



**Offshore Drilling Piping
Products & Service Provider**

制造精良装备
提供满意服务

Making excellent equipment
Providing satisfying service

COMPANY PROFILE

Jiaxing JCC Piping Engineering & Construction Co., Ltd provides comprehensive services such as drawing conversion and design, product manufacturing, warehousing, factory-based prefabrication, on-site installation, testing and commissioning of pipes in petroleum oil and chemical industry, offshore oil and gas industry, electrical energy industry, and ship piping systems.

We can manufacture pipe fittings in any material grade with a typical lead time of 4 to 8 weeks by utilizing our group manufacturing facility.

Fittings have been designed to address a number of factors which are vital to achieve high performance in difficult oilfield service. All fittings have wall thickness with ample erosion and corrosion allowances.

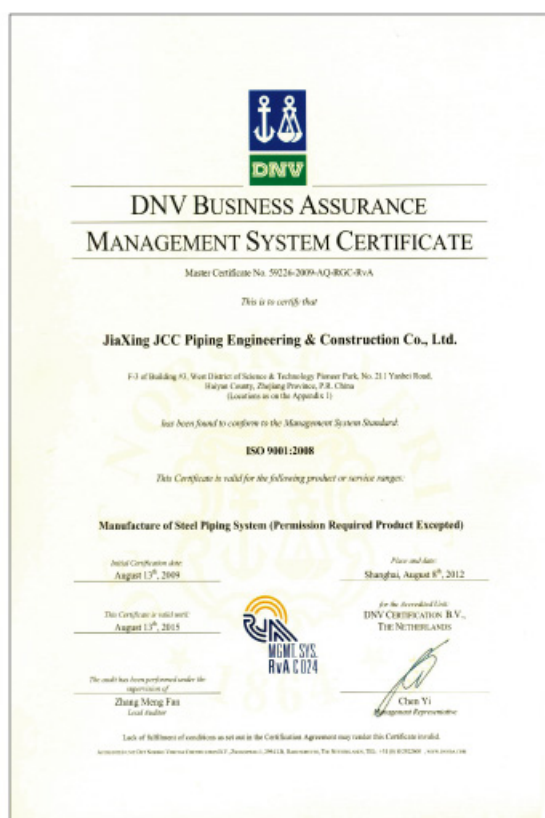
High-pressure Manifold Fittings are manufactured from wrought alloy steel. Fittings are die forged to ensure that they have a well defined and correctly contoured grain flow, high integrity and uniformity of shape. Elbows are produced from hollow bar, hot formed on purpose-made bending machines.

In addition, large quantities of forgings are held in stock, which enables us to react quickly to requests for customized specials.

Quality Assurance

All of the products we supply are manufactured, tested and certified in accordance with respective API, ANSI, ASTM, ASME and other international standards and our factory is already ISO9001 certified.

[Http://www.jccsh.com](http://www.jccsh.com)



MANUFACTURE STANDARDS

ASME B31.3

Process Piping for Chapter IX "High Pressure Piping"

ASME IX

Welding and Brazing Qualifications

API 6A

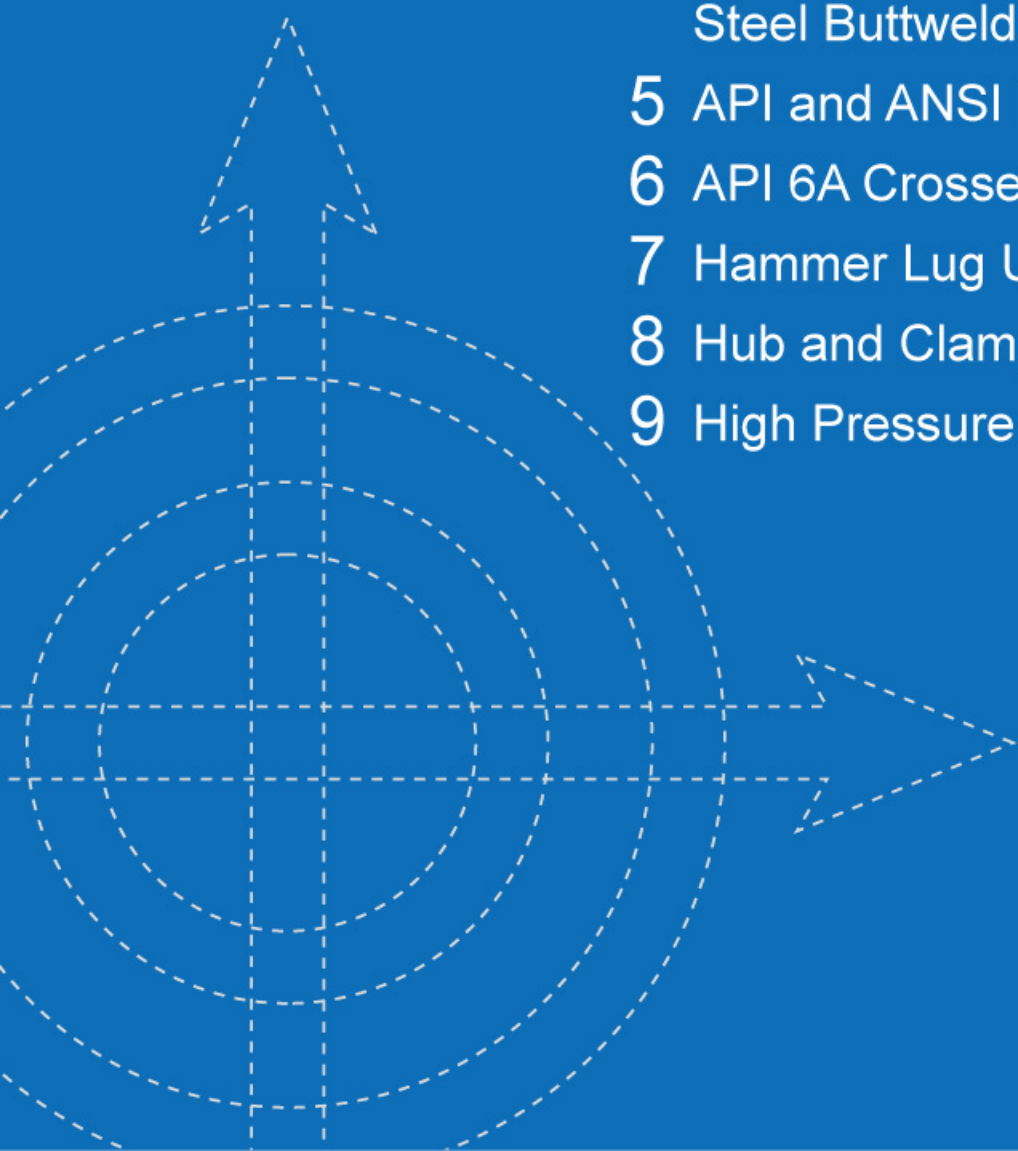
Specification for Wellhead and Christmas Tree Equipment

NACE MR0175

Petroleum and natural gas industries—Materials for use in H₂S containing Environments in oil and gas production— Parts 1, 2, and 3

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SECTION 1

General Product Material
Specifications



Section 1. General Product Material Specifications

All materials supplied by JCC are furnished with BS EN 10204.3.1 certificates as standard and can be supplied with BS EN 10204.3.2 certificates available upon request.

Materials are supplied in accordance with following, as applicable to the product:

ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Section 1. General Product Material Specifications

Element	%	A106 Gr B	A234 WPB	A333 Gr6	A420 WPL6	API 5L X52	WPHY 52	A182 F316L	A519 4130	A182 F51
Carbon (C)	Max Min	0.30 -	0.30 -	0.30 -	0.30 -	0.28 -	0.20 -	0.030 -	0.33 0.28	0.30 -
Manganese (Mg)	Max Min	1.06 0.29	1.06 0.29	1.06 0.29	1.35 0.50	1.40 -	1.45 1.00	2.00 -	0.60 0.40	2.00 -
Phosphorous (Ph)	Max Min	0.035 -	0.050 -	0.025 -	0.035 -	0.030 -	0.030 -	0.045 -	0.025 -	0.030 -
Sulphur (S)	Max Min	0.035 -	0.058 -	0.025 -	0.040 -	0.030 -	0.010 -	0.030 -	0.025 -	0.020 -
Silicon (Si)	Max Min	- 0.10	- 0.10	- 0.10	0.40 0.15	- -	0.40 0.15	1.00 -	0.35 0.15	1.00 -
Chromium (Cr)	Max Min	0.40 -	0.40 -	- -	0.30 -	- -	0.30 -	18.00 16.00	1.10 0.80	23.00 21.00
Molybdenum (Mo)	Max Min	0.15 -	0.15 -	- -	0.12 -	- -	0.25 -	3.00 2.00	0.25 0.15	3.50 2.50
Nickel (Ni)	Max Min	0.40 -	0.40 -	- -	0.40 -	- -	0.50 -	14.00 11.00	- -	6.50 4.50
Copper (Cu)	Max Min	0.40 -	0.40 -	- -	0.40 -	- -	0.35 -	- -	- -	- -
Nitrogen (N)	Max Min	- -	- -	- -	- -	- -	- -	- -	- -	0.20 0.08
Columbium (Cb)	Max Min	- -	0.02 -	- -	0.02 -	- -	0.04 -	- -	- -	- -
Titanium (Ti)	Max Min	- -	- -	- -	- -	- -	0.05 -	- -	- -	- -
Vanadium (V)	Max Min	0.08 -	0.08 -	- -	0.08 -	- -	0.10 -	- -	- -	- -
Aluminium (Al)	Max Min	- -	- -	- -	- -	- -	0.06 -	- -	- -	- -
Tensile Strength	Min PSI MPa	60,000 415	60,000 415	60,000 415	60,000 415	52,000 360	52,000 360	70,000 485	105,000 724	90,000 620
Yield Strength	Min PSI MPa	35,000 240	35,000 240	35,000 240	35,000 240	66,000 460	66,000 455	25,000 170	>80,000 552	65,000 450
Hardness	Max HB	-	197	-	-	-	-	-	237	237
Impact Values Deg C	J	-	-	18J min av -45	17.6J min av -45	27Jmin av -50	27Jmin av -50		42Jmin av -50	27J -50

GENERAL NOTE: JCC also supply a range of pipe and fittings in the following materials:
API 5L X60



SECTION 2

Pipe



Section 2. Pipe

All materials supplied by JCC are furnished with BS EN 10204.3.1 certificates as standard and can be supplied with BS EN 10204.3.2 certificates or third party verified certificates available upon request.

Pipe is supplied in accordance with the following, as applicable to the product:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
ANSI B16.10	Welded and Seamless Wrought Steel Pipes
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Section 2. Pipe

Table 2.1

Pipe Wall Thickness Schedule 5s - 60 & Weights (Kg/m)												
Nominal Bore (NB)	Outside Diameter (in)	Outside Diameter (mm)	W.T.	Sch 5s	Sch 10s	Sch 10	Sch 20	Sch 30	Sch 40s	Std wall	Sch 40	Sch 60
			Weight									
1/2"	0.840	21.336	mm Kg/m	1.65 0.81	2.11 1.02	- -	- -	- -	2.77 1.29	2.77 1.29	2.77 1.29	- -
3/4"	1.050	26.670	mm Kg/m	1.65 1.03	2.11 1.30	- -	- -	- -	2.87 1.71	2.87 1.71	2.87 1.71	- -
1"	1.315	33.401	mm Kg/m	1.65 1.31	2.77 2.12	- -	- -	- -	3.38 2.54	3.38 2.54	3.38 2.54	- -
1 1/4"	1.660	42.164	mm Kg/m	1.65 1.67	2.77 2.73	- -	- -	- -	3.56 3.44	3.56 3.44	3.56 3.44	- -
1 1/2"	1.900	48.260	mm Kg/m	1.65 1.93	2.77 3.16	- -	- -	- -	3.68 4.11	3.68 4.11	3.68 4.11	- -
2"	2.375	60.325	mm Kg/m	1.65 2.42	2.77 3.99	- -	- -	- -	3.91 5.52	3.91 5.52	3.91 5.52	- -
2 1/2"	2.875	73.025	mm Kg/m	2.11 3.75	3.05 5.34	- -	- -	- -	5.16 8.77	5.16 8.77	5.16 8.77	- -
3"	3.500	88.900	mm Kg/m	2.11 4.59	3.05 6.56	- -	- -	- -	5.49 11.47	5.49 11.47	5.49 11.47	- -
4"	4.500	114.300	mm Kg/m	2.11 5.93	3.05 8.50	- -	- -	- -	6.02 16.32	6.02 16.32	6.02 16.32	- -
5"	5.563	141.300	mm Kg/m	2.77 9.61	3.40 11.74	- -	- -	- -	6.55 22.10	6.55 22.10	6.55 22.10	- -
6"	6.625	168.275	mm Kg/m	2.77 11.48	3.40 14.04	- -	- -	- -	7.11 28.69	7.11 28.69	7.11 28.69	- -
8"	8.625	219.075	mm Kg/m	2.77 15.00	3.76 20.27	- -	6.35 33.82	7.04 37.38	8.18 42.49	8.18 42.49	8.18 42.49	10.31 53.90
10"	10.750	273.050	mm Kg/m	3.40 22.96	4.19 28.21	- -	6.35 42.41	7.80 51.81	9.27 61.23	9.27 61.23	9.27 61.23	12.70 82.79
12"	12.750	323.850	mm Kg/m	3.96 31.72	4.57 36.54	- -	6.35 50.48	8.38 66.20	9.53 75.00	9.53 75.00	10.31 80.94	14.28 110.62
14"	14.000	355.600	mm Kg/m	3.96 34.87	4.78 41.99	6.35 55.53	7.93 68.95	9.53 82.58	- -	9.53 82.58	11.13 96.00	15.09 128.42
16"	16.000	406.400	mm Kg/m	4.19 42.20	4.78 48.07	6.35 63.61	7.93 79.03	9.53 94.71	- -	9.53 94.71	12.70 125.20	16.66 162.59
18"	18.000	457.200	mm Kg/m	4.19 47.53	4.78 54.15	6.35 71.69	7.93 89.10	11.13 124.00	- -	9.53 106.83	14.28 158.27	19.05 209.00
20"	20.000	508.000	mm Kg/m	4.78 60.23	5.54 69.70	6.35 79.76	9.53 118.95	12.70 157.51	- -	9.53 118.95	15.09 185.90	20.63 251.65
22"	22.000	558.800	mm Kg/m	4.78 66.02	5.54 76.42	6.35 87.21	9.53 128.73	12.70 171.09	- -	9.53 128.73	- -	22.23 293.87
24"	24.000	609.600	mm Kg/m	5.54 83.20	6.35 94.45	6.35 94.45	9.53 140.94	14.28 209.54	- -	9.53 140.94	17.48 255.14	24.61 366.17
26"	26.000	660.400	mm Kg/m	- -	- -	7.93 127.04	12.70 202.72	- -	- -	9.53 152.39	- -	- -
28"	28.000	711.200	mm Kg/m	- -	- -	7.93 136.97	12.70 218.69	15.88 272.54	- -	9.53 164.34	- -	- -
30"	30.000	762.000	mm Kg/m	- -	6.35 119.25	7.93 146.94	12.70 234.67	15.88 292.54	- -	9.53 176.29	- -	- -
32"	32.000	812.800	mm Kg/m	- -	- -	7.93 156.84	12.70 250.64	15.88 312.54	- -	9.53 188.24	17.48 343.30	- -
34"	34.000	863.600	mm Kg/m	- -	- -	7.93 166.78	12.70 266.61	15.88 332.53	- -	9.53 200.18	17.48 365.31	- -
36"	36.000	914.400	mm Kg/m	- -	- -	7.93 176.52	12.70 282.27	15.88 352.14	- -	9.53 211.90	19.05 421.50	- -
38"	38.000	965.200	mm Kg/m	- -	- -	- -	- -	- -	- -	9.53 223.84	- -	- -
40"	40.000	1016.000	mm Kg/m	- -	- -	- -	- -	- -	- -	9.53 235.79	- -	- -

Section 2. Pipe

Table 2.2

Pipe Wall Thickness Schedule 80 - XXS & Weights (Kg/m)										
Nominal Bore (NB)	Outside Diameter (in)	Outside Diameter (mm)	W.T. Weight	Sch 8	Sch X	Sch 10	Sch 12	Sch 140	Sch 160	Sch XXS
1/2"	0.840	21.336	mm Kg/m	3.73 1.64	3.73 1.64	- -	- -	- -	4.78 1.97	7.47 2.59
3/4"	1.050	26.670	mm Kg/m	3.91 2.23	3.91 2.23	- -	- -	- -	5.56 2.93	7.82 3.69
1"	1.315	33.401	mm Kg/m	4.55 3.29	4.55 3.29	- -	- -	- -	6.35 4.30	9.09 5.53
1 1/4"	1.660	42.164	mm Kg/m	4.85 4.53	4.85 4.53	- -	- -	- -	6.35 5.69	9.70 7.88
1 1/2"	1.900	48.260	mm Kg/m	5.08 5.49	5.08 5.49	- -	- -	- -	7.14 7.35	10.15 9.70
2"	2.375	60.325	mm Kg/m	5.54 7.60	5.54 7.60	- -	- -	- -	8.74 11.29	11.07 13.65
2 1/2"	2.875	73.025	mm Kg/m	7.01 11.59	7.01 11.59	- -	- -	- -	9.53 15.15	14.02 20.72
3"	3.500	88.900	mm Kg/m	7.62 15.51	7.62 15.51	- -	- -	- -	11.13 21.67	15.24 28.11
4"	4.500	114.300	mm Kg/m	8.56 22.64	8.56 22.64	- -	11.13 28.75	- -	13.49 34.05	17.12 41.66
5"	5.563	141.300	mm Kg/m	9.53 31.44	9.53 31.44	- -	12.70 40.90	- -	15.88 49.94	19.05 58.32
6"	6.625	168.275	mm Kg/m	10.97 43.21	10.97 43.21	- -	14.27 55.03	- -	18.26 68.53	21.95 80.43
8"	8.625	219.075	mm Kg/m	12.70 64.58	12.70 64.58	15.09 76.94	18.26 90.23	20.62 102.47	23.01 111.16	22.23 109.57
10"	10.750	273.505	mm Kg/m	15.06 97.29	12.70 82.79	18.26 116.38	21.44 134.91	25.40 157.51	28.58 174.95	25.40 157.51
12"	12.750	323.850	mm Kg/m	17.48 133.88	12.70 98.95	21.44 162.14	25.40 189.82	28.58 211.31	33.32 242.40	25.40 189.82
14"	14.000	355.600	mm Kg/m	19.05 160.54	12.70 109.04	23.83 197.74	27.79 227.89	31.75 257.47	35.71 286.04	- -
16"	16.000	406.400	mm Kg/m	21.44 206.40	12.70 125.20	26.19 249.34	30.96 290.88	36.53 338.07	40.49 370.74	- -
18"	18.000	457.200	mm Kg/m	23.83 258.29	12.70 141.36	29.36 314.54	34.93 369.34	39.67 414.75	45.24 466.67	- -
20"	20.000	508.000	mm Kg/m	26.19 315.97	12.70 157.51	32.54 387.07	38.10 448.30	44.45 515.94	50.01 573.31	- -
22"	22.000	558.800	mm Kg/m	28.58 373.58	12.70 171.01	34.93 451.42	41.28 527.02	47.63 600.63	53.98 672.26	- -
24"	24.000	609.600	mm Kg/m	30.96 448.31	12.70 186.92	38.89 556.96	46.02 649.44	52.37 730.72	59.54 819.71	- -
26"	26.000	660.400	mm Kg/m	- -	12.70 202.70	- -	- -	- -	- -	- -
28"	28.000	711.200	mm Kg/m	- -	12.70 218.69	- -	- -	- -	- -	- -
30"	30.000	762.000	mm Kg/m	- -	12.70 234.67	- -	- -	- -	- -	- -
32"	32.000	812.800	mm Kg/m	- -	12.70 250.64	- -	- -	- -	- -	- -
34"	34.000	863.600	mm Kg/m	- -	12.70 266.61	- -	- -	- -	- -	- -
36"	36.000	914.400	mm Kg/m	- -	12.70 282.27	- -	- -	- -	- -	- -
38"	38.000	965.200	mm Kg/m	- -	12.70 298.24	- -	- -	- -	- -	- -
40"	40.000	1016.000	mm Kg/m	- -	12.70 314.22	- -	- -	- -	- -	- -

Section 2. Pipe

Table 2.3

NORSOK & Special Wall Thickness & Weights (Kg/m) (Available in ASTM A519 Gr 4130 Only)										
Nominal Bore (NB)	Outside Diameter (in)	Outside Diameter (mm)	W.T.	NORSOK	Special					
			Weight							
2"	2.375	60.300	mm	-	14.27	-	-	-	-	-
			Kg/m	-	16.20	-	-	-	-	-
3"	3.50	88.900	mm	-	20.00	-	-	-	-	-
			Kg/m	-	34.34	-	-	-	-	-
4"	4.500	114.300	mm	20.00	-	-	-	-	-	-
			Kg/m	46.50	-	-	-	-	-	-
4"	4.500	114.300	mm	-	30.00	-	-	-	-	-
			Kg/m	-	60.15	-	-	-	-	-
4"	4.500	114.300	mm	-	20.00	-	-	-	-	-
			Kg/m	-	46.50	-	-	-	-	-
5"	5.000	127.000	mm	-	25.40	-	-	-	-	-
			Kg/m	-	63.60	-	-	-	-	-
5"	5.563	141.300	mm	25.00	-	-	-	-	-	-
			Kg/m	72.00	-	-	-	-	-	-
5½" O _D	5.500	139.700	mm	-	31.75	-	-	-	-	-
			Kg/m	-	83.73	-	-	-	-	-
5½" O _D	5.500	139.700	mm	-	32.00	-	-	-	-	-
			Kg/m	-	84.99	-	-	-	-	-
6"	6.625	168.275	mm	30.00	-	-	-	-	-	-
			Kg/m	102.30	-	-	-	-	-	-
6¾"	6.750	171.450	mm	-	22.23	-	-	-	-	-
			Kg/m	-	81.81	-	-	-	-	-

NOTE - JCC hold in stock special/non standard pipe sizes and schedules in addition to those listed above.



SECTION 3

High Pressure Manifold Fittings



Section 3. High Pressure Manifold Fittings

Forged Long Sweep Manifold Fittings are designed and manufactured in general accordance with the following specifications:-

MSS-SP-75	Specifications for High Test Wrought Butt Weld Fittings.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping
ASME B16.9	Factory-Made Wrought Steel Buttwelding Fittings.
ASME VIII	Boiler and Pressure Vessel Code.
API 6A	Specification for Wellhead and Christmas Tree Equipment.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Long Sweep Manifold Fitting are available in both equal and reducing configurations. We can supply standard and special pipe wall schedules, for the following pressure ratings:-

Max. Working Pressure	5,000 PSI	7,500 PSI	10,000 PSI	15,000 PSI
Test Pressure	7,500 PSI	11,250 PSI	15,000 PSI	22,500 PSI
Operating Temperature Range	-60 to +345 °C	-60 to +345 °C	-60 to +345 °C	-60 to +345 °C
Min. Yield	52,000 PSI	>80,000 PSI	>80,000 PSI	>80,000 PSI
Min. Tensile	66,000 PSI	105,000 PSI	105,000 PSI	105,000 PSI
Material	ASTM A860 WPHY 52	AISI Gr 4130	AISI Gr 4130	AISI Gr 4130

GENERAL NOTE Please contact JCC for any special material or dimensional requirements.
MAX. working pressure stated are suitable for temperatures up to 121 °C.
De-rating of max. working pressure will occur as the operating temperature increases above 121 °C. Consult JCC for further details.

Section 3. High Pressure Manifold Fittings

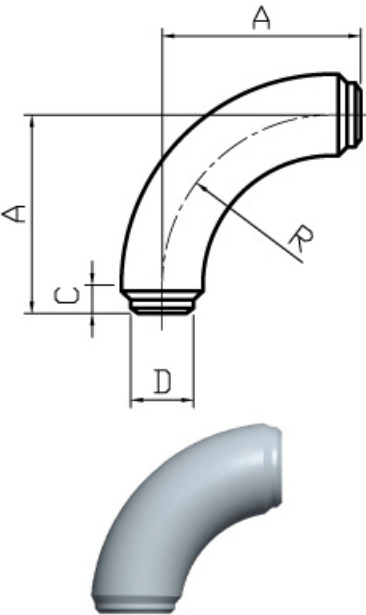
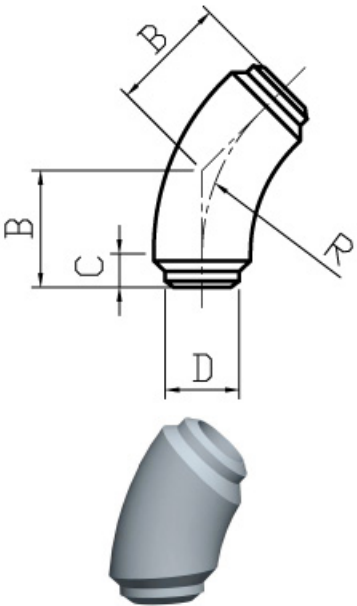


Table 3.1

90° Long Sweep Elbow					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	R	C	
2"	60.3	203	152	51	14
3"	88.9	203	152	51	20
4"	114.3	280	210	70	39
5"	141.3	305	240	65	57
6"	168.3	381	305	76	105
7"	177.8	381	305	76	200

Table 3.2

45° Long Sweep Elbow					
Size	All Dimensions in mm				Approx Weight (KG)
	D	B	R	C	
2"	60.3	118	152	56	9
3"	88.9	118	152	56	14
4"	114.3	162	210	75	26
5"	141.3	171	240	72	37
6"	168.3	203	305	76	57
7"	177.8	203	305	76	100



Section 3. High Pressure Manifold Fittings

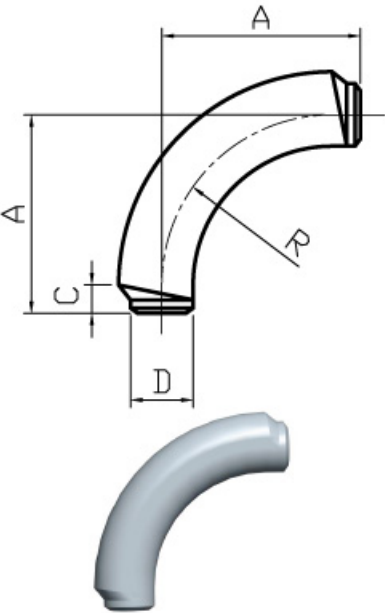
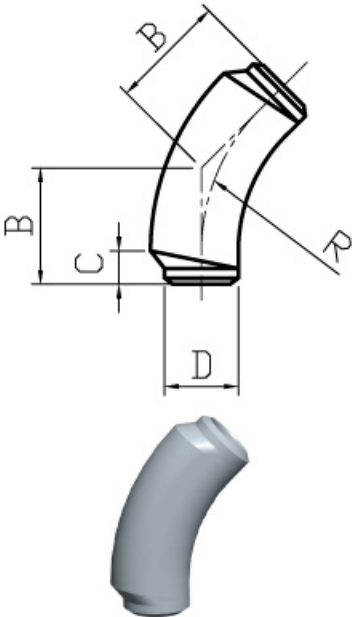


Table 3.3

90° 3D Double Backed Elbow					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	R	C	
2"	60.3	178	152	26	8
3"	88.9	305	229	76	29
4"	114.3	356	305	51	52
5"	141.3	432	381	51	87
6"	168.3	533	457	76	129
7"	177.8	609	533	76	220

Table 3.4

45° 3D Double Backed Elbow					
Size	All Dimensions in mm				Approx Weight (KG)
	D	B	R	C	
2"	60.3	121	152	58	7
3"	88.9	171	229	76	19
4"	114.3	178	305	51	31
5"	141.3	209	381	51	50
6"	168.3	265	457	76	75
7"	177.8	280	533	76	120



Section 3. High Pressure Manifold Fittings

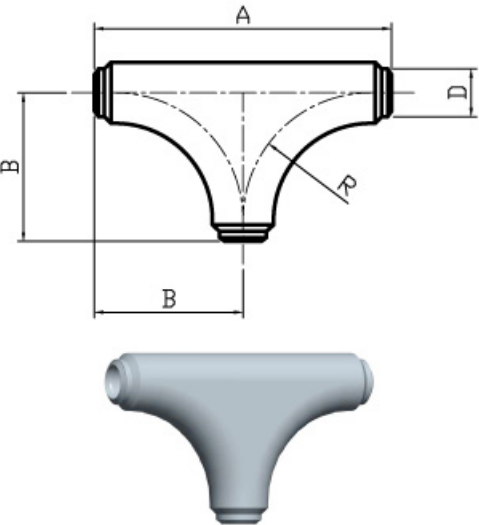
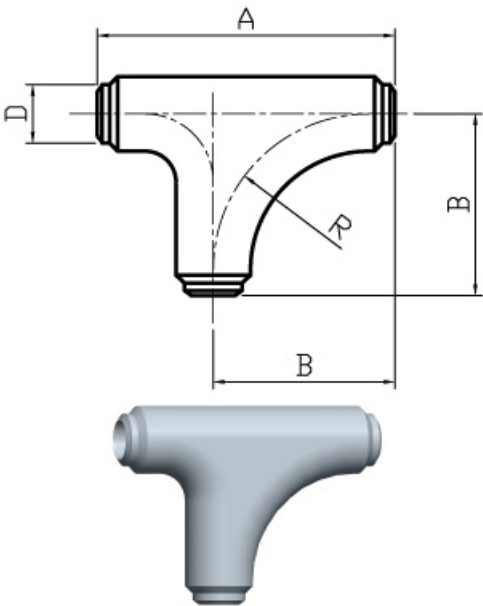


Table 3.5

Long Sweep Full Flow Tee					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	406	203	150	33
3"	88.9	406	203	150	39
4"	114.3	560	280	210	64
5"	141.3	610	305	240	90
6"	168.3	762	381	305	143
7"	177.8	762	381	305	220

Table 3.6

Long Sweep Tee					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	330	203	150	28
3"	88.9	330	203	150	34
4"	114.3	406	280	210	51
5"	141.3	483	305	240	76
6"	168.3	686	381	305	132
7"	177.8	686	381	305	210



Section 3. High Pressure Manifold Fittings

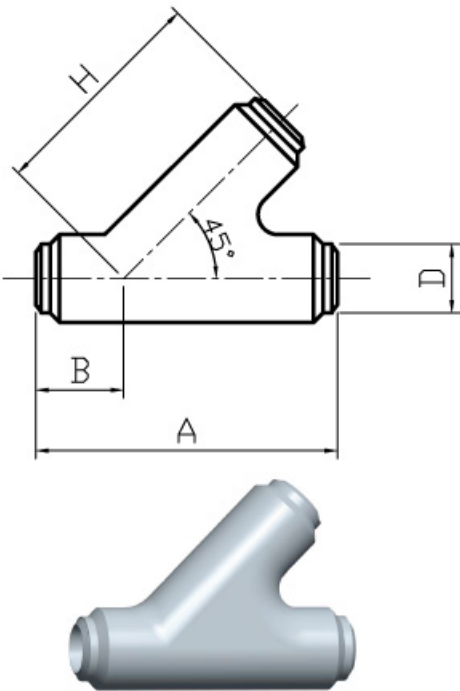
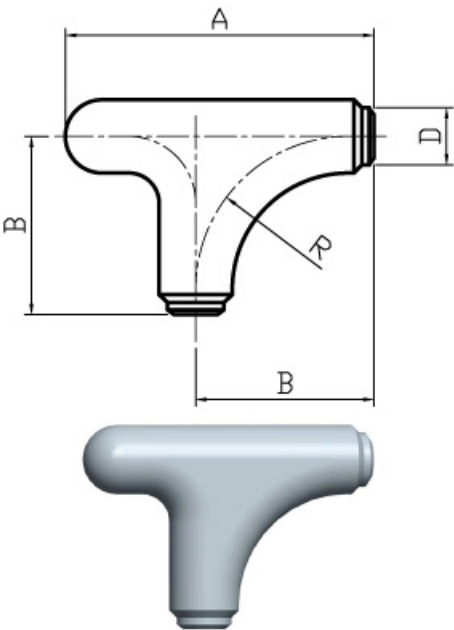


Table 3.7

45° Lateral Tee					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	H	
2"	60.3	171	60	111	20
3"	88.9	267	102	165	30
4"	114.3	330	114	216	60
5"	141.3	400	121	279	85
6"	168.3	450	133	318	128
7"	177.8	450	133	318	210

Table 3.8

Long Sweep Tee c/w Integral Bull Plug					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	406	203	150	28
3"	88.9	406	203	150	34
4"	114.3	560	280	210	51
5"	141.3	610	305	240	76
6"	168.3	762	381	305	132
7"	177.8	762	381	305	240



Section 3. High Pressure Manifold Fittings

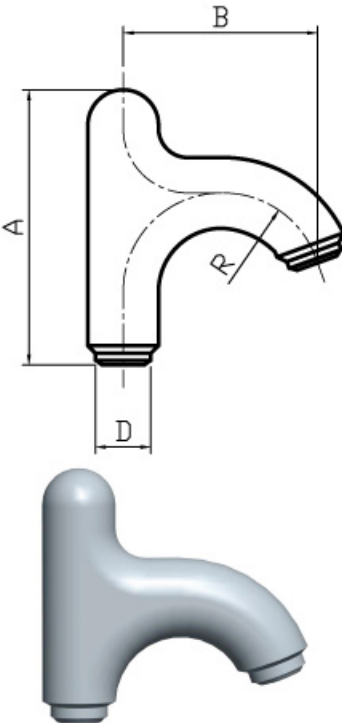
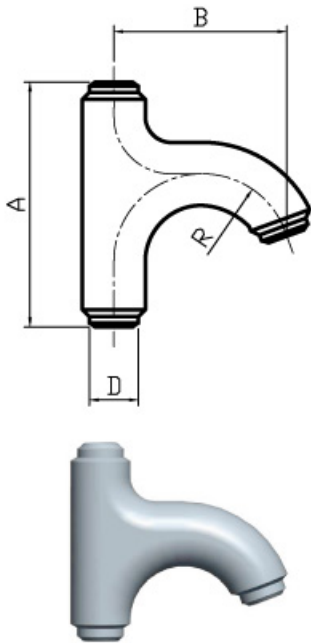


Table 3.9

160° Standpipe Gooseneck c/w Integral Bull Plug					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	406	309	152	48
3"	88.9	406	309	152	51
4"	114.3	560	431	210	97
5"	141.3	610	487	240	142
6"	168.3	762	600	305	255
7"	177.8	762	600	305	320

Table 3.10

160° Standpipe Gooseneck c/w Top Outlet					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	330	309	152	47
3"	88.9	330	309	152	48
4"	114.3	406	431	210	91
5"	141.3	483	487	240	133
6"	168.3	686	600	305	238
7"	177.8	686	600	305	300



Section 3. High Pressure Manifold Fittings

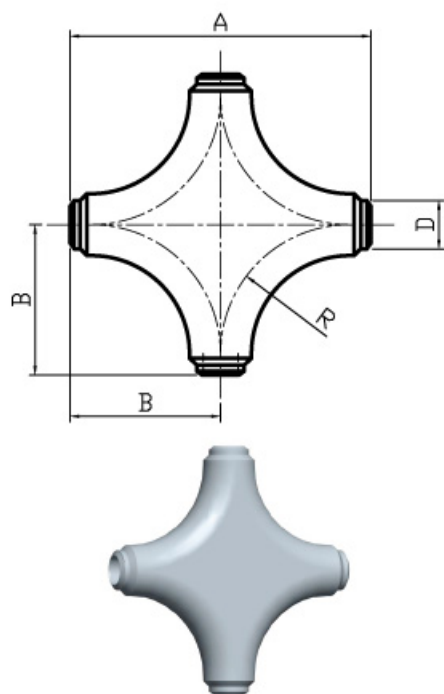
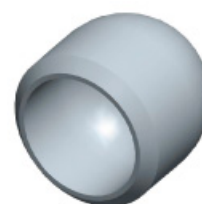
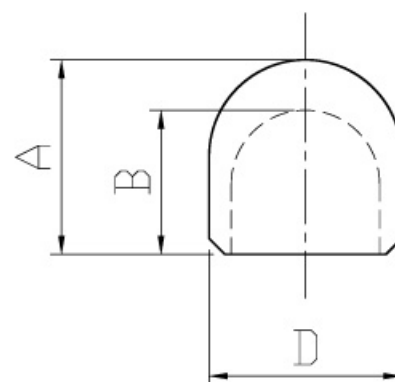


Table 3.11

Long Sweep Full Flow Cross					
Size	All Dimensions in mm				Approx Weight (KG)
	D	A	B	R	
2"	60.3	406	203	150	32
3"	88.9	406	203	150	48
4"	114.3	560	280	210	94
5"	141.3	610	305	240	138
6"	168.3	762	381	305	208
7"	177.8	762	381	305	300

Table 3.12

Bull Plug				
Size	All Dimensions in mm			Approx Weight (KG)
	D	A	B	
2"	60.3	70	48	1
3"	88.9	90	60	3
4"	114.3	115	81	6
5"	141.3	140	102	10
6"	168.3	170	126	18
7"	177.8	170	126	30





SECTION 4

Factory-Made Wrought
Steel Buttwelding Fittings



Section 4. Factory-Made Wrought Steel Buttwelding Fittings

ANSI / ASME B16.9 Buttwelding Fittings are designed and manufactured in accordance with the following specifications:

ASME B16.9	Factory-Made Wrought Steel Buttwelding Fittings.
MSS-SP-43	Wrought Stainless Steel But Weld Fittings.
MSS-SP-75	Specification for High Test Wrough Butt Weld Fittings.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
ASME VIII	Boiler and Pressure Vessel Code.
API 6A	Specification for Wellhead and Christmas Tree Equipment
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Buttwelding Fitting are available in either equal or with reducing configuration to suit various pressure ratings using materials as shown in the first table of this section.(for full material details please refer to Section 1)

Property	A234 Gr WPB	A420 Gr WPL6	A182 Gr 316L	A860 Gr WPHY52	A182 F51 UNS31803	AISI 4130
Tensile Strength	60,000PSI 415 MPa	60,000PSI 415 MPa	70,000PSI 485 MPa	66,000PSI 455 MPa	90,000PSI 620 MPa	105,000PSI 725 MPa
Yield Strength	35,000 PSI 240 MPa	35,000 PSI 240 MPa	25,000 PSI 170 MPa	52,000 PSI 360 MPa	65,000 PSI 450 MPa	>80,000 PSI >552 MPa
Impact Values Deg C	N/A	18J min.av. -45℃	N/A	27J min.av. -50℃	27J min.av. -50℃	42J min.av. -50℃
Hardness(MAX)	197 HB	N/A	N/A	235 HB	237 HB	237 HB
Elongation IN 2" Or 50mm	Long. 30% Trans.20%	Long. 30% Trans.16.5%	30%	32%	25%	18%

GENERAL NOTE: Please contact JCC for any special material or dimensional requirements.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

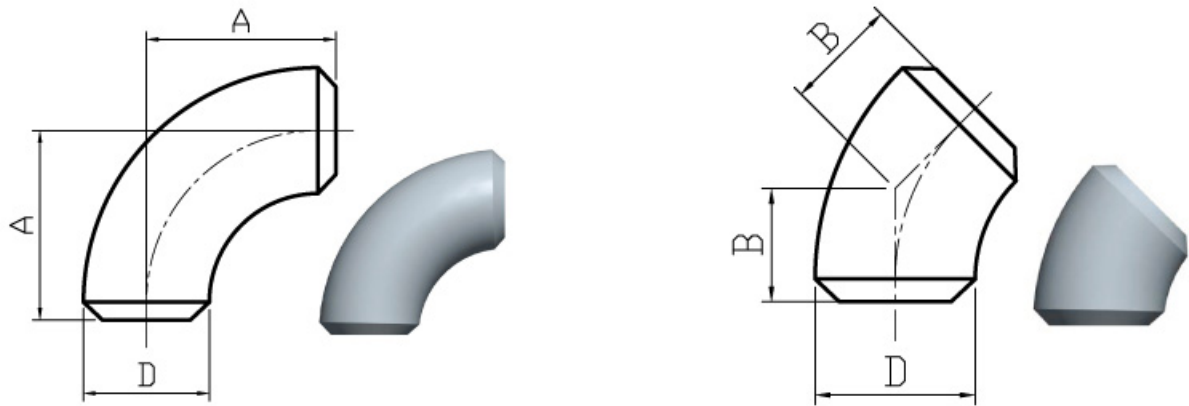


Table 4.1

Dimensions of Long Radius Elbows									
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D			Centre-to-End					
				90 deg. Elbows A			45 deg. Elbows B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
1/2	20	21	22	36	38	40	14	16	18
3/4	26	27	28	36	38	40	17	19	21
1	32	33	34	36	38	40	20	22	24
1 1/4	41	42	43	46	48	50	23	25	27
1 1/2	47	48	49	55	57	59	27	29	31
2	59	60	61	74	76	78	33	35	37
2 1/2	72	73	74	93	95	97	42	44	46
3	88	89	90	112	114	116	49	51	53
2 1/2	101	102	103	131	133	135	55	57	59
4	113	114	116	150	152	154	62	64	66
5	140	141	144	188	190	192	77	79	81
6	167	168	171	227	229	231	93	95	97
8	217	219	221	303	305	307	125	127	129
10	270	273	277	379	381	383	157	159	161
12	321	324	328	454	457	460	187	190	193
14	353	356	360	530	533	536	219	222	225
16	403	406	410	607	610	613	251	254	257
18	454	457	461	683	686	689	283	286	289
20	503	508	514	759	762	765	315	318	321

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

Table 4.1

Dimensions of Long Radius Elbows (continued)									
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D			Centre-to-End					
				90 deg. Elbows A			45 deg. Elbows B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
22	554	559	565	835	838	841	340	343	346
24	605	610	616	911	914	917	378	381	384
26	655	660	667	988	991	994	403	406	409
28	706	711	718	1064	1067	1070	435	438	441
30	757	762	769	1140	1143	1146	467	470	473
32	808	813	820	1214	1219	1224	497	502	507
34	859	864	871	1290	1295	1300	528	533	538
36	909	914	921	1367	1372	1377	560	565	570
38	960	965	972	1443	1448	1453	595	600	605
40	1011	1016	1023	1519	1524	1529	627	632	637
42	1062	1067	1074	1595	1600	1605	655	660	665
44	1113	1118	1125	1671	1676	1681	690	695	700
46	1163	1168	1175	1748	1753	1758	722	727	732
48	1214	1219	1226	1824	1829	1834	754	759	764

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

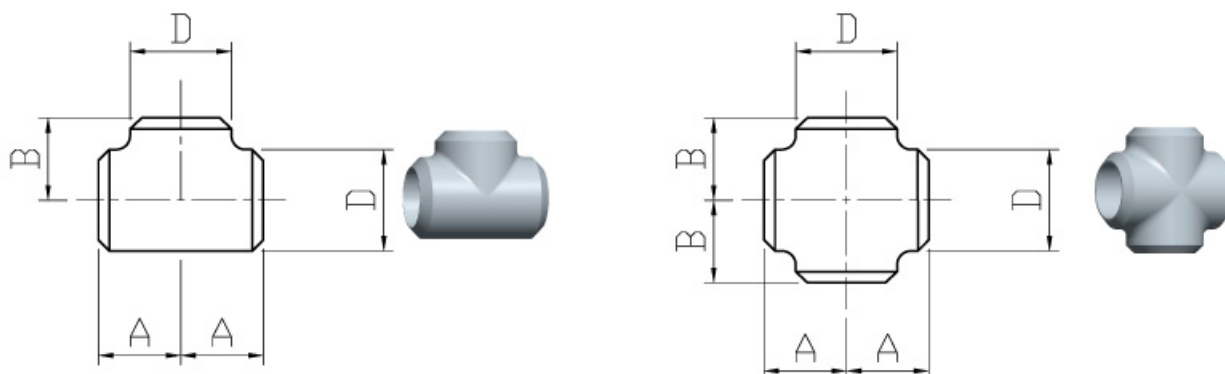


Table 4.2

Dimensions of Equal Tees and Crosses

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D			Centre-to-End					
				Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
1/2	20	21	22	23	25	27	23	25	27
3/4	26	27	28	27	29	31	27	29	31
1	32	33	34	36	38	40	36	38	40
1 1/4	41	42	43	46	48	50	46	48	50
1 1/2	47	48	49	55	57	59	55	57	59
2	59	60	61	62	64	66	62	64	66
2 1/2	72	73	74	74	76	78	74	76	78
3	88	89	90	84	86	88	84	86	88
3 1/2	101	102	103	93	95	97	93	95	97
4	113	114	116	103	105	107	103	105	107
5	140	141	144	122	124	126	122	124	126
6	167	168	171	141	143	145	141	143	145
8	217	219	221	176	178	180	176	178	180
10	270	273	277	214	216	218	214	216	218
12	321	324	328	251	254	257	251	254	257
14	353	356	360	276	279	282	276	279	282
16	403	406	410	302	305	308	302	305	308
18	454	457	461	340	343	346	340	343	346
20	503	508	514	378	381	384	378	381	384
22	554	559	565	416	419	422	416	419	422
24	605	610	616	429	432	435	429	432	435
26	655	660	667	492	495	498	492	495	498
28	706	711	718	518	521	524	518	521	524
30	757	762	769	556	559	562	556	559	562
32	808	813	820	592	597	602	592	597	602
34	859	864	871	630	635	640	630	635	640
36	909	914	921	668	673	678	668	673	678
38	960	965	972	706	711	716	706	711	716
40	1011	1016	1023	744	749	754	744	749	754
42	1062	1067	1074	757	762	767	706	711	716
44	1113	1118	1125	808	813	818	757	762	767
46	1163	1168	1175	846	851	856	795	800	805
48	1214	1219	1226	884	889	894	833	838	843

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Butt Welding Fittings

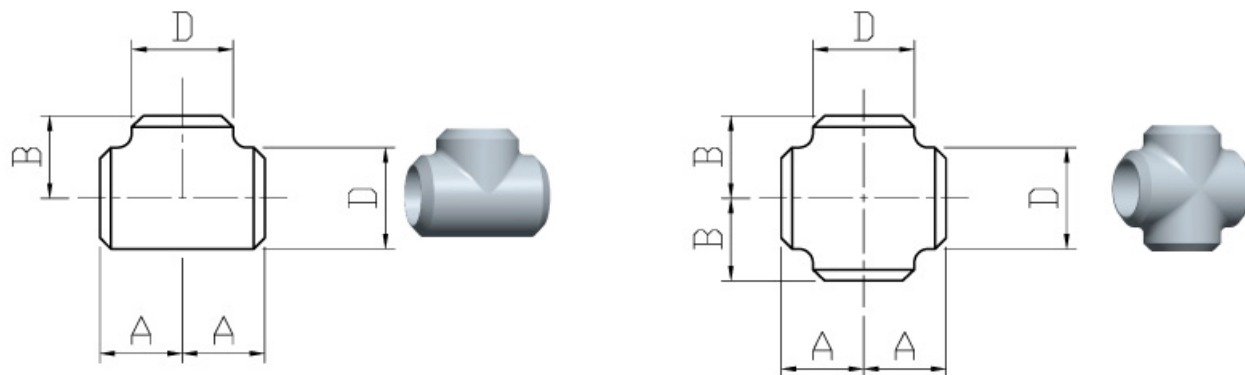


Table 4.3

Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses

Nominal Pipe Size (NPS)	Outside Diameter of Reducing Tees & Crosses						Centre-End lengths of Reducing Tees & Crosses					
	Run D			Outlet D			Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	20	21	22	16	17	18	23	25	27	23	25	27
$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	20	21	22	13	14	15	23	25	27	23	25	27
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	26	27	28	20	21	22	27	29	31	27	29	31
$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	26	27	28	16	17	18	27	29	31	27	29	31
$1 \times 1 \times \frac{3}{4}$	32	33	34	26	27	28	36	38	40	36	38	40
$1 \times 1 \times \frac{1}{2}$	32	33	34	20	21	22	36	38	40	36	38	40
$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	41	42	43	32	33	34	46	48	50	46	48	50
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	41	42	43	26	27	28	46	48	50	46	48	50
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	41	42	43	20	21	22	46	48	50	46	48	50
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	47	48	49	41	42	43	55	57	59	55	57	59
$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	47	48	49	32	33	34	55	57	59	55	57	59
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	47	48	49	26	27	28	55	57	59	55	57	59
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	47	48	49	20	21	22	55	57	59	55	57	59
$2 \times 2 \times 1\frac{1}{2}$	59	60	61	47	48	49	62	64	66	58	60	62
$2 \times 2 \times 1\frac{1}{4}$	59	60	61	41	42	43	62	64	66	55	57	59
$2 \times 2 \times 1$	59	60	61	32	33	34	62	64	66	49	51	53
$2 \times 2 \times \frac{3}{4}$	59	60	61	26	27	28	62	64	66	42	44	46
$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	72	73	74	59	60	61	74	76	78	68	70	72
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	72	73	74	47	48	49	74	76	78	65	67	69
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4}$	72	73	74	41	42	43	74	76	78	62	64	66
$2\frac{1}{2} \times 2\frac{1}{2} \times 1$	72	73	74	32	33	34	74	76	78	55	57	59
$3 \times 3 \times 2\frac{1}{2}$	88	89	90	72	73	74	84	86	88	81	83	85
$3 \times 3 \times 2$	88	89	90	59	60	61	84	86	88	74	76	78
$3 \times 3 \times 1\frac{1}{2}$	88	89	90	47	48	49	84	86	88	71	73	75
$3 \times 3 \times 1\frac{1}{4}$	88	89	90	41	42	43	84	86	88	68	70	72
$3\frac{1}{2} \times 3\frac{1}{2} \times 3$	101	102	103	88	89	90	93	95	97	90	92	94
$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$	101	102	103	72	73	74	93	95	97	87	89	91
$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	101	102	103	59	60	61	93	95	97	81	83	85
$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2}$	101	102	103	47	48	49	93	95	97	77	79	81
$4 \times 4 \times 3\frac{1}{2}$	113	114	116	101	102	103	103	105	107	100	102	104
$4 \times 4 \times 3$	113	114	116	88	89	90	103	105	107	96	98	100
$4 \times 4 \times 2\frac{1}{2}$	113	114	116	72	73	74	103	105	107	93	95	97
$4 \times 4 \times 2$	113	114	116	59	60	61	103	105	107	87	89	91
$4 \times 4 \times 1\frac{1}{2}$	113	114	116	47	48	49	103	105	107	84	86	88

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

Table 4.3

Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses (continued)												
Nominal Pipe Size (NPS)	Outside Diameter of Reducing Tees & Crosses						Centre-End lengths of Reducing Tees & Crosses					
	Run D			Outlet D			Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
5 x 5 x 4	140	141	144	113	114	116	122	124	126	115	117	119
5 x 5 x 3½	140	141	144	101	102	103	122	124	126	112	114	116
5 x 5 x 3	140	141	144	88	89	90	122	124	126	109	111	113
5 x 5 x 2½	140	141	144	72	73	74	122	124	126	106	108	110
5 x 5 x 2	140	141	144	59	60	61	122	124	126	103	105	107
6 x 6 x 5	167	168	171	140	141	144	141	143	145	135	137	139
6 x 6 x 4	167	168	171	113	114	116	141	143	145	128	130	132
6 x 6 x 3½	167	168	171	101	102	103	141	143	145	125	127	129
6 x 6 x 3	167	168	171	88	89	90	141	143	145	122	124	126
6 x 6 x 2½	167	168	171	72	73	74	141	143	145	119	121	123
8 x 8 x 6	217	219	221	167	168	171	176	178	180	166	168	170
8 x 8 x 5	217	219	221	140	141	144	176	178	180	160	162	164
8 x 8 x 4	217	219	221	113	114	116	176	178	180	154	156	158
8 x 8 x 3½	217	219	221	101	102	103	176	178	180	150	152	154
10 x 10 x 8	270	273	277	217	219	221	214	216	218	201	203	205
10 x 10 x 6	270	273	277	167	168	171	214	216	218	192	194	196
10 x 10 x 5	270	273	277	140	141	144	214	216	218	189	191	193
10 x 10 x 4	270	273	277	113	114	116	214	216	218	182	184	186
12 x 12 x 10	321	324	328	270	273	277	251	254	257	238	241	244
12 x 12 x 8	321	324	328	217	219	221	251	254	257	226	229	232
12 x 12 x 6	321	324	328	167	168	171	251	254	257	216	219	222
12 x 12 x 5	321	324	328	140	141	144	251	254	257	213	216	219
14 x 14 x 12	353	356	360	321	324	328	276	279	282	267	270	273
14 x 14 x 10	353	356	360	270	273	277	276	279	282	254	257	260
14 x 14 x 8	353	356	360	217	219	221	276	279	282	245	248	251
14 x 14 x 6	353	356	360	167	168	171	276	279	282	235	238	241
16 x 16 x 14	403	406	410	353	356	360	302	305	308	302	305	308
16 x 16 x 12	403	406	410	321	324	328	302	305	308	292	295	298
16 x 16 x 10	403	406	410	270	273	277	302	305	308	280	283	286
16 x 16 x 8	403	406	410	217	219	221	302	305	308	270	273	276
16 x 16 x 6	403	406	410	167	168	171	302	305	308	261	264	267
18 x 18 x 16	454	457	461	403	406	410	340	343	346	327	330	333
18 x 18 x 14	454	457	461	353	356	360	340	343	346	327	330	333
18 x 18 x 12	454	457	461	321	324	328	340	343	346	318	321	324
18 x 18 x 10	454	457	461	270	273	277	340	343	346	305	308	311
18 x 18 x 8	454	457	461	217	219	221	340	343	346	295	298	301
20 x 20 x 18	503	508	514	454	457	461	378	381	384	365	368	371
20 x 20 x 16	503	508	514	403	406	410	378	381	384	353	356	359
20 x 20 x 14	503	508	514	353	356	360	378	381	384	353	356	359
20 x 20 x 12	503	508	514	321	324	328	378	381	384	343	346	349
20 x 20 x 10	503	508	514	270	273	277	378	381	384	330	333	336
20 x 20 x 8	503	508	514	217	219	221	378	381	384	321	324	327
22 x 22 x 20	554	559	565	503	508	514	416	419	422	403	406	409
22 x 22 x 18	554	559	565	454	457	461	416	419	422	391	394	397
22 x 22 x 16	554	559	565	403	406	410	416	419	422	378	381	384
22 x 22 x 14	554	559	565	353	356	360	416	419	422	378	381	384
22 x 22 x 12	554	559	565	321	324	328	416	419	422	368	371	374
22 x 22 x 10	554	559	565	270	273	277	416	419	422	356	359	362
24 x 24 x 22	605	610	616	554	559	565	429	432	435	429	432	435
24 x 24 x 20	605	610	616	503	508	514	429	432	435	429	432	435

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Butt welding Fittings

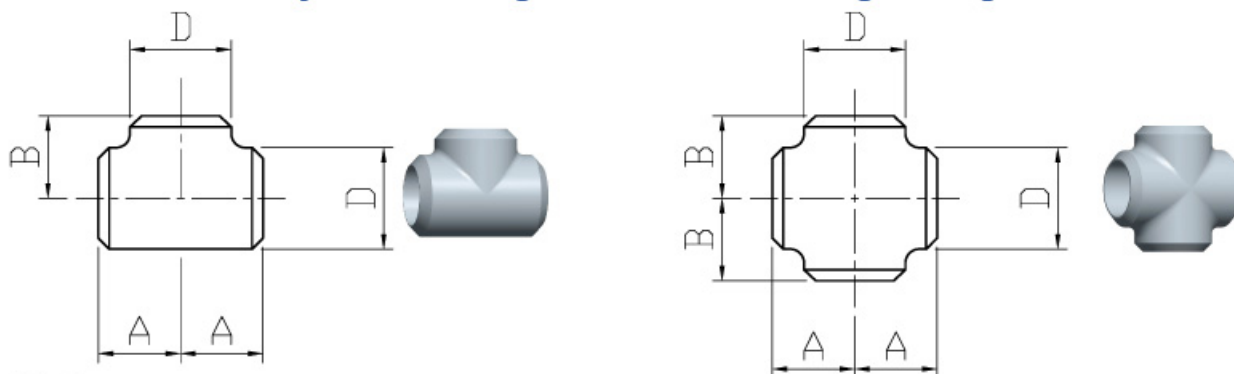


Table 4.3

Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses (continued)

Nominal Pipe Size (NPS)	Outside Diameter of Reducing Tees & Crosses						Centre-End lengths of Reducing Tees & Crosses					
	Run D			Outlet D			Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
24 x 24 x 18	605	610	616	454	457	461	429	432	435	416	419	422
24 x 24 x 16	605	610	616	403	406	410	429	432	435	403	406	410
24 x 24 x 14	605	610	616	353	356	360	429	432	435	403	406	410
24 x 24 x 12	605	610	616	321	324	328	429	432	435	394	397	400
24 x 24 x 10	605	610	616	270	273	277	429	432	435	381	384	387
26 x 26 x 24	655	660	667	605	610	616	492	495	498	480	483	486
26 x 26 x 22	655	660	667	554	559	565	492	495	498	467	470	473
26 x 26 x 20	655	660	667	503	508	514	492	495	498	454	457	460
26 x 26 x 18	655	660	667	454	457	461	492	495	498	441	444	447
26 x 26 x 16	655	660	667	403	406	410	492	495	498	429	432	435
26 x 26 x 14	655	660	667	353	356	360	492	495	498	429	432	435
26 x 26 x 12	655	660	667	321	324	328	492	495	498	419	422	425
28 x 28 x 26	706	711	718	655	660	667	518	521	524	518	521	524
28 x 28 x 24	706	711	718	605	610	616	518	521	524	505	508	511
28 x 28 x 22	706	711	718	554	559	565	518	521	524	492	495	498
28 x 28 x 20	706	711	718	503	508	514	518	521	524	480	483	486
28 x 28 x 18	706	711	718	454	457	461	518	521	524	467	470	473
28 x 28 x 16	706	711	718	403	406	410	518	521	524	454	457	460
28 x 28 x 14	706	711	718	353	356	360	518	521	524	454	457	460
28 x 28 x 12	706	711	718	321	324	328	518	521	524	445	448	451
30 x 30 x 28	757	762	769	706	711	718	556	559	562	543	546	549
30 x 30 x 26	757	762	769	655	660	667	556	559	562	543	546	549
30 x 30 x 24	757	762	769	605	610	616	556	559	562	530	533	536
30 x 30 x 22	757	762	769	554	559	565	556	559	562	518	521	524
30 x 30 x 20	757	762	769	503	508	514	556	559	562	505	508	511
30 x 30 x 18	757	762	769	454	457	461	556	559	562	492	495	498
30 x 30 x 16	757	762	769	403	406	410	556	559	562	480	483	486
30 x 30 x 14	757	762	769	353	356	360	556	559	562	480	483	486
30 x 30 x 12	757	762	769	321	324	328	556	559	562	470	473	476
30 x 30 x 10	757	762	769	270	273	277	556	559	562	457	460	463
32 x 32 x 30	808	813	820	757	762	768	592	597	602	579	584	589
32 x 32 x 28	808	813	820	706	711	718	592	597	602	567	572	577
32 x 32 x 26	808	813	820	655	660	667	592	597	602	567	572	577
32 x 32 x 24	808	813	820	605	610	616	592	597	602	554	559	564
32 x 32 x 22	808	813	820	554	559	565	592	597	602	541	546	551
32 x 32 x 20	808	813	820	503	508	514	592	597	602	528	533	538
32 x 32 x 18	808	813	820	454	457	461	592	597	602	516	521	526
32 x 32 x 16	808	813	820	403	406	410	592	597	602	503	508	513
32 x 32 x 14	808	813	820	353	356	360	592	597	602	503	508	513
34 x 34 x 32	859	864	871	808	813	820	630	635	640	617	622	627

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

Table 4.3

Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses (continued)

Nominal Pipe Size (NPS)	Outside Diameter of Reducing Tees & Crosses						Centre-End lengths of Reducing Tees & Crosses					
	Run D			Outlet D			Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
34 x 34 x 30	859	864	871	757	762	769	630	635	640	605	610	615
34 x 34 x 28	859	864	871	706	711	718	630	635	640	592	597	602
34 x 34 x 26	859	864	871	655	660	667	630	635	640	592	597	602
34 x 34 x 24	859	864	871	605	610	616	630	635	640	579	584	589
34 x 34 x 22	859	864	871	554	559	565	630	635	640	567	572	577
34 x 34 x 20	859	864	871	503	508	514	630	635	640	554	559	564
34 x 34 x 18	859	864	871	454	457	461	630	635	640	541	546	551
34 x 34 x 16	859	864	871	403	406	410	630	635	640	528	533	538
36 x 36 x 34	909	914	921	859	864	871	668	673	678	655	660	665
36 x 36 x 32	909	914	921	808	813	820	668	673	678	643	648	653
36 x 36 x 30	909	914	921	757	762	769	668	673	678	630	635	640
36 x 36 x 28	909	914	921	706	711	718	668	673	678	617	622	627
36 x 36 x 26	909	914	921	655	660	667	668	673	678	617	622	627
36 x 36 x 24	909	914	921	605	610	616	668	673	678	605	610	615
36 x 36 x 22	909	914	921	554	559	565	668	673	678	592	597	602
36 x 36 x 20	909	914	921	503	508	514	668	673	678	579	584	589
36 x 36 x 18	909	914	921	454	457	461	668	673	678	567	572	577
36 x 36 x 16	909	914	921	403	406	410	668	673	678	554	559	564
38 x 38 x 36	960	965	972	909	914	921	706	711	716	706	711	716
38 x 38 x 34	960	965	972	859	864	871	706	711	716	693	698	703
38 x 38 x 32	960	965	972	808	813	820	706	711	716	681	686	691
38 x 38 x 30	960	965	972	757	762	769	706	711	716	668	673	678
38 x 38 x 28	960	965	972	706	711	718	706	711	716	643	648	653
38 x 38 x 26	960	965	972	655	660	667	706	711	716	643	648	653
38 x 38 x 24	960	965	972	605	610	616	706	711	716	630	635	640
38 x 38 x 22	960	965	972	554	559	565	706	711	716	617	622	627
38 x 38 x 20	960	965	972	503	508	514	706	711	716	605	610	615
38 x 38 x 18	960	965	972	454	457	461	706	711	716	592	597	602
40 x 40 x 38	1011	1016	1023	960	965	972	744	749	754	744	749	754
40 x 40 x 36	1011	1016	1023	909	914	921	744	749	754	732	737	742
40 x 40 x 34	1011	1016	1023	859	864	871	744	749	754	719	724	729
40 x 40 x 32	1011	1016	1023	808	813	820	744	749	754	706	711	716
40 x 40 x 30	1011	1016	1023	757	762	769	744	749	754	693	698	703
40 x 40 x 28	1011	1016	1023	706	711	718	744	749	754	668	673	678
40 x 40 x 26	1011	1016	1023	655	660	667	744	749	754	668	673	678
40 x 40 x 24	1011	1016	1023	605	610	616	744	749	754	655	660	665
40 x 40 x 22	1011	1016	1023	554	559	565	744	749	754	643	648	653
40 x 40 x 20	1011	1016	1023	503	508	514	744	749	754	630	635	640
40 x 40 x 18	1011	1016	1023	454	457	461	744	749	754	617	622	627
42 x 42 x 40	1062	1067	1074	1011	1016	1023	757	762	767	706	711	716
42 x 42 x 38	1062	1067	1074	960	968	972	757	762	767	706	711	716
42 x 42 x 36	1062	1067	1074	909	914	921	757	762	767	706	711	716
42 x 42 x 34	1062	1067	1074	859	864	871	757	762	767	706	711	716
42 x 42 x 32	1062	1067	1074	808	813	820	757	762	767	706	711	716
42 x 42 x 30	1062	1067	1074	757	762	769	757	762	767	706	711	716
42 x 42 x 28	1062	1067	1074	706	711	718	757	762	767	693	698	703
42 x 42 x 26	1062	1067	1074	655	660	667	757	762	767	693	698	703
42 x 42 x 24	1062	1067	1074	605	610	616	757	762	767	655	660	665
42 x 42 x 22	1062	1067	1074	554	559	565	757	762	767	655	660	665

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Butt welding Fittings

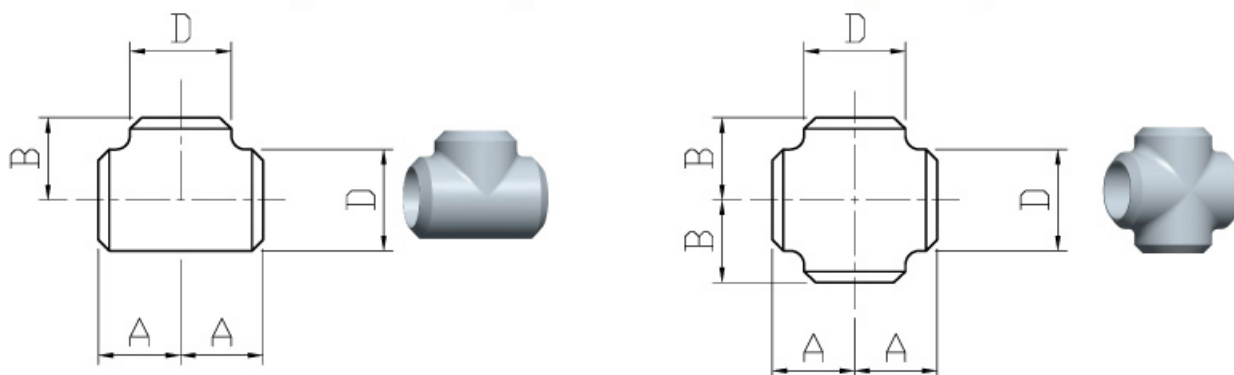


Table 4.3

Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses (continued)

Nominal Pipe Size (NPS)	Outside Diameter of Reducing Tees & Crosses						Centre-End lengths of Reducing Tees & Crosses					
	Run D			Outlet D			Run A			Outlet B		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
42 x 42 x 20	1062	1067	1074	503	508	514	757	762	767	655	660	665
42 x 42 x 18	1062	1067	1074	454	457	461	757	762	767	643	648	653
42 x 42 x 16	1062	1067	1074	403	406	410	757	762	767	630	635	640
44 x 44 x 42	1113	1118	1125	1062	1067	1074	808	813	818	757	762	767
44 x 44 x 40	1113	1118	1125	1011	1016	1023	808	813	818	744	749	754
44 x 44 x 38	1113	1118	1125	960	965	972	808	813	818	732	737	742
44 x 44 x 36	1113	1118	1125	909	914	921	808	813	818	719	724	729
44 x 44 x 34	1113	1118	1125	859	864	871	808	813	818	719	724	729
44 x 44 x 32	1113	1118	1125	808	813	820	808	813	818	706	711	716
44 x 44 x 30	1113	1118	1125	757	762	764	808	813	818	706	711	716
44 x 44 x 28	1113	1118	1125	706	711	718	808	813	818	693	698	703
44 x 44 x 26	1113	1118	1125	655	660	667	808	813	818	693	698	703
44 x 44 x 24	1113	1118	1125	605	610	616	808	813	818	693	698	703
44 x 44 x 22	1113	1118	1125	554	559	565	808	813	818	681	686	691
44 x 44 x 20	1113	1118	1125	503	508	514	808	813	818	681	686	691
46 x 46 x 44	1163	1168	1175	1113	1118	1125	846	851	856	795	800	805
46 x 46 x 42	1163	1168	1175	1062	1067	1074	846	851	856	782	787	792
46 x 46 x 40	1163	1168	1175	1011	1016	1023	846	851	856	770	775	780
46 x 46 x 38	1163	1168	1175	960	965	972	846	851	856	757	762	767
46 x 46 x 36	1163	1168	1175	909	914	921	846	851	856	757	762	767
46 x 46 x 34	1163	1168	1175	859	864	871	846	851	856	744	749	754
46 x 46 x 32	1163	1168	1175	808	813	820	846	851	856	744	749	754
46 x 46 x 30	1163	1168	1175	757	762	764	846	851	856	732	737	742
46 x 46 x 28	1163	1168	1175	706	711	718	846	851	856	732	737	742
46 x 46 x 26	1163	1168	1175	655	660	667	846	851	856	732	737	742
46 x 46 x 24	1163	1168	1175	605	610	616	846	851	856	719	724	729
46 x 46 x 22	1163	1168	1175	554	559	565	846	851	856	719	724	729
48 x 48 x 46	1214	1219	1226	1163	1168	1175	884	889	894	833	838	843
48 x 48 x 44	1214	1219	1226	1113	1118	1125	884	889	894	833	838	843
48 x 48 x 42	1214	1219	1226	1062	1067	1074	884	889	894	808	813	818
48 x 48 x 40	1214	1219	1226	1011	1016	1023	884	889	894	808	813	818
48 x 48 x 38	1214	1219	1226	960	965	972	884	889	894	808	813	818
48 x 48 x 36	1214	1219	1226	909	914	921	884	889	894	782	787	792
48 x 48 x 34	1214	1219	1226	859	864	871	884	889	894	782	787	792
48 x 48 x 32	1214	1219	1226	808	813	820	884	889	894	782	787	792
48 x 48 x 30	1214	1219	1226	757	762	769	884	889	894	757	762	767
48 x 48 x 28	1214	1219	1226	706	711	718	884	889	894	757	762	767
48 x 48 x 26	1214	1219	1226	655	660	667	884	889	894	757	762	767
48 x 48 x 24	1214	1219	1226	605	610	616	884	889	894	732	737	742
48 x 48 x 22	1214	1219	1226	554	559	565	884	889	894	732	737	742

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

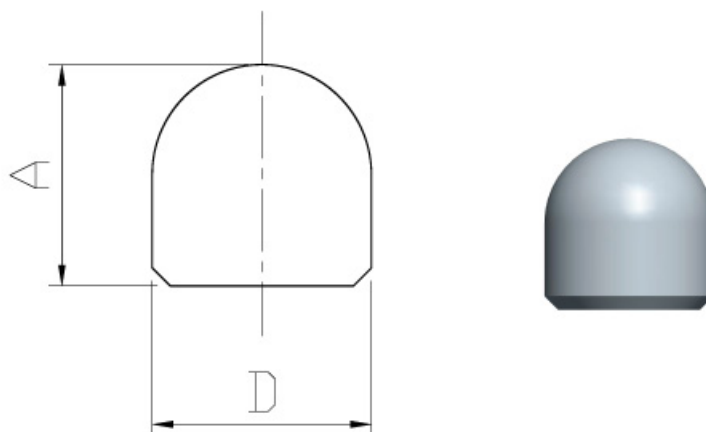


Table 4.4

Dimensions of End Caps										
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D			Length (1) A1			Limiting wall thickness for length A1	Length (2) A2		
	Min.	Nom.	Max.	Min.	Nom.	Max.		Min.	Nom.	Max.
1/2	20	21	22	21	25	29	3.73	21	25	29
3/4	26	27	28	21	25	29	3.91	21	25	29
1	32	33	34	34	38	42	4.55	34	38	42
1 1/4	41	42	43	34	38	42	4.85	34	38	42
1 1/2	47	48	49	34	38	42	5.08	34	38	42
2	59	60	61	34	38	42	5.54	40	44	48
2 1/2	72	73	74	34	38	42	7.01	47	51	55
3	88	89	90	47	51	55	7.62	60	64	68
3 1/2	101	102	103	60	64	68	8.08	72	76	80
4	113	114	116	60	64	68	8.56	72	76	80
5	140	141	144	69	76	83	9.53	82	89	96
6	167	168	171	82	89	96	10.97	95	102	109
8	217	219	221	95	102	109	12.70	120	127	134
10	270	273	277	120	127	134	12.70	145	152	159
12	321	324	328	145	152	159	12.70	171	178	185
14	353	356	360	158	165	172	12.70	184	191	198
16	403	406	410	171	178	185	12.70	196	203	210
18	454	457	461	196	203	210	12.70	222	229	236
20	503	508	514	222	229	236	12.70	247	254	261
22	554	559	565	247	254	261	12.70	247	254	261
24	605	610	616	260	267	274	12.70	298	305	312
26	655	660	667	257	267	277	-	-	-	-
28	706	711	718	257	267	277	-	-	-	-
30	757	762	769	257	267	277	-	-	-	-
32	808	813	820	257	267	277	-	-	-	-
34	859	864	871	257	267	277	-	-	-	-
36	909	914	921	257	267	277	-	-	-	-
38	960	965	972	295	305	315	-	-	-	-
40	1011	1016	1023	295	305	315	-	-	-	-
42	1062	1067	1074	295	305	315	-	-	-	-
44	1113	1118	1125	333	343	353	-	-	-	-
46	1163	1168	1175	333	343	353	-	-	-	-
48	1214	1219	1226	333	343	353	-	-	-	-

GENERAL NOTE: Dimensions are in mm.

(1) Length A1 applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length A1".

(2) Length A2 applies for thickness greater than given in column "Limiting Wall Thickness for Length A1" for NPS 24 and smaller. For NPS 26 and larger, length A2 shall be by agreement between manufacturer and purchaser.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

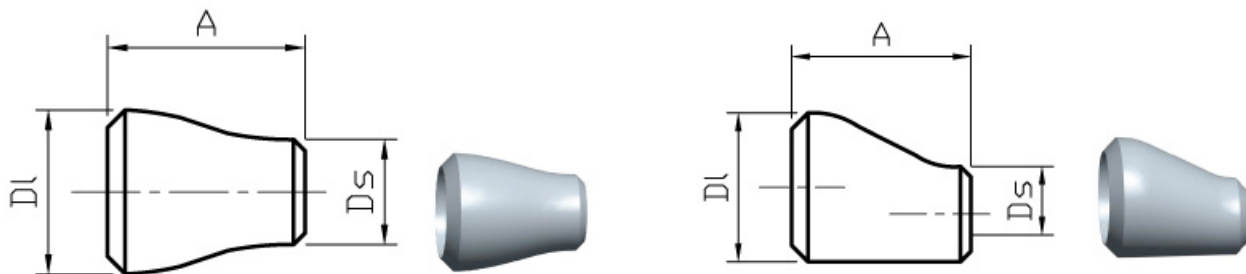


Table 4.5

Dimensions of Reducers									
Nominal Pipe Size (NPS)	Outside Diameter of Large End D			Outside Diameter of Small End D			End-to-End Length of Reducers A		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
$\frac{3}{4} \times \frac{1}{2}$	26	27	28	20	21	23	36	38	40
$\frac{3}{4} \times \frac{3}{8}$	26	27	28	16	17	18	36	38	40
$1 \times \frac{3}{4}$	32	33	34	26	27	28	49	51	53
$1 \times \frac{1}{2}$	32	33	34	20	21	22	49	51	53
$1\frac{1}{4} \times 1$	41	42	43	32	33	34	49	51	53
$1\frac{1}{4} \times \frac{3}{4}$	41	42	43	26	27	28	49	51	53
$1\frac{1}{4} \times \frac{1}{2}$	41	42	43	20	21	22	49	51	53
$1\frac{1}{2} \times 1\frac{1}{4}$	47	48	49	41	42	43	62	64	66
$1\frac{1}{2} \times 1$	47	48	49	32	33	34	62	64	66
$1\frac{1}{2} \times \frac{3}{4}$	47	48	49	26	27	28	62	64	66
$1\frac{1}{2} \times \frac{1}{2}$	47	48	49	20	21	22	62	64	66
$2 \times 1\frac{1}{2}$	59	60	61	47	48	49	74	76	78
$2 \times 1\frac{1}{4}$	59	60	61	41	42	43	74	76	78
2×1	59	60	61	32	33	34	74	76	78
$2 \times \frac{3}{4}$	59	60	61	26	27	28	74	76	78
$2\frac{1}{2} \times 2$	72	73	74	59	60	61	87	89	91
$2\frac{1}{2} \times 1\frac{1}{2}$	72	73	74	47	48	49	87	89	91
$2\frac{1}{2} \times 1\frac{1}{4}$	72	73	74	41	42	43	87	89	91
$2\frac{1}{2} \times 1$	72	73	74	32	33	34	87	89	91
$3 \times 2\frac{1}{2}$	88	89	90	72	73	74	87	89	91
3×2	88	89	90	59	60	61	87	89	91
$3 \times 1\frac{1}{2}$	88	89	90	47	48	49	87	89	91
$3 \times 1\frac{1}{4}$	88	89	90	41	42	43	87	89	91
$3\frac{1}{2} \times 3$	100	102	103	88	89	90	100	102	104
$3\frac{1}{2} \times 2\frac{1}{2}$	100	102	103	72	73	74	100	102	104
$3\frac{1}{2} \times 2$	100	102	103	59	60	61	100	102	104
$3\frac{1}{2} \times 1\frac{1}{2}$	100	102	103	47	48	49	100	102	104
$3\frac{1}{2} \times 1\frac{1}{4}$	100	102	103	41	42	43	100	102	104
$4 \times 3\frac{1}{2}$	113	114	116	101	102	103	100	102	104
4×3	113	114	116	88	89	90	100	102	104
$4 \times 2\frac{1}{2}$	113	114	116	72	73	74	100	102	104
4×2	113	114	116	59	60	61	100	102	104
$4 \times 1\frac{1}{2}$	113	114	116	47	48	49	100	102	104
5×4	140	141	144	113	114	116	125	127	129
$5 \times 3\frac{1}{2}$	140	141	144	101	102	103	125	127	129
5×3	140	141	144	88	89	90	125	127	129

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

Table 4.5

Dimensions of Reducers (continued)									
Nominal Pipe Size (NPS)	Outside Diameter of Large End D			Outside Diameter of Small End D			End-to-End Length of Reducers A		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
5 x 2½	140	141	144	72	73	74	125	127	129
5 x 2	140	141	144	59	60	61	125	127	129
6 x 5	167	168	171	140	141	142	138	140	142
6 x 4	167	168	171	113	114	116	138	140	142
6 x 3½	167	168	171	101	102	103	138	140	142
6 x 3	167	168	171	88	89	90	138	140	142
6 x 2½	167	168	171	72	73	74	138	140	142
8 x 6	217	219	221	167	168	171	150	152	154
8 x 5	217	219	221	140	141	144	150	152	154
8 x 4	217	219	221	113	114	116	150	152	154
8 x 3½	217	219	221	101	102	103	150	152	154
10 x 8	270	273	277	217	219	221	176	178	180
10 x 6	270	273	277	167	168	171	176	178	180
10 x 5	270	273	277	140	141	144	176	178	180
10 x 4	270	273	277	113	114	116	176	178	180
12 x 10	321	324	328	270	273	277	200	203	206
12 x 8	321	324	328	217	219	221	200	203	206
12 x 6	321	324	328	167	168	171	200	203	206
12 x 5	321	324	328	140	141	144	200	203	206
14 x 12	353	356	360	321	324	328	327	330	333
14 x 10	353	356	360	270	273	277	327	330	333
14 x 8	353	356	360	217	219	221	327	330	333
14 x 6	353	356	360	167	168	171	327	330	333
16 x 14	403	406	410	353	356	360	353	356	359
16 x 12	403	406	410	321	324	328	353	356	359
16 x 10	403	406	410	270	273	277	353	356	359
16 x 8	403	406	410	217	219	221	353	356	359
18 x 16	454	457	461	403	406	410	378	381	384
18 x 14	454	457	461	353	356	360	378	381	384
18 x 12	454	457	461	321	324	328	378	381	384
18 x 10	454	457	461	270	273	277	378	381	384
20 x 18	503	508	514	454	457	461	505	508	511
20 x 16	503	508	514	403	406	410	505	508	511
20 x 14	503	508	514	353	356	360	505	508	511
20 x 12	503	508	514	321	324	328	505	508	511
22 x 20	554	559	565	503	508	514	505	508	511
22 x 18	554	559	565	454	457	461	505	508	511
22 x 16	554	559	565	403	406	410	505	508	511
22 x 14	554	559	565	353	356	360	505	508	511
24 x 22	605	610	616	554	559	565	505	508	511
24 x 20	605	610	616	503	508	514	505	508	511
24 x 18	605	610	616	454	457	461	505	508	511
24 x 16	605	610	616	403	406	410	505	508	511
26 x 24	655	660	667	605	610	616	607	610	613
26 x 22	655	660	667	554	559	565	607	610	613
26 x 20	655	660	667	503	508	514	607	610	613
26 x 18	655	660	667	454	457	461	607	610	613

GENERAL NOTE: Dimensions are in mm.

Section 4. Factory-Made Wrought Steel Buttwelding Fittings

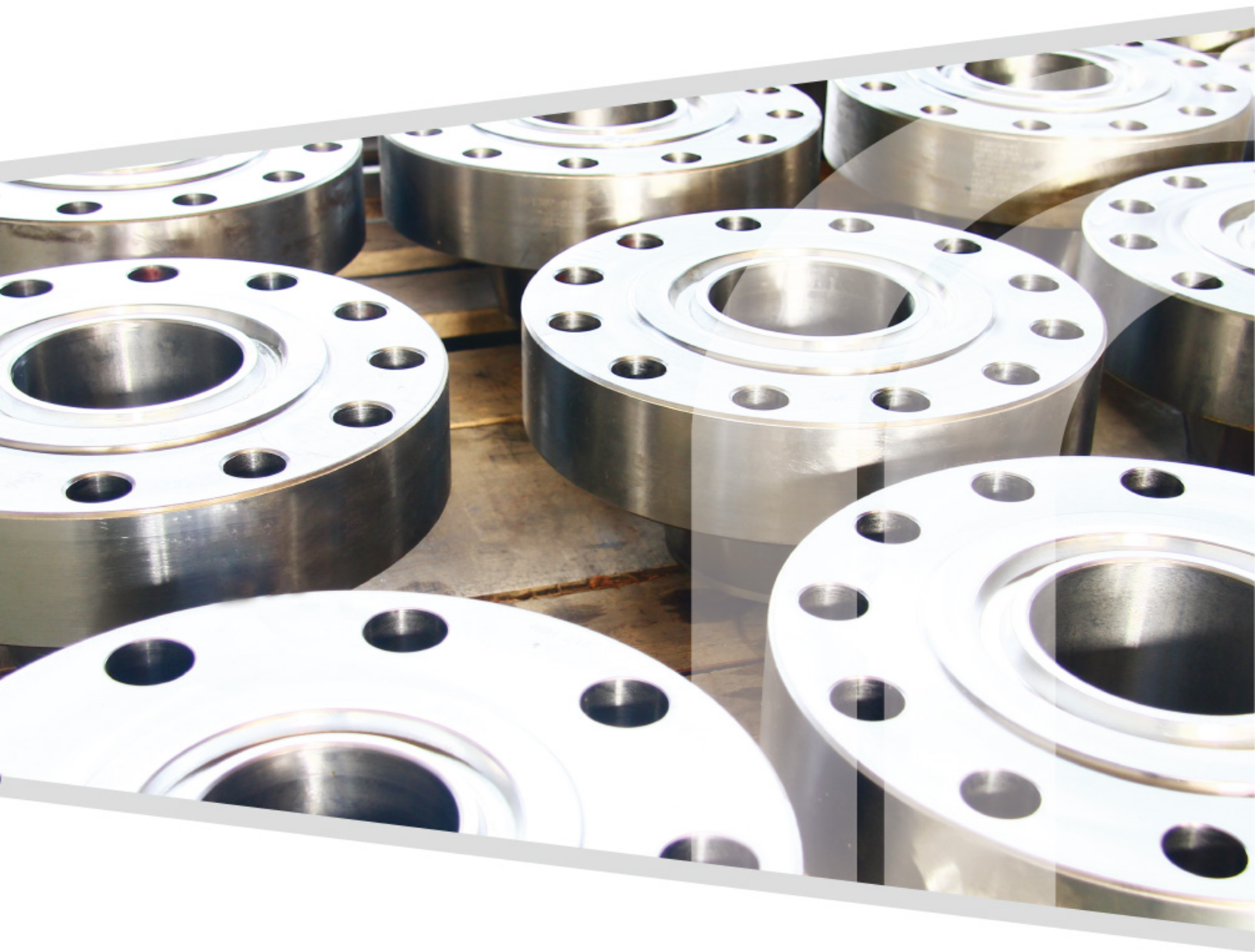
Table 4.5

Dimensions of Reducers (continued)									
Nominal Pipe Size (NPS)	Outside Diameter of Large End D			Outside Diameter of Small End D			End-to-End Length of Reducers A		
	Min.	Nom.	Max.	Min.	Nom.	Max.	Min.	Nom.	Max.
28 x 26	706	711	718	655	660	667	607	610	613
28 x 24	706	711	718	605	610	616	607	610	613
28 x 20	706	711	718	503	508	514	607	610	613
28 x 18	706	711	718	454	457	461	607	610	613
30 x 28	757	762	769	706	711	718	607	610	613
30 x 26	757	762	769	655	660	667	607	610	613
30 x 24	757	762	769	605	610	616	607	610	613
30 x 20	757	762	769	503	508	514	607	610	613
32 x 30	808	813	820	757	762	769	605	610	615
32 x 28	808	813	820	706	711	718	605	610	615
32 x 26	808	813	820	655	660	667	605	610	615
32 x 24	808	813	820	605	610	616	605	610	615
34 x 32	859	864	871	808	813	820	605	610	615
34 x 30	859	864	871	757	762	769	605	610	615
34 x 26	859	864	871	655	660	667	605	610	615
34 x 24	859	864	871	605	610	616	605	610	615
36 x 34	909	914	921	859	864	871	605	610	615
36 x 32	909	914	921	808	813	820	605	610	615
36 x 30	909	914	921	757	762	769	605	610	615
36 x 26	909	914	921	655	660	667	605	610	615
36 x 24	909	914	921	605	610	616	605	610	615
38 x 36	960	965	972	909	914	921	605	610	615
38 x 34	960	965	972	859	864	871	605	610	615
38 x 32	960	965	972	808	813	820	605	610	615
38 x 30	960	965	972	757	762	769	605	610	615
38 x 28	960	965	972	706	711	718	605	610	615
38 x 26	960	965	972	655	660	667	605	610	615
40 x 38	1011	1016	1023	960	965	972	605	610	615
40 x 36	1011	1016	1023	909	914	921	605	610	615
40 x 34	1011	1016	1023	859	864	871	605	610	615
40 x 32	1011	1016	1023	808	813	820	605	610	615
40 x 30	1011	1016	1023	757	762	769	605	610	615
42 x 40	1062	1067	1074	1011	1016	1023	605	610	615
42 x 38	1062	1067	1074	960	965	972	605	610	615
42 x 36	1062	1067	1074	909	914	921	605	610	615
42 x 34	1062	1067	1074	859	864	871	605	610	615
42 x 32	1062	1067	1074	808	813	820	605	610	615
42 x 30	1062	1067	1074	757	762	769	605	610	615
44 x 42	1113	1118	1125	1062	1067	1074	605	610	615
44 x 40	1113	1118	1125	1011	1016	1023	605	610	615
44 x 38	1113	1118	1125	960	965	972	605	610	615
44 x 36	1113	1118	1125	909	914	921	605	610	615
46 x 44	1163	1168	1175	1113	1118	1125	706	711	716
46 x 42	1163	1168	1175	1062	1067	1074	706	711	716
46 x 40	1163	1168	1175	1011	1016	1023	706	711	716
46 x 38	1163	1168	1175	960	965	972	706	711	716
48 x 46	1214	1219	1226	1163	1168	1175	706	711	716
48 x 44	1214	1219	1226	1113	1118	1125	706	711	716
48 x 42	1214	1219	1226	1062	1067	1074	706	711	716
48 x 40	1214	1219	1226	1011	1016	1023	706	711	716

GENERAL NOTE: Dimensions are in mm.

SECTION 5

API and ANSI Flanges



Section 5. API and ANSI Flanges

Section 5a. API 6A TYPE 6B and 6BX Flanges

API Flanges are designed and manufactured in accordance with the following specifications:-

API 6A	Specification for Wellhead and Christmas Tree Equipment.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
ASME VIII	Boiler and Pressure Vessel Code.
MSS-SP-55	Quality Standards for Steel Castings for Valves, Flanges and Fittings and other Piping Components.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Flanges are available as Weld Neck, Integral, Blind, Target & Test Blind for use with the following pressure ratings:-

Max. Working Pressure	2,000 PSI	3,000 PSI	5,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI
Test Pressure	4,000 PSI	6,000 PSI	7,500 PSI	15,000 PSI	22,500 PSI	30,000 PSI
Production Specific Levels	1, 2 & 3	1, 2 & 3	1, 2 & 3	2, 3 & 4	3 & 4	3 & 4
API Temperature Rating	K (-60° C) to Y (+345° C)	K (-60° C) to Y (+345° C)	K (-60° C) to Y (+345° C)	K (-60° C) to Y (+345° C)	K (-60° C) to Y (+345° C)	K (-60° C) to Y (+345° C)
Integral, Blind Target Blind & Test Flanges						
API Specified Min. Yield Min. Tensile Material	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	60,000 PSI 85,000 PSI API 60K	75,000 PSI 95,000 PSI API 75K	75,000 PSI 95,000 PSI API 75K
API Specified Min. Yield Min. Tensile Material	45,000 PSI 70,000 PSI API 45K	45,000 PSI 70,000 PSI API 45K	45,000 PSI 70,000 PSI API 45K	60,000 PSI 85,000 PSI API 60K	75,000 PSI 95,000 PSI API 75K	75,000 PSI 95,000 PSI API 75K

GENERAL NOTE Please contact JCC for any special material or dimensional requirements.
Max. working pressures stated are suitable for temperatures up to 121°C.
De-rating of max. working pressure will occur as the operating temperature increases above 121°C. Consult JCC for further details.
JCC generally offer AISI 4130 with 85,000 PSI min yield and 105,000 PSI min tensile.

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 2000 psi Rated Working Pressure

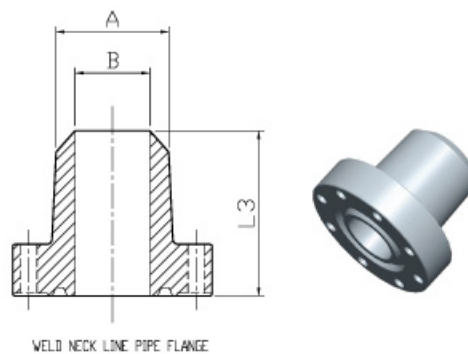
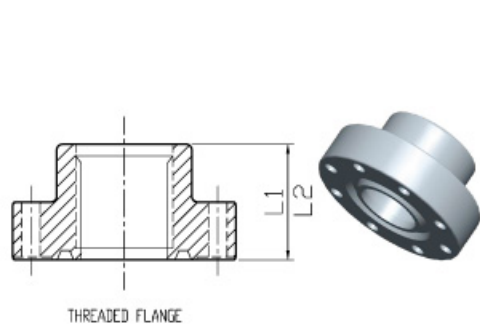


Table 5a.1

Hub and Bore Dimensions						
Nominal Size and Bore of Flange	Hub Length Threaded Line-Pipe Flange L1	Hub Length Threaded Casing Flange L2	Hub Length Welding Neck Line-Pipe Flange L3± 0.06	Neck Diameter Welding Neck Line-Pipe Flange A	Tolerance A	Maximum Bore of Welding Neck Flange B
2 ¹ / ₁₆	1.75	—	3.19	2.38	+0.09/-0.03	2.10
2 ⁹ / ₁₆	1.94	—	3.44	2.88	+0.09/-0.03	2.50
3 ¹ / ₈	2.12	—	3.56	3.50	+0.09/-0.03	3.10
4 ¹ / ₁₆	2.44	3.50	4.31	4.50	+0.09/-0.03	4.06
5 ¹ / ₈	2.69	4.00	4.81	5.56	+0.09/-0.08	4.84
7 ¹ / ₁₆	2.94	4.50	4.94	6.63	+0.16/-0.03	5.79
9	3.31	5.00	5.56	8.63	+0.16/-0.03	7.84
11	3.69	5.25	6.31	10.75	+0.16/-0.03	9.78
13 ⁵ / ₈	3.94	3.94	—	—	—	—
16 ³ / ₄	4.50	4.50	—	—	—	—
21 ¹ / ₄	5.38	5.38	—	—	—	—

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 2000 psi Rated Working Pressure

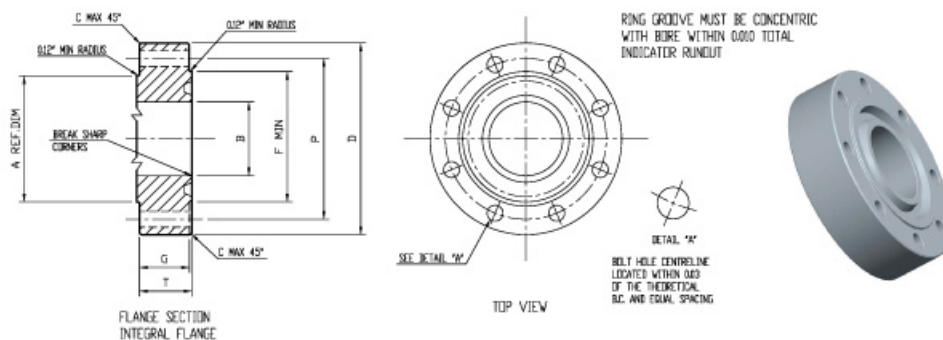


Table 5a.2

Hub and Bore Dimensions															
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Basic Thickness of Flange	Diameter of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number, R or RX
	B	D	D	C	F	T	G	A	P						
2 ¹ / ₁₆	2.09	6.50	±0.06	0.12	4.25	1.31	1.00	3.31	5.00	8	⁵ / ₈	0.75	+0.06	4.50	23
2 ⁹ / ₁₆	2.59	7.50	±0.06	0.12	5.00	1.44	1.12	3.94	5.88	8	³ / ₄	0.88	+0.06	5.00	26
3 ¹ / ₈	3.22	8.25	±0.06	0.12	5.75	1.56	1.25	4.62	6.62	8	³ / ₄	0.88	+0.06	5.25	31
4 ¹ / ₁₆	4.28	10.75	±0.06	0.12	6.88	1.81	1.50	6.00	8.50	8	⁷ / ₈	1.00	+0.06	6.00	37
5 ¹ / ₈	5.16	13.00	±0.06	0.12	8.25	2.06	1.75	7.44	10.50	8	1	1.12	+0.06	6.75	41
7 ¹ / ₁₆	7.16	14.00	±0.12	0.25	9.50	2.19	1.88	8.75	11.50	12	1	1.12	+0.06	7.00	45
9	9.03	16.50	±0.12	0.25	11.88	2.50	2.19	10.75	13.75	12	1 ¹ / ₈	1.25	+0.06	8.00	49
11	11.03	20.00	±0.12	0.25	14.00	2.81	2.50	13.50	17.00	16	1 ¹ / ₄	1.38	+0.06	8.75	53
13 ⁵ / ₈	13.66	22.00	±0.12	0.25	16.25	2.94	2.62	15.75	19.25	20	1 ¹ / ₄	1.38	+0.06	9.00	57
16 ³ / ₄	16.78	27.00	±0.12	0.25	20.00	3.31	3.00	19.50	23.75	20	1 ¹ / ₂	1.62	+0.09	10.25	65
21 ¹ / ₄	21.28	32.00	±0.12	0.25	25.00	3.88	3.50	24.00	28.50	24	1 ⁵ / ₈	1.75	+0.09	11.75	73

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 3000 psi Rated Working Pressure

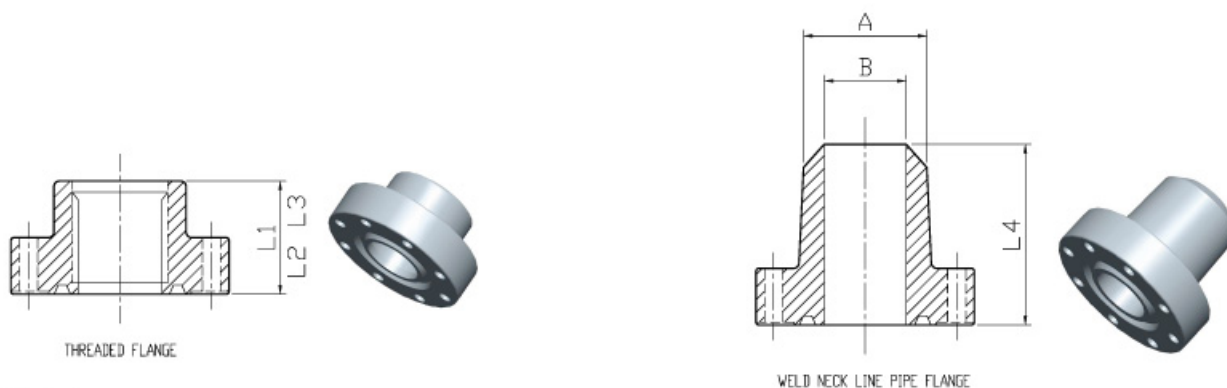


Table 5a.3

Hub and Bore Dimensions							
Nominal Size and Bore of Flange	Hub Length Threaded Line-Pipe Flange	Hub Length Threaded Casing Flange	Hub Length Tubing Flange	Hub Length Welding Neck Line-Pipe Flange	Neck Diameter Welding Neck Line-Pipe Flange	Tolerance	Maximum Bore of Welding Neck Flange
	L1	L2	L3	L4±0.06	A	A	B
2 ¹ / ₁₆	2.56	–	2.56	4.31	2.38	+0.09/-0.03	1.97
2 ⁹ / ₁₆	2.81	–	2.81	4.44	2.88	+0.09/-0.03	2.35
3 ¹ / ₈	2.44	–	2.94	4.31	3.50	+0.09/-0.03	2.93
4 ¹ / ₁₆	3.06	3.50	3.50	4.81	4.50	+0.09/-0.03	3.86
5 ¹ / ₈	3.44	4.00	–	5.31	5.56	+0.09/-0.03	4.84
7 ¹ / ₁₆	3.69	4.50	–	5.81	6.63	+0.16/-0.03	5.79
9	4.31	5.00	–	6.69	8.63	+0.16/-0.03	7.47
11	4.56	5.25	–	7.56	10.75	+0.16/-0.03	9.34
13 ⁵ / ₈	4.94	4.94	–	–	–	–	–
16 ³ / ₄	5.06	5.69	–	–	–	–	–
20 ³ / ₄	6.75	6.75	–	–	–	–	–

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 3000 psi Rated Working Pressure

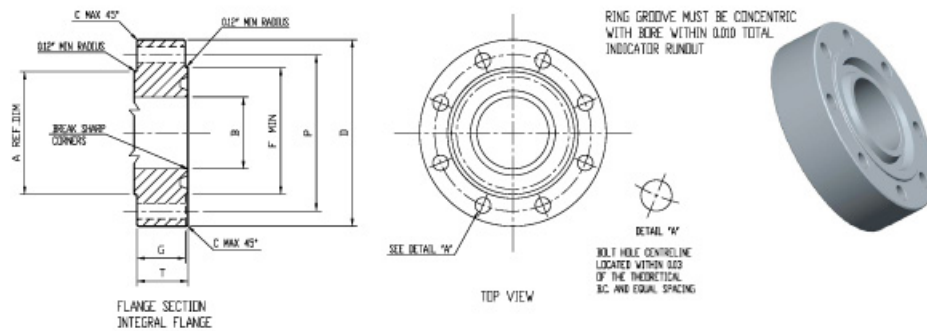


Table 5a.4

Hub and Bore Dimensions															
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Basic Thickness of Flange	Diameter of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number, R or RX
	B	D	D	C	F	T	G	A	P						
2 ¹ / ₁₆	2.09	8.50	±0.06	0.12	4.88	1.81	1.50	4.12	6.50	8	7/8	1.00	+0.06	6.00	24
2 ⁹ / ₁₆	2.59	9.62	±0.06	0.12	5.38	1.94	1.62	4.88	7.50	8	1	1.12	+0.06	6.50	27
3 ¹ / ₈	3.22	9.50	±0.06	0.12	6.12	1.81	1.50	5.00	7.50	8	7/8	1.00	+0.06	6.00	31
4 ¹ / ₁₆	4.28	11.50	±0.06	0.12	7.12	2.06	1.75	6.25	9.25	8	1 ¹ / ₈	1.25	+0.06	7.00	37
5 ¹ / ₈	5.16	13.75	±0.06	0.12	8.50	2.31	2.00	7.50	11.00	8	1 ¹ / ₄	1.38	+0.06	7.75	41
7 ¹ / ₁₆	7.16	15.00	±0.12	0.25	9.50	2.50	2.19	9.25	12.50	12	1 ¹ / ₈	1.25	+0.06	8.00	45
9	9.03	18.50	±0.12	0.25	12.12	2.81	2.50	11.75	15.50	12	1 ³ / ₈	1.50	+0.06	9.00	49
11	11.03	21.50	±0.12	0.25	14.25	3.06	2.75	14.50	18.50	16	1 ³ / ₈	1.50	+0.06	9.50	53
13 ⁵ / ₈	13.66	24.00	±0.12	0.25	16.50	3.44	3.12	16.50	21.00	20	1 ³ / ₈	1.50	+0.06	10.25	57
16 ³ / ₄	16.78	27.75	±0.12	0.25	20.62	3.94	3.50	20.00	24.25	20	1 ⁵ / ₈	1.75	+0.09	11.75	66
20 ³ / ₄	20.78	33.75	±0.12	0.25	25.50	4.75	4.25	24.50	29.50	20	2	2.12	+0.09	14.50	74

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 5000 psi Rated Working Pressure

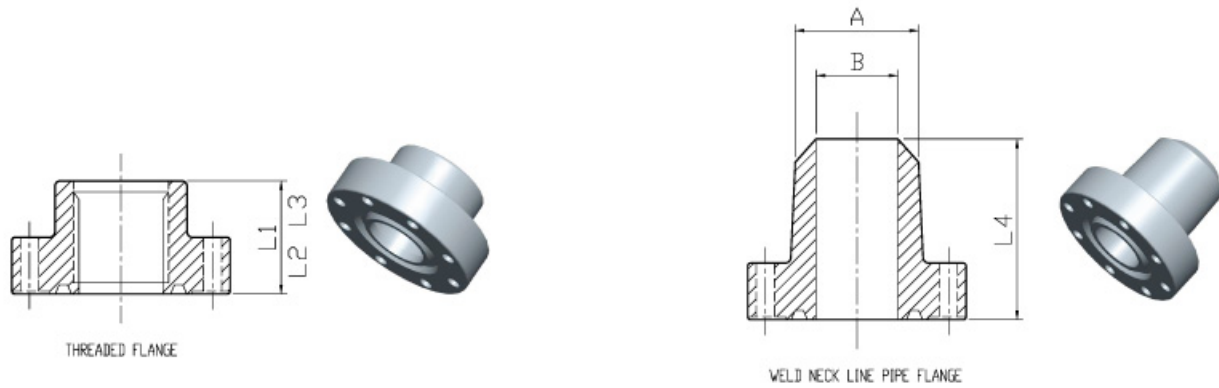


Table 5a.5

Hub and Bore Dimensions							
Nominal Size and Bore of Flange	Hub Length Threaded Line-Pipe Flange	Hub Length Threaded Casing Flange	Hub Length Tubing Flange	Hub Length Welding Neck Line-Pipe Flange	Neck Diameter Welding Neck Line-Pipe Flange	Tolerance	Maximum Bore of Welding Neck Flange
	L1	L2	L3	L4±0.06	A	A	B
2 ¹ / ₁₆	2.56	—	2.56	4.31	2.38	+0.09/-0.03	1.72
2 ⁹ / ₁₆	2.81	—	2.81	4.44	2.88	+0.09/-0.03	2.16
3 ¹ / ₈	3.19	—	3.19	4.94	3.50	+0.09/-0.03	2.65
4 ¹ / ₁₆	3.88	3.88	3.88	5.19	4.50	+0.09/-0.03	3.47
5 ¹ / ₈	4.44	4.44	—	6.44	5.56	+0.09/-0.03	4.34
7 ¹ / ₁₆	5.06	5.06	—	7.13	6.63	+0.16/-0.03	5.22
9	6.06	6.06	—	8.81	8.63	+0.16/-0.03	6.84
11	6.69	6.69	—	10.44	10.75	+0.16/-0.03	8.53

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5a. Type 6B Flanges for 5000 psi Rated Working Pressure

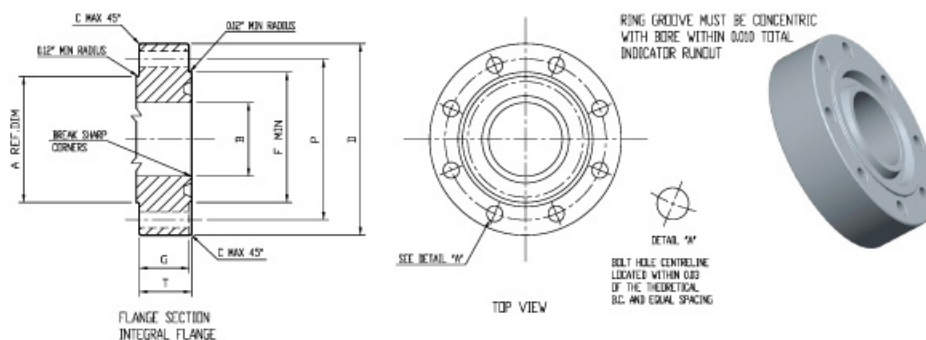


Table 5a.6

Hub and Bore Dimensions															
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Basic Thickness of Flange	Diameter of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number, R or RX
	B	D	D	C	F	T	G	A	P						
2 ¹ / ₁₆	2.09	8.50	±0.06	0.12	4.88	1.81	1.50	4.12	6.50	8	7/8	1.00	+0.06	6.00	24
2 ⁹ / ₁₆	2.59	9.62	±0.06	0.12	5.38	1.94	1.62	4.88	7.50	8	1	1.12	+0.06	6.50	27
3 ¹ / ₈	3.22	10.50	±0.06	0.12	6.62	2.19	1.88	5.25	8.00	8	1 ¹ / ₈	1.25	+0.06	7.25	35
4 ¹ / ₁₆	4.28	12.25	±0.06	0.12	7.62	2.44	2.12	6.38	9.50	8	1 ¹ / ₄	1.38	+0.06	8.00	39
5 ¹ / ₈	5.16	14.75	±0.06	0.12	9.00	3.19	2.88	7.75	11.50	8	1 ¹ / ₂	1.62	+0.06	10.00	44
7 ¹ / ₁₆	7.16	15.50	±0.12	0.25	9.75	3.62	3.25	9.00	12.50	12	1 ³ / ₈	1.50	+0.06	10.75	46
9	9.03	19.00	±0.12	0.25	12.50	4.06	3.62	11.50	15.50	12	1 ³ / ₈	1.75	+0.09	12.00	50
11	11.03	23.00	±0.12	0.25	14.63	4.69	4.25	14.50	19.00	12	1 ⁷ / ₈	2.00	+0.09	13.75	54

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5a. Type 6BX Integral Flanges for 2000, 3000, 5000 and 10,000 psi Rated Working Pressure

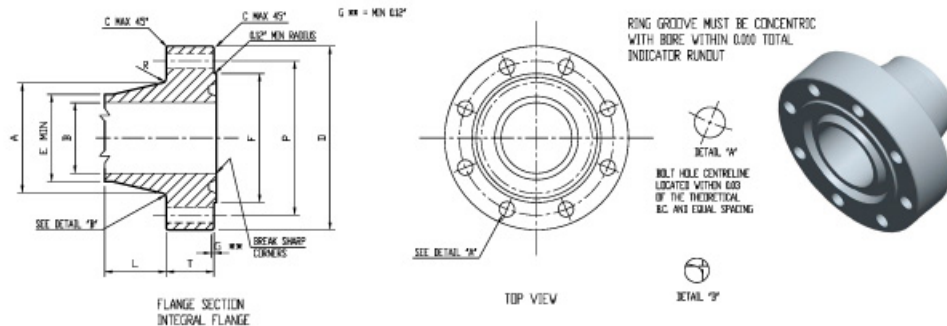


Table 5a.7

Hub and Flange Dimensions																	
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolts H-Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number R, RX or BX
B	D	D	C	F	T	A	E	L	R	P							
2000 psi																	
26 ³ / ₄	26.78	41.00	±0.12	0.25	31.69	4.97	32.91	29.25	7.31	0.62	37.50	20	1 ³ / ₄	1.88	+0.09	13.75	167
30	30.03	44.19	±0.12	0.25	35.75	5.28	36.69	32.80	7.75	0.62	40.94	32	1 ⁵ / ₈	1.75	+0.09	14.25	303
3000 psi																	
26 ³ / ₄	26.78	43.38	±0.12	0.25	32.75	6.34	34.25	30.56	7.31	0.62	39.38	24	2	2.12	+0.09	17.00	168
30	30.03	46.68	±0.12	0.25	36.31	6.58	38.19	34.30	7.75	0.62	42.94	32	1 ⁷ / ₈	2.00	+0.09	17.75	303
5000 psi																	
13 ⁵ / ₈	13.66	26.50	±0.12	0.25	18.00	4.44	18.94	16.69	4.50	0.62	23.25	16	1 ⁵ / ₈	1.75	+0.09	12.50	160
16 ³ / ₄	16.78	30.38	±0.12	0.25	21.06	5.13	21.88	20.75	3.00	0.75	26.62	16	1 ⁷ / ₈	2.00	+0.09	14.50	162
18 ³ / ₄	18.78	35.62	±0.12	0.25	24.69	6.53	26.56	23.56	6.00	0.62	31.62	20	2	2.12	+0.09	17.50	163
21 ¹ / ₄	21.28	39.00	±0.12	0.25	27.62	7.12	29.88	26.75	6.50	0.69	34.88	24	2	2.12	+0.09	18.75	165
10000 psi																	
1 ³ / ₁₆	1.84	7.38	±0.06	0.12	4.12	1.66	3.50	2.56	1.91	0.38	5.75	8	³ / ₄	0.88	+0.06	5.00	151
2 ¹ / ₁₆	2.09	7.88	±0.06	0.12	4.38	1.73	3.94	2.94	2.03	0.38	6.25	8	³ / ₄	0.88	+0.06	5.50	152
2 ⁹ / ₁₆	2.59	9.12	±0.06	0.12	5.19	2.02	4.75	3.62	2.25	0.38	7.25	8	⁷ / ₈	1.00	+0.06	6.00	153
3 ¹ / ₁₆	3.09	10.62	±0.06	0.12	6.00	2.30	5.59	4.34	2.50	0.38	8.50	8	1	1.12	+0.06	6.75	154
4 ¹ / ₁₆	4.09	12.44	±0.06	0.12	7.28	2.77	7.19	5.75	2.88	0.38	10.19	8	1 ¹ / ₈	1.25	+0.06	8.00	155
5 ¹ / ₈	5.16	14.06	±0.06	0.12	8.69	3.12	8.81	7.19	3.19	0.38	11.81	12	1 ¹ / ₈	1.25	+0.06	8.75	169
7 ¹ / ₁₆	7.09	18.88	±0.12	0.25	11.88	4.06	11.88	10.00	3.75	0.62	15.88	12	1 ¹ / ₂	1.62	+0.09	11.25	156
9	9.03	21.75	±0.12	0.25	14.12	4.88	14.75	12.88	3.69	0.62	18.75	16	1 ¹ / ₂	1.62	+0.09	13.00	157
11	11.03	25.75	±0.12	0.25	16.88	5.56	17.75	15.75	4.06	0.62	22.25	16	1 ³ / ₄	1.88	+0.09	15.00	158
13 ⁵ / ₈	13.66	30.25	±0.12	0.25	20.38	6.62	21.75	19.50	4.50	0.62	26.50	20	1 ⁷ / ₈	2.00	+0.09	17.25	159
16 ³ / ₄	16.78	34.31	±0.12	0.25	22.69	6.62	25.81	23.69	3.00	0.75	30.56	24	1 ⁷ / ₈	2.00	+0.09	17.50	162
18 ³ / ₄	18.78	40.94	±0.12	0.25	27.44	8.78	29.62	26.56	6.12	0.62	36.44	24	2 ¹ / ₄	2.38	+0.09	22.50	164
21 ¹ / ₄	21.28	45.00	±0.12	0.25	30.75	9.50	33.38	30.00	6.50	0.81	40.25	24	2 ¹ / ₂	2.62	+0.09	24.50	166

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5a. Type 6BX Integral Flanges for 15,000 and 20,000 psi Rated Working Pressure

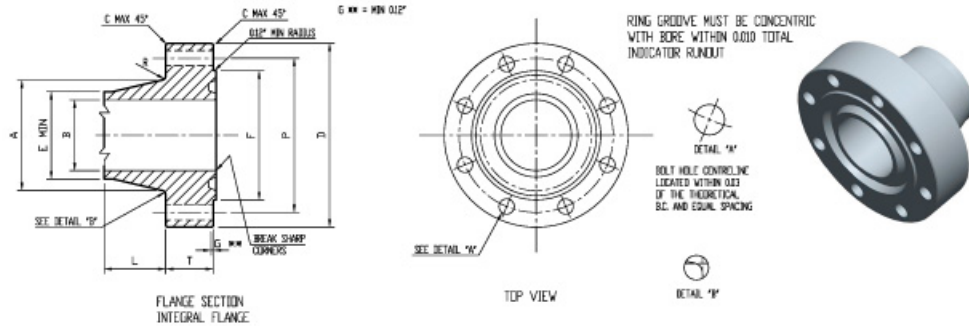


Table 5a.8

Hub and Flange Dimensions																	
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number BX
B	D	D	C	F	T	A	E	L	R	P							
15000 psi																	
1 ³ / ₁₆	1.84	8.19	±0.06	0.12	4.19	1.78	3.84	2.81	1.88	0.38	6.31	8	7/ ₈	1.00	+0.06/-0.02	5.50	151
2 ¹ / ₁₆	2.09	8.75	±0.06	0.12	4.50	2.00	4.38	3.25	2.12	0.38	6.88	8	7/ ₈	1.00	+0.06/-0.02	6.00	152
2 ⁹ / ₁₆	2.59	10.00	±0.06	0.12	5.25	2.25	5.06	3.94	2.25	0.38	7.88	8	1	1.12	+0.06/-0.02	6.75	153
3 ¹ / ₁₆	3.09	11.31	±0.06	0.12	6.06	2.53	6.06	4.81	2.50	0.38	9.06	8	1 ¹ / ₈	1.25	+0.06/-0.02	7.50	154
4 ¹ / ₁₆	4.09	14.19	±0.06	0.12	7.62	3.09	7.69	6.25	2.88	0.38	11.44	8	1 ³ / ₈	1.50	+0.06/-0.02	9.25	155
5 ¹ / ₈	5.16	16.50	±0.06	0.12	8.88	3.88	9.62	7.88	3.22	0.62	13.50	12	1 ¹ / ₂	1.62	+0.09/-0.02	11.50	169
7 ¹ / ₁₆	7.09	19.88	±0.12	0.25	12.00	4.69	12.81	10.88	2.62	0.62	16.88	16	1 ¹ / ₂	1.62	+0.09/-0.02	12.75	156
9	9.03	25.50	±0.12	0.25	15.00	5.75	17.00	13.75	4.88	0.62	21.75	16	1 ⁷ / ₈	2.00	+0.09/-0.02	15.75	157
11	11.03	32.00	±0.12	0.25	17.88	7.38	23.00	16.81	9.28	0.62	28.00	20	2	2.12	+0.09/-0.02	19.25	158
13 ⁵ / ₈	13.66	34.88	±0.12	0.25	21.31	8.06	23.44	20.81	4.50	1.00	30.38	20	2 ¹ / ₄	2.38	+0.09/-0.02	21.25	159
18 ³ / ₄	18.78	45.75	±0.12	0.25	28.44	10.06	32.00	28.75	6.12	1.00	40.00	20	3	3.12	+0.12/-0.02	26.75	164
20000 psi																	
1 ³ / ₁₆	1.84	10.12	±0.06	0.12	4.62	2.50	5.25	4.31	1.94	0.38	8.00	8	1	1.12	+0.06/-0.02	7.50	151
2 ¹ / ₁₆	2.09	11.31	±0.06	0.12	5.19	2.81	6.06	5.00	2.06	0.38	9.06	8	1 ¹ / ₈	1.25	+0.06/-0.02	8.25	152
2 ⁹ / ₁₆	2.59	12.81	±0.06	0.12	5.94	3.12	6.81	5.69	2.31	0.38	10.31	8	1 ¹ / ₄	1.38	+0.06/-0.02	9.25	153
3 ¹ / ₁₆	3.09	14.06	±0.06	0.12	6.75	3.38	7.56	6.31	2.50	0.38	11.31	8	1 ³ / ₈	1.50	+0.06/-0.02	10.00	154
4 ¹ / ₁₆	4.09	17.56	±0.06	0.12	8.62	4.19	9.56	8.12	2.88	0.38	14.06	8	1 ³ / ₄	1.88	+0.06/-0.02	12.25	155
7 ¹ / ₁₆	7.09	25.81	±0.12	0.25	13.88	6.50	15.19	13.31	3.81	0.62	21.81	16	2	2.12	+0.09/-0.02	17.50	156
9	9.03	31.69	±0.12	0.25	17.38	8.06	18.94	16.88	4.25	1.00	27.00	16	2 ¹ / ₂	2.62	+0.09/-0.02	22.38	157
11	11.03	34.75	±0.12	0.25	19.88	8.81	22.31	20.00	4.06	1.00	29.50	16	2 ³ / ₄	2.88	+0.09/-0.02	23.75	158
13 ⁵ / ₈	13.66	45.75	±0.12	0.25	24.19	11.50	27.31	24.75	5.25	1.00	40.00	20	3	3.12	+0.12/-0.02	30.00	159

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5a. Type 6BX Blind and Test Flanges for 10,000, 15,000 and 20,000 psi Rated Working Pressure

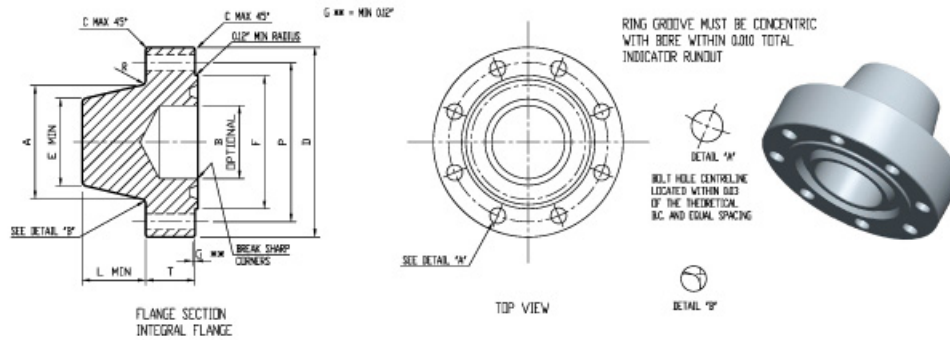


Table 5a.10

Hub and Flange Dimensions																	
Nominal Size and Bore of Flange	Maximum Bore	Outside Diameter of Flange	Tolerance	Maximum Chamfer	Diameter of Raised Face	Total Thickness of Flange	Large Diameter of Hub	Small Diameter of Hub	Length of Hub	Radius of Hub	Diameter of Bolt Circle	Number of Bolts	Diameter of Bolts	Diameter of Bolt Holes	Bolt Hole Tolerance (see note)	Length of Bolts	Ring Number BX
B	D	D	C	F	T	A	E	L	R	P							
10000 psi																	
1 ³ / ₁₆	1.84	7.38	±0.06	0.12	4.12	1.66	3.50	2.56	1.91	0.38	5.75	8	3/4	0.88	+0.06/-0.02	5.00	151
2 ¹ / ₁₆	2.09	7.88	±0.06	0.12	4.38	1.73	3.94	2.94	2.03	0.38	6.25	8	3/4	0.88	+0.06/-0.02	5.50	152
2 ⁹ / ₁₆	2.59	9.12	±0.06	0.12	5.19	2.02	4.75	3.62	2.25	0.38	7.25	8	7/8	1.00	+0.06/-0.02	6.00	153
3 ¹ / ₁₆	3.09	10.62	±0.06	0.12	6.00	2.30	5.59	4.34	2.50	0.38	8.50	8	1	1.12	+0.06/-0.02	6.75	154
4 ¹ / ₁₆	4.09	12.44	±0.06	0.12	7.28	2.77	7.19	5.75	2.88	0.38	10.19	8	1 ¹ / ₈	1.25	+0.06/-0.02	8.00	155
5 ¹ / ₈	5.16	14.06	±0.06	0.12	8.69	3.13	8.81	7.19	3.19	0.38	11.81	12	1 ¹ / ₈	1.25	+0.06/-0.02	8.75	169
15000 psi																	
1 ³ / ₁₆	1.84	8.19	±0.06	0.12	4.19	1.78	3.84	2.81	1.88	0.38	6.31	8	7/8	1.00	+0.06/-0.02	5.50	151
2 ¹ / ₁₆	2.09	8.75	±0.06	0.12	4.50	2.00	4.38	3.25	2.12	0.38	6.88	8	7/8	1.00	+0.06/-0.02	6.00	152
2 ⁹ / ₁₆	2.59	10.00	±0.06	0.12	5.25	2.25	5.06	3.94	2.25	0.38	7.88	8	1	1.12	+0.06/-0.02	6.75	153
3 ¹ / ₁₆	3.09	11.31	±0.06	0.12	6.06	2.53	6.06	4.81	2.50	0.38	9.06	8	1 ¹ / ₈	1.25	+0.06/-0.02	7.50	154
4 ¹ / ₁₆	4.09	14.19	±0.06	0.12	7.62	3.09	7.69	6.25	2.88	0.38	11.44	8	1 ³ / ₈	1.50	+0.06/-0.02	9.25	155
5 ¹ / ₈	5.16	16.50	±0.06	0.12	8.88	3.88	9.62	7.88	3.22	0.62	13.50	12	1 ¹ / ₂	1.62	+0.09/-0.02	11.50	169
20000 psi																	
1 ³ / ₁₆	1.84	10.12	±0.06	0.12	4.62	2.50	5.25	4.31	1.94	0.38	8.00	8	1	1.12	+0.06/-0.02	7.50	151
2 ¹ / ₁₆	2.09	11.31	±0.06	0.12	5.19	2.81	6.06	5.00	2.06	0.38	9.06	8	1 ¹ / ₈	1.25	+0.06/-0.02	8.25	152
2 ⁹ / ₁₆	2.59	12.81	±0.06	0.12	5.94	3.12	6.81	5.69	2.31	0.38	10.31	8	1 ¹ / ₄	1.38	+0.06/-0.02	9.25	153
3 ¹ / ₁₆	3.09	14.06	±0.06	0.12	6.75	3.38	7.56	6.31	2.50	0.38	11.31	8	1 ³ / ₈	1.50	+0.06/-0.02	10.00	154
4 ¹ / ₁₆	4.09	17.56	±0.06	0.12	8.62	4.19	9.56	8.12	2.88	0.38	14.06	8	1 ³ / ₄	1.88	+0.09/-0.02	12.25	155

GENERAL NOTE: Dimensions are in inches.
Minimum Bolt Hole Tolerance is - 0.02"

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

ANSI Flanges are designed in accordance with the following specifications:-

ANSI B16.5	Pipe Flanges and Flanged Fittings.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
ASME VIII	Boiler and Pressure Vessel Code.
MSS-SP-55	Quality Standards for Steel Castings for Valves, Flanges and Fittings and other Piping Components.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Flanges are available as Weld Neck, Integral, Blind, Target & Test Blind for use with the following pressure ratings:-

Rating	150lb	300lb	400lb	600lb	900lb	1,500lb	2,500lb
Max working pressure	285 PSI	740 PSI	990 PSI	1480 PSI	2220 PSI	3705 PSI	6170 PSI
Test Pressure	450 PSI	1125 PSI	1500 PSI	2225 PSI	3350 PSI	5575 PSI	9275 PSI
Operating Temperature Range	-28 to +540°C	-28 to +540°C	-28 to +540°C	-28 to +540°C	-28 to +540°C	-28 to +540°C	-28 to +540°C

GENERAL NOTE Please contact JCC for any special materials or threaded, slip on or lapped flange dimension.
 Max. working pressures stated are based upon carbon steel material group 1.1 @ 38°C in accordance with ANSI B16.5
 De-rating of max. working pressure will occur as the operating temperature increases above 38°C. Consult JCC for further details.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

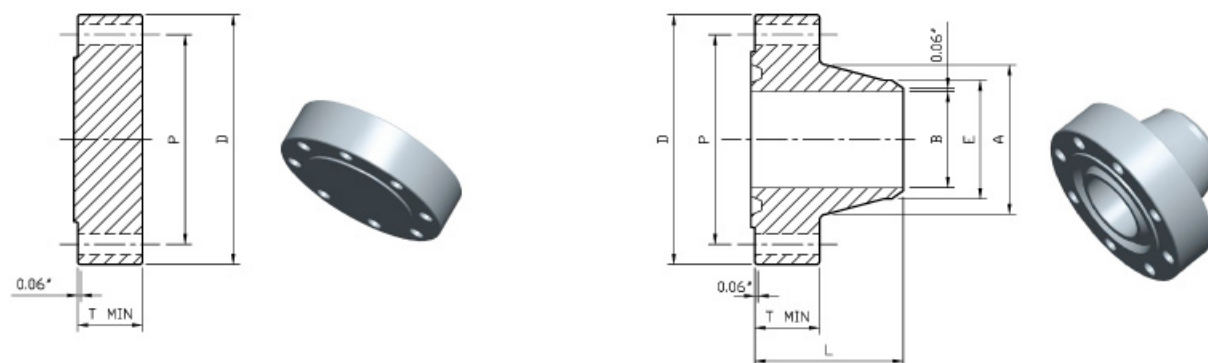


Table 5b.1

Class 150 Flanges												
Nominal Pipe Size (NPS)	Outside Diameter of Flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length Through Hub Welding Neck	Bore Welding Neck	Drilling				Length of Bolts	
							Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	0.06 in. Raised Face	Ring Joint
	'D'	'T'	'A'	'E'	'L'	'B'	'P'					
1/2	3.50	0.44	1.19	0.84	1.88	0.62	2.38	0.62	4	1/2	2.25	...
3/4	3.88	0.50	1.50	1.05	2.06	0.82	2.75	0.62	4	1/2	2.50	...
1	4.25	0.56	1.94	1.32	2.19	1.05	3.12	0.62	4	1/2	2.50	3.00
1 1/4	4.62	0.62	2.31	1.66	2.25	1.38	3.50	0.62	4	1/2	2.75	3.25
1 1/2	5.00	0.69	2.56	1.90	2.44	1.61	3.88	0.62	4	1/2	2.75	3.25
2	6.00	0.75	3.06	2.38	2.50	2.07	4.75	0.75	4	5/8	3.25	3.75
2 1/2	7.00	0.88	3.56	2.88	2.75	2.47	5.50	0.75	4	5/8	3.50	4.00
3	7.50	0.94	4.25	3.50	2.75	3.07	6.00	0.75	4	5/8	3.50	4.00
3 1/2	8.50	0.94	4.81	4.00	2.81	3.55	7.00	0.75	8	5/8	3.50	4.00
4	9.00	0.94	5.31	4.50	3.00	4.03	7.50	0.75	8	5/8	3.50	4.00
5	10.00	0.94	6.44	5.56	3.50	5.05	8.50	0.88	8	3/4	3.75	4.25
6	11.00	1.00	7.56	6.63	3.50	6.07	9.50	0.88	8	3/4	4.00	4.50
8	13.50	1.12	9.69	8.63	4.00	7.98	11.75	0.88	8	3/4	4.25	4.75
10	16.00	1.19	12.00	10.75	4.00	10.02	14.25	1.00	12	7/8	4.50	5.00
12	19.00	1.25	14.38	12.75	4.50	12.00	17.00	1.00	12	7/8	4.75	5.25
14	21.00	1.38	15.75	14.00	5.00	To be specified by purchaser	18.75	1.12	12	1	5.25	5.75
16	23.50	1.44	18.00	16.00	5.00		21.25	1.12	16	1	5.25	5.75
18	25.00	1.56	19.88	18.00	5.50		22.75	1.25	16	1 1/8	5.75	6.25
20	27.50	1.69	22.00	20.00	5.69		25.00	1.25	20	1 1/8	6.25	6.75
24	32.00	1.88	26.12	24.00	6.00		29.50	1.38	20	1 1/4	6.75	7.25

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

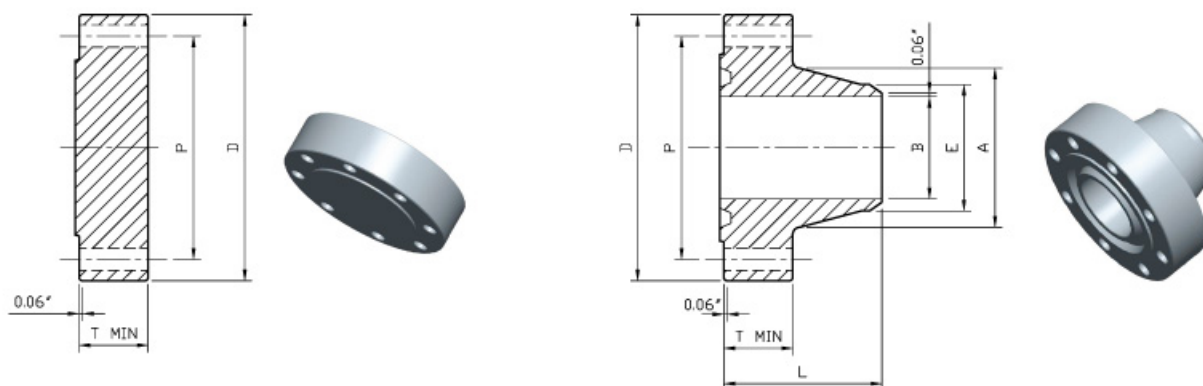


Table 5b.2

Class 300 Flanges												
Nominal Pipe Size (NPS)	Outside Diameter of flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Length Through Hub	Bore	Drilling				Length of Bolts	
							Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	Stud Bolts
	'D'	'T'	'A'	'E'	'L'	'B'						
1/2	3.75	0.56	1.50	0.84	2.06	0.62	2.62	0.62	4	1/2	2.50	3.00
3/4	4.62	0.62	1.88	1.05	2.25	0.82	3.25	0.75	4	5/8	3.00	3.50
1	4.88	0.69	2.12	1.32	2.44	1.05	3.50	0.75	4	5/8	3.00	3.50
1 1/4	5.25	0.75	2.50	1.66	2.56	1.38	3.88	0.75	4	5/8	3.25	3.75
1 1/2	6.12	0.81	2.75	1.90	2.69	1.61	4.50	0.88	4	3/4	3.50	4.00
2	6.50	0.88	3.31	2.38	2.75	2.07	5.00	0.75	8	5/8	3.50	4.00
2 1/2	7.50	1.00	3.94	2.88	3.00	2.47	5.88	0.88	8	3/4	4.00	4.50
3	8.25	1.12	4.62	3.50	3.12	3.07	6.62	0.88	8	3/4	4.25	4.75
3 1/2	9.00	1.19	5.25	4.00	3.19	3.55	7.25	0.88	8	3/4	4.25	5.00
4	10.00	1.25	5.75	4.50	3.38	4.03	7.88	0.88	8	3/4	4.50	5.00
5	11.00	1.38	7.00	5.56	3.88	5.05	9.25	0.88	8	3/4	4.75	5.25
6	12.50	1.44	8.12	6.63	3.88	6.07	10.62	0.88	12	3/4	4.75	5.50
8	15.00	1.62	10.25	8.63	4.38	7.98	13.00	1.00	12	7/8	5.50	6.00
10	17.50	1.88	12.62	10.75	4.62	10.02	15.25	1.12	16	1	6.25	6.75
12	20.50	2.00	14.75	12.75	5.12	12.00	17.75	1.25	16	1 1/8	6.75	7.25
14	23.00	2.12	16.75	14.00	5.62	12.00	20.25	1.25	20	1 1/8	7.00	7.50
16	25.50	2.25	19.00	16.00	5.75	To be specified by purchaser	22.50	1.38	20	1 1/4	7.50	8.00
18	28.00	2.38	21.00	18.00	6.25		24.75	1.38	24	1 1/4	7.75	8.25
20	30.50	2.50	23.12	20.00	6.38		27.00	1.38	24	1 1/4	8.00	8.75
24	36.00	2.75	27.62	24.00	6.62		32.00	1.62	24	1 1/2	9.00	10.00

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

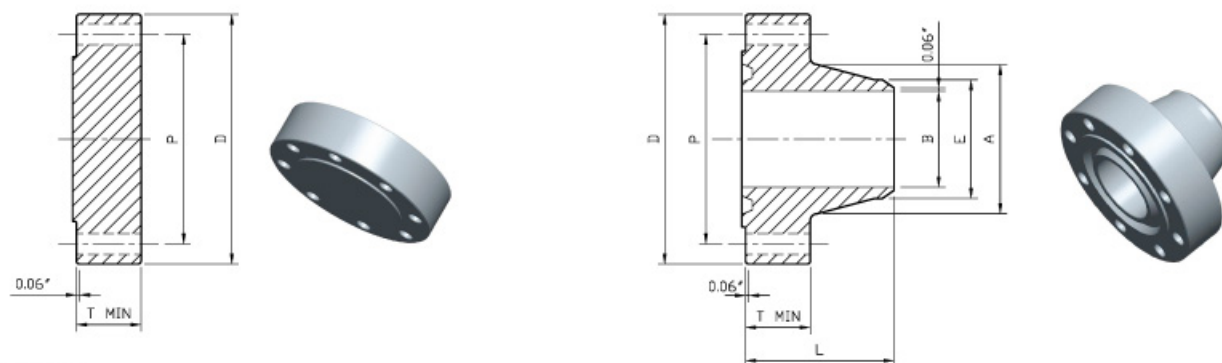


Table 5b.3

Class 400 Flanges												
					Length Through Hub	Bore	Drilling				Length of Bolts	
Nominal Pipe Size (NPS)	Outside Diameter of flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Welding Neck	Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	0.06 in. Raised Face	Ring Joint
	'D'	'T'	'A'	'E'	'L'	'B'	'P'					
1/2												
3/4												
1 1/4												
1 1/2												
2												
2 1/2												
3												
3 1/2												
4	10.00	1.38	5.75	4.50	3.50			7.88	1.00	8	7/8	5.50 5.50
5	11.00	1.50	7.00	5.56	4.00			9.2	1.00	8	7/8	5.75 5.75
6	12.50	1.62	8.12	6.63	4.06			10.62	1.00	12	7/8	6.00 6.00
8	15.00	1.88	10.25	8.63	4.62			13.00	1.12	12	1	6.75 6.75
10	17.50	2.12	12.62	10.75	4.88		To be specified by purchaser	15.25	1.25	16	1 1/8	7.50 7.50
12	20.50	2.25	14.75	12.75	5.38			17.75	1.38	16	1 1/4	8.00 8.00
14	23.00	2.38	16.75	14.00	5.88			20.25	1.38	20	1 1/4	8.25 8.25
16	25.50	2.50	19.00	16.00	6.00			22.50	1.50	20	1 1/8	8.75 8.75
18	28.00	2.62	21.00	18.00	6.50			24.75	1.50	24	1 1/8	9.00 9.00
20	30.50	2.75	23.12	20.00	6.62			27.00	1.62	24	1 1/2	9.50 9.75
24	36.00	3.00	27.62	24.00	6.88			32.00	1.88	24	1 3/4	10.50 11.00

Use Class 600 Dimensions in these sizes

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

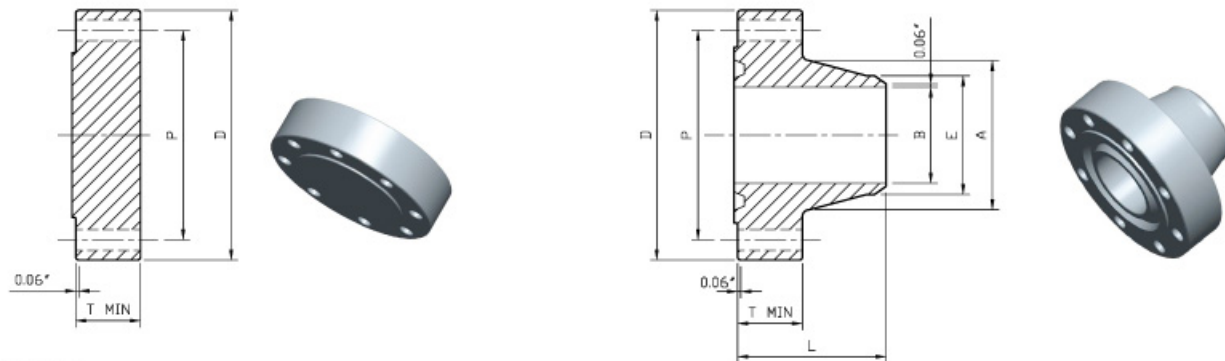


Table 5b.4

Class 600 Flanges												
					Length Through Hub	Bore	Drilling				Length of Bolts	
Nominal Pipe Size (NPS)	Outside Diameter of Flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Welding Neck	Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	0.06 in. Raised Face	Ring Joint
	'D'	'T'	'A'	'E'	'L'	'B'	'P'					
1/2	3.75	0.56	1.50	0.84	2.06	To be specified by purchaser	2.62	0.62	4	1/2	3.00	3.00
3/4	4.62	0.62	1.88	1.05	2.25		3.25	0.75	4	5/8	3.50	3.50
1	4.88	0.69	2.12	1.32	2.44		3.50	0.75	4	5/8	3.50	3.50
1 1/4	5.25	0.81	2.50	1.66	2.62		3.88	0.75	4	5/8	3.75	3.75
1 1/2	6.12	0.88	2.75	1.90	2.75		4.50	0.88	4	3/4	4.25	4.25
2	6.50	1.00	3.31	2.38	2.88		5.00	0.75	8	5/8	4.25	4.25
2 1/2	7.50	1.12	3.94	2.88	3.12		5.88	0.88	8	3/4	4.75	4.75
3	8.25	1.25	4.62	3.50	3.25		6.62	0.88	8	3/4	5.00	5.00
3 1/2	9.00	1.38	5.25	4.00	3.38		7.25	1.00	8	7/8	5.50	5.50
4	10.75	1.50	6.00	4.50	4.00		8.50	1.00	8	7/8	5.75	5.75
5	13.00	1.75	7.44	5.56	4.50		10.50	1.12	8	1	6.50	6.50
6	14.00	1.88	8.75	6.63	4.62		11.50	1.12	12	1	6.75	6.75
8	16.50	2.19	10.75	8.63	5.25		13.75	1.25	12	1 1/8	7.50	7.75
10	20.00	2.50	13.50	10.75	6.00		17.00	1.38	16	1 1/4	8.50	8.50
12	22.00	2.62	15.75	12.75	6.12		19.25	1.38	20	1 1/4	8.75	8.75
14	23.75	2.75	17.00	14.00	6.50		20.75	1.50	20	1 3/8	9.25	9.25
16	27.00	3.00	19.50	16.00	7.00		23.75	1.62	20	1 1/2	10.00	10.00
18	29.25	3.25	21.50	18.00	7.25		25.75	1.75	20	1 5/8	10.75	10.75
20	32.00	3.50	24.00	20.00	7.50		28.50	1.75	24	1 5/8	11.25	11.50
24	37.00	4.00	28.25	24.00	8.00		33.00	2.00	24	1 7/8	13.00	13.25

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

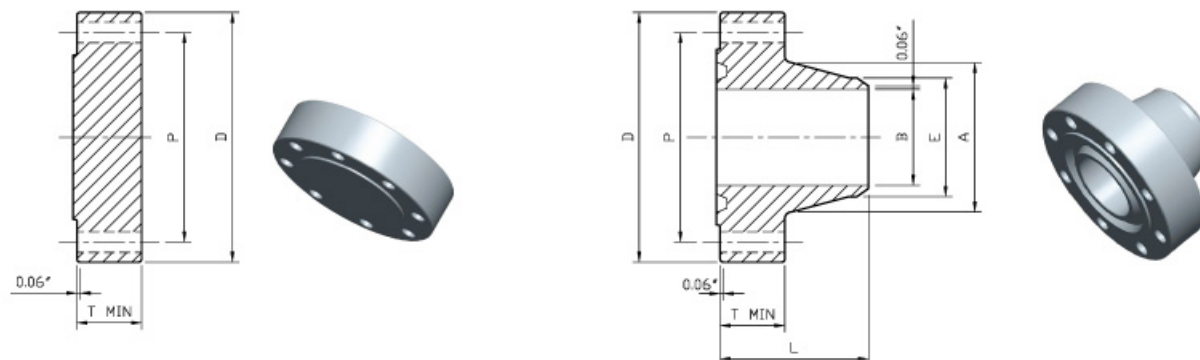


Table 5b.5

Class 900 Flanges													
					Length Through Hub	Bore	Drilling				Length of Bolts		
Nominal Pipe Size (NPS)	Outside Diameter of Flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Welding Neck	Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	Stud Bolts		
											0.06 in. Raised Face	Ring Joint	
	'D'	'T'	'A'	'E'	'L'	'B'	'P'						
1/2													
3/4													
1													
1 1/4													
Use Class 1500 dimensions in these sizes													
1 1/2													
2													
2 1/2													
3	9.50	1.50	5.00	3.50	4.00		7.50	1.00	8	7/8	5.75	5.75	
4	11.50	1.75	6.25	4.50	4.50		9.25	1.25	8	1 1/8	6.75	6.75	
5	13.75	2.00	7.50	5.56	5.00		11.00	1.38	8	1 1/4	7.50	7.50	
6	15.00	2.19	9.25	6.63	5.50		12.50	1.25	12	1 1/8	7.50	7.75	
8	18.50	2.50	11.75	8.63	6.38		15.50	1.50	12	1 3/8	8.75	8.25	
10	21.50	2.75	14.50	10.75	7.25	To be specified by purchaser	18.50	1.50	16	1 3/8	9.25	9.25	
12	24.00	3.12	16.50	12.75	7.88		21.00	1.50	20	1 3/8	10.00	10.00	
14	25.25	3.38	17.75	14.00	8.38		22.00	1.62	20	1 1/2	10.75	11.00	
16	27.75	3.50	20.00	16.00	8.50		24.25	1.75	20	1 5/8	11.25	11.50	
18	31.00	4.00	22.25	18.00	9.00		27.00	2.00	20	1 7/8	12.75	13.25	
20	33.75	4.25	24.50	20.00	9.75		29.50	2.12	20	2	13.75	14.25	
24	41.00	5.50	29.50	24.00	11.50		35.50	2.62	20	2 1/2	17.25	18.00	

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

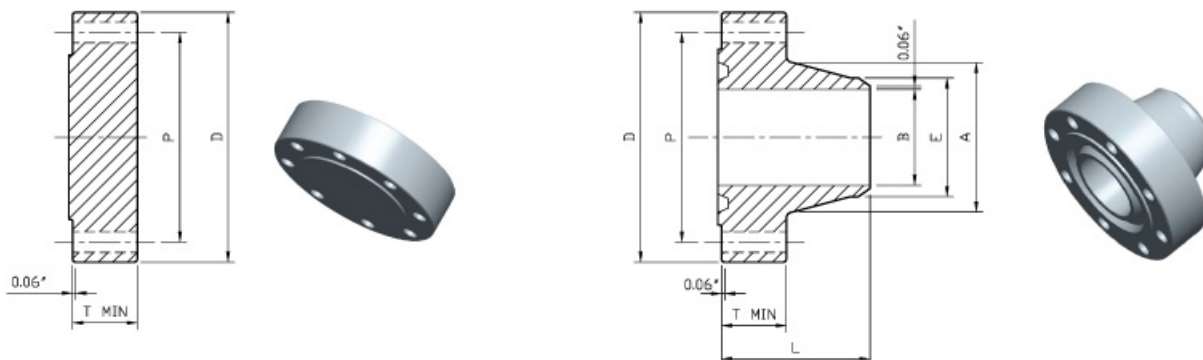


Table 5b.6

Class 1500 Flanges													
					Length Through Hub	Bore	Drilling				Length of Bolts		
Nominal Pipe Size (NPS)	Outside Diameter of Flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck			Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	0.06 in. Raised Face	Ring Joint
	'D'	'T'	'A'	'E'	'L'	'B'	'P'						
1/2	4.75	0.88	1.50	0.84	2.38	To be specified by purchased	3.25	0.88	4	3/4	4.25	4.25	
3/4	5.12	1.00	1.75	1.05	2.75		3.50	0.88	4	3/4	4.50	4.50	
1	5.88	1.12	2.06	1.32	2.88		4.00	1.00	4	7/8	5.00	5.00	
1 1/4	6.25	1.12	2.50	1.66	2.88		4.38	1.00	4	7/8	5.00	5.00	
1 1/2	7.00	1.25	2.75	1.90	3.25		4.88	1.12	4	1	5.50	5.50	
2	8.50	1.50	4.12	2.38	4.00		6.50	1.00	8	7/8	5.75	5.75	
2 1/2	9.62	1.62	4.88	2.88	4.12		7.50	1.12	8	1	6.25	6.25	
3	10.50	1.88	5.25	3.50	4.62		8.00	1.25	8	1 1/8	7.00	7.00	
4	12.25	2.12	6.38	4.50	4.88		9.50	1.38	8	1 1/4	7.75	7.75	
5	14.75	2.88	7.75	5.56	6.12		11.50	1.62	8	1 1/2	9.75	9.75	
6	15.50	3.25	9.00	6.63	6.75		12.50	1.50	12	1 3/8	10.25	10.50	
8	19.00	3.62	11.50	8.63	8.38		15.50	1.75	12	1 5/8	11.50	12.75	
10	23.00	4.25	14.50	10.75	10.00		19.00	2.00	12	1 7/8	13.25	13.50	
12	26.50	4.88	17.75	12.75	11.12		22.50	2.12	16	2	14.75	15.25	
14	29.50	5.25	19.50	14.00	11.75		25.00	2.38	16	2 1/4	16.00	16.75	
16	32.50	5.75	21.75	16.00	12.25		27.75	2.62	16	2 1/2	17.50	18.50	
18	36.00	6.38	23.50	18.00	12.88		30.50	2.88	16	2 3/4	19.50	20.75	
20	38.75	7.00	25.25	20.00	14.00		32.75	3.12	16	3	21.25	22.25	
24	46.00	8.00	30.00	24.00	16.00		39.00	3.62	16	3 1/2	24.25	25.50	

GENERAL NOTE: Dimensions are in inches.

Section 5. API and ANSI Flanges

Section 5b. ANSI B16.5 Flanges

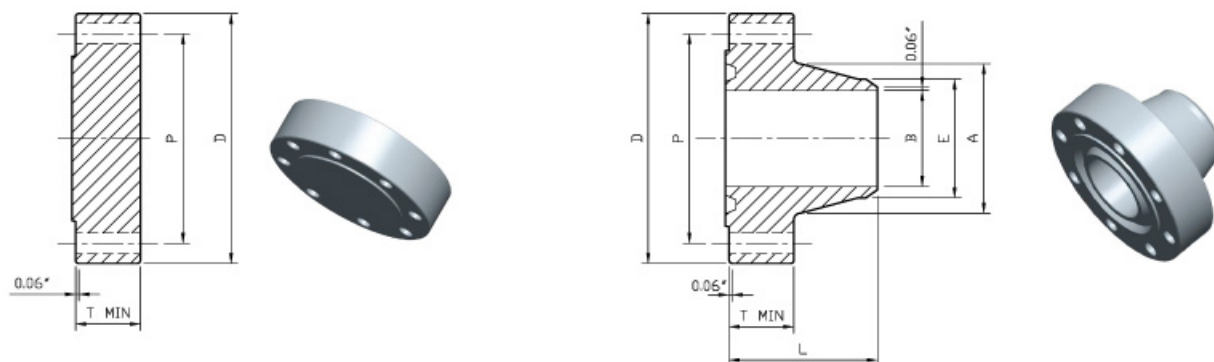


Table 5b.7

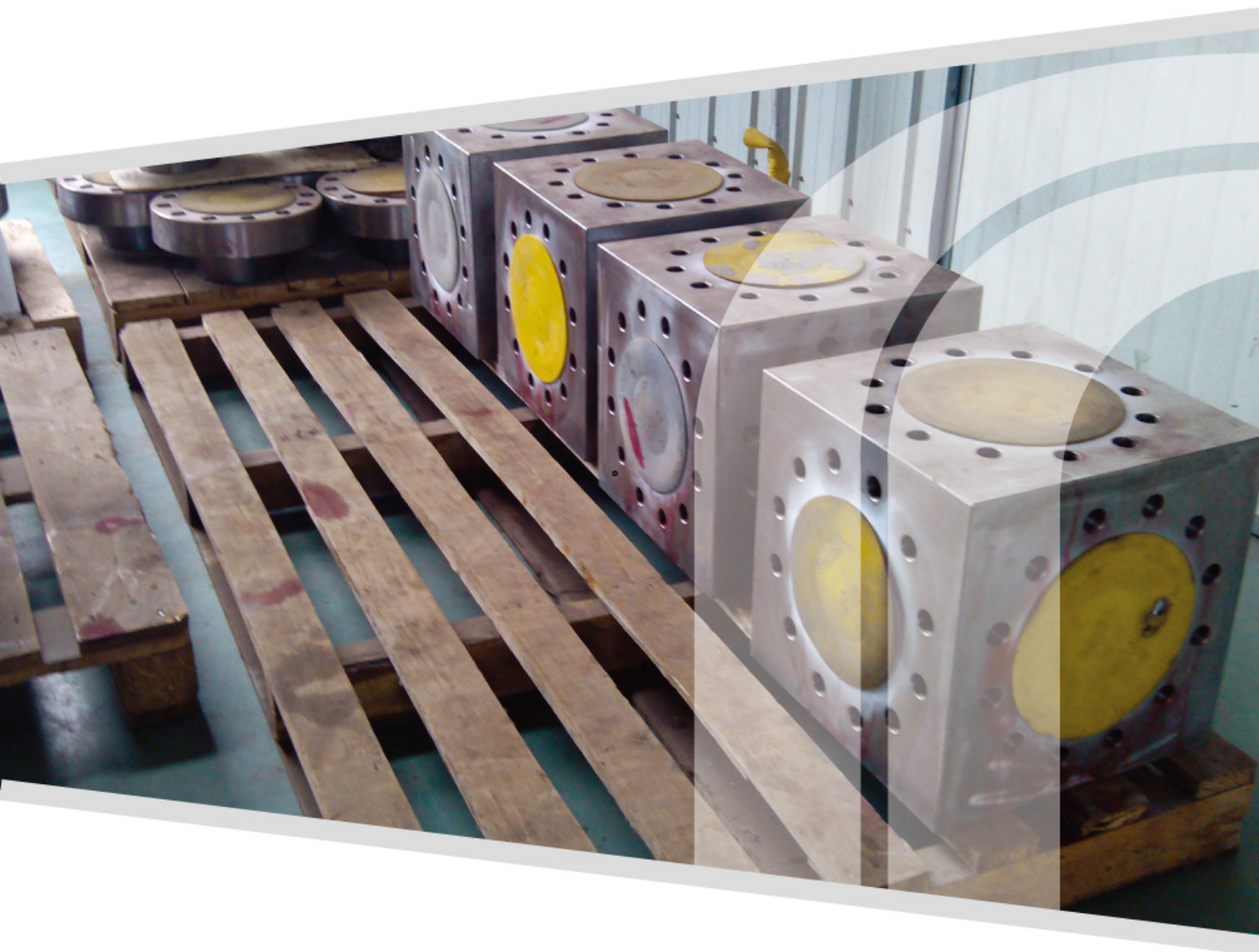
Class 2500 Flanges												
					Length Through Hub	Bore	Drilling				Length of Bolts	
Nominal Pipe Size (NPS)	Outside Diameter of Flange	Thickness of Flange Min.	Diameter of Hub	Hub Diameter Beginning of Chamfer Welding Neck	Welding Neck	Welding Neck	Diameter of Bolt Circle	Diameter of Bolt Holes	Number of Holes	Diameter of Bolts	0.06 in. Raised Face	Ring Joint
	'D'	'T'	'A'	'E'	'L'	'B'	'P'					
1/2	5.25	1.19	1.69	0.84	2.88	To be specified by purchased	3.50	0.88	4	3/4	4.75	4.75
3/4	5.50	1.25	2.00	1.05	3.12		3.75	0.88	4	3/4	5.00	5.00
1	6.25	1.38	2.25	1.32	3.50		4.25	1.00	4	7/8	5.50	5.50
1 1/4	7.25	1.50	2.88	1.66	3.75		5.12	1.12	4	1	6.00	6.00
1 1/2	8.00	1.75	3.12	1.90	4.38		5.75	1.25	4	1 1/8	6.75	6.75
2	9.25	2.00	3.75	2.38	5.00		6.75	1.12	8	1	7.00	7.00
2 1/2	10.50	2.25	4.50	2.88	5.62		7.75	1.25	8	1 1/8	7.75	8.00
3	12.00	2.62	5.25	3.50	6.62		9.00	1.38	8	1 1/4	8.75	9.00
4	14.00	3.00	6.50	4.50	7.50		10.75	1.62	8	1 1/2	10.00	10.25
5	16.50	3.62	8.00	5.56	9.00		12.75	1.88	8	1 3/4	11.75	12.25
6	19.00	4.25	9.25	6.63	10.75		14.50	2.12	8	2	13.50	14.00
8	21.75	5.00	12.00	8.63	12.50		17.25	2.12	12	2	15.00	15.50
10	26.50	6.50	14.75	10.75	16.50		21.25	2.62	12	2 1/2	19.25	20.00
12	30.00	7.25	17.38	12.75	18.25		24.38	2.88	12	2 3/4	21.25	22.00

GENERAL NOTE: Dimensions are in inches.



SECTION 6

API 6A Crosses
and Tees



Section 6. API 6A Crosses and Tees

API Flange Studded Crosses & Tees and Flanged Crosses & Tees are designed and manufactured in accordance with the following specifications:-

API 6A	Specification for Wellhead and Christmas Tree Equipment.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
ASME VIII	Boiler and Pressure Vessel Code.
MSS-SP-55	Quality Standards for Steel Castings for Valves, Flanges and Fittings and other Piping Components.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

API Flange Studded Crosses & Tees and Flanged Crosses & Tees are available either Equal or with Reducing configuration, for use with the following ratings:-

Max Working Pressure	2,000 PSI	3,000 PSI	5,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI
Test Pressure	4,000 PSI	6,000 PSI	7,500 PSI	15,000 PSI	22,500 PSI	30,000 PSI
Operating Temperature Range	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4
API Temperature Rating	K(-60℃)to Y(+345℃)	K(-60℃)to Y(+345℃)	K(-60℃)to Y(+345℃)	K(-60℃)to Y(+345℃)	K(-60℃)to Y(+345℃)	K(-60℃)to Y(+345℃)
API Specified Min.Yield	60,000 PSI	60,000 PSI	60,000 PSI	60,000 PSI	75,000 PSI	75,000 PSI
API Specified Min.Tensile	85,000PSI	85,000PSI	85,000PSI	85,000PSI	95,000PSI	95,000PSI
Material	API 60K	API 60K	API 60K	API 60K	API 75K	API 75K

GENERAL NOTE : Please contact JCC for any special material or dimensional requirements.
 Max. working pressures stated are suitable for temperature up to 121℃.
 De-rating of max. working pressure will occur as the operating temperature increases above 121℃. Consult JCC for further details.
 JCC generally offer AISI 4130 with 85,000 PSI min yield and 105,000 PSI min tensile.

Section 6. API 6A Crosses and Tees

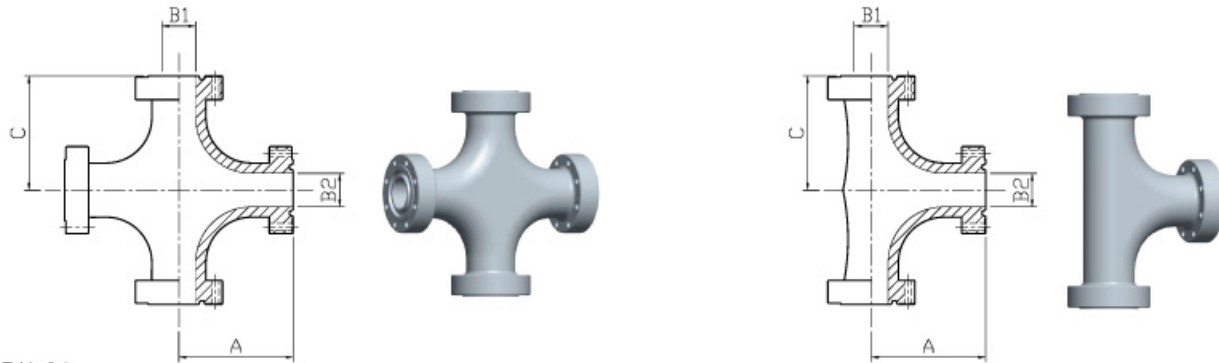


Table 6.1

API Flanged Crosses and Tees														
Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C	Centre to Face Horizontal Run A	Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C	Centre to Face Horizontal Run A	Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C	Centre to Face Horizontal Run A
	Vertical B1	Horizontal B2				Vertical B1	Horizontal B2				Vertical B1	Horizontal B2		
	(inches) + .03,-0	(inches) + .03,-0				(inches) ± .03	(inches) ± .03				(inches) + .03,-0	(inches) + .03,-0		
2,000	2⅞	2⅞	5.81	5.81	5,000	5⅞	4⅞	10.93	11.19	15,000	3⅞	3⅞	9.44	9.44
	2⅞	2⅞	5.94	6.31		5⅞	5⅞	12.19	12.19		4⅞	1⅜	8.69	10.25
	2⅞	2⅞	6.56	6.56		2⅞	1⅜	6.67	6.84		4⅞	2⅞	8.97	10.47
	3⅞	2⅞	6.06	6.69		2⅞	2⅞	6.92	6.92		4⅞	2⅞	9.59	10.72
	3⅞	2⅞	6.56	6.81		2⅞	1⅜	6.95	7.47		4⅞	3⅞	10.25	11.00
	3⅞	3⅞	7.06	7.06		2⅞	2⅞	7.20	7.55		4⅞	4⅞	11.69	11.69
	4⅞	2⅞	6.31	7.94		2⅞	2⅞	7.83	7.83		5⅞	1⅜	9.38	11.44
	4⅞	2⅞	6.81	8.06		3⅞	1⅜	7.23	8.22		5⅞	2⅞	9.63	11.63
	4⅞	3⅞	7.19	8.19		3⅞	2⅞	7.48	8.30		5⅞	2⅞	10.25	11.88
	4⅞	4⅞	8.56	8.56		3⅞	2⅞	8.11	8.58		5⅞	3⅞	10.94	12.18
3,000	3⅞	2⅞	7.31	7.81	10,000	3⅞	3⅞	8.86	8.86	20,000	5⅞	4⅞	12.38	12.75
	3⅞	2⅞	7.88	7.94		4⅞	1⅜	7.81	9.25		5⅞	5⅞	13.50	13.50
	3⅞	3⅞	7.56	7.56		4⅞	2⅞	8.06	9.33		1⅜	1⅜	8.94	8.94
	4⅞	2⅞	7.56	8.81		4⅞	2⅞	8.69	9.61		2⅞	1⅜	9.25	9.53
	4⅞	2⅞	8.12	8.94		4⅞	3⅞	9.44	9.89		2⅞	2⅞	9.84	9.84
	4⅞	3⅞	8.06	8.81		4⅞	4⅞	10.34	10.34		2⅞	1⅜	9.56	10.28
	4⅞	4⅞	9.06	9.06		5⅞	1⅜	8.19	10.06		2⅞	2⅞	10.16	10.59
	2⅞	2⅞	7.31	7.31		5⅞	2⅞	8.44	10.12		2⅞	2⅞	10.91	10.91
5,000	2⅞	2⅞	7.44	7.88	15,000	5⅞	2⅞	9.06	10.42	3⅞	1⅜	9.94	10.91	
	2⅞	2⅞	8.31	8.31		5⅞	3⅞	9.81	10.69	3⅞	2⅞	10.53	10.22	
	3⅞	2⅞	7.69	8.31		5⅞	4⅞	10.72	11.19	3⅞	2⅞	11.28	11.53	
	3⅞	2⅞	8.25	8.44		5⅞	5⅞	11.53	11.53	3⅞	3⅞	11.91	11.91	
	3⅞	3⅞	9.31	9.31		2⅞	1⅜	7.34	7.41	4⅞	1⅜	11.12	12.66	
	4⅞	2⅞	7.94	9.19		2⅞	2⅞	7.62	7.62	4⅞	2⅞	11.72	12.66	
	4⅞	2⅞	8.50	9.31		2⅞	1⅜	7.59	8.03	4⅞	2⅞	12.47	13.28	
	4⅞	3⅞	8.94	9.56		2⅞	2⅞	7.88	8.25	4⅞	3⅞	13.09	13.66	
	4⅞	4⅞	10.81	10.81		2⅞	2⅞	8.50	8.50	4⅞	4⅞	14.84	14.84	
	5⅞	2⅞	9.06	10.56		3⅞	1⅜	7.86	8.69					
	5⅞	2⅞	9.62	10.69		3⅞	2⅞	8.16	8.91					
	5⅞	3⅞	10.06	10.94		3⅞	2⅞	8.78	9.16					

GENERAL NOTE: Dimensions are in inches.

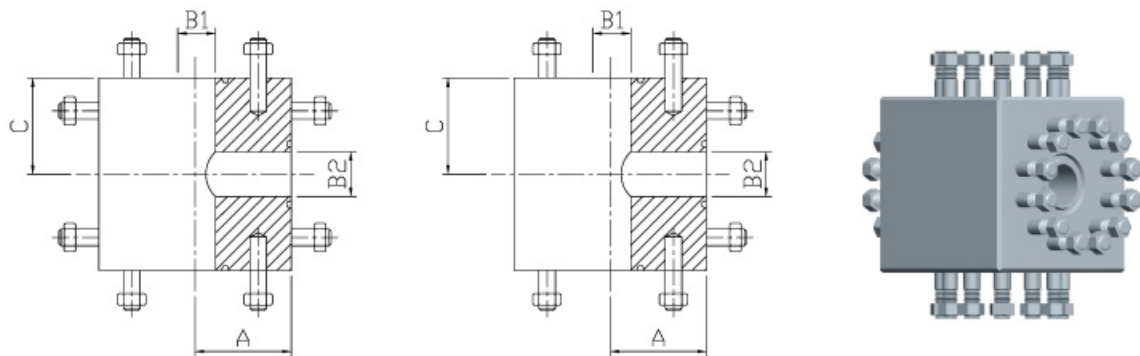


Table 6.2

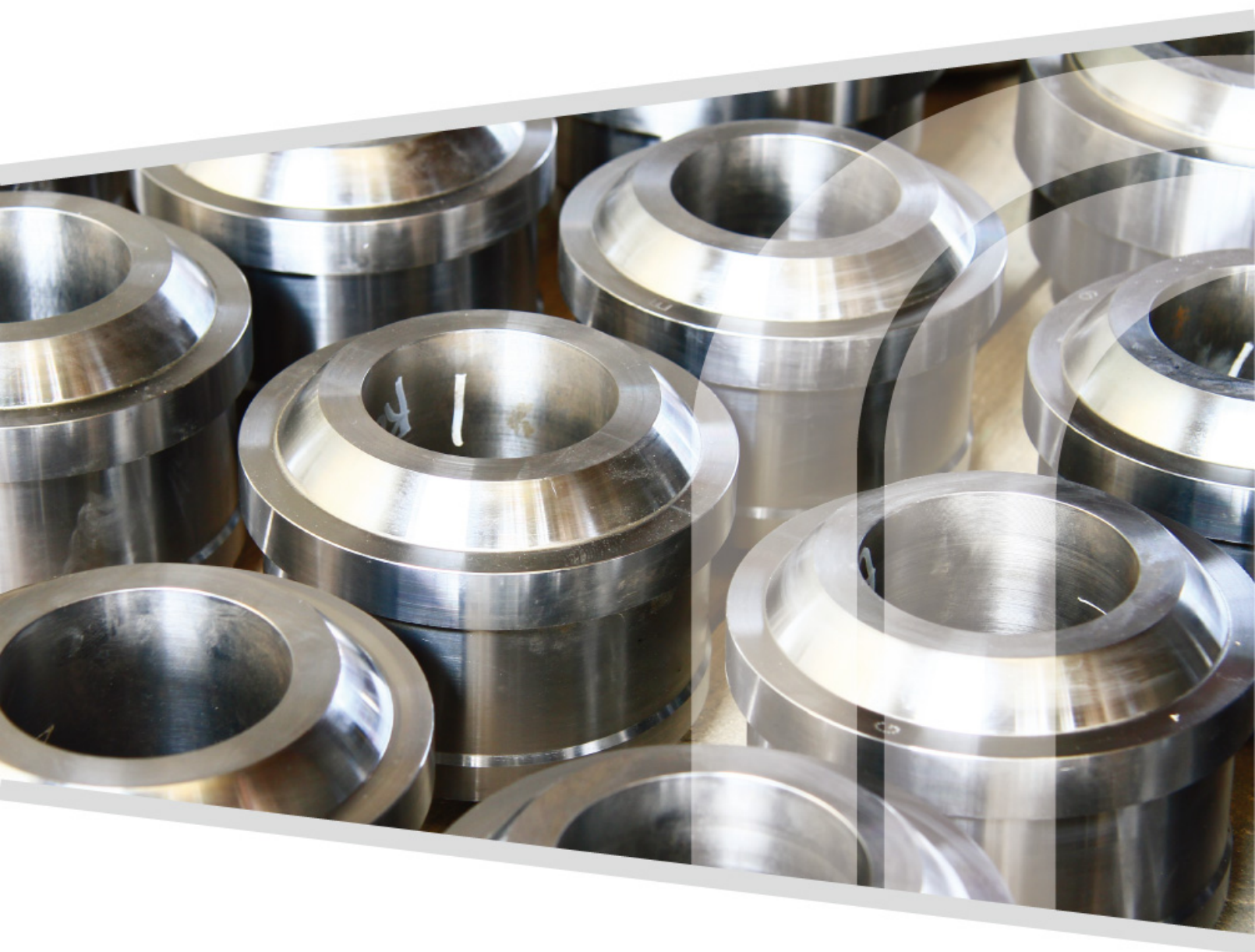
API Flanged Studded Crosses and Tees														
Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C (inches) ± .03	Centre to Face Horizontal Run A (inches) ± .03	Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C (inches) ± .03	Centre to Face Horizontal Run A (inches) ± .03	Rated Working Pressure (psi)	Nominal Size and Bore		Centre to Face Vertical Run C (inches) ± .03	Centre to Face Horizontal Run A (inches) ± .03
	Vertical B1	Horizontal B2				Vertical B1	Horizontal B2							
	(inches) + .03,-0	(inches) + .03,-0				(inches) + .03,-0	(inches) + .03,-0							
2,000	2 ¹ / ₁₆	2 ¹ / ₁₆	3.50	3.50	10,000	1 ¹³ / ₁₆	1 ¹³ / ₁₆	4.38	4.38	15,000	5 ¹ / ₈	1 ¹³ / ₁₆	6.62	8.75
	2 ³ / ₁₆	2 ¹ / ₁₆	3.50	4.00		2 ¹ / ₁₆	1 ¹³ / ₁₆	4.38	4.38		5 ¹ / ₈	2 ¹ / ₁₆	6.62	8.75
	2 ⁵ / ₁₆	2 ³ / ₁₆	4.50	4.50		2 ¹ / ₁₆	2 ¹ / ₁₆	4.38	4.38		5 ¹ / ₈	2 ³ / ₁₆	6.62	8.75
	3 ¹ / ₈	2 ¹ / ₁₆	3.50	4.50		2 ³ / ₁₆	1 ¹³ / ₁₆	4.50	5.12		5 ¹ / ₈	3 ¹ / ₁₆	6.62	8.75
	3 ¹ / ₈	2 ³ / ₁₆	4.50	4.50		2 ⁵ / ₁₆	2 ¹ / ₁₆	4.50	5.12		5 ¹ / ₈	4 ¹ / ₁₆	9.25	9.25
	3 ¹ / ₈	3 ¹ / ₈	4.50	4.50		2 ⁷ / ₁₆	2 ³ / ₁₆	5.12	5.12		5 ¹ / ₈	5 ¹ / ₈	9.25	9.25
	4 ¹ / ₁₆	2 ¹ / ₁₆	4.50	5.50		3 ¹ / ₁₆	1 ¹³ / ₁₆	4.50	5.88	20,000	1 ¹³ / ₁₆	1 ¹³ / ₁₆	6.47	6.47
	4 ¹ / ₁₆	2 ³ / ₁₆	4.50	5.50		3 ¹ / ₁₆	2 ¹ / ₁₆	4.50	5.88		2 ¹ / ₁₆	1 ¹³ / ₁₆	6.47	6.47
	4 ¹ / ₁₆	3 ¹ / ₈	4.50	5.50		3 ¹ / ₁₆	2 ³ / ₁₆	5.12	5.88		2 ¹ / ₁₆	2 ¹ / ₁₆	6.47	6.47
	4 ¹ / ₁₆	4 ¹ / ₁₆	5.50	5.50		3 ¹ / ₁₆	3 ¹ / ₁₆	5.88	5.88		2 ³ / ₁₆	1 ¹³ / ₁₆	7.28	7.28
3,000	3 ¹ / ₈	2 ¹ / ₁₆	4.50	5.00	20,000	4 ¹ / ₁₆	1 ¹³ / ₁₆	4.50	6.88	2 ³ / ₁₆	2 ¹ / ₁₆	7.28	7.28	
	3 ¹ / ₈	2 ³ / ₁₆	5.00	5.00		4 ¹ / ₁₆	2 ³ / ₁₆	4.50	6.88	2 ⁵ / ₁₆	2 ³ / ₁₆	7.28	7.28	
	3 ¹ / ₈	3 ¹ / ₈	5.00	5.00		4 ¹ / ₁₆	2 ⁵ / ₁₆	5.12	6.88	3 ¹ / ₁₆	1 ¹³ / ₁₆	7.97	7.97	
	4 ¹ / ₁₆	2 ¹ / ₁₆	4.50	6.12		4 ¹ / ₁₆	3 ¹ / ₁₆	5.88	6.88	3 ¹ / ₁₆	2 ¹ / ₁₆	7.97	7.97	
	4 ¹ / ₁₆	2 ³ / ₁₆	5.00	6.12		4 ¹ / ₁₆	4 ¹ / ₁₆	6.88	6.88	3 ¹ / ₁₆	2 ³ / ₁₆	7.97	7.97	
	4 ¹ / ₁₆	3 ¹ / ₈	5.00	6.12		5 ¹ / ₈	5 ¹³ / ₁₆	5.25	7.75	3 ¹ / ₁₆	3 ¹ / ₁₆	7.97	7.97	
	4 ¹ / ₁₆	4 ¹ / ₁₆	6.12	6.12		5 ¹ / ₈	2 ¹ / ₁₆	5.25	7.75	4 ¹ / ₁₆	1 ¹³ / ₁₆	9.91	9.91	
	4 ¹ / ₁₆	4 ¹ / ₁₆	6.12	6.12		5 ¹ / ₈	2 ³ / ₁₆	5.25	7.75	4 ¹ / ₁₆	2 ¹ / ₁₆	9.91	9.91	
5,000	2 ¹ / ₁₆	2 ¹ / ₁₆	4.50	4.50	15,000	5 ¹ / ₈	2 ³ / ₁₆	5.25	7.75	4 ¹ / ₁₆	2 ³ / ₁₆	9.91	9.91	
	2 ³ / ₁₆	2 ¹ / ₁₆	4.50	5.00		5 ¹ / ₈	3 ¹ / ₁₆	6.75	7.75	4 ¹ / ₁₆	3 ¹ / ₁₆	9.91	9.91	
	2 ⁵ / ₁₆	2 ³ / ₁₆	5.00	5.00		5 ¹ / ₈	4 ¹ / ₁₆	6.75	7.75	4 ¹ / ₁₆	4 ¹ / ₁₆	9.91	9.91	
	3 ¹ / ₈	2 ¹ / ₁₆	4.50	5.50		5 ¹ / ₈	5 ¹ / ₈	7.75	7.75					
	3 ¹ / ₈	2 ³ / ₁₆	5.50	5.50		1 ¹³ / ₁₆	1 ¹³ / ₁₆	5.00	5.00					
	3 ¹ / ₈	3 ¹ / ₈	5.50	5.50		2 ¹ / ₁₆	1 ¹³ / ₁₆	5.00	5.00					
	4 ¹ / ₁₆	2 ¹ / ₁₆	4.50	6.50		2 ¹ / ₁₆	2 ¹ / ₁₆	5.00	5.00					
	4 ¹ / ₁₆	2 ³ / ₁₆	5.00	6.50		2 ³ / ₁₆	1 ¹³ / ₁₆	5.50	5.50					
	4 ¹ / ₁₆	3 ¹ / ₈	5.50	6.50		2 ⁵ / ₁₆	2 ¹ / ₁₆	5.50	5.50					
	4 ¹ / ₁₆	4 ¹ / ₁₆	6.50	6.50		2 ⁷ / ₁₆	2 ³ / ₁₆	5.50	5.50					
	5 ¹ / ₈	2 ¹ / ₁₆	6.12	7.62		3 ¹ / ₁₆	1 ¹³ / ₁₆	6.31	6.31					
	5 ¹ / ₈	2 ³ / ₁₆	6.12	7.62		3 ¹ / ₁₆	2 ¹ / ₁₆	6.31	6.31					
	5 ¹ / ₈	3 ¹ / ₈	6.12	7.62		3 ¹ / ₁₆	2 ³ / ₁₆	6.31	6.31					
	5 ¹ / ₈	4 ¹ / ₁₆	7.97	7.97		3 ¹ / ₁₆	3 ¹ / ₁₆	6.31	6.31					
	5 ¹ / ₈	5 ¹ / ₈	7.97	7.97		4 ¹ / ₁₆	1 ¹³ / ₁₆	7.62	7.62					
						4 ¹ / ₁₆	2 ¹ / ₁₆	7.62	7.62					
				4 ¹ / ₁₆	2 ³ / ₁₆	7.62	7.62							
				4 ¹ / ₁₆	3 ¹ / ₁₆	7.62	7.62							
				4 ¹ / ₁₆	4 ¹ / ₁₆	7.62	7.62							

GENERAL NOTE: Dimensions are in inches.



SECTION 7

Hammer Lug Unions



Section 7. Hammer Lug Unions

Hammer Lug Unions are designed and manufactured in accordance with the following specifications:-

API 6A	Specification for Wellhead and Christmas Tree Equipment.
API RP-14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping.
ASME VIII	Boiler and Pressure Vessel Code.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Hammer Lug Unions are available in a range of sizes for use with the following ratings and services:-

Figure No:	100	200	206	600	602	1002*	1003**	1004	1502	2002	2202
Standard Service											
Max. Working Pressure	1,000 PSI	2,000 PSI	2,000 PSI	6,000 PSI	6,000 PSI	10,000 PSI	10,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI	N/A
Max. Test Pressure	1,500 PSI	3,000 PSI	3,000 PSI	9,000 PSI	9,000 PSI	15,000 PSI	15,000 PSI	15,000 PSI	22,500 PSI	30,000 PSI	N/A
Sour Service											
Max. Working Pressure	N/A	N/A	N/A	6,000 PSI	6,000 PSI	7,500 PSI	7,500 PSI	7,500 PSI	10,000 PSI	N/A	15,000 PSI
Max. Test Pressure	N/A	N/A	N/A	9,000 PSI	9,000 PSI	11,250 PSI	11,250 PSI	11,250 PSI	15,000 PSI	N/A	22,500 PSI

GENERAL NOTE : Please contact JCC for any special material or dimensional requirements.

* NOTE: 4", 5" and 6" Fig 1002 HLU's are de-rated to 7500 PSI CWP in standard service and 5,000 PSI CWP in sour service.

** NOTE: 4" and 5" Fig 1003 HLU's are de-rated to 7500 PSI CWP in standard service and 5,000 PSI CWP in sour service.

Section 7. Hammer Lug Unions

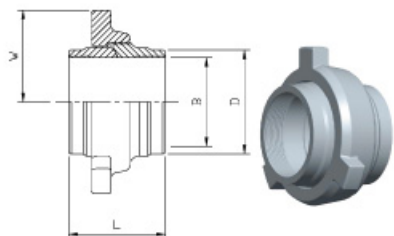


Fig 100 and Fig 200

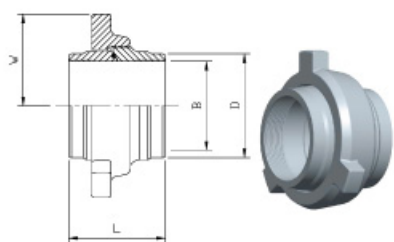


Fig 206 Union

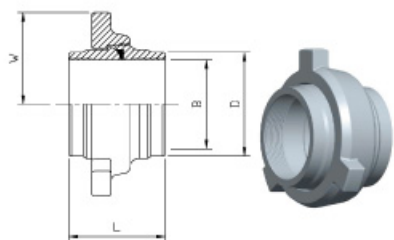


Fig 600 Union

Table 7.1

Figure 100 Union						
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L. End to End Threaded	B. Max Inside Diameter	Weight	
(in) (mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
2	50	73	70	82	55	2.20
2½	65	89	86	108	65	4.50
3	80	103	105	116	81	7.50
4	100	116	130	123	106	10.50
5	125	146	162	152	130	14.80
6	150	165	187	174	160	21.60
8	200	184	243	183	209	30.00

Table 7.2

Figure 200 and 206 Union						
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L. End to End Threaded	B. Max Inside Diameter	Weight	
(in) (mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1	25	51	40	63	28	0.80
1¼	32	57	51	71	37	1.00
1½	40	62	58	74	43	1.20
2	50	73	70	81	55	2.20
2½	65	89	84	105	65	3.80
3	80	99	104	117	81	6.70
4	100	114	130	125	106	8.30
5	125	146	162	152	130	14.80
6	150	165	187	174	160	21.60
8	200	184	243	183	209	30.00

Table 7.3

Figure 600 Union						
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L. End to End Threaded	B. Max Inside Diameter	Weight	
(in) (mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1	25	57	44	90	28	1.70
2	50	89	76	163	55	6.60
3	80	114	106	222	81	13.20
4	100	125	133	255	106	18.20

Section 7. Hammer Lug Unions

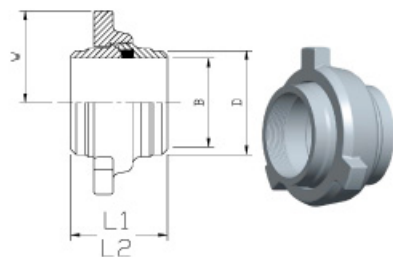


Fig 602 Union

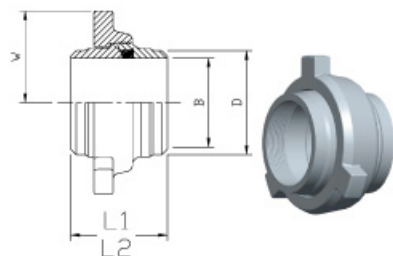


Fig 1002 Union

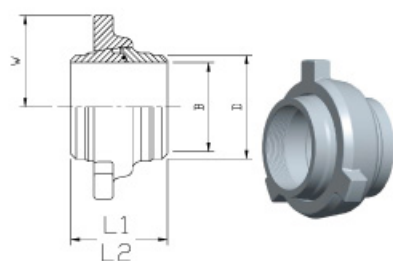


Fig 1003 Union

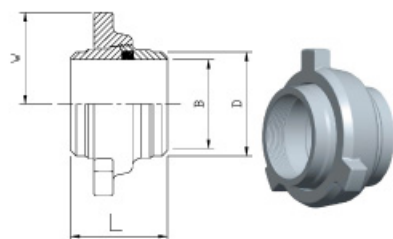


Fig 1004 Union

Table 7.4

Figure 602 Union							
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L1. End to End Threaded	L2. End to End Butt Weld	B. Inside Diameter Threaded	Weight	
(in)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1	25	57	44	89	90	28	1.80
1½	40	76	65	124	-	43	4.10
2	50	89	78	133	128	52	6.60
3	80	114	107	157	136	81	11.10
4	100	125	135	208	147	106	15.30

Table 7.5

Figure 1002 Union							
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L1. End to End Threaded	L2. End to End Butt Weld	B. Max Inside Diameter	Weight	
(in)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
1	25	57	33	89	90	28	1.80
2	50	89	77	133	127	52	6.60
3	80	114	107	157	136	77	11.10
4	100	125	135	208	147	102	15.30
5	125	152	141	-	157	-	27.00
6	150	184	169	-	166	-	39.00

Table 7.6

Figure 1003 Misaligning Union							
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L1. End to End Threaded	L2. End to End Butt Weld	B. Max Inside Diameter	Weight	
(in)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(kg)
2	50	89	73	120	120	50	6.00
3	80	124	113	232	231	81	20.10
4	100	152	140	279	279	101	36.90
5	125	152	141	-	278	-	36.40

Table 7.7

Figure 1004 Union					
Nominal Pipe Size	W. Nut Radius	D. Outside Diameter	L. End to End Butt Weld	Weight	
(in)	(mm)	(mm)	(mm)	(mm)	(kg)
5	125	152	141	210	38.60
6	150	184	168	238	36.60

Section 7. Hammer Lug Unions

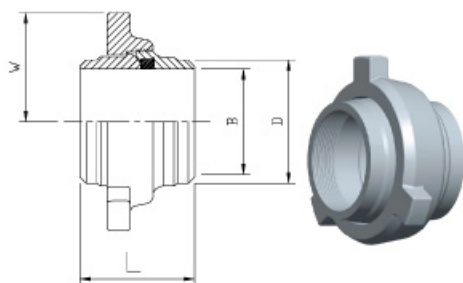


Fig 1502 Union

Table 7.8

Figure 1502 Union					
Nominal Pipe Size		W. Nut Radius	D. Outside Diameter	L. End to End Butt Weld	Weight
(in)	(mm)	(mm)	(mm)	(mm)	(kg)
1	25	69	55	111	3.70
1 1/2	40	93	75	137	7.50
2	50	95	82	157	9.50
3	80	116	114	133	13.00
4	100	152	114	216	34.00
5	125	165	141	229	43.00
6	150	184	168	248	66.00

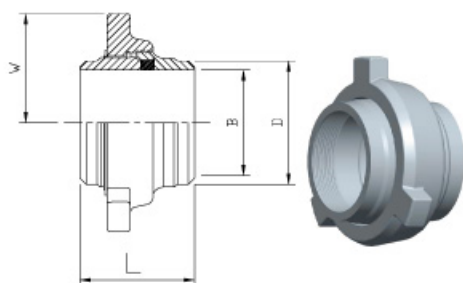


Fig 2002

Table 7.9

Figure 2002 Union					
Nominal Pipe Size		W. Nut Radius	D. Outside Diameter	L. End to End Butt Weld	Weight
(in)	(mm)	(mm)	(mm)	(mm)	(kg)
2	50	95	64	188	10.50
3*	80	124	105	243	21.80
4**	10	152	132	216	34.50
5	125	165	155	273	50.00
6	150	184	197	330	77.30

* NOTE: 3" Fig 2002 HLU is also known as 2 1/2" by other suppliers

** NOTE: 4" Fig 2002 HLU is also known as 3" by other suppliers

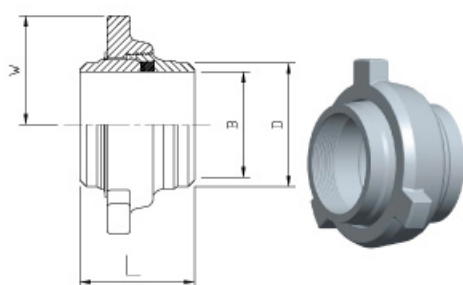


Fig 2202

Table 7.10

Figure 2202 Union					
Nominal Pipe Size		W. Nut Radius	D. Outside Diameter	L. End to End Butt Weld	Weight
(in)	(mm)	(mm)	(mm)	(mm)	(kg)
2	50	95	64	188	10.50
3*	80	124	105	243	21.80
4**	100	152	140	216	34.50
5	125	165	155	273	50.00
6	150	184	197	330	77.30

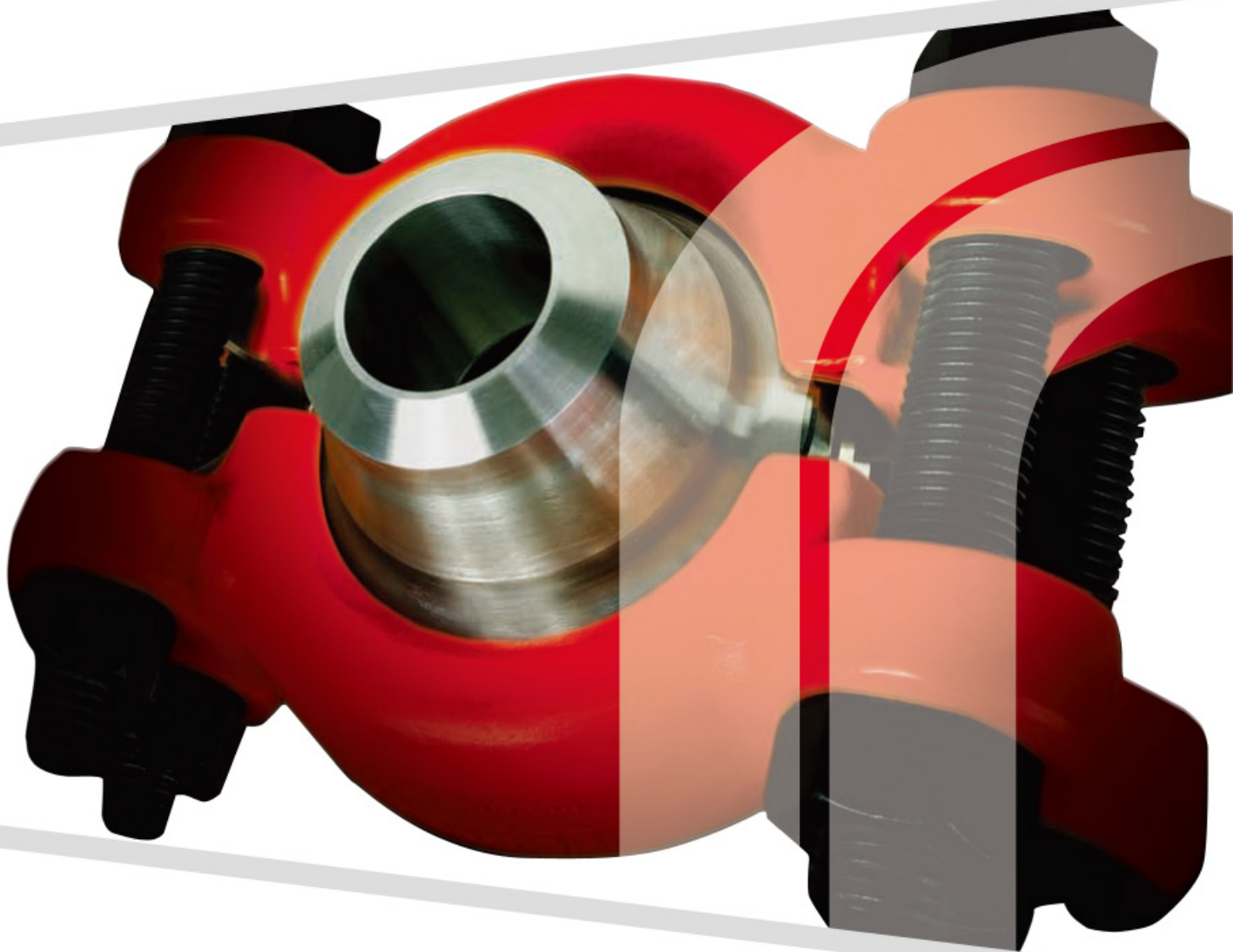
* NOTE: 3" Fig 2202 HLU is also known as 2 1/2" by other suppliers

** NOTE: 4" Fig 2202 HLU is also known as 3" by other suppliers



SECTION 8

Hubs and Clamps



Section 8. Hubs and Clamps

Hubs and Clamps are designed and manufactured in accordance with the following specifications:-

API 16A	Specification for Drill Through Equipment.
API 6A	Specification for Wellhead and Christmas Tree Equipment.
ASME VIII	Boiler and Pressure Vessel Code.
ANSI B31.3	Chemical Plant and Petroleum Refinery Piping.
NACE MR0175	Petroleum and natural gas industries—Materials for use in H ₂ S containing Environments in oil and gas production— Parts 1, 2, and 3

Hubs are available as Weld Neck, Integral & Blinds and are available in the following materials and pressure ratings:-

Max Working Pressure	2,000 PSI	3,000 PSI	5,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI
Test Pressure	3,000 PSI	4,500 PSI	7,500 PSI	15,000 PSI	22,500 PSI	30,000 PSI
Product Specification Levels	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4	1,2,3 & 4
API Temperature Rating	K(-60℃) to Y(+345℃)	K(-60℃) to Y(+345℃)	K(-60℃) to Y(+345℃)	K(-60℃) to Y(+345℃)	K(-60℃) to Y(+345℃)	K(-60℃) to Y(+345℃)
Min.Yield	60,000 PSI	60,000 PSI	60,000 PSI	60,000 PSI	75,000 PSI	75,000 PSI
Min. Tensile	85,000 PSI	85,000 PSI	85,000 PSI	85,000 PSI	95,000 PSI	95,000 PSI
Material	API 60K	API 60K	API 60K	API 60K	API 75K	API 75K

GENERAL NOTE : Please contact JCC for any special material or dimensional requirements.
 Max. working pressures stated are suitable for temperature up to 121℃.
 De-rating of max.working pressure will occur as the operating increases above 121℃. Consult JCC for further details.

Section 8. Hubs and Clamps

Section 8a API 16A Hubs and Clamps



Table 8a.1

API Type 16B Integral Hub Connections for 2,000 psi and 3,000 psi Rated Working Pressure							
Nominal Size and Bore B	Outside Diameter D	Total Thickness C	Large Diameter of Neck A	Neck Length for Clamp Clearance L	Ring Groove Number	Ring Gasket Number	Clamp Number
2,000 psi							
7 ¹ / ₁₆	10.375	1.443	8.875	2.50	SR-45	RX-45	25
16 ³ / ₄	20.375	1.269	19.000	3.13	SR-65	RX-65	12
21 ¹ / ₄	26.375	1.872	24.500	5.00	SR-73	RX-73	18
3,000 psi							
11	15.625	1.399	14.000	3.13	SR-53	RX-53	9
13 ⁵ / ₈	18.375	1.336	16.750	3.19	SR-57	RX-57	11
16 ³ / ₄	21.250	1.459	19.625	3.68	SR-65	RX-65	14

GENERAL NOTE: Dimensions are in inches.
Blind hub counterbore is optional.

Section 8. Hubs and Clamps

Section 8a API 16A Hubs and Clamps

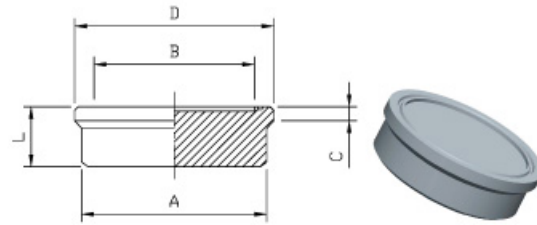
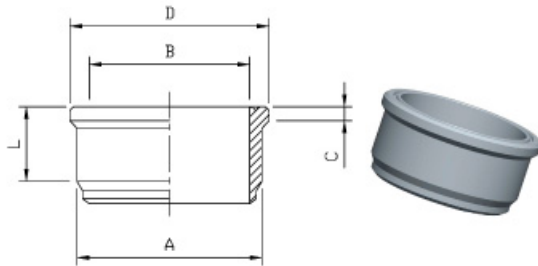


Table 8a.2

API Type 16BX Integral Hub Connections for 5,000 psi Rated Working Pressure

Nominal Size and Bore B	Outside Diameter D	Total Thickness C	Large Diameter of Neck A	Neck Length for Clamp Clearance L	Ring Gasket Number	Clamp Number
5,000 psi						
2 ¹ / ₁₆	5.031	1.166	3.656	2.22	BX-152	1
2 ⁹ / ₁₆	5.781	1.166	4.406	2.27	BX-153	2
3 ¹ / ₈	6.312	1.166	4.938	2.36	BX-154	4
4 ¹ / ₁₆	7.625	1.197	6.250	2.38	BX-155	5
7 ¹ / ₁₆	13.250	1.622	11.625	3.38	BX-156	6
9	13.250	1.622	11.625	3.38	BX-157	8
11	16.250	1.654	14.625	4.13	BX-158	10
13 ⁵ / ₈	20.625	1.871	19.000	4.88	BX-160	13
16 ³ / ₄	25.625	1.778	24.000	5.50	BX-162	19
21 ¹ / ₄	31.250	3.630	27.875	6.75	BX-165	27

GENERAL NOTE: Dimensions are in inches.
Blind hub counterbore is optional.

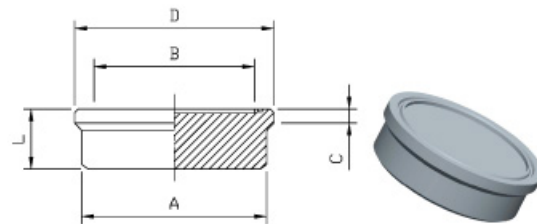
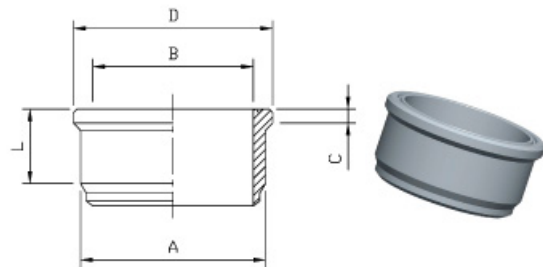


Table 8a.3

API Type 16BX Integral Hub Connections for 10,000 psi Rated Working Pressure

Nominal Size and Bore B	Outside Diameter D	Total Thickness C	Large Diameter of Neck A	Neck Length for Clamp Clearance L	Ring Gasket Number	Clamp Number
10,000 psi						
1 ³ / ₁₆	5.031	1.166	3.656	2.22	BX-151	1
2 ¹ / ₁₆	5.781	1.166	4.406	2.27	BX-152	2
2 ⁹ / ₁₆	6.312	1.166	4.938	2.36	BX-153	4
3 ¹ / ₁₆	7.625	1.197	6.250	2.38	BX-154	5
4 ¹ / ₁₆	8.437	1.310	6.812	2.82	BX-155	6
7 ¹ / ₁₆	16.250	1.653	14.625	4.13	BX-156	10
9	16.250	1.653	14.625	4.13	BX-157	10
11	20.625	2.035	18.625	4.75	BX-158	22
13 ⁵ / ₈	22.250	2.309	20.625	5.31	BX-159	15
16 ³ / ₄	28.000	3.005	25.000	6.17	BX-162	28
18 ³ / ₄	31.250	3.630	27.875	6.75	BX-164	27
21 ¹ / ₄	34.000	4.005	30.500	8.22	BX-166	26

GENERAL NOTE: Dimensions are in inches.
Blind hub counterbore is optional.

Section 8. Hubs and Clamps

Section 8a API 16A Hubs and Clamps

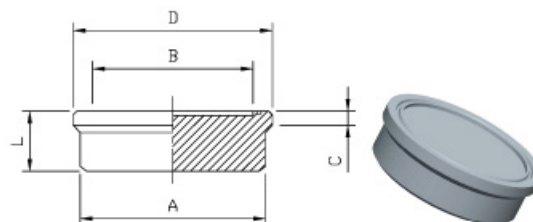
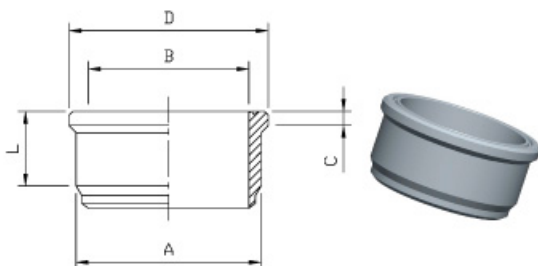


Table 8a.4

API Type 16BX Integral Hub Connections for 15,000 psi Rated Working Pressure

Nominal Size and Bore B	Outside Diameter D	Total Thickness C	Large Diameter of Neck A	Neck Length for Clamp Clearance L	Ring Gasket Number	Clamp Number
15,000 psi						
1 ³ / ₁₆	5.781	1.166	4.406	2.27	BX-151	2
2 ¹ / ₁₆	6.125	1.622	4.500	3.22	BX-152	3
2 ⁹ / ₁₆	6.125	1.622	4.500	3.22	BX-153	3
3 ¹ / ₁₆	8.437	1.310	6.812	2.82	BX-154	6
4 ¹ / ₁₆	13.250	1.622	11.625	3.38	BX-155	8
7 ¹ / ₁₆	20.626	2.035	18.625	4.75	BX-156	22
11	22.250	2.309	20.625	5.31	BX-158	15
13 ³ / ₈	28.000	3.005	25.000	6.17	BX-159	28
18 ³ / ₄	34.000	4.005	30.500	8.22	BX-164	26

GENERAL NOTE: Dimensions are in inches.
Blind hub counterbore is optional.

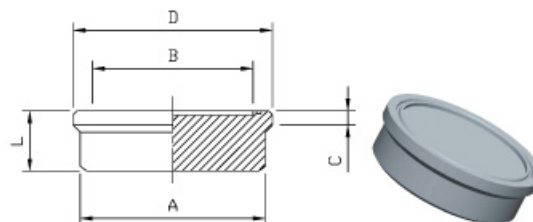
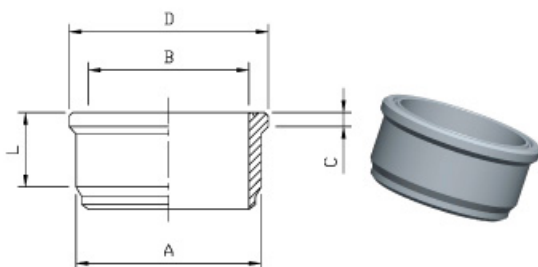


Table 8a.5

API Type 16BX Integral Hub Connections for 20,000 psi Rated Working Pressure

Nominal Size and Bore B	Outside Diameter D	Total Thickness C	Large Diameter of Neck A	Neck Length for Clamp Clearance L	Ring Gasket Number	Clamp Number
20,000 psi						
1 ³ / ₁₆	6.125	1.622	4.500	3.22	BX-151	3
2 ¹ / ₁₆	6.125	1.622	4.500	3.22	BX-152	3
2 ⁹ / ₁₆	8.437	1.310	6.812	2.82	BX-153	6
3 ¹ / ₁₆	13.250	1.622	11.625	3.38	BX-154	8
4 ¹ / ₁₆	16.250	1.653	14.625	4.13	BX-155	10
7 ¹ / ₁₆	22.250	2.308	20.625	5.31	BX-156	15
11	27.997	3.005	25.000	6.17	BX-158	28

GENERAL NOTE: Dimensions are in inches.
Blind hub counterbore is optional.

Section 8. Hubs and Clamps

Section 8a API 16A Hubs and Clamps

Table 8a.6

Clamps for API Type 16B and 16BX Hub Connections

HUB			HUB		
Clamp Number	API Designated Size	Working Pressure (psi)	Clamp Number	API Designated Size	Working Pressure (psi)
3	1 ³ / ₁₆	20,000	11	13 ⁵ / ₈	3,000
	2 ¹ / ₁₆	15,000	12	16 ³ / ₄	2,000
	2 ¹ / ₁₆	20,000	13	13 ⁵ / ₈	5,000
4	2 ⁹ / ₁₆	15,000	14	16 ³ / ₄	3,000
	2 ⁹ / ₁₆	10,000	15	7 ¹ / ₁₆	20,000
	3 ¹ / ₈	5,000		11	15,000
5	3 ¹ / ₁₆	10,000		13 ⁵ / ₈	10,000
	4 ¹ / ₁₆	5,000	18	21 ¹ / ₄	2,000
	2 ⁹ / ₁₆	20,000	19	16 ³ / ₄	5,000
6	3 ¹ / ₁₆	15,000	22	7 ¹ / ₁₆	15,000
	4 ¹ / ₁₆	10,000		11	10,000
	3 ¹ / ₁₆	20,000	25	7 ¹ / ₁₆	2,000
8	4 ¹ / ₁₆	15,000	26	16 ³ / ₄	15,000
	7 ¹ / ₁₆	5,000		21 ¹ / ₄	10,000
	9	5,000	27	18 ³ / ₄	10,000
9	11	3,000		21 ¹ / ₄	5,000
	4 ¹ / ₁₆	20,000	28	11	20,000
	7 ¹ / ₁₆	10,000		13 ⁵ / ₈	15,000
10	9	10,000		16 ³ / ₄	10,000
	11	5,000			

Table 8a.7

RX & BX RTJ Ring Numbers for API Specifications 16A Equipment

Ring Number	API Designated Size	Rated Working Pressure	Ring Number	API Designated Size	Rated Working Pressure	Ring Number	API Designated Size	Rated Working Pressure
Type 16B Integral Hub Connections:			Type 16BX Integral Hub Connections:					
RX 45	7 ¹ / ₁₆	2,000	BX 156	7 ¹ / ₁₆	5,000	BX 156	7 ¹ / ₁₆	15,000
RX 65	16 ³ / ₄	2,000	BX 157	9	5,000	BX 158	11	15,000
RX 73	21 ¹ / ₄	2,000	BX 158	11	5,000	BX 159	13 ⁵ / ₈	15,000
RX 53	11	3,000	BX 160	13 ⁵ / ₈	5,000	BX 164	18 ³ / ₄	15,000
RX 57	13 ⁵ / ₈	3,000	BX 162	16 ³ / ₄	5,000	BX 156	7 ¹ / ₁₆	20,000
RX 65	16 ³ / ₄	3,000	BX 165	21 ¹ / ₄	5,000	BX 158	11	20,000
			BX 156	7 ¹ / ₁₆	10,000			
			BX 157	9	10,000			
			BX 158	11	10,000			
			BX 159	13 ⁵ / ₈	10,000			
			BX 162	16 ³ / ₄	10,000			
			BX 164	18 ³ / ₄	10,000			
			BX 166	21 ¹ / ₄	10,000			

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

	HUBS				CLAMPS		SEALRINGS	
	A350 LF2 MOD	AISI 4130	A182 F316L	A182 F51	AISI 4140	A182 F304	AISI 4140	A564 630 (17-4PH)
Min. Tensile	70,000 PSI	90,000 PSI	75,000 PSI	90,000 PSI	100,000 PSI	75,000 PSI	100,000 PSI	115,000 PSI
Min. Yield	52,000 PSI	60,000 PSI	30,000 PSI	65,000 PSI	75,000 PSI	30,000 PSI	75,000 PSI	75,000 PSI
Hardness (Max.)	197 BHN	235 BHN	N/A	28 HRC	22 HRC	N/A	22 HRC	33 HRC
Impact Values	54/40 JOULES	40/32 JOULES	N/A	70/65 JOULES	42/32 JOULES	N/A	27/20 JOULES	27/20 JOULES
Impact Test Temp	-46°C	-46°C	N/A	-50°C	-46°C	N/A	-46°C	-46°C
Temper Temp	650°C	650°C	N/A	N/A	620°C	N/A	N/A	N/A

GENERAL NOTE: Please contact JCC for any special material or dimensional requirements.

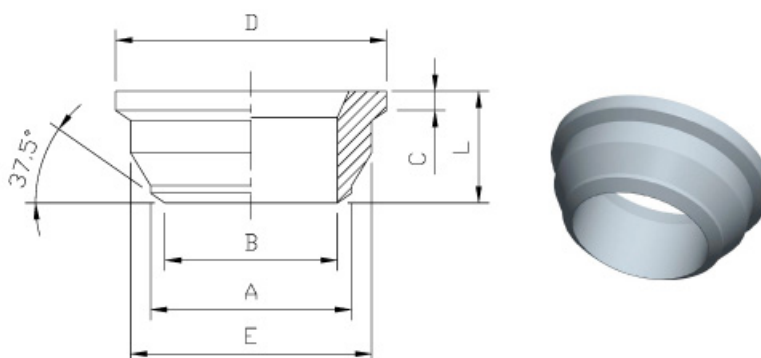


Table 8b.1

API Butt Weld Hubs Standard Clamp Series															
N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
ins	mm			ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
1/2"	(DN 15)	Std 40 40S	1in/5	0.622	15.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.6	0.3
0.840	(21.3)	XS 80 80S	1in/5	0.546	13.9	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.6	0.3
		160	1in/4	0.466	11.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.6	0.3
		XXS	1in/4	0.252	6.4	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.7	0.3
3/4"	(DN20)	Std 40 40S	1in/7	0.824	20.9	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.5	0.2
1.050	(26.7)	XS 80 80S	1in/7	0.742	18.8	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.6	0.3
		160	1in/5	0.614	15.6	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.7	0.3
		XXS	1in/4	0.434	11.0	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.7	0.3
1"	(DN25)	Std 40 40S	1in/11	1.049	26.6	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.5	0.2
1.315	(33.4)	XS 80 80S	1in/11	0.957	24.3	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.5	0.2
		160	1in/7	0.815	20.7	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.6	0.3
		XXS	1in/5	0.599	15.2	2.000	50.8	1.750	44.5	1.500	38.1	0.313	8.0	0.7	0.3
1 1/2"	(DN40)	Std 40 40S	1-1/2in/14	1.610	40.9	3.125	79.4	2.375	60.3	2.375	60.3	0.437	11.1	1.6	0.7
1.900	(48.3)	XS 80 80S	1-1/2in/13	1.500	38.1	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	1.9	0.8
		160	1-1/2in/13	1.338	34.0	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	2.0	0.9
		XXS	1-1/2in/11	1.100	27.9	3.125	79.4	2.375	60.3	2.375	60.3	0.500	12.7	2.4	1.1

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

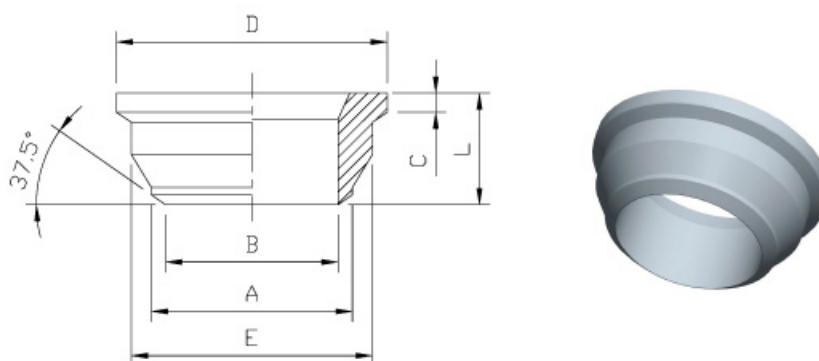


Table 8b.1

API Butt Weld Hubs Standard Clamp Series

N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
ins	mm			ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
2"	(DN50)	Std 40 40S	2in/20	2.067	52.5	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	2.2	1.0
2.375	(60.3)	XS 80 80S	2in/20	1.939	49.3	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	2.5	1.1
		160	2in/16	1.689	42.9	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	3.0	1.4
		XXS	2in/14	1.503	38.2	3.625	92.1	2.750	69.9	2.875	73.0	0.437	11.1	3.4	1.5
3"	(DN75)	Std 40 40S	3in/27	3.068	77.9	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	4.7	2.1
3.500	(88.9)	XS 80 80S	3in/27	2.900	73.7	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	5.2	2.4
		160	3in/25	2.624	66.6	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	6.3	2.9
		XXS	3in/23	2.300	58.4	5.000	127.0	3.250	82.6	4.000	101.6	0.500	12.7	7.4	3.3
4"	(DN100)	Std 40 40S	4in/40	4.026	102.3	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	6.7	3.1
4.500	(114.3)	XS 80 80S	4in/40	3.826	97.2	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	7.7	3.5
		160	4in/34	3.438	87.3	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	10.0	4.5
		XXS	4in/31	3.152	80.1	6.000	152.4	3.625	92.1	5.000	127.0	0.500	12.7	11.5	5.2
5"	(DN125)	Std 40 40S	5in/52	5.047	128.2	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	13.3	6.0
5.563	(141.3)	XS 80 80S	5in/52	4.813	122.3	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	14.8	6.7
		160	5in/46	4.313	109.6	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	19.2	8.7
		XXS	5in/40	4.063	103.2	7.500	190.5	4.375	111.1	6.500	165.1	0.625	15.9	21.9	9.9
6"	(DN 150)	Std 40 40S	6in/62	6.065	154.1	9.250	235.0	4.625	117.5	7.750	196.9	0.750	19.1	20.4	9.2
6.625	(168.3)	XS 80 80S	6in/56	5.761	146.3	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	24.9	11.3
		120	6in/64	5.501	139.7	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	27.7	12.6
		160	6in/52	5.189	138.8	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	30.7	13.9
		XXS	6in/52	4.897	124.4	9.250	235.0	4.625	117.5	7.750	196.9	0.812	20.6	32.7	14.8
8"	(DN 200)	Std 40 40S	8in/82	7.981	202.7	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	33.0	15.0
8.625	(219.1)	XS 80 80S	8in/76	7.625	193.7	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	40.3	18.3
		100	8in/76	7.439	189.0	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	42.4	19.2
		120	8in/72	7.189	182.6	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	47.8	21.7
		140	8in/72	7.001	177.8	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	49.9	22.6
		XXS	8in/67	6.875	174.6	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	52.9	24.0
		160	8in/67	6.813	173.1	11.500	292.1	5.375	136.5	10.000	254.0	0.750	19.1	53.6	24.3

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

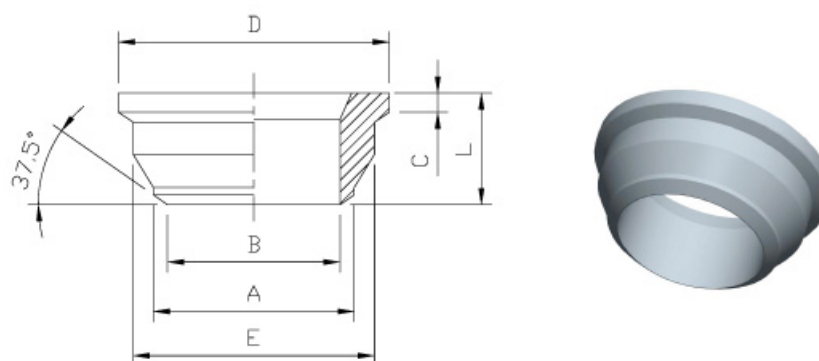


Table 8b.2

Butt Weld Hubs Heavy Duty Clamp Series (Non-standard)

N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
				ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
2"	(DN50)	Std 40 40S	H2in/20	2.067	52.5	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	6.2	2.8
2.375	(60.3)	XS 80 80S	H2in/20	1.939	49.3	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	6.5	2.9
		160	H2in/16	1.689	42.9	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	7.1	3.2
		XXS	H2in/14	1.503	38.2	4.750	120.7	3.250	82.6	3.750	95.3	0.625	15.9	7.5	3.4
3"	(DN75)	Std 40 40S	H3in/27	3.068	77.9	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	7.3	3.3
3.500	(88.9)	XS 80 80S	H3in/27	2.900	73.7	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	8.0	3.6
		160	H3in/25	2.624	66.6	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	9.2	4.2
		XXS	H3in/23	2.300	58.4	5.500	139.7	3.500	88.9	4.500	114.3	0.625	15.9	10.3	4.7
4"	(DN100)	Std 40 40S	H4in/40	4.026	102.3	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	11.9	5.4
4.500	(114.3)	XS 80 80S	H4in/40	3.826	97.2	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	13.0	5.9
		160	H4in/34	3.438	87.3	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	15.5	7.0
		XXS	H4in/31	3.152	80.1	6.750	171.5	4.000	101.6	5.750	146.1	0.625	15.9	17.2	7.8
8"	(DN200)	Std 40 40S	H8in/82	7.981	202.7	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	31.6	14.3
8.625	(219.1)	XS 80 80S	H8in/76	7.625	193.7	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	38.3	17.4
		100	H8in/76	7.439	189.0	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	40.3	18.3
		120	H8in/72	7.189	182.6	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	45.4	20.6
		140	H8in/72	7.001	177.8	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	47.2	21.4
		XXS	H8in/67	6.875	174.6	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	50.1	22.7
		160	H8in/67	6.813	173.1	11.500	292.1	5.000	127.0	9.500	241.3	1.000	25.4	50.7	23.0
10"	(DN250)	Std 40 40S	H10in/102	10.020	254.5	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	49.9	22.6
10.750	(273.1)	XS 60 80S	H10in/97	9.750	247.7	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	57.5	26.1
		80	H10in/97	9.564	242.9	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	60.7	27.6
		100	H10in/94	9.314	236.6	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	67.6	30.7
		120	H10in/92	9.064	230.2	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	71.4	32.4
		XXS 140	H10in/87	8.750	222.3	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	80.5	36.5
		160	H10in/84	8.500	215.9	13.625	346.1	6.000	152.4	11.625	295.3	1.250	31.8	86.2	39.1

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

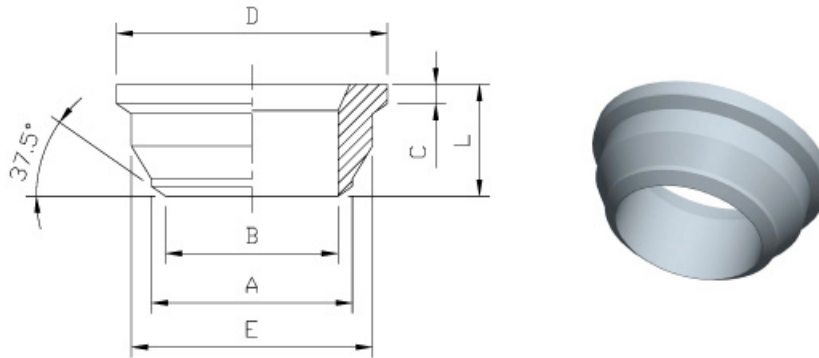


Table 8b.2

Butt Weld Hubs Heavy Duty Clamp Series (Non-standard)

N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
				ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
12"	(DN300)	Std 40S	H12in/120	12.000	304.8	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	77.1	35.0
12.750	(323.9)	40	H12in/120	11.938	303.2	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	78.8	35.8
		XS 80S	H12in/116	11.750	298.5	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	85.4	38.7
		80	H12in/116	11.376	289.0	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	94.4	42.8
		100	H12in/112	11.064	281.0	16.000	406.4	6.625	168.3	14.000	355.6	1.250	31.8	104.3	47.3
		XXS 120	H12in/106	10.750	273.1	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	112.9	51.2
		140	H12in/106	10.500	266.7	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	118.3	53.7
		160	H12in/102	10.126	257.2	16.000	406.4	6.625	168.3	14.000	355.6	1.375	34.9	129.3	58.7
14"	(DN350)	40	H14in/134	13.124	333.3	18.500	469.9	7.250	184.2	16.500	419.1	1.187	30.1	124.7	56.6
14.000	(355.6)	XS	H14in/130	13.000	330.2	18.500	469.9	7.250	184.2	16.500	419.1	1.187	30.1	133.2	60.4
		80	H14in/124	12.500	317.5	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	153.3	69.5
		100	H14in/124	12.124	307.9	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	163.8	74.3
		120	H14in/120	11.814	300.1	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	177.3	80.4
		140	H14in/116	11.500	292.1	18.500	469.9	7.250	184.2	16.500	419.1	1.250	31.8	187.2	84.9
		160	H14in/112	11.188	284.2	18.500	469.9	7.250	184.2	16.500	419.1	1.125	28.6	197.0	89.4
16"	(DN400)	XS 40	H16in/152	15.000	381.0	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	194.8	88.4
16.000	(406.4)	60	H16in/152	14.688	373.1	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	206.3	93.6
		80	H16in/144	14.314	363.6	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	229.1	103.9
		100	H16in/140	13.938	354.0	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	247.5	112.3
		120	H16in/137	13.564	344.5	21.000	533.4	7.875	200.0	19.000	482.6	1.625	41.3	260.5	118.2
		140	H16in/134	13.124	333.3	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	279.4	126.8
		160	H16in/130	12.812	325.4	21.000	533.4	7.875	200.0	19.000	482.6	1.688	42.9	293.9	133.3

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

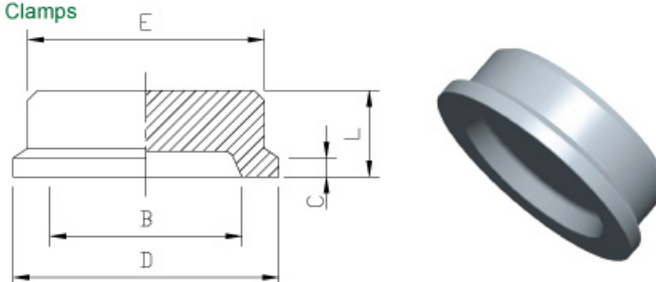


Table 8b.3

Blind Hubs Standard Clamp Series															
N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
ins	mm			ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
1/2*	(DN15)	Std 40 40S	1in/5	0.622	15.8	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
0.840	(21.3)	XS 80 80S	1in/5	0.546	13.9	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		160	1in/4	0.466	11.8	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		XXS	1in/4	0.252	6.4	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
3/4*	(DN20)	Std 40 40S	1in/7	0.824	20.9	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
1.050	(26.7)	XS 80 80S	1in/7	0.742	18.8	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		160	1in/5	0.614	15.6	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		XXS	1in/4	0.434	11.0	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
1"	(DN25)	Std 40 40S	1in/11	1.049	26.6	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
1.315	(33.4)	XS 80 80S	1in/11	0.957	24.3	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		160	1in/7	0.815	20.7	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
		XXS	1in/5	0.599	15.2	2.000	50.8	1.313	33.4	1.500	38.1	0.313	8.0	0.8	0.4
1 1/2*	(DN40)	Std 40 40S	1- 1/2 in/14	1.610	40.9	3.125	79.4	1.625	41.3	2.375	60.3	0.437	11.1	2.4	1.1
1.900	(48.3)	XS 80 80S	1- 1/2 in/13	1.500	38.1	3.125	79.4	1.625	41.3	2.375	60.3	0.500	12.7	2.5	1.1
		160	1- 1/2 in/13	1.338	34.0	3.125	79.4	1.625	41.3	2.375	60.3	0.500	12.7	2.5	1.1
		XXS	1- 1/2 in/11	1.100	27.9	3.125	79.4	1.625	41.3	2.375	60.3	0.500	12.7	2.5	1.1
2"	(DN50)	Std 40 40S	2in/20	2.067	52.5	3.625	92.1	1.750	44.5	2.875	73.0	0.437	11.1	3.7	1.7
2.375	(60.3)	XS 80 80S	2in/20	1.939	49.3	3.625	92.1	1.750	44.5	2.875	73.0	0.437	11.1	3.7	1.7
		160	2in/16	1.689	42.9	3.625	92.1	1.750	44.5	2.875	73.0	0.437	11.1	3.7	1.7
		XXS	2in/14	1.503	38.2	3.625	92.1	1.750	44.5	2.875	73.0	0.437	11.1	3.7	1.7
3"	(DN75)	Std 40 40S	3in/27	3.068	77.9	5.000	127.0	1.875	47.6	4.000	101.6	0.500	12.7	7.7	3.5
3.500	(88.9)	XS 80 80S	3in/27	2.900	73.7	5.000	127.0	1.875	47.6	4.000	101.6	0.500	12.7	7.7	3.5
		160	3in/25	2.624	66.6	5.000	127.0	1.875	47.6	4.000	101.6	0.500	12.7	7.7	3.5
		XXS	3in/23	2.300	58.4	5.000	127.0	1.875	47.6	4.000	101.6	0.500	12.7	7.7	3.5
4"	(DN100)	Std 40 40S	4in/40	4.026	102.3	6.000	152.4	2.125	54.0	5.000	127.0	0.500	12.7	13.0	5.9
4.500	(114.3)	XS 80 80S	4in/40	3.826	97.2	6.000	152.4	2.125	54.0	5.000	127.0	0.500	12.7	13.0	5.9
		160	4in/34	3.438	87.3	6.000	152.4	2.125	54.0	5.000	127.0	0.500	12.7	13.0	5.9
		XXS	4in/31	3.152	80.1	6.000	152.4	2.125	54.0	5.000	127.0	0.500	12.7	13.0	5.9
5"	(DN125)	Std 40 40S	5in/52	5.047	128.2	7.500	190.5	2.750	69.9	6.500	165.1	0.625	15.9	27.8	12.6
5.563	(141.3)	XS 80 80S	5in/52	4.813	122.3	7.500	190.5	2.750	69.9	6.500	165.1	0.625	15.9	27.8	12.6
		160	5in/46	4.313	109.6	7.500	190.5	2.750	69.9	6.500	165.1	0.625	15.9	27.8	12.6
		XXS	5in/40	4.063	103.2	7.500	190.5	2.750	69.9	6.500	165.1	0.625	15.9	27.8	12.6
6"	(DN150)	Std 40 40S	6in/62	6.065	154.1	9.250	235.0	2.875	73.0	7.750	196.9	0.750	19.1	42.6	19.3
6.625	(168.3)	XS 80 80S	6in/56	5.761	146.3	9.250	235.0	2.875	73.0	7.750	196.9	0.812	20.6	43.0	19.5
		120	6in/54	5.501	139.7	9.250	235.0	2.875	73.0	7.750	196.9	0.812	20.6	43.0	19.5
		160	6in/52	5.189	131.8	9.250	235.0	2.875	73.0	7.750	196.9	0.812	20.6	43.0	19.5
		XXS	6in/52	4.897	124.4	9.250	235.0	2.875	73.0	7.750	196.9	0.812	20.6	43.0	19.5
8"	(DN200)	Std 40 40S	8in/82	7.981	202.7	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
8.625	(219.1)	XS 80 80S	8in/76	7.625	193.7	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
		100	8in/76	7.439	189.0	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
		120	8in/72	7.189	182.6	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
		140	8in/72	7.001	177.8	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
		XXS	8in/67	6.875	174.6	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6
		160	8in/67	6.813	173.1	11.500	292.1	3.188	81.0	10.000	254.0	0.750	19.1	76.2	34.6

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

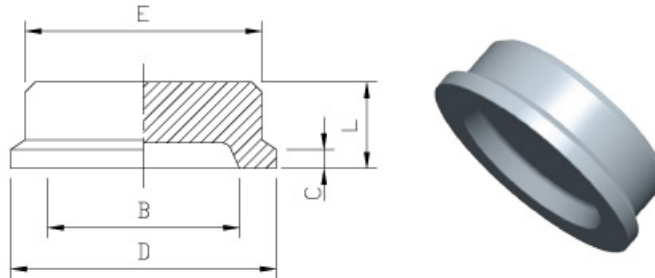


Table 8b.4

Blind Hubs Heavy Duty Clamp Series

N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
				ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
2"	(DN50)	Std 40 40S	H2in/20	2.067	52.5	4.750	120.7	1.875	63.5	3.750	95.3	0.625	15.9	7.0	3.2
2.375	(60.3)	XS 80 80S	H2in/20	1.939	49.3	4.750	120.7	1.875	63.5	3.750	95.3	0.625	15.9	7.0	3.2
		160	H2in/16	1.689	42.9	4.750	120.7	1.875	63.5	3.750	95.3	0.625	15.9	7.0	3.2
		XXS	H2in/14	1.503	38.2	4.750	120.7	1.875	63.5	3.750	95.3	0.625	15.9	7.0	3.2
3"	(DN75)	Std 40 40S	H3in/27	3.068	77.9	5.500	139.7	2.125	66.7	4.500	114.3	0.625	15.9	11.0	5.0
3.500	(88.9)	XS 80 80S	H3in/27	2.900	73.7	5.500	139.7	2.125	66.7	4.500	114.3	0.625	15.9	11.0	5.0
		160	H3in/25	2.624	66.6	5.500	139.7	2.125	66.7	4.500	114.3	0.625	15.9	11.0	5.0
		XXS	H3in/23	2.300	58.4	5.500	139.7	2.125	66.7	4.500	114.3	0.625	15.9	11.0	5.0
4"	(DN100)	Std 40 40S	H4in/40	4.026	102.3	6.750	171.5	2.750	82.6	5.750	146.1	0.625	15.9	21.9	10.0
4.500	(114.3)	XS 80 80S	H4in/40	3.826	97.2	6.750	171.5	2.750	82.6	5.750	146.1	0.625	15.9	21.9	10.0
		160	H4in/34	3.438	87.3	6.750	171.5	2.750	82.6	5.750	146.1	0.625	15.9	21.9	10.0
		XXS	H4in/31	3.152	80.1	6.750	171.5	2.750	82.6	5.750	146.1	0.625	15.9	21.9	10.0
8"	(DN200)	Std 40 40S	H8in/82	7.981	202.7	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
8.625	(219.1)	XS 80 80S	H8in/76	7.625	193.7	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
		100	H8in/76	7.439	189.0	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
		120	H8in/72	7.189	182.6	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
		140	H8in/72	7.001	177.8	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
		XXS	H8in/67	6.875	174.6	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
		160	H8in/67	6.813	173.1	11.500	292.1	3.188	88.9	9.500	241.3	1.000	25.4	73.3	33.2
10"	(DN250)	Std 40 40S	H10in/102	10.020	254.5	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
10.750	(273.1)	XS 60 80S	H10in/97	9.750	247.7	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
		80	H10in/97	9.564	242.9	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
		100	H10in/94	9.314	236.6	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
		120	H10in/92	9.064	230.2	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
		XXS 140	H10in/87	8.750	222.3	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1
		160	H10in/84	8.500	215.9	13.625	346.1	3.500	81.0	11.625	295.3	1.250	31.8	119.2	54.1

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

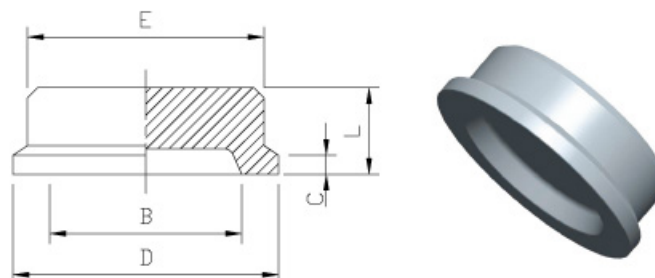


Table 8b.4

Blind Hubs Heavy Duty Clamp Series															
N.P.S. O.Dia A	(DN)	Pipe Schedule	Typical Designation Hub/S.Ring	Pipe Inside Diameter B		Hub Outside Diameter D		Hub Length L		Hub Backface Diameter E		Lip Thickness C		BW Hub Weight	
				ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
12"	(DN300)	Std 40S	H12in/120	12.000	304.8	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
12.750	(323.9)	40	H12in/120	11.938	303.2	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
		XS 80S	H12in/116	11.750	298.5	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
		80	H12in/116	11.376	289.0	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
		100	H12in/112	11.064	281.0	16.000	406.4	4.000	96.9	14.000	355.6	1.250	31.8	182.8	82.9
		XXS 120	H12in/106	10.750	273.1	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
		140	H12in/106	10.500	266.7	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
		160	H12in/102	10.126	257.2	16.000	406.4	4.000	96.9	14.000	355.6	1.375	34.9	184.5	83.7
14"	(DN350)	40	H14in/134	13.124	333.3	18.500	469.9	4.500	114.3	16.500	419.1	1.187	30.1	290.8	131.9
14.000	(355.6)	XS	H14in/130	13.000	330.2	18.500	469.9	4.500	114.3	16.500	419.1	1.187	30.1	290.8	131.9
		80	H14in/124	12.500	317.5	18.500	469.9	4.500	114.3	16.500	419.1	1.250	31.8	291.8	132.3
		100	H14in/124	12.124	307.9	18.500	469.9	4.500	114.3	16.500	419.1	1.250	31.8	291.8	132.3
		120	H14in/120	11.814	300.1	18.500	469.9	4.500	114.3	16.500	419.1	1.250	31.8	291.8	132.3
		140	H14in/116	11.500	292.1	18.500	469.9	4.500	114.3	16.500	419.1	1.250	31.8	291.8	132.3
		160	H14in/112	11.188	284.2	18.500	469.9	4.500	114.3	16.500	419.1	1.125	28.6	289.8	131.5
16"	(DN400)	XS 40	H16in/152	15.000	381.0	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6
16.000	(406.4)	60	H16in/152	14.688	373.1	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6
		80	H16in/144	14.314	363.6	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6
		100	H16in/140	13.398	354.0	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6
		120	H16in/137	13.564	344.5	21.000	533.4	5.000	127.0	19.000	482.6	1.625	41.3	431.2	195.6
		140	H16in/134	13.124	333.3	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6
		160	H16in/130	12.812	325.4	21.000	533.4	5.000	127.0	19.000	482.6	1.688	42.9	431.2	195.6

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

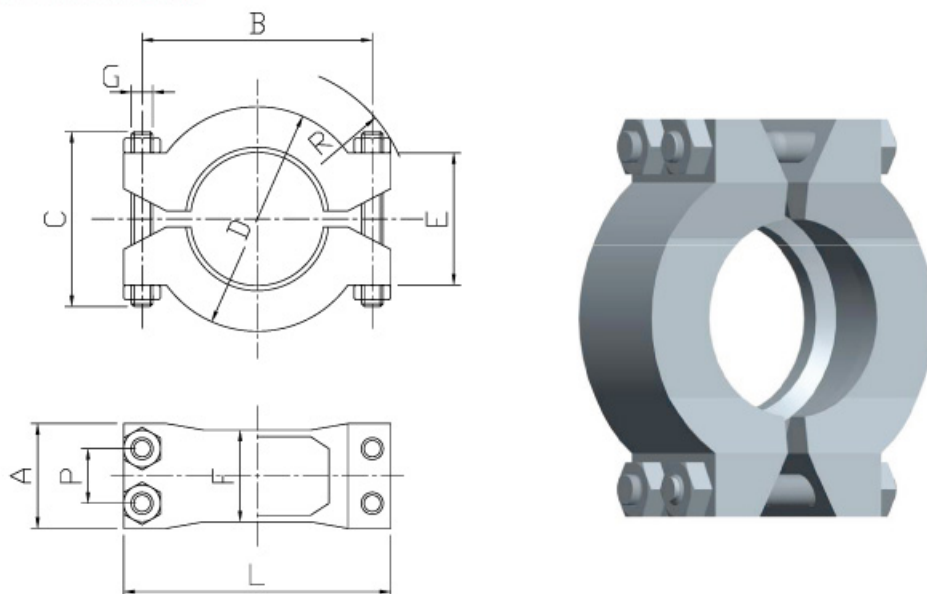


Table 8b.5

Clamps																						
Clamp Bolts Coating	Bolt Centres B		Clamp OD D		Overall Length L		Clamp Width F		Lug Separation E		Clamp Clearance R		Bolt Diameter G		Bolt Length C		Bolt Lug Width A		Bolt Pitch P		Clamp Weight	
	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	lb	kg
Standard Series Clamp Size																						
1"	3.25	83	2.81	71	4.25	108	1.38	35	2.19	56	2.63	67	0.500	13	3.50	89	2.25	57	1.25	32	4.2	1.9
1½"	5.00	127	4.50	114	6.50	165	2.00	51	3.25	83	4.00	102	0.625	16	5.00	127	3.13	79	1.63	41	9.9	4.5
2"	5.75	146	5.50	140	7.50	191	2.00	51	3.52	89	4.50	114	0.750	19	5.25	133	3.38	86	1.81	46	13.2	6.0
3"	7.50	191	6.88	175	9.25	235	2.38	60	4.60	117	5.25	133	0.750	19	6.50	165	3.38	86	1.81	46	23.6	10.7
4"	8.50	216	8.25	210	10.50	267	2.38	60	5.40	137	6.00	152	0.875	22	7.50	191	4.00	102	2.06	52	28.7	13.0
5"	10.25	260	9.88	251	12.38	314	3.13	79	6.13	156	7.25	184	1.000	25	8.25	210	4.50	114	2.31	59	41.0	18.6
6"	12.63	321	12.0	305	15.25	387	3.75	95	6.88	175	8.75	222	1.125	29	10.63	270	5.25	133	2.44	62	70.3	31.9
8"	15.25	387	14.5	368	18.5	470	3.75	95	7.88	200	9.88	251	1.250	32	12.00	305	5.75	146	2.88	73	110	50.0
Heavy Duty Series Clamp size																						
2"	7.25	184	6.88	175	9.00	229	2.88	73	4.88	124	5.63	143	0.875	22	7.50	191	3.75	95	2.00	51	24.3	11.0
3"	8.00	203	7.75	197	10.00	254	3.00	76	5.43	138	6.13	156	0.875	22	7.50	191	4.00	102	2.06	52	33.1	15.0
4"	9.56	243	9.00	229	11.75	298	3.00	76	5.75	146	7.00	178	1.000	25	8.25	210	4.38	111	2.31	59	39.9	18.1
8"	16.00	406	14.75	375	18.63	473	4.50	114	7.50	191	10.75	273	1.375	35	12.00	305	5.88	149	3.13	79	138	62.6
10"	18.25	464	17.63	448	22.50	572	5.50	140	10.50	267	12.75	324	1.625	41	15.63	397	7.25	184	3.63	92	243	110.0
12"	21.00	533	20.38	518	25.00	635	5.75	146	11.25	286	14.25	362	1.750	44	17.00	432	7.50	191	3.75	95	320	145.0
14"	24.75	629	23.00	584	29.25	743	6.13	156	11.25	286	16.25	413	1.875	48	17.25	438	8.25	210	4.25	108	430	195.0
16"	29.25	743	27.19	691	34.25	870	7.63	194	13.50	343	19.13	486	2.250	57	22.00	559	9.63	244	5.00	127	683	310.0

Section 8. Hubs and Clamps

Section 8b Pipeline Hubs and Clamps

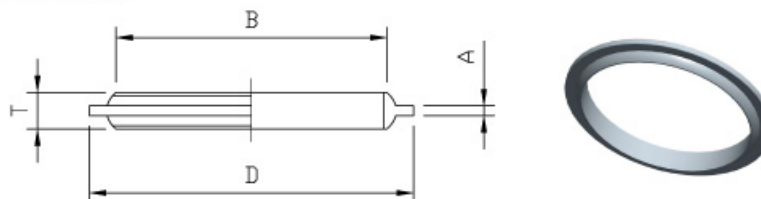


Table 8b.6

Sealings										
Sealing Size	Outside Diameter D		Inside Diameter B		Rib Thickness		Overall Thickness T		Sealing Weight	
	ins	mm	ins	mm	ins	mm	ins	mm	lbs	kg
4	1.000	25.4	0.500	12.7	0.125	3.2	0.375	9.5	0.03	0.01
5	1.094	27.8	0.625	15.9	0.125	3.2	0.375	9.5	0.03	0.01
7	1.375	34.9	0.906	23	0.125	3.2	0.375	9.5	0.04	0.02
11	1.750	44.5	1.125	28.6	0.125	3.2	0.375	9.5	0.06	0.03
13	2.375	60.3	1.500	38.1	0.125	3.2	0.375	9.5	0.11	0.05
14	2.625	66.7	1.609	40.9	0.250	6.4	0.563	14.3	0.28	0.13
16	2.750	69.9	1.868	47.4	0.250	6.4	0.625	15.9	0.28	0.13
20	3.250	82.6	2.063	52.4	0.250	6.4	0.750	19.1	0.45	0.2
23	3.500	88.9	2.375	60.3	0.250	6.4	0.750	19.1	0.48	0.22
25	4.000	102	2.672	67.9	0.250	6.4	0.750	19.1	0.62	0.28
27	4.250	108	3.063	77.8	0.250	6.4	0.750	19.1	0.62	0.28
31	4.500	114	3.250	82.6	0.250	6.4	0.750	19.1	0.69	0.31
34	5.000	127	3.688	93.7	0.250	6.4	0.750	19.1	0.80	0.36
40	5.500	140	4.063	103	0.250	6.4	1.000	25.4	1.13	0.51
42	6.375	162	4.188	106	0.250	6.4	1.000	25.4	1.68	0.76
46	6.250	159	4.750	121	0.250	6.4	1.000	25.4	1.34	0.61
52	6.625	168	5.313	135	0.250	6.4	1.000	25.4	1.33	0.60
54	6.812	173	5.500	140	0.250	6.4	1.000	25.4	1.57	0.71
56	7.500	191	5.750	146	0.250	6.4	1.000	25.4	1.82	0.83
62	7.875	200	6.065	154	0.375	9.5	1.375	34.9	3.13	1.42
64	8.625	219	6.500	165	0.375	9.5	1.375	34.9	3.80	1.72
67	8.750	222	6.875	175	0.375	9.5	1.375	34.9	3.61	1.64
72	9.500	241	7.250	184	0.375	9.5	1.375	34.9	4.40	2.00
76	10.000	254	7.750	197	0.375	9.5	1.375	34.9	4.67	2.12
82	10.125	257	8.250	210	0.375	9.5	1.375	34.9	4.26	1.93
84	11.125	283	8.500	216	0.375	9.5	1.375	34.9	5.79	2.63
87	11.375	289	8.875	225	0.375	9.5	1.375	34.9	5.77	2.62
91	11.500	292	9.125	232	0.375	9.5	1.375	34.9	5.66	2.57
92	11.625	295	9.250	235	0.375	9.5	1.375	34.9	5.78	2.62
94	11.750	298	9.500	241	0.375	9.5	1.375	34.9	5.61	2.54
97	12.000	305	9.875	251	0.375	9.5	1.375	34.9	5.55	2.52
102	12.250	311	10.250	260	0.375	9.5	1.375	34.9	5.48	2.49
106	12.750	324	10.750	273	0.375	9.5	1.375	34.9	5.72	2.59
112	14.125	359	11.250	286	0.625	15.9	1.625	41.3	12.30	5.59
116	14.125	359	11.750	298	0.375	9.5	1.375	34.9	7.21	3.27
120	13.875	352	12.000	305	0.375	9.5	1.375	34.9	6.04	2.74
122	14.125	359	12.250	311	0.375	9.5	1.375	34.9	6.16	2.79
124	14.625	371	12.500	318	0.375	9.5	1.375	34.9	7.10	3.22
130	15.000	381	13.000	330	0.500	12.7	1.500	38.1	8.47	3.84
134	15.500	394	13.500	343	0.500	12.7	1.500	38.1	8.78	3.98
137	16.500	419	13.875	352	0.625	15.9	1.625	41.3	13.70	6.21
140	16.500	419	14.000	356	0.500	12.7	1.500	38.1	10.98	4.98
144	17.000	432	14.500	368	0.500	12.7	1.500	38.1	11.35	5.15
152	17.750	451	15.250	387	0.500	12.7	1.500	38.1	11.89	5.39
160	18.500	470	16.000	406	0.500	12.7	1.500	38.1	12.44	5.64



SECTION 9

High Pressure Pipeline



MATERIAL TRACING – PIPE



Project Name
Material Storage Area



Mark

Material
Size
Heat number
Batch number



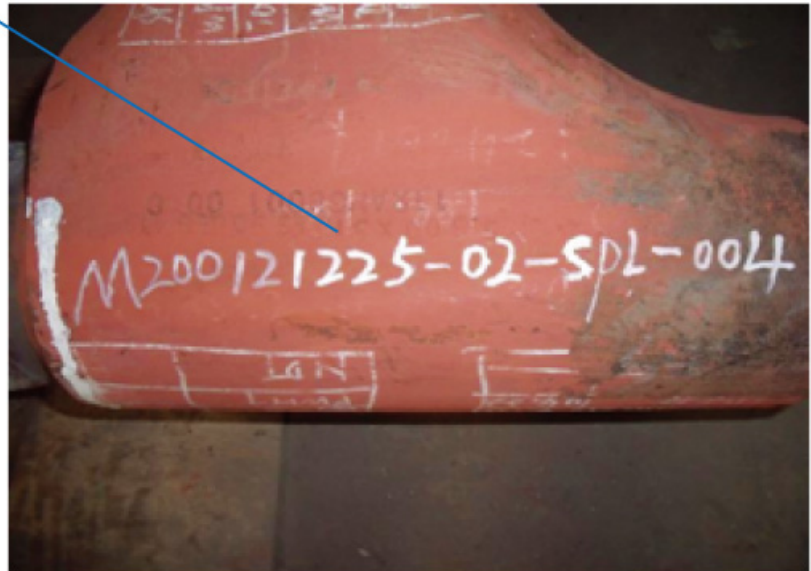
Stamp

H: Heat number
B: Batch number

MATERIAL TRACING –FITTINGS

STAMP

Size
Material
H: Heat number
B: Batch number



MATERIAL CUTTING –PIPE

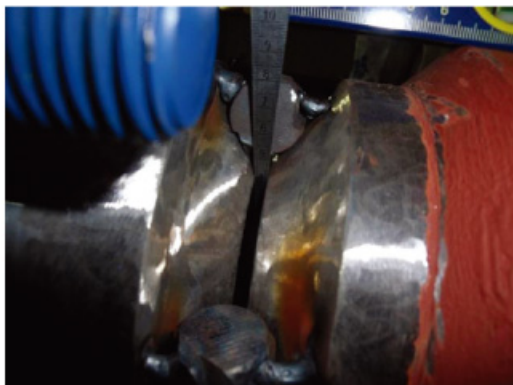


Band sawing machine

Beveling machine



FIT-UP



Control root opening according to WPS



Control 3D dimension

Support for Fit-up

Moulds for Fit-up



Welding

Preheating



Qualified Welder
Approved by DNV and ABS



WELD BOX

SPL No.:
WPS:
Joint No.:
Welder ID:
Date:
PWHT:
Hardness:
MT:
RT



Interpass Temperature 165~230°C

Auxiliary equipment for welding



Weld Joints Visual Inspection



Heat Treatment



Non asbestos thermal insulation



100-110-5-W14-200
100-110-5-W14-200

H W H W H W
H W H W H W

H W H W H W
H W H W H W

100-110-5-W14-200
100-110-5-W14-200



NDT

Ultrasonic Examination for Raw Material



Liquid Penetrant Examination for ring groove of flanges



Ultrasonic Examination for Weld(before PWHT)

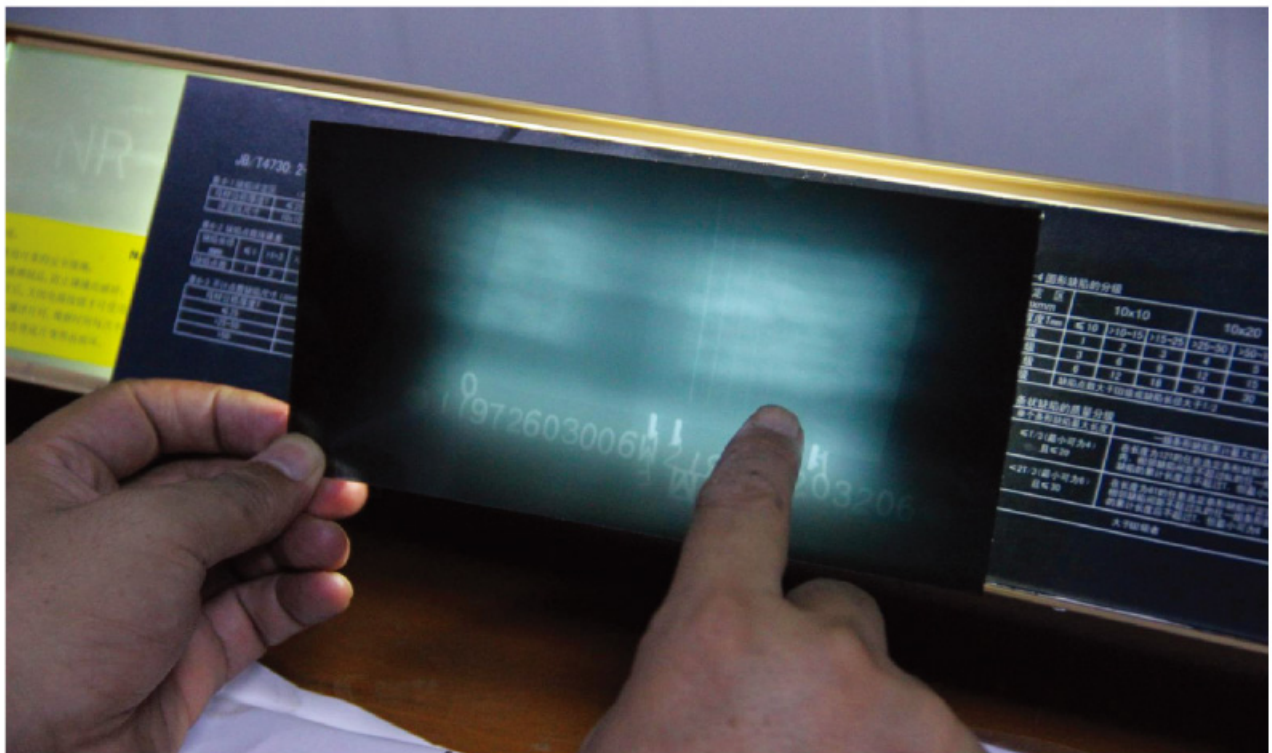


NDT

Magnetic particle Examination



Radiographic Examination films



Hydrostatic

Control Room



Test Zone



Check pressure gauges before Testing



Separated from control room



Inspection after hydrostatic test



Painting



Prefabricated high pressure pipeline spools



Cleaning and Dry for Pipelines



Packing





嘉兴市杰希希管道工程有限公司

JIAXING JCC PIPING ENGINEERING & CONSTRUCTION CO., LTD.

地址：浙江省嘉兴市海盐县武原镇盐北路211号科创园区3号楼3F

Add: 3/F, Building #3, West District, Science & Technology Pioneer Park,

NO. 211 Yanbei Road, Haiyan County, Zhejiang Province, China

电话Tel: 86-573-86213001 传真Fax: 86-573-86213000

网址Http://www.jccesh.com 电邮E-mail: mzzjcc@126.com 邮编Postcode: 314300