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SHINWHA HI-TEC PRODUCT CATALOG

The company offering the
highest quality and best customer satisfaction high

SHINHWA HI-TEC CO.,Ltd

CEO's MESSAGE

안녕하십니까?
성실과 신뢰의 기업 신화하이텍(주)입니다.

신화하이텍(주)에서는 최상의 품질과 고객 니즈의 충족을 위하여
최선을 다한다는 경영이념으로
품질경영시스템(ISO 9001:2015), 환경경영시스템(ISO 14001:2015) 및
생산자동화 시스템을 도입하여
품질개선과 신기술 개발에 지속적인 노력을 경주하고 있습니다.

신화하이텍(주)에서 생산되는
Pipe Fittings, Tube Fittings, Flanges, Pipe Clamp, Valve 등은
국내는 물론 해외로 수출하여 이미 그 기술력과 품질을 인정받고 있습니다.

최고의 품질과 신기술력의 확보를 위한 끊임없는 투자로
품질안정 및 고객만족을 목표로 노력하며,
도전적이며 진취적인 자세로 새로운 가치를 창조하여
대한민국을 넘어 세계일류기업으로 도약해 나가겠습니다.
과거의 실적과 경험을 바탕으로 미래의 신뢰를 약속드리며,
앞으로도 품질향상 및 고객만족을 위해 끊임없이 연구하고 노력하겠습니다.

신화하이텍(주)의 끝없는 도전을 지켜봐 주시길 부탁드립니다.
감사합니다.

대표이사 **송 성 수**

Hello
I am a director of SHINHWA Hi-Tec, which is a faithful and hard-working company.

Our company brought ISO 14001:2004 / ISO 9001:2008 (RINA / CISQ / IQ NET)
/ system and we are continually building quality and development of new technology.
We strive for the best quality management and our client's satisfaction of their needs.
Our products such as tube fitting for instrumentation, Pipe fitting, Valve for instrumentation
and hydraulics, Tube, Pipe clamp, SQ Flange, LSA flange etc, are getting credit for technology
and quality through export and selling in our country.

We won't forget our company's ideology for client satisfaction and happiness.
Also, we will try to make the best products and steadily develop the highest quality in the industry.
Please keep watching our company's continued challenge.
Thank you.

C.E.O **Song Sung Soo**

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All around you

The company offering the highest quality
and best customer satisfaction high.

SHINHWA HI-TEC CO.,Ltd

History of SHINWHA HI-TEC

2019	12	Renewal of ISO 9001, 14001, 45001 (ABS)
2018	12	Certificates CRN_Pipe Fitting
	11	Certificates CRN_Flange
	06	Acquired to Ped Certification [RINA]
	04	Acquired to Supplier License 'Petronas' in Malaysia
2017	12	Registration of DSME
2016	05	Acquired to Confirmation of Materials / Component Specialized Company [Ministry of Commerce Industry and Energy]
		Acquired to ISO 9001 : 2008 Certification [RINA / CISQ / IQNET]
		Acquired to ISO 14001 : 2008 Certification [RINA / CISQ / IQNET]
	03	Registration of 'Ino-Biz' [Small and Medium Business Administration]
2015	07	Estblish of 'Research and Development'
	06	Renewal of 'Venture Business' [Technology Guaranteed Fund]
	03	Contract for moving in 'Gang-seo normal industrial complex' [Jisa-dong, Gangseo- gu, Busan]
	02	Contracted with DK-LOK for exclusive agency
	01	Renewal of 'ISO 9001 : 2000' certification
2014	12	Renewal of MAIN- BIZ
2013	10	Acquired to 'Clean Workplace' certification
	05	Registration of 'Venture Business' [Technology Guaranteed Fund]
2012	04	Increasing of capital [four hundred miliion ▶ five hundred million won]
2011	12	Renewal of 'ISO 9001 : 2000' certification
		Increasing of capital [two hundred miliion ▶ four hundred million won]
	11	egistration of 'Main- Biz Businesses'
	09	Moving into new office [651-1, Eomgung- dong, Sasang- gu, Busan]
	07	Changed to 'SHINHWA HITEC' Co., Ltd ▶ Capitalized at two hundred miliion won
2010	11	Changed company name to 'SINHWA HITEC'
2009	06	Acquired to ISO 9001 : 2000 certification
2004	06	Establishment of 'SAEHAN HI-TEC'

CERTIFICATE

특허증

상표등록증

벤처기업확인서

기업부설연구소 인정서

경영혁신형 중소기업(Main-Biz) 확인서

기술혁신형 중소기업(Inno-Biz) 확인서

ISO 9001:2015(ABS)

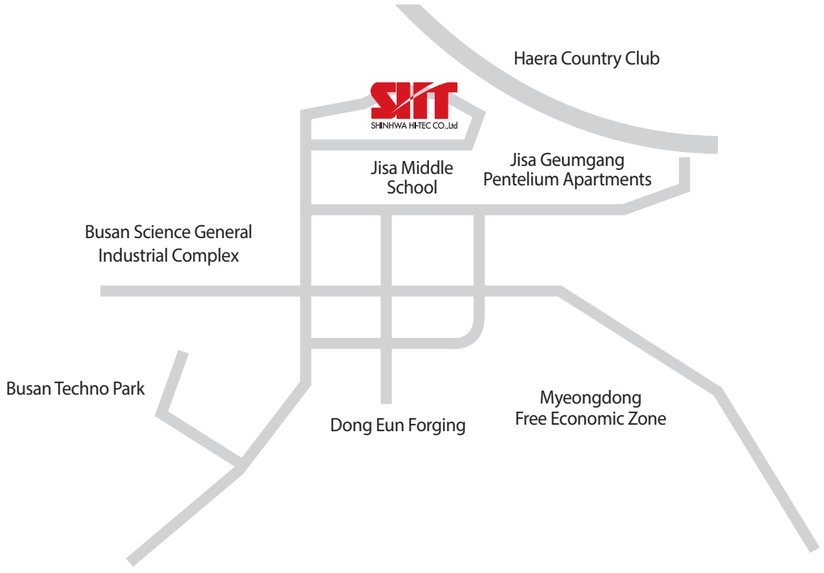
ISO 14001:2015(ABS)

ISO 45001:2018(ABS)

COMPANY

Company View

Company Location



FORGED FITTINGS

- **Class 2000, 3000, 6000, 9000 fittings to ANSI and JIS standards**
- **Carbon steel and stainless steel**
- **Pipe thread and socket weldings**

90˚ELBOW

45˚ELBOW

TEE

CROSS

FULL COUPLING

HALF COUPLING

CAP

BOSS

PLUG

UNION

SWAGE NIPPLE

HEX NIPPLE

PIPE NIPPLE

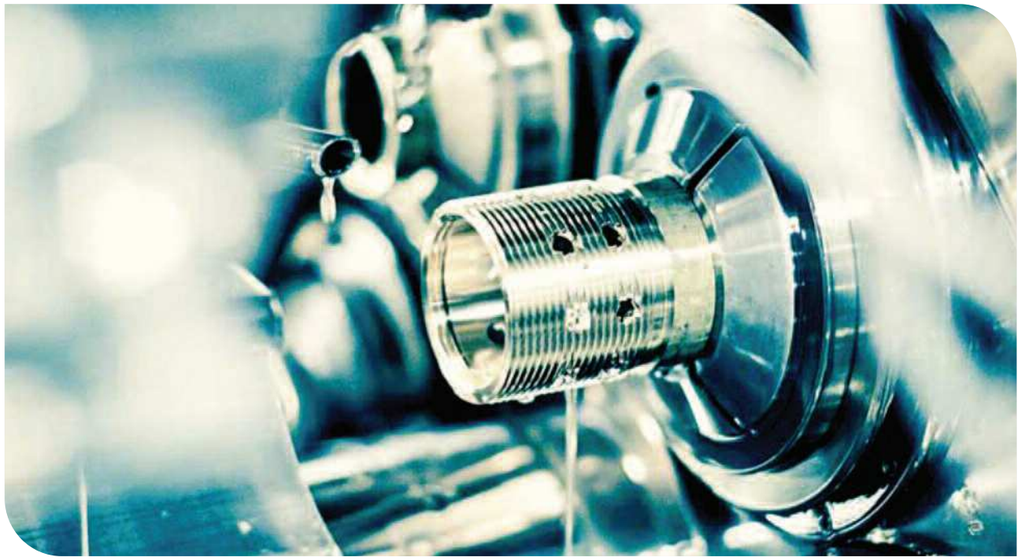
OUTLET

01

FORGED FITTINGS

FORGED FITTINGS
SOCKET WELDING FITTINGS
SOCKET WELDING & THREAD FITTINGS
THREADED FITTINGS
FORGED OUTLET FITTINGS
SPECIAL PRODUCT

FORGED FITTINGS



1 Pressure Ratings

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

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

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

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

| *Table 2* | Norminal wall thickness of Schedule 160 and Double Extra Strong Pipe.

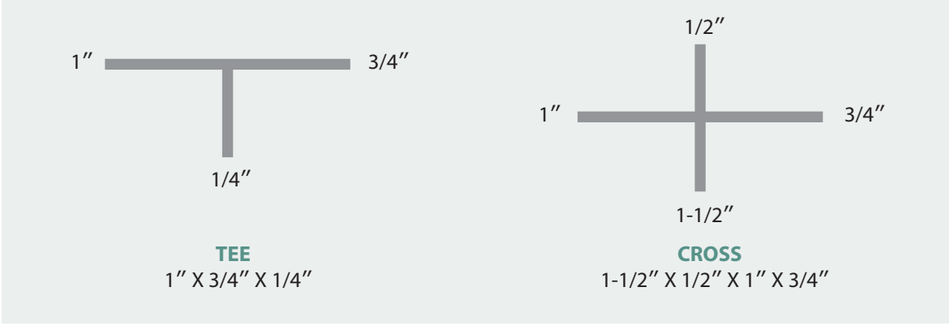
NPS.	Schedule 160		XX-S	
	in	mm	in	mm
1/8	0.124	3.15	0.190	4.83
1/4	0.145	3.68	0.230	6.05
3/8	0.158	4.01	0.252	6.40

| *Table 3* | Pressure/Temperaturs Ratings. Non-shock Working Pressure in Pounds per Square Incd

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

2 Size Identification

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

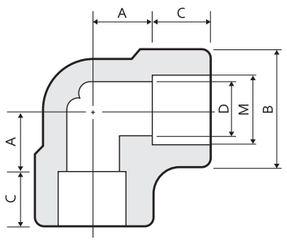


3 Threads

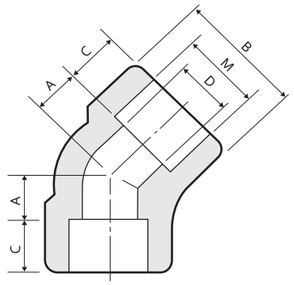
Unless otherwise specified in inquiry, all threaded fittings are supplied with NPT threads (ANSI B2.1 American Standard Tapesr Pipe Thread) other threads are also available on request:

SOCKET WELDING FITTINGS

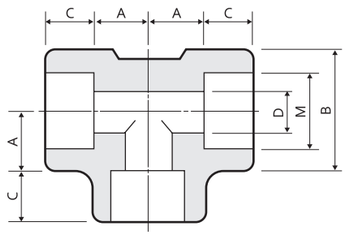
3000lb, 6000lb



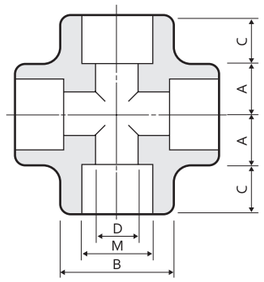
90˚Elbow



45˚ Elbow



Tee



Cross

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	11.1	10.0	0.10
3/8		27.5	12.7	13.4	12.0	0.14
1/2		35.0	16.1	16.0	13.0	0.26
3/4		40.0	21.4	20.0	15.0	0.36
1		48.0	27.2	23.0	16.0	0.54
1 1/4		58.0	35.5	28.0	18.0	0.89
1 1/2		64.0	41.2	33.0	20.0	1.10
2		76.0	52.7	40.0	22.0	1.75
2 1/2		92.0	65.9	42.0	24.0	2.52
3		110.0	78.1	57.1	31.5	5.25
4		146.0	102.0	70.0	45.0	9.51

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	7.9	10.0	0.09
3/8		27.5	12.7	7.9	12.0	0.15
1/2		35.0	16.1	13.0	13.0	0.25
3/4		40.0	21.4	13.0	15.0	0.29
1		48.0	27.2	14.0	16.0	0.44
1 1/4		58.0	35.5	18.0	18.0	0.67
1 1/2		64.0	41.2	22.0	20.0	0.88
2		76.0	52.7	24.0	22.0	1.25
2 1/2		92.0	65.9	29.0	24.0	3.12
3		110.0	78.1	34.0	31.5	4.85
4		146.0	102.0	42.0	45.0	8.4

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	11.5	10.0	0.12
3/8		27.0	12.7	13.5	12.0	0.18
1/2		34.5	16.1	16.5	13.0	0.33
3/4		40.0	21.4	18.5	15.0	0.43
1		49.0	27.2	22.5	16.0	0.68
1 1/4		58.0	35.5	26.5	18.0	1.07
1 1/2		64.0	41.2	31.5	20.0	1.35
2		79.0	52.7	38.5	22.0	2.21
2 1/2		92.0	65.9	42.0	24.0	2.91
3		110.0	78.1	57.0	31.5	4.86
4		146.0	102.0	70.0	45.0	12.24

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	7.9	10.0	0.18
3/8		27.0	12.7	7.9	12.0	0.17
1/2		34.5	16.1	13.0	13.0	0.36
3/4		40.0	21.4	13.0	15.0	0.52
1		49.0	27.2	14.0	16.0	0.68
1 1/4		58.0	35.5	18.0	18.0	1.02
1 1/2		64.0	41.2	22.0	20.0	1.89
2		79.0	52.7	24.0	22.0	2.33
2 1/2		92.0	65.9	29.0	24.0	7.48
3		110.0	78.1	34.0	31.5	10.43
4		146.0	102.0	42.0	45.0	18.14

Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	40.0	12.3	20.0	13.0	0.47
3/4		48.0	16.2	23.0	15.0	0.75
1		58.0	21.2	28.0	16.0	1.13
1 1/4		64.0	29.9	33.0	18.0	1.54
1 1/2		76.0	34.4	40.0	20.0	2.88
2		92.0	43.1	42.0	22.0	3.77
2 1/2		110.0	57.3	57.1	24.0	6.25
3		121.0	66.9	66.0	31.5	8.86
4		152.0	87.0	70.0	45.0	14.42

Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	40.0	12.3	13.0	13.0	0.41
3/4		48.0	16.2	14.0	15.0	0.61
1		58.0	21.2	22.0	16.0	0.99
1 1/4		64.0	29.9	22.0	18.0	1.32
1 1/2		76.0	34.4	24.0	20.2	2.01
2		92.0	43.1	29.0	22.0	3.56
2 1/2		110.0	57.3	34.0	24.0	5.85
3		121.0	66.9	34.0	31.5	6.71
4		152.0	87.0	42.0	45.0	12.50

Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/2	See Note (1) To be specified by purchaser	40.0	12.3	20.0	13.0	0.60
3/4		49.0	16.2	23.0	15.0	0.97
1		58.0	21.2	28.0	16.0	1.60
1 1/4		64.0	29.9	33.0	18.0	1.94
1 1/2		79.0	34.4	40.0	20.0	3.64
2		92.0	43.1	42.0	22.0	4.20
2 1/2		110.0	57.3	57.0	24.0	8.90
3		121.0	66.9	66.0	31.5	11.00
4		152.0	87.0	70.0	45.0	19.80

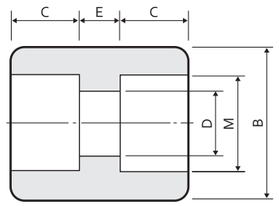
Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/2	See Note (1) To be specified by purchaser	40.0	12.3	20.0	13.0	0.66
3/4		49.0	16.2	23.0	15.0	1.22
1		58.0	21.2	28.0	16.0	1.73
1 1/4		64.0	29.9	33.0	18.0	2.38
1 1/2		79.0	34.4	40.0	20.0	3.75
2		92.0	43.1	42.0	22.0	7.86
2 1/2		110.0	57.3	57.0	24.0	10.60
3		121.0	66.9	66.0	31.5	13.60
4		152.0	87.0	70.0	45.0	26.00

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16. 11 or JIS B2316

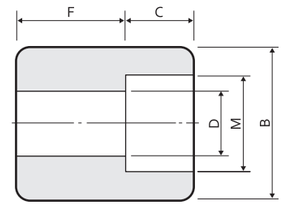
Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16. 11 or JIS B2316

SOCKET WELDING FITTINGS

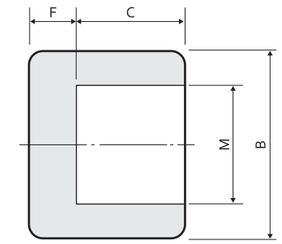
3000lb, 6000lb



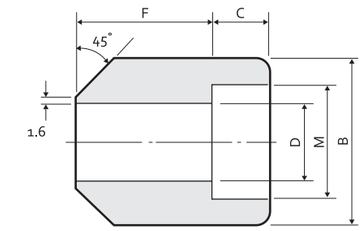
Full Couplling



Half Couplling



Cap



Boss

Size	M	B	D	C	E	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	10.0	6.5	0.05
3/8		25.0	12.7	10.0	6.5	0.06
1/2		32.0	16.1	10.0	10.0	0.11
3/4		38.0	21.4	13.0	10.0	0.18
1		45.0	27.2	13.0	13.0	0.23
1 1/4		55.0	35.5	13.0	13.0	0.33
1 1/2		60.0	41.2	13.0	13.0	0.35
2		75.0	52.7	16.0	19.0	0.75
2 1/2		95.0	65.9	16.0	19.0	1.19
3		110.0	78.1	16.0	19.0	1.53
4		140.0	102.0	19.0	19.0	2.91

Size	M	B	D	C	F	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	10.0	16.0	0.05
3/8		25.0	12.7	10.0	18.0	0.07
1/2		32.0	16.1	10.0	23.0	0.14
3/4		38.0	21.4	13.0	24.0	0.20
1		45.0	27.2	13.0	29.0	0.30
1 1/4		55.0	35.5	13.0	29.0	0.41
1 1/2		60.0	41.2	13.0	32.0	0.50
2		75.0	52.7	16.0	41.0	0.98
2 1/2		95.0	65.9	16.0	30.0	1.25
3		110.0	78.1	16 .0	45.0	2.19
4		140.0	102.0	19 .0	48.0	3.98

Size	M	B	D	C	E	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	35.0	12.3	10.0	10.0	0.15
3/4		40.0	16.2	13.0	10.0	0.21
1		50.0	21.2	13.0	13.0	0.36
1 1/4		60.0	29.9	13.0	13.0	0.48
1 1/2		65.0	34.4	13.0	13.0	0.53
2		80.0	43.1	16.0	19.0	1.06
2 1/2		100.0	57.3	16.0	19.0	1.64
3		120.0	66.9	16.0	19.0	2.74
4		160.0	87.0	19.0	19.0	4.67

Size	M	B	D	C	F	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	35.0	12.3	10.0	23.0	0.19
3/4		40.0	16.2	13.0	24.0	0.28
1		50.0	21.2	13.0	29.0	0.48
1 1/4		60.0	29.9	13.0	29.0	0.58
1 1/2		65.0	34.4	13.0	32.0	0.64
2		80.0	43.1	16.0	41.0	1.72
2 1/2		100.0	57.3	16.0	43.0	2.24
3		120.0	66.9	16.0	45.0	3.41
4		160.0	87.0	19.0	48.0	5.73

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16. 11 or JIS B2316.

Size	M	B	F	C	Weight (Kg)
3000 lb					
1/4	See Note (1) To be specified by purchaser	22.0	10.0	10.0	0.04
3/8		25.0	10.0	10.0	0.07
1/2		32.0	10.0	10.0	0.09
3/4		38.0	12.0	13.0	0.16
1		45.0	14.0	13.0	0.24
1 1/4		55.0	17.0	13.0	0.35
1 1/2		60.0	17.0	13.0	0.47
2		75.0	20.0	16.0	0.87
2 1/2		95.0	26.0	16.0	1.52
3		110.0	30.0	16.0	2.26
4		140.0	36.0	19.0	4.41

Size	M	B	D	F	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	16.0	10.0	0.06
3/8		25.0	12.7	18.0	10.0	0.07
1/2		32.0	16.1	23.0	10.0	0.13
3/4		38.0	21.4	24.0	13.0	0.17
1		45.0	27.2	29.0	13.0	0.28
1 1/4		55.0	35.5	29.0	13.0	0.39
1 1/2		60.0	41.2	32.0	13.0	0.45
2		75.0	52.7	41.0	16.0	0.87
2 1/2		80.0	65.9	43.0	16.0	1.25
3		110.0	78.1	45.0	16.0	1.98
4		146.0	102.0	48.0	19.0	3.90

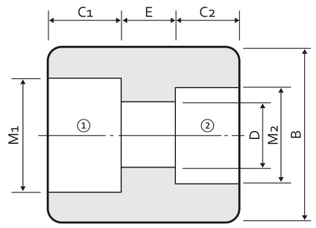
Size	M	B	F	C	Weight (Kg)
6000 lb					
1/2	See Note (1) To be specified by purchaser)	35.0	16.0	10.0	0.05
3/4		40.0	14.0	13.0	0.22
1		50.0	17.0	13.0	0.38
1 1/4		60.0	22.0	13.0	0.51
1 1/2		65.0	23.0	13.0	0.73
2		80.0	23.0	16.0	1.29
2 1/2		100.0	29.0	16.0	2.06
3		120.0	36.0	16.0	3.36

Size	M	B	D	F	C	Weight (Kg)
6000 lb						
1/2	See Note (1) To be specified by purchaser)	35.0	12.3	23.0	10.0	0.19
3/4		40.0	16.2	24.0	13.0	0.28
1		50.0	21.2	29.0	13.0	0.48
1 1/4		60.0	29.9	29.0	13.0	0.58
1 1/2		65.0	34.4	32.0	13.0	0.64
2		80.0	43.1	41.0	16.0	1.72
2 1/2		100.0	57.3	43.0	16.0	2.06
3		120.0	66.9	45.0	16.0	3.36

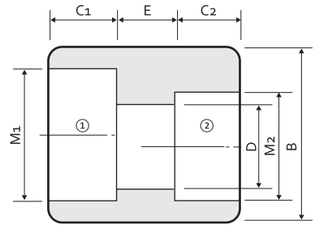
Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerances See ASME B16. 11 or JIS B2316.

SOCKET WELDING FITTINGS

3000lb, 6000lb



Con Reducer



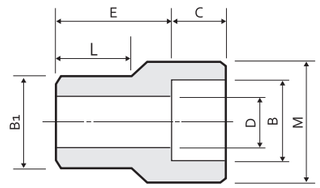
Ecc Reducer

Nominal SIZE		3000 lb							
①	②	B	M1	M2	D CON	D ECC	E	C1	C2
1/4	1/8	22.0	See Note (1) To be specified by purchaser	See Note (1) To be specified by purchaser	7.1	5.7	10.0	10.0	10.0
3/8	1/4	25.0			9.4	7.8	10.0	10.0	10.0
1/2	3/8	32.0			12.7	10.9	10.0	10.0	10.0
3/4	3/8	38.0			12.7	10.9	13.0	13.0	10.0
3/4	1/2	38.0			16.1	14.3	13.0	13.0	10.0
1	1/2	45.0			16.1	14.3	13.0	13.0	10.0
1	3/4	45.0			21.4	19.4	16.0	13.0	13.0
1 1/4	3/4	55.0			21.4	19.4	13.0	13.0	13.0
1 1/4	1	55.0			27.2	25.0	13.0	13.0	13.0
1 1/2	1	60.0			27.2	25.0	13.0	13.0	13.0
1 1/2	1 1/4	60.0			35.5	32.9	13.0	13.0	13.0
2	1 1/4	75.0			35.5	32.9	22.0	16.0	13.0
2	1 1/2	75.0			41.2	38.4	22.0	16.0	13.0

Nominal SIZE		6000 lb						
①	②	B	M1	M2	D	E	C1	C2
3/4	1/2	40.0	See Note (1) To be specified by purchaser	See Note (1) To be specified by purchaser	12.3	13.0	13.0	10.0
1	1/2	50.0			12.3	16.0	13.0	10.0
1	3/4	50.0			16.2	13.0	13.0	13.0
1 1/4	3/4	60.0			16.2	13.0	13.0	13.0
1 1/4	1	60.0			21.2	13.0	13.0	13.0
1 1/2	1	65.0			21.2	13.0	13.0	13.0
1 1/2	1 1/4	65.0			29.9	13.0	13.0	13.0
2	1 1/4	80.0			29.9	22.0	16.0	13.0
2	1 1/4	80.0			34.4	22.0	16.0	13.0

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerance Maker Standard.

Type 1



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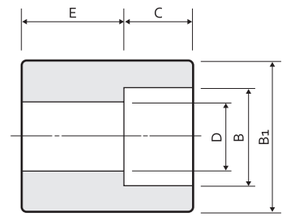
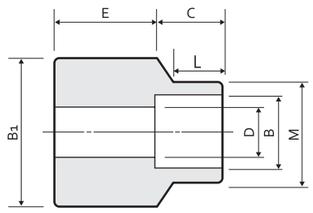
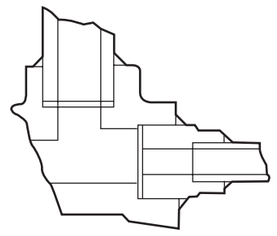


Type 3



Application of Reducer Insert



Reducing Insert

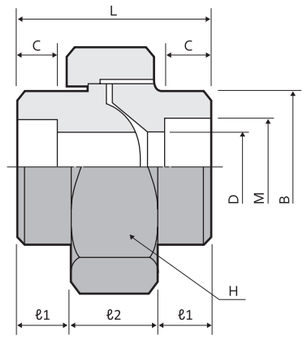
Orifice	Type	M	B1	B	C (Min.)	E	L	D	Weight (Kg)
3000 lb									
3/8 X 1/4	1	22.0	See Note (1) To be specified by purchaser	See Note (1) To be specified by purchaser	10	21	16	9.5	0.05
1/2 X 1/4	2	-			10	15	-	9.5	0.05
1/2 X 3/8	1	25.0			10	24	20	13	0.08
3/4 X 1/4	3	-			10	19	7	9.5	0.11
3/4 X 3/8	2	-			10	19	-	13	0.69
3/4 X 1/2	1	32.0			10	26	22	16	0.14
1 X 3/8	3	25.0			10	22	7	13	0.16
1 X 1/2	2	-			10	18	-	16	0.18
1 X 3/4	1	38.0			13	29	23	21	0.20
1 1/4 X 1/2	3	32.0			10	24	7	16	0.27
1 1/4 X 3/4	2	-			13	21	-	21	0.28
1 1/4 X 1	1	45.0			13	30	24.5	27	0.43
1 1/2 X 3/4	3	38.0			13	21	8	21	0.34
1 1/2 X 1	2	-			13	21	-	27	0.38
1 1/2 X 1 1/4	1	55.0			13	28	27	35	0.46
2 X 1	3	46.0			13	29	8	27	0.61
2 X 1 1/4	2	-			13	29	-	35	0.64
2 X 1 1/2	1	65.0			13	37	29	41	0.66
2 1/2 X 1 1/4	3	55.0			13	35	8	35	1.18
2 1/2 X 1 1/2	3	65.0			13	35	8	41	1.19
2 1/2 X 2	1	76.0			16	39	30	52	1.20
3 X 1 1/2	3	65.0			13	39	8	41	1.71
3 X 2	3	75.0			16	39	10	52	1.50
3 X 2 1/2	1	95.0			16	51	33.5	66	1.82

Orifice	Type	M	B1	B	C (Min.)	E	L	D	Weight (Kg)
6000 lb									
3/8 X 1/4	1	38.1	See Note (1) To be specified by purchaser	See Note (1) To be specified by purchaser	10	39	23	12.3	0.316
1 X 1/2	1	38.1			10	38	24	12.3	0.354
1 X 3/4	1	46.0			13	43	26	16.2	0.526
1 1/4 X 1/2	2	-			10	29	-	12.3	0.415
1 1/4 X 3/4	1	46.0			13	40	28	16.2	0.557
1 1/4 X 1	1	55.0			13	45	28	21.2	0.765
1 1/2 X 3/4	2	-			13	35	-	16.2	0.619
1 1/2 X 1	1	55.0			13	38	28	21.2	0.723
1 1/2 X 1 1/4	1	62.0			13	52	32	29.9	0.957
2 X 1	3	-			13	43	8	21.2	10.26
2X 1 1/4	1	62.0			13	54	34	29.9	1.137
2 X 1 1/2	1	75.0			13	63	34	34.4	0.911
2 1/2 X 1 1/4	3	62.0			13	46	8	29.9	1.478
2 1/2 X 1 1/2	2	-			13	46	-	34.4	1.881
2 1/2 X 2	1	95.0			16	73	36	43.1	2.918
3 X 1 1/2	3	75.0			13	50	8	34.4	2.370
3 X 2	2	-			16	70	-	43.1	3.313
3 X 2 1/2	1	110.0			16	83	38	57.3	3.562

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerance MSS SP-79.

SOCKET WELDING FITTINGS

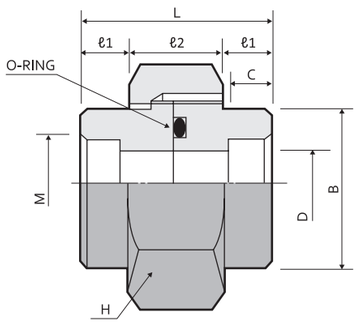
3000lb, 6000lb



R.J Union

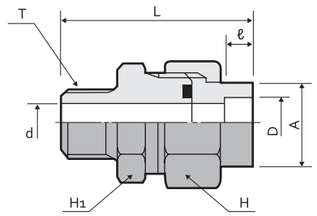
Size	M	B	ℓ1	ℓ2	L	C	D	H	Weight (Kg)
3000 lb									
1/4	See Note (1) To be specified by purchaser	23.0	10.5	19.0	40.0	10.0	9.4	36 HEX	0.17
3/8		26.0	13.0	19.0	45.0	10.0	12.7	41 HEX	0.24
1/2		31.5	14.0	21.0	49.0	10.0	16.1	46 HEX	0.34
3/4		39.0	16.0	26.0	58.0	13.0	21.4	54 HEX	0.58
1		47.0	19.0	27.0	65.0	13.0	27.2	63 HEX	0.86
1 1/4		55.0	21.0	30.0	72.0	13.0	35.5	77 OCT	1.19
1 1/2		61.0	21.0	34.0	76.0	13.0	41.2	83 OCT	1.50
2		75.5	24.0	37.0	85.0	16.0	52.7	95 OCT	2.12
2 1/2		95.0	34.0	42.0	110.0	18.0	65.9	124 OCT	4.50
3		110.0	37.5	45.0	120.0	22.5	78.1	142 OCT	6.60
4		140.0	45.0	50.0	140.0	25.0	102.0	176 OCT	10.50

Size	M	B	ℓ1	ℓ2	L	C	D	H	Weight (Kg)
6000 lb									
1/2	See Note (1) To be specified by purchaser	38.0	17.0	23.0	57.0	13.0	12.0	58 HEX	0.62
3/4		45.0	19.5	25.0	64.0	13.0	15.8	63 HEX	0.94
1		55.0	22.5	27.0	72.0	13.0	21.0	77 OCT	1.41
1 1/4		61.0	24.0	30.0	78.0	16.0	29.7	83 OCT	1.98
1 1/2		76.0	26.0	36.0	88.0	16.0	34.2	95 OCT	2.75
2		95.0	34.0	42.0	110.0	16.0	43.1	124 OCT	5.05
2 1/2		110.0	35.0	45.0	120.0	18.0	54.0	142 OCT	6.87
3		140.0	45.0	50.0	140.0	22.0	67.7	176 OCT	10.85



O-Ring Union

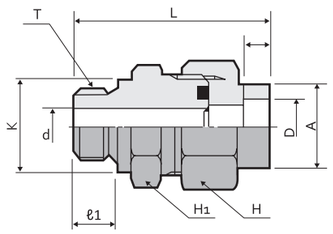
Size	M	B	D	C	ℓ1	ℓ2	L	H	O-Ring	Weight (Kg)
3000 lb										
1/4	See Note (1) To be specified by purchaser	23.0	10.0	10.0	10.0	18.0	38.0	36 HEX	P18	0.06
3/8		26.0	12.0	10.0	10.0	19.0	38.0	41 HEX	P20	0.07
1/2		31.5	16.0	10.0	12.0	21.0	45.0	46 HEX	G25	0.13
3/4		39.0	20.0	13.0	12.0	26.0	49.0	54 HEX	G30	0.17
1		47.0	25.5	13.0	15.0	27.0	56.0	63 HEX	G35	0.28
1 1/4		55.0	32.0	13.0	15.0	30.0	59.0	77 OCT	G45	0.39
2 1/2		61.0	38.0	13.0	18.0	34.0	69.0	83 OCT	G50	0.45
2		75.5	48.0	16.0	18.0	37.0	72.0	95 OCT	G65	3.90



[SWMC - R]

Male Connector

Designations	Nom. Size	D	ℓ	d	A	L	H	H1	T (PT)	ORing
SWMC02-03R	1/4	14.3	10	9	23.0	55	HEX36	HEX30	1/4	P18
SWMC03-03R	3/8	17.8	10	9	26.0	56	HEX41	HEX36	3/8	P20
SWMC03-04R	3/8	17.8	10	12	26.0	56	HEX41	HEX36	3/8	P20
SWMC04-04R	1/2	22.2	10	12	31.5	60	HEX46	HEX41	1/2	G25
SWMC04-06R	1/2	22.2	10	16	31.5	66	HEX46	HEX41	1/2	G25
SWMC06-06R	3/4	27.7	13	16	39.0	72	HEX54	HEX46	3/4	G30
SWMC06-08R	3/4	27.7	13	20	39.0	75	HEX54	HEX46	3/4	G30
SWMC08-08R	1	34.5	13	20	47.0	82	HEX63	HEX55	1	G35
SWMC08-10R	1	34.5	13	25	47.0	84	HEX63	HEX55	1 1/4	G35
SWMC10-10R	1 1/4	43.2	13	25	55.0	90	OCT77	OCT65	1 1/4	G45
SWMC10-12R	1 1/4	43.2	13	32	55.0	91	OCT77	OCT65	1 1/2	G45
SWMC12-12R	1 1/2	49.1	13	32	61.0	99	OCT83	OCT75	1 1/2	G50
SWMC12-16R	1 1/2	49.1	13	38	61.0	103	OCT83	OCT75	2	G50
SWMC16-16R	2	61.1	16	38	75.5	103	OCT95	OCT90	2	G65



[SWMC - G]

Male Connector

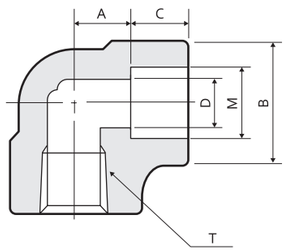
Designations	Nom. Size	D	ℓ	d	A	L	H	H1	T (PF)	ORing
SWMC02-02G	1/4	14.3	10	18.0	23.0	54	HEX36	HEX30	1/4	P18
SWMC02-03G	1/4	14.3	10	21.5	23.0	55	HEX36	HEX30	3/8	P18
SWMC03-03G	3/8	17.8	10	21.5	26.0	56	HEX41	HEX36	3/8	P20
SWMC03-04G	3/8	17.8	10	25.5	26.0	56	HEX41	HEX36	1/2	P20
SWMC04-04G	1/2	22.2	10	25.5	31.5	60	HEX46	HEX41	1/2	G25
SWMC04-06G	1/2	22.2	10	31.5	31.5	66	HEX46	HEX41	3/4	G25
SWMC06-06G	3/4	27.7	13	31.5	39.0	72	HEX54	HEX46	3/4	G30
SWMC06-08G	3/4	27.7	13	38.0	39.0	75	HEX54	HEX46	1	G30
SWMC08-08G	1	34.5	13	38.0	47.0	82	HEX63	HEX55	1	G35
SWMC08-10G	1	34.5	13	48.5	47.0	84	HEX63	HEX55	1 1/4	G35
SWMC10-10G	1 1/4	43.2	13	48.5	55.0	90	OCT77	OCT65	1 1/4	G45
SWMC10-12G	1 1/4	43.2	13	53.5	55.0	91	OCT77	OCT65	1 1/2	G45
SWMC12-12G	1 1/2	49.1	13	53.5	61.0	99	OCT83	OCT75	1 1/2	G50
SWMC12-16G	1 1/2	49.1	13	66.0	61.0	103	OCT83	OCT75	2	G50
SWMC16-16G	2	61.1	16	66.0	75.5	103	OCT95	OCT90	2	G65

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerance MSS SP-83 & Maker Standard.

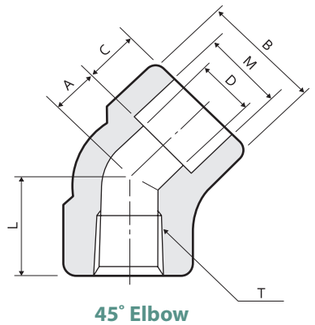
- Dimensions are in millimeters.
- Dimensional Tolerance Maker Standard.

SOCKET WELDING & THREADED FITTINGS

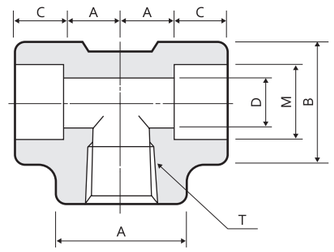
3000lb, 6000lb



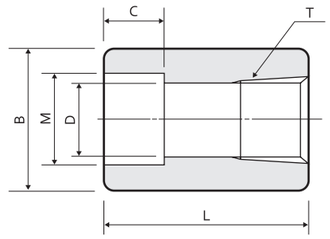
90˚Elbow



45˚ Elbow



Tee



Full Coupling

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	11.1	10.0	0.10
3/8		27.5	12.7	13.4	12.0	0.14
1/2		35.0	16.1	16.0	13.0	0.26
3/4		40.0	21.4	20.0	15.0	0.36
1		48.0	27.2	23.0	16.0	0.54
1 1/4		58.0	35.5	28.0	18.0	0.89
1 1/2		64.0	41.2	33.0	20.0	1.10
2		76.0	52.7	40.0	22.0	1.75
2 1/2		92.0	65.9	42.0	24.0	2.52
3		110.0	78.1	57.1	31.5	5.25
4		146.0	102.0	70.0	45.0	9.51

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	7.9	10.0	0.09
3/8		27.5	12.7	7.9	12.0	0.15
1/2		35.0	16.1	13.0	13.0	0.25
3/4		40.0	21.4	13.0	15.0	0.29
1		48.0	27.2	14.0	16.0	0.44
1 1/4		58.0	35.5	18.0	18.0	0.67
1 1/2		64.0	41.2	22.0	20.0	0.88
2		76.0	52.7	24.0	22.0	1.25
2 1/2		92.0	65.9	29.0	24.0	3.12
3		110.0	78.1	34.0	31.5	4.85
4		146.0	102.0	42.0	45.0	8.40

Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	40.0	12.3	20.0	13.0	0.47
3/4		48.0	16.2	23.0	15.0	0.75
1		58.0	21.2	28.0	16.0	1.13
1 1/4		64.0	29.9	33.0	18.0	1.54
1 1/2		76.0	34.4	40.0	20.0	2.88
2		92.0	43.1	42.0	22.0	3.77
2 1/2		110.0	57.3	57.1	24.0	6.25
3		121.0	66.9	66.0	31.5	8.86
4		152.0	87.0	70.0	45.0	14.42

Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/4	See Note (1) To be specified by purchaser	40.0	12.3	13.0	13.0	0.41
3/4		48.0	16.2	14.0	15.0	0.61
1		58.0	21.2	22.0	16.0	0.99
1 1/4		64.0	29.9	22.0	18.0	1.32
1 1/2		76.0	34.4	24.0	20.0	2.01
2		92.0	43.1	29.0	22.0	3.56
2 1/2		110.0	57.3	34.0	24.0	5.85
3		121.0	66.9	34.0	31.5	6.71
4		152.0	87.0	42.0	45.0	12.50

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerance Maker Standard.

Size	M	B	D	A	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	23.5	9.4	11.5	11.0	0.12
3/8		27.0	12.7	13.5	12.0	0.18
1/2		34.5	16.1	16.5	13.0	0.33
3/4		40.0	21.4	18.5	15.0	0.43
1		49.0	27.2	22.5	16.0	0.68
1 1/4		58.0	35.5	26.5	18.0	1.07
1 1/2		64.0	41.2	31.5	20.0	1.35
2		79.0	52.7	38.5	22.0	2.21
2 1/2		92.0	65.9	42.0	24.0	2.91
3		110.0	78.1	57.0	31.5	4.86
4		146.0	102.0	70.0	45.0	12.24

Size	M	B	D	L	C	Weight (Kg)
3000 lb						
1/4	See Note (1) To be specified by purchaser	22.0	9.4	30.0	10.0	0.18
3/8		25.0	12.7	30.0	10.0	0.17
1/2		32.0	16.1	40.0	10.0	0.36
3/4		38.0	21.2	43.0	13.0	0.52
1		45.0	27.0	50.0	13.0	0.68
1 1/4		55.0	35.4	55.0	13.0	1.02
1 1/2		60.0	41.2	55.0	13.0	1.89
2		75.0	52.7	64.0	16.0	2.33
2 1/2		95.0	62.7	70.0	16.0	7.48
3		110.0	78.0	80.0	16.0	10.43
4		140.0	102.0	95.0	19.0	18.14

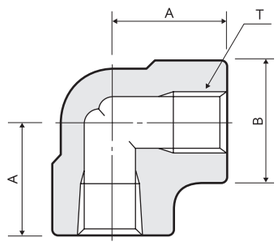
Size	M	B	D	A	C	Weight (Kg)
6000 lb						
1/2	See Note (1) To be specified by purchaser	40.0	12.0	20.0	13.0	0.60
3/4		49.0	15.8	23.0	15.0	0.97
1		58.0	21.0	28.0	16.0	1.60
1 1/4		64.0	29.7	33.0	18.0	1.94
1 1/2		79.0	34.0	40.0	20.0	3.64
2		92.0	43.1	42.0	22.0	4.20
2 1/2		110.0	54.0	57.0	24.0	8.90
3		121.0	67.7	66.0	31.5	11.00
4		152.0	87.0	70.0	45.0	19.80

Size	M	B	D	L	C	Weight (Kg)
6000 lb						
1/2	See Note (1) To be specified by purchaser	35.0	12.3	40.0	10.0	0.66
3/4		40.0	16.2	43.0	13.0	1.22
1		50.0	21.2	50.0	13.0	1.73
1 1/4		60.0	29.9	55.0	13.0	2.38
1 1/2		65.0	34.4	55.0	13.0	3.75
2		80.0	43.1	64.0	16.0	7.86
2 1/2		100.0	57.3	70.0	16.0	10.60
3		120.0	66.9	80.0	16.0	13.60
4		160.0	87.0	95.0	19.0	26.00

Notes (1) For the 'Bore'(M) other standard pipe outside diameter, refer to Engineering Data 6) Wall Thickness Schedules.
- Dimensions are in millimeters.
- Dimensional Tolerance Maker Standard.

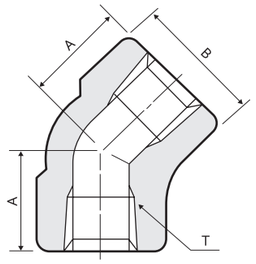
THREADED FITTINGS

2000lb, 3000lb, 6000lb



90˚Elbow

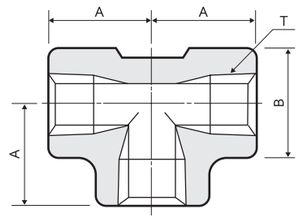
Size	B	A	Weight (Kg)
2000 lb			
1/4	23.5	19.4	0.10
3/8	27.5	24.7	0.14
1/2	35.0	29.1	0.28
3/4	40.0	36.2	0.35
1	48.0	43.0	0.56
1 1/4	58.0	53.4	0.90
1 1/2	64.0	61.2	1.14
2	76.0	74.7	1.84
2 1/2	92.0	86.7	3.25
3	110.0	109.5	5.64
4	146.0	147.0	9.86
3000 lb			
1/4	27.5	24.7	0.12
3/8	35.0	29.1	0.23
1/2	40.0	36.2	0.39
3/4	48.0	43.0	0.57
1	58.0	53.4	0.99
1 1/4	64.0	61.2	1.26
1 1/2	76.0	74.7	2.12
2	92.0	86.7	3.52
2 1/2	110.0	109.5	5.46
3	121.0	147.0	8.00
4	152.0	114.3	13.50
6000 lb			
3/8	40.0	33.5	0.40
1/2	48.0	38.5	0.68
3/4	64.0	44.5	1.13
1	58.0	50.8	1.59
1 1/4	76.0	60.5	2.60
1 1/2	92.0	64.0	4.32
2	110.0	85.0	7.33
2 1/2	121.0	95.5	9.25
3	146.0	106.5	12.05
4	152.0	114.3	14.10



45˚ Elbow

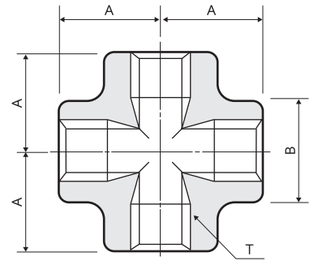
Size	B	A	Weight (Kg)
2000 lb			
1/4	23.5	17.9	0.09
3/8	27.5	17.9	0.11
1/2	35.0	26.0	0.25
3/4	40.0	28.0	0.30
1	48.0	30.0	0.46
1 1/4	58.0	36.0	0.69
1 1/2	64.0	42.0	0.92
2	76.0	46.0	1.30
2 1/2	92.0	53.0	2.22
3	110.0	65.5	3.85
4	146.0	87.0	8.10
3000 lb			
1/4	27.5	17.9	0.10
3/8	35.0	26.0	0.18
1/2	40.0	28.0	0.31
3/4	48.0	30.0	0.46
1	58.0	36.0	0.79
1 1/4	64.0	42.0	1.01
1 1/2	76.0	46.0	1.70
2	92.0	53.0	2.82
2 1/2	110.0	65.5	4.37
3	121.0	87.0	6.40
4	152.0	87.0	10.80
6000 lb			
3/8	40.0	28.6	0.32
1/2	48.0	30.0	0.54
3/4	64.0	33.3	0.90
1	58.0	42.0	1.27
1 1/4	76.0	46.0	2.08
1 1/2	92.0	53.0	3.46
2	110.0	64.0	5.86
2 1/2	121.0	64.0	7.40
3	146.0	80.0	9.64
4	152.0	80.0	11.28

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



Tee

Size(T)	B	A	Weight (Kg)
2000 lb			
1/4	23.5	22.5	0.44
3/8	27.0	25.5	0.51
1/2	34.5	29.5	0.60
3/4	40.0	33.5	0.68
1	49.0	38.5	0.77
1 1/4	58.0	44.5	0.90
1 1/2	64.0	51.5	1.04
2	79.0	60.5	2.10
2 1/2	92.0	66.0	3.94
3	110.0	88.5	5.98
4	146.0	115.0	12.36
3000 lb			
1/4	27.0	25.5	0.18
3/8	34.5	29.5	0.32
1/2	40.0	33.5	0.52
3/4	49.0	38.5	0.73
1	58.0	44.5	1.26
1 1/4	64.0	51.5	1.65
1 1/2	79.0	60.5	2.81
2	92.0	66.0	4.35
2 1/2	110.0	88.5	6.26
3	121.0	95.5	10.05
4	152.0	114.3	16.50
6000 lb			
3/8	40.0	33.5	0.59
1/2	49.0	38.5	0.96
3/4	58.0	44.5	1.50
1	64.0	51.5	2.10
1 1/4	79.0	60.5	3.30
1 1/2	92.0	66.0	5.72
2	110.0	88.5	9.64
2 1/2	121.0	95.5	13.40
3	146.0	1106.5	16.15
4	152.0	114.3	16.70



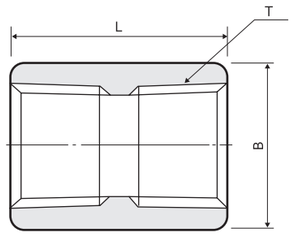
Cross

Size(T)	B	A	Weight (Kg)
2000 lb			
1/4	23.5	22.5	0.14
3/8	27.0	25.5	0.22
1/2	34.5	29.5	0.37
3/4	40.0	33.5	0.52
1	49.0	38.5	0.79
1 1/4	58.0	44.5	1.28
1 1/2	64.0	51.5	1.62
2	79.0	60.5	2.62
2 1/2	92.0	66.0	4.66
3	110.0	88.5	7.10
4	146.0	115.0	14.83
3000 lb			
1/4	27.0	25.5	0.23
3/8	34.5	29.5	0.40
1/2	40.0	33.5	0.63
3/4	49.0	38.5	0.93
1	58.0	44.5	1.47
1 1/4	64.0	51.5	1.78
1 1/2	79.0	60.5	3.42
2	92.0	66.0	5.50
2 1/2	110.0	88.5	7.66
3	121.0	95.5	11.21
4	152.0	114.3	19.00
6000 lb			
3/8	40.0	33.5	0.67
1/2	49.0	38.5	1.12
3/4	58.0	44.5	1.90
1	64.0	51.5	2.90
1 1/4	79.0	60.5	4.20
1 1/2	92.0	66.0	6.65
2	110.0	88.5	10.00
2 1/2	121.0	95.5	16.00
3	146.0	1106.5	19.87
4	152.0	114.3	24.60

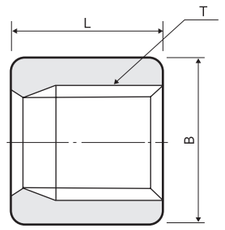
- Dimensions are in millimeters.
- Dimensional Tolerances See ANSI B16. 11 or JIS B2316.

THREADED FITTINGS

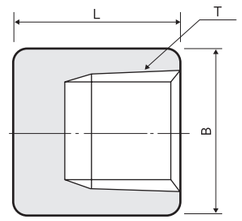
2000 lb, 3000 lb, 6000 lb



Full Coupling



Half Coupling



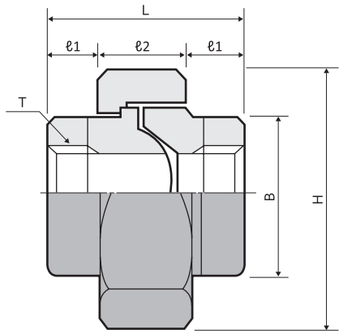
Cap

Size (T)	B	L	Weight (Kg)
2000 lb			
1/4	22.0	35.0	0.07
3/8	25.0	38.0	0.09
1/2	30.0	48.0	0.16
3/4	35.0	51.0	0.20
1	45.0	61.0	0.40
1 1/4	55.0	67.0	0.64
1 1/2	60.0	80.0	0.82
2	75.0	86.0	1.37
2 1/2	95.0	92.0	2.28
3	110.0	108.0	3.35
4	140.0	121.0	5.82
3000 lb			
1/4	22.0	35.0	0.05
3/8	25.0	38.0	0.06
1/2	30.0	48.0	0.14
3/4	35.0	51.0	0.22
1	45.0	61.0	0.42
1 1/4	55.0	67.0	0.72
1 1/2	60.0	80.0	1.07
2	75.0	86.0	1.40
2 1/2	95.0	92.0	2.55
3	110.0	108.0	3.83
4	140.0	121.0	6.35
6000 lb			
1/4	25.0	35.0	0.12
3/8	32.0	38.0	0.18
1/2	38.0	48.0	0.28
3/4	45.0	51.0	0.45
1	55.0	61.0	0.80
1 1/4	60.0	67.0	1.40
1 1/2	75.0	80.0	1.95
2	95.0	86.0	2.80
2 1/2	110.0	92.0	3.80
3	130.0	108.0	6.01
4	160.0	121.0	10.70

Size (T)	B	L	Weight (Kg)
2000 lb			
1/4	22.0	17.5	0.03
3/8	25.0	19.0	0.04
1/2	30.0	24.0	0.08
3/4	35.0	25.5	0.10
1	45.0	30.5	0.20
1 1/4	55.0	33.5	0.32
1 1/2	60.0	40.0	0.40
2	75.0	43.0	0.68
2 1/2	95.0	46.0	1.14
3	110.0	54.0	1.84
4	140.0	60.5	2.51
3000 lb			
1/4	22.0	17.5	0.03
3/8	25.0	19.0	0.03
1/2	30.0	24.0	0.07
3/4	35.0	25.5	0.10
1	45.0	30.5	0.21
1 1/4	55.0	33.5	0.37
1 1/2	60.0	40.0	0.52
2	75.0	43.0	0.69
2 1/2	95.0	46.0	1.25
3	110.0	54.0	1.84
4	140.0	60.5	3.51
6000 lb			
1/4	25.0	17.5	0.06
3/8	32.0	19.0	0.09
1/2	38.0	24.0	0.14
3/4	45.0	25.5	0.23
1	55.0	30.5	0.37
1 1/4	60.0	33.5	0.70
1 1/2	75.0	40.0	0.90
2	95.0	43.0	1.22
2 1/2	110.0	46.0	1.85
3	130.0	54.0	2.95
4	160.0	60.5	5.40

Size (T)	B	L	Weight (Kg)
2000 lb			
1/4	22.0	25.0	0.05
3/8	25.0	25.0	0.08
1/2	30.0	32.0	0.13
3/4	35.0	37.0	0.18
1	45.0	41.0	0.35
1 1/4	55.0	44.0	0.58
1 1/2	60.0	44.0	0.75
2	75.0	48.0	0.99
2 1/2	95.0	60.0	2.27
3	110.0	65.0	3.83
4	140.0	68.0	6.35
3000 lb			
1/4	22.0	25.0	0.05
3/8	25.0	25.0	0.08
1/2	30.0	32.0	0.12
3/4	35.0	37.0	0.20
1	45.0	41.0	0.31
1 1/4	55.0	44.0	0.60
1 1/2	60.0	44.0	0.73
2	75.0	48.0	1.05
2 1/2	95.0	60.0	2.27
3	110.0	65.0	3.83
4	140.0	68.0	6.35
6000 lb			
1/4	25.0	27.0	0.09
3/8	32.0	27.0	0.14
1/2	38.0	33.0	0.25
3/4	45.0	38.0	0.36
1	55.0	43.0	0.70
1 1/4	60.0	46.0	0.80
1 1/2	75.0	48.0	1.28
2	95.0	51.0	2.16
2 1/2	110.0	64.0	2.72
3	130.0	68.0	4.95
4	160.0	75.0	9.21

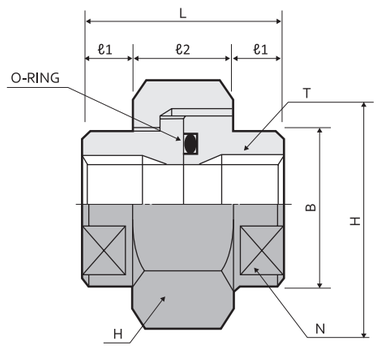
- Dimensions are in millimeters.
- Dimensional Tolerances See ANSI B16. 11 or JIS B2316.



R.J Union

Size	B	ℓ1	ℓ2	L	H	Weight (Kg)
3000 lb						
1/4	23.0	10.5	19.0	40.0	36 HEX	0.17
3/8	26.0	13.0	19.0	45.0	41 HEX	0.24
1/2	31.5	14.0	21.0	49.0	46 HEX	0.34
3/4	39.0	16.0	26.0	58.0	54 HEX	0.58
1	47.0	19.0	27.0	65.0	63 HEX	0.86
1 1/4	55.0	21.0	30.0	72.0	77 OCT	1.19
1 1/2	61.0	21.0	34.0	76.0	83 OCT	1.50
2	75.5	24.0	37.0	85.0	95 OCT	2.12
2 1/2	95.0	34.0	42.0	110.0	124 OCT	4.50
3	110.0	37.5	45.0	120.0	142 OCT	6.60
4	140.0	45.0	50.0	140.0	176 OCT	10.50

Size	B	ℓ1	ℓ2	L	H	Weight (Kg)
6000 lb						
1/2	38.0	17.0	23.0	57.0	54 HEX	0.62
3/4	45.0	19.5	25.0	64.0	63 HEX	0.94
1	55.0	22.5	27.0	72.0	77 OCT	1.41
1 1/4	61.0	24.0	30.0	78.0	83 OCT	1.98
1 1/2	76.0	26.0	36.0	88.0	95 OCT	2.75
2	95.0	34.0	42.0	110.0	124 OCT	5.05
2 1/2	110.0	35.0	45.0	120.0	142 OCT	6.87
3	140.0	45.0	50.0	140.0	176 OCT	10.85

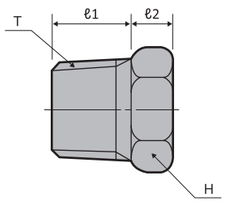


O-Ring Union

Size	B	ℓ1	ℓ2	L	N	H	ORing	Weight (Kg)
3000 lb								
1/4	23.0	10.0	18.0	38.0	19.0	36 HEX	P18	0.16
3/8	26.0	10.0	19.0	38.0	23.0	41 HEX	P20	0.21
1/2	31.5	12.0	21.0	45.0	29.0	46 HEX	G25	0.31
3/4	39.0	12.0	26.0	49.0	34.0	54 HEX	G30	0.44
1	47.0	15.0	27.0	56.0	41.0	63 HEX	G35	0.76
1 1/4	55.0	15.0	30.0	59.0	51.0	77 OCT	G45	1.11
1 1/2	61.0	18.0	34.0	69.0	60.0	83 OCT	G50	1.32
2	75.5	18.0	37.0	72.0	71.0	95 OCT	G65	1.85

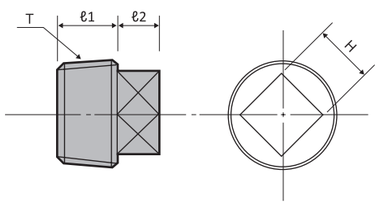
Notes
- Dimensions are in millimeters.
- Dimensional Tolerance MSS SP-83 & Maker Standard.

THREADED FITTINGS



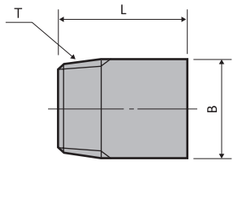
Hex. Head Plug

Size (T)	ℓ1	ℓ2	H	Weight (Kg)
1/8	11	7.0	11.0	0.03
1/4	14	8.0	17.0	0.03
3/8	15	8.0	19.0	0.06
1/2	19	9.0	22.0	0.08
3/4	21	10.0	27.0	0.14
1	24	11.0	36.0	0.22
1 1/4	27	12.0	46.0	0.51
1 1/2	27	14.0	51.0	0.62
2	31	16.0	65.0	1.02
2 1/2	32	19.0	78.0	1.76
3	40	21.0	95.0	2.66
4	42	32.0	116.0	5.90



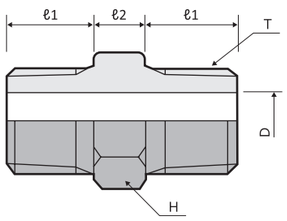
SQ. Head Plug

Size (T)	ℓ1	ℓ2	H	Weight (Kg)
1/8	9.0	7.0	7.0	0.007
1/4	12.0	8.0	9.0	0.014
3/8	13.0	9.0	12.0	0.028
1/2	16.0	10.0	14.0	0.057
3/4	18.0	11.0	17.0	0.085
1	20.0	12.0	19.0	0.140
1 1/4	22.0	13.0	24.0	0.255
1 1/2	22.0	14.0	27.0	0.397
2	26.0	15.0	32.0	0.680
2 1/2	27.0	20.0	38.0	1.020
3	29.0	21.0	43.0	1.301
4	32.0	25.0	63.5	3.257



Round Head Plug

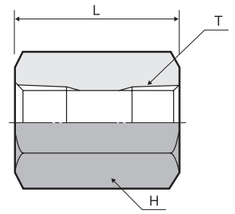
Size (T)	B	L	Weight (Kg)
1/8	10.5	35.0	0.057
1/4	13.5	41.5	0.057
3/8	17.5	41.5	0.085
1/2	22.0	44.5	0.170
3/4	27.0	44.5	0.170
1	34.0	51.0	0.340
1 1/4	43.0	51.0	0.340
1 1/2	48.5	51.0	0.710
2	60.0	63.5	1.361
2 1/2	73.0	70.0	2.155
3	89.0	70.0	3.456
4	114.0	76.0	5.838



Hex. Nipple

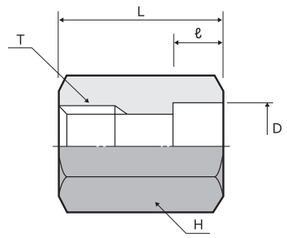
Size (T)	D	H	ℓ1	ℓ2	Weight (Kg)
1/8	5.5	11.0	10.0	7.0	0.03
1/4	7.0	14.0	14.0	9.0	0.04
3/8	9.0	17.0	14.0	9.0	0.05
1/2	12.0	22.0	19.0	9.0	0.09
3/4	15.0	27.0	19.0	10.0	0.15
1	20.0	36.0	24.0	11.0	0.27
1 1/4	28.0	46.0	24.0	12.0	0.45
1 1/2	32.0	50.0	25.0	14.0	0.62
2	40.0	65.0	26.0	16.0	1.03
2 1/2	60.0	78.0	38.0	18.0	1.51
3	74.0	95.0	40.0	20.0	2.22
4	97.0	116.0	50.0	25.0	2.81

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



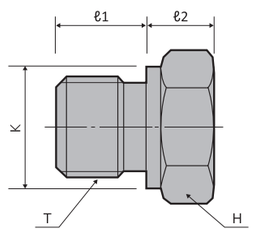
Hex Socket

Designations	T(PT)	H	L
SSA-01R	1/8	HEX17	30.0
SSA-02R	1/4	HEX22	30.0
SSA-03R	3/8	HEX24	30.0
SSA-04R	1/2	HEX30	40.0
SSA-06R	3/4	HEX36	42.0
SSA-08R	1	HEX46	50.0
SSA-10R	1 1/4	HEX55	55.0
SSA-12R	1 1/2	HEX60	55.0
SSA-16R	2	HEX75	64.0



Special Socket

Designations	T(PT)	D	L	ℓ	H
SSB-02WR	1/4	14.3	30	10.0	HEX22
SSB-03WR	3/8	17.8	30	10.0	HEX27
SSB-04WR	1/2	22.2	40	10.0	HEX32
SSB-06WR	3/4	27.7	43	13.0	HEX41
SSB-08WR	1	34.5	50	13.0	HEX46
SSB-10WR	1 1/4	43.2	55	13.0	HEX55
SSB-12WR	1 1/2	49.1	55	13.0	HEX65
SSB-16WR	2	61.1	64	16.0	HEX75

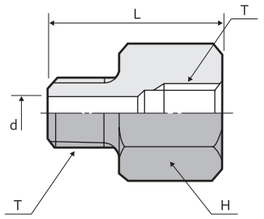


Hex Head Plug

Designations	T (PF)	ℓ1	ℓ2	K	H	O-Ring
SPC-01G	1/8	8.0	7.0	14.0	HEX14	P8
SPC-02G	1/4	12.0	9.0	19.0	HEX19	P11
SPC-03G	3/8	12.0	11.0	22.0	HEX22	P14
SPC-04G	1/2	14.0	13.0	27.0	HEX27	P18
SPC-06G	3/4	16.0	16.0	36.0	HEX36	P24
SPC-08G	1	18.0	18.0	41.0	HEX41	P29
SPC-10G	1 1/4	20.0	21.0	50.0	HEX50	P38
SPC-12G	1 1/2	21.0	21.0	55.0	HEX55	P44
SPC-16G	2	25.0	23.0	75.0	HEX75	P56

- Dimensions are in millimeters.
- Dimensional Tolerances Maker Standard.

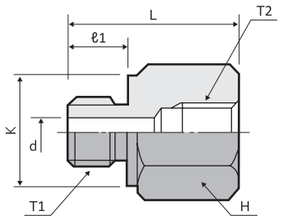
THREADED FITTINGS



TYPE - A

Designations	T(PT)	d	L	H
MFAA-02R	**1/4**	7	33	HEX22
MFAA-03R	**3/8**	9	36	HEX24
MFAA-04R	**1/2**	12	45	HEX30
MFAA-06R	**3/4**	16	50	HEX36
MFAA-08R	**1**	20	58	HEX46
MFAA-10R	**1 1/4**	28	67	HEX55
MFAA-12R	**1 1/2**	32	69	HEX65
MFAA-16R	**2**	40	79	HEX75

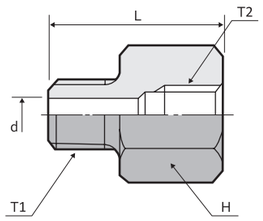
Male | Female Adapter



TYPE - B

Designations	T1(PF)	T2(PT)	d	K	ℓ1	L	H
MFAB-02R	1/4	1/4	6	19	12	33	HEX22
MFAB-03R	3/8	3/8	8	22	12	35	HEX24
MFAB-04R	1/2	1/2	12	27	14	42	HEX30
MFAB-06R	3/4	3/4	16	36	16	47	HEX36
MFAB-08R	1	1	22	41	18	55	HEX46
MFAB-10R	1 1/4	1 1/4	28	50	20	63	HEX55
MFAB-12R	1 1/2	1 1/2	31	55	21	66	HEX65
MFAB-16R	2	2	36	75	25	76	HEX75

Male | Female Adapter

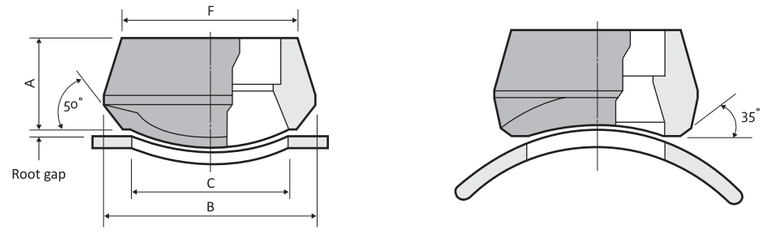


TYPE - C

Designations	T1(PT) X T2(PT)	d	L	H
MFAC01-02R	**1/8 X 1/4**	4	30	HEX22
MFAC01-03R	**1/8 X 3/8**	4	31	HEX24
MFAC02-03R	**1/4 X 3/8**	7	35	HEX24
MFAC02-04R	**1/4 X 1/2**	7	39	HEX30
MFAC02-06R	**1/4 X 3/4**	7	42	HEX36
MFAC03-04R	**3/8 X 1/2**	9	41	HEX30
MFAC03-06R	**3/8 X 3/4**	9	44	HEX36
MFAC03-08R	**3/8 X 1**	9	47	HEX46
MFAC04-06R	**1/2 X 3/4**	12	48	HEX36
MFAC04-08R	**1/2 X 1**	12	52	HEX46
MFAC04-10R	**1/2 X 1 1/4**	12	56	HEX55
MFAC06-08R	**3/4 X 1**	16	55	HEX46
MFAC06-10R	**3/4 X 1 1/4**	16	59	HEX55
MFAC06-12R	**3/4 X 1 1/2**	16	60	HEX65
MFAC08-10R	**1 X 1 1/4**	20	64	HEX55
MFAC08-12R	**1 X 1 1/2**	20	64	HEX65
MFAC08-16R	**1 X 2**	20	69	HEX75
MFAC10-12R	**1 1/4 X 1 1/2**	28	69	HEX65
MFAC10-16R	**1 1/4 X 2**	28	73	HEX75
MFAC12-16R	**1 1/2 X 2**	32	75	HEX75

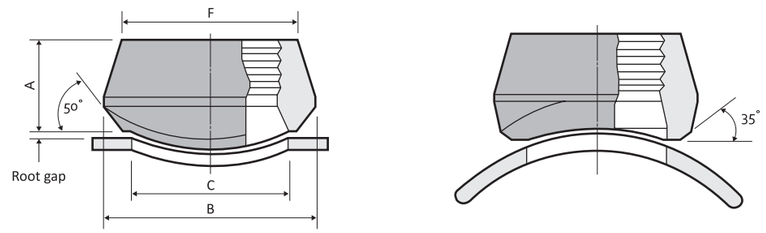
FORGED OUTLET FITTINGS

3000 lb, 6000 lb



Sockolet

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

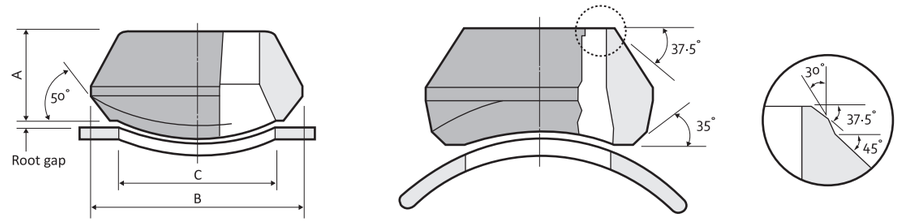


Threadolet

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

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

STD, X - S, SCH160, XX - S



Weldolet

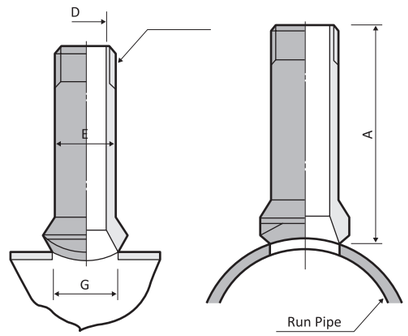
Outlet Size	A		B		C		APP' Weight (kg)	
	STD	X-S	STD	X-S	STD	X-S	STD	X-S
STD, X - S								
1/2	19.1	19.1	34.9	34.9	23.8	23.8	0.08	0.09
3/4	22.2	22.2	44.5	44.5	30.2	30.2	0.11	0.14
1	27.0	27.0	54.0	54.0	36.5	36.5	0.23	0.21
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5	0.36	0.41
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8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

Outlet Size	A		B		C		APP' Weight (kg)	
	Sch 160	XX-S	Sch 160	XX-S	Sch 160	XX-S	Sch 160	XX-S
SCH 160, XX - S								
1/2	19.1	19.1	34.9	34.9	23.8	23.8	0.08	0.09
3/4	22.2	22.2	44.5	44.5	30.2	30.2	0.11	0.14
1	27.0	27.0	54.0	54.0	36.5	36.5	0.23	0.21
1 1/4	31.8	31.8	65.1	65.1	44.5	44.5	0.36	0.41
1 1/2	33.3	33.3	73.0	73.0	50.8	50.8	0.45	0.50
2	38.1	38.1	88.9	88.9	65.1	65.1	0.80	0.80
2 1/2	41.3	41.3	103.2	103.2	76.2	76.2	1.14	1.20
3	44.5	44.5	122.2	122.2	93.7	93.7	1.82	1.90
4	50.8	50.8	152.4	152.4	120.7	120.7	2.86	2.90
5	57.2	57.2	179.4	179.4	141.3	141.3	4.66	4.70
6	60.3	77.8	215.9	225.4	169.9	169.9	6.45	10.50
8	69.9	98.5	263.5	292.1	220.7	220.7	10.68	16.80
10	77.8	93.7	322.3	323.9	274.7	265.1	17.73	20.90

- Dimensions are in millimeters.
- Dimensional Tolerance MSS SP-97 & Maker Standard.

FORGED OUTLET FITTINGS

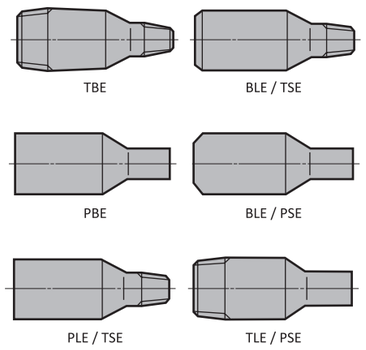
Nippolet



Outlet	A	G	D	E	Weight (kg)
SSA-01R	88.9	23.9	14.0	21.3	0.36
SSA-02R	88.9	30.2	18.8	26.7	0.56
SSA-03R	88.9	36.6	24.4	33.3	0.84
SSA-04R	88.9	44.5	32.5	42.2	1.22
SSA-06R	88.9	50.8	38.1	48.3	2.00
SSA-08R	88.9	65.0	49.3	60.5	3.12

3000lb
MSS SP-97 & Maker Standard

Swage Nipple

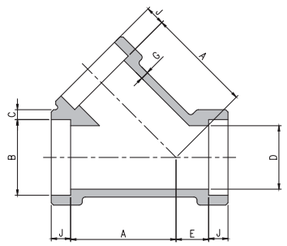


MSS SP -75

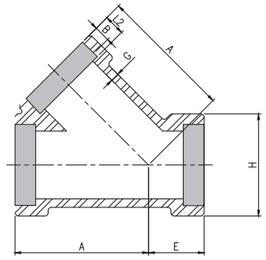
Large end Size	Small end Size	Length (mm)
1/2	3/8 - 1/8	70
3/4	1/2 - 1/8	76
1	3/8 - 1/8	89
1 1/4	1 - 1/8	102
1 1/2	1 1/4 - 1/8	114
2	1 1/2 - 1/8	165
2 1/2	2 - 1/8	178
3	2 1/2 - 1/8	203
4	3 - 1/8	229

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

SPECIAL PRODUCT



Socket-Welding 45˚Lateral Tee



Threaded 45˚Lateral Tee

Socket Welding									
DN	Nom.Pipe Size	B(1)	C(1)		D(1)	A	E	G(1) (Min)	J(1) (Min)
			(Avg)	(Min)					
3000Lb									
15	1/2	4.67	4.09	15.8	35	9	3.75	77.8	9.5
20	3/4	27.2	4.90	4.27	21.0	41	9	3.95	12.5
25	1	33.9	5.69	4.98	26.7	51	12	4.55	12.5
32	1-1/4	42.7	6.07	5.28	35.1	59	17	4.85	12.5
40	1-1/2	48.8	6.35	5.54	40.9	68	21	5.10	12.5
50	2	61.2	6.93	6.04	52.5	95	24	5.55	16.0
65	2-1/2	73.9	8.76	7.67	62.7	118	38	7.05	16.0
6000Lb									
15	1/2	21.8	5.97	5.18	11.8	41	9	4.78	9.5
20	3/4	27.2	6.96	6.04	15.6	51	12	5.56	12.5
25	1	33.9	7.92	6.93	20.7	59	17	6.35	12.5
32	1-1/4	42.7	7.92	6.93	29.5	68	21	6.35	12.5
40	1-1/2	48.8	8.92	7.80	34.0	95	24	7.14	12.5
50	2	61.2	10.92	9.50	42.9	106	31	8.74	16.0

(1) Dimensions refer ANSI B16. 11 for class 3M, socket welding fittings.
(2) Dimensions may vary in according to the customer and manufacuturer requirements.

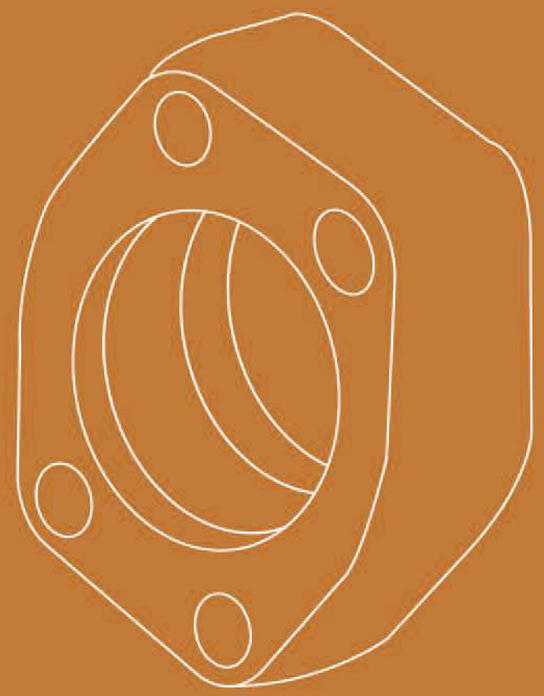
Threaded							
DN	Nom.Pipe Size	Length of Thread(Min)		A	E	G(1) (Min)	H(1) (Min)
		(Avg)	(Min)				
2000Lb							
15	1/2	10.9	13.6	46	20	3.18	33
20	3/4	12.7	13.9	55	23	3.18	38
25	1	14.7	17.3	65	26	3.68	46
32	1-1/4	17.0	18.0	73	31	3.89	56
40	1-1/2	17.8	18.4	82	35	4.01	62
50	2	19.0	19.2	113	42	4.27	75
65	2-1/2	23.6	28.9	136	56	5.61	92
6000Lb							
15	1/2	10.9	13.6	55	23	4.09	38
20	3/4	12.7	13.9	65	26	4.32	46
25	1	14.7	17.3	73	31	4.98	56
32	1-1/4	17.0	18.0	82	35	5.28	62
40	1-1/2	17.8	18.4	113	42	5.56	75
50	2	19.0	19.2	136	56	7.14	84

(1) Dimensions refer ANSI B16. 11 for class 3M, socket welding fittings.
(2) Dimensions 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).
(3) Dimensions of BSP and Pt are available if required.
(4) Dimensions may vary in according to the customer and manufacturer requirements.

02

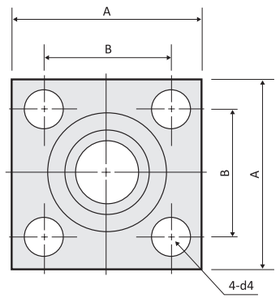
FLANGES

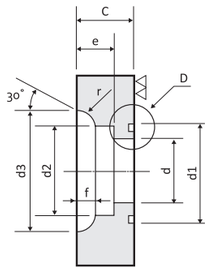
SQUARE FLANGE-SOCKET WELD ON
SOCKET WELD ON
SAE SOCKET WELD ON FLANGE
SAE THREAD FLANGE, SOCKET WELD ON FLANGE
SAE SOCKET WELD ON BOSS TYPE FLANGE
SAE THREAD BOSS TYPE FLANGE
SAE WELD ON FLANGE
SAE SPILT FLANGE



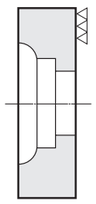
SQUARE FLANGE-SOCKET WELD ON

210Kg f/cm²

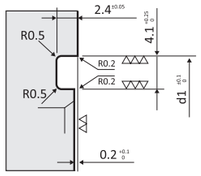




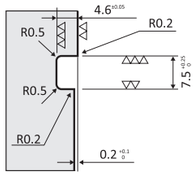
SHA



SHB



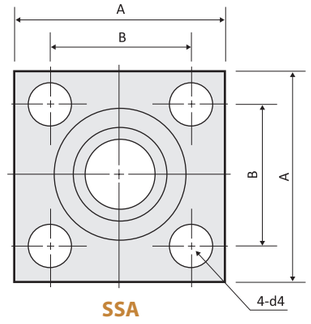
Detail D



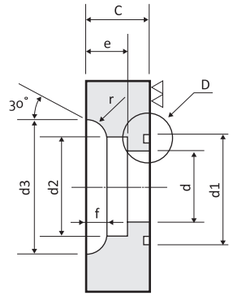
Detail D (150A)

TYPE	A	B	r	f	C	d2	d	e	d3	d1	d4	BOLT SIZE	O-RING KS-1B	Weight (Kg)
210Kg f/cm²														
SHA-B15	63	40	5	3.5	22	22.2	14.3	11	32	30	11.0	M10 X 60L	G25	0.56
SHA-B20	68	45	5	4.0	22	27.7	19.4	12	38	35	11.0	M10 X 60L	G30	0.60
SHA-B25	80	53	5	4.0	28	34.5	25.0	14	45	40	13.5	M12 X 75L	G35	1.08
SHA-B32	90	63	5	6.0	28	43.2	32.0	16	56	45	13.5	M12 X 75L	G40	1.32
SHA-B40	100	70	5	7.0	36	49.1	38.4	18	63	55	17.5	M16 X 95L	G50	2.00
SHA-B50	112	80	5	7.0	36	61.1	49.5	20	75	65	17.5	M16 X 95L	G60	2.53
SHA-B65	140	100	6	9.5	45	77.1	62.3	22	95	80	22.0	M20 X 120L	G75	4.94
SHA-B80	155	112	6	11.0	45	90.0	73.9	25	108	90	24.0	M22 X 120L	G85	5.82
SHA-B90	170	125	6	11.0	55	102.7	85.4	26	122	95	24.0	M22 X 135L	G90	10.66
SHA-B100	190	140	6	13.0	60	115.4	87.3	28	135	110	26.0	M24 X 140L	G105	13.10
SHA-B125	230	168	6	15.0	70	141.2	108.0	32	164	135	32.0	M30 X 165L	G130	28.60
SHA-B150	270	195	6	17.0	80	166.9	128.8	35	193	165	38.0	M36 X 190L	G155	37.70

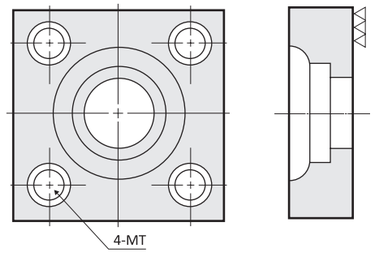
Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

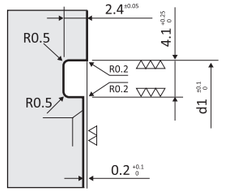


SSA

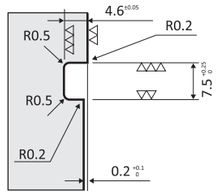


SSB





Detail D



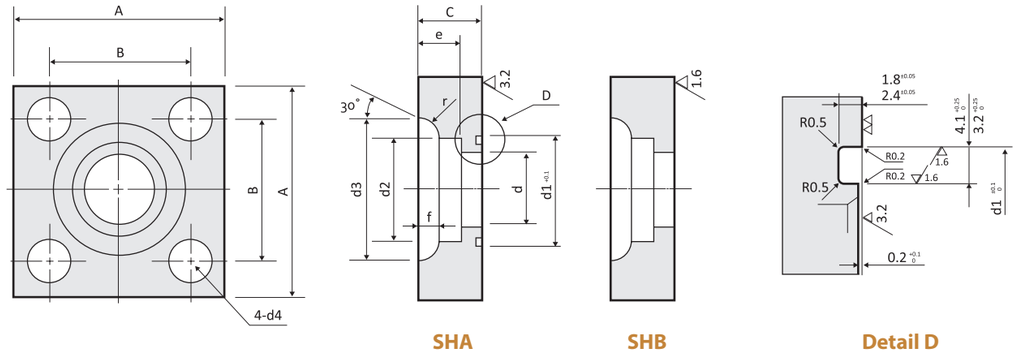
Detail D(150A)

TYPE	A	B	r	f	C	d2	d	e	d3	d1	d4	BOLT SIZE	O-RING KS-1B	Weight (Kg)
210Kg f/cm²														
SSA-B15	54	36	5	3.5	22	22.2	14.3	11	32	30	11.0	M10 X 45L	G25	0.40
SSA-B20	58	40	5	4.0	22	27.7	19.4	12	38	35	11.0	M10 X 45L	G30	0.43
SSA-B25	68	48	5	4.0	28	34.5	25.0	14	45	40	13.5	M12 X 55L	G35	0.68
SSA-B32	76	56	5	6.0	28	43.2	32.1	16	56	45	13.5	M12 X 55L	G40	0.85
SSA-B40	92	65	5	7.0	36	49.1	38.4	18	63	55	17.5	M16 X 70L	G50	1.60
SSA-B50	100	73	5	7.0	36	61.1	49.5	20	75	65	17.5	M16 X 70L	G60	1.85
SSA-B65	128	92	6	9.5	45	77.1	62.3	22	95	80	22.0	M20 X 90L	G75	3.80
SSA-B80	140	103	6	11.0	45	90.0	73.9	25	108	90	24.0	M22 X 90L	G85	4.37
SSA-B90	155	112	6	11.0	55	102.7	85.4	26	122	95	24.0	M22 x 110L	G90	8.20
SSA-B100	170	125	6	13.0	60	115.4	87.3	28	135	110	26.0	M24 X 120L	G105	10.00
SSA-B125	225	152	6	15.0	70	141.2	108.0	32	164	135	32.0	M30 X 140L	G130	22.00
SSA-B150	245	180	6	17.0	80	166.9	128.8	35	193	165	38.0	M36 X 160L	G155	23.00

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SQUARE FLANGE-SOCKET WELD ON

280Kg f/cm²

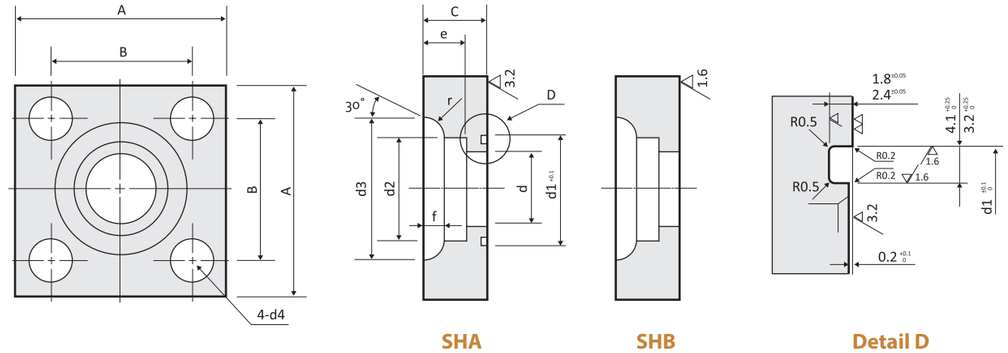


SHA SHB Detail D

TYPE	A	B	C	d	d1	d2	e	d3	d4	f	r	O-RING KS-1B	Weight (Kg)
280Kg f/cm²													
SHA-B15	66	43	22	12.3	24	22.2	12	34	11	4.0	5	P20	0.63
SHA-B20	72	48	25	16.2	30	27.7	12	40	11	4.5	5	G25	0.85
SHA-B25	85	58	35	21.2	35	34.5	14	48	13.5	5.0	5	G30	1.64
SHA-B32	98	68	35	29.9	45	43.2	18	60	17.5	6.5	5	G40	2.03
SHA-B40	105	74	40	34.4	50	49.1	20	66	17.5	7.5	5	G45	2.66
SHA-B50	130	90	50	43.1	60	61.1	20	79	22	8.0	5	G55	5.14
SHA-B65	150	108	60	57.3	75	77.1	25	100	24	10.0	6	G70	7.96
SHA-B80	170	120	65	66.9	85	90	25	114	26	12.0	6	G80	11.0

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

350Kg f/cm²



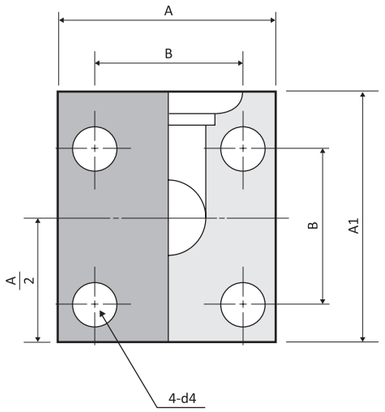
SHA SHB Detail D

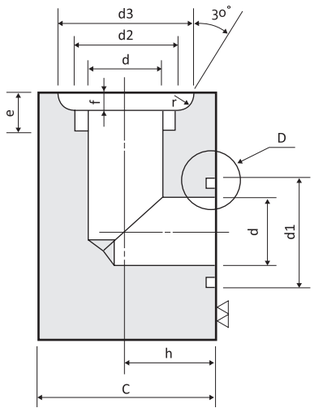
TYPE	A	B	C	d	d1	d2	e	d3	d4	f	r	O-RING KS-1B	Weight (Kg)
350Kg f/cm²													
SHA-B15	68	45	28	12.3	24	22.2	12	37.5	11.0	4.0	5	P20	0.9
SHA-B20	82	55	30	16.2	30	27.7	12	43.5	13.5	5.0	5	G25	1.3
SHA-B25	95	65	35	21.2	35	34.5	14	53.0	17.5	5.5	6	G30	2.0
SHA-B32	100	70	35	23.3	40	43.2	18	63.0	17.5	7.0	6	G35	2.2
SHA-B40	105	75	42	28.2	45	49.1	20	70.0	17.5	8.0	6	G40	2.8
SHA-B50	132	92	50	38.3	55	61.1	25	84.0	22.0	9 .0	6	G50	5.3
SHA-B65	160	112	60	48.3	65	77.1	30	105.0	26.0	12.0	7	G60	9.9
SHA-B80	190	130	68	58.7	75	90.0	30	120.0	33.0	13.5	7	G70	14.0

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

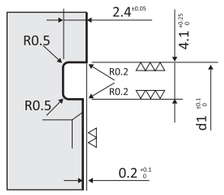
SOCKET WELD ON

210Kg f/cm²

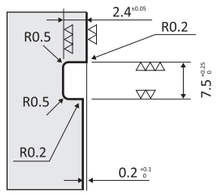




LSA



Detail D



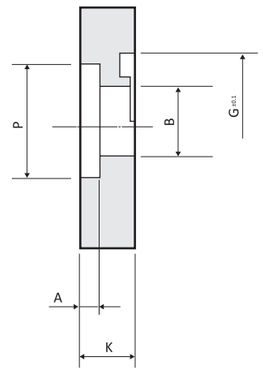
Detail D(150A)

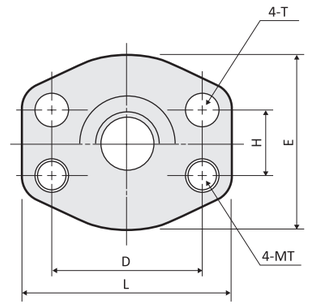
TYPE	A	A1	B	h	f	C	d3	d	e	r	d2	d1	d4	O-RING	Weight (Kg)
210Kg f/cm²															
LSA-15	54	63	36	20.0	3.5	40	32.0	14.3	11	5	22.2	30	11.0	G25	0.8
LSA-20	58	70	40	22.5	4.0	45	38.0	19.4	12	5	27.7	35	11.0	G30	1.06
LSA-25	68	82	48	25.0	4.0	50	45.0	25.0	14	5	34.5	40	13.0	G35	1.62
LSA-32	76	92	56	31.5	6.0	63	56.0	32.1	16	5	43.2	45	13.0	G40	2.62
LSA-40	92	110	65	35.5	7.0	71	63.0	38.4	18	5	49.1	55	18.0	G50	4.0
LSA-50	100	125	73	42.5	7.0	85	75.0	49.5	20	5	61.1	65	18.0	G60	5.9
LSA-65	128	150	92	53.0	9.5	106	95.0	62.3	22	6	77.1	80	22.0	G75	12.0
LSA-80	140	170	103	59.0	11.0	118	108.0	73.9	25	6	90.0	90	24.0	G85	16.5
LSA-90	155	185	112	65.0	11.0	130	122.0	85.4	26	6	102.7	95	24.0	G90	22.5
LSA-100	170	205	125	73.5	13.0	147	135.0	87.3	28	6	115.4	110	27.0	G105	30.0
LSA-125	225	250	152	88.0	15.0	176	164.0	108.0	32	6	141.2	135	33.0	G130	60.0
LSA-150	245	290	180	105.0	17.0	210	193.0	128.8	35	6	166.9	165	39.0	G155	87.0

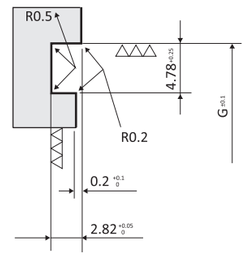
Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE SOCKET WELD ON FLANGE

500PSI







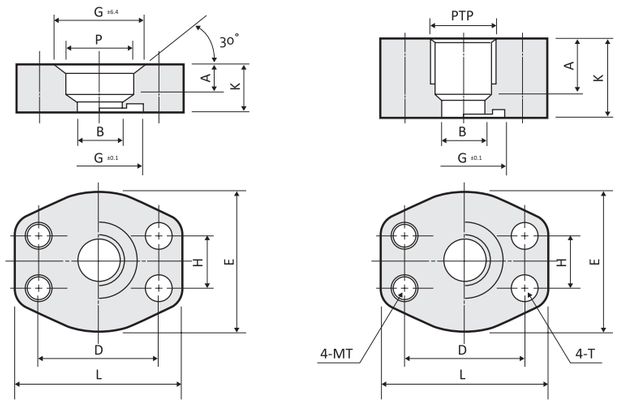
Detail O-Ring Groove

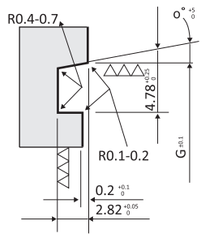
TYPE	E	L	H	D	K	P	B	A	G	T	O-RING AS568
500PSI											
BB-15S	46	54	17.5	38.1	10	22.2	13	3	25.50	M8	211
BB-20S	52	65	22.2	47.6	12	27.7	19	4	31.52	M10	214
BB-25S	60	70	26.2	52.4	12	34.5	25	4	39.70	M10	219
BB-32S	73	79	30.2	58.7	12	43.2	32	4	44.50	M10	224
BB-40S	82	94	35.7	69.9	15	49.1	38	4	53.80	M12	226
BB-50S	97	102	42.9	77.8	15	61.0	51	4	63.32	M12	229
BB-65S	106	114	50.8	88.9	15	77.0	63	4	76.02	M12	234
BB-80S	130	135	61.9	106.4	20	90.0	76	5	91.90	M16	238
BB-90S	136	152	69.9	120.7	20	102.4	89	5	104.60	M16	242
BB-100S	146	162	77.8	130.2	25	115.1	102	6	117.3	M16	247
BB-125S	170	190	92.1	152.4	28	140.6	127	8	142.69	M16	253

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE THREAD FLANGE, SOCKET WELD ON FLANGE

3000PSI





Detail O-Ring Groove

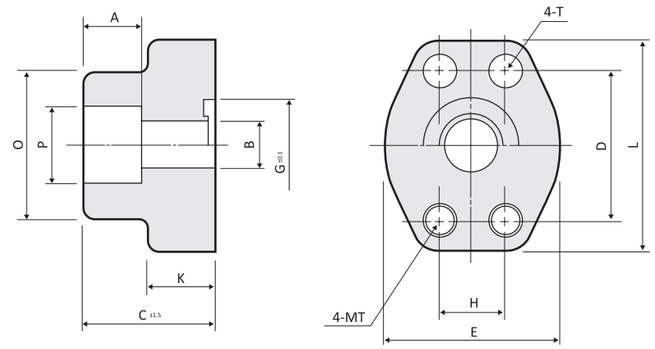
TYPE	E	L	H	D	K	P	B	A	G	T	O-RING AS568
3000PSI											
CL-15S	46	54	17.5	38.1	20	22.2	14	10	26.75	M8	211
CL-20S	52	65	22.2	47.6	20	27.7	19	14	31.52	M10	214
CL-25S	60	70	26.2	52.4	22	34.5	25	16	39.45	M10	219
CL-32S	73	79	30.2	58.7	24	43.2	32	18	50.62	M10	224
CL-40S	82	94	35.7	69.9	30	49.1	38	19	56.97	M12	226
CL-50S	94	102	42.9	77.8	35	61.1	51	22	66.50	M12	229
CL-65S	106	114	50.8	88.9	45	77.1	63	25	82.37	M12	234
CL-80S	130	135	61.9	106.0	50	90.0	73	32	95.07	M16	238
CL-90S	136	152	69.9	121.0	38	102.4	89	30	107.77	M16	242
CL-100S	146	162	77.8	130.0	38	115.1	99	30	123.65	M16	247

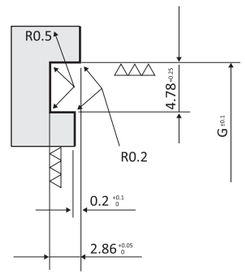
TYPE	E	L	H	D	K	P	B	A	G	T	O-RING AS568
3000PSI											
CL-15T	46	54	17.5	38.1	26	1/2	14	19	26.75	M8	211
CL-20T	52	65	22.2	47.6	28	3/4	19	19	31.52	M10	214
CL-25T	60	70	26.2	52.4	32	1	25	19	39.45	M10	219
CL-32T	73	79	30.2	58.7	36	1 1/4	32	22	50.62	M10	224
CL-40T	82	94	35.7	69.9	42	1 1/2	38	24	56.97	M12	226
CL-50T	94	102	42.9	77.8	42	2	51	30	66.50	M12	229
CL-65T	106	114	50.8	88.9	48	2 1/2	63	30	82.37	M12	234
CL-80T	130	135	61.9	106.0	48	3	73	34	95.07	M16	238

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE SOCKET WELD ON BOSS TYPE FLANGE

3000PSI, 6000PSI





Detail O-Ring Groove

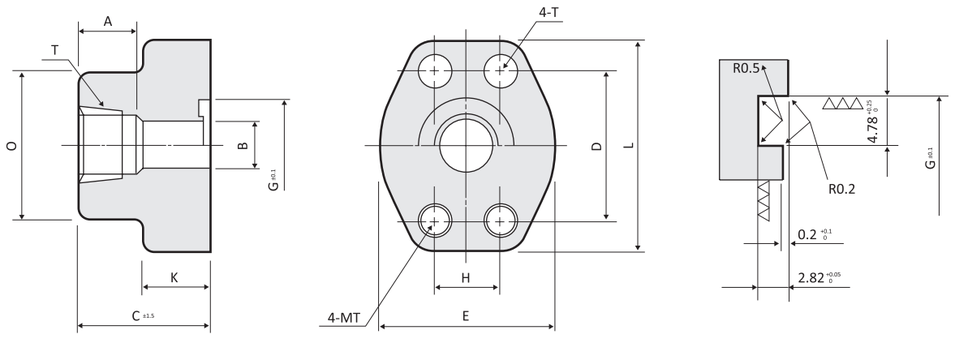
TYPE	MAX pressure kg/cm²	E	L	H	D	C	K	P	B	A	O	G	T	O-RING AS568
3000PSI														
EL-15S	350	46	54	17.5	38.1	36	16	22.2	13.0	19	32	25.50	M8	211
EL-20S	350	52	65	22.2	47.6	38	18	27.7	19.0	19	38	31.50	M10	214
EL-25S	350	60	70	26.2	52.4	38	18	34.5	25.0	19	44	39.70	M10	219
EL-32S	280	73	79	30.2	58.7	42	22	43.2	32.0	22	52	44.50	M10	224
EL-40S	210	82	94	35.7	69.9	45	25	49.1	38.0	24	58	53.80	M12	226
EL-50S	210	97	102	42.9	77.8	50	25	61.0	49.5	30	72	63.32	M12	229
EL-65S	175	106	114	50.8	88.9	50	25	77.0	62.3	30	88	76.02	M12	234
EL-80S	140	130	135	61.9	106.4	53	28	90.0	73.0	34	101	91.90	M16	238
EL-90S	35	136	152	69.9	120.7	53	28	102.4	85.4	34	114	104.60	M16	242
EL-100S	35	146	162	77.8	130.2	53	28	115.1	97.0	34	126	117.30	M16	247

TYPE	MAX pressure kg/cm²	E	L	H	D	C	K	P	B	A	O	G	T	O-RING AS568
6000PSI														
EH-15S	420	48	56	18.2	40.5	36	16	22.2	12.3	19	28	25.50	M8	211
EH-20S	420	60	71	23.8	50.8	42	22	27.7	16.2	22	38	31.52	M10	214
EH-25S	420	70	81	27.8	57.2	45	25	34.5	21.2	24	44	39.70	M12	219
EH-32S	420	78	95	31.8	66.7	48	28	43.2	29.9	25	55	44.50	M14	224
EH-40S	420	95	112	36.5	79.4	50	30	49.1	34.4	28	60	53.80	M16	226
EH-50S	420	114	134	44.5	96.8	63	38	61.0	43.1	30	72	63.32	M20	229

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE THREAD BOSS TYPE FLANGE

3000PSI, 6000PSI



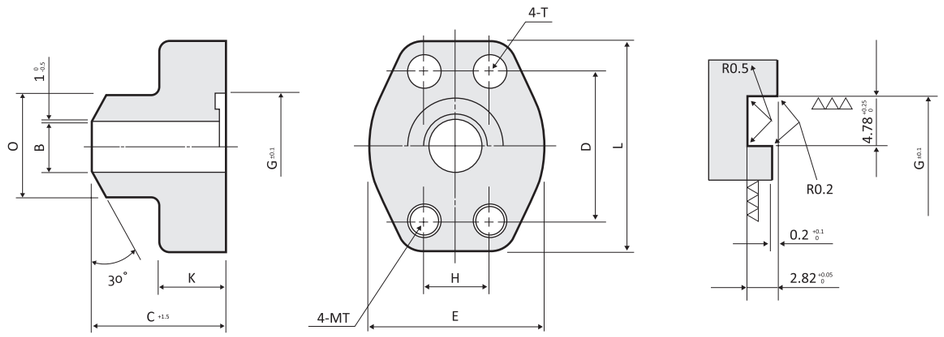
TYPE	MAX pressure kg/cm²	E	L	H	D	C	K	P	B	A	O	G	T	O-RING AS568
3000PSI														
DL-15T	350	46	54	17.5	38.1	36	16	1/2	13.0	19	32	25.50	M8	211
DL-20T	350	52	65	22.2	47.6	38	18	3/4	19.0	19	38	31.50	M10	214
DL-25T	350	60	70	26.2	52.4	38	18	1	25.0	19	44	39.70	M10	219
DL-32T	280	73	79	30.2	58.7	42	22	1 1/4	32.0	22	52	44.50	M10	224
DL-40T	210	82	94	35.7	69.9	45	25	1 1/2	38.0	24	58	53.80	M12	226
DL-50T	210	97	102	42.9	77.8	50	25	2	49.5	30	72	63.32	M12	229
DL-65T	175	106	114	50.8	88.9	50	25	2 1/2	62.3	30	88	76.02	M12	234
DL-80T	140	130	135	61.9	106.4	53	28	3	73.0	34	101	91.90	M16	238
DL-90T	35	136	152	69.9	120.7	53	28	102.4	85.4	34	114	104.60	M16	242
DL-100T	35	146	162	77.8	130.2	53	28	115.1	97.0	34	126	117.30	M16	247

TYPE	MAX pressure kg/cm²	E	L	H	D	C	K	P	B	A	O	G	T	O-RING AS568
6000PSI														
DH-15T	420	48	56	18.2	40.5	36	16	1/2	13	19	32	25.50	M8	211
DH-20T	420	60	71	23.8	50.8	42	22	3/4	19	22	38	31.50	M10	214
DH-25T	420	70	81	27.8	57.2	45	25	1	25	24	44	39.70	M12	219
DH-32T	420	78	95	31.8	66.7	48	28	1 1/4	32	25	55	44.50	M14	224
DH-40T	420	95	112	36.5	79.4	50	30	1 1/2	38	28	60	53.80	M16	226
DH-50T	420	114	134	44.5	96.8	63	38	2	49.5	30	72	63.32	M20	229

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE WELD ON FLANGE

3000PSI, 6000PSI



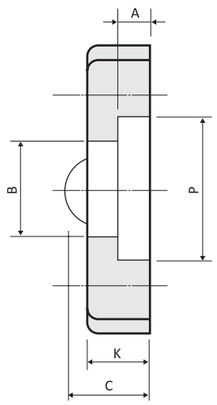
TYPE	MAX pressure kg/cm²	NORMAL SIZE FLANGE	E	L	H	D	C	K	O	B	G	T	O-RING AS568
3000PSI													
FL-01W	350	10A	46	54	17.5	38.1	36	16	17.3	10.0	21.92	M8	115
FL-02W	350	15A							21.7	13.0	25.50	M8	211
FL-03W	350	20A	52	65	22.2	47.6	38	18	27.2	19.0	31.50	M10	214
FL-05W	350	25A	60	70	26.2	52.4	38	18	34.0	25.0	39.70	M10	219
FL-08W	280	32A	73	79	30.2	58.7	42	22	42.7	32.0	44.50	M10	224
FL-11W	210	40A	82	94	35.7	69.9	45	25	48.6	38.0	53.80	M12	226
FL-13W	210	50A	97	102	42.9	77.8	50	25	60.5	49.5	63.32	M12	229
FL-14W	175	65A	106	114	50.8	88.9	50	25	76.3	62.3	76.02	M12	234
FL-15W	140	80A	130	135	61.9	106.4	53	28	89.1	73.0	91.90	M16	238
FL-16W	35	90A	136	152	69.9	120.7	53	28	101.6	85.4	104.60	M16	242
FL-17W	35	100A	146	162	77.8	130.2	53	28	114.3	97.0	117.30	M16	247
FL-18W	35	125A	180	184	92.1	152.4	53	28	140.2	120.8	142.70	M16	253

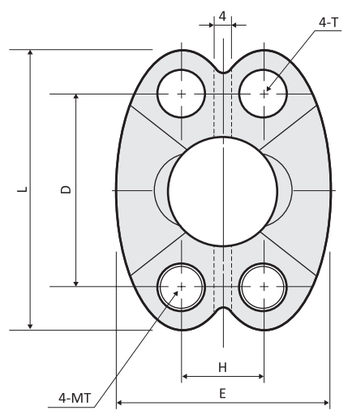
TYPE	MAX pressure kg/cm²	NORMAL SIZE FLANGE	E	L	H	D	C	K	O	B	G	T	O-RING AS568
6000PSI													
FH-15W	420	15A	48	56	18.2	40.5	38	18	21.7	12.3	25.50	M8	211
FH-20W	420	20A	60	71	23.8	50.8	42	22	27.2	16.2	31.50	M10	214
FH-25W	420	25A	70	81	27.8	57.2	45	25	34.0	21.2	39.70	M12	219
FH-32W	420	32A	78	95	31.8	66.7	48	28	42.7	29.9	44.50	M14	224
FH-40W	420	40A	95	112	36.5	79.4	50	30	48.6	34.4	53.80	M16	226
FH-50W	420	50A	114	134	44.5	96.8	63	38	60.5	43.1	63.32	M20	229
FH-65W	420	65A	152	180	58.7	123.8	78	45	76.3	57.3	76.02	M20	234

Notes
1. The following are producing base, "O"-RING GROOVE TYPES have DRILL HOLE, NON-"O"-RING GROOVE TYPES have TAP HOLE.
2. The ORDER BASE : ex) SHA15(O, N)
   O : "O"-RING TYPE. N : NON "O"-RING TYPE.
3. Manufacture SPECIAL TYPES.

SAE SPILT FLANGE

3000PSI, 6000PSI





TYPE	SIZE	E	L	H	D	C	K	P	B	A	T
3000PSI											
NL-15	15A	46	54	17.5	38.1	19	13	31.0	24.3	6.2	M8
NL-20	20A	52	65	22.2	47.6	22	14	38.9	32.2	6.2	M10
NL-25	25A	60	70	26.2	52.4	24	16	45.3	38.5	7.5	M10
NL-32	32A	73	79	30.2	58.7	24	16	51.6	43.7	7.5	M10
NL-40	40A	82	94	35.7	69.9	25	16	61.1	50.8	7.5	M12
NL-50	50A	94	102	42.9	77.8	26	16	72.3	62.8	9.0	M12
NL-65	65A	106	114	50.8	88.9	38	19	85.0	75.0	9.0	M12
NL-80	80A	130	135	61.9	106.4	41	22	102.4	91.0	9.0	M16
NL-90	90A	136	152	69.9	120.7	28	22	115.3	102.5	10.8	M16
NL-100	100A	152	162	77.8	130.2	35	25	128.4	115.3	10.8	M16
NL-125	150A	180	184	92.1	152.4	45	28	153.2	140.5	10.8	M16

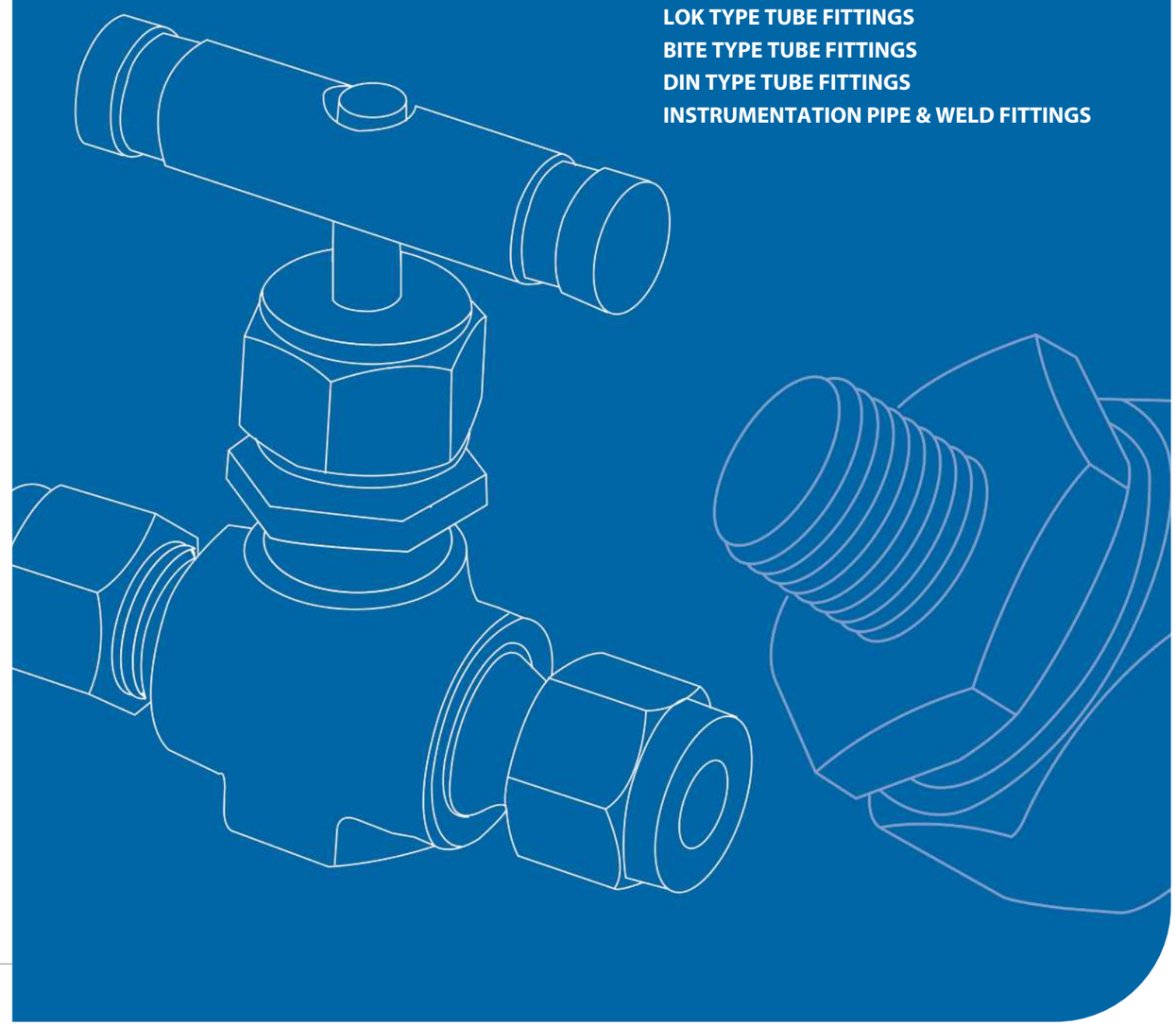
TYPE	SIZE	E	L	H	D	C	K	P	B	A	T
6000PSI											
NH-15	15A	48	56	18.2	40.5	22	16	32.6	24.6	7.2	M8
NH-20	20A	60	71	23.8	50.8	28	19	42.0	32.5	8.3	M10
NH-25	25A	70	81	27.8	57.2	33	24	48.4	38.9	9.0	M14
NH-32	32A	78	95	31.8	66.8	38	27	54.8	44.5	9.8	M14
NH-40	40A	94	112	36.5	79.4	43	30	64.3	51.6	12.1	M16
NH-50	50A	114	134	44.5	96.8	52	37	80.2	67.6	12.1	M20

Notes 1. Manufacture SPECIAL TYPES..

03

IDK-LOK

LOK TYPE TUBE FITTINGS
BITE TYPE TUBE FITTINGS
DIN TYPE TUBE FITTINGS
INSTRUMENTATION PIPE & WELD FITTINGS



DK-LOK Lok type tube Fittings

TUBE TO TUBE UNION

Union **DU** 11
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Union Tee **DT** 13
Union Cross **DX** 14
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Bulkhead Retalner **DBR** 16
Bulkhead Elbow Union **DBL** 16
Reducing Union **DUR** 17
Reducing Union Elbow **DLR** 18
Reducing Union Cross **DXR** 18
Reducing Union Tee **DTR** 19-20

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DK - LOK FLANGES

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DK-LOK Bite type tube Fittings

BITE TYPE TUBE FITTINGS

Straight Union **BU** 07

Union Elbow **BL** 07

Union Tee **BT** 08

Straight Bulkhead Union **BBU** 08

Bulkhead Elbow **BBL** 09

Long Male Connector **BLMC** 09

Male Connector **BMC-R** 10

Male Connector **BMC-G** 11

Male Connector (For O-Ring) **BOM** 12

Male Elbow **BLM** 13

Long Male Elbow **BLLM** 14

O-Seal Male Elbow **BOLM** 14

Banjo Elbow **BSLM** 15

Male Branch Tee **BBTM** 15

Male Run Tee **BRTM** 16

Bulkhead Female Connector **BBFC** 16

Female Connector **BFC** 17

Gauge Connector **BGC** 17

Female Elbow **BLF** 18

Female Branch Tee **BBTF** 18

Female Run Tee **BRTF** 19

Jig **BJ** 19

Hose Bulkhead Female Elbow **BHBLF** 25

Welding Connector **BCW** 26

Welding Bulkhead Union **BBUW** 26

Adapter **BA-R** 27

Adapter (For Copper Gasket) **BA-G** 27

Reducer **BR** 28

Positionnable Elbow **BLA** 28

Positionnable Branch Tee **BBTA** 29

Positionnable Run Tee **BRTA** 29

Air Purge Valave (Tube End) **BAP-1** 30

Air Purge Valave (Tube End) **BAP-2** 30

■ GENERAL INFORMATION FOR OUR BITE TYPE TUBE FITTINGS.

S-blto type tube fittings are precision machined, under strict quality control.
S-blto type tube fittings are the flareless tube fitting with the visible bite.
Thla added safety feature makes S-bite type the preferred fitting for non-flared tube connections.

■ How Do They Work?

The bite typeflareless hydraulic tube fitting was designed to work on medium to heavy wall tubing which was hard to flare and has three parts:
1. body, 2. sleeve, 3. nut. (As shown in Fig-1)

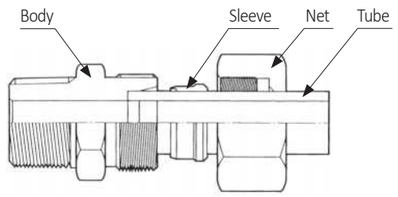


Fig-1

The sleeve is driven forward on the tube by the nut.
As the sleeve moves forward it meets the seal seat angle of the body which causes the sleeve to cam inward into the tube.
The sleeve then bites into the tube causing a small ridg of tube material to be pushed up in front of the biting edge of the sleeve.
(As shown in Fig-2 & 3)

Assembled, with bite in tube

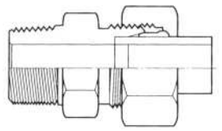


Fig-2

Detail of with bite in tube

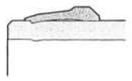


Fig-3

The make up of the fitting is critical in that the tube must be bottomed against the tube stop in the body or presetting tool during makeup. If it is not bottomed the tube will move forward with the sleeve and a bite will not be achieved Make sure the tube is bottomed.

A check is possible to see if the tube was bottomed during make up, To make this check look at the end of the tube, and notic if a circular appearing ring has been impressed into the tube end face. This impression will be caused by the tube stop which has a slight reverse angle rather than a flat face.

■ Material Specfications

Parts	Steel	Stainless Steel	Brass
Forged Body	S20C - S48C	SUS316	C3771
Bar stock Body	S20C - S48C	SUS316	C3604
Cold Formed Nut	S10C - S20C	-	-
Bar stock Nut	S20C - S48C	SUS316 - SUS304	C3604
Sleeve	S10C	SUS316 - SUS304	C3604

■ Applicable Pressure Rating

Our standard specifications of the fittings, which are shown in the catalog, are as below:

Fitting Size (applicable Tube O.D)	4 - 5	16 - 22	25 - 28 30 - 38	40 - 45	4 - 5
Rated pressure (kgf/cm2)	500	400	350	250	210
Max. working temperature (˚c)	300				

The Rated Pressure for the fittings are determined based on the results of severe repetitively conducted tests and the design calculation: precisely, the rated pressures are determined for each size of fittings while the safety factor of as much as 4 is taken into account in the design.

■ Suitable Tubing Materials

Common materal of tubing best suited for industrial service, and in accordance with various Industry Standards and recommendations of tubing manufactures, include:

Steel - Seamless,fully annealed, also welded and redrawn type suitable for bending. Maximum hardnss, Rockwell B72.

Stainless Steel - Seamless, fully annealed and welded redrawn, fully annealed suitable for bending.
Maximum hardness. Rockwell B90.

Copper - Seamless coils, soft or light annealed, maximum hardness Rockwell F55. Straight lengths, light drawn and general purpose, maximum hardness of 60 on Rockwell 30T scale.

■ Features

- 3ite Type Fitting are designed in accordance with DIN 2353.
- TIIG bite Type Fitting is consists of a body, a progressive ring (sleeve) and a Nut.
- The bite Type tube Fittings are designed and manufacture to produced a strong, reliable, leak-free joint upon proper assembly.

■ Standard Material Specifications

- Steel Fittings : Materials see DIN3859.
- Stainless Steel Fitting : X6CrNiMoTi 17122 in accordance with DIN17440, material no. 1.14571.
- Brass Fitting : CuZn35Ni2 in accordance with DIN17660/17672, material no. 2.0540.
- Elastomer Seal : NBR(BUNA-N), DIN 17660FPM(VITION).

■ Information

● Pressure and temperature load Capability

- Pressure Ranges

Series	Steel/Brass*		1.4571 (SS316)	
	Size	Pressure	Size	Pressure
LL	4 - 8	100 bar	4 - 8	100 bar
L	6 - 18	315 bar	6 - 15	250 bar
	-	-	18 - 22	160 bar
	22 - 42	160 bar	28 - 42	100 bar
S	6 - 14	630 bar	6 - 14	630 bar
	16 - 30	400 bar	16 - 25	400 bar
	38	315 bar	30 - 38	315 bar

Brass*: Pressure range of brass should be adapted 30% below of the steel.

● Pressure reduction with temperature

The following reduction of pressure compared with thecatalogue specification for higher temperatures.

Materials of fittings	Temperature range	Reduction of pressure
Steel	-40°C up to + 120°C	-
Brass	-60°C up to + 175°C	30%
316 stainless steel (1.4571)	-60°C up to + 20°C	-
	-60°C up to + 50°C	4%
	+100°C	11%
	+200°C	20%
	+300°C	29%
	+400°C	33%

For different material of tubes and fittings. The tubes must be tested separately concerning the allowed temperature range and the necessary reduction of pressure.

● Allowable working temperatures (TB)

A) For fittings materials

Material	Temperature
Steel	-40°C up to + 120°C (DIN 3859)
Brass	-60°C up to +175°C
316 Stainless Steel	-60°C up to + 400°C (DIN 17440)

Please refer to the information given in the section "Reduction of Pressure".

B) For seal - materials

Material	Temperature
NBR(e.g.Perbunan*)	-35°C up to + 100°C
FPM(e.g.Viton»)	-25°C up to + 200°C
PTFE(e.g.Teflon*)	-60°C up to + 240.C

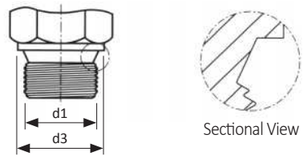
Caution! If different fitting and sealing material are used, the lowest temperature as indicated for each material is applicable!

■ Stud Ends & Tapped Hole Forms for tube Fittings

This standard specifies dimensions for stud ends and tapped holes with metric fine pitch thread and pipe thread for use with compression fittings, valves and screw plugs, general outlay of types.

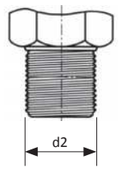
● Forms of Stud Ends

Form A (DIN 3852 Part 1+2) with sealing by washer.



Form B (DIN 3852 Part 1+2) with sealing by compression against .face of body.

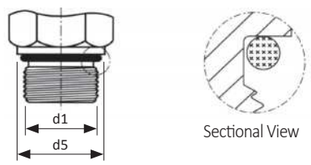
Form C (DIN 3852 Part 1+2) with sealing in tapered thread.



Metric (keg) DIN 158
B.S.P (keg) DIN 2999
NPT (keg) ANSI/ASME B1.20.1-1983

Form E (DIN 3852 Part 11) with sealing by DIN 3869 ring seals.

Form F (DIN 3852 Part 3) with sealing by (*O-Ring).

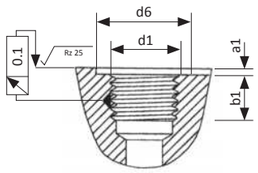


ED-Ring & O-Ring Seals made of NBR Standard (-20°C to 90°C) Available made of Viton Upon Request (-20° C to 200° C).

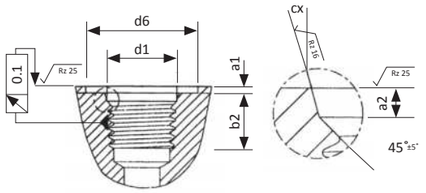
Thread size for		d3	d4	d5
From A, B and E, F stud ends d1	From C stud ends stud ends d2			
M8X1.0	M8X1.0keg.	-	-	10.9
M10X1.0	M10x1.0keg.	14	13.9	12.9
M12X1.5	M12X1.5keg.	17	16.9	16.9
M14X1.5	M14X1.5keg.	19	18.9	18.9
M16X1.5	M16X1.5keg.	21	21.9	20.9
M18X1.5	M18X1.5keg.	23	23.9	22.9
M20X1.5	M20x1.5keg.	25	25.9	24.9
M22X1.5	M22X1.5keg.	27	26.9	26.9
M26X1.5	-	31	31.9	30.9
M27X2.0	-	32	31.9	31.9
M33X2.0	-	39	39.9	37.9
M42X2.0	-	49	49.9	47.9
M48X2.0	-	55	54.9	54.9
G 1/8	1/8 NPT	14	13.9	-
G 1/4	1/4 NPT	18	18.9	-
G 3/8	3/8 NPT	22	21.9	-
G 1/2	1/2 NPT	26	26.9	-
G 3/4	3/4 NPT	32	31.9	-
G 1	1 NPT	39	39.9	-
G 1 1/4	1 1/4NPT	49	49.9	-
G 1 1/2	1 1/2NPT	55	54.9	-
7/6 - 20UNF	R 1/8 keg.	-	-	14.4
9/6 - 18UNF	R 1/4 keg.	-	-	17.6
3/4 - 16UNF	R 3/8 keg.	-	-	22.3
7/8 - 14UNF	R 1/2 keg.	-	-	25.5
1 1/6 - 12UN	R 3/4 keg.	-	-	31.9
1 5/6 - 12UN	R 1 keg.	-	-	38.2
1 5/8 - 12UN	R 1 1/4 keg.	-	-	47.7
-	R 1 1/2 keg.	-	-	-

■ Forms of Tapped Holes

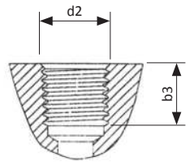
Form X (DIN 3852 Part 1+2)
for parallel Stud Ends.(Form A, B).
*d7 is for Stud Ends Form E.



Form W (DIN 3852 Part 3)
for Stud Ends with O-Ring.(Form F).



Form Z (DIN 3852 Part 1+2)
for tepered thredd Stud Ends.



Thread size for		d6 min	d7	a1 max	d2 $^{+0.4}_{0}$	b1 min	b2 min	b3 min	α ±1
From X, Y Topped Holes d1	From Z Topped Holes d2								
M8X1.0	M8X1.0keg.	13	-	1.0	1.6	-	10.0	5.5	12
M10X1.0	M10x1.0keg.	15	15	1.0	1.6	8	10.0	5.5	12
M12X1.5	M12Xl.5keg.	18	18	1.5	2.4	12	11.5	8.5	12
M14X1.5	M14Xl.5keg.	20	20	1.5	2.4	12	11.5	8.5	15
M16X1.5	M16X1.5keg.	22	23	1.5	2.4	12	13.0	8.5	15
M18X1.5	M18Xl.5keg.	24	25	2.0	2.4	12	14.5	8.5	15
M20X1.5	M2oxi.5keg.	26	27	2.0	2.4	14	14.0	10.5	15
M22X1.5	M22X1.5keg.	28	28	2.5	2.4	14	15.5	10.5	15
M26X1.5	-	32	33	2.5	3.1	16	16.0	-	15
M27X2.0	-	33	33	2.5	3.1	16	19.0	-	15
M33X2.0	-	40	41	2.5	3.1	18	19.0	-	15
M42X2.0	-	50	51	2.5	3.1	20	19.5	-	15
M48X2.0	-	56	56	2.5	3.1	22	22	-	15
G 1/8	1/8 NPT	15	15	1.0	-	8	-	6.9	-
G 1/4	1/4 NPT	19	20	1.5	-	12	-	10.0	-
G 3/8	3/8 NPT	23	23	2.0	-	12	-	10.3	-
G 1/2	1/2 NPT	27	28	2.5	-	14	-	13.6	-
G 3/4	3/4 NPT	33	33	2.5	-	16	-	14.1	-
G 1	1 NPT	40	41	2.5	-	18	-	16.8	-
G 1 1/4	1 1/4NPT	50	51	2.5	-	20	-	17.3	-
G 1 1/2	1 1/2NPT	56	56	2.5	-	22	-	17.3	-
7/16-20UNF	R 1/8 keg.	21	-	1.6	2.4	-	11.5	5.5	12
9/16-18UNF	R 1/4 keg.	25	-	1.6	2.5	-	12.7	8.5	12
3/4-16UNF	R 3/8 keg.	30	-	2.4	2.5	-	14.3	8.5	15
7/8-14UNF	R 1/2 keg.	34	-	2.4	2.5	-	16.7	10.5	15
1 1/16-12UN	R 3/4 keg.	41	-	2.4	3.3	-	19.0	13.0	15
1 5/16-12UN	R 1 keg.	49	-	3.2	3.3	-	19.0	16.0	15
1 5/8-12UN	R 1 1/4 keg.	58	-	3.2	3.3	-	19.0	17.0	15
-	R 1 1/2 keg.	-	-	-	-	-	-	17.0	-

■ Seamless precision stainless steel 1.4571

HIninless steel tubes (e.g. 1.4571), code X6CrNiMoTi 17122, must be cold-drawn and seamless, heat-treated without formation of scales, type m to DIN 17458, provide tolerances to DIN 2391, Part1.
The following tube wall thickness are suitable for use:

Tube O.D (D)	Tolerance	Wall * Thickness w	Weight	Design Pressure DIN 2413	
				Ⅰ	Ⅲ
mm	mm	mm	kg/m	bar	bar
4	±0.1	0.75	0.061	391	376
4		1	0.075	500	480
6	±0.1	1	0.125	372	357
6		1.5	0.168	526	505
6		2	0.200	662	637
6		2.25	0.211	725	696
8	±0.1	1	0.175	347	277
8		1.5	0.244	412	396
8		2	0.300	526	505
8		2.25	0.344	630	604
10	±0.1	1	0.225	294	238
10		1.5	0.319	357	343
10		2	0.401	458	439
10		2.5	0.469	551	529
10		3	0.525	638	612
12	±0.08	•1	0.275	245	201
12		1.5	0.394	368	291
12		2	0.501	391	376
12		2.5	0.594	474	455
12		3	0.615	551	529
12		3.5	0.744	624	599
15	±0.08	1.5	0.507	294	238
15		2	0.651	321	309
15		2.5	0.782	391	376
15		3	0.901	458	439
16	±0.08	2	0.701	368	291
16		2.5	0.845	370	355
16		3	0.977	433	416
18	±0.08	•1.5	0.620	245	201
18		2	0.801	327	262
18		2.5	0.967	333	320
18		3	1.126	391	376

Tube O.D (D)	Tolerance	Wall * Thickness w	Weight	Design Pressure DIN 2413	
				Ⅰ	Ⅲ
mm	mm	mm	kg/m	bar	bar
20	±0.08	0.25	1.095	368	291
20		3	1.277	357	343
20		3.5	1.433	408	392
20		4	1.600	458	439
22	±0.08	•2	1.002	267	218
22		2.5	1.220	334	267
22		3	1.426	328	315
25	±0.08	•2	1.152	235	193
25		2.5	1.408	294	238
25		3	1.635	353	281
25		4	2.092	378	363
25		4.5	2.307	418	402
25		5	2.501	458	439
28	±0.08	2	1.302	210	174
28		2.5	1.594	263	214
28		3	1.874	315	253
28		4	2.402	342	328
28		5	2.876	415	399
30	±0.8	3	2.028	294	238
30		4	2.605	321	309
30		5	3.400	391	376
35	±0.15	2	1.644	618	141
35		2.5	2.018	210	174
35		3	2.392	252	206
35		4	3.086	336	269
35		5	3.742	342	328
35		6	4.351	401	385
38	±0.15	4	3.405	309	249
38		5	4.131	318	305
38		6	4.807	373	358
38		7	5.426	427	410
42	±0.2	3	2.930	210	174
42		4	3.798	280	227

• Reinforce tube inserts are recommended where thin-walled tubes are subject to severe strains.
* Permissible variation in wall thickness (DIN 2391).

● Calculation Pressures :

• Calculated pressures to DIN 2413 part Ⅰ for primarily static load conditions.
• Yield point (K) : 245N/mm²(to DIN 17458)
• Safety factor(S) : 1.5
• Allowance factor (C) :

$$P = \frac{20 \cdot K \cdot t \cdot c}{SD} \text{ (bar)}$$

• Calculated pressures to DIN 2413 part Ⅲ for dynamic load conditions.
• Yield point (K) : 216N/mm²(assumed value)
• Safety factor(S) : 1.5

$$P = \frac{20 \cdot K \cdot t \cdot c}{S \cdot (D + \cdot t \cdot c)} \text{ (bar)}$$

Factor for consideration of wall thickness divergence for static and dynamic stress.

Tube Range	4mm/5mm	6mm/8mm	Larger
Factor(C)	0.8	0.85	0.9

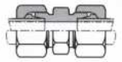
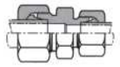
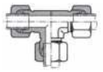
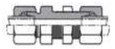
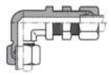
● Note

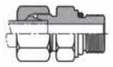
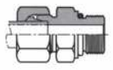
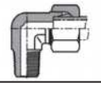
For a diameter ratio of O.D/I.D > 1.35, calculation made to DIN 2413 part Ⅲ and based on a pulsating fatigue limit of 225 N/mm².

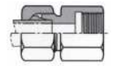
● Temperature range : - 60° C to + 400°C

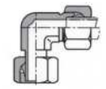
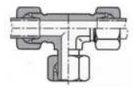
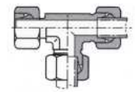
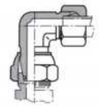
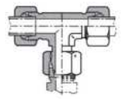
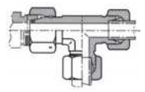
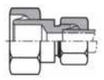
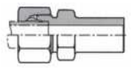
Reduction in pressure for higher temperatures.

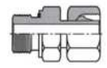
DK-LOK Din type tube Fittings

Tube Port to Tube Port		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Straight Union **DU**	16	G	E	G-V	111... 112...	P-GV
	Union Elbow **DL**	16	W	F	W-V	119... 120...	P-WV
	Reducing Union **DUR**	17	GR	-	GR-V	-	P-GV
	Union Tee **DT**	18	T	G	T-V	133... 135...	P-TV
	Union Cross **DC**	18	K	H	K-V	135... 136...	P-KV
	Reducing Tee **DTR**	19	TR	-	-	-	P-TV
	Bulkhead Union **DBU**	20	SV	K	GS-V	137...	P-GSV
	Welding Bulkhead Union **DBUW**	20	ESV	N	ES-V	141...	P-ESV
	Bulkhead Union Elbow **DBL**	21	WSV	L	WS-V	138...	P-WSV

Tube to Female Port		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Male Connector (UNF/Metric) with O-Ring **DOM-U/M**	22	GE-UNF/UN GEO	-		182...	P-GEV..U P-GEV.. M-FO.F
	Male Connector (BSP Tapered) **DMC-R**	23 24	GE-R	AP-R	GE-V..RK	103... 114...	P-GEV..RK
	Male Connector (BSP Paralled) **DMC-G**	23 24	GE-R	A-R	GR-V..R	110...	P-GEV..R
	Male Connector (Metric Paralled) **DMC-M**	25	GE-M	A-M	GR-V..M	109...	P-GEV..M
	Male Connector (BSP Paralled) with ED-Ring **DMC-GED**	26	GE-R-ED	A-RWD	GE-V..RWD	184...	P-GEV..R-WD
	Male Connector with ED-Ring **DMC-MED**	27	GE-M-ED	A-MWD	GE-V..MWD	184...	P-GEV..M-WD
	Male Connector (NPT Thread) **DMC-N**	28	GE-NPT	A/NPT	GE-V..NPT	105... 106...	P-GEV..NPT
	Male Elbow (BSPTapered/Metric Tapered) **DLM-R/M**	28	WE-R-M	B-R-M	WE-V..R..M	115... 116... 113... 114...	P-WEV..RK ..MK

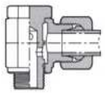
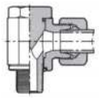
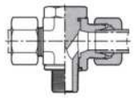
Tube to Male Port		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Female Connector (BSP Paralled/Metric Paralled) **DFC-G/M**	29	GAI-R -M	AL-R -M	GAIV..R ..M	144... 143...	P-GAV..R ..M

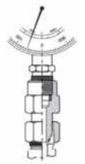
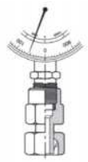
Tube Port to Tube Port(Adjustable Fittings)		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Adjustable Elbow with Standpipe **DLA**	30	EVW	vb	EW-V	158...	P-EWV-SV
	Adjustable Branch Tee with Standpipe **DBTA**	30	EVT	VC	ET-V	160...	P-ETV-SV
	Adjustable Run Tee with Standpipe **DRTA**	31	EVL	vd	EL-V	162...	P-ELV-SV
	Swivel Adjustable Elbow with Cone **DEW**	31	EW	VBDKO	EWVD	-	P-EWVD
	Swivel Adjustable Branch Tee with Cone **DET**	32	ET	VCDKO	ETVD	-	P-ETVD
	Swivel Adjustable Run Tee with Cone **DEL**	32	EL	VDDKO	ELVD	-	P-ELVD
	Standpipe Reducer **KOR**	33	KOR	RL□RS	-	-	-
	Reducer **DR**	34	-	-	KOR-V	148...78	P-REDV-SV
	Swivel Reducing Adaptor with Cone **DRED**	35	RED	RLDKO RSDKO	REDV	-	P-REDVD

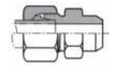
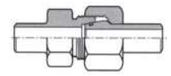
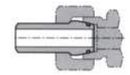
Tube Port to Female Port		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Adaptor(BSP Paralled/Metric Paralled) with ED-Ring **DA-GED/MED**	36	EVGE-R-ED -M-ED	VA-Rwd -Mwd	EG-V..RWD ..MWD	177... 174...	P-EGES..R-WD-SV ..M-WD-SV
	Swivel Adaptor(BSP Paralled /Metric Paralled)with ED-Ring **DEGE-G/M**	37	EVGE-R-ED -M-ED	VADKO-Rwd -Mwd	EGVD..RWD ..MWD	-	EGESD..R-WD ..M..WD

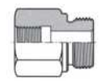
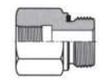
DK-LOK Din type tube Fittings

Tube Port to Tube Port		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Swivel Union with Cone **DUE**	38	-	EDKO	EDKV	-	SNV

Banjo Fittings		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Banjo Fittings(BSP Paralled/ Metric Paralled) with DKA-Ring **DSWVE-G/M**	39	SWVE-R -M	SBD-R -M	-	152.../153... 150.../151...	-
	High Pressure Banjo Fittings (BSP Paralled/Metric Paralled) with DKA-Ring **DWH-G/M**	40	-	SBE-R -M	EWHV-...R - ...M	157... 155...	P-RSWV..R ..M
	High Pressure Banjo Fittings (BSP Paralled/Metric Paralled) **DTH-G/M**	41	-	-	ETHV-...R -...M	-	P-RSTV..R ..V

Gauge Connector & Test Couplings		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Pressure Gauge Connector (BSP Paralled) with DKI-Ring **DGC-G**	42	MVA	O	MA-V...R	142...	V-MAV...R
	Swivel Gauge Adaptor (BSP Paralled) with Cone and DKI-Ring **DGE-G**	42	MAVE	VODKO	MAVD...R	-	EMASD...
	Gauge Connector (BSP Paralled) with Standpipe and DKI-Ring **DGA-G**	42	-	-	MAEV...R	-	P-EMAS...R -SV
	Tee Test Coupling with Threaded Connection DEMA 3-02G **DGMA**	43	GMA3	-	-	-	-
	Test Coupling with Threaded Connection M16 **DEMA3**	43	EMA3	-	-	-	-

Weld Fittings		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Welding Connector **AS**	44	AS	V	GAS-V	139...	P-ASV
	Welding Connector with DAK **DASK**	44	ASK	ESNO	ASKK..OD		-
	Welding Nipple with 0-Ring **DAK**	45	SKA	SNO	SK-A..OD	070...	SN
	Bulkhead Elbow **BBL**	45	SKAR	SNR	-	-	-

Adaptor		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Male Female Adaptor (BSP Paralled) **MFAD**	47	-	-	-	-	-
	Male Female Adaptor (BSP Paralled) **MFAE**	47	-	-	-	-	-
	Male Female Adaptor (BSP Paralled)with ED-Ring **MFAD-ED**	48	-	-	-	-	-
	Male Female Adaptor (BSP Paralled)with ED-Ring **MFAD-ED**	48	-	-	-	-	-

Plugs & Caps		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Blanking Plugs for Port with ED-Ring **DVSTI-GED/MED**	49	VSIT R-ED M-ED	VSCH -Rwd -Mwd	VSCH..WD	07	VS-R-WD -M-WD
	Blanking Plugs with O-Ring 49 (accord.to ISO 6149-3/ DIN 3582) **DVSTI**	49	VSIT M-OR	-	-	-	-
	Blanking Plug with O-Ring **DVKA**	50	VKA	VSTO..OD	VSTO..OD	-	VS...
	Tube Cap **DCA**	50	ROV	EVSV	EVSV	-	-

Spare parts		PAGE	EO	EMB	VOLZ	VOSS	WALPRO
	Nut **DN**	51	M	m	U-M	004...	P-GAV..R ..M
	Cutting Ring **DS**	51	DPR	S	S-DR	007...	S-R P-R

DK-LOK Instrumentation Pipe & Weld Fittings

THREAD FITTINGS

Close Nipple **GNC** 04

Hex Nipple **GNH** 04

Hex Peducing Nipple **GNR** 05

Hex Nipple **GNH** 05

Hex Nipple **GNH** 05

Hex Long Nipple **GNL** 05

Adapter **GAAMF** 06

Reducing Adapter **GABMF** 06

Adapter **GACMF** 06

Adapter **GADMF** 06

Reducing Hex Bushing **GHB** 07

Pipe Cap **GC** 07

Pipe Plug **GP** 07

Hex Coupling **GCG** 08

Hex Reducing Coupling **GCGR** 08

Union Ball Joint **GJU** 08

ISO parallel Copper **GASKET DGC** 08

Hollow Hex Plug **GPA** 08

Hollow Hex Plug **GPB** 08

Snubber Fitting **GS** 09

Elbow **GL** 09

Street Elbow **GLS** 09

Reducing Street Elbow **GLSR** 10

Male Elbow **GLM** 10

Tee **GT** 10

Run Tee **GTR** 10

Branch Tee **GTB** 11

Male Tee **GTM** 11

Cross **GX** 11

10K THREAD FITTINGS

Elbow **GL-10K** 12

Tee **GT-10K** 12

Cross **GX-10K** 13

Hex Nipple **GNH-10K** 13

Hex Coupling **GCG-10K** 13

Male Adapter **GAAMF-10K** 13

Reducing Adapter **GABMF-10K** 14

Reducing Adapter **GAMF-10K** 14

THREAD FITTINGS FOR OVER 1"

Elbow **GL-6K** 15

Tee **GT-6K** 15

Hex Coupling **GCG-6K** 15

Hex Coupling **GNH-6K** 15

Cross **GX-6K** 15

WELD FITTINGS

Union **GUSW** 16

Union Elbow **GLSW** 16

Union Tee **GTSW** 16

Male Connector **GCMSW** 16

Female Connector **GCFSW** 17

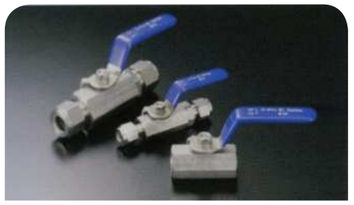
Male Elbow **GLMSW** 17

Female Elbow **GLFSW** 17

Female Elbow **GLFSW** 17

Pipe to Tube Socket Weld **GUWSW** 18

■ D - Pro Ball Valves



V81series
General Purpose Ball Valves
- Up to 1000psig [69bar] with PTFE seats
- Up to 230°C [446°F]
- SS316, Brass
- Butterfly handle optional
- DK - LOK OD 1/4 - OD 1inch
- Pipe thread 1/4 - 1inch

V82 series
Lowest Dead Volume Ball Valves
- Up to 3000psig [206bar]
- Up to 65°C [150°F]
- SS316, Brass
- 2 - way and 3 - way actuation
- Sealing without system pressure
- Analytical and Sampling applicaation
- DK - LOK OD 1/16 - OD 3/4inch
- Pipe thread 1/8 - 1/2inch

V824, V825 series
Lowest Dead Volume Ball Valves
- Up to 2500psig [172bar]
- Up to 65°C [150°F]
- SS316
- Switching 5 - way Ball Valves
- Crossover 4 - way Ball Valves
- Pipe thread 1/8 - 1/2inch

V83 series
Swing - Out Ball Valves
- Up to 3000psig [206bar]
- Up to 232°C [450°F]
- SS316, Carbon Steel
- Panel Mounting optional
- DK - LOK OD 1/4 - OD 1inch
- Pipe thread 1/8 - 1inch

V86 series
High Pressure Ball Valves
- Up to 10000psig [689bar]
- Up to 230°C [446°F]
- SS316, Carbon Steel
- 2 - way, 3 - way side and bottom entry
- DK patented Locking Device optional
- Panel Mounting optional
- DK - LOK OD 1/4 - OD 1inch
- Pipe thread 1/4 - 1inch

VT86 series
Trunnion Ball Valves
- Up to 10000psig [689bar]
- Up to 204°C [399°F]
- SS316
- 2 - way, 3 - way
- Panel Mounting optional
- DK - LOK OD 1/4 - OD 1/2inch
- Pipe thread 1/8 - 1/4inch

■ D - Pro Ball, Pneumatic Actuator and Plug Valves

VH86 series
Multi - Purpose Ball Valves
- Up to 6000psig [413bar]
- Up to 230°C [446°F]
- SS316
- 2 - way and 3 - way actuation
- DK - LOK OD 1/8 - OD 3/4inch
- Pipe thread 1/4 - 1/2inch

VH86
Pneumatic Actuators
- Pneumatic Actuator
- 90°, 180° actuation
- Single and Double return
- Limit Switch Double return
- Solenoid valve available

V23 series
Plug Valves
- Up to 3000psig [206bar]
- Up to 204°C [400°F]
- SS316 and Brass
- Flow throttling
- DK - LOK OD 1/8 - OD 1/2inch
- Pipe thread 1/8 - 1/2inch

■ D - Pro Check Valves

V33 series
Poppet Check Valves
- Up to 3000psig [206bar]
- Up to 190°C [375°F]
- SS316, Brass
- DK - LOK OD 1/8 - OD 1 inch
- Pipe thread 1/8 - 1 inch

VP33 series
One piece Check Valves
- Up to 3000psig [206bar]
- Up to 190°C [375°F]
- SS316, Brass
- O - ring seal blow - out proof design
- Pipe thread 1/4 - 1/2 inch

VL36 series
Lift Check Valves
- Up to 6000psig [413bar]
- Up to 482°C [900°F]
- SS316
- Metal to metal seat
- Application : Liquid System
- DK - LOK OD 1/4 - OD 3/4 inch
- Pipe thread 1/4 - 1/2 inch

VA33 series
Adjustable Check Valves
- Up to 3000psig [206bar]
- Cracking pressure adjustalbe from 3 to 600 psig
- O - ring seal blow - out proof design
- Pipe thread 1/4 - 1/2 inch

VH36 series
High Pressure Check Valves
- Up to 6000psig [413bar]
- Up to 204°C [400°F]
- SS316
- O - ring seal blow - out proof design
- DK - LOK OD 1/8 - OD 1 inch
- Pipe thread 1/8 - 1 inch

High Pressure
Metal flexible Hoses
- Up to 3600psig [248bar]
- Up to 454°C [850°F]
- SS316/SS316L
- DK - LOK OD 1/4 - OD 1 inch
- Male/Female NPT 1/4 - 1 inch

■ D - Pro Relief, Filters and Excess Flow Valves

V63, V66 series
Relief Valves
- Up to 6000psig [413bar]
- Up to 204°C [400°F]
- SS316
- Cracking pressure 50 to 6000 psig [3.4 to 413bar]
- DK - LOK OD 1/4 - OD 1/2 inch
- Pipe thread 1/4 - 1/2 inch

V73, V76 series
Filters
- Up to 3000psig [206bar] for V73 In-line Fiter
- Up to 204°C [400°F]
- SS316
- DK - LOK OD 1/8 - OD 1/2 inch
- Pipe thread 1/8 - 1/2 inch
- Filtering element 0.5, 2, 7, 15, 60 and 90 micron

VX36 series
Excess Flow Valves
- Up to 6000psig [413bar]
- Up to 204°C [400°F]
- SS316
- Designed to stop uncontrolled release of system media
- DK - LOK OD 1/4 - OD 1/2 inch
- Up to 6000psig [413bar]

■ D - Pro Quick Connectors

DQ series Quick Connectors
- Up to 3000psig [206bar]
- Up to 190°C [375°F]
- SS316, Brass
- DK - LOK OD 1/8 - OD 1 inch
- Pipe thread 1/8 - 1 inch

DQ Color coded & Keyed Connectors
- Up to 3000psig [206bar]
- Up to 190°C [375°F]
- SS316, Brass
- O - ring seal blow - out proof design
- Pipe thread 1/4 - 1/2 inch

DF series Full Flow Quick Connectors
- Up to 6000psig [413bar]
- Up to 482℃ [900°F]
- SS316
- Metal to metal seat
- Application : Liquid System
- DK - LOK OD 1/4 - OD 3/4 inch
- Pipe thread 1/4 - 1/2 inch

■ D - Pro Bellow, Needle and Toggle Valves

V13 Bellows Valve
- Up to 2500psig [172bar]
- Up to 648°C [1200°F]
- SS316
- DK - LOK OD 1/4 - OD 1/2 inch
- Pipe thread 1/4 - 1/2 inch

Metering Valves
High Pressure Check Valves
- Up to 2000psig [137bar]
- Up to 204°C [400°F]
- S316, Brass
- DK - LOK OD 1/16 - OD3/8 inch
- Pipe thread 1/8 - 1/4 inch
- Various Stem taper [1°, 3°, 6°]
- 1D, 3D Series Panel mount with no handle removal

V15 series
Interal Bonnet Needle Valves
- Up to 5000psig [344bar]
- Up to 232°C [450°F]
- SS316, Brass and Alloys
- Regulating Stem, Vee stem, and Soft seat
- Bar and Knob handles
- DK - LOK OD 1/8 - OD 3/4 inch
- Pipe thread 1/8 - 1/2 inch

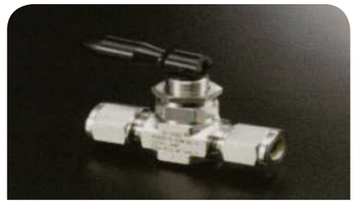
V16 series
- Up to 6000psig [413bar]
- Up to 648°C [1200°F]
- SS316 and Alloys
- Stem seal below actuating threads
- Non - rotating globe pattern stem tip
- DK - LOK OD 1/4 - OD 1 inch
- Pipe thread 1/8 - 1 inch
- Pipe socket weld 1/4 - 1/2 inch

VB16 series
Barstock Needle Valves
- Up to 6000psig [413bar]
- Up to 232°C [450°F]
- SS316 and Alloys
- Vee Tip standard
- Compact design
- DK - LOK OD 1/4 - OD 1/2 inch
- Pipe thread 1/4 - 3/4 inch

V46A series
Hex, Body Needle Valves
- Up to 10 000psig
- Up to 64°C [1200°F] with Grafoil Packing
- SS316 and Carbon steel
- Pipe thread 1/4 - 3/4 inch
- Non-rotating globe stem tip for long service life
- Stem seal below actuating threads to prevent system fluid contamination

■ D - Pro Bellow, Needle and Toggle Valves

V96 series
Rising Plug Valves
- Up to 6000psig [413bar]
- Up to 121°C [250°F]
- SS316
- KEL - F replaceable soft seat
- Stem seal below actuating threads
- Non - rotating globe pattern stem tip
- Straight - through roddable orifice for easy
- Pipe thread 1/4 - 3/4 inch



V103 series
Toggle Valves
- Up to 300psig [20.6bar]
- Up to 93°C [200°F]
- SS316 and Brass
- PTFE soft seat standard
- Sturdy SS handle for extended service life
- For instant open and close the valve
- For sampling and testing equipment
- DK - LOK OD 1/8 - OD 1/2 inch
- Pipe thread 1/8 - 3/8 inch

V824, V825 series
Lowest Dead Volume Ball Valves
- Up to 10 000psig [689bar]
- Up to 204°C [399°F] with FKM o-ring seal
- Up to 250°C [482°F] with Kalrez o-ring seal
- Premium four[4] sealing on stem for high pressure
- Stem seal below actuating threads prevent system fluid contamination
- SS316
- Pipe thread 1/4 - 1/2 inch

■ D - Pro Bleed, Purge and Gauge Root Valves

VBV series Bleed Valves
- Up to 10 000psig [689bar]
- Up to 454°C [850°F]
- SS316, Carbon Steel
- Male pipe thread 1/8 - 1/2 inch
- Vent the signal line pressure to atmosphere to assist in calibration of control valves or multi-valve manifolds

VPV series Purge Valves
- Up to 4000psig [275bar]
- Up to 315°C [600°F]
- SS316, Brass
- DK - LOK OD 1/8 - OD1/2 inch
- Pipe thread 1/8 - 1/2 inch
- Designed for manually bleeding, venting and draining system fluids.

V46 series Gauge Root Valves
- Up to 6000psig[413bar]
- Up to 232°C [450°F]
- SS316, Carbon Steel
- Pipe thread 1/2 - 3/4 inch
- Standard gauge valve, longer body gauge root valve and extended 4°± long body for pipe insulation are standard
- Grafoil packing for high temperature available
- Non - rotating globe stem tip
- Stem seal below actuating threads

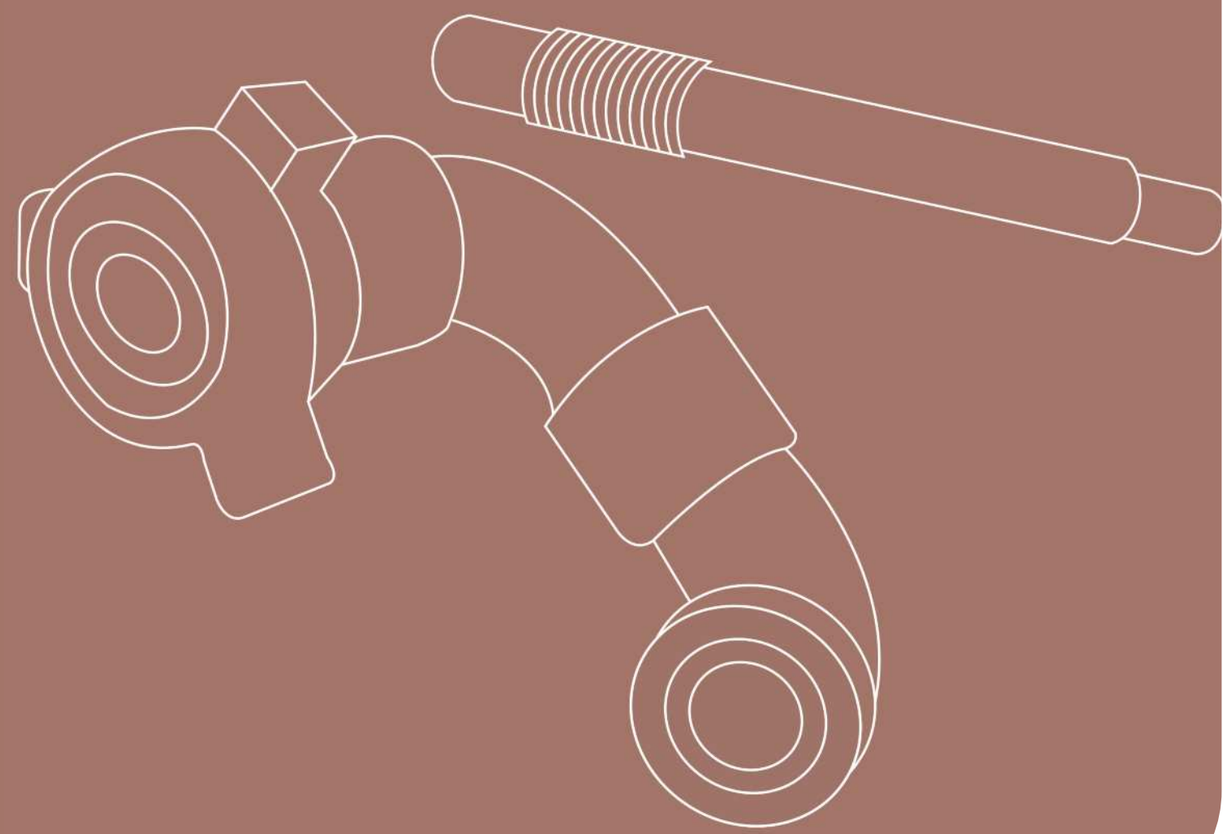
V56 series Manifolds
- Up to 6000psig [413bar]
- Up to 523°C [973°F] with Grafoil packing
- 2V, 3V, 5V as standard
- SS316, Carbon Steel
- Remote Mount, Direct Mount and Single Flanged as standard
- Non-rotating globe stem tip for long service life
- Stem seal below actuating threads to prevent system fluid contamination

V46V2 Block and Bleed Valves
- Up to 6000psig [413bar]
- Up to 523°C [973°F] with Grafoil packing
- SS316 meterial
- Male to female pipe 1/2 inch
- Designed for manually bleeding, venting and draining system fluids.

04

Valves for Oil Service

The technical power which is excellent, in order for to become the enterprise of first class with the product of top, will endeavor.



PRODUCTS

PLUG VALVES

1″ x 2″ 1502 M x F Standard & H2S
2″ x 2″ 1502 M x F , LP Thread Standard & H2S
3″ x 3″ 1502 M x F , LP Thread Standard & H2S
15,000psi working pressure 22,500 psi Tested

PLUG VALVE REPAIR KIT

Plug seal, plug, insert, insert o-ring, Adjust Nut

OTECO STYLE GATE VALVES

2″ to 5″, 2,000psi to 5,000psi WP
Female Line pipe connection / Union End connection /
Butt welded end connection / Flange end connection

PLUG VALVES

1″ x 2″ 1502 M x F Standard & H2S
2″ x 2″ 1502 M x F , LP Thread Standard & H2S
3″ x 3″ 1502 M x F , LP Thread Standard & H2S
15,000psi working pressure 22,500 psi Tested

PUB JOINT

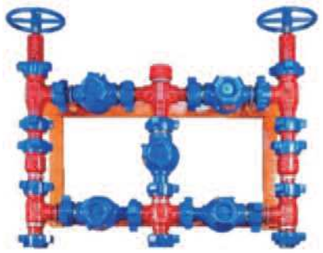
2″ & 3″ 10,000psi & 15,000psi WP, 1ft to 15ft Length
Integral Type (1ft to 10ft length)
Non pressure Seal Type (1ft to 20ft length)

HOSE LOOP

Designs are available for sour gas services at cold working pressures up to 15,000psi
2″ & 3″ Long Radius Style 50 & Style 10 8ft to 12ft

INTEGRAL FITTINGS

We provide series of high pressure integral fittings inkling Tees, Crosses, Elbows
2″ to 4″ 3,000psi to 20,000psi



MANIFOLD

5pcs of plug valves & 2 Adjustable choke valves
Available in standard and H2S service
H2S service made per NACE MR-0175
NPT and Autoclave ports are available by customer request
Other combinations are also available by customer request

PRODUCTS

CHOKE VALVE

2" to 3" Standard & H2S service
10,000psi to 20,000psi
Repair part can be interchangeable with international brands

CHOKE PART

Choke Stem, Choke Seat, Choke Bean

SWIVEL JOINT

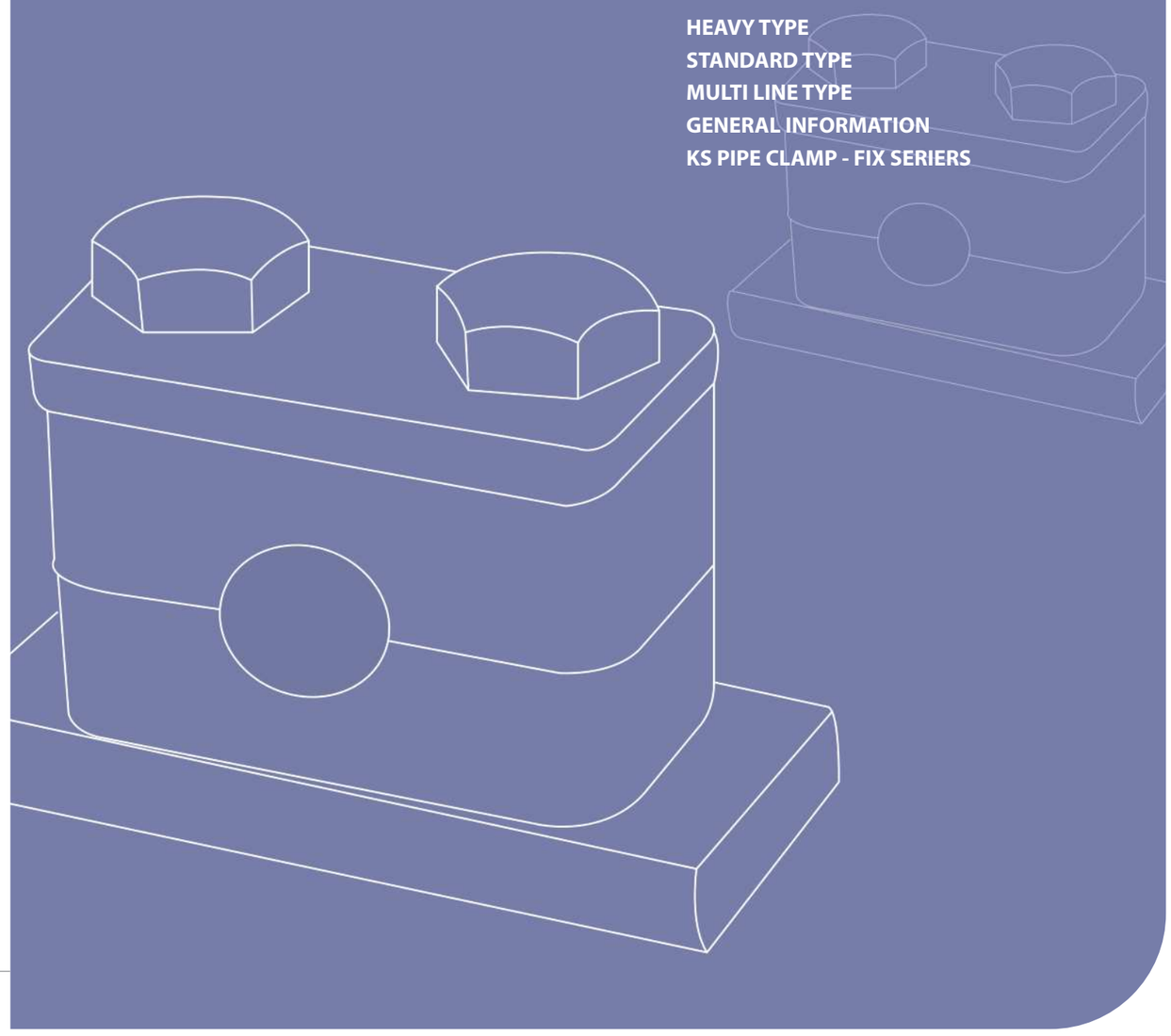
2" to 4", 6,000psi to 20,000psi WP
Fig602, Fig1002, Fig 1502 Style 10 to 100

HAMMER UNION

KPL Hammer unions can be interchanged with products in international market
The model of welding Union : FIG20, FIG60, FIG1002, FIG1502, FIG2002
The model of H2S welding Union : FIG602, FIG1002, FIG1502, FIG2202

05
CLAMPS

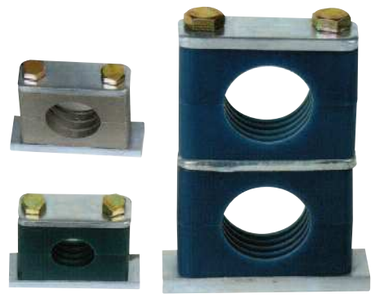
HEAVY TYPE
STANDARD TYPE
MULTI LINE TYPE
GENERAL INFORMATION
KS PIPE CLAMP - FIX SERIERS



HEAVY TYPE

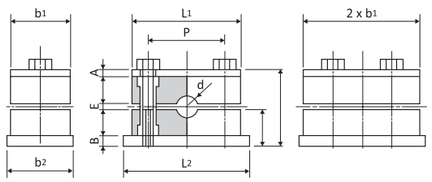
헤비 타입 파이프 클램프

- 디자인
  - 레일타입은 모든 시리즈(H30, H40, H60, H90)에 사용 할 수 있다.
  - 한 쌍의 클램프를 결합하는 금속타입은 모든 시리즈에 사용 할 수 있다.
  - 결합해서 조이는 두 금속타입은 모든 시리즈에 사용 할 수 있다.
- 재료
  - 폴리프로필렌 PP - 폴리아마드 PA - 알루미늄 AL
- 부속품 재료
  - 모든 부분의 금속은 레일너트를 제외한 곳에 스테인레스를 사용 할 수 있다.



HEAY TYPE PIPE CLAMPS

- **Design**
  - Rail type available for all series H30, H40, H60, and H90.
  - One double clamp on a weld plate type available for all series.
  - Two single clamps for stacking on a weld plate type available for all series.
- **Material**
  - Polyproylene PP - Polyamide PA - Alumminum AL
- **Accessories Material**
  - All metel parts available in stainless steel except rail nut.



Series	Tubings				Dimensions(mm)										BOLT
	Size	A	inch	DØ	L1	b1	tA	LB	b2	t2	h	E	H	P	
H-02	-	-	-	6	55	30	6	73	32	9	25	2	52	33	M10 x 45
	-	-	-	8											
	01	6	1/8	10.5											
	-	-	-	12											
	02	8	1/4	13.8											
	-	-	-	15											
	-	-	-	16											
	03	10	3/8	17.3											
H-04	-	-	-	20	70	30	6	85	32	9	33	2	68	45	M10 x 60
	04	15	1/2	21.7											
	-	-	-	25											
	06	20	3/4	27.2											
	-	-	-	30											
H-06	-	-	-	32	85	30	6	100	32	9	38	2	78	60	M10 x 75
	08	25	1	30.4											
	-	-	-	35											
	-	-	-	38											
	-	-	-	40											
	010	32	1 1/4	42.7											
	-	-	-	45											
H-08	012	40	1 1/2	48.6	115	45	8	150	50	9	58	3	119	90	M12 x 110
	-	-	-	50											
	-	-	-	55											
	016	50	2	60.5											
	-	-	-	65											
H-10	-	-	-	70	150	60	10	200	65	9	72	3	147	122	M16 x 140
	-	-	-	73											
	020	65	2 1/2	76.3											
	-	-	-	80											
	024	80	3	89.1											
H-12	028	90	3 1/4	101.6	205	80	16	270	90	16	101	3	205	168	M20 x 190
	032	100	4	114.3											
H-14	040	125	5	139.8	250	90	16	310	100	16	115	4	234	205	M24 x 230
	048	150	6	165.2											
H-16	064	200	8	216.4	320	122	25	380	130	25	160	4	324	265	M30 x 310
H-18	080	250	10	267.4	466	160	30	520	170	30	235	10	480	385	M33 x 460
	096	300	12	318.5											
H-20	-	350	14	355.6	630	180	36	680	190	36	301	30	632	535	M36 x 580
		400		406.4											

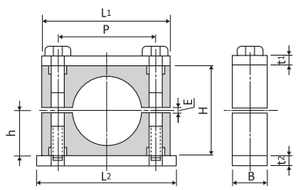
STANDARD TYPE

스텐다드 타입 파이프 클램프

- 디자인
  - 레일타입은 모든 시리즈에 사용 할 수 있다.
  - 한 쌍의 클램프를 결합하는 금속타입은 모든 시리즈에 사용 할 수 있다.
  - 결합해서 조이는 두 금속타입은 모든 시리즈에 사용 할 수 있다.
- 재료
  - PP (폴리프로필렌) - PA(폴리아마드)
- 부속품 재료
  - 모든 부분의 금속은 레일너트를 제외한 곳에 스테인레스를 사용 할 수 있다.

STANDARD TYPE PIPE CLAMPS

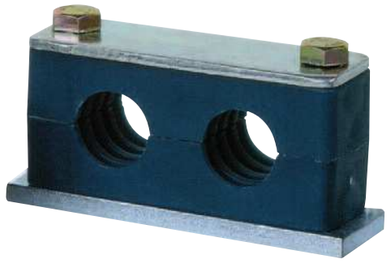
- **Design**
  - Rail type available for all series.
  - One double clamp on a weld plate type available for all series.
  - Two single clamps for stacking on a weld plate type available for all series.
- **Material**
  - PP(Polyproylene) - PA(Polyamide)
- **Accessories Material**
  - All metel parts available in stainless steel except rail nut.

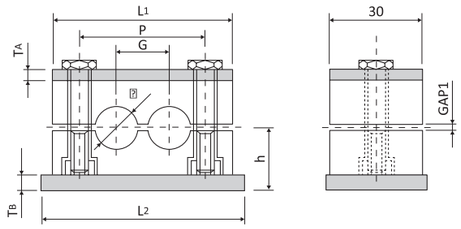


Series	DØ			Dimensions(mm)									BOLT
	A	inch	mm	L1	L2	B	tA	tB	E	h	H	P	
H-02	-	-	6	28	38	30	3	6	0.4	13	27	-	M6 x 30
	-	1/4	6.35										
	-	5/16	8										
	-	3/8	9.5										
	6	-	10										
	-	-	12										
H-04	-	-	6	37	47	30	3	6	0.5	13	27	20	M6 x 30
	-	1/4	6.35										
	-	5/16	8										
	-	3/8	9.5										
	-	-	10										
	6	-	12										
	-	1/2	12.7										
H-06	-	1/2	12.7	43	53	30	3	6	0.6	16	33	26	M6 x 35
	8	-	13.5										
	-	-	14										
	-	-	15										
	-	5/8	16										
	10	-	17.2										
	-	-	18										
H-08	-	3/4	19	50	60	30	3	6	0.8	17	35	33	M6 x 40
	-	-	20										
	15	-	21.3										
	-	7/8	22										
	-	1	25										
H-10	20	-	27.3	57	67	30	3	6	0.8	21	44	40	M6 x 45
	-	-	28										
	-	-	30										
	- 1	1 /4	32										
H-12	-	11 /4	32	69	79	30	3	6	0.8	27.5	56	52	M6 x 60
	25	-	34										
	-	-	35										
	-	11 /2	38										
	32	-	42										
H-14	-	13 /4	44.5	86	96	30	3	6	1.0	32	66	66	M6 x 70
	40	-	48.3										
	-	2	50.8										
	-	-	54										

MULTI LINE TYPE

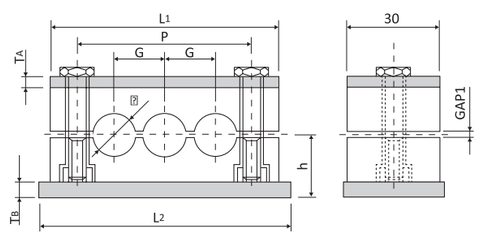
2 LINE TYPE





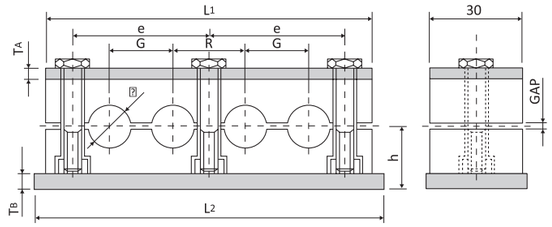
A	inch	mm	TA	TB	L1	L2	G	h	P	BOLT
-	1/4	Ø 6 x 2	3	6	62	76	18.5	20	42	M6 x 38
-	5/16	Ø 8 x 2	3	6	62	76	20.0	20	42	M6 x 38
6	3/8	Ø 10 x 2	3	6	62	76	20.0	20	42	M6 x 38
-	1/2	Ø 12 x 2	3	6	62	76	18.0	20	42	M8 x 38
8	-	Ø 15 x 2	3	6	76	89	29.0	22	58	M8 x 43
-	-	Ø 16 x 2	3	6	76	89	29.0	22	58	M8 x 43
10	5/8	Ø 17.3 x 2	3	6	76	89	29.0	22	58	M8 x 43
15	-	Ø 21.7 x 2	3	6	101	115	35.0	29	80	M8 x 55
20	7/8	Ø 25 x 2	3	6	101	115	35.0	29	80	M8 x 55
-	-	Ø 34 x 2	3	6	151	166	54.0	34	126	M8 x 57
32	-	Ø 42 x 2	3	6	151	166	54.0	34	126	M8 x 57

3 LINE TYPE



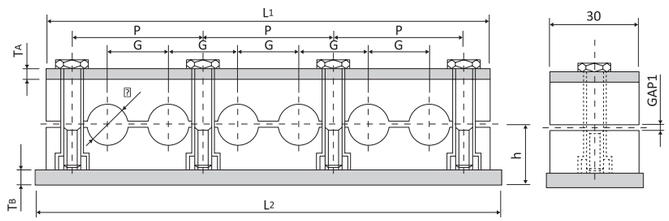
A	inch	mm	TA	TB	L1	L2	G	h	P	BOLT
-	1/4	Ø 6 x 3	4.5	4.5	85	100	21	22	65	M6 x 38
-	5/16	Ø 8 x 3	4.5	4.5	85	100	21	22	65	M6 x 38
6	3/8	Ø 10 x 3	4.5	4.5	85	100	21	22	65	M6 x 38
-	1/2	Ø 12 x 3	4.5	4.5	85	100	21	22	65	M8 x 38
8	-	Ø 15 x 3	4.5	4.5	108	123	27	22	88	M8 x 38
-	5/8	Ø 16 x 3	4.5	4.5	108	123	27	22	88	M8 x 38
10	-	Ø 17.3 x 3	4.5	4.5	108	123	27	22	88	M8 x 38
15	7/8	Ø 21.7 x 3	4.5	4.5	130	145	27	27	110	M8 x 55
20	-	Ø 25 x 3	4.5	4.5	130	145	27	27	110	M8 x 55

4 LINE TYPE



A	inch	mm	TA	TB	L1	L2	G	h	P	e	BOLT
-	1/4	Ø 6 x 4	3	6	107	123	18.5	21	87	-	M6 x 38
-	5/16	Ø 8 x 4	3	6	107	123	18.5	21	87		M6 x 38
6	3/8	Ø 10 x 4	3	6	107	123	18.5	21	87		M6 x 38
-	-	Ø 12 x 4	3	6	107	123	18.5	21	87		M6 x 38
8	5/8	Ø 15 x 4	3	6	143	157	27	21	123	61.5	M6 x 43
10	-	Ø 17.3 x 4	3	6	143	157	27	21	123	61.5	M8 x 43
15	-	Ø 20 x 4	3	6	143	157	27	21	123	61.5	M8 x 43

6 LINE TYPE



A	inch	mm	TA	TB	L1	L2	G	h	P	BOLT
-	1/4	Ø 6 x 6	4.5	6	200	220	30	24	60	M6 x 38
-	5/16	Ø 8 x 6	4.5	6	200	220	30	24	60	M6 x 38
6	3/8	Ø 10 x 6	4.5	6	200	220	30	24	60	M6 x 38
-	1.2	Ø 12 x 6	4.5	6	200	220	30	24	60	M6 x 38
8	-	Ø 12.7 x 6	4.5	6	200	220	30	24	60	M8 x 43
-	-	Ø 13 x 6	4.5	6	200	220	30	24	60	M8 x 43
-	-	Ø 15 x 6	4.5	6	200	220	30	24	60	M8 x 43

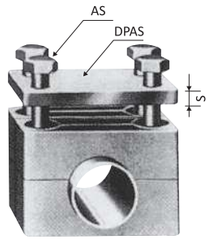
GENERAL INFORMATION

[WELDING TYPE]

[MOUNTING RAIL TYPE]

[BOLTING TYPE]

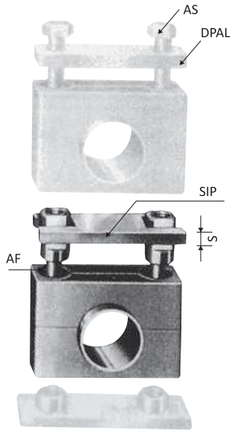
[DPAS - AS]
Hexagon Head Bolts and
Cover Plate for Double Clamps.



GROUP	3S	4S	5S	6S	7S
Bolt	M10 x 45	M10 x 60	M10 x 73	M12 x 100	M16 x 130
Plate thickness S	8	8	8	10	10

GROUP	3S8S	9S	10S	11S	12S
Bolt	M20 x 190	M24 x 220	M30 x 300	M30 x 450	M30 x 560
Plate thickness S	15	15	25	30	30

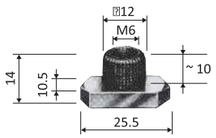
Stacking components have to be separately specified within the framework of the order.



[SIP - AF]
Stacking Bolts and
Safety Locking Plates.

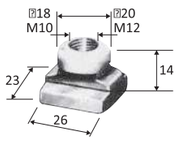
The AS and DPAL are fitted on of stack.
For the multi - level - assembly combine only clamps of the same Group.

Hexagon Rail Nut for rail mounting.



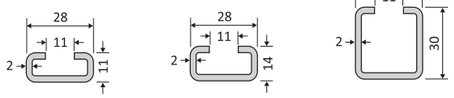
[SM]

Mounting Rail Boss for rail mounting.



[GMV10]
for sizes 3C - 5C
[GMV12]
for sizes 6C

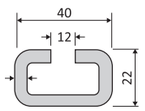
Mounting Rail in lengths of 1 and 2m.



[TS 11] [TS 14] [TS 30]

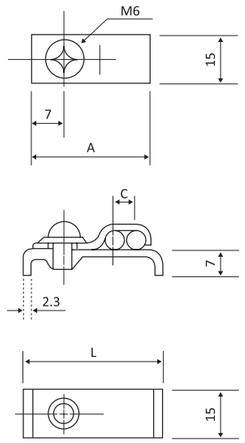
Mounting Rail in lengths of 1 and 2m.

[STSV]

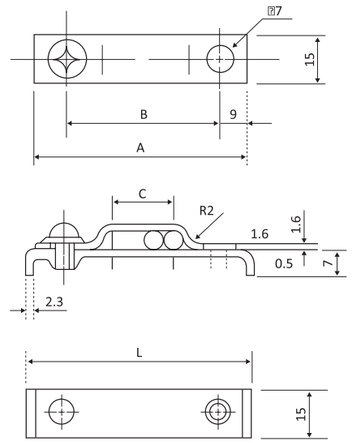


KS PIPE CLAMP - FIX SERIERS

CLASS 3



CLASS 4

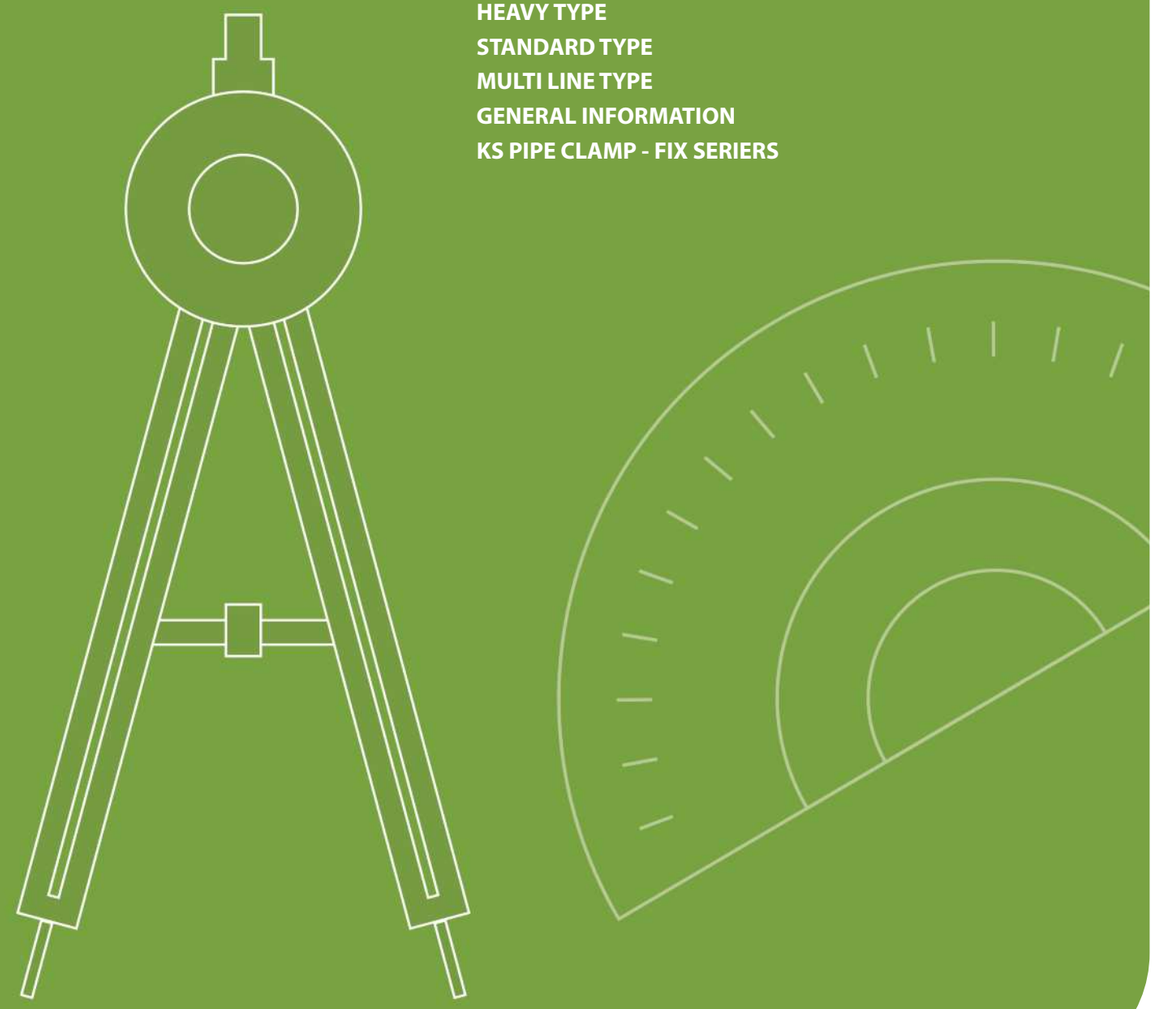


This tube clamp is used to fix correr piping.

MARK		TYPE	TUBE O.D. & Hole	A	B	C	L	R
FIX SERIES	S	A1	Ø 6 x 1	22	-	-	40	3
		A2	Ø 6 x 2	28	-	6	40	3
	H	A3	Ø 6 x 3	58	40	12	62	3
		A4	Ø 6 x 4	66	48	18	70	3
		A5	Ø 6 x 5	74	56	24	78	3
		A6	Ø 6 x 6	80	65	30	84	3
	S	B1	Ø 8 x 1	25	-	-	40	4
		B2	Ø 8 x 2	35	-	8	40	4
	H	B3	Ø 8 x 3	66	48	16	70	4
		B4	Ø 8 x 4	74	56	24	73	4
		B5	Ø 8 x 5	80	62	32	84	4
		B6	Ø 8 x 6	90	72	40	94	4
		B7	Ø 8 x 7	104	85	48	107	4
		B8	Ø 8 x 8	110	92	56	114	4
	S	D1	Ø 10 x 1	29	-	-	40	5
	H	D2	Ø 10 x 2	66	45	10	70	5
		D3	Ø 10 x 3	74	56	20	78	5
		D4	Ø 10 x 4	80	62	30	84	5
	S	E1	Ø 12 x 1	32	-	-	40	6
	H	E2	Ø 12 x 2	66	48	12	70	6
		E3	Ø 12 x 3	80	62	24	84	6
		E4	Ø 12 x 4	90	72	36	94	6
		E5	Ø 12 x 5	103	85	48	107	6
		G1	Ø 15 x 1	58	40	-	62	7.5
		G2	Ø 15 x 2	74	56	15	78	7.5
		G3	Ø 15 x 3	90	72	30	94	7.5
		G4	Ø 15 x 4	103	85	45	107	7.5

06

ENGINEERING DATA



HEAVY TYPE
STANDARD TYPE
MULTI LINE TYPE
GENERAL INFORMATION
KS PIPE CLAMP - FIX SERIERS

ENGINEERING DATA

1) Forged Socket Welding. Threaded Fitting Bore.

(in/mm)

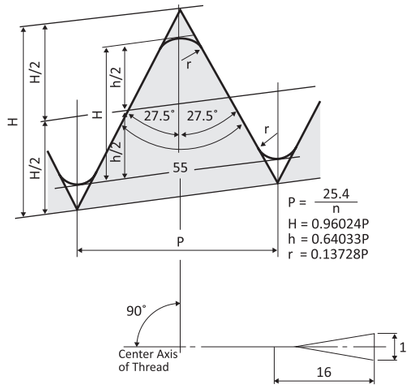
Outlet Size	ASME B16.11			JIS B2316	
	Socket Welding (M)		Threaded (T)	Socket Welding (M)	Threaded (T)
	In	mm			
1/8	10.90	10.65	NPT 1/8	11.0	PT 1/8
1/4	14.35	14.10	NPT 1/4	14.3	PT 1/4
3/8	17.80	17.55	NPT 3/8	17.8	PT 3/8
1/2	21.95	21.70	NPT 1/2	22.2	PT 1/2
3/4	27.30	27.05	NPT 3/4	27.7	PT 3/4
1	34.05	33.80	NPT 1	34.5	PT 1
1 1/4	42.80	42.55	NPT 1 1/4	43.2	PT 1 1/4
1 1/2	48.90	48.65	NPT 1 1/2	49.1	PT 1 1/2
2	61.35	61.10	NPT 2	61.1	PT 2
2 1/2	74.20	83.80	NPT 2 1/2	77.1	PT 2 1/2
3	90.15	89.80	NPT 3	90.0	PT 3
4	115.8	115.45	NPT 4	115.4	PT 4

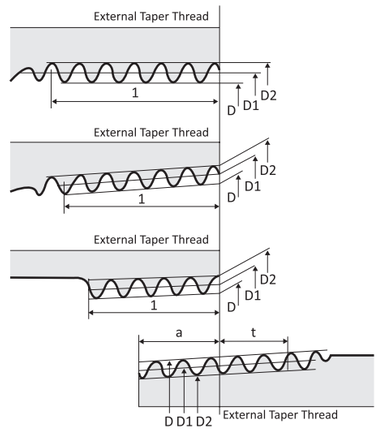
2) TOLERANCE

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

Nominal Pipe Size	ASME B16.11				Elbow, Tee, Cross	Coupling	Half Coupling
	Socket Bore Dia	Bore Dia. of Fitting	Concentricity of Bore	Concentricity of Axis	Center to Bottom of Socket	Bottom to Bottom of Socket	Bottom to Socket to Opposite Face
1/8	+0.012 -0.000	±0.03	Socket and Fitting bores within ±0.030	Maximum variation in alignment of socket and fitting bores for 1/4 in 12	±0.03	±0.06	±0.03
1/4	+0.012 -0.000	±0.03			±0.06	±0.12	±0.06
3/8	+0.012 -0.000	±0.03			±0.08	±0.16	±0.08
1/2	+0.012 -0.000	±0.06			±0.10	±0.20	±0.10

3) KS B0222 & JIS B0203 Pipe Threads.





Basic Thread Date.

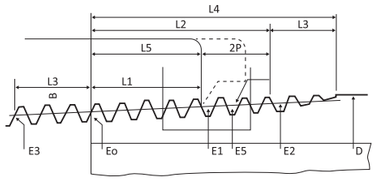
Nominal Size	Number of Threads Per Inch	Screw Thead			Basic Diameter			Position of Basic			Tolerances on Basic Diameters of Internal Parallel Thread	Effective Thread Length(Min.)				Nominal Pipe Size (For Reference)	
		Pitch	Height of Thread	Rounding	External Thread			External Thread		Internal Thread		External Thread	Internal Thread				
					Major Diameter d	Pitch Diameter d2	Minor Diameter d1	From the Ena' of Pipe		The End of Pipe		Fitting Allowance	When there is an Incomplate thead or More		When there is no Incomplete Thread		
					Internal Thread								Internal Taper thread	Internal Parallel Thread	Internal Taper and Parallel thread	Outside Diameter	Wall thickness
					Major Diameter	Major Diameter	Major Diameter	Basic length	Tolerance	Tolerance Axially							
	n	P	h	r	D	D2	D1	a	±b	±c	±	f	l	l	t		
PT15(1/2)	14	1.8143	1.162	0.25	20.955	19.793	18.631	8.16	1.81	2.27	0.142	5.00	12.7	15.0	9.1	21.7	2.8
PT20(3/4)	14	1.8143	1.162	0.25	26.441	25.279	24.117	9.53	1.81	2.27	0.142	5.60	14.1	16.3	10.2	27.2	2.8
PT25(1 1/4)	11	2.3091	1.479	0.32	33.249	31.770	30.291	10.39	2.31	2.89	0.180	6.40	16.2	19.0	11.5	34.0	3.2
PT32(1 1/4)	11	2.3091	1.479	0.32	41.910	40.431	38.952	12.70	2.31	2.89	0.180	6.40	18.5	21.4	13.4	42.7	3.5
PT40(1 1/2)	11	2.3091	1.479	0.32	47.803	46.324	44.845	12.70	2.31	2.89	0.180	6.40	18.5	21.4	13.4	48.6	3.5
PT50(2)	11	2.3091	1.479	0.32	59.614	58.135	56.656	15.88	2.31	2.89	0.180	7.50	22.8	25.7	16.9	60.5	3.8
PT65(2 1/2)	11	2.3091	1.479	0.32	75.184	73.705	72.226	17.46	3.46	3.46	0.217	9.22	26.7	30.2	18.6	76.3	4.2
PT80(3)	11	2.3091	1.479	0.32	87.884	86.405	84.926	20.64	3.46	3.46	0.217	9.22	29.9	33.3	21.1	89.1	4.2
PT90(3 1/2)	11	2.3091	1.479	0.32	100.330	98.851	97.372	22.23	3.46	3.46	0.217	9.30	31.5	34.9	22.4	101.6	4.2
PT100(4)	11	2.3091	1.479	0.32	113.030	111.551	110.072	25.40	3.46	3.46	0.217	10.40	35.9	39.3	25.9	114.3	4.5
PT125(5)	11	2.3091	1.479	0.32	138.430	136.952	135.472	25.58	3.46	3.46	0.217	11.40	40.1	43.6	29.3	139.8	4.5
PT150(6)	11	2.3091	1.479	0.32	163.830	162.351	160.872	28.58	3.46	3.46	0.217	11.50	40.1	43.6	29.3	165.2	5.0

• Dimensions are in millimeters.

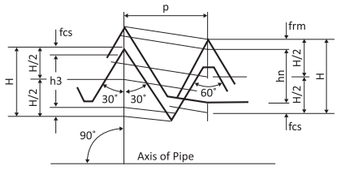
ENGINEERING DATA

4) ASME B2.1 Taper Pipe Threads.

(Except Dryseal)



Taper 1 in 16 on diameter
(Shown exaggerated in diagram).



Thread Height Dimensions.

Thread Element	27 Threads Per Inch P= 0.03704	18 Threads Per Inch P= 0.05556	14 Threads Per Inch P= 0.07143	11½ Threads Per Inch P= 0.08696	8 Threads Per Inch P= 0.12500
H=0.866p	0.0321	0.481	0.0619	0.0753	0.1082
hs=hh=0.760p	0.0281	0.422	0.0543	0.0661	0.095
frs=frn=0.033p	0.0012	0.0088	0.0024	0.0029	0.0041
fcs=fcn=0.073p	0.0027	0.0041	0.0052	0.0063	0.0091

Thread Height Dimensions.

Nominal Pipe Size (NPT)	Outside Diameter of Pipe D	Threads per inch n	Pitch of Thread P	Pich Diameter at beginning of External Thread	Handtight Engagement			Effective Thread, External		
					Length L1		Dia E1	Length L2		Dia E2
					In.	Thds.		In.	Thds.	
1	2	3	4	5	6	7	8	9	10	11
1/8	0.405	27.0	0.03704	0.36351	0.1615	4.36	0.37360	0.2639	7.12	0.38000
1/4	0.540	18.0	0.05556	0.47739	0.2278	4.10	0.49163	0.4018	7.23	0.50250
3/8	0.675	18.0	0.05556	0.61201	0.2400	4.32	0.62701	0.4078	7.34	0.63750
1/2	0.840	14.0	0.07143	0.75843	0.3200	4.48	0.77843	0.5337	7.47	0.79179
3/4	1.050	14.0	0.07143	0.96768	0.3390	4.75	0.98887	0.5457	7.64	1.00179
1	1.315	11.5	0.08696	1.21363	0.4000	4.60	1.23863	0.6828	7.85	1.25630
1 1/4	1.660	11.5	0.08696	1.55713	0.4200	4.83	1.58338	0.7068	8.13	1.60130
1 1/2	1.900	11.5	0.08696	1.79609	0.4200	4.83	1.82234	0.7235	8.32	1.84130
2	2.375	11.5	0.08695	2.26902	0.4360	5.01	2.29627	0.7565	8.70	2.31630
2 1/2	2.875	8.0	0.12500	2.71953	0.6820	5.46	2.76216	1.1375	9.10	2.79062
3	3.500	8.0	0.12500	3.34062	0.7660	6.13	3.38850	1.2000	9.60	3.41562
3 1/2	4.000	8.0	0.12500	3.83750	0.8210	6.57	3.88881	1.2500	10.00	3.91562
4	4.500	8.0	0.12500	4.33438	0.8440	6.57	4.38712	1.3000	10.40	4.41562

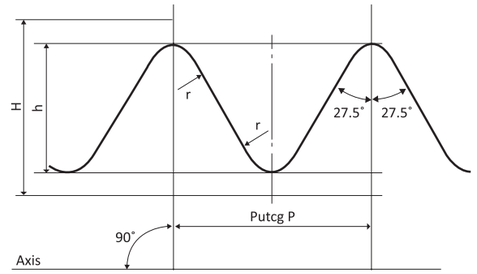
Nominal Pipe Size (NPT)-	Wrench Makeup Length for External Thread L2, L1		Wrench Makeup Length for Internal Thread			Vanish Thread V		Overall Length External Thread L4	Nominal, Complete External Threadss		Height of Thread h	Increase in Dia per Thread, 0.0625/n	Basic Minor Dia at small End of Pipe, Ka
			Length L3		Dia E3								
	In.	Thds.	In.	Thds.		In.	Thds.		Length L5	Length L5			
1	12	13	14	15	16	17	18	19	20	21	22	23	24
1/8	0.1024	2.76	0.1111	3	0.35656	0.1285	3.47	0.3924	0.1898	0.37537	0.2963	0.00237	0.3339
1/4	0.1740	3.13	0.1667	3	0.46697	0.1928	3.47	0.5946	0.2907	0.49556	0.04444	0.00347	0.4329
3/8	0.1678	3.02	0.1667	3	0.6016	0.1928	3.47	0.6006	0.2967	0.63056	0.04444	0.00446	0.5676
1/2	0.2137	2.99	0.2143	3	0.74504	0.2478	3.47	0.7815	0.3909	0.78286	0.05714	0.00446	0.7013
3/4	0.2067	2.99	0.2143	3	0.95429	0.2478	3.47	0.7935	0.7815	0.99286	0.05714	0.00543	0.9105
1	0.2828	3.25	0.2609	3	1.19733	0.3017	3.47	0.9845	0.7935	1.24543	0.06957	0.00543	1.1441
1 1/4	0.2868	3.3	0.2609	3	1.54083	0.3017	3.47	1.0085	0.9845	1.59043	0.06957	0.00543	1.4876
1 1/2	0.3035	3.49	0.2609	3	1.77978	0.3017	3.47	1.0252	1.0085	1.83043	0.06957	0.00543	1.7265
2	0.3205	3.69	0.2609	2	2.25272	0.3017	3.47	1.0582	1.0252	2.30543	0.06957	0.00543	2.1995
2 1/2	0.4555	3.64	0.25007	2	2.70391	0.4337	3.47	1.5712	1.0582	2.77500	0.10000	0.00781	2.6195
3	0.4340	3.47	0.25007	2	3.32500	0.4337	3.47	1.6337	1.5712	3.40000	0.10000	0.00781	3.2406
3 1/2	0.4290	3.43	0.2500	2	3.82188	0.4337	3.47	1.6837	1.6337	3.90000	0.10000	0.00781	3.7375
4	0.4560	3.65	0.2500	2	4.31875	0.4337	3.47	1.7337	1.7337	4.40000	0.10000	0.00781	4.2344

• Dimensions are in millimeters.

5) BS21-1973 British Standard Taper Pipe Threads.

(Except Dryseal)

- H = 0.960237 x P
- h = 0.460237 x P
- r = 0.137278 x P



Taper 1 in 16 on diameter
(Shown exaggerated in diagram)

BSP Size (Nominal Bore of Pipe)	NO. of Threads per Inch	Pitch	Depth of Thread	Basic - Diameters at Grage Plane			Gauqe Lenath			
				Major (Gauge Diameter)	Effective	Minor	Basic	Tolerance Plus and Minus	Max.	Min.
in.		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
1/8	14	0.07143	1.814	0.0457	1.162	0.825	20.955	0.7793	19.793	0.7336	18.631	0.3214	8.2	0.0714	1.8	0.3928	10.0	0.25	6.4
1/4	14	0.07143	1.814	0.0457	1.162	1.041	24.441	0.9953	25.279	0.9496	24.117	0.3750	9.5	0.0714	1.8	0.4464	11.3	0.3036	7.7
3/8	11	0.09091	2.309	0.0582	1.479	1.309	33.249	1.2508	31.770	1.1926	24.117	0.4091	10.4	0.0909	2.3	0.5000	12.7	0.3182	8.1
1/2	11	0.09091	2.309	0.0582	1.479	1.650	41.910	1.5918	40.431	1.5335	28.952	0.5000	12.7	0.0909	2.3	0.5909	15.0	0.4091	10.4
3/4	11	0.09091	2.309	0.0582	1.479	1.882	47.803	1.8238	46.324	1.7656	44.845	0.5000	12.7	0.0909	2.3	0.5909	15.0	0.4091	10.4
1	11	0.09091	2.309	0.0582	1.479	2.347	59.614	2.2888	58.135	2.2306	56.656	0.6250	15.9	0.0909	2.3	0.7159	18.2	0.5341	13.6
1 1/4	11	0.09091	2.309	0.0582	1.479	2.960	75.184	2.9018	73.705	2.8436	72.226	0.6875	17.5	0.1364	3.5	0.8239	21.0	0.5511	14.0
1 1/2	11	0.09091	2.309	0.0582	1.479	3.460	87.884	3.4018	86.405	3.3436	84.926	0.8125	20.6	0.1364	3.5	0.9486	24.1	0.6761	17.1
2	11	0.09091	2.309	0.0582	1.479	4.450	113.030	4.3918	111.551	4.3336	110.072	1.0000	25.4	0.1364	3.5	1.1364	28.9	0.8636	21.9
2 1/2	11	0.09091	2.309	0.0582	1.479	5.450	138.430	5.3918	136.951	5.3336	135.472	1.1250	28.6	0.1364	3.5	1.2614	32.1	0.9886	25.1
3	11	0.09091	2.309	0.0582	1.479	6.460	163.830	6.3918	162.351	6.3336	160.872	1.1250	28.6	0.1364	3.5	1.2614	32.1	0.9886	25.1

BSP Size (Nominal Bore of Pipe)	NO. of Threads per Inch	Length of Useful Thread on Pipe End Not Less than						Minor		Fitting Allowance		Wrenhing Allowance		Tolerance of Position of Gauge Plane Relative Taper Threaded Patrs (Plus and Minuts)		BSP Size (Norminal Bore of pipe)
		For Basic Gauge Length		For Max. Gauge Length		For Min. Gauge Length										
in.		in.	mm	in.	mm	in.	mm									in.
1/8	14	0.5178	13.2	0.5892	15.0	0.4464	11.4	0.1964	5.0	0.1071	2.7	0.0893	2.3	1/8
1/4	14	0.5714	14.5	0.6428	16.3	0.5000	12.7	0.1964	5.0	0.1071	2.7	0.0893	2.3	1/4
3/8	11	0.6591	16.8	0.7500	19.1	0.5682	14.5	0.2500	6.4	0.1364	3.5	0.1136	2.9	3/8
1/2	11	0.7500	19.1	0.8509	21.4	0.6591	16.8	0.2500	6.4	0.1364	3.5	0.1136	2.9	1/2
3/4	11	0.7200	19.1	0.8409	21.4	0.6591	16.8	0.2500	6.4	0.1364	3.5	0.1136	2.9	3/4
1	11	0.9204	23.4	1.0113	25.7	0.8295	21.1	0.2954	7.5	0.1818	4.6	0.1136	2.9	1
1 1/4	11	0.0511	26.7	1.1875	30.2	0.9247	23.2	0.3636	9.2	0.2273	5.8	0.1364	3.5	1 1/4
1 1/2	11	1.1761	29.8	1.3125	33.3	1.0397	26.3	0.3636	9.2	0.2273	5.8	0.1364	3.5	1 1/2
2	11	1.4091	35.8	1.5455	39.3	1.2727	32.3	0.4091	10.4	0.2727	6.9	0.1364	3.5	2
2 1/2	11	1.5795	40.1	1.7159	43.6	1.4431	36.6	0.4545	11.5	0.3182	8.1	0.1364	3.5	2 1/2
3	11	1.5795	40.1	1.7159	43.6	1.4431	36.6	0.4545	11.5	0.3182	8.1	0.1364	3.5	3

6) Wall Thickness Schedules.

JIS G3448 ANSI B 36.10M / JIS G3454 ANSI B 36.19M
JIS G3455 / JIS G3459

(in/mm)

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

Nominal Wall Thickness									Outside Diameter		Nominal Pipe Size	
Sch 40	Sch 60	XS	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160	XXS	JIS	ANSI	A	B
2.2	2.4	(3.0)	3.0	-	-	-	-	-	13.8	13.7	**8**	**1/4**
2.3	2.8	(3.2)	3.2	-	-	-	-	-	17.3	17.1	**10**	**3/8**
2.8	3.2	(3.7)	3.7	-	-	-	4.7	7.5	21.7	21.3	**15**	**1/2**
2.9	3.4	(3.9)	3.9	-	-	-	5.5	7.8	27.2	26.7	**20**	**3/4**
3.4	3.9	(4.5)	4.5	-	-	-	6.4	9.1	34.0	33.5	**25**	**1**
3.6	4.5	(4.9)	4.9	-	-	-	6.4	9.7	42.7	42.2	**32**	**1-1/4**
3.7	4.5	(5.1)	5.1	-	-	-	7.1	10.2	48.6	48.3	**40**	**1-1/2**
3.9	4.9	(5.5)	5.5	-	-	-	8.7	11.1	60.5	60.3	**50**	**2**
5.2	6	(7.0)	7.0	-	-	-	9.5	14	76.3	73.0	**65**	**2-1/2**
5.5	6.6	(7.6)	7.6	-	-	-	11.1	15.2	89.1	88.9	**80**	**3**
5.7	7	(8.1)	8.1	-	-	-	12.7	-	101.6	101.6	**90**	**3-1/2**
6	7.1	(8.6)	8.6	-	11.1	-	13.5	17.1	114.3	114.3	**100**	**4**
6.6	8.1	(9.5)	9.5	-	12.7	-	15.9	19	139.8	141.3	**125**	**5**
7.1	9.3	(11.0)	11.0	-	14.3	-	18.2	21.9	165.2	168.3	**150**	**6**
-	-	-	-	-	-	-	-	-	190.7	-	**175**	**7**
8.2	10.3	(12.7)	12.7	15.1	18.2	20.6	23.0	22.2	216.3	219.1	**200**	**8**
-	-	-	-	-	-	-	-	-	241.8	-	**225**	**9**
9.3	12.7	12.7	15.1	18.3	21.4	25.4	28.6	25.4	267.4	273.1	**250**	**10**
10.3	14.3	12.7	17.4	21.4	25.4	28.6	33.3	25.4	318.5	323.9	**300**	**12**
11.1	15.1	12.7	19.0	23.8	27.8	31.8	35.7	-	355.6	355.6	**350**	**14**
12.7	16.7	12.7	21.4	26.2	30.9	36.5	40.5	-	406.4	406.4	**400**	**16**
14.3	19	12.7	23.8	29.4	34.9	39.7	45.2	-	457.2	457.2	**450**	**18**
15.1	20.6	12.7	26.2	32.5	38.1	44.4	50.0	-	508.0	508.0	**500**	**20**
-	22.2	12.7	28.6	34.9	41.3	47.6	54.0	-	558.8	558.8	**550**	**22**
17.5	24.6	12.7	31.0	38.9	46	52.4	59.5	-	609.6	609.6	**600**	**24**
-	-	12.7	-	-	-	-	-	-	660.4	660.4	**650**	**26**
-	-	12.7	-	-	-	-	-	-	711.2	711.2	**700**	**28**
-	-	12.7	-	-	-	-	-	-	762.0	762.0	**750**	**30**
17.5	-	12.7	-	-	-	-	-	-	812.8	812.8	**800**	**32**
17.5	-	12.7	-	-	-	-	-	-	863.6	863.6	**850**	**34**
19.1	-	12.7	-	-	-	-	-	-	914.4	914.4	**900**	**36**
-	-	12.7	-	-	-	-	-	-	965.2	965.2	**950**	**38**
-	-	12.7	-	-	-	-	-	-	1016.0	1016.0	**1000**	**40**
-	-	12.7	-	-	-	-	-	-	1066.8	1066.8	**1050**	**42**
-	-	12.7	-	-	-	-	-	-	1117.6	1117.6	**1100**	**44**
-	-	12.7	-	-	-	-	-	-	1168.4	1168.4	**1150**	**46**
-	-	12.7	-	-	-	-	-	-	1219.2	1219.2	**1200**	**48**
-	-	*12.7	-	-	-	-	-	-	1270.0	1270.0	**1250**	**50**
-	-	*12.7	-	-	-	-	-	-	1320.8	1320.8	**1300**	**52**
-	-	*12.7	-	-	-	-	-	-	1371.6	1371.6	**1350**	**54**
-	-	*12.7	-	-	-	-	-	-	1422.4	1422.4	**1400**	**56**
-	-	*12.7	-	-	-	-	-	-	1473.2	1473.2	**1450**	**58**
-	-	*12.7	-	-	-	-	-	-	1524.0	1524.0	**1500**	**60**

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7) Material Specifications.

ASTM STANDARD

ASTM	Grade	Classification	CHEMICAL COMPOSITION								MECHANICAL PROPERTIES				
			C (%)	Mn (%)	P Max. (%)	S Max. (%)	Si (%)	Ni (%)	Cr (%)	Mo (%)	T.S. Mn. psi (kg/mm²)	Y.S. Mn. psi (kg/mm²)	EL. Mn. (%)	Red. Mn. (%)	HB
A-105*	-	Carbon Steel	Max 0.35	0.60 ~ 1.05	0.040	0.050	Max 0.35	Max 0.40	Max 0.30	Max 0.12	70.000 (49.2)	36.000 (25.3)	22	30	Max 187
A-181*	60	Carbon Steel	Max 0.35	Max 0.90	0.050	0.050	Max (0.35)	-	-	-	60,000 (42.2)	30,000 (21.1)	22	35	-
A-181	70	Carbon Steel	Max 0.35	Max 0.90	0.050	0.050	Max (0.35)	-	-	-	70,000 (49.2)	36,000 (25.3)	18	24	-
A-182	F1	1/2 MO	Max 0.28	0.6 ~ 0.90	0.045	0.045	0.15 ~ 0.35	-	-	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	30	143 ~ 192
A-182	F5	5Cr-1/2 MO	Max 0.15	0.30 ~ 0.60	0.030	0.030	Max 0.50	Max 0.50	4.0 ~ 6.00	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	35	143 ~ 217
A-182	F5a	5Cr-1/2 MO	Max 0.25	Max 0.6	0.040	0.030	Max 0.50	Max 0.50	4.0 ~ 6.00	0.44 ~ 0.65	90,000 (63.3)	65,000 (45.7)	22	50	187 ~ 248
A-182	F11-1	1 1/4Cr-1/2 MO	0.05 ~ 0.15	0.30 ~ 0.60	0.030	0.030	0.5 ~ 1.00	-	1.00 ~ 1.50	0.44 ~ 0.65	60,000 (42.2)	30,000 (21.1)	20	45	121 ~ 174
A-182	F11-2	1 1/4Cr-1/2 MO	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.040	0.5 ~ 1.00	-	1.00 ~ 1.50	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	30	143 ~ 174
A-182	F11-3	1 1/4Cr-1/2 MO	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.040	0.5 ~ 1.00	-	1.00 ~ 1.50	0.44 ~ 0.65	75,000 (52.7)	45,000 (31.6)	20	30	143 ~ 207
A-182	F12-1	1Cr-1/2 MO	0.05 ~ 0.15	0.30 ~ 0.60	0.045	0.045	Max 0.5	-	0.80 ~ 1.25	0.44 ~ 0.65	60,000 (42.2)	30,000 (21.1)	20	45	143 ~ 207
A-182	F12-2	1Cr-1/2 MO	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.045	0.10 ~ 0.60	-	0.80 ~ 1.25	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	30	156 ~ 207
A-182	F11	1 1/4Cr-1/2 MO	0.10 ~ 0.20	0.30 ~ 0.60	0.040	0.045	0.5 ~ 1.00	-	1.00 ~ 1.50	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	30	-
A-182	F12	1Cr-1/2 MO	0.10 ~ 0.20	0.30 ~ 0.80	0.040	0.045	0.1 ~ 0.6	-	0.8 ~ 1.25	0.44 ~ 0.65	70,000 (49.2)	40,000 (28.1)	20	30	-
A-182	F22	2 1/4Cr-1 MO	Max 0.15	0.30 ~ 0.60	0.040	0.045	Max 0.50	-	2.00 ~ 2.50	0.87 ~ 1.13	75,000 (52.7)	45,000 (31.6)	20	30	-
A-182	F304	18Cr-8 Ni	Max 0.08	Max 2.00	0.040	0.030	Max 1.00	8.00 ~ 11.00	18.00 ~ 20.00	-	75,000 (52.7)	30,000 (21.1)	30	50	-
A-182	F304L	18Cr-8 Ni Low	Max 0.03	Max 2.00	0.040	0.030	Max 1.00	8.00 ~ 13.00	18.00 ~ 20.00	-	75,000 (49.2)	25,000 (17.6)	30	50	-
A-182	F316	18Cr-8 Ni Mo	Max 0.08	Max 2.00	0.040	0.030	Max 1.00	10.00~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	75,000 (52.7)	30,000 (21.7)	30	50	-
A-182	F316L	18Cr-8 Ni Mo-Low	Max 0.03	Max 2.00	0.040	0.030	Max 1.00	10.00~ 15.00	16.00 ~ 18.00	2.00 ~ 3.00	65,000 (45.7)	25,000 (17.6)	30	50	-
A-182	F321	18Cr-8 Ni Ti	Max 0.08	Max 2.00	0.030	0.030	Max 1.00	9.00 ~ 12.00	Min 17.00	-	75,000 (52.7)	30,000 (21.1)	30	50	-
A-182	F347	18Cr-8 Ni Cb	Max 0.08	Max 2.00	0.030	0.030	Max 1.00	9.00 ~ 13.00	17.00 ~ 20.00	-	75,000 (52.7)	30,000 (21.1)	30	50	-
A-350*	LF1	Carbon Steel	Max 0.30	0.75 ~ 1.05	0.035	0.040	0.15 ~ 0.30	Max 0.40	Max 0.30	Max 0.12	60,000 ~ 85,000 (42.2~59.7)	30,000 (21.1)	25	38	-
A-350*	LF2	Carbon Steel	Max 0.30	Max 1.35	0.035	0.040	0.15 ~ 0.30	Max 0.40	Max 0.30	Max 0.12	70,000 ~ 95,000 (49.2~66.8)	36,000 (25.3)	22	30	-
A-350*	LF3	3 1/2 Ni	Max 0.20	Max 0.90	0.035	0.040	0.20 ~ 0.35	3.25 ~ 3.75	Max 0.30	Max 0.12	70,000 ~ 95,000 (49.2~66.8)	37,500 (26.4)	22	35	-

8) Comparison of ASTM SPEC. And Similar Standards.

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 27	Mild-to Medium-Strength Carbon Steel Casting			
	Gr. 60-30	SC 42	SC 42	-
	Gr. 65-35	SC 46	SC 46	-
	Gr. 70-36	SC 49	SC 49	-
A 48	Gray Cast Castings			
	Cl No. 20A-C	GC 15	FC 15	-
	Cl No. 30A-C	GC 20	FC 20	-
	Cl No. 35A-C	GC 25	FC 25	-
	Cl No. 40A-C	GC 30	FC 30	-
A 53	Welded and Seamless Pipe			
	Gr.A, Type S.	SPPS 38-S	STPG 38-S	STPG 370-S
	Gr.B, Type S.	SPPS 42-S	STPG 42-S	STPG 410-S
	Gr.A, Type E.	SPPS 38-E	STPG 38-E	STPG 370-E
	Gr.B, Type E.	SPPS 42-E	STPG 42-E	STPG 410-E
A 105	Forgings. Carbon Steel for Piping Components			
	-	SF 50	SF 50	SF 490
	-	SF 50	SF 50PV	SF 490PV
	-	SF 45	SF 45	SF 440
	-	SM 30C	S 30 C	-
	-	SM 25C	S 25 C	-
A 106	Seamless Carbon Steel Pipe for High-Temperature Service			
	Gr. A	SPPH 38	STS 38	STS 370
	-	SPHT 38-S	STPT 38-S	STPT 370-S
	Gr. B	SPPH 42	STS 42	STS 410
	-	SPHT 42-S	STPT 42-S	STPT 410-S
	Gr. C	SPPH 49	STS 49	-
	-	SPHT 49-S	STPT 49-S	-
A 126	Gray Iron Castings for Valves, Flanges and Pipe Fittings			
	Cl. A	GC 15	FC 15	-
	Cl. B	GC 20	FC 20	-
	Cl. C	GC 25	FC 30	-
	-	GC 30	FC 30	-

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 181	Forged or Rolled Steel Pipe Flanges, Forged Fittings and, Valve & Parts for General Service			
	Gr, I	SF 40	SF 40	-
	-	SF 45	SF 45PV	-
	Gr, II	SF 50	SF 50	-
	-	SF 50	SF 50PV	-
A 182	Forged or Rolled Steel Pipe Flanges, Forged Fittings &, Valve & Parts for High-Temp. Services			
	F 304	STSF 304	SUSF 304	-
	F 304H	STSF 304H	SUSF 304H	-
	F 304L	STSF 304L	SUSF 304L	-
	F 316	STSF 316	SUSF 316	-
	F 316H	STSF 316H	SUSF 316H	-
	F 316L	STSF 316L	SUSF 316L	-
	F 321	STSF 321	SUSF 321	-
	F 321H	STS 321H	SUSF 321H	-
	F 347	STS 347	SUSF 347	-
	F 347H	STS 347H	SUSF 347H	-
A 192	Seamless Carbon Steel Boiler Tubes for High-Pressure Services			
	-	STH 35-SC	STB 35-SC	-
	-	STH 35-SH	STB 35-SH	-
	-	STH 33-SH	STB 33-SH	-
A 193	Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Services			
	Gr. B5	SNB 5	SNB 5	-
	Gr. B7	SNB 7	SNB 7	-
	Gr. B16	SNB 16	SNB 16	-
A 194	Carbon & Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Services			
	Gr. 2H	SM 45C	S 45C	-
	Gr. 3	SNB 5	SNB 5	-
	Gr. 4	-	-	-
A 204	Pressure Vessel Plates, Alloy Steel, Molybdenum Alloy Steel Plates for Pressure Vessels			
	Gr. A	SBB 46M	SB 46M	-
	Gr. B	SBB 49M	SB 49M	-
	-	-	-	-

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8) Comparison of ASTM SPEC. And Similar Standards.

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 210	Seamless Medium-Carbon Steel Boiler and Superheater Tubes			
	Gr. A1	STH 42. SC	STB 42. SC	-
	-	STH 42. SH	STB 42. SH	-
A 213	Seamless Ferritic and Austenitic Alloy Steel Boiler. Superheater and Heat Exchanger Tubes			
	Gr. TP304	STS 304 TB	-	-
	Gr. TP304H	STS 304 HTB	-	-
	Gr. TP304L	STS 304 LTB	-	-
	Gr. TP316	STS 316 TB	-	-
	Gr. TP316H	STS 316 HTB	-	-
	Gr. TP316L	STS 316 LTB	-	-
	Gr. TP321	STS 321 TB	-	-
	Gr. TP347	STS 347 TB	-	-
A 216	Carbon Steel Castings Suits Suitable for Fusion Welding for Heigh-Temp. Service			
	Gr. WCA	SC 42	SC 42	-
	-	SCW 42	SCW 42	-
	-	SCPH 1	SCPH 1	-
	Gr. WCB	SC 49	SC 42	-
	-	SCW 49	SCW 49	-
	-	SCPH 2	SCPH 2	-
	Gr. WCC	SCW 49	SCW 49	-
	-	SCPH 2	SCPH 2	-
A 234	Piping Fittings of Wrought Carbon Steel and Alloy for Moderate and Elevated Temperature			
	Gr. WPA	-	PG 370	-
	Gr. WPB	-	PG 410	-
A 240	Chromium and Chromium-Nickel Stainless Steel Plates, Sheet, and Strip, for Fusion-Welded Unfired Pressure Vessel			
	Type 304	STS 304	SUS 304	-
	Type 304L	STS 304L	SUS 304L	-
	Type 316	STS 316	SUS 316	-
	Type 316L	STS 316L	SUS 316L	-
	Type 321	STS 321	SUS 321	-
	Type 347	STS 347	SUS 347	-
	Type 410	STS 410	SUS 410	-
	Type 429	STS 429	SUS 429	-

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 266	Carbon Steel Forgings for Seamless Drums, Heads, and Other Pressure Vessel Components			
	Cl. 1	SF 45	SF 45	-
	Cl. 2	SF 50	SF 50	-
A 268	Seamless and Welded Ferritic Stainless Steel Tubing for General Service			
	Gr. TP329	STS 329J1TB	SUS 329J1TB	-
	Gr. TP410	STS 410TB	SUS 410TB	-
	Gr. TP430	STS 430TB	SUS 430TB	-
A 278	Gray Iron Castings for Pressure Containing Parts for Temperature up to 650˚F(345˚C)			
	Cl. No. 20	GC 15	FC 15	-
	Cl. No. 30	GC 20	FC 20	-
	Cl. No. 35	GC 25	FC 25	-
	Cl. No. 40	GC 30	FC 30	-
A 283	Low and Intermediate-Tensile Strength Carbon Steel Plates of Structural Quality			
	Gr. C	SB 41	SS 41	SS 400
	Gr. D	SB 41	SS 41	SS 400
A 285	Pressure Vessel Plates, Alloy Steel, Molybdenum Alloy Steel Plates for Pressure Vessels			
	Gr. B	SBB 35	SB 35	-
	Gr. C	SBB 42	SB 42	-
A 302	Manganese-Molybdenum and Manganese-Molybdenum-Nickel Alloy Steel Plate for Pressure Vessel			
	Gr. A	SBV 1A	SBV 1A	-
	Gr. B	SBV 1B	SBV 1B	-
	Gr. C	SBV 2	SBV 2	-
	Gr. D	SBV 2	SBV 3	-
A 312	Seamless and Welded Austenitic Stainless Steel Pipe			
	Gr. TP 304	STS 304TP	SUS 304TP	-
	Gr. TP 304L	STS 304LTP	SUS 304LTP	-
	Gr. TP 316	STS 316TP	SUS 316TP	-
	Gr. TP 316L	STS 316LTP	SUS 316LTP	-
	Gr. TP 321	STS 321TP	SUS 321TP	-
	Gr. TP 347	STS 347TP	SUS 347TP	-
	-	-	-	-

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 320	Alloy Steel Bolting Materials for Low-Temperature Service			
	Gr. B8	STS 304B	SUS 304B	-
	Gr. B8C	STS 347B	SUS 347B	-
	Gr. B8M	STS 316B	SUS 316B	
A 335	Seamless Ferritic Alloy Steel Pipe for High-Temperature Service			
	Gr. P1	SPA 10	STPA 12	-
	Gr. P5	SPA 24	STPA 25	-
	Gr. P9	SPA 25	STPA 26	-
A 336	Alloy Steel Forgings for Seamless Drum, Heads, and Other Pressure Vessels			
	Cr. CIF 8	STSF 304	SUSF 304	-
	Cr. CIF8M	STSF 316	SUSF 316	-
	Cr. CIF8T	STSF 321	SUSF 321	-
A 351	Austenitic Steel Castings for High-Temperature Service			
	Gr. CF3	SSC 19A	SCS 19A	-
	Gr. CF3M	SSC 16A	SCS 16A	-
	Gr. CF8	SSC 13A	SCS 13A	-
	Gr. CF8C	SSC 21A	SCS 21A	-
A 356	Heavy-Walled Carbon and Low-Alloy Steel Castings for Steam Tubines			
	Gr. 1	SCPH 2	SCPH 2	-
	Gr. 2	SCPH 11	SCPH 11	-
	Gr. 6	SCPH 21	SCPH 21	-
	Gr. 9	SCPH 23	SCPH 23	-
A 387	Pressure Vessel Plates, Alloy Steel, Chromium-Molybdenum			
	Gr. 2Cl.1	-	SCMV1A	-
	Gr. 2Cl.2	-	SCMV1NT	-
	Gr. 5Cl.1	-	SCMV6A	-
	Gr. 5Cl.2	-	SCMV6NT	-
	Gr. 11Cl.1	-	SCMV3A	-
	Gr. 11Cl.2	-	SCMV3NT	-
A 403	Wrought Austenitic Stainless Steel Piping Fitting			
	Gr. WP304	-	SUS 304	-

ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 426	Centrifugally Cast Ferritic Alloy Steel Pipe for High-Temperature Service			
	Gr. CP1	SCPH11A	SCPH11A	-
	Gr. CP12	SCPH21A	SCPH21A	-
	Gr. CP22	SCPH32A	SCPH32A	-
	Gr. CPCA15	SSC1A	SSS1A	-
A 430	Austenitic Steel Forged and Bored Pipe for High-Temperature Service			
	Gr. FP304	STS 304TP	SUS 304TP	-
	Gr. FP304H	STS 304HTP	SUS 304HTP	-
	Gr. FP316	STS 316TP	SUS 316TP	-
	Gr. FP316H	STS 316HTP	SUS 316HTP	-
	Gr. FP321	STS 321TP	SUS 321TP	-
	Gr. FP321H	STS 321HTP	SUS 321HTP	-
	Gr. FP347	STS 347TP	SUS 347TP	-
A 447	Chromium-Nickel-Iron Alloy Casting for High-Temperature Service			
	Type 11	-	SCH 13	-
A 194	Centrifugally Cast Austenitic Steel Pipe for High-Temperature Service			
	Gr. CPF8	SSC 13A	SCS 13A	-
	Gr. CPF8M	SSC 14A	SCS 14A	-
	Gr. CPH20	SSC 17A	SCS 17A	-
	Gr. CPK20	SSC 18A	SCS 18A	-
	Gr. CPF8C	SSC 21A	SCS 21A	-
A 508	Quenchel and Tempered Vacuum Treated Carbon & Alloy Steel Forgings for Pressure Vessel			
	Cl. 1	SFVV 1	SFVV 1	-
	Cl. 2	SFVV 2	SFVV 2	-
	Cl. 3	SFVV 3	SFVV 3	-
	-	-	-	-
A 515	Carbon Steel Plates for Pressure Vessels for Intermediate and Higher Temperature Service			
	Gr. 55	SBB 35	SB 35	-
	Gr. 60	SBB 42	SB 42	-
	Gr. 65	SBB 46	SB 46	-
	Gr. 70	SBB 49	SB 49	-
	-	-	-	-

ENGINEERING DATA

8) Comparison of ASTM SPEC. And Similar Standards.

ASTM		KS	JIS		ASTM		KS	JIS	
Standard	Grade	Symbol	Symbol (old)	Symbols (New)	Standard	Grade	Symbol	Symbol (old)	Symbols (New)
A 516	Carbon Steel Plates for Pressure Vessels for Moderate and Lower Temperature Service								
	Gr. 60	SPPV 24	SPV 24	-					
	-	SGV 42	SPV 42	-					
	Gr. 65	SGV 46	SPV 46						
	Gr. 70	SGV 32	SPV 32						
	-	SGV 49	SPV 49	-					
A 524	Seamless Carbon Steel Pipe for Atmospheric and Lower Temperatures								
	Gr. 1	SPPS 38-S	STPG38-S	STPG370-S					
	-	SPPH 38	STS38	STPG370					
	Gr. 11	SPPS 42-S	STPG42-S	STPG410-S					
	-	SPPH 42	STS42	STPG410					
A 533	Manganese Molybdenum and Manganese Molybdenum Nickel Alloy Steel Plates. Quenched and Tempered for Pressure Vessels								
	Gr. ACl.1	SQV 1A	SQV 1A	-					
	Gr. ACl.2	SQV 1B	SQV 1B	-					
	Gr. BCl.2	SQV 2A	SQV 2A	-					
	Gr. CCl.1	SQV 2B	SQV 2B	-					
	-	SQV 3A	SQV 3A	-					

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