ANN AIK PTE LTD
(A wholly-owned subsidiary of AnnAik Limited)

Product Catalogue

2024 EDITION

COMPANY PROFILE

ANN AIK Pte Ltd is a wholly owned subsidiary of ANNAIK Limited, listed on the Singapore Stock Exchange.

"To be a global leader in steel piping products, known for our outstanding quality and unique upstream and downstream capabilities, from manufacturing to distribution and to environmental solutions business"

History

- Founded in 1977 for sale of general hardware products;
- Focused in sale and distribution of stainless steel piping products in 1980;
- Ventured to upstream manufacturing of steel flanges business in 2000;
- Listed on Singapore Stock Exchange ("SGX") in 2003; and
- Expanded to downstream environmental solutions business in 2005

BUSINESS

AnnAik's principal activities are:-

- Distribution of stainless and carbon steel piping products;
- Manufacturing of steel flanges, fittings; and
- Provision of environmental solutions services

Distribution

AnnAik is a leading distributor of steel piping products in Singapore. The products include pipes, flanges, elbows, tees, butt-weld fittings, high pressure forged fittings, valves, lap-joints and etc with more than 10,000 SKUs . These products are used in diverse industries ranging from marine engineering, offshore, shipbuilding and repair, semiconductor, oil and gas, petrochemical, utilities, pharmaceutical, food processing, IT infrastructure and healthcare. We serve over 450 customers globally and awarded with ISO 9001:2008 for quality management operations in stainless and carbon steel production and stocking together with bizSAFE level 3 accreditation. AnnAik's trading arm is mainly involved in bulk sale of primary and secondary flat products such as sheets, plates, coils and etc.

Manufacturing

AnnAik's steel flanges and fittings manufacturing facility in Malaysia is equipped with the latest production technology. The Company manufactures steel flanges and fittings under "SHINSEI" brand name and is also an OEM manufacturer for other approved brands in the world. The plant is capable for producing stainless and carbon steel forged flanges and butt-weld fittings of all dimensions, specifications and standards. The products are exported to markets in Europe, USA, South America, Middle East, South Africa, Japan, Australia, New Zealand and the ASEAN countries. The plant adopts and operates proper production procedures and management systems that meet international standards such as ISO 9001:2008, PED, ClassNK, CRN certifications and etc.

Environmental Solutions

The environmental solutions business focuses on build, operate and transfer ("BOT") industrial wastewater treatment plants in China. These industrial wastewater treatment plants are capable of treating up to 150,000 metric tons of industrial wastewater per day. We also own the technology for treating rural wastewater which involve in providing rural wastewater treatment equipment and system with after sales maintenance services to governmental operators in China. In Singapore, we have broaden our services offering to include consulting service and undertake turn-key project in water resource management to governmental and commercial operators locally and the South East Asian countries.

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All information contained herein was current at the time of publication.

There are a large number of standards (International and national) available that covers many products such as pipes, flanges, tubes and fittings. A brief description of the most common standards is given as follows:

DIN (Deutsche Industrie Norm)

The most common and internationally used DIN-Standards:

DIN 50049	Documents on material testing
DIN 259	Threads corresponding to ISO 228
DIN 2999	Threads corresponding to ISO 7
DIN 2527	Blind flanges
DIN 2576	Plane welding flanges PN 10
DIN 2642F/G	Loose flanges PN 10 and collars
DIN 2633/35	Welding neck flanges PN 16-40
DIN 2605/09	Tube bends 3D (R=1.5 O.D)
DIN 2615	Tee

EN (European Standard)
EN 10204 defines the various types of inspection documents supplied to the purchaser for the delivery of iron and steel products. EN 10204, was approved by CEN on 1991-08-21.

The requirements in EN 10204/3.1B are the same als DIN 50049/3.1B. The new standard will be implemented in Europe and replace DIN 50049 step by step. All new purchase orders require inspection certificates 3.1 according to EN 10204.

ISO (International Standardisation Organization)

The international standardisation organization, ISO, has issued standards for tubes and tube fittings. The ISO system is predominant in Europe.

The following ISO standards ar of interest:

ISO 5251	Stainless steel butt welding fittings: Bends, 1.5D/3D, 90° and 180° with and without straight ends, bends 5D, 90°, without straight ends, concentric and eccentric reducers, equal and reducing tees, end caps. Bevelling of ends.
ISO 7	Pipe threads where pressure-tight joints are made on the threads.

ANSI (American National Standard Institute)

The American ANSI system (formerly ASA and USAS) is a national system but is used throughout the world, particularly in Latin and North America; and within certain industries, e.g. the petrochemical industry. It can therefore be regarded as an internationally applied system.
For most sizes, the differences between ANSI and ISO outside diameters are negligible, and do not have to be taken into account. There are, however, two ANSI diameters, 73.02 and 141.3 mm, which differ significantly from their ISO counterparts, 76.1 and 139.7 mm.

The following standards apply to pipe, tube and tube fittings:

ANSI B 16.9	Butt welding fittings, e.g. elbows 90° and returns 180°, long radius (correspond to ISO 3D), tees and crosses, concentric and eccentric reducers, end caps, lap joint stub ends.
ANSI B 16.28	Wrought steel butt welding short radius elbows and returns.
ANSI B.16.25	Butt welding ends, end preparations,
ANSI B 16.5	Pipe flanges.
ANSI B 16.11	Forged steel fittings socket-welding and threaded.
ANSI B 16.3	Malleable iron threaded fittings, class 150 and 300 lb,
ANSI B 2.1	Pipe threads.
ANSI B 36.10	Seamless and welded stainless steel pipe 1/8” - 48”, Schedule 80, 160, STD, XS and XXS.
ANSI B 36.19	Seamless and welded stainless steel pipe 1/8” - 48” Schedule 5S, 10S, 40S and 80S. Nominal diameters, wall thicknesses and wall thickness tolerances.

MSS (Manufacturer's Standardisation Society)

MSS-SP (Standard Practices) is a manufacturing standard that is used internationally, although it was developed in the United States.

The most frequently used part of this standard for tube fittings is MSS-SP43, which covers light, stainless steel butt weldings fittings. With regard to dimensions, this standard corresponds to ANSI B 16.9, but with closer tolerances on the outside diameter.

Nace MR0175 (National Association of Corrosion Engineers)

This standard covers material requirements for sulfide stress cracking resistant metallic materials for oilfield equipment. Our SAF2205 (UNS S31803) is listed under table 1- duplex (austenitic/ferritic) materials for direct exposure to sour environments. Under the same section we should add SAF 2507 (UNS S32750). Ace to paragraph 3.9.4, added in January 90, the hardness for cold worked, solution annealed duplex material may not be greater than 34 HRC.

ASTM (American Society for Testing and Materials)

For materials and testing information the ANSI standards contain references to ASTM specifications. The following ASTM standards are used for stainless fittings.

ASTM Specification Al82/A182M
Forged or rolled alloy-steel pipe flanges, forged fittings, and valves and parts for high-temperature service.

Specific stipulation:
This standard covers tube fittings manufactured according to ANSI B16.5, a dimensional standard for flanges and flanged fittings, and ANSI B16.11, which covers forged socket welding and threaded fittings.

The material shall be forged as close as practicable to the specified shape and size. Forged and rolled bar may be used for small cylindrically shaped parts.

All austenitic and austenitic/ferritic forgings shall be furnished in the heat-treated condition. The heat treatment may be performed before machining.

This specification also covers fittings made in SAF2205 (UNS S31803).

Identification marks consisting of the manufacturer's symbol or name and the heat number, designation of service rating, specification number, steel grade and size shall be stamped on each forging. The marking confirms that the forging has been delivered in accordance with the specification.

ASTM Specification A403/A403M
Wrought austenitic stainless steel piping fittings.

Specific stipulation:
This specification covers two general classes, WP and CR, of wrought austenitic stainless steel fittings of seamless and welded construction covered by the latest revision of ANSI B16.9, ANSI B16.11, ANSI B16.28, MSS Standard Practice SP-79 and MSS standard practice SP-43.

Class WP. fittings are subdivided into three subclasses: Classes WP-S, WP-W, and WP-WX. They are manufactured to the requirements of ANSI B16.9, B16.11, B16.28, or MSS Standard Practice SP-79. Class WP-S fittings are manufactured from seamless product by a seamless method of manufacture (marked with class symbol WP-S); class WP-W fittings contain welds where the fitting, fabrication or construction welds have been radiographed (marked with class symbol WP-W); and class WP-WX fittings are those which contain welds where all welds have been radiographed (marked with class symbol WP-WX).

Class CR fittings are those manufactured to the requirements of MSS SP-43. Fittings according to class CR do not require non destructive testing. The material for fittings shall consist of forgings, bars, plates or seamless or welded tubular products. Fittings machined from bar shall be restricted to NPS 4 or smaller.

All fittings shall be furnished in the heat-treated condition. Fittings machined directly from solution annealed forgings and bar stock do not need to be resolution annealed. Hydrostatic testing is not required.

Each fitting shall be marked with the manufacturer's name or trademark, the schedule number or pressure rating, steel grade, class and size, and the heat number.

A certificate of compliance to the specification shall be the basis for approval.

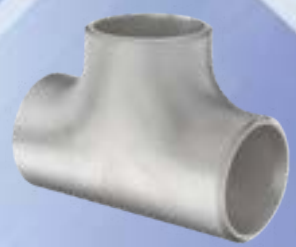
ASTM Specification A815/A815M
Wrought ferritic, ferritic/austenitic and martensitic stainless steel piping fittings.This specification corresponds with ASTM A403 but covers also ferritic and ferritic/austenitic stainless steel.

UNS (Unified Numbering System for Metals and Alloys)
UNS is relatively new. It will replace AISI in the future. New materials are now listed under this number system.

UNS S 31803
UNS S 32304
UNS S 32750
UNS N 08904
UNS N 08028

Commonly Materials Used for Pipes, Fittings and Flanges			
Classification	**Pipe**	**B.W. Fittings**	**Flanges**
Carbon Steels	A 106 Grade A	A 234 Grade WPA	A 105 Grade I
	A 106 Grade B	A 234 Grade WPB	A 105 Grade II
Alloy Steels	A 335 Grade P 1	A 234 Grade WP 1	A 182 Grade F 1
	A 335 Grade P 5	A 234 Grade WP 5	A 182 Grade F 5
	A 335 Grade P 7	A 234 Grade WP 7	A 182 Grade F 7
	A 335 Grade P 9	A 234 Grade WP 9	A 182 Grade F 9
	A 335 Grade P 11	A 234 Grade WP 11	A 182 Grade F 11
	A 335 Grade P 12	A 234 Grade WP 12	A 182 Grade F 12
	A 335 Grade P 22	A 234 Grade WP 22	A 182 Grade F 22
Steels for Low - Temperature Service	A 333 Grade 1	A 420 Grade WPL 1	A 350 Grade LF 1
	A 333 Grade 3	A 420 Grade WPL 3	A 350 Grade LF 3
	A 333 Grade 4	A 420 Grade WPL 4	A 350 Grade LF 4
	A 333 Grade 6	A 420 Grade WPL 6	A 350 Grade LF 6
	A 333 Grade 8	A 420 Grade WPL 8	A 350 Grade LF 8
Stainless Steels	A 312 Grade TP 304	A 403 Grade WP 304	A 182 Grade F 304
	A 312 Grade TP 304H	A 403 Grade WP 304H	A 182 Grade F 304H
	A 312 Grade TP 304L	A 403 Grade WP 304L	A 182 Grade F 304L
	A 312 Grade TP 316	A 403 Grade WP 316	A 182 Grade F 316
	A 312 Grade TP 316H	A 403 Grade WP 316H	A 182 Grade F 316H
	A 312 Grade TP 316L	A 403 Grade WP 316L	A 182 Grade F 316L
	A 312 Grade TP 321	A 403 Grade WP 321	A 182 Grade F 321
	A 312 Grade TP 321H	A 403 Grade WP 321H	A 182 Grade F 321H
	A 312 Grade TP 347	A 403 Grade WP 347	A 182 Grade F 347
	A 312 Grade TP 347H	A 403 Grade WP 347H	A 182 Grade F 347H

Code	GRADE	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	Other
405	13Cr-0.2Al	≤ 0.08	≤ 1.00	≤ 1.00	≤ 0.040	≤ 0.030	-	≤ 0.60	11.50-13.50	-	Al 0.10-0.30
410	13Cr	≤ 0.15	≤ 1.00	≤ 1.00	≤ 0.040	≤ 0.030	-	≤ 0.60	11.50-13.50	-	-
430	17Cr	≤ 0.12	≤ 0.75	≤ 1.00	≤ 0.040	≤ 0.030	-	≤ 0.60	16.00-18.00	-	-
443	22Cr-1Cu	≤ 0.20	≤ 0.75	≤ 1.00	≤ 0.040	≤ 0.030	0.90-1.25	≤ 0.50	18.00-23.00	-	-
446	25Cr	≤ 0.20	≤ 0.75	≤ 1.50	≤ 0.040	≤ 0.030	-	≤ 0.50	23.00-30.00	-	N 0.10-0.25
329	25Cr-4Ni-1.5Mo	≤ 0.08	≤ 1.00	≤ 1.50	≤ 0.040	≤ 0.030	-	3.00-6.00	23.00-28.00	1.00-3.00	-
430A	17Cr-Ti	≤ 0.10	≤ 1.00	≤ 1.00	≤ 0.040	≤ 0.030	-	-	16.00-18.00	-	Ti ≥7xC%
303	18Cr-9Ni-S	≤ 0.15	≤ 1.00	≤ 2.00	≤ 0.200	≤ 0.150	-	8.00-10.00	17.00-19.00	-	-
304	19Cr-10Ni	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	8.00-11.00	18.00-20.00	-	-
316	17Cr-12Ni-2.5Mo	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	10.00-14.00	16.00-18.00	2.00-3.00	-
304H	H * C-19Cr-10Ni	0.04-0.10	≤ 0.75	≤ 2.00	≤ 0.040	≤ 0.030	-	8.00-11.00	18.00-20.00	-	-
316H	H * C-17Cr-12Ni2-5Mo	0.04-0.10	≤ 0.75	≤ 2.00	≤ 0.030	≤ 0.030	-	11.00-14.00	16.00-18.00	2.00-3.00	-
321H	H* C-18Cr-11Ni-Ti	0.04-0.10	≤ 0.75	≤ 2.00	≤ 0.030	≤ 0.030	-	9.00-13.00	17.00-20.00	-	Ti 4xC%~0.60
347H	H * C-18Cr-11Ni-Nb	0.04-0.10	≤ 1.00	≤ 2.00	≤ 0.030	≤ 0.030	-	9.00-13.00	17.00-20.00	-	Nb+Ta 8xC%~1.00
348H	H * C-18Cr-11Ni-Nb(Ta)	0.04-0.10	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	9.00-13.00	17.00-20.00	-	Nb+Ta 8xC%~1.00 Ta < 0.10
304L	L*C-19Cr-11Ni	≤ 0.030	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	9.00-13.00	18.00-20.00	-	-
316L	L*C-17Cr-14Ni-25Mo	≤ 0.030	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	12.00-16.00	16.00-18.00	2.00-3.00	-
321	18Cr-11Ni-Ti	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	9.00-13.00	17.00-19.00	-	Ti ≥ 5XC%
347	18Cr-11Ni-Nb	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	9.00-13.00	17.00-19.00	-	Nb+Ta ≥ 10XC%
348	18Cr-11Ni-Nb(Ta)	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	9.00-13.00	17.00-20.00	-	Nb+Ta10XC%-1.00 Ta≤ 0.10
316 Cu	18Cr-12Ni-2Mo-2Cu	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	1.00-2.50	10.00-14.00	17.00-19.00	1.20-2.75	-
316CuL	L*C-18Cr-14Ni-2Mo-2Cu	≤ 0.030	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	1.00-2.50	12.00-16.00	17.00-19.00	1.20-2.75	-
317	19Cr-13Ni-3.5Mo	≤ 0.08	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	11.00-15.00	18.00-20.00	3.00-4.00	-
317L	L*C-19Cr-14Ni-3.5Mo	≤ 0.030	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	11.00-15.00	18.00-20.00	3.00-4.00	-
316B	18Cr-12Ni-2.5Mo-Ti	≤ 0.10	≤ 1.00	≤ 2.00	≤ 0.045	≤ 0.030	-	10.50-13.50	16.50-18.50	2.00-2.50	Ti=5XC%
KCP20	20Cr-30Ni-3.0 Mo-4Cu	≤ 0.07	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	3.00-4.00	28.00-30.00	19.00-21.00	2.00-3.00	Nb=10XC%
309S	23Cr-14Ni	≤ 0.15	≤ 1.00	≤ 2.00	≤ 0.040	≤ 0.030	-	12.00-15.00	22.00-24.00	-	-
310S	25Cr-20Ni	≤ 0.15	≤ 1.50	≤ 2.00	≤ 0.040	≤ 0.030	-	19.00-22.00	24.00-26.00	-	-



BUTT WELD FITTINGS

BUTT WELD FITTINGS (SEAMLESS / WELDED)

90° L/R Elbow

90° S/R Elbow

Concentric Reducer

Eccentric Reducer

180° L/R Elbow

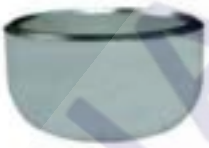
180° S/R Elbow

Reducing Tee

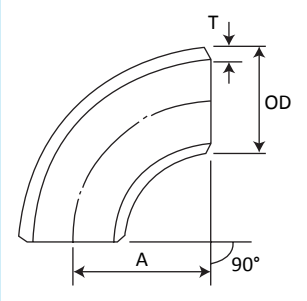
Equal Tee

45° L/R Elbow

Cap



Stub End



90° LONG RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to End (A)	Wall Thickness (T)				Weights (Kg.)			
			Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
3/8	0.680	1.50	0.065	0.091	0.126	-	0.058	0.073	0.085	-
1/2	0.840	1.50	0.083	0.109	0.147	0.188	0.060	0.076	0.097	0.150
3/4	1.050	1.50	0.083	0.113	0.154	0.219	0.070	0.090	0.110	0.230
1	1.315	1.50	0.109	0.133	0.179	0.250	0.140	0.160	0.220	0.260
1-1/4	1.660	1.88	0.109	0.140	0.191	0.250	0.230	0.253	0.400	0.419
1-1/2	1.900	2.25	0.109	0.145	0.200	0.281	0.310	0.403	0.510	0.640
2	2.375	3.00	0.109	0.154	0.218	0.344	0.510	0.710	0.904	1.320
2-1/2	2.875	3.75	0.120	0.203	0.276	0.375	0.860	1.360	1.810	2.350
3	3.500	4.50	0.120	0.216	0.300	0.438	1.22	2.18	2.98	3.83
3-1/2	4.000	5.25	0.120	0.226	0.318	-	1.70	2.84	3.90	-
4	4.500	6.00	0.120	0.237	0.337	0.531	2.00	4.17	6.18	8.02
5	5.563	7.50	0.134	0.258	0.375	0.625	3.46	6.51	9.25	14.70
6	6.625	9.00	0.134	0.280	0.432	0.719	4.96	10.41	16.33	26.00
8	8.625	12.00	0.148	0.322	0.500	-	10.55	21.55	33.11	-
10	10.750	15.00	0.165	0.365	0.500	-	19.6	38.6	49.4	-
12	12.750	18.00	0.180	0.375	0.500	-	27.2	59.3	71.2	-

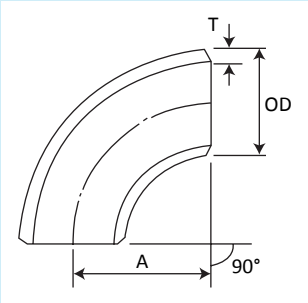
** Above weight list are based on theoretical calculation.*

90° LONG RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to End (A)	Wall Thickness (T)				Weights (Kg.)			
			Sch. 10s	Sch. 20	Sch. 40s / STD	Sch. 80s / XS	Sch. 10s	Sch. 20	Sch. 40s / STD	Sch. 80s / XS
14	14	21	0.188	0.312	0.375	0.500	36.4	56.7	70.3	91.9
16	16	24	0.188	0.312	0.375	0.500	47.6	74.3	91.2	120.0
18	18	27	0.188	0.312	0.375	0.500	59.8	94.2	122.0	153.0
20	20	30	0.218	0.375	0.375	0.500	92	144	144	190
22	22	33	0.218	0.375	0.375	0.500	99	170	170	225
24	24	36	0.250	0.375	0.375	0.500	141	208	208	275
26	26	39	0.312	0.500	0.375	0.500	198	315	238	315
28	28	42	0.312	0.500	0.375	0.500	230	366	276	366
30	30	45	0.312	0.500	0.375	0.500	264	421	317	421
32	32	48	0.312	0.500	0.375	0.500	301	479	361	479
34	34	51	0.312	0.500	0.375	0.500	339	542	408	542
36	36	54	0.312	0.500	0.375	0.500	381	608	457	608
38	38	57	0.312	-	0.375	0.500	425	-	510	678
40	40	60	0.312	-	0.375	0.500	471	-	565	751
42	42	63	0.312	-	0.375	0.500	520	-	624	829
44	44	66	0.312	-	0.375	0.500	571	-	685	910
46	46	69	0.312	-	0.375	0.500	624	-	749	995
48	48	72	0.312	-	0.375	0.500	679	-	815	1084

** Above weight list are based on theoretical calculation.*

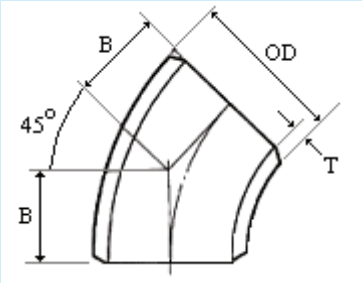


90° SHORT RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to End (A)	Wall Thickness (T)				Weights (Kg.)			
			Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
1/2	0.840	1.00	0.083	0.109	0.147	-	0.075	0.095	0.118	-
3/4	1.050	1.00	0.083	0.113	0.154	-	0.078	0.098	0.120	-
1	1.315	1.00	0.109	0.133	0.179	0.250	0.083	0.100	0.122	0.180
1-1/4	1.660	1.25	0.109	0.140	0.191	0.250	0.134	0.169	0.217	0.290
1-1/2	1.900	1.50	0.109	0.145	0.200	0.281	0.221	0.242	0.323	0.450
2	2.375	2.00	0.109	0.154	0.218	0.344	0.373	0.514	0.596	1.340
2-1/2	2.875	2.50	0.120	0.203	0.276	0.375	0.624	1.060	1.140	1.490
3	3.500	3.00	0.120	0.216	0.300	0.438	0.982	1.500	1.830	3.830
3-1/2	4.000	3.50	0.120	0.226	0.318	-	1.03	1.89	2.60	-
4	4.500	4.00	0.120	0.237	0.337	0.531	1.73	3.12	3.56	5.62
5	5.563	5.00	0.134	0.258	0.375	0.625	2.71	4.34	6.17	9.79
6	6.625	6.00	0.134	0.280	0.432	0.719	4.13	7.16	11.79	24.20
8	8.625	8.00	0.148	0.322	0.500	-	8.0	13.6	20.6	-
10	10.750	10.00	0.165	0.365	0.500	-	11.1	24.0	32.5	-
12	12.750	12.00	0.180	0.375	0.500	-	17.2	35.3	46.6	-
14	14.00	14.00	0.188	0.375	0.500	-	23.1	45.4	59.9	-
16	16.00	16.00	0.188	0.375	0.500	-	30.2	59.4	78.6	-
18	18.00	18.00	0.188	0.375	0.500	-	38.2	75.4	99.9	-
20	20.00	20.00	0.218	0.375	0.500	-	54.7	93.3	124.0	-
22	22.00	22.00	0.218	0.375	0.500	-	66.2	113.0	150.0	-
24	24.00	24.00	0.250	0.375	0.500	-	90.4	135.0	179.0	-

** Above weight list are based on theoretical calculation.*



45° LONG RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to End (B)	Wall Thickness (T)				Weights (Kg.)			
			Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
1/2	0.840	0.625	0.083	0.109	0.147	0.188	0.030	0.038	0.048	0.050
3/4	1.050	0.748	0.083	0.113	0.154	0.219	0.039	0.052	0.078	0.080
1	1.315	0.875	0.109	0.133	0.179	0.250	0.078	0.095	0.128	0.150
1-1/4	1.660	1.00	0.109	0.140	0.191	0.250	0.101	0.126	0.167	0.210
1-1/2	1.900	1.12	0.109	0.145	0.200	0.281	0.140	0.184	0.254	0.340
2	2.375	1.38	0.109	0.154	0.218	0.344	0.235	0.326	0.447	0.670
2-1/2	2.875	1.75	0.120	0.203	0.276	0.375	0.406	0.683	0.897	1.170
3	3.500	2.00	0.120	0.216	0.300	0.438	0.571	1.020	1.443	1.920
3-1/2	4.000	2.25	0.120	0.226	0.318	-	0.775	1.410	2.050	-
4	4.500	2.50	0.120	0.237	0.337	0.531	1.00	1.92	2.81	4.21
5	5.563	3.12	0.134	0.258	0.375	0.625	1.73	3.26	4.85	7.35
6	6.625	3.75	0.134	0.280	0.432	0.719	2.48	5.05	8.02	12.10
8	8.625	5.00	0.148	0.322	0.500	-	5.01	10.20	16.4	-
10	10.750	6.25	0.165	0.365	0.500	-	8.3	18.0	25.4	-
12	12.750	7.50	0.180	0.375	0.500	-	12.9	28.1	36.7	-

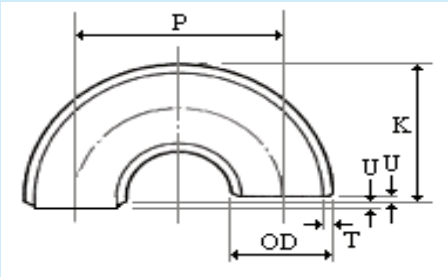
** Above weight list are based on theoretical calculation.*

45° LONG RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to End (B)	Wall Thickness (T)				Weights (Kg.)			
			Sch. 10s	Sch. 20	Sch. 40s / STD	Sch. 80s / XS	Sch. 10s	Sch. 20	Sch. 40s / STD	Sch. 80s / XS
14	14.00	8.75	0.188	0.312	0.375	0.500	17.3	28.6	32.9	42.4
16	16.00	10.00	0.188	0.312	0.375	0.500	22.6	34.8	43.3	55.7
18	18.00	11.25	0.188	0.312	0.375	0.500	28.7	44.1	54.9	70.9
20	20.00	12.50	0.218	0.375	0.375	0.500	41.0	70.0	70.0	88.2
22	22.00	13.50	0.218	0.375	0.375	0.500	49.7	85.0	85.0	104.8
24	24.00	15.00	0.250	0.375	0.375	0.500	68	101	101	134
26	26.00	16.00	0.312	0.500	0.375	0.500	99	158	119	158
28	28.00	17.25	0.312	0.500	0.375	0.500	115	183	138	183
30	30.00	18.50	0.312	0.500	0.375	0.500	132	211	159	211
32	32.00	19.75	0.312	0.500	0.375	0.500	151	240	181	240
34	34.00	21.00	0.312	0.500	0.375	0.500	170	271	204	271
36	36.00	22.25	0.312	0.500	0.375	0.500	191	304	229	304
38	38.00	23.62	0.312	-	0.375	0.500	213	-	255	339
40	40.00	24.88	0.312	-	0.375	0.500	236	-	283	376
42	42.00	26.00	0.312	-	0.375	0.500	260	-	312	415
44	44.00	27.38	0.312	-	0.375	0.500	286	-	343	455
46	46.00	28.62	0.312	-	0.375	0.500	312	-	375	498
48	48.00	29.88	0.312	-	0.375	0.500	340	-	408	542

** Above weight list are based on theoretical calculation.*



180° LONG RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to Center (P)	Back to Face (K)	Deviation (U)	Wall Thickness (T)				Weights (Kg.)			
					Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS
1/2	0.840	3.00	1.88	±0.03	0.065	0.083	0.109	0.147	0.091	0.118	0.156	0.199
3/4	1.050	2.25	1.69	±0.03	0.065	0.083	0.113	0.154	0.124	0.140	0.207	0.238
1	1.315	3.00	2.19	±0.03	0.065	0.109	0.133	0.179	0.163	0.268	0.307	0.408
1-1/4	1.660	3.75	2.75	±0.03	0.065	0.109	0.140	0.191	0.227	0.426	0.519	0.698
1-1/2	1.900	4.50	3.25	±0.03	0.065	0.109	0.145	0.200	0.327	0.580	0.735	1.020
2	2.375	6.00	4.19	±0.03	0.065	0.109	0.154	0.218	0.562	0.989	1.302	1.880
2-1/2	2.875	7.50	5.19	±0.03	0.083	0.120	0.203	0.276	1.097	1.651	2.730	3.560
3	3.500	9.00	6.25	±0.03	0.083	0.120	0.216	0.300	1.578	2.431	4.070	5.740
3-1/2	4.000	10.50	7.25	±0.03	0.083	0.120	0.226	0.318	2.113	3.256	5.650	12.720
4	4.500	12.00	8.25	±0.03	0.083	0.120	0.237	0.337	2.73	4.19	7.67	15.76
5	5.563	15.00	10.31	±0.03	0.109	0.134	0.258	0.375	5.66	7.26	13.00	19.39
6	6.625	18.00	12.31	±0.03	0.109	0.134	0.280	0.432	8.12	10.43	19.90	31.98
8	8.625	24.00	16.31	±0.03	0.109	0.148	0.322	0.500	13.98	20.15	40.30	64.33
10	10.750	30.00	20.38	±0.06	0.134	0.165	0.365	0.500	26.53	35.01	70.80	99.66
12	12.750	36.00	24.38	±0.06	0.156	0.180	0.375	0.500	47.16	53.97	111.44	144.96

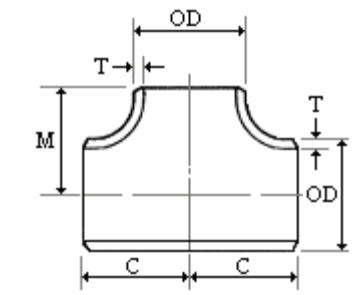
** Above weight list are based on theoretical calculation.*

180° SHORT RADIUS ELBOW

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Center to Center (P)	Back to Face (K)	Deviation (U)	Wall Thickness (T)				Weights (Kg.)			
					Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS
1	1.315	2.00	1.63	±0.03	0.065	0.109	0.133	0.179	0.104	0.168	0.205	0.262
1-1/4	1.660	2.50	2.06	±0.03	0.065	0.109	0.140	0.191	0.168	0.272	0.347	0.456
1-1/2	1.900	3.00	2.44	±0.03	0.065	0.109	0.145	0.200	0.231	0.376	0.490	0.655
2	2.375	4.00	3.19	±0.03	0.065	0.109	0.154	0.218	0.390	0.634	0.869	1.190
2-1/2	2.875	5.00	3.94	±0.03	0.083	0.120	0.203	0.276	0.747	1.070	1.820	2.380
3	3.500	6.00	4.75	±0.03	0.083	0.120	0.216	0.300	1.10	1.57	2.71	3.65
3-1/2	4.000	7.00	5.50	±0.03	0.083	0.120	0.226	0.318	1.47	2.10	3.77	5.21
4	4.500	8.00	6.25	±0.03	0.083	0.120	0.237	0.337	1.89	2.71	5.11	7.15
5	5.563	10.00	7.75	±0.03	0.109	0.134	0.258	0.375	3.84	4.69	8.64	12.20
6	6.625	12.00	9.31	±0.03	0.109	0.134	0.280	0.432	5.50	6.74	13.30	20.00
8	8.625	16.00	12.31	±0.03	0.109	0.148	0.322	0.500	9.60	12.97	26.80	40.70
10	10.750	20.00	15.38	±0.06	0.134	0.165	0.365	0.500	18.39	22.57	47.20	74.90
12	12.750	24.00	18.38	±0.06	0.156	0.180	0.375	0.500	30.49	35.10	71.94	94.91

** Above weight list are based on theoretical calculation.*

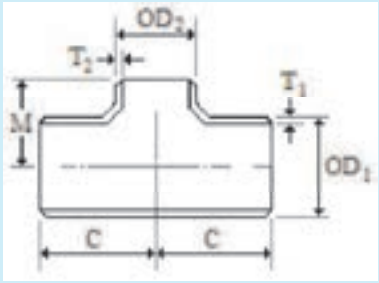


EQUAL TEE

Unit : inch

Nominal Pipe Size		Outside Dia. (OD)	Center to End (C,M)	Wall Thickness (T)				Weights (Kg.)			
Run	Outlet			Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
1/2	1/2	0.840	1.00	0.083	0.109	0.147	0.188	0.065	0.083	0.140	0.300
3/4	3/4	1.050	1.13	0.083	0.113	0.154	0.219	0.092	0.111	0.210	0.315
1	1	1.315	1.50	0.109	0.133	0.179	0.250	0.204	0.244	0.360	0.470
1-1/4	1-1/4	1.660	1.88	0.109	0.140	0.191	0.250	0.327	0.412	0.543	0.890
1-1/2	1-1/2	1.900	2.25	0.109	0.145	0.200	0.281	0.457	0.596	1.020	1.430
2	2	2.375	2.50	0.109	0.154	0.218	0.344	0.630	0.872	1.590	3.480
2-1/2	2-1/2	2.875	3.00	0.120	0.203	0.276	0.375	1.01	1.76	2.29	3.65
3	3	3.500	3.38	0.120	0.216	0.300	0.438	1.37	1.90	4.29	5.87
4	4	4.500	4.13	0.120	0.237	0.337	0.531	2.15	4.13	7.71	9.76
5	5	5.563	4.88	0.134	0.258	0.375	0.625	3.48	6.55	11.34	23.00
6	6	6.625	5.63	0.134	0.280	0.432	0.719	4.76	9.73	13.61	39.50
8	8	8.625	7.00	0.148	0.322	0.500	-	8.46	24.40	34.70	-
10	10	10.75	8.50	0.165	0.365	0.500	-	14.2	30.8	51.7	-
12	12	12.75	10.00	0.180	0.375	0.500	-	21.6	59.9	75.7	-
14	14	14.00	11.00	0.188	0.375	0.500	-	48.5	72.1	115.0	-
16	16	16.00	12.00	0.188	0.375	0.500	-	58.9	99.3	122.9	-
18	18	18.00	13.50	0.188	0.375	0.500	-	76.6	128.0	159.0	-
20	20	20.00	15.00	0.218	0.375	0.500	-	103	160	200	-
22	22	22.00	16.50	0.218	0.375	0.500	-	133	198	248	-
24	24	24.00	17.00	0.250	0.375	0.500	-	156	224	275	-

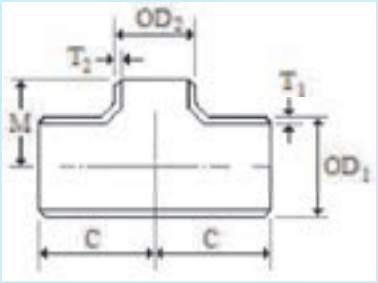
** Above weight list are based on theoretical calculation.*



REDUCING TEE

Unit : inch

Nominal Pipe Size		Outside Dia. (OD_1)	Outside Dia. (OD_2)	Center to End (C)	Center to End (M)	Wall Thickness (T)								Weights (Kg.)			
						Sch. 10s		Sch. 40s / STD		Sch. 80s / XS		Sch. 160		Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
Run	Outlet					T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2				
3/4	1/2	1.050	0.840	1.13	1.13	0.083	0.083	0.113	0.109	0.154	0.147	-	-	0.123	0.200	0.230	-
1	1/2	1.315	0.840	1.50	1.50	0.109	0.083	0.133	0.109	0.179	0.147	0.250	0.188	0.204	0.234	0.349	0.450
1	3/4	1.315	1.050	1.50	1.50	0.109	0.083	0.133	0.113	0.179	0.154	0.250	0.219	0.212	0.244	0.353	0.470
1-1/4	1/2	1.660	0.840	1.88	1.88	0.109	0.083	0.140	0.109	-	-	-	-	0.285	0.367	-	-
1-1/4	3/4	1.660	1.050	1.88	1.88	0.109	0.083	0.140	0.113	0.191	0.154	0.250	0.219	0.327	0.423	0.612	0.790
1-1/4	1	1.660	1.315	1.88	1.88	0.109	0.109	0.140	0.133	0.191	0.179	0.250	0.250	0.339	0.441	0.643	0.830
1-1/2	1/2	1.900	0.840	2.25	2.25	0.109	0.083	0.145	0.109	0.200	0.147	-	-	0.431	0.561	0.897	-
1-1/2	3/4	1.900	1.050	2.25	2.25	0.109	0.083	0.145	0.113	0.200	0.154	0.281	0.219	0.446	0.578	0.901	1.090
1-1/2	1	1.900	1.315	2.25	2.25	0.109	0.109	0.145	0.133	0.200	0.179	0.281	0.250	0.421	0.600	0.929	1.150
1-1/2	1-1/4	1.900	1.660	2.25	2.25	0.109	0.109	0.145	0.140	0.200	0.191	0.281	0.250	0.442	0.629	0.978	1.250
2	1/2	2.375	0.840	2.50	1.75	0.109	0.083	0.154	0.109	-	-	-	-	0.539	0.730	-	-
2	3/4	2.375	1.050	2.50	1.75	0.109	0.083	0.154	0.113	0.218	0.154	0.344	0.219	0.702	1.110	1.440	3.180
2	1	2.375	1.315	2.50	2.00	0.109	0.109	0.154	0.133	0.218	0.179	0.344	0.250	0.725	1.140	1.460	3.230
2	1-1/4	2.375	1.660	2.50	2.25	0.109	0.109	0.154	0.140	0.218	0.191	0.344	0.250	0.747	1.180	1.510	3.310
2	1-1/2	2.375	1.900	2.50	2.38	0.109	0.109	0.154	0.145	0.218	0.200	0.344	0.281	0.766	1.230	1.570	3.470
2-1/2	1	2.875	1.315	3.00	2.63	0.120	0.109	0.203	0.133	-	-	-	-	0.850	1.430	-	-
2-1/2	1-1/4	2.875	1.660	3.00	2.63	0.120	0.109	0.203	0.140	-	-	-	-	0.980	1.480	-	-
2-1/2	1-1/2	2.875	1.900	3.00	2.63	0.120	0.109	0.203	0.145	0.276	0.200	0.375	0.281	1.180	2.080	2.610	3.440
2-1/2	2	2.875	2.375	3.00	2.75	0.120	0.109	0.203	0.154	0.276	0.218	0.375	0.344	1.210	2.120	2.660	3.561
3	1	3.500	1.315	3.38	2.88	0.120	0.109	0.216	0.133	-	-	-	-	1.50	2.88	-	-
3	1-1/4	3.500	1.660	3.38	2.88	0.120	0.109	0.216	0.140	-	-	-	-	1.56	2.92	-	-
3	1-1/2	3.500	1.900	3.38	2.88	0.120	0.109	0.216	0.145	0.300	0.200	0.438	0.281	1.60	2.98	3.84	5.08
3	2	3.500	2.375	3.38	3.00	0.120	0.109	0.216	0.154	0.300	0.218	0.438	0.344	1.63	3.01	3.86	5.17
3	2-1/2	3.500	2.875	3.38	3.25	0.120	0.120	0.216	0.203	0.300	0.276	0.438	0.375	1.69	3.15	3.97	5.45
4	1-1/2	4.500	1.900	4.13	3.38	0.120	0.109	0.237	0.145	0.337	0.200	-	-	2.51	5.04	6.63	-
4	2	4.500	2.375	4.13	3.50	0.120	0.109	0.237	0.154	0.337	0.218	0.531	0.344	2.53	5.08	6.70	7.30
4	2-1/2	4.500	2.875	4.13	3.75	0.120	0.120	0.237	0.203	0.337	0.276	0.531	0.375	2.59	5.22	6.79	7.74
4	3	4.500	3.500	4.13	3.88	0.120	0.120	0.237	0.216	0.337	0.300	0.531	0.438	2.61	5.27	6.93	9.05
5	2	5.563	2.375	4.88	4.38	0.134	0.109	0.258	0.154	-	-	-	-	3.15	7.80	-	-
5	2-1/2	5.563	2.875	4.88	4.38	0.134	0.120	0.258	0.203	-	-	-	-	3.38	7.85	-	-
5	3	5.563	3.500	4.88	4.38	0.134	0.120	0.258	0.216	0.375	0.300	0.625	0.438	4.17	8.13	10.95	14.75
5	4	5.563	4.500	4.88	4.63	0.134	0.120	0.258	0.237	0.375	0.337	0.625	0.531	4.24	8.36	11.18	15.30
6	2	6.625	2.375	5.63	4.75	0.134	0.109	0.280	0.154	-	-	-	-	5.38	9.80	-	-
6	2-1/2	6.625	2.875	5.63	4.75	0.134	0.120	0.280	0.203	0.432	0.276	-	-	5.69	11.87	17.05	-
6	3	6.625	3.500	5.63	4.88	0.134	0.120	0.280	0.216	0.432	0.300	0.719	0.438	5.75	11.92	17.07	22.52
6	4	6.625	4.500	5.63	5.13	0.134	0.120	0.280	0.237	0.432	0.337	0.719	0.531	5.85	12.10	17.19	23.53
6	5	6.625	5.563	5.63	5.38	0.134	0.134	0.280	0.258	0.432	0.375	0.719	0.625	5.92	12.34	17.47	24.37
8	3	8.625	3.500	7.00	6.13	0.148	0.120	0.322	0.216	-	-	-	-	7.89	21.00	-	-
8	4	8.625	4.500	7.00	6.13	0.148	0.120	0.322	0.237	0.500	0.337	-	-	9.80	21.26	30.76	-
8	5	8.625	5.563	7.00	6.38	0.148	0.134	0.322	0.258	0.500	0.375	-	-	9.83	21.35	30.86	-
8	6	8.625	6.625	7.00	6.63	0.148	0.134	0.322	0.280	0.500	0.432	-	-	9.91	21.62	31.25	-



REDUCING TEE

Unit : inch

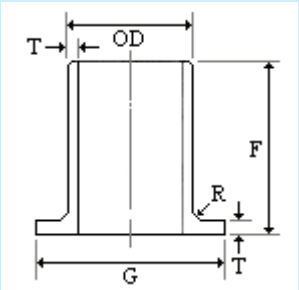
Nominal Pipe Size		Outside Dia. (OD_1)	Outside Dia. (OD_2)	Center to End (C)	Center to End (M)	Wall Thickness (T)								Weights (Kg.)			
						Sch. 10s		Sch. 40s / STD		Sch. 80s / XS		Sch. 160					
Run	Outlet					T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
10	3	10.750	3.500	8.50	7.50	0.165	0.120	0.365	0.216	-	-	-	-	13.98	33.86	-	-
10	4	10.750	4.500	8.50	7.50	0.165	0.120	0.365	0.237	-	-	-	-	14.36	35.98	-	-
10	5	10.750	5.563	8.50	7.50	0.165	0.134	0.365	0.258	0.500	0.375	-	-	16.47	36.14	47.47	-
10	6	10.750	6.625	8.50	7.63	0.165	0.134	0.365	0.280	0.500	0.432	-	-	16.58	36.27	47.96	-
10	8	10.750	8.625	8.50	8.00	0.165	0.148	0.365	0.322	0.500	0.500	-	-	16.69	36.85	48.39	-
12	5	12.750	5.563	10.00	8.63	0.180	0.134	0.375	0.258	-	-	-	-	23.78	50.32	-	-
12	6	12.750	6.625	10.00	8.63	0.180	0.134	0.375	0.280	0.500	0.432	-	-	25.10	51.96	67.48	-
12	8	12.750	8.625	10.00	9.00	0.180	0.148	0.375	0.322	0.500	0.500	-	-	25.32	52.38	67.92	-
12	10	12.750	10.750	10.00	9.50	0.180	0.165	0.375	0.365	0.500	0.500	-	-	25.48	53.72	68.81	-

REDUCING TEE

Unit : inch

Nominal Pipe Size		Outside Dia. (OD_1)	Outside Dia. (OD_2)	Center to End (C)	Center to End (M)	Wall Thickness (T)								Weights (Kg.)			
						Sch. 10s		Sch. 20s		Sch. 40s / STD		Sch. 80s / XS					
Run	Outlet					T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	Sch. 10s	Sch. 20s	Sch. 40s / STD	Sch. 80s / XS
14	6	14.00	6.625	11.00	9.75	0.188	0.134	-	-	0.375	0.280	-	-	26.40	-	54.23	-
14	8	14.00	8.625	11.00	9.75	0.188	0.148	0.312	0.250	0.375	0.322	0.500	0.500	28.79	52.00	57.88	75.22
14	10	14.00	10.75	11.00	10.13	0.188	0.165	0.312	0.250	0.375	0.365	0.500	0.500	28.96	52.37	58.34	75.89
14	12	14.00	12.75	11.00	10.63	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	29.14	52.73	58.81	76.57
16	6	16.00	6.625	12.00	11.00	0.188	0.134	-	-	0.375	0.280	-	-	30.30	-	64.39	-
16	8	16.00	8.625	12.00	11.13	0.188	0.148	-	-	0.375	0.322	-	-	31.56	-	65.80	-
16	10	16.00	10.75	12.00	11.63	0.188	0.165	0.312	0.250	0.375	0.365	0.500	0.500	34.26	61.89	68.88	89.51
16	12	16.00	12.75	12.00	11.63	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	34.47	62.32	69.43	90.32
16	14	16.00	14.00	12.00	12.00	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	34.67	62.76	69.98	91.13
18	8	18.00	8.625	13.50	12.63	0.188	0.148	-	-	0.375	0.322	-	-	40.00	-	84.30	-
18	10	18.00	10.75	13.50	12.63	0.188	0.165	-	-	0.375	0.365	-	-	40.50	-	84.60	-
18	12	18.00	12.75	13.50	12.63	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	43.37	78.33	87.17	113.28
18	14	18.00	14.00	13.50	13.00	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	43.62	78.88	87.87	114.30
18	16	18.00	16.00	13.50	13.00	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	43.89	79.43	88.57	115.33
20	10	20.00	10.75	15.00	14.00	0.218	0.165	-	-	0.375	0.365	-	-	60.7	-	103.6	-
20	12	20.00	12.75	15.00	14.00	0.218	0.180	-	-	0.375	0.375	-	-	62.8	-	105.3	-
20	14	20.00	14.00	15.00	14.00	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	64.5	107.6	107.6	139.9
20	16	20.00	16.00	15.00	14.00	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	64.9	108.4	108.4	141.1
20	18	20.00	18.00	15.00	14.50	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	65.2	109.1	109.1	142.4
22	16	22.00	16.00	16.50	15.00	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	78.0	130.2	130.2	169.2
22	18	22.00	18.00	16.50	15.50	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	78.5	131.1	131.1	170.7
22	20	22.00	20.00	16.50	16.00	0.218	0.218	0.375	0.375	0.375	0.375	0.500	0.500	79.0	132.1	132.1	172.3
24	10	24.00	10.75	17.00	16.00	0.250	0.165	-	-	0.375	0.365	-	-	92.6	-	134.9	-
24	12	24.00	12.75	17.00	16.00	0.250	0.180	-	-	0.375	0.375	-	-	94.4	-	136.5	-
24	14	24.00	14.00	17.00	16.00	0.250	0.188	-	-	0.375	0.375	-	-	95.3	-	137.1	-
24	16	24.00	16.00	17.00	16.00	0.250	0.188	0.375	0.312	0.375	0.375	0.500	0.500	96.8	138.2	138.2	179.6
24	18	24.00	18.00	17.00	16.50	0.250	0.188	0.375	0.312	0.375	0..375	0.500	0.500	97.7	139.2	139.2	181.3
24	20	24.00	20.00	17.00	17.00	0.250	0.218	0.375	0.375	0.375	0.375	0.500	0.500	98.0	140.2	140.2	182.9
24	22	24.00	22.00	17.00	17.00	0.250	0.218	0.375	0.375	0.375	0.375	0.500	0.500	98.6	141.2	141.2	184.5

** Above weight list are based on theoretical calculation.*



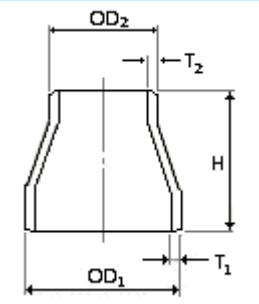
MSS SP 43 - STUB END

Unit : inch

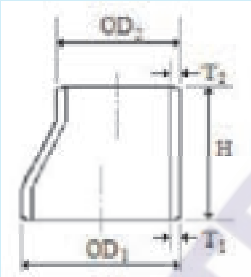
Nominal Pipe Size	Outside Dia. (OD)	Dia.of Lap (G)	Wall Thickness (T)				Length (F)	Radius (R)		Weights (Kg.)			
			Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS		Type A (Max)	Type B (Max)	Sch. 5s	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS
1/2	0.840	1.375	0.065	0.083	0.109	0.147	2.0	0.13	0.03	0.059	0.077	0.118	0.127
3/4	1.050	1.688	0.065	0.083	0.113	0.154	2.0	0.13	0.03	0.068	0.086	0.154	0.168
1	1.315	2.000	0.065	0.109	0.133	0.179	2.0	0.13	0.03	0.091	0.140	0.186	0.240
1-1/4	1.660	2.500	0.065	0.109	0.140	0.191	2.0	0.19	0.03	0.131	0.208	0.263	0.349
1-1/2	1.900	2.875	0.065	0.109	0.145	0.200	2.0	0.25	0.03	0.159	0.249	0.376	0.458
2	2.375	3.625	0.065	0.109	0.154	0.218	2.5	0.31	0.03	0.245	0.376	0.539	0.743
2-1/2	2.875	4.125	0.083	0.120	0.203	0.276	2.5	0.31	0.03	0.349	0.471	0.797	1.060
3	3.500	5.000	0.083	0.120	0.216	0.300	2.5	0.38	0.03	0.467	0.638	1.133	1.508
4	4.500	6.188	0.083	0.120	0.237	0.337	3.0	0.44	0.03	0.711	0.978	1.812	2.523
5	5.563	7.313	0.109	0.134	0.258	0.375	3.0	0.44	0.06	1.046	1.237	2.537	3.601
6	6.625	8.500	0.109	0.134	0.280	0.432	3.5	0.50	0.06	1.62	1.95	3.72	5.57
8	8.625	10.625	0.109	0.148	0.322	0.500	4.0	0.50	0.06	2.45	3.10	5.89	10.12
10	10.750	12.750	0.134	0.165	0.365	0.500	5.0	0.50	0.06	4.04	4.86	10.42	13.95
12	12.750	15.000	0.156	0.180	0.375	0.500	6.0	0.50	0.06	6.06	7.11	14.95	19.93
14	14.000	16.250	0.156	0.188	0.375	0.500	6.0	0.50	0.06	6.43	7.75	15.46	20.62
16	16.000	18.500	0.165	0.188	0.375	0.500	6.0	0.50	0.06	7.91	9.02	17.98	23.98
18	18.000	21.000	0.165	0.188	0.375	0.500	6.0	0.50	0.06	9.24	10.53	21.00	28.00
20	20.000	23.000	0.188	0.218	0.375	0.500	6.0	0.50	0.06	11.68	13.54	23.30	31.07
24	24.000	27.250	0.218	0.250	0.375	0.500	6.0	0.50	0.06	16.52	18.94	28.41	37.88

** Above weight list are based on theoretical calculation.*

BUTT WELD FITTINGS (SEAMLESS / WELDED)



CONCENTRIC REDUCER



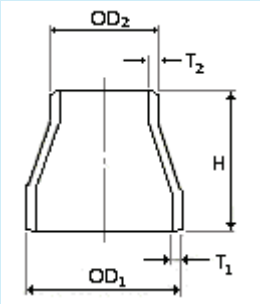
ECCENTRIC REDUCER

Unit : inch

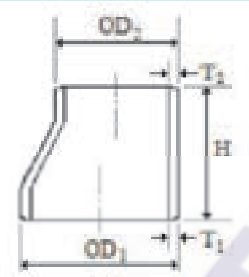
Nominal Pipe Size	Outside Dia. (OD_1)	Outside Dia. (OD_2)	Length (H)	Wall Thickness (T)								Weights (Kg.)			
				Sch. 10s		Sch. 40s / STD		Sch. 80s / XS		Sch. 160		Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
				T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2				
1/2 x 3/8	0.840	0.680	1.50	0.083	0.065	0.109	0.091	-	-	-	-	0.030	0.040	-	-
3/4 x 3/8	1.050	0.680	1.50	0.083	0.065	0.113	0.091	-	-	-	-	0.034	0.048	-	-
3/4 x 1/2	1.050	0.840	1.50	0.083	0.083	0.113	0.091	0.154	0.147	0.219	0.188	0.043	0.059	0.075	0.123
1 x 3/8	1.315	0.680	2.00	0.109	0.065	0.133	0.091	-	-	-	-	0.063	0.091	-	-
1 x 1/2	1.315	0.840	2.00	0.109	0.083	0.133	0.109	0.179	0.147	0.250	0.188	0.089	0.105	0.163	0.170
1 x 3/4	1.315	1.050	2.00	0.109	0.083	0.133	0.113	0.179	0.154	0.250	0.219	0.098	0.116	0.168	0.190
1-1/4 x 1/2	1.660	0.840	2.00	0.109	0.083	0.140	0.109	0.191	0.147	-	-	0.116	0.148	0.226	-
1 -1/4 x 3/4	1.660	1.050	2.00	0.109	0.083	0.140	0.113	0.191	0.154	-	-	0.120	0.150	0.230	-
1-1/4 x 1	1.660	1.315	2.00	0.109	0.109	0.140	0.133	0.191	0.179	0.250	0.250	0.125	0.157	0.245	0.290
1-1/2 x 1/2	1.900	0.840	2.50	0.109	0.083	0.145	0.109	0.200	0.147	0.281	0.188	0.154	0.204	0.276	0.342
1-1/2 x 3/4	1.900	1.050	2.50	0.109	0.083	0.145	0.113	0.200	0.154	0.281	0.219	0.156	0.211	0.294	0.350
1-1/2 x 1	1.900	1.315	2.50	0.109	0.109	0.145	0.133	0.200	0.179	0.281	0.250	0.170	0.219	0.308	0.380
1-1/2x1-1/4	1.900	1.660	2.50	0.109	0.109	0.145	0.140	0.200	0.191	0.281	0.250	0.195	0.263	0.331	0.430
2 x 1/2	2.375	0.840	3.00	0.109	0.083	0.154	0.109	0.218	0.147	-	-	0.208	0.290	0.364	-
2 x 3/4	2.375	1.050	3.00	0.109	0.083	0.154	0.113	0.218	0.154	0.344	0.219	0.214	0.298	0.453	0.617
2 x 1	2.375	1.315	3.00	0.109	0.109	0.154	0.133	0.218	0.179	0.344	0.250	0.237	0.322	0.458	0.643
2 x 1-1/4	2.375	1.660	3.00	0.109	0.109	0.154	0.140	0.218	0.191	0.344	0.250	0.258	0.352	0.525	0.704
2 x 1-1/2	2.375	1.900	3.00	0.109	0.109	0.154	0.145	0.218	0.200	0.344	0.281	0.273	0.372	0.544	0.750
2-1/2 x 1	2.875	1.315	3.50	0.120	0.109	0.203	0.133	0.276	0.179	-	-	0.370	0.630	0.739	-
2-1/2x1-1/4	2.875	1.660	3.50	0.120	0.109	0.203	0.140	0.276	0.191	0.375	0.250	0.394	0.661	0.825	1.023
2-1/2x1-1/2	2.875	1.900	3.50	0.120	0.109	0.203	0.145	0.276	0.200	0.375	0.281	0.396	0.670	0.856	1.080
2-1/2 x 2	2.875	2.375	3.50	0.120	0.109	0.203	0.154	0.276	0.218	0.375	0.344	0.432	0.724	0.938	1.216
3 x 1	3.500	1.315	3.50	0.120	0.109	0.216	0.133	0.300	0.179	0.438	0.250	0.408	0.716	0.888	1.408
3 x 1-1/4	3.500	1.660	3.50	0.120	0.109	0.216	0.140	0.300	0.191	0.438	0.250	0.430	0.775	1.037	1.431
3 x 1-1/2	3.500	1.900	3.50	0.120	0.109	0.216	0.145	0.300	0.200	0.438	0.281	0.444	0.783	1.105	1.449
3 x 2	3.500	2.375	3.50	0.120	0.109	0.216	0.154	0.300	0.218	0.438	0.344	0.478	0.846	1.178	1.574
3 x 2-1/2	3.500	2.875	3.50	0.120	0.120	0.216	0.203	0.300	0.276	0.438	0.375	0.548	0.983	1.291	1.712
4 x 1-1/2	4.500	1.900	4.00	0.120	0.109	0.237	0.145	0.337	0.200	0.535	0.281	0.630	1.241	1.730	2.429
4 x 2	4.500	2.375	4.00	0.120	0.109	0.237	0.154	0.337	0.218	0.535	0.344	0.656	1.270	1.780	2.580
4 x 2-1/2	4.500	2.875	4.00	0.120	0.120	0.237	0.203	0.337	0.276	0.535	0.375	0.706	1.370	2.007	2.760
4 x 3	4.500	3.500	4.00	0.120	0.120	0.237	0.216	0.337	0.300	0.535	0.438	0.748	1.450	2.129	3.000
5 x 2	5.563	2.375	5.00	0.134	0.109	0.258	0.154	-	-	-	-	1.03	1.92	-	-
5 x 2-1/2	5.563	2.875	5.00	0.134	0.120	0.258	0.203	0.375	0.276	-	-	1.10	2.16	3.02	-
5 x 3	5.563	3.500	5.00	0.134	0.120	0.258	0.216	0.375	0.300	0.625	0.438	1.20	2.27	3.55	5.32
5 x 4	5.563	4.500	5.00	0.134	0.120	0.258	0.237	0.375	0.337	0.625	0.535	1.32	2.50	3.77	5.59
6 x 2	6.625	2.375	5.50	0.134	0.109	0.280	0.154	-	-	-	-	1.33	2.54	-	-
6 x 2-1/2	6.625	2.875	5.50	0.134	0.120	0.280	0.203	0.432	0.276	-	-	1.35	2.74	4.51	-
6 x 3	6.625	3.500	5.50	0.134	0.120	0.280	0.216	0.432	0.300	0.719	0.438	1.50	3.04	5.03	7.21
6 x 4	6.625	4.500	5.50	0.134	0.120	0.280	0.237	0.432	0.337	0.719	0.535	1.62	3.30	5.44	7.88
6 x 5	6.625	5.563	5.50	0.134	0.134	0.280	0.258	0.432	0.375	0.719	0.625	1.75	3.57	5.71	8.63

** Above weight list are based on theoretical calculation.*

BUTT WELD FITTINGS (SEAMLESS / WELDED)



CONCENTRIC REDUCER



ECCENTRIC REDUCER

Unit : inch

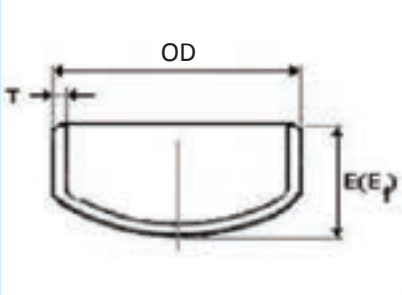
Nominal Pipe Size	Outside Dia. (OD_1)	Outside Dia. (OD_2)	Length (H)	Wall Thickness (T)								Weights (Kg.)			
				Sch. 10s		Sch. 40s / STD		Sch. 80s / XS		Sch. 160		Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	Sch. 160
				T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2				
8 x 3	8.625	3.500	6.00	0.148	0.120	0.322	0.216	-	-	-	-	2.33	5.08	-	-
8 x 4	8.625	4.500	6.00	0.148	0.120	0.322	0.237	0.500	0.337	-	-	2.56	5.10	8.43	-
8 x 5	8.625	5.563	6.00	0.148	0.134	0.322	0.258	0.500	0.375	-	-	2.70	5.40	8.83	-
8 x 6	8.625	6.625	6.00	0.148	0.134	0.322	0.280	0.500	0.432	-	-	2.85	5.71	9.24	-
10 x 5	10.750	5.563	7.00	0.165	0.134	0.365	0.258	0.500	0.375	-	-	3.30	8.21	13.00	-
10 x 6	10.750	6.625	7.00	0.165	0.134	0.365	0.280	0.500	0.432	-	-	3.87	8.78	13.50	-
10 x 8	10.750	8.625	7.00	0.165	0.148	0.365	0.322	0.500	0.500	-	-	4.21	9.58	14.22	-
12 x 5	12.750	5.563	8.00	0.180	0.134	0.375	0.258	-	-	-	-	4.97	12.08	-	-
12 x 6	12.750	6.625	8.00	0.180	0.134	0.375	0.280	0.500	0.432	-	-	5.73	12.40	18.39	-
12 x 8	12.750	8.625	8.00	0.180	0.148	0.375	0.322	0.500	0.500	-	-	6.11	13.70	19.07	-
12 x 10	12.750	10.750	8.00	0.180	0.165	0.375	0.365	0.500	0.500	-	-	6.55	14.70	19.48	-

** Above weight list are based on theoretical calculation.*

Unit : inch

Nominal Pipe Size	Outside Dia. (OD_1)	Outside Dia. (OD_2)	Length (H)	Wall Thickness (T)								Weights (Kg.)			
				Sch. 10s		Sch. 20s		Sch. 40s / STD		Sch. 80s / XS		Sch. 10s	Sch. 20s	Sch. 40s / STD	Sch. 80s / XS
				T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2				
14 x 6	14.00	6.625	13	0.188	0.134	-	-	0.375	0.280	0.500	0.432	11.0	-	22.0	28.7
14 x 8	14.00	8.625	13	0.188	0.148	0.312	0.250	0.375	0.322	0.500	0.500	12.1	21.7	24.2	31.5
14 x 10	14.00	10.750	13	0.188	0.165	0.312	0.250	0.375	0.365	0.500	0.500	13.2	23.7	26.4	34.4
14 x 12	14.00	12.750	13	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	14.3	25.7	28.6	37.2
16 x 8	16.00	8.625	14	0.188	0.148	0.312	0.250	0.375	0.322	0.500	0.500	14.2	25.4	28.3	36.9
16 x 10	16.00	10.750	14	0.188	0.165	0.312	0.250	0.375	0.365	0.500	0.500	15.4	27.6	30.8	40.1
16 x 12	16.00	12.750	14	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	16.5	29.7	33.1	43.1
16 x 14	16.00	14.000	14	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	17.3	30.9	34.5	44.9
18 x 10	18.00	10.750	15	0.188	0.165	0.312	0.250	0.375	0.365	0.500	0.500	17.7	31.8	35.4	46.1
18 x 12	18.00	12.750	15	0.188	0.180	0.312	0.250	0.375	0.375	0.500	0.500	18.9	34.0	37.9	49.3
18 x 14	18.00	14.000	15	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	19.7	35.4	39.4	51.3
18 x 16	18.00	16.000	15	0.188	0.188	0.312	0.312	0.375	0.375	0.500	0.500	20.9	37.6	41.9	54.5
20 x 10	20.00	10.750	20	0.218	0.165	-	-	0.375	0.365	-	-	30.6	-	53.2	-
20 x 12	20.00	12.750	20	0.218	0.180	0.375	0.250	0.375	0.375	0.500	0.500	32.8	53.5	53.8	70.0
20 x 14	20.00	14.000	20	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	34.0	55.3	55.8	72.7
20 x 16	20.00	16.000	20	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	36.1	59.1	59.3	76.9
20 x 18	20.00	18.000	20	0.218	0.188	0.375	0.312	0.375	0.375	0.500	0.500	38.0	62.0	62.4	81.3
24 x 14	24.00	14.000	20	0.250	0.188	0.375	0.312	0.375	0.375	0.500	0.500	43.7	62.2	62.4	81.3
24 x 16	24.00	16.000	20	0.250	0.188	0.375	0.312	0.375	0.375	0.500	0.500	46.1	65.6	65.8	85.5
24 x 18	24.00	18.000	20	0.250	0.188	0.375	0.312	0.375	0.375	0.500	0.500	48.3	68.6	68.9	89.9
24 x 20	24.00	20.000	20	0.250	0.218	0.375	0.375	0.375	0.375	0.500	0.500	50.6	72.3	72.3	94.1
24 x 22	24.00	22.000	20	0.250	0.218	0.375	0.375	0.375	0.375	0.500	0.500	46.0	68.6	68.6	90.1

** Above weight list are based on theoretical calculation.*



CAP

Unit : inch

Nominal Pipe Size	Outside Dia. (OD)	Wall Thickness (T)			Length (E)			Weights (Kg.)		
		Sch. 10s	Sch. 40s / STD	Sch. 80s / XS	E	Limiting Wall Thickness, T_f	E_f	Sch. 10s	Sch. 40s / STD	Sch. 80s / XS
1/2	0.840	0.083	0.109	0.147	1.00	0.18	1.00	0.040	0.046	0.054
3/4	1.050	0.083	0.113	0.154	1.00	0.15	1.00	0.052	0.059	0.086
1	1.315	0.109	0.133	0.179	1.50	0.18	1.50	0.090	0.109	0.139
1-1/4	1.660	0.109	0.140	0.191	1.50	0.19	1.50	0.113	0.145	0.159
1-1/2	1.900	0.109	0.145	0.200	1.50	0.20	1.50	0.130	0.171	0.222
2	2.375	0.109	0.154	0.218	1.50	0.22	1.75	0.168	0.234	0.344
2-1/2	2.875	0.120	0.203	0.276	1.50	0.28	2.00	0.242	0.420	0.512
3	3.500	0.120	0.216	0.300	2.00	0.30	2.50	0.362	0.664	0.888
4	4.500	0.120	0.237	0.337	2.50	0.32	3.00	0.585	1.170	1.510
5	5.563	0.134	0.258	0.375	3.00	0.34	3.50	0.978	1.900	2.890
6	6.625	0.134	0.280	0.432	3.50	0.38	4.00	1.35	2.83	4.24
8	8.625	0.148	0.322	0.500	4.00	0.43	5.00	2.49	5.11	7.76
10	10.750	0.165	0.365	0.500	5.00	0.50	6.00	3.84	8.92	13.11
12	12.750	0.180	0.375	0.500	6.00	0.50	7.00	6.15	14.10	17.94
14	14.000	0.188	0.375	0.500	6.50	0.50	7.50	7.85	16.35	21.11
16	16.000	0.188	0.375	0.500	7.00	0.50	8.00	9.56	18.60	25.73
18	18.000	0.188	0.375	0.500	8.00	0.50	9.00	12.10	23.54	32.57
20	20.000	0.218	0.375	0.500	9.00	0.50	10.00	17.90	29.06	40.21
24	24.000	0.250	0.375	0.500	10.50	0.50	12.00	30.15	41.85	57.86

**Length E applies for thickness not exceeding that given column "Limiting Wall Thickness"($T < T_f$).*
**Length E_f applies for thickness greater than that given column "Limiting Wall Thickness"($T > T_f$).*
** Above weight list are based on theoretical calculation.*

DIMENSIONAL TOLERANCES AND WELDING ENDS

(MSS SP-43 1986 Edition)

Dimensions in Inches

Nominal Pipe Size	All Fittings		90 Elbows 45 Elbows Tees	Reducers Lap-Joint Stub Ends	180° Returns			Caps	Lap-Joint Stub Ends	
	Outside Diameter at welding end	Wall Thickness	Centre-to-End Dimension (A, B, C, M)	Overall Length (F, H)	Centre-to- Centre Dimension (P)	Back-to-face Dimension (K)	Alignment of End (U)	Overall Length (E)	Fillet Radius of Lap (R)	Outside Diameter of Lap (G)
1/2 to 1-1/2	±0.03	NOT LESS THAN 87.5% OF NOMINAL THICKNESS	±0.06	±0.06	±0.25	±0.25	±0.03	±0.12	+0 -0.03	+0 -0.03
2 to 3-1/2	±0.03		±0.06	±0.06	±0.25	±0.25	±0.03	±0.12	+0 -0.03	+0 -0.03
4	±0.03		±0.06	±0.06	±0.25	±0.25	±0.03	±0.12	+0 -0.06	+0 -0.03
5 to 8	+0.06 -0.03		±0.06	±0.06	±0.25	±0.25	±0.03	±0.25	+0 -0.06	+0 -0.03
10 to 18	+0.09 -0.03		±0.09	±0.09	±0.38	±0.25	±0.06	±0.25	+0 -0.06	+0 -0.06
20 to 24	+0.12 -0.03		±0.09	±0.09	±0.38	±0.25	±0.06	±0.25	+0 -0.06	+0 -0.06

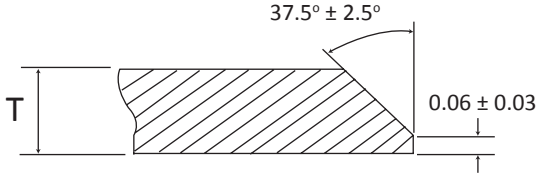
(ANSI B16.9-1993)

Dimensions in Inches

All Fittings				90° Elbows 45° Elbows Tees	Reducers Lap-Joint Stub Ends	Caps	180° Returns			Lap-Joint Stub Ends		
Nominal Pipe Size	Outside Diameter at welding end	Inside Diameter at End	Wall Thickness	Centre-to-End Dimension (A, B, C, M)	Overall Length (F, H)	Overall Length (E)	Centre-to- Centre Dimension (P)	Back-to-face Dimension (K)	Alignment of End (U)	Outside Diameter of Lap (G)	Thickness of Lap (T)	Fillet Radius of Lap (R)
1/2 to 2-1/2	+0.06 -0.03	±0.03	NOT LESS THAN 87.5% OF NOMINAL THICKNESS	±0.06	±0.06	±0.12	±0.25	±0.25	±0.03	+0 -0.03	+0.06 -0	+0 -0.03
3 to 3-1/2	±0.06	±0.06		±0.06	±0.06	±0.12	±0.25	±0.25	±0.03	+0 -0.03	+0.06 -0	+0 -0.03
4	±0.06	±0.06		±0.06	±0.06	±0.12	±0.25	±0.25	±0.03	+0 -0.03	+0.06 -0	+0 -0.06
5 to 8	+0.09 -0.06	±0.06		±0.06	±0.06	±0.25	+0.25	±0.25	±0.03	+0 -0.03	+0.06 -0	+0 -0.06
10 to 18	+0.16 -0.12	±0.12		±0.09	±0.09	±0.25	±0.38	±0.25	±0.06	+0 -0.06	+0.06 -0	+0 -0.06
20 to 24	+0.25 -0.19	±0.19		±0.09	±0.09	±0.25	±0.38	±0.25	±0.06	+0 -0.06	+0.06 -0	+0 -0.06
26 to 30	+0.25 -0.19	±0.19		±0.12	±0.19	±0.38						
32 to 48	+0.25 -0.19	±0.19		±0.19	±0.19	±0.38						

DETAIL OF WELDING END

Nominal pipe wall thickness less than 0.125"



Nominal pipe wall thickness 0.125" through 0.875"

JIS-ASTM CONTRAST LIST OF RELATIVE MATERIAL

Steel Items		JIS Specification		ATSM Specification			Marks of Tube Jointing Materials	BS Specification	DIN Specification
		Steel Tube	Steel Plate	Steel Tube	Steel Plate	Steel Materials		Steel Tube	Steel Tube
Carbon Steel		SGP	SS41	A53-Type F	A283-A	A235-A		3601-320	1626-st33
		STPG38	SM41B	A53-A	A242	A105	-	3601-360	1626-st37
		STPG42	SM41B	A53-B	A242	A105	-	3601-410	1626-st42
		STS35	SB35	-	-	-	-	-	-
		STS38	SB42	-	-	-	-	-	-
		STS42	SB42	-	-	-	-	-	-
		STS49	SB49	-	-	-	-	-	-
		STPT38	SB42	A106-A	A285-B	A105	-	3602-360	17175-st35.8
		STPTG42	SB42	A106-B	A515 - 65, 70	A105	WPB	3602-410	17175-st45.8
		STPT49	SB49	A106-C	-	-	WPC	3602-460	-
Alloy Steel	1/2 Mo Steel	STPA12	SB46M	A335-P1	A204-B	A182-F1	WP1	-	17175-15Mo3
	1Cr-1/2 Mo Steel	STPA22	SCMV2	A335-P12	A387-12	A182-F12	WP12	3604-620-440	17175-13CrMo44
	1-1/4Cr-1/2 Mo Steel	STPA23	SCMV3	A335-P11	A387-11	A182-F11	WP11	3604-621	-
	2-1/4Cr-1 Mo Steel	STPA24	SCMV4	A335-P22	A387-22	A182-F22	WP22	3604-622	17175-10CrMo910
	5Cr-1/2 Mo Steel	STPA25	SCMV6	A335-P5	A387-5	A182-5	WP5	3604-625	-
	9Cr-1 Mo Steel	STA26	-	A335-P9	A387-9	A182-9	WP9	-	-
Steel for Low Temperature	A l gilt Steel	STPL39	SLA33A	A333-6	A516 - 60, 65, 70	A350-LF2	WPL6	3603-410LT50	-
	3-1/2 Ni Steel	STPL46	-	A333-3	A203-D	A350-LF3	WPL3	3603-503LT100	-
	9 Ni Steel	STPL70	-	A333-8	A353	A522	WPL8	3603-503LT196	-
Stainless Steel	18-8 Stainless Steel	SUS304TP	SUS304	A312 - TP304	A240 - Type 304	A182 - F304	WP304	3605-304S18,S25	17440-X5CrNi189
	High Temperature 18-8 Stainless Steel	SUS304HTP	-	A312 - TP304H	A240 - Type 304H	A182 - F304H	WP304H	3605-304S59	-
	Low Carbon 18-8 Stainless Steel	SUS304LTP	SUS304L	A312 - TP304L	A240 - Type 304L	A182 - F304L	WP304L	3605-304S14,S22	17440-X2CrNi189
	22-12 Stainless Steel	SUS309STP	SUS309S	A312 - TP309	A240 - Type 309S	-	WP309	-	-
	25-20 Stainless Steel	SUS310STP	SUS310S	A312 - TP310	A240 - Type 310S	A182 - F310	WP310	-	-
	18-8(Nb + Ta) Stainless Steel	SUS347TP	SUS347	A312 - TP347	A240 - Type 347	A182 - F347	WP347	3605-347S18,S17	17440-X10CrNiNb189
	18-8 Mo Stainless Steel	SUS316TP	SUS316	A312 - TP316	A240 - Type 316	A182 - F316	WP316	3605-316S18,S26	17440-X5CrNiMo1810
	High Temperature 18-8 Mo Stainless Steel	SUS316HTP	-	A312 - TP316H	A240 - Type 316H	A182 - F316H	WP316H	3605-316S59	-
	Low Carbon 18-8 Mo Stainless Steel	SUS316LTP	SUS316L	A312 - TP316L	A240 - Type 316L	A182 - F316L	WP316L	3605-316S14,S22	17440-X2CrNiMo1810
	18-8 Ti Stainless Steel	SUS321TP	SUS321	A312 - TP321	A240 - Type 321	A182 - F321	WP321	3605-321S18,S22	17440-X10CrNiTi189
	High Temperature 18-8 Ti Stainless Steel	SUS321HTP	-	A312 - TP321H	A240 - Type 321H	A182 - F321H	WP321H	3605-321S59	-
	High Temperature 18-8 (Nb + Ta) Stainless Steel	SUS347HTP	-	A312 - TP347H	A240 - Type 347H	A182 - F347H	WP347H	3605-347S59	-
	25-5 Mo Stainless Steel	SUS329JITP	SUS329JI	A268 - TP329	-	-	-	-	-

RAW MATERIALS SPECIFICATIONS

For Fittings Made From Sheets, ASTM A240 Shall Be Applied As Follows

Type	Carbon max %	Mag-anese max %	Phosphorus max %	Sulphur max %	Silicon max %	Chromium max %	Nickel %	Other Elements	T.S Min Ksi	T.S Min Ksi	Elong-gation %	Hardness	
												HB	HRB
304	0.08	2.00	0.045	0.03	1.00	18.0 - 20.0	8.00 - 10.50		75	30	40	183	88
304L	0.03	2.00	0.045	0.03	1.00	18.0 - 20.0	8.00 - 12.00		70	25	40	183	88
316	0.08	2.00	0.045	0.03	1.00	16.0 - 18.0	10.00 - 14.00	Mo 2.00 3.00	75	30	40	217	95
316L	0.03	2.00	0.045	0.03	1.00	16.0 - 18.0	10.00 - 14.00	Mo 2.00 3.00	70	25	40	217	95

For Fittings Made From Seamless and Welded Pipes, ASTM A312 Shall Be Applied As Follows

Grade	Carbon max %	Mag-anese max %	Phosphorus max %	Sulphur max %	Silicon max %	Chromium max %	Nickel %	Other Elements	T.S Min Ksi	T.S Min Ksi
TP 304	0.08	2.00	0.040	0.03	0.75	18.0 - 20.0	8.00 - 11.0		75	30
TP 304L	0.035	2.00	0.040	0.03	0.75	18.0 - 20.0	8.00 - 13.0		70	25
TP 316	0.08	2.00	0.040	0.03	0.75	16.0 - 18.0	11.0 - 14.0	Mo 2.00 - 3.00	75	30
TP 316L	0.035	2.00	0.040	0.03	0.75	16.0 - 18.0	10.0 - 15.0	Mo 2.00 - 3.00	70	25

Tolerance Of Butt Weld Fittings in JIS and ASTM

Nominal Pipe Size (inch)	Outside Diameter (OD) JIS (mm)	Outside Diameter (OD) ATSM (mm)	Nominal Pipe Size (inch)	Outside Diameter (OD) JIS (mm)	Outside Diameter (OD) ATSM (mm)
1/2	21.3 - 21.7 - 22.5	20.9 - 21.3 - 22.1	5	139.0 - 139.8 - 140.6	140.5 - 141.3 - 142.1
3/4	26.8 - 27.2 - 28.0	26.3 - 26.7 - 27.5	6	164.4 - 165.2 - 164.4	167.5 - 168.3 - 169.5
1	33.6 - 34.0 - 34.8	33.0 - 33.4 - 34.2	8	215.5 - 216.3 - 217.5	218.3 - 219.1 - 220.3
1-1/4	42.3 - 42.7 - 43.5	41.8 - 42.2 - 43.0	10	265.8 - 267.4 - 269.0	271.5 - 273.1 - 275.0
1-1/2	48.2 - 48.6 - 49.4	47.6 - 48.3 - 49.5	12	316.9 - 318.5 - 320.5	322.3 - 323.9 - 325.9
2	60.1 - 60.5 - 61.3	59.8 - 60.3 - 61.1	14	354.0 - 355.6 - 357.6	354.0 - 355.6 - 357.6
2-1/2	75.9 - 76.3 - 77.1	72.9 - 73.0 - 73.8	16	404.8 - 406.4 - 408.4	404.8 - 406.4 - 410.0
3	88.7 - 89.1 - 89.9	88.5 - 88.9 - 89.4	18	455.6 - 457.2 - 459.2	455.6 - 457.2 - 459.2
3-1/2	101.2 - 101.6 - 102.4	101.2 - 101.6 - 102.4	20	505.6 - 508.0 - 511.0	505.6 - 508.0 - 511.0
4	113.5 - 114.3 - 115.1	113.5 - 114.3 - 115.1	24	607.2 - 609.6 - 612.6	607.2 - 609.6 - 612.6

150 # SCREWED FITTINGS

SCREWED FITTINGS

K-01

Elbow 90 Equal Banded F/F

K-01A

Elbow 90 Banded Reducing

K-01B

Elbow 90 Equal Banded Socket Weld

K-01C

Elbow With Strip

K-01D

Elbow 90 Non-Banded F/F

K-02

Tee Banded

K-02A

Tee Banded Reducing

K-02B

Tee Banded Socket Weld

K-02C

Y-Tee Banded

K-02D

Tee Non-Banded

K-03

Cross Banded

K-04

Street Elbow 90 M/F

K-04A

Street Elbow 45 M/F

K-04B

Street Elbow Non-Banded M/F

K-05

Elbow 45 Equal Banded F/F

K-05A

Elbow 45 Banded Socket Weld

K-06 / K-06A

Union Conical Joint F/F
Union Flat Seat With PTFE Gasket F/F

K-06B / K-06C

Union Conical Joint M/F
Union Flat Seat With PTFE Gasket M/F

K-06D / K-06E

Union Conical Joint BW/BW
Union Flat Seat With PTFE Gasket BW/BW

K-06F / K-06G

Union Conical Joint BW/F
Union Flat Seat With PTFE Gasket BW/F

SCREWED FITTINGS

K-06H / K-06I

Union Conical Joint BW/M

Union Flat Seat With PTFE Gasket BW/M

K-06J / K-06K

Union Conical Joint M/M

Union Flat Seat With PTFE Gasket M/M

K-06L / K-06O

Union Flat Seat Inside/Inside Thread

Union Conical Inside/Inside Thread

K-06P / K-06Q

Union Flat Seat Inside/Outside Thread

Union Conical Inside/Outside Thread

K-06N / K-06Q

Union Flat Seat Welded Ends

Union Conical Welded Ends

K-06R

Union Conical Joint Socket Weld

K-06Y

Union BW/M With Hexagon Nut

K-071 / K-072

Hexagon Nipple (DIN/BSP)

Hexagon Nipple (NPT/PT)

K-07A

Hexagon Nipple Reducing

K-07B

Barrel Nipple From Pipe

K-07C

Welding Nipple From Pipe

K-07D

Hose Nipple

K-07E

Hexagon Welding Nipple

K-08 / K-08A

Hexagon Plug, Taper (Conical) Thread

Hexagon Plug, parallel (Cylinder) Thread

K-08B

Square Plug

K-09

Hexagon Bushing M/F

K-09A

Negative Hexagon Bushing M/F

K-10

Hexagon Cap

K-10A

Round Cap Banded

K-10B

Round Cap Banded Socket Weld

SCREWED FITTINGS

K-11

Backnut (Locknut)

K-12

Socket (Coupling) Banded

K-12A

Socket (Coupling) Banded Reducing

K-12BN

Socket (Coupling) Plain

K-12CN

Half Socket (Coupling) Plain

K-12D

Socket (Coupling) Weld

K-12E

Socket (Coupling) O.D. Machined

K-12F

Half Socket (Half Coupling) O.D. Machined

K-12G

Socket (Coupling) Banded Reducing Socket Weld

K-12H

Half Socket (Half Coupling) Weld O.D. Machined

K-12IN

Socket (Coupling) Weld Plain

K-12JN

Half Socket (Half Coupling) Weld Plain

K-12K

Hexagon Socket (Coupling) Plain

K-13

Hose Nipple Female

K-14 / K-14A

Union Elbow Conical Joint F/F

Union Elbow Flat Seat With PTFE Gasket F/F

K-14B / K-14C

Union Conical Joint F/M

Union Flat Seat With PTFE Gasket F/M

K-14D / K-14E

Union Elbow Conical Joint F/BW

Union Elbow Flat Seat With PTFE Gasket F/BW

K-14F / K-14G

Union Elbow Conical Joint F/H

Union Elbow Flat Seat With PTFE Gasket F/H

K-16

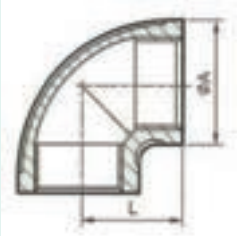
Welding Spud

K-17

Adaptor M/F

SCREWED FITTINGS

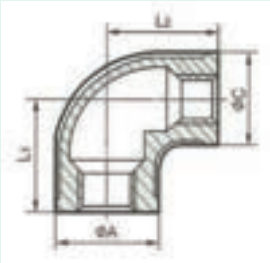
K-01 Elbow 90 Equal Banded F/F



Unit: mm

Size	ϕA	L
1/8″	15.5	17.5
1/4″	19.0	19.5
3/8″	22.5	23.5
1/2″	27.5	27.5
3/4″	33.0	32.5
1″	40.5	38.5
1-1/4″	50.0	45.5
1-1/2″	58.5	48.5
2″	70.0	57.5
2-1/2″	86.5	69.5
3″	100.0	78.5
4″	126.0	96.5

K-01A Elbow 90 Banded Reducing

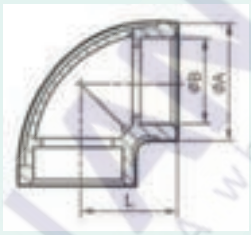


Unit: mm

Size	ϕA	ϕC	L_1	L_2
1/4″ x 1/8″	19.0	15.5	18.5	18.5
3/8″ x 1/8″	22.5	15.5	19.5	20.5
3/8″ x 1/4″	22.5	19.0	20.5	22.5
1/2″ x 1/8″	27.5	15.5	22.5	23.5
1/2″ x 1/4″	27.5	19.0	24.5	24.5
1/2″ x 3/8″	27.5	22.5	26.5	25.5
3/4″ x 1/4″	33.0	19.0	27.5	26.5
3/4″ x 3/8″	33.0	22.5	28.5	28.5
3/4″ x 1/2″	33.0	27.5	28.5	30.5
1″ x 1/4″	40.5	19.0	28.5	30.5
1″ x 3/8″	40.5	22.5	30.5	32.0
1″ x 1/2″	40.5	27.5	32.5	33.5
1″ x 3/4″	40.5	33.0	34.5	35.5
1-1/4″ x 3/8″	50.0	22.5	34.0	36.5

Size	ϕA	ϕC	L_1	L_2
1-1/4″ x 1/2″	50.0	27.5	36.5	38.5
1-1/4″ x 3/4″	50.0	33.0	38.5	40.5
1-1/4″ x 1″	50.0	40.5	40.5	42.5
1-1/2″ x 3/8″	58.5	22.5	34.0	40.0
1-1/2″ x 1/2″	58.5	27.5	36.0	41.5
1-1/2″ x 3/4″	58.5	33.0	38.5	43.5
1-1/2″ x 1″	58.5	40.5	41.5	45.5
1-1/2″ x 1-1/4″	58.5	50.0	45.5	48.5
2″ x 1/2″	70.0	27.5	42.0	51.5
2″ x 3/4″	70.0	33.0	44.0	52.5
2″ x 1″	70.0	40.5	46.5	53.5
2″ x 1-1/4″	70.0	50.0	48.5	54.5
2″ x 1-1/2″	70.0	58.5	52.5	55.5

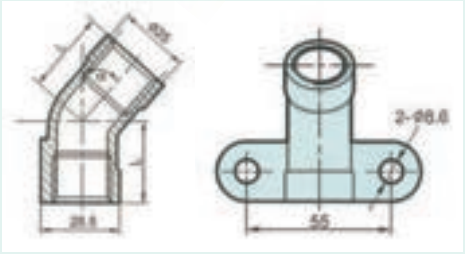
K-01B Elbow 90 Equal Banded Socket Weld



Unit: mm

Size	ϕA	ϕB	L
1/8″	17.0	11.0	19.0
1/4″	21.3	14.4	21.0
3/8″	23.5	17.8	21.3
1/2″	29.0	22.0	27.0
3/4″	36.0	27.4	33.0
1″	43.0	34.1	38.0
1-1/4″	52.0	42.9	45.0
1-1/2″	58.5	48.9	50.0
2″	71.5	61.4	57.0
2-1/2″	87.0	74.1	69.7
3″	99.5	90.1	77.0
4″	126.0	115.7	98.2

K-01C Elbow With Strip

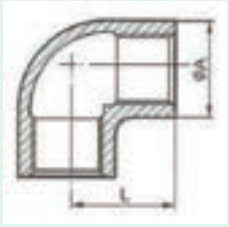


Unit: mm

Size	α	L
1/2″	45°	22.8
1/2″	60°	25.8
1/2″	75°	28.5
1/2″	90°	27.7

SCREWED FITTINGS

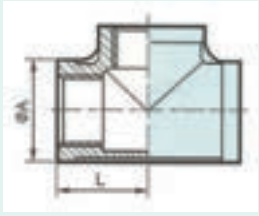
K-01D Elbow 90 Non-Banded F/F



Unit: mm

Size	ϕA	L
1/8″	15.0	17.0
1/4″	19.0	19.0
3/8″	23.0	23.0
1/2″	27.0	27.0
3/4″	33.0	32.0
1″	41.0	38.0
1-1/4″	50.0	46.0
1-1/2″	56.0	48.0
2″	69.0	57.0

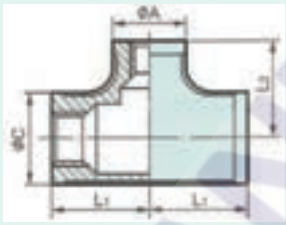
K-02 Tee Banded



Unit: mm

Size	ϕA	L
1/8″	15.5	17.5
1/4″	19.0	19.5
3/8″	22.5	23.5
1/2″	27.5	27.5
3/4″	33.0	32.5
1″	40.5	38.5
1-1/4″	50.0	45.5
1-1/2″	56.5	48.5
2″	70.0	57.5
2-1/2″	86.5	69.5
3″	100.0	78.5
4″	126.0	96.5

K-02A Tee Banded Reducing

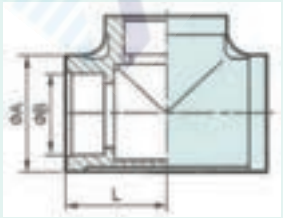


Unit: mm

Size	ϕA	ϕC	L_1	L_2
1/4″ x 1/8″	15.5	19.0	18.5	18.5
3/8″ x 1/8″	15.5	22.5	19.5	20.5
3/8″ x 1/4″	19.0	22.5	20.5	22.5
1/2″ x 1/8″	15.5	27.5	22.5	23.5
1/2″ x 1/4″	19.0	27.5	24.5	24.5
1/2″ x 3/8″	22.5	27.5	26.5	25.5
3/4″ x 1/4″	19.0	33.0	27.5	26.5
3/4″ x 3/8″	22.5	33.0	28.5	28.5
3/4″ x 1/2″	27.5	33.0	29.5	30.5
1″ x 1/4″	19.0	40.5	28.5	30.5
1″ x 3/8″	22.5	40.5	30.5	32.0
1″ x 1/2″	27.5	40.5	32.5	33.5
1″ x 3/4″	33.0	40.5	34.5	35.5
1-1/4″ x 3/8″	22.5	50.0	34.0	36.5

Size	ϕA	ϕC	L_1	L_2
1-1/4″ x 1/2″	27.5	50.0	36.0	38.5
1-1/4″ x 3/4″	33.0	50.0	38.5	40.5
1-1/4″ x 1″	40.5	50.0	40.5	42.5
1-1/2″ x 3/8″	22.5	56.5	34.0	40.0
1-1/2″ x 1/2″	27.5	56.5	36.0	41.5
1-1/2″ x 3/4″	33.0	56.5	38.5	43.5
1-1/2″ x 1″	40.5	56.5	41.5	45.5
1-1/2″ x 1-1/4″	50.0	56.5	45.5	48.5
2″ x 1/2″	27.5	69.0	39.0	47.5
2″ x 3/4″	33.0	69.0	41.5	49.5
2″ x 1″	40.0	69.0	44.5	51.5
2″ x 1-1/4″	50.00	70.0	48.5	54.5
2″ x 1-1/2″	56.5	70.0	52.5	55.5

K-02B Tee Banded Socket Weld

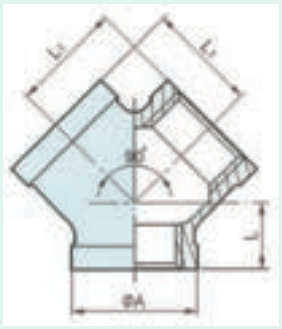


Unit: mm

Size	ϕA	ϕB	L
1/8″	17.0	11.0	19.0
1/4″	21.3	14.4	21.0
3/8″	23.5	17.8	23.6
1/2″	30.0	22.0	28.0
3/4″	35.0	27.4	33.0
1″	43.0	34.1	38.0
1-1/4″	52.0	42.9	45.0
1-1/2″	58.5	48.9	50.0
2″	71.5	61.4	58.0
2-1/2″	87.0	74.1	70.0
3″	100.0	90.1	78.5
4″	125.0	115.7	97.0

SCREWED FITTINGS

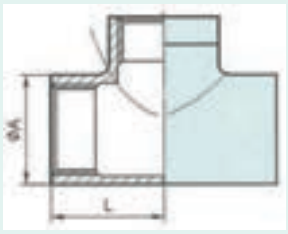
K-02C Y-Tee Banded



Unit: mm

Size	ϕA	L	L_1
1/8″	17.0	10.0	17.0
1/4″	21.0	13.0	19.0
3/8″	25.0	14.0	23.0
1/2″	29.0	18.0	27.0
3/4″	35.0	20.0	32.0
1″	43.0	23.0	38.0
1-1/4″	52.0	28.0	46.0
1-1/2″	58.0	30.0	48.0
2″	71.0	34.0	57.0
2-1/2″	88.0	40.0	68.0
3″	101.0	45.0	78.0
4″	129.0	52.0	97.0

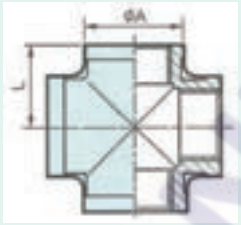
K-02D Tee Non-Banded



Unit: mm

Size	ϕA	L
1/8″	15.0	17.0
1/4″	19.0	19.0
3/8″	23.0	23.0
1/2″	27.0	27.0
3/4″	33.0	32.0
1″	41.0	38.0
1-1/4″	50.0	46.5
1-1/2″	56.0	48.0
2″	69.0	57.0

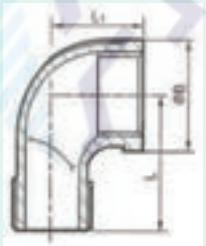
K-03 Cross Banded



Unit: mm

Size	ϕA	L
1/8″	15.5	17.5
1/4″	19.0	19.5
3/8″	22.5	23.5
1/2″	27.0	27.5
3/4″	32.5	32.5
1″	40.0	38.5
1-1/4″	50.0	45.5
1-1/2″	56.5	48.5
2″	69.0	57.5
2-1/2″	86.5	69.5
3″	100.0	78.5
4″	126.0	96.5

K-04 Street Elbow 90 M/F

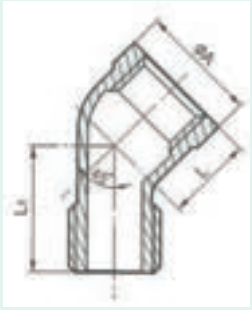


Unit: mm

Size	ϕB	L	L_1
1/8″	15.5	26.5	17.5
1/4″	19.0	27.5	19.5
3/8″	22.5	29.5	23.5
1/2″	27.0	35.5	27.5
3/4″	32.5	40.5	32.5
1″	40.0	46.5	38.5
1-1/4″	50.0	54.5	45.5
1-1/2″	56.5	57.5	48.5
2″	69.0	70.5	57.5
2-1/2″	86.5	83.5	69.5
3″	100.0	94.5	78.5
4″	126.0	115.5	97.5

SCREWED FITTINGS

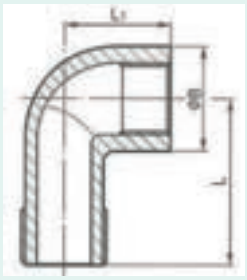
K-04A Street Elbow 45 M/F



Unit: mm

Size	ϕA	L	L_1
1/8″	17.0	16.0	21.0
1/4″	21.0	17.0	23.0
3/8″	25.0	19.0	27.0
1/2″	29.0	21.0	31.0
3/4″	35.0	25.0	36.0
1″	43.0	29.0	42.0
1-1/4″	52.0	34.0	49.0
1-1/2″	58.0	37.0	51.0
2″	71.0	42.0	59.0
2-1/2″	88.0	49.0	71.0
3″	101.0	54.0	79.0
4″	129.0	65.0	96.0

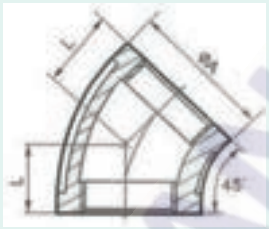
K-04B Street Elbow Non-Banded M/F



Unit: mm

Size	ϕB	L	L_1
1/8″	15.0	26.0	17.0
1/4″	19.0	30.0	19.0
3/8″	23.0	35.0	23.0
1/2″	27.0	40.0	27.0
3/4″	33.0	47.0	32.0
1″	41.0	54.0	38.0
1-1/4″	50.0	62.0	46.0
1-1/2″	56.0	68.0	48.0
2″	69.0	79.0	57.0

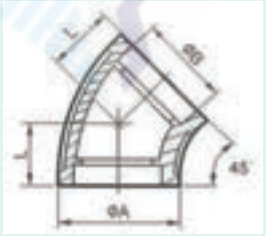
K-05 Elbow 45 Equal Banded F/F



Unit: mm

Size	ϕA	L
1/8″	15.5	18.5
1/4″	19.0	17.5
3/8″	22.5	19.5
1/2″	27.0	21.5
3/4″	32.5	25.5
1″	40.0	29.5
1-1/4″	50.0	33.5
1-1/2″	56.6	37.5
2″	69.0	42.5
2-1/2″	86.5	49.5
3″	100.0	54.5
4″	126.0	64.5

K-05A Elbow 45 Banded Socket Weld



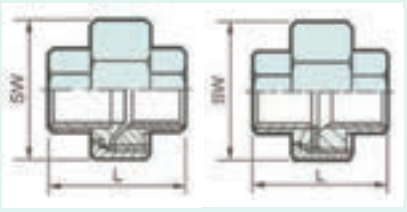
Unit: mm

Size	ϕA	ϕB	L
1/8″	18.0	11.0	18.0
1/4″	21.0	14.4	19.4
3/8″	25.0	17.8	20.0
1/2″	29.5	22.0	22.0
3/4″	35.6	27.2	25.0
1″	43.0	34.1	28.0
1-1/4″	52.4	42.9	33.0
1-1/2″	58.0	48.9	36.0
2″	72.0	61.4	43.0
2-1/2″	87.0	74.1	50.0
3″	100.0	90.0	55.0
4″	125.5	115.7	64.0

SCREWED FITTINGS

K-06 Union Conical Joint F/F

K-06A Union Flat Seat With PTFE Gasket F/F



K-06 K-06A

Unit: mm

Size	L	SW
1/8″	30.5	24.0
1/4″	34.0	30.0
3/8″	37.0	35.0
1/2″	40.5	41.0
3/4″	43.0	48.0
1″	50.5	54.0
1-1/4″	54.5	65.0
1-1/2″	58.5	72.0
2″	65.5	88.0
2-1/2″	76.0	109.0
3″	84.0	122.0
4″	111.0	150.0

K-06B Union Conical Joint M/F

K-06C Union Flat Seat With PTFE Gasket M/F

K-06B K-06C

Unit: mm

Size	L	SW
1/8″	39.0	24.0
1/4″	45.0	30.0
3/8″	48.5	35.0
1/2″	55.5	41.0
3/4″	59.0	48.0
1″	69.0	54.0
1-1/4″	75.5	65.0
1-1/2″	79.5	72.0
2″	91.0	88.0
2-1/2″	103.5	109.0
3″	114.5	122.0
4″	147.5	150.0

K-06D Union Conical Joint BW/BW

K-06E Union Flat Seat With PTFE Gasket BW/BW

K-06D K-06E

Unit: mm

Size	L	SW	D	d
1/8″	29.0	25.0	10.2	8.1
1/4″	35.5	30.0	13.5	10.0
3/8″	38.0	35.0	17.2	12.7
1/2″	42.0	42.0	21.4	16.7
3/4″	50.4	47.0	26.9	21.5
1″	48.0	53.0	33.7	26.5
1-1/4″	59.0	71.0	42.4	35.8
1-1/2″	64.0	78.0	48.3	42.0
2″	69.0	92.0	60.3	53.3
2-1/2″	80.0	112.0	76.1	66.5
3″	88.0	126.0	88.9	78.5
4″	108.0	157.0	114.3	104.0

K-06F Union Conical Joint BW/F

K-06G Union Flat Seat With PTFE Gasket BW/F

K-06F K-06G

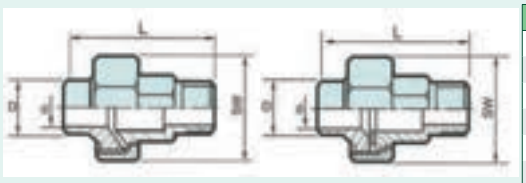
Unit: mm

Size	L	SW	D	d
1/8″	29.0	25.0	10.2	8.1
1/4″	35.5	30.0	13.5	10.0
3/8″	38.0	35.0	17.2	12.7
1/2″	42.0	42.0	21.4	16.7
3/4″	50.4	47.0	26.9	21.5
1″	48.0	53.0	33.7	26.5
1-1/4″	59.0	71.0	42.4	35.8
1-1/2″	64.0	78.0	48.3	42.0
2″	69.0	92.0	60.3	53.3
2-1/2″	80.0	112.0	76.1	66.5
3″	88.0	126.0	88.9	78.5
4″	108.0	157.0	114.3	104.0

SCREWED FITTINGS

K-06H Union Conical Joint BW/M

K-06I Union Flat Seat With PTFE Gasket BW/M



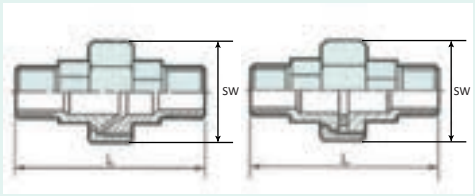
K-06H K-06I

Unit: mm

Size	L	SW	D	d
1/8″	40.0	25.0	10.2	8.1
1/4″	50.0	30.0	13.5	10.0
3/8″	50.0	35.0	17.2	12.7
1/2″	58.4	42.0	21.3	16.7
3/4″	66.0	47.0	26.9	21.5
1″	64.4	53.0	33.7	26.5
1-1/4″	83.0	71.0	42.4	35.8
1-1/2″	86.3	78.0	48.3	42.0
2″	94.0	92.0	60.3	53.3
2-1/2″	113.3	112.0	76.1	66.5
3″	126.3	126.0	88.9	78.5
4″	154.3	157.0	114.3	104.0

K-06J Union Conical Joint M/M

K-06K Union Flat Seat With PTFE Gasket M/M



K-06J K-06K

Unit: mm

Size	L	SW
1/8″	52.0	25.0
1/4″	61.0	30.0
3/8″	62.5	35.0
1/2″	73.0	42.0
3/4″	82.0	47.0
1″	90.0	53.0
1-1/4″	104.0	71.0
1-1/2″	109.6	78.0
2″	118.0	92.0
2-1/2″	145.0	112.0
3″	164.0	126.0
4″	205.0	157.0

K-06L Union Flat Seat Inside / Inside Thread

K-06O Union Flat Seat With PTFE Gasket M/M

K-06L K-06O

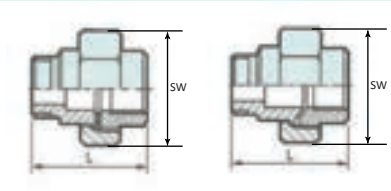
Unit: mm

Size	L	SW
1/8″	37.5	28.5
1/4″	37.5	28.5
3/8″	39.6	33.0
1/2″	46.0	38.5
3/4″	48.1	46.0
1″	51.4	51.0
1-1/4″	59.5	63.5
1-1/2″	71.0	75.0
2″	76.5	92.0
2-1/2″	90.5	110.0
3″	90.0	120.0

SCREWED FITTINGS

K-06M Union Flat Seat Inside / Outside Thread

K-06P Union Conical Inside / Outside Thread



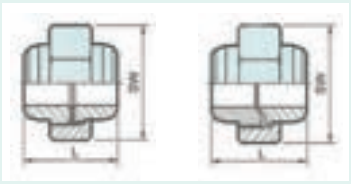
K-06M K-06P

Unit: mm

Size	L	SW
1/4″	50.0	28.5
3/8″	52.5	33.0
1/2″	61.5	38.5
3/4″	64.5	46.0
1″	71.5	51.0
1-1/4″	82.0	63.5
1-1/2″	95.0	75.0
2″	103.0	92.0
2-1/2″	123.0	110.0
3″	125.5	120.0

K-06N Union Flat Seat Welded Ends

K-06Q Union Conical Welded Ends



K-06N K-06Q

Unit: mm

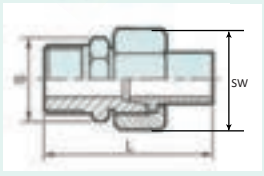
Size	L	SW
1/8″	37.0	28.5
1/4″	37.0	28.5
3/8″	39.6	33.0
1/2″	46.0	38.5
3/4″	48.1	46.0
1″	51.4	51.0
1-1/4″	59.5	63.5
1-1/2″	71.0	75.0
2″	76.5	92.0
2-1/2″	90.5	110.0
3″	89.0	120.0

K-06R Union Conical Joint Socket Weld

Unit: mm

Size	ϕB	L	SW
1/8″	11.0	29.0	25.0
1/4″	14.4	37.5	30.0
3/8″	17.8	38.0	35.0
1/2″	22.0	42.0	42.0
3/4″	27.4	50.4	47.0
1″	34.1	48.0	53.0
1-1/4″	42.9	59.0	71.0
1-1/2″	48.9	65.0	78.0
2″	61.4	69.0	92.0
2-1/2″	74.1	80.0	112.0
3″	90.1	88.0	127.0
4″	115.7	108.0	157.0

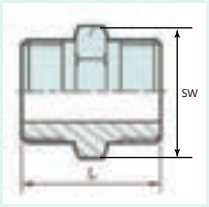
K-06Y Union BW/M with Hexagon Nut



Unit: mm

Size	L	S	SW
1/2″	60.0	24.0	27.0
3/4″	66.5	32.0	36.0
1″	74.0	41.0	41.0
1-1/4″	80.8	46.0	50.0
1-1/2″	82.0	55.0	60.0
2″	93.0	65.0	70.0

K-071 - 072 Hexagon Nipple



Unit: mm K-071

Size	L	SW
1/8″	23.6	12.0
1/4″	27.8	16.0
3/8″	28.0	19.0
1/2″	34.0	21.6
3/4″	40.0	30.0
1″	46.0	36.0
1-1/4″	52.5	46.0
1-1/2″	54.0	50.0
2″	62.0	64.5
2-1/2″	70.0	79.5
3″	78.4	90.0
4″	94.0	120.0

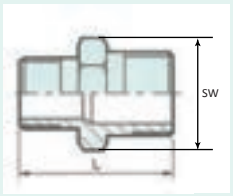
DIN/BSP

Unit: mm K-072

Size	L	SW
1/8″	28.0	12.0
1/4″	32.5	17.0
3/8″	36.0	20.0
1/2″	42.5	26.0
3/4″	46.0	32.0
1″	51.5	38.0
1-1/4″	58.0	46.0
1-1/2″	60.0	52.5
2″	65.0	62.0
2-1/2″	80.0	77.0
3″	90.0	92.0
4″	107.0	118.0

NPT/PT

K-07A Hexagon Nipple Reducing



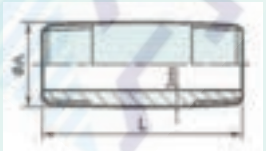
Unit: mm

Size	L	SW
1/4″ x 1/8″	25.5	16.0
3/8″ x 1/8″	26.0	18.0
3/8″ x 1/4″	28.5	18.0
1/2″ x 1/8″	34.0	26.0
1/2″ x 1/4″	32.0	24.0
1/2″ x 3/8″	32.5	24.0
3/4″ x 1/8″	37.0	30.0
3/4″ x 1/4″	37.0	30.0
3/4″ x 3/8″	34.5	30.0
3/4″ x 1/2″	38.0	30.0
1″ x 1/8″	39.0	35.0
1″ x 1/4″	39.0	35.0
1″ x 3/8″	40.0	35.0
1″ x 1/2″	41.0	36.0
1″ x 3/4″	42.0	36.0
1-1/4″ x 1/4″	45.0	46.0
1-1/4″ x 3/8″	46.0	46.0
1-1/4″ x 1/2″	48.0	46.0
1-1/4″ x 3/4″	45.5	46.0
1-1/4″ x 1″	48.5	46.0
1-1/2″ x 3/8″	48.0	50.0
1-1/2″ x 1/2″	49.0	50.0

Unit: mm

Size	L	SW
1-1/2″ x 3/4″	53.0	50.0
1-1/2″ x 1″	48.5	50.0
1-1/2″ x 1-1/4″	51.0	50.0
2″ x 1/2″	52.0	63.0
2″ x 3/4″	56.0	63.0
2″ x 1″	57.0	63.0
2″ x 1-1/4″	55.5	65.0
2″ x 1-1/2″	55.5	65.0
2-1/2″ x 3/4″	63.0	80.0
2-1/2″ x 1″	63.0	80.0
2-1/2″ x 1-1/4″	66.0	80.0
2-1/2″ x 1-1/2″	57.5	80.0
2-1/2″ x 2″	62.0	80.0
3″ x 1″	69.0	95.0
3″ x 1-1/4″	72.0	95.0
3″ x 1-1/2″	72.0	95.0
3″ x 2″	66.0	95.0
3″ x 2-1/2″	68.0	95.0
4″ x 1-1/2″	82.0	125.0
4″ x 2″	82.0	125.0
4″ x 2-1/2″	74.0	120.0
4″ x 3″	77.0	120.0

K-07B Barrel Nipple From Pipe



Unit: mm

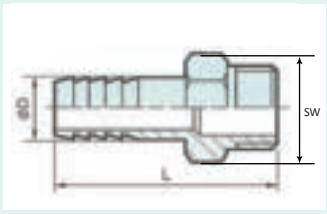
Size	ϕA	L	t
1/4″	13.5	40.0	2.24
3/8″	17.2	40.0	2.31
1/2″	21.3	60.0	2.77
3/4″	26.9	60.0	2.87
1″	33.7	60.0	3.38
1-1/4″	42.4	80.0	3.56
1-1/2″	48.3	80.0	3.68
2″	60.3	100.0	3.91
2-1/2″	76.1	120.0	5.16
3″	88.9	120.0	5.49
4″	114.3	150.0	6.02

K-07C Welding Nipple From Pipe

Unit: mm

Size	ϕA	L	t
1/4″	13.5	30.0	2.24
3/8″	17.2	30.0	2.31
1/2″	21.3	35.0	2.77
3/4″	26.9	40.0	2.87
1″	33.7	40.0	3.38
1-1/4″	42.4	50.0	3.56
1-1/2″	48.3	50.0	3.68
2″	60.3	50.0	3.91
2-1/2″	76.1	60.0	5.16
3″	88.9	70.0	5.49
4″	114.3	80.0	6.02

K-07D Hose Nipple



Unit: mm

Size	ϕD	L	SW
1/8″	4.50	45.0	12.5
1/4″	6.35	47.0	16.5
3/8″	9.50	55.0	20.0
1/2″	12.70	64.0	23.5
3/4″	19.05	68.0	31.0
1″	25.40	71.0	38.5
1-1/4″	31.80	80.0	46.0
1-1/2″	38.10	95.0	52.0
2″	50.80	105.0	62.0
2-1/2″	63.50	107.0	80.0
3″	76.20	112.0	91.0
4″	101.60	130.0	116.5

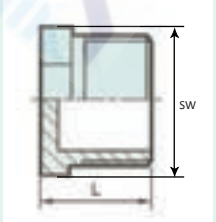
K-07E Hexagon Welding Nipple

Unit: mm

Size	ϕA	L	SW
1/8″	10.7	25.8	11.1
1/4″	14.0	30.6	14.3
3/8″	17.2	31.8	17.5
1/2″	20.7	38.4	22.2
3/4″	26.6	38.1	28.6
1″	32.9	42.9	34.9
1-1/4″	41.3	49.2	42.8
1-1/2″	48.8	54.0	50.8
2″	60.3	55.6	63.5
2-1/2″	76.1	70.0	80.0

K-08 Hexagon Plug, Taper (Conical) Thread

K-08A Hexagon Plug, Parallel (Cylinder) Thread



Unit: mm

Size	L	SW
1/8″	17.0	12.0
1/4″	17.5	16.0
3/8″	18.0	20.0
1/2″	21.0	24.0
3/4″	22.5	30.0
1″	25.5	36.0
1-1/4″	28.5	46.0
1-1/2″	28.5	50.0
2″	33.5	65.0
2-1/2″	37.0	80.0
3″	41.0	95.0
4″	48.0	120.0

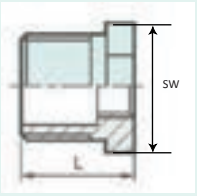
SCREWED FITTINGS

K-08B Square Plug

Unit: mm

Size	L	SW
1/8″	16.5	6 x 6
1/4″	20.0	9 x 9
3/8″	24.0	11 x 11
1/2″	20.5	13 x 13
3/4″	23.0	16 x 16
1″	27.5	21 x 21
1-1/4″	30.0	24 x 24
1-1/2″	31.0	27 x 27
2″	36.5	34 x 34
2-1/2″	40.5	41 x 41
3″	43.5	46 x 46
4″	54.0	60 x 60

K-09 Hexagon Bushing M/F



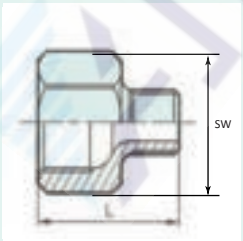
Unit: mm

Size	L	SW
1/4″ x 1/8″	15.2	18.0
3/8″ x 1/8″	16.5	18.0
3/8″ x 1/4″	16.5	18.0
1/2″ x 1/8″	21.0	26.0
1/2″ x 1/4″	21.0	26.0
1/2″ x 3/8″	21.0	26.0
3/4″ x 1/8″	24.0	30.0
3/4″ x 1/4″	24.0	30.0
3/4″ x 3/8″	24.0	30.0
3/4″ x 1/2″	24.0	30.0
1″ x 1/8″	27.0	35.0
1″ x 1/4″	27.0	35.0
1″ x 3/8″	27.0	35.0
1″ x 1/2″	27.0	35.0
1″ x 3/4″	27.0	35.0
1-1/4″ x 1/4″	30.0	45.0
1-1/4″ x 3/8″	30.0	45.0
1-1/4″ x 1/2″	30.0	45.0
1-1/4″ x 3/4″	30.0	45.0
1-1/4″ x 1″	30.0	45.0
1-1/2″ x 3/8″	38.0	52.0
1-1/2″ x 1/2″	38.0	52.0
1-1/2″ x 3/4″	38.0	52.0

Unit: mm

Size	L	SW
1-1/2″ x 1″	29.5	50.0
1-1/2″ x 1-1/4″	29.5	50.0
2″ x 1/4″	36.0	63.0
2″ x 3/8″	36.0	63.0
2″ x 1/2″	36.0	63.0
2″ x 3/4″	36.0	63.0
2″ x 1″	36.0	63.0
2″ x 1-1/4″	34.0	65.0
2″ x 1-1/2″	34.0	65.0
2-1/2″ x 1″	45.0	81.0
2-1/2″ x 1-1/4″	45.0	81.0
2-1/2″ x 1-1/2″	36.0	80.0
2-1/2″ x 2″	36.0	80.0
3″ x 1″	46.5	94.5
3″ x 1-1/4″	46.5	94.5
3″ x 1-1/2″	47.0	95.0
3″ x 2″	40.0	95.0
3″ x 2-1/2″	40.0	95.0
4″ x 1-1/4″	51.5	120.0
4″ x 1-1/2″	51.5	120.0
4″ x 2″	52.0	120.0
4″ x 2-1/2″	46.0	120.0
4″ x 3″	46.0	120.0

K-09A Negative Hexagon Bushing M/F



Unit: mm

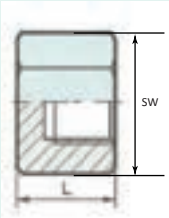
Size	L	SW
1/4″ x 1/8″	27.0	17.0
3/8″ x 1/8″	29.0	21.0
3/8″ x 1/4″	30.5	21.0
1/2″ x 1/8″	32.5	26.0
1/2″ x 1/4″	34.0	26.0
1/2″ x 3/8″	34.5	26.0
3/4″ x 1/8″	33.5	32.0
3/4″ x 1/4″	35.0	32.0
3/4″ x 3/8″	35.5	32.0
3/4″ x 1/2″	38.5	32.0
1″ x 1/8″	36.5	38.0
1″ x 1/4″	38.0	38.0
1″ x 3/8″	38.5	38.0
1″ x 1/2″	41.0	38.0
1″ x 3/4″	44.0	38.0
1-1/4″ x 1/4″	40.0	50.0
1-1/4″ x 3/8″	40.0	50.0

Unit: mm

Size	L	SW
1-1/4″ x 1/2″	42.5	50.0
1-1/4″ x 3/4″	45.0	50.0
1-1/4″ x 1″	47.0	50.0
1-1/2″ x 1/4″	41.0	54.0
1-1/2″ x 3/8″	42.0	54.0
1-1/2″ x 1/2″	45.0	54.0
1-1/2″ x 3/4″	46.0	54.0
1-1/2″ x 1″	48.0	54.0
1-1/2″ x 1-1/4″	50.0	54.0
2″ x 1/4″	44.5	68.0
2″ x 3/8″	31.0	68.0
2″ x 1/2″	49.0	68.0
2″ x 3/4″	51.0	68.0
2″ x 1″	51.0	68.0
2″ x 1-1/4″	53.0	68.0
2″ x 1-1/2″	54.0	68.0

SCREWED FITTINGS

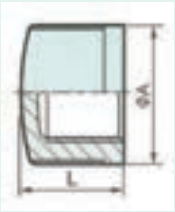
K-10 Hexagon Cap



Unit: mm

Size	L	SW
1/8″	13.0	15.0
1/4″	17.0	18.0
3/8″	19.0	21.0
1/2″	20.0	27.0
3/4″	24.0	30.0
1″	25.0	38.0
1-1/4″	28.0	50.0
1-1/2″	28.0	55.0
2″	34.0	70.0
2-1/2″	40.0	92.0
3″	45.0	109.0
4″	50.0	132.0

K-10A Round Cap Banded



Unit: mm

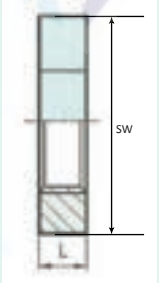
Size	ϕA	L
1/8″	15.5	13.0
1/4″	19.0	16.5
3/8″	22.5	17.0
1/2″	27.0	21.5
3/4″	32.5	23.0
1″	40.0	26.5
1-1/4″	50.0	29.5
1-1/2″	56.5	29.5
2″	69.0	34.0
2-1/2″	86.5	39.0
3″	100.0	42.5
4″	126.0	49.0

K-10B Round Cap Banded Socket Weld

Unit: mm

Size	ϕA	ϕB	L
1/8″	18.0	11.0	15.0
1/4″	21.0	14.4	17.0
3/8″	24.0	17.8	17.0
1/2″	27.3	22.0	19.0
3/4″	35.0	27.4	24.0
1″	42.0	34.1	29.0
1-1/4″	52.0	42.9	33.0
1-1/2″	57.5	48.9	34.0
2″	69.3	61.4	38.0
2-1/2″	92.0	74.1	41.0
3″	106.0	90.1	47.0
4″	134.0	115.7	53.0

K-11 Backnut (Locknut)



Unit: mm

Size	L	SW
1/8″	6.2	14.6
1/4″	7.0	23.0
3/8″	8.0	26.0
1/2″	10.0	31.0
3/4″	11.0	37.0
1″	10.0	46.0
1-1/4″	11.0	55.0
1-1/2″	12.0	63.0
2″	13.0	76.0
2-1/2″	16.0	95.0
3″	19.0	105.0
4″	20.0	131.0

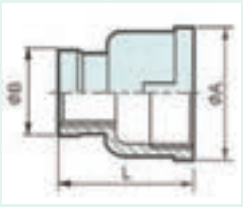
SCREWED FITTINGS

K-12 Socket (Coupling) Banded

Unit: mm

Size	ϕA	L
1/8″	16.0	24.0
1/4″	20.0	26.0
3/8″	25.0	29.0
1/2″	30.0	36.0
3/4″	37.2	38.0
1″	44.0	41.0
1-1/4″	52.0	49.0
1-1/2″	60.0	49.0
2″	72.0	55.0
2-1/2″	89.0	61.6
3″	104.0	71.0
4″	131.0	84.0

K-12A Socket (Coupling) Banded Reducing



Unit: mm

Size	ϕA	ϕB	L
1/4″ x 1/8″	19.0	15.5	26.0
3/8″ x 1/8″	22.5	15.5	27.0
3/8″ x 1/4″	22.5	19.0	27.0
1/2″ x 1/8″	29.0	17.0	34.0
1/2″ x 1/4″	27.0	19.0	35.0
1/2″ x 3/8″	27.0	22.5	35.0
3/4″ x 1/8″	36.7	17.0	38.0
3/4″ x 1/4″	36.7	21.0	38.0
3/4″ x 3/8″	32.5	22.5	37.0
3/4″ x 1/2″	32.5	27.0	37.0
1″ x 1/8″	43.0	17.2	42.0
1″ x 1/4″	43.0	21.2	42.0
1″ x 3/8″	43.0	25.4	42.0
1″ x 1/2″	40.0	27.0	43.0
1″ x 3/4″	40.0	32.5	43.0
1-1/4″ x 1/4″	52.0	21.2	48.0
1-1/4″ x 3/8″	52.0	25.4	48.0
1-1/4″ x 1/2″	52.0	30.0	48.0
1-1/4″ x 3/4″	50.0	32.5	49.0
1-1/4″ x 1″	50.0	40.0	49.0
1-1/2″ x 3/8″	59.0	23.3	48.0
1-1/2″ x 3/4″	59.0	35.5	49.0
1-1/2″ x 1/2″	59.0	29.0	51.0

Size	ϕA	ϕB	L
1-1/2″ x 1″	56.5	40.0	53.0
1-1/2″ x 1-1/4″	56.5	50.0	53.0
2″ x 1/2″	72.0	28.0	50.5
2″ x 3/4″	72.0	33.0	51.0
2″ x 1″	72.0	41.0	56.0
2″ x 1-1/4″	69.0	50.0	59.0
2″ x 1-1/2″	69.0	56.5	59.0
2-1/2″ x 3/4″	85.0	33.0	60.0
2-1/2″ x 1″	87.0	43.0	60.0
2-1/2″ x 1-1/4″	85.0	52.0	60.0
2-1/2″ x 1-1/2″	85.0	57.0	60.0
2-1/2″ x 2″	85.0	69.4	61.0
3″ x 1″	100.0	43.2	62.0
3″ x 1-1/4″	100.0	52.7	62.0
3″ x 1-1/2″	100.0	56.8	62.0
3″ x 2″	100.0	70.0	62.0
3″ x 2-1/2″	100.0	87.0	62.0
4″ x 1-1/4″	129.0	52.7	65.0
4″ x 1-1/2″	129.0	56.8	65.0
4″ x 2″	129.0	70.0	65.0
4″ x 2-1/2″	128.0	86.2	65.0
4″ x 3″	128.0	105.0	65.0

K-12BN Socket (Coupling) Plain

Unit: mm

Size	ϕA	L
1/8″	16.0	18.0
1/4″	19.5	26.0
3/8″	22.3	27.0
1/2″	27.7	34.0
3/4″	33.8	36.0
1″	37.5	43.0
1-1/4″	46.5	48.0
1-1/2″	53.0	48.0
2″	65.5	56.0
2-1/2″	82.0	65.0
3″	95.5	71.0
4″	121.5	83.0

DIN/BSP

Unit: mm

Size	ϕA	L
1/8″	14.5	25.7
1/4″	18.0	28.0
3/8″	21.5	30.2
1/2″	25.6	35.0
3/4″	30.2	40.4
1″	37.5	43.7
1-1/4″	46.7	50.1
1-1/2″	53.1	56.6
2″	71.2	65.1
2-1/2″	86.2	74.0
3″	105.7	82.0
4″	128.8	94.5

PT/NPT

SCREWED FITTINGS

K-12CN Half Socket (Half Coupling) Plain

Unit: mm

Size	ϕA	L
1/8″	18.0	11.0
1/4″	19.5	12.0
3/8″	22.3	13.0
1/2″	27.7	15.0
3/4″	33.6	17.4
1″	37.5	20.0
1-1/4″	46.5	22.0
1-1/2″	53.0	22.0
2″	65.5	26.0
2-1/2″	82.0	31.0
3″	95.5	34.0
4″	121.5	39.0

DIN/BSP

Unit: mm

Size	ϕA	L
1/8″	15.0	12.7
1/4″	18.6	14.6
3/8″	22.0	15.0
1/2″	26.2	17.9
3/4″	30.2	21.4
1″	37.5	22.3
1-1/4″	46.7	25.7
1-1/2″	53.1	28.6
2″	70.5	33.1
2-1/2″	86.0	37.8
3″	105.0	42.0
4″	132.0	48.5

PT/NPT

K-12D Socket (Coupling) Weld

Unit: mm

Size	ϕA	ϕB	L
1/8″	15.0	11.0	24.4
1/4″	18.8	14.4	26.9
3/8″	21.8	17.8	29.5
1/2″	26.7	22.0	34.0
3/4″	33.0	27.4	38.6
1″	40.9	34.1	42.4
1-1/4″	47.2	42.9	49.0
1-1/2″	55.1	48.9	54.9
2″	69.6	61.4	64.2
2-1/2″	84.6	74.1	73.2
3″	103.6	90.1	80.8
4″	127.0	115.7	92.5

K-12E Socket (Coupling) O.D. Machined

Unit: mm

Size	ϕA	L
1/8″	15.0	17.0
1/4″	18.5	25.0
3/8″	21.3	26.0
1/2″	26.4	34.0
3/4″	31.8	36.0
1″	39.5	43.0
1-1/4″	49.3	48.0
1-1/2″	55.5	48.0
2″	69.0	56.0
2-1/2″	87.0	65.0
3″	103.5	71.0
4″	129.0	83.0

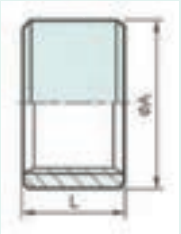
DIN/BSP

Unit: mm

Size	ϕA	L
1/8″	15.0	24.4
1/4″	18.8	26.9
3/8″	21.8	29.5
1/2″	26.7	34.0
3/4″	33.0	38.6
1″	40.9	42.4
1-1/4″	47.2	49.0
1-1/2″	55.1	54.9
2″	69.6	64.2
2-1/2″	84.6	73.2
3″	103.6	80.8
4″	127.0	92.5

PT/NPT

K-12F Half Socket (Coupling) O.D. Machined



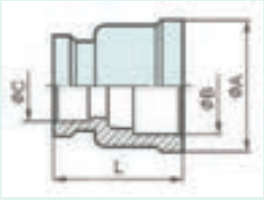
Unit: mm

Size	ϕA	L
1/8″	15.0	10.0
1/4″	18.5	11.0
3/8″	21.3	12.0
1/2″	26.4	15.0
3/4″	31.8	17.0
1″	39.5	20.0
1-1/4″	48.3	22.0
1-1/2″	54.5	22.0
2″	69.0	26.0
2-1/2″	87.0	31.0
3″	100.0	34.0
4″	126.0	39.0

Unit: mm

Size	ϕA	L
1/8″	15.0	12.2
1/4″	18.8	13.5
3/8″	21.8	14.8
1/2″	26.7	17.0
3/4″	33.0	19.3
1″	40.9	21.2
1-1/4″	47.2	24.5
1-1/2″	55.1	27.5
2″	69.6	32.1
2-1/2″	84.6	36.6
3″	103.6	40.4
4″	129.0	46.9

K-12G Socket (Coupling) Banded Reducing Socket Weld



Unit: mm

Size	ϕA	ϕB	ϕC	L
1/4″ x 1/8″	21.3	14.1	10.7	26.8
3/8″ x 1/8″	25.0	17.5	10.7	28.0
3/8″ x 1/4″	26.0	17.5	14.1	28.7
1/2″ x 1/8″	29.0	21.7	10.7	34.0
1/2″ x 1/4″	29.0	21.7	14.1	34.0
1/2″ x 3/8″	29.0	21.7	17.5	34.0
3/4″ x 1/8″	36.7	27.1	10.7	38.0
3/4″ x 1/4″	36.7	27.1	14.1	38.0
3/4″ x 3/8″	36.7	27.1	17.5	38.0
3/4″ x 1/2″	37.0	27.1	21.7	37.0
1″ x 1/8″	43.0	33.8	10.7	42.0
1″ x 1/4″	43.0	33.8	14.1	42.0
1″ x 3/8″	43.0	33.8	17.5	42.0
1″ x 1/2″	43.0	33.8	21.7	42.0
1″ x 3/4″	43.0	33.8	27.1	42.0
1-1/4″ x 1/4″	52.0	42.6	14.1	48.0
1-1/4″ x 3/8″	52.0	42.6	17.5	48.0
1-1/4″ x 1/2″	52.0	42.6	21.7	48.0
1-1/4″ x 3/4″	52.0	42.6	27.1	48.0
1-1/4″ x 1″	52.8	42.6	33.8	51.5
1-1/2″ x 3/8″	59.0	48.6	17.5	48.0
1-1/2″ x 1/2″	59.0	48.6	21.7	49.0
1-1/2′ x 3/4″	59.0	48.6	27.1	51.0

SIZE	ϕA	ϕB	ϕC	L
1-1/2″ x 1″	59.0	48.6	33.8	53.0
1-1/2″ x 1-1/4″	59.0	48.6	42.6	53.5
2″ x 1/2″	72.0	61.6	21.7	50.5
2″ x 3/4″	72.0	61.6	27.1	51.2
2″ x 1″	72.0	61.6	33.8	56.0
2″ x 1-1/4″	72.0	61.6	42.6	56.0
2″ x 1-1/2″	72.0	61.6	48.6	57.5
2-1/2″ x 3/4″	85.0	73.8	27.1	60.0
2-1/2″ x 1″	85.0	73.8	33.8	60.0
2-1/2″ x 1-1/4″	85.0	73.8	42.6	60.5
2-1/2″ x 1-1/2″	85.0	73.8	48.6	60.0
2-1/2″ x 2″	85.0	73.8	61.1	61.0
3″ x 1″	100.0	89.8	33.8	62.0
3″ x 1-1/4″	100.0	89.8	42.6	62.0
3″ x 1-1/2″	100.0	89.8	48.6	62.0
3″ x 2″	100.0	89.8	61.6	62.0
3″ x 2-1/2″	100.0	89.8	73.8	61.0
4″ x 1-1/4″	129.0	115.4	42.6	65.0
4″ x 1-1/2″	129.0	115.4	48.6	65.0
4″ x 2″	129.0	115.4	61.1	65.0
4″ x 2-1/2″	128.0	115.4	73.8	65.0
4″ x 3″	128.0	115.4	89.8	65.0

K-12H Half Socket (Half Coupling) Weld O.D. Machined

Unit: mm

SIZE	ϕA	ϕB	L
1/8″	15.0	10.7	12.2
1/4″	18.8	14.1	13.5
3/8″	21.8	17.5	14.8
1/2″	26.7	21.7	17.0
3/4″	33.0	27.1	18.3
1″	40.9	33.8	21.2
1-1/4″	47.2	42.6	24.5
1-1/2″	55.1	48.6	27.5
2″	69.6	61.1	32.1
2-1/2″	84.6	73.8	36.6
3″	103.6	89.8	40.4
4″	129.0	115.4	46.9

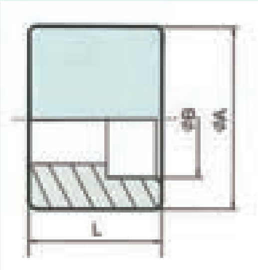
K-12IN Socket (Coupling) Weld Plain

Unit: mm

Size	ϕA	ϕB	L
1/8″	14.5	10.6	25.7
1/4″	18.0	14.0	28.0
3/8″	21.5	17.5	30.2
1/2″	25.6	21.7	35.0
3/4″	30.2	27.0	40.4
1″	37.5	33.7	43.7
1-1/4″	46.7	42.5	50.1
1-1/2″	53.1	48.6	56.6
2″	71.2	61.1	65.1
2-1/2″	86.2	73.8	74.0
3″	105.7	89.7	82.0
4″	128.8	115.4	94.5

SCREWED FITTINGS

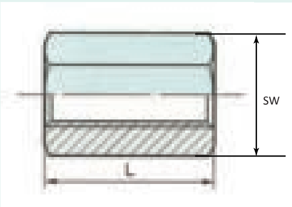
K-12JN Half Socket (Half Coupling) Weld Plain



Unit: mm

Size	ϕA	ϕB	L
1/8″	15.0	10.6	12.7
1/4″	18.6	14.0	14.6
3/8″	22.0	17.5	15.0
1/2″	26.2	21.7	17.9
3/4″	30.2	27.0	21.4
1″	37.5	33.7	22.3
1-1/4″	46.7	42.5	25.7
1-1/2″	53.1	48.6	28.6
2″	70.5	61.1	33.1
2-1/2″	86.0	73.8	37.8
3″	105.0	89.7	42.0
4″	132.0	115.4	48.5

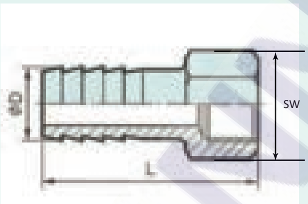
K-12K Hexagon Socket (Coupling) Plain



Unit: mm

Size	L	SW
1/8″	17.0	15.0
1/4″	25.0	17.0
3/8″	26.0	21.0
1/2″	34.0	26.0
3/4″	36.0	32.0
1″	43.0	38.0
1-1/4″	48.0	50.0
1-1/2″	48.0	54.0
2″	56.0	68.0

K-13 Hose Nipple Female



Unit: mm

Size	ϕD	L	SW
1/8″	6.5	39.0	15.0
1/4″	9.0	42.0	19.0
3/8″	11.0	53.0	22.0
1/2″	14.0	62.0	27.0
3/4″	20.5	63.5	32.0
1″	27.0	66.0	38.0
1-1/4″	33.0	74.0	50.0
1-1/2″	39.5	87.5	55.5
2″	52.0	94.5	67.5

K-14 Union Elbow Conical Joint F/F

K-14A Union Elbow Flat Seat With PTFE Gasket F/F

K-014 K-014A

Unit: mm

Size	L_1	L_2	SW
1/8″	39.0	19.0	25.0
1/4″	46.2	21.0	30.0
3/8″	49.0	25.0	35.0
1/2″	56.0	28.0	42.0
3/4″	62.7	33.0	47.0
1″	68.0	38.0	53.0
1-1/4″	79.5	45.0	71.0
1-1/2″	88.0	50.0	78.0
2″	93.8	58.0	92.0

K-14B Union Elbow Conical Joint F/M

K-14C Union Elbow Flat Seat With PTFE Gasket F/M

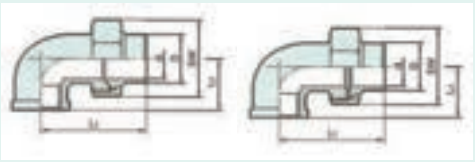
K-014B K-014C

Unit: mm

Size	L_1	L_2	SW
1/8″	50.7	19.0	25.0
1/4″	58.6	21.0	30.0
3/8″	61.0	25.0	35.0
1/2″	71.0	28.0	42.0
3/4″	78.7	33.0	47.0
1″	88.4	38.0	53.0
1-1/4″	102.9	45.0	71.0
1-1/2″	110.3	50.0	78.0
2″	119.4	58.0	92.0

K-14D Union Elbow Conical Joint F/BW

K-14E Union Elbow Flat Seat With PTFE Gasket F/BW



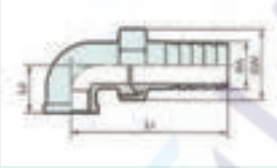
K-014D K-014E

Unit: mm

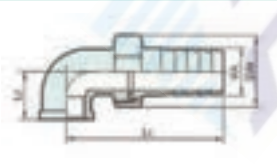
Size	L_1	L_2	SW	D	d
1/8″	39.0	19.0	25.0	10.2	8.1
1/4″	46.2	21.0	30.0	13.5	10.0
3/8″	48.5	25.0	35.0	17.2	12.7
1/2″	54.6	28.0	42.0	21.4	16.7
3/4″	62.7	33.0	47.0	26.9	21.5
1″	68.0	38.0	53.0	33.7	26.5
1-1/4″	78.5	45.0	71.0	42.4	35.8
1-1/2″	88.0	50.0	78.0	48.3	42.0
2″	93.8	58.0	92.0	60.3	53.3

K-14F Union Elbow Conical Joint F/H

K-14G Union Elbow Flat Seat With PTFE Gasket F/H



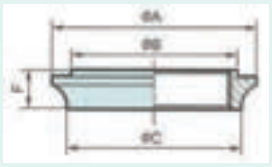
K-014F



Unit: mm

Size	L_1	L_2	ϕA	SW
1/8″	52.0	19.0	6.5	25.0
1/4″	56.0	21.0	9.0	30.0
3/8″	67.0	25.0	11.0	35.0
1/2″	77.5	28.0	14.0	42.0
3/4″	82.0	33.0	20.5	47.0
1″	88.0	38.0	27.0	53.0
1-1/4″	101.0	45.0	33.0	71.0
1-1/2″	119.5	50.0	39.5	78.0
2″	130.4	58.0	52.0	92.0

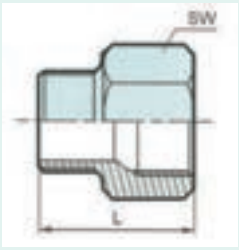
K-16 Welding Spud



Unit: mm

SIZE	φA	φB	φC	F
1/8″	34.7	21.0	17.8	12.0
1/4″	37.5	24.6	20.1	13.5
3/8″	40.8	24.7	23.2	13.0
1/2″	44.5	28.8	27.9	14.9
3/4″	48.5	33.8	33.0	16.9
1″	56.6	42.9	42.0	19.7
1-1/4″	65.6	49.1	51.9	19.0
1-1/2″	71.5	55.5	58.5	20.1
2″	86.0	68.0	71.0	22.0
2-1/2″	98.6	79.8	81.7	24.8
3″	114.4	93.2	97.0	24.0
4″	143.5	119.0	124.5	26.7

K-17 Adaptor M/F



Unit: mm

SIZE	L	SW
1/8″	26.0	15.0
1/4″	28.5	17.0
3/8″	31.0	21.0
1/2″	37.5	26.0
3/4″	41.0	32.0
1″	46.0	38.0
1-1/4″	49.0	50.0
1-1/2″	51.0	54.0
2″	57.0	68.0

Unit : Kg

FIG	DESCRIPTION	SIZES											
		1/8″	1/4″	3/8″	1/2″	3/4″	1″	1.1/4″	1.1/2″	2″	2.1/2″	3″	4″
K-01	ELBOW 90 EQUAL BANDED F/F	0.039	0.061	0.068	0.102	0.164	0.264	0.413	0.521	0.808	1.183	1.380	2.714
K-02	TEE BANDED	0.056	0.082	0.105	0.156	0.229	0.369	0.420	0.702	1.082	1.517	1.856	3.170
K-03	CROSS BANDED	0.038	0.072	0.103	0.144	0.249	0.435	0.701	0.768	1.258	1.770	2.031	3.490
K-04	STREET ELBOW 90 M/F	0.026	0.040	0.073	0.094	0.167	0.231	0.429	0.473	0.760	1.286	1.925	3.100
K-05	ELBOW 45 EQUAL BANDED F/F	0.036	0.050	0.087	0.118	0.147	0.246	0.347	0.416	0.673	0.918	1.154	1.993
K-06	UNION CONICAL JOINT F/F	0.054	0.101	0.128	0.207	0.275	0.314	0.737	0.815	1.221	1.879	2.591	4.340
K-06A	UNION FLAT SEAT WITH TELFON GASKET F/F	0.050	0.099	0.122	0.203	0.268	0.306	0.720	0.802	1.195	1.841	2.603	4.470
K-06B	UNION CONICAL JOINT M/F	0.059	0.108	0.133	0.230	0.332	0.403	0.865	0.978	1.509	2.457	3.450	5.720
K-06C	UNION FLAT SEAT WITH TEFLON GASKET M/F	0.060	0.107	0.135	0.228	0.310	0.388	0.847	0.946	1.461	2.435	3.427	5.695
K-06D	UNION CONICAL JOINT BW/BW	0.040	0.085	0.104	0.173	0.233	0.329	0.635	0.668	1.039	1.724	2.245	3.950
K-06E	UNION FLAT SEAT WITH TELFON GASKET BW/BW	0.036	0.082	0.100	0.170	0.225	0.310	0.609	0.645	1.021	1.625	2.221	3.899
K-06F	UNION CONCIAL JOINT BW/F	0.047	0.085	0.109	0.188	0.270	0.320	0.666	0.726	1.126	1.765	2.460	4.130
K-06G	UNION FLAT SEAT WITH TELFON GASKET BW/F	0.046	0.084	0.105	0.180	0.261	0.314	0.645	0.700	1.115	1.732	2.421	4.199
K-06H	UNION CONCIAL JOINT BW/M	0.057	0.101	0.129	0.200	0.308	0.399	0.827	0.925	1.432	2.517	3.200	6.450
K-06I	UNION FLAT SEAT WITH TELFON GASKET BW/M	0.055	0.088	0.127	0.205	0.301	0.392	0.800	0.870	1.388	2.317	3.100	6.435
K-06J	UNION CONICAL JOINT M/M	0.068	0.122	0.154	0.267	0.380	0.503	0.996	1.121	1.786	3.155	4.260	7.480
K-06K	UNION FLAT SEAT WITH TELFON GASKET M/M	0.065	0.121	0.151	0.261	0.375	0.495	0.990	1.098	1.700	3.080	4.191	7.421
K-072	HEXAGON NIPPLE	0.013	0.030	0.041	0.050	0.098	0.161	0.277	0.325	0.414	0.863	1.391	2.343
K-07D	HOSE NIPPLE	0.015	0.031	0.041	0.071	0.139	0.235	0.267	0.412	0.692	1.057	1.414	2.975
K-08	HEXAGON PLUG, TAPER (CONICAL) THREAD	0.012	0.020	0.036	0.051	0.076	0.119	0.195	0.297	0.432	0.806	1.164	1.961
K-08B	SQUARE PLUG	0.009	0.017	0.030	0.037	0.045	0.095	0.137	0.151	0.242	0.617	0.913	1.588
K-10	HEXAGON CAP	0.012	0.021	0.032	0.058	0.067	0.116	0.231	0.254	0.506	1.207	1.925	2.693
K-10A	ROUND CAP BANDED	0.014	0.022	0.033	0.063	0.072	0.125	0.209	0.246	0.375	0.865	1.180	1.852
K-11	BACKNUT (LOCKNUT)	0.013	0.019	0.022	0.039	0.056	0.079	0.110	0.154	0.227	0.431	0.531	0.744
K-12E	SOCKET / COUPLING (O.D. MACHINE)	0.015	0.030	0.032	0.062	0.078	0.137	0.232	0.266	0.466	0.813	1.220	2.134
K- 12F	HALF SOCKET / HALF COUPLING (O.D. MACHINE)	0.009	0.012	0.014	0.027	0.036	0.058	0.088	0.116	0.215	0.406	0.500	0.769

• *Above weight list are based on theoretical calculation.*

SCREWED FITTINGS — WEIGHT LIST

Unit : Kg

SIZES	DESCRIPTION / FIG				
	(K-01A) RED. ELBOW 90 BANDED F/F	(K-02A) RED. TEE BANDED F/F	(K-07A) RED. HEXAGON NIPPLE	(K-09) RED. HEXAGON BUSHING M/F	(K-12A) RED. SOCKET BANDED
1/4" x 1/8"	0.060	0.065	0.029	0.010	0.025
3/8" x 1/8"		0.073	0.043	0.019	0.035
3/8" x 1/4"	0.075	0.070	0.043	0.014	0.035
1/2" x 1/8"		0.096	0.050	0.043	0.076
1/2" x 1/4"	0.086	0.106	0.053	0.040	0.067
1/2" x 3/8"	0.098	0.116	0.063	0.034	0.065
3/4" x 1/8"			0.062	0.076	0.169
3/4" x 1/4"		0.158	0.070	0.071	0.132
3/4" x 3/8"	0.131	0.172	0.075	0.065	0.109
3/4" x 1/2"	0.165	0.236	0.105	0.054	0.108
1" x 1/8"			0.104	0.118	0.206
1" x 1/4"		0.249	0.105	0.109	0.168
1" x 3/8"		0.269	0.112	0.102	0.152
1" x 1/2"	0.179	0.320	0.115	0.099	0.129
1" x 3/4"	0.261	0.324	0.146	0.079	0.118
1.1/4" x 1/4"				0.231	
1.1/4" x 3/8"		0.330		0.215	0.260
1.1/4" x 1/2"		0.330	0.199	0.197	0.220
1.1/4" x 3/4"	0.295	0.374	0.219	0.183	0.180
1.1/4" x 1"	0.330	0.426	0.227	0.150	0.170
1.1/2" x 3/8"		0.440	0.228	0.340	0.300
1.1/2" x 1/2"		0.442	0.244	0.312	0.288
1.1/2" x 3/4"		0.457	0.250	0.303	0.286
1.1/2" x 1"	0.390	0.527	0.252	0.292	0.278
1.1/2" x 1.1/4"	0.470	0.578	0.311	0.202	0.257
2" x 1/2"		0.612	0.330	0.424	0.490
2" x 3/4"		0.667	0.341	0.420	0.480
2" x 1"	0.600	0.807	0.361	0.382	0.469
2" x 1.1/4"	0.633	0.847	0.379	0.360	0.440
2" x 1.1/2"	0.643	0.900	0.432	0.296	0.400
2.1/2" x 3/4"				0.875	
2.1/2" x 1"			0.700	0.855	0.687
2.1/2" x 1.1/4"			0.730	0.796	0.613
2.1/2" x 1.1/2"			0.739	0.753	0.554
2.1/2" x 2"			0.934	0.630	0.526
3" x 1"			1.013	1.248	0.880
3" x 1.1/4"			1.016	1.149	0.770
3" x 1.1/2"			1.068	1.206	0.723
3" x 2"			1.069	1.041	0.699
3" x 2.1/2"			1.138	0.767	0.660
4" x 1.1/2"				2.012	
4" x 2"			1.754	1.993	1.310
4" x 2.1/2"			1.754	1.631	1.293
4" x 3"			2.200	1.493	0.969

• *Above weight list are based on theoretical calculation*

CHEMICAL REQUIREMENT

ELEMENT (%)	MATERIAL TYPE	
	CF8	CF8M
C	0.08 Max	0.08 Max
Si	2.00 Max	1.50 Max
Mn	1.50 Max	1.50 Max
P	0.04 Max	0.04 Max
S	0.04 Max	0.04 Max
Ni	8.0 - 11.0	9.0 - 12.0
Cr	18.0 - 21.0	18.0 - 21.0
Mo	0.5 Max	2.0 - 3.0

TENSILE REQUIREMENT

TESTING ITEM	MATERIAL TYPE	
	CF8	CF8M
Tensile Strength, KSI (MPa)	70, (485) Min	70, (485) Min
Yield Strength, KSI (MPa)	30, (205) Min	30, (205) Min
Elongation in 2" or 50mm (%)	35.0 Min	30.0 Min

THREAD SPECIFICATIONS

ANSI B1.20.1 (NPT)	BS 21 (PT, BSP)	DIN 2999/259

DIMENSIONAL TOLERANCE

(In ACCORDANCE TO ISO 49/ ISO 4144) Unit: mm

SIZE	30 & Below	30 - 50	50 - 75	75 - 100	100 - 150	150 - 200
TOLERANCE	+/- 0.9	+/- 1.0	+/- 1.1	+/- 1.2	+/- 1.4	+/- 1.5

FORGED FITTINGS

FORGED FITTINGS

3000#/ 6000#/ 9000# SOCKET WELDING

Elbow 90°

Elbow 45°

Equal Tee

Reducing Tee

Cross

Full Coupling

Half Coupling

Reducing Coupling

Union

Round Cap

Wedding Outlet

Outlet

Boss

Swage Nipple

Reducer Insert

FORGED FITTINGS

3000#/ 6000# THREADED, BUTT WELD


Elbow 90°


Elbow 45°


Equal Tee


Reducing Tee


Cross


Full Coupling


Half Coupling


Reducing Coupling


Union


Round Cap


Outlet


Boss


Hex Nipple


Reducing Nipple


Swage Nipple


Hex Head Bushing


Street Elbow

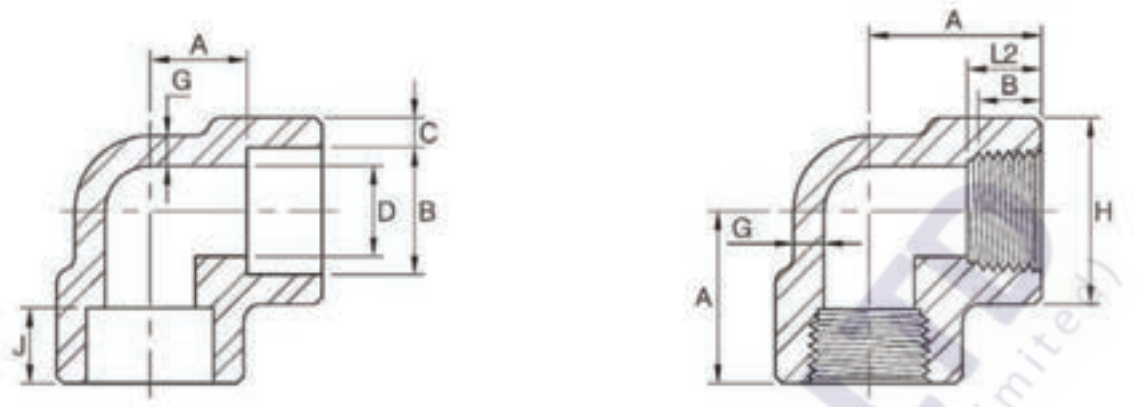

Hex Head Plug


Square Head Plug


Round Head Plug

90° ELBOW ASME B16.11-2011

(Rev: ASME B16.11-2009)



Dimensions in Millimeters.

Dimensions in Millimeters.

Socket Welding								
DN	Nom. Pipe Size	B(2)	C(1)		D(2)	A(2)	G (Min)	J (Min)
			(Avg)	(Min)				
3000Lb								
6	1/8	10.8	3.18	3.18	6.9	11.0	2.41	9.5
8	1/4	14.2	3.78	3.30	9.3	11.0	3.02	9.5
10	3/8	17.6	4.01	3.50	12.6	13.5	3.20	9.5
15	1/2	21.8	4.67	4.09	158	15.5	3.73	9.5
20	3/4	27.2	4.90	4.27	21.0	19.0	3.91	12.5
25	1	33.9	5.69	4.98	26.7	22.5	4.55	12.5
32	1-1/4	42.7	6.07	5.28	35.1	27.0	4.85	12.5
40	1-1/2	48.8	6.35	5.54	40.9	32.0	5.08	12,5
50	2	61.2	6.93	6.04	52.5	38.0	5.54	16. 0
65	2-1/2	73.9	8.76	7.67	62.7	41.0	7.01	16.0
60	3	89.8	9.52	8.30	78.0	57.0	7.62	16.0
100	4	115.2	10.69	9.35	102.3	66.5	8.56	19.0
6000Lb								
6	1/8	10.8	3.96	3.43	4.0	11.0	3.15	9.5
8	1/4	14.2	4.60	4.01	6.4	13.5	3.68	9.5
10	3/8	17.6	5.03	4.37	9.2	15.5	4.01	9.5
15	1/2	21.8	5.97	5.18	11.8	19.0	4.78	9.5
20	3/4	27.2	6.96	6.04	15.6	22.5	5.56	12.5
25	1	33.9	7.92	6.93	20.7	27.0	6.35	12.5
32	1-1/4	42.7	7.92	6.93	29.5	32.0	6.35	12.5
40	1-1/2	48.8	8.92	7.80	34.0	38.0	7.14	12.5
50	2	61.2	10.92	9.50	42.9	41.0	8.74	16.0
9000Lb								
15	1/2	21.8	9.35	8.18	6.4	25.5	7.47	9.5
20	3/4	27.2	9.78	8.56	11.1	28.5	7.82	12.5
25	1	33.9	11.38	9.96	15.2	32.0	9.09	72.5
32	1-1/4	42.7	12.14	10.62	22.8	35.0	9.70	12.5
40	1-1/2	48.8	12.70	11.12	28.0	38.0	10.15	12.5
50	2	61.2	13.84	12.12	38.2	54.0	11.07	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

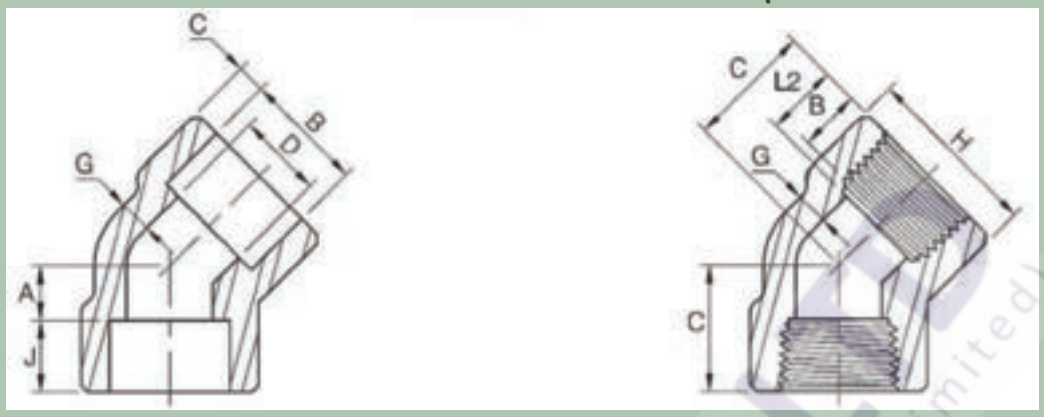
(2) Tolerance see page 57

Threaded						
DN	Nom. Pipe Size	Length of Thread. (Min)		A	G (Min)	H
		B(*)	L2(*)			
2000Lb						
6	1/8	6.4	6.7	21	3.18	22
8	1/4	8.1	10.2	21	3.18	22
10	3/8	9.1	10.4	25	3.18	25
15	1/2	10.9	13.6	28	3.18	33
20	3/4	12.7	13.9	33	3.18	38
25	1	14.7	17.3	38	3.68	46
32	1-1/4	17.0	18, 0	44	3.89	56
40	1-1/2	17.8	18.4	51	4.01	62
50	2	19.0	19.2	60	4.27	75
65	2-1/2	23.6	28.9	76	5.61	92
80	3	25.9	30.5	86	5,99	109
100	4	27.7	33.0	106	6.55	146
3000Lb						
6	1/8	6.4	6.7	21	3.18	22
8	1/4	8.1	10.2	25	3.30	25
10	3/8	9.1	10.4	28	3.51	33
15	1/2	10.9	13.6	33	4.09	38
20	3/4	12.7	13.9	38	4.32	46
25	1	14.7	17.3	44	4.98	56
32	1-1/4	17.0	18.0	51	5.28	62
40	1-1/2	17.8	18.4	60	5.56	75
50	2	19.0	19.2	64	7.14	84
65	2-1/2	23.6	28.9	83	7.65	102
80	3	25.9	30.5	95	8.84	121
100	4	27.7	33.0	114	11.18	152
6000Lb						
6	1/8	6.4	6.7	25	6.35	25
8	1/4	8 1	10.2	28	6.60	33
10	3/8	9.1	10.4	33	6.98	38
15	1/2	10.9	13.6	38	8.15	46
20	3/4	12.7	13.9	44	8.53	56
25	1	14.7	17.3	51	9.93	62
32	1-1/4	17.0	18.0	60	10.59	75
40	1-1/2	17.8	18.4	64	11.07	84
50	2	19.0	19.2	83	12.09	102
65	2-1/2	23.6	28.9	95	16.29	121
80	3	25.9	30.5	106	16.64	146
100	4	27.7	33.0	114	18.67	152

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

45° ELBOW ASME B16.11-2011

(Rev: ASME B16.11-2009)



Dimensions in Millimeters.

Socket Welding

DN	Nom. Pipe Size	B(2)	C(1)		D(2)	A(2)	G (Min)	J (Min)
			(Avg)	(Min)				
3000Lb								
6	1/8	10.8	3.18	3.18	6.9	8.0	2.41	9.5
8	1/4	14.2	3.78	3.30	9.3	8.0	3.02	9.5
10	3/8	17.6	4.01	3.50	12.6	8.0	3.20	9.5
15	1/2	21.8	4.67	4.09	15.8	11.0	3.73	9.5
20	3/4	27.2	4.90	4.27	21.0	13.0	3.91	12.5
25	1	33.9	5.69	4.98	26.7	14.0	4.55	12.5
32	1-1/4	42.7	6.07	5.28	35.1	17.5	4.85	12.5
40	1-1/2	48.8	6.35	5.54	40.9	20.5	5.08	12.5
50	2	61.2	6.93	6.04	52.5	25.5	5.54	16.0
65	2-1/2	73.9	8.76	7.67	62.7	28.5	7.01	16.0
60	3	89.8	9.52	8.30	78.0	32.0	7.62	16.0
100	4	115 2	10.69	9.35	102.3	41.0	8.56	19.0
6000Lb								
6	1/8	10.8	3.96	3.43	4.0	8.0	3.15	9.5
8	1/4	14.2	4.60	4.01	6.4	8.0	3.68	9.5
10	3/8	17.6	5.03	4,37	9.2	11,0	4.01	9.5
15	1/2	21.8	5.97	5.18	11.8	12.5	4.78	9.5
20	3/4	27.2	6.96	6.04	15.6	14.0	5.56	12.5
25	1	33.9	7.92	6.93	20.7	17.5	6.35	12.5
32	1-1/4	42.7	7.92	6.93	29.5	20.5	6.35	12.5
40	1-1/2	48.8	8.92	7.80	34.0	25.5	7.14	12.5
50	2	61.2	10.92	9.50	42.9	28.5	8.74	16.0
9000Lb								
15	1/2	21.8	9.35	8,18	6.4	15.5	7.47	9.5
20	3/4	27.2	9.78	8.56	11.1	19.0	7.82	12.5
25	1	33.9	11.38	9.96	15.2	20.5	9.09	12.5
32	1-1/4	42.7	12.14	10.62	22.8	22.5	9.70	12.5
40	1-1/2	48.8	12.70	11.12	28.0	255	10.15	12.5
50	2	61.2	13.84	12.12	38.2	28.5	11.07	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(2) Tolerance see page 57

Dimensions in Millimeters.

Threaded

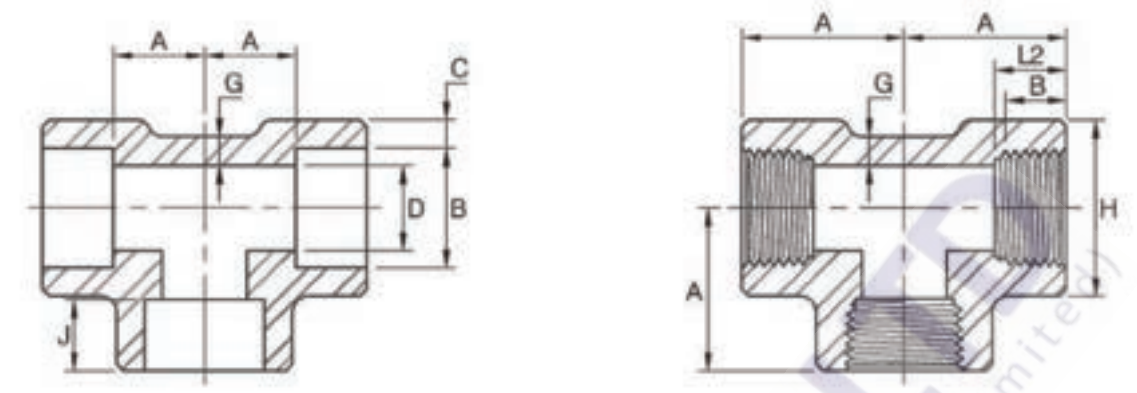
DN	Nom. Pipe Size	Length of Thread. (Min)		C	G (Min)	H
		B(*)	L2(*)			
2000Lb						
6	1/8	6.4	6.7	17	3.18	22
8	1/4	8.1	10.2	17	3.18	22
10	3/8	9,1	10,4	19	3.18	25
15	1/2	10.9	13.6	22	3.18	33
20	3/4	12.7	13.9	25	3.18	36
25	1	14.7	17.3	28	3,68	46
32	1-1/4	17.0	18.0	33	3.89	56
40	1-1/2	17.8	18.4	35	4.01	62
50	2	19.0	19.2	43	4.27	75
65	2-1/2	23.6	28.9	52	5.61	92
80	3	25.9	30.5	64	5.99	109
100	4	27.7	33.0	79	6.55	146
3000Lb						
6	1/8	6.4	6.7	17	3.18	22
8	1/4	8.1	10.2	19	3.30	25
10	3/8	9.1	10.4	22	3,51	33
15	1/2	10.9	13.6	25	4.09	38
20	3/4	12.7	13.9	28	4.32	46
25	1	14.7	17.3	33	4.96	56
32	1-1/4	17.0	18.0	35	5.28	62
40	1-1/2	17.8	18.4	43	5.56	75
50	2	19.0	19.2	44	7.14	84
65	2-1/2	23.6	28.9	52	7.65	102
80	3	25.9	30.5	64	8.84	121
100	4	27.7	33.0	79	11.18	152
6000Lb						
6	1/8	6.4	6.7	19	6.35	25
8	1/4	8 1	10.2	22	6.60	33
10	3/8	9.1	10.4	25	6.98	38
15	1/2	10.9	13.6	28	8.15	46
20	3/4	12.7	13.9	33	8.53	56
25	1	14.7	17.3	35	9.93	62
32	1-1/4	17.0	18.0	43	10.59	75
40	1-1/2	17.8	18.4	44	11.07	84
50	2	19.0	19.2	52	12.09	102
65	2-1/2	23.6	28.9	64	15.29	121
80	3	25.9	30.5	79	16.64	146
100	4	27.7	33.0	79	18.67	152

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

EQUAL & REDUCING TEE

ASME B16.11-2011

(Rev:ASME B16.11-2009)



Dimensions in Millimeters.

DN	Nom. Pipe Size	B(2)	C(1) (Avg)	C(1) (Min)	D(2)	A(2)	G (Min)	J (Min)
Socket Welding								
3000Lb								
6	1/8	10.8	3.18	3.18	6.9	11.0	2.41	9.5
8	1/4	14.2	3.78	3.30	9.3	11.0	3.02	9.5
10	3/8	17.6	4.01	3.50	12.6	13.5	3.20	9.5
15	1/2	21.8	4.67	4.09	15.8	15.5	3.73	9.5
20	3/4	27.2	4.90	4.27	21.0	19.0	3.91	12.5
25	1	33.9	5.69	4.98	26.7	22.5	4.55	12.5
32	1-1/4	42.7	6.07	5.28	35.1	27.0	4.85	12.5
40	1-1/2	48.8	6.35	5.54	40.9	32.0	5.08	12,5
50	2	61.2	6.93	6.04	52.5	38.0	5.54	16. 0
65	2-1/2	73.9	8.76	7.67	62.7	41.0	7.01	16.0
80	3	89.8	9.52	8.30	78.0	57.0	7.62	16.0
100	4	115.2	10.69	9.35	102.3	66.5	8.56	19.0
6000Lb								
6	1/8	10.8	3.96	3.43	4.0	11.0	3.15	9.5
8	1/4	14.2	4.60	4.01	6.4	13.5	3.68	9.5
10	3/8	17.6	5.03	4.37	9.2	15.5	4.01	9.5
15	1/2	21.8	5.97	5.18	11.8	19.0	4.78	9.5
20	3/4	27.2	6.96	6.04	15.6	22.5	5.56	12.5
25	1	33.9	7.92	6.93	20.7	27.0	6.35	12.5
32	1-1/4	42.7	7.92	6.93	29.5	32.0	6.35	12.5
40	1-1/2	48.8	8.92	7.80	34.0	38.0	7.14	12.5
50	2	61.2	10.92	9.50	42.9	41.0	8.74	16.0
9000Lb								
15	1/2	21.8	9.35	8.18	6.4	25.5	7.47	9.5
20	3/4	27.2	9.78	8.56	11.1	28.5	7.82	12.5
25	1	33.9	11.38	9.96	15.2	32.0	9.09	72.5
32	1-1/4	42.7	12.14	10.62	22.8	35.0	9.70	12.5
40	1-1/2	48.8	12.70	11.12	28.0	38.0	10.15	12.5
50	2	61.2	13.84	12.12	38.2	54.0	11.07	16.0

Dimensions in Millimeters.

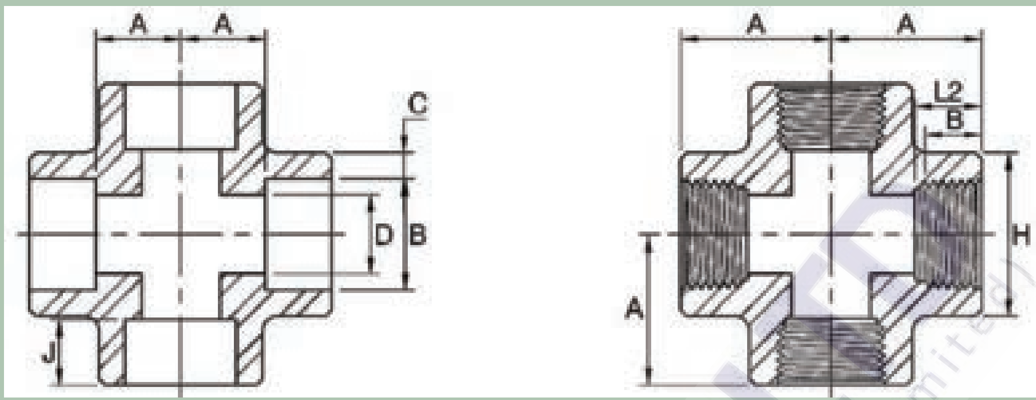
DN	Nom. Pipe Size	Length of Thread. (Min) B(*)	Length of Thread. (Min) L2(*)	A	G (Min)	H
Threaded						
3000Lb						
6	1/8	6.4	6.7	21	3.18	22
8	1/4	8.1	10.2	25	3.30	25
10	3/8	9.1	10.4	28	3.51	33
15	1/2	10.9	13.6	33	4.09	38
20	3/4	12.7	13.9	38	4.32	46
25	1	14.7	17.3	44	4.98	56
32	1-1/4	17.0	18.0	51	5.28	62
40	1-1/2	17.8	18.4	60	5.56	75
50	2	19.0	19.2	64	7.14	84
65	2-1/2	23.6	28.9	83	7.65	102
80	3	25.9	30.5	95	8.84	121
100	4	27.7	33.0	114	11.18	152
6000Lb						
6	1/8	6.4	6.7	25	6.35	25
8	1/4	8 1	10.2	28	6.60	33
10	3/8	9.1	10.4	33	6.98	38
15	1/2	10.9	13.6	38	8.15	46
20	3/4	12.7	13.9	44	8.53	56
25	1	14.7	17.3	51	9.93	62
32	1-1/4	17.0	18.0	60	10.59	75
40	1-1/2	17.8	18.4	64	11.07	84
50	2	19.0	19.2	83	12.09	102
65	2-1/2	23.6	28.9	95	16.29	121
80	3	25.9	30.5	106	16.64	146
100	4	27.7	33.0	114	18.67	152

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.
(2) Tolerance see page 57
(3) NPT Reducing Tee (Max 2" size): "A,G,H" in accordance with large size. The others in accordance with each size.
(4) SW Reducing Tee (Max 2" size): "C,G" in accordance with large size. "A,J" in accordance with one size smaller than large size of NPT range. The others in accordance with each size.

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

CROSS ASME B16.11-2011

(Rev: ASME B16.11-2009)



Dimensions in Millimeters.

Socket Welding

DN	Nom. Pipe Size	B(2)	C(1) (Avg)	C(1) (Min)	D(2)	A(2)	J (Min)
3000Lb							
6	1/8	10.8	3.18	3.18	6.9	11.0	9.5
8	1/4	14.2	3.78	3.30	9.3	11.0	9.5
10	3/8	17.6	4.01	3.50	12.6	13.5	9.5
15	1/2	21.8	4.67	4.09	15.8	15.5	9.5
20	3/4	27.2	4.90	4.27	21.0	19.0	12.5
25	1	33.9	5.69	4.98	26.7	22.5	12.5
32	1-1/4	42.7	6.07	5.28	35.1	27.0	12.5
40	1-1/2	48.8	6.35	5.54	40.9	32.0	12.5
50	2	61.2	6.93	6.04	52.5	36.0	16.0
65	2-1/2	73.9	8.76	7.67	62.7	41.0	16.0
80	3	89.8	9.52	8.30	78.0	57.0	16.0
100	4	115.2	10.69	9.35	102.3	66.5	19.0
6000Lb							
6	1/8	10.8	3.96	3.43	4.0	11.0	9.5
8	1/4	14.2	4.60	4.01	6.4	13.5	9.5
10	3/8	17.6	5.03	4.37	9.2	15.5	9.5
15	1/2	21.8	5.97	5.18	11.8	19.0	9.5
20	3/4	27.2	6.96	6.04	15.6	22.5	12.5
25	1	33.9	7.92	6.93	20.7	27.0	12.5
32	1-1/4	42.7	7.92	6.93	29.5	32.0	12.5
40	1-1/2	48.8	8.92	7.80	34.0	38.0	12.5
50	2	61.2	10.92	9.50	42.9	41.0	16.0
9000Lb							
15	1/2	21.8	9.35	8.18	6.4	25.5	9.5
20	3/4	27.2	9.78	8.56	11.1	28.5	12.5
25	1	33.9	11.38	9.96	15.2	22.0	12.5
32	1-1/4	42.7	12.14	10.62	22.8	35.0	12.5
40	1-1/2	48.8	12.70	11.12	28.0	38.0	12.5
50	2	61.2	13.84	12.12	38.2	54.0	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(2) Tolerance see page 57

Dimensions in Millimeters.

Threaded

DN	Nom. Pipe Size	Length of Thread. (Min) B(*)	Length of Thread. (Min) L2(*)	A	H
2000Lb					
6	1/8	6.4	6.7	21	22
8	1/4	8.1	10.2	21	22
10	3/8	9.1	10.4	25	25
15	1/2	10.9	13.6	28	33
20	3/4	12.7	13.9	33	38
25	1	14.7	17.3	38	46
32	1-1/4	17.0	18.0	44	56
40	1-1/2	17.8	18.4	51	62
50	2	19.0	19.2	60	75
65	2-1/2	23.6	28.9	76	92
80	3	25.9	30.5	86	109
100	4	27.7	33.0	106	146
3000Lb					
6	1/8	6.4	6.7	21	22
8	1/4	8.1	10.2	25	25
10	3/8	9.1	10.4	28	33
15	1/2	10.9	13.6	33	38
20	3/4	12.7	13.9	38	46
25	1	14.7	17.3	44	56
32	1-1/4	17.0	18.0	51	62
40	1-1/2	17.8	18.4	60	75
50	2	19.0	19.2	64	84
65	2-1/2	23.6	28.9	83	102
80	3	25.9	30.5	95	121
100	4	27.7	33.0	114	152
6000Lb					
6	1/8	6.4	6.7	25	25
8	1/4	8.1	10.2	28	33
10	3/8	9.1	10.4	33	38
15	1/2	10.9	13.6	38	46
20	3/4	12.7	13.9	44	56
25	1	14.7	17.3	51	62
32	1-1/4	17.0	18.0	60	75
40	1-1/2	17.8	18.4	64	84
50	2	19.0	19.2	83	102
65	2-1/2	23.6	28.9	95	121
80	3	25.9	30.5	106	146
100	4	27.7	33.0	114	152

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

FULL & REDUCING COUPLING

ASME B16.11-2011

(Rev: ASME B16.11-2009)

Dimensions in Millimeters.

Dimensions in Millimeters.

Socket Welding							
DN	Nom. Pipe Size	B(2)	C(1)		D(2)	E(2)	J (Min)
			(Avg)	(Min)			
3000Lb							
6	1/8	10.8	3.18	3.18	6.9	6.5	9.5
8	1/4	14.2	3.78	3.30	9.3	6.5	9.5
10	3/8	17.6	4.01	3.50	12.6	6.5	9.5
15	1/2	21.8	4.67	4.09	15.8	9.5	9.5
20	3/4	27.2	4.90	4.27	21.0	9.5	12.5
25	1	33.9	5.69	4.98	26.7	12.5	12.5
32	1-1/4	42.7	6.07	5.28	35.1	12.5	12.5
40	1-1/2	48.8	6.35	5.54	40.9	12.5	12.5
50	2	61.2	6.93	6.04	52.5	19.0	16.0
65	2-1/2	73.9	8.76	7.67	62.7	19.0	16.0
80	3	89.8	9.52	8.30	78.0	19.0	16.0
100	4	115.2	10.69	9.35	102.3	19.0	19.0
6000Lb							
6	1/8	10.8	3.96	3.43	4.0	6.5	9.5
8	1/4	14.2	4.60	4.01	6.4	6.5	9.5
10	3/8	17.6	5.03	4.37	9.2	6.5	9.5
15	1/2	21.8	5.97	5.18	11.8	9.5	9.5
20	3/4	27.2	6.96	6.04	15.6	9.5	12.5
25	1	33.9	7.92	6.93	20.7	12.5	12.5
32	1-1/4	42.7	7.92	6.93	29.5	12.5	12.5
40	1-1/2	48.8	8.92	7.80	34.0	12.5	12.5
50	2	61.2	10.92	9.50	42.9	19.0	16.0
9000Lb							
15	1/2	21.8	9.35	8.18	6.4	9.5	9.5
20	3/4	27.2	9.78	8.56	11.1	9.5	12.5
25	1	33.9	11.38	9.96	15.2	12.5	12.5
32	1-1/4	42.7	12.14	10.62	22.8	12.5	12.5
40	1-1/2	48.8	12.70	11.12	28.0	12.5	12.5
50	2	61.2	13.84	12.12	38.2	19.0	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.
(2) Tolerance see page 57
(3) Reducing Coupling : "C,J,E,M,W" in accordance with large size.
"D" in accordance with small size.
The others in accordance with each size.

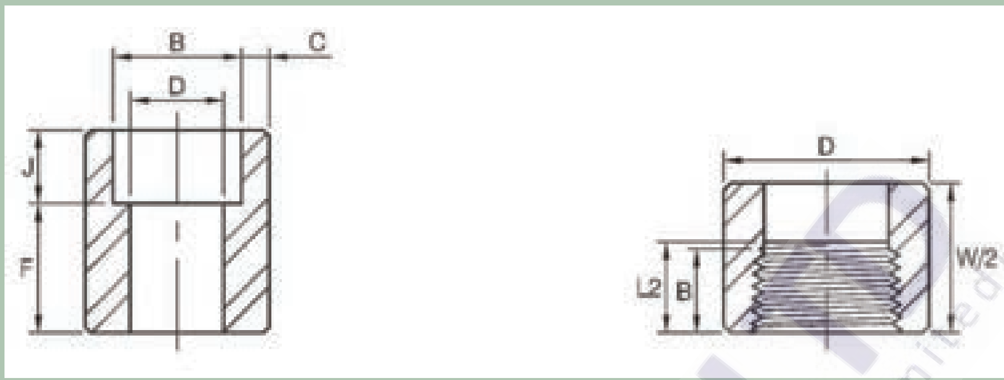
Threaded					
DN	Nom. Pipe Size	Length of Thread. (Min)		W	M
		B(*)	L2(*)		
3000Lb					
6	1/8	6.4	6.7	32	16
8	1/4	8.1	10.2	35	19
10	3/8	9.1	10.4	38	22
15	1/2	10.9	13.6	48	28
20	3/4	12.7	13.9	51	35
25	1	14.7	17.3	60	44
32	1-1/4	17.0	18.0	67	57
40	1-1/2	17.8	18.4	79	64
50	2	19.0	19.2	86	76
65	2-1/2	23.6	28.9	92	92
80	3	25.9	30.5	108	108
100	4	27.7	33.0	121	140
6000Lb					
6	1/8	6.4	6.7	32	22
8	1/4	8.1	10.2	35	25
10	3/8	9.1	10.4	38	32
15	1/2	10.9	13.6	48	38
20	3/4	12.7	13.9	51	44
25	1	14.7	17.3	60	57
32	1-1/4	17.0	18.0	67	64
40	1-1/2	17.8	18.4	79	76
50	2	19.0	19.2	86	92
65	2-1/2	23.6	28.9	92	108
80	3	25.9	30.5	108	127
100	4	27.7	33.0	121	159

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

HALF COUPLING

ASME B16.11-2011

(Rev: ASME B16.11-2009)



Dimensions in Millimeters.

Socket Welding							
DN	Nom. Pipe Size	B(2)	C(1) (Avg)	C(1) (Min)	D(2)	F(2)	J (Min)
3000Lb							
6	1/8	10.8	3.18	3.18	6.9	6.5	9.5
8	1/4	14.2	3.78	3.30	9.3	6.5	9.5
10	3/8	17.6	4.01	3.50	12.6	6.5	9.5
15	1/2	21.8	4.67	4.09	15.8	9.5	9.5
20	3/4	27.2	4.90	4.27	21.0	9.5	12.5
25	1	33.9	5.69	4.98	26.7	12.5	12.5
32	1-1/4	42.7	6.07	5.28	35.1	12.5	12.5
40	1-1/2	48.8	6.35	5.54	40.9	12.5	12.5
50	2	61.2	6.93	6.04	52.5	19.0	16.0
65	2-1/2	73.9	8.76	7.67	62.7	19.0	16.0
80	3	89.8	9.52	8.30	78.0	19.0	16.0
100	4	115.2	10.69	9.35	102.3	19.0	19.0
6000Lb							
6	1/8	10.8	3.96	3.43	4.0	6.5	9.5
8	1/4	14.2	4.60	4.01	6.4	6.5	9.5
10	3/8	17.6	5.03	4.37	9.2	6.5	9.5
15	1/2	21.8	5.97	5.18	11.8	9.5	9.5
20	3/4	27.2	6.96	6.04	15.6	9.5	12.5
25	1	33.9	7.92	6.93	20.7	12.5	12.5
32	1-1/4	42.7	7.92	6.93	29.5	12.5	12.5
40	1-1/2	48.8	8.92	7.80	34.0	12.5	12.5
50	2	61.2	10.92	9.50	42.9	19.0	16.0
9000Lb							
15	1/2	21.8	9.35	8.18	6.4	9.5	9.5
20	3/4	27.2	9.78	8.56	11.1	9.5	12.5
25	1	33.9	11.38	9.96	15.2	12.5	12.5
32	1-1/4	42.7	12.14	10.62	22.8	12.5	12.5
40	1-1/2	48.8	12.70	11.12	28.0	12.5	12.5
50	2	61.2	13.84	12.12	38.2	19.0	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(2) Tolerance see page 57

Dimensions in Millimeters.

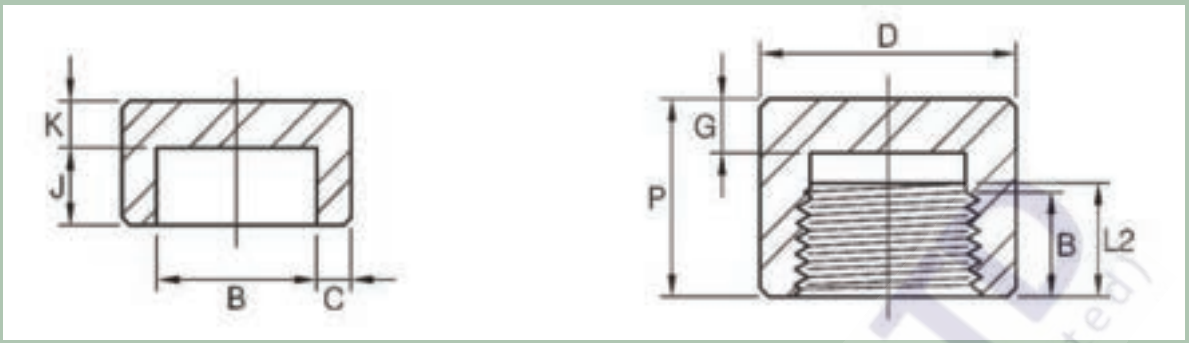
Threaded					
DN	Nom. Pipe Size	Length of Thread. (Min) B(*)	Length of Thread. (Min) L2(*)	W	D
3000Lb					
6	1/8	6.4	6.7	32	16
8	1/4	8.1	10.2	35	19
10	3/8	9.1	10.4	38	22
15	1/2	10.9	13.6	48	28
20	3/4	12.7	13.9	51	35
25	1	14.7	17.3	60	44
32	1-1/4	17.0	18.0	67	57
40	1-1/2	17.8	18.4	79	64
50	2	19.0	19.2	86	76
65	2-1/2	23.6	28.9	92	92
80	3	25.9	30.5	108	108
100	4	27.7	33.0	121	140
6000Lb					
6	1/8	6.4	6.7	32	22
8	1/4	8.1	10.2	35	25
10	3/8	9.1	10.4	38	32
15	1/2	10.9	13.6	48	38
20	3/4	12.7	13.9	51	44
25	1	14.7	17.3	60	57
32	1-1/4	17.0	18.0	67	64
40	1-1/2	17.8	18.4	79	76
50	2	19.0	19.2	86	92
65	2-1/2	23.6	28.9	92	108
80	3	25.9	30.5	108	127
100	4	27.7	33.0	121	159

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

ROUND CAP

ASME B16.11-2011

(Rev:ASME B16.11-2009)



Dimensions in Millimeters.

DN	Nom. Pipe Size	B(2)	C(1)		K (Min)	J (Min)
			(Avg)	(Min)		
3000Lb						
6	1/8	10.8	3.18	3.18	4.8	9.5
8	1/4	14.2	3.78	3.30	4.8	9.5
10	3/8	17.6	4.01	3.50	4.8	9.5
15	1/2	21.8	4.67	4.09	6.4	9.5
20	3/4	27.2	4.90	4.27	6.4	12.5
25	1	33.9	5.69	4.98	9.6	12.5
32	1-1/4	42.7	6.07	5.28	9.6	12.5
40	1-1/2	48.8	6.35	5.54	11.2	12.5
50	2	61.2	6.93	6.04	12.7	16.0
65	2-1/2	73.9	8.76	7.67	15.7	16.0
80	3	89.8	9.52	8.30	19.0	16.0
100	4	115.2	10.69	9.35	22.4	19.0
6000Lb						
6	1/8	10.8	3.96	3.43	6.4	9.5
8	1/4	14.2	4.60	4.01	6.4	9.5
10	3/8	17.6	5.03	4.37	6.4	9.5
15	1/2	21.8	5.97	5.18	7.9	9.5
20	3/4	27.2	6.96	6.04	7.9	12.5
25	1	33.9	7.92	6.93	11.2	12.5
32	1-1/4	42.7	7.92	6.93	11.2	12.5
40	1-1/2	48.8	8.92	7.80	12.7	12.5
50	2	61.2	10.92	9.50	15.7	16.0
9000Lb						
15	1/2	21.8	9.35	8.18	11.2	9.5
20	3/4	27.2	9.78	8.56	12.7	12.5
25	1	33.9	11.38	9.96	14.2	12.5
32	1-1/4	42.7	12.14	10.62	14.2	12.5
40	1-1/2	48.8	12.70	11.12	15.7	12.5
50	2	61.2	13.84	12.12	19.0	16.0

(1) Average of socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

(2) Tolerance see page 57

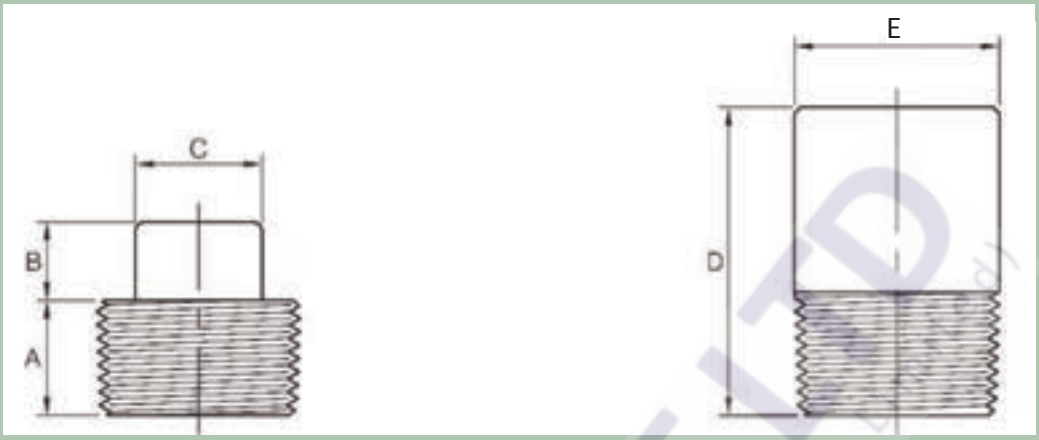
Dimensions in Millimeters.

DN	Nom. Pipe Size	Length of Thread. (Min)		P	D	G (Min)
		B(*)	L2(*)			
3000Lb						
6	1/8	6.4	6.7	19	16	4.8
8	1/4	8.1	10.2	25	19	4.8
10	3/8	9.1	10.4	25	22	4.8
15	1/2	10.9	13.6	32	28	6.4
20	3/4	12.7	13.9	37	35	6.4
25	1	14.7	17.3	41	44	9.7
32	1-1/4	17.0	18.0	44	57	9.7
40	1-1/2	17.8	18.4	44	64	11.2
50	2	19.0	19.2	48	76	12.7
65	2-1/2	23,6	28.9	60	92	15.7
80	3	25.9	30.5	65	108	19.0
100	4	27.7	33.0	68	140	22.4
6000Lb						
8	1/4	8.1	10.2	27	25	6.4
10	3/8	9.1	10.4	27	vw32	6.4
15	1/2	10.9	13.6	33	38	7.9
20	3/4	12.7	13.9	38	44	7.9
25	1	14.7	17.3	43	57	11.2
32	1-1/4	17.0	18.0	46	64	11.2
40	1-112	17.8	18.4	48	76	12.7
50	2	19.0	19.2	51	92	15.7
65	2-1/2	23.6	28.9	64	108	19.0
80	3	25.9	30.5	68	127	22.4
100	4	27.7	33.0	75	159	28.4

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

SQUARE & ROUND HEAD PLUG

ASME B16.11-2011
(Rev: ASME B16.11-2009)



Dimensions in Millimeters.

Square Head Plug				
DN	Nom. Pipe Size	A (Min)	B (Min)	C (Min)
6	1/8	10	6	7.15
8	1/4	11	6	9.55
10	3/8	13	8	11.11
15	1/2	14	10	14.29
20	3/4	16	11	15.88
25	1	19	13	20.64
32	1-1/4	21	14	23.81
40	1-1/2	21	16	28.58
50	2	22	18	33.34(1)
65	2-1/2	27	19	38.10
80	3	28	21	42.86
100	4	32	25	63.50

Dimensions in Millimeters.

Round Head Plug			
DN	Nom. Pipe Size	E (Nom.)	D (Min)
6	1/8	10	35
8	1/4	14	41
10	3/8	18	41
15	1/2	21	44
20	3/4	27	44
25	1	33	51
32	1-1/4	43	51
40	1-1/2	48	51
50	2	60	64
65	2-1/2	73	70
80	3	89	70
100	4	114	76

(1) ASME B16.11-2011 SIZE 2" DATA"C" WAS CONVERTED FROM INCH DATA INTO MILLIMETERS.

DIMENSIONAL TOLERANCE OF ASME B16.11 (SW FORGED FITTINGS)

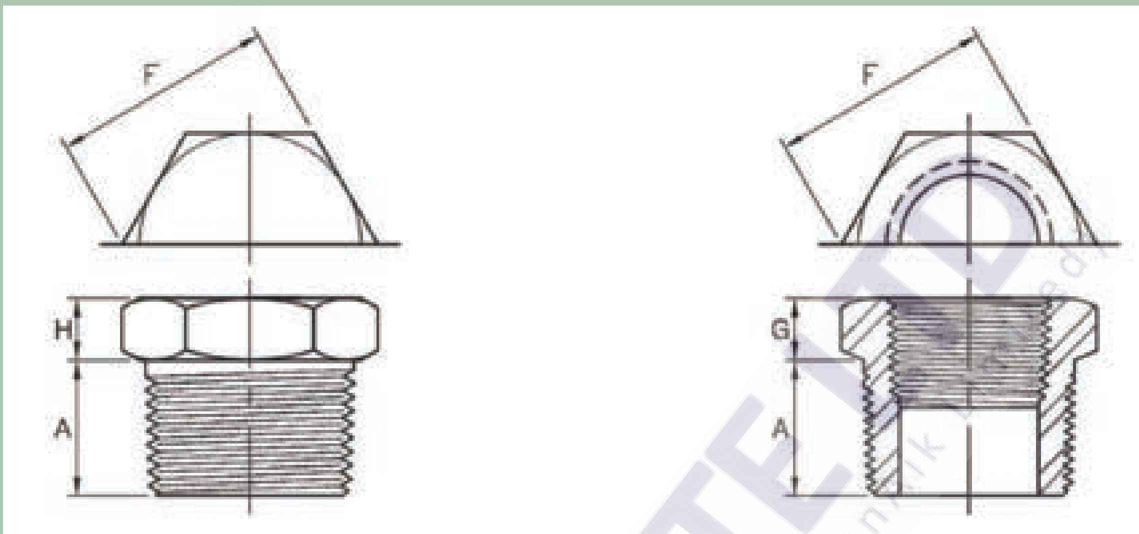
ASME B16.11-2011

Unit : mm

ITEM	Type of pipe fitting	Size				
		DN	6 to 8	10 to 20	25 to 50	65 to 100
		NPS	1/8 to 1/4	3/8 to 3/4	1 to 2	2-1/2 to 4
Bore diameter of socket (B)	All type of pipe fittings		+0.4 -0.0	+0.4 -0.0	+0.4 -0.0	+0.5 -0.0
Bore diameter of fitting (D)			±0.7	±0.7	±0.7	±1.4
Concentricity of bore (X)				± 0.8		
Coincidence of axes (Y)				1/200 Max		
Center to bottom of socket (A)	45°/ 90° Elbow, Tee, Cross		±1.0	±1.5	± 2.0	±2.5
Bottom to bottom of socket (E)	Full Coupling		±1.5	±3.0	±4.0	±5.0
Bottom to socket to opposite face (F)	Half Coupling		±1.0	±1.5	± 2.0	±2.5

HEX HEAD PLUG & BUSHING

ASME B16.11-2011
(Rev:ASME B16.11-2009)



Dimensions in Millimeters.

Hex Head Plug				
DN	Nom. Pipe Size	A (Min)	F (Nom.)	H (Min)
6	1/8	10	11.11	6
8	1/4	11	15.88	6
10	3/8	13	17.46	8
15	1/2	14	22.23	8
20	3/4	16	26.99	10
25	1	19	34.93	10
32	1-1/4	21	44.45	14
40	1-1/2	21	50.80	16
50	2	22	63.50	18
65	2-1/2	27	76.20	19
80	3	28	88.90	21
100	4	32	117.48	25

Dimensions in Millimeters.

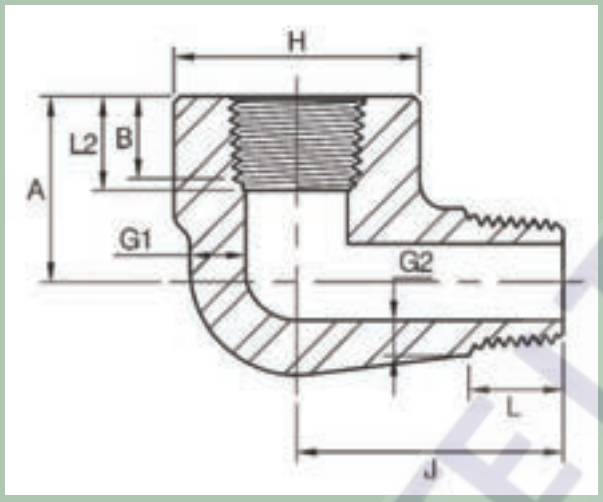
Hex Head Bushing				
DN	Nom. Pipe Size	A (Min)	F (Nom.)	G (Min)
8	1/4	11	15.88	3
10	3/8	13	17.46	4
15	1/2	14	22.23	5
20	3/4	16	26.99	6
25	1	19	34.93	6
32	1-1/4	21	44.45	7
40	1-1/2	21	50.80	8
50	2	22	63.50	9
65	2-1/2	27	76.20	10
80	3	28	88.90	10
100	4	32	117.48	13

(1) CAUTIONARY NOTE REGARDING HEX BUSHINGS.
Hex Head Bushings of one-size reduction should not be used in services where they might be subject to harmful loads and forces than internal pressures.

STREET ELBOW

ASME B16.11-2011

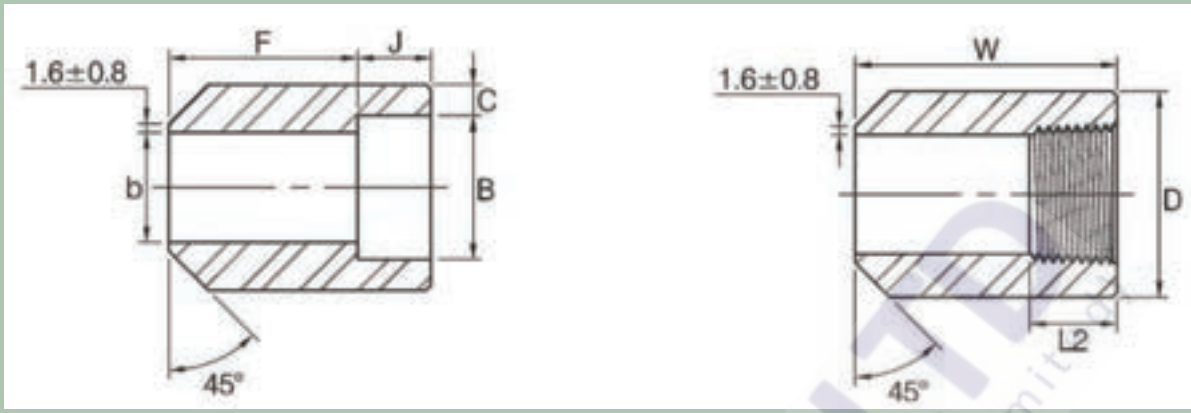
(Rev:ASME B16.11-2009)



Dimensions in Millimeters.

DN	Nom. Pipe Size	H	A	J	G1 (Min)	G2(1) (Min)	B(2) (Min)	L2(2) (Min)	L (Min)
3000Lb									
6	1/8	19	19	25	3.18	2.74	6.4	6.7	10.0
8	1/4	25	22	32	3.30	3.22	8.1	10.2	11.0
10	3/8	32	25	38	3.51	3.50	9.1	10.4	13.0
15	1/2	38	28	41	4.09	4.16	10.9	13.6	14.0
20	3/4	44	35	48	4.32	4.88	12.7	13.9	16.0
25	1	51	44	57	4.98	5.56	14.7	17.3	19.0
32	1-1/4	62	51	66	5.28	5.56	17.0	18.0	21.0
40	1-1/2	70	54	71	5.56	6.25	17.8	18.4	21.0
50	2	84	64	84	7.14	7.64	19.0	19.0	22.0
6000Lb									
6	1/8	25	22	32	5.08	4.22	6.4	6.7	10.0
8	1/4	32	25	38	5.66	5.28	8.1	10.2	11.0
10	3/8	38	28	41	6.98	5.59	9.1	10.4	13.0
15	1/2	44	35	48	8.15	6.53	10.9	13.6	14.0
20	3/4	51	44	57	8.53	6.86	12.7	13.9	16.0
25	1	62	51	66	9.93	7.95	14.7	17.3	19.0
32	1-1/4	70	54	71	10.59	8.48	17.0	18.0	21.0
40	1-1/2	84	64	84	11.07	8.89	17.8	18.4	21.0
50	2	102	83	105	12.09	9.70	19.0	19.0	22.0

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



Dimensions in Millimeters.

Socket Welding						
Nom. Pipe Size	DN	B (Min)	b	J (Min)	F	C (Min)
3000Lb						
1/8	6	10.7	6.8	10.0	28.0	3.2
1/4	8	14.1	9.2	10.0	32.0	3.3
3/8	10	17.6	12.5	11.0	34.0	3.5
1/2	15	21.8	15.5	13.0	38.0	4.1
3/4	20	27.4	21.0	13.0	38.0	4.3
1	25	34.1	26.5	16.0	35.0	5.0
1-1/2	40	49.0	40.5	19.0	32.0	5.6
2	50	61.0	52.0	22.0	29.0	6.1
2-1/2	65	73.8	62.0	22.0	29.0	7.7
3	80	89.7	78.0	22.0	29.0	8.3
6000Lb						
1/2	15	21.8	11.8	13.0	38.0	5.2
3/4	20	27.4	15.5	13.0	38.0	6.1
1	25	34.1	20.7	16.0	35.0	7.0
1-1/2	40	49.0	34.0	19.0	32.0	7.8
2	50	61.0	43.0	22.0	29.0	9.5
2-1/2	65	73.8	54.0	22.0	29.0	10.4
3	80	89.7	66.0	22.0	29.0	12.2

Dimensions in Millimeters.

Threaded				
Nom. Pipe Size	DN	D	W	L2 (Min)
1/8	6	16.0	38.0	6.70
114	8	19.0	41.0	10.21
318	10	22.0	45.0	10.36
1/2	15	29.0	51.0	13.56
3/4	20	35.0	51.0	13.86
1	25	45.0	51.0	17.34
1-1/2	40	64.0	51.0	18.38
2	50	76.0	51.0	19.22
2-1/2	65	95.0	51.0	28.89
3	80	110.0	57.0	30.48
4	100	140.0	64.0	33.02
6000Lb				
1/8	6	22.0	38.0	6.70
1/4	8	26.0	41.0	10.21
3/8	10	32.0	45.0	10.36
1/2	15	38.0	51.0	13.56
3/4	20	45.0	51.0	13.86
1	25	60.0	51.0	17.34
1-1/2	40	76.0	51.0	18.38
2	50	95.0	51.0	19.22

DIMENSIONAL TOLERANCE OF BS3799

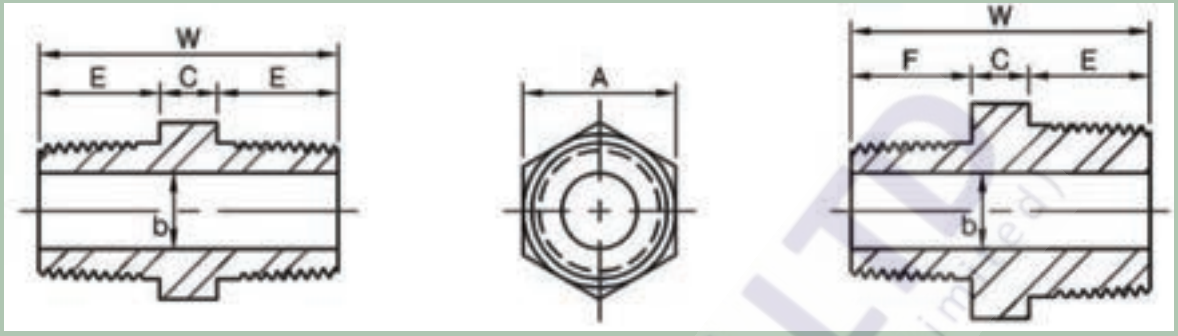
BS3799-1974

Unit : mm

Item	Type of pipe fitting	DN	6-8	10 -20	25-50	65 -80
		NPS	1/8"-114'	318"-3/4"	1"-2"	2-1/2"---3'
Concentricity of bore (X)	All fittings	±0.8				
Coincidence of axes (Y)		± 1 / 200				
Bore diameter of fitting (b)	Boss & Hex Nipple	±0.4				±0.8
Bottom of socket to opposite face	Boss	±0.8		±1.5	±2.0	±2.5

HEX NIPPLE & REDUCING NIPPLE

BS3799-1974



FULL SIZE

REDUCING SIZE

Dimensions in Millimeters.

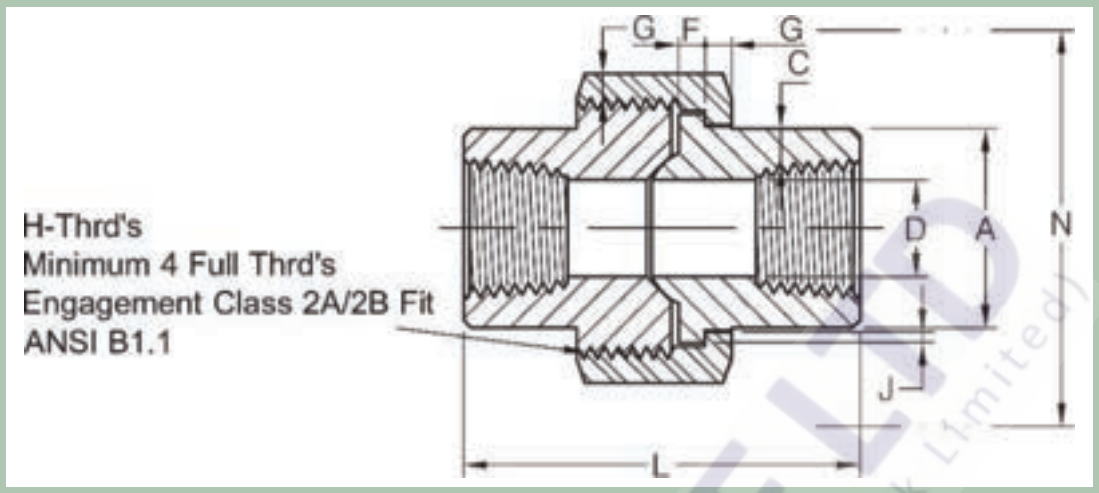
Nominal Size				A (Min)	W (Min)	E (Min)	b(1)		C (Min)	F (Min)
Equal		Reducing								
In	DN	In	DV				3M(2)	6M(2)		
1/8	(6)	-	-	11	26	10	5	2	6	-
1/4	(8)	-	-	15	36	15	8	6	6	-
-	-	1/4 x 1/8	(8 x 6)	15	31	15	5	2	6	10
3/8	(10)	-	-	18	40	16	11	8	8	-
-	-	3/8 x 1/4	(10 x 8)	18	39	16	8	6	8	15
1/2	(15)	-	-	22	48	20	14	11	8	-
-	-	1/2 x 3/8	(15 x 10)	22	44	20	11	8	8	16
-	-	1/2 x 1/4	(15 x 8)	22	43	20	8	6	8	15
3/4	(20)	-	-	27	52	21	19	13	10	-
-	-	3/4 x 1/2	(20 x 15)	27	50	21	14	11	9	20
-	-	3/4 x 3/8	(20 x 10)	27	46	21	11	8	9	16
1	(25)	-	-	35	60	25	24	17	10	-
-	-	1 x 3/4	(25 x 20)	35	56	25	19	13	10	21
-	-	1 x 1/2	(25 x 15)	35	55	25	14	11	10	20
1-1/2	(40)	-	-	50	68	26	38	30	16	-
-	-	1-1/2 x 1	(40 x 25)	50	67	26	24	17	16	25
-	-	1-1/2 x 3/4	(40 x 20)	50	63	26	19	13	16	21
-	-	1-1/2 x 1/2	(40 x 15)	50	62	26	14	11	16	20
2	(50)	-	-	62	71	27	49	39	17	-
-	-	2 x 1-1/2	(50 x 40)	62	70	27	38	30	17	26
-	-	2 x 1	(50 x 25)	62	70	27	24	17	18	25
-	-	2 x 3/4	(50 x 20)	62	65	27	19	13	17	21
-	-	2 x112	(50 x 15)	62	65	27	14	11	18	20

(1) Tolerance see page 60

(2) 3M & 6M symbols denote 3000 & 6000 classes.

THREADED END UNION

MSS SP-83-2006



3000Lb

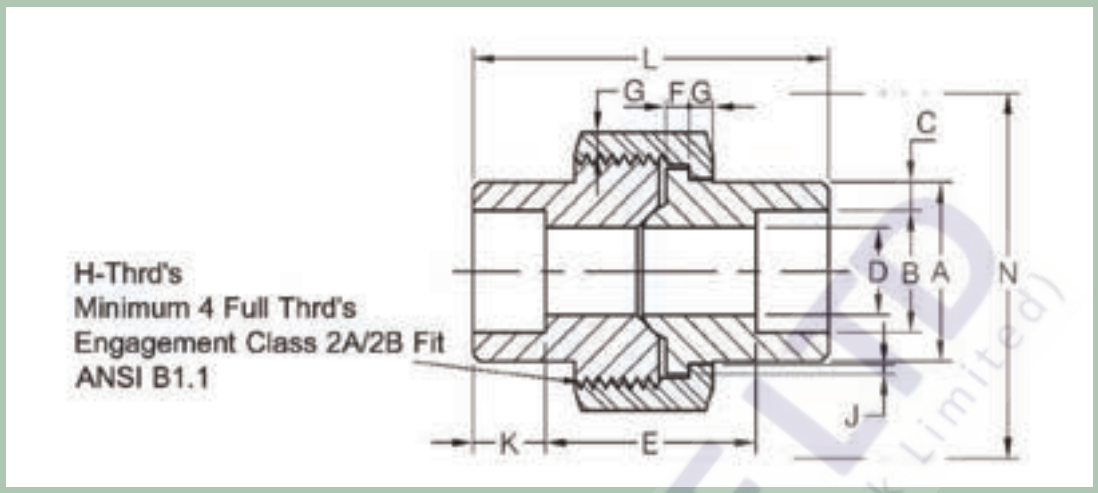
Dimensions in Millimeters.

Nom. Pipe Size	Pipe End	Wall	Water Way Bore	Male Flange	Nut	Thrds. Per 25.4mm	Bearing	Length Assem. Nom.	Clear Assem. Nut
	(Min) A	(Min) C	D[(1)]	(Min) F	(Min) G	H	(Min) J	L	N
1/8	14.7	2.41	8.43 6.43	3.18	3.18	16	1.24	41.4	50.8
1/4	19.0	3.02	11.13 9.45	3.18	3.18	16	1.24	41.4	50.8
3/8	22.9	3.20	14.27 13.51	3.43	3.43	14	1.37	46.0	55.9
1/2	27.7	3.73	17.86 17.07	3.68	3.68	14	1.50	49.0	58.4
3/4	33.5	3.91	23.01 21.39	4.06	4.06	11	1.68	56.9	66.0
1	41.4	4.55	28.98 27.74	4.57	4.45	11	1.85	62.0	78.7
1-1/4	50.5	4.85	37.69 35.36	5.33	5.21	10	2.13	71.1	94.0
1-1/2	57.2	5.08	55.58 52.12	5.84	5.59	10	2.31	76.5	111.8
2	70.1	5.54	55.58 52.12	6.60	6.35	10	2.69	86.1	132.1
2-1/2	85.3	7.01	66.27 64.31	7.49	7.11	8	3.07	102.4	149.9
3	102.4	7.62	88.25 77.27	8.26	8.00	8	3.53	109.0	175.3

(1) Upper and lower values for each size are the respective maximum and minimum dimensions.

SOCKET WELD END UNION

MSS SP-83-2006

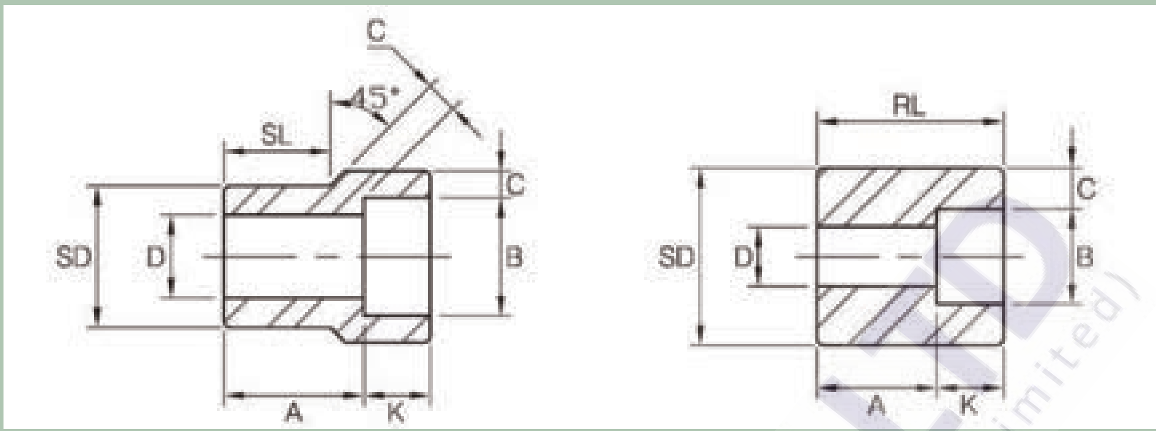


3000Lb

Dimensions in Millimeters.

Nom. Pipe Size	Pipe End (Min) A	Socket Bore Dia. B(1)	Socket Wall (Min) C	Water Way Bore D(1)	Laying Length E(1)	Male Flange (Min) F	Nut (Min) G	Thrds. Per 25.4mm H	Bearing (Min) J	Depth of Socket (Min) K	Length Assem. Nom. L	Clear Assem. Nut N
1/8	21 .8	11.18 10.67	3.18	7.59 6.07	22.4 19.1	3.18	3.18	16	1.24	9.7	41.4	50.8
1/4	21.8	14.61 14.10	3.30	10.01 8.48	22.4 19.1	3.18	3.18	16	1.24	9.7	41.4	50.8
3/8	25.9	18.03 17.53	3.51	13.28 11.76	26.9 20.6	3.43	3.43	14	1.37	9.7	46.0	55.9
1/2	31 .2	22.23 21.72	4.09	16.56 15.04	26.9 20.6	3.68	3.68	14	1.50	9.7	49.0	58.4
3/4	37.1	27.56 27.05	4.27	21.69 20.17	31.8 25.4	4.06	4.06	11	1.68	12.7	56.9	66.0
1	45.5	34.29 33.78	4.98	27.41 25.88	34.3 26.2	4.57	4.45	11	1.85	12.7	62.0	78.7
1-1/4	54.9	43.05 42.55	5.28	35.81 34.29	40.6 32.5	5.33	5.21	10	2.13	12.7	71.1	94.0
1-1/2	61.5	49.15 48.64	5.54	41.66 40.13	42.2 34.0	5.84	5.59	10	2.31	12.7	76.5	111.8
2	75.2	61.62 61.11	6.05	53.26 51.74	45.5 37.3	6.60	6.35	10	2.69	15.7	86.1	132.1
2-1/2	91.7	74.45 73.81	7.67	64.24 61.19	61.7 52.1	7.49	7.11	8	3.07	15.7	102.4	149.9
3	109.2	90.42 89.79	8.31	79.45 76.40	63.8 53.6	8.26	8.00	8	3.53	15.7	109.0	175.3

(1) Upper and lower values for each size are the respective maximum and minimum dimensions



TYPE 1 **TYPE 2(1)**

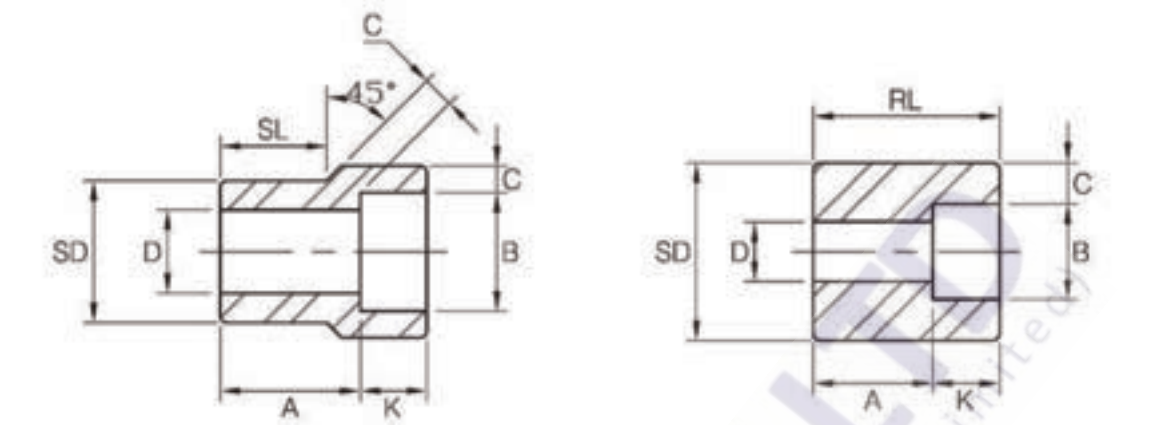
Dimensions in Millimeters.

Nom. Pipe Size	Type(2)		Socket		Shank Dia.	Laying Length A		Bore D		Wall (Min) C		Length			
												SL		RL(Min)	
	3M	6M	Dia. B	Depth (Min) K	SD	3M	6M	3M	6M	3M	6M	3M	6M	3M	6M
3/8 x 1/4	1	1	14.4	9.5	17.1	19.0	21.3	9.2	6.3	3.78	4.60	14.2	15.7	-	-
1/2 x 3/8	1	1	17.8	9.5	21.3	20.6	23.1	12.5	9.1	4.01	5.03	15.7	15.7	-	-
1/2 x 1/4	1	1	14.4	9.5	21.3	20.6	20.6	9.2	6.3	3.78	4.60	15.7	15.7	-	-
3/4 x 1/2	1	1	22.0	9.5	26.7	22.4	25.4	15.8	11.7	4.67	5.97	17.5	19.0	-	-
3/4 x 3/8	2	1	17.8	9.5	26.7	15.7	22.4	12.5	9.1	4.01	5.03	-	19.0	26.9	-
3/4 x 1/4	2	2	14.4	9.5	26.7	17.5	22.4	9.2	6.3	3.78	4.60	-	-	26.9	32.0
1 x 3/4	1	1	27.4	12.5	33.4	23.9	28.4	20.9	15.5	4.90	6.96	19.0	20.6	-	-
1 x 1/2	2	1	22.0	9.5	33.4	15.7	28.4	15.8	11.7	4.67	5.97	-	20.6	28.4	-
1 x 3/8	2	2	17.8	9.5	33.4	17.5	22.4	12.5	9.1	4.01	5.03	-	-	28.4	33.2
1 x 1/4	2	2	14.4	9.5	33.4	19.0	23.9	9.2	6.3	3.78	4.60	-	-	28.4	33.2
1-1/4 x 1	1	1	34.1	12.5	42.2	25.4	30.2	26.6	20.7	5.69	7.92	20.6	22.4	-	-
1-1/4 x 3/4	2	2	27.4	12.5	42.2	17.5	20.6	20.9	15.5	4.90	6.96	-	-	31.7	34.7
1-1/4 x 1/2	2	2	22.0	9.5	42.2	19.0	22.4	15.8	11.7	4.67	5.97	-	-	31.7	34.7
1-1/4 x 3/8	2	2	17.8	9.5	42.2	20.6	23.9	12.5	9.1	4.01	5.03	-	-	31.7	34.7
1-1/4 x 1/4	2	2	14.4	9.5	42.2	22.4	25.4	9.2	6.3	3.78	4.60	-	-	31.7	34.7
1-1/2 x 1-1/4	1	1	42.9	12.5	48.2	28.4	35.0	35.0	29.4	6.07	7.92	22.4	25.4	-	-
1-1/2 x 1	2	1	34.1	12.5	48.2	17.5	29.2	26.6	20.7	5.69	7.92	-	25.4	33.2	-
1-1/2 x 3/4	2	2	27.4	12.5	48.2	19.0	25.4	20.9	15.5	4.90	6.96	-	-	33.2	39.6
1-1/2 x 1/2	2	2	22.0	9.5	48.2	20.6	26.9	15.8	11.7	4.67	5.97	-	-	33.2	39.6
1-1/2 x 3/8	2	2	17.8	9.5	48.2	22.4	28.4	12.5	9.1	4.01	5.03	-	-	33.2	39.6
2 x 1-1/2	1	1	49.0	12.5	60.3	31.8	38.9	40.8	33.9	6.35	8.92	25.4	28.7	-	-
2 x 1-1/4	2	2	42.9	12.5	60.3	20.6	23.9	35.0	29.4	6.07	7.92	-	-	38.1	41.1
2 x 1	2	2	34.1	12.5	60.3	22.4	25.4	26.6	20.7	5.69	7.92	-	-	38.1	41.1
2 x 3/4	2	2	27.4	12.5	60.3	23.9	26.9	20.9	15.5	4.90	6.96	-	-	38.1	41.1
2 x 1/2	2	2	22.0	9.5	60.3	25.4	28.4	15.8	11.7	4.67	5.97	-	-	38.1	41.1

(1) At the option of the manufacturer Type 2 inserts may be furnished in Type 1 configuration.
(2) 3M & 6M symbols denote 3000 and 6000 classes

REDUCER INSERT

MSS SP-79-2011



TYPE 1 TYPE 2(1)

Dimensions in Millimeters.

Nom. Pipe Size	Type(2)		Socket		Shank Dia.	Laying Length A		Bore D		Wall (Min) C		Length SL		Length RL(Min)	
	3M	6M	Dia. B	Depth (Min) K	SD	3M	6M	3M	6M	3M	6M	3M	6M	3M	6M
2-1/2 x 2	1	1	61.4	16.0	73.0	46.0	42.7	52.4	42.8	6.93	10.92	38.1	31.8	-	-
2-1/2 x 1-1/2	2	2	49.0	12.5	73.0	35.0	35.0	40.8	33.9	6.35	8.92	-	-	53.8	53.8
2-1/2 x 1-1/4	2	2	42.9	12.5	73.0	36.6	36.6	35.0	29.4	6.07	7.92	-	-	53.8	53.8
2-1/2 x 1	2	2	34.1	12.5	73.0	38.1	38.1	26.6	20.7	5.69	7.92	-	-	53.8	53.8
2-1/2 x 3/4	2	2	27.4	12.5	73.0	39.6	38.1	20.9	15.5	4.90	6.96	-	-	53.8	53.8
3 x 2-1/2	1	1	74.1	16.0	88.9	38.1	57.2	62.7	54.0	8.76	11.91	31.8	44.4	-	-
3 x 2	2	2	61.4	16.0	88.9	25.4	31.8	52.4	42.8	6.93	10.92	-	-	47.4	53.8
3 x 1-1/2	2	2	49.0	12.5	88.9	28.4	31.8	40.8	33.9	6.35	8.92	-	-	47.4	53.8
3 x 1-1/4	2	2	42.9	12.5	88.9	30.2	31.8	35.0	29.4	6.07	7.92	-	-	47.4	53.8
3 x 1	2	2	34.1	12.5	88.9	31.8	31.8	26.6	20.7	5.69	7.92	-	-	47.4	53.8
4 x 3	2	-	90.0	16.0	114.3	33.3	-	77.9	-	9.52	-	-	-	60.4	-
4 x 2-1/2	2	-	74.1	16.0	114.3	38.1	-	62.7	-	8.76	-	-	-	60.4	-
4 x 2	2	-	61.4	16.0	114.3	38.1	-	52.4	-	6.93	-	-	-	60.4	-
4 x 1-1/2	2	-	49.0	12.5	114.3	41.1	-	40.8	-	6.35	-	-	-	60.4	-
4 x 1-1/4	2	-	42.9	12.5	114.3	42.9	-	35.0	-	6.07	-	-	-	60.4	-

(1) At the option of the manufacturer Type 2 inserts may be furnished in Type 1 configuration.
(2) 3M & 6M symbols denote 3000 and 6000 classes.

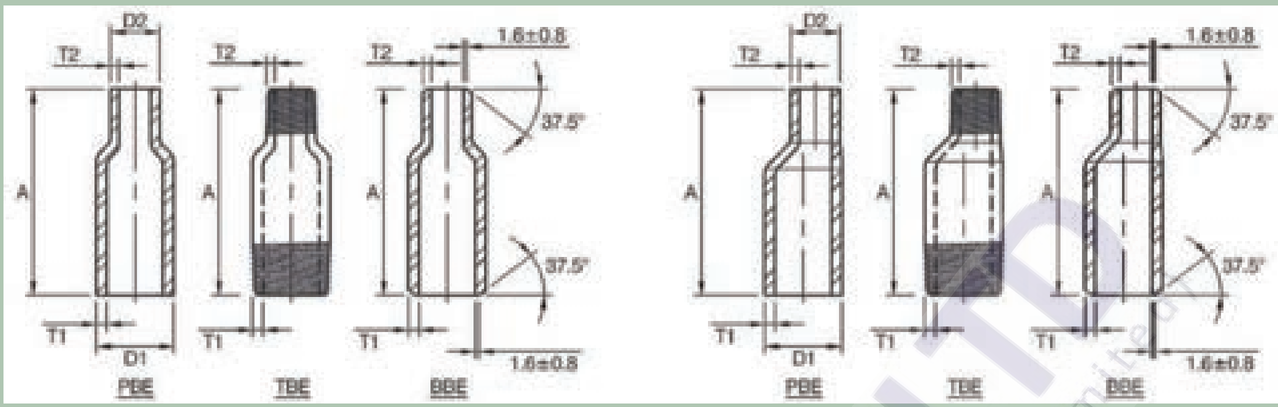
DIMENSIONAL TOLERANCE OF REDUCER INSERT

MSS SP-79-2011

Unit : inch

	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
Laying Length (A)			+1.5 -0.0		+2.0 -0.0				+2.5 -0.0		
Socket Dia (B)	±0.2								+0.3 -0.2		
Bore (D)	±0.8								±1.5		
Shank Dia (SD)		±0.25						±0.50			±0.8
Shank Length (SL)			+0.0 -1.5		+0.0 -2.0				+0.0 -2.5		

SWAGE NIPPLE *MSS SP-95-2006*



CONCENTRIC ECCENTRIC

Dimensions in Millimeters.

Nom. Pipe Size	Outside Diameter		End to End "A"	Wall Thickness (1)							
				T1				T2			
	Large End D1	Small End D2		Sch 40s / STD	Sch 80s / XS	Sch 160	Sch XXS	Sch 40s / STD	Sch 80s / XS	Sch 160	Sch XXS
1/4 X1/8	13.7	10.3	57	2.2	3.0	3.7	6.1	1.7	2.4		
3/8 X1/8	17.1	10.3	64	2.3	3.2	4.0	6.4	1.7	2.4		
3/8 X1/4	17.1	13.7	64	2.3	3.2	4.0	6.4	2.2	3.0		
1/2 X1/8	21.3	10.3	70	2.8	3.7	4.8	7.5	1.7	2.4		
1/2 X1/4	21.3	13.7	70	2.8	3.7	4.8	7.5	2.2	3.0		
1/2 X3/8	21.3	17.1	70	2.8	3.7	4.8	7.5	2.3	3.2		
3/4 X1/8	26.7	10.3	76	2.9	3.9	5.6	7.8	1.7	2.4		
3/4 X1/4	26.7	13.7	76	2.9	3,9	5,6	7.8	2.2	3.0		
3/4 X3/8	26.7	17.1	76	2.9	3.9	5.6	7.8	2.3	3.2		
3/4 X1/2	26.7	21.3	76	2.9	3.9	5.6	7.8	2.8	3.7	4.8	7.5
1 X1/8	33.4	10.3	89	3.4	4.5	6.4	9.1	1.7	2.4		
1 X1/4	33.4	13.7	89	3.4	4.5	6.4	9.1	2.2	3.0		
1 X3/8	33.4	17.1	89	3.4	4.5	6.4	9.1	2.3	3.2		
1 X1/2	33.4	21.3	89	3.4	4.5	6.4	9.1	2.8	3.7	4.8	7.5
1 X3/4	33.4	26.7	89	3.4	4.5	6.4	9.1	2.9	3.9	5.6	7.8
1-1/4 X1/8	42.2	10.3	102	3.6	4.9	6.4	9.7	1.7	2,4		
1-1/4 X1/4	42.2	13.7	102	3.6	4.9	6.4	9.7	2.2	3,0		
1-1/4 X3/8	42.2	17.1	102	3.6	4.9	6.4	9.7	2.3	3.2		
1-1/4 X1/2	42.2	21.3	102	3.6	4.9	6.4	9.7	2.8	3.7	4.8	7.5
1-1/4 X3/4	42.2	26.7	102	3.6	4.9	6.4	9.7	2.9	3.9	5.6	7.8
1-1/4 X1	42.2	33.4	102	3.6	4.9	6.4	9.7	3.4	4.5	6.4	9.1
1-1/2 X1/8	48.3	10.3	114	3.7	5.1	7.1	10.2	1.7	2.4		
1-1/2 X1/4	48.3	13.7	114	3.7	5.1	7.1	10.2	2.2	3.0		
1-1/2 X3/8	48.3	17.1	114	3.7	5.1	7.1	10.2	2.3	3.2		
1-1/2 X1/2	48.3	21.3	114	3.7	5.1	7.1	10.2	2.8	3.7	4.8	7.5
1-1/2 X3/4	48.3	26.7	114	3.7	5.1	7.1	10.2	2.9	3.9	5.6	7.8
1-1/2 X1	48.3	33.4	114	3.7	5.1	7.1	10.2	3.4	4.5	6.4	9.1
1-1/2 X1-1/4	48.3	42.2	114	3.7	5.1	7.1	10.2	3.6	4.9	6.4	9.7
2 X118	60.3	10.3	165	3.9	5.5	8.7	11.1	1.7	2.4		
2 X1/4	60.3	13.7	165	3.9	5,5	8.7	11.1	2.2	3.0		
2 X3/8	60.3	17.1	165	3.9	5.5	8.7	11.1	2.3	3.2		
2 X1/2	60.3	21.3	165	3.9	5.5	8.7	11.1	2.8	3.7	4.8	7.5
2 X3/4	60.3	26.7	165	3.9	5.5	8.7	11.1	2.9	3.9	5.6	7.8
2 X1	60.3	33.4	165	3.9	5.5	8.7	11.1	3.4	4.5	6.4	9.1
2 X1-1/4	60.3	42.2	165	3.9	5.5	8.7	11.1	3.6	4.9	6.4	9.7
2 X1-1/2	60.3	48.3	165	3.9	5.5	8.7	11.1	3.7	5.1	7.1	10.2

SWAGE NIPPLE

MSS SP-95-2006

Dimensions in Millimeters.

Nom. Pipe Size	Outside Diameter		End to End "A"	Wall Thickness (1)							
				T1				T2			
	Large End D1	Small End D2		Sch 40s / STD	Sch 80s / XS	Sch 160	Sch XXS	Sch 40s / STD	Sch 80s / XS	Sch 160	Sch XXS
2-1/2 X1/8	73.0	10.3	178	5.2	7.0	9.5	14.0	1.7	2.4		
2-1/2 X1/4	73.0	13.7	178	5.2	7.0	9.5	14.0	2.2	3.0		
2-1/2 X3/8	73.0	17.1	178	5.2	7.0	9.5	14.0	2.3	3.2		
2-1/2 X1/2	73.0	21.3	178	5.2	7.0	9.5	14.0	2.8	3.7	4.8	7.5
2-1/2 X3/4	73.0	26.7	178	5.2	7.0	9.5	14.0	2.9	3.9	5.6	7.8
2-1/2 X1	73.0	33.4	178	5.2	7.0	9.5	14.0	3.4	4.5	6.4	9.1
2-1/2 X1-1/4	73.0	42.2	178	5.2	7.0	9.5	14.0	3.6	4.9	6.4	9.7
2-1/2 X1-1/2	73.0	48.3	178	5.2	7.0	9.5	14.0	3.7	5.1	7.1	10.2
2-1/2 X2	73.0	60.3	178	5.2				3.9	5.5	8.7	11.1
3 X1/8	88.9	10.3	203	5.5				1.7	2.4		
3 X1/4	88.9	13.7	203	5.5	7.6	11.1	15.2	2.2	3.0		
3 X3/8	88.9	17.1	203	5.5	7.6	11.1	1 5.2	2.3	3.2		
3 X1/2	88.9	21.3	203	5.5	7.6	11.1	15.2	2.8	3.7	4.8	7.5
3 X3/4	88.9	26.7	203	5.5	7.6	11.1	15.2	2.9	3,9	5.6	7.8
3 X1	88.9	33.4	203	5.5	7.6	11.1	15.2	3.4	4.5	6.4	9.1
3 X1-1/4	88.9	42.2	203	5.5	7.6	11.1	15.2	3.6	4.9	6.4	9.7
3 X1-1/2	88.9	48.3	203	5.5	7.6	11.1	15.2	3.7	5.1	7.1	10.2
3 X2	88.9	60.3	203	5.5	7.6	11.1	15.2	3.9	5.5	8.7	11.1
3 X2-1/2	88.9	73.0	203	5.5	7.6	11.1	15.2	5.2	7.0	9.5	14.0
3-1/2 X1/8	101.6	10.3	203	5.7	8.1			1.7	2.4		
3-1/2 X1/4	101.6	13.7	203	5.7	8.1			2.2	3.0		
3-1/2 X3/8	101.6	17.1	203	5.7	8.1			2.3	3.2		
3-1/2 X1/2	101.6	21.3	203	5.7	8.1			2.8	3.7	4.8	7.5
3-1/3 X3/4	101.6	26.7	203	5.7	8.1			2.9	3.9	5.6	7.8
3-1/2 X1	101.6	33.4	203	5.7	8.1			3.4	4.5	6.4	9.1
3-1/2 X1-1/4	101.6	42.2	203	5.7	8.1			3.6	4,9	6.4	9.7
3-1/2 X1-1/2	101.6	48.3	203	5.7	8.1			3.7	5,1	7.1	10.2
3-1/2 X2	101.6	60.3	203	5.7	8.1			3.9	5.5	8.7	11.1
3-1/2 X2-1/2	101.6	73.0	203	5.7	8.1			5.2	7.0	9.5	14.0
3-1/2 X3	101.6	88.9	203	5.7	8.1			5.5	7.6	11.1	15.2
4 X1/4	114.3	13.7	229	6.0	8.6	13.5	17.1	2.2	3.0		
4 X3/8	114.3	17.1	229	6.0	8.6	13.5	17.1	2.3	3.2		
4 X1/2	114.3	21.3	229	6.0	8.6	13.5	17.1	2.8	3.7	4.8	7.5
4 X3/4	114.3	26.7	229	6.0	8.6	13.5	17.1	2.9	3.9	5.6	7.8
4 X1	114.3	33.4	229	6.0	8.6	13.5	17.1	3.4	4.5	6.4	9.1
4 X1-1/4	114.3	42.2	229	6.0	8.6	13.5	17.1	3.6	4.9	6.4	9.7
4 X1-1/2	114.3	48.3	229	6.0	8.6	13.5	17.1	3.7	5.1	7.1	10.2
4 X2	114.3	60.3	229	6.0	8.6	13.5	17.1	3.9	5.5	8.7	11.1
4 X2-1/2	114.3	73.0	229	6.0	8.6	13.5	17.1	5.2	7.0	9.5	14.0
4 X3	114.3	88.9	229	6.0	8.6	13.5	17.1	5.5	7.6	11.1	15.2
4 X3-1/2	114.3	101.6	229	6.0	8.6	13.5	17.1	5.7	8.1		

(1) Wall Thickness (T1, T2) in accordance with ASME B36.10M.

(2) Abbreviations

PBE: PLAIN BOTH ENDS BBE: BEVEL BOTH ENDS TBE: THREAD BOTH ENDS

PSE: PLAIN SMALL END BSE: BEVEL SMALL END TSE: THREAD SMALL END

PLE: PLAIN LARGE END BLE: BEVEL LARGE END TLE: THREAD LARGE END

DIMENSIONAL TOLERANCES OF SWAGE NIPPLES

MSS SP-95-2006

Unit : mm

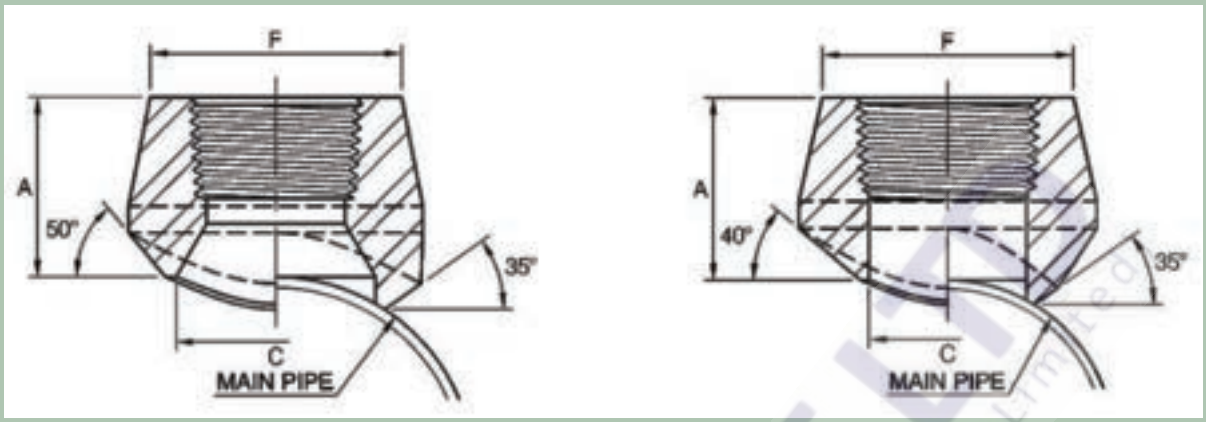
Nominal Pipe Size (Inch)	Overall Length	Outside Diameter at End		Fitting Wall Thickness (see Note 1)
		Square Cut Ends	Other End Connections	
1/8 - 3/8	±1.5	+0.4 -0.8	±0.8	Not less than 87.5% of Nominal Wall Thickness
1/2-1-1/2	±1.5	+0.4 -0.8	+1.5 -0.8	
2 -2-1/2	±3.0	±0.8	+1.5 -0.8	
3 -4	±3.0	±0.8	±1.5	

Note 1 : Prior to threading or grooving

OUTLET (THREADED END 90° BRANCH)

MSS SP-97-2012

THREADOLETS - REDUCING SIZE



REDUCING WAY

STRAIGHT WAY

Dimensions in Millimeters.

Reducing Way			
OutLet Pipe (in)	A	C	F
3000Lb			
1/8	19.0	13.7	17.3
1/4	19.0	13.7	22.0
3/8	20.6	17.1	25.9
1/2	25.4	21.3	31.4
3/4	26.9	26.7	37.1
1	33.3	33.4	45.5
1-1/4	33.3	42.2	57.0
1-1/2	35.0	48.3	64.0
2	38.1	60.3	76.0
2-1/2	46.0	73.0	92.0
3	50.8	88.9	109.2
4	57.2	114.3	140.0
6000Lb			
1/2	31.8	16,6	33.9
3/4	36.6	21.2	41.2
1	39.6	27.0	49.9
1-1/4	41.1	35.8	58.6
1-1/2	42.3	41.2	66.7
2	52.3	51.6	83.2

(1) Thread in accordance with ASME B1.20.1
(2) 3000LB outlet size 4 and less lit a number of run pipe sizes and the fitting are marked accordingly.
See page 72 for conventional run pipe size combination.

Dimensions in Millimeters.

Straight Way			
OutLet Pipe (in)	A	C	F
3000Lb			
1/4	19	16	4.8
3/8	25	19	4.8
1/2	25	22	4.8
3/4	32	28	6.4
1	37	35	6.4
1-1/4	41	44	9.7
1-1/2	44	57	9.7
2	44	64	11.2
2-1/2	48	76	12.7
3	60	92	15.7
4	65	108	19.0

(1) Thread in accordance with ASME B1.20.1

DIMENSIONAL TOLERANCES

MSS SP-97-2012

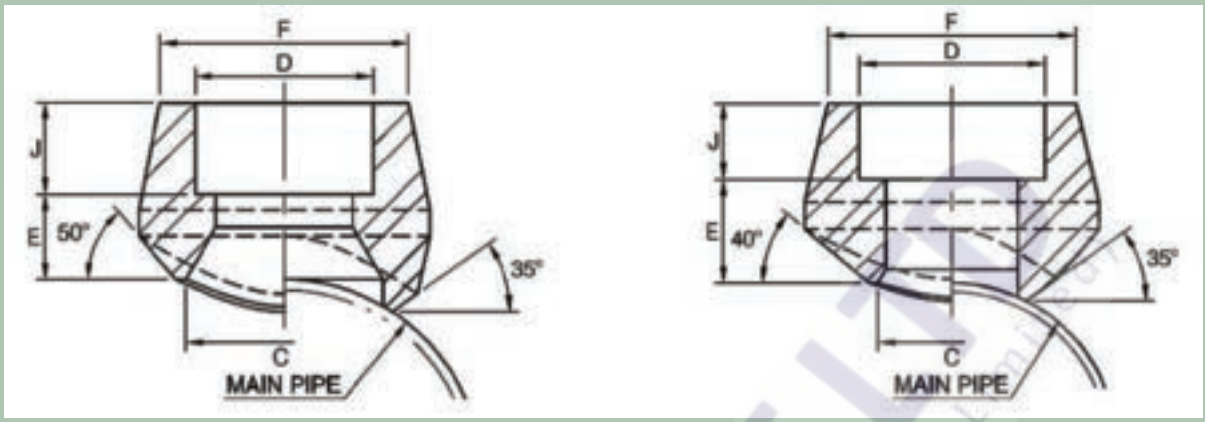
Unit : mm

Item	1/8″ - 3/4″	1″ - 4″
Face of fitting to crotch (A)	±0.8	±1.6

OUTLET (SOCKET WELDING END 90^{O} BRANCH)

MSS SP-97-2012

SOCKOLETS - REDUCING SIZE



REDUCING WAY

STRAIGHT WAY

Dimensions in Millimeters.

Reducing Way					
OutLet Pipe (in)	C	D	F	J (Min)	J (Max)
3000Lb					
1/8	13.7	10.8	22.0	9.5	11.0
1/4	13.7	14.2	22.0	9.5	11.0
3/8	19.1	17.6	25.9	9.5	13.0
1/2	21.3	21.8	31.4	9.5	16.0
3/4	26.7	27.2	37.1	12.5	16.0
1	33.4	33.9	45.5	12.5	23.0
1-1/4	42.2	42.7	57.0	12.5	23.0
1-1/2	48.3	48.8	64.0	12.5	24.0
2	60.3	61.2	76.0	15.0	24.0
2-1/2	73.2	73.9	92.0	16.0	26.0
3	88.9	89.8	109.2	16.0	31.0
4	114.3	115.2	140.0	19.0	31.0
6000Lb					
1/2	16.6	21.8	38.0	9.5	24.0
3/4	21 2	27 2	44.0	12.5	26.0
1	27.0	33.9	57.0	12.5	29.0
1-1/4	35.8	42.7	64.0	12.5	31.0
1-1/2	41.2	48.8	76.0	12.5	32.0
2	51.6	61.2	92.0	16.0	37.0

(1) Socket in accordance with ASME B16.11

(2) 3000LB Outlet size 4 and less fit a number of run pipe sizes and the fitting are marked accordingly.
See page 72 for conventional run pipe size combination.

Dimensions in Millimeters.

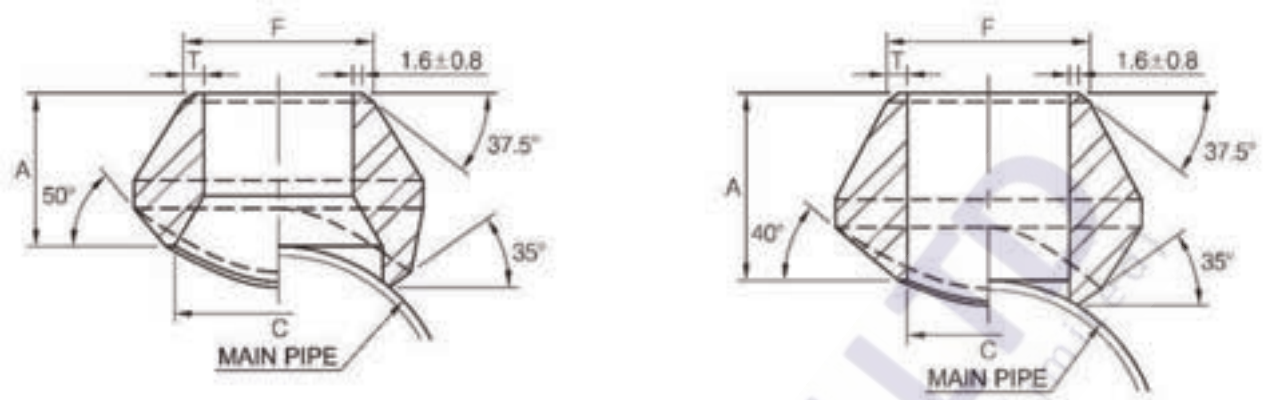
Straight Way					
OutLet Pipe (in)	C	D	F	J (Min)	J (Max)
3000Lb					
1/4	11.5	14.2	22.0	9.5	11.0
3/8	14.5	17.6	25.9	9.5	13.0
1/2	16.5	21.8	31.4	9.5	16.0
3/4	21.5	27.2	37.1	12.5	16.0
1	27.2	33.9	45.5	12.5	23.0
1-1/4	36.0	42.7	57.0	12.5	23.0
1-1/2	42.0	48.8	64.0	12.5	24.0
2	53.0	61.2	76.0	16.0	24.0
2-1/2	65.0	73.9	92.0	16.0	26.0
3	80.0	89.8	109.2	16.0	31.0
4	104.0	115.2	140.0	19.0	31.0

(1) Socket in accordance with ASME B16.11 .

OUTLET (BUTT WELDING END 90° BRANCH)

MSS SP-97-2012

WELDOLETS - REDUCING SIZE



REDUCING WAY

STRAIGHT WAY

STANDARD WEIGHT

Dimensions in Millimeters.

Reducing Way				
OutLet Pipe (in)	A	C	F	T
1/8	15.7	13.7	10.3	1.73
1/4	15.7	13.7	13.7	2.24
3/8	19.1	17.1	17.1	2.31
1/2	19.1	21.3	21.3	2.77
3/4	22.4	26.7	26.7	2.87
1	26.9	33.4	33.4	3.38
1-1/4	31.8	42.2	42.2	3.56
1-1/2	33.3	48.3	48.3	3.68
2	38.1	60.3	60.3	3.91
2-1/2	41.1	73.0	73.0	5.16
3	44.4	88.9	88.9	5.49
3-1/2	47.8	101.6	101.6	5.74
4	50.8	114.3	114.3	6.02
5	57.2	141.3	141.3	6.55
6	60.4	168.3	168.3	7.11
8	69.8	219.3	219.3	8.11
10	77.7	273.1	273.1	9.27
12	85.9	323.9	323.9	9.53
14	88.9	355.6	355.6	9.53
16	93.7	406.4	406.4	9.53
18	96.8	457.2	457.2	9.53
20	101.6	508.0	508.0	9.53
24	115.8	609.6	609.6	9.53

Dimensions in Millimeters.

Straight Way				
OutLet Pipe (in)	A	C	F	T
1/4	15.7	11.5	13.7	2.24
3/8	19.1	14.5	17.1	2.31
1/2	19.1	16.5	21.3	2.77
3/4	22.4	21.5	26.7	2.87
1	26.9	27.2	33.4	3.38
1-1/4	31.8	36.0	42.2	3.56
1-1/2	33.3	42.0	48.3	3.68
2	38.1	53.0	60.3	3.91
2-1/2	41.1	65.0	73.0	5.16
3	44.4	80.0	88.9	5.49
4	50.8	104.0	114.3	6.02

(1) Weld Bevel in Accordance with ASME B16.25.

(1) Weld Bevel in accordance with ASME B16.25
(2) Outlet size 4 and less fit a number of run pipe sizes and the fittings are marked accordingly.
See page 72 far conventional run pipe size combination.
(3) Outlet sizes 5 and up order to specific size combination.

DIMENSIONAL TOLERANCES

MSS SP-97-2012

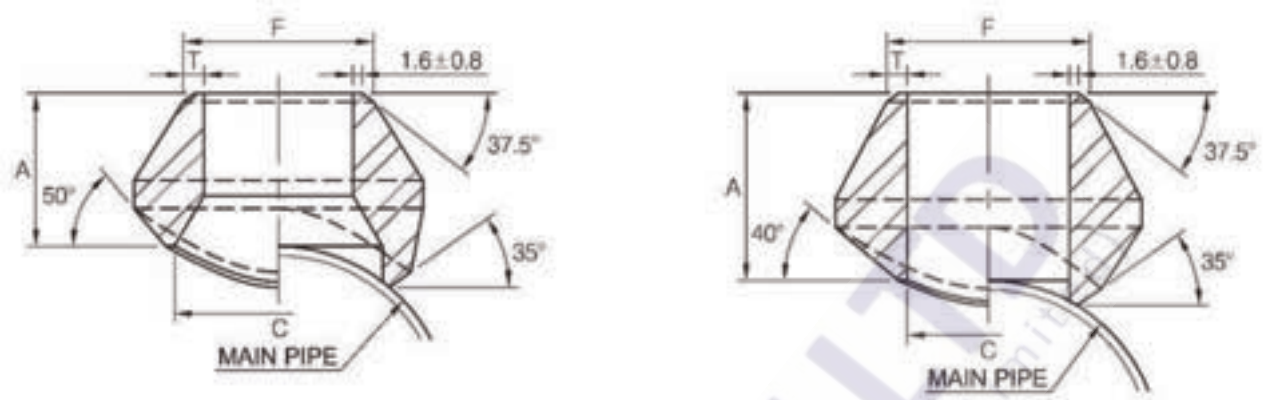
Unit : mm

Item	1/8″ - 3/4″	1″ - 4″	5″ - 12″	14″ - 24″
Face of fitting to crotch (A)	±0.8	±1.6	±3.2	±4.8

OUTLET (BUTT WELDING END 90° BRANCH)

MSS SP-97-2012

WELDOLETS - REDUCING SIZE



REDUCING WAY

STRAIGHT WAY

EXTRA STRONG

Dimensions in Millimeters.

Reducing Way				
OutLet Pipe (in)	A	C	F	T
1/8	15.7	13.7	10.3	2.41
1/4	15.7	13.7	13.7	3.02
3/8	19.1	17.1	17.1	3.20
1/2	19.1	21.3	21.3	3.73
3/4	22.4	26.7	26.7	3.91
1	26.9	33.4	33.4	4.55
1-1/4	31.8	42.2	42.2	4.85
1-1/2	33.3	48.3	48.3	5.08
2	38.1	60.3	60.3	5.54
2-1/2	41.1	73.0	73.0	7.01
3	44.4	88.9	88.9	7.62
3-1/2	47.8	101.6	101.6	8.56
4	50.8	114,3	114.3	8.56
5	57.2	141.3	141.3	9.53
6	77.7	168.3	168.3	10.97
8	98.6	219.3	219.3	12.70
10	93.7	273.1	273.1	12.70
12	103.1	323.9	323.9	12.70
14	100.1	355.6	355.6	12.70
16	106.2	406.4	406.4	12.70
18	111.2	457.2	457.2	12.70
20	119.1	508.0	508.0	12.70
24	139.7	609.6	609.6	12.70

Dimensions in Millimeters.

Straight Way				
OutLet Pipe (in)	A	C	F	T
1/4	15.7	11.5	13.7	3.02
3/8	19.1	14.5	17.1	3.20
1/2	19.1	76.5	21.3	3.73
3/4	22.4	21.5	26.7	3.91
1	26.9	27.2	33.4	4.55
1-1/4	31.8	36.0	42.2	4.85
1-1/2	33.3	42.0	48.3	5.08
2	38.1	53.0	60.3	5,54
2-1/2	41.1	65.0	73.0	7.01
3	44.4	80.0	88.9	7.62
4	50.8	104.0	114.3	8.56

(1) Weld Bevel in Accordance with ASME B16.25.

(1) Weld Bevel in accordance with ASME B16.25
(2) Outlet size 4 and less fit a number of run pipe sizes and the fittings are marked accordingly.
See page 72 far conventional run pipe size combination.
(3) Outlet sizes 5 and up order to specific size combination.

DIMENSIONAL TOLERANCES

MSS SP-97-2012

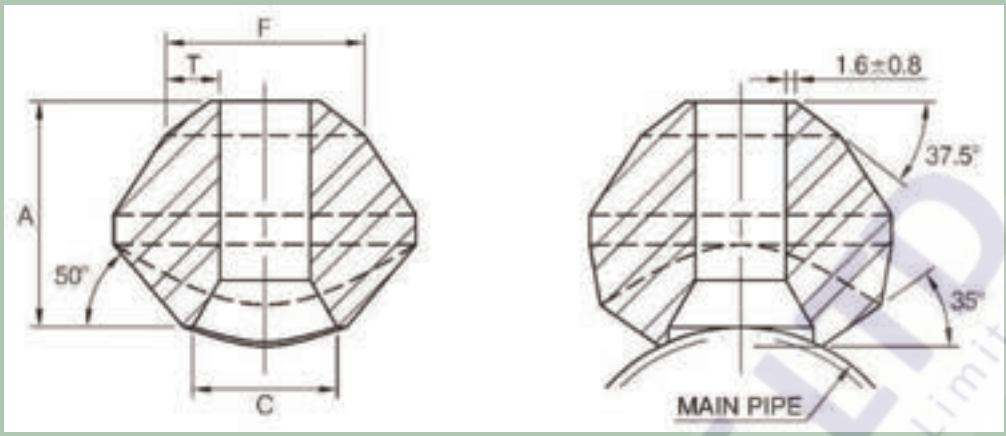
Unit : mm

Item	1/8″ - 3/4″	1″ - 4″	5″ - 12″	14″ - 24″
Face of fitting to crotch (A)	±0.8	±1.6	±3.2	±4.8

OUTLET (BUTT WELDING END 90° BRANCH)

MSS SP-97-2012

WELDOLETS - REDUCING SIZE



SCHEDULE 160 & DOUBLE EXTRA STRONG

Dimensions in Millimeters.

Reducing Way					
OutLet Pipe (in)	A	C	F	T	
				Sch 160	Sch XXS
1/2	28.4	13.8	21.3	4.78	7.47
3/4	31.8	18.9	26.7	5.56	7.82
1	38.1	24.3	33.4	6.35	9.09
1-1/4	44.4	32.5	42.2	6.35	9.70
1-1/2	50.8	38.1	48.3	7.14	10.15
2	55.4	49.2	60.3	8.74	11.07
2-1/2	62.0	59.0	73.0	9.53	14.02
3	73.2	73.7	88.9	11.13	15.24
4	84.1	97.2	114.3	13.49	17.12
5	93.7	122.2	141.3	15.88	19.05
6	104.6	146.4	168.3	18.26	21.95

(1) Weld bevel in accordance with ASME B16.25
(2) Outlet size by order to specific size combination.

CONVENTIONAL RUN PIPE SIZE COMBINATION

3000# THREAD END/SOCKET-WELD END/SCH STD & XS BUTT WELDING END

		OUTLET SIZE										
		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
RUN SIZE (MAIN PIPE)	Reducing Way	3/8"-3/4" 1"-36"	1/2" 3/4"-1-1/4" 1-1/2"-36"	3/4" 1" 1-1/4" 1-1/2"--3" 3-1/2"-36"	1" 1-1/4" 1-1/2" 2"-3" 3-1/2"-6" 8"-36"	1-1/4" 1-1/2" 2" 2-1/2" 3" 3-1/2"-4" 5"-10" 12"-36"	1-1/2" 2" 2-1/2" 3" 3-1/2"-5" 6"-8" 10"-36	2" 2-1/2" 3" 3-1/2" 4"-5" 6"-10" 12"-36"	2-1/2" 3" 3-1/2" 3" 5"-6" 8"--10" 12"-18" 20"-36"	3" 3-1/2" 4" 3" 6" 8" 10"-14" 16"-36"	3-1/2" 4" 5" 3" 8" 10" 12"-16" 18"-36"	5" 6" 8" 10" 12"-14" 16"-18" 20"-24" 26"-36"
	Straight Way	3/8"-36"	1/2"-36"	3/4"-36"	1"- 6"	1-1/4" - 1-1/2"	1-1/2" 2"-3" 3-1/2"-36"	2" 2-1/2"-4" 5"-36"	2-1/2" 3"-3-1/2" 4"-6" 8"-36"	3" 3-1/2"-4" 5"-8" 10"-36"	3-1/2" 4" 5" 6" 8"-12" 14"-36"	5" 6" 8" 10" 12"-16" 18"-36"

WEIGHT LIST

Unit :KG

SIZE NPS	90° Elbow				45° Elbow				Equal Tee				Reducing Tee		Boss
	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	3M
1/8"	0.09	0.10	0.10	0.17	0.08	0.09	0.09	0.11	0.13	0.13	0.14	0.20	-	-	-
1/4"	0.08	0.14	0.15	0.33	0.07	0.12	0.14	0.27	0.09	0.20	0.20	0.45	0.10	0.14	0.09
3/8"	0.12	0.29	0.29	0.45	0.11	0.24	0.26	0.39	0.15	0.38	0.43	0.63	0.17	0.42	0.14
1/2"	0.22	0.43	0.40	0.80	0.20	0.34	0.36	0.63	0.29	0.56	0.56	0.98	0.36	0.62	0.24
3/4"	0.33	0.69	0.73	1.31	0.28	0.56	0.57	1.07	0.42	0.92	0.94	1.65	0.47	0.93	0.28
1”	0.53	1.14	1.17	1.61	0.42	0.94	0.92	1.27	0.65	1.49	1.49	2.17	0.72	1.89	0.41
1-1/4"	0.84	1.42	1.48	2.93	0.69	1.03	1.11	2.24	1.04	1.76	1.93	3.74	1.10	2.17	0.44
1-1/2"	1.08	2.63	2.79	3.79	0.80	2.05	2.01	2.54	1.35	3.27	3.37	4.71	1.50	3.53	0.63
2”	1.68	2.92	3.28	7.31	1.35	2.23	2.09	4.37	2.04	3.53	3.95	7.88	2.30	4.03	1.09
2-1/2”	3.20	5.99	-	9.88	2.53	3.71	-	7.01	3.98	6.99	-	13.11	4.33	6.93	-
3”	5.38	6.88	-	17.73	5.10	5.97	-	14.16	5.90	10.19	-	21.70	6.56	10.59	-
4”	10.95	14.85	-	15.76	9.41	8.96	-	11.36	13.92	19.13	-	18.53	15.78	19.16	-

SIZE NPS	Street Elbow	Cross			Full Coupling				Half Coupling			
	3M NPT	3M SW	3M NPT	6M SW	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	6M SW	6M NPT
1/8"	0.13	0.16	0.17	0.17	0.04	0.05	0.05	0.08	0.04	0.02	0.06	0.07
1/4"	0.11	0.13	0.26	0.26	0.05	0.04	0.07	0.13	0.05	0.02	0.09	0.06
3/8"	0.22	0.20	0.44	0.45	0.07	0.06	0.11	0.20	0.07	0.03	0.12	0.09
1/2"	0.31	0.35	0.72	0.67	0.13	0.13	0.20	0.34	0.13	0.06	0.21	0.16
3/4"	0.53	0.47	1.06	1.07	0.17	0.19	0.27	0.50	0.21	0.10	0.31	0.24
1”	1.02	0.73	1.79	1.75	0.29	0.45	0.44	0.87	0.30	0.23	0.51	0.45
1-1/4"	1.13	1.12	2.13	2.26	0.45	0.81	0.60	1.09	0.34	0.34	0.75	0.55
1-1/2"	2.01	1.58	3.93	3.96	0.59	1.07	1.11	1.94	0.66	0.54	1.25	0.96
2”	2.91	2.25	4.27	4.42	0.86	1.40	1.62	2.87	1.09	0.70	1.92	1.70
2-1/2”	-	4.37	8.51	-	1.40	2.29	-	4.20	1.63	1.13	-	2.10
3”	-	6.69	12.45	-	1.78	3.38	-	6.10	2.10	1.68	-	3.05
4”	-	14.58	21.93	-	2.85	6.28	-	10.04	3.71	3.11	-	5.02

SIZE NPS	Reducing Coupling				Round Cap				Union		Hex Nipples	Reducing Nipples	Square Head Plug
	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	6M SW	6M NPT	3M SW	3M NPT	3M NPT	3M NPT	
1/8"	0.04	0.05	-	0.08	0.03	0.02	0.05	0.06	0.28	0.28	0.03	-	0.01
1/4"	0.05	0.05	-	0.06	0.04	0.04	0.08	0.06	0.28	0.28	0.04	-	0.01
3/8"	0.07	0.06	-	0.18	0.07	0.05	0.10	0.09	0.25	0.24	0.05	0.05	0.03
1/2"	0.13	0.13	0.24	0.31	0.10	0.11	0.16	0.26	0.35	0.34	0.09	0.09	0.05
3/4"	0.19	0.19	0.33	0.41	0.16	0.18	0.23	0.40	0.49	0.48	0.15	0.15	0.09
1”	0.27	0.39	0.65	0.85	0.25	0.37	0.36	0.71	0.81	0.77	0.27	0.27	0.16
1-1/4"	0.49	0.68	0.75	1.05	0.45	0.62	0.64	0.90	1.10	1.03	0.45	0.45	0.27
1-1/2"	0.59	0.99	1.20	1.81	0.59	0.72	0.94	1.28	1.61	1.63	0.62	0.62	0.38
2”	0.97	1.37	2.12	3.40	0.96	1.09	1.41	2.23	2.16	2.43	1.03	1.03	0.63
2-1/2”	1.42	2.07	-	4.20	1.43	2.22	-	3,68	3.50	3.63	1.51	1.51	0.96
3”	1.88	3.08	-	6.10	2.74	3.50	-	5.12	5.15	5.27	2.22	2.22	1.53
4”	3.31	5.44	-	10.04	4.24	4.84	-	8.60	11.59	12.00	4.00	-	3.83

SIZE NPS	Hex Head Plug	Round Head Plug	Bushing	Reducing inserts											
				SIZE	3M	6M	SIZE	3M	6M	SIZE	3M	6M	SIZE	3M	6M
1/8"	0.01	0.02	-	3/8 X 1/4	0.05	0.06	1-1/4 X 1/2	0.29	0.34	2 X 112	0.79	0.87	4 X 2-1/2	3.23	-
1/4"	0.03	0.05	0.01	1/2 X 318	0.07	0.09	1-1/4 X 3/8	0.32	0.36	2-1/2 X 2	1.02	1.43	4 X 2	3.74	-
3/8"	0.05	0.07	0.01	1/2 X 1/4	0.07	0.08	1-1/4 X 1/4	0.34	0.37	2-1/2 X 1-1/2	1.15	1.26	4 X 1-1/2	4.20	-
1/2"	0.07	0.12	0.03	3/4 X 1/2	0.11	0.15	1-1/2 X 1-1/4	0.34	0.53	2-1/2 X 1-1/4	1.32	1.38	4 X 1-1/4	4.39	-
3/4"	0.14	0.20	0.05	3/4 X 3/8	0.08	0.12	1-1/2 X 1	0.30	0.47	2-1/2 X 1	1.51	1.56			
1”	0.22	0.34	0.09	3/4 X 1/4	0.10	0.13	1-1/2 X 3/4	0.37	0.48	2-1/2 X 3/4	1.62	1.65			
1-1/4"	0.44	0.55	0.25	1 X 3/4	0.17	0.25	1-1/2 X 1/2	0.42	0.52	3 X 2-1/2	1.38	2.41			
1-1/2"	0.59	0.79	0.34	1 x 1/2	0.13	0.22	1-1/2 X 3/8	0.45	0.55	3 X 2	1.40	1.76			
2”	1.03	1.47	0.45	1 X 3/8	0.16	0.21	2 X 1-1/2	0.56	0.87	3 X 1-1/2	1.78	2.08			
2-1/2”	1.80	2.34	0.60	1 X 1/4	0.19	0.22	2 X 1-1/4	0.51	0.61	3 X 1-1/4	1.93	2.21			
3”	2.60	3.26	1.16	1-1/4 X 1	0.26	0.40	2 X 1	0.65	0.75	3X1	2.11	2.39			
4”	5.20	6.24	3.20	1-1/4 X 3/4	0.25	0.30	2 X 3/4	0.73	0.83	4X3	2.29	-			

** Above weight list are based on theoretical calculation.*

WEIGHT LIST

CON SWAGE NIPPLE UNIT WEIGHT

Unit :KG

SIZE	SCH 40S / STD	SCH 80S / XS	SCH 160
1/4″	-	-	-
3/8″	-	-	-
1/2″	-	0.15	0.23
3/4″	-	0.23	0.34
1″	-	0.30	0.45
1-1/4″	-	0.45	0.68
1-1/2″	-	0.53	0.91
2″	0.91	1.06	1.93
2-1/2″	1.36	1.59	3.64
3″	2.05	2.73	5.00
3-1/2″	2.50	3.41	6.14
4″	3.41	4.55	8.18
5″	5.23	7.73	15.00
6″	7.73	11.36	20.91
8″	13.18	20.00	35.45

** Above weight list are based on theoretical calculation.*

WELDOLET, THREADOLET, SOCKOLET UNIT WEIGHT

Unit :KG

SIZE	SCH 40S / STD	SCH 160
1/8″	0.16	-
1/4″	0.16	-
3/8″	0.16	0.17
1/2″	0.13	0.20
3/4″	0.20	0.51
1″	0.33	0.56
1-1/4″	0.42	0.71
1-1/2″	0.64	1.36
2″	1.06	2.31
2-1/2″	1.36	1.54
3″	1.98	2.87
3-1/2″	2.16	-
4″	3.23	4.77
5″	5.45	6.48
6″	7.14	12.73
8″	11.82	20.45
10″	16.59	38.64
12″	27.72	-
14″	31.82	-
16″	46.36	-
18″	59.09	-
20″	71.82	-
24″	131.82	-
26″	159.09	-

** Above weight list are based on theoretical calculation.*

FLANGES

FLANGES

SORF / SOFF

PLRF / PLFF

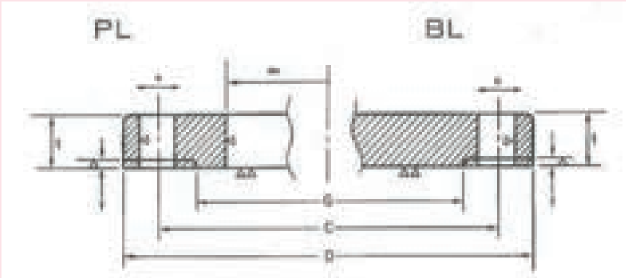
WNRF / WNFF

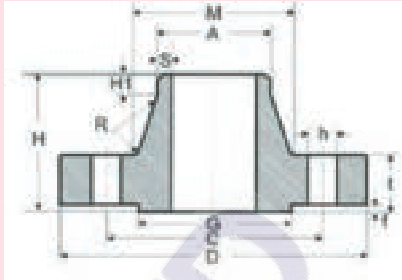
SWRF / SWFF

BLRF / BLFF

THRF / THFF

SOLJ / PLLJ





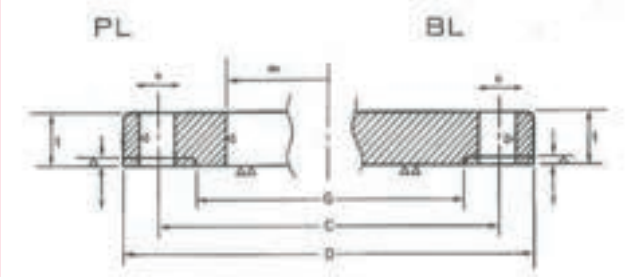
DIN STANDARD - PN10 - FLANGES

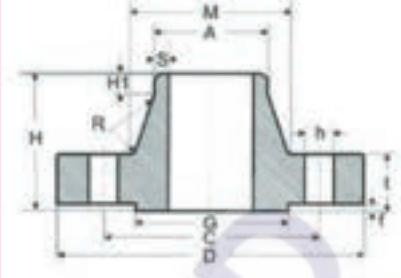
Nominal Pipe Size	Dia. of Hub: @Bevel (DIN pipe) / @Bevel (ISO pipe)	Dia. of Hub: @Base (DIN pipe) / @Base (ISO pipe)	Outside Dia. of Flange	Inside Dia. of Flange	Dia. of Bolt Circle	Thickness of Flange: WN	Thickness of Flange: BL	Thickness of Flange: PL	Thickness of Neck	Radius of Fillet	Length of Neck	Length thru Hub	Dia. of Raised Face	Height of Raised Face	No.of Bolt Hole	Dia. of Bolt Hole	Nom. Bolt Size
	A	M	D	do	C	t	t	t	S	R	H1	H	G	f		h	
10	14.0 17.2	25 28	90	14.5 17.7	60	14	14	14	1.8	4	6	35	40	2	4	14	M12
15	20.0 21.3	30 32	95	21.0 22.0	65	14	14	14	2.0	4	6	35	45	2	4	14	M12
20	25.0 26.9	38 40	105	26.0 27.6	75	16	16	16	2.3	4	6	38	58	2	4	14	M12
25	30.0 33.7	42 45	115	31.0 34.4	85	16	16	16	2.6	4	6	38	68	2	4	14	M12
32	38.0 42.4	52 56	140	39.0 43.1	100	16	16	16	2.6	6	6	40	78	2	4	18	M16
40	44.5 48.3	60 64	150	45.5 49.0	110	16	16	16	2.6	6	7	42	88	3	4	18	M16
50	57.0 60.3	72 75	165	58.1 61.1	125	18	18	18	2.9	6	8	45	102	3	4	18	M16
65	- 76.1	- 90	185	- 77.1	145	18	18	18	2.9	6	10	45	122	3	4	18	M16
80	- 88.9	- 105	200	- 90.3	160	20	20	20	3.2	8	10	50	138	3	8	18	M16
100	108.0 114.3	125 131	220	109.6 115.9	180	20	20	20	3.6	8	12	52	158	3	8	18	M16
125	133.0 139.7	150 156	250	134.8 141.6	210	22	22	22	4.0	8	12	55	188	3	8	18	M16
150	159.0 168.3	175 184	285	161.1 170.5	240	22	22	22	4.5	10	12	55	212	3	8	22	M20
200	- 219.1	- 235	340	- 221.8	295	24	24	24	5.9	10	16	62	268	3	8	22	M20
250	267.0 273.0	285 292	395	270.2 276.2	350	26	26	26	6.3	12	16	68	320	3	12	22	M20
300	- 323.9	- 344	445	- 327.6	400	26	26	26	7.1	12	16	68	370	4	12	22	M20
350	368.0 355.6	385 385	505	372.2 359.7	460	26	26	28	7.1	12	16	68	430	4	16	22	M20
400	419.0 406.4	440 440	565	423.7 411.0	515	26	26	32	7.1	12	16	72	482	4	16	26	M24
500	- 508.0	- 542	670	- 513.6	620	28	28	38	7.1	12	16	75	585	4	20	26	M24
600	- 609.6	- 642	780	- 616.6	725	28	-	-	7.1	12	18	80	685	5	20	30	M27
700	- 711.2	- 745	895	- 718.6	840	30	-	-	8.0	12	18	80	800	5	24	30	M27
800	- 812.8	- 850	1015	- 821.5	950	32	-	-	8.0	12	18	90	905	5	24	33	M30
900	- 914.4	- 950	1115	- 923.5	1050	34	-	-	10.0	12	20	95	1005	5	28	33	M30
1000	- 1016.0	- 1052	1230	- 1026.7	1160	34	-	-	10.0	16	20	95	1110	5	28	36	M33

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my)

DIN STANDARD FLANGE

PN16 FLANGE DIMENSIONS





DIN STANDARD - PN16 - FLANGES

Nominal Pipe Size	Dia. of Hub		Outside Dia. of Flange	Inside Dia. of Flange	Dia. of Bolt Circle	Thickness of Flange			Thickness of Neck	Radius of Fillet	Length of Neck	Length thru Hub	Dia. of Raised Face	Height of Raised Face	No.of Bolt Hole	Dia. of Bolt Hole	Nom. Bolt Size
	@Bevel (DIN pipe)	@Base (DIN pipe)				WN	BL	PL									
	@Bevel (ISO pipe)	@Base (ISO pipe)															
	A	M	D	do	C	t	t	t	S	R	H1	H	G	f		h	
10	14.0 17.2	25 28	90	14.5 17.7	60	14	14	14	1.8	4	6	35	40	2	4	14	M12
15	20.0 21.3	30 32	95	21.0 22.0	65	14	14	14	2.0	4	6	35	45	2	4	14	M12
20	25.0 26.9	38 40	105	26.0 27.6	75	16	16	16	2.3	4	6	38	58	2	4	14	M12
25	30.0 33.7	42 45	115	31.0 34.4	85	16	16	16	2.6	4	6	38	68	2	4	14	M12
32	38.0 42.4	52 56	140	39.0 43.1	100	16	16	16	2.6	6	6	40	78	2	4	18	M16
40	44.5 48.3	60 64	150	45.5 49.0	110	16	16	16	2.6	6	7	42	88	3	4	18	M16
50	57.0 60.3	72 75	165	58.1 61.1	125	18	18	18	2.9	6	8	45	102	3	4	18	M16
65	- 76.1	- 90	185	- 77.1	145	18	18	18	2.9	6	10	45	122	3	4	18	M16
80	- 88.9	- 105	200	- 90.3	160	20	20	20	3.2	8	10	50	138	3	8	18	M16
100	108.0 114.3	125 131	220	109.6 115.9	180	20	20	20	3.6	8	12	52	158	3	8	18	M16
125	133.0 139.7	150 156	250	134.8 141.6	210	22	22	22	4.0	8	12	55	188	3	8	18	M16
150	159.0 168.3	175 184	285	161.1 170.5	240	22	22	22	4.5	10	12	55	212	3	8	22	M20
200	- 219.1	- 235	340	- 221.8	295	24	24	24	5.9	10	16	62	268	3	12	22	M20
250	267.0 273.0	285 292	405	270.2 276.2	355	26	26	26	6.3	12	16	70	320	3	12	26	M24
300	- 323.9	- 344	460	- 327.6	410	28	28	28	7.1	12	16	78	378	4	12	26	M24
350	368.0 355.6	390 390	520	372.2 359.7	470	30	30	30	8.0	12	16	82	438	4	16	26	M24
400	419.0 406.4	445 445	580	423.7 411.0	525	32	32	32	8.0	12	16	85	490	4	16	30	M27
500	- 508.0	- 548	715	- 513.6	650	34	36	36	8.0	12	16	90	610	4	20	33	M30
600	- 609.6	- 652	840	- 616.6	770	36	-	40	8.8	12	18	95	725	5	20	36	M33
700	- 711.2	- 755	910	- 718.6	840	36	-	-	8.8	12	18	100	795	5	24	36	M33
800	- 812.8	- 855	1025	- 821.5	950	38	-	-	10.0	12	20	105	900	5	24	39	M36
900	- 914.4	- 955	1125	- 923.5	1050	40	-	-	10.0	12	20	110	1000	5	28	39	M36
1000	- 1016.0	- 1058	1255	- 1026.7	1170	42	-	-	10.0	16	22	120	1115	5	28	42	M39

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my)

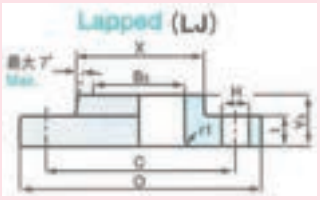
ESTIMATED WEIGHT LIST FOR DIN FLANGES

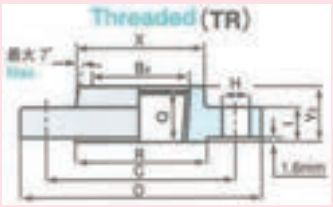
Nominal Bore	DIN CODE / TYPE OF FLANGES							
	DIN 2576 PN10 SOFF / PLFF	DIN 2527 PN10 BLFF	DIN 2527 PN10 BLRF	DIN 2632 PN10 WNRF	DIN 2543 PN16 SOFF / PLFF	DIN 2527 PN16 BLFF	DIN 2527 PN16 BLRF	DIN 2633 PN16 WNRF
10	0.60	0.63	0.56	0.58	0.60	0.63	0.56	0.58
15	0.67	0.72	0.64	0.65	0.67	0.72	0.64	0.65
20	0.94	1.01	0.93	0.95	0.94	1.01	0.93	0.95
25	1.05	1.23	1.13	1.14	1.05	1.23	1.13	1.14
32	1.62	1.80	1.66	1.69	1.62	1.80	1.66	1.69
40	1.80	2.09	1.85	1.86	1.80	2.09	1.85	1.86
50	2.47	2.88	2,59	2.53	2.47	2.88	2,59	2.53
65	3.00	3.66	3.33	3.06	3.00	3.66	3.33	3.06
80	3.39	4.77	4.34	3.70	3.39	4.77	4.34	3.70
100	4.20	5.65	5.26	4.62	4.20	5.65	5.26	4.62
125	5.46	8.42	7.67	6.30	5.46	8.42	7.67	6.30
150	6.57	10.40	9.85	7.75	6.57	10.40	9.85	7.75
200	9.31	16.50	15.65	11.30	9.00	16.10	15.06	11.00
250	11.90	24.00	23.10	14.70	12.90	24.90	23.90	15.60
300	13.80	30.90	29.40	17.60	16.70	35.10	33.60	22.00
350	20.60	40.60	38.00	23.60	24.20	47.80	46.20	31.20
400	27.90	49.40	47.50	26.10	30.70	63.50	61.50	39.30
500	41.10	75.00	72.70	38.10	50.80	102.00	99.50	61.00
600	52.30	85.80	82.17	44.60	68.00	120.67	115.00	75.40
700	67.60	124.00		62.40		226.50		77.00
800	97.00	182.50		84.10		236.00		101.00
900	117.00	260.00		98.50		325.00		122.00
1000	152.00	344.00		115.00		437.50		162.00

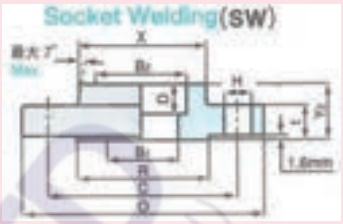
Above weight list are based on theoretical calculations

ANSI STANDARD FLANGE

A182 150# FLANGE DIMENSIONS





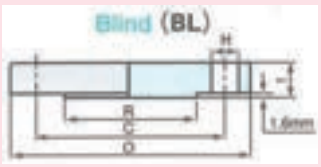


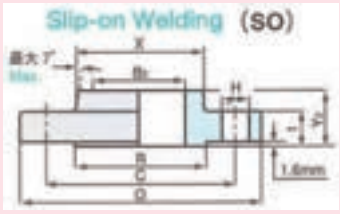
Unit : mm

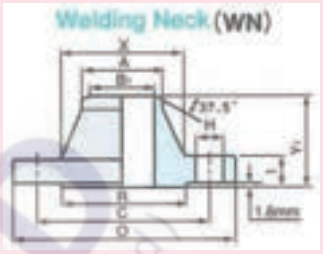
Class 150 LBS														
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges	Radius Of Fillets
			S O S W	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	t	r_1
15	1/2	89	22.4	22.9		17.1	15.8	13.9	11.8	21.3	30.0	35.1	11.2	3
20	3/4	99	27.7	28.2		22.5	20.9	18.8	15.6	26.7	38.1	42.9	12.7	3
25	1	108	34.5	35.1		27.9	26.6	24.3	20.7	33.5	49.3	50.8	14.3	3
32	1 1/4	117	43.2	43.7		36.6	35.1	32.5	29.5	42.2	58.7	63.5	15.9	5
40	1 1/2	127	49.5	50.0		42.7	40.9	38.1	34.0	48.3	65.0	73.2	17.5	6
50	2	152	62.0	62.5		54.9	52.5	49.2	42.8	60.3	77.8	91.9	19.1	8
65	2 1/2	178	74.7	75.4		67.2	62.7	59.2	53.9	73.0	90.4	104.6	22.3	8
80	3	190	90.7	91.4		82.9	77.9	73.7	66.7	88.9	108.0	127.0	23.9	10
90	3 1/2	216	103.4	104.1		95.6	90.1	85.5	-	101.6	122.0	139.7	23.9	10
100	4	229	116.1	116.9	To Be Specify By End User	108.3	102.3	97.2	87.3	114.3	134.9	157.2	23.9	11
125	5	254	143.8	144.5		134.4	128.2	122.3	109.5	141.2	164.0	185.7	23.9	11
150	6	279	170.7	171.4		161.6	154.1	146.3	131.8	168.4	192.1	215.9	25.4	13
200	8	343	221.5	222.2		211.6	202.7	193.7	173.1	219.2	246.1	269.7	28.6	13
250	10	406	276.4	277.4		264.6	254.4	247.7	215.9	273.1	304.8	323.9	30.2	13
300	12	483	327.2	328.2		314.6	304.8	298.5	257.2	323.9	365.1	381.0	31.8	13
350	14	535	359.2	360.2		346.0	336.5	330.2	284.2	355.6	400.1	412.8	35.0	13
400	16	595	410.5	411.2		396.8	387.3	381.0	325.5	406.4	457.2	469.9	36.6	13
450	18	635	461.8	462.3		447.6	438.1	431.8	366.7	457.2	504.8	533.4	39.7	13
500	20	700	513.1	514.4		497.0	488.9	482.6	408.0	508.0	558.8	584.2	42.9	13
600	24	815	616.0	616.0		596.9	590.5	584.2	490.6	609.6	663.0	692.2	47.7	13

(*) Dimensions for reference only

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my







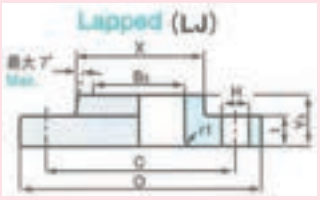
Unit : mm

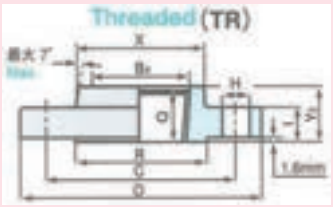
Class 150 LBS															
Nominal Pipe Size		Length Thru Hub			Depth Of Socket	Thread Length (Taper)	Dia. Of Bolt Circle	Dia. Of Bolt Hole	No. Of Bolt Hole	Approx. Weight (kg)					
		S O S W T R	L J	W N						W N	L J	S O	S W	B L	T R
A	B	Y_2	Y_3	Y_1	D	Q	C	H							
15	1/2	15.9	15.9	47.8	9.6	16.0	60.5	16	4	0.57	0.46	0.41	0.42	0.43	0.42
20	3/4	15.9	15.9	52.4	11.1	16.0	69.8	16	4	0.75	0.65	0.59	0.60	0.64	0.60
25	1	17.5	17.5	55.6	12.7	18.0	79.2	16	4	1.02	0.86	0.78	0.81	0.87	0.82
32	1 1/4	20.6	20.6	57.1	14.2	21.0	89.0	16	4	1.33	1.10	1.03	1.06	1.16	1.07
40	1 1/2	22.2	22.2	61.9	15.9	22.0	98.5	16	4	1.76	1.43	1.36	1.38	1.58	1.41
50	2	25.4	25.4	63.5	17.5	25.0	120.5	19	4	2.61	2.20	2.09	2.14	2.46	2.18
65	2 1/2	28.4	28.4	69.8	19.0	28.0	139.5	19	4	4.06	3.40	3.25	3.35	4.00	3.38
80	3	30.2	30.2	69.8	20.6	30.0	152.5	19	4	4.95	4.00	3.87	4.02	4.98	4.06
90	3 1/2	31.8	31.8	71.4	22.2	32.0	178.0	19	8	6.12	5.06	4.89	5.00	6.42	5.10
100	4	33.3	33.3	76.2	23.8	33.0	190.5	19	8	6.69	5.55	5.38	5.90	7.05	5.63
125	5	36.6	36.6	88.9	23.8	37.0	216.0	22	8	8.38	6.43	6.29	6.80	8.72	6.68
150	6	39.7	39.7	88.9	27.0	40.0	241.5	22	8	10.90	7.89	7.76	7.99	11.40	8.27
200	8	44.5	44.5	101.6	31.8	-	298.5	22	8	18.00	12.60	12.40	13.29	19.60	-
250	10	49.2	49.2	101.6	33.3	-	362.0	26	12	24.90	17.80	17.60	19.60	29.00	-
300	12	55.6	55.6	114.3	39.7	-	432.0	26	12	38.60	28.10	27.70	29.00	43.70	-
350	14	57.2	79.2	127.0	41.3	-	476.0	29	12	50.60	47.60	35.30	38.56	58.60	-
400	16	63.6	87.4	127.0	44.5	-	539.5	29	16	63.90	63.50	44.90	49.50	76.60	-
450	18	68.3	96.8	139.7	49.2	-	578.0	32	16	74.90	72.60	49.30	54.40	94.50	-
500	20	73.2	103.1	144.5	54.0	-	635.0	32	20	93.50	88.50	63.50	75.00	123.00	-
600	24	82.6	111.3	152.4	63.5	-	749.5	35	20	133.00	124.70	90.50	99.00	188.00	-

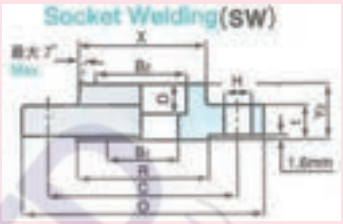
Above weight list are based on theoretical calculations.

ANSI STANDARD FLANGE

A182 300# FLANGE DIMENSIONS





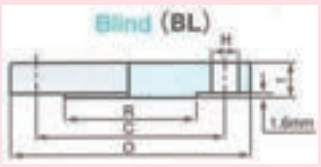


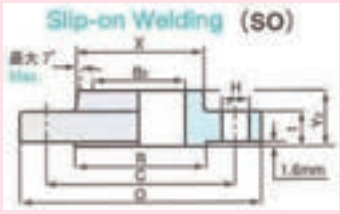
Unit : mm

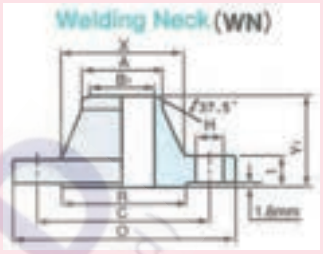
Class 300 LBS														
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges	Radius Of Fillets
			S O S W	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	t	r_1
15	1/2	95	22.4	22.9	23.5	17.1	15.8	13.9	11.8	21.3	38.1	35.1	14.3	3
20	3/4	117	27.7	28.2	29.0	22.5	20.9	18.8	15.6	26.7	47.8	42.9	15.9	3
25	1	124	34.5	35.1	36.0	27.9	26.6	24.3	20.7	33.5	54.0	50.8	17.5	3
32	1 1/4	133	43.2	43.7	44.5	36.6	35.1	32.5	29.5	42.2	63.5	63.5	19.1	5
40	1 1/2	155	49.5	50.0	50.5	42.7	40.9	38.1	34.0	48.3	69.9	73.2	20.6	6
50	2	165	62.0	62.5	63.5	54.9	52.5	49.2	42.8	60.3	84.1	91.9	22.4	8
65	2 1/2	190	74.7	75.4	76.0	67.2	62.7	59.2	53.9	73.0	100.0	104.6	25.4	8
80	3	210	90.7	91.4	92.0	82.9	77.9	73.7	66.7	88.9	117.3	127.0	28.6	10
90	3 1/2	229	103.4	104.1	105.0	95.6	90.1	85.5	-	101.6	133.4	139.7	30.2	10
100	4	254	116.1	116.9	118.0	108.3	102.3	97.2	87.3	114.3	146.0	157.2	31.8	11
125	5	279	143.8	144.5	145.0	134.4	128.2	122.3	109.5	141.2	177.8	185.7	35.1	11
150	6	318	170.7	171.4	171.5	161.6	154.1	146.3	131.8	168.4	206.2	215.9	36.6	13
200	8	381	221.5	222.2	222.3	211.6	202.7	193.7	173.1	219.2	260.3	269.7	41.3	13
250	10	444	276.4	277.4	276.4	264.6	254.4	247.7	215.9	273.1	320.7	323.9	47.8	13
300	12	520	327.2	328.2	329.0	314.6	304.8	298.5	257.2	323.9	374.7	381.0	50.8	13
350	14	585	359.2	360.2	360.4	346.0	336.5	330.2	284.2	355.6	425.4	412.8	54.0	13
400	16	650	410.5	411.2	411.2	396.8	387.3	381.0	325.5	406.4	482.6	469.9	57.2	13
450	18	710	461.8	462.3	462.3	447.6	438.1	431.8	366.7	457.2	533.4	533.4	60.4	13
500	20	775	513.1	514.4	513.0	497.0	488.9	482.6	408.0	508.0	587.4	584.2	63.5	13
600	24	915	616.0	616.0	614.4	596.9	590.5	584.2	490.6	609.6	701.7	692.2	69.9	13

(*) Dimensions for reference only

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my





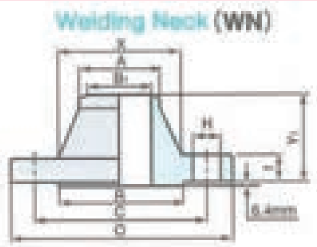


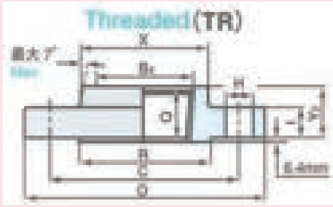
Unit : mm

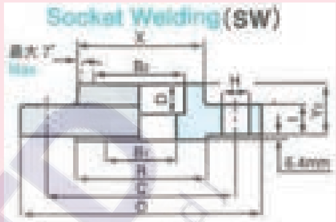
Class 300 LBS															
Nominal Pipe Size		Length Thru Hub			Depth Of Socket	Thread Length (Taper)	Dia. Of Bolt Circle	Dia. Of Bolt Hole	No. Of Bolt Hole	Approx. Weight (kg)					
		S O S W T R	L J	W N						W N	L J	S O	S W	B L	T R
A	B	Y_2	Y_3	Y_1	D	Q	C	H							
15	1/2	22.2	22.2	22.2	9.7	15.7	66.5	16	4	0.75	0.71	0.65	0.67	0.66	0.65
20	3/4	25.4	25.4	25.4	11.2	15.7	82.6	19	4	1.27	1.14	1.11	1.12	1.20	1.10
25	1	27.0	27.0	27.0	12.7	17.5	88.9	19	4	1.64	1.46	1.39	1.43	1.48	1.35
32	1 1/4	27.0	27.0	27.0	14.2	20.6	98.6	19	4	2.05	1.81	1.70	1.74	1.83	1.69
40	1 1/2	30.2	30.2	30.2	15.8	22.4	114.3	22	4	2.93	2.66	2.51	2.58	2.70	2.54
50	2	33.3	33.3	33.3	17.5	28.4	127.0	22	8	3.45	3.02	2.92	2.97	3.22	2.94
65	2 1/2	38.1	38.1	38.1	19.1	31.8	149.4	22	8	5.10	4.37	4.22	4.43	4.86	4.24
80	3	42.9	42.9	42.9	20.6	31.8	168.1	22	8	6.52	6.04	5.88	6.21	6.90	5.94
90	3 1/2	44.4	44.4	44.4	22.3	36.6	184.2	22	8	8.78	7.64	7.44	7.70	8.85	7.55
100	4	47.7	47.7	47.7	23.9	36.6	200.2	22	8	11.30	9.98	9.71	10.00	11.80	9.79
125	5	50.8	50.8	50.8	-	42.9	235.0	22	8	15.40	12.70	12.50	-	15.80	12.40
150	6	52.3	52.3	52.3	-	46.0	269.7	22	12	19.80	16.50	16.35	-	21.30	16.22
200	8	61.9	61.9	61.9	-	50.8	330.2	26	12	30.50	25.20	25.00	-	34.50	24.80
250	10	66.7	95.3	95.3	-	55.6	387.3	29	16	44.30	40.20	35.50	-	53.90	35.90
300	12	73.0	101.6	101.6	-	60.5	450.9	32	16	64.10	58.00	51.00	-	87.90	51.50
350	14	76.2	111.2	111.2	-	63.5	514.4	32	20	88.30	86.20	70.10	-	106.00	70.70
400	16	82.6	120.6	120.6	-	68.3	571.5	35	20	118.00	113.40	90.00	-	139.00	90.40
450	18	88.9	130.0	130.0	-	69.8	628.7	35	24	138.00	133.80	109.00	-	175.00	109.50
500	20	95.2	139.7	139.7	-	73.2	685.8	35	24	174.90	167.80	135.00	-	222.00	136.00
600	24	106.4	152.4	152.4	-	82.6	812.8	42	24	248.00	234.59	204.00	-	340.00	205.00

Above weight list are based on theoretical calculations.

A182 600# FLANGE DIMENSIONS







Unit : mm

Class 600 LBS														
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges (#)	Radius Of Fillets
			S O S W	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	t	r_1
15	1/2	95	22.4	22.9	23.5	17.1	15.8	13.9	11.8	21.3	38.1	35.1	14.3	3
20	3/4	117	27.7	28.2	29.0	22.5	20.9	18.8	15.6	26.7	47.8	42.9	15.9	3
25	1	124	34.5	35.1	36.0	27.9	26.6	24.3	20.7	33.5	54.0	50.8	17.5	3
32	1 1/4	133	43.2	43.7	44.5	36.6	35.1	32.5	29.5	42.2	63.5	63.5	20.6	5
40	1 1/2	155	49.5	50.0	50.5	42.7	40.9	38.1	34.0	48.3	69.9	73.2	22.2	6
50	2	165	62.0	62.5	63.5	54.9	52.5	49.2	42.8	60.3	84.1	91.9	25.4	8
65	2 1/2	190	74.7	75.4	76.0	67.2	62.7	59.2	53.9	73.0	100.0	104.6	28.6	8
80	3	210	90.7	91.4	92.0	82.9	77.9	73.7	66.7	88.9	117.3	127.0	31.7	10
90	3 1/2	229	103.4	104.1	105.0	95.6	90.1	85.5	-	101.6	133.4	139.7	34.9	10
100	4	273	116.1	116.9	117.8	108.3	102.3	97.2	87.3	114.3	152.4	157.2	38.1	11
125	5	330	143.8	144.5	145.0	134.4	128.2	122.3	109.5	141.2	188.9	185.7	44.4	11
150	6	356	170.7	171.4	171.5	161.6	154.1	146.3	131.8	168.4	222.3	215.9	47.6	13
200	8	419	221.5	222.2	222.3	211.6	202.7	193.7	173.1	219.2	273.1	269.7	55.6	13
250	10	510	276.4	277.4	276.4	264.6	254.4	247.7	215.9	273.1	342.9	323.9	63.5	13
300	12	560	327.2	328.2	329.0	314.6	304.8	298.5	257.2	323.9	400.1	381.0	66.7	13
350	14	605	359.2	360.2	360.4	346.0	336.5	330.2	284.2	355.6	431.8	412.8	69.8	13
400	16	685	410.5	411.2	411.2	396.8	387.3	381.0	325.5	406.4	495.3	469.9	76.2	13
450	18	745	461.8	462.3	462.3	447.6	438.1	431.8	366.7	457.2	546.1	533.4	82.6	13
500	20	815	513.1	514.4	513.0	497.0	488.9	482.6	408.0	508.0	609.6	584.2	88.9	13
600	24	940	616.0	616.0	614.4	596.9	590.5	584.2	490.6	609.6	717.5	692.2	101.6	13

(*) Dimensions for reference only
(#) Flange thickness (t) dimension does not include the Height of the Raised Face.

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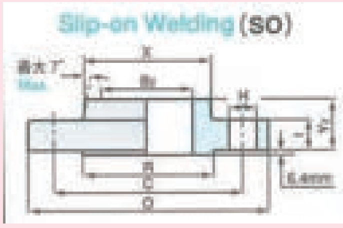
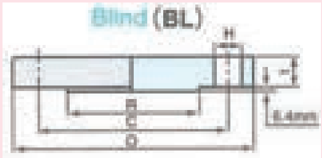
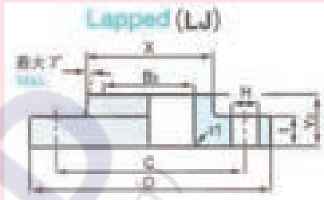




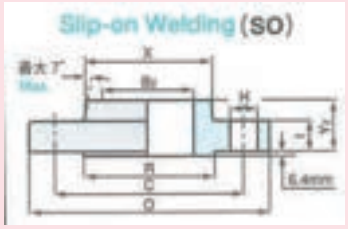


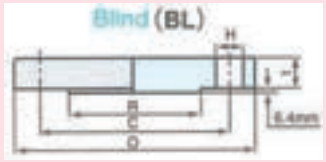
Unit : mm

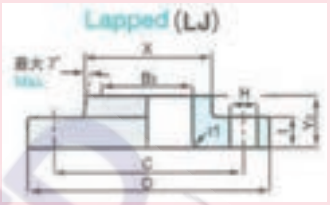
Class 600 LBS															
Nominal Pipe Size		Length Thru Hub			Depth Of Socket	Thread Length (Taper)	Dia. Of Bolt Circle	Dia. Of Bolt Hole	No. Of Bolt Hole	Approx. Weight (kg)					
		S O S W T R	L J	W N						W N	L J	S O	S W	B L	T R
A	B	Y_2	Y_3	Y_1	D	Q	C	H							
15	1/2	22.4	22.4	52.4	9.7	15.7	66.5	16	4	0.85	0.71	0.74	0.75	0.77	0.74
20	3/4	25.4	25.4	57.1	11.2	15.7	82.5	19	4	1.43	1.20	1.26	1.29	1.30	1.24
25	1	27.0	27.0	61.9	12.7	17.5	88.9	19	4	1.82	1.49	1.56	1.62	1.65	1.53
32	1 1/4	28.4	28.4	66.7	14.2	20.6	98.6	19	4	2.44	1.94	2.04	2.11	2.26	2.02
40	1 1/2	31.7	31.7	69.8	15.8	22.4	114.3	22	4	3.44	2.84	2.98	3.08	3.28	3.00
50	2	36.5	36.5	73.2	17.5	28.4	127.0	19	8	4.24	3.42	3.65	3.80	4.16	3.62
65	2 1/2	41.3	41.3	79.2	19.1	31.8	149.4	22	8	6.50	4.88	5.11	5.39	6.09	5.12
80	3	46.0	46.0	82.5	20.6	35.1	168.1	22	8	8.70	6.75	7.11	7.50	8.56	7.08
90	3 1/2	49.2	49.2	85.9	22.3	39.6	184.2	26	8	11.70	8.56	9.00	9.50	11.20	8.98
100	4	54.0	54.0	101.6	-	41.1	215.9	26	8	18.10	14.10	14.70	-	17.50	14.60
125	5	60.3	60.3	114.3	-	47.8	266.7	29	8	30.00	23.80	24.60	-	29.40	24.60
150	6	66.7	66.7	117.3	-	50.8	292.1	29	12	34.00	28.50	29.50	-	34.60	29.40
200	8	76.2	76.2	133.4	-	57.2	349.2	32	12	52.00	42.90	44.20	-	59.00	44.00
250	10	85.9	111.1	152.4	-	65.0	431.8	35	16	86.00	78.00	73.30	-	98.00	73.00
300	12	91.9	117.3	155.4	-	69.9	488.9	35	20	104.00	93.00	87.00	-	125.00	86.89
350	14	93.7	127.0	165.1	-	73.2	527.0	39	20	122.00	113.40	100.00	-	152.00	99.80
400	16	106.4	139.7	177.8	-	77.7	603.2	42	20	172.00	165.60	137.00	-	214.00	142.00
450	18	117.3	152.4	184.2	-	79.2	654.0	45	20	209.00	197.30	175.00	-	275.00	176.00
500	20	127.0	165.1	190.5	-	82.6	723.9	45	24	261.00	258.60	223.00	-	351.00	224.00
600	24	139.7	184.2	203.2	-	91.9	838.3	51	24	373.00	367.40	316.00	-	535.00	317.00

Above weight list are based on theoretical calculations.

A182 900# FLANGE DIMENSIONS







Unit : mm

Class 900 LBS														
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges (#)	Radius Of Fillets
			S O	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	t	r_1
15	1/2	120.6	22.3	22.9	23.6	17.1	15.8	13.9	-	21.3	38.1	35.0	22.3	3
20	3/4	130.0	27.7	28.2	29.0	22.5	20.9	18.8	-	26.7	44.4	42.9	25.4	3
25	1	149.3	34.5	35.0	35.8	27.9	26.6	24.5	-	33.4	52.3	50.8	28.4	3
32	1 1/4	158.7	43.2	43.7	44.4	36.6	35.1	32.5	-	42.2	63.5	63.5	28.4	5
40	1 1/2	177.8	49.5	50.0	50.5	42.7	40.9	38.1	-	48.3	69.8	73.1	31.7	6
50	2	215.9	62.0	62.5	63.5	54.9	52.7	49.5	-	60.3	104.6	91.9	38.1	8
65	2 1/2	244.3	74.7	75.4	76.2	67.2	62.7	59.0	-	73.0	123.9	104.6	41.1	8
80	3	241.3	90.7	91.4	92.2	82.9	77.9	73.7	-	88.9	127.0	127.0	38.1	10
100	4	292.1	116.1	116.8	117.6	108.3	102.3	97.2	-	114.3	158.7	157.2	44.4	11
125	5	349.2	143.8	144.5	144.5	134.4	128.2	122.3	-	141.2	190.5	185.6	50.8	11
150	6	381.0	170.7	171.4	171.4	161.6	154.2	146.3	-	168.4	234.9	215.9	55.6	13
200	8	469.9	221.5	222.2	222.2	211.6	202.7	193.7	-	219.2	298.4	269.7	63.5	13
250	10	546.1	276.3	277.4	276.3	264.6	254.5	247.7	-	273.0	368.3	323.8	69.8	13
300	12	609.6	327.1	328.2	328.7	314.6	304.9	298.5	-	323.8	419.1	381.0	79.2	13
350	14	641.3	359.1	360.2	360.4	346.0	336.6	330.2	-	355.6	450.8	412.7	85.8	13
400	16	704.8	410.5	411.2	411.2	396.8	387.3	381.0	-	406.4	508.0	469.9	88.9	13
450	18	787.4	461.8	462.3	462.0	447.6	438.1	431.8	-	457.2	565.1	533.4	101.6	13
500	20	857.2	513.1	514.3	512.8	497.0	488.9	482.6	-	508.0	622.3	584.2	107.9	13
600	24	1041.4	615.9	615.9	614.4	598.5	590.5	584.2	-	609.6	749.3	692.1	139.7	13

(*) Dimensions for reference only
(#) Flange thickness (t) dimension does not include the Height of the Raised Face.

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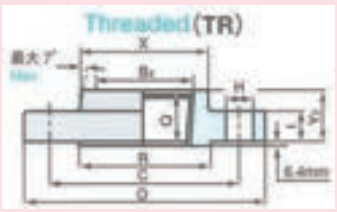
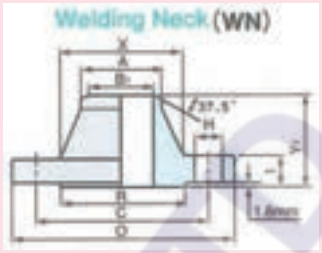




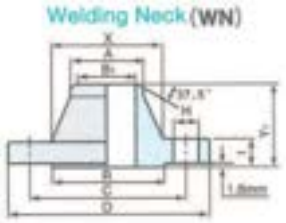
Unit : mm

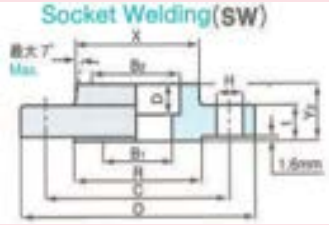
Class 900 LBS																
Nominal Pipe Size		Length Thru Hub			Depth Of Socket	Thread Length (Taper)	Dia. Of Bolt Circle	Dia. Of Bolt Hole	No. Of Bolt Hole	Approx. Weight					
		S O T R	L J	W N						W N	L J	S O	S W	B L	T R
A	B	Y_2	Y_3	Y_1	D	Q	C	H							
15	1/2	31.7	31.7	60.4	-	22.3	82.5	22.3	4	2.3	1.8	1.8	-	1.8	1.8
20	3/4	35.0	35.0	69.8	-	25.4	88.9	22.3	4	2.7	2.3	2.4	-	2.5	2.3
25	1	41.1	41.1	73.1	-	28.4	101.6	25.4	4	4.1	3.4	3.5	-	3.6	3.6
32	1 1/4	41.1	41.1	73.1	-	30.2	111.2	25.4	4	4.5	3.9	4.0	-	4.2	4.1
40	1 1/2	44.5	44.5	82.5	-	31.8	123.9	28.4	4	5.9	5.3	5.4	-	5.8	5.4
50	2	57.1	57.1	101.6	-	38.1	165.1	25.4	8	11.3	10.0	10.0	-	11.0	10.0
65	2 1/2	63.5	63.5	104.6	-	47.7	190.5	28.4	8	16.3	14.0	14.0	-	14.0	14.0
80	3	53.8	53.8	101.6	-	41.1	190.5	25.4	8	14.0	11.3	12.0	-	13.1	12.0
100	4	69.8	69.8	114.3	-	47.8	234.9	31.7	8	23.0	19.2	20.0	-	27.0	20.0
125	5	79.2	79.2	127.0	-	53.8	279.4	35.0	8	38.0	31.2	32.0	-	36.5	32.0
150	6	85.8	85.8	139.7	-	57.1	317.5	31.7	12	48.0	40.5	42.0	-	48.0	42.0
200	8	101.6	114.3	162.0	-	63.5	393.7	38.1	12	82.0	71.5	71.0	-	83.0	71.0
250	10	107.9	127.0	184.1	-	71.4	469.9	38.1	16	119.0	104.0	101.0	-	122.0	101.0
300	12	117.3	142.7	200.1	-	76.2	533.4	38.1	20	157.0	139.0	133.0	-	173.0	133.0
350	14	130.0	155.4	212.8	-	82.5	558.8	41.3	20	180.0	161.0	153.0	-	206.0	153.0
400	16	133.3	165.1	215.9	-	85.9	618.9	44.4	20	217.0	194.0	185.0	-	259.0	185.0
450	18	152.4	190.5	228.6	-	88.9	685.8	50.8	20	298.0	267.0	258.0	-	367.0	258.0
500	20	158.7	209.5	247.6	-	91.9	749.3	54.0	20	362.0	334.0	317.0	-	463.0	317.0
600	24	203.2	266.7	292.1	-	101.6	901.7	66.5	20	665.0	618.0	606.0	-	876.0	606.0

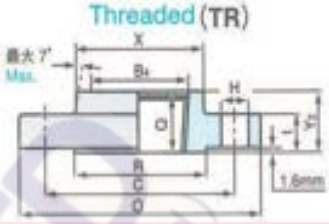
Above weight list are based on theoretical calculations.

ANSI STANDARD FLANGE

A182 1500# FLANGE DIMENSIONS





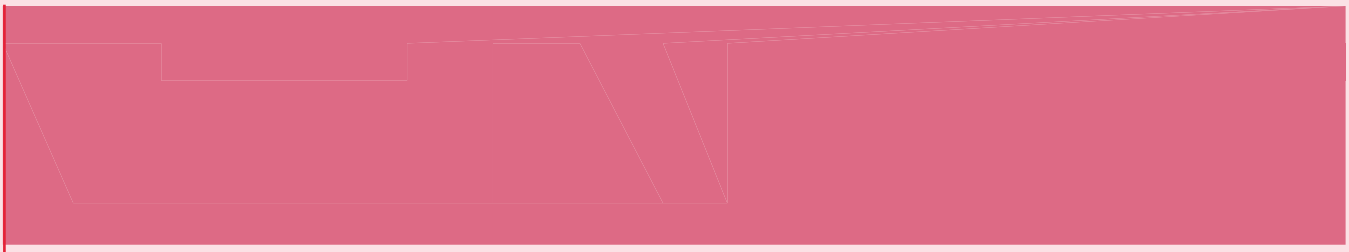


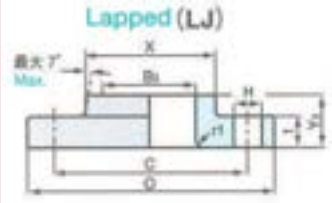
Unit : mm

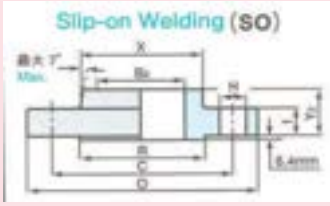
Class 1500 LBS														
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges (#)	Radius Of Fillets
			S O S W	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	T	r_1
15	1/2	120.6	22.3	22.9	23.6	17.1	15.8	13.9	-	21.3	38.1	35.0	22.3	3
20	3/4	130.0	27.7	28.2	29.0	22.5	20.9	18.8	-	26.7	44.4	42.9	25.4	3
25	1	149.3	34.5	35.0	35.8	27.9	26.6	24.5	-	33.4	52.3	50.8	28.4	3
32	1 1/4	158.7	43.2	43.7	44.4	36.6	35.1	32.5	-	42.2	63.5	63.5	28.4	5
40	1 1/2	177.8	49.5	50.0	50.5	42.7	40.9	38.1	-	48.3	69.8	73.1	31.7	6
50	2	215.9	62.0	62.5	63.5	54.9	52.7	49.5	-	60.3	104.6	91.9	38.1	8
65	2 1/2	244.3	74.7	75.4	76.2	67.2	62.7	59.0	-	73.0	123.9	104.6	41.1	8
80	3	266.7	90.7	91.4	92.2	82.9	77.9	73.7	-	88.9	133.3	127.0	47.7	10
10	4	311.1	116.1	116.8	117.6	108.3	102.3	97.2	-	114.3	162.0	157.2	53.8	11
125	5	374.6	143.8	144.5	144.5	134.4	128.2	122.3	-	141.2	196.8	185.6	73.1	11
150	6	393.7	170.7	171.4	171.4	161.6	154.2	146.3	-	168.4	228.6	215.9	82.5	13
200	8	482.6	221.5	222.2	222.2	211.6	202.7	193.7	-	219.2	292.1	269.7	91.9	13
250	10	584.2	276.3	277.4	276.3	264.6	254.5	247.7	-	273.0	368.3	323.8	107.9	13
300	12	673.1	327.1	328.2	328.7	314.6	304.9	298.5	-	323.8	450.8	381.0	123.9	13
350	14	749.3	359.1	360.2	-	346.0	336.6	330.2	-	355.6	495.3	412.7	133.3	13
400	16	825.5	410.5	411.2	-	396.8	387.3	381.0	-	406.4	552.4	469.9	146.0	13
450	18	914.4	461.8	462.3	-	447.6	438.1	431.8	-	457.2	596.9	533.4	162.0	13
500	20	984.2	513.1	514.3	-	497.0	488.9	482.6	-	508.0	641.3	584.2	177.8	13
600	24	1168.4	615.9	615.9	-	598.5	590.5	584.2	-	609.6	762.0	692.1	203.2	13

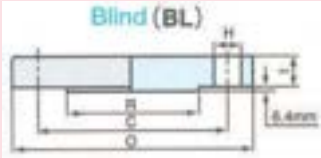
(*) Dimensions for reference only
(#) Flange thickness (t) dimension does not include the Height of the Raised Face.
REMARKS: 1500# SWRF ONLY HAVE SCH 40 & SCH 80 FROM ½" TO 2 ½" ONLY

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my









Class 2500 LBS													
Nominal Pipe Size		Out-side Dia. Of Flange	Diameter Of Bore (*)							Dia. Of Hub at Bevel End (*)	Dia. Of Hub at Base	Dia. Of Raised Face	Thick-ness Of Flanges (#)	Radius Of Fillets
			S O	L J	T R	W N , S W (Diameter Of Socket)								
						SCH 10s	SCH 40s / STD	SCH 80s / XS	SCH 160					
A	B	O	B_2	B_3	B_4	B_1				A	X	R	t	r_1
15	1/2	133.4	22.3	22.9	23.6	To Be Specified By End User			-	21.3	42.9	35.1	30.2	3
20	3/4	139.7	27.7	28.2	29.0				-	26.7	50.8	42.9	31.8	3
25	1	158.8	34.5	35.1	35.8				-	33.5	57.2	50.8	35.1	3
32	1 1/4	184.2	43.2	43.7	44.5				-	42.2	73.2	63.5	38.1	5
40	1 1/2	203.2	49.5	50.0	50.5				-	48.3	79.2	73.2	44.5	6
50	2	235.0	62.0	62.5	63.5				-	60.5	95.3	91.9	50.8	8
65	2 1/2	266.7	74.7	75.4	76.2				-	73.2	114.3	104.6	57.2	8
80	3	304.8	90.7	91.4	92.2				-	88.9	133.4	127.0	66.5	10
100	4	355.6	116.1	116.8	117.6				-	114.3	165.1	157.2	76.2	11
125	5	419.1	143.8	144.5	144.5				-	141.2	203.2	185.7	91.9	11
150	6	482.6	170.7	171.5	171.5				-	168.4	235.0	215.9	108.0	13
200	8	552.5	221.5	222.3	222.3				-	219.2	304.8	269.7	127.0	13
250	10	673.1	276.3	277.4	276.4				-	273.0	374.7	323.9	165.1	13
300	12	762.0	327.1	328.2	328.7				-	323.9	441.5	381.0	184.2	13

MATERIAL FOR STAINLESS STEEL FLANGES

ASTM A182

Chemical Composition									
Symbol of Class	C (%)	Si (%) Max and below	Mn (%) Max and below	P (%) Max and below	S (%) Max and below	Ni (%)	Cr (%)	Mo (%)	N (%)
F304	0.08 max. and below	1.00	2.00	0.045	0.030	8.00 ~ 11.00	18.00 ~ 20.00	-	0.1 max. and below
F304H	0.04 ~ 0.10	1.00	2.00	0.045	0.030	8.00 ~ 12.00	18.00 ~ 20.00	-	-
F304L	0.03 max. and below	1.00	2.00	0.045	0.030	8.00 ~ 13.00	18.00 ~ 20.00	-	0.1 max. and below
F304N	0.08 max. and below	1.00	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	0.10 ~ 0.16
F304LN	0.03 max. and below	1.00	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	0.10 ~ 0.16
F309H	0.04 ~ 0.10	1.00	2.00	0.045	0.030	12.00 ~ 15.00	22.00 ~ 24.00	-	0.10 ~ 0.16
F310	0.25 max. and below	1.00	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
F310H	0.04 ~ 0.10	1.00	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
F316	0.08 max. and below	1.00	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.1 max. and below
F316H	0.04 ~ 0.10	1.00	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	-
F316L	0.03 max. and below	1.00	2.00	0.045	0.030	10.00 ~ 15.00	16.00 ~ 18.00	2.00 ~ 3.00	0.1 max. and below
F316N	0.08 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
F316LN	0.03 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
F317	0.08 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
F317L	0.03 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
F321 (1)	0.08 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	-	-
F321H (2)	0.04 ~ 0.10	1.00	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	-	-
F347 (3)	0.08 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-
F347H (4)	0.04 ~ 0.10	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-
F348 (3)	0.08 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-
F348H (4)	0.04 ~ 0.10	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-

NOTES:

(1) Grade F321 shall have a titanium content of not less than 5 times the carbon content and no more than 0.70%
(2) Grade F321H shall have a titanium content of not less than 4 times the carbon content and no more than 0.70%
(3) Grade F347 and F348 shall have a niobium content of not less than 10 times the carbon content and no more than 1.10%
(4) Grade F347H and F348H shall have a niobium content of not less than 8 times the carbon content and no more than 1.00%

Mechanical Properties						
Symbol of Class	Tensile Strength Min and above	Yield Strength Min and above	Elongation in 2in Min and above	Reduction of Area Min and above	Solutioning Temperature Min and above	Quenching Cool Max and below
	MPa	MPa	%	%	°C	°C
F304	515 (1)	205	30	50	1040	260
F304H	515 (1)	205	30	50	1040	260
F304L	485 (2)	170	30	50	1040	260
F304N	550	240	30 (3)	50 (4)	1040	260
F304LN	515 (1)	205	30	50	1040	260
F309H	515 (1)	205	30	50	1040	260
F310	515 (1)	205	30	50	1040	260
F310H	515 (1)	205	30	50	1040	260
F316	515 (1)	205	30	50	1040	260
F316H	515 (1)	205	30	50	1040	260
F316L	485 (2)	170	30	50	1040	260
F316N	550	240	30 (3)	50 (4)	1040	260
F316LN	515 (1)	205	30	50	1040	260
F317	515 (1)	205	30	50	1040	260
F317L	485 (2)	170	30	50	1040	260
F321	515 (1)	205	30	50	1040	260
F321H	515 (1)	205	30	50	1095	260
F347	515 (1)	205	30	50	1040	260
F347H	515 (1)	205	30	50	1095	260
F348	515 (1)	205	30	50	1040	260
F348H	515 (1)	205	30	50	1095	260

NOTES:

(1) For sections over 5in. in thickness, the minimum tensile strength shall be 485 MPa.
(2) For sections over 5in. in thickness, the minimum tensile strength shall be 450 MPa.
(3) Longitudinal. The transverse elongation shall be 25% in 2in. min.
(4) Longitudinal. The transverse reduction of area shall be 45% min.

MATERIAL FOR STAINLESS STEEL FLANGES

ASTM A240

Chemical Composition										
Symbol of Class	C (%)	Si (%) Max and below	Mn (%) Max and below	P (%) Max and below	S (%) Max and below	Ni (%)	Cr (%)	Mo (%)	N (%)
304	0.08 max. and below	0.75	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	0.1 max. and below
304L	0.03 max. and below	0.75	2.00	0.045	0.030	8.00 ~ 12.00	18.00 ~ 20.00	-	0.1 max. and below
304H	0.04 ~ 0.10	0.75	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	-
304N	0.08 max. and below	0.75	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	0.10 ~ 0.16
304LN	0.03 max. and below	0.75	2.00	0.045	0.030	8.00 ~ 12.00	18.00 ~ 20.00	-	0.10 ~ 0.16
309S	0.08 max. and below	0.75	2.00	0.045	0.030	12.00 ~ 15.00	22.00 ~ 24.00	-	-
309H	0.04 ~ 0.10	0.75	2.00	0.045	0.030	12.00 ~ 15.00	22.00 ~ 24.00	-	-
310S	0.08 max. and below	1.50	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
310H	0.04 ~ 0.10	0.75	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
316	0.08 max. and below	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.1 max. and below
316L	0.03 max. and below	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.1 max. and below
316H	0.04 ~ 0.10	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	-
316N	0.08 max. and below	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
316LN	0.03 max. and below	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
317	0.08 max. and below	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	0.1 max. and below
317L	0.03 max. and below	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	0.1 max. and below
317LN	0.03 max. and below	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	0.10 ~ 0.22
321 (1)	0.08 max. and below	0.75	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	-	0.1 max. and below
321H (2)	0.04 ~ 0.10	0.75	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	-	-
347 (3)	0.08 max. and below	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-
347H (4)	0.04 ~ 0.10	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-
348 (5)	0.08 max. and below	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-
348H (6)	0.04 ~ 0.10	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-

NOTES:

(1) Ti = 5 x (C + N) mln. and 0.70% max.
(2) Ti = 4 x (C + N) min. and 0.70% max.
(3) Cb = 10 x C min. and 1.00% max.
(4) Cb = 8 x C min. and 1.00% max.
(5) Cb + Ta = 10 x C min. and 1.00% max. (where Ta=0.10% max. ; Co=0.20%)
(6) Cb + Ta = 8 x C min. and 1.00% max. (where Ta=0.10% max. ; Co=0.20%)

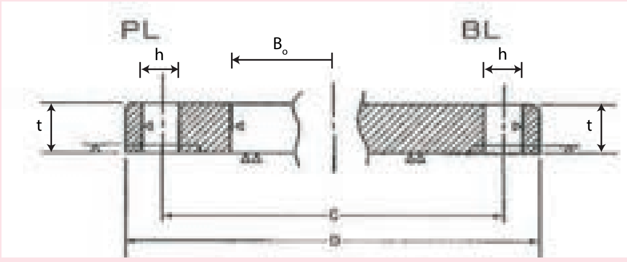
Mechanical Properties in Solution Treated					
Symbol of Class	Tensile Strength Min and above	Yield Strength[1] Min and above	Elongation in 2in Min and above	Hardness[2] Max and below	Application
	MPa	MPa	%	Brinell	
304	515	205	40.0	201	
304L	485	170	40.0	201	
304H	515	205	40.0	201	
304N	550	240	40.0	201	
304LN	515	205	40.0	201	
309S	515	205	40.0	217	
309H	515	205	40.0	217	
310S	515	205	40.0	217	
310H	515	205	40.0	217	
316	515	205	40.0	217	
316L	485	170	40.0	217	
316H	515	205	40.0	217	
316N	550	240	40.0	217	
316LN	515	205	40.0	217	
317	515	205	40.0	217	
317L	515	205	40.0	217	
317LN	550	240	40.0	217	
321	515	205	40.0	217	
321H	515	205	40.0	217	
347	515	205	40.0	201	
347H	515	205	40.0	201	
348	515	205	40.0	201	
348H	515	205	40.0	201	

Notes:

(1) Yield strength shall be determined by the offset method of 0.2% in accordance with Test Methods and Definitions A370.

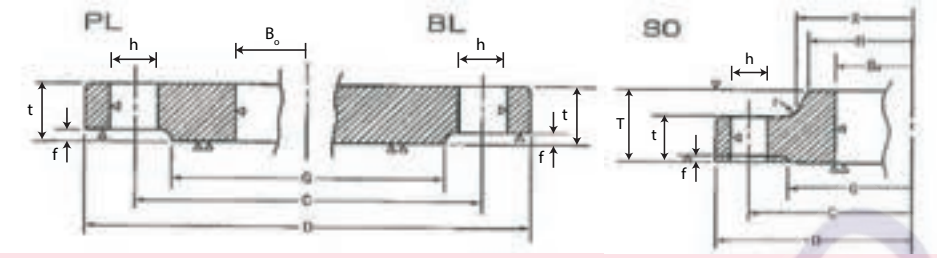
(2) Either Brineil or Rockwell B Hardness is permissible.

JIS 5K FLANGE DIMENSIONS



JIS 5K PIPE FLANGES DIMENSION										
Nominal Bore of Flange		Outside Diam. of Applicable JIS Pipe	Inside Diam. Of Flange	Outside Diam. Of Flange	Sectional Dimension of Flanges					
					Thickness of flange (t)		Length thru' hub	Diam. Of Hub		Radius of Fillet
					Except	Only				
B	A		B_o	D	BL	BL	T	H	X	r
3/8	10	17.3	17.8	75	9		13	23	26	4
1/2	15	21.7	22.2	80	9		13	27	30	4
3/4	20	27.2	27.7	85	10		15	33	36	4
1	25	34.0	34.5	95	10		17	41	44	4
1 1/4	32	42.7	43.2	115	12		19	50	53	4
1 1/2	40	48.6	49.1	120	12		20	56	60	4
2	50	60.5	61.1	130	14		24	69	73	4
2 1/2	65	76.3	77.1	155	14		27	86	91	4
3	80	89.1	90.0	180	14		30	99	105	4
3 1/2	90	101.6	102.6	190	14		-	-	-	-
4	100	114.3	115.4	200	16		36	127	130	4
5	125	139.8	141.2	235	16		40	154	161	4
6	150	165.2	166.6	265	18		40	182	189	4
7	175	190.7	192.1	300	18		-	-	-	-
8	200	216.3	218.0	320	20		-	-	-	-
9	225	241.8	243.7	345	20		-	-	-	-
10	250	267.4	269.5	385	22		-	-	-	-
12	300	318.5	321.0	430	22		-	-	-	-
14	350	355.6	358.1	480	24		-	-	-	-
16	400	406.4	409.0	540	24		-	-	-	-
18	450	457.2	460.0	605	24		40	495	500	5
20	500	508.0	511.0	655	24		40	546	552	5
22	550	558.8	562.0	720	26		42	597	603	5
24	600	609.6	613.0	770	26		44	648	654	5
26	650	660.4	664.0	825	26	28	48	702	708	5
28	700	711.1	715.0	875	26	30	48	751	758	5
30	750	762.0	766.0	945	28	32	52	802	810	5
32	800	812.8	817.0	995	28	34	52	854	862	5
34	850	863.6	868.0	1045	28	36	54	904	912	5
36	900	914.4	919.0	1095	30	36	56	956	964	5
40	1000	1016.0	1021.0	1195	32	40	60	1058	1066	5
44	1100	1117.6	1122.0	1305	32	44	71	1158	1170	7
48	1200	1219.2	1224.0	1420	34	48	77	1260	1272	7
54	1350	1371.6	1376.0	1575	34	54	80	1414	1426	7
60	1500	1524.0	1529.0	1730	36	58	86	1568	1580	7

For All Other Standard and Non-Standard Flanges (Customised Items), Kindly Refer To Shinsei Industry Sdn Bhd (web: http://www.ssflanges.com.my), Email: sales@ssflanges.com.my



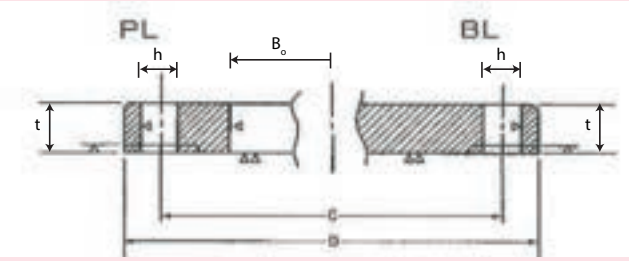
Unit : mm

JIS 5K PIPE FLANGES DIMENSION										
Nominal Bore of Flange		Sectional Dimension of Flanges		Diam. Of Bolt			Nominal Bolt Size	Est. Weight (kg)		
		Raised Face	Diam. Of Raised Face	Diam. Of Bolt Circle	No of Bolt Holes	Hole Diam.		PL	SO	BL
B	A	f	G	C		h				
3/8	10	1	39	55	4	12	M10	0.26	0.27	0.30
1/2	15	1	44	60	4	12	M10	0.30	0.31	0.33
3/4	20	1	49	65	4	12	M10	0.36	0.38	0.41
1	25	1	59	75	4	12	M10	0.45	0.48	0.52
1 1/4	32	2	70	90	4	15	M12	0.77	0.83	0.91
1 1/2	40	2	75	95	4	15	M12	0.82	0.90	1.00
2	50	2	85	105	4	15	M12	1.06	1.19	1.38
2 1/2	65	2	110	130	4	15	M12	1.48	1.72	2.00
3	80	2	121	145	4	19	M16	1.97	2.34	2.67
3 1/2	90	2	131	155	4	19	M16	2.08	-	2.99
4	100	2	141	165	8	19	M16	2.35	2.76	3.66
5	125	2	176	200	8	19	M16	3.20	4.02	5.16
6	150	2	206	230	8	19	M16	4.39	5.35	7.47
7	175	2	232	260	8	23	M20	5.42	-	9.52
8	200	2	252	280	8	23	M20	6.24	-	12.10
9	225	2	277	305	12	23	M20	6.57	-	13.90
10	250	2	317	345	12	23	M20	9.39	-	19.20
12	300	3	360	390	12	23	M20	10.20	-	24.20
14	350	3	403	435	12	25	M22	14.00	-	33.00
16	400	3	463	495	16	25	M22	16.90	-	41.70
18	450	3	523	555	16	25	M22	21.40	24.90	52.70
20	500	3	573	605	20	25	M22	23.00	27.00	61.60
22	550	3	630	665	20	27	M24	30.10	34.50	80.80
24	600	3	680	715	20	27	M24	32.50	37.80	92.70
26	650	3	735	770	24	27	M24	35.60	43.20	114.00
28	700	3	785	820	24	27	M24	38.00	45.80	138.00
30	750	3	840	880	24	33	M30	48.40	57.70	171.00
32	800	3	890	930	24	33	M30	51.20	61.30	202.00
34	850	3	940	980	24	33	M30	53.90	65.30	237.00
36	900	3	990	1030	24	33	M30	60.70	73.10	260.00
40	1000	3	1090	1130	28	33	M30	70.10	84.80	345.00
44	1100	3	1200	1240	28	33	M30	81.60	105.00	454.00
48	1200	3	1305	1350	32	33	M30	101.00	129.00	586.00
54	1350	3	1460	1505	32	33	M30	116.00	151.00	814.00
60	1500	3	1615	1660	36	33	M30	137.00	180.00	1060.00

Above weight list are based on theoretical calculations

JIS STANDARD FLANGE

JIS 10K FLANGE DIMENSIONS



JIS 10K PIPE FLANGES DIMENSION										
Nominal Bore of Flange		Outside Diam. of Applicable JIS Pipe	Inside Diam. Of Flange	Outside Diam. Of Flange	Sectional Dimension of Flanges					
					Thickness of flange (t)		Length thru' hub	Diam. Of Hub		Radius of Fillet
					Except	Only				
B	A		B_o	D	BL	BL	T	H	X	r
3/8	10	17.3	17.8	90	12		16	23	26	4
1/2	15	21.7	22.2	95	12		16	27	30	4
3/4	20	27.2	27.7	100	14		20	33	36	4
1	25	34.0	34.5	125	14		20	41	44	4
1 1/4	32	42.7	43.2	135	16		22	50	53	4
1 1/2	40	48.6	49.1	140	16		24	56	60	4
2	50	60.5	61.1	155	16		24	69	73	4
2 1/2	65	76.3	77.1	175	18		27	86	91	4
3	80	89.1	90.0	186	18		30	99	105	4
3 1/2	90	101.6	102.6	195	18		-	-	-	-
4	100	114.3	115.4	210	18		36	127	130	4
5	125	139.8	141.2	250	20		40	154	161	4
6	150	165.2	166.6	280	22		40	182	189	4
7	175	190.7	192.1	305	22		-	-	-	-
8	200	216.3	218.0	330	22		-	-	-	-
9	225	241.8	243.7	350	22		-	-	-	-
10	250	267.4	269.5	400	24		-	-	-	-
12	300	318.5	321.0	445	24		-	-	-	-
14	350	355.6	358.1	490	26		42	380	386	6
16	400	406.4	409.0	560	28		44	436	442	6
18	450	457.2	460.0	620	30		48	496	502	6
20	500	508.0	511.0	675	30		48	548	554	6
22	550	558.8	562.0	745	32	34	52	604	610	6
24	600	609.6	613.0	795	32	36	52	656	662	6
26	650	660.4	664.0	845	34	38	56	706	712	6
28	700	711.1	715.0	905	34	40	58	762	770	6
30	750	762.0	766.0	970	36	44	62	816	824	6
32	800	812.8	817.0	1020	36	46	64	868	876	6
34	850	863.6	868.0	1070	36	48	66	920	928	6
36	900	914.4	919.0	1120	38	50	70	971	979	6
40	1000	1016.0	1021.0	1235	40	56	74	1073	1081	6
44	1100	1117.6	1122.0	1345	42	62	95	1175	1185	8
48	1200	1219.2	1224.0	1465	44	66	101	1278	1290	8
54	1350	1371.6	1376.0	1630	48	74	110	1432	1450	8
60	1500	1524.0	1529.0	1795	50	82	123	1585	1605	8

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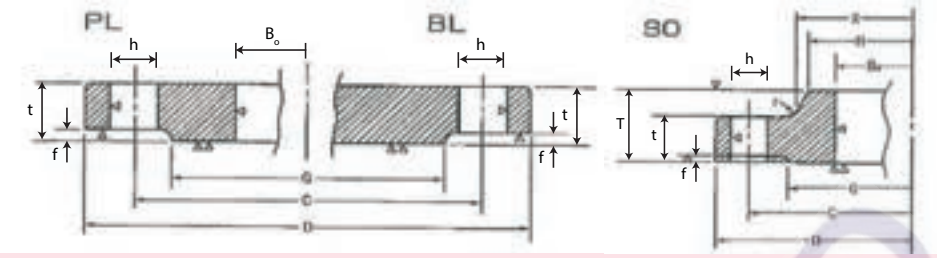
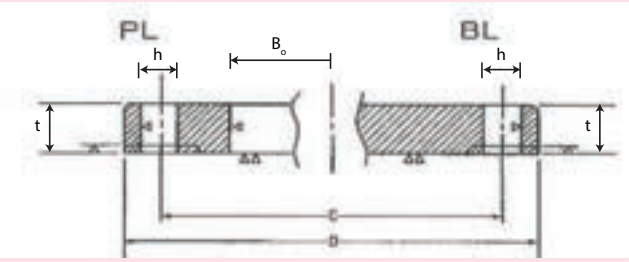


Unit : mm

JIS 10K PIPE FLANGES DIMENSION										
Nominal Bore of Flange		Sectional Dimension of Flanges		Diam. Of Bolt			Nominal Bolt Size	Est. Weight (kg)		
		Raised Face	Diam. Of Raised Face	Diam. Of Bolt Circle	No of Bolt Holes	Hole Diam.		PL	SO	BL
B	A	f	G	C		h				
3/8	10	1	46	65	4	15	M12	0.51	0.52	0.53
1/2	15	1	51	70	4	15	M12	0.56	0.58	0.60
3/4	20	1	56	75	4	15	M12	0.72	0.75	0.79
1	25	1	67	90	4	19	M16	1.12	1.16	1.22
1 1/4	32	2	76	100	4	19	M16	1.47	1.53	1.66
1 1/2	40	2	81	105	4	19	M16	1.55	1.65	1.79
2	50	2	96	120	4	19	M16	1.86	1.97	2.23
2 1/2	65	2	116	140	4	19	M16	2.58	2.77	3.24
3	80	2	126	150	8	19	M16	2.64	2.89	3.48
3 1/2	90	2	136	160	8	19	M16	2.73	-	3.90
4	100	2	151	175	8	19	M16	3.10	3.70	4.57
5	125	2	182	210	8	23	M20	4.73	5.70	7.18
6	150	2	212	240	8	23	M20	6.30	7.48	10.10
7	175	2	237	265	12	23	M20	6.75	-	11.80
8	200	2	262	290	12	23	M20	7.46	-	13.90
9	225	2	282	310	12	23	M20	7.70	-	15.80
10	250	2	324	355	12	25	M22	11.80	-	22.60
12	300	3	368	400	16	25	M22	12.60	-	27.80
14	350	3	413	445	16	25	M22	16.30	18.20	36.90
16	400	3	475	510	16	27	M24	23.20	25.80	52.10
18	450	3	530	565	20	27	M24	29.30	33.40	68.40
20	500	3	585	620	20	27	M24	33.30	38.00	81.60
22	550	3	640	680	20	33	M30	42.90	49.40	112.00
24	600	3	690	730	24	33	M30	45.40	52.60	134.00
26	650	3	740	780	24	33	M30	51.80	60.20	161.00
28	700	3	800	840	24	33	M30	59.00	70.20	196.00
30	750	3	855	900	24	33	M30	72.80	86.50	248.00
32	800	3	905	950	28	33	M30	76.00	92.00	286.00
34	850	3	955	1000	28	33	M30	80.10	98.70	330.00
36	900	3	1005	1050	28	33	M30	88.90	110.00	377.00
40	1000	3	1110	1160	28	39	M36	109.00	133.00	512.00
44	1100	3	1220	1270	28	39	M36	131.00	175.00	675.00
48	1200	3	1325	1380	32	39	M36	163.00	215.00	845.00
54	1350	3	1480	1540	36	45	M42	204.00	274.00	1180.00
60	1500	3	1635	1700	40	45	M42	248.00	340.00	1590.00

Above weight list are based on theoretical calculations



JIS 16K PIPE FLANGES DIMENSION									
Nominal Bore of Flange		Outside Diam. of Applicable JIS Pipe	Inside Diam. Of Flange	Outside Diam. Of Flange	Sectional Dimension of Flanges				
					Thickness of flange	Length thru' hub	Diam. Of Hub		Radius of Fillet
B	A		B_o	D	t	T	H	X	r
3/8	10	17.3	17.8	90	12	16	26	28	4
1/2	15	21.7	22.2	95	12	16	30	32	4
3/4	20	27.2	27.7	100	14	20	38	42	4
1	25	34.0	34.5	125	14	20	46	50	4
1 1/4	32	42.7	43.2	135	16	22	56	60	5
1 1/2	40	48.6	49.1	140	16	24	62	66	5
2	50	60.5	61.1	155	16	24	76	80	5
2 1/2	65	76.3	77.1	175	18	26	94	98	5
3	80	89.1	90.0	200	20	28	108	112	6
3 1/2	90	101.6	102.6	210	20	30	120	124	6
4	100	114.3	115.4	225	22	34	134	138	6
5	125	139.8	141.2	270	22	34	164	170	6
6	150	165.2	166.6	305	24	38	196	202	6
8	200	216.3	218.0	350	26	40	244	252	6
10	250	267.4	269.5	430	28	44	304	312	6
12	300	318.5	321.0	480	30	48	354	364	8
14	350	355.6	358.1	540	34	52	398	408	8
16	400	406.4	409.0	605	38	60	446	456	10
18	450	457.2	460.0	675	40	64	504	514	10
20	500	508.0	511.0	730	42	68	558	568	10
22	550	558.8	562.0	795	44	70	612	622	10
24	600	609.6	613.0	845	46	74	666	676	10

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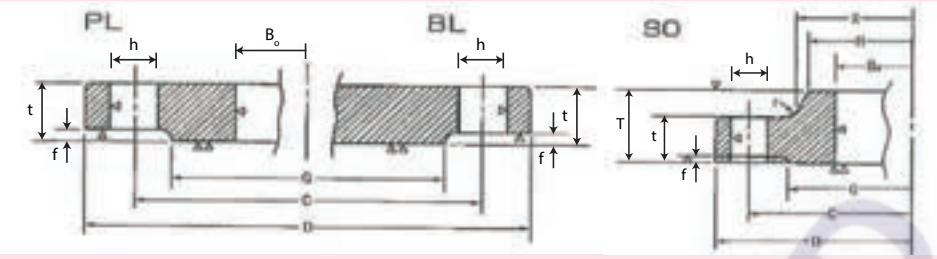


Unit : mm

JIS 16K PIPE FLANGES DIMENSION										
Nominal Bore of Flange		Sectional Dimension of Flanges		Diam. Of Bolt			Nominal Bolt Size	Est. Weight (kg)		
		Raised Face	Diam. Of Raised Face	Diam. Of Bolt Circle	No of Bolt Holes	Hole Diam.		PL	SO	BL
B	A	f	G	C		h				
3/8	10	1	46	65	4	15	M12	0.51	0.52	0.53
1/2	15	1	51	70	4	15	M12	0.57	0.58	0.60
3/4	20	1	56	75	4	15	M12	0.74	0.75	0.79
1	25	1	67	90	4	19	M16	1.15	1.18	1.22
1 1/4	32	2	76	100	4	19	M16	1.47	1.53	1.66
1 1/2	40	2	81	105	4	19	M16	1.61	1.68	1.79
2	50	2	96	120	8	19	M16	1.79	1.88	2.09
2 1/2	65	2	116	140	8	19	M16	2.51	2.68	3.08
3	80	2	132	160	8	23	M20	3.53	3.76	4.41
3 1/2	90	2	145	170	8	23	M20	3.80	3.89	4.92
4	100	2	160	185	8	23	M20	4.76	4.87	6.29
5	125	2	195	225	8	25	M22	6.92	7.09	9.21
6	150	2	230	260	12	25	M22	9.35	9.57	12.70
8	200	2	275	305	12	25	M22	11.80	12.00	18.40
10	250	2	345	380	12	27	M24	19.60	20.10	30.40
12	300	3	395	430	16	27	M24	23.60	24.30	40.50
14	350	3	440	480	16	33	M30	33.50	34.40	57.50
16	400	3	495	540	16	33	M30	46.30	47.40	81.70
18	450	3	560	605	20	33	M30	60.50	61.80	107.00
20	500	3	615	660	20	33	M30	71.70	73.70	132.00
22	550	3	670	720	20	39	M36	85.80	87.90	163.00
24	600	3	720	770	24	39	M36	96.10	98.40	192.00

Above weight list are based on theoretical calculations

MATERIAL FOR STAINLESS STEEL FLANGES

JIS G 3214

Chemical Composition									
Symbol of Class	C (%)	Si (%) Max and below	Mn (%) Max and below	P (%) Max and below	S (%) Max and below	Ni (%)	Cr (%)	Mo (%)	N (%)
SUS F304	0.08 max. and below	1.00	2.00	0.040	0.030	8.00 ~ 11.00	18.00 ~ 20.00	-	-
SUS F304H	0.04 ~ 0.10	1.00	2.00	0.040	0.030	8.00 ~ 12.00	18.00 ~ 20.00	-	-
SUS F304L	0.03 max. and below	1.00	2.00	0.040	0.030	9.00 ~ 13.00	18.00 ~ 20.00	-	-
SUS F304N	0.08 max. and below	0.75	2.00	0.040	0.030	8.00 ~ 11.00	18.00 ~ 20.00	-	0.10 ~ 0.16
SUS F304LN	0.03 max. and below	1.00	2.00	0.040	0.030	8.00 ~ 11.00	18.00 ~ 20.00	-	0.10 ~ 0.16
SUS F310	0.15 max. and below	1.00	2.00	0.040	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
SUS F316	0.08 max. and below	1.00	2.00	0.040	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	-
SUS F316H	0.04 ~ 0.10	1.00	2.00	0.040	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	-
SUS F316L	0.03 max. and below	1.00	2.00	0.040	0.030	12.00 ~ 15.00	16.00 ~ 18.00	2.00 ~ 3.00	-
SUS F316N	0.08 max. and below	0.75	2.00	0.040	0.030	11.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
SUS F316LN	0.03 max. and below	1.00	2.00	0.040	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.16
SUS F317	0.08 max. and below	1.00	2.00	0.040	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
SUS F317L	0.03 max. and below	1.00	2.00	0.040	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
SUS F321 (1)	0.08 max. and below	1.00	2.00	0.040	0.030	9.00 ~ 12.00	17.00 min. and above	-	-
SUS F321H (2)	0.04 ~ 0.10	1.00	2.00	0.040	0.030	9.00 ~ 12.00	17.00 min. and above	-	-
SUS F347 (3)	0.08 max. and below	1.00	2.00	0.040	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-
SUS F347H (4)	0.04 ~ 0.10	1.00	2.00	0.040	0.030	9.00 ~ 13.00	17.00 ~ 20.00	-	-

NOTES:

(1) Grade SUS F321 shall have a titanium content of not less than 5 times the carbon content and no more than 0.60%
(2) Grade SUS F321H shall have a titanium content of not less than 4 times the carbon content and no more than 0.60%
(3) Grade SUS F347 shall have a niobium content of not less than 10 times the carbon content and no more than 1.00%
(4) Grade SUS F347H shall have a niobium content of not less than 8 times the carbon content and no more than 1.00%

MATERIAL FOR STAINLESS STEEL FLANGES

JIS G 3214

Mechanical Properties						
Symbol of Class	Diameter or Thickness at Heat Treatment	Proof stress	Tensile Strength	Elongation	Reduction of Area	Hardness
				No.14A test piece		
	mm	N/mm²	N/mm²	%	%	HB
SUS F304	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F304H	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F304L	Under 130 130 ~ 200	175 min. and above	480 min. and above 450 min. and above	29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F304N	Under 130 130 ~ 200	240 min. and above	550 min. and above	29 min. and above 24 min. and above	50 min. and above 45 min. and above	217 max. and below
SUS F304LN	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F310	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	34 min. and above 29 min. and above	50 min. and above 40 min. and above	187 max. and below
SUS F316	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F316H	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F316L	Under 130 130 ~ 200	175 min. and above	480 min. and above 450 min. and above	29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F316N	Under 130 130 ~ 200	240 min. and above	550 min. and above	29 min. and above 24 min. and above	50 min. and above 45 min. and above	217 max. and below
SUS F316LN	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F317	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	29 min. and above	50 min. and above	187 max. and below
SUS F317L	Under 130 130 ~ 200	175 min. and above	480 min. and above 450 min. and above	29 min. and above	50 min. and above	187 max. and below
SUS F321	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F321H	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F347	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below
SUS F347H	Under 130 130 ~ 200	205 min. and above	520 min. and above 480 min. and above	43 min. and above 29 min. and above	50 min. and above 45 min. and above	187 max. and below

MATERIAL FOR STAINLESS STEEL FLANGES

JIS G 4304 / 4305

Chemical Composition									
Symbol of Class	C (%)	Si (%) Max and below	Mn (%) Max and below	P (%) Max and below	S (%) Max and below	Ni (%)	Cr (%)	Mo (%)	N (%)
SUS 304	0.08 max. and below	1.00	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00	-	-
SUS 304L	0.03 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 13.00	18.00 ~ 20.00	-	-
SUS 304N1	0.08 max. and below	1.00	2.50	0.045	0.030	7.00 ~ 10.50	18.00 ~ 20.00	-	0.10 ~ 0.25
SUS 304N2 (1)	0.08 max. and below	1.00	2.50	0.045	0.030	7.50 ~ 10.50	18.00 ~ 20.00	-	0.15 ~ 0.30
SUS 304LN	0.03 max. and below	1.00	2.00	0.045	0.030	8.50 ~ 11.50	17.00 ~ 19.00	-	0.12 ~ 0.22
SUS 316	0.08 max. and below	1.00	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	-
SUS 309S	0.08 max. and below	1.00	2.00	0.045	0.030	12.00 ~ 15.00	22.00 ~ 24.00	-	-
SUS 310S	0.08 max. and below	1.50	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	-	-
SUS 316L	0.03 max. and below	1.00	2.00	0.045	0.030	12.00 ~ 15.00	16.00 ~ 18.00	2.00 ~ 3.00	-
SUS 316N	0.08 max. and below	1.00	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	0.10 ~ 0.22
SUS 316LN	0.03 max. and below	1.00	2.00	0.045	0.030	10.50 ~ 14.50	16.50 ~ 18.50	2.00 ~ 3.00	0.10 ~ 0.22
SUS 317	0.08 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
SUS 317L	0.03 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	-
SUS 317LN	0.03 max. and below	1.00	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	0.10 ~ 0.22
SUS 321 (2)	0.08 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-
SUS 347 (3)	0.08 max. and below	1.00	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	-	-

NOTES:

(1) Grade SUS 304N2 shall have a niobium content of no more than 0.15%
(2) Grade SUS 321 shall have a titanium content of not less than 5 times the carbon content
(3) Grade SUS 347 shall have a niobium content of not less than 10 times the carbon content

Mechanical Properties In Solution Treated						
Symbol of Class	Solution Treatment	Proof stress	Tensile Strength	Elongation	Hardness	
	°C	N/mm²	N/mm²	%	HRB	HB
SUS 304	1010 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 304L	1010 ~ 1150 Rapid Cooling	175 min. and above	480 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 304N1	1010 ~ 1150 Rapid Cooling	275 min. and above	550 min. and above	35 min. and above	95 max. and below	217 max. and below
SUS 304N2	1010 ~ 1150 Rapid Cooling	345 min. and above	690 min. and above	35 min. and above	100 max. and below	248 max. and below
SUS 304LN	1010 ~ 1150 Rapid Cooling	245 min. and above	550 min. and above	40 min. and above	95 max. and below	217 max. and below
SUS 309S	1030 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 310S	1030 ~ 1180 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 316	1010 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 316L	1010 ~ 1150 Rapid Cooling	175 min. and above	480 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 316N	1010 ~ 1150 Rapid Cooling	275 min. and above	550 min. and above	35 min. and above	95 max. and below	217 max. and below
SUS 316LN	1010 ~ 1150 Rapid Cooling	245 min. and above	550 min. and above	40 min. and above	95 max. and below	217 max. and below
SUS 317	1010 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 317L	1010 ~ 1150 Rapid Cooling	175 min. and above	480 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 317LN	1010 ~ 1150 Rapid Cooling	245 min. and above	550 min. and above	40 min. and above	95 max. and below	217 max. and below
SUS 321	920 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below
SUS 347	980 ~ 1150 Rapid Cooling	205 min. and above	520 min. and above	40 min. and above	90 max. and below	187 max. and below

DIMENSIONAL TOLERANCE FOR FLANGES

IN ACCORDANCE TO ASME / ANSI B16.5			
ITEM	FLANGE TYPE	SIZE RANGE	TOLERANCE
OUTSIDE DIAMETER	ALL TYPES	610mm and less	+1.6 mm ; -1.6 mm
		Over 600mm	+3.2 mm ; -3.2 mm
INSIDE DIAMETER	W N	10" and below	+0.8 mm ; -0.8 mm
		Between 12" and 18"	+1.6 mm ; -1.6 mm
		20" and above	+3.2 mm ; -1.6 mm
	S O , L J	10" and below	+0.8 mm ; -0.0 mm
		12" and above	+1.6 mm ; -0.0 mm
	S W	Between 1/2" and 2"	+0.3 mm ; -0.0 mm
		Between 2" and 3"	+0.4 mm ; -0.0 mm
DIAMETER of SOCKET	S W	Between 1/2" and 2"	+0.4 mm ; -0.4 mm
		Between 2" and 3"	+0.8 mm ; -0.8 mm
DIAMETER at BASE of HUB	W N	610mm and less	+1.6 mm ; -1.6 mm
		Over 600mm	+3.2 mm ; -3.2 mm
	S O , S W , L J , T R	12" and below	+1.6 mm ; -0.8 mm
		14" and above	+3.2 mm ; -1.6 mm
DIAMETER of Hub at BEVEL END	W N	5" and below	+2.4 mm ; -0.8 mm
		6" and above	+4.0 mm ; -0.8 mm
THICKNESS of FLANGE	ALL TYPES	18" and below	+3.2 mm ; -0.0 mm
		20" and above	+4.8 mm ; -0.0 mm
BOLT CIRCLE DIAMETER	ALL TYPES	ALL SIZES	+1.6 mm ; -1.6 mm
DIAMETER of BOLT HOLE		ALL SIZES	+0.5 mm ; -0.5 mm
LENGTH THRU' HUB	W N	4" and below	+1.6 mm ; -1.6 mm
		Between 5" and 10"	+1.6 mm ; -3.2 mm
		12" and above	+3.2 mm ; -4.8 mm
	S O , S W , L J , T R	18" and below	+3.2 mm ; -0.8 mm
		20" and above	+4.8 mm ; -1.6 mm
THICKNESS at BEVEL END	W N	For All Nominal Pipe Size	Not Less Than 87.5% Of Nominal Thickness

IN ACCORDANCE TO JIS B2220		
ITEM	SIZE RANGE	TOLERANCE
OUTSIDE DIAMETER (D)	600mm and less	+1.5 mm ; -1.5 mm
	Over 600mm	+3.0 mm ; -3.0 mm
INSIDE DIAMETER (B_o)	100mm and less	+0.5 mm ; -0.0 mm
	>100mm, up to 400mm	+1.0 mm ; -0.0 mm
	>400mm, up to 600mm	+1.5 mm ; -0.0 mm
	>600mm, up to 800mm	+2.0 mm ; -0.0 mm
	>800mm, up to 1000mm	+2.5 mm ; -0.0 mm
	Over 1000mm	+3.0 mm ; -0.0 mm
DIAMETER OF HUB (H)	220mm and less	+2.0 mm ; -0.0 mm
	>220mm, up to 650mm	+4.0 mm ; -0.0 mm
	Over 650mm	+8.0 mm ; -0.0 mm
DIAMETER OF RAISED FACE (G)	700mm and less	+0.8 mm ; -0.8 mm
	Over 700mm	+1.5 mm ; -1.5 mm
THICKNESS OF FLANGE (t)	20mm and less	+1.5 mm ; -0.0 mm
	>20mm, up to 50mm	+2.0 mm ; -0.0 mm
	Over 50mm	+3.0 mm ; -0.0 mm
BOLT CIRCLE DIAMETER (C)	950mm and less	+0.8 mm ; -0.8 mm
	Over 950mm	+1.5 mm ; -1.5 mm
LENGTH THRU' HUB (T)	ALL SIZES	+2.0 mm ; -2.0 mm

PIPES

CHEMICAL COMPOSITION

Grade		Chemical Composition (%)							
		C	Si	Mn	P	S	Ni	Cr	Mo
JIS	SUS 304 TP	≦ 0.08	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	8.00 - 11.00	18.00 - 20.00	-
	SUS 304L TP	≦ 0.03	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	9.00 - 13.00	18.00 - 20.00	-
	SUS 316 TP	≦ 0.08	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	10.00 - 14.00	16.00 - 18.00	2.00 ~ 3.00
	SUS 316L TP	≦ 0.03	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	12.00 - 16.00	16.00 - 18.00	2.00 ~ 3.00
ASTM	TP 304	≦ 0.08	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	8.00 - 11.00	18.00 ~ 20.00	-
	TP 304L	≦ 0.035	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	8.00 ~ 13.00	18.00 - 20.00	-
	TP 316	≦ 0.08	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	10.00 - 14.00	16.00 - 18.00	2.00 ~ 3.00
	TP 316L	≦ 0.035	≦ 1.00	≦ 2.00	≦ 0.045	≦ 0.03	10.00 - 14.00	16.00 - 18.00	2.00 ~ 3.00

PRESSURE RATINGS FOR PIPES

The tables show the highest permissible internal pressure at 8 temperatures for steel grade 304L calculated according to the rules in ASME B31.3, Chemical Plant and Petroleum Refinery Piping.

The following formula has been used in the pressure calculations.

$$P = 68.95 \times \frac{2S \times E_j \times t_{min}}{OD - (2Y \times t_{min})}$$

American Standard
ASME B31.3

Longtitundinal Weld Joint Quality Factor (E_j)

ASTM specification	A 312	A 358	A 790	A 928
0 % radiographed Single butt weld	0.8	-	0.8	-
Double butt weld. Class 2	0.8	0.85	0.85	0.85
Spot radiographed Double butt weld. Class 5	-	0.9	-	0.9
100 % radiographed Single or double butt weld. Class 1,3,4	1.0	1.0	1.0	1.0

P = Internal pressure in ksi
t_{min} = Minimum allowable wall thickness in mm
S = Allowable stress in bar
E_j = Weld Joint Quality Factor. (Related to the type of joint and amount of examination.)
OD = Nominal outside diameter in mm
Y = 0.4 when t_{min} < 0D/6

Steel type	Pipe;no filler	with filler	Tube
Austenitic Duplex	A312 A790		

**Not yet in ASME B31.3*

Highest permissible pressure for other grades can be calculated by multiplying the maximum allowable pressure for 304L (shown in the tables below by the coefficient for the relevant grade and temperature). The following data is to be used as a guide and recommendations only. Factors other than temperature will also affect the strength (pressure) and corrosivness of the steel material.

Coefficients for obtaining highest permissible pressures for other steel grades

TP/UNS	AST	200 93	300 149	400 204	500 260	600 316	700 371	800 427	900°F 482°C
304L	18-9L	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
304	18-9	1.20	1.20	1.18	1.18	1.17	1.19	1.17	1.23
321	18-10Ti	1.20	1.20	1.18	1.17	1.17	1.17	1.19	1.28
316L	17-11-2L	1.00	1.00	0.98	0.97	0.96	0.96	0.95	0.99
316	17-11-2	1.20	1.20	1.22	1.21	1.21	1.21	1.22	1.30
S31803	2205	1.80	1.73	1.77	1.84	1.92	-	-	-
S32750	SAF 2507™	2.10	1.98	2.02	2.12	2.23	-	-	-
S31254	254 SMO®	1.41	1.28	1.26	1.25	1.28	1.30	-	-

PRESSURE RATINGS FOR PIPES

American Standard
ASME B 31.3
Pipe, ANSI Dimensions

Grade 304L	ASTM A312	ASTM A358
Wall thickness tolerance	12.50%	-0.3mm
Radiographic test	0%	100%
Joint Quality Factor (E_j)	0.8	1.0

Dimensions				ASTM	Max. allowable pressure in bar (1bar = 14.50 psi)								
OD mm	NPS	Wall mm	SCH		100˚F 40˚C	200˚F 93˚C	300˚F 149˚C	400˚F 204˚C	500˚F 260˚C	600˚F 316˚C	700˚F 371˚C	800˚F 427˚C	900˚F 482˚C
13.7	1/4	1.65	5S	A 312	212	212	212	201	188	178	171	165	151
17.2	3/8	1.65	5S	A 312	166	166	166	157	147	139	134	129	118
21.3	1/2	1.65	5S	A 312	132	132	132	125	117	111	107	103	94
21.3		2.11	10S	A 312	172	172	172	162	152	144	139	134	122
21.3		2.77	40S	A 312	231	231	231	218	204	193	186	180	164
26.7	3/4	1.65	5S	A 312	104	104	104	99	92	87	84	81	74
26.7		2.11	10S	A 312	135	135	135	128	120	113	109	105	96
26.7		2.87	40S	A 312	187	187	187	177	166	157	151	146	134
33.4	1	1.65	5S	A 312	82	82	82	78	73	69	67	64	59
33.4		2.77	10S	A 312	142	142	142	134	126	119	115	110	101
33.4		3.38	40S	A 312	176	176	176	166	156	147	142	137	125
42.2	1 1/4	1.65	5S	A 312	65	65	65	61	57	54	52	50	46
42.2		2.77	10S	A 312	111	111	111	105	98	93	90	86	79
42.2		3.56	40S	A 312	145	145	145	137	128	121	117	113	103
48.3	1 1/2	1.65	5S	A 312	56	56	56	53	50	47	46	44	40
48.3		2.77	10S	A 312	96	96	96	91	85	81	78	75	69
48.3		3.68	40S	A 312	130	130	130	123	115	109	105	101	92
60.3	2	1.65	5S	A 312	45	45	45	43	40	38	36	35	32
60.3		2.77	10S	A 312	77	77	77	72	68	64	62	60	55
60.3		3.91	40S	A 312	109	109	109	104	97	92	89	85	78
73.0	2 1/2	2.11	5S	A 312	48	48	48	45	42	40	38	37	34
73.0		3.05	10S	A 312	69	69	69	66	61	58	56	54	49
73.0		5.16	40S	A 312	120	120	120	113	106	100	97	93	85
88.9	3	2.11	5S	A 312	39	39	39	37	34	33	31	30	28
88.9		3.05	10S	A 312	57	57	57	54	50	48	46	44	40
88.9		5.49	40S	A 312	104	104	104	98	92	87	84	81	74
101.6	3 1/2	2.11	5S	A 312	34	34	34	32	30	28	27	26	24
101.6		3.05	10S	A 312	49	49	49	47	44	41	40	38	35
101.6		5.74	40S	A 312	95	95	95	90	84	79	77	74	68
114.3	4	2.11	5S	A 312	30	30	30	29	27	25	24	23	21
114.3		3.05	10S	A 312	44	44	44	41	39	37	35	34	31
114.3		6.02	40S	A 312	88	88	88	83	78	74	71	69	63
114.3	4	9.53	80S	A 358	177	177	177	167	157	148	143	138	126
141.3	5	2.77	5S	A 312	32	32	32	30	28	27	26	25	23
141.3		3.40	10S	A 312	39	39	39	37	35	33	32	31	28
141.3		6.55	40S	A 312	77	77	77	73	68	65	62	60	55
141.3	5	9.53	80S	A 358	159	159	159	150	141	133	128	124	113
168.3	6	2.77	5S	A 312	27	27	27	25	24	23	22	21	19
168.3		3.40	10S	A 312	33	33	33	31	29	28	27	26	24
168.3		7.11	40S	A 312	70	70	70	66	62	59	57	55	50
168.3	6	10.97	80S	A 358	154	154	154	146	136	129	124	120	110

PRESSURE RATINGS FOR PIPES

American Standard
ASME B 31.3
Pipe, ANSI Dimensions

Grade 304L	ASTM A312	ASTM A358
Wall thickness tolerance	12.50%	-0.3mm
Radiographic test	0%	100%
Joint Quality Factor (E_j)	0.8	1.0

Dimensions				ASTM	Max. allowable pressure in bar (1bar = 14.50 psi)								
OD mm	NPS	Wall mm	SCH		100°F 40°C	200°F 93°C	300°F 149°C	400°F 204°C	500°F 260°C	600°F 316°C	700°F 371°C	800°F 427°C	900°F 482°C
219.1	8	10.31	60	A 358	109	109	109	103	97	92	88	85	78
219.1		12.70	80	A 358	137	137	137	129	121	114	110	106	97
219.1		15.09	100	A 358	164	164	164	155	146	138	133	128	117
219.1		18.26	12	A 358	202	202	202	191	179	169	163	157	144
273.0	10	3.40	5S	A 312	20	20	20	19	18	17	16	16	14
273.0		4.19	10S	A 312	25	25	25	24	22	21	20	19	18
273.0		6.35	20S	A 312	38	38	38	36	34	32	31	30	27
273.0		9.27	40S	A 312	56	56	56	53	50	47	45	44	40
273.0	10	12.70	60	A 358	109	109	109	103	96	91	88	84	77
273.0		15.09	80	A 358	130	130	130	123	116	109	105	102	93
273.0		18.26	100	A 358	160	160	160	151	142	134	129	124	114
273.0		21.44	120	A 358	190	190	190	180	168	159	154	148	135
323.9	12	3.96	5S	A 312	20	20	20	19	18	17	16	15	14
323.9		4.57	10S	A 312	23	23	23	22	20	19	19	18	16
323.9		6.35	20S	A 312	32	32	32	30	28	27	26	25	23
323.9		9.53	40S	A 312	48	48	48	46	43	41	39	38	35
323.9	12	10.31	40	A 358	73	73	73	69	65	61	59	57	52
323.9		12.70	XS	A 358	91	91	91	86	81	76	74	71	65
323.9		14.27	60	A 358	103	103	103	97	91	86	83	80	73
323.9		17.48	80	A 358	128	128	128	121	113	107	103	99	91
323.9		21.44	100	A 358	159	159	159	150	141	133	128	123	113
323.9		25.40	120	A 358	190	190	190	180	169	159	154	148	136
355.6	14	3.96	5S	A 312	18	18	18	17	16	15	15	14	13
355.6		4.78	10S	A 312	22	22	22	21	19	18	18	17	16
355.6		6.35	10	A 312	29	29	29	28	26	24	24	23	21
355.6	14	7.92	20	A 358	50	50	50	48	44	42	41	39	36
355.6		9.53	30	A 358	61	61	61	58	54	51	49	48	43
355.6		11.13	40	A 358	72	72	72	68	64	60	58	56	51
355.6		12.70	XS	A 358	83	83	83	78	73	69	67	64	59
355.6		15.09	60	A 358	99	99	99	94	88	83	80	77	71
355.6		19.05	80	A 358	127	127	127	120	112	106	102	99	90
355.6		23.83	100	A 358	161	161	161	152	143	135	130	125	115
355.6		27.79	120	A 358	190	190	190	180	168	159	153	148	135
406.4	16	4.19	5S	A 312	17	17	17	16	15	14	14	13	12
406.4		4.78	10S	A 312	19	19	19	18	17	16	15	15	14
406.4		6.35	10	A 312	25	25	25	24	23	21	21	20	18
406.4	16	7.92	20	A 358	44	44	44	41	39	37	35	34	31
406.4		9.53	30	A 358	53	53	53	50	47	45	43	41	38
406.4		12.70	40	A 358	72	72	72	68	64	60	58	56	51
406.4		16.66	60	A 358	96	96	96	91	85	80	77	75	68
406.4		21.44	80	A 358	125	125	125	118	111	105	101	97	89
406.4		26.19	100	A 358	155	155	155	146	137	130	125	120	110
406.4		30.96	120	A 358	185	185	185	175	164	155	149	144	132

PRESSURE RATINGS FOR PIPES

American Standard
ASME B 31.3
Pipe, ANSI Dimensions

Grade 304L	ASTM A312	ASTM A358
Wall thickness tolerance	12.50%	-0.3mm
Radiographic test	0%	100%
Joint Quality Factor (E_j)	0.8	1.0

Dimensions				ASTM	Max. allowable pressure in bar (1bar = 14.50 psi)								
OD mm	NPS	Wall mm	SCH		100˚F 40˚C	200˚F 93˚C	300˚F 149˚C	400˚F 204˚C	500˚F 260˚C	600˚F 316˚C	700˚F 371˚C	800˚F 427˚C	900˚F 482˚C
457	18	4.19	5S	A 312	15	15	15	14	13	12	12	12	11
457		4.78	10S	A 312	17	17	17	16	15	14	14	13	12
457		6.35	10	A 312	23	23	23	21	20	19	18	18	16
457	18	7.92	20	A 358	39	39	39	37	34	33	31	30	28
457		9.53	30	A 358	47	47	47	45	42	40	38	37	34
457		12.70	XS	A 358	64	64	64	60	57	54	52	50	46
457		14.27	40	A 358	72	72	72	68	64	60	58	56	51
457		17.48	-	A 358	89	89	89	84	79	75	72	69	64
457		19.05	60	A 358	98	98	98	92	87	82	79	76	70
457		23.83	80	A 358	124	124	124	117	110	104	100	96	88
508	20	4.78	5S	A 312	15	15	15	14	14	13	12	12	11
508		5.54	10S	A 358	22	22	22	21	20	19	18	17	16
508		6.35	10	A 312	20	20	20	19	18	17	16	16	14
508	20	9.53	20	A 358	42	42	42	40	38	36	34	33	30
508		12.70	30	A 358	57	57	57	54	51	48	46	45	41
508		15.09	40	A 358	69	69	69	65	61	58	55	53	49
508		20.62	60	A 358	95	95	95	90	84	80	77	74	68
508		26.19	80	A 358	122	122	122	116	108	103	99	95	87
508		32.54	100	A 358	154	154	154	146	136	129	124	120	110
610	24	5.54	5S	A 312	15	15	15	14	13	12	12	11	10
610		6.35	10S	A 358	21	21	21	20	19	18	17	16	15
610	24	9.53	20	A 358	35	35	35	33	31	30	29	27	25
610		12.70	XS	A 358	48	48	48	45	42	40	38	37	34
610		14.27	30	A 358	54	54	54	51	48	45	43	42	38
610		17.48	40	A 358	66	66	66	63	59	56	54	52	47
610		24.59	60	A 358	95	95	95	90	84	79	77	74	67
610		30.94	80	A 358	121	121	121	114	107	101	97	94	86
660	26	7.92	10	A 358	27	27	27	25	24	22	22	21	19
660		9.53	STD	A 358	33	33	33	31	29	27	26	25	23
660		12.7	20	A 312	44	44	44	42	39	37	36	34	31
711	28	5.54	-	A 358	17	17	17	16	15	14	14	13	12
711		6.35	-	A 358	20	20	20	19	17	17	16	15	14
711		7.92	10	A 358	25	25	25	24	22	21	20	19	18
711		9.53	STD	A 358	30	30	30	29	27	25	24	24	22
711		12.70	20	A 358	41	41	41	39	36	34	33	32	29
711		15.88	30	A 358	51	51	51	49	46	43	42	40	37
762	30	6.35	5S	A 358	18	18	18	17	16	15	15	14	13
762		7.92	10S	A 358	23	23	23	22	21	19	19	18	17
762		9.53	STD	A 358	28	28	28	27	25	24	23	22	20
762	30	12.70	20	A 358	38	38	38	36	34	32	31	30	27
762		15.88	30	A 358	48	48	48	45	42	40	39	37	34
813	32	7.92	10	A 358	22	22	22	21	19	18	18	17	15
813		9.53	STD	A 358	26	26	26	25	23	22	21	21	19
813		12.70	20	A 358	36	36	36	34	32	30	29	28	25
864	34	5.54	-	A 358	14	14	14	13	12	12	11	11	10
864		7.92	10	A 358	20	20	20	19	18	17	17	16	15
864		9.53	STD	A 388	25	25	25	23	22	21	20	19	18
864		12.70	20	A 358	33	33	33	32	30	28	27	26	24

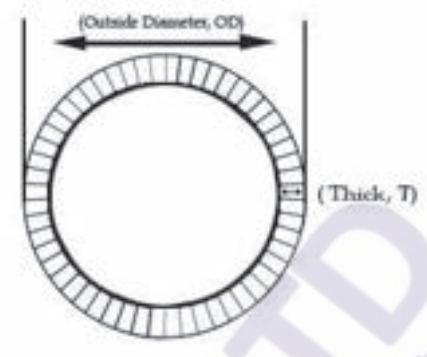
PRESSURE RATINGS FOR PIPES

American Standard
ASME B 31.3
Pipe, ANSI Dimensions

Grade 304L	ASTM A312	ASTM A358
Wall thickness tolerance	12.50%	-0.3mm
Radiographic test	0%	100%
Joint Quality Factor (E_j)	0.8	1.0

Dimensions				ASTM	Max. allowable pressure in bar (1bar = 14.50 psi)								
OD mm	NPS	Wall mm	SCH		100˚F 40˚C	200˚F 93˚C	300˚F 149˚C	400˚F 204˚C	500˚F 260˚C	600˚F 316˚C	700˚F 371˚C	800˚F 427˚C	900˚F 482˚C
914	36	6.35	-	A 358	15	15	15	14	14	13	12	12	11
914		7.92	10	A 358	19	19	19	18	17	16	16	15	14
914		9.53	STD	A 358	23	23	23	22	21	20	19	18	17
914		12.70	20	A 358	32	32	32	30	28	26	26	25	23
965	38	7.92	-	A 358	18	18	18	17	16	15	15	14	13
965		9.53	STD	A 358	22	22	22	21	20	19	18	17	16
965		12.70	XS	A 358	30	30	30	28	26	25	24	23	21
1016	40	6.35	-	A 358	14	14	14	13	12	12	11	11	10
1016		7.92	-	A 358	17	17	17	16	15	15	14	14	12
1016		9.53	STD	A 358	21	21	21	20	19	18	17	16	15
1016		12.70	XS	A 358	28	28	28	27	25	24	23	22	20
1067	42	7.92	-	A 358	17	17	17	16	15	14	13	13	12
1067		9.53	STD	A 358	20	20	20	19	18	17	16	16	14
1067		12.70	XS	A 358	27	27	27	26	24	23	22	21	19
1118	44	6.35	-	A 358	13	13	13	12	11	10	10	10	9
1118		7.92	-	A 358	16	16	16	15	14	13	13	12	11
1118		9.53	STD	A 358	19	19	19	18	17	16	15	15	14
1118		12.70	XS	A 358	26	26	26	24	23	22	21	20	18
1168	46	7.92	-	A 358	15	15	15	14	13	13	12	12	11
1168		9.53	STD	A 358	18	18	18	17	16	15	15	14	13
1168		12.70	XS	A 358	25	25	25	23	22	21	20	19	18
1219	48	6.35	-	A 358	11	11	11	11	10	10	9	9	8
1219		7.92	-	A 358	14	14	14	14	13	12	12	11	10
1219		9.53	STD	A 358	18	18	18	17	16	15	14	14	13
1219		12.70	XS	A 358	24	24	24	22	21	20	19	18	17
1321	52	9.53	-	A 358	16	16	16	15	14	14	13	13	12
1321		12.70	-	A 358	22	22	22	21	19	18	18	17	16
1372	54	9.53	-	A 358	16	16	16	15	14	13	13	12	11
1372		12.70	-	A 358	21	21	21	20	19	18	17	16	15
1422	56	9.53	-	A 358	15	15	15	14	13	13	12	12	11
1422		12.70	-	A 358	20	20	20	19	18	17	16	16	14
1524	60	9.53	-	A 358	14	14	14	13	12	12	11	11	10
1524		12.70	-	A 358	19	19	19	18	17	16	15	15	13
1626	64	9.53	-	A 358	13	13	13	12	12	11	11	10	9
1626		12.70	-	A 358	18	18	18	17	16	15	14	14	13

STAINLESS STEEL PIPES (SEAMLESS / WELDED)



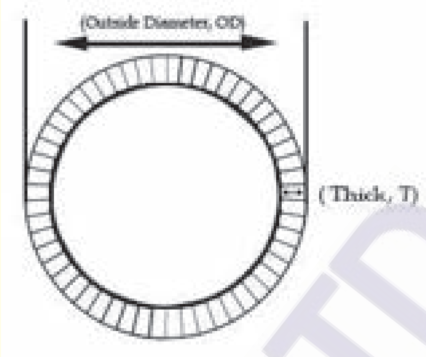
ASTM A312 / A358 / A778 ; ANSI / ASME B36.19M

N.B.	OUTSIDE DIAMETER		SCH 5s			SCH 10s		
	Inch	mm	THICK Inch	THICK mm	WEIGHT kg/m	THICK Inch	THICK mm	WEIGHT kg/m
1/8″	0.405	10.29	-	-	-	0.049	1.24	0.28
1/4″	0.540	13.72	-	-	-	0.065	1.65	0.49
3/8″	0.675	17.15	-	-	-	0.065	1.65	0.63
1/2″	0.840	21.34	0.065	1.65	0.80	0.083	2.11	1.00
3/4″	1.050	26.67	0.065	1.65	1.02	0.083	2.11	1.28
1″	1.315	33.40	0.065	1.65	1.29	0.109	2.77	2.09
1-1/4″	1.660	42.16	0.065	1.65	1.65	0.109	2.77	2.69
1-1/2″	1.900	48.26	0.065	1.65	1.90	0.109	2.77	3.11
2″	2.375	60.33	0.065	1.65	2.39	0.109	2.77	3.93
2-1/2″	2.875	73.03	0.083	2.11	3.69	0.120	3.05	5.26
3″	3.500	88.90	0.083	2.11	4.52	0.120	3.05	6.46
3-1/2″	4.000	101.60	0.083	2.11	5.18	0.120	3.05	7.41
4″	4.500	114.30	0.083	2.11	5.84	0.120	3.05	8.37
5″	5.563	141.30	0.109	2.77	9.46	0.134	3.40	11.60
6″	6.625	168.28	0.109	2.77	11.30	0.134	3.40	13.80
8″	8.625	219.08	0.109	2.77	14.80	0.148	3.76	20.00
10″	10.750	273.05	0.134	3.40	22.60	0.165	4.19	27.80
12″	12.750	323.85	0.156	3.96	31.20	0.180	4.57	36.00
14″	14.000	355.60	0.156	3.96	34.30	0.188	4.78	41.40
16″	16.000	406.40	0.165	4.19	41.60	0.188	4.78	47.30
18″	18.000	457.20	0.165	4.19	46.80	0.188	4.78	53.30
20″	20.000	508.00	0.188	4.78	59.30	0.218	5.54	68.60
22″	22.000	558.80	0.188	4.78	65.30	0.218	5.54	75.60
24″	24.000	609.60	0.218	5.54	82.50	0.250	6.35	94.50
30″	30.000	762.00	0.250	6.35	118.30	0.312	7.92	147.30

Available grades: TP304 / L (dual spec), TP316 / L (dual spec), TP317/ L, TP321, TP310S, S31803, S32205, S32750, etc.

** Above weight list are based on theoretical calculation.*
** Other dimensions and thickness are available on request.*

STAINLESS STEEL PIPES (SEAMLESS / WELDED)



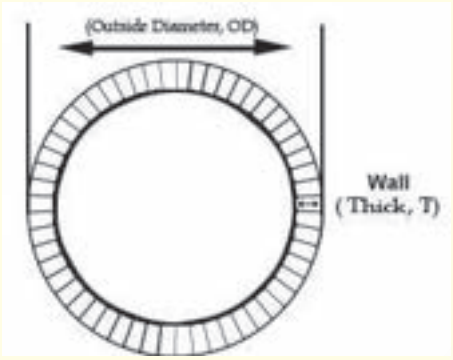
ASTM A312 / A358 / A778 ; ANSI / ASME B36.19M

N.B.	OUTSIDE DIAMETER		SCH 40s / STD			SCH 80s / XS			SCH 160		
	Inch	mm	THICK Inch	THICK mm	WEIGHT kg/m	THICK Inch	THICK mm	WEIGHT kg/m	THICK Inch	THICK mm	WEIGHT kg/m
1/8″	0.405	10.29	0.068	1.73	0.37	0.095	2.41	0.47	-	-	-
1/4″	0.540	13.72	0.088	2.24	0.63	0.119	3.02	0.80	-	-	-
3/8″	0.675	17.15	0.091	2.31	0.85	0.126	3.20	1.10	-	-	-
1/2″	0.840	21.34	0.109	2.77	1.27	0.147	3.73	1.62	0.188	4.78	1.95
3/4″	1.050	26.67	0.113	2.87	1.68	0.154	3.91	2.19	0.219	5.56	2.90
1″	1.315	33.40	0.133	3.38	2.50	0.179	4.55	3.42	0.250	6.35	4.24
1-1/4″	1.660	42.16	0.140	3.56	3.39	0.191	4.85	4.46	0.250	6.35	5.61
1-1/2″	1.900	48.26	0.145	3.68	4.05	0.200	5.08	5.41	0.281	7.14	7.25
2″	2.375	60.33	0.154	3.91	5.44	0.218	5.54	7.49	0.344	8.74	11.11
2-1/2″	2.875	73.03	0.203	5.16	8.64	0.276	7.01	11.40	0.375	9.53	14.92
3″	3.500	88.90	0.216	5.49	11.30	0.300	7.62	15.30	0.438	11.13	21.35
3-1/2″	4.000	101.60	0.226	5.74	13.60	0.318	8.08	18.60	-	-	-
4″	4.500	114.30	0.237	6.02	16.10	0.337	8.56	22.30	0.531	13.49	33.54
5″	5.563	141.30	0.258	6.55	21.80	0.375	9.53	30.90	0.625	15.88	49.11
6″	6.625	168.28	0.280	7.11	28.30	0.432	10.97	42.60	0.719	18.26	67.56
8″	8.625	219.08	0.322	8.18	42.50	0.500	12.70	64.60	0.906	23.01	111.27
10″	10.750	273.05	0.365	9.27	60.30	0.500	12.70	81.50	1.125	28.58	172.33
12″	12.750	323.85	0.375	9.52	73.80	0.500	12.70	97.40	1.312	33.32	238.76
14″	14.000	355.60	0.375	9.53	81.33	0.500	12.70	107.39	1.406	35.71	281.70
16″	16.000	406.40	0.375	9.53	93.27	0.500	12.70	123.30	1.594	40.49	365.35
18″	18.000	457.20	0.375	9.53	105.16	0.500	12.70	139.15	1.781	45.24	459.37
20″	20.000	508.00	0.375	9.53	117.15	0.500	12.70	155.12	1.969	50.01	564.81
22″	22.000	558.80	0.375	9.53	129.13	0.500	12.70	171.09	2.125	53.98	672.26
24″	24.000	609.60	0.375	9.53	141.12	0.500	12.70	187.06	2.344	59.54	808.22
30″	30.000	762.00	0.375	9.53	176.84	0.500	12.70	234.67	-	-	-

Available grades: TP304 / L (dual spec), TP316 / L (dual spec), TP317/ L, TP321, TP310S, S31803, S32205, S32750, etc.

** Above weight list are based on theoretical calculation.*
** Other dimensions and thickness are available on request.*

JIS G3459 - STAINLESS STEEL PIPES



Dimension & Weight

Nominal Outside Diameter (O.D)			Nominal Wall Thickness													
			SCH 5s		SCH 10s		SCH 20		SCH 40		SCH 80		SCH 120		SCH 160	
A	Inch	mm	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m	Wall THICK-NESS	kg/ m
6	1/8	10.5	1.00	0.237	1.20	0.278	1.50	0.336	1.70	0.373	2.40	0.484	-	-	-	-
8	1/4	13.8	1.20	0.377	1.65	0.499	2.00	0.588	2.20	0.636	3.00	0.807	-	-	-	-
10	3/8	17.3	1.20	0.481	1.65	0.643	2.00	0.762	2.30	0.859	3.20	1.120	-	-	-	-
15	1/2	21.7	1.65	0.824	2.10	1.03	2.50	1.20	2.80	1.32	3.70	1.66	-	-	4.70	1.99
20	3/4	27.2	1.65	1.05	2.10	1.31	2.50	1.54	2.90	1.76	3.90	2.26	-	-	5.50	2.97
25	1	34.0	1.65	1.33	2.80	2.18	3.00	2.32	3.40	2.59	4.50	3.31	-	-	6.40	4.40
32	1-1/4	42.7	1.65	1.69	2.80	2.78	3.00	2.97	3.60	3.51	4.90	4.61	-	-	6.40	5.79
40	1-1/2	48.6	1.65	1.93	2.80	3.19	3.00	3.41	3.70	4.14	5.10	5.53	-	-	7.10	7.34
50	2	60.5	1.65	2.42	2.80	4.02	3.50	4.97	3.90	5.50	5.50	7.54	-	-	8.70	11.20
65	2-1/2	76.3	2.10	3.88	3.00	5.48	3.50	6.35	5.20	9.21	7.00	12.10	-	-	9.50	15.80
80	3	89.1	2.10	4.55	3.00	6.43	4.00	8.48	5.50	11.50	7.60	15.40	-	-	11.10	21.60
90	3-1/2	101.6	2.10	5.20	3.00	7.37	4.00	9.72	5.70	13.60	8.10	18.90	-	-	12.70	28.10
100	4	114.3	2.10	5.87	3.00	8.32	4.00	11.00	6.00	16.20	8.60	22.60	11.1	28.50	13.50	33.90
125	5	139.8	2.80	9.56	3.40	11.60	5.00	16.80	6.60	21.90	9.50	30.80	12.7	40.20	15.90	49.10
150	6	165.2	2.80	11.30	3.40	13.70	5.00	20.00	7.10	28.00	11.00	42.30	14.3	53.80	18.20	66.60
200	8	216.3	2.80	14.90	4.00	21.20	6.50	34.00	8.20	42.50	12.70	64.40	18.2	89.80	23.00	111.0
250	10	267.4	3.40	22.40	4.00	26.20	6.50	42.20	9.30	59.80	15.10	94.90	21.4	131.0	28.60	170.0
300	12	318.5	4.00	31.30	4.50	35.20	6.50	50.50	10.30	79.10	17.40	131.0	25.4	185.0	33.30	237.0
350	14	355.6	-	-	-	-	-	-	11.10	95.30	19.00	159.0	27.8	227.0	35.70	284.0
400	16	406.4	-	-	-	-	-	-	12.70	125.0	21.40	205.0	30.9	289.0	40.50	369.0
450	18	457.2	-	-	-	-	-	-	14.30	158.0	23.80	257.0	34.9	367.0	45.20	464.0
500	20	508.0	-	-	-	-	-	-	15.10	185.0	26.20	314.0	38.1	446.0	50.00	570.0
550	22	558.8	-	-	-	-	-	-	15.90	215.0	28.60	378.0	41.3	532.0	54.00	679.0
600	24	609.6	-	-	-	-	-	-	17.50	258.0	31.00	447.0	46.0	646.0	59.50	815.0
650	26	660.4	-	-	-	-	-	-	18.90	302.0	34.00	531.0	49.1	748.0	64.20	953.0

Above weight list are based on theoretical calculations.

OUTSIDE DIAMETER OF STEEL PIPE

Nominal Pipe Size		Outside Diameter of Steel Pipe, mm		Nominal Pipe Size		Outside Diameter of Steel Pipe, mm	
mm	Inch	JIS Standard	ASME Standard	mm	Inch	JIS Standard	ASME Standard
10	3/8"	17.3	17.1	150	6"	165.2	168.3
15	1/2"	21.7	21.3	175	7"	190.7	-
20	3/4"	27.2	26.7	200	8"	216.3	219.1
25	1"	34.0	33.4	225	9"	241.8	-
32	1-1/4"	42.7	42.2	250	10"	267.4	273.0
40	1-1/2"	48.6	48.3	300	12"	318.5	323.8
50	2"	60.5	60.3	350	14"	355.6	355.6
65	2-1/2"	76.3	73.0	400	16"	406.4	406.4
80	3"	89.1	88.9	450	18"	457.2	457.2
90	3-1/2"	101.6	101.6	500	20"	508.0	508.0
100	4"	114.3	114.3	550	22"	558.8	558.8
125	5"	139.8	141.2	600	24"	609.6	609.6

Note:
** Outside Diameter of Steel Pipe of JIS Standard is in accordance with JIS G3452, G3454, G3455, G3456, G3457, G3458, G3459 and G3468*
** Outside Diameter of Steel Pipe of ASME Standard is in accordance with ASME B36.10M and ASME B36.19M.*

TOLERANCE

DIMENSIONAL TOLERANCE	(IN ACCORDANCE TO ASTM A312)	
ITEM	SIZE RANGE	TOLERANCE
OUTSIDE DIAMETER (OD)	48.26mm and less	+0.4 mm ; -0.8 mm
	>48.26mm, up to 114.3mm	+0.8 mm ; -0.8 mm
	>114.3mm, up to 219.08mm	+1.6 mm ; -0.8 mm
	>219.08mm, up to 457.2mm	+2.4 mm ; -0.8 mm
	>457.2mm, up to 660.4mm	+3.2 mm ; -0.8 mm
	>660.4mm, up to 863.6mm	+4.0 mm ; -0.8 mm
	More than 863.6mm	+4.8 mm ; -0.8 mm
THICKNESS	ALL SIZES	Not Less Than 87.5% Of Nominal Thickness
LENGTH *	ALL SIZES	+50.0 mm ; -0 mm

Length - Longer than 6M is available subject to negotiation.*

DIMENSIONAL TOLERANCE	(IN ACCORDANCE TO JIS G3459)	
ITEM	SIZE RANGE	TOLERANCE
OUTSIDE DIAMETER (OD)	LESS THAN 30.0mm	+0.3 mm ; -0.3 mm
	30.0MM or MORE	+1.0 % ; -1.0 %
THICKNESS	LESS THAN 2.0mm	+0.2 mm ; -0.2 mm
	2.0MM or MORE	+10.0 % ; -10.0 %
LENGTH *	ALL SIZES	Not Less Than Definite Cut Lengths

Length - Longer than 6M is available subject to negotiation.*

VALVES

Wafer Type Ball Valve
Fire Safe to API 607

DIN PN16/ANSI 150
ISO 5211 Direct Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Size: DN15-DN200
Lockable Handle

1-PC Ball Valve
Fire Safe to API 607

ANSI 150/300
ISO 5211 Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Standard Port
Body: S.S./C.S.
Size: 1” - 8”

2-PC Ball Valve
Fire Safe to API 607

ANSI 150/ANSI 300
ISO 5211 Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: 1/2” - 8”
Lockable Handle (Optional)

2-PC Ball Valve
Fire Safe to API 607

DIN PN40/PN16/ANSI 150
ISO 5211 Direct Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Size: DN15-DN200
Lockable Handle

Valve

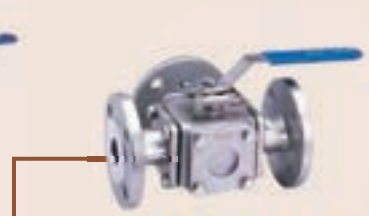
JIS 10K/ANSI 150
ISO 5211 Direct Mounting Pad
Blow-out-proof Stem
Body: S.S./C.S.
Size: 1/2” - 12”
Lockable Handle (Optional)

3-PC Ball Valve
Fire Safe to API 607

Ends: SE/BW/SW/OB/FE
DIN PN16/PN40/PN63/1000 W.O.G.
ISO 5211 Direct Mounting Pad
Anti-Static Device (Optional)
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: 1/2” - 4”
Lockable Handle (Optional)

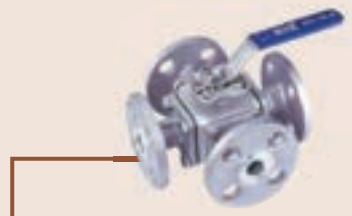
3-PC Ball Valve
Fire Safe to API 607

Ends: SE/BW/SW/FE
DIN PN16/PN40/PN63/1000 W.O.G.
ISO 5211 Mounting Pad
Anti-Static Device (Optional)
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: 1/2” - 4”
Lockable Handle (Optional)



A3W 3-Way Ball Valve

ANSI 150/300
PN16/40
ISO 5211 Direct Mounting Pad
Anti-Static Device (Optional)
Full Port
Body: S.S./C.S.
Size: 1/2” - 8”



A4W 4-Way Ball Valve

ANSI 150/300
PN16/40
ISO 5211 Direct Mounting Pad
Anti-Static Device (Optional)
Full Port
Body: S.S./C.S.
Size: 1/2” - 8”

1-PC Ball Valve

1000 W.O.G./2000 W.O.G.
Reduced Port
Blow-out-proof Stem
Body: S.S./C.S.
Size: 1/4” - 2”
Lockable Handle

2-PC Ball Valve
Fire Safe to API 607

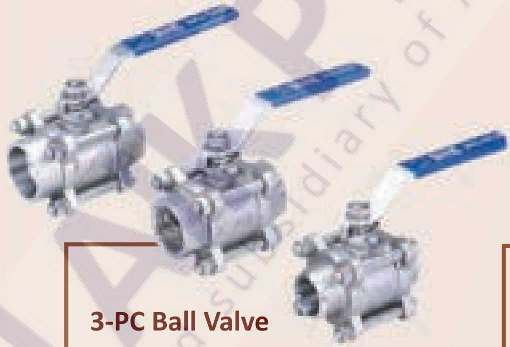
2000 W.O.G.
Reduced Port
Blow-out-proof Stem
Body: S.S./C.S.
Size: 1/2” - 2”
Lockable Handle

2-PC Ball Valve

PN63
ISO 5211 Direct Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: DN8 - DN100
Lockable Handle (Optional)

3-PC Ball Valve
Fire Safe to API 607

Bolt Enclosed Type
Ends: SE/BW/SW
2000 W.O.G./Class 800
ISO 5211 Direct Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: 1/2” - 2”
Lockable Handle (Optional)



3-PC Ball Valve

Ends: SE/BW/SW/Grooved Ends
1000 W.O.G.
Anti-Static Device
Blow-out-proof Stem
Body: S.S./C.S.
Size: 1/4” - 4”
Lockable Handle (Optional)

A3W 3-Way Ball Valve

T-port or L-port
1000 W.O.G.
Body: S.S./C.S.
Size: 1/2” - 2”

2-PC Ball Valve

1000 W.O.G.
Anti-Static Device (Optional)
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: 1/4” - 4”
Lockable Handle (Optional)

3-PC Ball Valve
Fire Safe to API 607

Ends: SE/BW/SW/OB
PN63/ 1000 W.O.G.
ISO 5211 Direct Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Body: S.S./C.S.
Size: DN15 - DN100
Lockable Handle (Optional)

Class 1500/2500 Ball Valve
Fire Safe to API 607

Ends: SE/BW/SW
Anti-Static Device
Blow-out-proof Stem
Reduced Port
Body: S.S./C.S.
Seats: PEEK + 15%CF
Size: 1/2” - 2”
NACE

VALVES

Sanitary Ball Valve

Ends: Clamp/Weld
1000 W.O.G.
Body: SS316/SS316L
Seat: PTFE + 15% G.F. with
Cavity Filler (Optional)
Size: 1/2" - 4"

R7 Butterfly Valve, Wafer. Lug Type

ANSI 150/JIS 10K/DIN PN10
Seat: NBR/EPDM/VITON/PTFE
Body/Disc: Cast Iron/S.S.
Operator: Lock Lever, Worm Gear
Size: 2" - 24"

N5 Needle Valve

High Pressure 6000/10000 W.O.G.
Screwed Ends
Body: Investment Cast S.S./C.S.
Size: 1/4" - 1"

K5 Swing Check Valve

Class 600 Screwed Ends
Body: S.S.
Size: SE: 1/2" - 3"

O5 Globe Valve

Class 600 Screwed Ends
Rising Stem
Body: S.S.
Size: 1/2" - 2"

G5 Gate Valve

Class 600 Screwed Ends
Non rising Stem
Body: S.S.
Size: 1/2" - 3"

O8 Y Globe Valve

Class 600 Screwed Ends
Body: S.S.
Size Range: 1/4" - 2"

K8 Y Spring Check Valve

Class 600 Screwed Ends
Body: S.S.
Size Range: 1/4" - 2"

Pneumatic Actuated Ball Valve

Operation: Pneumatic
Double Acting / Single Acting
Connection: SE/BW/SW/FE
Size: 1/2"(DN15) - 10"(DN250)
Optional: 3/2 or 5/2
Solenoid Valve, Limit Switch Box,
Filter Regulator

Gate Valve

Description
Bolted Bonnet
Outside Screw and Yoke
Solid Wedge for 15A - 50A (1 /2" - 2")
Flexible Wedge for 65A - 300A (2-1/2" - 12")
Rising Stem
Non-rising Handwheel
Integral Seat Ring for API 603
RF End
Seat Ring Stellite for API 600

Pressure Class:
ASME 150/300
JIS10K
PN16
Size: 1/2"- 24" (15A - 600A)
Stainless Steel/ Carbon Steel/ Ductile Iron
Other materials available on request

API-598 Test Standard

Globe Valve

Description
Bolted Bonnet
Outside Screw and Yoke
Rising Stem and Handwheel
Yoke Integral with Bonnet
Integral Seat Ring for API 603
Loose Disc
RF End
Seat Ring Stellite for API 600

Pressure Class:
ASME 150/300
JIS10K
PN16
Size: 1/2"- 24" (15A - 600A)

Stainless Steel/ Carbon Steel/ Ductile Iron
Other materials available on request

API-598 Test Standard

Check Valve

Description
Bolted Bonnet
For Horizontal or Vertical Lines
Swing Type
Integral Seat Ring for API 603
RF End
Seat Ring Stellite for API 600

Pressure Class:
ASME 150/300
JIS10K
PN16
Size: 1 /2"- 24" (15A - 600A)

Stainless Steel/ Carbon Steel/ Ductile Iron
Other materials available on request

API-598 Test Standard

Y-Strainer Valve

Pressure Class:
ASME 150
JIS 10K
PN16
Size: 1/2"- 12" (15A - 300A)
End Connection: RF End

Stainless Steel/ Carbon Steel/ Ductile Iron
Other materials available on request

API-598 Test Standard

VALVES

Cryogenic Ball Valve

Ends: SE/BW/SW
1500 W.O.G.
ISO 5211 Mounting Pad
Anti-Static Device
Blow-out-proof Stem
Full Port
Body: S.S.
Seat: PCTFE(Kel-F)
Size: 1/2" - 2"

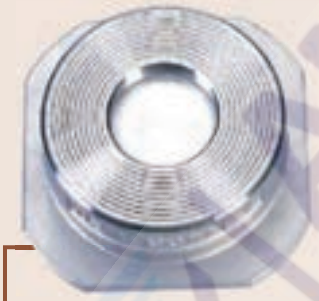
Special Material Ball Valve Monel, Inconel, Alloy20, Hastelloy

Flanged end:
ANSI 150/300, PN16/PN40, JIS 10K
Threaded end:
1000 W.O.G., 2000 W.O.G.
Anti-Static Device
Blow-out-proof Stem
Full Port, Reduced Port
Size: Range: 1/4" - 8"
Lockable Handle (Optional)

Trunnion Ball Valve API 6D Fire Safe to API 607

ASME class 150, 300, 600, 900, 1500, 2500
Ends: Flanged End, Butt Weld End
Anti-Static Device
Blow-out-proof Stem
Full Port, Reduced Port
Body: A105, LF2, F316, F316L, F51, F53
Size: Range: 2"(DN50) - 24" (DN600)
Lever Operate, Gear Operate,
Pneumatic Actuator Operate

ACCESSORIES



K9 Wafer Type, Spring Check Valve

ANSI 150/300
DIN PN 6/10/16/25/40
Body: S.S.
Disc: S.S.
Spring: S.S.
Size: 1/2" - 8"

K9 Check Valve, Wafer Type

ANSI 150/JIS 10K/DIN PN10
Double Disc Type
Seat: NBR/EPDM/VITON
Body: Cast Iron/Ductile Iron/S.S.
Disc: S.S.
Size: 2" - 24"

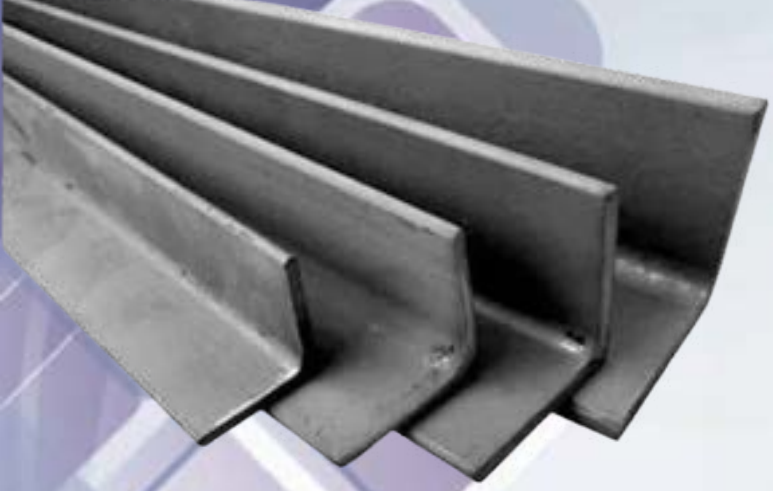
Stainless Steel Balls

Material: AISI-316 & 304
Size: 1/4" - 16"

OEM Valves

Valves and special design to customer' requests

For All Other Standard and Non-Standard Valves (Customised Items), Kindly Refer to Ichinose Emico Valves (S) Pte Ltd (web: www.ievs.co), Email: sales@ievs.co



STRUCTURAL PRODUCTS

COIL, SHEETS AND PLATES

Sizes and Unit Weights

Size	1219mm x 2438mm (4' x 8')				1524mm x 3048mm (5' x 10')			
AISI	TYPE 304, 304L		TYPE 316, 316L		TYPE 304, 304L		TYPE 316, 316L	
WT / TH	KG / PC	PCS / MT	KG / PC	PCS / MT	KG / PC	PCS / MT	KG / PC	PCS / MT
0.3	7.07	141.4	7.11	140.7	11.06	90.42	11.13	89.85
0.4	9.42	106.2	9.48	105.5	14.75	67.80	14.84	67.39
0.45	10.60	94.34	10.67	93.72	16.59	60.28	16.70	59.88
0.5	11.78	84.89	11.85	84.39	18.44	54.23	18.56	53.88
0.55	12.95	77.22	13.04	76.69	20.28	49.31	20.41	49.00
0.6	14.13	70.77	14.22	70.32	22.12	45.21	22.27	44.90
0.7	16.49	60.64	16.59	60.28	25.81	38.74	25.98	38.49
0.8	18.84	53.08	18.96	52.74	29.50	33.90	29.69	33.68
0.9	21.20	47.17	21.33	46.88	33.18	30.14	33.40	29.94
1.0	23.55	42.46	23.70	42.19	36.87	27.12	37.11	26.95
1.2	28.26	35.39	28.44	35.16	44.24	22.60	44.53	22.46
1.5	35.33	28.30	35.55	28.13	55.31	18.08	55.67	17.96
2.0	47.10	21.23	47.40	21.10	73.74	13.56	74.22	13.47
2.3	54.17	18.46	54.51	18.35	84.80	11.79	85.35	11.72
2.5	58.88	16.98	59.25	16.88	92.18	10.85	92.78	10.78
3.0	70.65	14.15	71.10	14.06	110.6	9.04	111.33	8.98
4.0	94.20	10.62	94.80	10.55	147.5	6.78	148.4	6.74
4.5	106.0	9.44	106.7	9.38	165.9	6.03	167.0	5.99
5.0	117.8	8.49	118.5	8.44	184.4	5.42	185.6	5.39
6.0	141.3	7.08	142.2	7.03	221.2	4.52	222.7	4.49
7.5	176.6	5.66	177.8	5.63	276.5	3.62	278.3	3.59
8	188.4	5.31	189.6	5.27	295.0	3.39	296.9	3.37
9	212.0	4.72	213.3	4.69	331.9	3.01	334.0	2.99
10	235.5	4.25	237.0	4.22	368.7	2.71	371.1	2.69
12	282.6	3.54	284.4	3.52	442.4	2.26	445.3	2.25
15	353.3	2.83	355.5	2.81	553.1	1.81	556.7	1.80
18	423.9	2.36	426.6	2.34	663.7	1.51	668.0	1.50
20	471.0	2.12	474.0	2.11	737.4	1.36	742.2	1.35
22	518.1	1.93	521.4	1.92	811.2	1.23	816.4	1.22
25	588.8	1.70	592.5	1.69	921.8	1.08	927.8	1.08
30	706.5	1.42	711.0	1.41	1106.0	0.90	1113.0	0.9
32	753.6	1.33	758.4	1.32	1180.0	0.85	1188.0	0.84
38	894.9	1.12	900.6	1.11	1401.0	0.71	1410.0	0.71
40	942.0	1.06	948.0	1.05	1475.0	0.68	1484.0	0.67
44	1036.0	0.97	1043.0	0.96	1622.0	0.62	1633.0	0.61
50	1178.0	0.85	1185	0.84	1844.0	0.54	1856.0	0.54
65	1531.0	0.65	1541	0.65	2397.0	0.42	2412.0	0.41
75	1766.0	0.57	1778	0.56	2765.0	0.36	2783.0	0.36

Above weight and quality list are based on theoretical calculations.

COIL, SHEETS AND PLATES

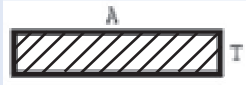
Finish Designation	Finish Method and Degree of Finish
No. 1	Hot-rolled, annealed and descaled. Generally used in industrial applications, where heat or corrosion resistance is required but surface smoothness is not particularly important.
No. 2 D	Dull, smooth finish produced by cold rolling, annealing and pickling. Steel is soft and has a silver white surface, suited for deep drawing as well as general uses.
No. 2 B	Bright, smooth cold-rolled finish obtained by skinpass rolling of No. 2D. Specified for general use.
No. 3	Intermediate polished finish obtained with rather coarse abrasives (#100 to #120 mesh). A higher luster can be attained by further polishing after fabrication.
No. 4	A standard polished finish produced with finer abrasives (#150 to #180 mesh). Widely specified for restaurant and kitchen equipment and dairy processing equipment.
#240	Polish finish of about #240. Used when finer finish than No. 4 finish is desired such as equipment for restaurants and household kitchens.
#320	Polishing finish of about #320.
#400	High luster finish produced by polishing No. 2B first with #400 buffing iron and then with buffing cloth. Suited for general use.
H.L	Special polished finish having continuous lines produced with abrasives of an appropriate grain size. Mainly used in architectural applications.
BA	Highly reflective finish produced by cold rolling, bright annealing and temper rolling. Used where a lustrous surface is specially required.

Remarks: Upon request, strip surface protection is provided such as bonding of vinyl sheets or vinyl coating.

No	Raw Materials Supply	Sizes	Width / Length
1	Cold Rolled Steel	0.3 - 10 mm or Clients Requirements	According to Clients Requirement
2	Hot Rolled Steel		
3	Galvanised Iron Steel		
4	Galvanneal Steel		
5	Electro - Galvanised Steel		
6	Stainless Steel (202/304/304L/316/316L/409L/430/439L/etc)		

For All Other Standards and Non-Standard Types Of Plates & Coil (Customised Items), Kindly Refer To Metal Wang Pte Ltd (web: www.metalwang.co), Email: terence@metalwang.co

Standard Sizes and Unit Weights of Flat Bar in Inch Size



Size	Thickness (T)									
Width (A)	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1-1/4
1 / 2	0.217	0.326	0.435							
5 / 8	0.272	0.408	0.543							
3 / 4	0.326	0.489	0.652	0.816	0.979	1.30				
1	0.435	0.652	0.870	1.09	1.30	1.74	2.18	2.61		
1 - 1/4	0.544	0.816	1.09	1.36	1.63	2.18	2.72	3.26		
1 - 1/2	0.653	0.979	1.30	1.63	1.96	2.61	3.26	3.92	5.22	
1 - 3/4	0.761	1.14	1.52	1.90	2.28	3.04	3.81	4.57	6.09	
2	0.870	1.30	1.74	2.18	2.61	3.48	4.35	5.22	6.96	8.70
2 - 1/2		1.63	2.18	2.72	3.26	4.35	5.44	6.52	8.70	10.9
3		1.96	2.61	3.26	3.91	5.22	6.52	7.83	10.4	13.1
3 - 1/2			3.04	3.81	4.57	6.09	7.61	9.14	12.2	15.2
4			3.48	4.35	5.22	6.96	8.70	10.4	13.9	17.4
5							10.9	13.1	17.4	21.8
6								15.7	20.9	26.1

*Unit Weight lb/ft : Accordance with AISI/**

Unit : Inch

Standard Sizes and Unit Weights of Flat Bar in Metric Size

Size	Thickness (T)															
Width (A)	3	4	5	6	7	8	9	10	12	15	16	19	20	22	25	30	40
10		0.316	0.396	0.474													
12	0.285	0.379	0.474	0.569	0.759												
14	0.332	0.443	0.554	0.663													
15	0.335	0.474	0.593	0.712	0.948	1.07	1.19										
16	0.379	0.505	0.632	0.759	1.01												
20	0.474	0.632	0.790	0.948	1.27	1.42	1.58	1.89	2.38								
25	0.593	0.790	0.987	1.19	1.58	1.78	1.97	2.38	2.96	3.16	3.75	3.96					
30	0.712	0.948	1.19	1.42	1.89	2.13	2.38	2.85	3.55	3.79	4.50	4.74	5.21	5.93			
35	0.829	1.11	1.38	1.66	2.21	2.49	2.77	3.32	4.15	4.43	5.25	5.54	6.08	6.91			
40	0.948	1.27	1.58	1.89	2.53	2.85	3.16	3.79	4.74	5.05	6.01	6.32	6.95	7.90			
45	1.07	1.42	1.78	2.13	2.85	3.20	3.55	4.27	5.33	5.69	6.75	7.12	7.82	8.89			
50	1.19	1.58	1.97	2.38	3.16	3.55	3.96	4.74	5.93	6.32	7.51	7.90	8.70	9.87	11.9	13.8	
60	1.42	1.89	2.38	2.85	3.79	4.27	4.74	5.69	7.12	7.59	8.50	9.48	10.5	11.9	14.2	16.6	
65	1.54	2.05	2.57	3.08	4.11	4.62	5.13	6.16	7.70	8.21	9.76	10.3	11.3	12.9	15.4	18.0	
70		2.21	2.77	3.32	4.43	4.98	5.54	6.63	8.29	8.85	10.5	11.1	12.2	13.8	16.6	19.3	
75	1.81	2.38	2.96	3.55	4.74	5.33	5.93	7.12	8.89	9.48	11.3	11.9	13.1	14.8	17.8	20.7	
80			3.16	3.79	5.05	5.69	6.32	7.59	9.48	10.1	12.0	12.7	13.9	15.8	18.9	22.1	
90			3.55	4.27	5.69	6.40	7.12	8.53	10.7	11.4	13.5	14.2	15.6	17.8	21.3	24.9	
100	2.42	3.22	3.96	4.74	6.32	7.12	7.90	9.48	11.9	12.7	15.0	15.8	17.4	19.7	23.8	27.7	
125								12.0	14.8	15.8	18.7	19.7	21.7	24.7	29.6	34.5	39.6
150								14.2	17.8	18.9	22.5	23.8	26.1	29.6	35.5	41.5	47.4
175									20.7	22.1	26.3	27.7	30.4	34.5	41.5	48.4	55.4
200								15.7	20.9	25.3	30.0	31.6	34.7	39.7	47.4	55.4	63.2

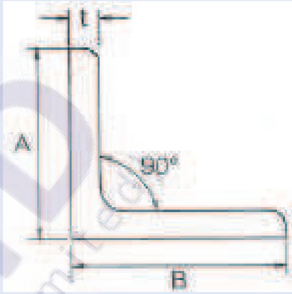
*Unit Weight kg/m : Accordance with DIN 17440/**

Unit : mm

** Above weight list are based on theoretical calculations.*

Standard Sizes and Unit Weights of Angle Bar in Inch Size

Size	Thickness (t)					
Leg A x B (in.)	1/8	3/16	1/4	5/16	3/8	1/2
3/4 x 3/4	0.599	0.856				
1 x 1	0.814	1.18	1.52			
1-1/4 x 1-1/4	1.03	1.51	1.96			
1-1/2 x 1-1/2	1.25	1.83	2.39	1.09	1.30	1.74
2 x 2	1.68	2.49	3.26	1.36	1.63	2.18
2-1/2 x 2-1/2		3.13	4.14	1.63	1.96	2.61
3 x 3			5.01	1.90	2.28	3.04
3-1/2 x 3-1/2			5.88	2.18	2.61	3.48
4 x 4			6.75	2.72	3.26	4.35



*Unit Weight lb/ft : Accordance with AISI/**

Unit : Inch

Standard Sizes and Unit Weights of Angle bar in Metric Size

Size	Thickness (t)										
Leg A x B (mm)	3	4	5	6	7	8	9	10	11	12	13
20 x 20	0.890	1.13	1.38								
25 x 25	1.13	1.45	1.77	2.06							
30 x 30	1.36	1.77	2.17	2.53							
35 x 35	1.61	2.09	2.57	3.01							
40 x 40	1.85	2.41	2.98	3.49							
45 x 45	2.12	2.76	3.40	4.00							
50 x 50	2.36	3.07	3.79	4.46		5.76	6.42	7.06			
60 x 60			4.58	5.42	6.24						
65 x 65			5.03	5.95	6.84	7.71	8.60	9.48			
70 x 70				6.42	7.39	8.34	9.31	10.3			
75 x 75				6.89	7.95	8.97	10.0	11.1	12.1	13.1	14.0
80 x 80				7.37	8.50	9.61	10.7	11.8	12.9	14.0	15.0
90 x 90				8.33	9.65	10.9	12.2	13.4	14.7	15.9	17.2
100 x 100				9.28	10.8	12.2	13.6	15.0	16.4	17.8	19.2

*Unit Weight kg/m : Accordance with DIN 17440/**

Unit : mm

(1) Standard length : Random length of 4 to 6 meters or Clients Request.
(2) Size tolerances are in accordance with JIS G4317.

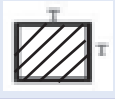
** Above weight list are based on theoretical calculations.*

Standard Sizes, Tolerances and Unit Weights of C - Channel Bar

	Size H x B x t		Tolerance mm			U.Weight AISI304, 304L	
	mm	(in.)	H	B	t	kg / m	(lb / ft)
Rolled Channels	40 x 20 x 3		± 1.5	± 1.5	± 0.4	1.79	
	50 x 25 x 3		± 1.5	± 1.5	± 0.5	2.27	
	80 x 40 x 5		± 1.5	± 1.5	± 0.6	5.96	
	100 x 50 x 4		± 2.0	± 2.0	± 0.6	6.18	
	100 x 50 x 6		± 2.0	± 2.0	± 0.6	9.01	
	130 x 65 x 6		± 3.0	± 3.0	± 0.6	11.9	
Welded Channels	60 x 30 x 5		± 2.0	± 2.0	± 0.5	4.37	
	120 x 60 x 6		± 3.0	± 3.0	± 0.6	10.9	
	130 x 65 x 9		± 3.0	± 3.0	± 0.7	17.3	
	140 x 70 x 7		± 3.0	± 3.0	± 0.7	14.9	
	150 x 75 x 6	(6 x 3 x 1/4)	± 3.0	± 3.0	± 0.7	13.8	(10.1)
	150 x 75 x 9	(6 x 3 x 3/8)	± 3.0	± 3.0	± 0.7	20.1	(14.8)
	160 x 80 x 8		± 4.0	± 4.0	± 0.7	19.4	
	180 x 90 x 8		± 4.0	± 4.0	± 0.7	22.0	
	180 x 90 x 9		± 4.0	± 4.0	± 0.7	24.6	
	200 x 100 x 8	(8 x 4 x 5/16)	± 4.0	± 4.0	± 0.7	24.5	(16.7)
	200 x 100 x 9	(8 x 4 x 3/8)	± 4.0	± 4.0	± 0.7	27.4	(20.0)
	200 x 100 x 10		± 4.0	± 4.0	± 0.8	30.2	-
	200 x 100 x 12	(8 x 4 x 1/2)	± 4.0	± 4.0	± 0.8	35.8	(26.7)

Above weight list are based on theoretical calculations.

Standard Sizes and Unit Weights of Square Bar

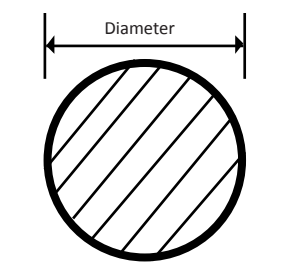


Size (T)														
	Inch Size (in)	3/4 (1.96)	-	-	1 (3.48)	-	-	1-1/4 (5.44)	-	1-1/2 (7.83)	-	-	-	2 (13.9)
	Metric Size [mm]	19 [2.85]	20 [3.16]	22 [3.82]	25 [4.94]	28 [6.19]	30 [7.12]	32 [8.09]	36 [10.3]	38 [11.4]	40 [12.7]	-	45 [16.0]	50 [19.7]

( ): Unit Weight lb/ft *[ ]: Unit Weight kg/m*

Above weight list are based on theoretical calculations.

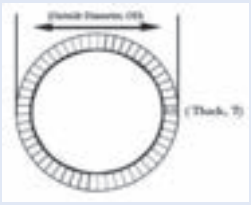
Standard Sizes and Unit Weights of Round Bar



Diameter		Weight	Diameter		Weight	Diameter		Weight
mm	inch	kg / m	mm	inch	kg / m	mm	inch	kg / m
2		0.025	22.22	7/8	3.05	60		22.3
3		0.055	24		3.59	63.5	2 - 1/2	25.0
4		0.10	25		3.88	65		26.2
5		0.15	25.4	1	4.00	69.85	2 - 3/4	30.3
6		0.22	26		4.19	70		30.4
6.35	1/4	0.25	28		4.86	75	3	34.9
7		0.30	28.58	1 - 1/8	5.06	80		39.7
7.94	5/16	0.39	30		5.58	85		44.7
8		0.40	31.75	1 - 1/4	6.23	90	3 - 1/2	50.2
9		0.50	32		6.36	95		56.2
9.52	3/8	0.56	35		7.60	100	4	62.0
10		062	36		8.07	105		68.5
11		0.75	38		8.96	110		75.3
12		0.89	38.1	1 - 1/2	8.97	115	4 - 1/2	81.8
12.7	1/2	0.99	40		9.92	120		89.3
13		1.05	41.28	1 - 5/8	10.7	130		105.0
14		1.21	4		10.9	140	5 - 1/2	121.5
15		1.39	44.45	1 - 3/4	12.47	150	6	140.0
15.88	5/8	1.56	45		12.6	160		159.0
16		1.59	46		13.2	170		179.0
17		1.78	47.62	1 - 7/8	14.2	180		201.0
18		2.02	48		14.3	190		224.0
19		2.24	50		15.5	200		248.0
19.05	3/4	2.25	50.8	2	16.0			
20		2.48	55		18.8			
22		3.00	57.15	2 - 1/4	20.3			

Above weight list are based on theoretical calculations.

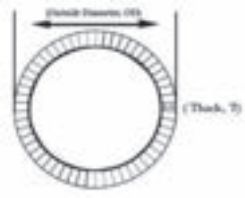
For All Other Standards and Non-Standard Types Of Flat Products (Customised Shapes Items), Kindly Refer To Metal Wang Pte Ltd (web: www.metalwang.co), Email: terence@metalwang.co



Sizes and Unit Weights

Outside Diameter (OD)		Type	Wall Thickness (T)																	
			0.6		0.7		0.8		1.0		1.2		1.5		2.0		2.5		3.0	
inch	mm		kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′	kg/m	kg/20′
3/8	9.50	AISI 304									0.25	1.513	0.30	1.82	0.38	2.28			0.50	2.99
		AISI 430																		
1/2	12.7	AISI 304	0.181	1.10	0.209	1.27	0.237	1.44	0.291	1.77	0.344	2.10	0.418	2.55	0.54	3.25			0.74	4.42
		AISI 430	0.176	1.07	0.203	1.24	0.203	1.40	0.283	1.73	0.334	2.04	0.406	2.47						
5/8	15.9	AISI 304	0.229	1.40	0.265	1.62	0.301	1.83	0.371	2.26	0.439	2.68	0.538	3.28	0.70	4.22			0.98	5.88
		AISI 430	0.222	1.35	0.257	1.57	0.292	1.78	0.360	2.19	0.427	2.60	0.522	3.18						
	16	AISI 304	0.230	1.40	0.267	1.63	0.303	1.85	0.374	2.28	0.442	2.69	0.542	3.30						
		AISI 430	0.224	1.37	0.259	1.58	0.294	1.79	0.363	2.21	0.430	2.62	0.562	3.21						
3/4	19.1	AISI 304	0.277	1.69	0.321	1.96	0.365	2.23	0.451	2.75	0.533	3.26	0.658	4.01	0.87	5.20			1.22	7.34
		AISI 430	0.269	1.64	0.321	1.90	0.354	2.16	0.438	2.67	0.520	3.17	0.639	3.90						
7/8	22.2	AISI 304	0.323	1.97	0.375	2.29	0.426	2.60	0.528	3.22	0.628	3.83	0.773	4.71	1.01	6.16			1.46	8.75
		AISI 430	0.314	1.91	0.364	2.33	0.414	2.52	0.513	3.13	0.610	3.72	0.751	4.58	0.977	5.96				
	25	AISI 304	0.365	2.23	0.429	2.62	0.482	2.94	0.598	3.65	0.711	4.33	0.878	5.35	1.15	7.01				
		AISI 430	0.354	2.16	0.411	2.51	0.468	2.85	0.581	3.54	0.691	4.21	0.853	5.20	1.11	6.77				
1	25.4	AISI 304	0.371	2.26	0.431	2.63	0.490	2.99	0.608	3.71	0.723	4.41	0.893	5.44	1.17	7.13			1.70	10.21
		AISI 430	0.360	2.19	0.417	2.54	0.476	2.90	0.590	3.60	0.702	4.28	0.867	5.29	1.13	6.89				
1-1/8	28.6	AISI 304	0.418	2.55	0.486	2.96	0.554	3.38	0.687	4.19	0.819	4.99	1.01	6.16	1.32	8.05			1.94	11.67
		AISI 430	0.406	2.47	0.472	2.88	0.538	3.28	0.668	4.07	0.795	4.85	0.983	5.99	1.29	7.86				
1-1/4	31.8	AISI 304			0.542	3.30	0.618	3.77	0.767	4.68	0.915	5.58	1.13	6.89	1.48	9.02	1.82	11.1	2.15	13.1
		AISI 430			0.527	3.21	0.600	3.66	0.745	4.54	0.888	5.41	1.10	6.71	1.44	8.78	1.77	10.8	2.09	12.7
	32	AISI 304			0.546	3.33	0.622	3.79	0.772	4.71	0.921	5.61	1.14	6.95	1.49	9.08	1.84	11.2	2.17	13.2
		AISI 430			0.530	3.23	0.604	3.68	0.750	4.57	0.894	5.45	1.11	6.77	1.45	8.84	1.78	10.9	2.10	19.8
1-1/2	38.1	AISI 304			0.652	3.97	0.743	4.53	0.924	5.63	1.10	6.71	1.37	8.35	1.80	11.0	2.22	13.5	2.62	16.0
		AISI 430			0.633	3.86	0.722	4.40	0.897	5.47	1.07	6.52	1.33	8.11	1.75	10.7	2.15	13.1	2.55	15.3
1-5/8	41.3	AISI 304					0.807	4.92	1.00	6.10	1.20	7.32	1.49	9.08	1.96	11.9	2.42	14.8	2.86	17.4
		AISI 430					0.784	4.78	0.974	5.94	1.16	7.07	1.44	8.78	1.90	11.6	2.35	14.3	2.78	16.9

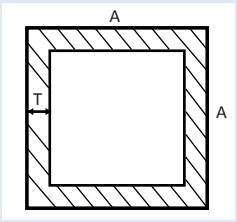
Above weight list are based on theoretical calculations.



Sizes and Unit Weights

Outside Diameter (OD)		Type	Wall Thickness (T)																	
			0.6		0.7		0.8		1.0		1.2		1.5		2.0		2.5		3.0	
inch	mm		kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'
1-3/4	44.5	AISI 304					0.871	5.31	1.08	6.58	1.29	7.86	1.61	9.81	2.12	12.9	2.62	16.0	3.10	18.9
		AISI 430					0.846	5.16	1.05	6.40	1.26	7.68	1.56	9.51	2.06	12.6	2.54	15.5	3.01	18.3
	45	AISI 304					0.881	5.37	1.10	6.71	1.31	7.99	1.63	9.94	2.14	13.0	2.65	16.2	3.14	19.1
		AISI 430					0.855	5.21	1.06	6.46	1.27	7.74	1.58	9.63	2.08	12.7	2.57	15.7	3.05	18.6
1-7/8	48.3	AISI 304					0.947	5.77	1.18	7.19	1.41	8.60	1.75	10.7	2.31	14.1	2.85	17.4	3.39	20.7
		AISI 430					0.920	5.61	1.14	6.95	1.37	8.35	1.70	10.4	2.24	13.7	2.77	16.9	3.29	20.1
	50	AISI 304							1.22	7.44	1.46	8.90	1.81	11.0	2.39	14.6	2.96	18.0	3.51	21.4
		AISI 430							1.19	7.25	1.42	8.66	1.76	10.7	2.32	14.1	2.87	17.5	3.41	20.8
2	50.8	AISI 304							1.24	7.56	1.48	9.02	1.84	11.2	2.43	14.8	3.01	18.3	3.57	21.8
		AISI 430							1.20	7.32	1.44	8.78	1.79	10.9	2.36	14.4	2.92	17.8	3.47	21.2
	60.8	AISI 304									1.77	10.8	2.20	13.4	2.91	17.7	3.61	22.0	4.30	26.2
		AISI 430									1.72	10.5	2.14	13.0	2.83	17.3	3.51	21.4	4.17	25.4
2-1/2	63.5	AISI 304									1.86	11.3	2.32	14.1	3.06	18.7	3.80	23.2	4.52	27.6
		AISI 430									1.81	11.0	2.25	13.7	2.98	18.2	3.69	22.5	4.39	26.8
3	76.2	AISI 304									2.24	13.7	2.79	17.0	3.70	22.6	4.59	28.0	5.47	33.3
		AISI 430									2.18	13.3	2.71	16.5	3.59	21.9	4.46	27.2	5.31	32.4
3-1/2	88.9	AISI 304									2.67	15.99	3.32	19.92	4.40	26.41			6.53	39.16
		AISI 430																		
4	101.6	AISI 304									3.05	18.31	3.80	22.81	5.04	30.27			7.49	44.95
		AISI 430																		

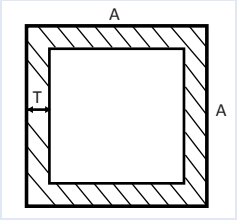
Above weight list are based on theoretical calculations.



Sizes and Unit Weights

Side Length mm (inch) (AxA)	Type	Wall Thickness (T)										BWG (inch)			
		1.0		1.2		1.5		2.0		3.0		BWG 18 (0.049)		BWG 16 (0.065)	
		kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/ft	kg/20'	kg/ft	kg/20'
12 x 12	AISI 304	0.347	2.12	0.409	2.49							0.128	2.57		
	AISI 430	0.337	2.05	0.397	2.42							0.125	2.49		
12.7 x 12.7 (1/2 x 1/2)	AISI 304	0.369	2.25	0.436	2.66	0.54	3.24	0.69	4.13	0.92	5.49	0.137	2.74		
	AISI 430	0.359	2.19	0.423	2.58							0.133	2.66		
14 x 14	AISI 304	0.411	2.51	0.485	2.96							0.152	3.05		
	AISI 430	0.399	2.43	0.471	2.87							0.148	2.96		
15.9 x 15.9 (5/8 x 5/8)	AISI 304	0.471	2.87	0.558	3.40	0.69	4.17	0.89	5.37	1.21	7.28	0.175	3.51		
	AISI 430	0.457	2.79	0.542	3.30							0.170	3.40		
16 x 16	AISI 304	0.474	2.89	0.562	3.43							0.176	3.53		
	AISI 430	0.460	2.80	0.545	3.32							0.171	3.43		
19 x 19	AISI 304	0.569	3.47	0.676	4.12	0.831	5.07					0.212	4.25	0.276	5.52
	AISI 430	0.553	3.37	0.656	4.00	0.807	4.92					0.206	4.13	0.268	5.36
19.1 x 19.1 (3/4 x 3/4)	AISI 304	0.572	3.49	0.680	4.15	0.836	5.10	1.10	6.61	1.51	9.08	0.214	4.27	0.278	5.56
	AISI 430	0.556	3.39	0.660	4.02	0.811	4.94					0.207	4.15	0.270	5.39
20 x 20	AISI 304	0.601	3.66	0.714	4.35	0.878	5.35					0.224	4.49	0.292	5.85
	AISI 430	0.584	3.56	0.693	4.22	0.853	5.20					0.218	4.36	0.284	5.68
21 x 21	AISI 304	0.633	3.86	0.752	4.58	0.926	5.64					0.236	4.72	0.308	6.16
	AISI 430	0.614	3.74	0.730	4.45	0.899	5.48					0.230	4.59	0.299	5.99
22.2 x 22.2 (7/8 x 7/8)	AISI 304	0.671	4.09	0.798	4.86	0.983	5.99	1.30	7.81	1.80	10.82	0.251	5.02	0.326	6.52
	AISI 430	0.651	3.97	0.774	4.72	0.955	5.82					0.244	4.88	0.317	6.34
25 x 25	AISI 304	0.760	4.63	0.904	5.51	1.12	6.83					0.284	5.69	0.372	7.44
	AISI 430	0.738	4.50	0.878	5.35	1.08	6.58					0.276	5.52	0.360	7.19
25.4 x 25.4 (1 x 1)	AISI 304	0.772	4.71	0.919	5.60	1.14	6.95	1.51	9.05	2.10	12.62	0.289	5.79	0.378	7.56
	AISI 430	0.750	4.57	0.893	5.44	1.10	6.71					0.281	5.61	0.369	7.38
28 x 28	AISI 304	0.855	5.21	1.02	6.22	1.26	7.68					0.320	6.40	0.421	8.41
	AISI 430	0.830	5.06	0.989	6.03	1.22	7.44					0.311	6.22	0.408	8.17
30 x 30	AISI 304	0.918	5.60	1.09	6.64	1.35	8.23	1.77	10.8			0.344	6.89	0.452	9.03
	AISI 430	0.892	5.44	1.06	6.46	1.32	8.05	1.72	10.5			0.335	6.71	0.439	8.78

Above weight list are based on theoretical calculations.



Sizes and Unit Weights

Side Length mm (inch) (AxA)	Type	Wall Thickness (T)										BWG (inch)			
		1.0		1.2		1.5		2.0		3.0		BWG 18 (0.049)		BWG 16 (0.065)	
		kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/m	kg/20'	kg/ft	kg/20'	kg/ft	kg/20'
31.8 x 31.8 (1-1/4 x 1-1/4)	AISI 304	0.975	5.94	1.16	27.07	1.44	8.78	1.89	11.5	2.70	16.21	0.366	7.32	0.482	9.63
	AISI 430	0.947	5.77	1.13	6.89	1.40	8.53	1.83	11.2			0.357	7.13	0.466	9.33
32 x 32	AISI 304	0.982	5.99	1.17	7.13	1.45	8.84	1.90	11.6			0.369	7.38	0.485	9.69
	AISI 430	0.953	5.81	1.14	6.95	1.41	8.60	1.85	11.3			0.357	7.13	0.469	9.39
34 x 34	AISI 304	1.05	6.40	1.25	7.62	1.54	9.39	2.03	12.4			0.393	7.86	0.515	10.3
	AISI 430	1.01	6.16	1.21	7.38	1.50	9.14	1.97	12.0			0.381	7.62	0.500	10.0
35 x 35	AISI 304	1.08	6.58	1.28	7.80	1.59	9.69	2.09	12.7			0.405	8.11	0.531	10.6
	AISI 430	1.05	6.40	1.25	7.62	1.55	9.45	2.03	12.4			0.393	7.86	0.515	10.3
38 x 38	AISI 304	1.17	7.13	1.40	8.53	1.73	10.5	2.28	13.9			0.439	8.78	0.579	11.6
	AISI 430	1.14	6.95	1.36	8.29	1.68	10.2	2.22	13.5			0.427	8.53	0.564	11.3
38.1 x 38.1 (1-1/2 x 1-1/2)	AISI 304	1.18	7.19	1.40	8.53	1.74	10.6	2.29	14.0	3.29	19.74	0.442	8.84	0.582	11.6
	AISI 430	1.14	6.95	1.36	8.29	1.69	10.3	2.22	13.5			0.430	8.60	0.564	11.3
40 x 40	AISI 304	1.24	7.56	1.48	9.02	1.83	11.2	2.41	14.7	3.52	21.5	0.463	9.27	0.613	12.3
	AISI 430	1.20	7.32	1.43	8.72	1.78	10.9	2.34	14.3	3.42	20.8	0.451	9.02	0.594	11.9
46 x 46	AISI 304	1.43	8.72	1.70	10.4	2.12	12.9	2.79	17.0	4.09	24.9	0.536	10.7	0.707	14.1
	AISI 430	1.38	8.41	1.65	10.1	2.05	12.5	2.71	16.5	3.97	24.2	0.521	10.4	0.686	13.7
50 x 50	AISI 304			1.86	11.3	2.31	14.1	3.04	18.5	4.47	27.2	0.585	11.7	0.771	15.4
	AISI 430			1.80	11.0	2.24	13.7	2.96	18.0	4.34	26.5	0.567	11.3	0.750	15.0
50.8 x 50.8 (2 x 2)	AISI 304			1.89	11.5	2.34	14.3	3.09	18.8	4.55	27.7	0.594	11.9	0.783	15.7
	AISI 430			1.83	11.2	2.28	13.9	3.00	18.3	4.42	26.9	0.576	11.5	0.762	15.2
60 x 60	AISI 304			2.24	13.7	2.78	16.9	3.68	22.4	5.42	33.0	0.704	14.1	0.930	18.6
	AISI 430			2.17	13.2	2.70	16.5	3.57	21.8	5.27	32.1	0.683	13.7	0.902	18.0

Above weight list are based on theoretical calculations.

Sizes and Unit Weights

Side Length mm (inch) (AxB)	Type	Wall Thickness (T) 1.0 kg/m	1.0 kg/20'	1.2 kg/m	1.2 kg/20'	1.5 kg/m	1.5 kg/20'	2.0 kg/m	2.0 kg/20'	BWG (inch) BWG 18 (0.049) kg/ft	BWG 18 (0.049) kg/20'	BWG 16 (0.065) kg/ft	BWG 16 (0.065) kg/20'
19 x 10	AISI 304	0.426	2.60	0.505	3.08					0.158	3.17		
20 x 10	AISI 304	0.442	2.69	0.524	3.19					0.164	3.29		
20 x 15	AISI 304	0.522	3.18	0.619	3.77					0.194	3.89		
22 x 10	AISI 304	0.474	2.89	0.562	3.43					0.176	3.53		
22 x 12	AISI 304	0.506	3.08	0.600	3.66					0.188	3.77		
24 x 14	AISI 304	0.569	3.47	0.676	4.12	0.831	5.07			0.212	4.25	0.276	5.52
25 x 14	AISI 304	0.585	3.57	0.695	4.23	0.855	5.21			0.218	4.36	0.284	5.68
25.4 x 12.7 (1 x 1/2)	AISI 304	0.571	3.48	0.678	4.13	0.833	5.08			0.213	4.26	0.277	5.54
	AISI 430	0.554	3.38	0.658	4.01	0.809	4.93			0.207	4.14	0.269	5.38
30 x 10	AISI 304	0.601	3.66	0.714	4.35	0.878	5.35			0.224	4.49	0.292	5.85
30 x 20	AISI 304	0.760	4.63	0.904	5.51	1.12	6.83			0.284	5.69	0.372	7.44
32 x 16	AISI 304	0.728	4.44	0.866	5.28	1.07	6.52			0.272	5.44	0.357	7.13
32 x 17	AISI 304	0.744	4.54	0.885	5.39	1.09	6.64			0.278	5.57	0.363	7.25
38.1 x 25.4 (1-1/2 x 1)	AISI 304	0.974	5.94	1.16	7.07	1.44	8.78			0.366	7.32	0.479	9.57
	AISI 430	0.945	5.76	1.13	6.89	1.40	8.53			0.354	7.07	0.466	9.33
40 x 10	AISI 304	0.760	4.63	0.904	5.51	1.12	6.83			0.284	5.69	0.372	7.44
40 x 15	AISI 304	0.839	5.11	0.999	6.09	1.24	7.56			0.314	6.28	0.411	8.23
40 x 18	AISI 304	0.886	5.40	1.06	6.46	1.31	7.99			0.332	6.64	0.436	8.72
40 x 20	AISI 304	0.918	5.60	1.09	6.64	1.35	8.23	1.77	10.8	0.344	6.89	0.451	9.02
40 x 25	AISI 304			1.19	7.25	1.47	8.96	1.93	11.8	0.375	7.50	0.491	9.81
40 x 28	AISI 304			1.25	7.62	1.54	9.39	2.03	12.4	0.393	7.86	0.515	10.3
50 x 25	AISI 304			1.38	8.41	1.71	10.4	2.25	13.7	0.433	8.66	0.570	11.4
50.8 x 25.4 (2 x 1)	AISI 304			1.40	8.53	1.74	10.6	2.29	14.0	0.442	8.84	0.582	11.6
	AISI 430			1.36	8.29	1.69	10.3	2.22	13.5	0.430	8.60	0.564	11.3
51 x 26	AISI 304			1.42	8.66	1.76	10.7	2.31	14.1	0.445	8.90	0.588	11.8
60 x 20	AISI 304			1.48	9.02	1.83	11.2	2.41	14.7	0.463	9.27	0.613	12.3
60 x 40	AISI 304			1.86	11.3	2.31	14.1	3.04	18.5	0.585	11.7	0.771	15.4
75 x 45	AISI 304					2.78	16.9	3.68	22.4			0.930	18.6
76.2 x 25.4 (3 x 1)	AISI 304					2.34	14.3	3.09	18.8			0.783	15.7
	AISI 430					2.28	13.9	3.00	18.3			0.762	15.2
80 x 40	AISI 304					2.78	16.9	3.68	22.4			0.930	18.6

Above weight list are based on theoretical calculations.

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