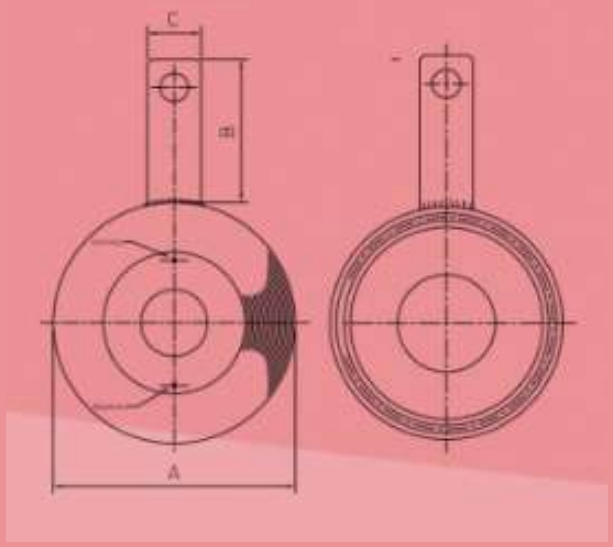
PRODUCT CATALOG 2022

GALPERTI GROUP *The Original*

PT MITRA GALPERTI

Production Department

A
ORIFICE PLATES



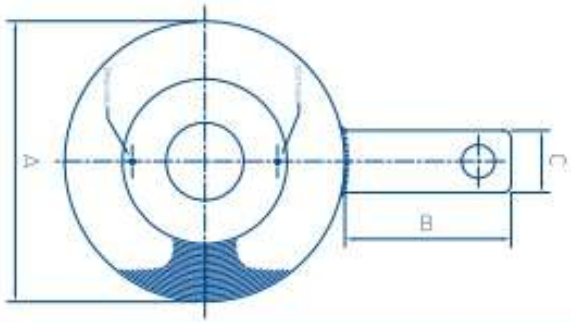
Orifice plates can be designed and calculated in accordance with any required standard. Mitra Galperti standard plates are in stainless steel 316L, with RF gasket surface and with material certificates 3.1. Of course all other materials including material certificates are possible, as well as other designs and standards, such as DIN or JIS, RTJ oval or octogonal. Mitra Galperti stamps the measured orifice diameter in the tagplate in order to use the exact dimensions in the flow computer. Strength calculations can be produced for checking the thickness against pressure loss over the plate. Since for most common sizes base materials are on stock, the prices can be kept low and deliveries are short. Rush deliveries can even be made the same day.

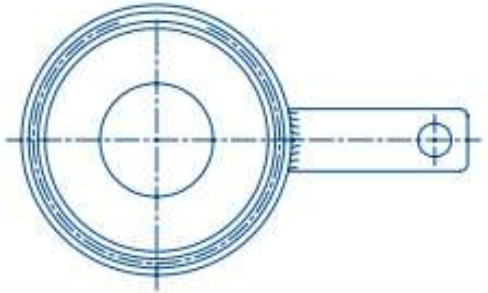
ORDERING DATA

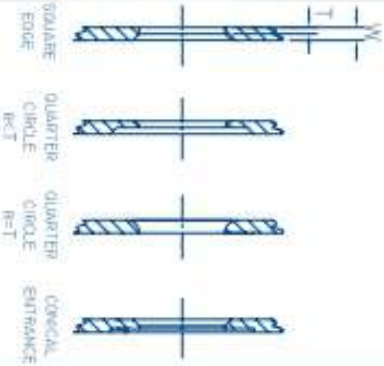
- **DESIGN CODES »** ISO 5167, DIN 1952, BS 1042, AGA, API, Miller, Spink
- **TYPE OF PLATE »** Square edge » Conical entrance » Quarter circle » Restriction » Eccentric » RTJ interchangable or integral
- **GACKET FACING »** RF, FF, RTJ oval, RTJ octogonal
- **MATERIALS »** SS304/316/316L/316Ti/321 » Monel » Duplex / Super Duplex » Hastelloy C22, C276 » Alloy 20 » Titanium »PTFE

Line size		A												B	C	W	T
		ANS Class						DIN Nom. -pressure									
		150	300	600	900	1500	2500	NP10	NP 16	NP 25	NP 40	NP 64	NP 100				
½"	15	48	54	54				53				63		102	32	1,5	0,4
¾"	20	57	67	67				63						102	32	1,5	0,4
1"	25	67	76	73	79			73				84		102	32	1,5	0,4
1¼"	32	76	83	83	88			84				89		102	32	1,5	0,6
1½"	40	86	95	95	98			94				104		102	32	2,0	0,8
2"	50	105	111	111	143		146	107				113	119	102	32	2,5	1,0
2½"	65	124	130	130	165		168	127				138	144	102	32	3,0	1,0
3"	80	137	149	149	168	174	196	142				148	154	102	32	3,0	1,5
4"	100	175	181	194	207	209	235	162		168		174	180	114	38	3,0	1,5
5"	125	197	216	241	248	254	279	192		194		210	217	114	38	3,0	1,5
6"	150	222	251	267	289	282	317	218		224		247	257	114	38	3,0	1,5
8"	200	279	308	321	359	353	387	273		284	290	309	324	127	38	6,0	3,5
10"	250	340	362	400	435	435	476	328	329	340	352	364	391	152	44	6,0	3,5
12"	300	410	422	457	498	520	549	378	384	400	417	424	458	152	44	6,0	3,5
14"	350	451	486	492	521	578		438	444	457	474	486	512	152	44	9,0	6,0
16"	400	514	540	565	575	641		489	495	514	546	543	572	152	44	9,0	6,0
18"	450	549	597	613	637	704								152	51	12,0	8,0
20"	500	606	654	682	697	755		594	617	624	628	657	704	152	51	12,0	8,0
24"	550	717	775	790	837	901		695	734	731	747	764	813	152	51	16,0	10,0

Larger sizes on request.







B
ORIFICE FLANGES

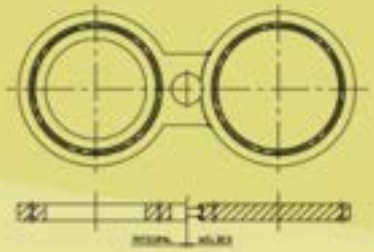
Orifice flanges are standard according ASME B16.36, which means ½" NPT flange tappings complete with plugs and jackscrews. In the case of an orifice assembly this can be completed with orifice plate and gaskets. The flanges can optionally be executed with corner or other possible process connections, such as SW or with BW, plain-end or flanged welding nipples. This can be completed with valves, condensate pots and/or differential pressure transmitters. Orifice are fabricated in accordance with ISO 5167 requirements and several construction codes such as ASME B31.3 or Stoomwezen Rules for Pressure Vessels. Apart from flange tappings,. The flanges can optionally supplied with dowell pins to ensure correct positioning of pipework up- and downstream of orifice plate. orifice flanges can be supplied in any required material complete with material certificates 3.1 or 3.2

ORDERING DATA

- **DESIGN CODES »** ASME B16.36, ISO 5167, AGA, ANSI, BS, DIN
- **TYPE OF FLANGE »** WN • SO • threaded
- **CLASS »** 150 – 2500 #
- **FLANGE FACING »** RF or RTJ
- **TYPE OF TAPPINGS »** Flange tappings » Corner tappings » Radius tappings » Pipe tappings
- **TAPPING SETS »** Single, Double
- **PROCESS CONNECTIONS »** NPT threaded » Flanged » Socket Weld » Butt Weld
- **MATERIALS »** A105N / A350LF2 / A182-F5, F11, F22, F91 / C21 » A182-F304(L), A182-F316(L)/Ti, A182-F321(L) » A182-F51 / 1.4462 / UNS S32760 (super duplex) » Monel / Hastelloy C22, C276 / Alloy 20 » Titanium » On request

C

SPECTACLE BLINDS, SPADES & SPACERS



PT MITRA GALPERTI spectacle plates, blinds and spacers are available in any size, class, finish and material quality. Due to the nature of our engineering and our further production programme we manufacture each spectacle plate with utmost care, being convinced that it is just as important as any other item in a plant. Our complete organization and production is fully governed by a Quality Assurance Programme to ISO 19001 that guarantees you a perfect quality at competitive prices. The execution shown below, as well as the dimensions are our standard. In general the production costs are lower than for fabrication to client's standard, especially in case of small quantities per item. As the thicklnessses shown below are calculated in accordance with ANS B 31.3, for full ratiing as per ANS B 16.5, including 1 mm corrosion allowance on both sides, our standard will suit you as well. Spectacle plates are always fabricated from plate materials to DIN material qualities as shown on the righthand tabel. Forged spectacle plates are too expensive. DIN materials are suitable alternatives as they fully cover the mechanical and chemical proporties of common ASTM materials. All the DIN materials shown are in stock in almost any size and thickness.

Though all materials as a standard are fully covered by material certificates as per DIN 50049-3.1 we also can supply with inspection by an independent authority. As a standard all items are hard stamped with size, class, material quality, heat number and our manufacturer's symbol. When required, your stock or code number can be added, eventually together with a colour coding. The spectacles are stamped on the blind portion and the blinds and spacers on the grips. Stamping on the periphery is possible, though expensive. Large size spectacles in corrosive resistant materials as stainless steel, Monel, Hastelloy and others are very expensive. We are in a position to manufacture these items from carbon steel covering all medium contacted parts with a lining of a suitable quality. Offcourse all welding will be done according to official procedures and by qualified welders.

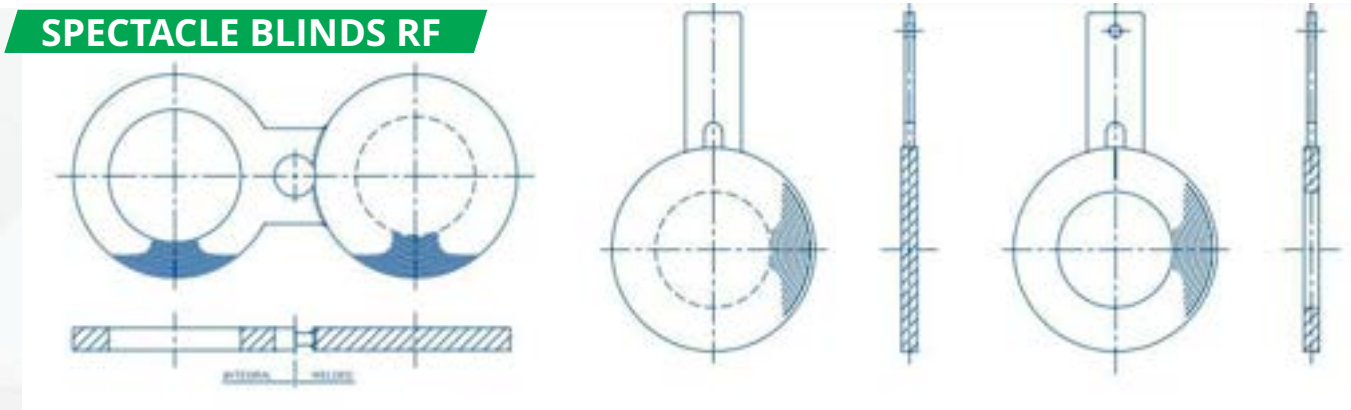
ANS class 150/PN20																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,2	0,25	0,35	0,50	0,90	2,0	3,6	7,2	13,9	23	39	50	68	83	107	178

ANS class 300/PN50																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,20	0,35	0,40	0,90	1,4	3,3	5,6	13,6	25	38	61	86	116	153	205	336

ANS class 600/PN100																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,20	0,40	0,55	1,2	1,9	4,5	9,1	21	38	69	99	122	184	205	281	435

ANS class 900/PN150																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,35	0,55	0,80	1,7	4,6	6,5	11,9	30	58	101	149	171	229	292	382	655

SPECTACLE BLINDS RF



Material equivalents			Mechanical and Chemical properties as per DIN											
ASTM	DIN	Werkst .no	Tensile N/mm²	Yield min N/mm²	%C	%Si	%Mn	%P max.	%S max.	%Cr	%Al	%Ni	%Mo	others
A240 Gr. A	17155 15Mo3	1.5415	440-530	270	0,12-0,20	0,10-0,35	0,40-0,90	0,035	0,030	<0,25	-	-	0,25-0,35	
A283 Gr. C	17155 HII	1,0425	410-500	250	<0,20	<0,35	0,50-1,30	0.035	0,030	-	>0,02	-	-	
A285 Gr. C	17155 HII	1,0425	410-500	250	<0,20	<0,35	0,50-1,30	0,035	0,030	-	>0,02	-	-	
A387 Gr. 5 CL.1	- 12CrMo 19 5	1.7362	590-740	390	<0,15	0,30-0,50	0,30-0,60	0,035	0,035	4,50-0,65	0,45-0,65	-	-	
A387 Gr. 11 CL.1	17155 13CrMo44	1.7335	440-560	300	0,08-0,18	0,10-0,35	0,40-1,00	0,035	0,030	0,70-1,10	0,40-0,60	-	-	
A387 Gr. 22 CL.1	17155 10CrMo9 10	1.7380	450-600	280	0,06-0,15	<0,50	0,40-0,70	0,035	0,030	2,00-2,50	0,90-1,10	-	-	
A515 Gr. 55	17155 HII	1.0425	410-500	250	<0,20	<0,35	0,50-1,30	0,035	0,30	-	>0,02	-	-	
A515 Gr. 70	17155 19Mn5	1.0482	520-620	320	0,17-0,22	0,30-0,60	1,00-1,30	0,045	0,045	<0,30	-	-	-	
A516 Gr. 65	17102 T StE 355	1.0566	480-620	345	<0,18	0,10-0,50	0,90-1,60	0,030	0,025	<0,30	>0,20	-	-	
A240 Tp. 304	17440 X5CrNi 18 10	1.4301	500-700	195	<0,07	<1,00	<2,00	0,045	0,030	17-19	-	8,50-10,5	-	
A240 Tp. 304 L	17440 X2CrNi 19 11	1.4306	460-680	180	<0,03	<1,00	<2,00	0,045	0,030	18-20	-	10-12,50	-	
A240 Tp. 316	17440 X5CrNiMo17 12 2	1.4401	510-710	205	<0,07	<1,00	<2,00	0,045	0,030	16,5-18,5	-	10,5-13,5	2,00-2,50	
A240 Tp. 316 L	17440 X5CrNiMo17 12 2	1.4404	490-690	190	<0,03	<1,00	<2,00	0,045	0,030	16,5-18,5	-	11-14	2,00-2,50	
A240 Tp. 321	17440 X6CrNiTi 18 10	1.4541	500-730	200	<0,08	<1,00	<2,00	0,045	0,030	17-19	-	9-12	-	
A240 Tp. 347	17440 X6CrNiNb 18 10	1.4550	510-740	205	<0,08	<1,00	<2,00	0,045	0,030	17-19	-	9-12	-	

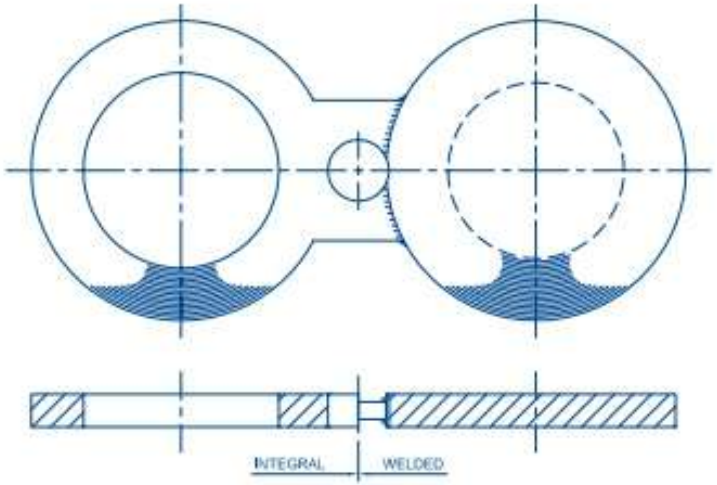
ANS class 600/PN100															
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,20	0,40	0,55	1,2	1,9	4,5	9,1	21	38	69	99	122	184	205	281	435

ANS class 2500/PN420																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"					
	15	20	25	40	50	80	100	150	200	250	300					
W	0,50	0,75	1,2	2,9	5,4	14,0	25	64	1079	200	316					

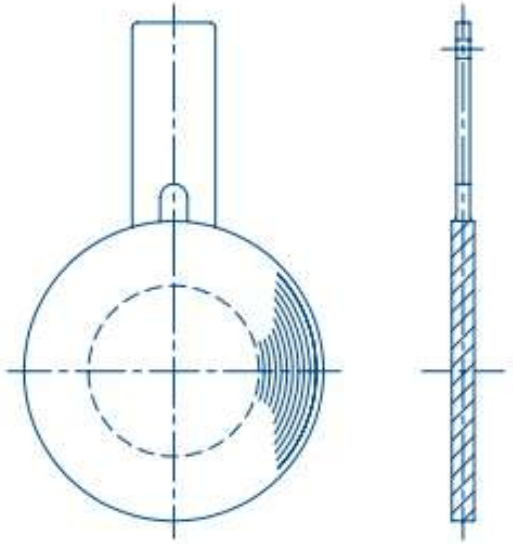
ANS class 600/PN100																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
W	0,20	0,40	0,55	1,2	1,9	4,5	9,1	21	38	69	99	122	184	205	281	435

ANS class 2500/PN420																
Weight (Kg)	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"					
	15	20	25	40	50	80	100	150	200	250	300					
W	0,50	0,75	1,2	2,9	5,4	14,0	25	64	1079	200	316					

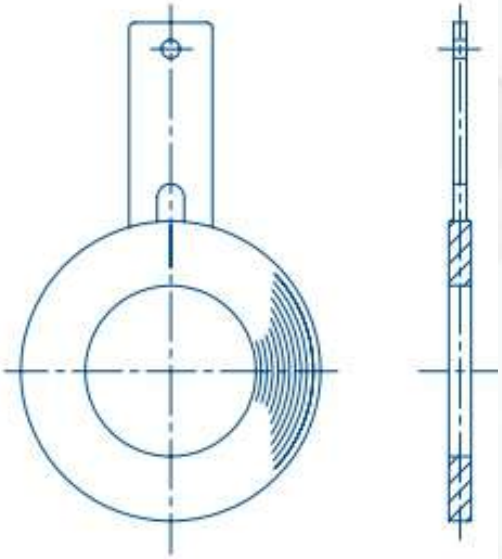
SPECTACLE PLATE RF



BLIND RF



SPACER RF



Spectacle blinds, spades and spacers are manufactured in accordance with clients requirements in any required material with any required certification. The spectacle blinds, spades and spacers are flame cut from plate material and are machined with a smooth or stock finish gasket contact surface. RTJ male and female is also possible. Larger sizes are welded by qualified welders. Sizes over 8" are supplied with lifting lugs. Colour coding will be applied if required.

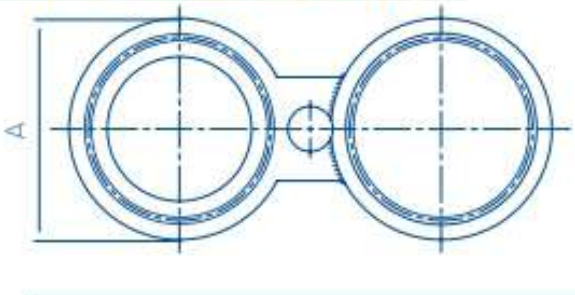
ORDERING DATA

- **DESIGN CODES »** ASME, API, ANSI, BS, DIN, Stoomwezen, TüV
- **GACKET FACING »** RF » RTJ female » RTJ male
- **MATERIALS »** ASTM A285-C / DIN 17155 H2 » A240- TP304/316(L)/316Ti/321 or DIN equivalent » ASTM A516- 60/65/70 » TstE 335 / 355 / 19Mn5 » 1.4462 / UNS S32760 / » Carbon steel cladded with alloys

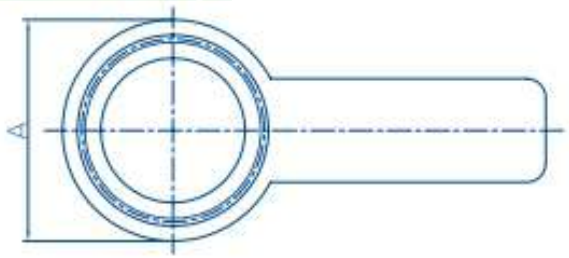
LINE SIZE		ANS class 600/PN100				ANS class 900/PN150			
inch	mm	R	A	W	T	R	A	W	T
2"	50	R23	108	4	26	R24	124	5	29
3"	80	R31	146	8	30	R31	156	9	34
4"	100	R37	175	10	34	R37	181	15	37
6"	150	R45	241	23	40	R45	241	30	45
8"	200	R49	301	40	46	R49	308	50	54
10"	250	R53	356	63	53	R53	362	75	62
12"	300	R57	413	95	61	R57	419	120	70
14"	350	R61	457	115	64	R62	487	165	80
16"	400	R65	508	155	70	R66	524	220	87
18"	450	R69	575	216	78	R70	594	320	100
20"	500	R73	635	290	96	R74	648	400	107
24"	600	R77	749	475	102	R78	772	665	127
R: ANS Ringnumber						W: Weight spectacle plate in Kg			

LINE SIZE		ANS class 1500/PN250				ANS class 2500/PN420			
inch	mm	R	A	W	T	R	A	W	T
2"	50	R24	124	5	32	R26	133	9	43
3"	80	R35	168	13	40	R32	168	16	51
4"	100	R39	194	19	45	R38	203	27	62
6"	150	R46	248	38	58	R47	279	66	83
8"	200	R50	318	74	70	R51	340	113	98
10"	250	R54	371	112	80	R55	425	216	121
12"	300	R58	438	175	96	R60	495	324	135
14"	350	R63	489	247	105				
16"	400	R67	546	330	116				
18"	450	R71	613	445	127				
20"	500	R75	673	570	137				
24"	600	R79	794	915	162				
R: ANS Ringnumber						W: Weight spectacle plate in Kg			

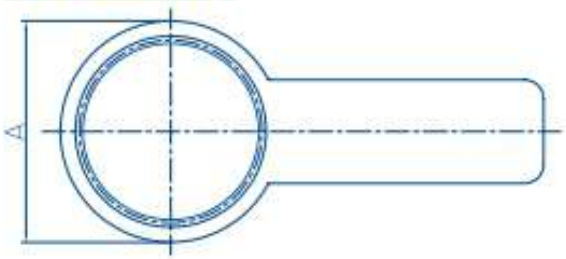
SPECTACLE PLATE RTJ



BLIND RTJ



SPACER RTJ



D
BLEED RING

PT MITRA GALPERTI is well known Bleed Ring Manufacturers in Indonesia with high quality raw material, face of the bleed ring can be manufactured to match with any flange type.Bleed ring is a ring section with one or more radial pipe connections manufacturerd to fit between standard flanges within the bolt circle, using conventional gasket material. The ring normally comes in sizes 3/4" tapped or 1/2" socket weld for connecting with instruments and valves . RTJ bleed ring has different sizes based on the ANSI flange rating of the process piping.There is no more difference between Drip Rings and Bleed rings.

The standard sizes NPS 1 to NPS 24 and ASME Pressure Classes 150 through 1500. 2 Bleed Ring can be used instead of an orifice flange union. It is easily installed as compare to orifice flanges, especially in a brown field application.Flat Face bleed Ring provide a convenient way of draining piping, taking samples, attaching instruments or even bleeding of a valve. When used with a valve and blind flange, it allows you to relieve the pressure if your valve is leaking before you remove the flange, check Bleed Ring Dimensions, sizes and weight as per requirement.

ANSI/ASME B16.5 Bleed Ring Standard Specification

Dimensions	ASME B16.5 – ASME B16.20 – ASME 31.3
Size	1/2" – 24" AND 1 13/16" – 4 1/16"
Class	150 LBS, 300 LBS, 600 LBS, 900 LBS, 1500 LBS, 2500 LBS, DIN Standard ND-6,10, 16, 25, 40 Etc.
Flange Face Type	Flate Face (FF), Raised Face (RF), Ring Type Joint (RTJ)

ASME B16.5 Bleed Ring Material Specification

Stainless Steel Bleed Ring :
ASTM A 182, A 240 F 304, 304L, 304H, 316, 316L, 316Ti, 310, 310S, 321, 321H, 317, 347, 347H, 904L

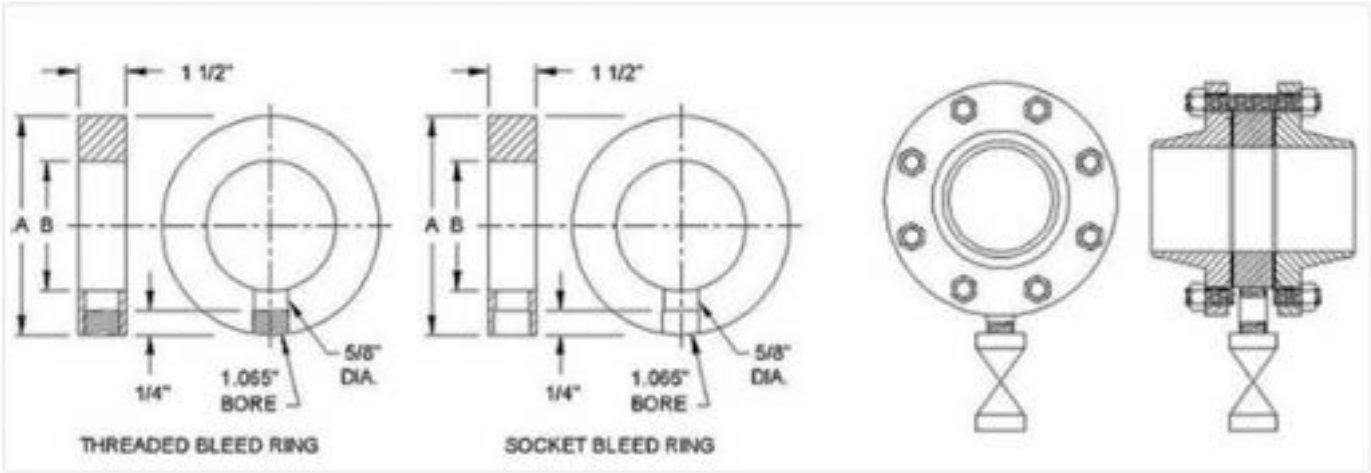
Duplex & Super Duplex Steel Bleed Ring :
ASTM / ASME A/SA 182 F 44, F 45, F51, F 53, F 55, F 60, F 61

Carbon Steel Bleed Ring :
ASTM / ASME A/SA 105 ASTM / ASME A 350 , ASTM A 181 LF 2 / A516 Gr.70 A36, A694 F42, F46, F52, F60, F65, F706
Low Temperature Carbon Steel Bleed Ring : ASTM A350, LF2, Lf3

Alloy Steel Bleed Ring :
ASTM / ASME A/SA 182 & A 387 F1, F5, F9, F11, F12, F22, F91
Copper Alloy Steel Bleed Ring : ASTM SB 61 , SB62 , SB151 , SB152 UNS No. C 70600 (Cu-Ni 90/10), C 71500 (Cu-Ni 70/30), UNS No. C 10100, 10200, 10300, 10800, 12000, 12200

Nickel Alloy Bleed Ring :
ASTM SB564, SB160, SB472, SB162
Nickel 200 (UNS No. N02200),
Nickel 201 (UNS No. N02201),
Monel 400 (UNS No. N04400),
Monel 500 (UNS No. N05500),
Inconel 800 (UNS No. N08800),
Inconel 825 (UNS No. N08825),
Inconel 600 (UNS No. N06600),
Inconel 625 (UNS No. N06625),
Inconel 601 (UNS No. N06601),
Hastelloy C 276 (UNS No. N10276),
Alloy 20 (UNS No. N08020)

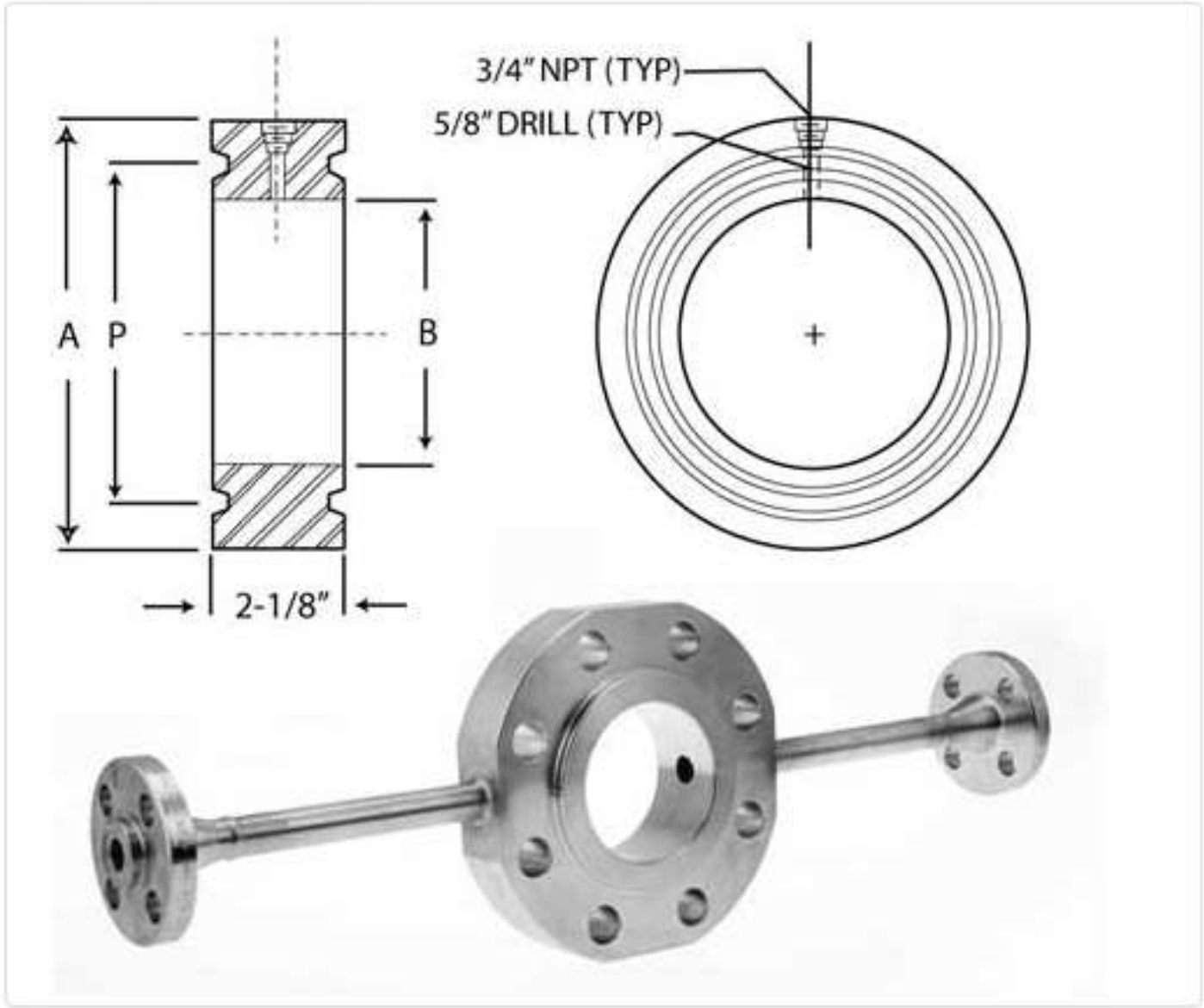
ANSI BLEED RING DIMENSIONS BLEED RING SIZES



Class 150 Bleed Ring Dimensions, 4 Bleed Ring Weight

Pipe Size (NPS)	ASME-ANSI Class Dimension A (Outside Diameter – IN)						B (Inside BORE-IN)
	150	300	600	900	1500	2500	
1/2	–	–	–	–	–	–	–
3/4	–	–	–	–	–	–	–
1	2 1/2	2 3/4	2 3/4	3	3	3 1/4	1 1/8
1 1/4	3 2 7/8	3 1/8	3 1/8	3 3/8	–	–	1 1/2
1 1/2	3 1/4	3 5/8	3 5/8	3 3/4	3 3/4	4 1/2	1 5/8
2	4	4 1/4	4 1/4	5 1/2	5 1/2	5 5/8	2 1/8
2 1/2	4 3/4	5	5	6 3/8	–	6 1/2	2 1/2
3	5 1/4	5 3/4	5 3/4	6 1/2	6 3/4	7 5/8	3 1/8
3 1/2	6 1/4	6 3/8	6 1/4	–	–	–	3 5/8
4	6 3/4	7	7 1/2	8	8 1/8	9 1/8	4 1/8
5	7 5/8	8 3/8	9 3/8	9 5/8	9 7/8	10 7/8	5 1/8
6	8 5/8	9 3/4	10 3/8	11 1/4	11	12 3/8	6 1/8
8	10 7/8	12	12 1/2	14	13 3/4	15 1/8	8
10	13 1/4	14 1/8	15 5/8	17	17	18 5/8	10 1/8
12	16	16 1/2	17 3/4	19 1/2	20 3/8	21 1/2	12
14	17 5/8	19	19 1/4	20 3/8	22 5/8	–	13 1/4
16	15 1/4	21 1/8	22	22 3/8	25 1/8	–	15 1/4
18	21 1/2	23 3/8	24	25	27 5/8	–	17 1/4
20	23 3/4	25 5/8	26 3/4	27 3/8	29 5/8	–	19 1/4
22	–	–	–	–	–	–	–
24	28 1/8	30 3/8	31	32 7/8	35 3/8	–	23 1/4

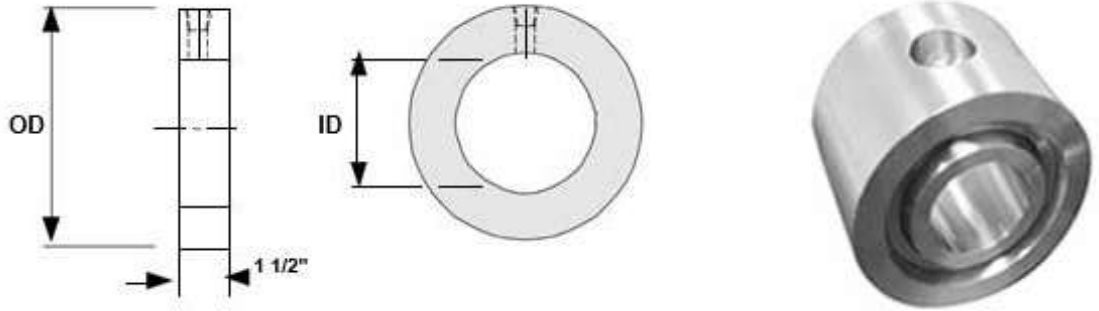
RTJ Bleed Ring Dimensions, RTJ Bleed Ring Weight



DIMENSIONAL DATA

Line Size	300# / 400# / 600#			900#			1500#			2500#		
	A	B	RING	A	B	RING	A	B	RING	A	B	RING
1"	2.750	1.320	R-16	2.812	1.320	R-16	2.812	1.320	R-16	3.250	1.320	R-18
1-1/2"	3.562	1.900	R-20	3.625	1.900	R-20	3.625	1.900	R-20	4.500	1.900	R-23
2"	4.250	2.375	R-23	4.875	2.375	R-24	4.875	2.375	R-24	5.250	2.375	R-26
2-1/2"	5.000	2.875	R-26	5.375	2.875	R-27	5.375	2.875	R-27	5.875	2.875	R-28
3"	5.750	3.500	R-31	6.125	3.500	R-31	6.625	3.500	R-35	6.625	3.500	R-32
4"	6.875	4.500	R-37	7.125	4.500	R-37	7.625	4.500	R-39	8.000	4.500	R-38
6"	9.500	6.625	R-45	9.500	6.625	R-45	9.750	6.625	R-46	11.000	6.625	R-47
8"	11.875	8.625	R-49	12.125	8.625	R-49	12.500	8.625	R-50	13.375	8.625	R-51
10"	14.000	10.750	R-53	14.250	10.750	R-53	14.625	10.750	R-54	16.750	10.750	R-55
12"	16.250	12.750	R-57	16.500	12.750	R-57	17.250	12.750	R-58	19.500	12.750	R-60

Raised Face Bleed Ring Dimensions



Raised Face

Pipe Size	All sizes ID	150# OD	150# Weight	300# OD	300# Weight	600# OD	600# Weight	900# OD	900# Weight	1500# OD	1500# Weight
1	1.32	2.50	2	2.75	2	2.75	2	3	3	3	3
1 1/2	1.90	3.25	3	3.63	3	3.625	3	3.75	4	3.75	4
2	2.38	4.00	4	4.25	5	4.25	5	5.5	9	5.5	9
2 1/2	2.88	4.75	5	5.00	6	5	6	6.375	11	6.375	11
3	3.50	5.25	6	5.75	8	5.75	8	6.5	11	6.75	12
4	4.50	6.75	9	7.00	11	7.5	13	8	16	8.125	16
6	6.63	8.63	12	9.75	19	10.375	23	11.25	30	11	28
8	8.63	10.88	18	12.00	27	12.5	31	14	44	13.75	42
10	10.75	13.25	24	14.13	32	15.58	47	17	62	17	62
12	12.75	16.00	37	16.50	43	17.75	57	19.375	77	20.25	89

Types of Bleed Ring

- ANSI B16.5 Bleed Ring
- 2 Bleed Rings
- 4 Bleed Ring
- ASME B16.20 Drip Rings
- Raised Face Bleed Ring Suppliers
- Bleed Ring Flat Face
- ANSI B16.20 class 150 Bleed Ring Stockholder
- Bleed Ring Class 150
- ASME B31.3 Bleed Rings
- ANSI B16.5 Class 150 Bleed Ring
- Pipe Bleed Ring
- Bleed Ring Dimensions
- 2 150# Bleed ring
- Vent Rings
- Bleed Rings in ASME B31.3
- Raised Face Bleed Rings
- High Quality Bleed Ring
- Steel Bleed Ring

E

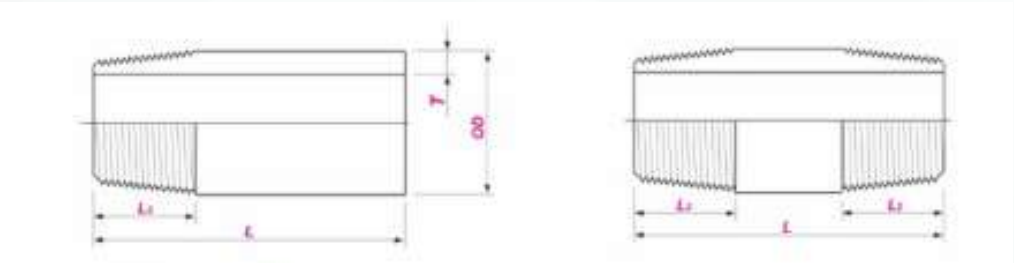
PIPE NIPPLE/ BARREL NIPPLE

Basic pattern of steel pipe nipple is a short piece of pipe with threads at both end or at one end. Its function is to connect pipes or other fittings in same or different diameter. We also call the basic type as barrel nipple or pipe nipple. It can be simply made from a piece of pipe.

Steel Pipe Nipple Dimensions

Steel pipe nipples has different types, and for each type their specifications are different. Generally speaking, the dimension ranges of pipe nipples are.

- Size: 1/8" to 12" / DN6 to DN300
- Thickness: Sch 10S, 20, STD, 40, XS, 80, 160, XXS
- Standard: ANSI / ASME B16.11, ASTM A53 & A106, API 5L, API 5CT



Pipe Size

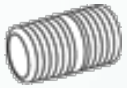
- 1/8
- 1/4
- 3/8
- 1/2
- 5/8
- 3/4
- 1
- 1 1/4
- 1 1/2
- 2
- 2 1/2
- 3
- 4
- 6
- 8

Thread Type

- NPT
- BSPT
- NPTF
- BSPP
- Metric
- UNF

Threading

Threaded on Both Ends



Fully Threaded

Threaded on One End

Unthreaded

Schedule

40

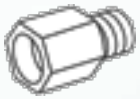
80

160

XXH

Type

Pipe

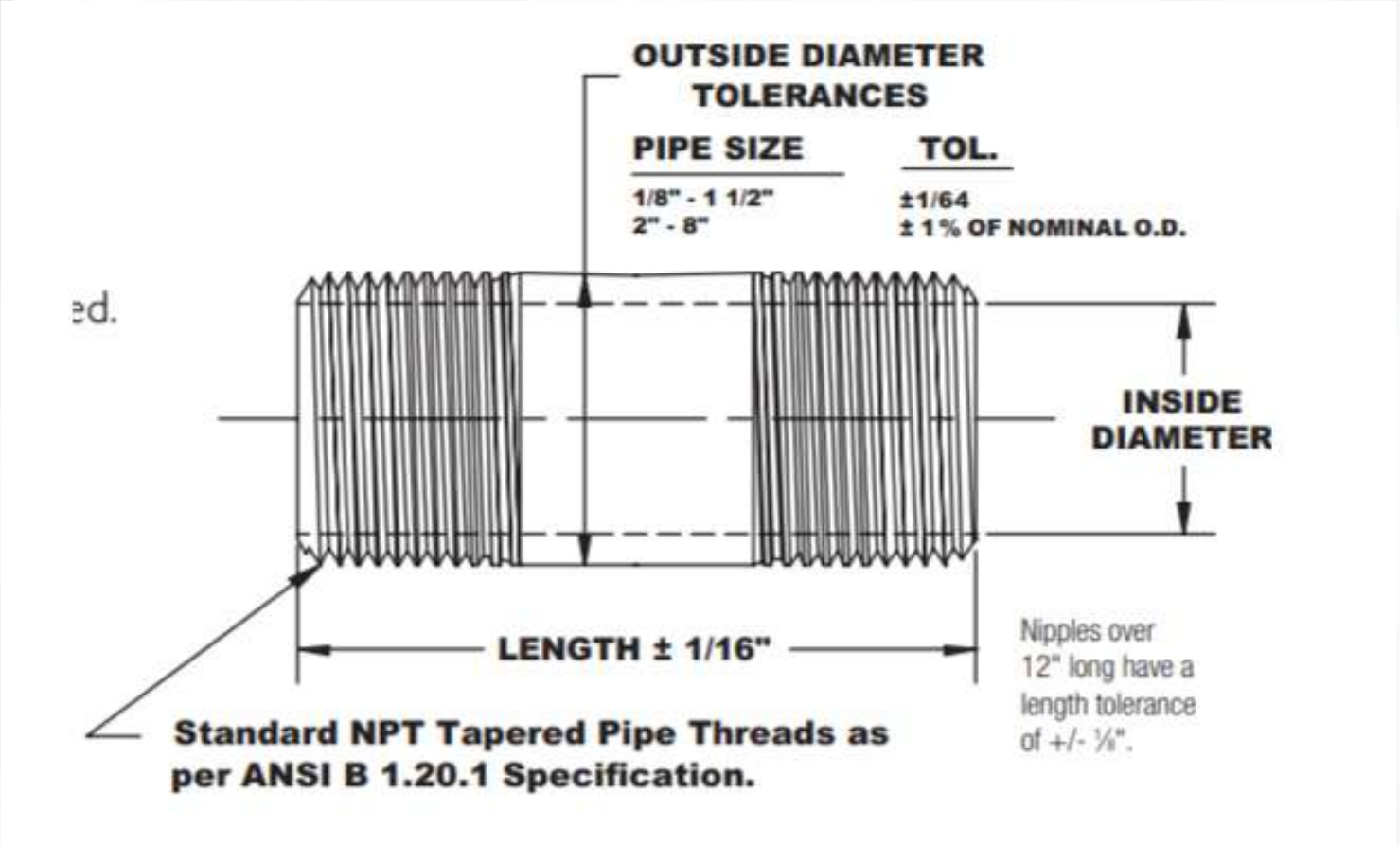


Adapter

Connector

Reducer

Reducing Adapter



And their accompanying diagram of the available standard nipple lengths. What's important about this is the "close" lengths - these are nipples that are fully threaded, and so its the shortest length they could be at that diameter. If you subtract this from any of the others you get the unthreaded length.

Example: a 1" size pipe 6" long. The close length is 1 1/2", so the remaining unthreaded portion must be 3 1/2". (Plus or minus 1/8" as noted on the first diagram).

Pipe Size	Pipe O.D.	Length Close	Pipe Nipple Lengths															
in	in	in																
⅛	0.405	¼	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
¼	0.540	⅜	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
⅜	0.675	1	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
½	0.840	1⅛	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
¾	1.050	1⅛	1½	2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1	1.315	1⅛		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1¼	1.660	1⅛		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
1½	1.900	1¼		2	2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
2	2.375	2			2½	3	3½	4	4½	5	5½	6	7	8	9	10	11	12
2½	2.875	2½				3	3½	4	4½	5	5½	6	7	8	9	10	11	12
3	3.500	2⅛				3	3½	4	4½	5	5½	6	7	8	9	10	11	12
4	4.500	2⅛						4	4½	5	5½	6	7	8	9	10	11	12
5	5.563	3							4½	5	5½	6	7	8	9	10	11	12
6	6.625	3⅛							4½	5	5½	6	7	8	9	10	11	12

Note: Other lengths available.

F
FLANGES

A flange is an external or internal ridge, or rim (lip), for strength, as the flange of an iron beam such as an I-beam or a T-beam; or for attachment to another object, as the flange on the end of a pipe, steam cylinder, etc., or on the lens mount of a camera; or for a flange of a rail car or tram wheel. Thus flanged wheels are wheels with a flange on one side to keep the wheels from running off the rails. The term "flange" is also used for a kind of tool used to form flanges. Pipes with flanges can be assembled and disassembled easily.

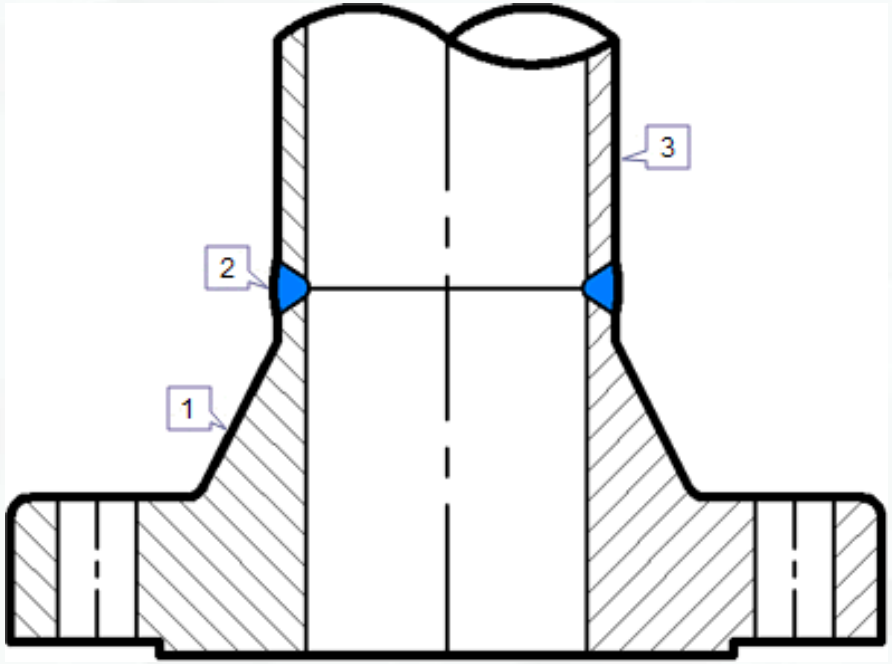
The standard flange and special flange range produced at PT MITRA GALPERTI are available in various dimension options in a wide range of material.

PT MITRA GALPERTI FLANGES

The standard type of steel flanges mostly used are:

- Welding Neck Flange
- Slip On Flange
- Socket Weld Flange
- Lap Joint Flange
- Threaded Flange
- Blind Flange

Welding Neck Flange



Details of Welding Neck Flange

1. Weld Neck flange
2. Butt Weld
3. Pipe or Fitting

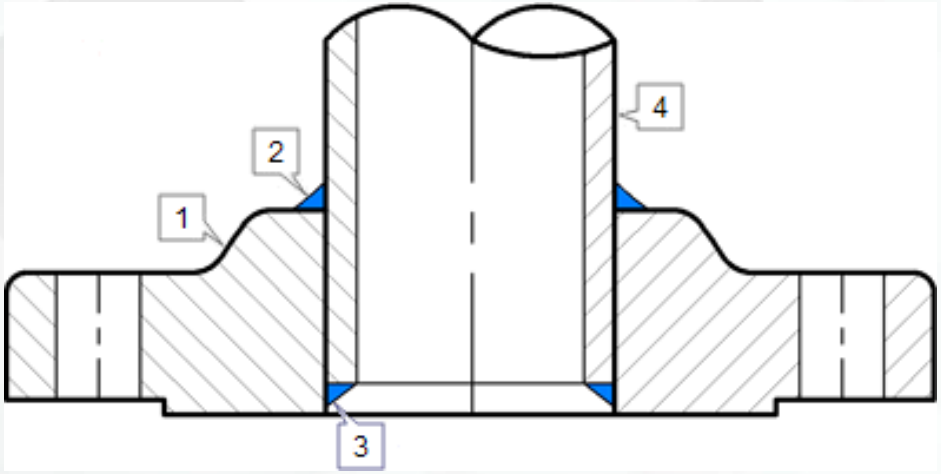
Welding Neck Flanges are easy to recognize at the long tapered hub, that goes gradually over to the wall thickness from a pipe or fitting.

The long tapered hub provides an important reinforcement for use in several applications involving high pressure, sub-zero and / or elevated temperatures. The smooth transition from flange thickness to pipe or fitting wall thickness effected by the taper is extremely beneficial, under conditions of repeated bending, caused by line expansion or other variable forces.

These flanges are bored to match the inside diameter of the mating pipe or fitting so there will be no restriction of product flow. This prevents turbulence at the joint and reduces erosion. They also provide excellent stress distribution through the tapered hub and are easily radiographed for flaw detection.

This flange type will be welded to a pipe or fitting with a single full penetration, V weld (Buttweld).

Slip on Flange



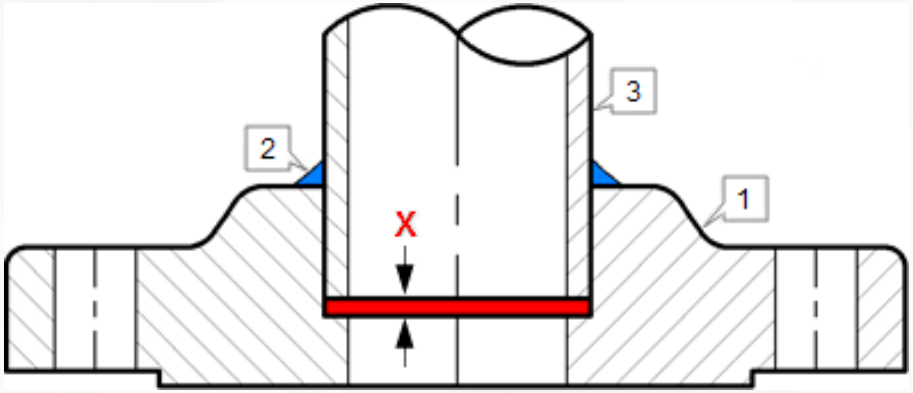
Details of Slip On Flange

1. Slip On flange
2. Filled weld outside
3. Filled weld inside
4. Pipe

The calculated strength from a Slip On flange under internal pressure is of the order of two-thirds that of Welding Neck flanges, and their life under fatigue is about one-third that of the latter.
The connection with the pipe is done with 2 fillet welds, as well at the outside as also at the inside of the flange.
The X measure on the image, are approximately :
Wall thickness of pipe + 3 mm.
This space is necessary, to do not damage the flange face, during the welding process.
A disadvantage of the flange is, that principle always firstly a pipe must be welded and then just a fitting. A combination of flange and elbow or flange and tee is not possible, because named fittings have not a straight end, that complete slid in the Slip On flange.

Socket Weld flange

Socket Weld flanges were initially developed for use on small-size high pressure piping. Their static strength is equal to Slip On flanges, but their fatigue strength 50% greater than double-welded Slip On flanges. The connection with the pipe is done with 1 fillet weld, at the outside of the flange. But before welding, a space must be created between flange or fitting and pipe.
ASME B31.1 1998 127.3 Preparation for Welding (E) Socket Weld Assembly says :
In assembly of the joint before welding, the pipe or tube shall be inserted into the socket to the maximum depth and then withdrawn approximately 1/16" (1.6 mm) away from contact between the end of the pipe and the shoulder of the socket. The purpose for the bottoming clearance in a Socket Weld is usually to reduce the residual stress at the root of the weld that could occur during solidification of the weld metal. The image shows you the X measure for the expansion gap. The disadvantage of this flange is right the gap, that must be made. By corrosive products, and mainly in stainless steel pipe systems, the crack between pipe and flange can give corrosion problems. In some processes this flange is also not allowed. I am not an expert in this matter, but on the internet, you will find a lot of information about forms of corrosion. Also for this flange counts, that principle always firstly a pipe must be welded and then just a fitting.

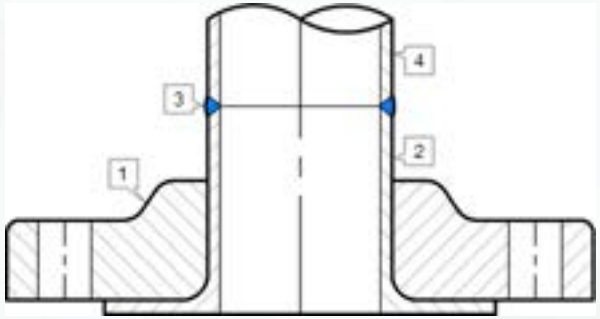


Details of Socket Weld Flange

1. Socket Weld flange
2. Filled weld
3. Pipe

X = Expansion gap

Lap Joint Flange



Details of Lap Joint Flange

1. Lap Joint flange
2. Stub End
3. Butt weld
4. Pipe or Fitting

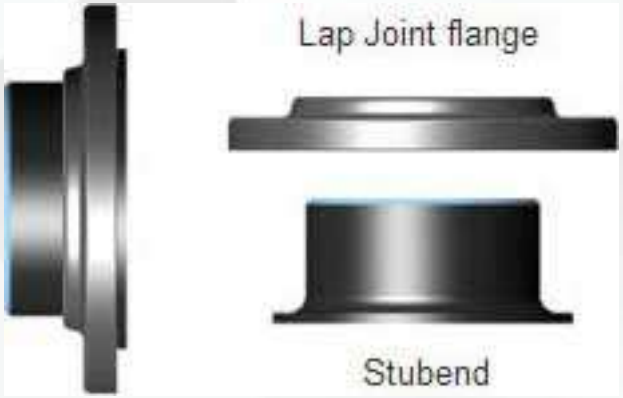
Lap Joint Flanges have all the same common dimensions as any other flange named on this page however it does not have a raised face, they used in conjunction with a "Lap Joint Stub End". These flanges are nearly identical to a Slip On flange with the exception of a radius at the intersection of the flange face and the bore to accommodate the flanged portion of the Stub End. Their pressure-holding ability is little, if any, better than that of Slip On flanges and the fatigue life for the assembly is only one tenth that of Welding Neck flanges.

They may be used at all pressures and are available in a full size range. These flanges slip over the pipe, and are not welded or otherwise fastened to it. Bolting pressure is transmitted to the gasket by the pressure of the flange against the back of the pipe lap (Stub End).

Lap Joint flanges have certain special advantages:

- Freedom to swivel around the pipe facilitates the lining up of opposing flange bolt holes.
- Lack of contact with the fluid in the pipe often permits the use of inexpensive carbon steel flanges with corrosion resistant pipe.
- In systems which erode or corrode quickly, the flanges may be salvaged for re-use.

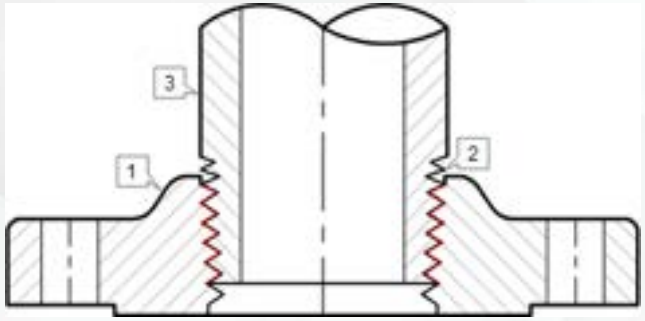
Stub End



Lap Joint Flange With A Stub End

A Stub End always will be used with a Lap Joint flange, as a backing flange. This flange connections are applied, in low-pressure and non critical applications, and is a cheap method of flanging. In a stainless steel pipe system, for example, a carbon steel flange can be applied, because they are not come in contact with the product in the pipe. Stub Ends are available in almost all pipe diameters. Dimensions and dimensional tolerances are defined in the ASME B.16.9 standard. Light-weight corrosion resistant Stub Ends (fittings) are defined in MSS SP43.

Threaded flange



Details of Threaded Flange

1. Threaded flange
2. Thread
3. Pipe or Fitting

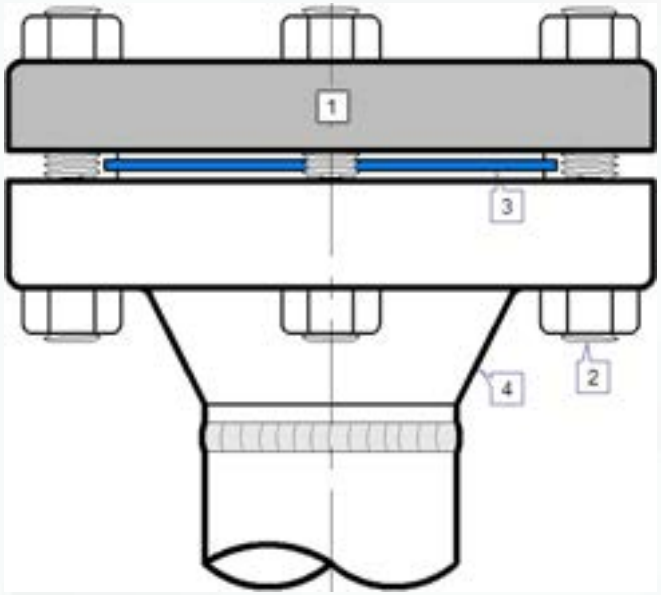
Threaded Flanges are used for special circumstances with their main advantage being that they can be attached to the pipe without welding. Sometimes a seal weld is also used in conjunction with the threaded connection. Although still available in most sizes and pressure ratings, screwed fittings today are used almost exclusively in smaller pipe sizes. A threaded flange or fitting is not suitable for a pipe system with thin wall thickness, because cutting thread on a pipe is not possible. Thus, thicker wall thickness must be chosen...what is thicker ?

ASME B31.3 Piping Guide says:

Where steel pipe is threaded and used for steam service above 250 psi or for water service above 100 psi with water temperatures above 220° F, the pipe shall be seamless and have a thickness at least equal to schedule 80 of ASME B36.10.

Blind Flange

Blind Flanges are manufactured without a bore and used to blank off the ends of piping, Valves and pressure vessel openings. From the standpoint of internal pressure and bolt loading, blind flanges, particularly in the larger sizes, are the most highly stressed flange types. However, most of these stresses are bending types near the center, and since there is no standard inside diameter, these flanges are suitable for higher pressure temperature applications.



Details of Blind Flange

1. Blind flange
2. Stud Bolt
3. Gasket
4. Other flange

G
FORGED FITTINGS

DESIGN / DIMENSIONS

According to: **ASME B16.11, MSS SP95, BS 3799 MSSSP83**
From 1/8" TO 4"
RATING / SCHED.
BW : 40/STD/80/160/XS/XXS
SW : 3000/6000/9000
NPT : 2000/3000/6000

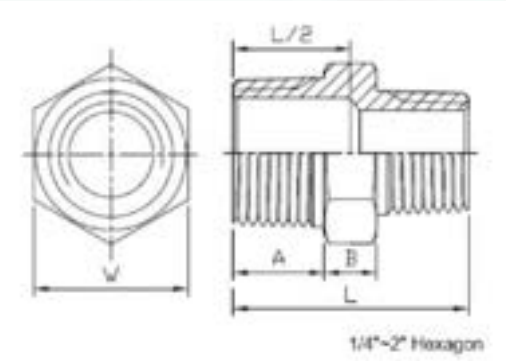
PT MITRA GALPERTI FORGE FITTINGS :

- 90°ELBOW
- 45°ELBOW
- ELBOW MF
- HALF COUPLING
- REDUCING COUPLING
- COUPLING
- COUPLING MF
- COUPLING SW X FIL
- CAP
- TEE
- REDUCING TEE
- HEXAGONAL NIPPLE
- HEXAGONAL HEAD PLUG
- HEX RED. MF
- RED. HEX. NIPPLE
- ROUND HEAD PLUG
- CONC./ECC. REDUCERS
- BOSS
- SWAGE NIPPLE MSSP 95
- PIPE NIPPLE
- CROSS
- UNION MSS SP83
- UNION MF
- HEX BUSHING

RED. HEX. NIPPLE

Forged reducing hexagonal nipples class 3000 NPT and **6000 NPT** are used on internal threading or valves. They are normally supplied with hex wrench with double end (with different diameters) threaded NPT.

ANSI B16.11 - ASME B1.20.1
Size ¼" - 2"
Class 3000# & 6000#
Material : Carbon Steel, Stainless Steel, Duplex, Alloy Steel



- Precision pipe fittings for instrumentation and process control
- Fine threads constructed to ensure leak-free & reliable systems
- Male threads are protected with plastic cap
- Various materials including SS316, Brass and Carbon steel
- Many choice of connections and configurations are available
- Male NPT to reduced male NPT

Standard Pattern

SIZE		A		B		L		W	
		mm	in	mm	in	mm	in	mm	in
1/4"	1/8"	13	0.51	6	0.24	31	1.22	15.1	0.59
3/8"	1/8"	14	0.55	7	0.28	34	1.34	18.6	0.73
	1/4"	14	0.55	7	0.28	34	1.34	18.6	0.73
1/2"	1/8"	16.5	0.65	8	0.31	36.5	1.44	23	0.91
	1/4"	16.5	0.65	8	0.31	36.5	1.44	23	0.91
	3/8"	16.5	0.65	8	0.31	36.5	1.44	23	0.91
3/4"	1/8"	16	0.63	8	0.31	40	1.57	29	1.14
	1/4"	16	0.63	8	0.31	40	1.57	29	1.14
	3/8"	17	0.67	8	0.31	41	1.61	28.5	1.12
	1/2"	17	0.67	8	0.31	41.5	1.63	28.5	1.12
1"	1/4"	20	0.79	9	0.35	41	1.61	35.4	1.39
	3/8"	20	0.79	9	0.35	42.5	1.67	35.4	1.39
	1/2"	20	0.79	9	0.35	45	1.77	35.4	1.39
	3/4"	20	0.79	9	0.35	45	1.77	35.4	1.39

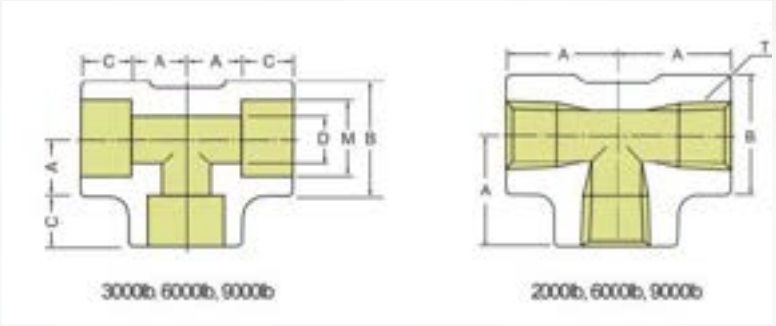
SIZE		A		B		L		W	
		mm	in	mm	in	mm	in	mm	in
1-1/4"	1/4"	21	0.83	10	0.39	42	1.65	44.5	1.75
	3/8"	21	0.83	10	0.39	47	1.85	44.5	1.75
	1/2"	21	0.83	10	0.39	49	1.93	44.5	1.75
	3/4"	21	0.83	10	0.39	49	1.93	44.5	1.75
	1"	22	0.87	10	0.39	52	2.05	44.5	1.75
1-1/2"	1/4"	20	0.79	10.5	0.41	42.5	1.65	51	2.01
	3/8"	21	0.83	10	0.39	47	1.85	50	1.97
	1/2"	21	0.83	10	0.39	49	1.93	50	1.97
	3/4"	21	0.83	10	0.39	49	1.93	50	1.97
	1"	21.5	0.85	11	0.39	52.5	2.07	50	1.97
	1-1/4"	22	0.87	11	0.43	55	2.17	51	2.01
2"	3/8"	23	0.91	11	0.43	52	2.05	61.5	2.42
	1/2"	23	0.91	11	0.43	52	2.05	61.5	2.42
	3/4"	23	0.91	11	0.43	41.5	1.63	61.5	2.42
	1"	23	0.91	11	0.43	53.5	2.11	61.5	2.42
	1-1/4"	23	0.91	11	0.43	56	2.2	61.5	2.42
	1-1/2"	23	0.91	11	0.43	55.5	2.19	61.5	2.42

HEXAGONAL-BUSHING

HEXAGONAL BUSHING is a forged fittings manufactured in accordance with B16.11. HEXAGONAL BUSHING is a fitting used to joint two threaded items of different size.

TEE

TEE is a forged fitting used for splitting and changing flow direction of run pipe of 90° deg. It is available in two categories: EQUAL if header and branch pipe have the same size REDUCED if header and branch pipe have the different size TEE can be manufactured with butt-weld extremities, socket extremities or threaded extremities.



Dimensions of TEE can be in accordance with ASME B16.9, MSS SP-75. TEE can be manufactured on customer's request with a special design.

Socket Welding Type

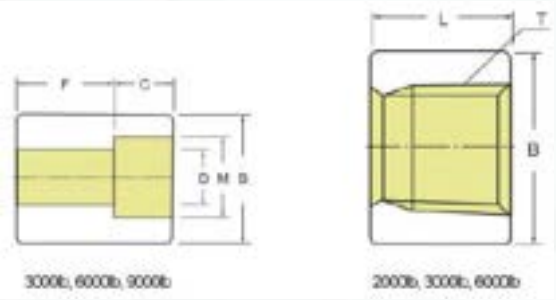
Size M	3000lb				6000lb				9000lb			
	B	D	A	C	B	D	A	C	B	D	A	C
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	26.5	9.4	11.1	10.0	-	-	-	-	-	-	-	-
3/8	26.5	12.7	13.4	10.0	-	-	-	-	-	-	-	-
1/2	34.0	16.1	16.0	13.0	38.5	12.0	20.0	16.0	46.5	6.4	23.0	16.0
3/4	38.5	21.2	20.0	14.0	46.5	15.8	23.0	16.0	56.5	11.0	28.0	16.0
1	46.5	27.0	23.0	15.0	56.5	21.0	28.0	18.0	63.5	15.2	33.0	18.0
1 1/4	56.5	35.4	28.0	17.0	63.5	29.7	33.0	20.0	76.0	22.7	40.0	20.0
1 1/2	63.5	41.2	33.0	18.0	76.0	34.2	40.0	22.0	84.0	27.9	42.0	22.0
2	76.0	52.7	39.0	22.0	84.0	43.1	42.0	24.0	110.0	38.1	54.0	24.0
2 1/2	92.0	62.7	42.0	24.0	110.0	54.0	57.1	24.0	121.0	45.0	66.0	24.0
3	110.0	78.0	57.1	31.5	121.0	67.7	66.0	31.5	146.0	58.4	70.0	31.5
4	146.0	102.0	68.0	45.0	152.0	87.0	70.0	45.0	-	-	-	-

Threaded Type

Size T	2000lb		3000lb		6000lb	
	B	A	B	A	B	A
	mm	mm	mm	mm	mm	mm
1/4	26.5	25.4	26.5	25.4	-	-
3/8	26.5	25.4	34.0	28.5	38.5	33.5
1/2	34.0	28.5	38.5	33.5	46.5	38.1
3/4	38.5	33.5	46.5	38.1	56.5	44.5
1	46.5	38.1	56.5	44.5	63.5	50.8
1 1/4	56.5	44.5	63.5	50.8	76.0	60.5
1 1/2	63.5	50.8	76.0	60.5	84.0	64.0
2	76.0	60.5	84.0	64.0	110.0	83.0
2 1/2	92.0	64.0	110.0	83.0	121.0	95.5
3	110.0	83.0	121.0	95.5	146.0	106.5
3 1/2	121.0	95.5	146.0	106.5	152.0	114.3
4	146.0	106.5	152.0	114.3	152.0	114.3

- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

HALF-COUPLING



HALF-COUPLING is a forged fittings manufactured in accordance with B16.11. A HALF-COUPLING is a fitting that allows one pipe and one fitting to be joint together. A HALF-COUPLING can per manufactured with socket-weld extremity or threaded extremity.

Socket Welding Type

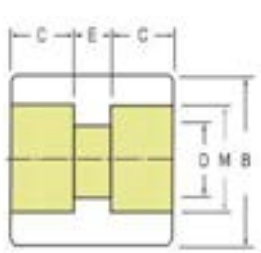
Size M	3000lb				6000lb				9000lb			
	B	D	A	C	B	D	A	C	B	D	A	C
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	21.0	9.4	10.0	15.7	-	-	-	-	-	-	-	-
3/8	25.0	12.7	10.0	17.5	-	-	-	-	-	-	-	-
1/2	31.0	16.1	10.0	22.4	32.6	12.0	10.0	22.4	40.4	6.4	10.0	22.4
3/4	36.3	21.2	13.0	23.9	40.0	15.8	13.0	23.9	45.5	11.0	13.0	23.9
1	44.5	27.0	13.0	28.4	48.5	21.0	13.0	28.4	55.0	15.2	13.0	28.4
1 1/4	54.0	35.4	13.0	30.2	57.2	29.7	13.0	30.2	66.5	22.7	13.0	30.2
1 1/2	60.3	41.2	13.0	31.8	64.7	34.2	13.0	31.8	73.0	27.9	13.0	31.8
2	73.5	52.7	16.0	41.1	80.3	43.1	16.0	41.1	88.0	38.1	16.0	41.1
2 1/2	92.5	62.7	16.0	42.9	98.0	54.0	16.0	42.9	108.0	45.0	16.0	42.9
3	106.8	78.0	16.0	44.5	114.3	67.7	16.0	44.5	127.0	58.4	16.0	44.5
4	140.0	102.0	19.0	47.7	160.0	87.0	19.0	47.7	160.0	80.3	19.0	47.7

Threaded Type

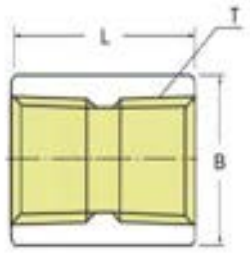
Size T	2000lb		3000lb		6000lb	
	B	L	B	L	B	L
	mm	mm	mm	mm	mm	mm
1/4	19.0	17.5	19.0	17.5	25.4	17.5
3/8	22.0	19.0	22.0	19.0	31.8	19.0
1/2	28.5	24.0	28.5	24.0	38.1	24.0
3/4	35.0	25.5	35.0	25.5	44.5	25.5
1	44.5	30.5	44.5	30.5	57.0	30.5
1 1/4	57.0	33.5	57.0	33.5	63.5	33.5
1 1/2	63.5	40.0	63.5	40.0	76.0	40.0
2	76.0	43.0	76.0	43.0	92.0	43.0
2 1/2	92.0	46.0	92.0	46.0	108.0	46.0
3	108.0	54.0	108.0	54.0	127.0	54.0
3 1/2	127.0	57.0	127.0	57.0	140.0	57.0
4	140.0	60.5	140.0	60.5	160.0	60.5

- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

FULL COUPLING



3000lb, 6000lb, 9000lb



2000lb, 6000lb, 9000lb

FULL COUPLING is a forged fittings manufactured in accordance with B16.11. FULL-COUPLING is a fitting that allows one pipe and one fitting to be joint together. FULL COUPLING can per manufactured with socket-weld extremity or threaded extremity.

Socket Welding Type

Size M	3000lb				6000lb				9000lb			
	B	D	A	C	B	D	A	C	B	D	A	C
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	21.0	9.4	10.0	6.4	-	-	-	-	-	-	-	-
3/8	25.0	12.7	10.0	6.4	-	-	-	-	-	-	-	-
1/2	31.0	16.1	10.0	9.6	32.6	12.0	10.0	9.6	40.4	6.4	10.0	9.6
3/4	36.3	21.2	13.0	9.6	40.0	15.8	13.0	9.6	45.5	11.0	13.0	9.6
1	44.5	27.0	13.0	12.7	48.5	21.0	13.0	12.7	55.0	15.2	13.0	12.7
1 1/4	54.0	35.4	13.0	12.7	57.2	29.7	13.0	12.7	66.5	22.7	13.0	12.7
1 1/2	60.3	41.2	13.0	12.7	64.7	34.2	13.0	12.7	73.0	27.9	13.0	12.7
2	73.5	52.7	16.0	19.1	80.3	43.1	16.0	19.1	88.0	38.1	16.0	19.1
2 1/2	92.5	62.7	16.0	19.1	98.0	54.0	16.0	19.1	108.0	45.0	16.0	19.1
3	106.8	78.0	16.0	19.1	114.3	67.7	16.0	19.1	127.0	58.5	16.0	19.1
4	140.0	102.0	19.0	19.1	160.0	87.0	19.0	19.1	160.0	80.3	19.0	19.1

Threaded Type

Size T	2000lb		3000lb		6000lb	
	B	L	B	L	B	L
	mm	mm	mm	mm	mm	mm
1/4	19.0	35.0	19.0	35.1	25.4	35.0
3/8	22.0	38.0	22.0	38.1	31.8	38.0
1/2	28.5	48.0	28.5	48.0	38.1	48.0
3/4	35.0	51.0	35.0	51.0	44.5	51.0
1	44.5	61.0	44.5	61.0	57.0	61.0
1 1/4	57.0	67.0	57.0	67.0	63.5	67.0
1 1/2	63.5	80.0	63.5	80.0	76.0	80.0
2	76.0	86.0	76.0	86.0	92.0	86.0
2 1/2	92.0	92.0	92.0	92.0	108.0	92.0
3	108.0	108.0	108.0	108.0	127.0	108.0
3 1/2	127.0	114.3	127.0	114.3	140.0	114.3
4	140.0	121.0	140.0	121.0	160.0	121.0

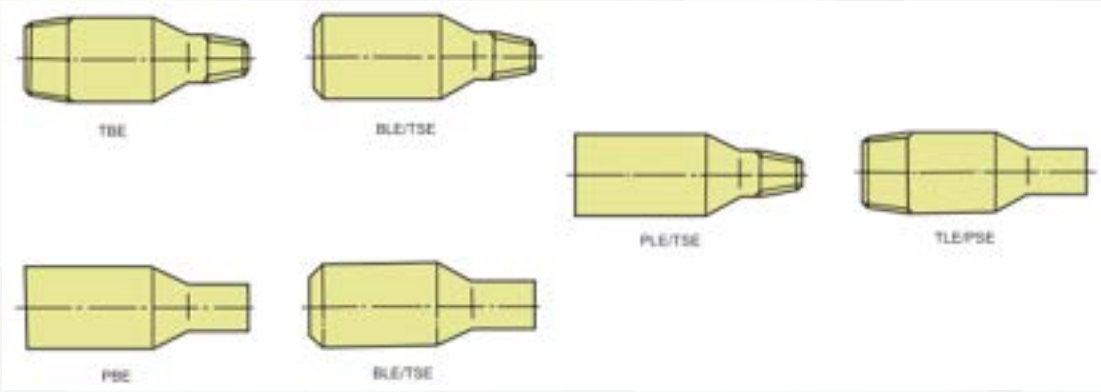
- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

SWAGE NIPPLE

Swage nipple is also called reducing nipple,is **a kind of forged pipe fitting**.It is usually used MSS SP-95 standard, common materials are carbon steel,stainless steel and alloy steel. Swage nipples also named reducing nipple, one end large diameter one end small, they are **made from forgings or formed by seamless pipes**. The end of swage nipple is plain, beveled and threaded. What is the difference between swage and reducer?

The swage nipple and reducer raw materials are different:

The raw materials of reducers is seamless steel pipes or steel plates,and the raw materials of swage nipple is round bar steel or billet steel



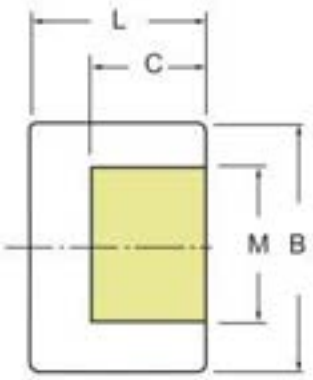
Large end Size	Small end Size MSS SP-95 mm	Length MSS SP-95 mm
1/2	3/8~1/8	70
3/4	1/2~1/8	76
1	3/4~1/8	89
1 1/4	1~1/8	102
1 1/2	1 1/4~1/8	114
2	1 1/2~1/8	165
2 1/2	2~1/8	178
3	2 1/2~1/8	203
3 1/2	3~1/8	203
4	3 1/2~1/4	229
5	4~1/4	279
6	5~1/2	305
8	6~1	330
10	8~2	381
12	10~2	406

Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser

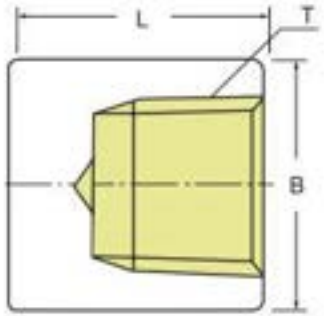
CAP

Pipe caps **act as protective device and are designed to protect pipe ends of various shapes**. The main purpose of using pipe caps is to waterproof the connections. They are also used to close the the ends of hydraulic or pneumatic pipes and tubes. Pipe cap is usually used for **protecting the end of pipe and other fittings**, so the shape are designed according to the shape of pipe line. End caps are usually used for protecting the end of pipe and other fittings, so the shape are designed according to the shape of pipe line.

Welding Type & Thread Type



3000lb, 6000lb, 9000lb



2000lb, 3000lb, 6000lb

Socket Welding Type

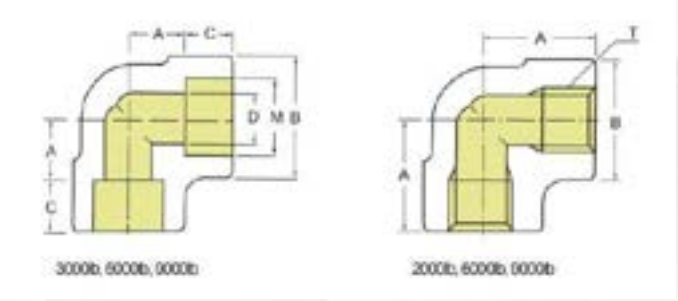
Size M	3000lb			6000lb			9000lb		
	B	C	L	D	C	L	D	C	L
	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	21.0	10.0	20.0	-	-	-	-	-	-
3/8	25.0	10.0	20.0	-	-	-	-	-	-
1/2	31.0	10.0	20.0	32.6	10.0	26.0	40.4	10.0	30.0
3/4	36.3	13.0	25.0	40.0	13.0	27.0	45.5	13.0	30.0
1	44.5	13.0	27.0	48.5	13.0	30.0	55.0	13.0	33.0
1 1/4	54.0	13.0	30.0	57.2	13.0	35.0	66.5	13.0	40.0
1 1/2	60.3	13.0	30.0	64.7	13.0	36.0	73.0	13.0	40.0
2	73.5	16.0	36.0	80.3	16.0	39.0	88.0	16.0	43.0
2 1/2	92.5	16.0	42.0	98.0	16.0	45.0	108.0	16.0	50.0
3	106.8	16.0	46.0	114.3	16.0	52.0	127.0	16.0	58.0
4	140.0	19.0	55.0	-	-	-	-	-	-

Threaded Type

Size T	2000lb		3000lb		6000lb	
	B	L	B	L	B	L
	mm	mm	mm	mm	mm	mm
1/4	19.0	25.0	19.0	25.0	25.4	27.0
3/8	22.0	25.0	22.0	25.0	31.8	27.0
1/2	28.5	32.0	28.5	32.0	38.1	33.0
3/4	35.0	37.0	35.0	37.0	44.5	38.0
1	44.5	41.0	44.5	41.0	57.0	43.0
1 1/4	57.0	44.0	57.0	44.0	63.5	46.0
1 1/2	63.5	44.0	63.5	44.0	76.0	48.0
2	76.0	48.0	76.0	48.0	92.0	51.0
2 1/2	92.0	60.0	92.0	60.0	108.0	64.0
3	108.0	65.0	108.0	65.0	127.0	68.0
3 1/2	127.0	68.0	127.0	68.0	140.0	70.0
4	140.0	68.0	140.0	68.0	160.0	75.0

- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

90° ELBOW



Socket Welding Type

Size M	3000lb				6000lb				9000lb			
	B	D	A	C	B	D	A	C	B	D	A	C
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	26.5	9.4	11.1	10.0	-	-	-	-	-	-	-	-
3/8	26.5	12.7	13.4	10.0	-	-	-	-	-	-	-	-
1/2	34.0	16.1	16.0	13.0	38.5	12.0	20.0	16.0	46.5	6.4	23.0	16.0
3/4	38.5	21.2	20.0	14.0	46.5	15.8	23.0	16.0	56.5	11.0	28.0	16.0
1	46.5	27.0	23.0	15.0	56.5	21.0	28.0	18.0	63.5	15.2	33.0	18.0
1 1/4	56.5	35.4	28.0	17.0	63.5	29.7	33.0	20.0	76.0	22.7	40.0	20.0
1 1/2	63.5	41.2	33.0	18.0	76.0	34.2	40.0	22.0	84.0	27.9	42.0	22.0
2	76.0	52.7	39.0	22.0	84.0	43.1	42.0	24.0	110.0	38.1	54.0	24.0
2 1/2	92.0	62.7	42.0	24.0	110.0	54.0	57.1	24.0	121.0	45.0	66.0	24.0
3	110.0	78.0	57.1	31.5	121.0	67.7	66.0	31.5	146.0	58.5	70.0	31.5
4	146.0	102.0	68.0	45.0	152.0	87.0	70.0	45.0	-	-	-	-

Threaded Type

Size T	2000lb		3000lb		6000lb	
	B	A	B	A	B	A
	mm	mm	mm	mm	mm	mm
1/4	26.5	25.4	26.5	25.4	-	-
3/8	26.5	25.4	34.0	28.5	38.5	33.5
1/2	34.0	28.5	38.5	33.5	46.5	38.1
3/4	38.5	33.5	46.5	38.1	56.5	44.5
1	46.5	38.1	56.5	44.5	63.5	50.8
1 1/4	56.5	44.5	63.5	50.8	76.0	60.5
1 1/2	63.5	50.8	76.0	60.5	84.0	64.0
2	76.0	60.5	84.0	64.0	110.0	83.0
2 1/2	92.0	64.0	110.0	83.0	121.0	95.5
3	110.0	83.0	121.0	95.5	146.0	106.5
3 1/2	121.0	95.5	146.0	106.5	152.0	114.3
4	146.0	106.5	152.0	114.3	152.0	114.3

- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

45° ELBOW

Socket Welding Type

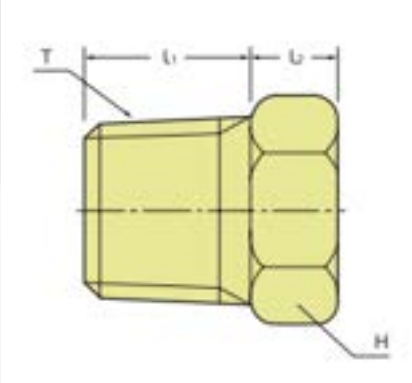
Nominal Pipe Size	3000lb				6000lb				9000lb			
	B	D	A	C	B	D	A	C	B	D	A	C
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/4	26.5	9.4	7.9	10.0	-	-	-	-	-	-	-	-
3/8	26.5	12.7	7.9	10.0	-	-	-	-	-	-	-	-
1/2	34.0	16.1	13.0	13.0	38.5	12.0	13.0	16.0	46.5	6.4	14.0	16.0
3/4	38.5	21.2	13.0	14.0	46.5	15.8	14.0	16.0	56.5	11.0	22.0	16.0
1	46.5	27.0	14.0	15.0	56.5	21.0	22.0	18.0	63.5	15.2	22.0	18.0
1 1/4	56.5	35.4	18.0	17.0	63.5	29.7	22.0	20.0	76.0	22.7	24.0	20.0
1 1/2	63.5	41.2	22.0	18.0	76.0	34.2	24.0	22.0	84.0	27.9	29.0	22.0
2	76.0	52.7	24.0	22.0	84.0	43.1	29.0	24.0	110.0	36.1	34.0	24.0
2 1/2	92.0	62.7	29.0	24.0	110.0	54.0	34.0	24.0	121.0	45.0	34.0	24.0
3	110.0	78.0	34.0	31.5	121.0	67.7	34.0	31.5	146.0	58.5	42.0	31.5
4	146.0	102.0	42.0	45.0	152.0	87.0	42.0	45.0	-	-	-	-

Threaded Type

Size T	2000lb		3000lb		6000lb	
	B	A	B	A	B	A
	mm	mm	mm	mm	mm	mm
1/4	26.5	19.1	26.5	19.1	-	-
3/8	26.5	19.1	34.0	26.0	38.5	28.6
1/2	34.0	26.0	38.5	28.6	46.5	30.0
3/4	38.5	28.6	46.5	30.0	56.5	33.3
1	46.5	30.0	56.5	33.3	63.5	42.0
1 1/4	56.5	33.3	63.5	42.0	76.0	46.0
1 1/2	63.5	42.0	76.0	46.0	84.0	53.0
2	76.0	46.0	84.0	53.0	110.0	64.0
2 1/2	92.0	53.0	110.0	64.0	121.0	64.0
3	110.0	64.0	121.0	64.0	146.0	80.0
3 1/2	121.0	64.0	146.0	80.0	152.0	80.0
4	146.0	80.0	152.0	80.0	152.0	80.0

- *Dimensions are in millimeters*
- *Dimensional Tolerances See ASME B16.11 or JIS B2316*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

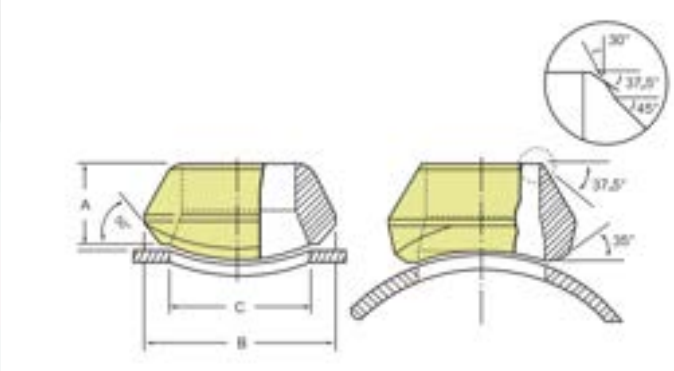
HEX HEAD PLUG



Size T	3000lb		
	L1	L2	H
	mm	mm	mm
1/8	11.0	6.3	11.0
1/4	13.0	6.3	16.0
3/8	14.0	8.0	18.0
1/2	18.0	8.0	22.0
3/4	19.0	10.0	27.0
1	21.0	10.0	35.0
1 1/4	22.0	14.0	44.0
1 1/2	24.0	16.0	51.0
2	25.0	18.0	63.5
2 1/2	32.0	19.0	76.5
3	40.0	21.0	99.0
3 1/2	41.0	22.0	103.0
4	42.0	32.0	117.0

WELDOLET

STD(Sch40), X-S(Sch80), Sch160, XX-S



STD, X-S

Outlet Size	A		B		C		APP. Weight	
	STD	X-S	STD	X-S	STD	X-S	STD	X-S
	mm	mm	mm	mm	mm	mm	kg	kg
1/2	19.1	19.1	34.9	34.9	23.8	23.8	0.08	0.09
3/4	22.2	22.2	44.5	44.5	30.2	30.2	0.11	0.14
1	27.0	27.0	54.0	54.0	38.5	38.5	0.23	0.21
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5	0.39	0.41
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8	0.45	0.50
2	38.1	38.1	88.9	88.9	65.1	65.1	0.80	0.80
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2	1.14	1.20
3	44.5	44.5	122.2	122.2	93.7	93.7	1.82	1.90
4	50.8	50.8	152.4	152.4	120.7	120.7	2.86	2.90
5	57.2	57.2	179.4	179.4	141.3	141.3	4.60	4.70
6	60.3	77.8	215.9	225.4	169.9	169.9	6.45	10.53
8	69.9	98.5	263.5	282.1	220.7	220.7	10.68	16.80
10	77.8	93.7	322.3	323.9	274.7	295.1	17.73	20.90
12	85.7	103.2	377.8	397.4	325.4	317.5	26.82	27.70
14	88.9	100.0	409.6	431.8	357.2	350.8	30.00	31.60
16	93.7	106.4	463.6	466.7	406.0	403.2	34.10	46.40
18	96.8	111.1	520.7	523.9	458.8	455.6	44.10	50.10
20	101.6	119.1	571.5	582.6	508.0	509.6	53.80	71.80
24	115.9	139.7	689.0	708.0	614.4	638.2	100.00	131.80

Sch160, XX-S

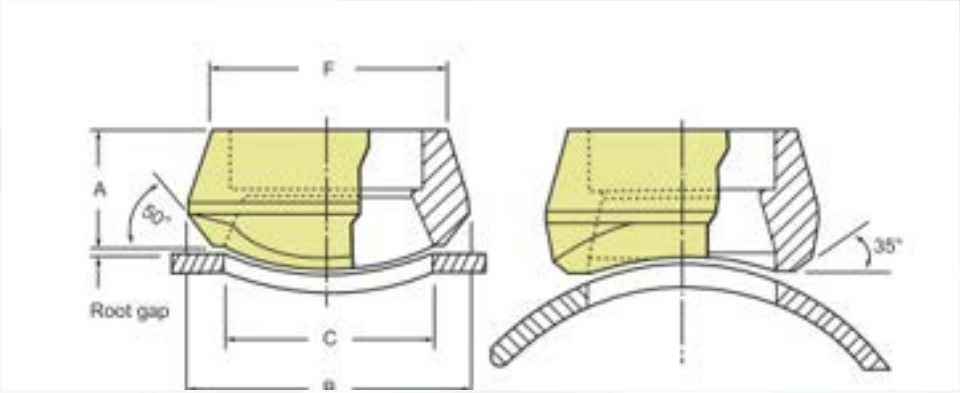
Outlet Size	A		B		C		Appr. Weight	
	STD	X-S	STD	X-S	STD	X-S	STD	X-S
	mm	mm	mm	mm	mm	mm	kg	kg
1/2	28.6	28.6	34.9	34.9	14.3	14.3	0.11	-
3/4	31.8	31.8	44.5	44.5	19.1	19.1	0.32	-
1	38.1	38.1	50.8	50.8	25.4	25.4	0.38	0.38
1 1/4	44.5	44.5	61.9	61.9	33.3	33.3	0.57	0.57
1 1/2	50.8	50.8	69.9	69.9	38.1	38.1	0.80	0.80
2	55.6	55.6	81.0	81.0	42.9	42.9	1.00	1.00
2 1/2	61.9	61.9	96.8	96.8	54.0	54.0	1.54	1.54
3	73.0	73.0	120.7	120.7	73.0	73.0	2.90	2.90
4	84.1	84.1	152.4	152.4	98.4	98.4	4.80	4.80
5	93.7	93.7	187.3	187.3	122.2	122.2	6.50	6.50
6	104.8	104.8	220.7	220.7	146.1	146.1	12.70	12.70
8	111.1	111.1	284.2	284.2	173.0	173.0	20.50	20.50
10	125.4	125.4	312.7	312.7	215.9	215.9	38.60	38.60

- *Dimensions are in millimeters*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

SOCKOLET

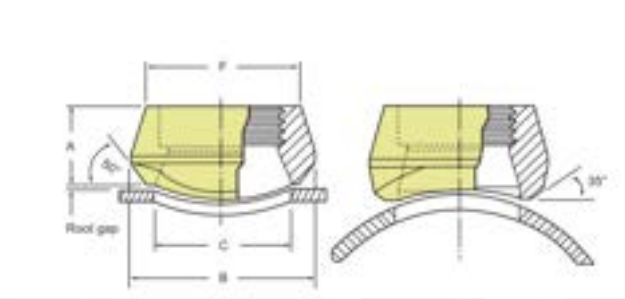
Manufacture. Socket weld and threaded outlets are manufactured to the requirements of ASME/ ANSI B16.11 - Forged fitting, socket welding and threaded, although outlet dimensions are not specified in B16.11. Buttweld outlets are manufactured to the requirements of ASME/ANSI B16.9 - Factory-made wrought steel buttwelding fittings, although outlet dimensions are not specified in B16.9

Pressure Rating. Outlets are rated the same as seamless steel pipe, as defined in the American National Standard Codes for Pressure Piping, ANSI B31.1 and B31.3, the ASME Boiler and Pressure Vessel Code. Refer to page 5-28 for a summary of pipe pressure rating calculations.



Outlet Size	A		B		C		F		APP' Weight	
	3000#	6000#	3000#	6000#	3000#	6000#	C	6000#	6000#	6000#
	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
1/2	25.4	31.8	34.9	44.5	23.8	19.1	31.8	39.7	0.14	0.23
3/4	27.0	36.5	44.5	50.8	30.2	25.4	36.5	45.2	0.15	0.36
1	33.3	39.7	54.0	61.9	36.5	33.3	46.0	57.2	0.27	0.59
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1	55.6	65.1	0.39	0.73
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2	61.9	76.2	0.47	0.91
2	38.1	58.7	88.9	103.2	65.1	58.7	74.6	92.1	0.73	2.33
2 1/2	46.0	-	103.2	-	76.2	-	87.3	-	1.25	-
3	50.8	-	122.2	-	93.7	-	104.8	-	1.73	-
4	57.2	-	152.4	-	120.7	-	130.2	-	3.30	-

THREADOLET



Outlet Size	A		B		C		F		APP' Weight	
	3000#	6000#	3000#	6000#	3000#	6000#	C	6000#	6000#	6000#
	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg
1/2	25.4	31.8	34.9	44.5	23.8	19.1	31.8	39.7	0.11	0.20
3/4	27.0	36.5	44.5	50.8	30.2	25.4	36.5	46.6	0.16	0.34
1	33.3	39.7	54.0	61.9	36.5	33.3	46.0	57.2	0.28	0.56
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1	55.6	65.1	0.41	0.71
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2	61.9	76.2	0.45	0.89
2	38.1	52.4	88.9	103.2	65.1	69.9	74.6	92.1	0.80	2.31
2 1/2	46.0	-	103.2	-	76.2	-	87.3	-	1.36	-
3	50.8	-	122.2	-	93.7	-	104.8	-	1.98	-
4	57.2	-	152.4	-	120.7	-	130.2	-	3.23	-

- *Dimensions are in millimeters*
- *Fittings of special dimensions, sizes, shapes and tolerances may be made by agreement between the manufacturer and the purchaser*

H

BUTWELD FITTINGS

PT MITRA GALPERTI BUTWELD FITTINGS :

- Elbows
- Tees
- Reducers
- Caps

- Feature of MITRA GALPERTI Brand Butt-welding Fittings Butt-welding piping Fittings of MG Material are manufactured with Carbon steel and Stainless steel pipe materials supplied by Japanese manufacturers and other first class pipe manufactures in accordance with the standards and specifications .
- Applicable Standard of Butt-welding fittings (1) ASME Standards ASME B 16.9 Factory-Made Wrought Buttwelding Fittings (2) ASTM Standards A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service A420 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service A403 Wrought Austenitic Stainless Steel Piping Fittings A960 Standard Specification for Common Requirements for Wrought Steel Piping Fittings (3) NACE Standards NACE MR0175 / ISO 15156 Petroleum and natural gas industries—Materials for use in H2S-containing environments in oil and gas production MR0103 Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments.

Material Specification for Products

Material	ASTM (Fittings)	ASTM (Pipe)
Carbon steel	A234 WPB	A106 Grade B
	A420 WPL6	A333 Grade 6
Austenitic Stainless steel	A403 WP304/304L	A312 TP304/304L
	A403 WP316/316L	A312 TP316/316L

Inspection

Appearance inspection is done by visual observation. Dimensional inspection is done according to ASME B 16.9. Inspection Certificate : according to EN 10204 type, 3.1: 2004

Carbon

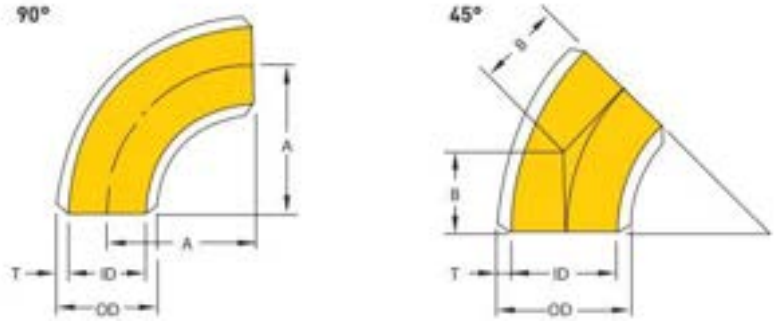
Carbon steel fittings are painted with clear or black coating material for WPB and brown one for WPL6.

Marking

Marking on products by MSS SP-25
(1) Manufacturer's name or Trade mark
(2) Material Type
(3) Size
(4) Description
(5) Manufacturing Number

ELBOWS

LONG RADIUS ELBOWS



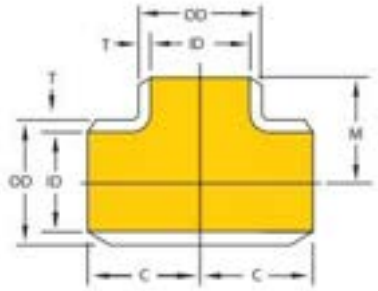
ASME B16.1				MSS SP-75			
NB	O.D. at Bevel	A (mm)	B (mm)	NB	O.D. at Bevel	A (mm)	B (mm)
1/2	21,3	38,1	15,9				
3/4	26,7	38,1	19,1				
1	33,4	38,1	22,2				
1 1/4	42,2	47,6	25,4				
1 1/2	48,3	57,2	28,6				
2	60,3	76,2	34,9				
2 1/2	73,0	95,3	44,5				
3	88,9	114,3	50,8				
3 1/2	101,6	133,4	57,2				
4	114,3	152,4	63,5				
5	141,3	190,5	79,4				
6	168,3	228,6	95,3				
8	219,1	304,8	127,0				
10	273,1	381,0	158,7				
12	323,9	457,2	190,5				
14	355,6	533,4	222,3				
16	406,4	609,6	254,0	16	406,4	609,6	254,0
18	457,2	685,8	285,8	18	457,2	685,8	285,8
20	508,0	762,0	317,5	20	508,0	762,0	317,5
22	558,8	838,2	342,9	22	558,8	838,2	342,9
24	609,6	914,4	381,0	24	609,6	914,4	381,0
26	660,4	990,6	406,4	26	660,4	990,6	406,4
28	711,2	1066,8	438,2				
30	762,0	1143,0	469,9	30	762,0	1143,0	469,9
32	812,8	1219,2	501,7				
34	863,6	1295,4	533,4	34	863,6	1295,4	533,4
36	914,4	1371,6	565,2	36	914,4	1371,6	565,2
38	965,2	1447,8	600,1	38	965,2	1447,8	600,1
40	1016,0	1524,0	631,8	40	1016,0	1524,0	631,8
42	1066,8	1600,2	660,4	42	1066,8	1600,2	660,4
44	1117,6	1676,4	695,3	44	1117,6	1676,4	695,3
46	1168,4	1752,6	727,1	46	1168,4	1752,6	727,1
48	1219,2	1828,8	758,8	48	1219,2	1828,8	758,8

SHORT RADIUS ELBOWS

ASME B16.28 (mm)		
NB	O.D. at Bevel D	Centre to End A
1	33,40	25,40
1 1/4	42,16	31,75
1 1/2	48,26	38,10
2	60,33	50,80
2 1/2	73,03	63,50
3	88,90	76,20
3 1/2	101,60	88,90
4	114,30	101,60
5	141,30	127,00
6	168,28	152,40
8	219,08	203,20
10	273,05	254,00
12	323,85	304,80
14	355,60	355,60
16	406,40	406,40
18	457,20	457,20
20	508,00	508,00
22	558,80	558,80
24	609,60	609,60

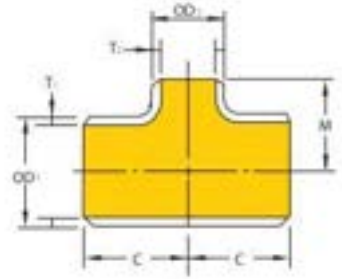
TEES

EQUAL TEES



ASME B16.9				MSS SP-75			
NB	O.D. at Bevel	C (mm)	M (mm)	NB	O.D. at Bevel	C (mm)	M (mm)
1/2	21,3	25,4	25,4				
3/4	26,7	28,6	28,6				
1	33,4	38,1	38,1				
1 1/4	42,2	47,6	47,6				
1 1/2	48,3	57,2	57,2				
2	60,3	63,5	63,5				
2 1/2	73,0	76,2	76,2				
3	88,9	85,7	85,7				
3 1/2	101,6	95,3	95,3				
4	114,3	104,8	104,8				
5	141,3	123,8	123,8				
6	168,3	142,9	142,9				
8	219,1	177,8	177,8				
10	273,1	215,9	215,9				
12	323,9	254,0	254,0				
14	355,6	279,4	279,4				
16	406,4	304,8	304,8	16	406,4	304,8	304,8
18	457,2	342,9	342,9	18	457,2	342,9	342,9
20	508,0	381,0	381,0	20	508,0	381,0	381,0
22	558,8	419,1	419,1	22	558,8	419,1	419,1
24	609,6	431,8	431,8	24	609,6	431,8	431,8
26	660,4	495,3	495,3	26	660,4	495,3	495,3
28	711,2	520,7	520,7				
30	762,0	558,8	558,8	30	762,0	558,8	558,8
32	812,8	596,9	596,9				
34	863,6	635,0	635,0	34	863,6	635,0	635,0
36	914,4	673,1	673,1	36	914,4	673,1	673,1
38	965,2	711,2	711,2	38	965,2	711,2	711,2
40	1016,0	749,3	749,3	40	1016,0	749,3	749,3
42	1066,8	762,0	711,2	42	1066,8	762,0	711,2
44	1117,6	812,8	762,0	44	1117,6	812,8	762,0
46	1168,4	850,9	800,1	46	1168,4	850,9	800,1
48	1219,2	889,0	838,2	48	1219,2	889,0	838,2

REDUCING OUTLET TEES



ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
1/2	3/8	21,3	17,2	25,4	25,4						
1/2	1/4	21,3	13,7	25,4	25,4						
3/4	1/2	26,7	21,3	28,6	28,6						
3/4	3/8	26,7	17,2	28,6	28,6						
1	3/4	33,4	26,7	38,1	38,1						
1	1/2	33,4	21,3	38,1	38,1						
1 1/4	1	42,2	33,4	47,6	47,6						
1 1/4	3/4	42,2	26,7	47,6	47,6						
1 1/4	1/2	42,2	21,3	47,6	47,6						
1 1/2	1 1/4	48,3	42,2	57,2	57,2						
1 1/2	1	48,3	33,4	57,2	57,2						
1 1/2	3/4	48,3	26,7	57,2	57,2						
1 1/2	1/2	48,3	21,3	57,2	57,2						
2	1 1/2	60,3	48,3	63,5	60,3						
2	1 1/4	60,3	42,2	63,5	57,2						
2	1	60,3	33,4	63,5	50,8						
2	3/4	60,3	26,7	63,5	44,5						
2 1/2	2	73,0	60,3	76,2	69,9						
2 1/2	1 1/2	73,0	48,3	76,2	66,7						
2 1/2	1 1/4	73,0	42,2	76,2	63,5						
2 1/2	1	73,0	33,4	76,2	57,2						
3	2 1/2	88,9	73,0	85,7	82,6						
3	2	88,9	60,3	85,7	76,2						
3	1 1/2	88,9	48,3	85,7	73,0						
3	1 1/4	88,9	42,2	85,7	69,9						
3 1/2	3	101,6	88,9	95,3	92,1						
3 1/2	2 1/2	101,6	73,0	95,3	88,9						
3 1/2	2	101,6	60,3	95,3	82,6						
3 1/2	1 1/2	101,6	48,3	95,3	79,4						
4	3 1/2	114,3	101,6	104,8	101,6						
4	3	114,3	88,9	104,8	98,4						
4	2 1/2	114,3	73,0	104,8	95,3						

ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
4	2	114,3	60,3	104,8	88,9						
4	1 1/2	114,3	48,3	104,8	85,7						
5	4	141,3	114,3	123,8	117,5						
5	3 1/2	141,3	101,6	123,8	114,3						
5	3	141,3	88,9	123,8	111,1						
5	2 1/2	141,3	73,0	123,8	108,0						
5	2	141,3	60,3	123,8	104,8						
6	5	168,3	141,3	142,9	136,5						
6	4	168,3	114,3	142,9	130,2						
6	3 1/2	168,3	101,6	142,9	127,0						
6	3	168,3	88,9	142,9	123,8						
6	2 1/2	168,3	73,0	142,9	120,7						
8	6	219,1	168,3	177,8	168,3						
8	5	219,1	141,3	177,8	161,9						
8	4	219,1	114,3	177,8	155,6						
8	3 1/2	219,1	101,6	177,8	152,4						
10	8	273,1	219,1	215,9	203,2						
10	6	273,1	168,3	215,9	193,7						
10	5	273,1	141,3	215,9	190,5						
10	4	273,1	114,3	215,9	184,2						
12	10	323,9	273,1	254,0	241,3						
12	8	323,9	219,1	254,0	228,6						
12	6	323,9	168,3	254,0	219,1						
12	5	323,9	141,3	254,0	215,9						
14	12	355,6	323,9	279,4	269,9						
14	10	355,6	273,1	279,4	257,2						
14	8	355,6	219,1	279,4	247,7						
14	6	355,6	168,3	279,4	238,1						
16	14	406,4	355,6	304,8	304,8	16	14	406,4	355,6	304,8	304,8
16	12	406,4	323,9	304,8	295,3	16	12	406,4	323,9	304,8	295,3
16	10	406,4	273,1	304,8	282,6	16	10	406,4	273,1	304,8	282,6
16	8	406,4	219,1	304,8	273,1	16	8	406,4	219,1	304,8	273,1
16	6	406,4	168,3	304,8	263,5	16	6	406,4	168,3	304,8	263,5
18	16	457,2	406,4	342,9	330,2	18	16	457,2	406,4	342,9	330,2
18	14	457,2	355,6	342,9	330,2	18	14	457,2	355,6	342,9	330,2
18	12	457,2	323,9	342,9	320,7	18	12	457,2	323,9	342,9	320,7
18	10	457,2	273,1	342,9	308,0	18	10	457,2	273,1	342,9	308,0
18	8	457,2	219,1	342,9	298,5	18	8	457,2	219,1	342,9	298,5
20	18	508,0	475,2	381,0	368,3	20	18	508,0	475,2	381,0	368,3
20	16	508,0	406,4	381,0	355,6	20	16	508,0	406,4	381,0	355,6
20	14	508,0	355,6	381,0	355,6	20	14	508,0	355,6	381,0	355,6
20	12	508,0	323,9	381,0	344,1	20	12	508,0	323,9	381,0	344,1

ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
20	10	508,0	273,1	381,0	333,4	20	10	508,0	273,1	381,0	333,4
20	8	508,0	219,1	381,0	323,9	20	8	508,0	219,1	381,0	323,9
22	20	558,8	508,0	419,1	406,4	22	20	558,8	508,0	419,1	406,4
22	18	558,8	457,2	419,1	393,7	22	18	558,8	457,2	419,1	393,7
22	16	558,8	406,4	419,1	381,0	22	16	558,8	406,4	419,1	381,0
22	14	558,8	355,6	419,1	381,0	22	14	558,8	355,6	419,1	381,0
22	12	558,8	323,9	419,1	371,5	22	12	558,8	323,9	419,1	371,5
22	10	558,8	273,1	419,1	358,8	22	10	558,8	273,1	419,1	358,8
24	22	609,6	558,8	431,8	431,8	24	22	609,6	558,8	431,8	431,8
24	20	609,6	508,0	431,8	431,8	24	20	609,6	508,0	431,8	431,8
24	18	609,6	457,2	431,8	419,1	24	18	609,6	457,2	431,8	419,1
24	16	609,6	406,4	431,8	406,4	24	16	609,6	406,4	431,8	406,4
24	14	609,6	355,6	431,8	406,4	24	14	609,6	355,6	431,8	406,4
24	12	609,6	323,9	431,8	396,9	24	12	609,6	323,9	431,8	396,9
24	10	609,6	273,1	431,8	384,2	24	10	609,6	273,1	431,8	384,2
26	24	660,4	609,6	495,3	482,6	26	24	660,4	609,6	495,3	482,6
26	22	660,4	558,8	495,3	469,9	26	22	660,4	558,8	495,3	469,9
26	20	660,4	508,0	495,3	457,2	26	20	660,4	508,0	495,3	457,2
26	18	660,4	457,2	495,3	444,5	26	18	660,4	457,2	495,3	444,5
26	16	660,4	406,4	495,3	431,8	26	16	660,4	406,4	495,3	431,8
26	14	660,4	355,6	495,3	431,8	26	14	660,4	355,6	495,3	431,8
26	12	660,4	323,9	495,3	422,3	26	12	660,4	323,9	495,3	422,3
28	26	711,2	660,4	520,7	520,7						
28	24	711,2	609,6	520,7	508,0						
28	22	711,2	558,8	520,7	495,3						
28	20	711,2	508,0	520,7	482,6						
28	18	711,2	457,2	520,7	469,9						
28	16	711,2	406,4	520,7	457,2						
28	14	711,2	355,6	520,7	457,2						
28	12	711,2	323,9	520,7	447,7						
30	28	762,0	711,2	558,8	546,1						
30	26	762,0	660,4	558,8	546,1	30	26	762,0	660,4	558,8	546,1
30	24	762,0	609,6	558,8	533,4	30	24	762,0	609,6	558,8	533,4
30	22	762,0	558,8	558,8	520,7	30	22	762,0	558,8	558,8	520,7
30	20	762,0	508,0	558,8	508,0	30	20	762,0	508,0	558,8	508,0
30	18	762,0	457,2	558,8	495,3	30	18	762,0	457,2	558,8	495,3
30	16	762,0	406,4	558,8	482,6	30	16	762,0	406,4	558,8	482,6
30	14	762,0	355,6	558,8	482,6	30	14	762,0	355,6	558,8	482,6
30	12	762,0	323,9	558,8	473,1	30	12	762,0	323,9	558,8	473,1
30	10	762,0	273,1	558,8	460,4	30	10	762,0	273,1	558,8	460,4
32	30	812,8	762,0	596,9	584,2						
32	28	812,8	711,2	596,9	571,5						

ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
32	26	812,8	660,4	596,9	571,5						
32	24	812,8	609,6	596,9	558,8						
32	22	812,8	558,8	596,9	546,1						
32	20	812,8	508,0	596,9	533,4						
32	18	812,8	457,2	596,9	520,7						
32	16	812,8	406,4	596,9	508,0						
32	14	812,8	355,6	596,9	508,0						
34	32	863,6	812,8	635,0	622,3						
34	30	863,6	762,0	635,0	609,6	34	30	863,6	762,0	635,0	609,6
34	28	863,6	711,2	635,0	596,9						
34	26	863,6	660,4	635,0	596,9	34	26	863,6	660,4	635,0	596,9
34	24	863,6	609,6	635,0	584,2	34	24	863,6	609,6	635,0	584,2
34	22	863,6	558,8	635,0	571,5	34	22	863,6	558,8	635,0	571,5
34	20	863,6	508,0	635,0	558,8	34	20	863,6	508,0	635,0	558,8
34	18	863,6	457,2	635,0	546,1	34	18	863,6	457,2	635,0	546,1
34	16	863,6	406,4	635,0	533,4	34	16	863,6	406,4	635,0	533,4
36	34	914,4	863,6	673,1	660,4	36	34	914,4	863,6	673,1	660,4
36	32	914,4	812,8	673,1	647,7						
36	30	914,4	762,0	673,1	635,0	36	30	914,4	762,0	673,1	635,0
36	28	914,4	711,2	673,1	622,3						
36	26	914,4	660,4	673,1	622,3	36	26	914,4	660,4	673,1	622,3
36	24	914,4	609,6	673,1	609,6	36	24	914,4	609,6	673,1	609,6
36	22	914,4	558,8	673,1	596,9	36	22	914,4	558,8	673,1	596,9
36	20	914,4	508,0	673,1	584,2	36	20	914,4	508,0	673,1	584,2
36	18	914,4	457,2	673,1	571,5	36	18	914,4	457,2	673,1	571,5
36	16	914,4	406,4	673,1	558,8	36	16	914,4	406,4	673,1	558,8
38	36	965,2	914,4	711,2	711,2	38	36	965,2	914,4	711,2	711,2
38	34	965,2	863,6	711,2	698,5	38	34	965,2	863,6	711,2	698,5
38	32	965,2	812,8	711,2	685,8	38	32	965,2	812,8	711,2	685,8
38	30	965,2	762,0	711,2	673,1	38	30	965,2	762,0	711,2	673,1
38	28	965,2	711,2	711,2	647,7						
38	26	965,2	660,4	711,2	647,7	38	26	965,2	660,4	711,2	647,7
38	24	965,2	609,6	711,2	635,0	38	24	965,2	609,6	711,2	635,0
38	22	965,2	558,8	711,2	622,3	38	22	965,2	558,8	711,2	622,3
38	20	965,2	508,0	711,2	609,6	38	20	965,2	508,0	711,2	609,6
38	18	965,2	457,2	711,2	596,9	38	18	965,2	457,2	711,2	596,9
40	38	1016,0	965,2	749,3	749,3	40	38	1016,0	965,2	749,3	749,3
40	36	1016,0	914,4	749,3	736,6	40	36	1016,0	914,4	749,3	736,6
40	34	1016,0	863,6	749,3	723,9	40	34	1016,0	863,6	749,3	723,9
40	32	1016,0	812,8	749,3	711,2	40	32	1016,0	812,8	749,3	711,2
40	30	1016,0	762,0	749,3	698,5	40	30	1016,0	762,0	749,3	698,5
40	28	1016,0	711,2	749,3	673,1						

ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
40	26	1016,0	660,4	749,3	673,1	40	26	1016,0	660,4	749,3	673,1
40	24	1016,0	609,6	749,3	660,4	40	24	1016,0	609,6	749,3	660,4
40	22	1016,0	558,8	749,3	647,7	40	22	1016,0	558,8	749,3	647,7
40	20	1016,0	508,0	749,3	635,0	40	20	1016,0	508,0	749,3	635,0
40	18	1016,0	457,2	749,3	622,3	40	18	1016,0	457,2	749,3	622,3
42	36	1066,8	914,4	762,0	711,2	42	36	1066,8	914,4	762,0	711,2
42	34	1066,8	863,6	762,0	711,2	42	34	1066,8	863,6	762,0	711,2
42	32	1066,8	812,8	762,0	711,2	42	32	1066,8	812,8	762,0	711,2
42	30	1066,8	762,0	762,0	711,2	42	30	1066,8	762,0	762,0	711,2
42	28	1066,8	711,2	762,0	698,5	42	28	1066,8	711,2	762,0	698,5
42	26	1066,8	660,4	762,0	698,5	42	26	1066,8	660,4	762,0	698,5
42	24	1066,8	609,6	762,0	660,4	42	24	1066,8	609,6	762,0	660,4
42	22	1066,8	558,8	762,0	660,4	42	22	1066,8	558,8	762,0	660,4
42	20	1066,8	508,0	762,0	660,4	42	20	1066,8	508,0	762,0	660,4
42	18	1066,8	457,2	762,0	647,7	42	18	1066,8	457,2	762,0	647,7
42	16	1066,8	406,4	762,0	635,0	42	16	1066,8	406,4	762,0	635,0
44	42	1117,6	1066,8	812,8	762,0	44	42	1117,6	1066,8	812,8	762,0
44	40	1117,6	1016,0	812,8	749,3	44	40	1117,6	1016,0	812,8	749,3
44	38	1117,6	965,2	812,8	736,6	44	38	1117,6	965,2	812,8	736,6
44	36	1117,6	914,4	812,8	723,9	44	36	1117,6	914,4	812,8	723,9
44	34	1117,6	863,6	812,8	723,9	44	34	1117,6	863,6	812,8	723,9
44	32	1117,6	812,8	812,8	711,2	44	32	1117,6	812,8	812,8	711,2
44	30	1117,6	762,0	812,8	711,2	44	30	1117,6	762,0	812,8	711,2
44	28	1117,6	711,2	812,8	698,5						
44	26	1117,6	660,4	812,8	698,5	44	26	1117,6	660,4	812,8	698,5
44	24	1117,6	609,6	812,8	698,5	44	24	1117,6	609,6	812,8	698,5
44	22	1117,6	558,8	812,8	685,8	44	22	1117,6	558,8	812,8	685,8
44	20	1117,6	508,0	812,8	685,8	44	20	1117,6	508,0	812,8	685,8
46	44	1168,4	1117,6	850,9	800,1	46	44	1168,4	1117,6	850,9	800,1
46	42	1168,4	1066,8	850,9	787,4	46	42	1168,4	1066,8	850,9	787,4
46	40	1168,4	1016,0	850,9	774,7	46	40	1168,4	1016,0	850,9	774,7
46	38	1168,4	965,2	850,9	762,0	46	38	1168,4	965,2	850,9	762,0
46	36	1168,4	914,4	850,9	762,0	46	36	1168,4	914,4	850,9	762,0
46	34	1168,4	863,6	850,9	749,3	46	34	1168,4	863,6	850,9	749,3
46	32	1168,4	812,8	850,9	749,3	46	32	1168,4	812,8	850,9	749,3
46	30	1168,4	762,0	850,9	736,6	46	30	1168,4	762,0	850,9	736,6
46	28	1168,4	711,2	850,9	736,6						
46	26	1168,4	660,4	850,9	736,6	46	26	1168,4	660,4	850,9	736,6
46	24	1168,4	609,6	850,9	723,9	46	24	1168,4	609,6	850,9	723,9
46	22	1168,4	558,8	850,9	723,9	46	22	1168,4	558,8	850,9	723,9
48	46	1219,2	1168,4	889,0	838,2	48	46	1219,2	1168,4	889,0	838,2
48	44	1219,2	1117,6	889,0	838,2	48	44	1219,2	1117,6	889,0	838,2

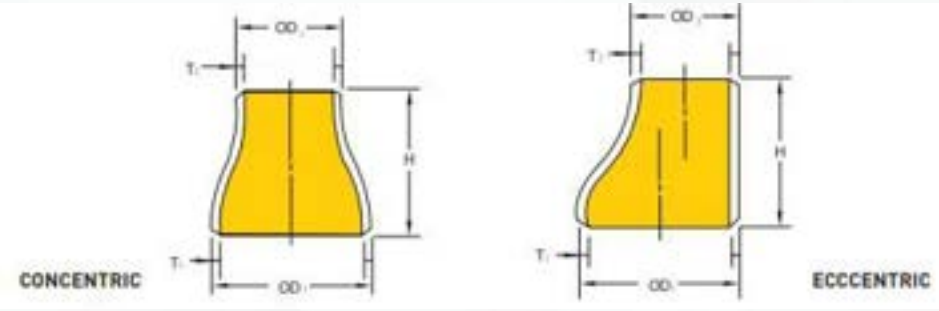
ASME B16.9						MSS SP-75					
NB		O.D. at Bevel		Run	Outlet	NB		O.D. at Bevel		Run	Outlet
Run	Outlet	Run	Outlet	C (mm)	M (mm)	Run	Outlet	Run	Outlet	C (mm)	M (mm)
48	42	1219,2	1066,8	889,0	812,8	48	42	1219,2	1066,8	889,0	812,8
48	40	1219,2	1016,0	889,0	812,8	48	40	1219,2	1016,0	889,0	812,8
48	38	1219,2	965,2	889,0	812,8	48	38	1219,2	965,2	889,0	812,8
48	36	1219,2	914,4	889,0	787,4	48	36	1219,2	914,4	889,0	787,4
48	34	1219,2	863,6	889,0	787,4	48	34	1219,2	863,6	889,0	787,4
48	32	1219,2	812,8	889,0	787,4	48	32	1219,2	812,8	889,0	787,4
48	30	1219,2	762,0	889,0	762,0	48	30	1219,2	762,0	889,0	762,0
48	28	1219,2	711,2	889,0	762,0						
48	26	1219,2	660,4	889,0	762,0	48	26	1219,2	660,4	889,0	762,0
48	24	1219,2	609,6	889,0	736,6	48	24	1219,2	609,6	889,0	736,6
48	22	1219,2	558,8	889,0	736,6	48	22	1219,2	558,8	889,0	736,6

REDUCING OUTLET TEES

ASME B16.9					MSS SP-75				
NB		O.D. at Bevel			NB		O.D. at Bevel		
LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)	LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)
3/4	3/8	26,7	17,2	38,1					
3/4	1/2	26,7	21,3	38,1					
1	3/4	33,4	26,7	50,8					
1	1/2	33,4	21,3	50,8					
1 1/4	1	42,2	33,4	50,8					
1 1/4	3/4	42,2	26,7	50,8					
1 1/4	1/2	42,2	21,3	50,8					
1 1/2	1 1/4	48,3	42,2	63,5					
1 1/2	1	48,3	33,4	63,5					
1 1/2	3/4	48,3	26,7	63,5					
1 1/2	1/2	48,3	21,3	63,5					
2	1 1/2	60,3	48,3	76,2					
2	1 1/4	60,3	42,2	76,2					
2	1	60,3	33,4	76,2					
2	3/4	60,3	26,7	76,2					
2 1/2	2	73,0	60,3	88,9					
2 1/2	1 1/2	73,0	48,3	88,9					
2 1/2	1 1/4	73,0	42,2	88,9					
2 1/2	1	73,0	33,4	88,9					
3	2 1/2	88,9	73,0	88,9					
3	2	88,9	60,3	88,9					
3	1 1/2	88,9	48,3	88,9					
3	1 1/4	88,9	42,2	88,9					
3 1/2	3	101,6	88,9	101,6					
3 1/2	2 1/2	101,6	73,0	101,6					
3 1/2	2	101,6	60,3	101,6					
3 1/2	1 1/2	101,6	48,3	101,6					
3 1/2	1 1/4	101,6	42,2	101,6					

NOTE: LE = Large End, SE= Small End

REDUCERS



REDUCING OUTLET TEES

ASME B16.9					MSS SP-75				
NB		O.D. at Bevel			NB		O.D. at Bevel		
LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)	LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)
4	3 1/2	114,3	101,6	101,6					
4	3	114,3	88,9	101,6					
4	2 1/2	114,3	73,0	101,6					
4	2	114,3	60,3	101,6					
4	1 1/2	114,3	48,3	101,6					
5	4	141,3	114,3	127,1					
5	3 1/2	141,3	101,6	127,0					
5	3	141,3	88,9	127,0					
5	2 1/2	141,3	73,0	127,0					
5	2	141,3	60,3	127,0					
6	5	168,3	141,3	139,7					
6	4	168,3	114,3	139,7					
6	3 1/2	168,3	101,6	139,7					
6	3	168,3	88,9	139,7					
6	2 1/2	168,3	73,0	139,7					
8	6	219,1	168,3	152,4					
8	5	219,1	141,3	152,4					
8	4	219,1	114,3	152,4					
8	3 1/2	219,1	101,6	152,4					
10	8	273,1	219,1	177,8					
10	6	273,1	168,3	177,8					
10	5	273,1	141,3	177,8					
10	4	273,1	114,3	177,8					
12	10	323,9	273,1	203,2					
12	8	323,9	219,1	203,2					
12	6	323,9	168,3	203,2					
12	5	323,9	141,3	203,2					
14	12	355,6	323,9	330,2					
14	10	355,6	273,1	330,2					
14	8	355,6	219,1	330,2					
14	6	355,6	168,3	330,2					
16	14	406,4	355,6	355,6	16	14	406,4	355,6	355,6
16	12	406,4	323,9	355,6	16	12	406,4	323,9	355,6
16	10	406,4	273,1	355,6	16	10	406,4	273,1	355,6
16	8	406,4	219,1	355,6	16	8	406,4	219,1	355,6
18	16	457,2	406,4	381,0	18	16	457,2	406,4	381,0
18	14	457,2	355,6	381,0	18	14	457,2	355,6	381,0
18	12	457,2	323,9	381,0	18	12	457,2	323,9	381,0
18	10	457,2	273,1	381,0	18	10	457,2	273,1	381,0

NOTE: LE = Large End, SE= Small End

REDUCING OUTLET TEES

ASME B16.9					MSS SP-75				
NB		O.D. at Bevel			NB		O.D. at Bevel		
LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)	LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)
20	18	508,0	457,2	508,0	20	18	508,0	457,2	508,0
20	16	508,0	406,4	508,0	20	16	508,0	406,4	508,0
20	14	508,0	355,6	508,0	20	14	508,0	355,6	508,0
20	12	508,0	323,9	508,0	20	12	508,0	323,9	508,0
22	20	558,8	508,0	508,0	22	20	558,8	508,0	508,0
22	18	558,8	457,2	508,0	22	18	558,8	457,2	508,0
22	16	558,8	406,4	508,0	22	16	558,8	406,4	508,0
22	14	558,8	355,6	508,0	22	14	558,8	355,6	508,0
24	22	609,6	558,8	508,0	24	22	609,6	558,8	508,0
24	20	609,6	508,0	508,0	24	20	609,6	508,0	508,0
24	18	609,6	457,2	508,0	24	18	609,6	457,2	508,0
24	16	609,6	406,4	508,0	24	16	609,6	406,4	508,0
26	24	660,4	609,6	609,6	26	24	660,4	609,6	609,6
26	22	660,4	558,8	609,6	26	22	660,4	558,8	609,6
26	20	660,4	508,0	609,6	26	20	660,4	508,0	609,6
26	18	660,4	457,2	609,6	26	18	660,4	457,2	609,6
28	26	711,2	660,4	609,6					
28	24	711,2	609,6	609,6					
28	20	711,2	508,0	609,6					
28	18	711,2	457,2	609,6					
30	28	762,0	711,2	609,6					
30	26	762,0	660,4	609,6	30	26	762,0	660,4	609,6
30	24	762,0	609,6	609,6	30	24	762,0	609,6	609,6
30	20	762,0	508,0	609,6	30	20	762,0	508,0	609,6
32	30	812,8	762,0	609,6					
32	28	812,8	711,2	609,6					
32	26	812,8	660,4	609,6					
32	24	812,8	609,6	609,6					
34	32	863,6	812,8	609,6					
34	30	863,6	762,0	609,6	34	30	863,6	762,0	609,6
34	26	863,6	660,4	609,6	34	26	863,6	660,4	609,6
34	24	863,6	609,6	609,6	34	24	863,6	609,6	609,6
36	34	914,4	863,6	609,6	36	34	914,4	863,6	609,6
36	32	914,4	812,8	609,6					
36	30	914,4	762,0	609,6	36	30	914,4	762,0	609,6
36	26	914,4	660,4	609,6	36	26	914,4	660,4	609,6
36	24	914,4	609,6	609,6	36	24	914,4	609,6	609,6
38	36	965,2	914,4	609,6	38	36	965,2	914,4	609,6
38	34	965,2	863,6	609,6	38	34	965,2	863,6	609,6

NOTE: LE = Large End, SE= Small End

REDUCING OUTLET TEES

ASME B16.9					MSS SP-75				
NB		O.D. at Bevel			NB		O.D. at Bevel		
LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)	LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)
38	32	965,2	812,8	609,6	38	32	965,2	812,8	609,6
38	30	965,2	762,0	609,6	38	30	965,2	762,0	609,6
38	28	965,2	711,2	609,6					
38	26	965,2	660,4	609,6	38	26	965,2	660,4	609,6
					38	24	965,2	609,6	609,6
					38	22	965,2	558,8	609,6
					38	20	965,2	508,0	609,6
40	38	1016,0	965,2	609,6	40	38	1016,0	965,2	609,6
40	36	1016,0	914,4	609,6	40	36	1016,0	914,4	609,6
40	34	1016,0	863,6	609,6	40	34	1016,0	863,6	609,6
40	32	1016,0	812,8	609,6	40	32	1016,0	812,8	609,6
40	30	1016,0	762,0	609,6	40	30	1016,0	762,0	609,6
					40	26	1016,0	660,4	609,6
					40	24	1016,0	609,6	609,6
					40	22	1016,0	558,8	609,6
					40	20	1016,0	508,0	609,6
42	40	1066,8	1016,0	609,6					
42	38	1066,8	965,2	609,6					
42	36	1066,8	914,4	609,6	42	36	1066,8	914,4	609,6
42	34	1066,8	863,6	609,6	42	34	1066,8	863,6	609,6
42	32	1066,8	812,8	609,6	42	32	1066,8	812,8	609,6
42	30	1066,8	762,0	609,6	42	30	1066,8	762,0	609,6
					42	26	1066,8	660,4	609,6
					42	24	1066,8	609,6	609,6
44	42	1117,6	1066,8	609,6	44	42	1117,6	1066,8	609,6
44	40	1117,6	1016,0	609,6	44	40	1117,6	1016,0	609,6
44	38	1117,6	965,2	609,6	44	38	1117,6	965,2	609,6
44	36	1117,6	914,4	609,6	44	36	1117,6	914,4	609,6
					44	34	1117,6	863,6	609,6
					44	32	1117,6	812,8	609,6
					44	30	1117,6	762,0	609,6
					44	26	1117,6	660,4	609,6
					44	24	1117,6	609,6	609,6
					44	22	1117,6	558,8	609,6
46	44	1168,4	1117,6	711,2	46	44	1168,4	1117,6	711,2
46	42	1168,4	1066,8	711,2	46	42	1168,4	1066,8	711,2
46	40	1168,4	1016,0	711,2	46	40	1168,4	1016,0	711,2
46	38	1168,4	965,2	711,2	46	38	1168,4	965,2	711,2
					46	36	1168,4	914,4	711,2

NOTE: LE = Large End, SE= Small End

REDUCING OUTLET TEES

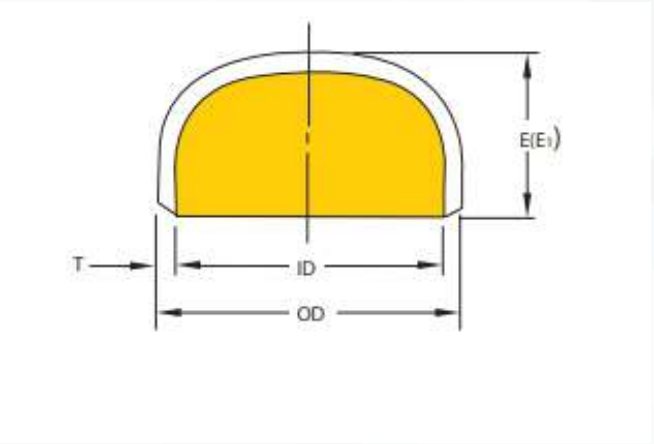
ASME B16.9					MSS SP-75				
NB		O.D. at Bevel			NB		O.D. at Bevel		
LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)	LE (inch)	SE (inch)	LE (mm)	SE (mm)	H (mm)
					46	34	1168,4	863,6	711,2
					46	32	1168,4	812,8	711,2
					46	30	1168,4	762,0	711,2
					46	26	1168,4	660,4	711,2
					46	24	1168,4	609,6	711,2
48	46	1219,2	1168,4	711,2	48	46	1219,2	1168,4	711,2
48	44	1219,2	1117,6	711,2	48	44	1219,2	1117,6	711,2
48	42	1219,2	1066,8	711,2	48	42	1219,2	1066,8	711,2
48	40	1219,2	1016,0	711,2	48	40	1219,2	1016,0	711,2
					48	38	1219,2	965,2	711,2
					48	36	1219,2	914,4	711,2
					48	34	1219,2	863,6	711,2
					48	32	1219,2	812,8	711,2
					48	30	1219,2	762,0	711,2
					48	26	1219,2	660,4	711,2
					48	24	1219,2	609,6	711,2

NOTE: LE = Large End, SE= Small End

END CAPS

ASME B16.9					MSS SP-75				
ND (inch)	O.D. at Bevel (mm)	# E (mm)	Limiting W.T. for Length E (mm)	E, [3] (mm)	ND (inch)	O.D. at Bevel (mm)	# E (mm)	Limiting W.T. for Length E (mm)	E, (mm)
1/2	21,3	25,4	3,7	25,4					
3/4	26,7	25,4	3,9	25,4					
1	33,4	38,1	4,4	38,1					
1 1/4	42,2	38,1	4,9	38,1					
1 1/2	48,3	38,1	5,1	38,1					
2	60,3	38,1	5,5	44,5					
2 1/2	73,0	38,1	7,0	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	9,5	88,9					
6	168,3	88,9	11,0	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					
14	406,4	177,8	12,7	203,2	14	406,4	177,8	25,4	203,2
16	457,2	203,2	12,7	228,6	16	457,2	203,2	25,4	228,6
20	508,0	228,6	12,7	254,0	20	508,0	228,6	25,4	254,0
22	558,8	254,0	12,7	254,0	22	558,8	254,0	25,4	254,0
24	609,6	266,7	12,7	304,8	24	609,6	266,7	25,4	304,8
26	660,4	266,7			26	660,4	266,7	25,4	304,8
28	711,2	266,7							
30	762,0	266,7			30	762,0	266,7	25,4	304,8
32	812,8	266,7							
34	863,6	266,7			34	863,6	266,7	25,4	304,8
36	914,4	266,7			36	914,4	266,7	25,4	304,8
38	965,2	304,8			38	965,2	304,8	25,4	342,9
40	1016,0	304,8			40	1016,0	304,8	25,4	342,9

CAPS



END CAPS

ASME B16.9					MSS SP-75				
NB (inch)	O.D. at Bevel (mm)	# E (mm)	Limiting W.T. for Length E (mm)	E, [3] (mm)	NB (inch)	O.D. at Bevel (mm)	# E (mm)	Limiting W.T. for Length E (mm)	E, (mm)
42	1066,8	304,8			42	1066,8	304,8	25,4	342,9
44	1117,6	342,9			44	1117,6	342,9	25,4	281,0
46	1168,4	342,9			46	1168,4	342,9	25,4	281,0
48	1219,2	342,9			48	1219,2	342,9	25,4	281,0

Note :

The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in ASME Boiler and Pressure Vessel Code.

#Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length E"

1 Length E1 applies for thicknessgreater than that given in column "Limiting Wall Thickness" for sizes 24in and smaller For sizes 26in. and larger, length E1, shall be by agreement between manufacturer and purchaser.

TOLERANCES

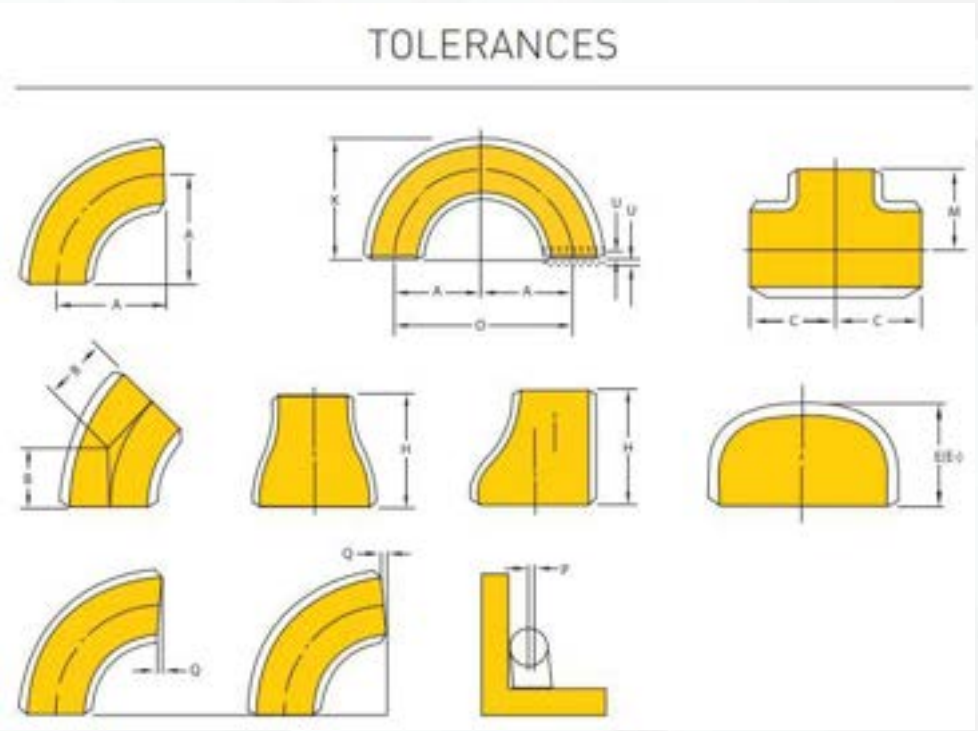
TOLERANCE FOR ASME B16.9/B16.28

All Fittings				90-Deg and 45-Deg Elbows and Tees	Reducers and Lap-Joint Stub Ends	Caps	180-Deg Returns			Lap-Joint Ends	
Nominal Pipe Size (Inch)	Outside* Diameter at Bevel (1), (2)	Inside Diameter at End (1), (3), (4)	Wall Thickness (3)	Center-to-End Dimension A, B, C, M	Overall Length F, H	Overall Length E	Center-to-Center Dimension G	Back-to-Face Dimension K	Alignment of Ends U	Outside Diameter at Lap G	Fillet Radius of Lap R
1/2 - 2 1/2	+1.6 -0.8	±0.8	Not less than 87.5 % of nominal thickness	±1.6	±1.6	±3.2	±6.4	±6.4	±0.8	0 -0.8	0 -0.8
3 - 3 1/2	±1.6	±1.6		±1.6	±1.6	±3.2	±6.4	±6.4	±0.8	0 -0.8	0 -0.8
4	±1.6	±1.6		±1.6	±1.6	±3.2	±6.4	±6.4	±0.8	0 -0.8	0 -1.6
5 - 8	+2.4 -1.6	±1.6		±1.6	±1.6	±6.4	±6.4	±6.4	±0.8	0 -0.8	0 -1.6
10 - 18	+4.0 -3.2	±3.2		±2.4	±2.4	±6.4	±9.5	±6.4	±1.6	0 -1.6	0 -1.6
20 - 24	+6.4 -4.8	±4.8		±2.4	±2.4	±6.4	±9.5	±6.4	±1.6	0 -1.6	0 -1.6
26 - 30	+6.4 -4.8	±4.8		±3.2	±4.8	±9.5	-	-	-	-	-
32 - 48	+6.4 -4.8	±4.8		±4.8	±4.8	±9.5	-	-	-	-	-

Note :

- *Dimensions in mm*
- *Out-of-round is the sum of absolute values of plus and minus tolerance*
- *This tolerance may be exceeded in localized areas of formed fitting whe e increased wall thicknss is required to meet design requirements of para 2.2*
- *The inside diameter and the nominal wall thicknesses at ends are to be specified by the purchaser*
- *Unless otherwise specified by the purchaser, these tolerances apply to the nominal inside diameter, which equals the difference between the nominal outside and twice the nominal wall thickness*

Nomina Pipe Size	Angularity Tol.	
	Off Angle Q	Off Plane P
1/2 - 4	0.8	1.6
5 - 8	1.6	3.2
10 - 12	2.4	4.8
14 - 16	2.4	6.4
18 - 24	3.2	9.5
26 - 30	4.8	9.5
32 - 42	4.8	12.7
44 - 48	4.8	19.1



TOLERANCE FOR MSS SP - 75

All Fittings

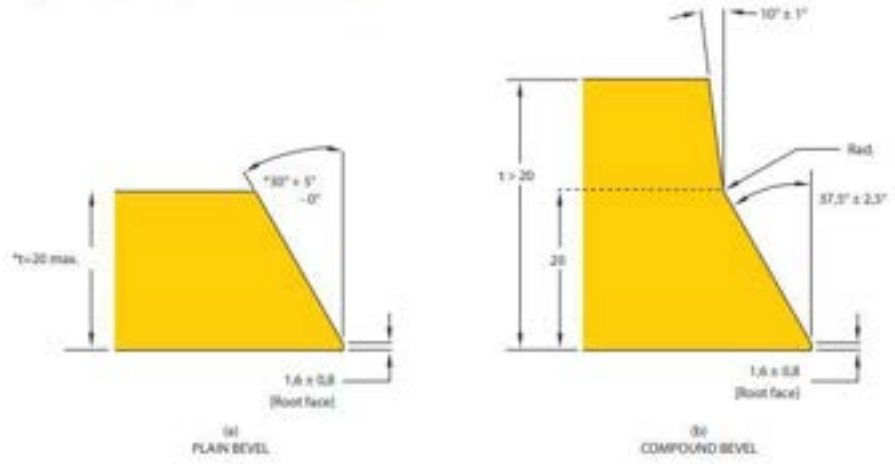
Nominal Pipe Size (Inch)	Inside (1) Diameter at End	Wall (3) Thick-ness	Out-of-roundness (2)		Center-to-end Dimensions A, B, C, M				Overall Length H	Overall Length E	Angularity Off Angle Q	Elbows Off Plane	Reducers Off Plane (4)
			At ends of fitting		Throughout	Tees							
			Elbows (5)	Other	Body of Elbows (4)	and 1 SR elbows	3R elbows	Reducers	Caps				
16 to 24	± 2.3	- 0.3	4.8	3.1	2.5%	± 2.3	± 3.1	± 2.3	± 6.4	1.6	6.4	2.5%	
26 to 36	± 2.3	- 0.3	Note 5	3.1	2.5%	± 3.1	± 6.4	± 4.8	± 9.7	2.3	12.7	2.5%	
38 to 48	± 3.1	- 0.3	Note 5	3.1	2.5%	± 4.8	± 9.7	± 9.7	± 9.7	3.1	19.1	2.5%	

Note :

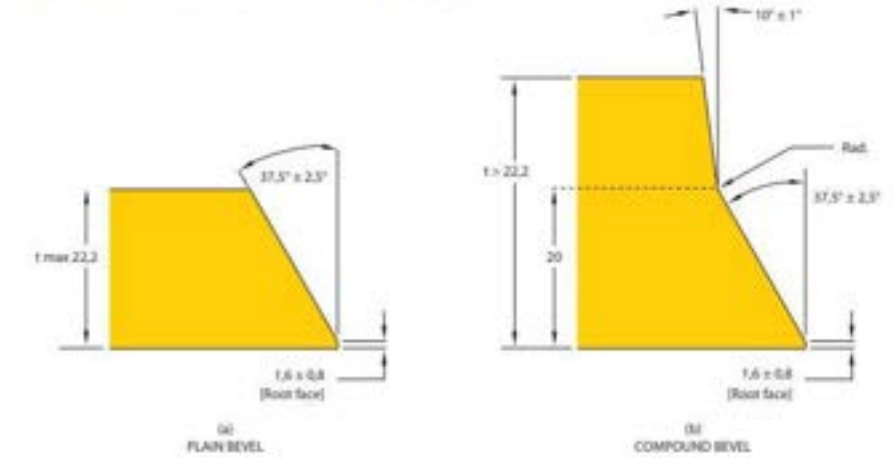
- *Dimensions in mm*
- *The inside diameter at end shall be determined by circumferential measurements, and the tolerance refers to variations from nominal I.D calculations by (OD nom - (2t) nom)*
- *Out-of-roundness tolerance shall be the difference between the maximum and minimum diameters measured on any radial cross-section*
- *Minus 0.3 mm except that isolated non-continuous reduction are permitted in accordance with subsection 13.2.1 Excess thickness whether on inside or outside is to be treated in accordance with sketch given in figure 3*
- *When elbows are intended for field segmenting, out-of-roundness tolerance may be furnished to 1% by agreement between the manufacturer and the purchaser. It is recognized that extra thickness, if any, may be on the I.D*
- *Out-of-roundness tolerances at end shall be 1% of diameter for NPS 26 and larger*
- *Percent of O.D*
- *Outside diameter may be tapered at angle to 30° beyon weld bevel*

BEVEL TYPES

WELDING BEVEL FOR FITTINGS - MSS SP - 75 (MM)



WELDING BEVEL FOR FITTINGS - ASME B16.9/B16.28 (MM)



Note :

Plain bevel up to » 25,4 mm at manufacturers option Plain bevel may be 37,5° up to » 24" at manufacturers optionwaF

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