1	17.5	15.9	7.7	11.91	7.92	137	R27	3
3	136.5	11.1	17.5	15.9	7.7	11.91	7.92	168	R35	3
4	161.9	11.1	17.5	15.9	7.7	11.91	7.92	194	R39	3
5	193.7	11.1	17.5	15.9	7.7	11.91	7.92	229	R44	3
6	211.1	12.7	19.1	17.5	8.7	13.49	9.53	248	R46	3
8	269.9	15.9	22.2	20.7	10.5	16.67	11.13	318	R50	4
10	323.9	15.9	22.2	20.7	10.5	16.67	11.13	371	R54	4
12	381	22.2	28.6	27	14.8	23.01	14.27	438	R58	5
14	419.1	25.4	33.4	31.8	17.3	27	15.88	489	R63	6
16	469.9	28.6	36.5	34.9	19.8	30.18	17.48	546	R67	8
18	533.4	28.6	36.5	34.9	19.8	30.18	17.48	613	R71	8
20	584.2	31.8	39.7	38.1	22.3	33.32	17.48	673	R75	10
24	692.2	34.9	44.5	41.3	24.8	36.53	20.62	794	R79	11

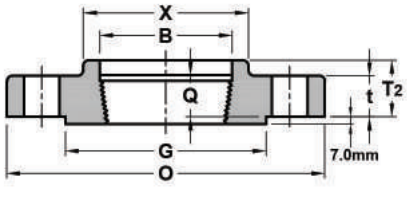
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CLASS 2500 FLANGES B16.5 RAISE FACE

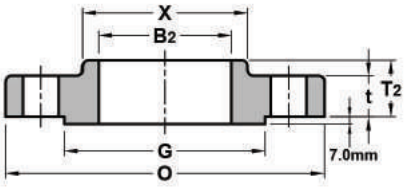




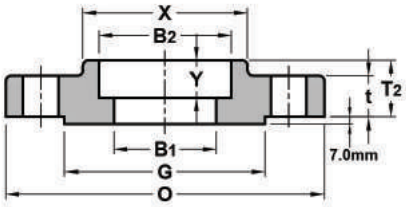




THREADED



SLIP-ON



SOCKET WELDING

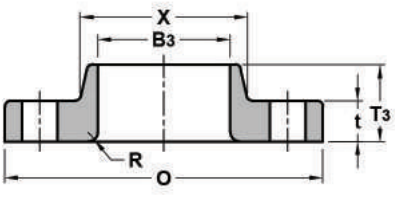
Unit : mm

Nominal Pipe Size	Out-side Diam.	Min. Thickness	Diam. of Hub	O.D of Rasied Face	Diam. of Hub at Bevel	Length Through Hub			Min. Thread Length	Bore		
						Welding Neck	Threaded	Lap Joint		Welding Nect / Socket Welding	Min. Lap Joint	Counter Bore Min. Threaded
	O	t	X	G	A	T1	T2	T3	Q	B1	B3	B
1/2	135	30.2	43	35.1	21.3	73	40	40	29	To be Specified by Purchaser	22.9	23.6
3/4	140	31.8	51	42.9	26.7	79	43	43	32		28.2	29
1	160	35	57	50.8	33.4	89	48	48	35		34.9	35.8
1 1/4	185	38.1	73	63.5	42.2	95	52	52	39		43.7	44.4
1 1/2	205	44.5	79	73.2	48.3	111	60	60	45		50	50.6
2	235	50.9	95	91.9	60.3	127	70	70	51		62.5	63.5
2 1/2	265	57.2	114	104.6	73	143	79	79	58		75.4	76.2
3	305	66.7	133	127	88.9	168		92	63.5		91.4	
4	355	76.2	165	157.2	114.3	190		108	69.9		116.8	
5	420	92.1	203	185.7	141.3	229		130	76.2		144.4	
6	485	108	235	215.9	168.3	273		152	82.6		171.4	
8	550	127	305	269.7	219.1	318		178	95.3		222.2	
10	670	165.1	375	323.9	273	419		229	108		277.4	
12	760	184.2	441	381	323.8	464		254	120.7		328.2	

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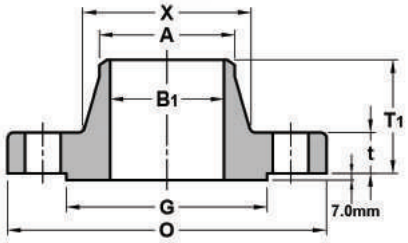
CLASS 2500 FLANGES B16.5 RAISE FACE





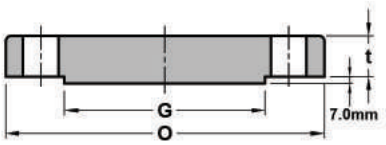
LAP JOINT





WELDING NECK





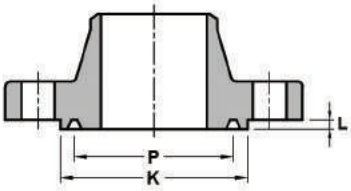
BLIND

Unit : mm

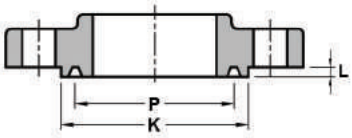
Nominal Pipe Size	Radius of Lap-Joint	Drilling			Bolting				Approximate Weight(Kg)			
		Bolt Circle Diam.	Num. of Holes	Diam. of Holes	Diam. of Bolt (inch)	Male Female Tongue Groove	Stud Bolt Length		Welding Neck	Slip-on / Threaded	Lap Joint	Blind
	R						7mm Raised Face	Ring Joint				
1/2	3	88.9	4	22.2	3/4	115	120	120	3.18	3.18	3	3.18
3/4	3	95.2	4	22.2	3/4	120	125	125	4.08	4.08	3.63	4.54
1	3	108	4	25.4	7/8	135	140	140	5.45	5.44	4.99	5.44
1 1/4	5	130.2	4	28.6	1	145	150	150	9.07	8.16	7.26	8.16
1 1/2	6	146	4	31.8	1 1/8	165	170	170	11.35	11	9.99	10.44
2	8	171.4	8	28.6	1	170	180	180	19.07	17.25	16.8	17.71
2 1/2	8	196.8	8	31.8	1 1/8	190	195	205	23.61	24.97	24.06	25.42
3	10	228.6	8	34.9	1 1/4	215	220	230	42.68	37.68	36.32	39.04
4	11	273	8	41.3	1 1/2	250	255	260	64	58	54.48	60.38
5	11	323.8	8	47.6	1 3/4	290	300	310	110.68	95.25	92.53	101.15
6	13	368.3	8	54	2	335	345	355	176.46	146.51	143.01	156.63
8	13	438.2	12	54	2	375	380	395	261.27	219.99	213.38	240.62
10	13	539.8	12	66.7	2 1/2	485	490	510	484.43	419.57	408.6	465.36
12	13	619.1	12	73	2 3/4	535	540	560	692.35	590.2	572.95	664.06

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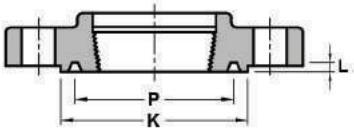
CLASS 2500 FLANGES B16.5 RTJ



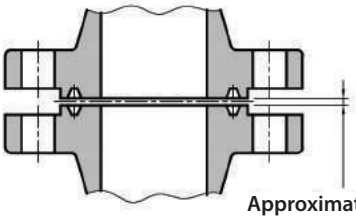
WELDING NECK



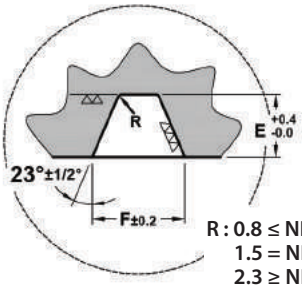
SLIP-ON



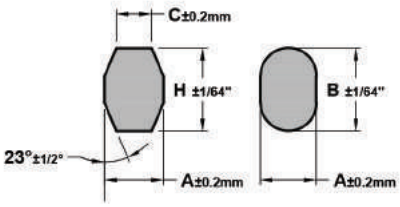
THREADED



Approximate Distance between Flanges



R : 0.8 ≤ NPS 2"
1.5 = NPS 2.1/2"~8"
2.3 ≥ NPS 10"



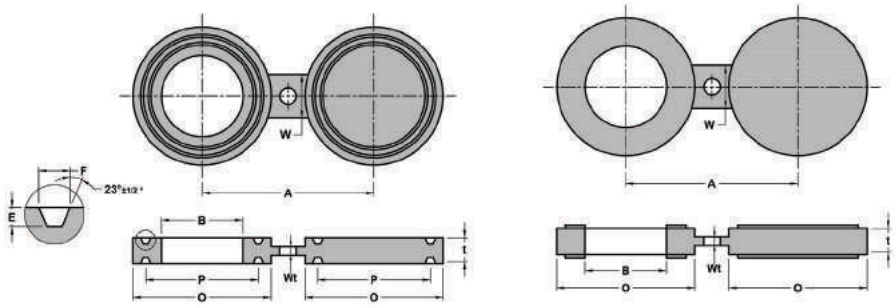
Octagonal Ring Oval Ring

Unit : mm

Nominal Pipe Size	Pitch Diam. Ring & Groove	Width of Ring	Height of Ring		Width Flat on Octa. Ring	Width of Groove	Depth of Groove	Diam. of R.F. for Ring Joint or Lapped	Ring Number	Approximate Distance Between Flanges
			Oval	Octagonal						
	P	A	B	H	C	F	E(L*)	K(Min.)		
1/2	42.9	8	14.3	12.7	5.2	8.7	6.4	65	R13	13
3/4	50.8	8	14.3	12.7	5.2	8.7	6.4	73	R16	16
1	60.3	8	14.3	12.7	5.2	8.7	6.4	82.5	R18	18
1 1/4	72.2	11.1	17.5	15.9	7.7	11.9	7.9	102	R21	21
1 1/2	82.6	11.1	17.5	15.9	7.7	11.9	7.9	114	R23	23
2	101.6	11.1	17.5	15.9	7.7	11.9	7.9	133	R26	26
2 1/2	111.1	12.7	19.1	17.5	8.7	13.5	9.5	149	R28	28
3	127	12.7	19.1	17.5	8.7	13.5	9.5	168	R32	32
4	157.2	15.9	22.2	20.7	10.5	16.7	11.1	203	R38	38
5	190.5	19.1	25.4	23.8	12.3	19.8	12.7	241	R42	42
6	228.6	19.1	25.4	23.8	12.3	19.8	12.7	279	R47	47
8	279.4	22.2	28.6	27	14.8	23	14.3	340	R51	51
10	342.9	28.6	36.5	34.9	19.8	30.2	17.5	425	R55	55
12	406.4	31.8	39.7	38.1	22.3	33.3	17.5	495	R60	60

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SPECTACLE BLIND - B16.48



Class 150

Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	44.5	60.5	3.0	38.1	15.7	-	-	-	-	-	-	-	-	-
3/4	20.8	53.8	69.9	3.0	38.1	15.7	-	-	-	-	-	-	-	-	-
1	26.7	63.5	79.2	3.0	38.1	15.7	33.5	63.5	79.2	19.1	50.8	47.6	8.7	6.4	15.7
1 1/4	42.2	73.2	88.9	6.4	38.1	15.7	42.2	73.2	88.9	19.1	50.8	57.2	8.7	6.4	15.7
1 1/2	48.3	82.6	98.6	6.4	38.1	15.7	48.3	82.6	98.6	19.1	57.2	65.1	8.7	6.4	15.7
2	60.5	101.6	120.7	6.4	50.8	19.1	60.5	101.6	120.7	19.1	57.2	82.6	8.7	6.4	19.1
2 1/2	73.2	120.7	139.7	6.4	50.8	19.1	73.2	120.7	139.7	22.4	57.2	101.6	8.7	6.4	19.1
3	88.9	133.4	152.4	6.4	63.5	19.1	88.9	133.4	152.4	22.4	57.2	114.3	8.7	6.4	19.1
3 1/2	101.6	158.8	177.8	9.7	63.5	19.1	101.6	153.9	177.8	22.4	63.5	131.8	8.7	6.4	19.1
4	114.3	171.5	190.5	9.7	63.5	19.1	114.3	171.5	190.5	22.4	63.5	149.2	8.7	6.4	19.1
5	141.2	193.5	215.9	9.7	76.2	22.4	141.2	193.5	215.9	25.4	69.9	171.5	8.7	6.4	22.4
6	168.1	128.9	241.3	12.7	76.2	22.4	168.1	218.9	241.3	25.4	82.6	193.7	8.7	6.4	22.4
8	218.9	276.4	298.5	12.7	76.2	22.4	218.9	273.1	298.5	28.4	95.3	247.7	8.7	6.4	22.4
10	273.1	336.6	362.0	15.7	101.6	25.4	273.1	330.2	362.0	31.8	101.6	304.8	8.7	6.4	25.4
12	323.9	406.4	431.8	19.1	101.6	25.4	323.9	406.4	431.8	35.1	120.7	381.0	8.7	6.4	25.4
14	355.6	447.5	476.3	19.1	108.0	28.4	355.6	425.5	476.3	35.1	127.0	396.9	8.7	6.4	28.4
16	406.4	511.0	539.8	22.4	108.0	28.4	406.4	482.6	539.8	38.1	127.0	454.0	8.7	6.4	28.4
18	457.2	546.1	577.9	25.4	114.3	31.8	457.2	546.1	577.9	41.1	127.0	517.5	8.7	6.4	31.8
20	508.0	603.3	635.0	28.4	120.7	31.8	508.0	596.9	635.0	41.1	127.0	558.8	8.7	6.4	31.8
24	609.6	714.2	749.3	31.8	139.7	35.1	609.6	711.2	749.3	47.8	152.4	673.1	8.7	6.4	35.1

Class 300

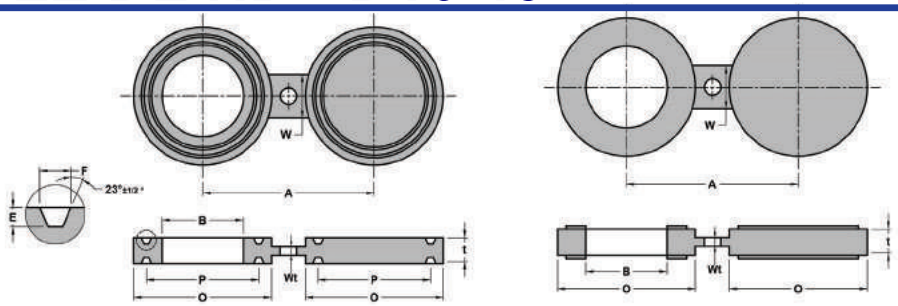
Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	50.8	66.5	6.4	38.1	15.7	21.3	50.8	57.4	15.7	38.1	34.1	7.1	5.6	15.7
3/4	20.8	63.5	82.6	6.4	38.1	19.1	26.7	63.5	82.6	19.1	44.5	42.9	8.7	6.4	19.1
1	26.7	69.9	88.9	6.4	38.1	19.1	33.5	69.9	88.9	19.1	50.8	50.8	8.7	6.4	19.1
1 1/4	42.2	79.2	98.6	6.4	38.1	19.1	42.2	79.2	98.6	22.4	50.8	60.3	8.7	6.4	19.1
1 1/2	48.3	91.9	114.3	6.4	50.8	22.4	48.3	90.4	114.3	22.4	57.2	68.3	8.7	6.4	22.4
2	60.5	108.0	127.0	9.7	50.8	19.1	60.5	108.0	127.0	25.4	57.2	82.6	11.9	7.9	19.1
2 1/2	73.2	127.0	149.4	9.7	63.5	22.4	73.2	127.0	149.4	28.4	57.2	101.6	11.9	7.9	22.4
3	88.9	146.1	168.1	9.7	63.5	22.4	88.9	146.1	168.1	28.4	57.2	123.8	11.9	7.9	22.4
3 1/2	101.6	162.1	184.2	12.7	63.5	22.4	101.6	158.8	184.2	28.4	63.5	131.8	11.9	7.9	22.4
4	114.3	177.8	200.2	12.7	63.5	22.4	114.3	174.8	200.2	31.8	63.5	149.2	11.9	7.9	22.4
5	141.2	212.9	235.0	15.7	76.2	22.4	141.2	209.6	235.0	35.1	69.9	181.0	11.9	7.9	22.4
6	168.1	247.7	269.7	15.7	76.2	22.4	168.1	241.3	269.7	35.1	82.6	211.2	11.9	7.9	22.4
8	218.9	304.8	330.2	22.4	88.9	25.4	218.9	301.8	330.2	41.1	95.3	269.9	11.9	7.9	25.4
10	273.1	358.6	387.4	25.4	101.6	28.4	273.1	355.6	387.4	44.5	101.6	323.9	11.9	7.9	28.4
12	323.9	419.1	450.9	28.4	101.6	31.8	323.9	412.8	450.9	50.8	120.7	381.0	11.9	7.9	31.8
14	355.6	482.6	514.4	31.8	120.7	31.8	355.6	457.2	514.4	53.8	127.0	419.1	11.9	7.9	31.8
16	406.4	536.4	571.5	38.1	124.0	35.1	406.4	508.0	571.5	57.2	127.0	469.9	11.9	7.9	35.1
18	457.2	593.9	628.7	41.1	114.3	35.1	457.2	574.5	628.7	60.5	127.0	533.4	11.9	7.9	35.1
20	508.0	650.7	685.8	44.5	120.7	35.1	508.0	635.0	685.8	69.9	127.0	584.2	13.5	9.5	35.1
24	609.6	771.7	812.8	50.8	139.7	41.1	609.6	749.3	812.8	79.2	152.4	692.2	16.7	11.1	41.1

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SPECTACLE BLIND - B16.48



Class 600

Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	50.8	66.5	6.4	38.1	15.7	21.3	50.8	57.4	19.1	38.1	34.1	7.1	5.6	15.7
3/4	20.8	63.5	82.6	6.4	38.1	19.1	26.7	63.5	82.6	22.4	44.5	42.9	8.7	6.4	19.1
1	26.7	69.9	88.9	6.4	57.2	19.1	33.5	69.9	88.9	22.4	50.8	50.8	8.7	6.4	19.1
1 1/4	36.6	79.2	98.6	9.7	57.2	19.1	42.2	79.2	98.6	22.4	50.8	60.3	8.7	6.4	19.1
1 1/2	42.7	91.9	114.3	9.7	66.5	22.4	48.3	90.4	114.3	22.4	57.2	68.3	8.7	6.4	22.4
2	54.9	108.0	127.0	9.7	57.2	19.1	60.5	108.0	127.0	28.4	57.2	82.6	11.9	7.9	19.1
2 1/2	67.1	127.0	149.4	12.7	66.5	22.4	73.2	127.0	149.4	31.8	57.2	101.6	11.9	7.9	22.4
3	82.8	146.1	168.1	12.7	66.5	22.4	88.9	146.1	168.1	31.8	57.2	128.8	11.9	7.9	22.4
3 1/2	95.5	158.8	184.2	15.7	76.2	25.4	101.6	158.8	184.2	35.1	63.5	131.8	11.9	7.9	25.4
4	108.2	190.5	215.9	15.7	76.2	25.4	114.3	174.8	215.9	35.1	63.5	149.2	11.9	7.9	25.4
5	134.6	238.3	266.7	19.1	85.9	28.4	141.2	209.6	266.7	38.1	69.9	181.0	11.9	7.9	28.4
6	161.5	263.7	292.1	22.4	85.9	28.4	168.1	241.3	292.1	44.5	82.6	211.2	11.9	7.9	28.4
8	211.6	317.5	349.3	28.4	95.3	31.8	218.9	301.8	349.3	50.8	95.3	269.9	11.9	7.9	31.8
10	264.7	396.7	431.8	35.1	104.6	35.1	273.1	355.6	431.8	57.2	101.6	323.9	11.9	7.9	35.1
12	314.7	454.2	489.0	41.1	104.6	35.1	323.9	412.8	489.0	63.5	120.7	381.0	11.9	7.9	35.1
14	345.9	489.0	527.1	44.5	114.3	38.1	355.6	457.2	527.1	66.5	127.0	419.1	11.9	7.9	38.1
16	396.7	561.8	603.3	50.8	124.0	41.1	406.4	508.0	603.3	73.2	127.0	469.9	11.9	7.9	41.1
18	447.5	609.6	654.1	53.8	133.4	44.5	457.2	574.5	654.1	79.2	127.0	533.4	11.9	7.9	44.5
20	496.8	679.5	723.9	63.5	133.4	44.5	508.0	635.0	723.9	88.9	127.0	584.2	13.5	9.5	44.5
24	596.9	787.4	838.2	73.2	152.4	50.8	609.6	749.3	838.2	104.6	152.4	692.2	16.7	11.1	50.8

Class 900

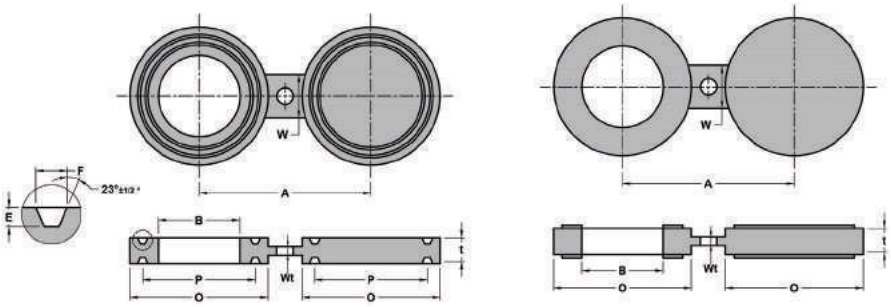
Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	60.5	82.6	6.4	38.1	22.4	21.3	60.5	82.6	22.4	38.1	39.4	8.7	6.4	22.4
3/4	20.8	66.5	88.9	6.4	41.1	22.4	26.7	66.5	88.9	22.4	44.5	44.5	8.7	6.4	22.4
1	26.7	76.2	101.6	6.4	57.2	25.4	33.5	71.4	101.6	22.4	50.8	50.8	8.7	6.4	25.4
1 1/4	36.6	85.9	111.3	9.7	57.2	25.4	42.2	81.0	111.3	25.4	50.8	60.3	8.7	6.4	25.4
1 1/2	42.7	95.3	124.0	9.7	66.5	28.4	48.3	91.9	124.0	25.4	63.5	68.3	8.7	6.4	28.4
2	54.9	139.7	165.1	12.7	57.2	25.4	60.5	124.0	165.1	31.8	50.8	95.3	11.9	7.9	25.4
2 1/2	67.1	162.1	190.5	12.7	66.5	28.4	73.2	136.7	190.5	35.1	66.5	108.0	11.9	7.9	28.4
3	82.8	165.1	190.5	15.7	66.5	25.4	88.9	155.4	190.5	35.1	66.5	123.8	11.9	7.9	25.4
4	108.2	203.2	235.0	19.1	76.2	31.8	114.3	180.8	235.0	41.1	73.2	149.2	11.9	7.9	31.8
5	134.6	244.3	279.4	22.4	85.9	35.1	141.2	215.9	279.4	44.5	73.2	181.0	11.9	7.9	35.1
6	161.5	285.8	317.5	25.4	85.9	31.8	168.1	241.3	317.5	47.8	73.2	211.2	11.9	7.9	31.8
8	211.6	355.6	393.7	35.1	95.3	38.1	218.9	307.8	393.7	57.2	79.2	269.9	11.9	7.9	38.1
10	264.7	431.8	469.9	41.1	104.6	38.1	273.1	362.0	469.9	63.5	120.7	323.9	11.9	7.9	38.1
12	314.7	495.3	533.4	47.8	104.6	38.1	323.9	419.1	533.4	73.2	120.7	381.0	11.9	7.9	38.1
14	345.9	517.7	558.8	53.8	114.3	41.1	355.6	466.9	558.8	82.6	120.7	419.1	16.7	11.1	41.1
16	396.7	571.5	616.6	60.5	124.0	44.5	406.4	523.7	616.0	91.9	127.0	469.9	16.7	11.1	44.5
18	447.5	635.0	685.8	66.5	133.4	50.8	457.2	593.9	685.8	101.6	133.4	533.4	19.8	12.7	50.8
20	496.8	695.5	749.3	73.2	133.4	53.8	508.0	647.7	749.3	111.3	127.0	584.2	19.8	12.7	53.8
24	596.9	835.2	901.7	88.9	152.4	66.5	609.6	771.7	901.7	133.4	139.7	692.2	27.0	15.9	66.5

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SPECTACLE BLIND - B16.48



Class 1500

Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	60.5	82.6	6.4	38.1	22.4	21.3	60.5	82.6	22.4	38.1	39.4	8.7	6.4	22.4
3/4	20.8	66.5	88.9	9.7	41.1	22.4	26.7	66.5	88.9	25.4	44.5	44.5	8.7	6.4	22.4
1	26.7	76.2	101.6	9.7	63.5	25.4	33.5	71.4	101.6	25.4	53.8	50.8	8.7	6.4	25.4
1 1/4	35.1	85.9	111.3	9.7	63.5	25.4	42.2	81.0	111.3	25.4	53.8	60.3	8.7	6.4	25.4
1 1/2	40.9	95.3	124.0	12.7	69.9	28.4	48.3	91.9	124.0	28.4	57.2	68.3	8.7	6.4	28.4
2	52.6	139.7	165.1	12.7	69.9	25.4	60.5	124.0	165.1	35.1	53.8	95.3	11.9	7.9	25.4
2 1/2	62.7	162.1	190.5	15.7	76.2	28.4	73.2	136.7	190.5	38.1	57.2	108.0	11.9	7.9	28.4
3	78.0	171.5	203.2	19.1	76.2	31.8	88.9	168.1	203.2	44.5	73.2	136.5	11.9	7.9	31.8
4	102.4	206.2	241.3	22.4	88.9	35.1	114.3	193.5	241.3	47.8	76.2	161.9	11.9	7.9	35.1
5	128.3	251.0	292.1	28.4	88.9	41.1	141.2	228.6	292.1	53.8	76.2	193.7	11.9	7.9	41.1
6	153.9	279.4	317.5	35.1	88.9	38.1	168.1	247.7	393.7	60.5	79.2	211.2	13.5	9.5	38.1
8	202.7	349.3	393.7	41.1	101.6	44.5	218.9	317.5	482.6	73.2	85.9	269.9	16.7	11.1	44.5
10	254.5	431.8	482.6	50.8	114.3	50.8	273.1	371.3	571.5	82.6	133.4	323.9	16.7	11.1	50.8
12	303.3	517.7	571.5	60.5	114.3	53.8	323.9	438.2	635.0	101.6	133.4	381.0	23.0	14.3	53.8
14	333.2	574.5	635.0	66.5	127.0	60.5	355.6	489.0	704.9	111.3	139.7	419.1	27.0	15.9	60.5
16	381.0	638.0	704.9	76.2	133.4	66.5	406.4	546.1	774.7	124.0	146.1	469.9	30.2	17.5	66.5
18	428.8	701.5	774.7	85.9	146.1	73.2	457.2	612.6	831.9	133.4	152.4	533.4	30.2	17.5	73.2
20	477.8	752.3	831.9	95.3	152.4	79.2	508.0	673.1	749.3	142.7	165.1	584.2	33.4	17.5	79.2
24	574.5	898.7	990.6	111.3	177.8	91.9	609.6	793.8	990.6	168.1	177.8	692.2	36.5	20.6	91.9

Class 2500

Unit : mm

Nominal Pipe Size	SPECTACLE RAISED FACE						SPECTACLE RING JOINT FACING								
	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Hole Diam.	Inside Diam	Outside Diam	Center -line Diam	Thick -ness	Web Width	Pitch Diam	Width of Groove	Depth of Groove	Hole Diam.
	B	O	A	t	W		B	O	A	t	W	P	F	E	
1/2	15.7	66.5	88.9	9.7	38.1	22.4	21.3	65.0	88.9	25.4	38.1	42.9	8.7	6.4	22.4
3/4	20.8	73.2	95.3	9.7	41.1	22.4	26.7	73.2	95.3	28.4	44.5	50.8	8.7	6.4	22.4
1	26.7	82.6	108.0	9.7	63.5	25.4	33.5	82.6	108.0	28.4	53.8	60.3	8.7	6.4	25.4
1 1/4	35.1	101.6	130.0	12.7	63.5	28.4	42.2	101.6	130.0	35.1	53.8	72.2	11.9	7.9	28.4
1 1/2	40.9	114.3	146.1	15.7	69.9	31.8	48.3	114.3	146.1	38.1	60.5	82.6	11.9	7.9	31.8
2	52.6	142.7	171.5	15.7	69.9	28.4	60.5	133.4	171.5	41.1	57.2	101.6	11.9	7.9	28.4
2 1/2	62.7	165.1	196.9	19.1	76.2	31.8	73.2	149.4	196.9	47.8	60.5	111.1	13.5	9.5	31.8
3	78.0	193.5	228.6	22.4	76.2	35.1	88.9	168.1	228.6	50.8	76.2	127.0	13.5	9.5	35.1
4	102.4	231.6	273.1	28.4	88.9	41.1	114.3	203.2	273.1	63.5	82.6	157.2	16.7	11.1	41.1
5	128.3	276.4	323.9	35.1	88.9	47.8	141.2	241.3	323.9	73.2	88.9	190.5	19.8	12.7	47.8
6	153.9	314.5	368.3	41.1	88.9	53.8	168.1	279.4	368.3	82.6	95.3	228.6	19.8	12.7	53.8
8	198.4	384.0	438.2	53.8	101.6	53.8	218.9	339.9	438.2	98.6	95.3	279.4	23.0	14.3	53.8
10	247.7	472.9	539.8	66.5	114.3	66.5	273.1	425.5	539.8	117.3	90.9	342.9	30.2	17.5	66.5
12	288.8	546.1	619.3	79.2	114.3	73.2	323.9	795.3	619.3	133.4	152.4	406.4	33.4	17.5	73.2

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BUTT WELD PIPE FITTINGS



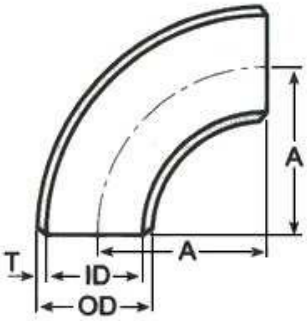
HIGH PRESSURE PIPE FITTING

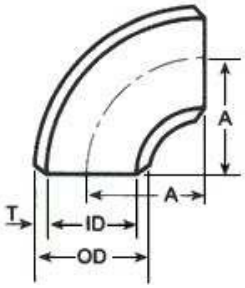
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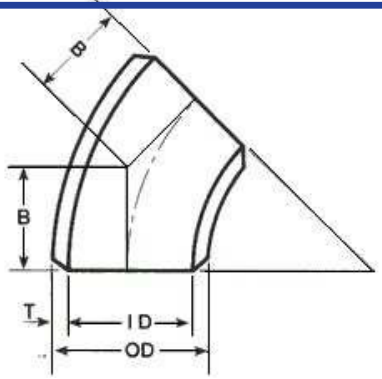
Type	1. Elbow, Tee, Cross, Coupling, Half Coupling, Cap, Plug, Bushing, Union, HEX. Nipple, Swage nipple, Bull Plug, Street Elbow, Boss, Reducer Insert and Out-let…etc 2. Threaded (NPT or PT Type), Socket-Weld, Butt-welding
Size	NPS 1/8”~4” DN 6~100
Rating Pressure	Threaded End – 2000 / 3000 / 6000 LBS. Socket-weld End – 3000 / 6000 / 9000 LBS. Butt-weld End – SCH40 / SCH80 / SCH160 / XXS.
Specifications	1. Dim. Spec. : ASME B16.11-2009 (Revision of ASME B16.11-2005) MSS – SP – 79, 83, 95, 97 and BS3799. ANSI / ASME B1.20.1-1983 NPT 2. Material Spec. : ASTM A105, A350 LF2, A106, A312, A234, A403 ASTM A182 (F304, F304L, F316, F316L, F304H, F316H, F317L, F321, F11, F22, F91) 3. Size of Raw Material: DIA. 19~85mm Round Bar.
Marking	1. Carbon and Alloy Steel: Marked by stamping. 2. Stainless Steel: Marked by electro-etched, jet printed or stamping. 3. 3/8” under: Brand only. 4. 1/2” to 4”: Marked with brand, material, heat code, B16 (For ASME B16.11 product), pressure and size.
Finishing	Carbon steel: Galvanized or black. Stainless steel: Pickled.

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LONG AND SHORT RADIUS ELBOW - ANSI B16.9





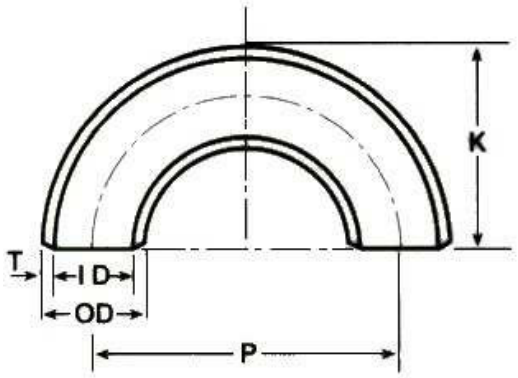


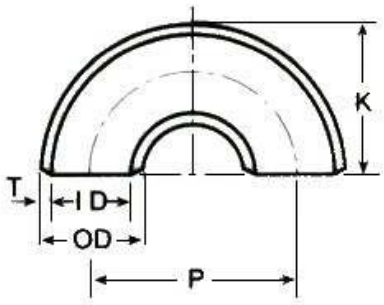
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Center to End			
		Long Radius Elbows		Short Radius Elbows	
		90 degree. A	45 degree B	90 degree A	45 degree B
1/2	21.3	38.1	15.7	-	-
3/4	26.7	38.1	19.1	-	-
1	33.4	38.1	22.4	25.4	-
1-1/4	42.2	47.8	25.4	31.8	-
1-1/2	48.3	57.2	28.4	38.1	-
2	60.3	76.2	35.1	50.8	-
2-1/2	73.0	95.2	44.4	63.5	-
3	88.9	114.3	50.8	76.2	31.6
3-1/2	101.6	133.4	57.2	88.9	36.8
4	114.3	152.4	63.5	101.6	42.1
5	141.3	190.5	79.2	127.0	52.6
6	168.3	228.6	95.2	152.4	63.4
8	219.1	304.8	127.0	203.2	84.2
10	273.1	381.0	158.8	254.0	105.2
12	323.9	457.2	190.5	304.8	126.3
14	355.6	533.4	222.2	355.6	147.3
16	406.4	609.6	254.0	406.4	168.3
18	457.2	685.8	285.8	457.2	189.4
20	508.0	762.0	317.5	508.0	210.4
22	558.8	838.2	342.9	558.8	231.5
24	609.6	914.4	381.0	609.6	252.5
26	660.4	990.6	406.4	660.4	273.5
28	711.2	1066.8	438.2	711.2	294.6
30	762.0	1143.0	469.9	762.0	315.6
32	812.8	1219.2	501.6	812.8	378.1
34	863.6	1295.4	533.4	863.6	357.7
36	914.4	1371.6	565.2	914.4	378.8
38	965.2	1447.8	599.9	-	-
40	1016.0	1524.0	632.0	1016.0	420.8
42	1066.8	1600.2	660.4	1066.8	441.9
44	1117.6	1676.4	695.5	1117.6	462.9
46	1168.4	1752.6	726.9	-	-
48	1219.2	1828.8	759.0	1219.2	505.0
52*	1320.8	-	-	1320.8	547.1
54*	1371.6	2057.4	852.2	1371.6	568.1
56*	1422.4	2133.6	883.8	1422.4	589.2
60*	1524.0	2286.0	946.9	1524.0	631.3
66*	1676.4	2514.6	1041.6	-	-
68*	1727.0	2591	1073	1727	-
72*	1829.0	2743	1137	1829	-
76*	1930.0	2896	1199	1930	-
80	2032.0	3048	1263	2032	-

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LONG AND SHORT RADIUS ELBOW - ANSI B16.9

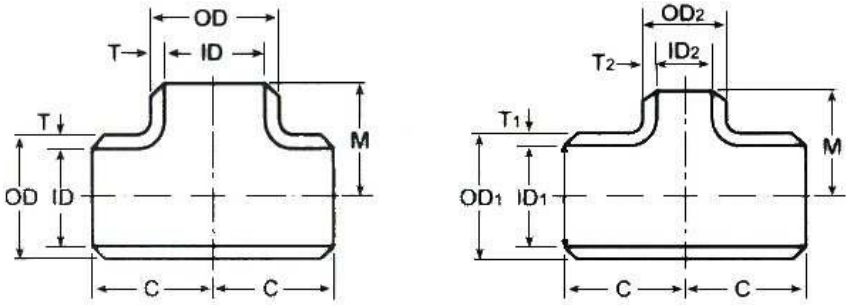




Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Long Radius Elbows		Short Radius Elbows	
		Center to Center. P	Back to Face K	Center to Center. P	Back to Face K
1/2	21.3	76.2	47.8	-	-
3/4	26.7	76.2	50.8	-	-
1	33.4	76.2	55.6	50.8	41.1
1-1/4	42.2	95.2	69.8	63.5	52.3
1-1/2	48.3	114.3	82.6	76.2	62.0
2	60.3	152.4	106.4	101.6	81.0
2-1/2	73.0	109.5	131.8	127.0	100.1
3	88.9	228.6	158.8	152.4	120.7
3-1/2	101.6	266.7	184.2	177.8	139.7
4	114.3	304.8	209.6	203.2	158.8
5	141.3	381.0	261.9	254.0	196.9
6	168.3	457.2	312.7	304.8	236.5
8	219.1	609.6	414.3	406.4	312.7
10	273.1	762.0	517.7	508.0	390.7
12	323.9	914.4	619.3	609.6	466.9
14	355.6	1066.8	711.2	711.2	533.4
16	406.4	1219.2	812.8	812.8	609.6
18	457.2	1371.6	914.4	914.4	685.8
20	508.0	1524.0	1016.0	1016.0	762.0
22	558.8	1676.4	1117.6	1117.6	838.2
24	609.6	1828.8	1219.2	1219.2	914.4

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EQUAL AND REDUCING TEES - ANSI B16.9



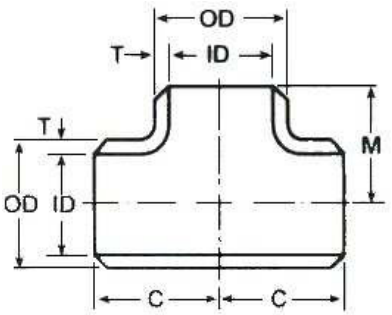
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
1/2 x 1/2	21.3	21.3	25.4	25.4
1/2 x 3/8		17.1		25.4
1/2 x 1/4		13.7		25.4
3/4 x 3/4	26.7	26.7	28.4	28.4
3/4 x 1/2		21.3		28.4
3/4 x 3/8		17.1		28.4
1 x 1	33.4	33.4	38.1	38.1
1 x 3/4		26.7		38.1
1 x 1/2		21.3		38.1
1-1/4 x 1-1/4	42.2	42.2	47.8	47.8
1-1/4 x 1		33.4		47.8
1-1/4 x 3/4		26.7		47.8
1-1/4 x 1/2		21.3		47.8
1-1/2 x 1-1/2	48.3	48.3	57.2	57.2
1-1/2 x 1-1/4		42.2		57.2
1-1/2 x 1		33.4		57.2
1-1/2 x 3/4		26.7		57.2
1-1/2 x 1/2		21.3		57.2
2 x 2	60.3	60.3	63.5	63.5
2 x 1-1/2		48.3		60.5
2 x 1-1/4		42.2		57.2
2 x 1		33.4		50.8
2 x 3/4		26.7		44.4
2 x 1/2*		21.3		
2-1/2 x 2-1/2	73.0	73.0	76.2	76.2
2-1/2 x 2		60.3		69.8
2-1/2 x 1-1/2		48.3		66.5
2-1/2 x 1-1/4		42.2		63.5
2-1/2 x 1		33.4		57.2
3 x 3	88.9	88.9	85.9	85.9
3 x 2-1/2		73.0		82.6
3 x 2		60.3		76.2
3 x 1-1/2		48.3		73.2
3 x 1-1/4		42.2		69.8
3 x 1*		33.4		
3-1/2 x 3-1/2	101.6	101.6	95.2	95.2
3-1/2 x 3		88.9		91.9
3-1/2 x 2-1/2		73.0		88.9
3-1/2 x 2		60.3		82.6
3-1/2 x 1-1/2		48.3		79.2

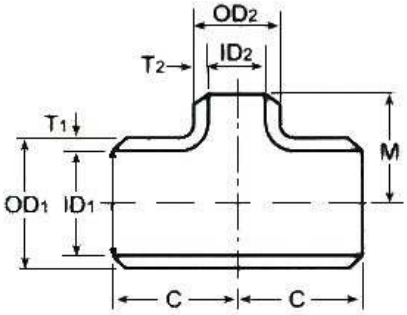
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
4 x 4	114.3	114.3	104.6	104.6
4 x 3-1/2		101.6		101.6
4 x 3		88.9		98.6
4 x 2-1/2		73.0		95.2
4 x 2		60.3		88.9
4 x 1-1/2		48.3		85.9
4 x 1-1/4		42.2		
4 x 1*		33.5		
5 x 5	141.3	141.3	124.0	124.0
5 x 4		114.3		117.3
5 x 3-1/2		101.6		114.3
5 x 3		88.9		111.3
5 x 2-1/2		73.0		108.0
5 x 2		60.3		104.6
5 x 1-1/2*		48.3		
6 x 6	168.3	168.3	142.7	142.7
6 x 5		141.3		136.7
6 x 4		114.3		130.0
6 x 3-1/2		101.6		127.0
6 x 3		88.9		124.0
6 x 2-1/2		73.0		120.6
6 x 2*		60.3		
8 x 8	219.1	219.1	177.8	177.8
8 x 6		168.3		168.1
8 x 5		141.3		162.1
8 x 4		114.3		155.4
8 x 3-1/2		101.6		152.4
8 x 3*		88.9		
10 x 10	273.1	273.1	215.9	215.9
10 x 8		219.1		203.2
10 x 6		168.3		193.5
10 x 5		141.3		190.5
10 x 4		114.3		184.2
12 x 12	323.9	323.9	254.0	254.0
12 x 10		273.1		241.3
12 x 8		219.1		228.6
12 x 6		168.3		218.9
12 x 5		141.3		215.9

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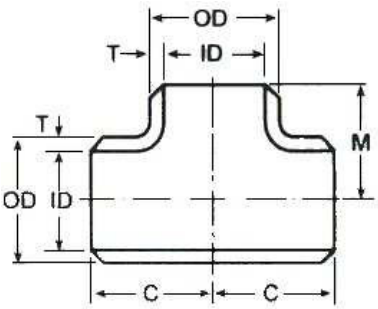
Nominal Pipe Size (NPS)			Outside Diameter At Bevel D		Center to End	
			Run	Outlet	Run C	Outlet (1) M
14	x	14	355.6	355.6	279.4	279.4
14	x	12		323.9		269.7
14	x	10		273.1		257.0
14	x	8		219.1		247.6
14	x	6		168.3		238.3
16	x	16	406.4	406.4	304.8	304.8
16	x	14		355.6		304.8
16	x	12		323.9		295.1
16	x	10		273.1		282.4
16	x	8		219.1		373.0
16	x	6		168.3		263.7
18	x	18	457.2	457.2	342.9	342.9
18	x	16		406.4		330.2
18	x	14		355.6		330.2
18	x	12		323.9		320.5
18	x	10		273.1		307.8
18	x	8		219.1		298.4
20	x	20	508.0	508.0	381.0	381.0
20	x	18		457.2		369.3
20	x	16		406.4		355.6
20	x	14		355.6		355.6
20	x	12		323.9		345.9
20	x	10		273.1		333.2
20	x	8		219.1		323.8
22	x	22	558.8	558.8	419.1	419.1
22	x	20		508.0		406.4
22	x	18		457.2		393.7
22	x	16		406.4		381.0
22	x	14		355.6		381.0
22	x	12		323.9		371.3
22	x	10		273.1		358.6
24	x	24	609.6	609.6	431.8	431.8
24	x	22		558.8		431.8
24	x	20		508.0		431.8
24	x	18		457.2		419.1
24	x	16		406.4		406.4
24	x	14		355.6		406.4
24	x	12		323.9		396.7
24	x	10		273.1		384.0

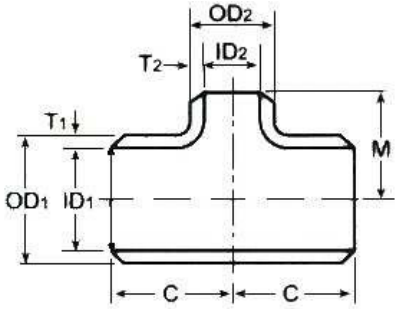
Nominal Pipe Size (NPS)			Outside Diameter At Bevel D		Center to End	
			Run	Outlet	Run C	Outlet (1) M
26	x	22		558.8		469.9
26	x	20		508.0		457.2
26	x	18		457.2		444.5
26	x	16		406.4		431.8
26	x	14		355.6		431.8
26	x	12		323.1		422.1
28	x	28	711.2	711.2	520.7	520.7
28	x	26		660.4		520.7
28	x	24		609.6		508.0
28	x	22		558.8		495.3
28	x	20		508.0		482.6
28	x	18		457.2		469.9
28	x	16		406.4		457.2
28	x	14		355.6		457.2
28	x	12		323.1		447.5
30	x	30	762.0	762.0	558.8	558.8
30	x	28		711.2		546.1
30	x	26		660.4		546.1
30	x	24		609.6		533.4
30	x	22		558.8		520.7
30	x	20		508.0		508.0
30	x	18		457.2		495.3
30	x	16		406.4		482.6
30	x	14		355.6		482.6
30	x	12		323.9		472.6
30	x	10		273.1		460.2
32	x	32	812.8	812.8	596.9	596.9
32	x	30		762.0		584.2
32	x	28		711.2		571.5
32	x	26		660.4		571.5
32	x	24		609.6		558.8
32	x	22		558.8		546.1
32	x	20		508.0		533.4
32	x	18		457.2		520.7
32	x	16		406.4		508.0
32	x	14		355.6		508.0
34	x	34	863.6	863.6	635.0	635.0
34	x	32		812.8		622.3
34	x	30		762.0		609.6

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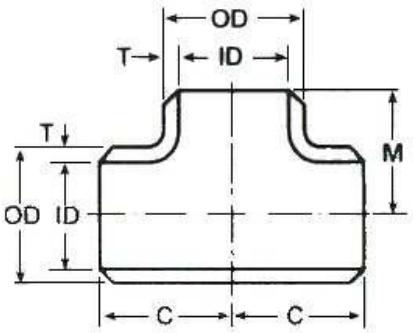
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
34 x 24		609.6		584.2
34 x 22		558.8		571.5
34 x 20		508.0		558.8
34 x 18		457.2		546.1
34 x 16		406.4		533.4
36 x 36	914.4	914.4	673.1	673.1
36 x 34		863.6		660.4
36 x 32		812.8		647.7
36 x 30		762.0		635.0
36 x 28		711.2		622.3
36 x 26		660.4		622.3
36 x 24		609.6		609.6
36 x 22		558.8		596.9
36 x 20		508.0		584.2
36 x 18		457.2		571.5
36 x 16		406.4		558.8
38 x 38	965.2	965.2	711.2	711.2
38 x 36		914.4		711.2
38 x 34		863.6		698.5
38 x 32		812.8		685.8
38 x 30		762.0		673.1
38 x 28		711.2		647.7
38 x 26		660.4		647.7
38 x 24		609.6		635.0
38 x 22		558.8		622.3
38 x 20		508.0		609.6
38 x 18		457.2		596.9
40 x 40	1016.0	1016.0	749.3	749.3
40 x 38		965.2		749.3
40 x 36		914.4		736.6
40 x 34		863.6		723.9
40 x 32		812.8		711.2
40 x 30		762.0		698.5
40 x 28		711.2		673.1
40 x 26		660.4		673.1
40 x 24		609.6		660.4
40 x 22		558.8		647.7
40 x 20		508.0		635.0
40 x 18		457.2		622.3
42 x 42	1066.8	1066.8	762.0	711.2

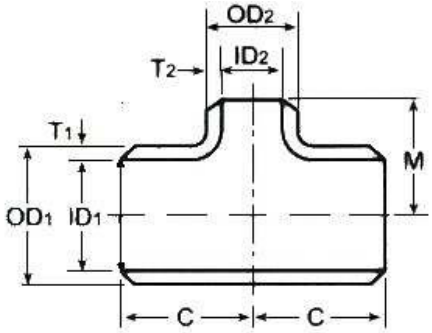
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
42 x 38		965.2		711.2
42 x 36		914.4		711.2
42 x 34		863.6		711.2
42 x 32		812.8		711.2
42 x 30		762.0		711.2
42 x 28	1066.8	711.2	762.0	698.5
42 x 26		660.4		698.5
42 x 24		609.6		660.4
42 x 22		558.8		660.4
42 x 20		508.0		660.4
42 x 18		457.2		647.7
42 x 16		406.4		635.0
44 x 44	1117.6	1117.6	812.8	762.0
44 x 42		1066.8		762.0
44 x 40		1016.0		749.3
44 x 38		965.2		736.6
44 x 36		914.4		723.9
44 x 34		863.6		723.9
44 x 32		812.8		711.2
44 x 30		762.0		711.2
44 x 28		711.2		698.5
44 x 26		660.4		698.5
44 x 24		609.6		698.5
44 x 22		558.8		685.8
44 x 20		508.0		685.8
46 x 46	1168.4	1168.4	850.9	800.1
46 x 44		1117.6		800.1
46 x 42		1066.8		787.4
46 x 40		1016.0		774.7
46 x 38		965.2		762.0
46 x 36		914.4		762.0
46 x 34		863.6		749.3
46 x 32		812.8		749.3
46 x 30		762.0		736.6
46 x 28		711.2		736.6
46 x 26		660.4		736.6
46 x 24		609.6		723.9
46 x 20*		508.0		723.9
48 x 48	1219.2	1219.2	889.0	838.2
48 x 46		1168.4		838.2

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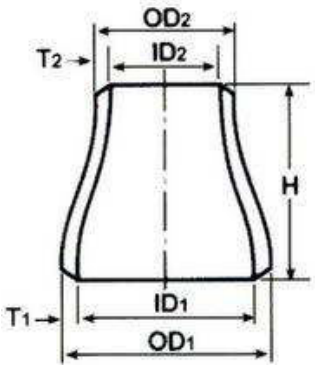
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
8 x 42		1066.8		812.8
8 x 40		1016.0		812.8
8 x 38		965.2		812.8
8 x 36		914.4		787.4
8 x 34		863.6		787.4
8 x 32	1219.2	812.8	889.0	787.4
8 x 44		1117.6		838.2
8 x 42		1066.8		812.8
8 x 40		1016.0		812.8
8 x 38		965.2		812.8
8 x 36		914.4		787.4
8 x 34		863.6		787.4
8 x 32		812.8		787.4
8 x 30		762.0		762.0
8 x 28		711.2		762.0
8 x 26		660.4		762.0
8 x 24		609.6		736.6
8 x 22		558.8		736.6
2 x 52*	1320.8	1320.8	965.2	914.4
2 x 48*		1219.2		863.6
2 x 44*		1117.6		812.8
2 x 40*		1016.0		762.0
4 x 54*	1371.6	1371.6	1003.3	952.5
4 x 52*		1320.8		914.4
4 x 48*		1219.2		863.6
4 x 44*		1117.6		863.6
4 x 40*		1016.0		812.8
4 x 28*		711.2		787.4
4 x 20*		508.0		787.4
6 x 56*	1422.4	1422.4	1041.4	965.2
6 x 52*		1320.8		914.4
6 x 48*		1219.2		863.6
6 x 44*		1117.6		812.8
6 x 40*		1016.0		812.8
6 x 28*		711.2		812.8
6 x 20*		508.0		812.8
0 x 60*	1524.0	1524.0	1117.6	1016.0
0 x 56*		1422.4		965.2
0 x 52*		1320.8		914.4

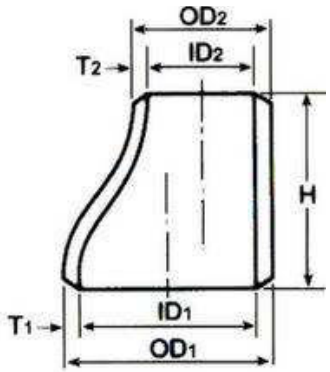
Nominal Pipe Size (NPS)	Outside Diameter At Bevel D		Center to End	
	Run	Outlet	Run C	Outlet (1) M
60 x 40*		1016.0		863.6
60 x 28*		711.2		863.6
60 x 20*		508.0		863.6
64 x 64*	1626.0	1626.0	1194.0	1092.0
64 x 60*		1524.0		1067.0
64 x 56*		1422.0		1016.0
64 x 52*		1321.0		965.0
64 x 48*		1219.0		914
66 x 66*	1676.4	1676.4	1219.2	1066.8
68 x 68*	1727.0	1727.0	1270.0	1168.0
68 x 64*		1626.0		1143.0
68 x 60*		1524.0		1118.0
68 x 56*		1422.0		1067.0
68 x 52*		1321.0		1016.0
68 x 48*		1219.0		965.0
72 x 72*	1829.0	1829.0	1320.0	1245.0
72 x 68*		1727.0		1219.0
72 x 64*		1626.0		1194.0
72 x 60*		1524.0		1168.0
72 x 56*	1829.0	1422.0	1320.0	1118.0
72 x 52*		1321.0		1067.0
72 x 48*		1219.0		1016.0
76 x 76*	1930.0	1930.0	1422.0	1320.0
76 x 72*		1829.0		1295.0
76 x 68*		1727.0		1270.0
76 x 64*		1626.0		1245.0
76 x 60*		1524.0		1219.0
76 x 56*		1422.0		1168.0
76 x 52*		1321.0		1118.0
76 x 48*		1219.0		1067.0
80 x 80*	2032.0	2032.0	1499.0	1397.0
80 x 76*		1930.0		1372.0
80 x 72*		1829.0		1346.0
80 x 68*		1727.0		1321.0
80 x 64*		1626.0		1295.0
80 x 60*		1524.0		1270.0
80 x 56*		1422.0		1219.0
80 x 52*		1321.0		1168.0
80 x 48*		1219.0		1118.0

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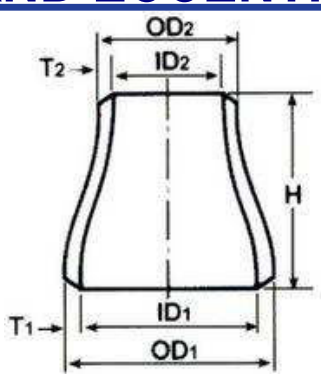
Nominal Pipe Size (NPS)			Outside Diameter at Bevel		End-to-end
			Large End	Small End	
3/4	x	1/2	26.7	21.3	38.1
3/4	x	3/8		17.3	
1	x	3/4	33.4	26.7	50.8
1	x	1/2		21.3	
1-1/4	x	1	42.2	33.4	50.8
1-1/4	x	3/4		26.7	
1-1/4	x	1/2		21.3	
1-1/2	x	1-1/4	48.3	42.2	63.5
1-1/2	x	1		33.4	
1-1/2	x	3/4		26.7	
1-1/2	x	1/2		21.3	
2	x	1-1/2	60.3	48.3	76.2
2	x	1-1/4		42.2	
2	x	1		33.4	
2	x	3/4		26.7	
2-1/2	x	2	73.0	60.3	88.9
2-1/2	x	1-1/2		48.3	
2-1/2	x	1-1/4		42.2	
2-1/2	x	1		33.4	
3	x	2-1/2	88.9	73.0	88.9
3	x	2		60.3	
3	x	1-1/2		48.3	
3	x	1-1/4		42.2	
3-1/2	x	3	101.6	88.9	101.6
3-1/2	x	2-1/2		73.0	
3-1/2	x	2		60.3	
3-1/2	x	1-1/2		48.3	
3-1/2	x	1-1/4		42.2	
4	x	3-1/2	114.3	101.6	101.6
4	x	3		88.9	
4	x	2-1/2		73.0	
4	x	2		60.3	
4	x	1-1/2		48.3	
5	x	4	141.3	114.3	127.0
5	x	3-1/2		101.6	
5	x	3		88.9	
5	x	2-1/2		73.0	
5	x	2		60.3	
6	x	5	168.3	141.3	139.7
6	x	4		114.3	
6	x	3-1/2		101.6	
6	x	3		88.9	

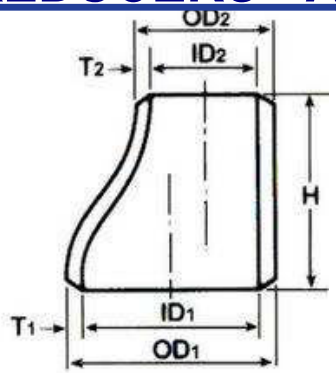
Nominal Pipe Size (NPS)			Outside Diameter at Bevel		End-to-end
			Large End	Small End	
8	x	6	219.1	168.3	152.4
8	x	5		141.3	
8	x	4		114.3	
8	x	3-1/2		101.6	
8	x	3		88.9	
8	x	2-1/2		73.0	
10	x	8	273.1	29.1	177.8
10	x	6		168.3	
10	x	5		141.3	
10	x	4		114.3	
12	x	10	323.9	273.1	203.2
12	x	8		219.1	
12	x	6		168.3	
12	x	5		141.3	
14	x	12	355.6	323.9	330.2
14	x	10		273.1	
14	x	8		219.1	
14	x	6		168.3	
16	x	14	406.4	355.6	355.6
16	x	12		323.9	
16	x	10		273.1	
16	x	8		219.1	
18	x	16	457.2	406.4	381.0
18	x	14		355.6	
18	x	12		323.9	
18	x	10		273.1	
18	x	8		219.1	
20	x	18	508.0	457.2	508.0
20	x	16		406.4	
20	x	14		355.6	
20	x	12		323.9	
20	x	10		273.0	
22	x	20	558.8	508.0	508.0
22	x	18		457.2	
22	x	16		406.4	
22	x	14		355.6	
22	x	12		323.8	
24	x	22	609.6	558.8	508.0
24	x	20		508.0	
24	x	18		457.2	
24	x	16		406.4	
24	x	16		355.6	

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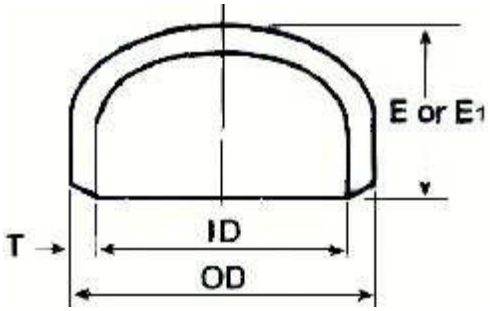
Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-end
	Large End	Small End	
26 x 24	660.4	609.6	609.6
26 x 22		558.8	
26 x 20		508.0	
26 x 18		457.2	
26 x 16		406.4	
26 x 14		355.6	
28 x 26	711.2	660.4	609.6
28 x 24		609.6	
28 x 22		559.0	
28 x 20		508.0	
28 x 18		457.2	
28 x 16		406.4	
28 x 14		355.6	
30 x 28	762.0	711.2	609.6
30 x 26		660.4	
30 x 24		609.6	
30 x 22		559.0	
30 x 20		508.0	
30 x 18		457.0	
30 x 16		406.4	
30 x 14		355.6	
32 x 30	813.0	762.0	609.6
32 x 28		711.0	
32 x 26		660.0	
32 x 24		610.0	
32 x 22		559.0	
32 x 20		508.0	
34 x 32	863.6	812.8	609.6
34 x 30		762.0	
34 x 28		711.0	
34 x 26		711.2	
34 x 24		660.4	
34 x 22		559.0	
36 x 34	914.0	864.0	609.6
36 x 32		813.0	
36 x 30		762.0	
36 x 28		711.0	
36 x 26		660.0	
36 x 24		610.0	
36 x 22		559.0	
38 x 36	965.0	914.0	609.6
38 x 34		864.0	
38 x 32		813.0	
38 x 30		762.0	
38 x 28		711.0	
38 x 26		660.0	
38 x 24		610.0	

Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-end
	Large End	Small End	
40 x 38	1016.0	965.0	609.6
40 x 36		914.0	
40 x 34		864.0	
40 x 32		813.0	
40 x 30		762.0	
40 x 28		711.0	
42 x 40	1067.0	1016.0	609.6
42 x 38		965.0	
42 x 36		914.4	
42 x 34		863.6	
42 x 32		812.8	
42 x 30		762.0	
42 x 28		711.0	
44 x 42	1117.6	1066.8	609.6
44 x 40		1016.0	
44 x 38		965.2	
44 x 36		914.4	
44 x 34		864.0	
44 x 32		813.0	
46 x 44	1168.4	1117.6	711.2
46 x 42		1066.8	
46 x 40		1016.0	
46 x 38		965.2	
46 x 36		914.0	
46 x 34		864.0	
48 x 46	1219.2	1168.4	711.2
48 x 44		1117.6	
48 x 42		1066.8	
48 x 40		1016.0	
48 x 38		965.0	
48 x 36		914.0	
52 x 48	1321.0	1219.0	711.2
52 x 46		1168.0	
52 x 44		1118.0	
52 x 42		1067.0	
52 x 40		1016.0	
56 x 52	1422.0	1321.0	711.2
56 x 48		1219.0	
56 x 44		1118.0	
52 x 40		1016.0	
60 x 56	1524.0	1422.0	711.2
60 x 52		1321.0	
60 x 48		1219.0	
60 x 44		1118.0	

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PIPE CAPS - ANSI B16.9



Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Length (2) E	Limiting Wall Thickness for Length E	Length (3) E1
1/2	21.3	25.4	4.6	25.4
3/4	26.7	25.4	3.8	25.4
1	33.4	38.1	4.6	38.1
1-1/4	42.2	38.1	4.8	38.1
1-1/2	48.3	38.1	5.1	38.1
2	60.3	38.1	5.6	44.4
2-1/2	73.0	38.1	7.1	50.8
3	88.9	50.8	7.6	63.5
3-1/2	101.6	63.5	8.1	76.2
4	114.3	63.5	8.6	76.2
5	141.3	76.2	9.7	88.9
6	168.3	88.9	10.9	101.6
8	219.1	101.6	12.7	127.0
10	273.1	127.0	12.7	152.4
12	323.9	152.4	12.7	177.8
14	355.6	165.1	12.7	190.5
16	406.4	177.8	12.7	203.2
18	457.2	203.2	12.7	228.6
20	508.0	228.6	12.7	254.0
22	558.8	254.0	12.7	254.0
24	609.6	266.7	12.7	304.8
26	660.4	266.7		
28	711.2	266.7		
30	762.0	266.7		
32	812.8	266.7		
34	863.6	266.7		
36	914.4	266.7		
38	965.2	304.8		
40	1016.0	304.8		
42	1066.8	304.8		
44	1117.6	342.9		
46	1168.4	342.9		
48	1219.2	342.9		

Wall thickness for caps up to and including 36” conform to ANSI B36.10 specifications. Caps 38” and larger conform to XS specifications for wall thickness of 36”. These are Wellgrow’s standards as no internationally recognized standards have been set for such large size wall thickness.

(1) 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.
(2) Length E applies for thickness not exceeding that given in column “limiting wall thickness for length E”.
(3) Length E1 applies for thickness greater than that given in column “limiting wall thickness” for NPS 24 and smaller. For NPS 26 and larger, length E1 shall be by agreement between manufacturer and purchaser.

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WALL THICKNESS SCHEDULE

ANSI B36.19M ANSI B36.10M (in mm)

Nominal Pipe Size		Outside Diameter		Nominal Wall Thickness																	
A	B	JIS	ANSI	Sch 5S	Sch 10S	Sch 20S	GS	Sch 10	LG (7.9)	Sch 20	Sch 30	STD	Sch 40	Sch 60	XS	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160	XXS
8	1/4	13.8	13.7	1.2	1.65	2.0	2.3	-	-	-	-	(2.2)	2.2	2.4	(3.0)	3.0	-	-	-	-	-
10	3/8	17.3	17.1	1.2	1.65	2.0	2.3	-	-	-	-	(2.3)	2.3	2.8	(3.2)	3.2	-	-	-	-	-
15	1/2	21.7	21.3	1.65	2.1	2.5	2.8	-	-	-	-	(2.8)	2.8	3.2	(3.7)	3.7	-	-	-	4.7	7.5
20	3/4	27.2	26.7	1.65	2.1	2.5	2.8	-	-	-	-	(2.9)	2.9	3.4	(3.9)	3.9	-	-	-	5.5	7.8
25	1	34.0	33.4	1.65	2.8	3.0	3.2	-	-	-	-	(3.4)	3.4	3.9	(4.5)	4.5	-	-	-	6.4	9.1
32	1-1/4	42.7	42.2	1.65	2.8	3.0	3.5	-	-	-	-	(3.6)	3.6	4.5	(4.9)	4.9	-	-	-	6.4	9.7
40	1-1/2	48.6	48.3	1.65	2.8	3.0	3.5	-	-	-	-	(3.7)	3.7	4.5	(5.1)	5.1	-	-	-	7.1	10.2
50	2	60.5	60.3	1.65	2.8	3.5	3.8	-	-	-	-	(3.9)	3.9	4.9	(5.5)	5.5	-	-	-	8.7	11.1
65	2-1/2	76.3	73.0	2.1	3.0	3.5	4.2	-	-	-	-	(5.2)	5.2	6.0	(7.0)	7.0	-	-	-	9.5	14.0
80	3	89.1	88.9	2.1	3.0	4.0	4.2	-	-	-	-	(5.5)	5.5	6.6	(7.6)	7.6	-	-	-	11.1	15.2
90	3-1/2	101.6	101.6	2.1	3.0	4.0	4.2	-	-	-	-	(5.7)	5.7	7.0	(8.1)	8.1	-	-	-	12.7	-
100	4	114.3	114.3	2.1	3.0	4.0	4.5	-	-	-	-	(6.0)	6.0	7.1	(8.6)	8.6	-	11.1	-	13.5	17.1
125	5	139.8	141.3	2.8	3.4	5.0	4.5	-	-	-	-	(6.6)	6.6	8.1	(9.5)	9.5	-	12.7	-	15.9	19.0
150	6	165.2	168.3	2.8	3.4	5.0	5.0	-	5.0**	-	-	(7.1)	7.1	9.3	(11.0)	11.0	-	14.3	-	18.2	21.9
175	7	190.7	-	-	-	-	5.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	8	216.3	219.1	2.8	3.8	6.5	5.8	-	5.8**	6.4	7.0	(8.2)	8.2	10.3	(12.7)	12.7	15.1	18.2	20.6	23.0	22.2
225	9	241.8	-	-	-	-	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
250	10	267.4	273.1	3.4	4.2	6.5	6.6	-	6.6**	6.4	7.8	(9.3)	9.3	12.7	12.7	15.1	18.3	21.4	25.4	28.6	25.4
300	12	318.5	323.9	4.0	4.6	6.5	6.9	-	6.9**	6.4	8.4	9.5	10.3	14.3	12.7	17.4	21.4	25.4	28.6	33.3	25.4
350	14	355.6	355.6	4.0	4.8	7.9	7.9	6.4	7.9	7.9	9.5	9.5	11.1	15.1	12.7	19.0	23.8	27.8	31.8	35.7	-
400	16	406.4	406.4	4.2	4.8	7.9	7.9	6.4	7.9	7.9	9.5	9.5	12.7	16.7	12.7	21.4	26.2	30.9	36.5	40.5	-
450	18	457.2	457.2	4.2	4.8	7.9	7.9	6.4	7.9	7.9	11.1	9.5	14.3	19.0	12.7	23.8	29.4	34.9	39.7	45.2	-
500	20	508.0	508.0	4.8	5.5	7.9	7.9	6.4	7.9	9.5	12.7	9.5	15.1	20.6	12.7	26.2	32.5	38.1	44.4	50.0	-
550	22	558.8	558.8	4.8	5.5	-	-	6.4	7.9	9.5	12.7	9.5	-	22.2	12.7	28.6	34.9	41.3	47.6	54.0	-
600	24	609.6	609.6	5.5	6.4	-	-	6.4	7.9	9.5	14.3	9.5	17.5	24.6	12.7	31.0	38.9	46.0	52.4	59.5	-
650	26	660.4	660.4	-	-	-	-	7.9	7.9	12.7	-	9.5	-	-	12.7	-	-	-	-	-	-
700	28	711.2	711.2	-	-	-	-	7.9	7.9	12.7	15.9	9.5	-	-	12.7	-	-	-	-	-	-
750	30	762.0	762.0	6.4	7.9	-	-	7.9	7.9	12.7	15.9	9.5	-	-	12.7	-	-	-	-	-	-
800	32	812.8	812.8	-	-	-	-	7.9	7.9	12.7	15.9	9.5	17.5	-	12.7	-	-	-	-	-	-
850	34	863.6	863.6	-	-	-	-	7.9	7.9	12.7	15.9	9.5	17.5	-	12.7	-	-	-	-	-	-
900	36	914.4	914.4	-	-	-	-	7.9	7.9	12.7	15.9	9.5	19.1	-	12.7	-	-	-	-	-	-
950	38	965.2	965.2	-	-	-	-	-	7.9	12.7	-	9.5	-	-	12.7	-	-	-	-	-	-
1000	40	1016.0	1016.0	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1050	42	1066.8	1066.8	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1100	44	1117.6	1117.6	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1150	46	1168.4	1168.4	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1200	48	1219.2	1219.2	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1250	50	1270.0	1270.0	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1300	52	1320.8	1320.8	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1350	54	1371.6	1371.6	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1400	56	1422.4	1422.4	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1450	58	1473.2	1473.2	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1500	60	1524.0	1524.0	-	-	-	-	-	7.9	-	-	9.5	-	-	12.7	-	-	-	-	-	-
1600	64	1626.0																			
1700	68	1727.0																			
1800	72	1829.0																			
1900	76	1932.0																			
2000	80	2032.0																			

**Applied only small end side of the tee and reducers.
The numerical values in parenthesis are the same thickness as Sch. 40 or Sch. 80.

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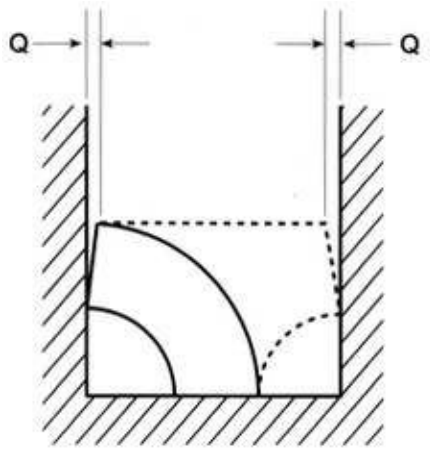
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ANSI DIMENSIONAL TOLERANCES

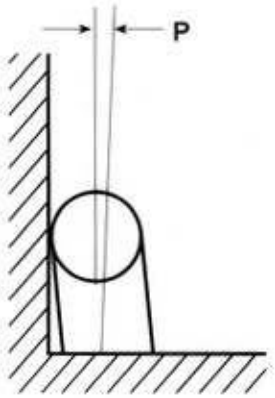
ANSI B16.9, B16.28 (in mm)

Nominal Pipe Size	All Fittings			90° and 45° Elbows	Tees	Reducers	Caps	180° Returns		
	Outside Diameter at Bevel OD	Inside Diameter at End ID	Wall Thickness T	Center-to-end Dimension A, B	Center-to-end Dimension C, M	Overall Length H	Overall Length E	Center-to-center Dimension P	Back-to-face Dimension K	Alignment of Ends U
1/2~2-1/2	+1.5 -0.7	±0.7	Not less than 87.5% of nominal thickness	±1.5	±1.5	±1.5	±3.0	±6.3	±6.3	±0.7
3~4	±1.5	±1.5								
5~8	+2.2 -1.5						±6.3			
10~18	+4.0 -3.0	±3.0		±2.2	±2.2	±2.2		±9.6		±0.7
20~24	+6.3 -4.8	±4.8								
26~30				±3.0	±3.0	±4.8	±9.6	-	-	-
32~48				±4.8	±4.8					
*50~60	+9.5 -6.4	±6.4		±9.5	±9.5	±9.5	-			
*62~70	+12.7 -9.5	±9.5		±12.7	-	-				
*72~80	+15.9 -11.9	±11.9		±15.9						

Nominal Pipe Size	Angularity Tolerance	
	Off Angle Q	Off Plane P
1/2~4	0.7	1.5
5~8	1.5	3.0
10~12	2.2	4.8
14~16		6.3
18~24	3.0	9.6
26~30	4.8	
32~42		12.7
44~48		19.0
*50~60	6.4	
*62~70	9.5	
*72~80	11.9	



Off Angle



Off Plane

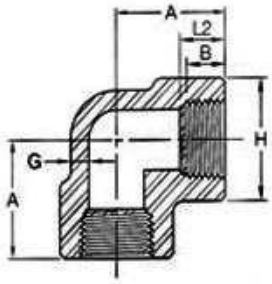
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FORGED HIGH PRESSURE PIPE FITTING

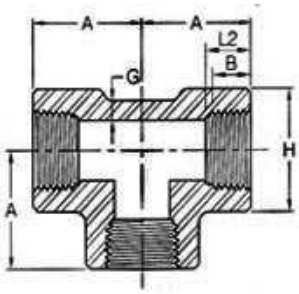


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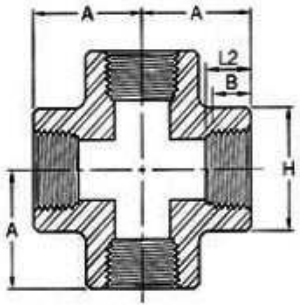
THREAD FITTING ASME B16.11



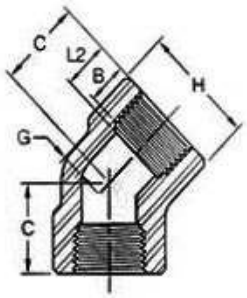
90° ELBOW



TEE



CROSS



45° ELBOW

DN	Nom. Pipe Size	Center to End Elbow, Tee, Cross A			Center to End 45° Elbow C			Outside Diameter Of Band H			Minimum Wall Thickness G			Length of Thread Min. (1)	
		2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L2
6	1/8”	21	21	25	17	17	19	22	22	25	3.18	3.18	6.35	6.4	6.7
8	1/4”	21	25	28	17	19	22	22	25	33	3.18	3.30	6.60	8.1	10.2
10	3/8”	25	28	33	19	22	25	25	33	38	3.18	3.51	6.98	9.1	10.4
15	1/2”	28	33	38	22	25	28	33	38	46	3.18	4.09	8.15	10.9	13.6
20	3/4”	33	38	44	25	28	33	38	46	56	3.18	4.32	8.53	12.7	13.9
25	1”	38	44	51	28	33	35	46	56	62	3.68	4.98	9.93	14.7	17.3
32	1-1/4”	44	51	60	33	35	43	56	62	75	3.89	5.28	10.59	17.0	18.0
40	1-1/2”	51	60	64	35	43	44	62	75	84	4.01	5.56	11.07	17.8	18.4
50	2”	60	64	83	43	44	52	75	84	102	4.27	7.14	12.09	19.0	19.2
65	2-1/2”	76	83	95	52	52	64	92	102	121	5.61	7.65	15.29	23.6	28.9
80	3”	86	95	106	64	64	79	109	121	146	5.99	8.84	16.64	25.9	30.5
100	4”	106	114	114	79	79	79	146	152	152	6.55	11.18	18.67	27.7	33.0

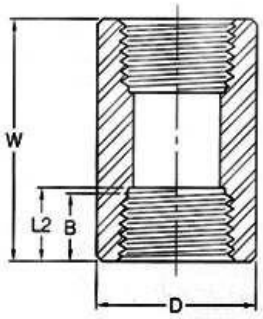
(1) Dimensions in Millimeters.

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

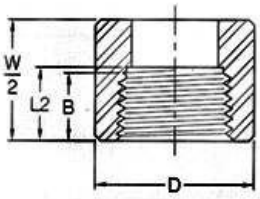
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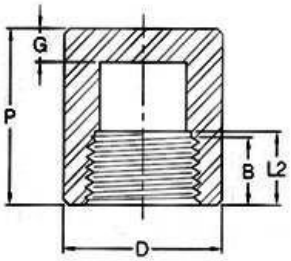
THREAD FITTING ASME B16.11



COUPLING



HALF COUPLING



CAP

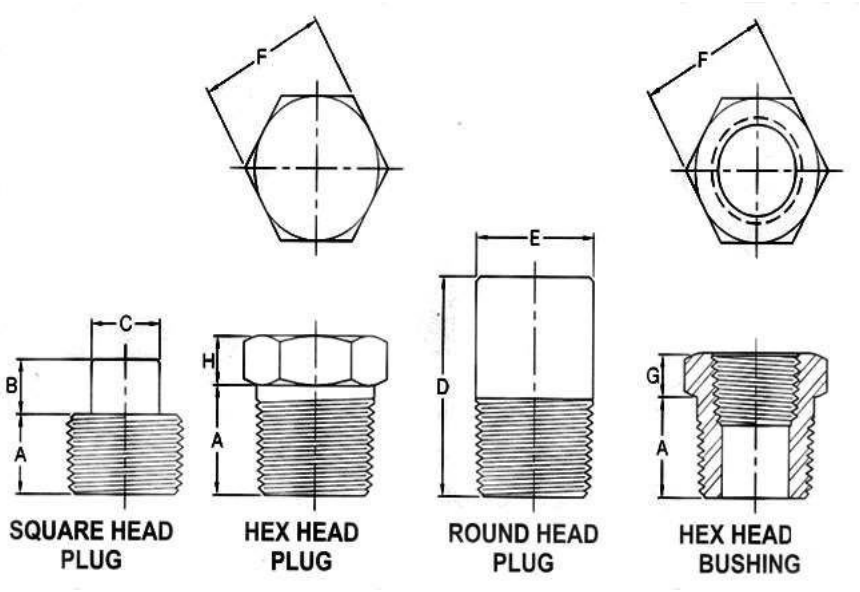
DN	Nom. Pipe Size	Center to End Coupling W	Center to End Cap P		Outside Diameter D		End Wall Thickness G Min.		Length of Thread Min. (1)	
		3000 & 6000	3000	6000	3000	6000	3000	6000	B	L2
6	1/8”	32	19		16		4.8		6.4	6.7
8	1/4”	35	25	27	19	25	4.8	6.4	8.1	10.2
10	3/8”	38	25	27	22	32	4.8	6.4	9.1	10.4
15	1/2”	48	32	33	28	38	6.4	7.9	10.9	13.6
20	3/4”	51	37	38	35	44	6.4	7.9	12.7	13.9
25	1”	60	41	43	44	57	9.7	11.2	14.7	17.3
32	1-1/4”	67	44	46	57	64	9.7	11.2	17.0	18.0
40	1-1/2”	79	44	48	64	76	11.2	12.7	17.8	18.4
50	2”	86	48	51	76	92	12.7	15.7	19.0	19.2
65	2-1/2”	92	60	64	92	108	15.7	19.0	23.6	28.9
80	3”	108	65	68	108	127	19.0	22.4	25.9	30.5
100	4”	121	68	75	140	159	22.4	28.4	27.7	33.0

(1) Dimensions in Millimeters.

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

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THREAD FITTING ASME B16.11



DN	Nom. Pipe Size	Length (Min.)	Square Head Plug		Round Head Plug		Hex. Head Plug & Bushing		
			Height of Square (Min.)	Width Flat (Min.)	Nominal Diameter of Head (Nom)	Length (Min.)	Width Flat (Nom.)	Hex. Height (Min.)	
								Bushing	Plug
		A	B	C	E	D	F	G	H
6	1/8”	10	6	7	10	35			6
8	1/4”	11	6	10	14	41	16	3	6
10	3/8”	13	8	11	18	41	18	4	8
15	1/2”	14	10	14	21	44	22	5	8
20	3/4”	16	11	16	27	44	27	6	10
25	1”	19	13	21	33	51	36	6	10
32	1-1/4”	21	14	24	43	51	46	7	14
40	1-1/2”	21	16	28	48	51	50	8	16
50	2”	22	18	32	60	64	65	9	18
65	2-1/2”	27	19	36	73	70	75	10	19
80	3”	28	21	41	89	70	90	10	21
100	4”	32	25	65	114	76	115	13	25

(1) Dimensions in Millimeters.

(2) CAUTIONARY NOTE REGARDING HEX BUSHINGS.

Hex head bushing of one-size reduction should not be used in services where they might be subject to harmful loads and forces other than internal pressure.

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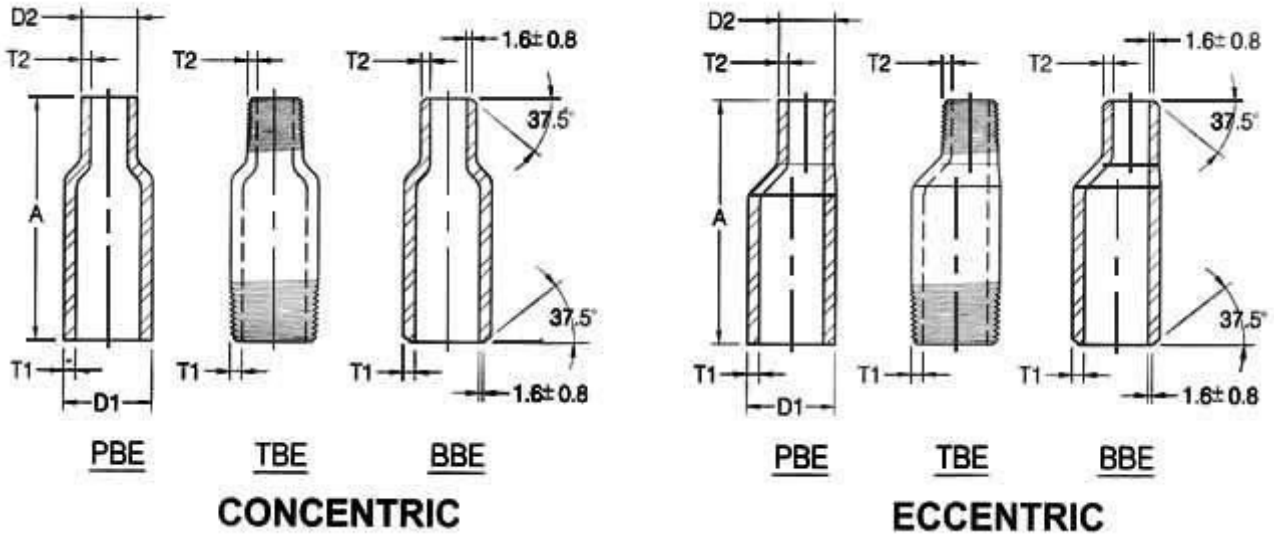
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SWAGED NIPPLE MSS-SP95

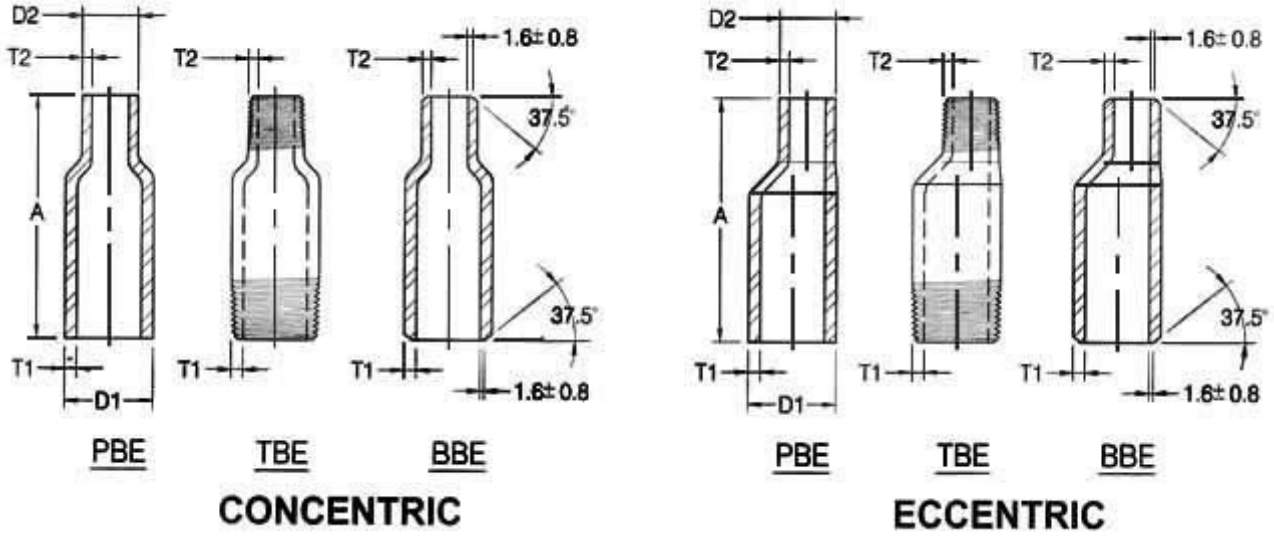


Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"	Wall Thickness							
				T1				T2			
	Large End D1	Small End D2		Sch40 (STD)	Sch80 (XS)	Sch160	XXS	Sch40 (STD)	Sch80 (XS)	Sch160	XXS
1/4"x1/8"	13.7	10.3	57	2.2	3.0	3.7	6.1	1.7	2.4		
3/8"x1/8"	17.1	10.3	64	2.3	3.2	4.0	6.4	1.7	2.4		
3/8"x1/4"	17.1	13.7	64	2.3	3.2	4.0	6.4	2.2	3.0		
1/2"x1/8"	21.3	10.3	70	2.8	3.7	4.8	7.5	1.7	2.4		
1/2"x1/4"	21.3	13.7	70	2.8	3.7	4.8	7.5	2.2	3.0		
1/2"x3/8"	21.3	17.1	70	2.8	3.7	4.8	7.5	2.3	3.2		
3/4"x1/8"	26.7	10.3	76	2.9	3.9	5.6	7.8	1.7	2.4		
3/4'x1/4"	26.7	13.7	76	2.9	3.9	5.6	7.8	2.2	3.0		
3/4"x3/8"	26.7	17.1	76	2.9	3.9	5.6	7.8	2.3	3.2		
3/4"x1/2"	26.7	21.3	76	2.9	3.9	5.6	7.8	2.8	3.7	4.8	7.5
1"x1/8"	33.4	10.3	89	3.4	4.5	6.4	9.1	1.7	2.4		
1"x1/4"	33.4	13.7	89	3.4	4.5	6.4	9.1	2.2	3.0		
1"x3/8"	33.4	17.1	89	3.4	4.5	6.4	9.1	2.3	3.2		
1"x1/2"	33.4	21.3	89	3.4	4.5	6.4	9.1	2.8	3.7	4.8	7.5
1"x3/4"	33.4	26.7	89	3.4	4.5	6.4	9.1	2.9	3.9	5.6	7.8
1-1/4"x1/8"	42.2	10.3	102	3.6	4.9	6.4	9.7	1.7	2.4		
1-1/4"x1/4"	42.2	13.7	102	3.6	4.9	6.4	9.7	2.2	3.0		
1-1/4"x3/8"	42.2	17.1	102	3.6	4.9	6.4	9.7	2.3	3.2		
1-1/4"x1/2"	42.2	21.3	102	3.6	4.9	6.4	9.7	2.8	3.7	4.8	7.5
1-1/4"x3/4"	42.2	26.7	102	3.6	4.9	6.4	9.7	2.9	3.9	5.6	7.8
1-1/4"x1"	42.2	33.4	102	3.6	4.9	6.4	9.7	3.4	4.5	6.4	9.1
1-1/2"x1/8"	48.3	10.3	114	3.7	5.1	7.1	10.2	1.7	2.4		
1-1/2"x1/4"	48.3	13.7	114	3.7	5.1	7.1	10.2	2.2	3.0		
1-1/2"x3/8"	48.3	17.1	114	3.7	5.1	7.1	10.2	2.3	3.2		
1-1/2"x1/2"	48.3	21.3	114	3.7	5.1	7.1	10.2	2.8	3.7	4.8	7.5
1-1/2"x3/4"	48.3	26.7	114	3.7	5.1	7.1	10.2	2.9	3.9	5.6	7.8
1-1/2"x1"	48.3	33.4	114	3.7	5.1	7.1	10.2	3.4	4.5	6.4	9.1
1-1/2"x1-1/4"	48.3	42.2	114	3.7	5.1	7.1	10.2	3.6	4.9	6.4	9.7
2"x1/8"	60.3	10.3	165	3.9	5.5	8.7	11.1	1.7	2.4		
2"x1/4"	60.3	13.7	165	3.9	5.5	8.7	11.1	2.2	3.0		
2"x3/8"	60.3	17.1	165	3.9	5.5	8.7	11.1	2.3	3.2		
2"x1/2"	60.3	21.3	165	3.9	5.5	8.7	11.1	2.8	3.7	4.8	7.5

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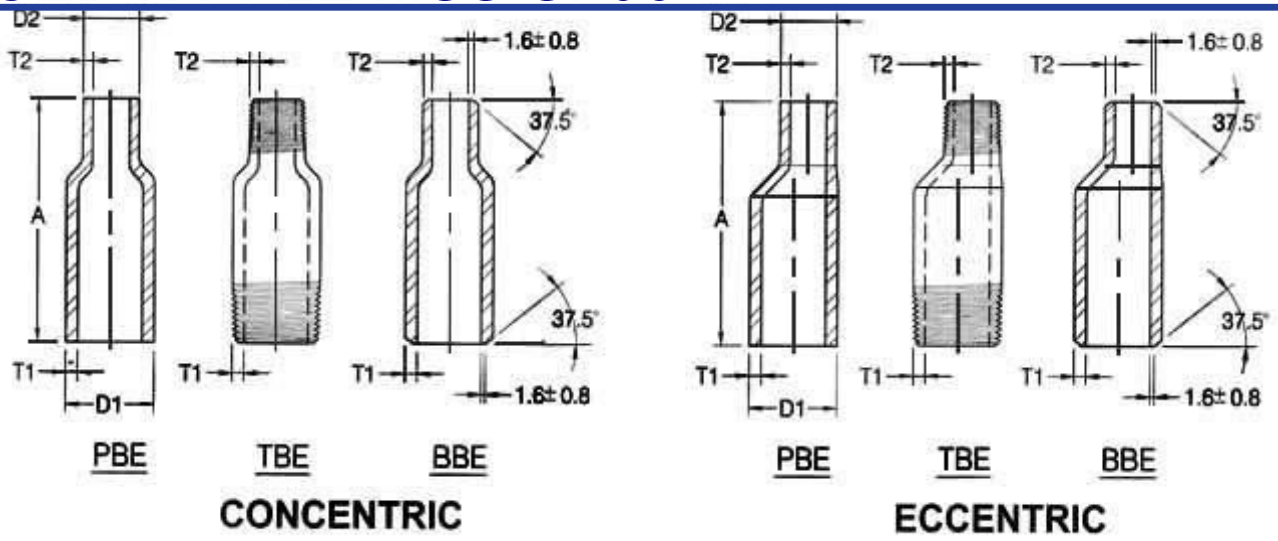


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Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"	Wall Thickness							
				T1				T2			
	Large End D1	Small End D2		Sch40 (STD)	Sch80 (XS)	Sch160	XXS	Sch40 (STD)	Sch80 (XS)	Sch160	XXS
2"x3/4"	60.3	26.7	165	3.9	5.5	8.7	11.1	2.9	3.9	5.6	7.8
2"x1"	60.3	33.4	165	3.9	5.5	8.7	11.1	3.4	4.5	6.4	9.1
2"x1-1/4"	60.3	42.2	165	3.9	5.5	8.7	11.1	3.6	4.9	6.4	9.7
2"x1-1/2"	60.3	48.3	165	3.9	5.5	8.7	11.1	3.7	5.1	7.1	10.2
2-1/2"x1/8"	73.0	10.3	178	5.2	7.0	9.5	14.0	1.7	2.4		
2-1/2"x1/4"	73.0	13.7	178	5.2	7.0	9.5	14.0	2.2	3.0		
2-1/2"x3/8"	73.0	17.1	178	5.2	7.0	9.5	14.0	2.3	3.2		
2-1/2"x1/2"	73.0	21.3	178	5.2	7.0	9.5	14.0	2.8	3.7	4.8	7.5
2-1/2"x3/4"	73.0	26.7	178	5.2	7.0	9.5	14.0	2.9	3.9	5.6	7.8
2-1/2"x1"	73.0	33.4	178	5.2	7.0	9.5	14.0	3.4	4.5	6.4	9.1
2-1/2"x1-1/4"	73.0	42.2	178	5.2	7.0	9.5	14.0	3.6	4.9	6.4	9.7
2-1/2"x1-1/2"	73.0	48.3	178	5.2	7.0	9.5	14.0	3.7	5.1	7.1	10.2
2-1/2"x2"	73.0	60.3	178	5.2	7.0	9.5	14.0	3.9	5.5	8.7	11.1
3"x1/8"	88.9	10.3	203	5.5	7.6	11.1	15.2	1.7	2.4	3.2	4.8
3"x1/4"	88.9	13.7	203	5.5	7.6	11.1	15.2	2.2	3.0	3.7	6.1
3"x3/8"	88.9	17.1	203	5.5	7.6	11.1	15.2	2.3	3.2	4.0	6.4
3"x1/2"	88.9	21.3	203	5.5	7.6	11.1	15.2	2.8	3.7	4.8	7.5
3"x3/4"	88.9	26.7	203	5.5	7.6	11.1	15.2	2.9	3.9	5.6	7.8
3"x1"	88.9	33.4	203	5.5	7.6	11.1	15.2	3.4	4.5	6.4	9.1
3"x1-1/4"	88.9	42.2	203	5.5	7.6	11.1	15.2	3.6	4.9	6.4	9.7
3"x1-1/2"	88.9	48.3	203	5.5	7.6	11.1	15.2	3.7	5.1	7.1	10.2
3"x2"	88.9	60.3	203	5.5	7.6	11.1	15.2	3.9	5.5	8.7	11.1
3"x2-1/2"	88.9	73.0	203	5.5	7.6	11.1	15.2	5.2	7.0	9.5	14.0
3-1/2"x1/8"	101.6	10.3	203	5.7	8.1			1.7	2.4		
3-1/2"x1/4"	101.6	13.7	203	5.7	8.1			2.2	3.0		
3-1/2"x3/8"	101.6	17.1	203	5.7	8.1			2.3	3.2		
3-1/2"x1/2"	101.6	21.3	203	5.7	8.1			2.8	3.7	4.8	7.5
3-1/2"x3/4"	101.6	26.7	203	5.7	8.1			2.9	3.9	5.6	7.8
3-1/2"x1"	101.6	33.4	203	5.7	8.1			3.4	4.5	6.4	9.1
3-1/2"x1-1/4"	101.6	42.2	203	5.7	8.1			3.6	4.9	6.4	9.7

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SWAGED NIPPLE MSS-SP95



(C

Nominal Pipe Size (NPS)	Outside Diameter		End To End "A"	Wall Thickness							
				T1				T2			
	Large End D1	Small End D2		Sch40 (STD)	Sch80 (XS)	Sch160	XXS	Sch40 (STD)	Sch80 (XS)	Sch160	XXS
3-1/2"x1-1/2"	101.6	48.3	203	5.7	8.1			3.7	5.1	7.1	10.2
3-1/2"x2"	101.6	60.3	203	5.7	8.1			3.9	5.5	8.7	11.1
3-1/2"x2-1/2"	101.6	73.0	203	5.7	8.1			5.2	7.0	9.5	14.0
3-1/2"x3"	101.6	88.9	203	5.7	8.1			5.5	7.6	11.1	15.2
4"x1/4"	114.3	13.7	229	6.0	8.6	13.5	17.1	2.2	3.0		
4"x3/8"	114.3	17.1	229	6.0	8.6	13.5	17.1	2.3	3.2		
4"x1/2"	114.3	21.3	229	6.0	8.6	13.5	17.1	2.8	3.7	4.8	7.5
4"x3/4"	114.3	26.7	229	6.0	8.6	13.5	17.1	2.9	3.9	5.6	7.8
4"x1"	114.3	33.4	229	6.0	8.6	13.5	17.1	3.4	4.5	6.4	9.1
4"x1-1/4"	114.3	42.2	229	6.0	8.6	13.5	17.1	3.6	4.9	6.4	9.7
4"x1-1/2"	114.3	48.3	229	6.0	8.6	13.5	17.1	3.7	5.1	7.1	10.2
4"x2"	114.3	60.3	229	6.0	8.6	13.5	17.1	3.9	5.5	8.7	11.1
4"x2-1/2"	114.3	73.0	229	6.0	8.6	13.5	17.1	5.2	7.0	9.5	14.0
4"x3"	114.3	88.9	229	6.0	8.6	13.5	17.1	5.5	7.6	11.1	15.2
4"x3-1/2"	114.3	101.6	229	6.0	8.6	13.5	17.1	5.7	8.1		

(1) Dimensions in Millimeters.
(2) Wall Thickness : T1 & T2 in accordance with ASME B36.10M

PBE : Plain Both Ends　　BBE : Bevel Both Ends　　TBE : Thread Both Ends
PSE : Plain Small End　　BSE : Bevel Small End　　TSE : Thread Small End
PLE : Plain Large End　　BLE : Bevel Large End　　TLE : Thread Large End

Dimensional Tolerance of Swaged Nipple

Nominal Pipe Size (inch)	Overall Length (mm)	Outside diameter at end		Wall Thickness (prior to threading or grooving)
		Square Cut Ends (mm)	Other End Connection (mm)	
1/8" to 3/8"	± 1.5	+ 0.40 - 0.80	± 0.80	Not less than 87.5% of nominal wall thickness
1/2" to 1-1/2"	± 1.5	+ 0.40 - 0.80	+ 1.50 - 0.80	
2" to 2-1/2"	± 3.0	± 0.80	+ 1.50 - 0.80	
3" to 4"	± 3.0	± 0.80	± 1.50	

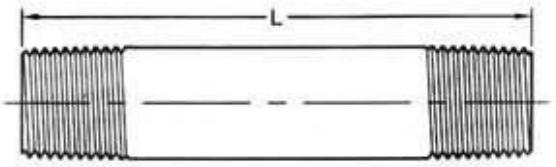
(1) Dimensions in Millimeters

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PIPE NIPPLE THREADED



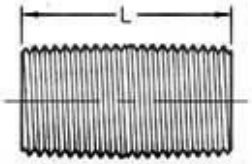
Plain End



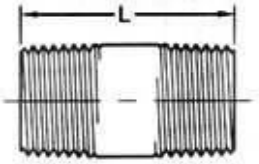
Long Nipple



Bevel End



Close Nipple



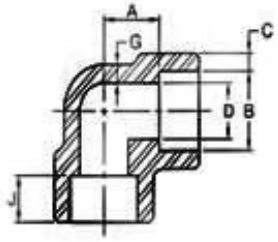
Short Nipple

Nom. Pipe Size	L			Plain End Weight (kg/m)			
	Close Nipple	Short Nipple	Long Nipple	Sch40/STD	Sch80/XS	Sch160	XXS
1/8”	3/4	1-1/2	2~12	0.37	0.47		
1/4”	7/8	1-1/2	2~12	0.63	0.80		
3/8”	1	1-1/2	2~12	0.84	1.10		
1/2”	1-1/8	1-1/2	2~12	1.27	1.62	1.95	2.55
3/4”	1-3/8	2	2-1/2~12	1.69	2.20	2.90	3.64
1”	1-1/2	2	2-1/2~12	2.50	3.24	4.24	5.45
1-1/4”	1-5/8	2-1/2	3~12	3.39	4.47	5.61	7.77
1-1/2”	1-3/4	2-1/2	3~12	4.05	5.41	7.25	9.55
2”	2	2-1/2	3~12	5.44	7.48	11.11	13.44
2-1/2”	2-1/2	3	3-1/2~12	8.63	11.41	14.92	20.39
3”	2-5/8	3	3-1/2~12	11.29	15.27	21.35	27.68
3-1/2”	2-3/4	4	4-1/2~12	13.57	18.64		
4”	2-7/8	4	4-1/2~12	16.08	22.32	33.54	41.03
5”	3	4-1/2	5~12	21.77	30.97	49.12	57.43
6”	3-1/8	4-1/2	5~12	28.26	42.56	67.57	79.22

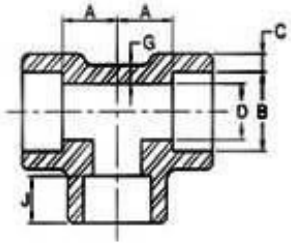
(1) Dimensions in Millimeters.
(2) Thickness in accordance with ASME B1.20.1
(3) Weld bevel in accordance with ASME B16.25
(4) Weight in accordance with ASME B36.10M Table 1.

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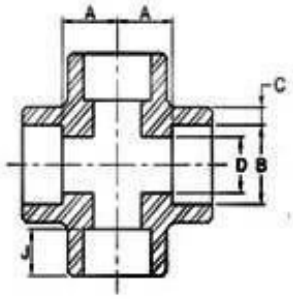
SOCKET WELD FITTINGS ASME B16.11



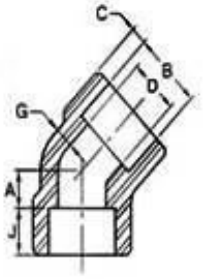
90° ELBOW



CROSS



TEE



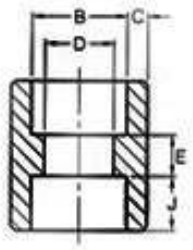
45° ELBOW

DN	Nom. Pipe Size	Center to Bottom of Socket-A						Socket Bore Dia. B	Bore Dia. Of Fitting D			Socket Wall Thickness (2) C						Body Wall Thickness G			Depth of Socket Min. J
		90° Elbows Tees, Crosses			45° Elbows							Class Designation						Class Designation			
		Class Designation			Class Designation				Class Designation			3000		6000		9000		3000	6000	9000	
		3000	6000	9000	3000	6000	9000		3000	6000	9000	Ave.	Min	Ave.	Min	Ave.	Min	Min.	Min.	Min.	
6	1/8”	11.0	11.0		8.0	8.0		10.8	6.9	4.0		3.18	3.18	3.96	3.43			2.41	3.15		9.5
8	1/4”	11.0	13.5		8.0	8.0		14.2	9.3	6.4		3.78	3.30	4.60	4.01			3.02	3.68		9.5
10	3/8”	13.5	15.5		8.0	11.0		17.6	12.6	9.2		4.01	3.50	5.03	4.37			3.20	4.01		9.5
15	1/2”	15.5	19.0	25.5	11.0	12.5	15.5	21.8	15.8	11.8	6.4	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	9.5
20	3/4”	19.0	22.5	28.5	13.0	14.0	19.0	27.2	21.0	15.6	11.1	4.90	4.27	6.96	6.04	9.78	8.56	3.91	5.56	7.82	12.5
25	1”	22.5	27.0	32.0	14.0	17.5	20.5	33.9	26.7	20.7	15.2	5.69	4.98	7.92	6.93	11.38	9.96	4.55	6.35	9.09	12.5
32	1-1/4”	27.0	32.0	35.0	17.5	20.5	22.5	42.7	35.1	29.5	22.8	6.07	5.28	7.92	6.93	12.14	10.62	4.85	6.35	9.70	12.5
40	1-1/2”	32.0	38.0	38.0	20.5	25.5	25.5	48.8	40.9	34.0	28.0	6.35	5.54	8.92	7.80	12.70	11.12	5.08	7.14	10.15	12.5
50	2”	38.0	41.0	54.0	25.5	28.5	28.5	61.2	52.5	42.9	38.2	6.93	6.04	10.92	9.50	13.84	12.12	5.54	8.74	11.07	16.0
65	2-1/2”	41.0			28.5			73.9	62.7			8.76	7.67					7.01			16.0
80	3”	57.0			32.0			89.8	78.0			9.52	8.30					7.62			16.0
100	4”	66.5			41.0			115.2	102.3			10.69	9.35					8.56			19.0

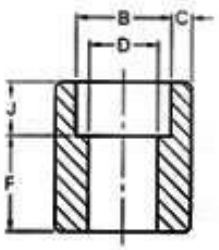
(1) Dimensions in Millimeters.
(2) Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.
(3) Upper and lower values for each size are the respective maximum and minimum dimensions.

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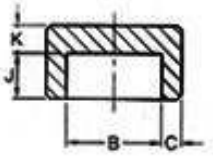
SOCKET WELD FITTINGS ASME B16.11



COUPLING



HALF COUPLING



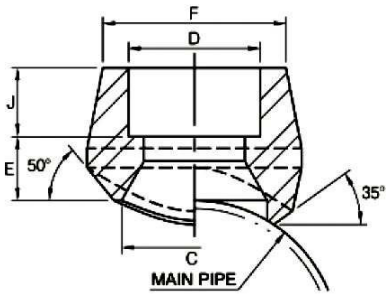
CAP

DN	Nom. Pipe Size	Socket Bore Dia. B	Bore Dia. Of Fitting D			Socket Wall Thickness (2) C						Laying Lengths		Depth of Socket Min. J	End Wall Thickness K Min.		
			Class Designation			Class Designation						Coupling E	Half Coupling F		Class Designation		
						3000		6000		9000							
			3000	6000	9000	Ave.	Min	Ave.	Min	Ave.	Min				3000	6000	9000
6	1/8”	10.8	6.9	4.0		3.18	3.18	3.96	3.43			6.5	16.0	9.5	4.8	6.4	
8	1/4”	14.2	9.3	6.4		3.78	3.30	4.60	4.01			6.5	16.0	9.5	4.8	6.4	
10	3/8”	17.6	12.6	9.2		4.01	3.50	5.03	4.37			6.5	17.5	9.5	4.8	6.4	
15	1/2”	21.8	15.8	11.8	6.4	4.67	4.09	5.97	5.18	9.35	8.18	9.5	22.5	9.5	6.4	7.9	11.2
20	3/4”	27.2	21.0	15.6	11.1	4.90	4.27	6.96	6.04	9.78	8.56	9.5	24.0	12.5	6.4	7.9	12.7
25	1”	33.9	26.7	20.7	15.2	5.69	4.98	7.92	6.93	11.38	9.96	12.5	28.5	12.5	9.6	11.2	14.2
32	1-1/4”	42.7	35.1	29.5	22.8	6.07	5.28	7.92	6.93	12.14	10.62	12.5	30.0	12.5	9.6	11.2	14.2
40	1-1/2”	48.8	40.9	34.0	28.0	6.35	5.54	8.92	7.80	12.70	11.12	12.5	32.0	12.5	11.2	12.7	15.7
50	2”	61.2	52.5	42.9	38.2	6.93	6.04	10.92	9.50	13.84	12.12	19.0	41.0	16.0	12.7	15.7	19.0
65	2-1/2”	73.9	62.7			8.76	7.67					19.0	43.0	16.0	15.7	19.0	
80	3”	89.8	78.0			9.52	8.30					19.0	44.5	16.0	19.0	22.4	
100	4”	115.2	102.3			10.69	9.35					19.0	48.0	19.0	22.4	28.4	

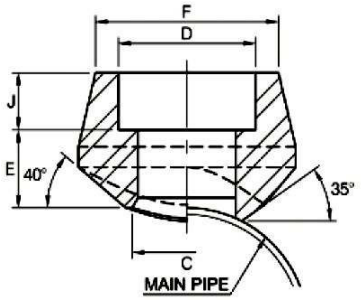
(1) Dimensions in Millimeters.
(2) Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.
(3) Reducer: C, J, E in accordance with large size.
D in accordance with small size
The others in accordance with each size.

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BRANCH OUTLET SOCKET WELD MSS-SP97



REDUCING WAY



STRAIGHT WAY

Out-Let Pipe NPS	Reducing Way									
	C		D		F		J (Min)		E (Min)	
	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000
1/8”	13.7		10.8		22.0		9.7		10.4	
1/4”	13.7		14.2		22.0		9.7		10.4	
3/8”	19.1		17.6		25.9		9.7		12.7	
1/2”	21.3	16.6	21.8	21.8	31.4	38.0	9.7	9.7	16.0	23.9
3/4”	26.7	21.2	27.2	27.2	37.1	44.0	12.7	12.7	16.0	25.4
1”	33.4	27.0	33.9	33.9	45.5	57.0	12.7	12.7	22.4	28.7
1-1/4”	42.2	35.8	42.7	42.7	57.0	64.0	12.7	12.7	22.4	30.2
1-1/2”	48.3	41.2	48.8	48.8	64.0	76.0	12.7	12.7	23.9	31.8
2”	60.3	51.6	61.2	61.2	76.0	92.0	15.8	15.8	23.9	36.6
2-1/2”	73.2		73.9		92.0		15.8		25.4	
3”	88.9		89.8		109.2		15.8		30.2	
4”	114.3		115.2		140.0		19.1		30.2	

Out-Let Pipe NPS	Straight Way				
	C	D	F	J (Min)	E (Min)
	3000				
1/8”					
1/4”	11.5	14.2	22.0	9.7	10.4
3/8”	14.5	17.6	25.9	9.7	12.7
1/2”	16.5	21.8	31.4	9.7	16.0
3/4”	21.5	27.2	37.1	12.7	16.0
1”	27.2	33.9	45.5	12.7	22.4
1-1/4”	36.0	42.7	57.0	12.7	22.4
1-1/2”	42.0	48.8	64.0	12.7	23.9
2”	53.0	61.2	76.0	15.8	23.9
2-1/2”	65.0	73.9	92.0	15.8	25.4
3”	80.0	89.8	109.2	15.8	30.2
4”	104.0	115.2	140.0	19.1	30.2

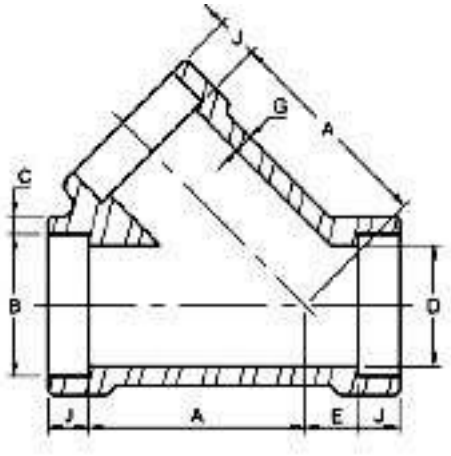
(1) Dimensions in Millimeters.
(2) Socket in accordance with ASME B16.11
(3) 3000LBS outlet size 4 and less fit a number of run pipe sizes and the fitting are marked accordingly.

Conventional Run Size Combinations

		OUTLET SIZE										
		1/4”	3/8”	1/2”	3/4”	1”	1-1/4”	1-1/2”	2”	2-1/2”	3”	4”
RUN SIZE (Main Pipe)	Reducing way	3/8”~3/4” 1”~36”	1/2” 3/4”~1-1/4” 1-1/2”~36”	3/4” 1” 1-1/4” 1-1/2”~3” 3-1/2”~36”	1” 1-1/4” 1-1/2” 2”~3” 3-1/2”~6” 8”~36”	1-1/4” 1-1/2” 2” 2-1/2” 3” 3-1/2”~4” 5”~10” 12~36”	1-1/2” 2” 2-1/2” 3” 3-1/2”~5” 6”~8” 10” ~ 36”	2” 2-1/2” 3” 3-1/2” 4”~5” 6”~10” 12”~36”	2-1/2” 3” 3-1/2” 4” 5”~6” 8”~10” 12”~18” 20”~36”	3” 3-1/2” 4” 5” 6” 8” 10”~14” 16”~36”	3-1/2” 4” 5” 6” 8” 10” 12”~16” 18”~36”	5” 6” 8” 10” 12”~14” 16”~18” 20”~24” 26”~36”
	Straight way	3/8”~36”	1/2”~36”	3/4”~36”	1”~36”	1-1/4”~1-1/2” 2”~36”	1-1/2” 2”~3” 3-1/2”~36”	2” 2-1/2”~4” 5”~36”	2-1/2” 3”~3-1/2” 4”~6” 8”~36”	3” 3-1/2”~4” 5”~8” 10”~36”	3-1/2” 4” 5” 6” 8”~12” 14”~36”	5” 6” 8” 10” 12”~16” 18”~36”

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LATERAL TEE SOCKET WELD



3000LB

DN	Nom. Pipe Size	B (2)	B (2)		D (1)	A	E	G (2) (Min)	J (2) (Min)
			(Avg)	(Min)					
15	1/2”	21.8	4.67	4.09	15.8	35	9	3.75	9.5
20	3/4”	27.2	4.90	4.27	21.0	41	9	3.95	12.5
25	1”	33.9	5.69	4.98	26.7	51	12	4.55	12.5
32	1-1/4”	42.7	6.07	5.28	35.1	59	17	4.85	12.5
40	1-1/2”	48.8	6.35	5.54	40.9	68	21	5.10	12.5
50	2”	61.2	6.93	6.04	52.5	95	24	5.55	16.0
65	2-1/2”	73.9	8.76	7.67	62.7	118	38	7.05	16.0

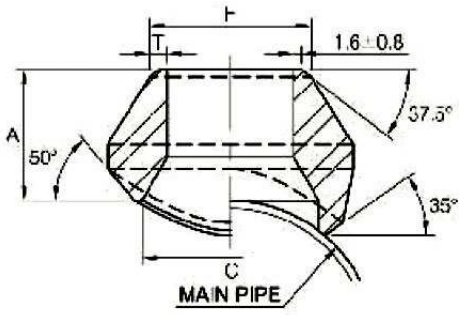
6000LB

DN	Nom. Pipe Size	B (2)	B (2)		D (2)	A	E	G (2) (Min)	J (2) (Min)
			(Avg)	(Min)					
15	1/2”	21.8	5.97	5.18	11.8	41	9	4.78	9.5
20	3/4”	27.2	6.96	6.04	15.6	51	12	5.56	12.5
25	1”	33.9	7.92	6.93	20.7	59	17	6.35	12.5
32	1-1/4”	42.7	7.92	6.93	29.5	68	21	6.35	12.5
40	1-1/2”	48.8	8.92	7.80	34.0	95	24	7.14	12.5
50	2”	61.2	10.92	9.50	42.9	106	31	8.74	16.0

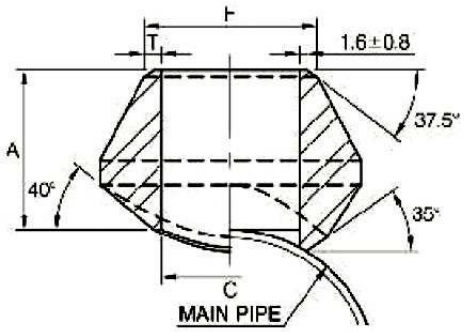
(1) Dimensions in Millimeters.
(2) Dimensions refer to ANSI B16.11
(3) Dimensions may vary according to the customer’s and manufacturer’s requirement.

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BRANCH OUTLET BUTT WELD MSS-SP97



REDUCING WAY



STRAIGHT WAY

Standard Weight and Extra Strong

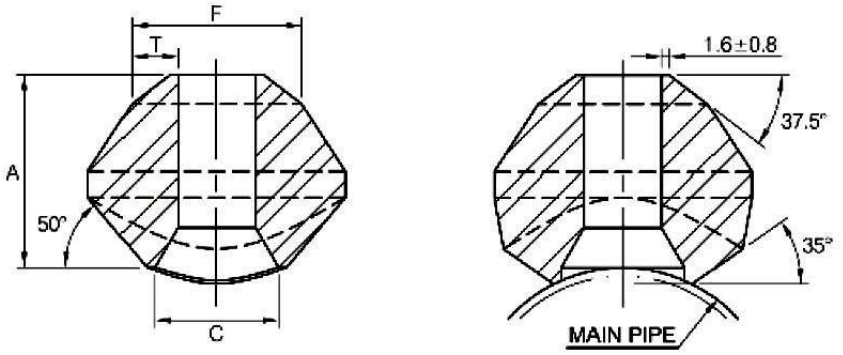
Out-Let Pipe NPS	Reducing Way				
	A	C	F	T	
				Standard Weight	Extra Strong
1/8”	16.0	13.7	10.3	1.73	2.41
1/4”	16.0	13.7	13.7	2.24	3.02
3/8”	19.0	17.1	17.1	2.31	3.20
1/2”	19.0	21.3	21.3	2.77	3.73
3/4”	22.0	26.7	26.7	2.87	3.91
1”	27.0	33.4	33.4	3.38	4.55
1-1/4”	32.0	42.2	42.2	3.56	4.85
1-1/2”	33.0	48.3	48.3	3.68	5.08
2”	38.0	60.3	60.3	3.91	5.54
2-1/2”	41.0	73.0	73.0	5.16	7.01
3”	44.0	88.9	88.9	5.49	7.62
3-1/2”	48.0	101.6	101.6	5.74	8.56
4”	51.0	114.3	114.3	6.02	8.56
5”	57.0	141.3	141.3	6.55	9.53
6”	78.0	168.3	168.3	7.11	10.97
8”	99.0	219.3	219.3	8.11	12.70
10”	94.0	273.1	273.1	9.27	12.70
12”	103.0	323.9	323.9	9.53	12.70
14”	100.0	355.6	355.6	9.53	12.70
16”	106.0	406.4	406.4	9.53	12.70
18”	111.0	457.2	457.2	9.53	12.70
20”	119.0	508.0	508.0	9.53	12.70
24”	140.0	609.6	609.6	9.53	12.70

Out-Let Pipe NPS	Straight Way				
	A	C	F	T	
				Standard Weight	Extra Strong
1/8”					
1/4”	16.0	11.5	13.7	2.24	3.02
3/8”	19.0	14.5	17.1	2.31	3.20
1/2”	19.0	16.5	21.3	2.77	3.73
3/4”	22.0	21.5	26.7	2.87	3.91
1”	27.0	27.2	33.4	3.38	4.55
1-1/4”	32.0	36.0	42.2	3.56	4.85
1-1/2”	33.0	42.0	48.3	3.68	5.08
2”	38.0	53.0	60.3	3.91	5.54
2-1/2”	41.0	65.0	73.0	5.16	7.01
3”	44.0	80.0	88.9	5.49	7.62
3-1/2”					
4”	51.0	104.0	114.3	6.02	8.56

(1) Dimensions in Millimeters.
(2) Weld Bevel in accordance with ASME B16.25
(3) Outside size 4 and less fit a number of run pipe sizes and the fitting are marked accordingly.
(4) Outside size 5 and up order to specific size combination

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BRANCH OUTLET SOCKET WELD MSS-SP97



Schedule 160 and Double Extra Strong

Out-Let Pipe	A	C	F	T	
				Sch.160	XXS
1/2”	28.0	13.8	21.3	4.78	7.47
3/4”	32.0	18.9	26.7	5.56	7.82
1”	38.0	24.3	33.4	6.35	9.09
1-1/4”	44.0	32.5	42.2	6.35	9.70
1-1/2”	51.0	38.1	48.3	7.14	10.15
2”	55.0	49.2	60.3	8.74	11.07
2-1/2”	62.0	59.0	73.0	9.53	14.02
3”	73.0	73.7	88.9	11.13	15.24
4”	84.0	97.2	114.3	13.49	17.12
5”	94.0	122.2	141.3	15.88	19.05
6”	105.0	146.4	168.3	18.26	21.95

(1) Dimensions in Millimeters.
(2) Weld Bevel in accordance with ASME B16.25
(3) Outlet size by order to specific size combination.

Conventional Run Size Combinations

		OUTLET SIZE										
		1/4”	3/8”	1/2”	3/4”	1”	1-1/4”	1-1/2”	2”	2-1/2”	3”	4”
RUN SIZE (Main Pipe)	Reducing way	3/8”~3/4” 1”~36”	1/2” 3/4”~1-1/4” 1-1/2”~36”	3/4” 1” 1-1/4” 1-1/2”~3” 3-1/2”~36”	1” 1-1/4” 1-1/2” 2”~3” 3-1/2”~6” 8”~36”	1-1/4” 1-1/2” 2” 2-1/2” 3” 3-1/2”~4” 5”~10” 12~36”	1-1/2” 2” 2-1/2” 3” 3-1/2”~5” 6”~8” 10” ~ 36”	2” 2-1/2” 3” 3-1/2” 4”~5” 6”~10” 12”~36”	2-1/2” 3” 3-1/2” 4” 5”~6” 8”~10” 12”~18” 20”~36”	3” 3-1/2” 4” 5” 6” 8” 10”~14” 16”~36”	3-1/2” 4” 5” 6” 8” 10” 12”~16” 18”~36”	5” 6” 8” 10” 12”~14” 16”~18” 20”~24” 26”~36”
	Straight way	3/8”~36”	1/2”~36”	3/4”~36”	1”~36”	1-1/4”~1-1/2” 2”~36”	1-1/2” 2”~3” 3-1/2”~36”	2” 2-1/2”~4” 5”~36”	2-1/2” 3”~3-1/2” 4”~6” 8”~36”	3” 3-1/2”~4” 5”~8” 10”~36”	3-1/2” 4” 5” 6” 8”~12” 14”~36”	5” 6” 8” 10” 12”~16” 18”~36”

Each charted outlet size is designed to fit a number of run pipe size.

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DIMENSION TOLERANCE OF ASME B16.11

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Unit: m/m

Item	Type of pipe Fitting	Nominal diameter				
		DN	6 to 8	10 to 20	25 to 50	65 to 100
		NPS	1/8 to 1/4	3/8 to 3/4	1 to 2	2-1/2 to 4
Bore diameter of socket (B)	All types of Pipe Fitting	+ 0.4 - 0				+ 0.5 - 0
Bore diameter of fitting (D)		± 0.7				± 1.4
Concentricity of bore (X)		± 0.8				
Coin cadence of axes (Y)		1 / 200 Max				
Center to bottom of socket (A)	45, 90D Elbow, Tee, Cross	± 1.0		± 1.5	± 2.0	± 2.5
Bottom to bottom of socket (E)	Full Coupling	± 1.5		± 3.0	± 4.0	± 5.0
Bottom of socket to opposite face (F)	Half Coupling	± 1.0		± 1.5	± 2.0	± 2.5

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