

PT. UNGGUL PRAKARSA PRISMA



FORGED STEEL FITTINGS

Forged Steel Socket-Welding & Threaded Fittings

Socket-Welding Type (ASME)

- 90°, 45° Elbow, Tee, Cross
- Full Coupling, Half Coupling, Reducer, Cap, Boss
- Reducer Insert
- Union

Threaded Type

- 90°, 45° Elbow, Tee, Cross
- Full Coupling, Half Coupling, Cap, Reducer
- Union
- Boss & Plug, Bushing, Nipple & Swaged

Outlet

- Weld-outlet, Socket-outlet, Thread-outlet
- Nipple-outlet, Flanged End Outlet

Socket-Welding Type (KS/JIS)

- 90°, 45° Elbow, Tee, Cross
- Full Coupling, Half Coupling,
- Reducer, Cap
- Approx Weight List (Socket / Threaded)

1. Pressure Ratings

These fittings shall be designated as pressure class 2000, 3000 and 6000 fittings for threading and pressure class 3000, 6000 and 9000 for socket-welding. This designation identifies the fittings with their ratings as shown as follows, Table 1.

Table1 : Correlation of Fittings Class With Schedule Number of Wall Designation of Pipe for Calculation of Ratings

Class Designation of Fitting	Type of Fitting	Pipe Used For Rating Basic	
		Schedule No.	Wall Designation
2000	Threaded	80	X-S
3000	Threaded	160	-
6000	Threaded	-	XX-S
3000	Socket-Welding	80	X-S
6000	Socket-Welding	160	-
9000	Socket-Welding	-	XX-S

- This table is not intended to restrict the use of pipe of thinner or thicker wall with fittings. Pipe actually used may be thinner or thicker in nominal wall than that shown in Table 1. When thinner pipe is used, its strength may govern the rating. When thicker pipe is used (e. g., for mechanical strength), the strength of the fitting governs the rating.

Table2 : Nominal Wall Thickness of Schedule 160 and Double Extra Strong Pipe

NPS.	Schedule 160		XX-S	
	in	mm	in	mm
1/8	0.124	3.15	0.190	4.83
1/4	0.145	3.68	0.238	6.05
3/8	0.158	4.01	0.252	6.40

Table3 : Pressure / Temperature Ratings

Non-shock Working Pressure in Pounds per Square Inch

Service Temperature Degree ° F	2000lb Threaded Fittings				
	Carbon Steel	F304	F316	F22	F5
100	2000	1715	2000	2000	2000
150	1970	1615	1970	1970	1970
200	1940	1520	1940	1940	1940
250	1915	1445	1915	1915	1915
300	1895	1370	1896	1895	1895
350	1875	1310	1875	1875	1875
400	1850	1245	1850	1850	1850
450	1810	1195	1810	1810	1810
500	1735	1140	1735	1735	1735
550	1640	1100	1640	1640	1640
600	1540	1060	1540	1540	1540
650	1430	1020	1430	1430	1430
700	1305	985	1370	1340	1340
750	1180	950	1305	1245	1245
800	1015	915	1240	1155	1155
850	830	880	1180	1060	1060
900	615	860	1115	970	970
950	425	845	1055	880	880
1000	235	830	990	740	695

Table3 : Pressure / Temperature Ratings

Non-shock Working Pressure in Pounds per Square Inch

Service Temperature Degree ° F	3000lb Socket Welding and Threaded Fittings				
	Carbon Steel	F304	F316	F22	F5
100	3000	2570	3000	3000	3000
150	2950	2425	2950	2950	2950
200	2915	2280	2915	2915	2915
250	2875	2170	2875	2875	2875
300	2845	2055	2845	2845	2845
350	2810	1965	2810	2810	2810
400	2775	1870	2775	2775	2775
450	2715	1790	2715	2715	2715
500	2605	1715	2605	2605	2605
550	2460	1650	2460	2460	2460
600	2310	1590	2310	2310	2310
650	2150	1535	2150	2150	2150
700	1960	1480	2055	2010	2010
750	1775	1425	1960	1870	1870
800	1525	1370	1865	1735	1735
850	1250	1330	1770	1595	1595
900	925	1290	1675	1455	1455
950	640	1270	1580	1320	1320
1000	350	1250	1485	1115	1040

Service Temperature Degree ° F	6000lb Socket Welding and Threaded Fittings				
	Carbon Steel	F304	F316	F22	F5
100	6000	5145	6000	6000	6000
150	5915	4855	5915	5915	5915
200	5830	4565	5830	5830	5830
250	5750	4340	5750	5750	5750
300	5690	4115	5690	5690	5690
350	5625	3930	5690	5625	5625
400	5550	3745	5550	5550	5550
450	5430	3585	5430	5430	5430
500	5210	3430	5210	5210	5210
550	4925	3305	4925	4925	4925
600	4620	3180	4620	4620	4620
650	4300	3070	4300	4300	4300
700	3920	2960	4110	4025	4025
750	3550	2580	3920	3745	3745
800	3050	2745	3730	3470	3470
850	2500	2660	3540	3190	3190
900	1885	2580	3350	2915	2915
950	1295	2540	3165	2640	2640
1000	715	2500	2975	2230	2085

2. Size Identification

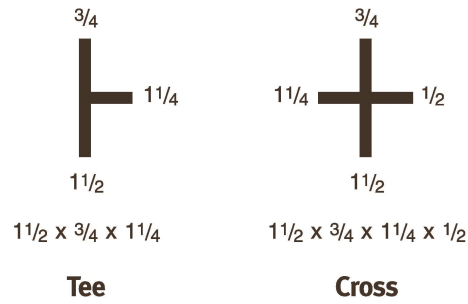


Fig.1 Method of Designating Outlets of Reducing Tees and Crosses

In the case of reducing tees and crosses, the size of the largest run opening shall be given first, followed by the size of the opening at the opposite end of the run.

Where the fitting is a tee, the size of the branch is given last.

Where the fitting is a cross, the largest side-outlet is the third dimension given, followed by the opening.

The line sketches, Fig.1, illustrate how the reducing fittings are read.

3. Threaded

Unless otherwise specified in inquiry, all threaded fittings are supplied with NPT threads(ASME B1.20.1 American National Standard Taper Pipe Threads) for reference, other available threads are:

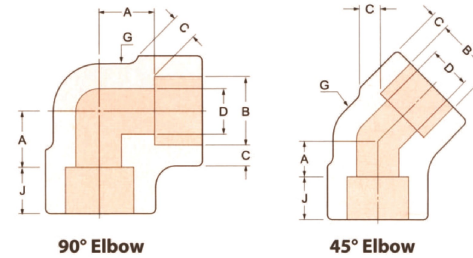
- ISO/R7, Pipe Threads for Gas List Tubes and Screwed Fittings where Pressure-Tight Joints are made on the threads(BS 2.1&JIS B0203 PT Thread).
- API 5B, Line Pipe Threads.
- KS B0222 Taper Pipe Threads.

4. Bore Diameter of Fittings

Bore diameter of fitting(B), (S) are manufactured for conforming with JIS, ASME or MSS dimension.

90° Elbow, 45° Elbow,

3000# 6000# 9000#



ANSI B16.11

Nom Pipe Size	Socket Bore Dia B	Bore Diameter of Fitting-D		
		3000	6000	9000
1/8	10.8 11.2	6.1~7.6	3.2~4.8	-
1/4	14.2 14.6	8.5~10.0	5.6~7.1	-
3/8	17.6 18.0	11.8~13.3	8.4~9.9	-
1/2	21.8 22.2	15.0~16.6	11.0~12.5	5.6~7.2
3/4	27.2 27.6	20.2~21.7	14.8~16.3	10.3~11.8
1	33.9 34.3	25.9~27.4	19.9~21.5	14.4~16.0
1 1/4	42.7 43.1	34.3~35.8	28.7~30.2	22.0~23.5
1 1/2	48.8 49.2	40.1~41.6	33.2~34.7	27.2~28.7
2	61.2 61.7	51.7~53.3	42.1~43.6	37.4~38.9
2 1/2	73.9 74.4	61.2~64.2	-	-
3	89.8 90.3	76.4~79.4	-	-
4	115.2 115.7	100.7~103.8	-	-

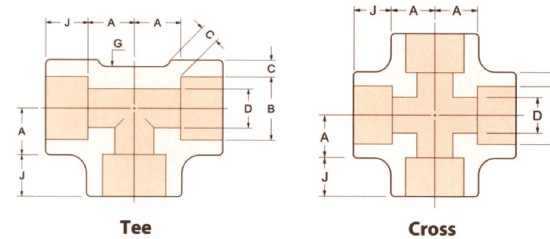
- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(Unit : mm)

Socket Wall Thickness C(Ave/Min)			Depth of Socket Min-J
3000	6000	9000	
3.18 / 3.18	3.96 / 3.43	-	9.5
3.78 / 3.30	4.60 / 4.01	-	9.5
4.01 / 3.50	5.03 / 4.37	-	9.5
4.67 / 4.09	5.97 / 5.18	9.35 / 8.18	9.5
4.90 / 4.27	6.96 / 6.04	9.78 / 8.56	12.5
5.69 / 4.98	7.92 / 6.93	11.38 / 9.96	12.5
6.07 / 5.28	7.92 / 6.93	12.14 / 10.62	12.5
6.35 / 5.54	8.92 / 7.80	12.70 / 11.12	12.5
6.93 / 6.04	10.92 / 9.50	13.84 / 12.12	16.0
8.76 / 7.67	-	-	16.0
9.52 / 8.30	-	-	16.0
10.69 / 9.35	-	-	19.0

Tee, Cross

3000# 6000# 9000#



(Unit : mm)

ANSI B16.11

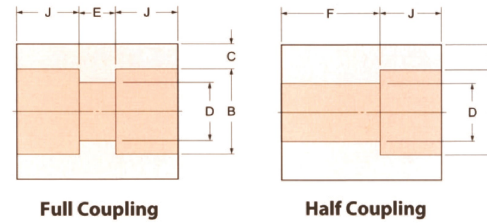
Nom Pipe Size	Body Wall Thickness Min-G		
	3000	6000	9000
1/8	2.41	3.15	-
1/4	3.02	3.68	-
3/8	3.20	4.01	-
1/2	3.73	4.78	7.47
3/4	3.91	5.56	7.82
1	4.55	6.35	9.09
1 1/4	4.85	6.35	9.70
1 1/2	5.08	7.14	10.15
2	5.54	8.74	11.07
2 1/2	7.01	-	-
3	7.62	-	-
4	8.56	-	-

Center to Bottom of Socket-A					
90° Elbow, Tees and Crosses			45° Elbow		
3000	6000	9000	3000	6000	9000
11.0	11.0	-	8.0	8.0	-
11.0	13.5	-	8.0	8.0	-
13.5	15.5	-	8.0	11.0	-
15.5	19.0	25.5	11.0	12.5	15.5
19.0	22.5	28.5	13.0	14.0	19.0
22.5	27.0	32.0	14.0	17.5	20.5
27.0	32.0	35.0	17.5	20.5	22.5
32.0	38.0	38.0	20.5	25.5	25.5
38.0	41.0	54.0	25.5	28.5	28.5
41.0	-	-	28.5	-	-
57.0	-	-	32.0	-	-
66.5	-	-	41.0	-	-

- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Full Coupling
Half Coupling

3000# 6000# 9000#



ANSI B16.11

Nom Pipe Size	Socket Bore Dia B	Bore Diameter of Fitting-D		
		3000	6000	9000
1/8	10.8 11.2	6.1~7.6	3.2~4.8	-
1/4	14.2 14.6	8.5~10.0	5.6~7.1	-
3/8	17.6 18.0	11.8~13.3	8.4~9.9	-
1/2	21.8 22.2	15.0~16.6	11.0~12.5	5.6~7.2
3/4	27.2 27.6	20.2~21.7	14.8~16.3	10.3~11.8
1	33.9 34.3	25.9~27.4	19.9~21.5	14.4~16.0
1 1/4	42.7 43.1	34.3~35.8	28.7~30.2	22.0~23.5
1 1/2	48.8 49.2	40.1~41.6	33.2~34.7	27.2~28.7
2	61.2 61.7	51.7~53.3	42.1~43.6	37.4~38.9
2 1/2	73.9 74.4	61.2~64.2	-	-
3	89.8 90.3	76.4~79.4	-	-
4	115.2 115.7	100.7~103.8	-	-

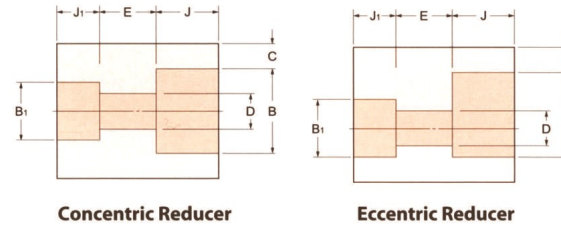
- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(Unit : mm)

Socket Wall Thickness C(Ave/Min)			Depth Min J	Laying Lengths	
3000	6000	9000		F/C E	H/C F
3.18/3.18	3.96/3.43	-	9.5	6.5	16.0
3.78/3.30	4.60/4.01	-	9.5	6.5	16.0
4.01/3.50	5.03/4.37	-	9.5	6.5	17.5
4.67/4.09	5.97/5.18	9.35/8.18	9.5	9.5	22.5
4.90/4.27	6.96/6.04	9.78/8.56	12.5	9.5	24.0
5.69/4.98	7.92/6.93	11.38/9.96	12.5	12.5	28.5
6.07/5.28	7.92/6.93	12.14/10.62	12.5	12.5	30.0
6.35/5.54	8.92/7.80	12.70/11.12	12.5	12.5	32.0
6.93/6.04	10.92/9.50	13.84/12.12	16.0	19.0	41.0
8.76/7.67	-	-	16.0	19.0	43.0
9.52/8.30	-	-	16.0	19.0	44.5
10.69/9.35	-	-	19.0	19.0	48.0

Concentric Reducer
Eccentric Reducer

3000# 6000# 9000#



ANSI B16.11

Nom Pipe Size	Socket Bore Dia Min		Bore Diameter of Fitting-D		
	B	B ₁	3000	6000	9000
1/4 x 1/8	14.2/14.6	10.8/11.2	6.1/7.6	3.2/4.8	-
3/8 x 1/4	17.6/18.0	14.2/14.6	8.5/10.0	5.6/7.1	-
1/2 x 1/4	21.8/22.2	14.2/14.6	8.5/10.0	5.6/7.1	-
x 3/8	-	17.6/18.0	11.8/13.3	8.4/9.9	-
3/4 x 1/4	27.2/27.6	14.2/14.6	8.5/10.0	5.6/7.1	-
x 3/8	-	17.6/18.0	11.8/13.3	8.4/9.9	-
x 1/2	-	21.8/22.2	15.0/16.6	11.0/12.5	5.6/7.2
1 x 3/8	33.9/34.3	17.6/18.0	11.8/13.3	8.4/9.9	-
x 1/2	-	21.8/22.2	15.0/16.6	11.0/12.5	5.6/7.2
x 3/4	-	27.2/27.6	20.2/21.7	14.8/16.3	10.3/11.8
1 1/4 x 1/2	42.7/43.1	21.8/22.2	15.0/16.6	10.2/12.5	5.6/7.2
x 3/4	-	27.2/27.6	20.2/21.7	14.8/16.3	10.3/11.8
x 1	-	33.9/34.3	25.9/27.4	19.9/21.5	14.5/16.0
1 1/2 x 3/4	48.8/49.2	27.2/27.6	20.2/21.7	14.8/16.3	14.8/16.3
x 1	-	33.9/34.3	25.9/27.4	19.9/21.5	14.5/16.0
x 1 1/4	-	42.7/43.1	34.3/35.8	28.7/30.2	22.0/23.5
2 x 1	61.2/61.7	33.9/34.3	25.9/27.4	19.9/21.5	14.5/16.0
x 1/4	-	42.7/43.1	34.3/35.8	28.7/30.2	22.0/23.5
x 1/2	-	48.8/49.2	40.1/41.6	33.2/34.7	27.2/28.7
2 1/2 x 1 1/4	73.9/74.4	42.7/43.1	34.3/35.8	28.7/30.2	22.0/23.5
x 1 1/2	-	48.8/49.2	40.1/41.6	33.2/34.7	27.2/28.7
x 2	-	61.2/61.7	51.7/53.3	42.1/43.6	27.4/38.9

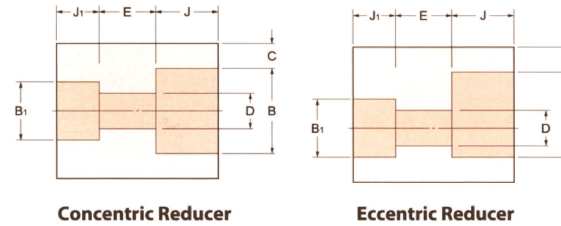
(Unit : mm)

Socket Wall Thickness C(Ave/Min)			Depth Min		Laying Lengths [Min/Max]
3000	6000	9000	J	J ₁	E
3.78/3.30	4.60/4.01	-	9.5	9.5	5.0/8.0
4.01/3.50	5.03/4.37	-	9.5	9.5	3.5/9.5
4.67/4.09	5.97/5.18	9.35/8.18	9.5	9.5	6.5/12.5
-	-	-	9.5	9.5	-
4.90/4.27	6.96/6.04	9.78/8.56	12.5	9.5	6.5/12.5
-	-	-	12.5	9.5	-
-	-	-	12.5	9.5	-
5.69/4.98	7.92/6.93	11.38/9.96	12.5	9.5	8.5/16.5
-	-	-	12.5	9.5	-
-	-	-	12.5	12.5	-
6.07/5.28	7.92/6.93	12.14/10.62	12.5	12.5	8.5/16.5
-	-	-	12.5	12.5	-
-	-	-	12.5	12.5	-
6.35/5.54	8.92/7.80	12.70/11.12	12.5	12.5	8.5/16.5
-	-	-	12.5	12.5	-
-	-	-	12.5	12.5	-
6.93/6.04	10.92/9.50	13.84/12.12	16.0	12.5	15.0/23.0
-	-	-	16.0	12.5	-
-	-	-	16.0	12.5	-
8.76/7.67	-	-	16.0	12.5	14.0/24.0
-	-	-	16.0	12.5	-
-	-	-	16.0	16.0	-

FORGED STEEL FITTINGS

Concentric Reducer
Eccentric Reducer

3000# 6000# 9000#



ANSI B16.11

Nom Pipe Size	Socket Bore Dia Min		Bore Diameter of Fitting-D		
	B	B ₁	3000	6000	9000
3 x 1 1/2	89.8/90.3	48.8/49.2	40.1/41.6	33.2/34.7	-
x 2	-	61.2/61.7	51.7/53.3	42.1/43.6	-
x 2 1/2	-	73.9/74.4	61.2/64.2	-	-
4 x 2	115.2/115.7	61.2/61.7	51.7/53.3	-	-
x 2 1/2	-	73.9/74.4	61.2/64.2	-	-
x 3	-	89.8/90.3	76.4/79.4	-	-

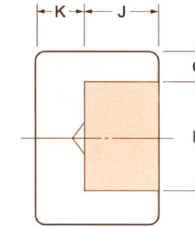
- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(Unit : mm)

Socket Wall Thickness C(Ave/Min)			Depth Min		Laying Lengths (Min/Max)
3000	6000	9000	J	J ₁	E
9.52/8.30	-	-	16.0	12.5	14.0/24.0
-	-	-	16.0	16.0	-
-	-	-	16.0	16.0	-
10.69/9.35	-	-	19.0	16.0	14.0/24.0
-	-	-	19.0	16.0	-
-	-	-	19.0	16.0	-

Cap

3000# 6000# 9000#



ANSI B16.11

Nom Pipe Size	Socket Bore Dia B	Socket Wall Thickness C(Ave/Min)		
		3000	6000	9000
1/8	10.8 11.2	3.18/3.18	3.96/3.43	-
1/4	14.2 14.6	3.78/3.30	4.60/4.01	-
3/8	17.6 18.0	4.01/3.50	5.03/4.37	-
1/2	21.8 22.2	4.67/4.09	5.97/5.18	9.35/8.18
3/4	27.2 27.6	4.90/4.27	6.96/6.04	9.78/8.56
1	33.9 34.3	5.69/4.98	7.92/6.93	11.38/9.96
1 1/4	42.7 43.1	6.07/5.28	7.92/6.96	12.14/10.62
1 1/2	48.8 49.2	6.35/5.54	8.92/7.80	12.70/11.12
2	61.2 61.7	6.93/6.04	10.92/9.50	13.84/12.12
2 1/2	73.9 74.4	8.67/7.67	-	-
3	89.8 90.3	9.52/8.30	-	-
4	115.2 115.7	10.69/9.35	-	-

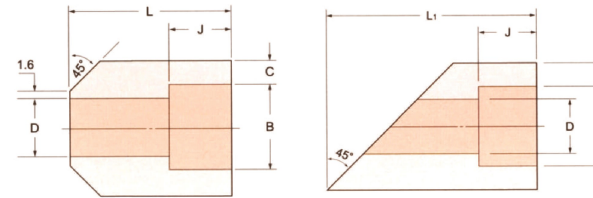
(Unit : mm)

Depth Min J	Socket Wall Thickness K(Min)		
	3000	6000	9000
9.5	4.8	6.4	-
9.5	4.8	6.4	-
9.5	4.8	6.4	-
9.5	6.4	7.9	11.2
12.5	6.4	7.9	12.7
12.5	9.6	11.2	14.2
12.5	9.6	11.2	14.2
12.5	11.2	12.7	15.7
16.0	12.7	15.7	19.0
16.0	15.7	19.0	-
16.0	19.0	22.4	-
19.0	22.4	28.4	-

- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Boss

3000# 6000# 9000#



Type. 1

Type. 2

ANSI B16.11

Nom Pipe Size	Socket Bore Dia B	Bore Diameter of Fitting-D		
		3000	6000	9000
1/4	14.2 14.6	8.5~10.0	5.6~7.1	-
3/8	17.6 18.0	11.8~13.3	8.4~9.9	-
1/2	21.8 22.2	15.0~16.6	11.0~12.5	5.6~7.2
3/4	27.2 27.6	20.2~21.7	14.8~16.3	10.3~11.8
1	33.9 34.3	25.9~27.4	19.9~21.5	14.4~16.0
1 1/4	42.7 43.1	34.3~35.8	28.7~30.2	22.0~23.5
1 1/2	48.8 49.2	40.1~41.6	33.2~34.7	27.2~28.7
2	61.2 61.7	51.7~53.3	42.1~43.6	37.4~38.9

(Unit : mm)

Socket Wall Thickness C(Ave/Min)			Depth Min J	End to End	
3000	6000	9000		L	L1
3.78/3.30	4.60/4.01	-	9.5	25.7	62
4.01/3.50	5.03/4.37	-	9.5	27.5	66
4.67/4.09	5.97/5.18	9.35/8.18	9.5	32.4	82
4.90/4.27	6.96/6.04	9.78/8.56	12.5	36.9	88
5.69/4.98	7.92/6.93	11.38/9.96	12.5	41.4	96
6.07/5.28	7.92/6.93	12.14/10.62	12.5	43.2	105
6.35/5.54	8.92/7.80	12.70/11.12	12.5	44.8	112
6.93/6.04	10.92/9.50	13.84/12.12	16.0	57.1	125

- Dimensions are in millimeters.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

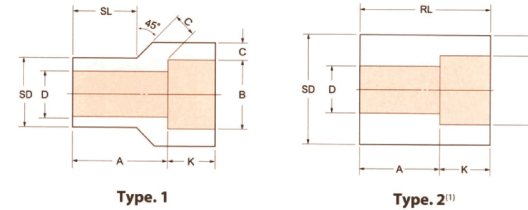
Reducer Insert

3000# 6000#

MSS SP-79

Nominal Pipe Size	Type ⁽²⁾		Socket Min		Shank Dia SD	Laying Length A	
	3M	6M	Dia B	Depth k		3M	6M
3/8 X 1/4	1	1	14.35	9.65	17.15	19	21
1/2 X 3/8	1	1	17.78	9.65	21.34	21	23
X 1/4	1	1	14.35	9.65	21.34	21	21
3/4 X 1/2	1	1	21.97	9.65	26.67	22	25
X 3/8	2	1	17.78	9.65	26.67	16	22
X 1/4	2	2	14.35	9.65	26.67	18	22
1 X 3/4	1	1	27.31	12.70	33.40	24	28
X 1/2	2	1	21.97	9.65	33.40	16	28
X 3/8	2	2	17.78	9.65	33.40	18	22
X 1/4	2	2	14.35	9.65	33.40	19	24
1 1/4 X 1	1	1	34.04	12.70	42.16	25	30
X 3/4	2	2	27.31	12.70	42.16	18	21
X 1/2	2	2	21.97	9.65	42.16	19	22
X 3/8	2	2	17.78	9.65	42.16	21	24
X 1/4	2	2	14.35	9.65	42.16	22	25
1 1/2 X 1 1/4	1	1	42.80	12.70	48.26	28	35
X 1	2	2	34.04	12.70	48.26	18	29
X 3/4	2	2	27.31	12.70	48.26	19	25
X 1/2	2	2	21.97	9.65	48.26	21	27
X 3/8	2	2	17.78	9.65	48.26	22	28

- At the option of the manufacturer Type 2 Reducers may be furnished in Type 1 configuration.
- 3M and 6M symbols denote 3000 and 6000 classes.



(Unit : mm)

Bore D		Wall Thickness Min C		Length Min.			
3M	6M	3M	6M	SL		RL	
				3M	6M	3M	6M
9.0	6.5	3.78	4.60	14	16	-	-
12.5	9.0	4.01	5.03	16	16	-	-
9.0	6.0	3.78	4.60	16	16	-	-
16.0	11.5	4.67	5.93	17	19	-	-
12.5	9.0	4.01	5.03	-	19	27	-
9.0	6.5	3.78	4.60	-	-	27	32
21.0	15.5	4.90	6.96	19	21	-	-
16.0	11.5	4.67	5.97	-	21	28.5	-
12.5	9.0	4.01	5.03	-	-	28.5	33
9.0	6.0	3.78	4.60	-	-	28.5	33
26.5	20.5	5.69	7.92	21	22	-	-
21.0	15.5	4.90	6.96	-	-	32	35
16.0	11.5	4.67	5.97	-	-	32	35
12.5	9.0	4.01	5.03	-	-	32	35
9.0	6.0	3.78	4.60	-	-	32	35
35.0	29.5	6.07	7.92	22	25	-	-
26.5	20.5	5.69	7.92	-	25	33	-
21.0	15.5	4.90	6.96	-	-	33	40
16.0	11.5	4.67	5.97	-	-	33	40
12.5	9.0	4.01	5.03	-	-	33	40

- ※ Laying Length A- Sizes 3/8* thru 3/4* ±1.50mm
 Sizes 1* thru 2* ±2.00mm
 Sizes 2 1/2* thru 4* ±2.50mm
- ※ Laying Length B- Sizes 3/8* thru 2* ±0.13mm
 Sizes 2 1/2* thru 4* ±2.50mm

TORELANCES

- ※ Bore D- Sizes 3/8* thru 3/4* ±0.8mm
- ※ Socket Dia SD- Sizes 2 1/2* thru 4* ±0.25mm
 Sizes 1/4* thru 1 1/2* ±0.25mm
 Sizes 2* thru 3* ±0.75mm
 Sizes 4* ±0.25mm
- ※ Shank Length SL- Sizes 3/8* thru 3/4* -1.5mm
 Sizes 1* thru 2* -2.0mm
 Sizes 2 1/2* thru 4* -2.5mm

FORGED STEEL FITTINGS

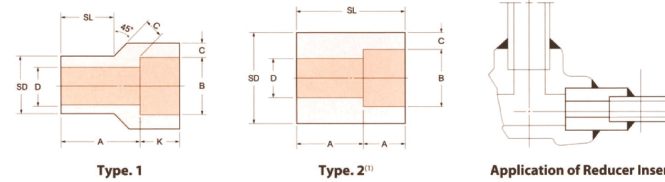
Reducer Insert

3000# 6000#

MSS SP-79

Nominal Pipe Size	Type ⁽²⁾		Socket Min		Shank Dia SD	Laying Length A	
	3M	6M	Dia B	Depth k		3M	6M
2 X 1 1/2	1	1	48.90	12.70	60.33	32	39
X 1 1/4	2	2	42.80	12.70	60.33	21	24
X 1	2	2	34.04	12.70	60.33	22	25
X 3/4	2	2	27.31	12.70	60.33	24	27
X 1/2	2	2	21.97	9.65	60.33	25	28
2 1/2 X 2	1	1	61.37	15.75	73.03	46	43
X 1 1/2	2	2	48.90	12.70	73.03	35	35
X 1 1/4	2	2	42.80	12.70	73.03	37	37
X 1	2	2	34.04	12.70	73.03	38	38
X 3/4	2	2	27.31	12.70	73.03	40	38
3 X 2 1/2	1	1	74.07	15.75	88.90	38	57
X 2	2	2	61.37	15.75	88.90	25	32
X 1 1/2	2	2	48.90	12.70	88.90	29	32
X 1 1/4	2	2	42.80	12.70	88.90	30	32
X 1	2	2	34.04	12.70	88.90	32	32
4 X 3	2	1	90.04	15.75	114.30	33	-
X 2 1/2	2	2	74.07	15.75	114.30	38	-
X 2	2	2	61.37	15.75	114.30	38	-
X 1 1/2	2	2	48.90	12.70	114.30	42	-
X 1 1/4	2	2	42.80	12.70	114.30	43	-

- At the option of the manufacturer Type 2 Reducers may be furnished in Type 1 configuration.
- 3M and 6M symbols denote 3000 and 6000 classes.



(Unit : mm)

Bore D		Wall Thickness Min C		Length Min.			
3M	6M	3M	6M	SL		RL	
				3M	6M	3M	6M
41.0	34.0	6.35	8.92	25	28	-	-
35.0	29.5	6.07	7.92	-	-	38	41
26.5	20.5	5.69	7.92	-	-	38	41
21.0	15.5	4.90	6.96	-	-	38	41
16.0	11.5	4.67	5.97	-	-	38	41
52.5	43.0	6.93	10.92	38	32	-	-
41.0	34.0	6.35	8.92	-	-	54	54
35.0	29.5	6.07	7.92	-	-	54	54
26.5	20.5	5.69	7.92	-	-	54	54
21.0	15.5	4.90	6.96	-	-	54	54
62.5	54.0	8.76	11.91	32	-	-	-
52.5	43.0	6.93	10.92	-	-	48	54
41.0	34.0	6.35	8.92	-	-	48	54
35.0	29.5	6.07	7.92	-	-	48	54
26.5	20.5	5.69	7.92	-	-	48	54
78.0	-	9.53	-	-	-	60	-
62.5	-	8.76	-	-	-	60	-
52.5	-	6.93	-	-	-	60	-
41.0	-	6.35	-	-	-	60	-
35.0	-	6.07	-	-	-	60	-

- ※ Laying Length A- Sizes 3/8* thru 3/4* ±1.50mm
 Sizes 1* thru 2* ±2.00mm
 Sizes 2 1/2* thru 4* ±2.50mm
- ※ Laying Length B- Sizes 3/8* thru 2* ±0.13mm
 Sizes 2 1/2* thru 4* ±2.50mm

TORELANCES

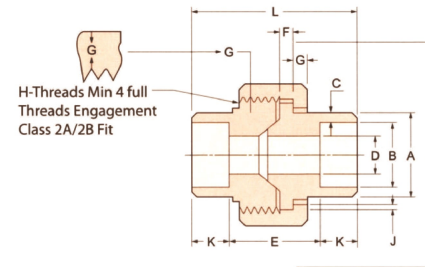
- ※ Bore D- Sizes 3/8* thru 3/4* ±0.8mm
- ※ Socket Dia SD- Sizes 2 1/2* thru 4* ±0.25mm
 Sizes 1/4* thru 1 1/2* ±0.25mm
 Sizes 2* thru 3* ±0.75mm
 Sizes 4* ±0.25mm
- ※ Shank Length SL- Sizes 3/8* thru 3/4* -1.5mm
 Sizes 1* thru 2* -2.0mm
 Sizes 2 1/2* thru 4* -2.5mm

Union

3000#

MSS SP-83

Nom Pipe Size	Pipe End Min	Socket Bore Dia	Socket Wall Min	Water Way Bore	Laying Lwngh	Male Flange Min
	A	B	C	D	E	F
1/4	21.8	14.22 13.97	3.30	9.85 9.45	22,4 19,0	3.17
3/8	25.9	17.78 17.53	3.48	13.92 13.51	26,9 20,6	3.43
1/2	31.2	21.84 21.59	4.06	17.47 17.07	26,9 20,6	3.68
3/4	37.1	27.18 26.92	4.27	21.79 21.39	31,8 25,4	4.06
1	45.5	34.04 33.78	4.95	28.14 27.74	34,3 26,2	4.57
1 1/4	54.9	42.67 42.42	5.28	35.76 35.36	40,6 32,5	5.33
1 1/2	61.5	48.77 48.51	5.54	41.61 41.20	42,2 34,0	5.84
2	75.2	61.47 61.21	6.05	52.53 52.12	45,5 37,3	6.60
2 1/2	91.7	74.17 73.66	7.65	64.72 64.31	61,7 52,1	7.49
3	109.2	90.17 89.66	8.31	77.67 77.27	63,8 53,6	8.25

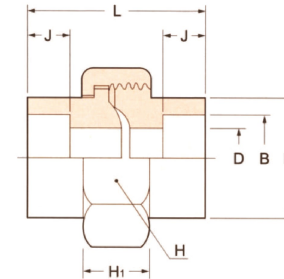


(Unit : mm)

Nut Min	Thrds. Per 25.4 Max.	Bearing Min.	Depth Of Socket Min.	Length Ass'y Nominal	Clear Ass'y Nut
G	H	J	K	L	M
3.17	16	1.24	9.6	41.4	49.0
3.43	14	1.37	9.6	46.0	55.0
3.68	14	1.4	9.6	49.0	57.0
4.06	11	1.68	12.7	56.9	67.0
4.44	11	1.85	12.7	62.0	79.0
5.21	11	2.13	12.7	71.1	94.0
5.59	10	2.31	12.7	76.5	111.0
6.35	10	2.69	15.8	86.1	132.0
7.11	8	3.07	15.8	102.4	148.0
8.00	8	3.53	15.8	109.0	175.0

Union

3000# 6000#



(Unit : mm)

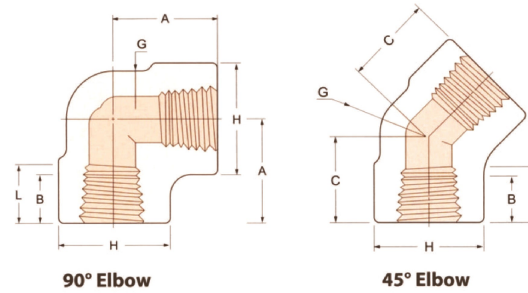
Nom Pipe Size	Socket Borer Dia Min-B	Bore-D		Pipe End-M		Depth Min J
		3000	6000	3000	6000	
1/4	14.10	9.0	6.5	23.0	25	10
3/8	17.55	12.5	9.0	25.9	32	10
1/2	21.70	16.0	11.5	31.5	38	10
3/4	27.05	21.0	15.5	38.0	42	13
1	33.80	26.5	20.5	46.0	49	13
1 1/4	42.55	35.0	29.5	55.0	59	13
1 1/2	48.65	41.0	34.0	61.5	69	13
2	61.10	52.5	43.0	75.5	90	16
2 1/2	73.80	62.5	54.0	92.0	105	16
3	89.80	78.0	66.8	109.2	125	24
4	115.45	102.3	-	140.0	-	24

Length Ass'y Nomi-L		Nut-H*		Nut-H1	
3000	6000	3000	6000	3000	6000
45	51	38	38	20	20
51	54	42	48	20	20
54	57	46	55	20	26
57	64	55	60	26	26
64	72	63	72	26	28
72	80	74	82	30	30
78	89	82	91	36	36
89	110	101	120	38	40
110	120	120	150	40	45
110	140	142	176	42	50
128	-	180	-	45	-

*Nut-H : 3000# Size 1/8~1" Hexagon, 1 1/4~4" : Octagon
 6000# Size 1/8~3/4" Hexagon, 1~3" : Octagon

90° Elbow, 45° Elbow

2000# 3000# 6000#



ANSI B16.11

Nom Pipe Size	Center to End Elbow, Tees, Crosses A			Center to End 45° Elbow C		
	2000	3000	6000	2000	3000	6000
1/8	21	21	25	17	17	19
1/4	21	25	28	17	19	22
3/8	25	28	33	19	22	25
1/2	289	33	38	22	25	28
3/4	33	38	44	25	28	33
1	38	44	51	28	33	35
1 1/4	44	51	60	33	35	43
1 1/2	51	60	64	35	43	44
2	60	64	83	43	44	52
2 1/2	76	83	95	52	52	64
3	86	95	106	64	64	79
4	106	114	114	79	79	79

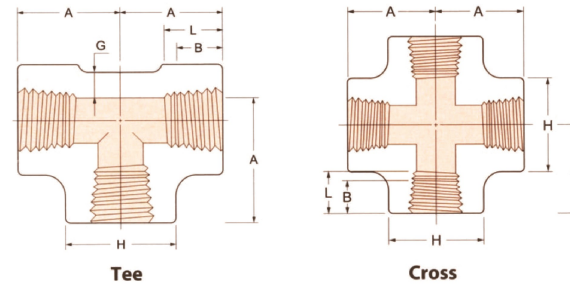
(Unit : mm)

Outside Diameter of Bend H			Minimum Wall Thickness G			Length of thread Min(1)	
2000	3000	6000	2000	3000	6000	B	L
22	22	25	3.18	3.18	6.35	6.4	6.7
22	25	33	3.18	3.30	6.60	8.1	10.2
25	33	38	3.18	3.51	6.98	9.1	10.4
33	38	46	3.18	4.09	8.15	10.9	13.6
38	46	56	3.18	4.32	8.53	12.7	13.9
46	56	62	3.68	4.98	9.93	14.7	17.3
56	62	75	3.89	5.28	10.59	17.0	18.0
62	75	84	4.01	5.56	11.07	17.8	18.4
75	84	102	4.27	7.14	12.09	19.0	19.2
92	102	121	5.61	7.65	15.29	23.6	28.9
110	121	146	5.99	8.84	16.64	25.9	30.5
146	152	152	6.55	11.18	18.67	27.7	33.0

• Dimensions B is minimum length of perfect thread. The length of useful thread(L plus threads with fully formed roots and crests) shall not be less than L[effective length of external thread] required by American National Standard for Pipe Threads[ASME B1.20.1]

Tee, Cross

2000# 3000# 6000#



ANSI B16.11

Nom Pipe Size	Center to End Elbow, Tees, Crosses A			Min Outside Diameter of H		
	2000	3000	6000	2000	3000	6000
1/8	21	21	25	22	22	25
1/4	21	25	28	22	25	33
3/8	25	28	33	25	33	38
1/2	28	33	38	33	38	46
3/4	33	38	44	38	46	56
1	38	44	51	46	56	62
1 1/4	44	51	60	56	62	75
1 1/2	51	60	64	62	75	84
2	60	64	83	75	84	102
2 1/2	76	83	95	92	102	121
3	86	95	106	109	121	146
4	106	114	114	146	152	152

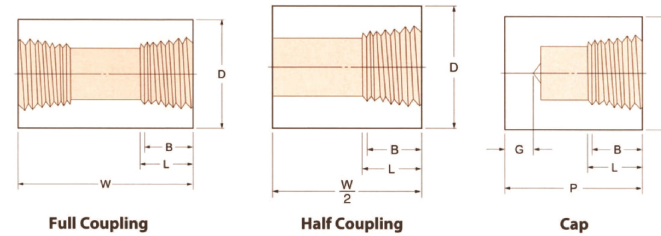
(Unit : mm)

Minimum Wall Thickness G			Length of thread Min(1)	
2000	3000	6000	B	L
3.18	3.18	6.35	6.4	6.7
3.18	3.30	6.60	8.1	10.2
3.18	3.51	6.98	9.1	10.4
3.18	4.09	8.15	10.9	13.6
3.18	4.32	8.53	12.7	13.9
3.68	4.98	9.93	14.7	17.3
3.89	5.28	10.59	17.0	18.0
4.01	5.56	11.07	17.8	18.4
4.27	7.14	12.09	19.0	19.2
5.61	7.65	15.29	23.6	28.9
5.99	8.84	16.64	25.9	30.5
6.55	11.18	18.67	27.7	33.0

• Dimensions B is minimum length of perfect thread. The length of useful thread(L plus threads with fully formed roots and crests) shall not be less thn L[effective length of external thread] required by American National Standard fot Pipe Threads[ASME B1.20.1]

Full Coupling
Half Coupling, Cap

3000# 6000#



ANSI B16.11

Nom Pipe Size	Outside Diameter D		Full Coupling End to End W
	3000	6000	
1/8	16	22	32
1/4	19	25	35
3/8	22	32	38
1/2	28	38	48
3/4	35	44	51
1	44	57	60
1 1/4	57	64	67
1 1/2	64	76	79
2	76	92	86
2 1/2	92	108	92
3	108	127	108
4	140	159	121

(Unit : mm)

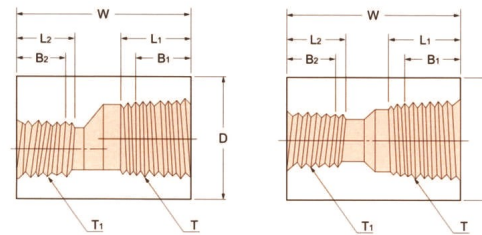
Cap				Length of thread Min(1)	
Ent to End P		Thickness Min G		B	L
3000	6000	3000	6000		
19	-	4.8	-	6.4	6.7
25	27	4.8	6.4	8.1	10.2
25	27	4.8	6.4	9.1	10.4
32	33	6.4	7.9	10.9	13.6
37	38	6.4	7.9	12.7	13.9
41	43	9.7	11.2	14.7	17.3
44	46	9.7	11.2	17.0	18.0
44	48	11.2	12.7	17.8	18.4
48	51	12.7	15.7	19.0	19.2
60	64	15.7	19.0	23.6	28.9
65	68	19.0	22.4	25.9	30.5
68	75	22.4	28.4	27.7	33.0

• Dimensions B is minimum length of perfect thread. The length of useful thread(L plus threads with fully formed roots and crests) shall not be less thn L[effective length of external thread] required by American National Standard fot Pipe Threads[ASME B1.20.1]

*Class 2000 and NPS 1/8 class 6000 couplings, half couplings, and caps are not included in this standard

**Concentric Reducer
Eccentric Reducer**

3000# 6000#



Concentric Reducer

Eccentric Reducer

(Unit : mm)

Nom Pipe Size	Min Outside Diameter D		End to End W	Length of thread Min[1]			
	3000	6000		B1	B2	L1	L2
T X T	3000	6000	6000	B1	B2	L1	L2
1/4 X 1/8	19.0	25.4	35	8.12	6.35	10.20	6.70
3/8 X 1/4	22.0	31.8	38	9.14	8.12	10.35	10.20
1/2 X 1/4	28.5	38.1	48	10.92	8.12	13.55	10.20
X 3/8	28.5	38.1	48	10.92	9.14	13.55	10.35
3/4 X 1/4	35.0	44.5	51	12.70	8.12	13.86	10.20
X 3/8	35.0	44.5	51	12.70	9.14	13.86	10.35
X 1/2	35.0	44.5	51	12.70	10.92	13.86	13.55
1 X 3/8	44.5	57.0	60	14.73	9.14	17.34	10.35
X 1/2	44.5	57.0	60	14.73	10.92	17.34	13.55
X 3/4	44.5	57.0	60	14.73	12.70	17.34	13.86
1 1/4 X 1/2	57.0	63.5	67	17.01	10.92	17.95	13.55
X 3/4	57.0	63.5	67	17.01	12.70	17.95	13.86
X 1	57.0	63.5	67	17.01	14.73	17.95	17.34
1 1/2 X 3/4	63.1	76.0	80	17.78	12.70	18.37	13.86
X 1	63.5	76.0	80	17.78	14.73	18.37	17.34
X 1 1/4	63.5	76.0	80	17.78	17.01	18.37	17.95

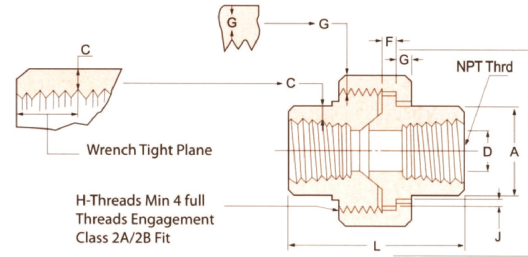
Nom Pipe Size	Min Outside Diameter D		End to End W	Length of thread Min[1]			
	3000	6000		B1	B2	L1	L2
T X T	3000	6000	6000	B1	B2	L1	L2
2 X 1	76.0	92.0	86	19.05	14.73	19.21	17.34
X 1 1/4	76.0	92.0	86	19.05	17.01	19.21	17.95
X 1 1/2	76.0	92.0	86	19.05	17.78	19.21	18.37
2 1/2 X 1 1/4	92.0	108.0	92	23.62	17.01	28.90	17.95
X 1 1/2	92.0	108.0	92	23.62	17.78	28.90	18.37
X 2	92.0	108.0	92	23.62	19.05	28.90	19.21
3 X 1 1/4	108.0	127.0	108	25.90	17.78	30.48	18.37
X 2	108.0	127.0	108	25.90	19.05	30.48	19.21
X 2 1/2	108.0	127.0	108	25.90	23.62	30.48	28.90
4 X 2	140.0	160.0	121	27.68	19.06	33.02	19.21
X 2 1/2	140.0	160.0	121	27.68	23.62	33.02	28.90
X 3	140.0	160.0	121	27.68	25.90	33.02	30.48

Union

3000#

MSS SP-83

Nom. Pipe Size	Pipe End Min	Stock Wall Min	Water Way Bore	Male Flange Min
	A	C	D	F
1/8	14.7	2.41	6.83 6.43	3.17
1/4	19.0	3.02	9.85 9.45	3.17
3/8	22.9	3.20	13.92 13.51	3.43
1/2	27.7	3.73	17.47 17.07	3.68
3/4	33.5	3.91	21.79 21.39	4.06
1	41.4	4.55	28.14 27.74	4.57
1 1/4	50.5	4.85	35.76 35.36	5.33
1 1/2	57.2	5.08	41.61 41.20	5.84
2	70.1	5.54	52.53 52.12	6.60
2 1/2	85.3	7.01	61.72 64.31	7.49
3	102.4	7.62	77.67 77.27	8.25

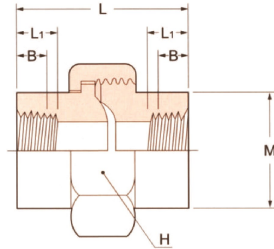


(Unit : mm)

Nut Min	Thrds. Per 25.4 Max	Bearing Min.	Length Ass'y Nominal	Clear Ass'y Nut
G	H	J	L	N
3.2	16	1.24	41.4	49.0
3.2	16	1.24	41.4	49.0
3.4	14	1.37	46.0	55.0
3.7	14	1.4	49.0	57.0
4.1	11	1.68	56.9	67.0
4.4	11	1.85	62.0	79.0
5.2	11	2.13	71.1	94.0
5.6	10	2.31	76.5	111.0
6.4	10	2.67	86.1	132.0
7.1	8	3.07	102.4	148.0
8.0	8	3.53	109.0	175.0

Union

3000# 6000#



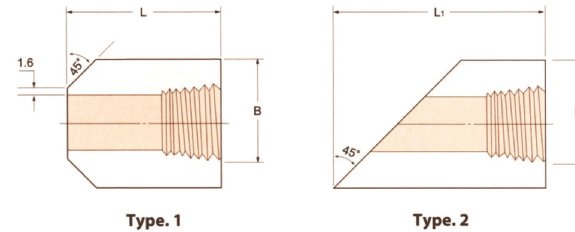
(Unit : mm)

Nom Pipe Size	Pipe End M		Length Ass'y Nomi L		Nut H		Length of Thread Min	
	3000	6000	3000	6000	3000	6000	L1	B
1/4	23.0	30	45	54	38	46	10.20	8.12
3/8	25.9	36	51	57	42	54	10.35	9.14
1/2	31.5	42	54	64	46	60	13.55	10.92
3/4	38.0	49	57	72	55	72	13.86	12.70
1	46.0	56	69	80	63	80	17.34	14.73
1 1/4	55.0	64	72	89	74	94	17.95	17.01
1 1/2	61.5	76	78	108	82	100	18.37	17.78
2	75.5	90	89	114	101	120	19.21	19.05
2 1/2	92.0	105	110	120	120	150	28.90	23.62
3	109.2	125	110	140	142	180	30.48	25.90
4	140.0	-	128	-	180	-	33.02	27.68

*Nut-H : 3000# Size 1/8-1" Hexagon, 1 1/4-4" : Octagon
6000# Size 1/8-3/4" Hexagon, 1-3" : Octagon

Boss

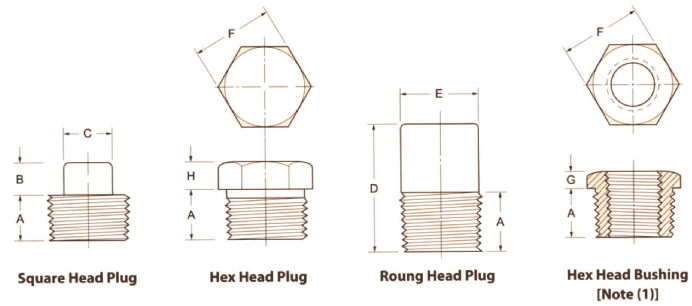
3000# 6000#



(Unit : mm)

Nom Pipe Size	Outside Diameter D	End to End			
		B	A	L	L1
1/4	8	19.0	25.4	17.5	62
3/8	10	22.3	31.8	19.0	66
1/2	15	28.4	38.1	24.0	82
3/4	20	35.0	44.5	25.5	88
1	25	44.5	57.0	30.0	96
1 1/4	32	57.0	63.5	33.5	105
1 1/2	40	63.5	76.2	39.5	112
2	50	76.2	92.0	43.0	125

Plug
Bushing



ANSI B16.11

Nom Pipe Size	Length (Min) A	Plugs Square Head	
		Height of Square (min) B	Width Flats (Min) C
1/8	10	6	7
1/4	11	6	10
3/8	13	8	11
1/2	14	10	14
3/4	16	11	16
1	19	13	21
1 1/4	21	14	24
1 1/2	21	16	28
2	22	18	32
2 1/2	27	19	36
3	28	21	41
4	32	25	65

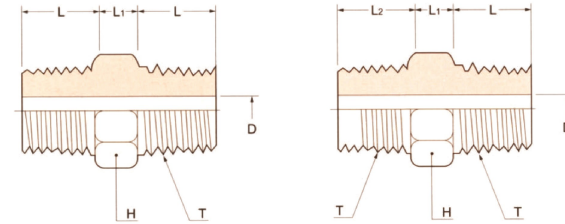
(Unit : mm)

Plugs Round Head		Hex Plugs & Bushing		
Length (Min) D	Nominal Diameter of Head E	Width Flats (Nom) F	Hex Height Min	
			Bushing G	Plug H
35	10	11	-	6
41	14	16	3	6
41	18	18	4	8
44	21	22	5	8
44	27	27	6	10
51	33	36	6	10
51	43	46	7	14
51	48	50	8	16
64	60	65	9	18
70	73	75	10	19
70	89	90	10	21
76	114	115	13	25

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

Nipple

3000# 6000#



Reducing Nipple

IHARA STD (Unit : mm)

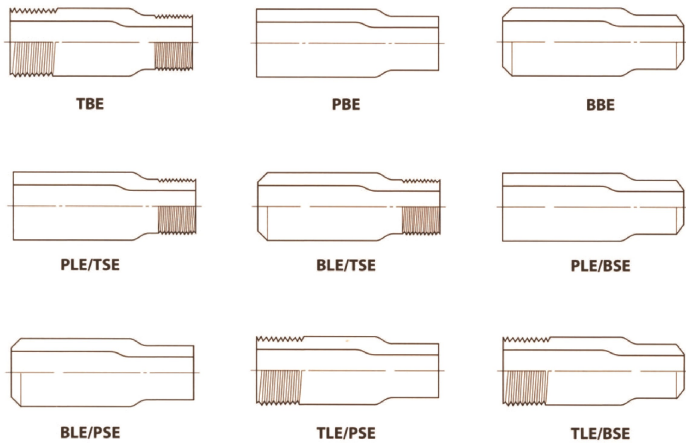
Nom Pipe Size	D	H *	L	L1
1/8	5.5	11.0	10	6
1/4	7	16.0	14	8
3/8	9	18.0	14	8
1/2	12	22.0	19	9
3/4	15	27.0	19	10
1	20	35.0	24	11
1 1/4	28	44.0	24	12
1 1/2	32	51.0	25	14
2	40	63.5	26	16
2 1/2	60	76.2	38	18
3	74	95.0	40	20

H * : Size 2" and smaller are Hexagonal Bodies 3" is Octagonal body

IHARA STD (Unit : mm)

Nom Pipe Size T X T1	D	H *	L	L1	L2
3/8 X 1/4	7	18	14	8	14
1/2 X 1/4	7	22	19	9	14
X 3/8	9	22	19	9	14
3/4 X 1/4	7	27	19	10	14
X 3/8	9	27	19	10	14
X 1/2	12	27	19	10	19
1 X 3/8	9	35	24	11	14
X 1/2	12	35	24	11	19
X 3/4	15	35	24	11	19
1 1/4 X 1/2	12	44	24	12	19
X 3/4	15	44	24	12	19
X 1	20	44	24	12	24
1 1/2 X 3/4	15	51	25	14	19
X 1	20	51	25	14	24
X 1 1/4	28	51	25	14	24
2 X 1	20	63.5	26	16	24
X 1 1/4	28	63.5	26	16	24
X 1 1/2	32	63.5	26	16	25
2 1/2 X 1 1/4	28	76.2	38	18	24
X 1 1/2	32	76.2	38	18	25
X 2	40	76.2	38	18	26
3 X 1 1/2	32	95	40	20	25
X 2	40	95	40	20	26
X 2 1/2	60	95	40	20	38

Swaged Nipple



MSS SP-95

Large end Size	Small end Size	Length (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 ~ 1/8	229
5	4 ~ 1/4	279
6	5 ~ 1/2	304

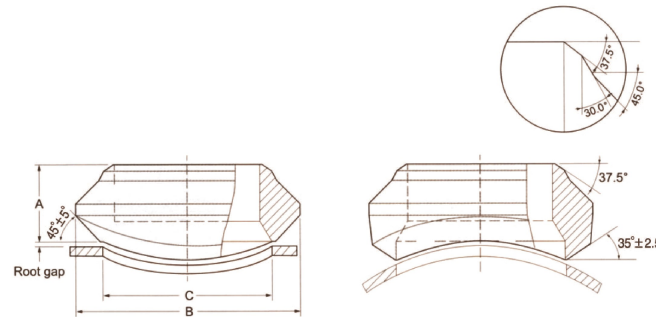
- BBE : Beveled both end
- TBE : Threaded both end
- PBE : Plane both end
- PLE / TSE : Plane large end - Threaded small end
- BLE / TSE : Beveled large end - Threaded small end
- TLE / PSE : Threaded large end - Plane small end
- BLE / PSE : Beveled large end - Plane small end
- PLE / BSE : Plane large end - Beveled small end
- TLE / BSE : Threaded large end - Beveled small end

*Pipe schedule numbers and weight designations accordance with ASME B36.10

*Swaged Nipples are from Forged Steel or Pipe

Weld-outlet

STD(Sch 40) X-S(Sch 80) Sch 160 XX-S



STD, X-S

(Unit : mm)

Outlet Size	A		B		C	
	STD	X-S	STD	X-S	STD	X-S
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	397.4	325.4	317.5
14	88.9	100.0	409.6	431.8	357.2	350.8
16	93.7	106.4	463.6	466.7	408.0	403.2
18	96.8	111.1	520.7	523.9	458.0	455.6
20	101.6	119.1	571.5	582.6	508.0	509.6
24	115.9	139.7	689.0	708.0	614.4	638.2

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-Let size to 36 inch

SCH 160, XX-S

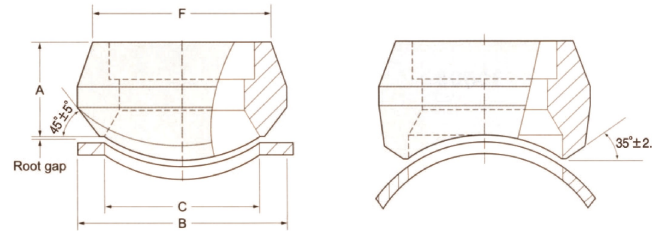
(Unit : mm)

Outlet Size	A		B		C	
	SCH 160	XX-S	SCH 160	XX-S	SCH 160	XX-S
1/2	28.6	28.6	34.9	34.9	14.3	14.3
3/4	31.8	31.8	44.5	44.5	19.1	19.1
1	38.1	38.1	50.8	50.8	25.4	25.4
1 1/4	44.5	44.5	61.9	61.9	33.3	33.3
1 1/2	50.8	50.8	69.9	69.9	38.1	38.1
2	55.6	55.6	81.0	81.0	42.9	42.9
2 1/2	61.9	61.9	96.8	96.8	54.0	54.0
3	73.0	73.0	120.7	120.7	73.0	73.0
4	84.1	84.1	152.4	152.4	98.4	98.4
5	93.7	93.7	187.3	187.3	122.2	122.2
6	104.8	104.8	220.7	220.7	146.1	146.1
8	111.1	111.1	284.2	284.2	173.0	173.0
10	125.4	125.4	312.7	312.7	215.9	215.9

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-Let size to 36 inch

Socket-outlet

3000# 6000#



(Unit : mm)

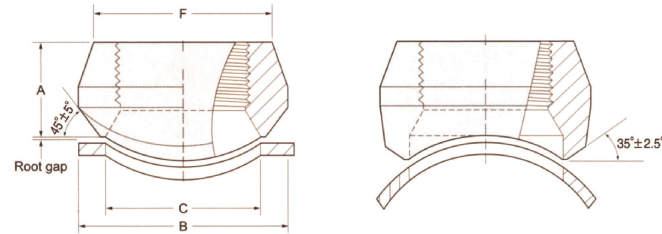
Outlet Size	A		B	
	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5
3/4	27.0	36.5	44.5	50.8
1	33.3	39.7	54.0	61.9
1 1/4	33.3	41.3	65.1	69.9
1 1/2	34.9	42.9	73.0	82.6
2	38.1	58.7	88.9	103.2
2 1/2	46.0	-	103.2	-
3	50.8	-	122.2	-
4	57.2	-	152.4	-

C		F	
3000#	6000#	3000#	6000#
23.8	19.1	31.8	39.7
30.2	25.4	36.5	45.2
36.5	33.3	46.0	57.2
44.5	38.1	55.6	65.1
50.8	49.2	61.9	76.2
65.1	69.9	74.6	92.1
76.2	-	87.3	-
93.7	-	104.8	-
120.7	-	130.2	-

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-Let size to 36 inch
- For the 3000# and 6000# Socket-outlets and Thread-outlets, Inside Bore, Thread, Socket Bore and Socket Depth Dimentions are According to ASME B16.11

Thread-outlet

3000lb 6000lb



(Unit : mm)

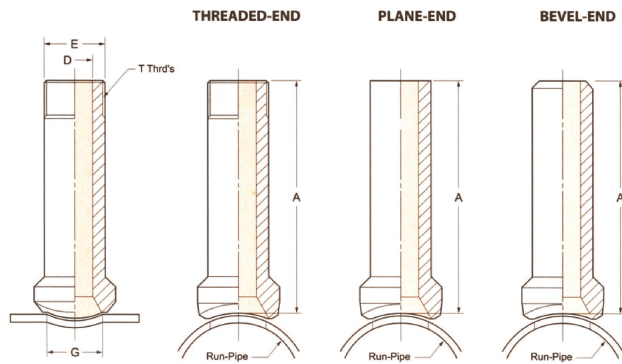
Outlet Size	A		B	
	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5
3/4	27.0	36.5	44.5	50.8
1	33.3	39.7	54.0	61.9
1 1/4	33.3	41.3	65.1	69.9
1 1/2	34.9	42.9	73.0	82.6
2	38.1	52.4	88.9	103.2
2 1/2	46.0	-	103.2	-
3	50.8	-	122.2	-
4	57.2	-	152.4	-

C		F	
3000#	6000#	3000#	6000#
23.8	19.1	31.8	39.7
30.2	25.4	36.5	45.2
36.5	33.3	46.0	57.2
44.5	38.1	55.6	65.1
50.8	49.2	61.9	76.2
65.1	69.9	74.6	92.1
76.2	-	87.3	-
93.7	-	104.8	-
120.7	-	130.2	-

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-Let size to 36 inch
- For the 3000# and 6000# Socket-outlets and Thread-outlets, Inside Bore, Thread, Socket Bore and Socket Depth Dimentions are According to ASME B16.11

Nipple-outlet

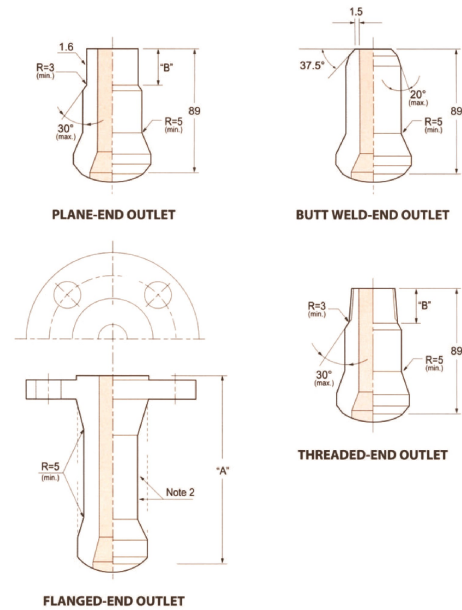
3000#



STD, X-S

Run Pipe Size	Outlet Size T	A	G	D	E	Unit Weight (kg)
36- 3/4	1/2	88.9	23.9	14.0	21.3	0.36
36-1	3/4	88.9	30.2	18.8	26.7	0.56
36-1 1/4	1	88.9	36.6	24.4	33.3	0.84
36-1 1/2	1 1/4	88.9	44.5	32.5	42.2	1.22
36-2	1 1/2	88.9	50.8	38.1	48.3	2.00
36-2 1/2	2	88.9	65.0	49.3	60.5	3.12

Flanged End Outlet

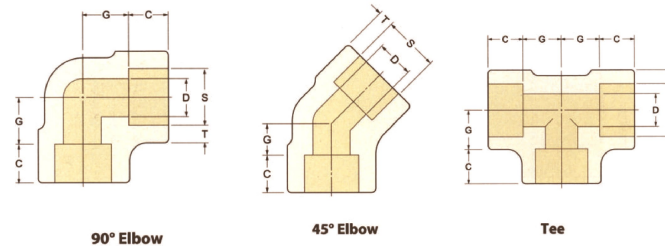


Nominal Size DN	"A" (Face flanges to crotch) Cross					"B" Min (mm)
	150#	300#	600#	1500#	2500#	
15						25
20						30
25	150	150	150	150	150	
40						
50					165	

- Dimensions are in millimeters.
- Shape only indicative, other shape are also acceptable.

90° Elbow, 45° Elbow

Sch40, Sch80, Sch160



JIS B2316

Nom Pipe Size		Socket Bore Dia		Bore Diameter of Fitting-D	
A	B	S	TOL	Sch40	Sch80
6	1/8	11.0	+ 0.3 - 0	7.1	5.7
8	1/4	14.3		9.4	7.8
10	3/8	17.8		12.7	10.9
15	1/2	22.2		16.1	14.3
20	3/4	27.7		21.4	19.4
25	1	34.5		27.2	25.0
32	1 1/4	43.2		36.5	32.9
40	1 1/2	49.1		41.2	38.4
50	2	61.1	+ 0.4 - 0	52.7	49.5
65	2 1/2	77.1		65.9	62.3
80	3	90.0		78.1	73.9
100	4	115.5		102.3	97.1

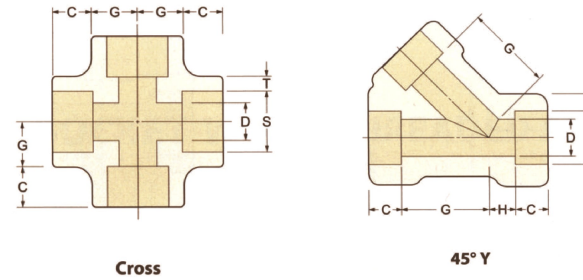
TOL : Tolerances

(Unit : mm)

Bore Diameter of Fitting-D		Socket Wall Thickness Min-T		Depth of Socket Min-C
Sch160	TOL	Sch40, 80	Sch160	
4.0	± 0.4	3.2	3.5	9.6
6.5		3.3	4.0	9.6
9.0		3.5	4.4	9.6
12.3		4.1	5.2	9.6
16.2		4.3	6.1	12.7
21.2		5.0	7.0	12.7
29.9		5.4	7.0	12.7
34.4		5.6	7.8	12.7
43.1	± 0.8	6.1	9.6	15.9
57.3		7.7	10.4	15.9
66.9		8.4	12.2	15.9
87.3		9.4	18.0	19.0

Tee, Cross

Sch40, Sch80, Sch160



JIS B2316

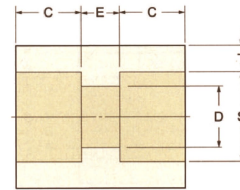
(Unit : mm)

Nom Pipe Size		Center to Bottom of Socket-C			
		90° E, Tee, Cross-G		45° Elbow-G	
A	B	Sch40, 80	Sch160	Sch40, 80	Sch160
6	1/8	11.1	-	7.9	-
8	1/4	11.1	-	7.9	-
10	3/8	13.5	-	7.9	-
15	1/2	15.9	19.1	11.1	12.7
20	3/4	19.1	22.2	12.7	14.3
25	1	22.2	27.0	14.3	17.5
32	1 1/4	27.0	31.8	17.5	20.6
40	1 1/2	31.8	38.1	20.6	25.4
50	2	38.1	41.3	25.4	28.6
65	2 1/2	41.3	57.2	28.6	31.8
80	3	57.2	63.5	31.8	34.9
100	4	66.5	-	41.5	-

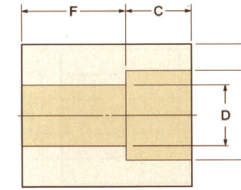
Center to Bottom of Socket-C				TOL
45° Y-G		45° Y-H		
Sch40, 80	Sch160	Sch40, 80	Sch160	
-	-	-	-	± 0.8
31.8	-	7.9	-	
36.5	-	7.9	-	
41.3	50.8	11.1	12.7	± 1.5
50.8	60.3	12.7	14.3	
60.3	71.4	14.3	17.5	
71.4	81.0	17.5	20.6	± 2.0
81.0	98.4	20.6	25.4	
98.4	120.0	25.4	28.6	
-	-	-	-	± 2.5
-	-	-	-	
-	-	-	-	

Full Coupling Half Coupling

Sch40, Sch80, Sch160



Full Coupling



Half Coupling

JIS B2316

Nom Pipe Size		Socket Bore Dia		Bore Diameter of Fitting-D			
A	B	S	TOL	Sch40	Sch80	Sch160	TOL
6	1/8	11.0	± 0.3 - 0	7.1	5.7	4.0	± 0.4
8	1/4	14.3		9.4	7.8	6.5	
10	3/8	17.8		12.7	10.9	9.0	
15	1/2	22.2		16.1	14.3	12.3	
20	3/4	27.7		21.4	19.4	16.2	
25	1	34.5		27.2	25.0	21.2	
32	1 1/4	43.2		36.5	32.9	29.9	
40	1 1/2	49.1		41.2	38.4	34.4	
50	2	61.1	52.7	49.5	43.1	± 0.8	
65	2 1/2	77.1	65.9	62.3	57.3		
80	3	90.0	78.1	73.9	66.9		
100	4	115.5	± 0.4 - 0	102.3	97.1	87.3	

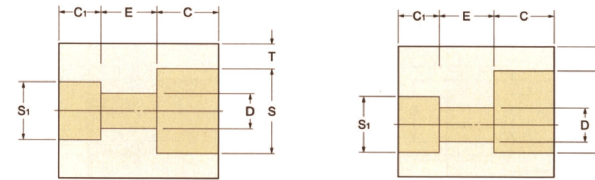
TOL : Tolerances
F/C : Full Coupling
H/C : Half Coupling

(Unit : mm)

Socket Wall Thickness Min-T		Depth of Min-C	Laying Lengths			
Sch40,80	Sch160		F/C		H/C	
			E	TOL	F	TOL
3.2	3.5	9.6	6.4	± 1.5	15.9	± 0.8
3.3	4.0	9.6	6.4		15.9	
3.5	4.4	9.6	6.4	± 3.0	17.5	± 1.5
4.1	5.2	9.6	9.5		22.2	
4.3	6.1	12.7	9.5		23.8	
5.0	7.0	12.7	12.7	± 4.0	28.6	± 2.0
5.4	7.0	12.7	12.7		30.2	
5.6	7.8	12.7	12.7		31.8	
6.1	9.6	15.9	19.1		41.3	
7.7	10.4	15.9	19.1	± 5.0	42.9	± 2.5
8.4	12.2	15.9	19.1		44.5	
9.4	18.0				47.7	

**Concentric Reducer
Eccentric Reducer**

Sch40, Sch80, Sch160



Concentric Reducer

Eccentric Reducer

JIS B2316

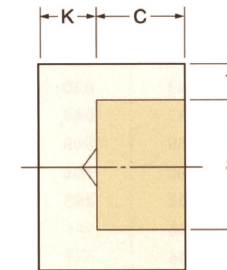
Nom Pipe Size(A)	Socket Bore Dia		Bore Diameter of Fitting-D		
	BS	S ₁	Sch40	Sch40,80	Sch160
8 × 6	14.3	11.0	7.1	5.7	4.0
10 × 8	17.8	14.3	9.4	7.8	6.5
15 × 8	22.2	14.3	9.4	7.8	6.5
× 10	-	17.8	12.7	10.9	9.0
20 × 8	27.7	14.3	9.4	7.8	6.5
× 10	-	17.8	12.7	10.9	9.0
× 10	-	22.2	16.1	14.3	12.3
25 × 10	34.5	17.8	12.7	10.9	9.0
× 15	-	22.2	16.1	14.3	12.3
× 20	-	27.7	21.4	19.4	16.2
32 × 15	43.2	22.2	16.1	14.3	12.3
× 20	-	27.7	21.4	19.4	16.2
× 25	-	34.5	27.2	25.0	21.2
40 × 20	49.1	27.7	21.4	19.4	16.2
× 25	-	34.5	27.2	25.0	21.2
× 32	-	43.2	35.5	32.9	29.9
50 × 25	61.1	34.5	27.2	25.0	21.2
× 32	-	43.2	35.5	32.9	29.9
× 40	-	49.1	41.2	38.4	34.4
65 × 32	77.1	43.2	35.5	32.9	29.9
× 40	-	49.1	41.2	38.4	34.4
× 50	-	61.1	52.7	49.5	43.1
80 × 40	90.0	49.1	41.2	38.4	34.4
× 50	-	61.1	52.7	49.5	43.1
× 65	-	77.1	65.9	62.3	57.3
100 × 50	115.5	61.1	52.7	49.5	43.1
× 65	-	77.1	65.9	62.3	57.3
× 80	-	90.0	78.1	73.9	66.9

(Unit : mm)

Socket Wall Thickness Min-T		Depth Min		Laying Lengths E
Sch80	Sch160	C	C ₁	
3.3	4.0	9.6	9.6	6.4
3.5	4.4	9.6	9.6	6.4
4.1	5.2	9.6	9.6	9.5
4.1	5.2	9.6	9.6	9.5
4.3	6.1	12.7	9.6	9.5
4.3	6.1	12.7	9.6	9.5
4.3	6.1	12.7	9.6	9.5
5.0	7.0	12.7	9.6	12.7
5.0	7.0	12.7	9.6	12.7
5.0	7.0	12.7	12.7	12.7
5.4	7.0	12.7	12.7	12.7
5.4	7.0	12.7	12.7	12.7
5.4	7.0	12.7	12.7	12.7
5.6	7.8	12.7	12.7	12.7
5.6	7.8	12.7	12.7	12.7
5.6	7.8	12.7	12.7	12.7
6.1	9.6	15.9	12.7	19.1
6.1	9.6	15.9	12.7	19.1
6.1	9.6	15.9	12.7	19.1
7.7	10.4	15.9	12.7	19.1
7.7	10.4	15.9	12.7	19.1
7.7	10.4	15.9	15.9	19.1
8.4	12.2	15.9	12.7	19.1
8.4	12.2	15.9	15.9	19.1
8.4	12.2	15.9	15.9	19.1
9.4	18.0	19.0	15.9	19.1
9.4	18.0	19.0	15.9	19.1
9.4	18.0	19.0	15.9	19.1

Cap

Sch40, Sch80, Sch160



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Nom Pipe Size		Socket Bore Dia	
A	B	S	TOL
6	1/8	11.0	+ 0.3 - 0
8	1/4	14.3	
10	3/8	17.8	
15	1/2	22.2	
20	3/4	27.7	
25	1	34.5	
32	1 1/4	43.2	
40	1 1/2	49.1	
50	2	61.1	
65	2 1/2	77.1	+ 0.4 - 0
80	3	90.0	

TOL : Tolerances

(Unit : mm)

Socket Wall Thickness Min-T		Depth Min-C	End Thickness Min-K	
Sch40, 80	Sch160		Sch40, 80	Sch160
3.2	3.5	9.6	5	-
3.3	4.0	9.6	5	-
3.5	4.4	9.6	5	-
4.1	5.2	9.6	6.5	8.0
4.3	6.1	12.7	6.5	8.0
5.0	7.0	12.7	9.5	11.0
5.4	7.0	12.7	9.5	14.0
5.6	7.8	12.7	11.0	16.0
6.1	9.6	15.9	12.5	19.0
7.7	10.4	15.9	16.0	19.2
8.4	12.2	15.9	19.0	22.5

Socket Welding Fittings Approx Weight List

NPS	90° Elbow		45° Elbow	
	3000	6000	3000	6000
1/4	0.11	0.12	0.09	0.18
3/8	0.12	0.20	0.17	0.19
1/2	0.20	0.30	0.18	0.23
3/4	0.28	0.60	0.23	0.50
1	0.46	1.05	0.35	0.69
1 1/4	0.65	1.40	0.65	0.88
1 1/2	0.96	2.40	0.80	1.85
2	1.50	3.65	1.20	2.93
2 1/2	2.25	-	3.06	-
3	4.00	-	4.76	-
4	9.40	-	8.25	-

NPS	F/Coupling		H/Coupling	
	3000	6000	3000	6000
1/4	0.06	0.06	0.06	0.07
3/8	0.06	0.07	0.08	0.08
1/2	0.11	0.14	0.14	0.30
3/4	0.17	0.25	0.20	0.43
1	0.27	0.36	0.34	0.69
1 1/4	0.35	0.46	0.48	0.96
1 1/2	0.43	0.58	0.51	1.20
2	0.72	1.20	1.00	2.05
2 1/2	1.13	1.60	1.55	3.25
3	1.50	2.18	2.13	4.33
4	2.50	3.95	3.65	6.45

(Unit : kg)

Tee		Cross	
3000	6000	3000	6000
0.10	0.17	0.17	0.23
0.16	0.19	0.18	0.40
0.28	0.31	0.36	0.66
0.37	0.86	0.51	1.12
0.57	1.45	0.68	1.73
0.87	1.70	1.02	2.38
1.28	3.04	1.38	3.75
1.80	4.44	2.32	7.86
2.85	-	7.48	-
5.50	-	10.43	-
12.24	-	18.14	-

(Unit : kg)

Cap		Boss		Union	
3000	6000	3000	6000	3000	6000
0.04	0.04	0.09	0.09	0.23	0.25
0.05	0.06	0.14	0.15	0.35	0.42
0.07	0.22	0.24	0.45	0.40	0.85
0.13	0.35	0.28	0.52	0.50	1.00
0.21	0.55	0.41	0.73	0.70	1.30
0.37	0.89	0.44	0.77	1.20	2.00
0.60	1.15	0.63	1.12	1.50	3.80
0.99	2.05	1.09	1.82	2.58	6.40
1.50	3.75	-	-	5.14	6.87
2.30	5.10	-	-	7.12	10.85
4.00	8.20	-	-	12.40	-

Socket Welding Fittings Approx Weight List

NPS	Weld-outlet			
	S.T.D	XS	Sch160	XXS
1/2	0.08	0.09	0.11	0.11
3/4	0.11	0.14	0.32	0.32
1	0.23	0.21	0.38	0.38
1 1/4	0.36	0.41	0.57	0.57
1 1/2	0.45	0.50	0.80	0.80
2	0.80	0.80	1.00	1.00
2 1/2	1.14	1.20	1.54	1.54
3	1.82	1.90	2.90	2.90
4	2.86	2.90	4.80	4.80
5	4.66	4.70	6.50	6.50
6	6.45	10.50	12.70	12.70
8	10.68	16.80	20.50	20.50
10	17.73	20.90	38.60	38.60

(Unit : kg)

Socket-outlet		Thread-outlet	
3000	6000	3000	6000
0.14	0.23	0.11	0.20
0.15	0.36	0.16	0.34
0.27	0.59	0.28	0.56
0.39	0.73	0.41	0.71
0.47	0.91	0.45	0.89
0.73	2.33	0.80	2.30
1.25	-	1.36	-
1.73	-	1.98	-
3.30	-	3.22	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Threaded Welding Fittings Approx Weight List

NPS	90° Elbow		45° Elbow	
	2000	3000	2000	3000
1/4	0.11	0.17	0.06	0.11
3/8	0.14	0.29	0.11	0.23
1/2	0.25	0.59	0.20	0.34
3/4	0.31	0.63	2.09	0.54
1	0.51	1.02	0.43	0.85
1 1/4	0.77	1.25	0.63	0.97
1 1/2	1.02	1.59	0.74	1.36
2	1.59	2.47	1.22	1.93
2 1/2	2.95	4.85	3.35	6.52
3	4.76	6.55	5.13	4.76
4	10.30	13.80	8.65	8.68

NPS	F/Coupling		H/Coupling	
	3000	6000	3000	6000
1/4	0.05	0.12	0.02	0.06
3/8	0.06	0.18	0.03	0.09
1/2	0.14	0.28	0.07	0.14
3/4	0.21	0.45	0.10	0.23
1	0.41	0.80	0.21	0.37
1 1/4	0.72	1.40	0.36	0.70
1 1/2	1.06	1.95	0.52	0.90
2	1.40	2.80	0.69	1.22
2 1/2	2.55	3.80	1.25	1.85
3	3.83	6.00	1.84	2.95
4	6.35	10.70	3.51	5.40

(Unit : kg)

Tee		Cross	
2000	3000	2000	3000
0.11	0.13	0.23	0.17
0.14	0.37	0.23	0.45
0.25	0.54	0.40	0.68
0.43	0.85	0.51	1.13
0.65	1.13	0.77	1.61
0.91	1.42	1.13	1.87
1.25	2.27	1.45	2.95
2.10	3.06	2.38	3.69
3.94	5.96	7.46	7.60
5.98	9.24	8.85	8.96
12.40	17.90	14.50	14.80

(Unit : kg)

Cap		Boss	
3000	6000	3000	6000
0.05	0.09	0.09	0.13
0.08	0.14	0.11	0.24
0.12	0.25	0.24	0.44
0.20	0.36	0.29	0.55
0.31	0.70	0.42	0.74
0.60	0.80	0.61	0.75
0.73	1.28	0.65	1.17
1.05	2.16	1.13	1.90
2.27	2.72	-	-
3.83	4.95	-	-
6.35	9.21	-	-

Threaded Welding Fittings Approx Weight List

NPS	Union		Nipple
	3000	6000	
1/4	0.14	0.45	0.04
3/8	0.20	0.60	0.05
1/2	0.35	0.85	0.09
3/4	0.43	1.40	0.15
1	0.65	1.75	0.27
1 1/4	0.98	3.00	0.45
1 1/2	1.26	4.00	0.62
2	2.01	5.50	1.03
2 1/2	5.14	6.87	1.51
3	7.12	10.85	2.22
4	12.40	-	-

(Unit : kg)

S/H Plug	H/H Plug	R/H Plug	H/H Bushing	Flush Bushing
0.01	0.03	0.05	0.03	0.03
0.03	0.06	0.08	0.03	0.03
0.06	0.09	0.17	0.03	0.03
0.09	0.14	0.17	0.09	0.06
0.14	0.23	0.34	0.09	0.06
0.25	0.51	0.34	0.17	0.06
0.40	0.63	0.71	0.31	0.09
0.68	1.02	1.36	0.74	0.17
1.02	1.76	2.15	1.08	0.29
1.31	2.67	3.45	1.59	0.45
3.26	5.90	5.83	3.77	0.91