



BUTT WELD FITTINGS

Stainless Steel: ASTM A403 WP 304/ 304L/ 304H/316/ 316L/ 317/ 317L/ 321/ 310/ 347/904L etc.

Carbon Steel: ASTM A234 WPB/A420 WPL3/A420 WPL6/ MSS-SP-75 WPHY 42/46/52 / 56/60/65/70

Alloy Steel: ASTM A234 WP1/ WP5/ WP9/ WP11/ WP22/ WP91 etc.

Others: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types: Elbow, Tee, Reducer, Return Bends, Stub-Ends, Cap, Collar, Cross, Insert etc.

Size: 1/4" NB TO 32" NB. (Seamless & Welded)

Wall Thickness: Sch. 5S To Sch. XXS.



FORGED FITTINGS

Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/310/ 347/ 904L etc.

Carbon Steel: ASTM A105 / A694 F42/46/ 52/56/ 60/ 65/70 / A350 LF3/ A350 LF2.

Alloy Steel: ASTM A182 F1/ F5/ F9/ F11/ F22/ F91 etc.

Others: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types: Elbow, Tee, Union, Cross, Coupling, Cap, Bushing , Plug, Swage Nipple, Welding Boss, Hexagon Nipple, Barrel Nipple, Welding Nipple, Parraler Nipple, Street Elbow, Hexagon Nut, Hose Nipple, Bend, Adapter, Insert, Weldolet, Elbowlet, Sockolet, Thredolet, Nipolet, Letrolet, etc.

Size: 1/4" NB TO 4" NB. (Socketweld & Threaded)

Class: 3000#, 6000#, 9000#.



FLANGES

Stainless Steel: ASTM A182 F304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/ 310/ 347/ 904L etc.

Carbon Steel: ASTM A105/ A694 F42/46/52/56/60/65/70/A350 LF3/A350 LF2, etc.

Alloy Steel: ASTM A182 F1/ F5/ F9/ F11/ F22/ F91 etc.

Others: Monel, Nickel, Inconel, Hastalloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead, etc.

Types: Weldneck, Slipon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Orifcae, Long Weldneck, Deck Flange, RTJ, Flange

Size: 1/2" NB TO 24" NB.

Class: 150#, 300#, 400#, 600#, 900#, 1500# & 2500#.



Our Products



PIPES

Stainless Steel: ASTM A312 TP 304/ 304L/ 304H/ 316/ 316L/ 317/ 317L/ 321/310/ 347/ 904L etc.

Carbon Steel: ASTM A53 GR. B/ A106 GR. B/ API 5L GRADE B/ API 5L GR.X42/46/52/56/60/65/70/

Low Temperature, Carbon Steel: A333 Gr.3/ Gr.6 etc.

Alloy Steel: ASTM A335 GR. P1/ P5/ P9/ P11/ P22/ P91 etc.

Nickel Alloys: Monel, Nickel, Inconel, Hastalloy, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel,

Non Ferrous Metal: Copper, Brass, Bronze, Zinc, Lead etc.

Types: Round, Square, Rectangular.

Size: Upto 24" NB. (Seamless & Welded)

Wall Thickness: Sch. 5S to Sch. XXS



FASTENERS

Stainless Steel: AISI 302, 304, 304L, 316, 316L, 310, 317, 317L, 321, 347, 410, 420, 904L etc.

Alloy Steel: 4.6, 5.6, 6.6, 8.8, 10.9 & 12.9 / 'R', 'S', 'T' Conditions.

Carbon Steel: Bare Condition, Galvanized, Phosphetised, Cadum Plated, Hot Deep Galvanized, Bloodied, Nickel Chrome Plated, etc.

Non Ferrous Metal: Copper, Brass, Aluminium, Titanium, Nichrome, Al.Bronze Phosphorous Bronze, etc.

Types: Bolts, Nuts, Washers, Anchor Fasteners, Stud Bolts, Eye Bolt, Stud, Threaded Rod, Cotter Pin, Socket Screw, Fine Fasteners & Spares, Foundation Fasteners, etc.



SHEETS, PLATES, COILS & RODS

Material Grade: Stainless Steel, Nickel Alloys, Carbon Steel, Alloy Steel, Other Ferrous & Non-Ferrous Metals.

Types: Sheet, Plates, Strips, Round Bars, Wires, Channel, etc.

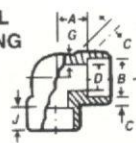


FORGED FITTINGS

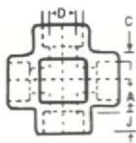
Stainless Steel	: A182 304, 304L, 304H, 3016, 3016L, 3016H, 316Ti, 321, 347, 347H, 904L.
Carbon Steel	: A105, A105N
Low Alloy Steel	: A350 LF2, LF3, LF6.
Alloy Steel	: A182 F1, F11, F22, E9, F91, F92.
Duplex Steel	: A182 F51, F60, UNS S31803, UNS S2205
Super Duplex Steel	: A 182 F44, F53, F55, SMO 254, UNS S31254, UNS S32750, UNS S32760.
High Nickel Alloys	: Nickel 200, 201, Monel K 400 & 500. Inconel 600, 601, 625, 800, 825, Hastelloy C276, Alloy 20.
Cupro Nickel	: 90/10 (UNS C70600), 70/30 (UNSC71500)
Others	: Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed Steel, Zinc, Lead etc.
Type	: Elbow, Tee, Coupling, Cap, Plug, Adaptor, Socket, Cross, Nipple, Bhusing, Boss, Insert, Union, Thermowell Stub, Weldolets, Sweepolets, Threadolets, Nepolets, Elbolets, Flexolets, Sockolets, Latrolets, Brazolets, Coupolets.
Size	: 1/4" NB to 4" NB. (socketweld & Threaded)
Class	: 3000#, 6000#, 9000#

DIMENSIONS OF SOCKET WELD FITTINGS (ANSI B 16.11)

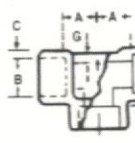
FORGED STEEL
SOCKET-WELDING
FITTINGS
ANSI B16.11



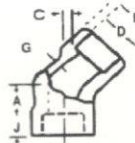
ELBOW 90 DEG



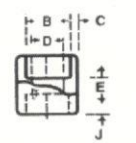
CROSS



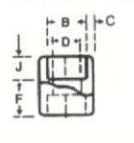
TEE



ELBOW 45 DEG



COUPLING

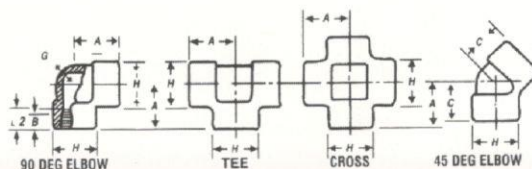


HALF COUPLING

Nom. Pipe Size	Socket bore Dia.(2) B	Bore Diameter of (2) Fitting D			Socket Wall Thickness (1) C						Depth of Socket J Min.	Centre to Bottom of Socket - A						Laying Lengths		Tolerances			
												90DEG Elbows, Tees, and Crosses			45DEG Elbows								
		Pressure Class Designation			3000			6000		9000		Pressure Class Designation						E	Half F	A	E	F	
					3000	6000	9000	Ave.	Min.	Ave.		Min.	Ave.	Min.	3000	6000	9000						3000
1/8	10.92	7.59	4.80		3.17	3.17	3.96	3.42			9.65	11.17	11.17		7.87	7.87		6.35	15.74	0.76	1.52	0.76	
	10.66	6.07	3.20																				
1/4	14.35	10.00	7.11		3.78	3.30	4.59	4.01			9.65	11.17	13.46		7.87	7.87		6.35	15.74	0.76	1.52	0.76	
	14.09	8.48	5.58																				
3/8	17.78	13.28	9.88		4.01	3.50	5.02	4.36			9.65	13.46	15.74		7.87	11.17		6.35	17.52	1.52	3.04	1.52	
	17.25	11.76	8.35																				
1/2	22.04	16.56	12.54	7.62	4.68	4.08	5.96	5.18	9.34	8.17	9.65	15.74	19.05	25.40	11.17	12.70	15.74	9.65	22.35	1.52	3.04	1.52	
	21.71	15.03	11.02	6.09																			
3/4	27.30	21.69	16.30	11.78	4.90	4.26	6.95	6.04	9.77	8.55	12.70	19.05	22.35	28.44	12.70	14.22	19.05	9.65	23.87	1.52	3.04	1.52	
	27.05	20.16	14.78	10.26																			
1	34.03	27.40	21.46	15.97	5.68	4.97	7.92	6.93	11.37	9.95	12.70	22.35	26.92	31.75	14.22	17.52	20.57	12.70	28.44	2.03	4.06	2.09	
	33.78	25.88	19.93	14.45																			
1.1/4	42.79	35.81	30.22	23.52	6.07	5.28	7.92	6.93	12.14	10.61	12.70	26.92	31.75	35.05	17.52	20.51	22.35	12.70	30.22	2.03	4.06	2.09	
	42.54	34.30	28.70	21.99																			
1.1/2	48.89	41.65	34.74	28.70	6.35	5.53	8.91	7.79	12.70	11.12	12.70	31.71	38.10	38.10	20.57	25.40	25.40	12.70	31.75	2.03	4.06	2.03	
	48.64	40.13	33.22	27.17																			
2	61.36	53.26	43.61	38.93	6.93	6.04	10.92	9.49	13.84	12.11	15.74	38.10	41.14	58.84	25.40	28.44	28.44	19.05	41.14	2.03	4.06	2.03	
	61.11	52.20	41.90	37.41																			
2.1/2	74.18	64.23			8.76	7.67					15.74	41.14			28.44			19.05	43.09	2.54	5.08	2.54	
	73.18	61.18																					
3	90.17	79.45			9.52	8.30					15.74	57.15			31.75			19.05	44.45	2.54	5.08	2.54	
	89.78	76.40																					
4	115.82	103.78			10.89	9.34					19.05	66.54			41.14			19.05	47.75	2.54	5.08	2.54	
	115.44	100.73																					

DIMENSIONS OF THREADED FITTINGS

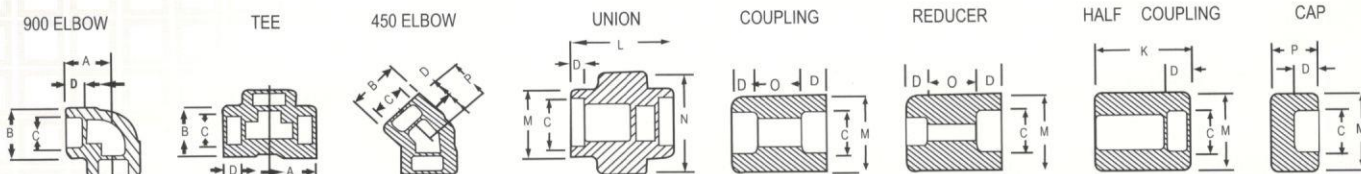
FORGED STEEL
THREADED FITTINGS
ANSI B16.11



Nom. Pipe Size	A			C			H			G			Min.	
	2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L ₂
1/8	20.57	20.57	24.63	17.52	17.52	18.93	22.35	22.30	25.40	3.175	3.11	6.350	6.303	6.70
1/4	20.57	24.63	28.44	17.52	18.93	22.35	22.35	25.40	33.20	3.175	3.302	6.604	8.128	10.205
3/8	24.63	28.44	33.27	18.93	22.35	25.40	25.40	33.27	38.10	3.175	2.505	6.985	9.544	10.298
1/2	28.44	33.27	38.10	22.35	25.40	28.44	33.27	38.10	45.97	3.175	4.089	8.153	10.922	13.555
3/4	33.27	38.10	44.45	25.40	28.44	33.27	38.10	45.97	55.62	3.175	4.318	8.534	12.700	13.860
1	38.10	44.45	50.80	28.44	33.27	35.05	45.97	55.62	61.97	3.688	4.978	9.931	14.732	17.843
1-1/4	44.45	50.80	63.45	33.27	35.05	42.92	55.62	61.97	75.43	3.688	5.283	10.591	17.018	17.952
1-1/2	50.80	60.45	76.02	33.05	42.92	43.68	61.97	75.43	84.07	4.013	5.568	11.074	17.780	18.376
2	60.45	63.50	82.55	42.92	43.68	52.32	75.43	84.07	101.60	4.267	7.137	12.090	19.050	19.138
2-1/2	76.20	82.55	95.25	52.37	52.32	63.50	91.94	101.60	120.65	5.613	7.645	15.290	23.622	28.905
3	85.85	92.25	106.42	63.50	63.50	79.24	109.47	120.65	146.05	5.994	8.839	16.637	25.408	30.500
4	106.42	114.30	114.30	78.24	78.24	79.24	146.05	152.40	152.40	6.555	11.669	18.684	27.777	33.000

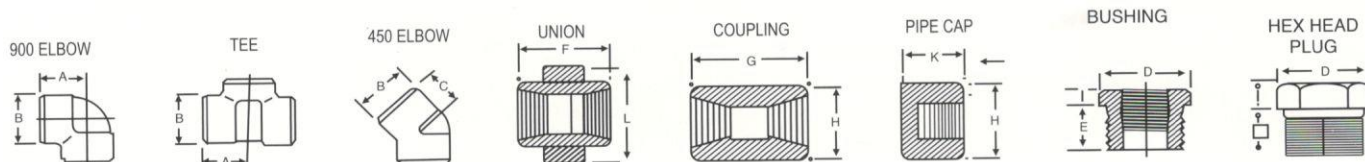


SOCKET WELD FITTING TO ANSI B-16.11



NOM BORE	PIPE O.D.	3000 LBS.								COMMON FACTORS					6000 LBS.				
		A max.	B max.	K	J	L	M	N	P	Q	C min.	D min.	O min.	O max.	A	B	M	K	N
1/8"	10.3	22	18.5	26	16	40	17.3	32	15	10	10.7	10	5	8	22	22	20	25	46
1/4"	13.7	22	22	26	18	43	21.2	32	15	10	14.1	10	5	8	27	25	24	25	51
3/8"	17.2	25	25	26	19	48	25.4	36	16.5	10	17.6	10	3	9	27	28	28	26	60
1/2"	21.3	27	32	30	21	51	31	41	16.5	10	21.7	10	6	13	31	34	34	31	72
3/4"	26.7	34	38	36	24	57	37	50	19.5	13	27	13	6	13	37	42	41	35	80
1"	33.4	37	46	40	25	64	45.2	60	22.5	13	33.8	13	9	17	42	50	50	40	94
1 1/4"	42.2	42	56	40	29	70	55	70	22.5	13	42.6	13	9	17	47	59	58	41	100
1 1/2"	48.3	47	62	40	30	79	61.4	78	24	13	48.7	13	9	17	53	67	66	43	122
2"	60.3	56	75	52	37	89	75	95	29	13	61.2	16	15	23	59	84	83	55	
2 1/2"	73.02	60	92	52	48	114	91.3	125	32	16	73.8	16	14	24		102		56	
3"	89.00	76	110	52	51	127	108.8	140	35	16	89.8	16	14	24		121		58	
4"	114.50	88	137	58		150	136.9		42	19	115.5	19	14	24		152		64	

FORGED SCREWED FITTING TO ANSI B-16.11 3000/6000 LBS. THREADED TO ASA B 2.1



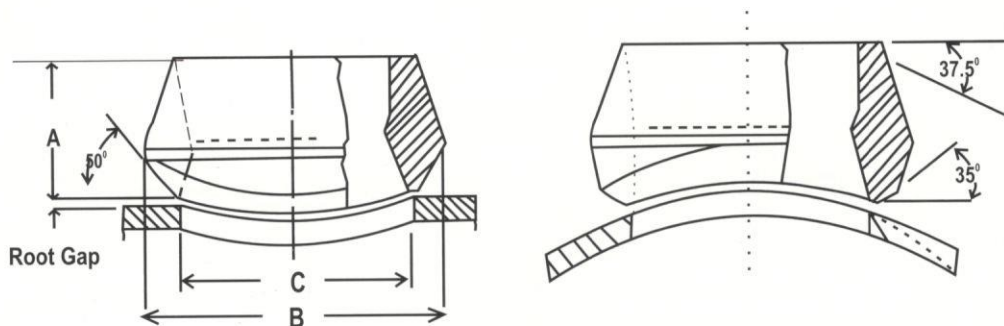
(DIMENSIONS IN MM)

NOM BORE	PIPE O.D.	3000 LBS								COMMON FACTORS				6000 LBS					
		A	B	C	G	H	K	D	E	F	I	J	L	A	B	C	G	H	K
1/8"	10.3	21	22	17	32	16	19	11	10	40	-	6	-	25	25	19	32	22	-
1/4"	13.7	25	25	19	35	19	25	16	11	43	3	6	32	29	33	22	35	25	27
3/8"	17.2	29	33	22	38	22	25	17.5	13	48	4	8	38	33	38	25	38	32	27
1/2"	21.3	33	38	25	48	29	32	22	15	51	5	8	46	38	46	29	48	38	33
3/4"	26.7	38	46	29	51	35	37	27	16	57	6	10	51	44	56	33	51	44	38
1"	33.4	44	56	33	60	44	41	35	19	64	6	10	60	51	62	35	60	57	43
1 1/4"	42.2	51	62	35	67	57	44	44.5	21	70	7	14	72	60	75	43	67	64	46
1 1/2"	48.3	60	75	43	79	64	44	51	21	79	8	16	80	64	84	44	79	76	48
2"	60.3	64	84	45	86	76	48	63.5	22	88	9	17	94	83	102	52	86	92	51
2 1/2"	73.02	83	102	52	92	92	60	76	27	118	10	21	122	95	121	64	92	108	64
3"	89.0	95	121	64	108	108	65	89	29	121	10	25	140	106	146	79	108	127	68
4"	114.5	114	152	79	121	140	68	117.5	32	150	13	25	180	114	152	79	121	159	75

DIMENSIONS AND OTHERS SPECIFICATIONS AS PER CUSTOMERS REQUIREMENTS ARE AVAILABLE ON REQUEST



FORGED STEEL OUTLET FITTINGS WELDOLETS STD (Sch 40), XS (Sch 80) MSS SP- 97



Outlet Size	A		B		C	
	STD	XS	STD	XS	STD	XS
1/2	19.1	19.1	34.9	34.9	23.8	23.8
3/4	22.2	22.2	44.5	44.5	30.2	30.2
1	27.0	27.0	54.0	54.0	36.5	36.5
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8
2	38.1	38.1	88.9	88.9	65.1	65.1
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2
3	44.5	44.5	122.2	122.2	93.7	93.7
4	50.8	50.8	152.4	152.4	120.7	120.7
5	57.2	57.2	179.4	179.4	141.3	141.3
6	60.3	77.8	215.9	225.4	169.9	169.9
8	69.9	98.5	263.5	292.1	220.7	220.7
10	77.8	93.7	322.3	323.9	274.7	265.1
12	85.7	103.2	377.8	379.4	325.4	317.5
14	88.9	100.0	409.6	431.8	357.2	350.6
16	93.7	106.4	463.6	466.7	408.0	403.2
18	96.8	111.1	520.7	523.9	458.8	455.6
20	101.6	119.1	571.5	582.6	508.8	509.6
24	115.9	139.7	689.0	708.0	614.4	638.2
26	119.1	146.1	738.2	765.2	666.8	692.2

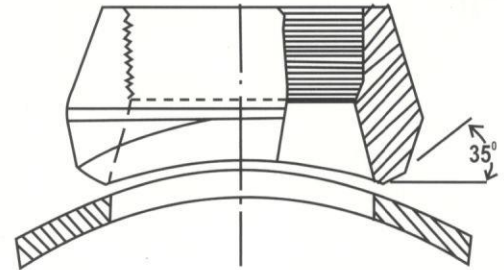
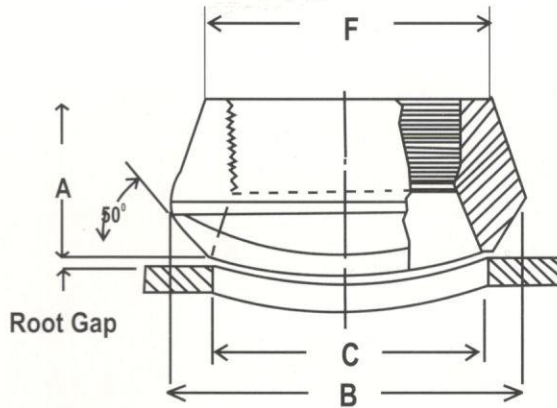
Applicable Run Pipe Size are From out-let to 36"

Standard Weight Fittings are the same as Schedule 40 Fittings Unit 10" and Extra Fittings are the same as Schedule 80 Unit 8"

Pipe Schedule Numbers and Weight Designation are in According with MSS SP-97

When Ordering Sockolets and Thredolets, Includes the Quantity, Run and Out-let Size, Item and Rating (or Schedule Number)and Material

FORGED STEEL OUTLET FITTINGS THREADOLETS MSS SP- 97



Outlet Size	A		B		C	
	3000#	6000#	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5	23.8	19.1
3/4	27.0	36.5	44.5	50.8	30.2	25.4
1	33.3	39.7	54.0	61.9	36.5	33.3
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1
1 1/2	34.9	42.9	73.0	62.6	50.8	49.2
2	38.1	52.4	88.9	103.2	65.1	69.9
2 1/2	46.0	-	103.2	-	76.2	-
3	50.8	-	122.2	-	93.7	-
4	57.2	-	152.4	-	102.7	-

Applicable Run Pipe Size are From out-let to 36"

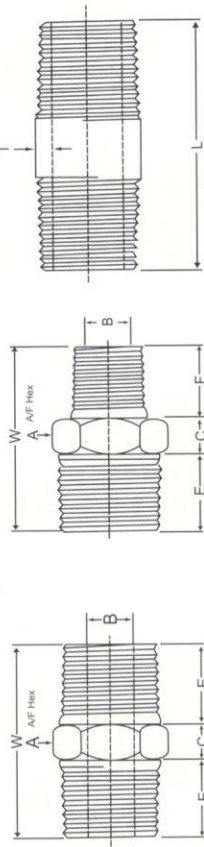
For the 3000# and 6000# Socklets and Threadlets, Inside Bore, Thread, Socket Bore and Socket depth Dimensions are According to MSS SP-97

Pipe Schedule Numbers and Weight Designation are in According with MSS SP-97

When Ordering Socklets and Threadlets, Includes the Quantity, Run and Out-let Size, Item and Rating (or Schedule Number)and Material

Socket Weld and Threaded Fittings

Hexagonal and Round Nipples - BS 3799



Hexagonal Nipples

Round Nipples

Hexagonal nipple dimensions (based on BS 3799:1974)

Nominal Size		Reducing		A min	B min		C min	E min	F min	W min
		Equal	mm		3000 lb	6000 lb				
1/8	6	-	-	11	5	2	6	10	-	26
1/4	8	-	-	15	8	6	6	15	-	36
3/8	10	-	8 x 6	15	5	2	6	15	10	31
-	-	-	1/4 x 1/8	18	11	8	8	16	-	40
1/2	15	-	3/8 x 1/4	22	14	11	8	20	-	48
-	-	-	1/2 x 3/8	22	11	8	8	20	16	44
3/4	20	-	1/2 x 1/2	27	19	13	10	21	-	52
-	-	-	3/4 x 1/2	27	14	11	9	21	20	50
1	25	-	3/4 x 3/8	35	24	17	10	25	-	60
-	-	-	1 x 3/4	35	19	13	10	25	21	56
1 1/2	40	-	1 x 1/2	50	38	30	16	26	-	68
-	-	-	1 1/2 x 1	50	24	17	16	26	25	67
2	50	-	1 1/2 x 3/4	62	49	39	17	27	-	71
-	-	-	2 x 1 1/2	62	38	30	17	27	26	70
2 1/2	65	-	2 x 1	62	24	17	18	27	25	70
-	-	-	2 x 3/4	62	19	13	17	27	21	65
3	80	-	2 x 1/2	62	14	11	18	27	20	65

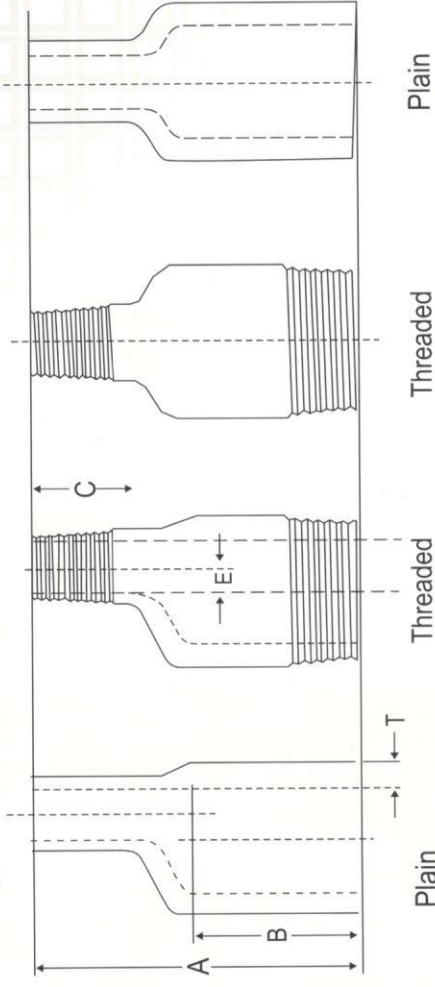
Round nipple dimensions (based on BS 3799:1974)

Nominal Size	Standard Lengths				Wall Thickness	
	mm	mm	mm	mm	3000 lb	6000 lb
1/8	6	75	100	150	-	-
1/4	8	75	100	150	-	-
3/8	10	75	100	150	-	-
1/2	15	75	100	150	-	-
3/4	20	75	100	150	-	-
1	25	75	100	150	-	-
1 1/2	40	75	100	150	-	-
2	50	75	100	150	-	-
2 1/2	65	75	100	150	-	-
3	80	75	100	150	-	-
4	100	75	100	150	-	-

Note
Other round nipple lengths, L, are available when specified

Socket Weld and Threaded Fittings

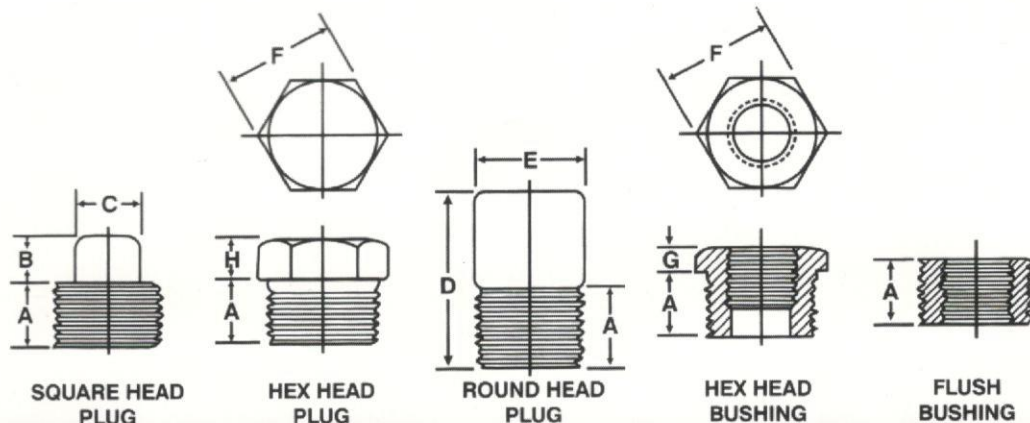
Swage Nipples - BS 3799



Dimensions of swage nipples (BS 3799:1974)

Nominal Size		Parallel Length, min		Eccentricity		Wall Thickness	
		A	B	C	E	Threaded / Plain	Plain / Threaded
3/8 x 1/4	10 x 8	76	48	16	1.6	3000 lb	6000 lb
1/2 x 3/8	15 x 10	89	56	19	1.6	-	-
1/2 x 1/4	15 x 8	89	56	19	3.2	-	-
3/4 x 1/2	20 x 15	95	57	22	2.4	-	-
3/4 x 3/8	20 x 10	95	57	22	4.0	-	-
1 x 3/4	25 x 20	102	64	22	2.8	-	-
1 x 1/2	25 x 15	102	64	22	5.2	-	-
1 1/2 x 1	40 x 25	114	70	25	6.7	-	-
1 1/2 x 3/4	40 x 20	114	70	25	9.5	-	-
1 1/2 x 1/2	40 x 15	114	70	25	11.9	-	-
2 x 1 1/2	50 x 40	165	108	29	5.6	-	-
2 x 1	50 x 25	165	108	29	12.7	-	-
2 x 3/4	50 x 20	165	108	29	15.5	-	-
2 x 1/2	50 x 15	165	108	29	17.5	-	-
2 1/2 x 2	65 x 50	178	114	32	4.8	-	-
2 1/2 x 1 1/2	65 x 40	178	114	32	10.3	-	-
3 x 2 1/2	80 x 65	203	133	41	7.1	-	-
3 x 2	80 x 50	203	133	41	11.9	-	-
3 x 1 1/2	80 x 40	203	133	41	17.5	-	-
4 x 3	100 x 80	229	140	48	11.9	-	-
4 x 2 1/2	100 x 65	229	140	48	19.1	-	-

HIGH PRESSURE FITTING ANSI B 16.11: 1996 Steel Plugs and Bushings



Nominal Pipe Size	Thread Length (Minimum) A	Plugs Square Head		Plugs Round Head		Hex. Plugs and Bushings		
		Height of Square (Minimum) B	Width Flats (Minimum) C	Nom. Diam. of Head E	Length (Minimum) D	Width Flats (Nominal) F	Hex. Height (Min.)	
							Bushing G	Plug H
1/8	0.38	0.25	0.28	0.41	1.38	0.44		0.25
1/4	0.44	0.25	0.38	0.53	1.62	0.62	0.12	0.25
3/8	0.50	0.31	0.44	0.69	1.62	0.69	0.16	0.31
1/2	0.56	0.38	0.56	0.84	1.75	0.88	0.19	0.31
3/4	0.62	0.44	0.62	1.06	1.75	1.06	0.22	0.38
1	0.75	0.50	0.81	1.31	2.00	1.38	0.25	0.38
1 1/4	0.81	0.56	0.94	1.69	2.00	1.75	0.28	0.56
1 1/2	0.81	0.62	1.12	1.91	2.00	2.00	0.31	0.62
2	0.88	0.69	1.31	2.38	2.50	2.50	0.34	0.69
2 1/2	1.06	0.75	1.50	2.88	2.75	3.00	0.38	0.75
3	1.12	0.81	1.69	3.50	2.75	3.50	0.41	0.81
4	1.25	1.00	2.50	4.50	3.00	4.62	0.50	1.00

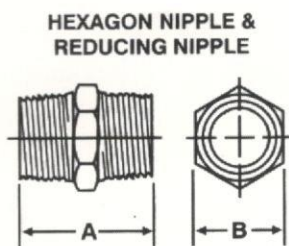


Fig. 5 & 6

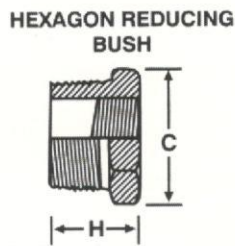


Fig. 7



Fig. 8

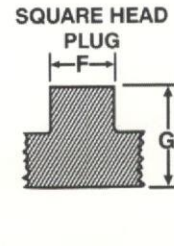


Fig. 9

	Nominal Bore											
	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
A	1.37	1.5	1.68	2.12	2.31	2.62	2.80	2.87	3.06	3.12	3.5	4.1
B	0.525	0.600	0.820	0.920	1.10	1.39	1.86	2.05	2.50	3.125	3.625	5.51
C	0.525	0.600	0.820	0.920	1.10	1.39	1.86	2.05	2.50	3.125	3.625	5.51
D	0.25	0.25	0.28	0.31	0.37	0.37	0.37	0.44	0.50	0.62	0.75	0.89
E	0.600	0.820	0.920	1.10	1.48	1.67	2.25	2.375	2.750	3.35	4.45	5.50
F	0.250	0.34	0.4	0.50	0.56	0.75	0.87	1.05	1.25	1.44	1.50	2.00
G	0.56	0.75	0.75	0.93	1.00	1.25	1.37	1.37	1.68	1.87	2.06	2.43
H	0.68	0.68	0.68	0.87	0.93	1.18	1.37	1.43	1.62	1.81	2.06	2.50

1) Available on demand

2) All dimensions are in inches



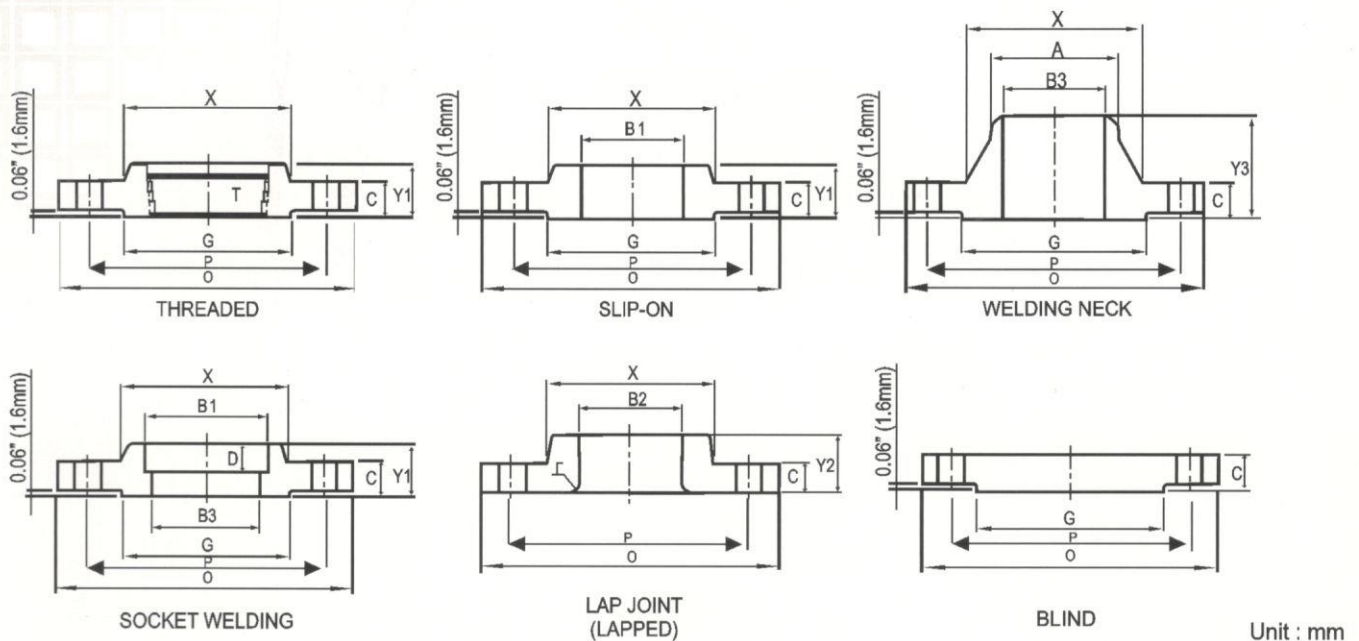
FLANGES

Stainless Steel	:	ASTM182F 304/304L/304H/316/3016L/317/ 31/321/347/904L etc.
Carbon Steel	:	ASTM A105/ A694 F42/46/52/56/60/65/70/A350 LF3/A350 LF2, etc.
Alloy Steel	:	ASTM AF1/ F5/F9/F11/F22/F91/ etc.
Duplex Steel	:	2205 (Duplex), 2507, (Super Duplex) UNS-31803, 32750, 32760, 32990
Super Duplex Steel	:	UNS S31254, UNS S32750, UNS S32760.
High Nickel Alloys	:	Monel, Nickel, Inconel, Hastelloy
Cupro Nickel	:	90/10 (UNS C70600), 70/30 (UNSC71500)
Others	:	Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed, Zinc, Lead, Cupro Nickel etc.
Type	:	Weldneck, Slipon, Blind, Socket Weld, Lap Joint, Spectacles, Ring Joint, Oriface, Long Weldneck, Flange, etc.
Size	:	1/8" NB to 42" NB.
Class	:	150#, 300#, 600#, 900#, 1500# & 2500#.

Also as per the National & International Standard.

CLASS 150 FLANGES

ANSI B 16.5 FORGED FLANGES



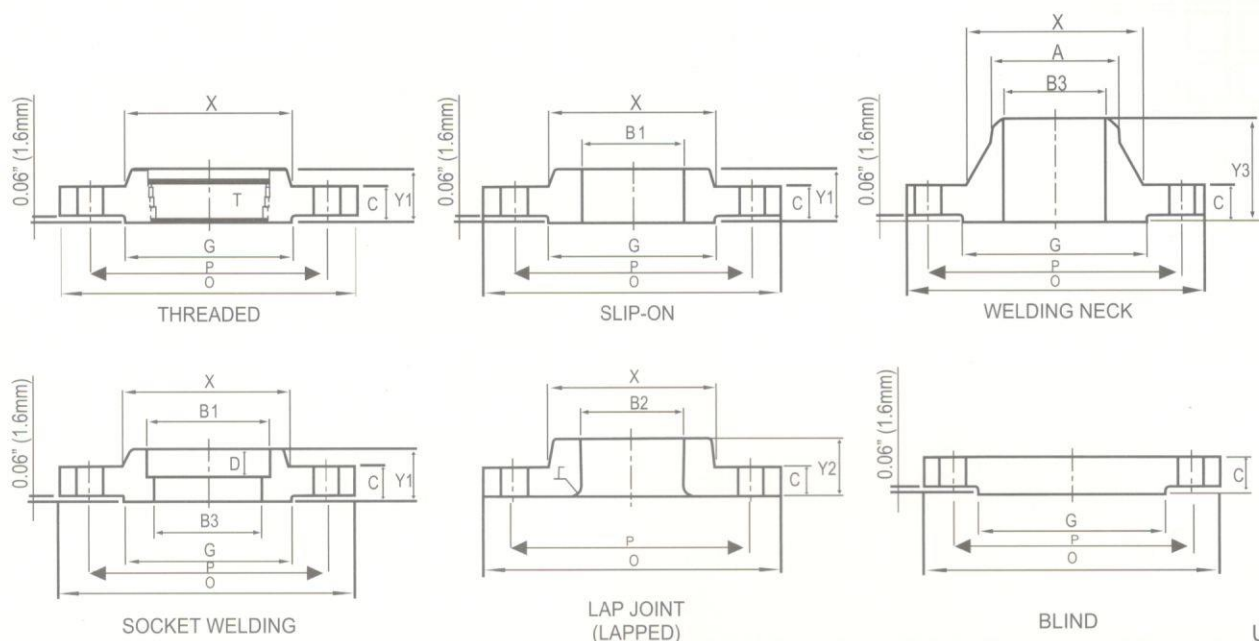
Normal Pipe Size	Outside Diam. of Flanges	Thk. of Flange Min.	Diam. of Hub	O.D. of Raised Face	Hub Diam. Chamfer of W.N	LENGTH THROUGH HUB				BORE			Corner Radius of Bore of Lapped Flange	Depth of Socket	DRILLING				LENGTH OF STUD BOLTS			
						Threaded Slip-on Socket Welding	Lapped	Welding Neck	Thread Length	Slip-on Socket Welding	Lapped	Welding Neck Socket Welding			Diam. of Bolt Circle	Diam. of Bolt Holes	Number of Bolts	Diam. of Bolts (Inch)	Machine Bolts		Stud Bolts	
																			0.06 in Raised Face	0.06 in Raised Face	Ring Joint	
O	c	x	G	A	Y1	Y2	Y3	T	B1	B2	B3	r	D	P								
15	89.0	11.2	30.2	35.1	21.3	15.7	15.7	47.8	15.7	22.4	22.9	To be specified by Purchaser	3.0	9.7	60.5	15.8	4	1/2	50.8	57.2	-	
20	98.5	12.7	38.1	42.9	26.7	15.7	15.7	52.3	15.7	27.7	28.2		3.0	11.2	69.9	15.8	4	1/2	50.8	63.5	-	
25	108.0	14.2	49.3	50.8	33.5	17.5	17.5	55.6	17.5	34.5	35.1		3.0	12.7	79.3	15.8	4	1/2	57.2	63.5	76.2	
32	117.5	15.7	58.7	63.5	42.2	20.6	20.6	57.2	20.6	43.2	43.7		4.8	14.2	88.9	15.8	4	1/2	57.2	69.9	82.6	
40	127.0	17.5	65.0	73.2	48.3	22.4	22.4	62.0	22.4	49.5	50.0		6.4	15.8	98.6	15.8	4	1/2	63.5	69.9	82.6	
50	152.5	19.1	77.7	91.9	60.5	25.4	25.4	63.5	25.4	62.0	62.5		7.9	17.5	120.7	19.1	4	5/8	69.9	82.6	95.3	
65	178.0	22.4	90.4	104.6	73.2	28.4	28.4	69.9	28.4	74.7	75.4		7.9	19.1	139.7	19.1	4	5/8	76.2	88.9	101.6	
80	190.5	23.9	108.0	127.0	88.9	30.2	30.2	69.9	30.2	90.7	91.4		9.7	20.6	152.4	19.1	4	5/8	76.2	88.9	101.6	
90	216.0	23.9	122.2	139.7	101.6	31.8	31.8	71.4	31.8	103.4	104.1		9.7	-	177.8	19.1	8	5/8	76.2	88.9	101.6	
100	228.5	23.9	134.9	157.2	114.3	33.3	33.3	76.2	33.3	116.1	116.8		11.2	-	190.5	19.1	8	5/8	76.2	88.9	101.6	
125	254.0	23.9	163.6	185.7	141.2	36.6	36.6	88.9	36.6	143.8	144.5		11.2	-	215.9	22.4	8	3/4	82.6	95.3	108.0	
150	279.5	25.4	192.0	215.9	168.4	39.6	39.6	88.9	39.6	170.7	171.5		12.7	-	241.3	22.4	8	3/4	82.6	101.6	114.3	
200	343.0	28.4	246.1	269.7	219.2	44.5	44.5	101.6	44.5	221.5	222.3		12.7	-	298.5	22.4	8	3/4	88.9	108.0	120.7	
250	406.5	30.2	304.8	323.9	273.1	49.3	49.3	101.6	49.3	276.4	277.4		12.7	-	362.0	25.4	12	7/8	101.6	114.3	127.0	
300	482.5	31.8	365.3	381.0	323.9	55.6	55.6	114.3	55.6	327.2	328.2		12.7	-	431.8	25.4	12	7/8	101.6	120.7	133.4	
350	533.5	35.1	400.1	412.8	355.6	57.2	79.2	127.0	57.2	359.2	360.2		12.7	-	476.3	28.5	12	1	114.3	133.4	146.1	
400	597.0	36.6	457.2	469.9	406.4	63.5	87.4	127.0	63.5	410.5	411.2		12.7	-	539.8	31.8	16	1	114.3	133.4	146.1	
450	635.0	39.6	505.0	533.4	457.2	68.3	96.8	139.7	68.3	461.8	462.3		12.7	-	577.9	31.8	16	11/8	127.0	146.1	158.8	
500	698.5	42.9	558.8	584.2	508.0	73.2	103.1	144.5	73.2	513.1	514.4		12.7	-	635.0	35.1	20	11/8	139.7	158.8	171.5	
600	813.0	47.8	663.4	692.2	609.6	82.6	111.3	152.4	82.6	616.0	616.0		12.7	-	749.3	35.1	20	11/8	152.4	171.5	184.2	

To be specified by Purchaser

- Blind Flanges may be made with the same hub as that used for slip-on Flanges or without hub.
- The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelisms, spot facing is carried out according to MSS SP-9, without reducing thickness ©
- Depth of socket (D) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacture's option.

CLASS 300 FLANGES

ANSI B 16.5 FORGED FLANGES



Unit : mm

Normal Pipe Size	Outside Diam. of Flanges	Thk. of Flange Min.	Diam. of Hub	O.D. of Raised Face	Hub Diam. Chamfer of W.N	LENGTH THROUGH HUB			Thread Length		BORE			Corner Radius of Bore of Lapped Flange	Counter Bore Thread ed Flange Min.	Depth of Socket	DRILLING				LENGTH OF STUD BOLTS		
						Threaded Slip-on Socket Welding	Lapped	Welding Neck			Slip-on Socket Welding	Lapped					Welding Neck Socket Welding	Diam. of Bolt Circle	Diam. of Bolt Holes	Number of Bolts	Diam. of Bolts (inch)	Machine Bolts	Stud Bolts
	O	c	x	G	A	Y1	Y2	Y3	T	B1	B2	B3	r	Q	D	P			0.06 in Raised Face	0.06 in Raised Face	Ring Joint		
15	95.5	14.2	38.1	35.1	21.3	22.4	22.4	52.3	15.7	22.4	22.9	To be specified by Purchaser	3.0	23.6	9.7	66.5	15.7	4	1/2	57.2	63.5	76.2	
20	117.5	15.7	47.8	42.9	26.7	25.4	25.4	57.2	15.7	27.7	28.2		3.0	29.0	11.2	82.6	19.1	4	5/8	63.5	76.2	88.9	
25	124.0	17.5	53.8	50.8	33.5	26.9	26.9	62.0	17.5	34.5	35.1		3.0	35.8	12.7	88.9	19.1	4	5/8	63.5	76.2	88.9	
32	133.5	19.1	63.5	63.5	42.2	26.9	26.9	65.0	20.6	43.2	43.7		4.8	44.5	14.2	98.6	19.1	4	5/8	69.9	82.6	95.3	
40	155.5	20.6	69.9	73.2	48.3	30.2	30.2	68.3	22.4	49.5	50.0		6.4	50.5	15.7	114.3	22.4	4	3/4	76.2	88.9	101.6	
50	165.0	22.4	84.1	91.9	60.5	33.3	33.3	69.9	28.4	62.0	62.5		7.9	63.5	17.5	127.0	19.1	8	5/8	76.2	88.9	101.6	
65	190.5	25.4	100.1	104.6	73.2	38.1	38.1	76.2	31.8	74.7	75.4		7.9	76.2	19.1	149.4	22.4	8	3/4	82.6	101.6	114.3	
80	209.5	28.4	117.3	127.0	88.9	42.9	42.9	79.2	31.8	90.7	91.4		9.7	92.2	20.6	168.1	22.4	8	3/4	88.9	108.0	120.7	
90	228.5	30.2	133.4	139.7	101.6	44.5	44.5	81.0	36.6	103.4	104.1		9.7	104.9	22.4	184.2	22.4	8	3/4	95.3	108.0	127.0	
100	254.0	31.8	146.1	157.2	114.3	47.8	47.8	85.9	36.6	116.1	116.8		11.2	117.6	-	200.2	22.4	8	3/4	95.3	114.3	127.0	
125	279.5	35.1	177.8	185.7	141.2	50.8	50.8	96.6	42.9	143.8	144.5		11.2	144.5	-	235.0	22.4	8	3/4	108.0	120.7	133.4	
150	317.5	36.6	206.2	215.9	168.4	52.3	52.3	98.6	46.0	170.7	171.5		12.7	171.5	-	269.7	22.4	12	3/4	108.0	120.7	139.7	
200	381.0	41.1	260.4	269.7	219.2	62.0	62.0	111.3	50.8	221.5	222.3		12.7	222.3	-	330.2	22.4	12	7/8	120.7	139.7	152.4	
250	444.5	47.8	320.5	323.9	273.1	66.5	95.3	117.3	55.6	276.4	277.4		12.7	276.4	-	387.4	25.4	16	1	139.7	158.8	171.5	
300	520.5	50.8	374.5	381.0	323.9	73.2	101.6	130.0	60.5	327.2	328.2		12.7	328.7	-	450.9	28.4	16	1 1/8	146.1	171.5	184.2	
350	584.0	53.8	425.5	412.8	355.6	76.2	111.3	142.7	63.5	359.2	360.2		12.7	360.4	-	514.4	31.8	20	1 1/8	158.8	177.8	190.5	
400	647.5	57.2	482.6	469.9	406.4	82.6	120.7	146.1	68.3	410.5	411.2		12.7	411.2	-	571.5	31.8	20	1 1/4	165.1	190.5	230.2	
450	711.0	60.5	533.4	533.4	457.2	88.9	130.0	158.8	69.9	461.8	462.3		12.7	462.0	-	628.7	35.1	24	1 1/4	171.5	196.9	209.6	
500	774.5	63.5	587.2	584.2	508.0	95.3	139.7	162.1	73.2	513.1	514.4		12.7	512.8	-	685.8	35.1	24	1 1/4	184.2	203.2	222.3	
600	914.5	69.9	701.5	692.2	609.6	106.4	152.4	168.1	82.6	616.0	616.0		12.7	614.4	-	812.8	41.1	24	1 1/2	203.2	228.6	254.0	

To be specified by Purchaser

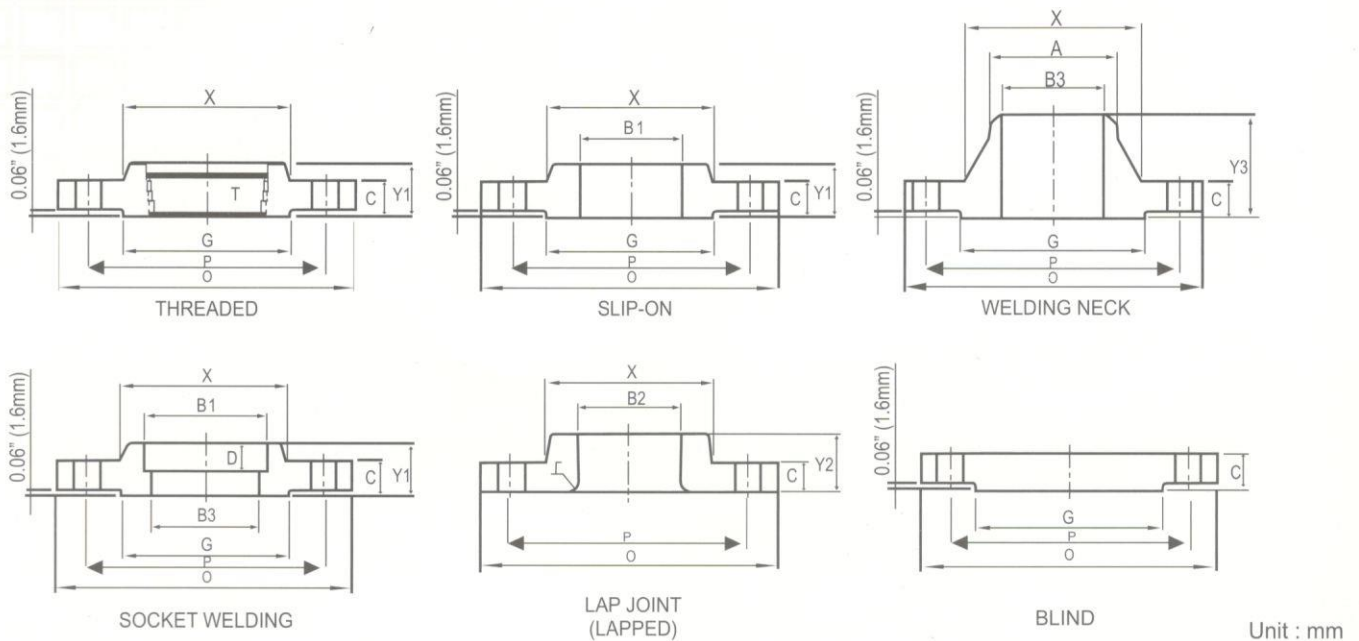
3. Blind Flanges may be made with the same hub as that used for slip-on Flanges or without hub.

4. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelism, spot facing is carried out according to MSS SP-9, without reducing thickness ©

5. Depth of socket (D) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacture's option.

CLASS 600 FLANGES

ANSI B 16.5 FORGED FLANGES

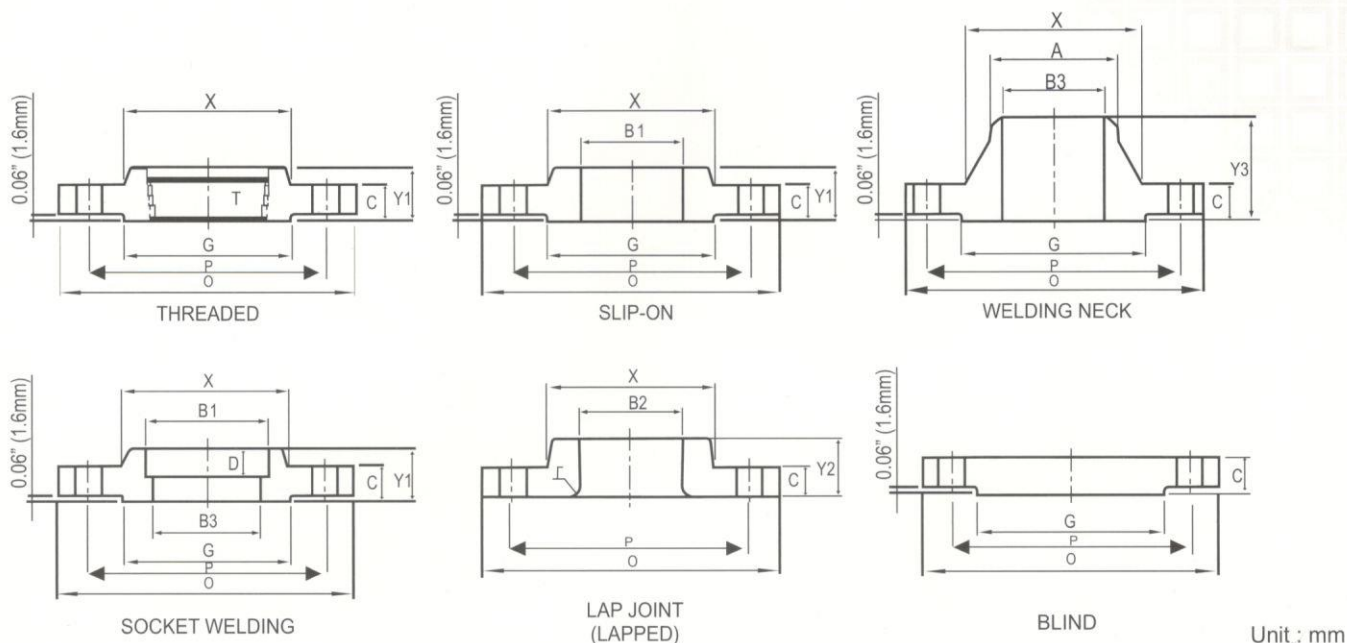


Normal Pipe Size	Outside Diam. of Flanges	Thk. of Flange Min.	Diam. of Hub	O.D. of Raised Face	Hub Diam. Chamfer of W.N.	LENGTH THROUGH HUB			Thread Length	BORE			Corner Radius of Bore of Lapped Flange	Counter Bore Threaded Flange Min.	Depth of Socket	DRILLING				LENGTH OF STUD BOLTS		
						Threaded Slip-on Socket Welding	Lapped	Welding Neck		Slip-on Socket Welding	Lapped	Welding Neck Socket Welding				Diam. of Bolt Circle	Diam. of Bolt Holes	Number of Bolts	Diam. of Bolts (inch)	Raised Face (0.25 inch)	Male & Female of Tongue & Groove	Ring Joint
	O	C	X	G	A	Y1	Y2	Y3	T	B1	B2	B3	r	Q	D	P						
15	95.5	14.2	38.1	35.1	21.3	22.4	22.4	52.3	15.7	22.4	22.9		3.0	23.6	9.7	66.5	15.7	4	1/2	76.2	69.9	76.2
20	117.5	15.7	47.8	42.9	26.7	25.4	25.4	57.2	15.7	27.7	28.2		3.0	29.0	11.2	82.6	19.1	4	5/8	88.9	82.6	88.9
25	124.0	17.5	53.8	50.8	33.5	26.9	26.9	62.0	17.5	34.5	35.1		3.0	35.8	12.7	88.9	19.1	4	5/8	88.9	82.6	88.9
32	133.5	20.6	63.5	63.5	42.2	28.4	28.4	66.5	20.6	43.2	43.7		4.8	44.5	14.2	98.6	19.1	4	5/8	95.3	86.9	95.3
40	155.5	22.4	69.9	73.2	48.3	31.8	31.8	69.9	22.4	49.5	50.0		6.4	50.5	15.7	114.3	22.4	4	3/4	108.0	101.6	108.0
50	165.0	25.4	84.1	91.9	60.5	36.6	36.6	73.2	28.4	62.0	62.5		7.9	63.5	17.5	127.0	19.1	8	5/8	108.0	101.6	108.0
65	190.5	28.4	100.1	104.6	73.2	51.1	41.1	79.2	31.8	74.7	75.4		7.9	76.2	19.1	149.4	22.4	8	3/4	120.7	114.3	120.7
80	209.5	31.8	117.3	127.0	88.9	46.0	46.0	82.6	35.1	90.7	91.4		9.7	92.2	20.6	168.1	22.4	8	3/4	127.0	120.7	127.0
90	228.5	35.1	133.4	139.7	101.6	49.3	49.3	85.9	39.6	103.4	104.1		9.7	104.9	-	184.2	25.4	8	7/8	139.7	133.4	139.7
100	273.0	38.1	152.4	157.2	114.3	53.8	53.8	101.6	41.1	116.1	116.8		11.2	117.6	-	215.9	25.4	8	7/8	146.1	139.7	146.1
125	330.0	44.5	189.0	185.7	141.2	60.5	60.5	114.3	47.8	143.8	144.5		11.2	144.5	-	266.7	28.4	8	1	165.1	158.8	165.1
150	355.5	47.8	222.3	215.9	168.4	66.5	66.5	117.3	50.8	170.7	171.5		12.7	171.5	-	292.1	28.4	12	1	171.5	165.1	171.5
200	419.0	55.6	273.1	269.7	219.2	76.2	76.2	133.4	57.2	221.5	222.3		12.7	222.3	-	349.3	31.8	12	1 1/8	190.5	184.2	196.9
250	508.0	63.5	342.9	323.9	273.1	85.9	111.3	152.4	65.0	276.4	277.4		12.7	276.4	-	431.8	35.1	16	1 1/4	215.9	209.6	215.9
300	559.0	66.6	400.1	381.0	323.9	91.9	117.3	155.4	69.9	327.2	328.2		12.7	328.7	-	489.0	35.1	20	1 1/4	222.3	215.9	222.3
350	603.5	69.9	431.8	412.8	355.6	93.7	127.0	165.1	73.2	359.2	360.2		12.7	360.4	-	527.1	38.1	20	1 3/8	235.0	228.6	235.0
400	686.0	76.2	495.3	469.9	406.4	106.4	139.7	177.8	77.7	410.5	411.2		12.7	411.2	-	603.3	41.1	20	1 1/2	254.0	247.7	254.0
450	743.0	82.6	546.1	533.4	457.2	117.3	152.4	184.2	79.2	461.8	462.3		12.7	462.0	-	654.1	44.5	20	1 5/8	273.1	266.7	273.1
500	813.0	88.9	609.6	584.2	508.0	128.0	165.1	190.5	82.6	513.1	514.4		12.7	512.8	-	723.9	44.5	24	1 5/8	285.8	279.4	291.1
600	940.0	101.6	717.6	692.2	609.6	139.7	184.2	203.2	91.9	616.0	616.0		12.7	614.4	-	838.2	50.8	24	1 7/8	330.2	323.9	336.6

3. Blind Flanges may be made with the same hub as that used for slip-on Flanges or without hub.
4. The gasket surface and backside (bearing surface for bolting) are made parallel within 1 degree. To accomplish parallelisms, spot facing is carried out according to MSS SP-9, without reducing thickness @ 6.35 mm extra thickness.
5. Dimensions of size 1/2" through 3 1/2" are the same as for class 400 flanges.
6. Depth of socket (D) is covered by ANSI B 16.5 only in sizes through 3 inch, over 3 inch is at the manufacture's option.

CLASS 900 FLANGES

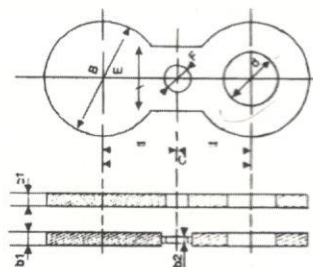
ANSI B 16.5 FORGED FLANGES



Normal Pipe Size	Outside Diam. of Flanges	Thk. of Flange Min.	Diam. of Hub	Hub Diam. Chamfer of W.N	LENGTH THROUGH HUB				BORE			Corner Radius of Bore of Lapped Flange	Counter Bore Threaded Flange Min.	Depth of Socket	DRILLING				LENGTH OF STUD BOLTS		
					Threaded Slip-on Socket Welding	Lapped	Welding Neck	Thread Length	Slip-on	Lapped	Welding Neck				Diam. of Bolt Circle	Diam. of Bolt Holes	Number of Bolts	Diam. of Bolts (inch)	Raised Face (0.25 inch)	Male & Female of Tongue & Groove	Ring Joint
	O	C	X	A	Y1	Y2	Y3	T	B1	B2	B3	r	Q	D	P						
15	120.7	22.4	38.1	21.3	31.8	31.8	60.5	22.4	22.4	22.9		3.0	23.6	9.7	82.6	22.4	4	3/4	108.0	101.6	108.0
20	130.0	25.4	44.5	26.7	35.1	36.1	69.9	25.4	27.7	28.2		3.0	29.0	11.2	88	22.4	4	3/4	114.3	108.0	114.3
25	149.4	28.4	52.3	33.5	41.1	41.1	73.2	28.4	34.5	35.1		3.0	35.8	12.7	101.6	25.4	4	7/8	127.0	120.7	127.0
32	158.8	28.4	63.5	42.2	41.1	41.1	73.2	30.2	43.2	43.7		4.8	44.5	14.2	111.3	25.4	4	7/8	127.0	120.7	127.0
40	177.8	31.8	69.9	48.3	44.5	44.5	82.6	31.8	49.5	50.0		6.4	50.5	15.7	124.0	28.4	4	1	139.7	133.4	139.7
50	215.9	38.1	104.5	60.5	57.2	57.2	101.6	38.1	62.0	62.5		7.9	63.5	17.5	165.1	25.4	8	7/8	146.1	138.7	146.1
65	244.3	41.1	124.0	73.2	63.5	63.5	104.6	47.8	74.7	75.4		7.9	76.2	19.1	190.5	28.4	8	1	158.8	152.4	158.8
80	241.3	38.1	127.0	88.9	53.8	53.8	101.6	41.1	90.7	91.4		9.7	92.2	-	190.5	25.4	8	7/8	146.1	139.7	146.1
100	292.1	44.5	158.8	114.3	69.9	69.9	114.3	47.8	116.1	116.8		11.2	117.6	-	235.0	31.8	8	11/8	171.5	165.1	171.5
125	349.3	50.8	190.5	141.2	79.2	79.2	127.0	53.8	143.8	144.5		11.2	144.5	-	279.4	35.1	8	11/4	190.5	184.2	190.5
150	381.0	55.6	235.0	168.4	85.9	85.9	139.7	57.2	170.7	171.5		12.7	171.5	-	317.5	31.8	12	11/8	190.5	184.2	190.5
200	469.9	63.5	298.5	219.2	101.6	114.3	162.5	63.5	221.5	222.3		12.7	222.3	-	393.7	38.1	12	13/8	222.3	215.9	222.3
250	546.1	69.9	368.3	273.1	108.0	127.0	184.2	71.4	276.4	277.4		12.7	276.4	-	469.9	38.1	16	13/8	235.0	228.6	235.0
300	609.5	79.2	419.1	323.9	117.3	142.7	200.2	76.2	327.2	328.2		12.7	328.7	-	533.4	38.1	20	13/8	254.0	247.7	254.0
350	641.4	85.9	450.9	355.6	130.0	155.4	212.9	82.6	359.2	360.2		12.7	360.4	-	558.8	41.1	20	11/2	273.1	266.7	279.4
400	704.9	88.9	508.0	406.4	133.4	165.1	215.9	85.9	410.5	411.2		12.7	411.2	-	616.0	44.5	20	15/8	285.8	279.4	292.1
450	787.4	101.6	565.2	457.2	152.4	190.5	228.6	88.9	461.8	462.3		12.7	462.0	-	685.8	50.8	20	17/8	323.9	317.5	336.6
500	857.3	108.0	622.3	508.0	158.8	209.6	247.7	91.9	513.1	514.4		12.7	512.8	-	749.3	53.8	20	2	349.3	342.9	362.0
600	1041.4	139.7	749.3	609.6	203.2	266.7	292.1	101.6	616.0	616.0		12.7	614.4	-	901.7	68.5	20	21/2	438.2	431.8	457.2

3. Dimensions of sizes 1/2" through 3 1/2" are the same as for class 1500 Flanges.
4. Socket welding flanges may be provided in NPS 1/2" through 2 1/2" using 1500 dimensions.
5. 6.35 mm extra thickness.

Spectacle Blinds



ON	150 lbs							300 lbs						
	B	d	C	E	b1	b2	F	B	d	C	E	b1	b2	F
1/2	44	15	60	25	6.5	4	16	51	18	67	30	6.5	4	16
3/4	54	22	70	30	6.5	4	16	63	22	83	35	6.5	4	16
1	63	28.5	79	35	6.5	4	16	70	28.5	89	40	6.5	4	16
1 1/4	73	35	89	40	6.5	4	16	79	35	98	45	6.5	4	16
1 1/2	82	41.5	98	50	6.5	4	16	82	41.5	114	55	6.5	4	23
2	101	54	121	50	6.5	4	19	108	54	125	28	6.5	4	16
2 1/2	120	66.5	140	50	6.5	4	19	127	66.5	149	35	6.5	4	23
3	133	79.5	152	50	6.5	4	19	146	79.5	168	40	9.5	6	23
3 1/2	159	92	178	60	6.5	4	19	152	92	184	45	9.5	6	23
4	171	108	191	45	6.5	4	19	178	108	200	50	12.5	8	23
5	193	133.5	216	50	9.5	6	22	212	133.5	235	60	12.5	8	23
6	219	159	241	55	9.5	6	22	247	159	270	45	18	8	23
8	276	209.5	298	60	12.5	8	22	305	209.5	330	55	19	10	23
10	336	260.5	362	70	16	8	28	359	260.5	387	45	25.5	14	23
12	406	305	432	65	22.5	10	28	419	305	451	50	28.5	18	23
14	441	336.5	476	70	25.5	14	29	476	336.5	514	45	32	20	23
16	505	387.5	540	70	25.5	14	28	530	387.5	572	50	36.5	22	23
18	540	438	578	70	25.5	14	32	587	438	629	45	41.5	24	23
20	597	469	635	70	28.5	16	32	645	489	686	50	44.5	24	23
22	657	546	692	65	35	20	35	702	546	743	50	44.5	24	23
24	708	590.5	750	75	35	20	35	765	590.5	813	60	54	40	23
26	762	641.5	806	70	51	32	35	822	641.5	876	50	73	60	23
28	826	692	864	60	51	32	35	895	692	940	60	73	60	23
30	870	743	914	65	54	34	35	940	743	997	60	85	70	23
32	936	794	978	65	54	34	41	1003	794	1054	65	85	70	23
34	978	844.5	1029	65	57	34	41	1044	844.5	1105	70	98	80	23
36	1035	895.5	1086	60	67	34	41	1105	895.5	1168	65	98	80	23

ON	450 lbs							600 lbs						
	B	d	C	E	b1	b2	F	B	d	C	E	b1	b2	F
1/2	51	16	67	30	6.5	4	16	51	16	67	30	6.5	4	16
3/4	63	22	83	35	6.5	4	16	63	22	83	35	6.5	4	16
1	70	28.5	89	40	9.5	6	19	70	28.5	89	40	9.5	6	19
1 1/4	79	35	98	45	9.5	6	19	79	35	98	50	9.5	6	19
1 1/2	92	41.5	114	55	9.5	6	23	92	41.5	114	55	9.5	6	23
2	108	54	127	28	9.5	6	16	108	54	127	28	9.5	6	16
2 1/2	127	63.5	149	35	9.5	6	23	127	63.5	149	35	12.5	8	23
3	146	79.5	168	40	12.5	8	23	146	79.5	168	40	16	10	23
3 1/2	159	92	184	45	12.5	8	23	159	92	184	45	16	10	23
4	174	105	200	50	16	10	23	190	105	216	55	16	10	23
5	209	130	235	60	16	10	23	238	130	267	70	22.5	14	23
6	244	155.5	270	45	19	12	23	263	155.5	292	45	25.8	15	23
8	301	203	330	58	22.5	14	23	317	203	349	55	32	20	23
10	355	257	387	45	28.5	16	23	390	257	432	45	38	24	23
12	416	305	451	50	38	24	23	454	305	489	40	44.5	30	23
14	479	336.5	514	45	41.5	26	23	489	336.5	527	40	51	36	23
16	533	387.5	572	50	47.5	30	23	562	387.5	603	50	57	40	23
18	590	438	629	45	57	40	23	609	438	654	55	63	50	23
20	644	489	686	50	57	40	23	679	489	724	50	70	64	23
22	698	540	743	50	70	55	23	730	540	778	55	70	64	23
24	765	590.5	813	60	70	55	23	787	590.5	838	55	82	68	23
26	819	641.5	876	50	85	70	23	851	641.5	915	50	101	85	23
28	889	692.2	783	60	85	70	23	911	692.2	965	55	101	85	23
30	930	734	997	60	98	80	23	959	734	1022	60	110	90	23
32	1000	794	918	65	98	80	23	1119	794	1080	60	110	90	23
34	1041	844.5	1105	70	108	90	23	1060	844.5	1130	65	117	100	23
36	1105	895.5	1168	55	110	95	23	1117	895.5	1194	65	124	110	23

NOTE : 1) Preferable one piece except for stainless and allied steels, which can be manufactured in 3 pieces.
 2) Dimensions of other standards available on request.



DIMENSIONAL OF PIPE FLANGES AS PER TABLE BS-10

Table D: For Working Steam Pressure
upto 50 lbs per sq.inch

Nominal Pipe Size	O.D of Pipe	Dia.of Flange	Dia.of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	21.3	95.3	66.7	4	12.7	4.8
3/4"	26.7	101.6	73.0	4	12.7	4.8
1"	33.4	114.3	82.6	4	12.7	4.8
1 1/4"	42.2	120.7	87.6	4	12.7	6.4
1 1/2"	48.3	133.4	98.4	4	12.7	6.4
2"	60.3	152.4	114.3	4	15.9	7.9
2 1/2"	73.0	165.1	127.0	4	15.9	7.9
3"	88.9	184.2	146.1	4	15.9	9.5
3 1/2"	101.6	203.2	165.1	4	15.9	9.5
4"	114.3	215.9	177.8	4	15.9	9.5
5"	141.3	254.0	209.6	8	15.9	12.7
6"	168.3	279.4	228.6	8	15.9	12.7
7"	190.5	304.8	260.4	8	15.9	12.7
8"	219.1	336.6	292.1	8	15.9	12.7
9"	244.5	368.3	323.9	8	15.9	15.9
10"	273.0	406.4	355.6	8	19.1	15.9
12"	323.0	457.2	406.4	12	19.1	15.9
14"	355.6	527.1	469.9	12	22.2	19.1
16"	406.4	577.9	520.7	12	22.2	19.1
18"	457.2	641.4	584.2	12	22.2	22.2
20"	508.0	704.9	641.4	16	22.5	25.4
24"	609.6	825.5	755.7	16	25.4	28.6

Table E: For Working Steam Pressure 50 lbs
upto 100 lbs per sq.inch

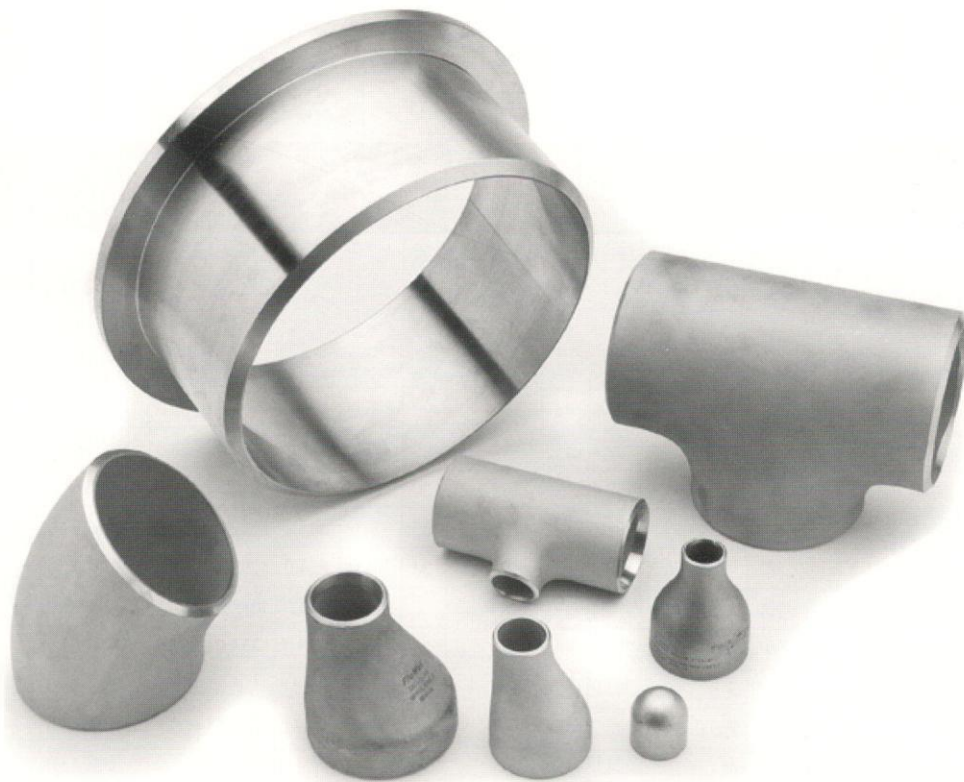
Nominal Pipe Size	Dia.of Flange	Dia. of Bolt Circle	No.of Bolt	Dia.of Bolt	Thickness
1/2"	95.3	66.7	4	12.7	6.4
3/4"	101.6	73.0	4	12.7	6.4
1"	114.3	82.6	4	12.7	7.1
1 1/4"	120.7	87.6	4	12.7	7.9
1 1/2"	133.4	98.4	4	12.7	8.7
2"	152.4	114.3	4	15.9	9.5
2 1/2"	165.1	127.0	4	15.9	10.3
3"	184.2	146.1	4	15.9	11.1
3 1/2"	203.2	165.1	4	15.9	11.9
4"	215.9	177.8	4	15.9	12.7
5"	254.0	209.6	8	15.9	14.3
6"	279.4	228.6	8	15.9	17.5
7"	304.8	260.4	8	15.9	19.1
8"	336.6	292.1	8	15.9	19.1
9"	368.3	323.9	8	15.9	20.6
10"	406.4	355.6	8	19.1	22.2
12"	457.2	406.4	12	19.1	25.4
14"	527.1	469.9	12	22.2	25.4
16"	577.9	520.7	12	22.2	25.4
18"	641.4	584.2	12	22.2	28.6
20"	704.9	641.4	16	22.5	31.8
24"	825.5	755.7	16	25.4	38.1

Table F: For Working Steam Pressure
above 100 lbs and upto 150 lbs per sq.inch

Nominal Pipe Size	O.D of Pipe	Dia.of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	21.3	95.3	66.7	4	12.7	9.5
3/4"	26.7	101.6	73.0	4	12.7	9.5
1"	33.4	120.7	87.3	4	15.9	9.5
1 1/4"	42.2	133.4	98.4	4	15.9	12.7
1 1/2"	48.3	139.7	104.8	4	15.9	12.7
2"	60.3	165.1	127.0	4	15.9	15.9
2 1/2"	73.0	184.2	146.1	8	15.9	15.9
3"	88.9	203.2	165.1	8	15.9	15.9
3 1/2"	101.6	215.9	177.8	8	15.9	19.1
4"	114.3	228.6	190.5	8	15.9	19.1
5"	141.3	279.4	235.0	8	19.1	22.2
6"	168.3	304.8	260.4	12	19.1	22.2
7"	190.3	336.6	292.1	12	19.1	22.2
8"	219.1	368.3	323.9	12	19.1	25.4
9"	244.5	406.4	355.6	12	22.2	25.4
10"	273.0	431.8	381.0	12	22.2	25.4
12"	323.0	489.0	438.2	16	22.2	28.6
14"	355.6	552.5	495.3	16	25.4	31.8
16"	406.4	609.6	552.5	20	25.4	31.8
18"	457.2	673.1	609.6	20	28.6	34.9
20"	508.0	736.6	673.1	24	28.6	38.1
24"	609.6	850.9	781.1	24	31.8	41.3

Table H: For Working Steam Pressure
above 150 lbs and upto 250 lbs per sq.inch

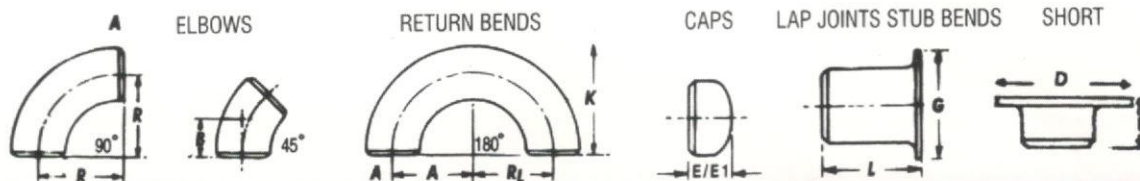
Nominal Pipe Size	Dia.of Flange	Dia. of Bolt Circle	No. of Bolt	Dia. of Bolt	Thickness
1/2"	114.3	82.6	4	15.9	12.7
3/4"	114.3	82.6	4	15.9	12.7
1"	120.78	87.3	4	15.9	14.3
1 1/4"	133.4	98.4	4	15.9	17.5
1 1/2"	139.7	104.8	4	15.9	17.5
2"	165.1	127.0	4	15.9	19.1
2 1/2"	184.2	146.1	8	15.9	19.1
3"	203.2	165.1	8	15.9	22.2
3 1/2"	215.9	177.8	8	15.9	22.2
4"	228.6	190.5	8	15.9	25.4
5"	279.4	235.0	8	19.1	28.6
6"	304.8	260.4	12	19.1	28.6
7"	336.6	292.1	12	19.1	31.8
8"	368.3	323.9	12	19.1	31.8
9"	406.4	355.6	12	22.2	34.9
10"	431.8	381.0	12	22.2	34.9
12"	489.0	438.2	16	22.2	38.1
14"	552.5	495.3	16	25.4	41.3
16"	609.6	552.5	20	25.4	44.5
18"	673.1	609.6	20	28.6	47.6
20"	736.6	673.1	24	28.6	50.6
24"	850.9	781.1	25	31.8	57.2



BUTT-WLED FITTINGS

Stainless Steel	: A182 304, 304L, 304H, 3016, 3016L, 3016H, 316TI, 321, 347, 347H, 904L.
Carbon Steel	: ASTM A234 WPB/A420 WPL3/A420 WP6/MSS-SP-75 WPHY 42/ 46/ 52/ 56/60/65/70/A53GR.B/A106 GR.B/ASM 192/A179/ etc
Alloy Steel	: ASTM A234 WP1/WP9/WP11/WP22/WP91 etc.
Duplex Steel	: UNS S31803, UNS S2205
Super Duplex Steel	: UNS S31254, UNS S32750, UNS S32760.
High Nickel Alloys	: Nickel 200, 201, Monel K 400 & 500. Inconel 600, 601, 625, 800, 825, Hastelloy C276, Alloy 20, Smo-254
Cupro Nickel	: 90/10 (UNS C70600), 70/30 (UNSC71500)
Others	: Monel, Nickel, Inconel, Hastelloy, Copper, Brass, Bronze, Titanium, Tantalum, Bismuth, Aluminium, High Speed, Zinc, Lead etc.
Type	: Elbow, Tee, Reducer, Return Bends, Stub-Ends, Cap, Collar, Cross
Size	: 1/4" NB to 32" NB. (Seamless) & 1/4" NB (Welded)
Wall Thickness	: Sch. 55 to sch. XXS.

DIMENSION OF BUTT WELDING FITTINGS TO ANSI B 16.9/MSS SP 43

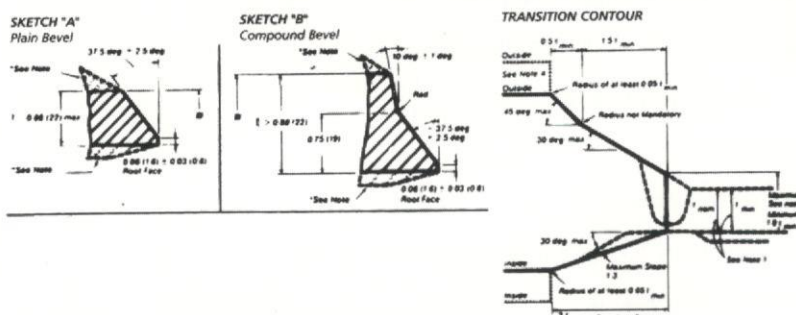


NOM BORE	PIPE OD	RADIUS 'R'		B 1.5 D	K	E/E1	G	LENGTH 'L'		D	h
		1 D	1.5 D					MSS SP 43	ANSI B 16.9		
1/2	21.3	12.7	38.1	15.9	48	25.4	34.9	50.8	76.2	45	8
3/4	26.7	19.05	38.1	19.0	51	25.4	42.8	50.8	76.2	54	8
1	33.4	25.4	38.1	22.2	56	38.1	50.8	50.8	101.6	64	10
1 1/4	42.1	31.75	47.6	25.0	70	38.1	63.5	50.8	101.6	74	12
1 1/2	48.3	38.1	57.15	28.6	83	38.1	73.0	50.8	101.6	84	12
2	60.3	50.8	76.2	35.0	106	44*	92.0	63.5	152.4	102	16
2 1/2	73.0	63.5	95.25	44.0	132	51*	106	63.5	152.4	122	16
3	88.9	76.2	114.3	50.8	159	64*	127.0	63.5	152.4	138	18
3 1/2	101.6	88.9	133.35	57.2	184	76*	139.7	76.2	152.4	148	18
4	114.3	101.3	152.4	63.5	210	76*	157.2	76.2	152.4	158	20
5	141.3	127.0	190.5	79.4	262	89*	185.7	76.2	208.2	188	20
6	168.3	152.4	228.6	95.3	313	102*	218	88.9	203.2	212	25
8	219.1	203.2	304.8	127.0	414	127*	270.0	101.6	203.2	270	30
10	373.1	254.0	381.0	158.7	518	152*	324.0	127.0	254.0	325	30
12	323.9	304.8	457.2	190.5	619	176*	361.0	152.4	254.0	380	35
14	355.6	355.6	533.4	222.2	711	191*	412.8	152.4	305.0	415	40
16	406.4	406.4	609.6	254.0	---	203*	470.0	152.4	305.0	470	40

* All dimensions are in mm

NOM BORE	PIPE OD	RADIUS 'R'		B 1.5 D	K	E/E1	G	LENGTH 'L'		D	h
		1 D	1.5 D					MSS SP 43	ANSI B 16.9		
18	457.2	457.2	685.8	285.7	914	229*	533.4	152.4	305.0	535	40
20	508.0	508.0	762.0	317.6	1016	254*	584.2	152.4	305.0	585	40
22	558.8	558.8	838.2	343.0	1118	254*	641.4	152.4	305.0	642	40
24	609.6	609.6	914.4	381.0	1219	305*	692.2	152.4	305.0	693	40
26	660.0	660.0	991.0	405.0	---	267.0	---	---	---	---	---
28	711.0	711.0	1067.0	438.0	---	267.0	---	---	---	---	---
30	762.0	762.0	1143.0	470.0	---	267.0	---	---	---	---	---
32	813.0	813.0	1219.0	502.0	---	267.0	---	---	---	---	---
34	864.0	864.0	1295.0	533.0	---	267.0	---	---	---	---	---
36	914.0	914.0	1372.0	565.0	---	267.0	---	---	---	---	---
38	965.0	965.0	1448.0	600.0	---	305.0	---	---	---	---	---
40	1016.0	1016.0	1524.0	632.0	---	305.0	---	---	---	---	---
42	1067.0	1067.0	1600.0	660.0	---	305.0	---	---	---	---	---
44	1118.0	1118.0	1676.0	695.0	---	343.0	---	---	---	---	---
46	1168.0	1168.0	1753.0	727.0	---	343.0	---	---	---	---	---
48	1219.0	1219.0	1829.0	759.0	---	343.0	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---	---

EDGE PERPETRATION AS PER ANSI B 16.9 - B 16.25



Normal wall Thickness	End Preparation
Less than x*	Cut square or slightly chamfer, at mrfs option
x* to 0.88 incl (22)	Plain bevel as in sketch "A" above
More than 0.88 (22)	Compound bevel as in sketch "B" above x* = 0.19 (5) for carbon steel or Ferritic Alloy Steel and 0.12 (4) for Austenitic Alloy steel.

- The value 1 min is whichever of the following as applicable :
(a) the min ordered wall thickness of the pipe;
(b) 0.875 times the nominal wall thickness of pipe ordered to a pipe schedule wall thickness which has as under tolerance of 12.5%
- The maximum thickness at end of the component is :
(a) The greater of 1 min. + 0.15 in. (4mm) or 1.15 t min, when ordered on a minium wall basis
(b) The greater of t min , +0.15 in. (4 mm) or 1.10 t nom. When ordered on a nominal wall basis
- Weld bevel is shown for illustrations only.
- Where transition using maximum slope do no intersect outside surface, as shown by phantom outline, maximum slopes shown or alternate radii shown in phantom outline shall be used.
- Dimension is parenthesis are in millimeters. Other are in inches.

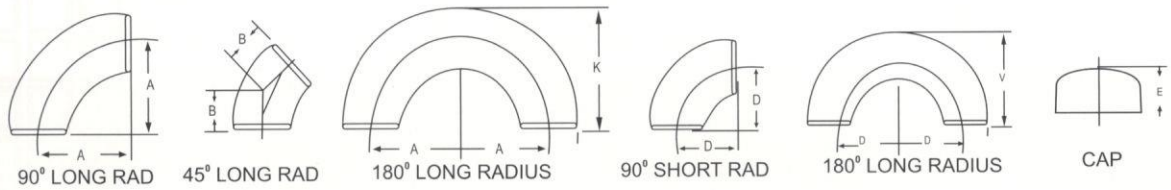
Note : 2. The shape of cap shall be ellipsoidal.

Note : 2. Of specification ANSI b 16.9 for cap E1 & E2 to be consider

Length E1 applies for thickness greater than that given in columun "Limiting wall Thickness" for NPS 24 (DIN 600) & smaller, For NPS 26 (DN 650) and larger, length E1 shall be by agreement between manufacturer and purchaser

*E1 Height

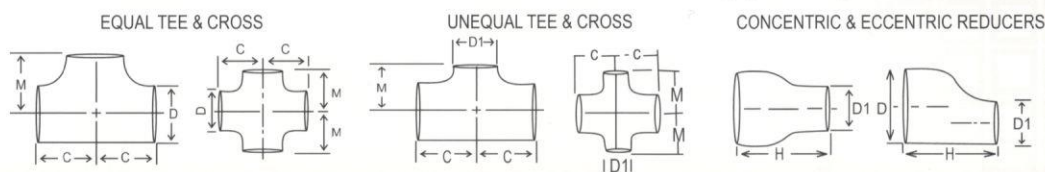
BUTT WELDING FITTINGS



DIMENSIONAL STANDARD ANSI B-16.9 AND B-16.28

Nominal Pipe Size	Pipe O.D.	Centre to End			Back to Face		
		A	B	D	E	V	K
1/2	21.3	38	16	---	25	---	43
3/4	26.7	29	11	25	25	---	43
1	33.4	38	22	32	38	41	56
1 1/4	42.2	48	25	38	38	52	70
1 1/2	48.3	57	29	51	38	62	83
2	60.3	76	35	64	38	81	106
2 1/2	73.0	95	44	76	38	100	132
3	88.9	114	51	89	51	121	159
3 1/2	101.6	133	57	102	64	140	184
4	114.3	152	64	127	64	159	210
5	141.3	190	79	152	76	197	262
6	168.3	229	95	203	89	237	313
8	219.1	305	127	254	102	313	414
10	273.1	381	159	305	127	391	518
12	323.9	457	190	356	152	467	619
14	355.6	533	222	406	165	538	711
16	406.4	610	254	457	178	610	813
18	457.0	686	286	508	203	686	914
20	508.0	762	318	559	229	762	1016
22	559.0	838	343	610	254	838	1118
24	610.0	914	381	660	267	914	1219
26	660.0	991	406	771	267	---	---
28	711.0	1067	438	762	267	---	---
30	762.0	1143	470	813	267	---	---
32	813.0	1219	502	884	267	---	---
34	864.0	1295	533	914	267	---	---
36	914.0	1372	565	965	305	---	---
38	965.0	1448	600	1016	305	---	---
40	1016.0	1524	632	1067	343	---	---
42	1067.0	1600	660	1118	---	---	---
44	1118.0	1676	695	1168	---	---	---
46	1168.0	1753	727	---	---	---	---
48	1219.0	1829	759	---	---	---	---

DIMENSIONS OF BUTT WELDING FITTINGS TO ANSI B 16.9 (upto 48") / MSS SP 43 (upto 24")



Nominal Pipe Size	Center to End Run	Center to End Branch	Length	Nominal Pipe Size	Center to End Run	Center to End Branch	Length	Nominal Pipe Size	Center to End Run	Center to End Branch	Length	Nominal Pipe Size	Center to End Run	Center to End Branch	Length	Nominal Pipe Size	Center to End Run	Center to End Branch	Length	Nominal Pipe Size	Center to End Run	Center to End Branch	Length
D x D1	C	M	H	D x D1	C	M	H	D x D1	C	M	H	D x D1	C	M	H	D x D1	C	M	H	D x D1	C	M	H
1 x 1	38	38	---	5 x 5	124	124	-	18 x 18	343	343	-	30 x 30	559	559	-	38 x 38	711	711	-	44 x 44	813	762	-
1 x 1/2	38	38	51	5 x 2	124	105	127	18 x 16	343	330	381	30 x 28	559	546	610	38 x 36	711	711	610	44 x 42	813	762	610
1 x 3/4	38	38	51	5 x 2 1/2	124	108	127	18 x 14	343	330	381	30 x 26	559	546	610	38 x 34	711	698	610	44 x 40	813	749	610
1 1/4 x 1 1/4	48	48	51	5 x 3	124	111	127	18 x 12	343	321	381	30 x 24	559	533	610	38 x 32	711	688	610	44 x 38	813	737	610
1 1/4 x 1/2	48	48	51	5 x 3 1/2	124	114	127	18 x 10	343	308	381	30 x 22	559	521	610	38 x 30	711	673	610	44 x 36	813	724	610
1 1/4 x 3/4	48	48	51	5 x 4	124	117	127	18 x 8	343	298	(381)	30 x 20	559	(508)	(610)	38 x 28	711	648	610	44 x 34	813	724	(610)
1 1/4 x 1	48	48	51	6 x 6	143	143	-	20 x 20	381	381	-	30 x 16	559	(495)	(610)	38 x 26	711	648	610	44 x 32	813	711	(610)
1 1/2 x 1 1/2	57	57	-	6 x 2 1/2	143	121	140	20 x 18	381	368	508	30 x 14	559	(483)	(610)	38 x 24	711	635	(610)	44 x 30	813	711	(610)
1 1/2 x 1/2	57	57	64	6 x 3	143	124	140	20 x 16	381	356	508	30 x 12	559	(483)	(610)	38 x 22	711	622	(610)	44 x 28	813	698	(610)
1 1/2 x 3/4	57	57	64	6 x 3 1/2	143	127	140	20 x 14	381	356	508	30 x 10	559	(473)	(610)	38 x 20	711	610	(610)	44 x 26	813	698	(610)
1 1/2 x 1	57	57	64	6 x 4	143	130	140	20 x 12	381	346	508	32 x 32	597	597	-	40 x 40	749	749	-	44 x 24	813	698	(610)
1 1/2 x 1 1/4	57	57	64	6 x 5	143	137	140	20 x 10	381	333	(508)	32 x 30	597	584	610	40 x 38	749	749	610	44 x 22	813	686	(610)
2 x 2	64	64	-	8 x 8	178	178	-	20 x 8	381	324	(508)	32 x 28	597	572	610	40 x 36	749	737	610	44 x 20	813	686	(610)
2 x 3/4	64	44	76	8 x 6	178	168	152	22 x 22	419	419	-	32 x 26	597	572	610	40 x 34	749	724	610	46 x 46	851	800	-
2 x 1	64	51	76	8 x 5	178	162	152	22 x 20	419	406	508	32 x 24	597	559	610	40 x 32	749	711	610	46 x 44	851	800	711
2 x 1 1/4	64	57	76	8 x 4	178	156	152	22 x 18	419	384	508	32 x 22	597	546	(610)	40 x 30	749	689	610	46 x 42	851	787	711
2 x 1 1/2	64	60	76	8 x 3 1/2	178	152	152	22 x 16	419	381	508	32 x 20	597	533	(610)	40 x 28	749	673	(610)	46 x 40	851	775	711
2 1/2 x 2 1/2	76	76	-	10 x 10	216	216	-	22 x 14	419	381	508	32 x 18	597	521	(610)	40 x 26	749	673	(610)	46 x 38	851	762	711
2 1/2 x 1	76	57	89	10 x 8	216	203	178	22 x 12	419	371	(508)	32 x 16	597	508	(610)	40 x 24	749	660	(610)	46 x 36	851	762	(711)
2 1/2 x 1 1/4	76	64	89	10 x 6	216	194	178	22 x 10	419	359	(508)	32 x 14	597	508	(610)	40 x 22	749	648	(610)	46 x 34	851	749	(711)
2 1/2 x 1	76	67	89	10 x 5	216	194	178	24 x 24	432	432	-	34 x 34	635	635	-	40 x 20	749	635	(610)	46 x 32	851	749	(711)
2 1/2 x 1 1/4	76	70	89	10 x 4	216	184	178	24 x 22	432	432	508	34 x 32	635	622	610	40 x 18	749	622	(610)	46 x 30	821	737	(711)
3 x 3	86	86	-	12 x 12	254	254	-	24 x 20	432	432	508	34 x 30	635	610	610	42 x 42	762	711	-	46 x 28	851	737	(711)
3 x 1 1/4	86	70	89	12 x 10	254	241	203	24 x 18	432	419	508	34 x 28	635	597	610	42 x 40	762	711	610	46 x 26	851	737	(711)
3 x 1 1/2	86	73	89	12 x 8	254	229	203	24 x 16	432	406	508	34 x 26	635	597	610	42 x 38	762	711	610	46 x 24	851	724	(711)
3 x 2	86	76	89	12 x 6	254	219	203	24 x 14	432	406	(508)	34 x 24	635	597	610	42 x 36	762	711	610	46 x 22	851	724	(711)
3 x 2 1/2	86	83	89	12 x 5	254	216	203	24 x 12	432	397	(508)	34 x 22	635	584	(610)	42 x 34	762	711	610	48 x 48	889	838	-
3 1/2 x 3 1/2	95	95	-	14 x 14	279	279	-	24 x 10	432	384	(508)	34 x 20	635	572	(610)	42 x 32	762	711	610	48 x 46	889	838	711
3 1/2 x 1 1/2	95	79	102	14 x 12	279	270	330	26 x 26	495	495	-	34 x 18	635	559	(610)	42 x 30	762	711	610	48 x 44	889	838	711
3 1/2 x 2	95	93	102	14 x 10	279	257	330	26 x 24	495	483	610	34 x 16	635	533	(610)	42 x 28	762	698	(610)	48 x 42	889	813	711
3 1/2 x 2 1/2	95	89	102	14 x 8	279	248	330	26 x 22	495	470	610	36 x 36	673	673	-	42 x 26	762	698	(610)	48 x 40	889	813	(711)
3 1/2 x 3	95	92	102	14 x 6	279	238	330	26 x 20	495	457	610	36 x 34	673	660	610	42 x 24	762	660	(610)	48 x 38	889	787	(711)
4 x 4	105	105	-	16 x 16	305	305	-	26 x 18	495	444	610	36 x 32	673	648	610	42 x 22	762	660	(610)	48 x 36	889	787	(711)
4 x 1 1/2	105	86	102	16 x 14	305	305	356	26 x 16	495	432	(610)	36 x 30	673	635	610	42 x 20	762	660	(610)	48 x 34	889	787	(711)
4 x 2	105	89	102	16 x 12	305	295	356	26 x 14	495	432	(610)	36 x 28	673	622	610	42 x 18	762	648	(610)	48 x 32	889	787	(711)
4 x 2 1/2	105	95	102	16 x 10	305	283	356	26 x 12	495	422	(610)	36 x 26	673	622	610	42 x 16	762	635	(610)	48 x 30	889	762	(711)
4 x 3	105	98	102	16 x 8	305	273	356	28 x 28	521	521	-	36 x 24	673	610	(610)	48 x 28	889	762	(711)	48 x 26	889	762	(711)
4 x 3 1/2	105	102	102	16 x 6	305	264	(356)	28 x 26	521	521	610	36 x 22	673	597	(610)	48 x 24	889	737	(711)	48 x 22	889	737	(711)
								28 x 24	521	508	610	36 x 20	673	584	(610)								
								28 x 22	521	495	610	36 x 18	673	572	(610)								
								28 x 20	521	483	610	36 x 16	673	559	(610)								
								28 x 18	521	470	(610)												
								28 x 16	521	457	(610)												
								28 x 14	521	457	(610)												
								28 x 12	521	448	(610)												

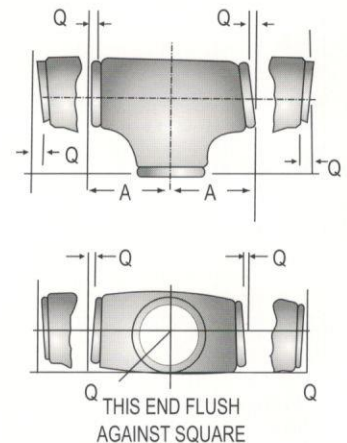
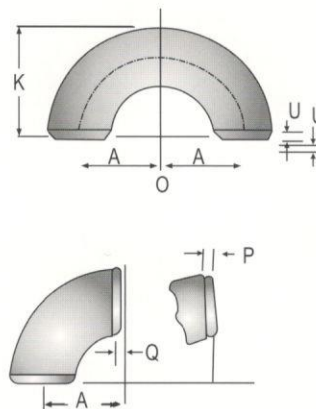
- Figures in brackets are as per the manufacturer's standard
- Outlet dimension M for run sizes NPS 14 (DN 350) and large is recommended but not required.

All dimensions in mm

DIMENSIONAL TOLERANCES IN MM OF BUTTWELD FITTINGS TO ANSI B 16.9/B 16.28

All Fittings				90° and 45° Elbows and Tees	Reducers and Lap Joints Stub Ends	Caps	180 Degree Returns			Lap Joint Stub Ends		
Nominal Pipe Size (NPS)	Outside Diameter at Bevel(1) D	Inside Diameter at End (2), (3)	Wall Thickness (2) t	Center to End Dimension A,B,C,M	Overall Length L.H.	Overall Length E	Center to Center Dimension O	Back to Face Dimension K	Align-ment of Ends U	Outside Diameter of Lap G	Thickness of Lap T	Fillet Radius of Lap R
½ to 2 ½	± 1	± 0.8		± 2	± 2	± 4	± 7	± 7	± 1	±0, -1	±2, -0	±0, -1
3 to 3 ½	± 1	± 1.6		± 2	± 2	± 4	± 7	± 7	± 1	±0, -1	±2, -0	±0, -1
4	+ 2-1	± 1.6	Not Less	± 2	± 2	± 4	± 7	± 7	± 1	±0, -1	±2, -0	±0, -2
5 to 6	+3, -2	± 1.6	than	± 2	± 2	± 7	± 7	± 7	± 1	±0, -1	±2, -0	±0, -2
8	+3, -2	± 1.6	87.5%	± 2	± 2	± 7	± 7	± 7	± 1	±0, -1	±2, -0	±0, -2
10	+4, -3	± 3.2	of	± 2	± 2	± 7	± 10	± 7	± 2	±0, -2	±2, -0	±0, -2
12 to 18	+4, -3	± 3.2	Nominal	± 3	± 3	± 7	± 10	± 7	± 2	±0, -2	±2, -0	±0, -2
20 to 24	+6, -5	± 4.8	Thickness	± 3	± 3	± 7	-	± 7	± 2	±0, -2	±2, -0	±0, -2
26 to 30	+7, -5	± 4.8		± 3	± 5	± 10	-	-	-	-	-	-
32 to 48	+7, -5	± 4.8		± 5	± 5	± 10	-	-	-	-	-	-

Nominal Pipe Size (MPS)	Angularity Tol.	
	Off Angle O	Off Plane P
1/2 to 4	1	2
5 to 8	2	4
10 to 12	3	5
14 to 16	3	7
18 to 24	4	10
26 to 30	5	10
32 to 42	5	13
44 to 48	5	20



DIMENSIONAL TOLERANCES IN MM FOR SOCKETWELD FITTINGS TO ANSI B-16.11

Nominal Bore Inch	Elbows Tees Crosses	Couplings	Half Couplings	All Fittings	Bore diameter of Fittings	Fittings Wall Thickness	Concentricity of Bores
	Center to Bottom of Socket	Bottom to Bottom of Socket	Bottom of Socket to opposite Face	Bore diameter of Socket			
1/8 & 1/4	± 0.8	± 1.6	± 0.8			Not less than	Socket and
3/8 to 3/4	± 1.6	± 3.0	± 1.6	± 0.3	± 0.4	Nominal	Fittings Bore
1 to 2	± 2.0	± 4.0	± 2.0			Pipe Wall	within
2½" to 4	± 2.5	± 5	± 2.5	± 0.4		Thickness	± 0.8

DIMENSIONAL TOLERANCES IN MM FOR SCREWED FITTINGS TO ANSI B-16.11

Nominal Bore Inch	Elbows Tees Crosses		Couplings* Half Couplings		Bushing Plug.			
	Center to End	Diameter of Bore	Overall Length	Diameter	Height of Head	Length Under Head	Across Flat	Overall Length
½ to ¾	+ 0.8	+ 1.6	± 1.6	+1.6	±0.8	±1.6	+0	± 1.6
		- 0.8		- 0			- 0.8	
1 to 2	+ 1.6	+ 2.4	± 3.2	+2.4	±1.6	±2.4	+0	± 2.4
		- 1.6	- 0	- 0			- 1.6	