HEBEI LEADING METALS & PIPING INDUSTRIES CO., LTD.

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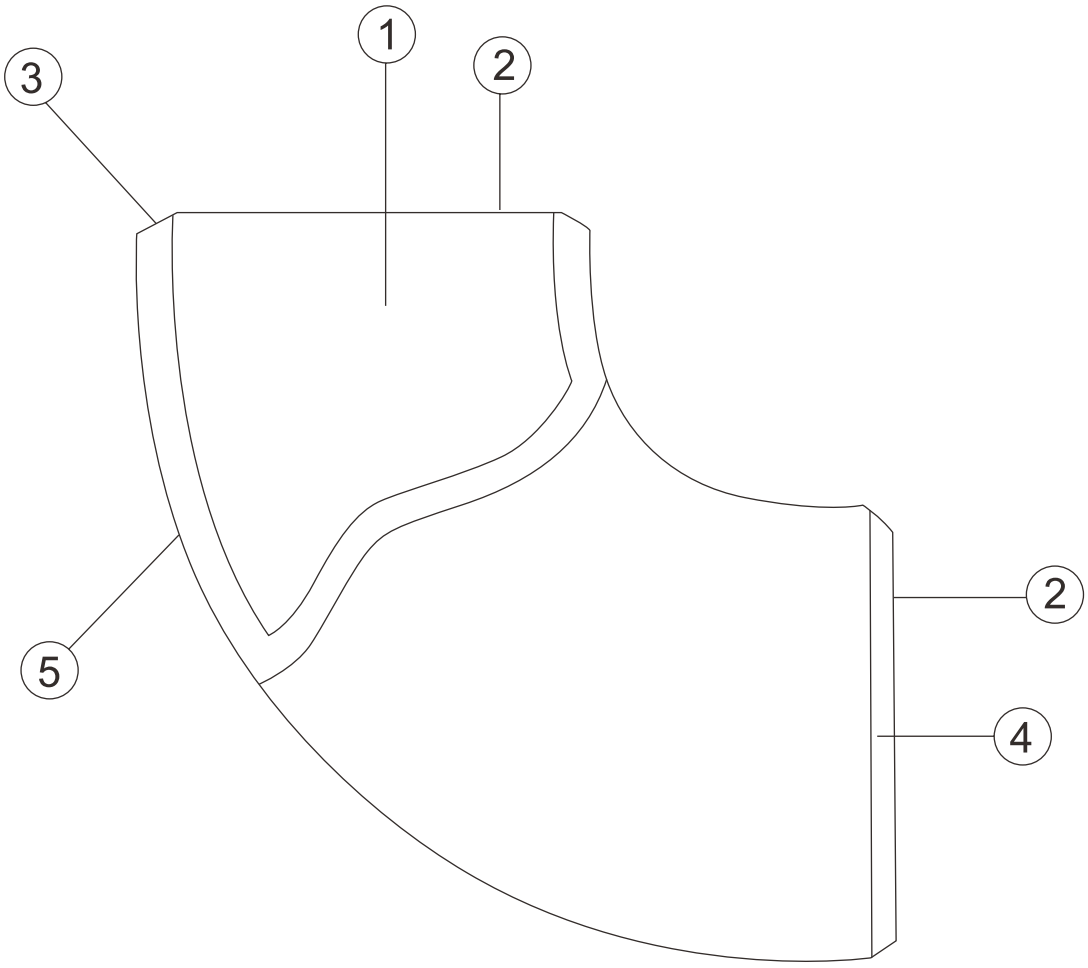


1.True diameter maintained throughout the smooth bore for unrestricted flow
2.Ends are true and square
3.Bevels and lands accurately machined for good welding
4.Clear identification of size,schedule or nominal wall thickness,material and heat code
5.Full,uniform wall thickness for maximum strength

MATERIAL AND MANUFACTURING STANDARDS

The manufacture of welding fittings is governed by industry standards established by such associations as (1) the American Society for Testing and Materials (ASTM), (2) the American National Standards Institute (ANSI), (3) the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS), (4) the Pipe Fabrication Institute (PFI) and (5) the Canadian Standards Association (CSA). They cover specifications for materials, methods of manufacture, dimensions and quality control procedures. All welding fittings conform to one or more of these standards.

ASTM STANDARDS

Carbon steel welding fittings are manufactured from seamless steel tubing and furnished in accordance with ASTM Standard A-234,with material specifications in accordance with ASTM A-106,Grade B,for fittings made from pipe; ASTM A-515,Grade 65 or 70,for fittings made from plate.

Alloy steel welding fittings are furnished in accordance with ASTM standard A-234,with materials specifications to A-335 Grades P1,carbon-molybdenum,and Grades P12,P11,P22,P5,P7,P9 chrome molybdenum for fittings made from pipe, ASTM A-204 Grade B,carbon molybdenum and ASTM A-387 Grades 12,11,22,5,7,9 chrome molybdenum for fittings made from plate.

Welding fittings are also available in accordance with ASTM specification A-420 covering low-temperature service,down to -150℉(-101℃),

Welding fittings are also manufactured and furnished in corrosion-resistant Yoloy CR and Yoloy LT(ASTM A-420-WPL9).

Stainless steel welding fittings are manufactured and available in the following types：304,304L,316,316L and 347.They are furnished in accordandce with ASTM Standard A-403,with material specifications to ASTM A-312 covering fittings made from pipe and A-240 for fitting made from plate.

ANSI,MSS,ASME AND CSA STANDARDS

ANSI and MSS standards govern fitting dimensions and tolerances. ANSI B16.9 “Wrought Steel Butt Welding Fittings" is the basic standard. It covers all steel butt-welding fittings sizes NPS 1/2 through NPS 24 (DN15 through DN 600),other ANSI and MSS standards,written to supplement B16.9, are as follows:

ANSI B16.25:Butt-welding Ends

ANSI B16.28:Butt-welding short radius elbows and returns

MSS SP-25: Marking of each fitting

MSS SP-43: Light-wall stainless steel fittings,NPS 3/4 through NPS 24(DN 20 through DN 600)

MSS SP-75: High Test Wrought Welding Fittings

The following codes and standards influence the manufacture of welding fittings, where applicable:

ANSI B31.1: Power piping

ANSI B31.2: Fuel gas piping

ANSI B31.3: Petroleum refinery piping
ANSI B31.4: Liquid petroleum transportation piping systems
ANSI B31.5: Refrigeration piping
ANSI B31.7: Nuclear power piping
ANSI B31.8: Gas transmission and distribution piping systems
ANSI B36.10: Welded and seamless wrought steel pipe
ANSI B36.19: Stainless steel pipe
CSA Z183: Oil pipe line transportation systems
CSA Z184: Gas pipe line systems
CSA Z245.10: Requirements for wrought steel butt welding fittings and flanges
ASME: BoiLer and pressure vessel code

SPECIAL METALS

High test wrought butt welding fittings conforming to MSS SP-75 are available in sizes NPS 16 (DN 400) and larger with physical properties to match pipe with 42,000,46,000,52,000,60,000,65,000* and over p.s.i. minimum yield strengths. All fittings containing welds are 100% radiographed per Par. UW-51 Section VIII of the ASME boiler and pressure vessel Code, and stress relieved.

Other ferrous alloys fittings are available manufactured from ASTM alloy specifications other than those listed in the "ASTM Standards" above.

Non-Ferrous metals fittings of relatively common metals, such as aluminum, nickel,copper, etc., can be readily furnished; production is limited only by availability of raw materials. The same is true of less common metals, such as the various grades of Hastelloy, Inconel, Incoloy, Monel, Alloy-20,rare types of stainless steel and other unusual analyses.

* Equals 290, 317, 359, 414, 448 Mpa, respectively.

METRIC EQUIVALENTS

The International System(SI) metric equivalent of British units are shown throughout this catalogue.

NPS(Nominal Pipe Size)	=DN_1△ (Nominal Diameter)
Operating Pressure Class	=PN_1△ (Pressure Number)
1 inch	=25.4 millimetres
1 pound, weight	=0.4536 kilograms
1 Psi	=0.06895 bars
·1 Psi,stress	=0.006895 megapascals(MPa)

△From the SI designations, Diametre Nominal and Pression Nominal

DIMENSIONS & TOLERANCES

DIMENSIONAL TOLERANCES

ALL FITTNGS				90° & 45° ELBOWS TEES CROSSES LATERALS	CAPS	180° RETURNS			LAP. JONT STUB ENDS AND REDUCERS	LAP-JONT STUB ENDS			
NPS / DN	OUTSIDE' DIAMETER AT BEVEL O.D.	INSIDE DIAMETER AT END I.D.	WALL THCKNESS	CENTER TO END A.B.C.M	OVERALL LENGTH E	CENTER TO CENTER H	BACK TO FACE K	PARALLELITY OF PLANES OF ENDS	OVERALL LENGTH FL	OUTSIDE DIAMETER OF LAP G	THICKNESS OF LAP I	FILLET RADIUS OF LAP R	OUTSDE DIAMETER OF BARREL
1/2 -2 1/2 15-65	+.06 -.03 ±1	±0.3 ±.8	Not Less than 87.5% of nominal thickness	±.06 ±2	±.12 ±4	±.25 ±7	±.25 ±7	±.03 ±1	±.06 ±2	±0 -.03 +0 -1	+.06 -0 +2 -0	+0 -.03 +0 -1	–
3-3 1/2 80-90	±.06 ±1	±.06 ±1.6		±.06 ±2	±.12 ±4	±.25 ±7	±.25 ±7	±.03 ±1	±.06 ±2	+0 -.03 +0 -1	+.06 -0 +2 -0	+0 -.03 +0 -1	
4 100	±.06 +2 -1	±.06 ±1.6		±.06 ±2	±.12 ±4	±.25 ±7	±.25 ±7	±.03 ±1	±.06 ±2	+0 -.03 +0 -1	+.06 -0 +2 -0	+0 -.06 +0 -2	
5-6 125-150	+.09 -.06 +3 -1	±.06 ±1.6		±.06 ±2	±.25 ±7	±.25 ±7	±.25 ±7	±.03 ±1	±.06 ±2	+0 -.03 +0 -1	+.06 -0 +2 -0	+0 -.06 +0 -2	
8 200	+. 09 -. 06 ±2	±.06 ±1.6		±.06 ±2	±.25 ±7	±.25 ±7	±.25 ±7	±.03 ±1	±.06 ±2	+0 -.03 +0 -1	+.06 -0 +2 -0	+0 -.06 +0 -2	
10 250	+.16 -.12 +4 -3	±.12 ±3.2		±.09 ±2	±.25 ±7	±.38 ±10	±.25 ±7	±.06 ±2	±.09 ±2	+0 -.06 +0 -2	+.06 -0 +2 -0	+0 -.06 +0 -2	
12-18 300-450	+.16 -.12 +4 -3	±.12 ±3.2		±.09 ±3	±.25 ±7	±.38 ±10	±.25 ±7	±.06 ±2	±.09 ±3	+0 -.06 +0 -2	+.06 -0 +2 -0	+0 -.06 +0 -2	
20-24 500-600	+.25 -.19 +6 -5	±.19 ±4.8		±.09 ±3	±.25 ±7	±.38 ±10	±.25 ±7	±.06 ±2	±.09 ±3	+0 -.06 +0 -2	+.06 -0 +2 -0	+0 -.06 +0 -2	
26-30 650-750	+.25 -.19 +7 -5	±.19 ±4.8		±.12 ±3	±.38 ±10				±.19 ±5				
32-48 800-1200	+.25 -.19 +7 -5	±.19 ±4.8		±.19 ±5	±.38 ±10				±.19 ±5				

Out-of-round is the sum of absolute values of plus and minus tolerance.

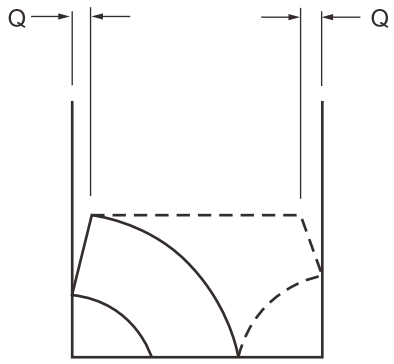
INCHES
MILLIMETRES

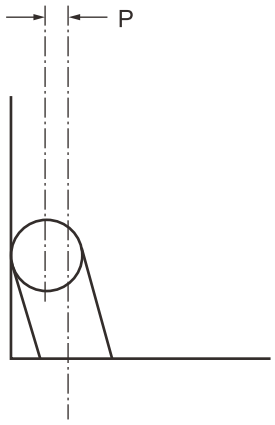
ANGULARITY TOLERANCES, ANSI B16.9

ANGULARITY TOLERANCES ±

Nominal Pipe Size NPS	DN	Off Angle Q	Off Plane p
1/2-4		.03	.06
	15-100	1	2
5-8		.06	.12
	125-200	2	4
10-12		.09	.19
	250-300	3	5
14-16		.09	.25
	350-400	3	7

Nominal Pipe Size NPS	DN	Off Angle Q	Off Plane p
18-24		.12	. 38
	450-600	4	10
26-30		.19	.38
	650-750	5	10
32-34		.19	.50
	800-850	5	13
44-48		.19	.75
	1125-1200	5	20





INCHES
MILLIMETRES

DIMENSIONS OF SEAMLESS AND WELDED PIPE

STANDARDS: ANSI B36.10,ANSI B36.19

NPS			SCH.5		SCH.10		GAS DIST		SCH.20		SCH.30		STD.		SCH.40	
	DN	O.D.	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL
1/8		.405			0.310	0.049			0.287	0.059			.269	.068	STD	STD
	3	10.3			7.82	1.24			7.30	1.5			7.52	1.73	STD	STD
1/4		.540			0.410	0.065			0.381	0.079			.364	.088	STD	STD
	6	13.7			10.40	1.65			9.70	2.0			9.25	2.24	STD	STD
3/8		.675			0.550	0.065			0.520	0.079			.493	.091	STD	STD
	10	17.1			13.90	1.65			13.20	2.0			12.52	2.31	STD	STD
1/2		.840			0.760	0.083			0.646	0.098			.622	.109	STD	STD
	15	21.3			19.29	2.11			16.4	2.5			15.80	2.77	STD	STD
3/4		1.050	.920	. 065	.884	.083			0.854	0.098			.824	.113	STD	STD
	20	26.7	23.37	1.65	22.45	2.11			21.7	2.5			20.93	2.87	STD	STD
1		1.315	1.185	.065	1.097	.109			1.078	0.12			1.049	.133	STD	STD
	25	33.4	30.10	1.65	27.86	2.77			27.40	3.0			26.64	3.38	STD	STD
1 1/4		1.660	1.530	.065	1.442	.109			1.425	0.12			1.380	.140	STD	STD
	32	42.2	38.86	1.65	36.63	2.77			36.20	3.0			35.05	3.58	STD	STD
1 1/2		1.900	1.770	.065	1.682	.109			1.665	0.12			1.610	.145	STD	STD
	40	48.3	44.96	1.65	42.72	2.77			42.3	3.0			40.89	3.68	STD	STD
2		2.375	2.245	.065	2.157	.109			2.126	0.13			2.067	.154	STD	STD
	50	60.3	57.02	1.65	54.79	2.77			54.00	3.20			52.50	3.91	STD	STD
2 1/2		2.875	2.709	.083	2.635	.120			2.523	0.18			2.469	.203	STD	STD
	65	73.0	68.81	2.11	66.93	3.05			64.10	4.50			62.71	5.16	STD	STD
3		3.500	3.334	.083	3.260	.120			3.145	0.18			3.068	.216	STD	STD
	80	88.9	84.68	2.11	82.80	3.05			79.90	4.50			77.93	5.49	STD	STD
3 1/2		4.000	3.834	0.83	3.760	.120			3.645	0.18			3.548	.226	STD	STD
	90	101.6	97.38	2.11	95.50	3.05			92.60	4.50			90.12	5.74	STD	STD
4		4.500	4.334	.083	4.260	.120	4.124	.188	4.114	0.19			4.026	.237	STD	STD
	100	114.3	110.08	2.11	108.20	3.05	104.75	4.78	104.50	4.90			102.26	6.02	STD	STD
5		5.563	5.345	.109	5.295	.134			5.161	0.20			5.047	.258	STD	STD
	125	141.3	135.76	2.77	134.49	3.40			131.10	5.10			128.19	6.55	STD	STD
6		6.625	6.407	.109	6.357	.134	6.187	.219	6.193	0.22			6.065	.280	STD	STD
	150	168.3	162.74	2.77	161.47	3.40	157.15	5.56	157.30	5.50			154.05	7.11	STD	STD
8		8.625	8.407	.109	8.329	.148	8.187	.219	8.125	.250	8.071	.277	7.981	.322	STD	STD
	200	219.1	213.54	2.77	211.56	3.76	207.95	5.56	206.38	6.35	205.00	7.04	202.72	8.18	STD	STD
10		10.750	10.482	.134	10.420	.165	10.312	.219	10.250	.250	10.136	.307	10.020	.365	STD	STD
	250	273.1	266.24	3.40	264.67	4.19	261.92	5.56	260.35	6.35	257.45	7.80	254.51	9.27	STD	STD
12		12.750	12.420	.156	12.390	.180	12.250	.250	12.250	.250	12.090	.330	12.000	.375	11.938	.406
	300	323.9	315.47	3.96	314.71	4.57	311.15	6.35	311.15	6.35	307.09	8.38	304.80	9.53	303.23	10.31
14		14.000			13.500	.250	13.500	.250	13.376	.312	STD	STD	13.250	.375	13.124	.438
	350	355.6			342.90	6.35	342.90	6.35	339.75	7.92	STD	STD	336.55	9.53	333.35	11.12

DIMENSIONS OF SEAMLESS AND WELDED PIPE

STANDARDS: ANSI B36.10,ANSI B36.19

NPS	DN	O.D.	SCH.5		SCH.10		GAS DIST		SCH.20		SCH.30		STD.		SCH.40	
			I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL
16		16.000			15.500	.250	15.500	. 250	15.376	.312	STD	STD	15.250	.375	XS	XS
	400	406.4			393.70	6.35	393.70	6.35	390.55	7.92	STD	STD	387.35	9.53	XS	XS
18		18.000			17.500	.250	17.500	.250	17.376	.312	17.124	.438	17.250	.375	16.876	.562
	450	457.2			444.50	6.35	444.50	6.35	441.35	7.92	434.95	11.12	438.15	9.53	428.65	14.27
20		20.000			19.500	.250	19.500	.250	STD	STD	XS	XS	19.250	.375	18.814	.594
	500	508.0			495.30	6.35	495.30	6.35	STD	STD	XS	XS	488.95	9.53	477.88	15.09
22		22.000			21.500	.250			STD	STD	XS	XS	21.250	.375		
	550	558.8			546.10	6.35			STD	STD	XS	XS	539.75	9.53		
24		24.000			23.500	.250	23.500	.250	STD	STD	22.876	.562	23.250	.375	22.624	.688
	600	609.6			596.90	6.35	596.90	6.35	STD	STD	581.05	14.27	590.55	9.53	574.65	17.47
26		26.000			25.376	.312			XS	XS			25.250	.375		
	650	660.4			644.55	7.92			XS	XS			641.35	9.53		
28		28.000			27.376	.312			XS	XS	26.750	.625	27.250	.375		
	700	711.2			695.35	7.92			XS	XS	679.45	15.88	692.15	9.53		
30		30.000			29.376	.312			XS	XS	28.750	.625	29.250	.375		
	750	762.0			746.15	7.92			XS	XS	730.25	15.88	742.95	9.53		
36		36.000			35.376	.312			XS	XS	34.750	.625	35.250	.375	34.500	.750
	900	914.4			898.55	7.92			XS	XS	882.65	15.88	895.35	9.53	876.30	19.05
42		42.000									40.750	.625	41.250	.375	40.500	.750
	1100	1067									1035.0	15.88	1047.8	9.53	1028.7	19.05
44		44.000											43.250	.375		
	–	1118											1098.6	9.53		
46		46.000											45.250	.375		
	–	1168											1149.4	9.53		
48		48.000											47.250	.375		
	1200	1219											1200.2	9.53		

wall dimension shown are nominal thickness.

INCHES
MILLIMETRES

DIMENSIONS OF SEAMLESS AND WELDED PIPE

STANDARDS: ANSI B36.10,ANSI B36.19

NPS	DN	O.D.	SCH.60		XS		SCH. 80		SCH.100		SCH.120		SCH.140		SCH.160		XXS	
			I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL
1/8		.405			.215	.095	XS	XS										
	3	10.3			5.46	2.41	XS	XS										
1/4		.540			.302	.119	XS	XS										
	6	13.7			7.67	3.02	XS	XS										
3/8		.675			.423	.126	XS	XS										
	10	17.1			10.74	3.20	XS	XS										
1/2		.840			.546	.147	XS	XS							.464	.188	.252	.294
	15	21.3			13.87	3.73	XS	XS							11.79	4.78	6.40	7.47
3/4		1.050			.742	.154	XS	XS							.612	.219	.434	.308
	20	26.7			18.85	3.91	XS	XS							15.54	5.56	11.02	7.82
1		1.315			.957	.179	XS	XS							.815	.250	.599	.358
	25	33.4			24.31	4.75	XS	XS							20.70	6.35	15.21	9.09
1 1/4		1.660			1.278	.191	XS	XS							1.160	.250	.896	.382
	32	42.2			32.46	4.85	XS	XS							29.46	6.35	22.76	9.70
1 1/2		1.900			1.500	.200	XS	XS							1.338	.281	1.100	.400
	40	48.3			38.10	5.08	XS	XS							33.99	7.14	27.94	10.16
2		2.375			1.939	.218	XS	XS							1.687	.344	1.503	.436
	50	60.3			49.25	5.54	XS	XS							42.85	8.74	38.18	11.07
2 1/2		2.875			2.323	.276	XS	XS							2.125	.375	1.771	.552
	65	73.0			59.00	7.01	XS	XS							53.98	9.53	44.98	14.02
3		3.500			2.900	.300	XS	XS							2.624	.438	2.300	.600
	80	88.9			73.66	7.62	XS	XS							66.65	11.13	58.42	15.24
3 1/2		4.000			3.364	.318	XS	XS									(1)2.728	(1).636
	90	101.6			85.45	8.08	XS	XS									69.29	16.15
4		4.500			3.826	.337	XS	XS			3.624	.438			3.438	.531	3.152	.674
	100	114.3			97.18	8.56	XS	XS			92.05	11.13			87.33	13.49	80.06	17.12
5		5.563			4.813	.375	XS	XS			4.563	.500			4.313	.625	4.063	.750
	125	141.3			122.25	9.53	XS	XS			115.90	12.70			109.55	15.88	103.20	19.05
6		6.625			5.761	.432	XS	XS			5.501	.562			5.187	.719	4.897	.864
	150	168.3			146.33	10.97	XS	XS			139.73	14.27			131.75	18.26	124.38	21.95
8		8.625	7.813	.406	7.625	.500	XS	XS	7.437	.594	7.187	.719	7.001	.812	6.813	.906	6.875	.875
	200	219.1	196.45	10.31	193.68	12.70	XS	XS	188.90	15.09	182.55	18.26	177.83	20.62	173.05	23.01	174.63	22.23
10		10.750	XS	XS	9.750	.500	9.562	.594	9.312	.719	9.062	.844	8.750	1.000	8.500	1.125	SCH140	
	250	273.1	XS	XS	247.65	12.70	242.87	15.09	236.52	18.26	230.17	21.44	222.25	25.40	215.90	28.58	SCH140	
12		12.750	11.626	.582	11.750	.500	11.374	.688	11.062	.844	10.750	1.000	10.500	1.125	10.126	1.312	SCH120	
	300	323.9	295.30	14.27	298.45	12.70	288.90	17.48	280.97	21.44	273.05	25.40	266.70	28.58	257.20	33.32	SCH120	

INCHES
MILLIMETRES

DIMENSIONS OF SEAMLESS AND WELDED PIPE

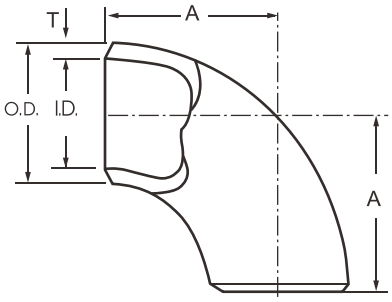
STANDARDS: ANSI B36.10,ANSI B36.19

NPS	DN	O.D.	SCH.60		XS		SCH. 80		SCH.100		SCH.120		SCH.140		SCH.160		XXS	
			I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL	I.D.	WALL
14		14.000	12.812	.594	13.000	.500	12.500	.750	12.124	.938	11.812	1.094	11.500	1.250	11.188	1.406		
	350	355.6	325.42	15.09	330.20	12.70	317.50	19.05	307.95	23.83	300.02	27.79	292.10	31.75	284.18	35.71		
16		16.000	14.688	.656	15.00	.500	14.312	.844	13.938	1.031	13.562	1.219	13.124	1.438	12.812	1.594		
	400	406.4	373.08	16.66	381.00	12.70	363.52	21.44	354.03	26.19	344.47	30.96	333.35	36.53	325.42	40.49		
18		18.000	16.500	.750	17.000	.500	16.124	.938	15.688	1.156	15.250	1.375	14.876	1.562	14.438	1.781		
	450	457.2	419.10	19.05	431.80	12.70	409.55	23.83	398.48	29.36	387.35	34.93	377.85	39.67	366.73	45.24		
20		20.000	18.376	.812	19.000	.500	17.938	1.031	17.438	1.281	17.000	1.500	16.500	1.750	16.062	1.969		
	500	508.0	466.75	20.62	482.60	12.70	455.63	26.19	442.93	32.54	431.80	38.10	419.10	44.45	407.97	50.01		
22		22.000	20.250	.875	21.000	.500	19.750	1.125	19.250	1.375	18.750	1.625	18.250	1.875	17.750	2.125		
	550	558.8	514.35	22.23	533.40	12.70	501.65	28.58	488.95	34.93	476.25	41.28	463.55	47.63	450.85	53.98		
24		24.000	22.082	.969	23.00	.500	21.562	1.219	20.938	1.531	20.376	1.812	19.876	2.062	19.312	2.344		
	600	609.6	560.37	24.61	584.20	12.70	547.67	30.96	531.83	38.89	517.55	46.02	504.85	52.37	490.52	59.54		
26		26.000			25.000	.500												
	650	660.2			635.00	12.70												
28		28.000			27.000	.500												
	700	711.2			685.80	12.70												
30		30.000			29.000	.500												
	750	762.0			736.6	12.70												
36		36.000			35.000	.500												
	900	914.4			889.00	12.70												
42		42.000			41.000	.500												
	1100	1067			1041.4	12.70												
44		44.000			43.000	.500												
	-	1118			1092.2	12.70												
46		46.000			45.000	.500												
	-	1168			1143.0	12.70												
48		48.000			47.000	.500												
	1200	1219			1193.8	12.70												

INCHES
MILLIMETRES

90° ELBOWS LONG RADIUS

STANDARD WEIGHT,EXTRA STRONG,
SCHEDULE 160, DOUBLE EXTRA STRONG
Carbon and ferritic alloy steel,
ASTM A-234.
ANSI B16.9



NPS	DN	OUTSDE DIAMETER AT BEVEL O.D.	CENTRE TO END A	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT APPROX WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG APPROX WEIGHT	SCHEDULE160 INSIDE DIAMETER I.D.	SCHEDULE160 WALL THICKNESS T	SCHEDULE160 APPROX WEIGHT	DOUBLE EXTRA STRONG INSIDE DIAMETER I.D.	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG APPROX WEIGHT
1/2		.840	1.50	.622	0.109	0.2	.546	.147	0.2	-	-	-	-	-	-
	15	21	38	15.80	2.77	0.09	13.87	3.73	.09	-	-	-	-	-	-
3/4		1.050	(1)1.12	.824	0.113	0.3	.742	.154	0.2	-	-	-	-	-	-
	20	27	29	20.93	2.87	0.14	18.85	3.91	.09	-	-	-	-	-	-
1		1.315	1.50	1.049	0.133	0.4	.957	.179	0.5	0.815	.250	0.6	.599	.358	0.8
	25	33	38	26.64	3.38	0.18	24.31	4.55	0.23	20.7	6.35	0.27	15.21	9.09	0.36
1 1/4		1.660	1.88	1.380	0.140	0.5	1.278	.191	0.7	1.160	.250	1.0	.896	.382	1.4
	32	42	48	35.05	3.56	0.23	32.46	4.85	0.32	29.5	6.35	0.45	22.76	9.70	0.63
1 1/2		1.900	2.25	1.610	0.145	0.75	1.500	.200	1.0	1.338	.281	1.8	1.100	.400	2.0
	40	48	57	40.89	3.68	0.34	38.10	5.08	0.45	34.0	7.14	0.81	27.94	10.16	0.90
2		2.375	3.0	2.067	0.154	1.5	1.939	.218	2.0	1.687	.344	3.2	1.503	.436	3.8
	50	60	76	52.50	3.91	0.68	49.25	5.54	0.9	42.9	8.74	1.44	38.18	11.07	1.71
2 1/2		2.875	3.75	2.469	0.203	3.0	2.323	.276	4.0	2.125	.375	6.0	1.771	.552	7.1
	65	73	95	62.71	5.16	1.35	59.00	7.01	1.8	54.0	9.53	2.70	44.98	14.02	3.20
3		3.500	4.50	3.068	0.216	4.5	2.900	.300	6.0	2.624	.438	9.0	2.300	.600	11.2
	80	89	114	77.93	5.49	2.03	73.66	7.62	2.7	66.7	11.13	4.05	58.42	15.24	5.04
(2)3 1/2		4.000	5.25	3.548	0.226	6.2	3.364	.318	8.5	-	-	-	(2)2.728	(2).636	16.2
	90	102	133	90.12	5.74	2.8	85.45	8.08	3.83	-	-	-	69.29	16.15	7.3
4		4.500	6.00	4.026	0.237	8.5	3.826	.337	12	3.438	.531	19	3.152	.674	21.2
	100	114	152	102.26	6.02	3.8	97.18	8.56	5.4	87.3	13.49	8.5	80.06	17.12	9.5
5		5.563	7.50	5.047	0.258	14.2	4.813	.375	20	4.313	.625	33	4.063	.750	38
	125	141	190	128.19	6.55	6.4	122.25	9.53	9.0	109.6	15.88	15	103.20	19.05	17
6		6.625	9.00	6.065	0.280	23	5.761	.432	32	5.187	.719	59	4.897	.864	63
	150	168	229	154.05	7.11	10.4	146.33	10.97	14	131.8	18.26	27	124.38	21.95	28

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

NPS	DN	OUTSIDE DIAMETER AT BEVEL O.D.	CENTRE TO END A	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT APPROX WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG APPROX WEIGHT	SCHEDULE160 INSIDE DIAMETER I.D.	SCHEDULE160 WALL THICKNESS T	SCHEDULE160 APPROX WEIGHT	DOUBLE EXTRA STRONG INSIDE DIAMETER I.D.	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG APPROX WEIGHT
8		8.625	12.00	7.981	0.322	45	7.625	.500	68	6.813	.906	127	6.875	.875	120
	200	219	305	202.72	8.18	20	193.68	12.70	31	173.05	23.01	57	174.63	22.23	54
10		10.750	15.00	10.02	0.365	78	9.750	.500	112	8.500	1.125	270			
	250	273	381	254.5	9.27	35	247.65	12.70	50	215.90	28.58	122			
12		12.750	18.00	12.00	0.375	118	11.750	.500	150	10.126	1.312	460			
	300	324	457	304.8	9.53	53	298.45	12.70	68	257.20	33.53	207			
14		14.000	21.0	13.25	0.375	147	13.00	.500	192	11.188	1.406	563			
	350	356	533	336.6	9.53	66	330.2	12.70	86	284.18	35.71	253			
16		16.000	24.0	15.25	0.375	202	15.00	.500	258	12.812	1.594	825			
	400	406	610	386.1	9.53	91	381.0	12.70	116	325.42	40.49	371			
18		18.000	27.0	17.25	0.375	256	17.00	.500	326						
	450	457	686	438.2	9.53	115	431.8	12.70	147						
20		20.000	30.0	19.25	0.375	310	19.00	.500	420						
	500	508	762	489.0	9.53	139	482.6	12.70	189						
22		22.000	33.0	21.25	0.375	394	21.00	.500	520						
	550	559	838	539.8	9.53	177	533.4	12.70	234						
24		24.000	36.0	23.25	0.375	446	23.00	.500	606						
	600	610	914	590.6	9.53	201	584.2	12.70	273						
26		26.000	39.0	25.25	0.375	550	25.00	.500	729						
	650	660	991	641.4	9.53	247	635.0	12.70	328						
30		30.000	45.0	29.25	0.375	736	29.00	.500	953						
	750	762	1143	743.0	9.53	331	736.6	12.70	429						
36		36.000	54.0	35.25	0.375	1062	35.00	.500	1412						
	900	914	1372	895.4	9.53	478	889.0	12.70	635						
42△		42.000	63.0	41.25	0.375	1370	41.00	.500	1890						
	1100	1067	1600	1047.8	9.53	616	1041.1	12.70	820						

(1)May be furnished as 1.5 in,(38mm) at the manufacturer's option.

(2)3-1/2XXS is not specified in ANSI B36.10

△Produced from X-rayed,stress-relieved welded pipe. Welds are 100% radiographed in accordance with the requirements of ASME Unfired Pressure Vessel Code.

These fittings are also available in other sizes and/or wall thicknesses.

INCHES
MILLIMETRES

POUNDS
KILOGRAMS

90°ELBOWS
SHORT RADIUS

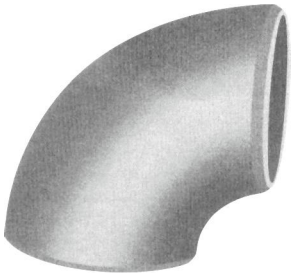
STANDARD WEIGHT, EXTRA STRONG,

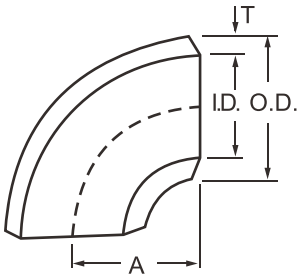
AND DOUBLE EXTRA STRONG

Carbon and ferritic alloy steel

ANSI B16. 28

ASTM A-234





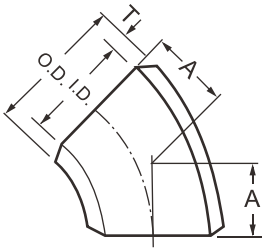
NPS / DN	OUTSIDE DIAMETER AT BEVEL O.D.	CENTRE TO END A	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT APPROX. WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG APPROX. WEIGHT	DOUBLE EXTRA STRONG INSIDE DIAMETER I.D.	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG APPROX. WEIGHT
1	1.315	1.0	1.049	.133	.25	-	-	-	-	-	-
25	33	25	26.64	3.38	.11	-	-	-	-	-	-
1 1/4	1.660	1.25	1.380	.140	.38	-	-	-	-	-	-
32	42	32	35.05	3.56	.17	-	-	-	-	-	-
1 1/2	1.900	1.5	1.610	.145	.50	1.500	.200	.75	1.100	.400	1.5
40	48	38	40.89	3.68	.23	38.10	5.08	.34	27.94	10.16	.68
2	2.375	2.0	2.067	.154	.88	1.939	.218	1.50	1.503	.436	2.8
50	60	51	52.50	3.91	.40	49.25	5.54	.68	38.18	11.07	1.26
2 1/2	2.875	2.5	2.469	.203	1.75	2.323	.276	2.25	1.771	.552	4.9
65	73	64	62.71	5.16	.79	59.00	7.01	1.01	44.98	14.02	2.21
3	3.500	3.0	3.068	.216	3.00	2.900	.300	3.75	2.300	.600	7.0
80	89	76	77.93	5.49	1.35	73.66	7.62	1.69	58.42	15.24	3.15
3 1/2	4.000	3.5	3.548	.226	4.00	3.364	.318	5.50	(1)2.728	(1).636	10.5
90	102	89	90.12	5.74	1.80	85.45	8.08	2.48	69.29	16.15	4.73
4	4.500	4.0	4.026	.237	6.00	3.826	.337	7.75	3.152	.674	14.1
100	114	102	102.26	6.02	2.70	97.18	8.56	3.5	80.06	17.12	6.35
5	5.563	5.0	5.047	.258	9.5	4.813	.375	13.5	4.063	.750	26
125	141	127	128.19	6.55	4.28	122.25	9.53	6.1	103.20	19.05	12
6	6.625	6.0	6.065	.280	15.5	5.761	.432	22.5	4.897	.864	43
150	168	152	154.05	7.11	7	146.33	10.97	10.1	124.38	21.95	19.4
8	8.625	8.0	7.981	.322	31	7.625	.500	46	6.875	.875	80
200	219	203	202.72	8.18	14	193.68	12.70	21	174.63	22.23	36
10	10.750	10.0	10.02	.365	55	9.750	.500	71			
250	273	254	254.5	9.27	25	247.65	12.70	32			
12	12.750	12.0	12.00	.375	78	11.750	.500	100			
300	324	305	304.8	9.53	35	298.45	12.70	45			
14	14.000	14.0	13.25	.375	104	13.00	.500	132			
350	356	356	336.6	9.53	47	330.02	12.70	59			
16	16.000	16.0	15.25	.375	118	15.00	.500	160			
400	406	406	387.4	9.53	53	381.0	12.70	72			
18	18.000	18.0	17.25	.375	148	17.00	.500	194			
450	457	457	438.2	9.53	67	431.8	12.70	87			
20	20.000	20.0	19.25	.375	210	19.00	.500	280			
500	508	508	489.0	9.53	95	482.6	12.70	126			
24	24.000	24.0	23.25	.375	288	23.00	.500	370			
600	610	610	590.6	9.53	130	584.2	12.70	167			
(2)30	30.000	30.0	29.25	.375	480	29.00	.500	634			
(2)750	762	762	743.0	9.53	216	736.6	12.70	285			
(2)36	36.000	36.0	35.25	.375	695	35.00	.500	940			
(2)900	914	914	895.4	9.53	313	889.0	12.70	423			

(1)NPS 3-1/2(DN 90)XXS is not specified in ANSI B36.10

(2)These Sizes not covered in ANSI B16.28

These fittings are also available in other sizes and/or wall thicknesses

INCHES	POUNDS
MILLIMETRES	KILOGRAMS



45°ELBOWS LONG RADIUS

STANDARD WEIGHT,EXTRA STRONG,
SCHEDULE 160. DOUBLE EXTRA STRONG
Carbon and ferritic alloy steel.
ASTM A-234. ANSI B16.9

NPS	DN	OUTSDE DIAMETER AT BEVEL O.D.	CENTRE TO END A	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT APPROX WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG APPROX WEIGHT	SCHEDULE160 INSIDE DIAMETER I.D.	SCHEDULE160 WALL THICKNESS T	SCHEDULE160 APPROX WEIGHT	DOUBLE EXTRA STRONG INSIDE DIAMETER I.D.	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG APPROX WEIGHT
1/2		.840	.62	.622	.109	.08	-	-	-	-	-	-	-	-	-
	15	21	16	15.80	2.77	.04	-	-	-	-	-	-	-	-	-
3/4		1.050	.44	.824	.113	.08	.742	.154	.16	-	-	-	.434	.308	0.17
	20	27	11	20.93	2.87	.04	18.85	3.91	.07	-	-	-	11.02	7.82	.08
1		1.315	.88	1.049	.133	.25	.957	.179	.28	.815	.250	.38	.599	.358	.40
	25	33	22	26.64	3.38	.11	24.31	4.55	.13	20.70	6.35	.17	15.21	9.09	.18
1 1/4		1.660	1.00	1.380	.140	.33	1.278	.191	.44	1.160	.250	.50	.896	.382	.55
	32	42	25	35.05	3.56	.15	32.46	4.85	.20	29.46	6.35	.23	22.76	9.70	.25
1 1/2		1.900	1.12	1.610	.145	.47	1.500	.200	.60	1.338	.281	1.00	1.100	.400	1.15
	40	48	29	40.89	3.68	.21	38.10	5.08	.27	34.0	7.14	.45	27.94	10.16	.52
2		2.375	1.38	2.067	.154	.78	1.939	.218	1.05	1.687	.344	1.75	1.503	.436	2.13
	50	60	35	52.50	3.91	.35	49.25	5.54	.47	42.85	8.74	.79	38.18	11.07	.96
2 1/2		2.875	1.75	2.469	.203	1.66	2.323	.276	1.91	2.125	.375	3.00	1.771	.552	3.75
	65	73	44	62.71	5.16	.75	59.00	7.01	.86	53.98	9.53	1.35	44.98	14.02	1.7
3		3.500	2.00	3.068	.216	2.25	2.900	.300	3.08	2.624	.438	4.5	2.300	.600	5.75
	80	89	51	77.93	5.49	1.01	73.66	7.62	1.39	66.65	11.13	2.0	58.42	15.24	2.6
3 1/2		4.000	2.25	3.548	.226	3.16	3.364	.318	4.75	-	-	-	2.728	.636	8.65
	90	102	57	90.12	5.74	1.42	85.45	8.08	2.14	-	-	-	69.29	16.15	3.9
4		4.500	2.50	4.026	.237	4.25	3.826	.337	5.88	3.428	.531	9.5	3.152	.674	10.7
	100	114	64	102.26	6.02	1.91	97.18	8.56	2.65	87.33	13.49	4.3	80.06	17.12	4.8
5		5.563	3.12	5.047	.258	7.25	4.813	.375	10.0	4.313	.625	4.3	4.63	.750	19
	125	141	79	128.19	6.55	3.26	122.25	9.53	4.65	109.55	15.88	7.65	103.20	19.05	8.6
6		6.625	3.75	6.065	.280	11.5	5.761	.432	16.7	5.187	.719	30	4.897	.864	32
	150	168	95	154.05	7.11	5.18	146.33	10.97	7.5	131.8	18.26	13.5	124.38	21.95	14.4
8		8.625	5.00	7.981	.322	22.5	7.625	.500	34	6.813	.906	64	6.875	.875	60
	200	219	127	202.72	8.18	10	193.68	12.70	15	173.05	23.01	29	174.63	22.23	27
10		10.750	6.25	10.02	.365	39	9.750	.500	53	8.500	1.125	135	-	-	-
	250	273	159	254.5	9.27	18	247.65	12.70	24	215.9	28.58	61	-	-	-
12		12.750	7.50	12.00	.375	59	11.750	.500	74	10.126	1.312	230	-	-	-
	300	324	190	304.8	9.53	27	298.45	12.70	33	257.2	33.32	104	-	-	-
14		14.000	8.75	13.25	.375	74	13.00	.500	95	11.188	1.406	278	-	-	-
	350	356	222	336.6	9.53	33	330.2	12.70	43	284.2	35.71	125	-	-	-
16		16.000	10.00	15.25	.375	101	15.00	.500	131	12.812	1.594	415	-	-	-
	400	406	254	387.4	9.53	46	381.0	12.70	59	325.4	40.49	187	-	-	-
18		18.000	11.25	17.25	.375	128	17.00	.500	170						
	450	457	286	438.2	9.53	58	431.8	12.70	77						
20		20.000	12.50	19.25	.375	155	19.00	.500	205						
	500	508	318	489.0	9.53	70	482.6	12.70	92						
22		22.000	13.50	21.25	.375	197	21.00	.500	260						
	550	559	343	539.8	9.53	89	533.4	12.70	117						
24		24.000	15.00	23.25	.375	223	23.00	500	295						
	600	610	381	590.6	9.53	100	584.2	12.70	133						
26		26.000	16.00	25.25	.375	275	25.00	.500	365						
	650	660	406	641.4	9.53	124	635.0	12.70	164						
30		30.000	18.50	29.25	.375	367	29.00	.500	475						
	750	762	470	743.0	9.53	165	736.6	12.70	214						
36		36.000	22.25	35.25	.375	531	35.00	.500	706						
	900	914	565	895.4	9.53	239	889.0	12.70	318						
42△		42.000	26.00	41.25	.375	7.10	41.00	.500	950						
	1100	1067	660	1047.8	9.53	320	1041.4	12.70	428						

★NPS 3-1/2(DN 90) XXS is not specified in ANSI B36.10.
△Produced from X-rayed,stress-relieved welded pipe.
Welds are 100% radiographed in accordance with the requirements of ASME Unfired Pressure Vessel Code.
These fitings are also available in other sizes and/or wall thicknesses.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

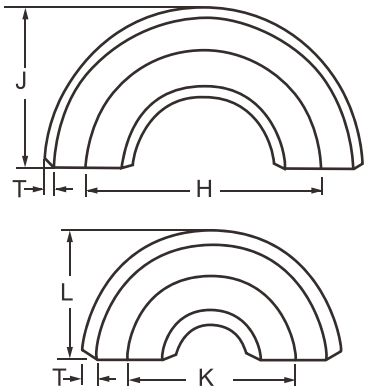
180°RETURNS LONG RADIUS SHORT RADIUS

STANDARD WEIGHT & EXTRA STRONG

Carbon and ferritic alloy steel,ASTM A-234.

ANSI B16.9

ANSI B16.28



NPS	DN	OUTSIDE DIAMETER O.D.	LONG RADIUS CENTER TO CENTER NOMINAL H	LONG RADIUS BACK TO FACE NOMINAL J	SHORT RADIUS CENTER TO CENTER NOMINAL K	SHORT RADIUS BACK TO FACE NOMINAL L	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT LONG RADIUS APPROX WEIGHT	STANDARD WEIGHT SHORT RADIUS APPROX WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG LONG RADIUS APPROX WEIGHT	EXTRA STRONG SHORT RADIUS APPROX WEIGHT
1/2		.840	3.00	1.88	(1)-	-	.622	.109	.25	(1)-	.546	.147	.45	(1)-
	15	21	76	48	(1)-	-	15.80	2.77	.11	(1)-	13.87	3.73	.20	(1)-
3/4		1.050	2.25	1.69	(1)-	-	.824	.113	.33	(1)-	.742	.154	.45	(1)-
	20	27	57	43	(1)-	-	20.93	2.87	.15	(1)-	18.85	3.91	.20	(1)-
1		1.315	3.00	2.19	2.0	1.62	1.049	.133	.75	.50	.957	.179	1.0	(1)-
	25	33	76	56	51	41	26.64	3.38	.34	.23	24.31	4.55	.45	(1)-
1 1/4		1.660	3.75	2.75	2.5	2.06	1.380	.140	1.0	.75	1.278	.191	1.5	(1)-
	32	42	95	70	64	52	35.05	3.56	.45	.34	32.46	4.85	.68	(1)-
1 1/2		1.900	4.50	3.25	3.0	2.44	1.610	.145	1.5	1.0	1.500	.200	2.0	1.5
	40	48	114	83	76	62	40.89	.368	.68	.45	38.10	5.08	.90	.68
2		2.375	6.00	4.19	4.0	3.19	2.067	.154	3.0	1.8	1.939	.213	4.4	3.0
	50	60	152	106	102	81	52.50	3.91	1.35	.81	49.25	5.54	2.0	1.35
2 1/2		2.875	7.50	5.19	5.0	3.94	2.469	.203	6.0	3.5	2.323	.276	7.5	4.5
	65	73	191	132	127	100	62.71	5.16	2.70	1.58	59.00	7.01	3.38	2.03
3		3.500	9.00	6.25	6.0	4.75	3.068	.216	9.0	6.0	2.900	.300	12.0	7.5
	80	89	229	159	152	121	77.93	5.49	4.05	2.70	73.66	7.62	5.40	3.38
3 1/2		4.000	10.50	7.25	7.0	5.5	3.548	.226	12.5	8.0	3.364	.318	17.0	11.0
	90	102	267	184	178	140	90.12	5.74	5.63	3.60	85.45	8.08	7.65	5
4		4.500	12.0	8.25	8.0	6.25	4.026	.237	17.0	12.0	3.826	.337	23.5	15.5
	100	114	305	210	203	159	102.26	6.02	7.65	5.40	97.18	8.56	10.6	7
5		5.563	15.0	10.31	10.0	7.75	5.047	.258	28.5	19.0	4.813	.357	40.0	27.0
	125	141	381	262	254	197	128.19	6.55	12.83	8.55	122.25	9.53	18	12
6		6.625	18.0	12.31	12.0	9.31	6.065	.280	46	31.0	5.761	.432	67	45.0
	150	168	457	313	305	237	154.05	7.11	20.70	14	146.33	10.97	30	20

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

NPS	DN	OUTSIDE DIAMETER O.D.	LONG RADIUS CENTER TO CENTER NOMINAL H	LONG RADIUS BACK TO FACE NOMINAL J	SHORT RADIUS CENTER TO CENTER NOMINAL K	SHORT RADIUS BACK TO FACE NOMINAL L	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT LONG RADIUS APPROX WEIGHT	STANDARD WEIGHT SHORT RADIUS APPROX WEIGHT	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG LONG RADIUS APPROX WEIGHT	EXTRA STRONG SHORT RADIUS APPROX WEIGHT
8		8.625	24.0	16.31	16.0	12.31	7.981	.322	90	62	7.625	.500	138	92
	200	219	610	414	406	313	202.72	8.18	40.5	28	193.68	12.70	62	41
10		10.750	30.0	20.38	20.0	15.38	10.02	.365	156	110	9.750	.500	215	142
	250	273	762	518	508	391	254.5	9.27	70.20	49.5	247.65	12.70	97	64
12		12.750	36.0	24.38	24.0	18.38	12.00	.375	236	156	11.750	.500	300	200
	300	324	914	619	610	467	304.8	9.53	106.20	70	298.45	12.70	135	90
14		14.000	42.0	28.0	28.0	21.0	13.25	.375	294	208	13.00	.500	376	264
	350	356	1067	711	711	533	336.6	9.53	132.30	94	330.2	12.70	169	119
16		16.000	48.0	32.0	32.0	24.0	15.25	.375	404	236	15.00	.500	524	320
	400	406	1219	813	813	610	387.4	9.53	181.80	106	381.0	12.70	236	144
18		18.000	54.0	36.0	36.0	27.0	17.25	.375	512	296	17.00	.500	676	388
	450	457	1372	914	914	686	438.2	9.53	230.4	133	431.8	12.70	304	175
20		20.000	60.0	40.0	40.0	30.0	19.25	.375	617	420	19.00	.500	824	560
	500	508	1524	1016	1016	762	489.0	9.53	277.7	189	482.6	12.70	371	252
22		22.000	66.0	44.0	(2)-	-	21.25	.375	787	(2)-	21.00	.500	1040	(2)-
	550	559	1676	1118	(2)-	-	539.8	9.53	354.2	(2)-	533.4	12.70	468	(2)-
24		24.000	72.0	48.0	48.0	36.0	23.25	.375	890	576	23.00	.500	1183	740
	600	610	1829	1219	1219	914.4	590.6	9.53	400.5	259	584.2	12.70	532	333
(3)26		26.000	78.0	52.0	(2)-	-	25.25	.375	1100	(2)-	25.00	.500	1458	(2)-
	(3)650	660	1981	1321	(2)-	-	641.4	9.53	495.0	(2)-	635.0	12.70	656	(2)-
(3)30		30.000	90.0	60.0	60.0	45.0	29.25	.375	1441	960	29.00	.500	1910	1272
	(3)750	762	2286	1524	1524	1143	743.0	9.53	648.5	432	736.6	12.70	860	572

(1)These Sizes of Short Radius Returns are not available

(2)Available by special order only

(3)These Sizes not covered by ANSI B16.9 or ANSI B16.28

Particulars and specifications of long radius,Sch.160 and XXS,and Short Radius

XXS available on request

These fittings'are also available in other sizes and/or wall thicknesses

INCHES
MILLIMETRES

POUNDS
KILOGRAMS

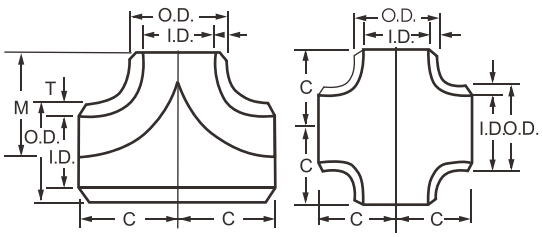
STRAIGHT TEES &CROSSES★

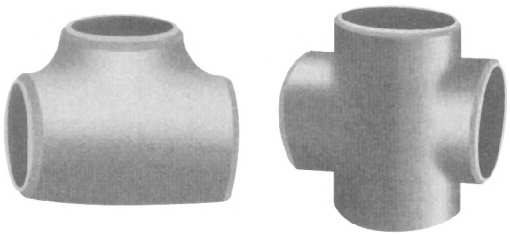
STANDARD WEIGHT AND EXTRA STRONG

Carbon and ferritic alloy steel

ASTM A-234

ANSI B16.9





NPS	DN	OUTSIDE DIAMETER O.D.	CENTER TO END. RUN. C	CENTER TO END. OUTLET M	STANDARD WEIGHT INSIDE DIAMETER I.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT APPROX. WEIGHT TEE	STANDARD WEIGHT APPROX. WEIGHT CROSS	EXTRA STRONG INSIDE DIAMETER I.D.	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG APPROX. WEIGHT TEE	EXTRA STRONG APPROX. WEIGHT CROSS
1/2		.840	1.00	1.00	.622	.109	.25	-	.546	.147	.34	-
	15	21	25	25	15.8	2.77	.11	-	13.87	3.73	.15	-
3/4		1.050	1.12	1.12	.824	.113	.37	-	.742	.154	.44	-
	20	27	29	29	20.93	2.87	.17	-	18.85	3.91	.2	-
1		1.315	1.50	1.50	1.049	.133	.63	-	.957	.179	.8	-
	25	33	38	38	26.64	3.38	.28	-	24.31	4.55	.36	-
1 1/4		1.660	1.88	1.88	1.380	.140	1.25	1.60	1.278	.191	1.6	2.20
	32	42	48	48	35.05	3.56	.57	.72	32.46	4.85	.73	.99
1 1/2		1.900	2.25	2.25	1.610	.145	1.5	2.10	1.500	.200	2.0	2.60
	40	48	57	57	40.89	3.68	.68	.95	38.10	5.08	.9	1.17
2		2.375	2.50	2.50	2.067	.154	2.0	2.55	1.939	.218	3.0	3.25
	50	60	64	64	52.50	3.91	.9	1.15	49.25	5.54	1.3	1.46
2 1/2		2.875	3.00	3.00	2.469	.203	4.0	3.40	2.323	.276	5.7	4.15
	65	73	76	76	62.71	5.16	1.8	1.53	59.00	7.01	2.6	1.87
3		3.500	3.38	3.38	3.068	.216	6.0	4.10	2.900	.300	7.7	6.20
	80	89	86	86	77.93	5.49	2.7	1.85	73.66	7.62	3.5	2.79
3 1/2		4.000	3.75	3.75	3.548	.226	7.5	5.65	3.364	.318	10.0	9.5
	90	102	95	95	90.12	5.74	3.4	2.54	85.45	8.08	.45	4.28
4		4.500	4.12	4.12	4.026	.237	10.2	9.25	3.826	.337	14	12.7
	100	114	105	105	102.3	6.02	4.6	4.16	97.18	8.56	6.3	5.72
5		5.563	4.88	4.88	5.047	.258	16	11.20	4.813	.375	23	18.0
	125	141	124	124	128.2	6.55	7.3	5.04	122.2	9.53	10.4	9.1
6		6.625	5.62	5.62	6.065	.280	23.5	25.0	5.761	.432	38.2	31.5
	150	168	143	143	154.0	7.11	10.7	11	146.3	10.97	17	14
8		8.625	7.00	7.00	7.981	.322	44.8	41.5	7.625	.500	67	52.0
	200	219	178	178	202.7	8.18	20	19	193.7	12.70	30	24

NPS	DN	OUTSIDE DIAMETER O.D.	CENTER TO END. RUN. C	CENTER TO END. OUTLET M	STANDARD WEIGHT				EXTRA STRONG			
					INSIDE DIAMETER I.D.	WALL THICKNESS T	APPROX. WEIGHT TEE	APPROX. WEIGHT CROSS	INSIDE DIAMETER I.D.	WALL THICKNESS T	APPROX. WEIGHT TEE	APPROX. WEIGHT CROSS
10		10.750	8.50	8.50	10.02	.365	74.2	72	9.750	.500	110	85.0
	250	273	216	216	254.5	9.27	34	32	247.6	12.70	50	38
12		12.750	10.0	10.0	12.00	.375	126	96	11.750	.500	165	130
	300	324	254	254	304.8	9.53	56.70	43	298.4	12.70	74	59
14		14.000	11.0	11.0	13.25	.375	159	121	13.00	.500	225	145
	350	356	279	279	336.6	9.53	71.55	54	330.2	12.70	101	65
16		16.000	12.0	12.0	15.25	.375	220	145	15.00	.500	265	180
	400	406	305	305	387.4	9.53	99.0	65	381.0	12.70	119	81
18		18.000	13.5	13.5	17.25	.375	295	170	17.00	.500	358	210
	450	457	343	343	438.2	9.53	132.8	77	431.8	12.70	161	95
20		20.000	15.0	15.0	19.25	.375	363	195	19.00	.500	450	240
	500	508	381	381	489.0	9.53	163.4	88	482.6	12.70	203	108
22		22.000	16.5	16.5	21.25	.375	449	-	21.00	.500	540	-
	550	559	419	419	539.8	9.53	202	-	533.4	12.70	243	-
24		24.000	17.0	17.0	23.25	.375	515	230	23.00	.500	625	300
	600	610	432	432	590.6	9.53	259	103	584.2	12.70	281	135
26		26.000	19.5	19.5	25.25	.375	655	-	25.00	.500	840	-
	650	660	495	495	641.4	9.53	295	-	635.0	12.70	378	-
30		30.000	22.0	22.0	29.25	.375	1010	-	29.00	.500	1175	-
	750	762	559	559	743.0	9.53	455	-	736.6	12.70	529	-
36		36.000	26.5	26.5	35.25	.375	1450	-	35.00	.500	1650	-
	900	914	673	673	895.4	9.53	653	-	889.0	12.70	743	-
42		42.000	30.0	28.0	41.25	.375	1730	-	41.0	.500	1970	-
	1100	1067	762	711	1048	9.53	779	-	1041	12.70	887	-

Tees size 20 NPS (DN 500) and smaller, Crosses size 16 NPS(DN 400) and smaller, are normally furnished as seamless. Larger size non-seamless Tees and Crosses are produced from X-rayed, stress-relieved welded pipe. Welds are 100% radiographed in accordance with the requirements of ASME Unfired Pressure Vessel Code

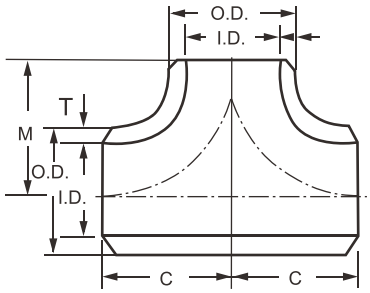
★Reducing outlet crosses available on request.
These fittings are also available in other sizes and/or wall thicknesses.

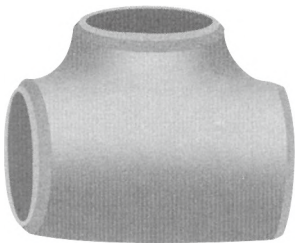
INCHES
MILLIMETRES

POUNDS
KILOGRAMS

STRAIGHT TEES

SCHEDULE 160&
DOUBLE EXTRA STRONG
Carbon and ferritic alloy steel,
ASTM A-234,
ANSI B16.9



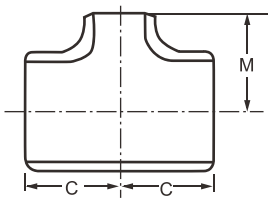


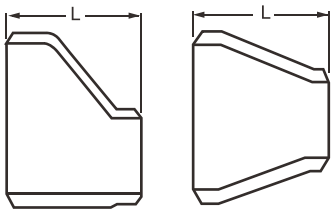
NPS	DN	OUTSIDE DIAMETER AT BEVEL O.D.	CENTER TO END. RUN. NOMINAL C	CENTER TO END. OUTLET NOMINAL M	SCHEDULE 160 INSIDE DIAMETER I.D.	SCHEDULE 160 WALL THICKNESS T	SCHEDULE 160 APPROX. WEIGHT	DOUBLE EXTRA STRONG INSIDE DIAMETER I.D.	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG APPROX. WEIGHT
3/4		1.050	1.12	1.12	.612	.219	.65	.434	.308	1.16
	20	27	29	29	15.54	5.6	.29	11.02	7.82	.52
1		1.315	1.50	1.50	.815	.250	1.10	.599	.358	1.25
	25	33	38	38	20.70	6.35	50	15.21	9.09	.56
1 1/4		1.660	1.88	1.88	1.160	.250	2.10	.896	.382	2.32
	32	42	48	48	29.46	6.35	.95	22.76	9.70	1.04
1 1/2		1.900	2.25	2.25	1.338	.281	3.00	1.100	.400	3.38
	40	48	57	57	33.99	7.14	1.35	27.94	10.16	1.52
2		2.375	2.50	2.50	1.687	.344	4.5	1.503	.436	5.20
	50	60	64	64	42.85	8.74	2.03	38.18	11.07	2.34
2 1/2		2.875	3.00	3.00	2.125	.375	7.0	1.771	.552	9.63
	65	73	76	76	53.98	9.53	3.15	44.98	14.02	4.33
3		3.500	3.38	3.38	2.624	.438	11.5	2.300	.600	13.5
	80	89	86	86	66.65	11.13	5.18	58.42	15.24	6.08
3 1/2		4.000	3.75	3.75	-	-	-	2.728	.636	23
	90	102	95	95	-	-	-	69.29	16.15	10.35
4		4.500	4.12	4.12	3.438	.531	21.5	3.152	.674	25
	100	114	105	105	87.33	13.49	9.7	80.06	17.12	11
5		5.563	4.88	4.88	4.313	.625	37	4.063	.750	40
	125	141	124	124	109.6	15.88	17	103.2	19.05	18
6		6.625	5.62	5.62	5.187	.719	63	4.897	.864	66
	150	168	143	143	131.8	18.26	28	124.4	21.95	30
8		8.625	7.00	7.00	6.813	.906	114	6.875	.875	120
	200	219	178	178	173.1	23.01	51	174.6	22.23	54
10		10.750	8.50	8.50	8.500	1.125	265	-	-	-
	250	273	216	216	215.9	28.58	119	-	-	-
12		12.750	10.00	10.00	10.126	1.312	389	-	-	-
	300	324	254	254	257.2	33.32	175	-	-	-
14		14.000	11.00	11.00	11.188	1.406	525	-	-	-
	350	356	279	279	284.2	35.71	236	-	-	-
16		16.000	12.00	12.00	12.812	1.594	820	-	-	-
	400	406	305	305	325.4	40.49	369		-	-

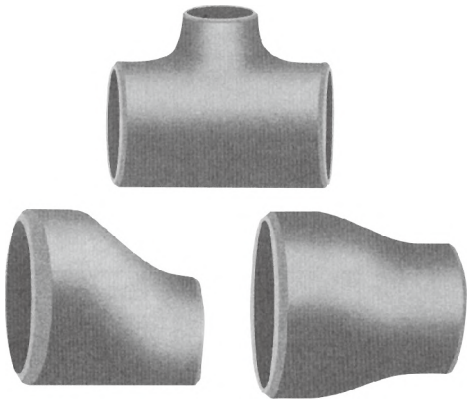
INCHES	POUNDS
MILLIMETRES	KILOGRAMS

★REDUCING TEES AND REDUCERS

CONCENTRIC AND ECCENTRIC
STANDARD WEIGHT,
EXTRA-STRONG
SCHEDULE 160,
DOUBLE EXTRA STRONG
Carbon and ferritic alloy steel
ASTM A-234
ANSI B16. 9







RUN		OUTLET OR REDUCED END		NOMINAL CENTER-TO-END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHT							
NPS		NPS		RUN	OUTLET		STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
	DN		DN	C	M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
1/2		△1/4		1.00	1.00	–	.25	–	.27	–	–	–	–	–
	15		6	25	25	–	.11	–	.12	–	–	–	–	–
		△3/8		1.00	1.00	–	.25	–	.28	–	–	–	–	–
			10	25	25	–	.11	–	.13	–	–	–	–	–
3/4		△3/8		1.12	1.12	1.5	.37	.22	.43	.24	.63	.27	–	–
	20		10	29	29	□ 38	.17	0.1	.20	.11	.29	.12	–	–
		1/2		1.12	1.12	1.5	.37	.25	.44	.25	.63	.29	1.12	–
			15	29	29	38	.17	0.1	.20	.11	.29	.13	.51	–
1		3/8		1.50	1.50	2.0	.60	.27	.75	.31	.90	.31	–	2.50
	25		10	38	38	51	.25	0.1	.34	.14	.41	.14	–	1.13
		1/2		1.50	1.50	2.0	.65	.30	.75	.33	.90	.36	1.14	2.50
			15	38	38	51	.27	0.14	.34	.15	.41	.16	.52	1.13
		3/4		1.50	1.50	2.0	.69	.32	.80	.36	1.00	.41	1.19	2.60
			20	38	38	51	.31	0.15	.40	.16	.45	.19	.54	1.18
1 1/4		1/2		1.88	1.88	2.0	1.3	.34	1.65	.42	1.67	.46	1.95	2.61
	32		15	48	48	51	.59	.15	.75	.19	.76	.21	.88	1.18
		3/4		1.88	1.88	2.0	1.2	.37	1.66	.46	1.68	.51	2.02	2.72
			20	48	48	51	.54	0.17	.75	.21	.76	.23	.92	1.23
		1		1.88	1.88	2.0	1.2	.39	1.90	.49	2.00	59	2.14	2.84
			25	48	48	51	.54	0.18	.86	.22	.91	.27	.97	1.29
1 1/2		1/2		2.25	2.25	2.5	2.1	.44	2.2	.52	2.41	.66	2.84	2.90
	40		15	57	57	64	.95	0.2	1.00	.24	1.09	.30	1.29	1.32

INCHES
MILLIMETRES

POUNDS
KILOGRAMS

★REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN	OUTLET OR REDUCED END	NOMINAL CENTER-TO-END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHT							
NPS	NPS	RUN	RUN		STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
DN	DN	C	M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
1 1/2	3/4	2.25	2.25	2.5	1.8	.47	2.3	.55	2.49	.74	2.93	2.96
40	20	57	57	64	.82	0.21	1.04	.25	1.13	.34	1.33	1.34
	1	2.25	2.25	2.5	1.7	.50	2.4	.61	2.60	.81	3.08	2.99
	25	57	57	64	.77	0.23	1.10	.28	1.18	.37	1.40	1.36
	1 1/4	2.25	2.25	2.5	1.7	.58	2.6	.66	2.90	.90	3.26	3.02
	32	57	57	64	.77	0.26	1.18	.30	1.32	.41	1.48	1.37
2	3/4	2.50	1.75	3.0	2.0	.82	2.7	.89	3.35	1.30	4.26	3.06
50	20	64	44	76	.91	.37	1.22	.40	1.52	.59	1.93	1.39
	1	2.25	2.00	3.0	2.0	.89	2.7	.90	3.60	1.52	4.41	3.12
	25	64	51	76	.91	.40	1.22	.41	1.63	.69	2.00	1.42
	1 1/4	2.50	2.25	3.0	2.1	.94	2.8	1.02	3.75	1.78	4.65	3.20
	32	64	57	76	.95	.43	1.27	.46	1.70	.81	2.11	1.45
	1 1/2	2.50	2.38	3.0	2.2	1.03	2.8	1.20	3.90	1.84	5.18	3.31
	40	64	60	76	1.00	.47	1.27	.54	1.77	.83	2.35	1.50
2 1/2	1	3.00	2.25	3.5	3.0	1.42	4.2	1.55	5.90	2.10	8.00	3.40
65	25	76	57	89	1.36	.64	1.91	.70	2.68	.95	3.63	1.54
	1 1/4	3.00	2.50	3.5	3.2	1.59	4.3	1.75	6.00	2.31	8.40	3.46
	32	76	64	89	1.45	.72	1.95	.79	2.72	1.05	3.81	1.57
	1 1/2	3.00	2.62	3.5	3.5	1.71	4.5	2.02	6.20	2.43	9.13	3.52
	40	76	67	89	1.60	.78	2.04	.92	2.81	1.10	4.14	1.60
	2	3.00	2.75	3.5	3.5	1.84	4.5	2.25	6.60	2.59	9.18	3.64
	50	76	70	89	1.60	.83	2.04	1.02	3.00	1.17	4.16	1.65
3	△1	3.38	2.62	3.5	5.0	2.10	6.0	2.45	-	-	-	
80	25	86	67	□ 89	2.27	1.0	2.72	1.11	-	-	-	
	1 1/4	3.38	2.75	3.5	5.1	2.28	6.0	2.60	9.20	2.91	12.0	3.75
	32	86	70	89	2.31	1.0	2.72	1.18	4.17	1.32	5.4	1.70
	1 1/2	3.38	2.88	3.5	5.1	2.42	6.12	2.70	9.35	3.10	12.2	3.90
	40	86	73	89	2.31	1.1	2.81	1.22	4.24	1.41	5.5	1.77
	2	3.38	3.00	3.5	5.2	2.56	6.5	2.75	9.68	3.43	12.5	4.00
	50	86	76	89	2.36	1.16	2.95	1.25	4.4	1.6	5.7	1.8
	2 1/2	3.38	3.25	3.5	6.0	2.64	7.5	2.90	10.20	3.75	13.5	4.25
	65	86	83	89	2.72	1.20	3.40	1.32	4.6	1.7	6.1	1.9
3 1/2	1 1/4	-	-	4.00	7.5	2.68	-	3.10	-	-	-	4.72
90	32	-	-	□ 102	3.40	1.21	-	1.40	-	-	-	2.12
	1 1/2	3.75	3.12	4.00	7.5	2.72	11.0	3.20	-	-	16.3	5.30
	40	95	79	102	3.40	1.23	5.0	1.45	-	-	7.4	2.4
	2	3.75	3.25	4.00	8.2	2.77	11.2	3.35	-	-	16.7	5.64
	50	95	83	102	3.72	1.26	5.1	1.52	-	-	7.6	2.6
	2 1/2	3.75	3.50	4.00	8.3	2.82	12.0	3.50	-	-	17.5	5.92
	65	95	89	102	3.76	1.28	5.4	1.59	-	-	7.9	2.7

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

★REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN		OUTLET OR REDUCED END		NOMINAL CENTER-TO-END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHT							
NPS		NPS		RUN	OUTLET		STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
	DN		DN	C	M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
31/2		3		3.75	3.62	4.00	9.5	2.88	12.6	4.00	-	-	18.5	6.20
	90		80	95	92	102	4.31	1.31	5.7	1.81	-	-	8.4	2.8
4		△1		-	-	4.00	12.0	2.91	-	4.10	-	-	-	-
	100		25	-	-	□ 102	5.44	1.31	-	1.85	-	-	-	-
		1 1/2		4.12	3.38	4.00	12.	2.97	13.0	4.30	16.8	5.40	21.5	6.53
			40	105	86	102	5.44	1.33	5.9	1.95	7.6	2.5	9.8	3.0
		2		4.12	3.50	4.00	9.4	2.94	13.0	4.50	17.2	5.59	22.0	6.72
			50	105	89	102	4.26	1.35	5.9	2.04	7.8	2.5	10.0	3.1
		2 1/2		4.12	3.75	4.00	9.4	3.02	13.6	4.60	17.7	5.64	22.7	6.89
			65	105	95	102	4.26	1.37	6.2	2.1	8.0	2.6	10.3	3.1
		3		4.12	3.88	4.00	9.5	3.08	14.2	4.75	18.5	5.81	23.3	7.10
			80	105	98	102	4.31	1.40	6.4	2.2	8.4	2.6	10.6	3.2
		3 1/2		4.12	4.00	4.00	10.0	3.12	14.9	4.90	-	-	24.5	7.4
			90	105	102	102	4.35	1.42	6.8	2.2	-	-	11	3.4
5		2		4.88	4.12	5.00	14.5	3.28	18.0	5.30	30.5	7.95	35.6	10.5
	125		50	124	105	127	6.6	1.49	8.1	2.4	13.8	3.6	16.2	4.8
		2 1/2		4.88	4.25	5.00	14.5	3.36	18.2	5.50	31.0	9.00	36.2	12.2
			65	124	108	127	6.6	1.52	8.3	2.5	14.1	4.1	16.4	5.5
		3		4.88	4.38	5.00	14.5	3.55	18.8	5.75	31.7	10.5	37.2	13.7
			80	124	111	127	6.6	1.61	8.5	2.6	14.4	4.8	17	6.2
		3 1/2		4.88	4.50	5.00	15.0	3.69	20.0	6.10	-	-	38.0	14.9
			90	124	114	127	6.8	1.67	9.1	2.8	-	-	17	6.8
		4		4.88	4.62	5.00	15.1	3.81	22.5	6.50	33.2	11.7	39.0	15.5
			100	124	117	127	6.9	1.74	10.2	3.0	15.1	5.3	18	7.0
6		△2		5.62	4.75	5.50	19.5	4.28	30	7.75	45.5	-	53.0	-
	150		50	143	121	□ 140	8.9	1.94	13.6	3.5	20.6	-	24	-
		2 1/2		5.62	4.75	5.50	20.0	4.40	31	8.25	48.2	13.0	56.6	17.5
			65	143	121	140	9.1	2.00	14.1	3.7	21.9	5.9	26	7.9
		3		5.62	4.88	5.50	21.0	4.64	31.5	8.75	48.9	15.0	57.5	18.2
			80	143	124	140	9.5	2.10	14.3	4.0	22.2	6.8	26	8.3
		3 1/2		5.62	5.00	5.50	21.5	4.81	32.0	9.50	-	-	58.5	19.0
			90	143	127	140	9.8	4.8	14.5	4.3	-	-	27	8.6
		4		5.62	5.12	5.50	21.5	5.06	32.5	11.00	50.5	17.5	59.3	19.7
			100	143	130	140	9.8	2.3	14.7	5.0	22.9	7.9	27	8.9
		5		5.62	5.38	5.50	23	5.32	33.0	12.00	52.6	19.1	62.1	21.0
			125	143	137	140	10.4	2.41	15	5.4	23.9	8.7	28	9.5
8		△3		7.00	6.00	6.00	38	7.29	63	14.50	-	28.5	-	25.7
	200		80	178	152	□ 152	17.2	3.31	29	6.6	-	12.9	-	11.7
		3 1/2		7.00	6.00	6.00	39	7.65	63	16.0	-	-	96.5	27.1
			90	178	152	152	17.7	3.47	29	7.3	-	-	44	12.3

INCHES
MILLIMETRES

POUNDS
KILOGRAMS

REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN	OUTLET OR REDUCED END	NOMINAL CENTER TO END OF TEES		NOMINAL LENGTH OF REDUCERS L	APPROXIMATE WEIGHTS							
NPS	NPS	RUN	OUTLET		STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
DN	DN	C	M		TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
8	4	7.00	6.12	6.00	40.5	8.12	64	16.5	98.7	33.0	97.5	28.5
200	100	178	156	152	18.4	3.68	29	7.5	44.8	15.0	44	13
	5	7.0	6.38	6.0	41.0	8.53	65	17.0	101	37.0	100	29.7
	125	178	162	152	18.6	3.8	30	7.7	46	17	45.5	13.5
	6	7.0	6.62	6.0	44.0	9.02	65	18.5	104	41.0	104	33.0
	150	178	168	152	20	4.1	30	8.4	47	19	47	15
10	△3	8.5	7.25	□ 7.0	72.0	11.0	90	21.0	181	-	-	-
250	80	216	184	178	32	5.0	41	9.5	82	-	-	-
	4	8.5	7.25	7.0	75.0	12.5	92	23.0	183	45.0	-	41.0
	100	216	184	178	34	5.6	41	10.4	83	20.5	-	19
	5	8.5	7.50	7.0	75.0	15.0	96	25.0	190	49.0	-	44.0
	125	216	191	178	34	6.8	43	11.3	86	22	-	20
	6	8.5	7.62	7.0	79.0	17.0	98	28.0	193	53.0	-	48.0
	150	216	194	178	36	7.7	44	12.7	88	24	-	22
	8	8.5	8.00	7.0	79.2	21.0	100	29.5	208	59.0	-	52.0
	200	216	203	178	36	9.5	45	13.4	94	27	-	24
12	△4	10.0	8.50	□ 8.0	101	23.0	132	32	301	-	-	-
300	100	254	216	203	46	10.4	59	14.5	137	-	-	-
	5	10.0	8.50	8.0	105	25.0	134	33	305	72.0	-	67.0
	125	254	216	203	47	11.3	60	15	139	32.5	-	30
	6	10.0	8.63	8.0	105	28.0	136	34	308	75.0	-	69.0
	150	254	21.9	203	47	12.6	61	15.5	140	34	-	31
	8	10.0	9.00	8.0	105	30.0	140	36	315	83.0	-	72.0
	200	254	229	203	47	13.5	63	16	143	38	-	33
	10	10.0	9.50	8.0	130	32.0	148	39	332	94.0	-	75.0
	250	254	241	203	59	14.4	67	18	151	43	-	34
	6	11.0	9.38	13.0	146	58.0	184	59	410	110	-	-
	150	279	238	330	66	26	83	27	186	50	-	-
14	8	11.0	9.75	13.0	147	59.5	187	61	435	125	-	-
350	200	279	248	330	66	27	84	28	197	57	-	-
	10	11.0	10.13	13.0	149	61.0	190	62	470	137	-	-
	250	279	257	330	67	27	86	28	213	62	-	-
	12	11.0	10.63	13.0	152	64.0	196	75	495	153	-	-
	300	279	270	330	68	29	88	34	225	69	-	-
16	△6	12.0	10.38	14.0	179	-	231	-	540	-	-	-
400	150	305	264	356	81	-	104	-	245	-	-	-

Wall thickness and other pipe size data are in accordance with ANSI B36.10.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN		OUTLET OR REDUCED END		NOMINAL CENTER TO END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHTS							
							STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
NPS	DN	NPS	DN	RUN C	OUTLET M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
16	400	8	200	12.0 305	10.75 273	14.0 356	186 84	69.0 31	236 106	89 40	565 256	168 76	- -	- -
		10	250	12.0 305	11.13 283	14.0 356	196 88	72.0 32	248 111	95 43	610 277	190 86	- -	- -
		12	300	12.0 305	11.63 295	14.0 356	211 95	75.0 34	259 117	101 46	675 306	220 100	- -	- -
		14	350	12.0 305	12.00 305	14.0 356	219 99	80 36	261 117	106 48	750 340	265 120	- -	- -
18	450	△8	200	13.5 343	11.75 298	15.0 381	236 106	- -	302 136	- -	- -	- -	- -	- -
		10	250	13.5 343	12.13 308	15.0 381	249 112	81 36	311 140	112 51	- -	- -	- -	- -
		12	300	13.5 343	12.63 321	15.0 381	261 117	82 37	332 149	115 52	- -	- -	- -	- -
		14	350	13.5 343	13.00 330	15.0 381	270 122	84 38	340 153	117 53	- -	- -	- -	- -
		16	400	13.5 343	13.00 330	15.0 381	282 127	85 38	352 158	119 54	- -	- -	- -	- -
20	500	△8	200	15.0 381	12.75 324	20.0 □ 508	294 133	- -	379 172	- -	- -	- -	- -	- -
		△10	250	15.0 381	13.13 333	20.0 508	307 139	- -	385 175	- -	- -	- -	- -	- -
		12	300	15.0 381	13.63 346	20.0 508	316 143	110 50	401 182	149 68	- -	- -	- -	- -
		14	350	15.0 381	14.00 356	20.0 508	329 149	117 53	418 190	153 69	- -	- -	- -	- -
		16	400	15.0 381	14.00 356	20.0 508	341 155	123 56	432 196	158 72	- -	- -	- -	- -
		18	450	15.0 381	14.50 368	20.0 508	355 161	126 57	449 204	165 75	- -	- -	- -	- -
22	550	△10	250	16.5 419	14.13 359	20.0 508	366 166	- -	471 214	- -	- -	- -	- -	- -
		△12	300	16.5 419	14.63 371	20.0 508	382 173	- -	479 217	- -	- -	- -	- -	- -
		14	350	16.5 419	15.00 381	20.0 508	395 179	128 58	487 221	168 76	- -	- -	- -	- -
		16	400	16.5 419	15.00 381	20.0 508	412 187	133 60	499 226	171 78	- -	- -	- -	- -
		18	450	16.5 419	15.50 394	20.0 508	429 195	140 64	522 237	175 79	- -	- -	- -	- -

INCHES
MILLIMETRES

POUNDS
KILOGRAMS

REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN		OUTLET OR REDUCED END		NOMINAL CENTER TO END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHTS							
NPS		NPS		RUN	OUTLET		STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
	DN		DN	C	M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
22		20		16.5	16.00	20.0	443	143	540	181	-	-	-	-
	550		500	419	406	508	201	65	245	82	-	-	-	-
24		△10		17.0	15.13	□ 20.0	451	149	556	183	-	-	-	-
	600		250	432	384	508	205	68	252	83	-	-	-	-
		△12		17.0	15.63	20.0	455	152	562	187	-	-	-	-
			300	432	397	508	206	69	255	85	-	-	-	-
		△14		17.0	16.00	20.0	468	154	571	191	-	-	-	-
			350	432	406	508	212	70	259	87	-	-	-	-
		16		17.0	16.00	20.0	479	156	585	194	-	-	-	-
			400	432	406	508	217	71	265	88	-	-	-	-
		18		17.0	16.50	20.0	490	160	597	198	-	-	-	-
			450	432	419	508	222	73	271	90	-	-	-	-
		20		17.0	17.00	20.0	506	165	614	205	-	-	-	-
			500	432	432	508	230	75	279	93	-	-	-	-
26		△12		19.5	16.63	□ 24.0	534	-	685	-	-	-	-	-
	650		300	495	422	610	242	-	302	-	-	-	-	-
		△14		19.5	17.00	□ 24.0	547	-	679	-	-	-	-	-
			350	495	432	610	248	-	308	-	-	-	-	-
		△16		19.5	17.00	24.0	561	-	691	-	-	-	-	-
			400	495	432	610	254	-	313	-	-	-	-	-
		18		19.5	17.50	24.0	575	170	714	215	-	-	-	-
			450	495	444	610	261	77	324	98	-	-	-	-
		20		19.5	18.00	24.0	592	172	733	221	-	-	-	-
			500	495	457	610	268	78	332	100	-	-	-	-
		22		19.5	18.50	24.0	623	174	756	229	-	-	-	-
			550	495	470	610	283	79	343	104	-	-	-	-
		24		19.5	19.00	24.0	643	177	780	235	-	-	-	-
			600	495	483	610	292	80	354	107	-	-	-	-
30		△14		22.0	19.00	□ 24.0	675	-	865	-	-	-	-	-
	750		350	559	483	610	305	-	392	-	-	-	-	-
		△16		22.0	19.00	□ 24.0	690	-	895	-	-	-	-	-
			400	559	483	610	313	-	406	-	-	-	-	-
		△18		22.0	19.5	□ 24.0	721	-	932	-	-	-	-	-
			450	559	495	610	327	-	423	-	-	-	-	-
		20		22.0	20.00	24.0	744	180	978	264	-	-	-	-
			500	559	508	610	337	82	444	120	-	-	-	-
		22		22.0	20.5	24.0	768	200	1031	270	-	-	-	-
			550	559	521	610	348	91	468	122	-	-	-	-
		24		22.0	21.0	24.0	792	215	1050	275	-	-	-	-
			600	559	533	610	359	98	476	125	-	-	-	-

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

REDUCING TEES AND REDUCERS CONCENTRIC & ECCENTRIC continued

RUN		OUTLET OR REDUCED END		NOMINAL CENTER TO END OF TEES		NOMINAL LENGTH OF REDUCERS	APPROXIMATE WEIGHTS							
							STANDARD WEIGHT		EXTRA STRONG		SCHEDULE 160		DOUBLE EXTRA STRONG	
NPS	DN	NPS	DN	RUN C	OUTLET M	L	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER	TEE	REDUCER
30	750	26	650	22.0 559	21.5 546	24.0 610	845 383	235 107	1085 492	282 128	- -	- -	- -	- -
36	900	△16	400	26.5 673	22.0 559	□ 24.0 610	1280 581	-	1220 553	- -	- -	- -	- -	- -
		△18	450	26.5 673	22.5 572	□ 24.0 610	1305 592	- -	1310 594	- -	- -	- -	- -	- -
		△20	500	26.5 673	23.0 584	□ 24.0 610	1360 617	310 141	1395 633	320 145	- -	- -	- -	- -
		△22	560	26.5 673	23.5 597	□ 24.0 610	1390 631	- -	1465 665	- -	- -	- -	- -	- -
		24	600	26.5 673	24.0 610	24.0 610	1410 640	340 154	1510 685	360 163	- -	- -	- -	- -
		26	650	26.5 673	24.5 622	24.0 610	1425 646	- -	1555 705	- -	- -	- -	- -	- -
		30	750	26.5 673	25.0 635	24.0 610	1432 650	375 170	1595 723	385 175	- -	- -	- -	- -
42	1100	△18	450	30.0 762	25.5 648	24.0 610	1550 703	- -	1770 803	- -	- -	- -	- -	- -
		△20	500	30.0 762	26.0 660	24.0 610	1590 721	- -	1810 821	- -	- -	- -	- -	- -
		△22	550	30.0 762	26.0 660	24.0 610	1630 739	- -	1850 839	- -	- -	- -	- -	- -
		△24	600	30.0 762	26.0 660	24.0 610	1645 745	390 177	1865 846	405 184	- -	- -	- -	- -
		△26	650	30.0 762	27.5 698	24.0 610	1665 755	425 193	1890 857	440 200	- -	- -	- -	- -
		30	750	30.0 762	28.0 711	□ 24.0 610	1690 767	445 202	1910 866	465 211	- -	- -	- -	- -
		36	900	30.0 762	28.0 711	□ 24.0 610	1710 776	470 213	1935 878	495 225	- -	- -	- -	- -

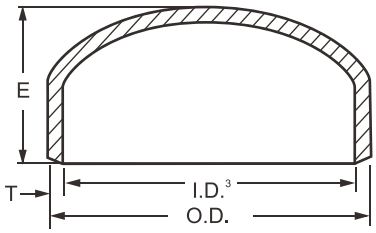
When ordering Reducing Tees,specify the run pipe size first,followed by the outlet size.Example:2X2X1.
When ordering Reducers,specify the Large End first followdd by the Small End size and the type.Example: 2X1 eccentric.
These fittings are also available in other sizes and//or wall thicknesses.
Wall thickness and other pipe size data are in accordance with ANSI B36.10.
△This size of Reducer is not covered in ANSI B16.9
□ This size of Reducer supplied concentric,only.

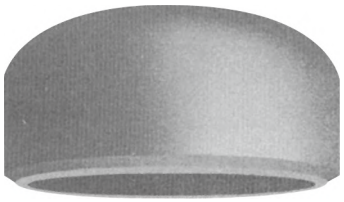
Tees size 20 NPS (DN 500) and smaller, Reducers size 24 NPS(DN 600) and Smaller,are normally furnished as seamless.larger size non-seamless Tees and Reducers are Produced from X-rayed, stress relieved welded pipe. Welds are 100% radiographed in accordance with the requirements of the ASME Unfired Pressure Vessel Code.

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

CAPS

STANDARD,EXTRA STRONG,SCH.160,
DOUBLE EXTRA STRONG
Carbon and ferritic alloy steel,
ASTM A-234.
ANSI B16.9





NPS	DN	OUTSIDE DIAMETER AT BEVEL O.D.	STANDARD WEIGHT WALL THICKNESS T	STANDARD WEIGHT NOMINAL LENGTH [1]E	STANDARD WEIGHT APPROX. WEIGHT	EXTRA STRONG WALL THICKNESS T	EXTRA STRONG NOMINAL LENGTH [1]E	EXTRA STRONG APPROX. WEIGHT	SCHEDULE 160 WALL THICKNESS T	SCHEDULE 160 NOMINAL LENGTH [1]E	SCHEDULE 160 APPROX. WEIGHT	DOUBLE EXTRA STRONG WALL THICKNESS T	DOUBLE EXTRA STRONG NOMINAL LENGTH [1]E	DOUBLE EXTRA STRONG APPROX. WEIGHT
1/2		.840	.109	1.0	.1	.147	1.0	.09	-	-	-	-	-	-
	15	21	2.77	25	.05	3.73	25	.04	-	-	-	-	-	-
3/4		1.050	.113	1.0	.1	.154	1.0	.1	-	-	-	-	-	-
	20	27	2.87	25	.05	3.91	25	.05	-	-	-	-	-	-
1		1.315	.133	1.5	.2	.179	1.5	.2	.250	1.5	.4	.358	1.5	1.0
	25	33	3.38	38	.09	4.55	38	.09	6.36	38	.2	9.09	38	.45
1 1/4		1.660	.140	1.5	.3	.191	1.5	.4	.250	1.5	.5	.382	1.5	1.5
	32	42	3.56	38	.14	4.85	38	.18	6.35	38	.2	9.70	38	.68
1 1/2		1.900	.145	1.5	.4	.200	1.5	.5	.281	1.5	.6	.400	1.5	2.5
	40	48	3.68	38	.18	5.08	38	.23	7.14	38	.3	10.16	38	1.1
2		2.375	.154	1.5	.6	.218	1.5	.8	.344	1.75	1.25	.436	1.75	3.0
	50	60	3.91	38	.27	5.54	38	.36	8.74	44	.6	11.07	44	1.4
2 1/2		2.875	.203	1.5	.9	.276	1.5	1.0	.375	2.0	1.75	.552	2.0	4.0
	65	73	5.16	38	.41	7.01	38	.45	9.53	51	.8	14.02	51	1.8
3		3.500	.216	2.0	1.4	.300	2.0	2.0	.438	2.5	2.9	.600	2.5	6.0
	80	89	5.49	51	.64	7.62	51	.91	11.13	64	1.3	15.24	64	2.7
3 1/2		4.000	.226	2.5	2.2	.318	2.5	2.8	-	-	-	[2].636	3.0	7.5
	90	102	5.74	64	1.0	8.08	64	1.3	-	-	-	[2]16.15	76	3.4
4		4.500	.237	2.5	3.0	.337	2.5	3.5	.531	3.0	5.9	.674	3.0	9.0
	100	114	6.02	64	1.4	8.56	64	1.6	13.49	76	2.7	17.12	76	4.1
5		5.563	.258	3.0	4.5	.375	3.0	5.8	.625	3.5	10	.750	3.5	13.5
	125	141	6.55	76	2.0	9.53	76	2.6	15.88	89	4.5	19.05	89	5.1
6		6.625	.280	3.5	7.2	.432	3.5	9.2	.719	4.0	15	.864	4.0	18
	150	168	7.11	89	3.3	10.97	89	4.2	18.26	102	6.8	21.95	102	8.2

INCHES	POUNDS
MILLIMETRES	KILOGRAMS

NPS / DN	OUTSIDE DIAMETER AT BEVEL O.D.	STANDARD WEIGHT			EXTRA STRONG			SCHEDULE 160			DOUBLE EXTRA STRONG		
		WALL THICKNESS T	NOMINAL LENGTH (1)E	APPROX. WEIGHT	WALL THICKNESS T	NOMINAL LENGTH (1)E	APPROX. WEIGHT	WALL THICKNESS T	NOMINAL LENGTH (1)E	APPROX. WEIGHT	WALL THICKNESS T	NOMINAL LENGTH (1)E	APPROX. WEIGHT
8	8.625	.322	4.0	12.0	.500	4.0	15	.906	5.0	31	.875	5.0	26
200	219	8.18	102	5.4	12.70	102	6.8	23.01	127	14	22.23	127	12
10	10.750	.365	5.0	18	.500	5.0	25	1.125	6.0	57	-	-	-
250	273	9.27	127	8.2	12.70	127	11.3	28.58	152	26	-	-	-
12	12.750	.375	6.0	27	.500	6.0	35	1.312	7.0	95	-	-	-
300	324	9.53	152	12	12.70	152	16	33.32	178	43	-	-	-
14	14.000	.375	6.5	33	.500	6.5	43	1.406	7.5	130	-	-	-
350	356	9.53	165	15	12.70	165	20	35.71	191	59	-	-	-
16	16.000	.375	7.0	42	.500	7.0	54	1.594	8.0	165	-	-	-
400	406	9.53	178	19	12.70	178	25	40.49	203	75	-	-	-
18	18.000	.375	8.0	55	.500	8.0	73						
450	457	9.53	203	25	12.70	203	33						
20	20.000	.375	9.0	68	.500	9.0	90						
500	508	9.53	229	31	12.70	229	41						
22	22.000	.375	10.0	86	.500	10.0	110						
550	559	9.53	254	39	12.70	254	50						
24	24.000	.375	10.5	96	.500	10.5	127						
600	610	9.53	267	44	12.70	267	58						
26	26.000	.375	10.5	110	.500	10.5	145						
650	660	9.53	267	50	12.70	267	66						
30	30.000	.375	10.5	132	.500	10.5	175						
750	762	9.53	267	60	12.70	267	79						
36	36.000	.375	10.5	192	.500	10.5	235						
900	914	9.53	267	87	12.70	267	107						
42	42.000	.375	12.0	225	.500	12.0	295						
1100	1067	9.53	305	102	12.70	305	134						

(1)See dimensional tolerances.

(2)This size not covered in ANSI B36.10, dimensions of wrought steel pipe.

(3)For inside diameter.

These fittings are also available in other sizes and/or wall thicknesses.

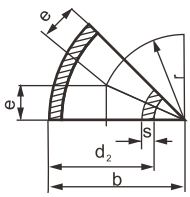
INCHES
MILLIMETRES

POUNDS
KILOGRAMS

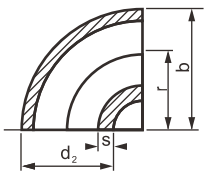
ELBOWS & CAPS

DIN2605-1991
DIN2617-1991

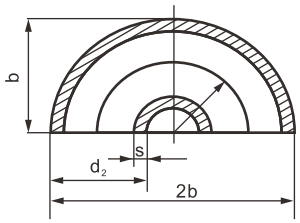
45° Elbow



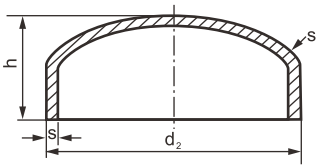
90° Elbow



180° Elbow



Caps



Nominal Size DN	Outside Diameter d_2	Wall Thickness s, for series 3	r	b	e	h	Approx. Weight (kg)			
							45° Elbows	90° Elbows	180° Elbows	Caps.
15	21.3	2.0	28.0	38	12	25	0.02	0.04	0.08	0.02
20	26.9	2.3	29.0	43	12	25	0.04	0.07	0.14	0.04
25	33.7	2.6	38.0	56	16	38	0.06	0.12	0.24	0.07
32	42.4	2.6	48.0	69	20	38	0.10	0.19	0.38	0.11
40	48.3	2.6	57.0	82	24	38	0.14	0.27	0.54	0.14
50	60.3	2.9	76	108	32	38	0.25	0.49	0.98	0.26
65	76.1	2.9	95	133	39	38	0.40	0.79	1.58	0.34
80	88.9	3.2	114	159	47	51	0.61	1.22	2.44	0.50
100	114.3	3.6	152	210	63	64	1.19	2.37	4.74	1.07
125	139.7	4.0	190	260	79	76	2.02	4.04	8.08	1.55
150	168.3	4.5	229	313	95	89	3.25	6.50	13.00	2.65
200	219.1	6.3	305	414	126	102	7.95	15.9	31.8	5.60
250	273	6.3	381	518	158	127	12.45	24.9	49.8	8.10
300	323.9	7.1	457	619	189	152	20	40	80	11.75
350	355.6	8.0	533	711	221	165	28.6	57.2	114.4	16.12
400	406.4	8.8	610	813	253	178	41.1	82.2	164.4	22.27
450	457	10	686	914	284	203	60	119	238	32.61
500	508	11	762	1016	316	229	81	162	324	45.15
600	610	12.5	914	1219	379	267	136	271	542	70.83
700	711	12.5	1067	1422	422	267	177	353	706	88.14
800	813	12.5	1219	1626	505	267	231	461	922	107.5
900	914	12.5	1372	1829	568	267	-	-	-	128.59
1000	1016	12.5	1524	2032	631	305	-	-	-	160.55
1200	1220	-	1830	2440	758	343		-	-	

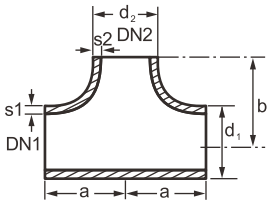
TOLERANCES

Nominal Size DN	Limit Deviations for Dimension				Lower Limit Deviations for Wall Thickness	
	45°Elbows b	90°Elbows b	180°Elbows 2b	Caps h		
15-65	+/-6.0	+/-2.5	+/-8.0	+/-4	+15%/ −12.5% for all sizes and wall thickness	+15% -12.5%
80-100	+/-7.0	+/-3.0	+/-9.0	+/-4		
125-200	+/-8.5	+/-3.5	+/-10.0	+/-7		
250	+/-9.5	+/-4.0	+/-14.0	+/-7		
300-450	+/-12.0	+/-5.0	+/-14.0	+/-7		
500-600	+/-14.5	+/-6.0	+/-16.0	+/-7		
700	+/-14.5	+/-6.0	To Be	+/-10		+15% -0.50mm
800-1200	+/-19.0	+/-8.0	Agreed	+/-10		

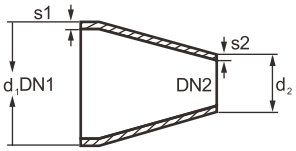
TEES & REDUCERS

DIN2615-1992
DIN2616-1991

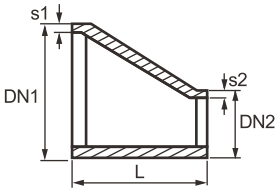
Tees



Con Reducers



Ecc Reducers

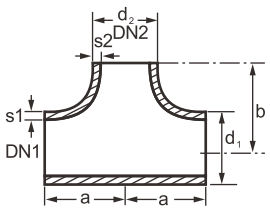


Nominal Size DN1	Outside Diameter d1	Wall Thickness s1, for series 3	Nominal Size DN2	Outside Diameter d2	Wall Thickness s2, for series 3	Tees		Reducers	Approx. Weight (kg)	
						a	b	L	Tees	Reducers
15	21.3	2.0	15	21.3	2.0	25	25	-	0.09	-
20	26.9	2.3	20	26.9	2.3	29	29	-	0.15	-
20	26.9	2.3	15	21.3	2.0	29	29	38	0.13	0.042
25	33.7	2.6	25	33.7	2.6	38	38	-	0.29	-
25	33.7	2.6	20	26.9	2.3	38	38	50	0.29	0.097
25	33.7	2.6	15	21.3	2.0	38	38	50	0.29	0.09
32	42.4	2.6	32	42.4	2.6	48	48	-	0.50	-
32	42.4	2.6	25	33.7	2.6	48	48	50	0.46	0.12
32	42.4	2.6	20	26.9	2.3	48	48	50	0.46	0.12
32	42.4	2.6	15	21.3	2.0	48	48	50	0.46	0.12
40	48.3	2.6	40	48.3	2.6	57	57	-	0.70	-
40	48.3	2.6	32	42.4	2.6	57	57	64	0.66	0.19
40	48.3	2.6	25	33.7	2.6	57	57	64	0.65	0.185
40	48.3	2.6	20	26.9	2.3	57	57	64	0.65	0.165
50	60.3	2.9	50	60.3	2.9	64	64	-	1.04	-
50	60.3	2.9	40	48.3	2.6	64	60	76	0.97	0.31
50	60.3	2.9	32	42.4	2.6	64	57	76	0.96	0.31
50	60.3	2.9	25	33.7	2.6	64	51	76	0.96	0.29
50	60.3	2.9	20	26.9	2.3	64	44	76	0.96	0.29
65	76.1	2.9	65	76.1	2.9	76	76	-	2.00	-
65	76.1	2.9	50	60.3	2.9	76	70	90	1.80	0.53
65	76.1	2.9	40	48.3	2.6	76	67	90	1.50	0.48
65	76.1	2.9	32	42.4	2.6	76	64	90	1.50	0.48
65	76.1	2.9	25	33.7	2.6	76	57	90	1.50	0.48
80	88.9	3.2	80	88.9	3.2	86	86	-	2.20	-
80	88.9	3.2	65	76.1	2.9	86	83	90	2.00	0.62
80	88.9	3.2	50	60.3	2.9	86	76	90	2.00	0.62
80	88.9	3.2	40	48.3	2.6	86	73	90	2.00	0.56
80	88.9	3.2	32	42.4	2.6	86	70	90	2.00	0.53
100	114.3	3.6	100	114.3	3.6	105	105	-	4.00	-
100	114.3	3.6	80	88.9	3.2	105	98	100	3.50	0.97
100	114.3	3.6	65	76.1	2.9	105	95	100	3.50	0.97
100	114.3	3.6	50	60.3	2.9	105	89	100	3.50	0.97
100	114.3	3.6	40	48.3	2.6	105	86	100	3.50	0.80
125	139.7	4.0	125	139.7	4.0	24	124	-	6.50	-
125	139.7	4.0	100	114.3	3.6	124	117	127	6.50	1.71
125	139.7	4.0	80	88.9	3.2	124	111	127	6.50	1.71
125	139.7	4.0	65	76.1	2.9	124	108	127	6.50	1.71
125	139.7	4.0	50	60.3	2.9	124	105	127	6.50	1.71
150	168.3	4.5	150	168.3	4.5	143	143	-	10.50	-
150	168.3	4.5	125	139.7	4.0	143	137	140	10.50	2.53
150	168.3	4.5	100	114.3	3.6	143	130	140	10.00	2.53
150	168.3	4.5	80	88.9	3.2	143	124	140	10.00	2.53
150	168.3	4.5	65	76.1	2.9	143	121	140	10.00	2.53

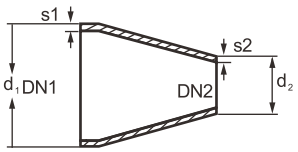
TEES & REDUCERS

DIN2615-1992
DIN2616-1991

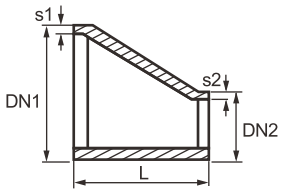
Tees



Con Reducers



Ecc Reducers

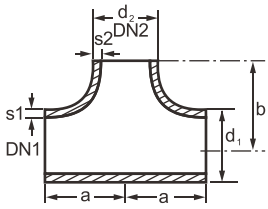


Nominal Size DN1	Outside Diameter d1	Wall Thickness s1, for series 3	Nominal Size DN2	Outside Diameter d2	Wall Thickness s2, for series 3	Tees		Reducers	Approx. Weight (kg)	
						a	b	L	Tees	Reducers
200	219.1	6.3	200	219.1	6.3	178	178	-	19.0	-
200	219.1	6.3	150	168.3	4.5	178	168	152	18.0	5.03
200	219.1	6.3	125	139.7	4.0	178	162	152	18.0	5.03
200	219.1	6.3	100	114.3	3.6	178	156	152	18.0	5.03
200	219.1	6.3	80	88.9	3.2	178	152	152	18.0	5.03
250	273	6.3	250	273	6.3	216	216	-	40.0	-
250	273	6.3	200	219.1	6.3	216	203	178	37.0	7.40
250	273	6.3	150	168.3	4.5	216	194	178	36.0	7.40
250	273	6.3	125	139.7	4.0	216	191	178	36.0	7.40
250	273	6.3	100	114.3	3.6	216	184	178	36.0	7.40
300	323.9	7.1	300	323.9	7.1	254	254	-	62.0	-
300	323.9	7.1	250	273	6.3	254	241	203	62.0	11.29
300	323.9	7.1	200	219.1	6.3	254	229	203	62.0	11.29
300	323.9	7.1	150	168.3	4.5	254	219	203	49.0	11.29
300	323.9	7.1	125	139.7	4.0	254	216	203	49.0	11.29
350	355.6	8.0	350	355.6	8.0	279	279	-	77.0	-
350	355.6	8.0	300	323.9	7.1	279	270	330	77.0	22.54
350	355.6	8.0	250	273	6.3	279	257	330	72.00	22.54
350	355.6	8.0	200	219.1	6.3	279	248	330	72.00	22.54
350	355.6	8.0	150	168.3	4.5	279	238	330	72.00	22.54
400	406.4	8.8	400	406.4	8.8	305	305	-	94	-
400	406.4	8.8	350	355.6	8.0	305	305	355	94	30.49
400	406.4	8.8	300	323.9	7.1	305	295	355	88	30.49
400	406.4	8.8	250	273	6.3	305	283	355	88	30.49
400	406.4	8.8	200	219.1	6.3	305	273	355	88	30.49
400	406.4	8.8	150	168.3	4.5	305	264	355	88	30.49
450	457	10	450	457	10	343	343	-	125	-
450	457	10	400	406.4	8.8	343	330	381	125	41.91
450	457	10	350	355.6	8.0	343	330	381	120	41.91
450	457	10	300	323.9	7.1	343	321	381	120	41.91
450	457	10	250	273	6.3	343	308	381	120	41.91
450	457	10	200	219.1	6.3	343	298	381	120	41.91
500	508	11	500	508	11	381	381	-	228	-
500	508	11	450	457	10	381	368	508	228	68.58
500	508	11	400	406.4	8.8	381	356	508	228	68.58
500	508	11	350	355.6	8.0	381	356	508	224	68.58
500	508	11	300	323.9	7.1	381	346	508	224	68.58
500	508	11	250	273	6.3	381	333	508	219	68.58
500	508	11	200	219.1	6.3	381	324	508	219	68.58
600	610	12.5	600	610	12.5	432	432	-	423	-

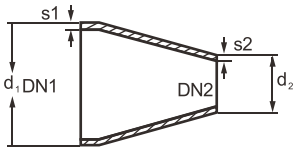
TEES & REDUCERS

DIN2615-1992
DIN2616-1991

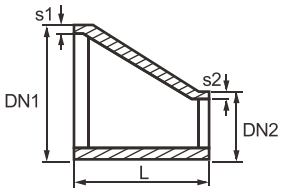
Tees



Con Reducers



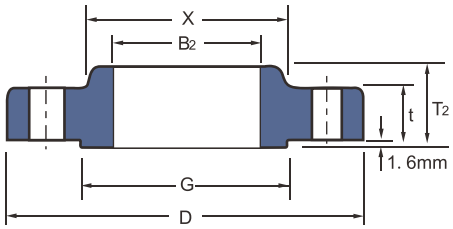
Ecc Reducers



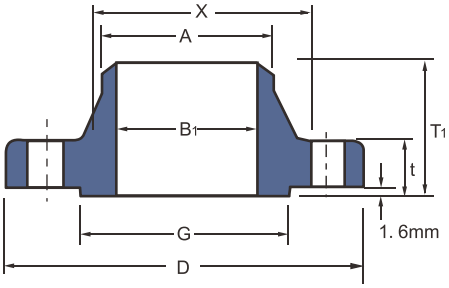
Nominal Size DN1	Outside Diameter d1	Wall Thickness s1, for serles 3	Nominal Size DN2	Nominal Size d2	Wall Thickness s2, for serles 3	Tees		Reducers	Approx. Weight (kg)	
						a	b	L	Tees	Reducers
600	610	12.5	500	508	11	432	432	508	309	97.03
600	610	12.5	450	457	10	432	419	508	309	97.03
600	610	12.5	400	406.4	8.8	432	406	508	231	97.03
600	610	12.5	350	355.6	8.0	432	406	508	231	97.03
600	610	12.5	300	323.9	7.1	432	397	508	231	97.03
600	610	12.5	250	273	6.3	432	384	508	231	97.03
700	711	12.5	700	711	12.5	521	521	-	-	-
700	711	12.5	600	610	12.5	521	508	610	-	-
700	711	12.5	500	508	11	521	483	610	-	-
700	711	12.5	450	457	10	521	470	610	-	-
700	711	12.5	400	406.4	8.8	521	457	610	-	-
700	711	12.5	350	355.6	8.0	521	457	610	-	-
700	711	12.5	300	323.9	7.1	521	448	610	-	-
800	813	12.5	800	813	12.5	597	597	-	-	-
800	813	12.5	700	711	12.5	597	572	610	-	-
800	813	12.5	600	610	12.5	597	559	610	-	-
800	813	12.5	500	508	11	597	533	610	-	-
800	813	12.5	450	457	10	597	521	610	-	-
800	813	12.5	400	406.4	8.8	597	508	610	-	-
800	813	12.5	350	355.6	8.0	597	508	610	-	-
900	914	12.5	900	914	12.5	673	673	-	-	-
900	914	12.5	800	813	12.5	673	648	610	-	-
900	914	12.5	700	711	12.5	673	622	610	-	-
900	914	12.5	600	610	12.5	673	610	610	-	-
900	914	12.5	500	508	11	673	584	610	-	-
900	914	12.5	450	457	10	673	572	610	-	-
900	914	12.5	400	406.4	8.8	673	559	610	-	-
1000	1016	12.5	1000	1016	12.5	749	749	-	-	-
1000	1016	12.5	900	914	12.5	749	737	610	-	-
1000	1016	12.5	800	813	12.5	749	711	610	-	-
1000	1016	12.5	700	711	12.5	749	673	610	-	-
1000	1015	12.5	600	610	12.5	749	660	610	-	-
1000	1016	12.5	500	508	11	749	635	610	-	-
1000	1016	12.5	450	457	10	749	622	610	-	-

Nominal Size DN	Limit Deviations for Tees a and b	Dimension Reducers L	Lower Limit Deviations for Wall Thickness: Tees	Lower Limit Deviations for Wall Thickness: Reducers
15-65	+/-2.0	+/-2.5	+15% -12.5%	
80-100		+/-3.0		
125-200		+/-3.5		
250	+/-3.0	+/-4.0		
300-450		+/-5.0		
500-600		+/-6.0		+15% -0.50mm
600-700				
800	+/-5.0			
900-1000		+/-8.0		

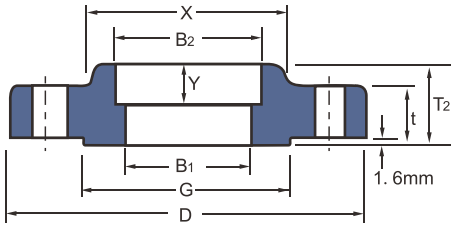
CLASS 150



SLIP ON



WELDING NECK



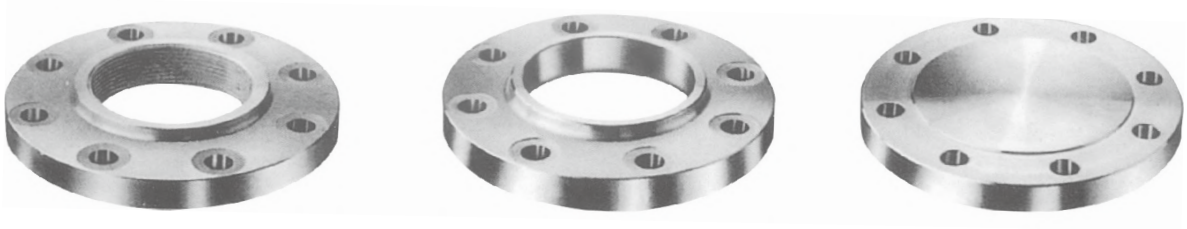
SOCKET WELDING

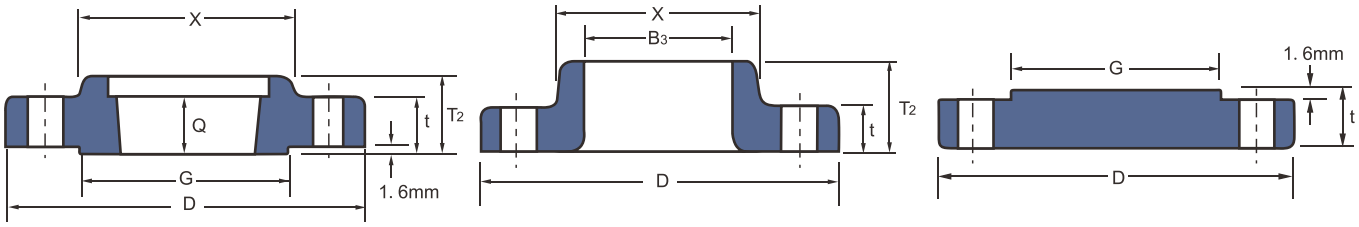
ANSI B16.5

Unit: mm

Nominal Pipe Size	Outside Diam	O.D. of Raised Face	Diam. at Base of Hub	Thickness	BORE			LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Slip on Socket Wellding	Lap Joint	Welding Neck	Slip on Threaded Socket Wellding	Lap Joint			
	D	G	X	t	B_1	B_2	B_3	T_1	T_2	T_3	A	R	Q
1/2	89	35.1	30.2	11.2	15.7	22.4	22.9	47.8	15.7	15.7	21.3	3.0	157
3/4	99	42.9	38.1	12.7	20.8	27.7	28.2	52.3	15.7	15.7	26.7	3.0	15.7
1	108	50.8	49.3	14.2	26.7	34.5	35.1	55.6	17.5	17.5	33.5	3.0	17.5
1 1/4	117	63.5	58.7	15.7	35.1	43.2	43.7	57.2	20.6	20.6	42.2	4.8	20.6
1 1/2	127	73.2	65.0	17.5	40.9	49.5	50.0	62.0	22.4	22.4	48.3	6.4	22.4
2	152	91.9	77.7	19.1	52.6	62.0	62.5	63.5	25.4	25.4	60.5	7.9	25.4
2 1/2	178	104.6	90.4	22.4	62.7	74.7	75.4	69.9	28.4	28.4	73.2	7.9	28.4
3	191	127.0	108.0	23.9	78.0	90.7	91.4	69.9	30.2	30.2	88.9	9.7	30.2
3 1/2	216	139.7	122.2	23.9	90.2	103.4	104.1	71.4	31.8	31.8	101.6	9.7	31.8
4	229	157.2	134.9	23.9	102.4	116.1	116.8	76.2	33.3	33.3	114.3	11.2	33.3
5	254	185.7	163.6	23.9	128.3	143.8	144.5	88.9	36.6	36.6	141.2	11.2	36.6
6	279	215.9	192.0	25.4	154.2	170.7	171.5	88.9	39.6	39.6	168.4	12.7	39.6
8	343	269.7	246.1	28.4	202.7	221.5	222.3	101.6	44.5	44.5	219.2	12.7	44.5
10	406	323.9	304.8	30.2	254.5	276.4	277.4	101.6	49.3	49.3	273.1	12.7	49.3
12	483	381.0	365.3	31.8	304.8	327.2	328.2	114.3	55.6	55.6	323.9	12.7	55.6
14	533	412.8	400.1	35.1	336.6	359.2	360.2	127.0	57.2	79.2	355.6	12.7	57.2
16	597	469.9	457.2	36.6	387.1	410.5	411.2	127.0	63.5	87.4	406.4	12.7	63.5
18	635	533.4	505.0	39.6	438.2	461.8	462.3	139.7	68.3	96.8	457.2	12.7	68.3
20	699	584.2	558.8	42.9	489.0	513.1	514.4	144.5	73.2	103.1	508.0	12.7	73.2
24	813	692.2	663.4	47.8	590.6	616.0	616.0	152.4	82.6	111.3	609.6	12.7	82.6

CLASS 150





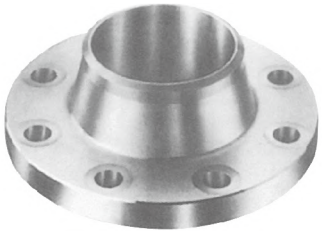
THREADED LAP JOINT BLIND

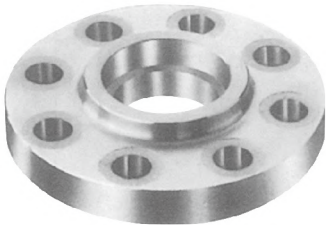
ANSI B16.5

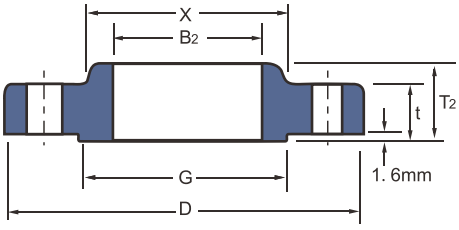
Unit: mm

Nominal Pipe Size	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck	Slip on and Threaded	Lap Joint	Blind	Socket Welding
	Y					Raised Face	Raised Face	Ring Joint	Kg	Kg	Kg	Kg	Kg
1/2	9.7	60.5	4	15.7	1 / 2	50.8	57.2	-	0.52	0.47	0.51	0.47	0.47
3/4	11.2	69.9	4	15.7	1 / 2	50.8	63.5	-	0.92	0.75	0.70	0.63	0.76
1	12.7	79.2	4	15.7	1 / 2	57.2	63.5	76.2	1.10	0.86	0.93	0.95	0.87
1 1/4	14.2	88.9	4	15.7	1 / 2	57.2	69.9	82.6	1.40	1.40	1.40	1.40	1.43
1 1/2	15.7	98.6	4	15.7	1 / 2	63.5	69.9	82.6	1.81	1.41	1.51	1.62	1.45
2	17.5	120.7	4	19.1	5 / 8	69.9	82.6	95.3	2.8	2.26	2.38	2.64	2.33
2 1/2	19.1	139.7	4	19.1	5 / 8	76.2	88.9	101.6	4.28	3.43	3.60	4.06	3.55
3	50.6	152.4	4	19.1	5 / 8	76.2	88.9	101.6	5.18	4.00	4.04	5.00	4.15
3 1/2	22.4	177.8	8	19.1	5 / 8	76.2	88.9	101.6	5.50	5.00	4.99	5.90	5.00
4	23.9	190.5	8	19.1	5 / 8	76.2	88.9	101.6	7.32	5.75	5.96	7.50	5.99
5	23.9	215.9	8	22.4	3 / 4	82.6	95.3	108.0	8.91	6.51	6.44	9.00	6.96
6	26.9	241.3	8	22.4	3 / 4	82.6	101.6	114.3	11.26	7.81	7.70	12.00	8.41
8	31.8	298.5	8	22.4	3 / 4	88.9	108.0	120.7	18.00	13.00	12.66	20.00	13.93
10	33.3	362.0	12	25.4	7 / 8	101.6	114.3	127.0	25.00	17.10	17.00	30.00	19.50
12	39.6	431.8	12	25.4	7 / 8	101.6	120.7	133.4	38.98	27.68	28.30	44.00	29.03
14	41.4	476.3	12	28.4	1	114.3	133.4	146.1	51.71	35.20	41.50	64.00	38.56
16	44.5	539.8	16	28.4	1	114.3	133.4	146.1	64.41	45.00	52.98	78.00	47.37
18	49.3	577.9	16	31.8	1 1 / 8	127.0	146.1	158.8	74.84	54.00	68.00	95.00	58.72
20	54.1	635.0	20	31.8	1 1 / 8	139.7	158.8	171.5	89.36	73.00	85.00	125.00	77.81
24	63.5	749.3	20	35.1	1 1 / 4	152.4	171.5	184.2	119.66	96.00	120.00	190.00	100.75

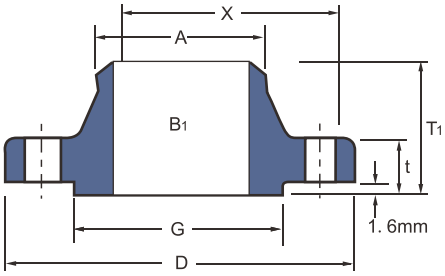
CLASS 300



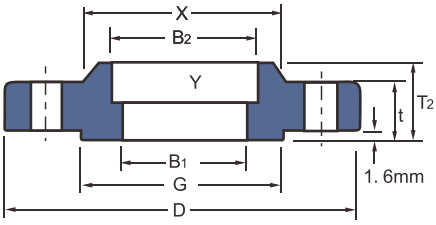




SLIP ON



WELDING NECK



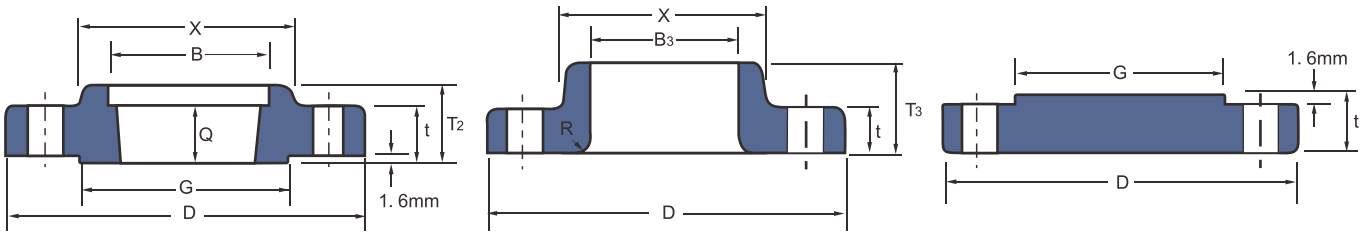
SOCKET WELDING

ANSI B16.5

Unit: mm

Nominal Pipe Size	Outside Diam	Diam at Base of Hub	O. D. of Raised face	Thick ness	BORE				LENGTH THRU HUB			Diam at Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Slip on Socket Welding	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip on Threaded Socket Welding	Lap Joint			
	D	X	G	t	B_1	B_2	B_3	B	T_1	T_2	T_3	A	R	Q
1/2	95	38.1	35.1	14.2	15.7	22.4	22.9	23.6	52.3	22.4	22.4	21.3	3.0	15.7
3/4	117	47.8	42.9	15.7	30.8	27.7	28.2	29.0	57.2	25.4	25.4	26.7	3.0	15.7
1	124	53.8	50.8	17.5	26.7	34.5	35.1	35.8	62.0	26.9	26.9	33.5	3.0	17.5
1 1/4	133	63.5	63.5	19.1	35.1	43.2	43.7	44.5	65.0	26.9	26.9	42.2	4.8	20.6
1 1/2	155	69.9	73.2	20.6	40.9	49.5	50.0	50.5	68.3	30.2	30.2	48.3	6.4	22.4
2	165	84.1	91.9	22.3	52.6	62.0	62.5	63.5	69.9	33.3	33.3	60.5	7.9	28.4
2 1/2	191	100.1	104.6	25.4	62.7	74.7	75.4	76.2	76.2	38.1	38.1	73.2	7.9	31.8
3	210	117.3	127.0	28.4	78.0	90.7	91.4	92.2	79.2	42.9	42.9	88.9	9.7	31.8
3 1/2	229	133.4	139.7	30.2	90.2	103.4	104.1	104.9	81.0	44.5	44.5	101.6	9.7	36.6
4	254	146.1	157.2	31.7	102.4	116.1	116.8	117.6	85.9	47.8	47.8	114.3	11.2	36.6
5	279	177.8	185.7	35.0	128.3	143.8	144.5	144.5	98.6	50.8	50.8	141.2	11.2	42.9
6	318	206.2	215.9	36.6	154.2	170.7	171.5	171.5	98.6	52.6	52.3	168.4	12.7	46.0
8	381	260.4	269.7	41.1	202.7	221.5	222.3	222.3	111.3	62.0	62.0	219.2	12.7	50.8
10	445	320.5	323.9	47.8	254.5	276.4	277.4	276.4	117.3	66.5	95.3	273.1	12.7	55.6
12	521	374.7	381.0	50.8	304.8	327.2	328.2	328.7	130.0	73.2	101.6	323.9	12.7	60.5
14	584	425.5	412.8	53.8	336.6	359.2	360.2	360.4	142.7	76.2	111.3	355.6	12.7	63.5
16	648	482.6	469.9	57.2	387.4	410.5	411.2	411.2	146.1	82.6	120.7	406.4	12.7	68.3
18	711	533.4	533.4	60.5	438.2	461.8	462.3	462.0	158.8	88.9	130.0	457.2	12.7	69.9
20	775	587.2	584.2	63.5	489.0	513.1	514.4	512.8	162.1	95.3	139.7	508.0	12.7	73.2
24	914	701.5	692.2	69.9	590.6	616.0	616.0	614.4	168.1	106.4	152.4	609.6	12.7	82.6

CLASS 300



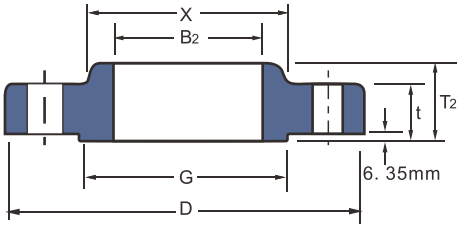
THREADED LAPJOINT BLIND

ANSI B16.5

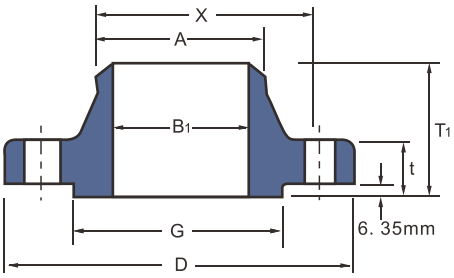
Unit: mm

Nominal Pipe Size	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck	Slip on and threaded	Lap Joint	Blind	Socket Welding
	Y					Raised Face	Raised Face	Ring Joint	Kg	Kg	Kg	Kg	Kg
1/2	9.7	66.5	4	15.7	1/2	57.2	63.5	76.2	0.80	0.62	0.61	0.65	0.62
3/4	11.2	82.6	4	19.1	5/8	63.5	76.2	88.9	1.40	1.30	1.30	1.40	1.34
1	12.7	88.9	4	19.1	5/8	63.5	76.2	88.9	1.64	1.50	1.50	1.50	1.55
1 1/4	14.2	98.6	4	19.1	5/8	69.9	82.6	95.3	2.10	1.70	1.70	2.80	1.76
1 1/2	15.7	114.3	4	22.4	3/4	76.2	88.9	101.6	3.06	2.60	2.60	2.80	2.69
2	17.5	127.0	8	19.1	5/8	76.2	88.9	101.6	3.50	3.00	3.00	3.30	3.14
2 1/2	19.1	149.4	8	22.4	3/4	82.6	101.6	114.3	5.31	4.50	4.50	5.40	4.74
3	20.6	168.1	8	22.4	3/4	88.9	108.0	120.7	7.32	5.90	5.80	7.00	6.29
3 1/2	22.4	184.2	8	22.4	3/4	95.3	108.0	127.0	8.2	7.72	7.72	9.53	
4	23.9	200.2	8	22.4	3/4	95.3	114.3	127.0	11.30	10.13	10.07	12.00	
5	23.9	235.0	8	22.4	3/4	108.0	120.7	133.4	15.12	13.00	13.00	16.00	
6	26.9	269.7	12	22.4	3/4	108.0	120.7	139.7	20.00	17.00	16.00	22.00	
8	31.8	330.2	12	25.4	7/8	120.7	139.7	152.4	30.48	26.00	25.00	36.00	
10	33.3	387.4	16	28.4	1	139.7	158.8	171.5	43.74	34.16	39.92	55.34	
12	39.6	450.9	16	31.8	1 1/8	146.1	171.5	184.2	64.41	51.26	60.00	80.00	
14	41.4	514.4	20	31.8	1 1/8	158.8	177.8	190.5	88.30	75.00	85.00	110.00	
16	44.5	571.5	20	35.1	1 1/4	165.1	190.5	203.2	115.00	94.00	112.00	139.25	
18	49.3	628.7	24	35.1	1 1/4	171.5	196.9	209.6	143.00	109.00	135.00	178.00	
20	54.1	685.5	24	35.1	1 1/4	184.2	203.2	222.3	175.00	136.00	165.00	223.17	
24	63.5	812.8	24	41.1	1 1/2	203.2	228.6	254.0	260.00	245.00	250.00	355.00	

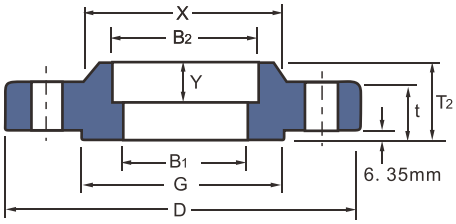
CLASS 600



SLIP ON



WELDING NECK



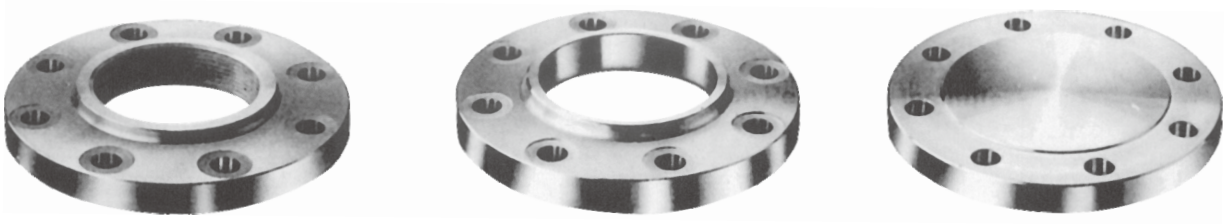
SOCKET WELDING

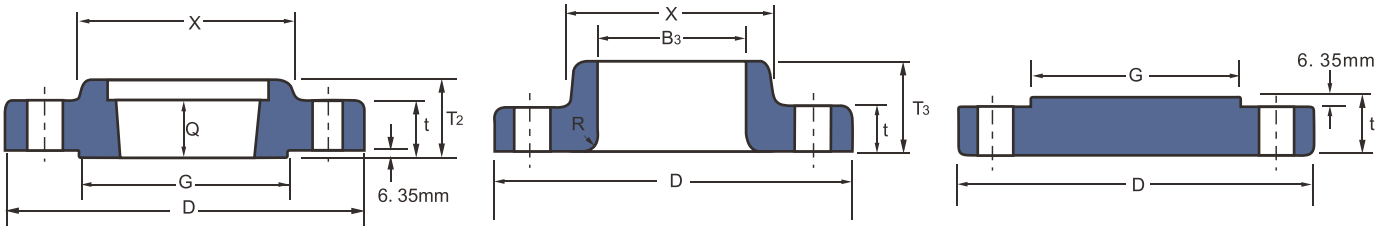
ANSI B16.5

Unit: mm

Nominal Pipe Size	Outside Diam	Diam at Base of Hub	O. D. of Raised Face	Thickness	BORE				LENGTH THRU HUB			Diam. of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Slip on Socket Welding	Lap Joint	Counter Bore Min. Thread Min.	Welding Neck	Slip on Threaded Socket Welding	Lap Joint			
	D	X	G	t	B_1	B_2	B_3	B	T_1	T_2	T_3	A	R	Q
1/2	95	38.1	35.1	14.2	See Note(1) To be specified by purchaser	22.4	22.9	23.6	52.3	22.4	22.4	21.3	3.0	15.7
3/4	117	47.8	42.9	15.7		27.7	28.2	29.0	57.2	25.4	25.4	26.7	3.0	15.7
1	124	53.8	50.8	17.5		34.5	35.1	35.8	62.0	26.9	26.9	33.5	3.0	17.5
1 1/4	133	63.5	63.5	20.6		43.2	43.7	44.5	66.5	28.4	28.4	42.2	4.8	20.6
1 1/2	155	69.9	73.2	22.4		49.5	50.0	50.5	69.9	31.8	31.8	48.3	6.4	22.4
2	165	84.1	91.9	25.4		62.0	62.5	63.5	73.2	36.6	36.6	60.5	7.9	28.4
2 1/2	191	100.1	104.6	28.4		72.7	75.4	76.2	79.2	41.1	41.1	73.2	7.9	31.8
3	210	117.3	127.0	31.8		90.7	91.4	92.2	82.6	46.0	46.0	88.9	9.7	35.1
3 1/2	229	133.4	139.7	35.1		103.4	104.1	104.9	85.9	49.3	49.3	101.6	9.7	39.6
4	273	152.4	157.2	38.1		116.1	116.8	117.6	101.6	53.8	53.8	114.3	11.2	41.1
5	330	189.0	185.7	44.5		143.8	144.5	144.5	114.3	60.5	60.5	141.2	11.2	47.8
6	356	222.3	215.9	47.8		170.7	171.5	171.5	117.3	66.5	66.5	168.4	12.7	50.8
8	419	273.1	269.7	55.6		221.5	222.3	222.3	133.4	76.2	76.2	219.2	12.7	57.2
10	508	342.9	323.9	63.5		276.4	277.4	276.4	152.4	85.9	111.3	273.1	12.7	65.0
12	559	400.1	381.0	66.45		327.2	328.2	328.7	155.4	91.9	117.3	323.9	12.7	69.9
14	603	431.8	412.8	69.9		359.2	360.2	360.4	165.1	93.7	127.0	355.6	12.7	73.2
16	686	495.3	469.9	76.2		410.5	411.2	411.2	177.8	106.4	139.7	406.4	12.7	77.7
18	743	546.1	533.4	82.6		461.8	462.3	462.0	184.2	117.3	152.4	457.2	12.7	79.2
20	813	609.6	584.2	88.9		513.1	514.4	512.8	190.5	127.0	165.1	508.0	12.7	82.6
24	940	717.6	692.2	101.6		616.0	616.0	614.4	203.2	139.7	184.2	609.6	12.7	91.9

CLASS 600





THREADED LAPJOINT BLIND

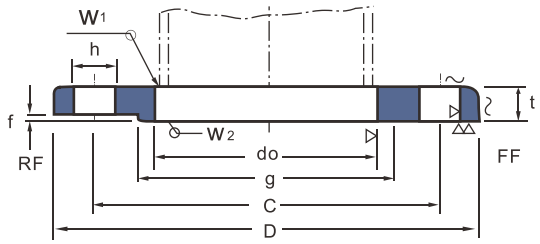
ANSI B16.5

Unit: mm

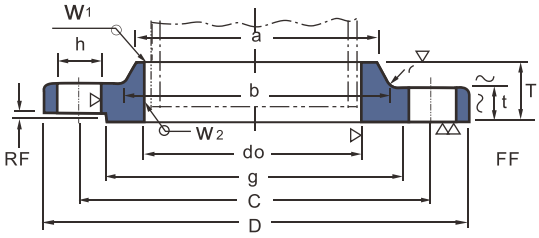
Nominal Pipe Size	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Stud Bolt Length			Welding Neck	Slip on and threaded	Lap Joint	Blind	Socket Welding
	Y					0. 25" Raised Face	Male Female Tongue Groove	Ring Joint	Kg	Kg	Kg	Kg	Kg
1/2	9. 7	66. 5	4	15. 7	1 / 2	76. 2	69. 9	76. 2	0. 98	0. 98	0. 98	0. 98	0. 98
3/4	11. 2	82. 6	4	19. 1	5/8	88. 9	82. 6	88. 9	1. 60	1. 40	1. 40	1. 40	1. 36
1	12. 7	88. 9	4	19. 1	5/8	88. 9	82. 6	88. 9	2. 00	2. 00	2. 00	2. 00	2. 11
1 1/4	14. 2	98. 6	4	19. 1	5/8	95. 3	88. 9	95. 3	2. 80	2. 70	2. 70	2. 70	3. 03
1 1/2	15. 7	114. 3	4	22. 4	3/4	108. 0	101. 6	108. 0	3. 80	3. 80	3. 80	3. 80	3. 88
2	17. 5	127. 0	8	19. 1	5/8	108. 0	101. 6	108. 0	4. 54	4. 10	4. 00	4. 60	4. 37
2 1/2	19. 1	149. 4	8	22. 4	3/4	120. 7	114. 3	120. 7	8. 20	5. 90	5. 90	6. 80	6. 36
3	20. 6	168. 1	8	22. 4	3/4	127. 0	120. 7	127. 0	8. 80	7. 30	7. 30	8. 90	7. 44
3 1/2	22. 4	184. 2	8	25. 4	7/8	139. 7	133. 4	139. 7	12. 00	9. 53	9. 40	13. 17	
4	23. 9	215. 9	8	25. 4	7/8	146. 1	139. 7	146. 1	17. 00	17. 00	17. 00	18. 60	
5	23. 9	266. 7	8	28. 4	1	165. 1	158. 8	165. 1	31. 00	29. 00	29. 00	30. 84	
6	26. 9	292. 1	12	28. 4	1	171. 5	165. 1	171. 5	36. 77	36. 32	36. 00	39. 00	
8	31. 8	349. 3	12	31. 8	1 1/8	190. 5	184. 2	193. 9	55. 00	52. 00	52. 00	64. 00	
10	33. 3	431. 8	16	35. 1	1 1/4	215. 9	209. 6	215. 9	90. 00	77. 00	77. 00	102. 00	
12	39. 6	489. 0	20	35. 1	1 1/4	222. 3	215. 9	222. 3	110. 00	97. 52	108. 86	132. 00	
14	41. 4	527. 1	20	38. 1	1 3/8	235. 0	228. 6	235. 0	127. 00	102. 00	113. 00	159. 00	
16	44. 5	603. 3	20	41. 1	1 1/2	254. 0	247. 7	254. 0	177. 06	149. 82	165. 71	224. 73	
18	49. 3	654. 1	20	44. 5	1 5/8	273. 1	266. 7	273. 1	215. 65	182. 00	197. 00	285. 00	
20	54. 1	723. 9	24	44. 5	1 5/8	285. 8	279. 4	282. 1	267. 86	231. 54	260. 00	365. 00	
24	63. 5	838. 2	24	50. 8	1 7/8	330. 2	323. 9	336. 6	372. 00	330. 00	370. 00	565. 00	

5K JIS B2220

NOMINAL SIZE 10 400mm



NOMINAL SIZE 450 1000mm

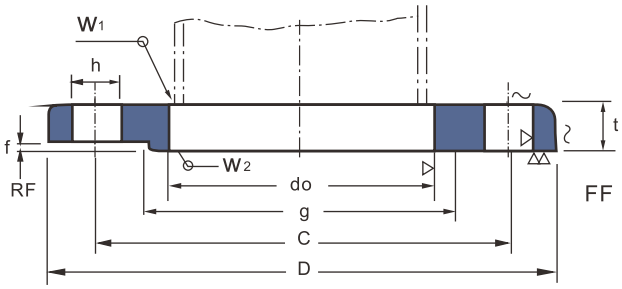


Unit: mm

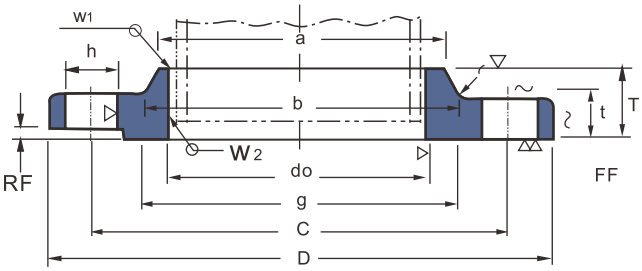
Nominal Dia. of Flange	Outside Dia. of Flange D	Sectional Dimensions of flange												Nominal Bolt Size	Welding		Weight (kg)
		Dia. of Bolt Circle C	Dia. of Raised Face g	Inside Dia. of Flange do	Outside Dia. of Applicable Pipe	t	T	Dia. of Hub		Radius r	Raised Face	Hole Dia. H	Number of Bolt Holes		W_1	W_2	
								a	b								
(10)	75	55	39	17.8	17.3	9	–	–	–	–	1	12	4	M10	5.0	2.5	0.27
15	80	60	44	22.2	21.7	9	–	–	–	–	1	12	4	M10	5.0	3.0	0.30
(20)	85	65	49	27.7	27.2	10	–	–	–	–	1	12	4	M10	5.0	3.0	0.37
25	95	75	59	34.5	34.0	10	–	–	–	–	1	12	4	M10	5.0	3.0	0.45
(32)	115	90	70	43.2	72.7	12	–	–	–	–	2	15	4	M12	6.0	3.0	0.78
40	120	95	75	49.1	48.6	12	–	–	–	–	2	15	4	M12	6.0	3.0	0.83
50	130	105	85	61.1	60.5	14	–	–	–	–	2	15	4	M12	6.0	3.0	1.07
65	155	130	110	77.1	76.3	14	–	–	–	–	2	15	4	M12	6.0	4.0	1.49
80	180	145	121	90.0	89.1	14	–	–	–	–	2	19	4	M16	6.0	4.0	1.99
(90)	190	155	131	102.6	101.6	14	–	–	–	–	2	19	4	M16	6.0	4.0	2.09
100	200	165	141	115.4	114.3	16	–	–	–	–	2	19	8	M16	7.0	4.0	2.39
125	235	200	176	141.2	139.8	16	–	–	–	–	2	19	8	M16	7.0	4.0	3.23
150	265	230	206	166.6	165.2	18	–	–	–	–	2	19	8	M16	7.0	5.0	4.41
(175)	300	260	232	192.1	190.7	18	–	–	–	–	2	23	8	M20	7.5	5.0	5.51
200	320	280	252	218.0	216.3	20	–	–	–	–	2	23	8	M20	8.5	6.0	6.33
(225)	345	305	277	243.7	241.8	20	–	–	–	–	2	23	12	M20	9.0	6.0	6.64
250	385	345	317	269.5	267.4	22	–	–	–	–	2	23	12	M20	10.0	6.0	9.45
300	430	390	360	321.0	318.5	22	–	–	–	–	3	23	12	M20	10.0	6.0	10.30
350	480	435	403	358.1	355.6	24	–	–	–	–	3	25	12	M22	12.0	7.0	14.00
400	540	495	463	409.0	406.4	24	–	–	–	–	3	25	16	M22	12.0	7.0	16.90
450	605	555	523	460.0	457.2	24	40	495	500	5	3	25	16	M22	12.0	7.0	24.80
500	655	605	573	511.0	508.0	24	40	546	552	5	3	25	20	M22	12.0	7.0	26.90
550	720	665	630	562.0	558.8	26	42	597	603	5	3	27	20	M24	12.0	7.0	34.10
600	770	715	680	613.0	609.6	26	44	648	654	5	3	27	20	M24	12.0	7.0	37.50
650	825	770	735	664.0	660.4	26	48	702	708	5	3	27	24	M24	12.0	7.0	42.80
700	875	820	785	715.0	711.2	26	48	751	758	5	3	27	24	M24	12.0	7.0	45.40
750	945	880	840	766.0	762.0	28	52	802	810	5	3	33	24	M30	12.0	7.0	57.40
800	995	930	890	817.0	812.8	28	52	854	862	5	3	33	24	M30	13.0	8.0	60.80
850	1045	980	940	868.0	863.6	28	54	904	912	5	3	33	24	M30	13.0	8.0	63.50
900	1095	1030	990	919.0	914.4	30	56	956	964	5	3	33	24	M30	13.0	8.0	75.30
1000	1195	1130	1090	1021.0	1016.0	32	60	1058	1066	5	3	33	28	M30	14.0	9.0	88.50
*(1100)	1305	1240	1200	1123.0	1117.6	32	–	–	–	–	3	33	28	M30			
*1200	1420	1350	1305	1225.0	1219.2	34	–	–	–	–	3	33	32	M30			
*1350	1575	1505	1460		1371.6	34	–	–	–	–	3	33	32	M30			
*1500	1730	1660	1615		1524.0	36	–	–	–	–	3	33	36	M30			

10K JIS B2220

NOMINAL SIZE 10 225mm



NOMINAL SIZE 250 1000mm

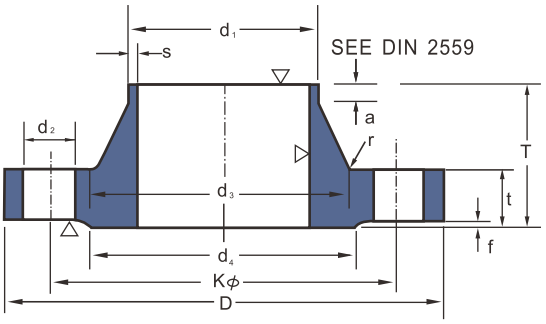


Unit: mm

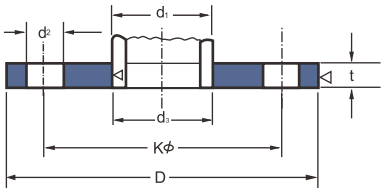
Nominal Dia. of Flange	Outside Dia. of Flange D	Sectional Dimentions of Flange												Nominal Bolt Size	Weld Length(Reference)		Weight (Kg)
		Bolt Circle Dia. C	Dia. of Raised Face g	Inside Dia.of Flange do	Outside Dia.of Steel Pipe	t	T	Dia.of Hub a	Dia.of Hub b	Radius r	Raised Face	Hole Dia. h	Number of Bolt Holes		W_1	W_2	
10	90	65	46	17.8	17.3	12		–	–	–	1	15	4	M12	5	2.5	0.52
15	95	70	51	22.2	21.7	12		–	–	–	1	15	4	M12	5	3	0.57
20	100	75	56	27.7	27.2	14		–	–	–	1	15	4	M12	5	3	0.73
25	125	90	67	34.5	34	14		–	–	–	1	19	4	M16	5	3	1.13
32	135	100	76	43.2	42.7	16		–	–	–	2	19	4	M16	6	3	1.48
50	140	105	81	49.1	48.6	–	–	–	–	–	2	19	4	M16	6	3	1.56
50	155	120	96	61.1	60.5	16	–	–	–	–	2	19	4	M16	6	3	1.88
65	175	140	116	77.1	76.3	18	–	–	–	–	2	19	4	M16	6.5	4	2.6
80	185	150	126	90	89.1	18	–	–	–	–	2	19	8	M16	6.5	4	2.61
(90)	195	160	136	102.66	101.6	18	–	–	–	–	2	19	8	M16	6.5	4	2.76
100	210	175	151	115.4	114.3	18	–	–	–	–	2	19	8	M16	7	4	3.14
125	250	210	182	141.2	139.8	20	–	–	–	–	2	23	8	M20	7.5	4	4.77
150	280	240	212	166.6	165.2	22	–	–	–	–	2	23	8	M20	8	5	6.34
(175)	305	265	237	192.1	190.7	22	–	–	–	–	2	23	12	M20	9	5	6.82
200	330	290	262	218	216.3	22	–	–	–	–	2	23	12	M20	9	6	7.53
(225)	350	310	282	243.7	241.8	22	–	–	–	–	2	23	12	M20	9	6	7.74
250	400	355	324	269.5	267.4	24	36	288	292	6	2	25	12	M22	10	6	12.7
300	445	400	368	321	318.5	24	38	340	345	6	3	25	16	M22	10	6	13.8
350	490	445	413	358.1	355.6	26	42	380	386	6	3	25	16	M22	12	7	18.2
400	560	510	475	409	406.4	28	44	436	442	6	3	27	16	M24	12	7	25.2
450	620	565	530	460	457.2	30	48	496	502	6	3	27	20	M24	14	8	33
500	675	620	585	511	508	30	48	548	554	6	3	27	20	M24	14	8	37.6
550	745	680	640	562	558.8	32	52	604	610	6	3	33	20	M30	15	9	49.7
600	795	730	690	613	609.6	32	52	656	662	6	3	33	24	M30	16	10	52.6
650	845	780	740	664	660.4	34	56	706	712	6	3	33	24	M30	16	10	60.6
700	905	840	800	715	711.2	34	58	762	770	6	3	33	24	M30	17	10	70.6
750	970	900	855	766	762	36	62	816	824	6	3	33	24	M30	18	11	85.8
800	1020	950	905	817	812.8	36	64	868	876	6	3	33	28	M30	19	12	91.2
850	1070	1000	955	868	863.6	36	66	920	928	6	3	33	28	M30	19	12	98.6
900	1120	1050	1005	919	914.4	38	70	971	979	6	3	33	28	M30	22	14	109
1000	1235	1160	1110	1021	1016	40	74	1073	1081	6	3	39	28	M36	22	14	133
*(1100)	1345	1270	1220	1123	1117.6	42	–	–	–	–	3	39	28	M36			
*1200	1465	1380	1325	1225	1219.2	44	–	–	–	–	3	39	32	M36			
*1350	1630	1540	1480	–	1371.6	48	–	–	–	–	3	45	36	M42			
(1500)	1795	1700	1635	–	1524.0	50	–	–	–	–	3	45	40	M42			

6BAR DIN 2573 SLIP ON
DIN 2527 BLIND
DIN 2631 WELDING NECK

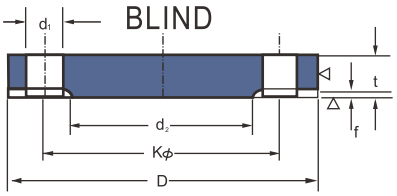
WELDING NECK



SLIP ON



BLIND

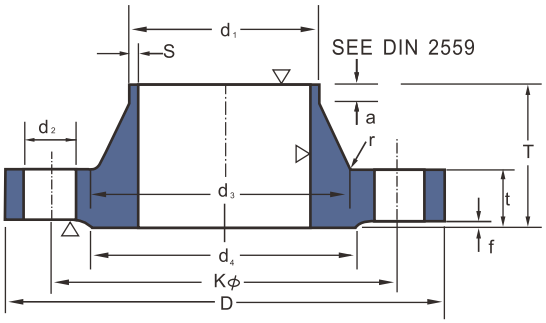


Unit: mm

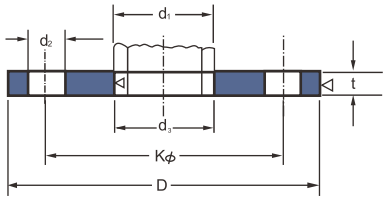
Bore		Common Dimension						Hub				Raised Face		Drilling				Approx. Weight(Kg)	
Nominal Bore	d_1	D	t Welding Neck	t Slip On	t Blind	K	T	d_3	S	r	a	d_4	f	Number of Bolt	x		d_2	DIN 2573	DIN 2631
10	14 17. 2*)	75	12	12	12	50	28	22 26	1. 8	4	6	35	2	4	M10	–	11. 5	0. 036	0. 335
15	20 21. 3*)	80	12	12	12	55	30	28 30	2. 0	4	6	40	2	4	M10	–	11. 5	0. 410	0. 329
20	25 26. 9*)	90	14	14	14	65	32	35 38	2. 3	4	6	50	2	4	M10	–	11. 5	0. 600	0. 592
25	30 33. 7*)	100	14	14	14	75	35	40 42	2. 6	4	6	60	2	4	M10		11. 5	0. 740	0. 747
32	38 42. 4*)	120	14	16	14	90	35	50 55	2. 6	6	6	70	2	4	M12	(1/2")	14	1. 19	1. 05
40	44. 5 48. 3*)	130	14	16	14	100	38	58 62	2. 6	6	7	80	3	4	M12	(1/2")	14	1. 39	1. 18
50	57 60. 3*)	140	14	16	14	110	38	70	2. 9	6	8	90	3	4	M12	(1/2")	14	1. 53	1. 34
65	76. 1*)	160	14	16	14	130	38	74 88	2. 9	6	9	110	3	4	M12	(1/2")	14	1. 89	1. 67
80	88. 9*)	190	16	18	16	150	42	102	3. 2	8	10	128	3	4	M16	(1/2")	18	2. 98	2. 71
100	108 114. 3*)	210	16	18	16	170	45	122 130	3. 6	8	10	148	3	4	M16	(5/8")	18	3. 46	3. 24
125	133 139. 7*)	243	18	20	18	200	48	148 155	4. 0	8	10	178	3	8	M16	(5/8")	18	4. 60	4. 49
150	159 168. 3*)	265	18	20	18	225	48	172 184	4. 5	10	12	202	3	8	M16	(5/8")	18	5. 22	5. 15
200	216 219. 1*)	320	20	22	20	280	55	230 236	5. 9	10	15	258	3	8	M16	(5/8")	18	7. 15	7. 78
250	267 273*)	375	22	24	22	335	60	282 290	6. 2	12	15	312	3	12	M16	(5/8")	18	9. 61	10. 8
300	318 323. 9*)	440	22	24	22	395	62	335 342	7. 1	12	15	365	4	12	M20	(3/4")	23	12. 6	14. 0
350	355. 6*) 368	490	22	26	22	445	62	385	7. 1	12	15	415	4	12	M20	(3/4")	23	15. 6	16. 1
400	406. 4*) 419	540	22	28	22	495	65	438	7. 1	12	15	455	4	16	M20	(3/4")	23	18. 4	18. 3
500	508*) 521	645	24	30	24	600	68	538	7. 1	12	15	570	4	20	M20	(3/4")	23	24. 5	24. 6
600	609. 6*) 622	755	24			705	70	640	7. 1	12	16	670	5	20	M24	(7/8")	27		
700	711. 2*) 720	860	24			810	70	740	7. 1	12	16	775	5	24	M24	(7/8")	27		
800	812. 8*) 820	975	24			920	70	842	7. 1	12	16	880	5	24	M27	(1")	30		
900	914. 4*) 920	1075	26			1020	70	942	7. 1	12	16	980	5	24	M27	(1")	30		
1000	1016*) 1020	1175	26			1120	70	1045	7. 1	16	16	1080	5	28	M27	(1")	30		

10BAR DIN 2576 SLIP ON
DIN 2527 BLIND
DIN 2632 WELDING NECK

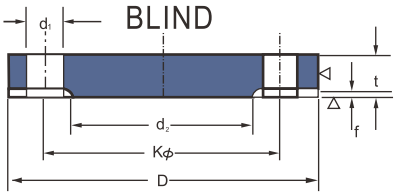
WELDING NECK



SLIP ON



BLIND

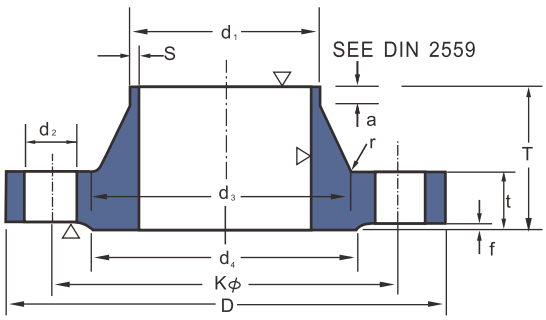


Unit: mm

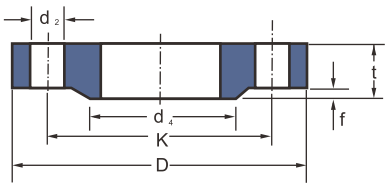
Bore		Common Dimension						Hub				Raised Face			Drilling			Approx Weight(Kg)	
Nominal Bore	d_1	D	t Welding Neck	t Slip on	t Blind	K	T	d_3	S	r	a≈	d_4	f	Number of Bolt	Dia. of Bolt		d_2	DIN 2576	DIN 2632
10	14 17.2*)	90	14	14	14	60	35	25 28	1.8	4	6	40	2	4	M12	(1/2")	14	0.613	0.580
15	20 21.3*)	95	14	14	14	65	35	30 32	2.0	4	6	45	2	4	M12	(1/2")	14	0.675	0.648
20	25 26.9*)	105	16	16	16	75	38	38 40	2.3	4	6	58	2	4	M12	(1/2")	14	0.947	0.952
25	30 33.7*)	115	16	16	16	85	38	42 45	2.6	4	6	68	2	4	M12	(1/2")	14	1.14	1.14
32	38 42.4*)	140	16	16	16	100	40	52 56	2.6	6	6	78	2	4	M16	(5/8")	18	1.66	1.69
40	44.5 48.3*)	150	16	16	16	110	42	60 64	2.6	6	7	88	3	4	M16	(5/8")	18	1.89	1.86
50	57 60.3*)	165	18	18	18	125	45	72 75	2.9	6	8	102	3	4	M16	(5/8")	18	2.51	2.53
65	76.1*)	185	18	18	18	145	45	90	2.9	6	10	122	3	4	M16	(5/8")	18	3.00	3.06
80	88.9*)	200	20	20	20	160	50	105	3.2	8	10	138	3	4	M16	(5/8")	18	3.79	3.70
100	108 114.3*)	220	20	20	20	180	52	125 131	3.6	8	12	158	3	8	M16	(5/8")	18	4.20	4.62
125	133 139.7*)	250	22	22	22	210	55	150 156	4.0	8	12	188	3	8	M16	(5/8")	18	5.71	6.30
150	159 168.3*)	285	22	22	22	240	55	175 184	4.5	10	12	212	3	8	M20	(3/4")	23	6.72	7.75
200	216 219.1*)	340	24	24	24	295	62	232 235	5.9	10	16	268	3	8	M20	(3/4")	23	9.50	11.3
250	267 273*)	395	26	26	26	350	68	285 292	6.3	12	16	320	3	12	M20	(3/4")	23	12.5	14.7
300	318 323.9*)	445	26	26	28	400	68	335 344	7.1	12	16	370	4	12	M20	(3/4")	23	14.4	17.6
350	355.6*) 368	505	26	28	30	460	68	385	7.1	12	16	430	4	16	M20	(3/4")	23	20.6	23.6
400	406.4*) 419	565	26	32	32	515	72	440	7.1	12	16	482	4	16	M24	(7/8")	27	27.9	28.6
500	508*) 521	670	28	38	34	620	75	542	7.1	12	16	585	4	20	M24	(7/8")	27	41.1	38.1
600	609.6*) 622	780	28			725	80	642	7.1	12	18	685	5	20	M27	(1")	30		
700	711.2*) 720	895	30			840	80	745	8.0	12	18	800	5	24	M27	(1")	30		
800	812.8*) 820	1015	32			950	90	850	8.0	12	18	905	5	24	M30	(11/8")	33		
900	914.4*) 920	1115	34			1050	95	950	10.0	12	20	1005	5	28	M30	(11/8")	33		
1000	1016*) 1020	1230	34			1160	95	1052	10.0	16	20	1110	5	28	M33	(11/4")	36		

16BAR DIN 2543 SLIP ON
DIN 2527 BLIND
DIN 2633 WELDING NECK

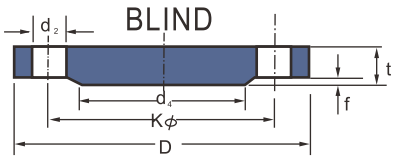
WELDING NECK



SLIP ON



BLIND

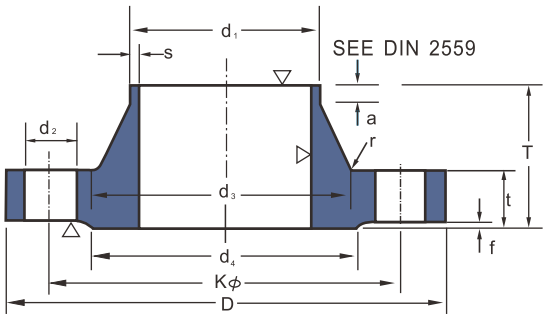


Unit: mm

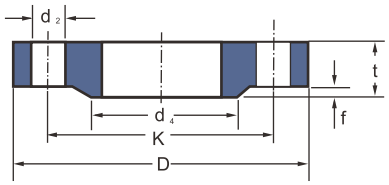
Bore			Common Dimension					Hub				Raised Face		Drilling				Approx Weight (Kg)	
			t																
Nominal Bore	d_1	D	Welding Neck	Slip on (No Hub)	Blind	K	T	d_3	S	r	a≈	d_4	f	Number of Bolt	Dia. of Bolt		d_2	DIN 2543	DIN 2633
10	14 17.2*)	90	14		14	60	35	25 28	1.8	4	6	40	2	4	M12	(1/2")	14	0.63	0.58
15	20 21.3*)	95	14	14	14	65	35	30 32	2.0	4	6	45	2	4	M12	(1/2")	14	0.72	0.648
20	25 26.9*)	105	16	16	16	75	38	38 40	2.3	4	6	58	2	4	M12	(1/2")	14	1.01	0.952
25	30 33.7*)	115	16	16	16	85	38	42 45	2.6	4	6	68	2	4	M12	(1/2")	14	1.23	1.14
32	38 42.4*)	140	16	16	16	100	40	52 56	2.6	6	6	78	2	4	M16	(5/8")	18	1.80	1.69
40	44.5 48.3*)	150	16	16	16	110	42	60 64	2.6	6	7	88	3	4	M16	(5/8")	18	2.09	1.86
50	57 60.3*)	165	18	18	18	125	45	72 75	2.9	6	8	102	3	4	M16	(5/8")	18	2.88	2.53
65	76.1*)	185	18	18	18	145	45	90	2.9	6	10	122	3	4	M16	(5/8")	18	3.66	3.06
80	88.9*)	200	20	20	20	160	50	105	2.2	8	10	138	3	8	M16	(5/8")	18	4.77	3.70
100	108 114.3*)	220	20	20	20	180	52	125 131	3.6	8	12	158	3	8	M16	(5/8")	18	5.65	4.62
125	133 139.7*)	250	22	22	22	210	55	150 156	4.0	8	12	188	3	8	M16	(5/8")	18	8.42	6.30
150	159 168.3*)	285	22	22	22	240	55	175 184	4.5	10	12	212	3	8	M20	(3/4")	23	10.4	7.75
200	216 219.1*)	340	24	24	24	295	62	232 235	5.9	10	16	268	3	12	M20	(3/4")	23	16.1	11.0
250	267 273*)	405	26	26	26	355	70	285 292	6.3	12	16	320	3	12	M24	(7/8")	27	24.9	15.6
300	318 323.9*)	460	28	28	28	410	78	338 344	7.1	12	16	378	4	12	M24	(7/8")	27	35.1	22.0
350	355.6*) 368	520	30	30	30	470	82	390	8.0	12	16	438	4	16	M24	(7/8")	27	47.8	31.2
400	406.4*) 419	580	32	32	32	525	85	445	8.0	12	16	490	4	16	M27	(1")	30	63.5	39.3
500	508*) 521	715	34	36	34	650	90	548	8.0	12	16	610	4	20	M30	(11/8")	33	102.0	61.0
600	609.6*) 622	840	36	40		770	95	652	8.8	12	18	725	5	20	M33	(11/4")	36		
700	711.2*) 720	910	36			840	100	755	8.8	12	18	795	5	24	M33	(11/4")	36		
900	812.8*) 820	1025	38			950	105	855	10.0	12	20	900	5	24	M36	(13/8")	39		
900	914.4*) 920	1125	40			1050	110	955	10.0	12	20	1000	5	28	M36	(13/8")	39		
1000	1016*) 1020	1255	42			1170	120	1058	10.0	16	20	1115	5	28	M39	(11/2")	42		

25BAR DIN 2544 SLIP ON
DIN 2527 BLIND
DIN 2634 WELDING NECK

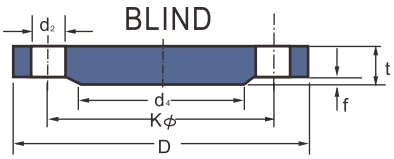
WELDING NECK



SLIP ON



BLIND

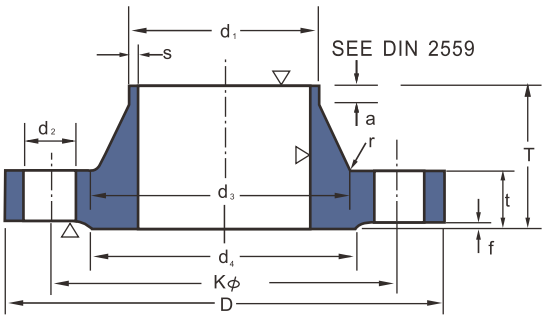


Unit: mm

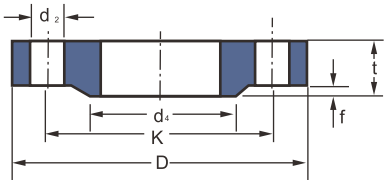
Bore		Common Dimension						Hub				Raised Face		Drilling				Approx. Weight (Kg)	
Nominal Bore	d_1	D	t Welding Neck	t Slip on (No Hub)	t Blind	K	T	d_3	S	r	a≈	d_4	f	Number of Bolt	Dia. Bolt		d_2	DIN 2544	DIN 2634
10	14 17.2*)	90	16	16	16	60	35	25 28	1.8	4	6	40	2	4	M12	(1/2")	14	0.72	0.661
15	20 21.3*)	95	16	16	16	65	38	30 32	2.0	4	6	45	2	4	M12	(1/2")	14	0.81	0.746
20	25 26.9*)	105	18	18	18	75	40	38 40	2.3	4	6	58	2	4	M12	(1/2")	14	1.24	1.06
25	30 33.7*)	115	18	18	18	85	40	42 46	2.6	4	6	68	2	4	M12	(1/2")	14	1.38	1.29
32	38 42.4*)	140	18	18	18	100	42	52 56	2.6	6	6	78	2	4	M16	(5/8")	18	2.03	1.88
40	44.5 48.3*)	150	18	18	18	110	45	60 64	2.6	6	7	88	3	4	M16	(5/8")	18	2.35	2.34
50	57 60.3*)	165	20	20	20	125	48	72	2.9	6	8	102	3	4	M16	(5/8")	18	3.20	2.82
65	76.1*)	185	22	22	22	145	52	75 90	2.9	6	10	122	3	8	M16	(5/8")	18	4.29	3.74
80	88.9*)	200	24	24	24	160	58	105	3.2	8	12	138	3	8	M16	(5/8")	15	5.88	4.75
100	108 114.3*)	235	24	24	24	190	65	128 134	3.6	8	12	162	3	8	M20	(3/4")	23	7.54	6.52
125	133 139.7*)	270	26	26	26	220	68	155 162	4.0	8	12	188	3	8	M24	(7/8")	27	10.8	9.07
150	159 168.3*)	300	28	28	28	250	75	182 192	4.5	10	12	218	3	8	M24	(7/8")	27	14.5	11.8
200	216 219.1*)	360	30	30	30	310	80	240 244	6.3	10	16	278	3	12	M24	(7/8")	27	22.3	17.0
250	267 273*)	425	32	32	32	370	88	292 298	7.1	12	18	335	3	12	M27	(1")	30	33.5	24.4
300	318 323.9*)	485	34	34	34	430	92	345 352	8.0	12	18	395	4	16	M27	(1")	30	46.3	31.2
350	355.6*) 368	555	38	38	38	490	100	398	8.0	12	20	450	4	16	M30	(1 1/8")	33	68.0	47.2
400	406.4*) 419	620	40	40	40	550	110	452	8.8	12	20	505	4	16	M33	(1 1/4")	36	89.7	61.7
500	508*) 521	730	44	44	44	660	125	558	10.0	12	20	615	4	20	M33	(1 1/4")	36	138.0	89.6
600	609.6*) 622	845	46			770	125	660	11.0	12	20	720	5	20	M36	(1 3/8")	39		104.0
700	721.2*) 720	960	46			875	125	760	12.5	12	20	820	5	24	M39	(1 1/2")	42		136.0
800	812.8*) 820	1085	50			990	135	865	14.2	12	22	930	5	24	M45	(1 3/4")	48		186.0
900	914.4*) 930	1185	54			1090	145	968	16.0	12	24	1030	5	28	M45	(1 3/4")	48		236.0
1000	1016*) 1020	1320	58			1210	155	1070	17.5	16	24	1140	5	28	M52	(2")	56		307.0

40BAR DIN 2545 SLIP ON
DIN 2527 BLIND
DIN 2635 WELDING NECK

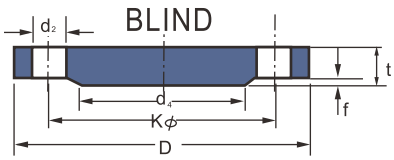
WELDING NECK



SLIP ON



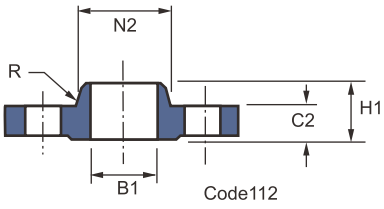
BLIND



Unit: mm

Bore		Common Dimension						Hub				Raised Face		Drilling				Approx Weight (Kg)	
Nominal Bore	d_1	D	t Welding Neck	t Slip on (No Hub)	t Blind	K	T	d_3	S	r	a≈	d_4	f	Number of Bolt	Dia. of Bolt		d_2	DIN 2545	DIN 2635
10	14 17.2*)	90	16		16	60	35	25 28	1.8	4	6	40	2	4	M12	(1/2")	14	0.72	0.661
15	20 21.3*)	95	16	16	16	65	38	30 32	2.0	4	6	45	2	4	M12	(1/2")	14	0.81	0.746
20	25 26.9*)	105	18	18	18	75	40	38 40	2.3	4	6	58	2	4	M12	(1/2")	14	1.24	1.06
25	30 33.7*)	115	18	18	18	85	40	42 46	2.6	4	6	68	2	4	M12	(1/2")	14	1.38	1.29
32	38 42.4*)	140	18	18	18	100	42	52 56	2.6	6	6	78	2	4	M16	(5/8")	18	2.03	1.88
40	44.5 48.3*)	150	18	18	18	110	45	60 64	2.6	6	7	88	3	4	M16	(5/8")	18	2.35	2.33
50	57 60.3*)	165	20	20	20	125	48	72 75	2.9	6	8	102	3	4	M16	(5/8")	18	3.20	2.82
65	76.1*)	185	22	22	22	145	52	90	2.9	6	10	122	3	8	M16	(5/8")	18	4.29	3.74
80	88.9*)	200	24	24	24	160	58	105	3.2	8	12	138	3	8	M16	(5/8")	18	5.88	4.75
100	108 114.3*)	235	24	24	24	190	65	128 134	3.6	8	12	162	3	8	M20	(3/4")	23	7.54	6.52
125	133 139.7*)	270	26	26	26	220	68	155 162	4.0	8	12	188	3	8	M24	(7/8")	27	10.8	9.07
150	159 168.3*)	300	28	28	28	250	75	182 192	4.5	10	12	218	3	8	M24	(7/8")	27	14.5	11.80
(175)	(191) 193.7*)	350	32	32	32	295	82	215 218	5.6	10	15	260	3	12	M27	(1")	30	22.1	18.2
200	216 219.1*)	375	34	34	34	320	88	240 244	6.3	10	16	285	3	12	M27	(1")	30	27.2	21.5
250	267 273*)	450	38	38	38	385	105	298 306	7.1	12	18	345	3	12	M30	(1 1/8")	33	43.8	34.9
300	318 323.9*)	515	42	42	42	450	115	352 362	8.0	12	18	410	4	16	M30	(1 1/8")	33	63.3	49.7
350	355.6*) 368	580	46	46	46	510	125	408	8.8	12	20	465	4	16	M33	(1 1/4")	36	89.5	68.1
400	406.4*) 419	660	50	50	50	585	135	462	11.0	12	20	535	4	16	M36	(1 3/8")	39	127.0	96.5
500	508*) 521	755	52	52	52	670	140	562	14.2	12	20	615	4	20	M39	(1 1/2")	42	172.0	117.0

PN10



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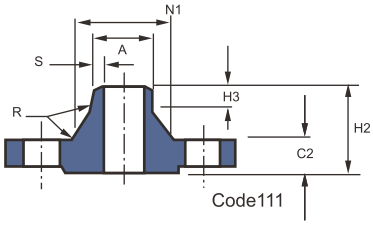

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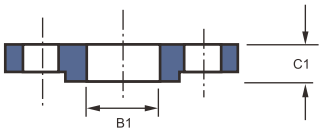

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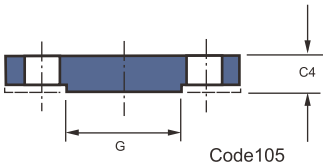


Code105

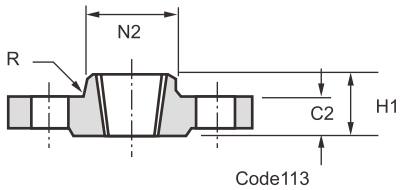
BS4504

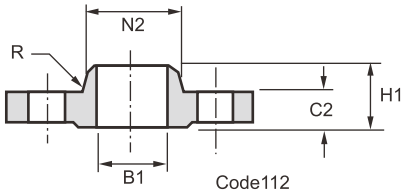
Unit: mm

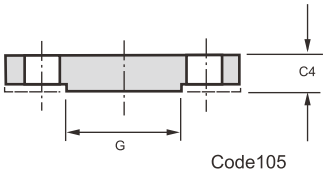
Table 10. Dimensions of PN 10 flanges

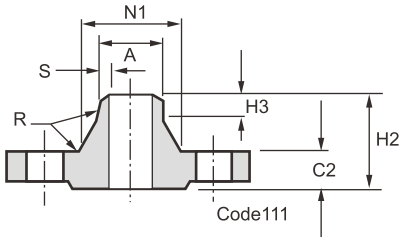
Nominal size DN	Mating dimensions: Outside diameter D	Diameter of bolt circle K	Diameter of bolt hole L	Bolting: Number	Bolting: Size	outside diameter of neck A	Bore diameters B1	Flange thickness: C1	C2	C4	Diameter of shoulder G	Lengths: H1	H2	H3	Neck diameters: N1	N2	Radius R	Neck thickness S
Codes affected	101, 105, 111, 112					111	101 112	101 104	111 112	105	105	112	111	111	111	112	111 112	111
10 15 20 25 32 40 50 65 80 100 125 150	Use PN 16 dimensions																	
	mm	mm	mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
200	340	295	22	8	M20	219.1	221.5	24	24	24	190	44	62	16	234	246	8	5.6
250	395	350	22	12	M20	273.0	276.5	26	26	26	235	46	68	16	288	298	10	6.3
300	445	400	22	12	M20	323.9	327.5	26	26	26	285	46	68	16	342	350	10	7.1
350	505	460	22	16	M20	355.6	359.5	28	26	26	325	53	68	16	390	400	10	7.1
400	565	515	26	16	M24	400.4	411.0	32	26	26	375	57	72	16	440	456	10	7.1
450	615	565	26	20	M24	457.0	467.0	36	28	28	425	63	72	16	488	502	12	7.1
500	670	620	26	20	M24	508.0	513.5	38	28	28	475	67	75	16	540	559	12	7.1
600	780	725	30	20	M27	610.0	616.5	42	28	34	575	75	80	18	640	658	12	7.1
700	895	840	30	24	M27	711.0	–	–	30	38	670	–	80	18	746	–	12	8.0
800	1015	950	33	24	M30	813.0	–	–	32	42	770	–	90	18	848	–	12	8.0
900	1115	1050	33	28	M30	914.0	–	–	34	46	860	–	95	20	948	–	12	10.0
1000	1230	1160	36	28	M33	1060.0	–	–	34	52	960	–	95	20	1050	–	12	10.0
1200	1455	1380	39	32	M36	1220.0	–	–	38	60	1160	–	115	25	1256	–	12	11.0
1400	1675	1590	42	36	M39	1420.0	–	–	42	–	–	–	120	25	1460	–	12	12.0
1600	1915	1820	48	40	M45	1620.0	–	–	46	–	–	–	130	25	1666	–	12	14.0
1800	2115	2020	48	44	M45	1820.0	–	–	50	–	–	–	140	30	1866	–	15	15.0
2000	2325	2230	48	48	M45	2020.0	–	–	54	–	–	–	150	30	2070	–	15	16.0
2200	2550	2440	56	52	M52	2220.0	–	–	58	–	–	–	160	35	2275	–	18	
2400	2760	2650	56	56	M52	2420.0	–	–	62	–	–	–	170	35	2478	–	18	
2600	2960	2850	56	60	M52	2620.0	–	–	66	–	–	–	180	40	2680	–	18	
2800	3180	3070	56	64	M52	2820.0	–	–	70	–	–	–	190	40	2882	–	18	
3000	3405	3290	62	68	M56	3020.0	–	–	75	–	–	–	200	45	3085	–	18	

PN16









BS4504

Unit: mm

Table 16. Dimensions of PN 16 flanges

Nominal size DN	Mating dimensions					outside diameter of neck	Bore diameters	Flange thickness			Diameter of shoulder	Lengths			Neck diameters		Radius	Neck thickness
	Outside diameter	Diameter of bolt circle	Diameter of bolt hole	Bolting														
				Number	Size													
	D	K	L			A	B1	C1	C2	C4	G	H1	H2	H3	N1	N2	R	S
Codes affected	101, 105, 111, 112, 113					111	101 112	101	111 112 113	105	105	112 113	111	111	111	112 113	111 112 113	111
	mm	mm	mm			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
10	90	60	14	4	M12	17.2	18.0	14	14	14	–	20	35	6	28	30	3	1.8
15	95	65	14	4	M12	21.3	22.0	14	14	14	–	20	35	6	32	35	3	2.0
20	105	75	14	4	M12	26.9	27.5	16	16	16	–	24	38	6	39	45	4	2.3
25	115	85	14	4	M12	33.7	34.5	16	16	16	–	24	38	6	46	52	4	2.6
32	140	100	18	4	M16	42.4	43.5	18	16	16	–	26	40	6	56	60	5	2.6
40	150	110	18	4	M16	48.3	49.5	18	16	16	–	26	42	7	64	70	5	2.6
50	165	125	18	4	M16	60.3	61.5	20	18	18	–	28	45	8	74	84	5	2.9
65	185	145	18	4	M16	76.1	77.5	20	18	18	55	32	45	10	921	104	6	2.9
80	200	160	18	8	M16	88.9	90.5	20	20	20	70	34	50	10	110	118	6	3.2
100	220	180	18	8	M16	114.3	116.5	22	20	20	90	40	52	12	130	140	6	3.6
125	250	210	18	8	M16	139.7	141.5	22	22	22	115	44	55	12	158	168	6	4.0
150	285	240	22	8	M20	168.3	170.5	24	22	22	140	44	55	12	184	195	8	4.5
200	340	295	22	12	M20	219.1	221.5	26	24	24	190	44	62	16	234	246	8	5.6
250	405	355	26	12	M24	273.0	276.5	29	26	26	235	46	70	16	288	298	10	6.3
300	460	410	26	12	M24	323.9	327.5	32	28	28	285	46	78	16	342	350	10	7.1
350	520	470	26	16	M24	355.6	359.0	35	30	30	325	57	82	16	390	400	10	8.0
400	580	525	30	16	M27	406.4	411.0	38	32	32	375	63	85	16	444	456	10	8.0
450	640	585	30	20	M27	457.0	462.0	42	34	36	425	68	87	16	490	502	12	8.0
500	715	650	33	20	M30	508.0	513.0	46	34	36	475	73	90	16	546	559	12	8.0
600	840	770	39	20	M33	610.0	616.5	52	36	44	575	83	95	18	650	658	12	8.8
700	910	840	36	24	M33	711.0	–	60*	36	48	670	83	100	18	750	760	12	8.8
800	1025	950	39	24	M36	813.0	–	68*	38	52	770	90	105	20	848	864	12	10.0
900	1125	1050	39	28	M36	914.0	–	76*	40	58	860	94	110	20	948	968	12	10.0
1000	1255	1170	42	28	M39	1016.0	–	84*	42	64	960	100	120	22	1056	1072	12	10.0
1200	1485	1390	48	32	M45	1220.0	–	98*	48	76	1160	–	130	30	1260	–	12	12.5
1400	1685	1590	48	36	M45	1420.0	–	–	52	–	–	–	145	30	1465	–	12	14.2
1600	1930	1820	56	40	M52	1620.0	–	–	58	–	–	–	160	35	1668	–	12	16.0
1800	2130	2020	56	44	M52	1820.0	–	–	62	–	–	–	170	35	1870	–	15	17.5
2000	2345	2230	62	48	M56	2020.0	–	–	66	–	–	–	190	40	2072	–	15	20.0