

# FITTINGS

## Forged Products

*The technology of A-JOO continues to evolve*

## AJ A-JOO FITTING Co., Ltd.

### ■ HEAD OFFICE & FACTORY

591-7, Hwajeon-Dong, Gangseo-Gu, Busan, Korea  
Tel : +82-51-832-9700~7  
Fax : +82-51-832-9708~9  
E-mail [ajooft@hanmail.net](mailto:ajooft@hanmail.net)

### ■ 본사 및 공장

부산광역시 강서구 화전동 591-7번지  
대 표 : (051) 832-9700~7  
팩 스 : (051) 832-9708~9  
이메일 : [ajooft@hanmail.net](mailto:ajooft@hanmail.net)

[Http://www.ajooftitting.co.kr](http://www.ajooftitting.co.kr)





# AJ A-JOO FITTING Co., Ltd.

## Company Introduction

안녕하십니까?

(주) 아주피팅을 고객 여러분께 소개드릴 수 있게 되어 큰 기쁨으로 생각합니다.  
 당사는 1993년 고압용 플랜지 및 피팅 전문 생산 업체로 설립하여 국내·외 **발전설비, 석유화학, 조선 등 중요 플랜트 분야**에 고품질의 다양한 고압용 피팅류와 플랜지를 공급해 왔습니다.

이 결과로 2002년 9월 ISO 9002(KSA: Korea Standard Association) 품질 경영시스템을 인증받았으며, 2002년 10월 KS B 1506 (스테인레스 강제 용접식 플랜지) 한국산업규격(KS)을 획득하여 스테인레스 플랜지 전문생산업체로서 현재 하수처리장, 반도체, 환경산업 분야에 납품하고 있습니다.

저희 (주)아주피팅공업 직원 일동은 고객을 위한 가치창출에 최선을 다하고 약속을 최우선으로 생각하는 (주)아주피팅이 되고자 부단히 노력 하겠습니다.  
 많은 지도편달을 바랍니다.

(주) 아 주 피 팅  
 대표이사 : 주 영 태  
*Joo, Young-Tae*



## » Quality Assurance Certificate



## » Company History

- 1993. 03 Established the Company in Busan Korea
- 1996. 05 A-JOO FITTING Industries Co., Ltd.
- 2001. 12 Increasing of business items and installations
- 2002. 01 Certified by Korean Industrial Standards in stainless steel welding flanges (KS B1506)
- 2003. 06 Certified by KSA-QA in accordance with ISO 9001/KS A 9001 Standard.
- 2004. 03 Small and medium enterprises Prize. (Busan-Bank)
- 2006 .05 Venture Business Certificate
- 2006 .12 INNO-BIZ(Small and Medium Business Administration)
- 2008. 01 Certified by KAB-QA in accordance with ISO 14001/KS A 14001 Standard.
- 2010. 05 Certified by HBS-QA in accordance with ISO 9001:2008 / PED 97/23/ECStandard.
- 2011. 01 Move to Hwajeon Industrial Area
- 2012 01 IOOC, POGC, IOEC approved vendor list in Iran







**아주피팅의 기술**은 새로운 발전을 약속합니다.  
 끊임없는 기술개발과 연구로 업계의 표준을 만들어 가겠습니다.  
 고객의 입장에서 먼저 실천하고 생각합니다!

## Main Products

### FORGED FITTINGS



# CONTENTS

[www.ajoofitting.co.kr](http://www.ajoofitting.co.kr)

KS B1542 (JIS B2316)  
 ASME B16.11

#### Socket-Welding Type

- 10 | 90°, 45° Elbow
- 11 | Tee, Cross
- 12 | Coupling, Half Coupling
- 13 | Cap, Boss
- 14 | Union
- 15 | Reducing Insert

#### Threaded Type

- 16 | 90°, 45° Elbow
- 17 | Tee, Cross
- 18 | Coupling, Half Coupling, Cap
- 19 | Plug, HEX Nipple
- 20 | HEX Bushing, Boss Type A
- 21 | Union

#### Outlet

- 22 | Weldolet
- 23 | Sockolet, Thredolet
- 24 | Nippolet, Swaged Nipple

#### Technical Data

- 25 | Forged Socket Welding Threaded Fitting Bore, Tolerance
- 26 | KS B0222 & JIS B0203 Pipe Threads, (Except Dryseal)
- 27 | ASME B1.20.1 Taper Pipe Threads.
- 28 | BS21-1973 British Standard Taper Pipe Threads, (Except Dryseal)
- 29 | Material Specifications
- 30 | Technical Data
- 32 | Wall Thickness Schedules



# FORGED STEEL

SOCKET - WELDING  
& THREADED FITTING

**AJ** A-JOO FITTING Co., Ltd.



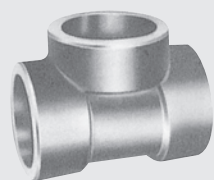
## Socket Welding Fittings



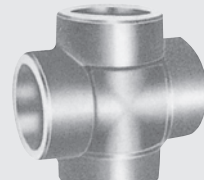
90° Elbow



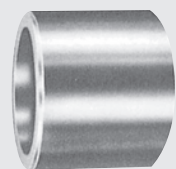
45° Elbow



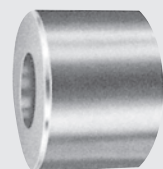
Tee



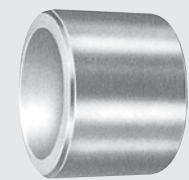
Cross



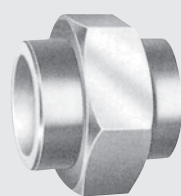
Coupling



Reducer

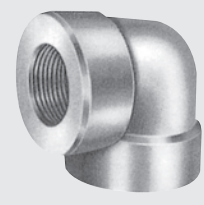


Cap



Union

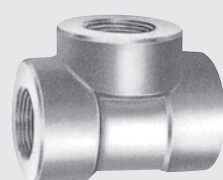
## Threaded Fittings



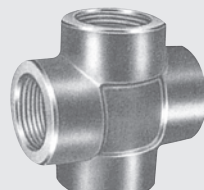
90° Elbow



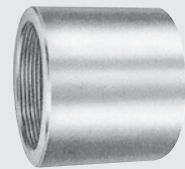
45° Elbow



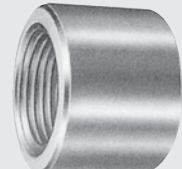
Tee



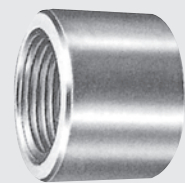
Cross



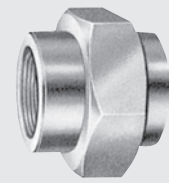
Full Coupling



Half Coupling



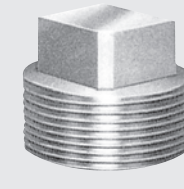
Cap



Union



Hex Head Plug



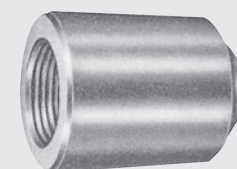
S.Q Head Plug



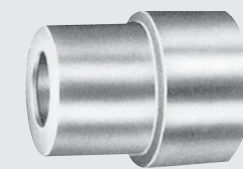
Round Head Plug



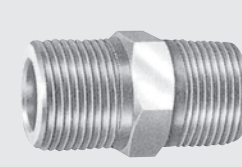
Hex Head Bushing



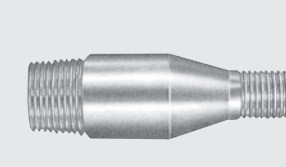
Boss



Insert

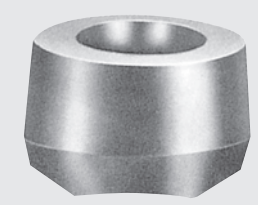


Nipple

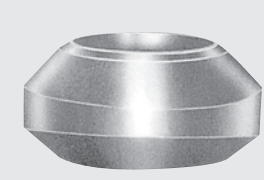


Swage Nipple

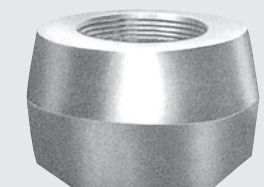
## Outlet Fittings



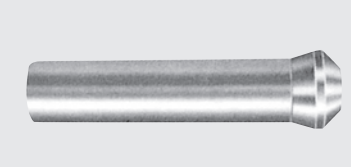
Socket-Outlet



Wedling-Outlet

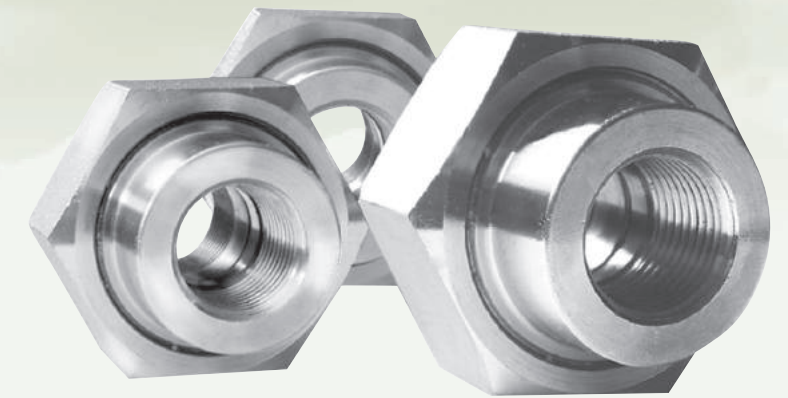
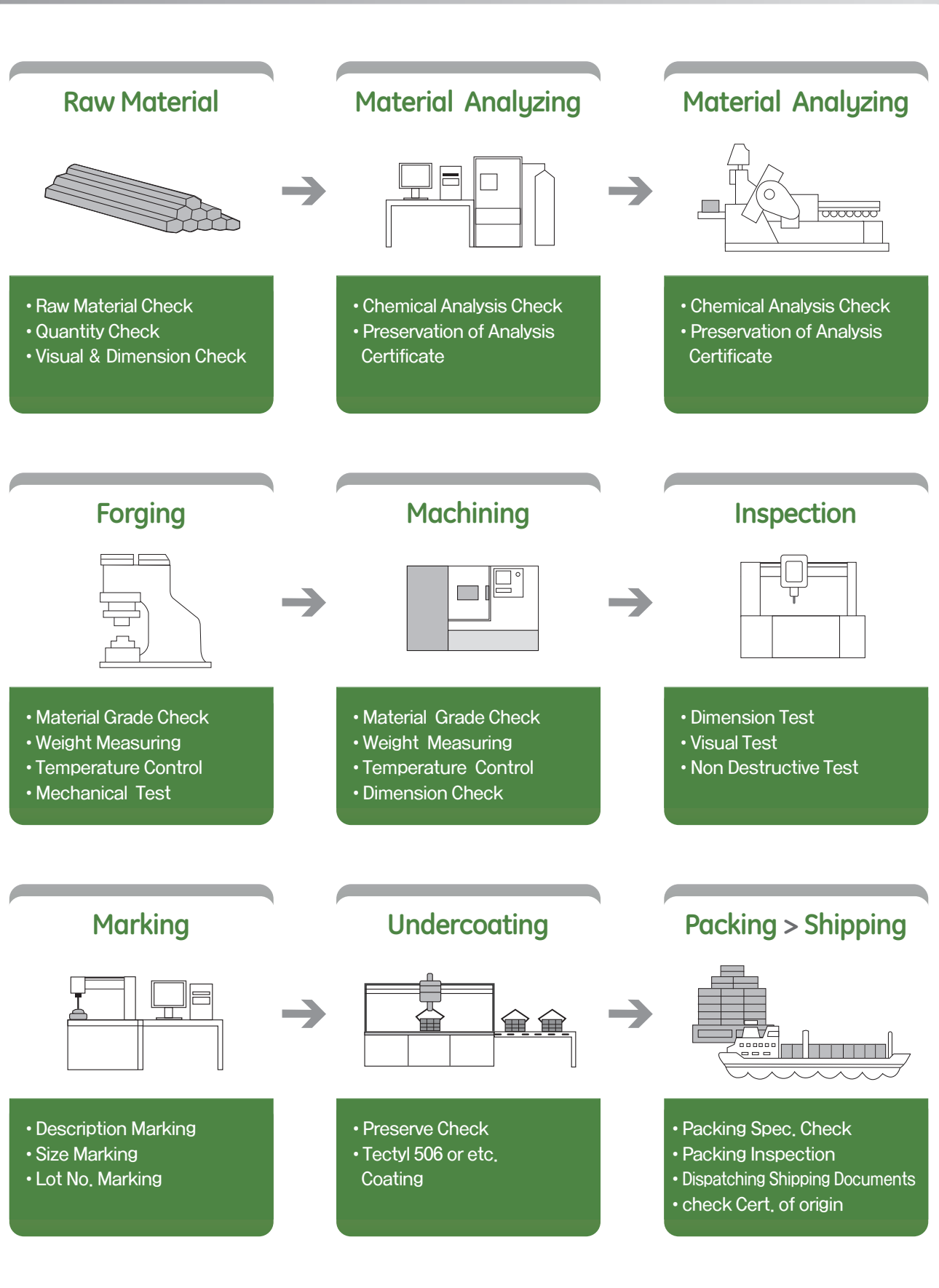


Thread-Outlet



Nipple-Outlet

# Manufacturing Process



## A-JOO FORGED FITTINGS

- » SOCKET - WELDING
- » THREADED FITTING
- » OUTLET
- » TECHNICAL DATA

# FORGED FITTING

## SOCKET WELDING & THREADED FITTINGS

### 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.

**Table 1 :** Correlation of Fittings Class With Schedule Number of Wall Designation of Pipe for Calculation of Ratings.

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

**Table 2 :** 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	0.230	6.05
3/8	0.158	4.01	0.252	6.40

**Table 3 :** Pressure/Temperature Ratings

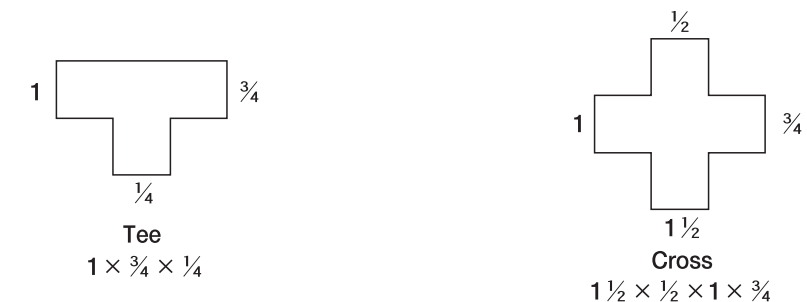
Non-shock Working Pressure in Pounds per Square Inch

Service Temperature Degree F	2000lb Threaded Fittings					3000lb Socket Welding and Threaded Fittings					6000lb Socket Welding and Threaded Fittings				
	Carbon Steel	F304	F316	F22	F5	Carbon Steel	F304	F316	F22	F5	Carbon Steel	F304	F316	F22	F5
100	2000	1715	2000	2000	2000	3000	2570	3000	3000	3000	6000	5145	6000	6000	6000
150	1970	1615	1970	1970	1970	2950	2425	2950	2950	2950	5915	4855	5915	5915	5915
200	1940	1520	1940	1940	1940	2915	2280	2915	2915	2915	5830	4565	5830	5830	5830
250	1915	1445	1915	1915	1915	2875	2170	2975	2975	2975	5750	4340	5750	5750	5750
300	1975	1370	1896	1895	1895	2845	2055	2845	2845	2845	5690	4115	5690	5690	5690
350	1875	1310	1875	1875	1875	2810	1965	2810	2810	2810	5625	3930	5690	5625	5625
400	1850	1245	1850	1850	1850	2775	1870	2775	2775	2775	5550	3745	5550	5550	5550
450	1810	1195	1810	1710	1810	2715	1790	2715	2715	2715	5430	3585	5430	5430	5430
500	1735	1140	1735	1635	1735	2605	1715	2605	2605	2605	5210	3430	5210	5210	5210
550	1640	1100	1640	1540	1640	2460	1650	2460	2460	2460	4925	3305	4925	4925	4925
600	1540	1060	1540	1440	1540	2310	1590	2310	2310	2310	4620	3180	4620	4620	4620
650	1430	1020	1430	1330	1430	2150	1535	2150	2150	2150	4300	3070	4300	4300	4300
700	1305	985	1370	1240	1340	1960	1480	2055	2010	2010	3920	2960	4110	4025	4025
750	1180	950	1305	1145	1245	1775	1425	1960	1870	1870	3550	2850	3920	3745	3745
800	1015	915	1240	1055	1155	1525	1370	1865	1735	1735	3050	2745	3730	3470	3470
850	830	880	1180	1060	1060	1250	1330	1770	1595	1595	2500	2660	3540	3190	3190
900	615	860	1115	970	970	925	1290	1675	1455	1455	1885	2580	3350	2915	2915
950	425	845	1055	880	880	640	1270	1580	1320	1320	1295	2540	3165	2640	2640
1000	235	830	990	740	695	350	1250	1485	1115	1240	715	2500	2975	2230	2085

### 2. Size Identification

The size of a fitting is identified by the nominal pipe size.

For reducing fittings, the size of the largest run opening is to be given first, followed by the size of the opening opposite of the same run. The branch size of a Tee is given last. Where the case is a Cross, the largest side-outlet is thirdly given, then the opening opposite.



### 3. Threads

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

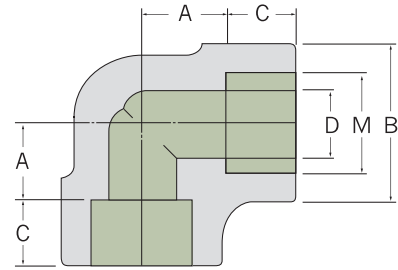
- ISO/R7, Pipe Threads for Gas List Tubes and Screwed Fittings where Pressure-tight Joints are made on the threads (BS 2.1 & JIS B0203PT Thread)
- API 5B, Line Pipe Threads.
- KSB0222 Taper Pipe Threads



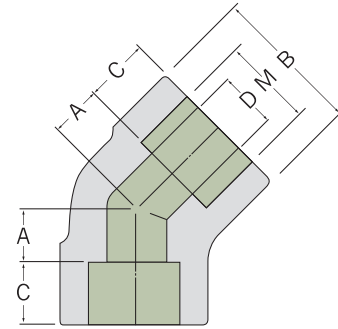
# SOCKET WELDING FITTINGS

3000lb, 6000lb, 9000lb

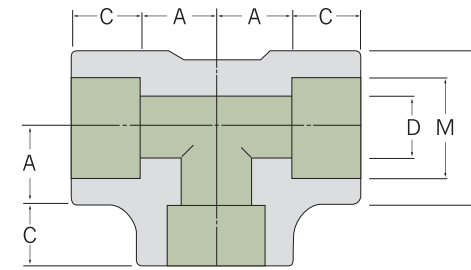
## 90° Elbow



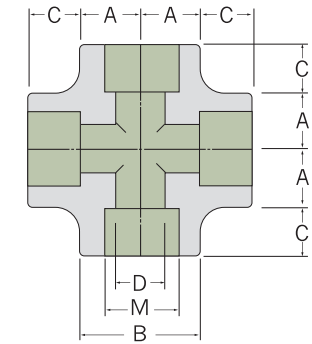
## 45° Elbow



## Tee



## Cross



Size	M	B	D	A	C	Unit Weight (Kg)
------	---	---	---	---	---	------------------

3000 lb						
1/4	See Note (1) To be specified by purchaser	23.0	9.4	11.0	10	0.132
3/8		26.5	12.7	13.5	12	0.113
1/2		34.0	16.1	15.5	13	0.226
3/4		38.5	21.4	19.0	14	0.312
1		46.5	27.2	22.5	16	0.596
1 1/4		56.5	35.5	27.0	18	0.709
1 1/2		63.5	41.2	32.0	19	0.850
2		76.0	52.7	38.0	22	1.474
2 1/2	92.0	65.9	41.0	26	2.460	
3	110.0	78.1	57.0	29	4.650	
4	146.0	102.3	66.5	33	9.410	

6000 lb						
1/2	See Note (1)	38.5	12.3	19.0	14	0.425
3/4		46.5	16.2	22.5	16	0.652
1		56.5	21.2	27.0	18	1.020
1 1/4		63.5	29.9	32.0	19	1.446
1 1/2		76.0	34.4	38.0	22	2.380
2		84.0	43.1	41.0	26	3.760
2 1/2		110.0	57.3	57.0	29	6.120
3		121.0	66.9	66.5	33	8.760
4	152.0	87.3	70.0	45	14.300	

9000 lb						
1/2	See Note (1)	46.5	6.7	25.5	16	0.510
3/4		56.5	11.6	28.5	18	0.782
1		63.5	15.8	32.0	19	1.224
1 1/4		76.0	23.3	35.0	22	1.807
1 1/2		84.0	28.2	38.0	26	2.975
2		110.0	38.3	54.0	29	4.700
2 1/2		121.0	48.3	66.0	33	10.512
3	146.0	58.7	70.0	36	13.020	

Size	M	B	D	A	C	Unit Weight (Kg)
------	---	---	---	---	---	------------------

3000 lb						
1/4	See Note (1) To be specified by purchaser	23.0	9.4	8	10	0.093
3/8		26.5	12.7	8	11	0.142
1/2		34.0	16.1	11	13	0.264
3/4		38.5	21.4	13.0	14	0.397
1		46.5	27.2	14.0	16	0.624
1 1/4		56.5	35.5	17.5	18	0.907
1 1/2		63.5	41.2	20.5	19	0.782
2		76.0	52.7	25.5	21	1.265
2 1/2	92.0	65.9	28.5	27	3.062	
3	110.0	78.1	32.0	31	4.763	
4	146.0	102.3	41.0	35	8.250	

6000 lb						
1/2	See Note (1)	38.5	12.3	12.5	14	0.397
3/4		46.5	16.2	14	16	0.595
1		56.5	21.2	17.5	18	0.935
1 1/4		63.5	29.9	20.5	19	1.157
1 1/2		76.0	34.4	25.5	21	1.982
2		84.0	43.1	28.5	27	4.000
2 1/2		110.0	57.3	32.0	31	5.875
3		121.0	66.4	41.0	35	6.509
4	152.0	87.3	54.0	45	12.360	

9000 lb						
1/2	See Note (1)	46.5	6.7	15.5	16	0.875
3/4		56.5	11.6	19	18	1.369
1		63.5	15.8	20.5	19	1.725
1 1/4		76.0	23.3	22.5	21	2.931
1 1/2		84.0	28.2	25.5	27	5.062
2		110.0	38.3	28.5	31	6.400
2 1/2		121.0	48.3	32	35	7.925
3	146.0	58.7	41	35	11.569	

- Notes
- (1) For the 'Bore'(M) other than standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

Size	M	B	D	A	C	Unit Weight (Kg)
------	---	---	---	---	---	------------------

3000 lb						
1/4	See Note (1) To be specified by purchaser	23.0	9.4	11.0	10	0.161
3/8		26.5	12.7	13.5	12	0.142
1/2		34.0	16.1	15.5	13	0.170
3/4		38.5	21.4	19.0	14	0.397
1		46.5	27.2	22.5	16	0.624
1 1/4		56.5	35.5	27.0	18	0.907
1 1/2		63.5	41.2	32.0	19	1.134
2		76.0	52.7	38.0	22	1.701
2 1/2	92.0	65.9	41.0	26	3.424	
3	110.0	78.1	57.0	29	5.670	
4	146.0	102.3	66.5	33	12.247	

6000 lb						
1/2	See Note (1)	38.5	12.3	19.0	14	0.623
3/4		46.5	16.2	22.5	16	0.907
1		56.5	21.2	27.0	18	1.503
1 1/4		63.5	29.9	32.0	19	1.701
1 1/2		76.0	34.4	38.0	22	2.948
2		84.0	43.1	41.0	26	3.702
2 1/2		110.0	57.3	57.0	29	8.723
3		121.0	66.9	66.5	33	10.660
4	152.0	87.3	70.0	45	19.020	

9000 lb						
1/2	See Note (1)	46.5	6.7	25.5	16	0.779
3/4		56.5	11.6	28.5	18	1.333
1		63.5	15.8	32.0	19	1.879
1 1/4		76.0	23.3	35.0	22	2.126
1 1/2		84.0	28.2	38.0	26	3.685
2		110.0	38.3	54.0	29	4.627
2 1/2		121.0	48.3	66.0	33	10.903
3	146.0	58.7	70.0	36	13.325	

- Notes
- (1) For the 'Bore'(M) other than standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

Size	M	B	D	A	C	Unit Weight (Kg)
------	---	---	---	---	---	------------------

3000 lb						
1/4	See Note (1) To be specified by purchaser	23.0	9.4	11.0	10	0.182
3/8		26.5	12.7	13.4	12	0.170
1/2		34.0	16.1	16.0	13	0.368
3/4		38.5	21.4	20.0	14	0.519
1		46.5	27.2	23.0	16	0.680
1 1/4		56.5	35.5	28.0	18	1.020
1 1/2		63.5	41.2	33.0	19	1.389
2		76.0	52.7	40.0	22	2.326
2 1/2	92.0	65.9	42.0	26	7.484	
3	110.0	78.1	57.1	29	10.432	
4	146.0	102.3	70.0	33	18.144	

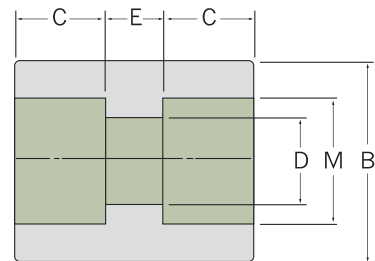
6000 lb						
1/2	See Note (1)	38.5	12.3	20.2	14	0.660
3/4		46.5	16.2	23.0	16	1.120
1		56.5	21.2	28.0	18	1.730
1 1/4		63.5	29.9	33.0	19	2.381
1 1/2		76.0	34.4	40.0	22	3.750
2		84.0	43.1	42.0	26	7.860
2 1/2		110.0	57.3	57.1	29	10.600
3		121.0	66.9	66.0	33	13.600
4	152.0	87.3	70.0	45	26.000	

9000 lb						
1/2	See Note (1)	46.5	6.7	25.5	16	1.615
3/4		56.5	11.6	28.5	18	2.113
1		63.5	15.8	32.0	19	3.896
1 1/4		76.0	23.3	35.0	22	6.298
1 1/2		84.0	28.2	38.0	26	9.280
2		110.0	38.3	54.0	29	18.741
2 1/2		121.0	48.3	66.0	33	25.702
3	146.0	58.7	70.0	36	33.761	

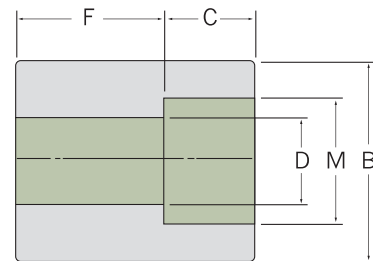
# SOCKET WELDING FITTINGS

3000lb, 6000lb, 9000lb

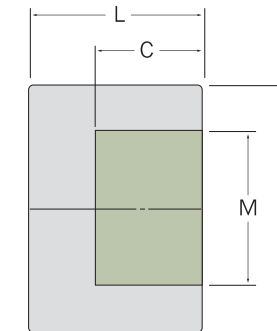
## Full Coupling



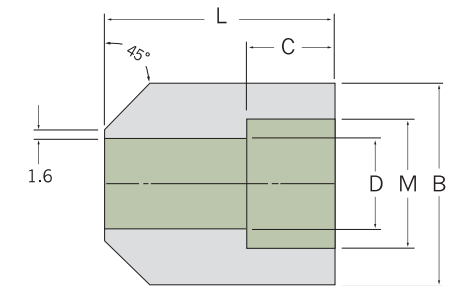
## Half Coupling



## Cap



## Boss



Size	M	B	D	C	E	Unit Weight (Kg)
<b>3000 lb</b>						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	10	6.4	0.05
3/8		26.0	12.7	10	6.4	0.12
1/2		32.0	16.1	10	9.6	0.12
3/4		38.0	21.4	13	9.6	0.18
1		46.0	27.2	13	12.7	0.26
1 1/4		55.0	35.5	13	12.7	0.35
1 1/2		63.0	41.2	13	12.7	0.47
2		75.0	52.7	16	19.1	0.81
2 1/2		95.0	65.9	16	19.1	1.25
3		110.0	78.1	16	19.1	1.53
4	140.0	102.3	19	19.1	2.91	
<b>6000 lb</b>						
1/2	See Note (1)	35.0	12.3	10	9.6	0.170
3/4		42.0	16.2	13	9.6	0.249
1		50.0	21.2	13	12.7	0.420
1 1/4		60.0	29.9	13	12.7	0.525
1 1/2		68.0	34.4	13	12.7	0.665
2		85.0	43.1	16	19.1	1.240
2 1/2		100.0	57.3	16	19.1	1.640
3		114.3	66.9	16	19.1	2.746
4		160.0	87.3	19	19.1	4.679
<b>9000 lb</b>						
1/2	See Note (1)	42.0	6.7	10	9.6	0.270
3/4		48.0	11.6	13	9.6	0.327
1		60.0	15.8	13	12.7	0.518
1 1/4		70.0	23.3	13	12.7	0.813
1 1/2		75.0	28.2	13	12.7	0.940
2		90.0	38.3	16	19.1	1.553
2 1/2		110.0	48.3	16	19.1	2.430
3		130.0	58.7	16	19.1	3.721
4		160.0	80.1	19	19.1	5.137

Size	M	B	D	C	F	Unit Weight (Kg)
<b>3000 lb</b>						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	10	15.7	0.058
3/8		26.0	12.7	10	17.5	0.073
1/2		32.0	16.1	10	22.4	0.138
3/4		38.0	21.4	13	23.9	0.203
1		46.0	27.2	13	28.4	0.313
1 1/4		55.0	35.5	13	30.2	0.431
1 1/2		63.0	41.2	13	31.8	0.593
2		75.0	52.7	16	41.1	1.280
2 1/2		95.0	65.9	16	42.9	1.490
3		110.0	78.1	16	44.5	2.202
4	140.0	102.0	19	47.7	4.250	
<b>6000 lb</b>						
1/2	See Note (1)	35.0	12.3	10	22.4	0.193
3/4		42.0	16.2	13	23.9	0.284
1		50.0	21.2	13	28.4	0.488
1 1/4		60.0	29.9	13	30.2	0.583
1 1/2		68.0	34.4	13	31.8	0.640
2		85.0	43.1	16	41.1	1.726
2 1/2		100.0	57.3	16	42.9	2.247
3		114.3	66.9	16	44.5	3.412
4		160.0	87.3	19	47.7	5.730
<b>9000 lb</b>						
1/2	See Note (1)	42.0	6.7	10	22.4	0.312
3/4		48.0	11.6	13	23.9	0.389
1		60.0	15.8	13	28.4	0.641
1 1/4		70.0	23.3	13	30.2	0.980
1 1/2		75.0	28.2	13	31.8	1.179
2		90.0	38.3	16	41.1	1.994
2 1/2		110.0	48.3	16	42.9	3.210
3		130.0	58.7	16	44.5	4.597
4		160.0	80.1	19	47.7	7.610

Size	M	B	C	L	Unit Weight (Kg)	
<b>3000 lb</b>						
1/4	See Note (1) To be specified by purchaser	22.0	10	20	0.048	
3/8		26.0	10	20	0.076	
1/2		32.0	10	20	0.100	
3/4		38.0	13	25	0.182	
1		46.0	13	27	0.241	
1 1/4		55.0	13	30	0.350	
1 1/2		63.0	13	30	0.612	
2		75.0	16	36	0.880	
2 1/2		95.0	16	42	1.520	
3		110.0	16	46	2.208	
4	140.0	19	55	4.417		
<b>6000 lb</b>						
1/2	See Note (1)	35.0	10	26	0.055	
3/4		42.0	13	27	0.223	
1		50.0	13	30	0.382	
1 1/4		60.0	13	35	0.511	
1 1/2		60.0	13	36	0.735	
2		85.0	16	39	1.289	
2 1/2		100.0	16	45	2.056	
3		114.3	16	52	3.364	
<b>9000 lb</b>						
1/2		See Note (1)	42.0	10	30	0.262
3/4	48.0		13	30	0.320	
1	60.0		13	33	0.520	
1 1/4	70.0		13	40	1.256	
1 1/2	75.0		13	40	1.440	
2	90.0		16	43	1.686	
2 1/2	110.0		16	50	2.986	
3	130.0		16	58	4.666	

Size	M	B	D	C	L	Unit Weight (Kg)	
<b>3000 lb</b>							
1/4	See Note (1)	22.0	9.4	10	30	0.09	
3/8		26.0	12.7	10	30	0.14	
1/2		32.0	16.1	10	33	0.24	
3/4		38.0	21.4	13	35	0.28	
1		46.0	27.2	13	43	0.41	
1 1/4		55.0	35.5	13	46	0.44	
1 1/2		65.0	41.2	13	50	0.63	
2		75.0	52.7	16	57	1.09	
<b>6000 lb</b>							
1/2		See Note (1)	35.0	12.3	10	33	0.45
3/4	42.0		16.2	13	35	0.52	
1	55.0		21.2	13	43	0.73	
1 1/4	60.0		29.9	13	46	0.77	
1 1/2	70.0		34.4	13	50	0.12	
2	85.0		43.1	16	57	1.82	

- Notes
- (1) For the 'Bore'(M) other them standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

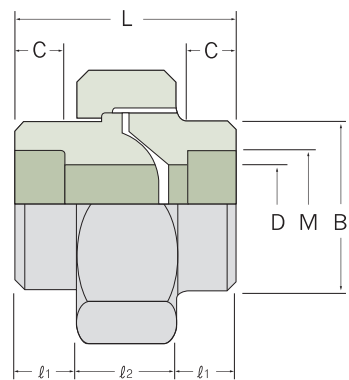
- Notes
- (1) For the 'Bore'(M) other them standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316



# SOCKET WELDING FITTINGS

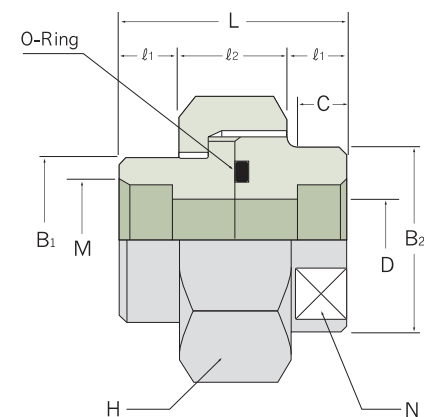
3000lb, 6000lb

## R.J Union



Size	M	B	l <sub>1</sub>	l <sub>2</sub>	L	C	D	H	Unit Weight (Kg)
<b>3000 lb</b>									
1/4	See Note (1) To be specified by purchaser	21.0	11.5	18	41	10.0	9.4	35HEX	0.187
3/8		25.0	14.0	18	46	10.0	12.7	40HEX	0.245
1/2		32.0	15.0	21	51	10.0	16.1	46HEX	0.430
3/4		40.0	17.0	23	57	13.0	21.2	58HEX	0.620
1		48.0	19.5	25	64	13.0	27.0	65HEX	1.030
1 1/4		55.0	22.5	27	72	13.0	35.4	76OCT	1.150
1 1/2		63.5	24.0	30	78	13.0	41.2	83OCT	1.530
2		76.0	26.0	36	88	16.0	52.7	103OCT	3.050
2 1/2		95.0	34.0	42	110	18.0	62.7	124OCT	5.140
3		116.0	37.5	45	120	22.5	78.0	142OCT	7.120
4	148.0	45.0	50	140	25.0	102.0	176OCT	12.400	
<b>6000 lb</b>									
1/2	See Note (1)	40.0	17.0	23	57	13	12.0	56HEX	0.62
3/4		44.5	19.5	25	64	13	15.8	65HEX	0.94
1		51.0	22.5	27	72	13	21.0	74OCT	1.98
1 1/4		57.2	24.0	30	78	16	29.7	83OCT	1.41
1 1/2		71.5	26.0	36	88	16	34.2	103OCT	2.75
2		90.0	34.0	42	110	16	43.1	124OCT	5.05
2 1/2		105.0	35.0	45	120	18	54.0	150OCT	6.87
3		125.0	45.0	50	140	22	67.7	176OCT	10.85

## O-Ring Union

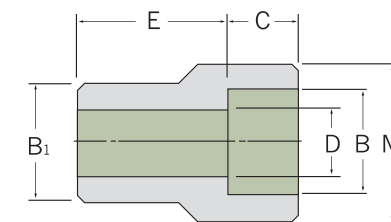


Size	M	B <sub>1</sub>	B <sub>2</sub>	D	C	l <sub>1</sub>	l <sub>2</sub>	L	N	H	O-Ring	Unit Weight (Kg)
<b>3000 lb</b>												
1/2	See Note (1)	22	24	10	10	10	18	38	21	35HEX	P18	0.160
3/4		27	30	12	10	10	18	38	26	41HEX	P20	0.228
1		32	35	16	10	12	20	44	32	46HEX	G25	0.328
1 1/4		38	42	20	13	12	26	50	38	54HEX	G30	0.535
1 1/2		47	52	25	13	15	26	56	46	63HEX	G35	0.786
2		56	60	32	13	15	30	60	54	77HEX	G45	1.104
2 1/2		63	68	38	13	18	36	72	63	80OCT	G50	1.542
3		76	82	48	17	18	36	72	77	95OCT	G65	2.080

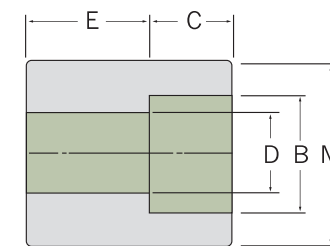
- Notes
- (1) For the 'Bore'(M) other than standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

## Reducing Insert

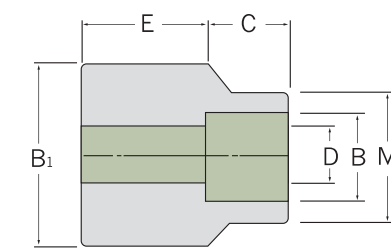
### Type 1



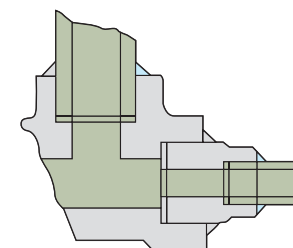
### Type 2



### Type 3



### Application of Reducer Insert



Size	Type	M	B <sub>1</sub>	B	C(Min.)	E	L	D	Unit Weight (Kg)					
<b>3000 lb</b>														
3/8 x 1/4	1	22.2	See Note (1) To be specified by purchaser	See Note (1) To be specified by purchaser	9.6	21	16	9.4	0.051					
1/2 x 1/4	2	-								9.6	15	-	9.4	0.052
1/2 x 3/8	1	25.4								9.6	24	20	12.7	0.086
3/4 x 1/4	3	-								9.6	19	7	9.4	0.109
3/4 x 3/8	2	-								9.6	19	-	12.7	0.697
3/4 x 1/2	1	31.8								9.6	26	22	16.1	0.146
1 x 3/8	3	25.4								9.6	22	7	12.7	0.161
1 x 1/2	2	-								9.6	22	-	16.1	0.183
1 x 3/4	1	38.1								12.7	29	23	21.4	0.208
1 1/4 x 1/2	3	31.8								9.6	24	7	16.1	0.273
1 1/4 x 3/4	2	-	12.7	24	-	21.4	0.286							
1 1/4 x 1	1	46.0	12.7	32	24.5	27.2	0.436							
1 1/2 x 3/4	3	38.1	12.7	26	8	21.4	0.348							
1 1/2 x 1	2	-	12.7	26	-	27.2	0.384							
1 1/2 x 1 1/4	1	55.0	12.7	35	27	35.5	0.463							
2 x 1	3	46.0	12.7	29	8	27.2	0.615							
2 x 1 1/4	2	-	12.7	29	-	35.5	0.647							
2 x 1 1/2	1	65.0	12.7	37	29	41.2	0.661							
2 1/2 x 1 1/4	3	55.0	12.7	35	8	35.5	1.183							
2 1/2 x 1 1/2	3	65.0	12.7	35	8	41.2	1.107							
2 1/2 x 2	1	76.0	15.9	39	30	52.7	1.200							
3 x 1 1/2	3	65.0	12.7	39	8	41.2	1.715							
3 x 2	3	75.0	15.9	39	10	52.7	1.542							
3 x 2 1/2	1	95.0	15.9	51	33.5	65.9	1.825							
<b>6000 lb</b>														
3/4 x 1/2	1	38.1	See Note (1)	See Note (1)	12.3	39	23	12.3	0.316					
1 x 1/2	1	38.1								12.3	38	24	12.3	0.354
1 x 3/4	1	46.0								16.2	43	26	16.2	0.526
1 1/4 x 1/2	2	-								12.3	29	-	12.3	0.415
1 1/4 x 3/4	1	46.0								16.2	40	28	16.2	0.557
1 1/4 x 1	1	55.0								21.2	45	28	21.2	0.765
1 1/2 x 3/4	2	-								16.2	35	-	16.2	0.619
1 1/2 x 1	1	55.0								21.2	38	28	21.2	0.723
1 1/2 x 1 1/4	1	62.0								29.9	52	32	29.9	0.957
2 x 1	3	-								21.2	43	8	21.2	1.026
2 x 1 1/4	1	62.0	29.9	54	34	29.9	1.137							
2 x 1 1/2	1	75.0	34.4	63	34	34.4	0.911							
2 1/2 x 1 1/4	3	62.0	29.9	46	8	29.9	1.478							
2 1/2 x 1 1/2	2	-	34.4	46	-	34.4	1.881							
2 1/2 x 2	1	95.0	43.1	73	36	43.1	2.918							
3 x 1 1/2	3	75.0	34.4	50	8	34.4	2.370							
3 x 2	2	95.0	43.1	70	-	43.1	3.313							
3 x 2 1/2	1	110.0	57.3	83	38	57.3	3.562							

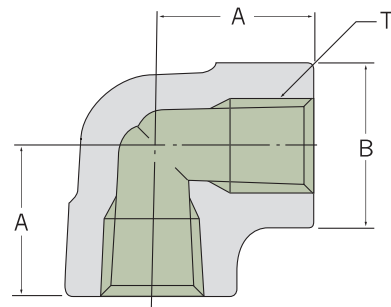
- Notes
- (1) For the 'Bore'(M) other than standard pipe outside diameter.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316



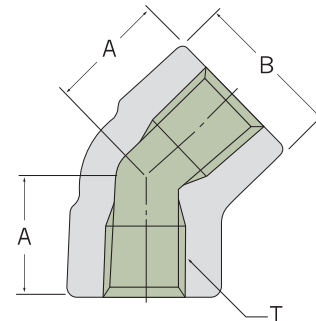
# THREADED FITTINGS

2000lb, 3000lb, 6000lb

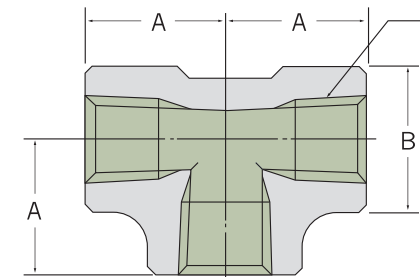
## 90° Elbow



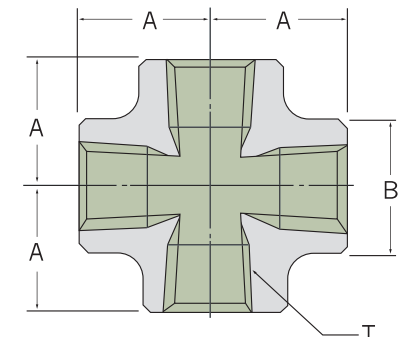
## 45° Elbow



## Tee



## Cross



Size T	B	A	Unit Weight (Kg)
<b>2000 lb</b>			
1/4	23.0	21	0.13
3/8	26.5	25	0.12
1/2	34.0	28	0.23
3/4	38.5	33	0.36
1	46.5	38	0.55
1 1/4	56.5	44	0.95
1 1/2	63.5	51	1.12
2	76.0	60	1.96
2 1/2	92.0	76	3.25
3	110.0	86	5.64
3 1/2	121.0	95	6.92
4	146.0	106	10.43
<b>3000 lb</b>			
1/4	26.5	25	0.120
3/8	34.0	28	0.235
1/2	38.5	33	0.390
3/4	46.5	38	0.570
1	56.5	44	0.990
1 1/4	63.5	51	1.260
1 1/2	76.0	60	2.125
2	84.0	64	3.520
2 1/2	110.0	83	5.460
3	121.0	95	8.000
3 1/2	146.0	106	11.230
4	152.0	114	13.500
<b>6000 lb</b>			
3/8	38.5	33	0.40
1/2	46.5	38	0.68
3/4	56.5	44	1.13
1	63.5	51	1.59
1 1/4	76.0	60	2.60
1 1/2	84.0	64	4.32
2	110.0	83	7.33
2 1/2	121.0	95	9.25
3	146.0	106	12.05
3 1/2	152.0	114	14.30
4	152.0	114	14.10

Size T	B	A	Unit Weight (Kg)
<b>2000 lb</b>			
1/4	23.0	18	0.16
3/8	26.5	19	0.13
1/2	34.0	22	0.25
3/4	38.5	25	0.32
1	46.5	28	0.43
1 1/4	56.5	33	0.75
1 1/2	63.5	35	1.06
2	76.0	43	1.49
2 1/2	92.0	52	2.45
3	110.0	64	4.00
3 1/2	121.0	64	5.12
4	146.0	79	8.68
<b>3000 lb</b>			
1/4	26.5	19	0.16
3/8	34.0	22	0.28
1/2	38.5	25	0.38
3/4	46.5	28	0.51
1	56.5	33	1.03
1 1/4	63.5	35	1.22
1 1/2	76.0	43	2.36
2	84.0	44	3.66
2 1/2	110.0	52	6.12
3	121.0	64	6.12
3 1/2	146.0	79	8.40
4	152.0	79	11.30
<b>6000 lb</b>			
3/8	38.5	25	0.45
1/2	46.5	28	0.72
3/4	56.5	33	1.00
1	63.5	35	1.56
1 1/4	76.0	43	2.29
1 1/2	84.0	44	3.80
2	110.0	52	5.76
2 1/2	121.0	64	7.20
3	146.0	79	11.30
3 1/2	152.0	79	13.20
4	152.0	79	11.80

Size T	B	A	Unit Weight (Kg)
<b>2000 lb</b>			
1/4	23.0	21	0.18
3/8	26.5	25	0.14
1/2	34.0	28	0.26
3/4	38.5	33	0.43
1	46.5	38	0.65
1 1/4	56.5	44	0.91
1 1/2	63.5	51	1.25
2	76.0	60	2.10
2 1/2	92.0	76	3.94
3	110.0	86	5.98
3 1/2	121.0	95	7.41
4	146.0	106	12.36
<b>3000 lb</b>			
1/4	26.5	25	0.18
3/8	34.0	28	0.32
1/2	38.5	33	0.52
3/4	46.5	38	0.73
1	56.5	44	1.26
1 1/4	63.5	51	1.65
1 1/2	76.0	60	2.81
2	84.0	64	4.35
2 1/2	110.0	83	6.26
3	121.0	95	10.05
3 1/2	146.0	106	14.62
4	152.0	114	16.50
<b>6000 lb</b>			
3/8	38.5	33	0.59
1/2	46.5	38	0.96
3/4	56.5	44	1.50
1	63.5	51	2.10
1 1/4	76.0	60	3.30
1 1/2	84.0	64	5.72
2	110.0	83	9.64
2 1/2	121.0	95	13.40
3	146.0	106	16.15
3 1/2	152.0	114	18.23
4	152.0	114	16.70

Size T	B	A	Unit Weight (Kg)
<b>2000 lb</b>			
1/4	23.0	21	0.14
3/8	26.5	25	0.22
1/2	34.0	28	0.37
3/4	38.5	33	0.52
1	46.5	38	0.79
1 1/4	56.5	44	1.28
1 1/2	63.5	51	1.62
2	76.0	60	2.62
2 1/2	92.0	76	4.66
3	110.0	86	7.10
3 1/2	121.0	95	8.85
4	146.0	106	14.83
<b>3000 lb</b>			
1/4	26.5	25	0.23
3/8	34.0	28	0.40
1/2	38.5	33	0.63
3/4	46.5	38	0.93
1	56.5	44	1.47
1 1/4	63.5	51	1.78
1 1/2	76.0	60	3.42
2	92.0	64	5.50
2 1/2	110.0	83	7.66
3	121.0	95	11.21
3 1/2	146.0	106	16.72
4	152.0	114	19.00
<b>6000 lb</b>			
3/8	38.5	33	0.67
1/2	46.5	38	1.12
3/4	56.5	44	1.90
1	63.5	51	2.90
1 1/4	76.0	60	4.20
1 1/2	92.0	64	6.65
2	110.0	83	10.00
2 1/2	121.0	95	16.00
3	146.0	106	19.87
3 1/2	152.0	114	28.10
4	152.0	114	24.60

• Dimensions are in millimeters.  
• Dimensional Tolerances See ASME B16.11 or JIS B2316

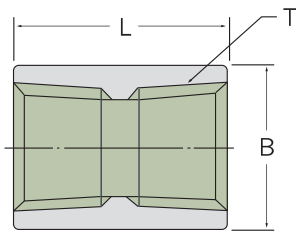
• Dimensions are in millimeters.  
• Dimensional Tolerances See ASME B16.11 or JIS B2316



# THREADED FITTINGS

3000lb, 6000lb

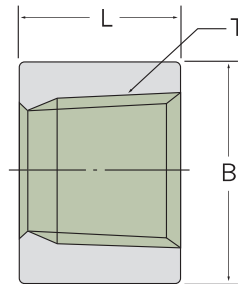
## Full Coupling



Size T	B	L	Unit Weight (Kg)
<b>3000 lb</b>			
1/4	22.0	35.1	0.050
3/8	25.0	38.1	0.061
1/2	30.0	48.0	0.142
3/4	35.0	51.0	0.218
1	45.0	61.0	0.418
1 1/4	57.0	67.0	0.720
1 1/2	63.5	80.0	1.065
2	76.0	86.0	1.400
2 1/2	92.0	92.0	2.550
3	108.0	108.0	3.830
3 1/2	127.0	114.3	5.720
4	140.0	121.0	6.350

Size T	B	L	Unit Weight (Kg)
<b>6000 lb</b>			
1/4	25.0	35.0	0.120
3/8	32.0	38.0	0.180
1/2	38.1	48.0	0.280
3/4	45.0	51.0	0.450
1	57.0	61.0	0.800
1 1/4	63.5	67.0	1.400
1 1/2	76.0	80.0	1.950
2	92.0	86.0	2.800
2 1/2	108.0	92.0	3.800
3	127.0	108.0	6.010
3 1/2	140.0	114.3	8.250
4	160.0	121.0	10.700

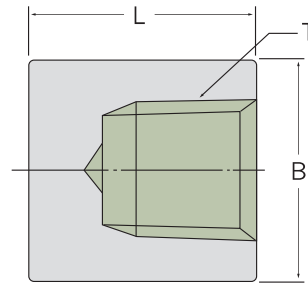
## Half Coupling



Size T	B	L	Unit Weight (Kg)
<b>3000 lb</b>			
1/4	22.0	17.5	0.025
3/8	25.0	19.0	0.030
1/2	30.0	24.0	0.070
3/4	35.0	25.5	0.100
1	45.0	30.5	0.210
1 1/4	57.0	33.5	0.365
1 1/2	63.5	40.0	0.520
2	76.0	43.0	0.690
2 1/2	92.0	46.0	1.250
3	108.0	54.0	1.840
3 1/2	127.0	57.5	2.860
4	140.0	60.5	3.510

Size T	B	L	Unit Weight (Kg)
<b>6000 lb</b>			
1/4	25.0	17.5	0.06
3/8	32.0	19.0	0.09
1/2	38.1	24.0	0.14
3/4	45.0	25.5	0.23
1	57.0	30.5	0.37
1 1/4	63.5	33.5	0.70
1 1/2	76.0	40.0	0.90
2	92.0	43.0	1.22
2 1/2	108.0	46.0	1.85
3	127.0	54.0	2.95
3 1/2	140.0	57.5	4.12
4	160.0	60.5	5.40

## CAP



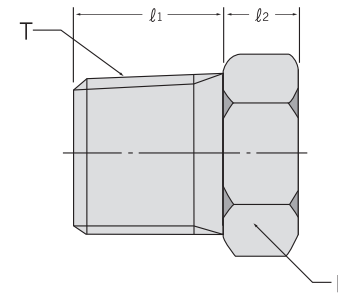
Size T	B	L	Unit Weight (Kg)
<b>3000 lb</b>			
1/4	22.0	25	0.05
3/8	25.0	25	0.08
1/2	30.0	32	0.12
3/4	35.0	37	0.20
1	45.0	41	0.31
1 1/4	57.0	44	0.60
1 1/2	63.5	44	0.73
2	76.0	48	1.05
2 1/2	92.0	60	2.27
3	108.0	65	3.83
3 1/2	127.0	68	4.52
4	140.0	68	6.35

Size T	B	L	Unit Weight (Kg)
<b>6000 lb</b>			
1/4	25.0	27	0.09
3/8	32.0	27	0.14
1/2	38.1	33	0.25
3/4	45.0	38	0.36
1	57.0	43	0.70
1 1/4	63.5	46	0.80
1 1/2	76.0	48	1.28
2	92.0	51	2.16
2 1/2	108.0	64	2.72
3	127.0	68	4.95
3 1/2	140.0	70	6.84
4	160.0	75	9.21

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

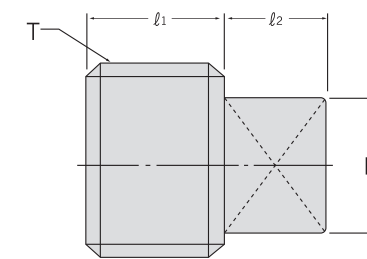
3000lb

## Hex. Head Plug



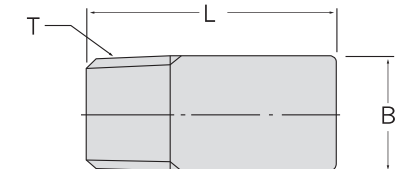
Size T	l2	l2	H	Unit Weight (Kg)
<b>3000 lb</b>				
1/8	11	6.3	11.0	0.03
1/4	13	6.3	14.0	0.03
3/8	14	8.0	19.0	0.06
1/2	18	8.0	22.0	0.08
3/4	19	10.0	27.0	0.14
1	21	10.0	36.0	0.22
1 1/4	22	14.0	46.0	0.51
1 1/2	24	16.0	50.0	0.62
2	25	18.0	63.5	1.02
2 1/2	32	19.0	76.2	1.76
3	40	21.0	99.0	2.66
3 1/2	41	22.0	103.0	3.72
4	42	32.0	117.0	5.90

## Square Plug



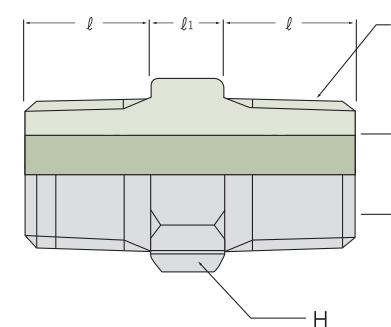
Size T	l2	l2	H	Unit Weight (Kg)
<b>3000 lb</b>				
1/8	9.9	6.6	7.0	0.007
1/4	13.0	6.6	9.0	0.014
3/8	13.0	7.9	12.0	0.028
1/2	15.0	9.9	14.0	0.057
3/4	16.0	11.0	17.0	0.085
1	20.1	13.0	19.0	0.140
1 1/4	21.1	15.0	24.0	0.255
1 1/2	21.1	16.0	27.0	0.397
2	23.1	18.0	32.0	0.680
2 1/2	27.0	20.0	38.1	1.020
3	29.0	21.0	42.9	1.301
3 1/2	30.0	22.2	47.6	2.050
4	32.0	25.0	63.5	3.257

## Round Plug



Size T	B	L	Unit Weight (Kg)
<b>3000 lb</b>			
1/8	10.3	35.0	0.057
1/4	13.5	41.3	0.057
3/8	17.5	41.3	0.085
1/2	21.4	44.5	0.170
3/4	27.0	44.5	0.170
1	33.4	50.8	0.340
1 1/4	42.9	50.8	0.340
1 1/2	48.4	50.8	0.710
2	60.3	63.5	1.361
2 1/2	73.0	70.0	2.155
3	88.9	70.0	3.456
3 1/2	101.6	76.2	4.216
4	114.3	76.2	5.838

## Hex. Nipple



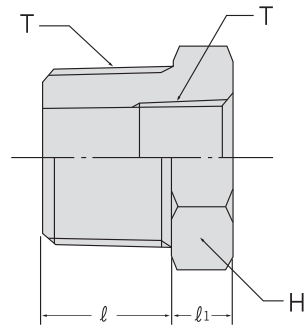
Size T	d	H	l	l1
<b>3000 lb</b>				
1/8	4	HEX12	10	6
1/4	7	HEX17	14	8
3/8	9	HEX19	15	8
1/2	12	HEX22	19	9
1 1/4	16	HEX27	21	10
1	20	HEX36	24	11
1 1/4	28	HEX46	27	12
1 1/2	32	HEX50	27	14
2	40	HEX65	31	16



# THREADED FITTINGS

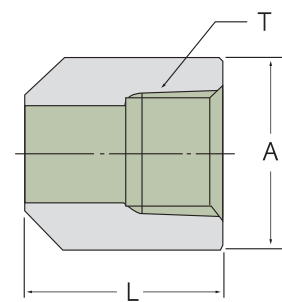
3000lb

## Hex. Bushing



T × T <sub>1</sub> (PT) (PT)	H	ℓ	ℓ <sub>1</sub>
<b>3000 lb</b>			
1/4 × 1/8	HEX17	14	8
3/8 × 1/4	HEX19	15	8
1/2 × 1/4	HEX24	19	9
1/2 × 3/8	HEX24	19	9
3/4 × 1/4	HEX30	21	10
3/4 × 3/8	HEX30	21	10
1 × 1/4	HEX36	24	11
1 × 3/8	HEX36	24	11
1 × 1/2	HEX36	24	11
1 × 3/4	HEX36	24	11
1 1/4 × 1/2	HEX46	27	12
1 1/4 × 3/4	HEX46	27	12
1 1/4 × 1	HEX46	27	12
1 1/2 × 1/2	HEX50	27	14
1 1/2 × 3/4	HEX50	27	14
1 1/2 × 1	HEX50	27	14
1 1/2 × 1 1/4	HEX50	27	14
2 × 3/4	HEX65	31	16
2 × 1	HEX65	31	16
2 × 1 1/4	HEX65	31	16
2 × 1 1/2	HEX65	31	16

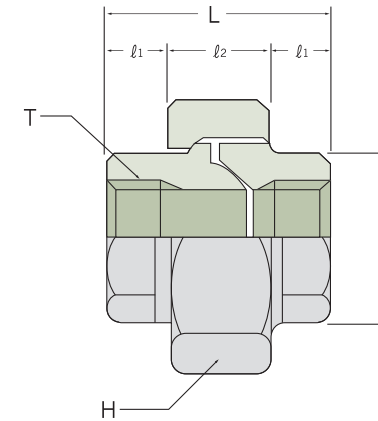
## Boss Type A



T (PT)	A	L
<b>3000 lb</b>		
1/4	22	30
3/8	26	30
1/2	32	33
3/4	38	35
1	46	43
1 1/4	55	46
1 1/2	65	50
2	75	57

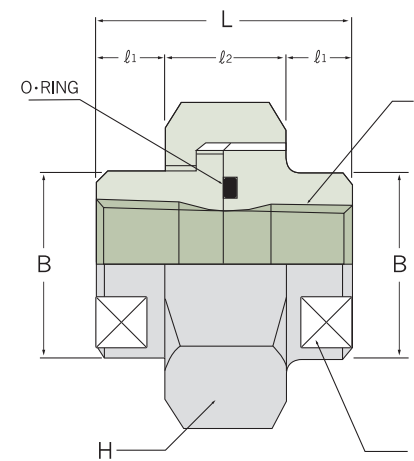
3000lb, 6000lb

## R.J Union



Size T	B	ℓ <sub>1</sub>	ℓ <sub>2</sub>	L	H	Unit Weight (Kg)
<b>3000 lb</b>						
1/4	21.0	11.5	18	41	35HEX	0.19
3/8	25.0	14.0	18	46	40HEX	0.25
1/2	32.0	15.0	21	51	46HEX	0.43
3/4	40.0	17.0	23	57	58HEX	0.62
1	48.0	19.5	25	64	65HEX	1.03
1 1/4	55.5	22.5	27	72	76OCT	1.15
1 1/2	63.5	24.0	30	78	83OCT	1.54
2	76.0	26.0	36	88	103OCT	3.05
2 1/2	95.0	34.0	42	110	124OCT	5.14
3	110.0	37.0	45	120	150OCT	7.12
4	148.0	45.0	50	140	180OCT	12.40
<b>6000 lb</b>						
1/4	25.4	13.5	19	46	40HEX	0.25
3/8	32.0	15.0	21	51	46HEX	0.43
1/2	40.0	17.0	23	57	56HEX	0.62
3/4	44.5	19.5	25	64	65HEX	0.94
1	51.0	22.5	27	72	74OCT	1.08
1 1/4	57.2	24.0	30	78	83OCT	1.41
1 1/2	71.5	26.0	36	88	103OCT	2.75
2	90.0	34.0	42	110	124OCT	5.05
2 1/2	105.0	37.5	45	120	150OCT	6.87
3	125.0	45.0	50	140	180OCT	10.85

## O-Ring Union



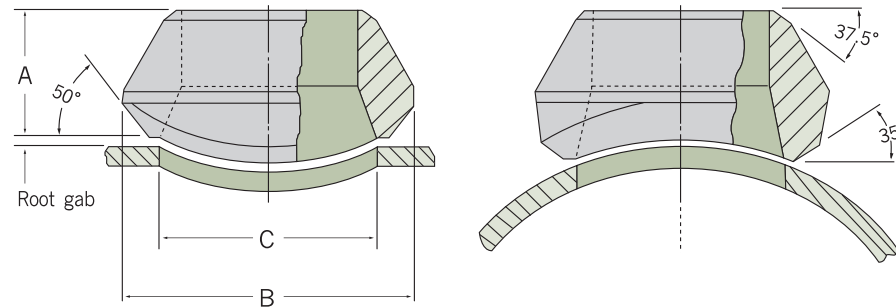
Size T	B	ℓ <sub>1</sub>	ℓ <sub>2</sub>	L	L	H	O-Ring	Unit Weight (Kg)
<b>3000 lb</b>								
1/4	22	10	18	38	21	35HEX	P18	0.160
3/8	27	10	18	38	26	41HEX	P20	0.215
1/2	32	12	20	44	32	46HEX	G25	0.312
3/4	38	12	26	50	38	54HEX	G30	0.477
1	47	15	26	56	46	63HEX	G35	0.764
1 1/4	56	15	30	60	54	77HEX	G45	1.106
1 1/2	63	18	36	72	63	80OCT	G50	1.327
2	76	18	36	72	77	95OCT	G65	1.856

- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16.11 or JIS B2316

# FORGED OUTLET FITTINGS

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

## Weldolet(SWLT)



### STD, X-S

Outlet Size	A		B		C		APP'Weight(kg)	
	STD	X-S	STD	X-S	STD	X-S	STD	X-S
1/2	19.1	19.1	34.9	34.9	23.8	23.8	0.08	0.09
3/4	22.2	22.2	44.5	44.5	30.2	30.2	0.11	0.14
1	27.0	27.0	54.0	54.0	36.5	36.5	0.23	0.21
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5	0.36	0.41
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8	0.45	0.50
2	38.1	38.1	88.9	88.9	65.1	65.1	0.80	0.80
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2	1.14	1.20
3	44.5	44.5	122.2	122.2	93.7	93.7	1.82	1.90
4	50.8	50.8	152.4	152.4	120.7	120.7	2.86	2.90
5	57.2	57.2	179.4	179.4	141.3	141.3	4.66	4.70
6	60.3	77.8	215.9	225.4	169.9	169.9	6.45	10.50
8	69.9	98.5	263.5	292.1	220.7	220.7	10.68	16.80
10	77.8	93.7	322.3	323.9	274.7	265.1	17.73	20.90
12	85.7	103.2	377.8	397.4	325.4	317.5	26.82	27.70
14	88.9	100.0	409.6	431.8	357.2	350.8	30.00	31.80
16	93.7	106.4	463.6	466.7	408.0	403.2	34.10	46.40
18	96.8	111.1	520.7	523.9	458.8	455.6	44.10	59.10
20	101.6	119.1	571.5	582.6	508.0	509.6	53.60	71.80
24	115.9	139.7	689.0	708.0	614.4	638.2	100.00	131.80

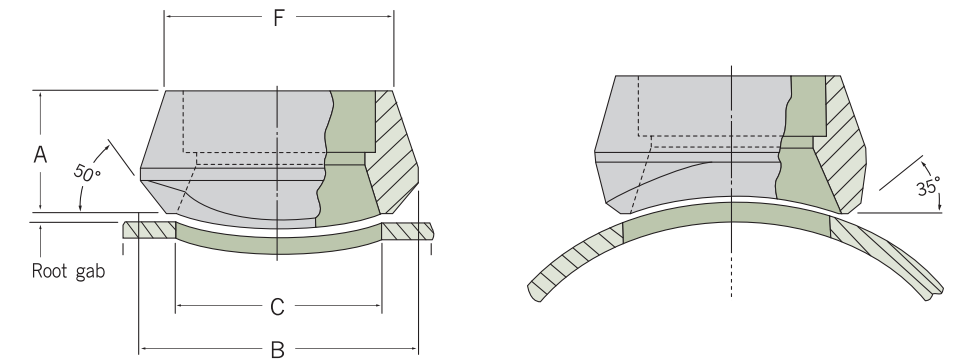
### Sch 160, XX-S

Outlet Size	A		B		C		APP'Weight(kg)	
	Sch 160	XX-s	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	0.11	-
3/4	31.8	31.8	44.5	44.5	19.1	19.1	0.32	-
1	38.1	38.1	50.8	50.8	25.4	25.4	0.38	0.38
1 1/4	44.5	44.5	61.9	61.9	33.3	33.3	0.57	0.57
1 1/2	50.8	50.8	69.9	69.9	38.1	38.1	0.80	0.80
2	55.6	55.6	81.0	81.0	42.9	42.9	1.00	1.00
2 1/2	61.9	61.9	96.8	96.8	54.0	54.0	1.54	1.54
3	73.0	73.0	120.7	120.7	73.0	73.0	2.90	2.90
4	84.1	84.1	152.4	152.4	98.4	98.4	4.80	4.80
5	93.7	93.7	187.3	187.3	122.2	122.2	6.50	6.50
6	104.8	104.8	220.7	220.7	146.1	146.1	12.70	12.70
8	111.1	111.1	284.2	284.2	173.0	173.0	20.50	20.50
10	125.4	125.4	312.7	312.7	215.9	215.9	38.60	38.60

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

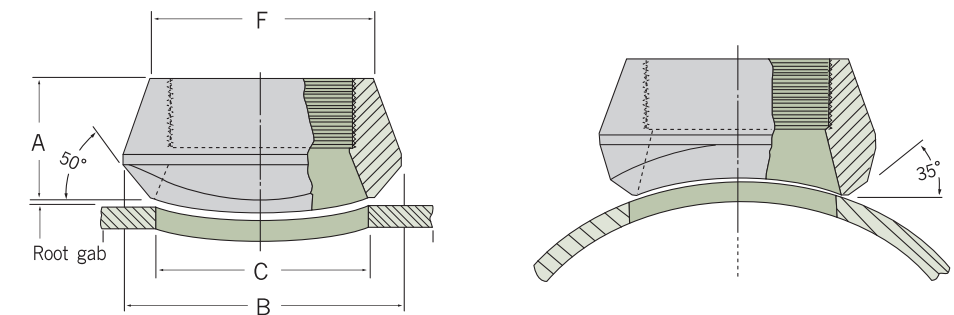
3000#, 6000#

## Socketlet(SCLT)



Outlet Size	A		B		C		F		APP'Weight(kg)	
	3000#	6000#	3000#	6000#	3000#	6000#	3000#	6000#	3000#	6000#
1/2	25.4	31.8	34.9	44.5	23.8	19.1	31.8	39.7	0.14	0.23
3/4	27.0	36.5	44.5	50.8	30.2	25.4	36.5	46.6	0.15	0.36
1	33.3	39.7	54.0	61.9	36.5	33.3	46.0	57.2	0.27	0.59
1 1/4	33.3	41.3	65.1	69.9	44.5	38.1	55.6	65.1	0.39	0.73
1 1/2	34.9	42.9	73.0	82.6	50.8	49.2	61.9	76.2	0.47	0.91
2	38.1	58.7	88.9	103.2	65.1	58.7	74.6	92.1	0.73	2.33
2 1/2	46.0	-	103.2	-	76.2	-	87.3	-	1.25	-
3	50.8	-	122.2	-	93.7	-	104.8	-	1.73	-
4	57.2	-	152.4	-	120.7	-	130.2	-	3.30	-

## Threadolet(STLT)



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

- Dimensions are in millimeters.
- Applicable Run Pipe Sizes are from Out-let Size to 36 inch
- For the 3000# and 6000# Socketlets and Threadolets, Inside Bore, Thread Socket Bore and Socket Depth Dimensions are According to ASME B16.11.

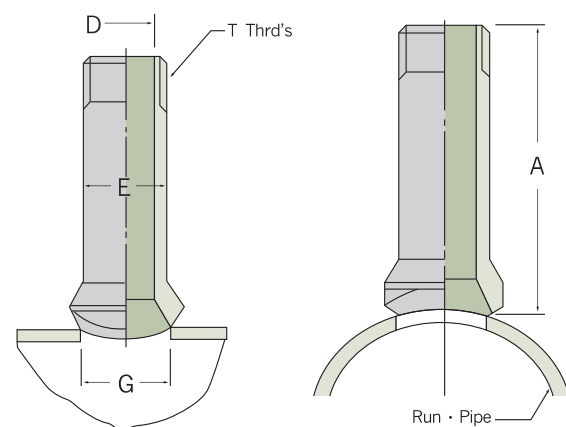


# FORGED OUTLET FITTINGS

# TECHNICAL DATA

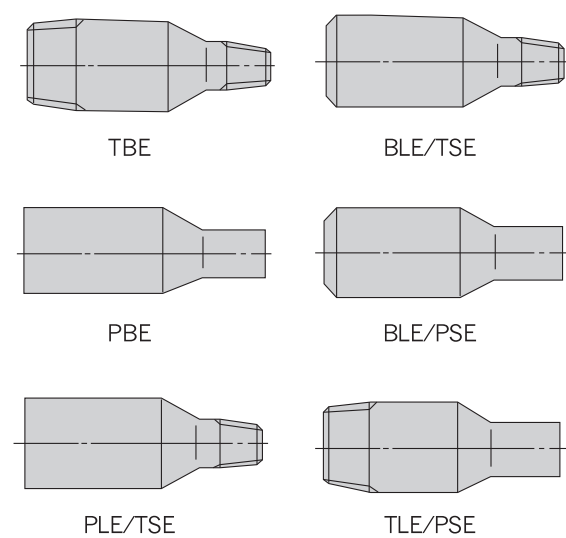
3000lb

## Nipplet



Run Pipe Size	Outlet Size T	A	G	D	E	Unit Weight (kg)
<b>3000 lb</b>						
36- 3/4	1/4	88.9	23.9	14.0	21.3	0.36
36-1	3/8	88.9	30.2	18.8	26.7	0.56
36- 1/4	1	88.9	36.6	24.4	33.3	0.84
36- 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

## Swaged Nipple



Large end Size	Small end Size	Length(mm)
<b>3000 lb</b>		
1/2	3/8 ~ 1/8	70
3/4	1/2 ~ 1/8	76
1	1/2 ~ 1/4	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

•Swaged Nipples are made from Forged Steel or Pipe

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

## 1. Forged Socket Welding. Threaded Fitting Bore

in millimeters.

	ASME B16.11		JIS B2316		
	Socket Welding(M)	Threaded(T)	Socket Welding(M)	Threaded(T)	
1/8"	10.90,	10.65	NPT 1/8	11.0	PT 1/8
1/4"	14.35,	14.10	NPT 1/4	14.3	PT 1/4
3/8"	17.80,	17.55	NPT 3/8	17.8	PT 3/8
1/2"	21.95,	21.70	NPT 1/2	22.2	PT 1/2
3/4"	27.30,	27.05	NPT 3/4	27.7	PT 3/4
1"	34.05,	33.80	NPT 1	34.5	PT 1
1 1/4"	42.80,	42.55	NPT 1 1/4	43.2	PT 1 1/4
1 1/2"	48.90,	48.65	NPT 1 1/2	49.1	PT 1 1/2
2"	61.35,	61.10	NPT 2	61.1	PT 2
2 1/2"	74.20,	73.80	NPT 2 1/2	77.1	PT 2 1/2
3"	90.15,	89.80	NPT 3	90.0	PT 3
4"	115.8,	115.45	NPT 4	115.4	PT 4

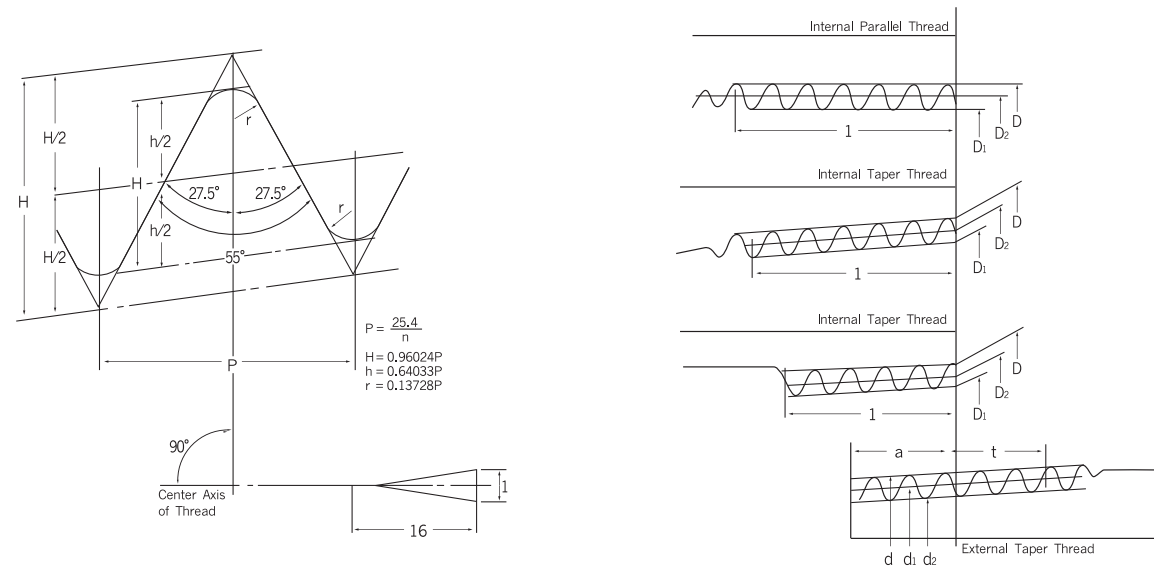
## 2. TOLERANCE

### Forged Socket Welding, Threaded Fitting(ASME B16.11)

Nominal Pipe Size	All Fittings				Elbow, Tee, Cross	Coupling	Half Coupling
	Socket Bore Dia	Bore Dia. of Fitting	Concentricity of Bore	Concidence of Axis	Center to Bottom of Socket	Bottom to Bottom of Socket	Bottom to Socket to Opposite Face
1/8-1/4	+0.012 -0.000	±0.03	Socket and Fitting bores within ±0.03	Maximum variation in alignment of socket and fitting bores for in 12	±0.03	±0.06	±0.03
3/8-3/4	+0.012 -0.000	±0.03			±0.06	±0.12	±0.06
1-2	+0.012 -0.000	±0.03			±0.08	±0.16	±0.08
2 1/2-3	+0.012 -0.000	±0.06			±0.10	±0.20	±0.10

# TECHNICAL DATA

## 3. KS B0222 & JIS B0203 Pipe Threads

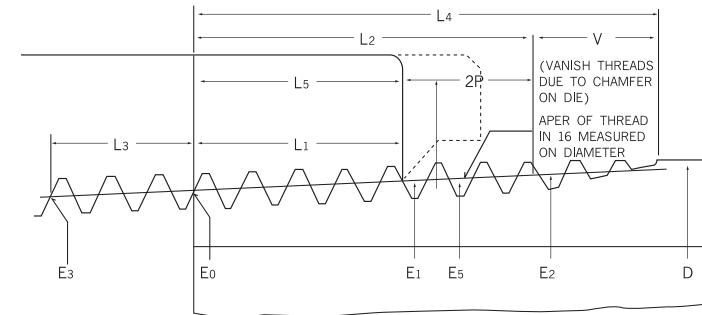


### Basic Thread Data

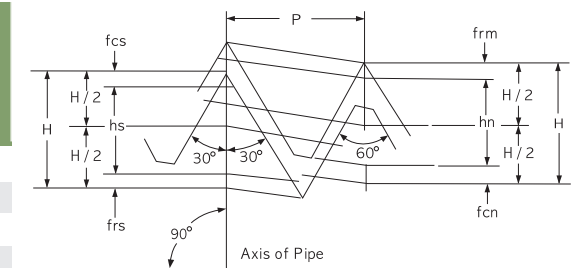
Nominal Size	Number of Threads Per Inch	Screw Thread			Basic Diameter			Position of Basic Diameter			Tolerances on Basic Diameters of Internal Parallel Thread	Effective Thread Length (Min.)				Nominal Pipe Size (For Reference)		
		Pitch	Height of Thread	Rounding	External Thread			External Thread	Internal Thread	External Thread		Internal Thread	External Thread	Internal Thread	External Thread			Internal Thread
					Major Diameter $d$	Pitch Diameter $d_2$	Minor Diameter $d_1$											
					Major Diameter	Pitch Diameter	Minor Diameter	Basic Length	Tolerance Axially	Tolerance Axially		Internal Taper thread	Internal Parallel Thread	Internal Taper and Parallel thread	Outside Diameter			Wall thickness
n	P	h	r	D	D <sub>2</sub>	D <sub>1</sub>	a	±b	±c	±	f	l	l	t				
PT 15( 1/2 )	14	1.8143	1.162	0.25	20.955	19.793	18.631	8.16	1.81	2.27	0.142	5.00	12.7	15.0	9.1	21.7	2.8	
PT 20( 3/4 )	14	1.8143	1.162	0.25	26.441	25.279	24.117	9.53	1.81	2.27	0.142	5.60	14.1	16.3	10.2	27.2	2.8	
PT 25( 1 )	11	2.3091	1.479	0.32	33.249	31.770	30.291	10.39	2.31	2.89	0.180	6.40	16.2	19.0	11.5	34.0	3.2	
PT 32(1 1/4 )	11	2.3091	1.479	0.32	41.910	40.431	38.952	12.70	2.31	2.89	0.180	6.40	18.5	21.4	13.4	42.7	3.5	
PT 40(1 1/2 )	11	2.3091	1.479	0.32	47.803	46.324	44.845	12.70	2.31	2.89	0.180	6.40	18.5	21.4	13.4	48.6	3.5	
PT 50( 2 )	11	2.3091	1.479	0.32	59.614	58.135	56.656	15.88	2.31	2.89	0.180	7.50	22.8	25.7	16.9	60.5	3.8	
PT 65(2 1/2 )	11	2.3091	1.479	0.32	75.184	73.705	72.226	17.46	3.46	3.46	0.217	9.22	26.7	30.2	18.6	76.3	4.2	
PT 80( 3 )	11	2.3091	1.479	0.32	87.884	86.405	84.926	20.64	3.46	3.46	0.217	9.22	29.9	33.3	21.1	89.1	4.2	
PT 90(3 1/2 )	11	2.3091	1.479	0.32	100.330	98.851	97.372	22.23	3.46	3.46	0.217	9.30	31.5	34.9	22.4	101.6	4.2	
PT 100( 4 )	11	2.3091	1.479	0.32	113.030	111.551	110.072	25.40	3.46	3.46	0.217	10.40	35.9	39.3	25.9	114.3	4.5	
PT 125( 5 )	11	2.3091	1.479	0.32	138.430	136.952	135.472	25.58	3.46	3.46	0.217	11.40	40.1	43.6	29.3	139.8	4.5	
PT 150( 6 )	11	2.3091	1.479	0.32	163.830	162.351	160.872	28.58	3.46	3.46	0.217	11.50	40.1	43.6	29.3	165.2	5.0	

• Dimensions are in millimeters.

## 4. ASME B1.20.1 Taper Pipe Threads. (Except Dryseal)



Taper 1 in 16 on Diameter (Shown Exaggerated in Diagram)



### Thread Height Dimensions

Thread Element	27 Threads Per inch P= 0.03704	18 Threads Per inch P= 0.05556	14 Threads Per inch P= 0.07143	11 1/2 Threads Per inch P= 0.08696	8 Threads Per inch P= 0.12500
H=0.866p	0.0321	0.4810	0.0619	0.0753	0.1082
hs=hn=0.760p	0.0281	0.0422	0.0543	0.0661	0.0950
frs=frn=0.033p	0.0012	0.0088	0.0024	0.0029	0.0041
fcs=fcn=0.073p	0.0027	0.0041	0.0052	0.0063	0.0091

### Basic Thread Data

Nominal Pipe Size (NPT)	Outside Diameter of Pipe D	Threads per inch n	Pitch of Thread P	Pitch Diameter at beginning of External Thread	Handtight Engagement		Effective Thread, External			
					Length L <sub>1</sub>		Dia E <sub>1</sub>	Length L <sub>2</sub>		Dia E <sub>2</sub>
					In.	Thds.		In.	Thds.	
1	2	3	4	5	6	7	8	9	10	11
1/8	0.405	27.0	0.03704	0.36351	0.1615	4.36	0.37360	0.2639	7.12	0.38000
1/4	0.540	18.0	0.05556	0.47739	0.2278	4.10	0.49163	0.4018	7.23	0.50250
3/8	0.675	18.0	0.05556	0.61201	0.2400	4.32	0.62701	0.4078	7.43	0.63750
1/2	0.840	14.0	0.07143	0.75843	0.3200	4.48	0.77843	0.5337	7.47	0.79179
3/4	1.050	14.0	0.07143	0.96768	0.3390	4.75	0.98887	0.5457	7.64	1.00179
1	1.315	11.5	0.08696	1.21363	0.4000	4.60	1.23863	0.6828	7.85	1.25630
1 1/4	1.660	11.5	0.08696	1.55713	0.4200	4.83	1.58338	0.7068	8.13	1.60130
1 1/2	1.900	11.5	0.08696	1.79609	0.4200	4.83	1.82234	0.7235	8.32	1.84130
2	2.375	11.5	0.08696	2.26902	0.4360	5.01	2.29627	0.7565	8.70	2.31630
2 1/2	2.875	8.0	0.12500	2.71953	0.6820	5.46	2.76216	1.1375	9.10	2.79062
3	3.500	8.0	0.12500	3.34062	0.7660	6.13	3.38850	1.2000	9.60	3.41562
3 1/2	4.000	8.0	0.12500	3.83750	0.8210	6.57	3.88881	1.2500	10.00	3.91562
4	4.500	8.0	0.12500	4.33438	0.8440	6.75	4.38712	1.3000	10.40	4.41562

Nominal Pipe Size (NPT)	Wrench Makeup Length for External Thread L <sub>2</sub> L <sub>1</sub>		Wrench Makeup Length for External Thread		Vanish Thread V		Overall Length External Thread L <sub>4</sub>	Nominal, Complete External Threads <sup>3</sup>		Height of Thread h	Increase in Dia per Thread, 0.0625/n	Basic Minor Dia at Small End of Pipe, Ka	
	In.	Thds.	In.	Thds.	In.	Thds.		Length L <sub>4</sub>	Dia E <sub>5</sub>				
1	12	13	14	15	16	17	18	19	20	21	22	23	24
1/8	0.1024	2.76	0.1111	3	0.35656	0.1285	3.47	0.3924	0.1898	0.37537	0.02963	0.00231	0.3339
1/4	0.1740	3.13	0.1667	3	0.46697	0.1928	3.47	0.5946	0.2907	0.49556	0.04444	0.00347	0.4329
3/8	0.1678	3.02	0.1667	3	0.60160	0.1928	3.47	0.6006	0.2967	0.63056	0.04444	0.00347	0.5676
1/2	0.2137	2.99	0.2143	3	0.74504	0.2478	3.47	0.7815	0.3909	0.78286	0.05714	0.00446	0.7013
3/4	0.2067	2.89	0.2143	3	0.95429	0.2478	3.47	0.7935	0.4029	0.99286	0.05714	0.00446	0.9105
1	0.2828	3.25	0.2609	3	1.19733	0.3017	3.47	0.9845	0.5089	1.24543	0.06957	0.00543	1.1441
1 1/4	0.2868	3.30	0.2609	3	1.54083	0.3017	3.47	1.0085	0.5329	1.59043	0.06957	0.00543	1.4876
1 1/2	0.3035	3.49	0.2609	3	1.77978	0.3017	3.47	1.0252	0.5496	1.83043	0.06957	0.00543	1.7265
2	0.3205	3.69	0.2609	3	2.25272	0.3017	3.47	1.0582	0.5826	2.30543	0.06957	0.00543	2.1995
2 1/2	0.4555	3.64	0.2500	2	2.70391	0.4337	3.47	1.5712	0.8875	2.77500	0.10000	0.00781	2.6195
3	0.4340	3.47	0.2500	2	3.32500	0.4337	3.47	1.6337	0.9500	3.40000	0.10000	0.00781	3.2406
3 1/2	0.4290	3.43	0.2500	2	3.82188	0.4337	3.47	1.6837	1.0000	3.90000	0.10000	0.00781	3.7375
4	0.4560	3.65	0.2500	2	4.31875	0.4337	3.47	1.7337	1.0500	4.40000	0.10000	0.00781	4.2344

• Dimensions are in inches.



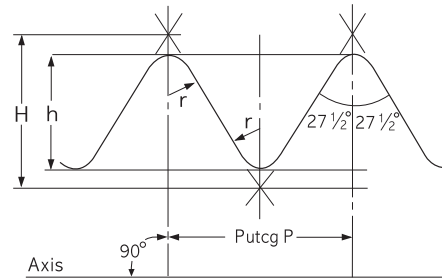
# TECHNICAL DATA

## 5. BS21-1973 British Standard Taper Pipe Threads. (Except Dryseal)

$$H = 0.960237 P$$

$$h = 0.460327 P$$

$$r = 0.137278 P$$



Taper 1 in 16 on Diameter  
(Shown Exaggerated in Diagram)

BSP Size Nominal Bore of Pipe	No. of Threads per inch	Pitch		Depth of Thread		BASIC-Diameters at Gauge Plane						Gauge Length							
						Major (Gauge Diameter)		Effective		Minor		Basic		Tolerance Plus and Minus		Max.		Min.	
						in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1/2	14	0.07143	1.814	0.0457	1.162	0.825	20.955	0.7793	19.793	0.7336	18.631	0.3214	8.2	0.0714	1.8	0.3928	10.0	0.2500	6.4
3/4	14	0.07143	1.814	0.0457	1.162	1.041	24.441	0.9953	25.279	0.9496	24.117	0.3750	9.5	0.0714	1.8	0.4464	11.3	0.3036	7.7
1	11	0.09091	2.309	0.0582	1.479	1.309	33.249	1.2508	31.770	1.1926	30.291	0.4091	10.4	0.0909	2.3	0.5000	12.7	0.3182	8.1
1 1/4	11	0.09091	2.309	0.0582	1.479	1.650	41.910	1.5918	40.431	1.5335	38.952	0.5000	12.7	0.0909	2.3	0.5909	15.0	0.4091	10.4
1 1/2	11	0.09091	2.309	0.0582	1.479	1.882	47.803	1.8238	46.324	1.7656	44.845	0.5000	12.7	0.0909	2.3	0.5909	15.0	0.4091	10.4
2	11	0.09091	2.309	0.0582	1.479	2.347	59.614	2.2888	58.135	2.2306	56.656	0.6250	15.9	0.0909	2.3	0.7159	18.2	0.5341	13.6
2 1/2	11	0.09091	2.309	0.0582	1.479	2.960	75.184	2.9018	73.705	2.8436	72.226	0.6875	17.5	0.1364	3.5	0.8239	21.0	0.5511	14.0
3	11	0.09091	2.309	0.0582	1.479	3.460	87.884	3.4018	86.405	3.3436	84.926	0.8125	20.6	0.1364	3.5	0.9486	24.1	0.6761	17.1
4	11	0.09091	2.309	0.0582	1.479	4.450	113.030	4.3918	111.551	4.3336	110.072	1.0000	25.4	0.1364	3.5	1.1364	28.9	0.8636	21.9
5	11	0.09091	2.309	0.0582	1.479	5.450	138.430	5.3918	136.951	5.3336	135.472	1.1250	28.6	0.1364	3.5	1.2614	32.1	0.9886	25.1
6	11	0.09091	2.309	0.0582	1.479	6.450	162.351	6.3918	162.351	6.3336	160.872	1.1250	28.6	0.1364	3.5	1.2614	32.1	0.9886	25.1

BSP Size Nominal Bore of Pipe	No. of Threads per inch	Effective Thread, External						Fitting Allowance	Wrenching Allowance	Tolerance of Position of Gauge Plane Relative to Face of internally Taper Threaded Parts (Plus and Minus)	BSP Size Nominal Bore of Pipe			
		For Basic Gauge Length		For Max. Gauge Length		For Min. Gauge Length								
		in.	mm	in.	mm	in.	mm							
1/8	14	0.5178	13.2	0.5892	15.0	0.4464	11.4	0.1964	5.0	0.1071	2.7	0.0893	2.3	1/8
3/4	14	0.5714	14.5	0.6428	16.3	0.5000	12.7	0.1964	5.0	0.1071	2.7	0.0893	2.3	3/4
1	11	0.6591	16.8	0.7500	19.1	0.5682	14.5	0.2500	6.4	0.1364	3.5	0.1136	2.9	1
1 1/4	11	0.7500	19.1	0.8509	21.4	0.6591	16.8	0.2500	6.4	0.1364	3.5	0.1136	2.9	1 1/4
1 1/2	11	0.7200	19.1	0.8409	21.4	0.6591	16.8	0.2500	6.4	0.1364	3.5	0.1136	2.9	1 1/2
2	11	0.9204	23.4	1.0113	25.7	0.8259	21.1	0.2954	7.5	0.1818	4.6	0.1136	2.9	2
2 1/2	11	1.0511	26.7	1.1875	30.2	0.9247	23.2	0.3636	9.2	0.2273	5.8	0.1364	3.5	2 1/2
3	11	1.1761	29.8	1.3125	33.3	1.0397	26.3	0.3636	9.2	0.2273	5.8	0.1364	3.5	3
4	11	1.4091	35.8	1.5455	39.3	1.2727	32.3	0.4091	10.4	0.2727	6.9	0.1364	3.5	4
5	11	1.5795	40.1	1.7159	43.6	1.4431	36.6	0.4545	11.5	0.3182	8.1	0.1364	3.5	5
6	11	1.5795	40.1	1.7159	43.6	1.4431	36.6	0.4545	11.5	0.3182	8.1	0.1364	3.5	6

## 6. Material Specifications

ASTM STANDARD

ASTM	Grade	Classification	CHEMICAL COMPOSITION								MECHANICAL PROPERTIES				
			C %	Mn %	P Max. %	S Max. %	Si %	Ni %	Cr %	Mo %	T.S. Min. psi (kg/mm <sup>2</sup> )	Y.S. Min. psi (kg/mm <sup>2</sup> )	EL. Min. %	Red. Min. %	HB
A-105*		Carbon Steel	Max 0.35	0.60~1.05	0.040	0.050	Max 0.35	Max 0.40	Max 0.30	Max 0.12	70,000 (49.2)	36,000 (25.3)	22	30	Max 187
A-181* 60		Carbon Steel	Max 0.35	Max 0.90	0.050	0.050	Max (0.35)				60,000 (42.2)	30,000 (21.1)	22	35	
A-181 70		Carbon Steel	Max 0.35	Max 0.90	0.050	0.050	Max (0.35)				70,000 (49.2)	36,000 (25.3)	18	24	
A-182 F1		1/2MO	Max 0.28	0.60~0.90	0.045	0.045	0.15~0.35			0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	143~192
A-182 F5		5Cr-1/2MO	Max 0.15	0.30~0.60	0.030	0.030	Max 0.50	Max 0.50	4.00~6.00	0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	35	143~217
A-182 F5a		5Cr-1/2MO	Max 0.25	Max 0.60	0.040	0.030	Max 0.50	Max 0.50	4.00~6.00	0.44~0.65	90,000 (63.3)	65,000 (45.7)	22	50	187~248
A-182 F11-1		1 1/4Cr-1/2MO	0.05~0.15	0.30~0.60	0.030	0.030	0.50~1.00		1.00~1.50	0.44~0.65	60,000 (42.2)	30,000 (21.1)	20	45	121~174
A-182 F11-2		1 1/4Cr-1/2MO	0.10~0.20	0.30~0.80	0.040	0.040	0.50~1.00		1.00~1.50	0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	143~207
A-182 F11-3		1 1/4Cr-1/2MO	0.10~0.20	0.30~0.80	0.040	0.040	0.50~1.00		1.00~1.50	0.44~0.65	75,000 (52.7)	45,000 (31.6)	20	30	156~207
A-182 F12-1		1Cr-1/2MO	0.05~0.15	0.30~0.60	0.045	0.045	Max 0.50		0.80~1.25	0.44~0.65	60,000 (42.2)	30,000 (21.1)	20	45	121~174
A-182 F12-2		1Cr-1/2MO	0.10~0.20	0.30~0.80	0.040	0.040	0.10~0.60		0.80~1.25	0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	143~174
A-182 F11		1 1/4Cr-1/2MO	0.10~0.20	0.30~0.60	0.040	0.040	0.50~1.00		1.00~1.50	0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	143~207
A-182 F12		1Cr-1/2MO	0.10~0.20	0.30~0.80	0.040	0.040	0.10~0.60		0.80~1.25	0.44~0.65	70,000 (49.2)	40,000 (28.1)	20	30	143~207
A-182 F22		2 1/4Cr-1 MO	Max 0.15	0.30~0.60	0.040	0.040	Max 0.50		2.00~2.50	0.87~1.13	75,000 (52.7)	45,000 (31.6)	20	30	156~207
A-182 F304		18Cr-8 Ni	Max 0.08	Max 2.00	0.040	0.030	Max 1.00	8.00~11.00	18.00~20.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-182 F304L		18Cr-8 Ni Low	Max 0.035	Max 2.00	0.040	0.030	Max 1.00	8.00~13.00	18.00~20.00		75,000 (49.2)	25,000 (17.6)	30	50	
A-182 F316		18Cr-8 Ni Mo	Max 0.08	Max 2.00	0.040	0.030	Max 1.00	10.00~14.00	16.00~18.00	2.00~3.00	75,000 (52.7)	30,000 (21.7)	30	50	
A-182 F316L		18Cr-8 Ni Mo-Low	Max 0.035	Max 2.00	0.040	0.030	Max 1.00	10.00~15.00	16.00~18.00	2.00~3.00	65,000 (45.7)	25,000 (17.6)	30	50	
A-182 F321		18Cr-8 Ni Ti	Max 0.08	Max 2.00	0.030	0.030	Max 1.00	9.00~12.00	Min 17.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-182 F347		18Cr-8 Ni Cb	Max 0.08	Max 2.00	0.030	0.030	Max 1.00	9.00~13.00	17.00~20.00		75,000 (52.7)	30,000 (21.1)	30	50	
A-350* LF1		Carbon Steel	Max 0.30	0.75~1.05	0.035	0.040	0.15~0.30	Max 0.40	Max 0.30	Max 0.12	60,000~85,000 (42.2~59.7)	30,000 (21.1)	25	38	
A-350* LF2		Carbon Steel	Max 0.30	Max 1.35	0.035	0.040	0.15~0.30	Max 0.40	Max 0.30	Max 0.12	70,000~95,000 (49.2~66.8)	36,000 (25.3)	22	30	
A-350* LF3		3 1/2 Ni	Max 0.20	Max 0.90	0.035	0.040	0.20~0.35	3.25~3.75	Max 0.30	Max 0.12	70,000~95,000 (49.2~66.8)	37,500 (26.4)	22	35	

- OTHER ELEMENTS : copper (0.40% MAX.), Vanadium (0.03% MAX.), Columbium (0.02% MAX.)
- The sum of Cu, Ni, Cr and Mo shall not be exceed 1.00%
- The sum of Cr and Mo shall not be exceed 0.32%

# TECHNICAL DATA

# STANDARDS

Steel Composition	ASTM Specification and Grade			KS Specification and Grade			
	Marking Symbol	Pipe	Plate	Forging	Marking Symbol	Pipe	Plate
Carbon Steel	-	A120	A283-A	-	SPP	SPP	SB41
	-	A53-B	A284	-	PS38(W), PS38, PT38(W), PT38	SPPS38	SWS41B
	-	A53-B	A284	-	PS42(W), PS42, PT42(W), PT42	SPPS42	SWS41B
	-				HT38, HT38(W)	SPHT38	SBB42
	WPB	A106-B	A515-60or70 A516-60or70	A105	HT42, HT42(W)	SPHT42	SBB42
	WPC	A106-C	A516-70 A516-70	A105	HT49, HT49(W)	SPHT49	SBB49
Low Temperature Steel	WPL6	A333 and A334-6	A516-60	A350-LF2	PL39	SPHL39	SLA39
	WPL3	A333 and A334-3	A203-D	A350-LF3	-	-	-
	WPL9	A333 and A334-9	A203-A	A350-LF9	-	-	-
Alloy Steel	WP1	A335-P1	A203-B	A182-F1	PA12, FA12	SPA12	SBB46M
	WP12	A335-P12	A387-12	A182-F12	PA22, FA22	SPA22	SCMV2
	WP11	A335-P11	A387-11	A182-F11	PA23, FA23	SPA23	SCMV3
	WP22	A335-P22	A387-22	A182-F22	PA24, FA24	SPA24	SCMV4
	WP7	A335-P5	A387-5	A182-F5	PA25, FA25	SPA25	SCMV6
	WP5	A335-P7	A387-7	A182-F7	-	-	-
	WP9	A335-P9	A387-9	A182-F9	-	-	-
	WP91	A335-P91	A387-91	A182-F91	-	-	-
		WP304	A312-TP304	A240-Type304	A182-F304	STS304, STS304W, STS304F	STS304TP
	WP304H	A312-TP304H	A240-Type304H	A182-F304H	-	-	-
	WP304L	A312-TP304L	A240-Type304L	A182-F304L	STS304L, STS304LW, STS304LF	STS304LTP	STS304L
	WP309	A312-TP309	A240-Type309S	-	STS309S, STS309SW, STS309SF	STS309STP	STS309S
	WP310	A312-TP310	A240-Type310S	A182-F310	STS310S, STS310SW, STS310SF	STS310STP	STS310S
	WP316	A312-TP316	A240-Type316	A182-F316	STS316, STS316W, STS316F	STS316TP	STS316
	WP316H	A312-TP316H	A240-Type316H	A182-F316H	STS316H, STS316HF	STS316HTP	-
	WP316L	A312-TP316L	A240-Type316L	A182-F316L	STS316L, STS316LW, STS316LF	STS316LTP	STS316L
	WP317L	A312-TP317L	A240-Type317L	A182-F317L	STS317L, STS317LW	STS317LTP	STS317L
	WP321	A312-TP321	A240-Type321	A182-F321	STS321, STS321W, STS321F	STS321TP	STS321
	WP321H	A312-TP321H	A240-Type321H	A182-F321H	-	-	-
	WP347	A312-TP347	A240-Type347	A182-F347	STS347, STS347W, STS347F	STS347TP	STS347
	WP347H	A312-TP347H	A240-Type347H	A182-F347H	STS347H, STS347HF	STS347HTP	-

JIS Specification and Grade			B.S. Specification and Grade	DIN Specification and Grade	Steel Composition
Marking Symbol	Pipe	Plate	Pipe	Pipe	
FSGP or SGP	SGP(STPY400)	SS400	1387-M	2440-ST33-1	Carbon Steel
PG370(W), PS370(W), PT370(W), PT370	STPG370	SM41B	3602-ERW23	1626-ST37	Carbon Steel
PG410(W), PS410(W), PT410(W), PT410	STPG410	SM41B	3602-ERW27	-	Carbon Steel
FS370, PT370(W)	STPT370	SB42	3602-Steel 23	17175-ST35.8	Carbon Steel
FS410, PT410(W)	STPT410	SB42	3602-Steel 27	17175-ST45.8	Carbon Steel
FS480, PT480(W)	STPT480	SB49	3602-Steel 35	-	Carbon Steel
FL380(W)	STPL380	-	3603-Steel27 LT30	-	Carbon Steel
FL450(W)	STPL450	-	3603-Steel503 LT100	-	31/2% Ni Steel
FL690(W)	STPL690	-	-	-	2% Ni-1% Cu Steel
PA12(W), FA12	STPA12	-	-	17175-15 Mo3	Carbon-Molybdenum Steel
PA22(W), FA22	STPA22	-	3603-HF620	17175-13 Cr Mo44	1%Cr-1/2%-Molybdenum Steel
PA23(W), FA23	STPA23	-	3603-HF621	-	11/4%Cr-1/2%-Molybdenum Steel
PA24(W), FA24	STPA24	SCMV4	3603-HF622, 27	17175-10 Cr Mo910	21/4%Cr-1%-Molybdenum Steel
PA25(W), FA25	STPA25	-	3603-HF625	-	5%Cr-1/2%-Molybdenum Steel
-	-	-	-	-	7%Cr-1/2%-Molybdenum Steel
PA26(W), FA26	STPA26	-	-	-	9%Cr-1%-Molybdenum Steel
-	-	-	-	-	9%Cr-1% Mo-0.2%V+Cb+N
SUS304, SUS304W, SUS304F	SUS304TP	SUS304	3605-801	17440-X5 Cr Ni189	18% Cr-8% Ni Steel
SUS304H, SUS304HF	SUS304HTP	-	3605-811	-	18% Cr-8% Ni-(0.04-0.10)% C Steel
SUS304L, SUS304LW	SUS304LTP	SUS304L	3605-811L	17440-X2 Cr Ni189	18% Ni-0.035% C Steel
SUS309S, SUS309SW, SUS309SF	SUS309STP	SUS309S	-	-	22% Cr-12% Ni Steel
SUS310S, SUS310SW, SUS310SF	SUS310STP	SUS310S	3605-805S	-	25% Cr-20% Ni Steel
SUS316, SUS316W, SUS316F	SUS316TP	SUS316	3605-845	17440-X5 Cr Ni Mo1810	18% Cr-8% Ni-Mo Steel
SUS316H, SUS316HF	SUS316HTP	-	3605-855	-	18% Cr-8% Ni-Mo(0.04-0.10)% C Steel
SUS316L, SUS316LW	SUS316LTP	SUS316L	3605-845L	17440-X2 Cr Ni Mo1810	18% Cr-8% Ni-Mo-0.035% C Steel
SUS317L	SUS317LTP	SUS317L	-	-	18% Cr-12% Ni-3.5% Mo-Low C
SUS321, SUS321W, SUS321F	SUS321TP	SUS321	3605-822Ti	17440-X10 Cr Ni Ti189	18% Cr-8% Ni-Ti Steel
SUS321H, SUS321HF	SUS321HTP	-	3605-822Ti	-	18% Cr-8% Ni-Ti(0.04-0.10)% C Steel
SUS347, SUS347W, SUS347F	SUS347TP	SUS347	3605-822Nb	17440-X1 Cr Ni Nb189	18% Cr-8% Ni-Cb+Ta Steel
SUS347H, SUS347HF	SUS347HTP	-	3605-832Nb	-	18% Cr-8% Ni-Cb+Ta(0.04-0.10)% C Steel



# WALL THICKNESS SCHEDULES

Nominal Pipe		Outside Diameter		Nominal Wall Thickness								
A	B	JIS	ANSI	Sch5S	Sch10S	Sch20S	GS	Sch 10	LG(7.9)	Sch 20	Sch 30	STD
8	¼	13.8	13.7	1.2	1.65	2.0	2.3	-	-	-	-	(2.2)
10	⅜	17.3	17.1	1.2	1.65	2.0	2.3	-	-	-	-	(2.3)
15	½	21.7	21.3	1.65	2.1	2.5	2.8	-	-	-	-	(2.8)
20	¾	27.2	26.7	1.65	2.1	2.5	2.8	-	-	-	-	(2.9)
25	1	34.0	33.4	1.65	2.8	3.0	3.2	-	-	-	-	(3.4)
32	1-¼	42.7	42.2	1.65	2.8	3.0	3.5	-	-	-	-	(3.6)
40	1-½	48.6	48.3	1.65	2.8	3.0	3.5	-	-	-	-	(3.7)
50	2	60.5	60.3	1.65	2.8	3.5	3.8	-	-	-	-	(3.9)
65	2-½	76.3	73.0	2.1	3.0	3.5	4.2	-	-	-	-	(5.2)
80	3	89.1	88.9	2.1	3.0	4.0	4.2	-	-	-	-	(5.5)
90	3-½	101.6	101.6	2.1	3.0	4.0	4.2	-	-	-	-	(5.7)
100	4	114.3	114.3	2.1	3.0	4.0	4.5	-	-	-	-	(6.0)
125	5	139.8	141.3	2.8	3.4	5.0	4.5	-	-	-	-	(6.6)
150	6	165.2	168.3	2.8	3.4	5.0	5.0	-	5.0**	-	-	(7.1)
175	7	190.7	-	-	-	-	5.3	-	-	-	-	-
200	8	216.3	219.1	2.8	3.8	6.5	5.8	-	5.8**	6.4	7.0	(8.2)
225	9	241.8	-	-	-	-	6.2	-	-	-	-	-
250	10	267.4	273.1	3.4	4.2	6.5	6.6	-	6.6**	6.4	7.8	(9.3)
300	12	318.5	323.9	4.0	4.6	6.5	6.9	-	6.9**	6.4	8.4	9.5
350	14	355.6	355.6	4.0	4.8	7.9	7.9	6.4	7.9	7.9	9.5	9.5
400	16	406.4	406.4	4.2	4.8	7.9	7.9	6.4	7.9	7.9	9.5	9.5
450	18	457.2	457.2	4.2	4.8	7.9	7.9	6.4	7.9	7.9	11.1	9.5
500	20	508.0	508.0	4.8	5.5	7.9	7.9	6.4	7.9	9.5	12.7	9.5
550	22	558.8	558.8	4.8	5.5	-	-	6.4	7.9	9.5	12.7	9.5
600	24	609.6	609.6	5.5	6.4	-	-	6.4	7.9	9.5	14.3	9.5
650	26	660.4	660.4	-	-	-	-	7.9	7.9	12.7	-	9.5
700	28	711.2	711.2	-	-	-	-	7.9	7.9	12.7	15.9	9.5
750	30	762.0	762.0	6.4	7.9	-	-	7.9	7.9	12.7	15.9	9.5
800	32	812.8	812.8	-	-	-	-	7.9	7.9	12.7	15.9	9.5
850	34	863.6	863.6	-	-	-	-	7.9	7.9	12.7	15.9	9.5
900	36	914.4	914.4	-	-	-	-	7.9	7.9	12.7	15.9	9.5
950	38	965.2	965.2	-	-	-	-	-	7.9	-	-	9.5
1000	40	1016.0	1016.0	-	-	-	-	-	7.9	-	-	9.5
1050	42	1066.8	1066.8	-	-	-	-	-	7.9	-	-	9.5
1100	44	1117.6	1117.6	-	-	-	-	-	7.9	-	-	9.5
1150	46	1168.4	1168.4	-	-	-	-	-	7.9	-	-	9.5
1200	48	1219.2	1219.2	-	-	-	-	-	7.9	-	-	9.5
1250	50	1270.0	1270.0	-	-	-	-	-	*7.9	-	-	*9.5
1300	52	1320.8	1320.8	-	-	-	-	-	*7.9	-	-	*9.5
1350	54	1371.6	1371.6	-	-	-	-	-	*7.9	-	-	*9.5
1400	56	1422.4	1422.4	-	-	-	-	-	*7.9	-	-	*9.5
1450	58	1473.2	1473.2	-	-	-	-	-	*7.9	-	-	*9.5
1500	60	1524.0	1524.0	-	-	-	-	-	*7.9	-	-	*9.5

JIS G3448  
JIS G3454  
JIS G3455  
JIS G3459

ASME B36.10M  
ASME B36.19M

(unit : mm)

Nominal Wall Thickness									Outside Diameter		Nominal Pipe	
Sch40	Sch60	XS	Sch80	Sch100	Sch120	Sch140	Sch160	XXS	JIS	ANSI	A	B
2.2	2.4	( 3.0)	3.0	-	-	-	-	-	13.8	13.7	8	¼
2.3	2.8	( 3.2)	3.2	-	-	-	-	-	17.3	17.1	10	⅜
2.8	3.2	( 3.7)	3.7	-	-	-	4.7	7.5	21.7	21.3	15	½
2.9	3.4	( 3.9)	3.9	-	-	-	5.5	7.8	27.2	26.7	20	¾
3.4	3.9	( 4.5)	4.5	-	-	-	6.4	9.1	34.0	33.5	25	1
3.6	4.5	( 4.9)	4.9	-	-	-	6.4	9.7	42.7	42.2	32	1-¼
3.7	4.5	( 5.1)	5.1	-	-	-	7.1	10.2	48.6	48.3	40	1-½
3.9	4.9	( 5.5)	5.5	-	-	-	8.7	11.1	60.5	60.3	50	2
5.2	6.0	( 7.0)	7.0	-	-	-	9.5	14.0	76.3	73.0	65	2-½
5.5	6.6	( 7.6)	7.6	-	-	-	11.1	15.2	89.1	88.9	80	3
5.7	7.0	( 8.1)	8.1	-	-	-	12.7	-	101.6	101.6	90	3-½
6.0	7.1	( 8.6)	8.6	-	11.1	-	13.5	17.1	114.3	114.3	100	4
6.6	8.1	( 9.5)	9.5	-	12.7	-	15.9	19.0	139.8	141.3	125	5
7.1	9.3	(11.0)	11.0	-	14.3	-	18.2	21.9	165.2	168.3	150	6
-	-	-	-	-	-	-	-	-	190.7	-	175	7
8.2	10.3	(12.7)	12.7	15.1	18.2	20.6	23.0	22.2	216.3	219.1	200	8
-	-	-	-	-	-	-	-	-	241.8	-	225	9
9.3	12.7	12.7	15.1	18.3	21.4	25.4	28.6	25.4	267.4	273.1	250	10
10.3	14.3	12.7	17.4	21.4	25.4	28.6	33.3	25.4	318.5	323.9	300	12
11.1	15.1	12.7	19.0	23.8	27.8	31.8	35.7	-	355.6	355.6	350	14
12.7	16.7	12.7	21.4	26.2	30.9	36.5	40.5	-	406.4	406.4	400	16
14.3	19.0	12.7	23.8	29.4	34.9	39.7	45.2	-	457.2	457.2	450	18
15.1	20.6	12.7	26.2	32.5	38.1	44.4	50.0	-	508.0	508.0	500	20
-	22.2	12.7	28.6	34.9	41.3	47.6	54.0	-	558.8	558.8	550	22
17.5	24.6	12.7	31.0	38.9	46.0	52.4	59.5	-	609.6	609.6	600	24
-	-	12.7	-	-	-	-	-	-	660.4	660.4	650	26
-	-	12.7	-	-	-	-	-	-	711.2	711.2	700	28
-	-	12.7	-	-	-	-	-	-	762.0	762.0	750	30
17.5	-	12.7	-	-	-	-	-	-	812.8	812.8	800	32
17.5	-	12.7	-	-	-	-	-	-	863.6	863.6	850	34
19.1	-	12.7	-	-	-	-	-	-	914.4	914.4	900	36
-	-	12.7	-	-	-	-	-	-	965.2	965.2	950	38
-	-	12.7	-	-	-	-	-	-	1016.0	1016.0	1000	40
-	-	12.7	-	-	-	-	-	-	1066.8	1066.8	1050	42
-	-	12.7	-	-	-	-	-	-	1117.6	1117.6	1100	44
-	-	12.7	-	-	-	-	-	-	1168.4	1168.4	1150	46
-	-	12.7	-	-	-	-	-	-	1219.2	1219.2	1200	48
-	-	*12.7	-	-	-	-	-	-	1270.0	1270.0	1250	50
-	-	*12.7	-	-	-	-	-	-	1320.8	1320.8	1300	52
-	-	*12.7	-	-	-	-	-	-	1371.6	1371.6	1350	54
-	-	*12.7	-	-	-	-	-	-	1422.4	1422.4	1400	56
-	-	*12.7	-	-	-	-	-	-	1473.2	1473.2	1450	58
-	-	*12.7	-	-	-	-	-	-	1524.0	1524.0	1500	60