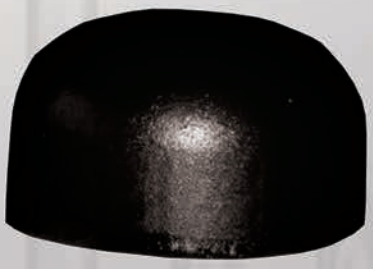





WOLFF
Pipelines Ltd

Fitting - at its best



WOLFF Pipelines Limited established in 1992 is a premier manufacturer of butt-weld fittings in carbon, Alloy and stainless steel.

WOLFF offers a range of precision finished butt-weld fittings to ensure a good flow in seamless and welded pipes.

Long radius elbows, straight tees, equal tees along with concentric and eccentric reducers are all available in a number of different sizes to match the pipes you are fitting.

WOLFF provides products to a world-wide customer base. Users include **oil and gas production, refining, Petrochemical, chemical, pulp and paper, nuclear and fossil power, shipbuilding, and food processing industries.**

Quality, good service, on time delivery and customer satisfaction are the main objectives of our company.The experienced and professional approach of everyone in **WOLFF** means that we can give our customers an excellent all round service from initial enquiry right through to delivery - **ON TIME.**

DIMENSIONS

1/2" to 52"

INPUT MATERIALS

Seamless,Longitudanally welded pipes/ forged tubing

MATERIALS

Carbon steel
Alloyed steel
Stainless steel
Duplex steel
Ni-alloys

QUALITY CONTROL

Raw Material Inspection
Mechanical and Chemical Tests
Heat Treatment
Non-Destructive Test
Visual & Dimensional Inspection

TESTING EQUIPMENTS

Ultrasonic Test Equipment
X-Ray & Gamma Ray
Hydrostatic Pressure Tester
Spectrometer
Hardness Tester
Impact Tester

All flanges are according to international standards
ASME-DIN-EN 1092-1-BS-NF-UNI-AFNOR

We also produce as per customers requirement
Long Welding Neck, Special Flanges and Stub ends.

The range of materials includes
Carbon Steel- Low Alloy Steel- Stainless Steel
Special Alloys: Duplex- Super Duplex and other Nickel Alloy

Size Range
Nominal Pipe Size- 1/2" to 42" in all pressure ratings

FORGED STEEL FLANGES

WOLFF
Pipelines Ltd
Fitting - at its best

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WROUGHT CARBON STEEL WALL THICKNESS STANDARDS

TABLE 1

ASME B36.10M-1996

Nominal Paper Size		Outside Diameter	Nominal Wall Thickness												
A	B	ASME	SCH10	SCH20	SCH30	STD	SCH40	SCH60	XS	SCH80	SCH100	SCH120	SCH140	SCH160	XXS
15	1/2	0.840	0.083	-	0.095	0.109	0.109	-	0.147	0.147	-	-	-	0.188	0.294
20	3/4	1.050	0.083	-	0.095	0.113	0.113	-	0.154	0.154	-	-	-	0.219	0.308
25	1	1.315	0.109	-	0.114	0.133	0.133	-	0.179	0.179	-	-	-	0.250	0.358
32	1 1/4	1.660	0.109	-	0.117	0.140	0.140	-	0.191	0.191	-	-	-	0.250	0.382
40	1 1/2	1.900	0.109	-	0.125	0.145	0.145	-	0.200	0.200	-	-	-	0.281	0.400
50	2	2.375	0.109	-	0.125	0.154	0.154	-	0.218	0.218	-	-	-	0.344	0.436
65	2 1/2	2.875	0.120	-	0.188	0.203	0.203	-	0.276	0.276	-	-	-	0.375	0.552
80	3	3.500	0.120	-	0.188	0.216	0.216	-	0.300	0.300	-	-	-	0.438	0.600
90	3 1/2	4.000	0.120	-	0.188	0.226	0.226	-	0.318	0.318	-	-	-	-	-
100	4	4.500	0.120	-	0.188	0.237	0.237	-	0.337	0.337	-	0.438	-	0.531	0.674
125	5	5.563	0.134	-	-	0.258	0.258	-	0.375	0.375	-	0.500	-	0.625	0.750
150	6	6.625	0.134	-	-	0.280	0.280	-	0.432	0.432	-	0.562	-	0.719	0.864
200	8	8.625	0.148	0.250	0.277	0.322	0.322	0.406	0.500	0.500	0.594	0.719	0.812	0.906	0.875
250	10	10.750	0.165	0.250	0.307	0.365	0.365	0.500	0.500	0.594	0.719	0.844	1.000	1.125	1.100
300	12	12.750	0.180	0.250	0.330	0.375	0.406	0.562	0.500	0.688	0.844	1.000	1.125	1.312	1.100
350	14	14.000	0.250	0.312	0.375	0.375	0.438	0.594	0.500	0.750	0.938	1.094	1.250	1.406	-
400	16	16.000	0.250	0.312	0.375	0.375	0.500	0.656	0.500	0.844	1.031	1.219	1.438	1.594	-
450	18	18.000	0.250	0.312	0.438	0.375	0.562	0.750	0.500	0.938	1.156	1.375	1.562	1.781	-
500	20	20.000	0.250	0.375	0.500	0.375	0.594	0.812	0.500	1.031	1.281	1.500	1.750	1.969	-
550	22	22.000	0.250	0.375	0.500	0.375	-	0.875	0.500	1.125	1.375	1.625	1.875	2.125	-
600	24	24.000	0.250	0.375	0.562	0.375	0.688	0.969	0.500	1.219	1.531	1.812	2.062	2.344	-
650	26	26.000	0.312	0.500	-	0.375	-	-	0.500	-	-	-	-	-	-
700	28	28.000	0.312	0.500	0.625	0.375	-	-	0.500	-	-	-	-	-	-
750	30	30.000	0.312	0.500	0.625	0.375	-	-	0.500	-	-	-	-	-	-
800	32	32.000	0.312	0.500	0.625	0.375	0.688	-	0.500	-	-	-	-	-	-
850	34	34.000	0.312	0.500	0.625	0.375	0.688	-	0.500	-	-	-	-	-	-
900	36	36.000	0.312	0.500	0.625	0.375	0.750	-	0.500	-	-	-	-	-	-
950	38	38.000	-	-	-	0.375	-	-	0.500	-	-	-	-	-	-
1000	40	40.000	-	-	-	0.375	-	-	0.500	-	-	-	-	-	-
1050	42	42.000	-	-	-	0.375	-	-	0.500	-	-	-	-	-	-
1100	44	44.000	-	-	-	0.375	-	-	0.500	-	-	-	-	-	-
1150	46	46.000	-	-	-	0.375	-	-	0.500	-	-	-	-	-	-
1200	48	48.000	-	-	-	0.375	-	-	0.500	-	-	-			-

ALL DIMENSIONS ARE IN INCHES



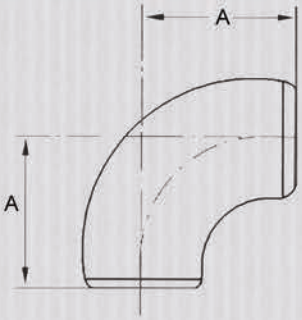


TABLE 2

ASME B36.10M-1996

Nominal Paper Size		Outside Diameter	Nominal Wall Thickness												
A	B	ASME	SCH10	SCH20	SCH30	STD	SCH40	SCH60	XS	SCH80	SCH100	SCH120	SCH140	SCH160	XXS
15	1/2	21.3	2.11	2.5	2.41	2.77	2.77	-	3.73	3.73	-	-	-	4.78	7.47
20	3/4	26.7	2.11	-	2.41	2.87	2.87	-	3.91	3.91	-	-	-	5.56	7.82
25	1	33.4	2.77	-	2.90	3.38	3.38	-	4.55	4.55	-	-	-	6.35	9.09
32	1 1/4	42.2	2.77	-	2.97	3.56	3.56	-	4.85	4.85	-	-	-	6.35	9.70
40	1 1/2	48.3	2.77	-	3.18	3.68	3.68	-	5.08	5.08	-	-	-	7.14	10.15
50	2	60.3	2.77	-	3.18	3.91	3.91	-	5.54	5.54	-	-	-	8.74	11.07
65	2 1/2	73.0	3.05	-	4.78	5.16	5.16	-	7.01	7.01	-	-	-	9.53	14.02
80	3	88.9	3.05	-	4.78	5.49	5.49	-	7.62	7.62	-	-	-	11.13	15.24
90	3 1/2	101.6	3.05	-	4.78	5.74	5.74	-	8.08	8.08	-	-	-	-	-
100	4	114.3	3.05	-	4.78	6.02	6.02	-	8.56	8.56	-	11.13	-	13.49	17.12
125	5	141.3	3.40	-	-	6.55	6.55	-	9.53	9.53	-	12.70	-	15.88	19.05
150	6	168.3	3.40	-	-	7.11	7.11	-	10.97	10.97	-	14.27	-	18.26	21.95
200	8	219.1	3.76	6.35	7.04	8.18	8.18	10.31	12.70	12.70	15.09	18.26	20.62	23.01	22.23
250	10	273.0	4.19	6.35	7.80	9.27	9.27	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40
300	12	373.8	4.57	6.35	8.38	9.53	10.31	14.27	12.70	17.48	21.44	25.40	28.58	33.32	25.40
350	14	355.6	6.35	7.92	9.53	9.53	11.13	15.09	12.70	19.05	23.83	27.79	31.75	35.71	-
400	16	406.4	6.35	7.92	9.53	9.53	12.70	16.66	12.70	21.44	26.19	30.96	36.53	40.49	-
450	18	457.2	6.35	7.92	11.13	9.53	14.27	19.05	12.70	23.83	29.36	34.93	39.67	45.24	-
500	20	508.0	6.35	9.53	12.70	9.53	15.09	20.62	12.70	26.19	32.54	38.10	44.45	50.01	-
550	22	558.8	6.35	9.53	12.70	9.53	-	22.23	12.70	28.58	34.93	41.28	47.63	53.98	-
600	24	609.6	6.35	9.53	14.27	9.53	17.48	24.61	12.70	30.96	38.89	46.02	52.37	59.54	-
650	26	660.4	7.92	12.70	-	9.53	-	-	12.70	-	-	-	-	-	-
700	28	711.2	7.92	12.70	15.88	9.53	-	-	12.70	-	-	-	-	-	-
750	30	762.0	7.92	12.70	15.88	9.53	-	-	12.70	-	-	-	-	-	-
800	32	812.8	7.92	12.70	15.88	9.53	17.48	-	12.70	-	-	-	-	-	-
850	34	863.6	7.92	12.70	15.88	9.53	17.48	-	12.70	-	-	-	-	-	-
900	36	914.4	7.92	12.70	15.88	9.53	19.05	-	12.70	-	-	-	-	-	-
950	38	965.2	-	-	-	9.53	-	-	12.70	-	-	-	-	-	-
1000	40	1016.0	-	-	-	9.53	-	-	12.70	-	-	-	-	-	-
1050	42	1066.8	-	-	-	9.53	-	-	12.70	-	-	-	-	-	-
1100	44	1117.6	-	-	-	9.53	-	-	12.70	-	-	-	-	-	-
1150	46	1168.4	-	-	-	9.53	-	-	12.70	-	-	-	-	-	-
1200	48	1219.2	-	-	-	9.53	-	-	12.70	-	-	-			-

ALL DIMENSIONS ARE IN MILLIMETERS



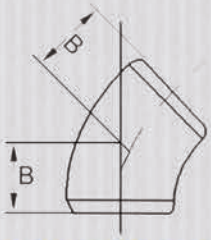


TABLE 3

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End						Approx Weight (kg)			
			90° Elbows A		45° Eibows B		90° Elbows			45° Elbows		
	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
1/2	0.84	21.3	1.50	38	0.62	16	0.08	0.10	-	0.04	0.05	-
3/4	1.05	26.7	1.12	29	0.44	11	0.10	0.13	-	0.05	0.07	-
1	1.32	33.4	1.50	38	0.88	22	0.15	0.20	0.40	0.08	0.09	0.18
1 1/4	1.66	42.2	1.88	48	1.00	25	0.26	0.34	0.59	0.13	0.17	0.30
1 1/2	1.90	48.3	2.25	57	1.12	29	0.37	0.49	0.87	0.18	0.25	0.43
2	2.38	60.3	3.00	76	1.38	35	0.65	0.89	1.62	0.33	0.45	0.81
2 1/2	2.88	73.0	3.75	95	1.75	44	1.37	1.79	3.22	0.68	0.90	1.61
3	3.50	88.9	4.50	114	2.00	51	2.04	2.74	4.97	1.02	1.37	2.49
3 1/2	4.00	101.6	5.25	133	2.25	57	2.82	3.91	7.82	1.41	1.95	3.90
4	4.50	114.3	6.00	152	2.50	64	3.84	5.36	9.81	1.92	2.68	4.90
5	5.56	141.3	7.50	190	3.12	79	6.48	9.13	16.9	3.24	4.57	8.46
6	6.62	168.3	9.00	229	3.75	95	9.94	15.0	27.8	4.97	7.50	13.9
8	8.62	219.1	12.00	305	5.00	127	20.1	30.5	50.8	10.1	15.3	25.4
10	10.75	273.0	15.00	381	6.25	159	35.4	47.7	83.49	17.7	23.9	41.8
12	12.75	323.8	18.00	457	7.50	190	52.0	68.7	137.4	26.0	34.4	68.7
14	14.00	355.6	21.00	533	8.75	222	67.9	89.9	-	34.0	45.0	-
16	16.00	406.4	24.00	610	10.00	254	89.0	118	-	44.5	59.0	-
18	18.00	457.2	27.00	686	11.25	286	113	150	24.00	56.5	74.9	-
20	20.00	508.0	30.00	762	12.50	318	140	186	-	69.9	92.8	-
22	22.00	558.8	33.00	838	13.50	343	169	225	-	84.7	113	-
24	24.00	609.6	36.00	914	15.00	381	202	268	-	101	134	-
26	26.00	660.4	39.00	991	16.00	406	237	315	-	119	158	-
28	28.00	711.2	42.00	1067	17.25	438	275	366	-	138	183	-
30	30.00	762.0	45.00	1143	18.50	470	316	421	-	158	211	-
32	32.00	812.8	48.00	1219	19.75	502	360	480	-	180	240	-
34	34.00	863.6	51.00	1295	21.00	533	407	542	-	203	271	-
36	36.00	914.4	54.00	1372	22.25	565	457	608	-	228	304	-
38	38.00	965.2	57.00	1448	23.62	600	509	678	-	254	339	-
40	40.00	1016.0	60.00	1524	24.88	632	564	752	-	282	376	-
42	42.00	1066.8	63.00	1600	26.00	660	622	828	-	311	414	-
44	44.00	1117.6	66.00	1676	27.38	695	683	911	-	342	455	-
46	46.00	1168.4	69.00	1753	28.62	727	-	-	-	-	-	-
48	48.00	1219.2	72.00	1829	29.88	759	814	1085	-	407	542	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2

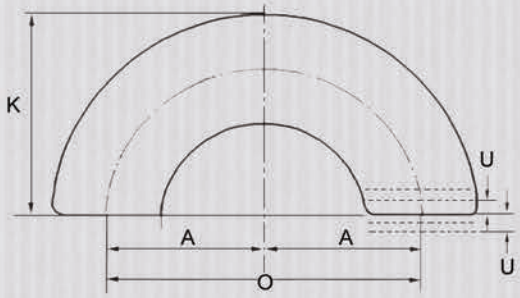
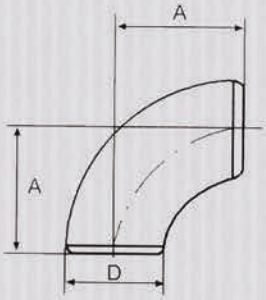


TABLE 4

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-Center O		Back-to-Face K		Approx Weight (kg)		
	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS
1/2	0.84	21.3	3.00	76	1.88	48	0.16	0.20	-
3/4	1.05	26.7	2.25	57	1.69	43	0.16	0.20	-
1	1.32	33.4	3.00	76	2.19	56	0.31	0.40	0.80
1 1/4	1.66	42.2	3.75	95	2.75	70	0.53	0.69	1.18
1 1/2	1.90	48.3	4.50	114	3.25	83	0.76	1.00	1.74
2	2.38	60.3	6.00	152	4.19	106	1.36	1.85	3.24
2 1/2	2.88	73.0	7.50	191	5.19	132	2.67	3.50	6.44
3	3.50	88.9	9.00	229	6.25	159	4.19	5.63	9.94
3 1/2	4.00	101.6	10.50	267	7.25	184	5.90	7.99	16.0
4	4.50	114.3	12.00	305	8.25	210	7.95	11.0	19.6
5	5.56	141.3	15.00	381	10.31	262	13.5	19.0	33.8
6	6.62	168.3	18.00	457	12.31	313	20.9	31.3	55.6
8	8.62	219.1	24.00	610	16.31	414	41.9	63.6	101.6
10	10.75	273.0	30.00	762	20.38	518	74.0	99.7	167.0
12	12.75	323.8	36.00	914	24.38	619	108.7	143.6	274.8
14	14.00	355.6	42.00	1067	28.00	711	141.9	187.9	-
16	16.00	406.4	48.00	1219	32.00	813	186.0	246.6	-
18	18.00	457.2	54.00	1372	36.00	914	236.2	313.5	-
20	20.00	508.0	60.00	1524	40.00	1016	292.6	388.7	-
22	22.00	558.8	66.00	1676	44.00	1118	353.2	470.3	-
24	24.00	609.6	72.00	1829	48.00	1219	422.2	560.1	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2.



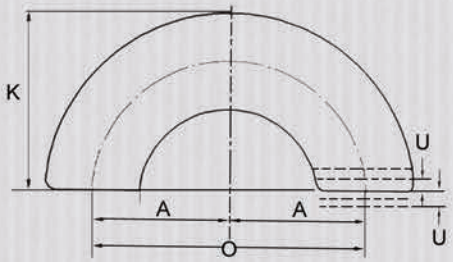
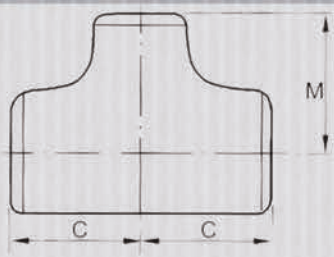


TABLE 5

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		90° Elbows		180° Returns				Approx Weight (kg)					
			Center-to-End A		Center-to-Center O		Back-to-Face K		90° Elbows			180° Returns		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
1	1.32	33.4	1.00	25	2.00	51	1.62	41	0.10	-	-	0.21	-	-
1 1/4	1.66	42.2	1.25	32	2.50	64	2.06	52	0.17	-	-	0.35	-	-
1 1/2	1.90	48.3	1.50	38	3.00	76	2.44	62	0.25	0.33	0.66	0.50	0.66	1.32
2	2.38	60.3	2.00	51	4.00	102	3.19	81	0.43	0.59	1.08	0.90	1.23	2.16
2 1/2	2.88	73.0	2.50	64	5.00	127	3.94	100	0.91	1.19	2.14	1.78	2.32	4.28
3	3.50	88.9	3.00	76	6.00	152	4.75	121	1.36	1.83	3.31	2.78	3.69	6.62
3 1/2	4.00	101.6	3.50	89	7.00	178	5.50	140	1.88	2.61	5.22	3.90	5.31	10.62
4	4.50	114.3	4.00	102	8.00	203	6.25	159	2.56	3.58	6.54	5.27	7.31	13.08
5	5.56	141.3	5.00	127	10.00	254	7.75	197	4.32	6.09	11.3	8.94	12.6	22.6
6	6.62	168.3	6.00	152	12.00	305	9.31	237	6.63	10.0	18.5	13.9	20.7	37.0
8	8.62	219.1	8.00	203	16.00	406	12.31	313	13.4	20.3	35.5	28.0	42.0	71.0
10	10.75	273.0	10.00	254	20.00	508	15.38	391	23.6	31.8	63.6	49.5	66.7	127.2
12	12.75	323.8	12.00	305	24.00	610	18.38	467	34.6	45.8	91.6	70.5	91.8	183.2
14	14.00	355.6	14.00	356	28.00	711	21.00	533	45.3	60.0	-	90.6	122.8	-
16	16.00	406.4	16.00	406	32.00	813	24.00	610	59.1	78.3	-	118.4	160	-
18	18.00	457.2	18.00	457	36.00	914	27.00	686	75	99.9	-	142	200	-
20	20.00	508.0	20.00	508	40.00	1016	30.00	762	93.1	124	-	186	248	-
22	22.00	558.8	22.00	559	44.00	1118	33.00	838	113	150	-	226	298	-
24	24.00	609.6	24.00	610	48.00	1219	36.00	914	135	179	-	270	358	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2.



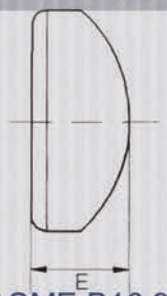
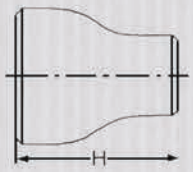


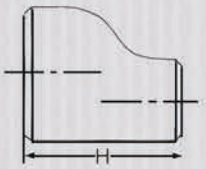
TABLE 6

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bavel D		Center-to-End						Approx Weight (kg)					
			Run C		Outlet M		Length E		Straight Tees			Caps		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
1/2	0.84	21.3	1.00	25	1.00	25	1.00	25	0.11	0.16	-	0.05	0.06	-
3/4	1.05	26.7	1.12	29	1.12	29	1.00	25	0.17	0.21	-	0.06	0.07	-
1	1.32	33.4	1.50	38	1.50	38	1.50	38	0.35	0.42	0.84	0.10	0.13	0.27
1 1/4	1.66	42.2	1.88	48	1.88	48	1.50	38	0.61	0.75	1.49	0.14	0.18	0.35
1 1/2	1.90	48.3	2.25	57	2.25	57	1.50	38	0.92	1.13	2.26	0.17	0.22	0.43
2	2.38	60.3	2.50	64	2.50	64	1.50	38	1.34	1.69	3.39	0.23	0.30	0.61
2 1/2	2.88	73.0	3.00	76	3.00	76	1.50	38	2.37	2.92	4.54	0.37	0.46	0.92
3	3.50	88.9	3.38	86	3.38	86	2.00	51	3.38	4.29	7.63	0.64	0.84	1.86
3 1/2	4.00	101.6	3.75	95	3.75	95	2.50	64	4.47	5.72	9.63	0.96	1.29	2.60
4	4.50	114.3	4.12	105	4.12	105	2.50	64	5.72	7.45	15.5	1.16	1.55	3.10
5	5.56	141.3	4.88	124	4.88	124	3.00	76	8.99	12.0	23.9	1.91	2.61	5.22
6	6.62	168.3	5.62	143	5.62	143	3.50	89	13.3	19.1	38.6	2.91	4.20	8.40
8	8.62	219.1	7.00	178	7.00	178	4.00	102	24.4	34.7	69.0	5.13	7.40	12.9
10	10.75	273.0	8.50	216	8.50	216	5.00	127	41.4	53.6	93.8	9.08	11.9	20.8
12	12.75	323.8	10.00	254	10.00	254	6.00	152	53.6	69.5	139	13.4	17.3	34.6
14	14.00	355.6	11.00	279	11.00	279	6.50	165	61.7	80.8	-	16.0	20.8	-
16	16.00	406.4	12.00	305	12.00	305	7.00	178	66.1	87.7	-	20.1	26.2	-
18	18.00	457.2	13.50	343	13.50	343	8.00	203	83.9	111	-	25.9	33.9	-
20	20.00	508.0	15.00	381	15.00	381	9.00	229	104	138	-	32.6	42.6	-
22	22.00	558.8	16.50	419	16.50	419	10.00	254	126	167	-	38.7	51.7	-
24	24.00	609.6	17.00	432	17.00	432	10.50	267	139	185	-	45.0	60.1	-
26	26.00	660.4	19.50	495	19.50	495	10.50	267	176	234	-	50.3	67.3	-
28	28.00	711.2	20.50	521	20.50	521	10.50	267	192	256	-	56.0	74.9	-
30	30.00	762.0	22.00	559	22.00	559	10.50	267	228	304	-	62.0	82.9	-
32	32.00	812.8	23.50	597	23.50	597	10.50	267	249	331	-	68.3	91.2	-
34	34.00	863.6	25.00	635	25.00	635	10.50	267	295	393	-	74.8	100	-
36	36.00	914.4	26.50	673	26.50	673	10.50	267	334	441	-	81.7	109	-
38	38.00	965.2	28.00	711	28.00	711	12.00	305	358	549	-	94	126	-
40	40.00	1016.0	29.50	749	29.50	749	12.00	305	383	511	-	102	137	-
42	42.00	1066.8	30.00	762	28.00	711	12.00	305	416	557	-	110	147	-
44	44.00	1117.6	32.00	813	30.00	762	13.50	343	448	597	-	125	167	-
46	46.00	1168.4	33.50	851	31.50	800	13.50	343	483	646	-	134	179	-
48	48.00	1219.2	35.00	889	33.00	838	13.50	343	518	691	-	143	191	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2.

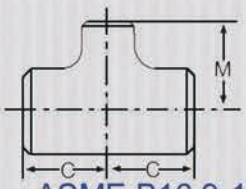
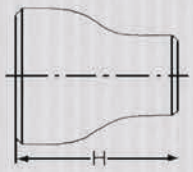



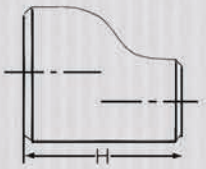
TABLE 7

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End		Approx Weight (kg)					
	D_1		D		Run C		Outlet M		H		Reducing Outlet Tees			Reducers		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
3/4x1/2	1.05	26.7	0.84	21.3	1.12	29	1.12	29	1.50	38	0.16	0.20	-	0.06	0.08	-
1x3/4	1.32	33.4	1.05	26.7	1.50	38	1.50	38	2.00	51	0.32	0.40	0.80	0.12	0.15	0.25
1x1/2	1.32	33.4	0.84	21.3	1.50	38	1.50	38	2.00	51	0.30	0.39	0.78	0.11	0.13	0.22
1 1/4x1	1.66	42.2	1.32	33.4	1.88	48	1.88	48	2.00	51	0.57	0.71	1.45	0.16	0.21	0.35
1 1/4x3/4	1.66	42.2	1.05	26.7	1.88	48	1.88	48	2.00	51	0.54	0.67	1.42	0.14	0.19	0.31
1 1/4x1/2	1.66	42.2	0.84	21.3	1.88	48	1.88	48	2.00	51	0.51	0.65	1.38	0.13	0.17	0.28
1 1/2x1 1/4	1.90	48.3	1.66	42.2	2.25	57	2.25	57	2.50	64	0.82	1.10	2.20	0.24	0.32	0.57
1 1/2x1	1.90	48.3	1.32	33.4	2.25	57	2.25	57	2.50	64	0.79	1.06	2.16	0.22	0.29	0.50
1 1/2x3/4	1.90	48.3	1.05	26.7	2.25	57	2.25	57	2.50	64	0.75	1.00	-	0.20	0.27	0.45
1 1/2x1/2	1.90	48.3	0.84	21.3	2.25	57	2.25	57	2.50	64	0.72	0.95	-	0.19	0.25	0.41
2x1 1/2	2.38	60.3	1.90	48.3	2.50	64	2.38	60	3.00	76	1.19	1.63	3.30	0.37	0.51	0.91
2x1 1/4	2.38	60.3	1.66	42.2	2.50	64	2.25	57	3.00	76	1.11	1.52	3.25	0.35	0.48	0.85
2x1	2.38	60.3	1.32	33.4	2.50	64	2.00	51	3.00	76	1.07	1.46	3.18	0.32	0.44	0.77
2x3/4	2.38	60.3	1.05	26.7	2.50	64	1.75	44	3.00	76	1.01	1.38	-	0.29	0.41	-
2 1/2x2	2.88	73.0	2.38	60.3	3.00	76	2.75	70	3.50	89	2.13	2.81	5.62	0.72	0.95	1.68
2 1/2x1 1/2	2.88	73.0	1.90	48.3	3.00	76	2.62	67	3.50	89	2.05	2.70	5.40	0.66	0.86	1.51
2 1/2x1 1/4	2.88	73.0	1.66	42.2	3.00	76	2.50	64	3.50	89	2.01	2.64	-	0.63	0.82	1.42
2 1/2x1	2.88	73.0	1.32	33.4	3.00	76	2.25	57	3.50	89	1.96	2.57	-	0.58	0.76	-
3x2 1/2	3.50	88.9	2.88	73.0	3.38	86	3.25	83	3.50	89	3.28	4.19	8.38	0.93	1.25	2.25
3x2	3.50	88.9	2.38	60.3	3.38	86	3.00	76	3.50	89	3.12	3.89	7.78	0.85	1.13	2.01
3x1 1/2	3.50	88.9	1.90	48.3	3.38	86	2.88	73	3.50	89	2.88	3.78	-	0.78	1.04	1.83
3x1 1/4	3.50	88.9	1.66	42.2	3.38	86	2.75	70	3.50	89	2.81	3.73	-	0.75	1.00	-
3 1/2x3	4.00	101.6	3.50	88.9	3.75	95	3.62	92	4.00	102	4.32	5.66	9.52	1.28	1.77	-
3 1/2x2 1/2	4.00	101.6	2.88	73.0	3.75	95	3.50	89	4.00	102	4.14	5.47	9.40	1.23	1.65	-
3 1/2x2	4.00	101.6	2.38	60.3	3.75	95	3.25	83	4.00	102	3.98	5.18	-	1.10	1.51	-
3 1/2x1 1/2	4.00	101.6	1.90	48.3	3.75	95	3.12	79	4.00	102	3.74	5.07	-	1.02	1.41	-
3 1/2x1 1/4	4.00	101.6	1.66	42.2	-	-	-	-	4.00	102	-	-	-	0.98	1.35	-
4x3 1/2	4.50	114.3	4.00	101.6	4.12	105	4.00	102	4.00	102	5.62	7.26	-	1.54	2.14	-
4x3	4.50	114.3	3.50	88.9	4.12	105	3.88	98	4.00	102	5.40	7.08	14.06	1.45	2.02	3.65
4x2 1/2	4.50	114.3	2.88	73.0	4.12	105	3.75	95	4.00	102	5.22	6.73	13.46	1.37	1.90	3.41
4x2	4.50	114.3	2.38	60.3	4.12	105	3.50	89	4.00	102	5.05	6.62	13.24	1.27	1.76	3.11
4x1 1/2	4.50	114.3	1.90	48.3	4.12	105	3.38	86	4.00	102	4.81	6.51	-	1.19	1.65	-
5x4	5.56	141.3	4.50	114.3	4.88	124	4.62	117	5.00	127	8.36	11.8	23.6	2.50	3.52	6.47
5x3 1/2	5.56	141.3	4.00	101.6	4.88	124	4.50	114	5.00	127	8.13	11.4	-	2.38	3.34	-
5x3	5.56	141.3	3.50	88.9	4.88	124	4.38	111	5.00	127	7.95	11.2	22.4	2.27	3.18	5.78
5x2 1/2	5.56	141.3	2.88	73.0	4.88	124	4.25	108	5.00	127	7.79	10.9	-	2.16	3.02	5.46
5x2	5.56	141.3	2.38	60.3	4.88	124	4.12	105	5.00	127	7.58	10.7	-	2.02	2.82	-
6x5	6.62	168.3	5.56	141.3	5.62	143	5.38	137	5.50	140	12.4	18.5	37.0	3.57	5.38	9.89
6x4	6.62	168.3	4.50	114.3	5.62	143	5.12	130	5.50	140	11.8	17.7	35.4	3.30	4.96	8.98
6x3 1/2	6.62	168.3	4.00	101.6	5.62	143	5.00	127	5.50	140	11.6	17.4	-	3.17	4.76	-
6x3	6.62	168.3	3.50	88.9	5.62	143	4.88	124	5.50	140	11.4	17.2	34.4	3.04	4.56	8.24
6x2 1/2	6.62	168.3	2.88	73.0	5.62	143	4.75	121	5.50	140	11.3	16.9	-	2.94	4.36	7.83

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2.

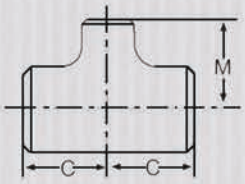
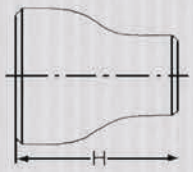



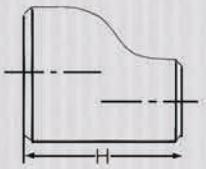
TABLE 7 (CONT'D)

ASME B16.9-1993

Nominal Pipe Size	Outside Diameter at Bevel				Center-to-End				End-to-End H		Approx Weight(Kg)					
	D_1		D_2		Run C		Outlet M				Reducing Outlet Tees			Reducers		
(NPS)	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
8x6	8.62	219.1	6.62	168.3	7.00	178	6.62	168	6.00	152	22.7	30.2	60.4	5.71	8.61	14.3
8x5	8.62	219.1	5.56	141.3	7.00	178	6.38	162	6.00	152	22.0	29.3	58.6	5.40	8.13	13.4
8x4	8.62	219.1	4.50	114.3	7.00	178	6.12	156	6.00	152	21.4	28.5	57.0	5.10	7.67	12.6
8x3 1/2	8.62	219.1	4.00	101.6	7.00	178	6.00	152	6.00	152	21.0	27.9	-	4.96	7.45	-
10x8	10.75	273.0	8.62	219.1	8.50	216	8.00	203	7.00	178	38.8	51.6	-	9.58	12.9	-
10x6	10.75	273.0	6.62	168.3	8.50	216	7.62	194	7.00	178	37.1	49.3	-	8.78	11.8	-
10x5	10.75	273.0	5.56	141.3	8.50	216	7.50	191	7.00	178	36.5	48.5	-	8.42	11.3	-
10x4	10.75	273.0	4.50	114.3	8.50	216	7.25	184	7.00	178	35.9	47.7	-	8.05	10.7	-
12x10	12.75	323.8	10.75	273.0	10.00	254	9.50	241	8.00	203	50.5	67.7	-	13.6	18.0	-
12x8	12.75	323.8	8.62	219.1	10.00	254	9.00	229	8.00	203	48.3	64.7	-	12.7	16.7	-
12x6	12.75	323.8	6.62	168.3	10.00	254	8.62	219	8.00	203	46.6	62.4	-	11.8	15.6	-
12x5	12.75	323.8	5.56	141.3	10.00	254	8.50	216	8.00	203	46.0	61.6	-	11.3	15.0	-
14x12	14.00	355.6	12.75	323.8	11.00	279	10.62	270	13.00	330	58.4	78.3	-	25.4	33.6	-
14x10	14.00	355.6	10.75	273.0	11.00	279	10.12	257	13.00	330	55.0	73.7	-	23.6	31.2	-
14x8	14.00	355.6	8.62	219.1	11.00	279	9.75	248	13.00	330	52.6	70.5	-	21.8	28.9	-
14x6	14.00	355.6	6.62	168.3	11.00	279	9.38	238	13.00	330	50.8	68.1	-	19.8	26.3	-
16x14	16.00	406.4	14.00	355.6	12.00	305	12.00	305	14.00	356	63.8	84.8	-	31.0	41.1	-
16x12	16.00	406.4	12.75	323.8	12.00	305	11.62	295	14.00	356	61.1	81.9	-	29.6	39.2	-
16x10	16.00	406.4	10.75	273.0	12.00	305	11.12	283	14.00	356	59.2	79.3	-	27.8	36.8	-
16x8	16.00	406.4	8.62	219.1	12.00	305	10.75	273	14.00	356	58.0	77.7	-	24.7	32.9	-
16x6	16.00	406.4	6.62	168.3	12.00	305	10.38	264			56.6	75.8	-	-	-	-
18x16	18.00	457.2	16.00	406.4	13.50	343	13.00	330	15.00	381	78.9	105	-	37.8	51.1	-
18x14	18.00	457.2	14.00	355.6	13.50	343	13.00	330	15.00	381	78.4	105	-	35.7	47.4	-
18x12	18.00	457.2	12.75	323.8	13.50	343	12.62	321	15.00	381	78.1	104	-	34.3	45.5	-
18x10	18.00	457.2	10.75	273.0	13.50	343	12.12	308	15.00	381	78.1	104	-	31.2	42.3	-
18x8	18.00	457.2	8.62	219.1	13.50	343	11.75	298					-	-	-	-
20x18	20.00	508.0	18.00	457.2	15.00	381	14.50	368	20.00	508	93.5	125	-	56.4	74.9	-
20x16	20.00	508.0	16.00	406.4	15.00	381	14.00	356	20.00	508	93.0	124	-	53.5	71.1	-
20x14	20.00	508.0	14.00	355.6	15.00	381	14.00	356	20.00	508	92.4	123	-	50.8	67.4	-
20x12	20.00	508.0	12.75	323.8	15.00	381	13.62	346	20.00	508	92.4	123	-	47.6	63.3	-
20x10	20.00	508.0	10.75	273.0	15.00	381	13.12	333			92.4	123	-	-	-	-
20x8	20.00	508.0	8.62	219.1	15.00	381	12.75	324					-	-	-	-
22x20	22.00	558.8	20.00	508.0	16.50	419	16.00	406	20.00	508	123	163	-	62.4	83.0	-
22x18	22.00	558.8	18.00	457.2	16.50	419	15.50	394	20.00	508	120	159	-	59.6	79.2	-
22x16	22.00	558.8	16.00	406.4	16.50	419	15.00	381	20.00	508	117	156	-	56.9	75.6	-
22x14	22.00	558.8	14.00	355.6	16.50	419	15.00	381	20.00	508	117	156	-	53.2	70.8	-
22x12	22.00	558.8	12.75	323.8	16.50	419	14.62	371			117	156	-	-	-	-
22x10	22.00	558.8	10.75	273.0	16.50	419	14.12	359					-	-	-	-
24x22	24.00	609.6	22.00	558.8	17.00	432	17.00	432	20.00	508	138	183	-	68.5	91.1	-
24x20	24.00	609.6	20.00	508.0	17.00	432	17.00	432	20.00	508	136	181	-	65.7	87.3	-
24x18	24.00	609.6	18.00	457.2	17.00	432	16.50	419	20.00	508	133	177	-	63.0	83.8	-
24x16	24.00	609.6	16.00	406.4	17.00	432	16.00	406	20.00	508	133	177	-	63.0	83.8	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2.

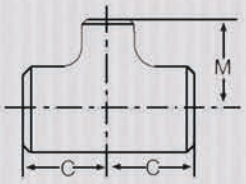
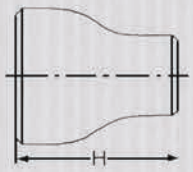



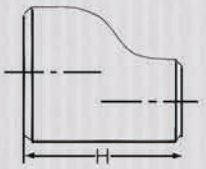
TABLE 7 (CONT'D)

ASME B16.9-1993

Nominal Pipe Size	Outside Diameter at Bevel				Center-to-End				End-to-End H		Approx Weight (kg)					
	D_1		D_2		Run C		Outlet M				Reducing Outlet Tees			Reducers		
(NPS)	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
24x14	24.00	609.6	14.00	355.6	17.00	432	16.00	406	-	-	133	177	-	-	-	-
24x12	24.00	609.6	12.75	323.8	17.00	432	15.62	397	-	-	133	177	-	-	-	-
24x10	24.00	609.6	10.75	273.0	17.00	432	15.12	384	-	-	-	-	-	-	-	-
26x24	26.00	660.4	24.00	609.6	19.50	495	19.00	483	24.00	610	172	229	-	89.4	119	-
26x22	26.00	660.4	22.00	558.8	19.50	495	18.50	470	24.00	610	169	225	-	86.1	114	-
26x20	26.00	660.4	20.00	508.0	19.50	495	18.00	457	24.00	610	166	221	-	82.7	110	-
26x18	26.00	660.4	18.00	457.2	19.50	495	17.50	444	24.00	610	166	221	-	82.7	110	-
26x16	26.00	660.4	16.00	406.4	19.50	495	17.00	432	-	-	166	221	-	-	-	-
26x14	26.00	660.4	14.00	355.6	19.50	495	17.00	432	-	-	166	221	-	-	-	-
26x12	26.00	660.4	12.75	323.8	19.50	495	16.62	422	-	-	-	-	-	-	-	-
28x26	28.00	711.2	26.00	660.4	20.50	521	20.50	521	24.00	610	188	251	-	96.7	129	-
28x24	28.00	711.2	24.00	609.6	20.50	521	20.00	508	24.00	610	183	244	-	93.3	124	-
28x22	28.00	711.2	22.00	558.8	20.50	521	19.50	495	24.00	610	182	242	-	90.1	120	-
28x20	28.00	711.2	20.00	508.0	20.50	521	19.00	483	24.00	610	182	242	-	90.1	120	-
28x18	28.00	711.2	18.00	457.2	20.50	521	18.50	470	-	-	-	-	-	-	-	-
28x16	28.00	711.2	16.00	406.4	20.50	521	18.00	457	-	-	-	-	-	-	-	-
28x14	28.00	711.2	14.00	355.6	20.50	521	18.00	457	-	-	-	-	-	-	-	-
28x12	28.00	711.2	12.75	323.8	20.50	521	17.62	448	-	-	-	-	-	-	-	-
30x28	30.00	762.0	28.00	711.2	22.00	559	21.50	546	24.00	610	226	301	-	104	138	-
30x26	30.00	762.0	26.00	660.4	22.00	559	21.50	546	24.00	610	222	296	-	101	134	-
30x24	30.00	762.0	24.00	609.6	22.00	559	21.00	533	24.00	610	218	291	-	97.4	130	-
30x22	30.00	762.0	22.00	558.8	22.00	559	20.50	521	24.00	610	218	291	-	97.4	130	-
30x20	30.00	762.0	20.00	508.0	22.00	559	20.00	508	-	-	-	-	-	-	-	-
30x18	30.00	762.0	18.00	457.2	22.00	559	19.50	495	-	-	-	-	-	-	-	-
30x16	30.00	762.0	16.00	406.4	22.00	559	19.00	483	-	-	-	-	-	-	-	-
30x14	30.00	762.0	14.00	355.6	22.00	559	19.00	483	-	-	-	-	-	-	-	-
30x12	30.00	762.0	12.75	323.8	22.00	559	18.62	473	-	-	-	-	-	-	-	-
30x10	30.00	762.0	10.75	273.0	22.00	559	18.12	460	-	-	-	-	-	-	-	-
32x30	32.00	812.8	30.00	762.0	23.50	597	23.00	584	24.00	610	247	324	-	111	148	-
32x28	32.00	812.8	28.00	711.2	23.50	597	22.50	572	24.00	610	240	319	-	108	144	-
32x26	32.00	812.8	26.00	660.4	23.50	597	22.50	572	24.00	610	238	317	-	105	139	-
32x24	32.00	812.8	24.00	609.6	23.50	597	22.00	559	24.00	610	238	317	-	105	139	-
32x22	32.00	812.8	22.00	558.8	23.50	597	21.50	546	-	-	-	-	-	-	-	-
32x20	32.00	812.8	20.00	508.0	23.50	597	21.00	533	-	-	-	-	-	-	-	-
32x18	32.00	812.8	18.00	457.2	23.50	597	20.50	521	-	-	-	-	-	-	-	-
32x16	32.00	812.8	16.00	406.4	23.50	597	20.00	508	-	-	-	-	-	-	-	-
32x14	32.00	812.8	14.00	355.6	23.50	597	20.00	508	-	-	-	-	-	-	-	-
34x32	34.00	863.6	32.00	812.8	25.00	635	24.50	622	24.00	610	292	389	-	119	158	-
34x30	34.00	863.6	30.00	762.0	25.00	635	24.00	610	24.00	610	290	380	-	115	153	-
34x28	34.00	863.6	28.00	711.2	25.00	635	23.50	597	24.00	610	288	377	-	112	149	-
34x26	34.00	863.6	26.00	660.4	25.00	635	23.50	597	24.00	610	288	377	-	112	149	-
34x24	34.00	863.6	24.00	609.6	25.00	635	23.00	584	-	-	-	-	-	-	-	-

GENERAL NOTE: For Wall Thickness See Table 1 & Table 2

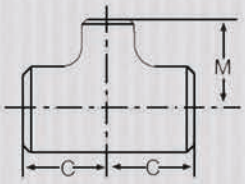
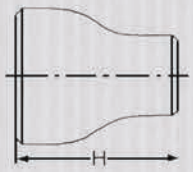



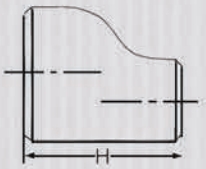
TABLE 7 (CONT"D)

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End H		Approx Weight (kg)					
	D_1		D_2		Run C		Outlet M				Reducing Outlet Tees			Reducers		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
34x22	34.00	863.6	22.00	558.8	25.00	635	22.50	572	-	-	-	-	-	-	-	-
34x20	34.00	863.6	20.00	508.0	25.00	635	22.00	559	-	-	-	-	-	-	-	-
34x18	34.00	863.6	18.00	457.2	25.00	635	21.50	546	-	-	-	-	-	-	-	-
34x16	34.00	863.6	16.00	406.4	25.00	635	21.00	533	-	-	-	-	-	-	-	-
36x34	36.00	914.4	34.00	863.6	26.50	673	26.00	660	24.00	610	329	434	-	126	168	-
36x32	36.00	914.4	32.00	812.8	26.50	673	25.50	648	24.00	610	326	431	-	122	163	-
36x30	36.00	914.4	30.00	762.0	26.50	673	25.00	635	24.00	610	323	422	-	119	159	-
36x28	36.00	914.4	28.00	711.2	26.50	673	24.50	622	24.00	610	323	422	-	119	159	-
36x26	36.00	914.4	26.00	660.4	26.50	673	24.50	622	24.00	610	-	-	-	-	-	-
36x24	36.00	914.4	24.00	609.6	26.50	673	24.00	610	24.00	610	-	-	-	-	-	-
36x22	36.00	914.4	22.00	558.8	26.50	673	23.50	597	-	-	-	-	-	-	-	-
36x20	36.00	914.4	20.00	508.0	26.50	673	23.00	584	-	-	-	-	-	-	-	-
36x18	36.00	914.4	18.00	457.2	26.50	673	22.50	572	-	-	-	-	-	-	-	-
36x16	36.00	914.4	16.00	406.4	26.50	673	22.00	559	-	-	-	-	-	-	-	-
38x36	38.00	965.2	36.00	914.4	28.00	711	28.00	711	24.00	610	-	-	-	-	-	-
38x34	38.00	965.2	34.00	863.6	28.00	711	27.50	698	24.00	610	-	-	-	-	-	-
38x32	38.00	965.2	32.00	812.8	28.00	711	27.00	686	24.00	610	-	-	-	-	-	-
38x30	38.00	965.2	30.00	762.0	28.00	711	26.50	673	24.00	610	-	-	-	-	-	-
38x28	38.00	965.2	28.00	711.2	28.00	711	25.50	648	24.00	610	-	-	-	-	-	-
38x26	38.00	965.2	26.00	660.4	28.00	711	25.50	648	24.00	610	-	-	-	-	-	-
38x24	38.00	965.2	24.00	609.6	28.00	711	25.00	635	-	-	-	-	-	-	-	-
38x22	38.00	965.2	22.00	558.8	28.00	711	24.50	622	-	-	-	-	-	-	-	-
38x20	38.00	965.2	20.00	508.0	28.00	711	24.00	610	-	-	-	-	-	-	-	-
38x18	38.00	965.2	18.00	457.2	28.00	711	23.50	597	-	-	-	-	-	-	-	-
40x38	40.00	1016	38.00	965.2	29.50	749	29.50	749	24.00	610	-	-	-	-	-	-
40x36	40.00	1016	36.00	914.4	29.50	749	29.00	737	24.00	610	378	486	-	137	183	-
40x34	40.00	1016	34.00	863.6	29.50	749	28.50	724	24.00	610	376	484	-	134	179	-
40x32	40.00	1016	32.00	812.8	29.50	749	28.00	711	24.00	610	374	482	-	131	175	-
40x30	40.00	1016	30.00	762.0	29.50	749	27.50	698	24.00	610	374	482	-	131	175	-
40x28	40.00	1016	28.00	711.2	29.50	749	26.50	673	-	-	-	-	-	-	-	-
40x26	40.00	1016	26.00	660.4	29.50	749	26.50	673	-	-	-	-	-	-	-	-
40x24	40.00	1016	24.00	609.6	29.50	749	26.00	660	-	-	-	-	-	-	-	-
40x22	40.00	1016	22.00	558.8	29.50	749	25.50	648	-	-	-	-	-	-	-	-
40x20	40.00	1016	20.00	508.0	29.50	749	25.00	635	-	-	-	-	-	-	-	-
40x18	40.00	1016	18.00	457.2	29.50	749	24.50	622	-	-	-	-	-	-	-	-
42x40	42.00	1067	40.00	1016	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x38	42.00	1067	38.00	965.2	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x36	42.00	1067	36.00	914.0	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x34	42.00	1067	34.00	863.6	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x32	42.00	1067	32.00	812.8	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x30	42.00	1067	30.00	762.0	30.00	762	28.00	711	24.00	610	-	-	-	-	-	-
42x28	42.00	1067	28.00	711.2	30.00	762	27.50	698	-	-	-	-	-	-	-	-

GENERAL NOTE: Foe Wall Thickness See Table 1 & Table 2.

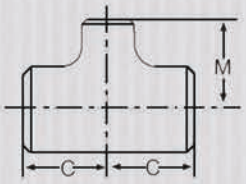



TABLE 7 (CONT"D)

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End H		Approx Weight (kg)					
	D_1		D_2		Run C		Outlet M				Reducing Outlet Tees			Reducers		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	STD	XS	XXS	STD	XS	XXS
42x26	42.00	1067	26.00	660.4	30.00	762	27.50	698	-	-	-	-	-	-	-	-
42x24	42.00	1067	24.00	609.6	30.00	762	26.00	660	-	-	-	-	-	-	-	-
42x22	42.00	1067	22.00	558.8	30.00	762	26.00	660	-	-	-	-	-	-	-	-
42x20	42.00	1067	20.00	558.0	30.00	762	26.00	660	-	-	-	-	-	-	-	-
42x18	42.00	1067	18.00	457.2	30.00	762	25.50	648	-	-	-	-	-	-	-	-
42x16	42.00	1067	16.00	406.4	30.00	762	25.00	635	-	-	-	-	-	-	-	-
44x42	44.00	1118	42.00	1067	32.00	813	30.00	757	24.00	610	-	-	-	-	-	-
44x40	44.00	1118	40.00	1016	32.00	813	29.50	744	24.00	610	444	579	-	152	202	-
44x38	44.00	1118	38.00	965.2	32.00	813	29.00	732	24.00	610	-	-	-	-	-	-
44x36	44.00	1118	36.00	914.4	32.00	813	28.50	719	24.00	610	439	574	-	146	194	-
44x34	44.00	1118	34.00	863.6	32.00	813	28.50	719	-	-	436	571	-	143	191	-
44x32	44.00	1118	32.00	812.8	32.00	813	28.00	706	-	-	-	-	-	-	-	-
44x30	44.00	1118	30.00	762.0	32.00	813	28.00	711	-	-	-	-	-	-	-	-
44x28	44.00	1118	28.00	711.2	32.00	813	27.50	698	-	-	-	-	-	-	-	-
44x26	44.00	1118	26.00	660.4	32.00	813	27.50	698	-	-	-	-	-	-	-	-
44x24	44.00	1118	24.00	609.6	32.00	813	27.50	698	-	-	-	-	-	-	-	-
44x22	44.00	1118	22.00	558.8	32.00	813	27.00	686	-	-	-	-	-	-	-	-
44x20	44.00	1118	20.00	508.0	32.00	813	27.00	686	-	-	-	-	-	-	-	-
46x44	46.00	1168	44.00	1118	33.50	851	31.50	800	28.00	711	-	-	-	-	-	-
46x42	46.00	1168	42.00	1067	33.50	851	31.00	787	28.00	711	-	-	-	-	-	-
46x40	46.00	1168	40.00	1016	33.50	851	30.50	775	28.00	711	-	-	-	-	-	-
46x38	46.00	1168	38.00	965.2	33.50	851	30.00	762	28.00	711	-	-	-	-	-	-
46x36	46.00	1168	36.00	914.4	33.50	851	30.00	762	-	-	-	-	-	-	-	-
46x34	46.00	1168	34.00	863.6	33.50	851	29.50	749	-	-	-	-	-	-	-	-
46x32	46.00	1168	32.00	812.8	33.50	851	29.50	749	-	-	-	-	-	-	-	-
46x30	46.00	1168	30.00	762.0	33.50	851	29.00	737	-	-	-	-	-	-	-	-
46x28	46.00	1168	28.00	711.2	33.50	851	29.00	737	-	-	-	-	-	-	-	-
46x26	46.00	1168	26.00	660.4	33.50	851	29.00	737	-	-	-	-	-	-	-	-
46x24	46.00	1168	24.00	609.6	33.50	851	28.50	724	-	-	-	-	-	-	-	-
46x22	46.00	1168	22.00	558.8	33.50	851	28.50	724	-	-	-	-	-	-	-	-
48x46	48.00	1219	46.00	1168	35.00	889	33.00	838	28.00	711	-	-	-	-	-	-
48x44	48.00	1219	44.00	1118	35.00	889	33.00	838	28.00	711	513	671	-	166	222	-
48x42	48.00	1219	42.00	1067	35.00	889	32.00	813	28.00	711	-	-	-	-	-	-
48x40	48.00	1219	40.00	1016	35.00	889	32.00	813	28.00	711	509	666	-	161	214	-
48x38	48.00	1219	38.00	965.2	35.00	889	32.00	813	-	-	-	-	-	-	-	-
48x36	48.00	1219	36.00	914.4	35.00	889	31.00	787	-	-	504	661	-	156	208	-
48x34	48.00	1219	34.00	863.6	35.00	889	31.00	787	-	-	-	-	-	-	-	-
48x32	48.00	1219	32.00	812.8	35.00	889	31.00	787	-	-	-	-	-	-	-	-
48x30	48.00	1219	30.00	762.0	35.00	889	30.00	762	-	-	-	-	-	-	-	-
48x28	48.00	1219	28.00	711.2	35.00	889	30.00	762	-	-	-	-	-	-	-	-
48x26	48.00	1219	26.00	660.4	35.00	889	30.00	762	-	-	-	-	-	-	-	-
48x24	48.00	1219	24.00	609.6	35.00	889	29.00	737	-	-	-	-	-	-	-	-
48x22	48.00	1219	22.00	558.8	35.00	889	29.00	737	-	-	-	-	-	-	-	-

GENERAL NOTE: Foe Wall Thickness See Table 1 & Table 2.

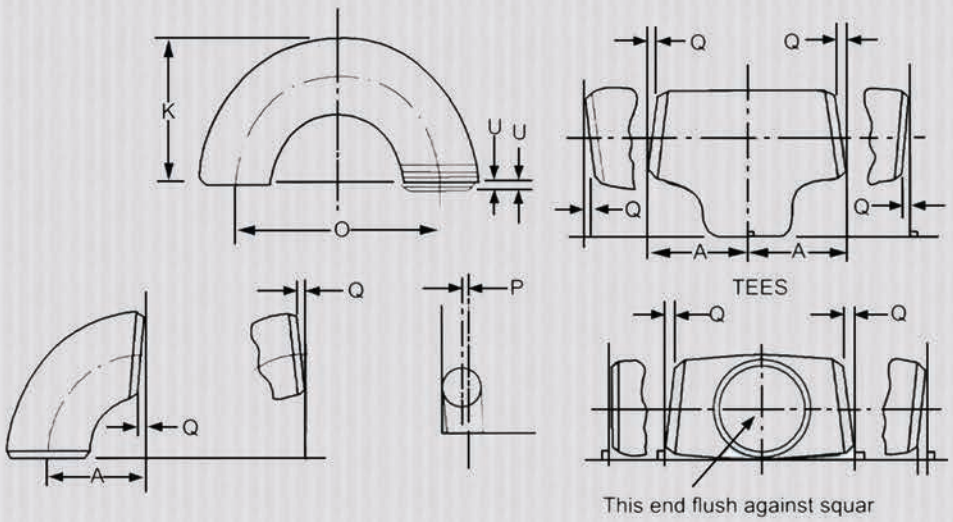
TABLE 8A

ASME B16.9-1993/ASME B16.28-1994

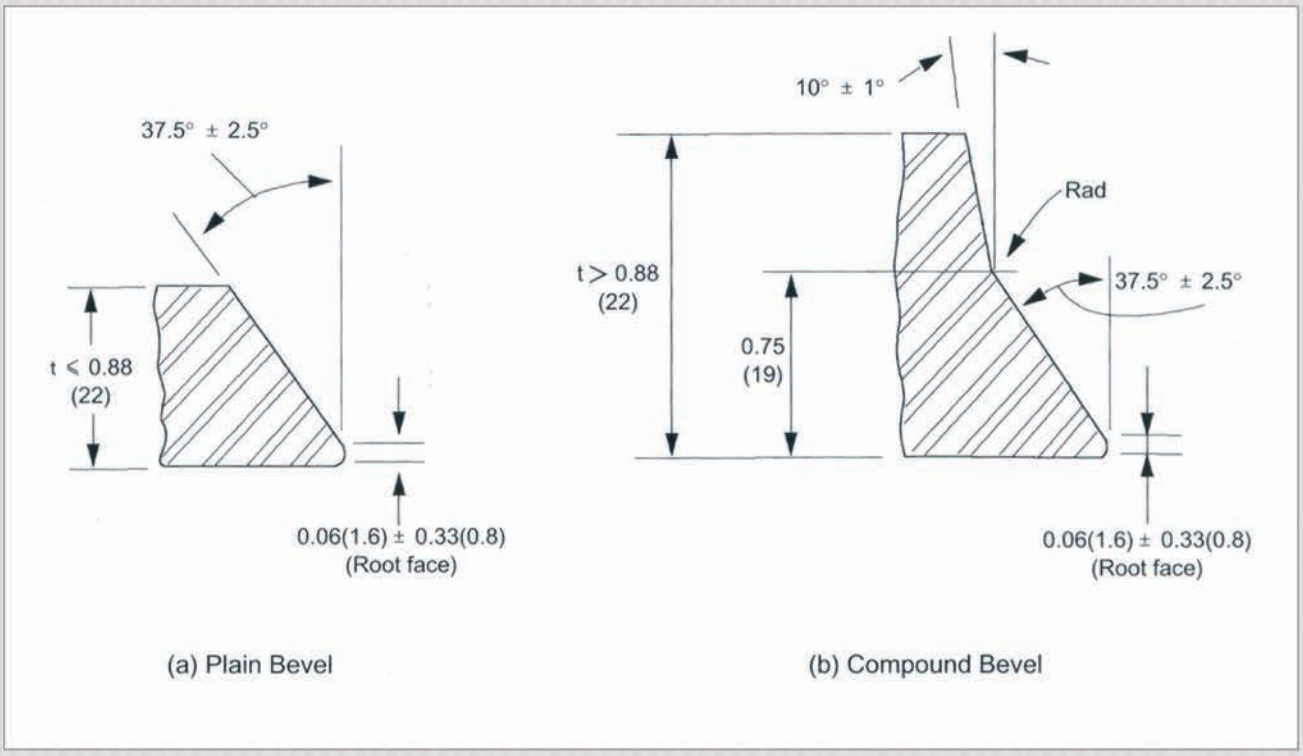
	All Fittings			90° and 45° Elbows and Tees	Reducers	Caps	180° Returns		
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Inside Diameter at End	Wall Thickness t	Center-to-End Dimension A,B,C,M	Over all Length H	Over all Length E	Center-to-Center Dimension O	Back-to-Face Dimension K	Alignment of Ends U
1/2-2 1/2	+0.06 -0.03	± 0.03	Not Less then 87.5% of nominal thickness	± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03
3-3 1/2	±0.06	± 0.06		± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03
4	±0.06	± 0.06		± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03
5-8	+0.09 -0.06	± 0.06		± 0.06	± 0.06	± 0.25	± 0.25	± 0.25	± 0.03
10-18	+0.16 -0.12	± 0.12		± 0.09	± 0.09	± 0.25	± 0.38	± 0.25	± 0.06
20-24	+0.2 -0.19	± 0.19		± 0.09	± 0.09	± 0.25	± 0.38	± 0.25	± 0.06
26-30	+0.25 ±0.19	± 0.19		± 0.12	± 0.19	± 0.38	-	-	-
32-48	+0.25 ±0.19	± 0.19		± 0.19	± 0.19	± 0.38	-	-	-

TABLE 8B

Nominal Pipe Size (NPS)	Angularity Tol.	
	Off Angle Q	Off Plane P
1/2-4	± 0.03	± 0.06
5-8	± 0.06	± 0.12
10-12	± 0.09	± 0.19
14-16	± 0.09	± 0.25
18-24	± 0.12	± 0.38
26-30	± 0.19	± 0.38
32-42	± 0.19	± 0.50
44-48	± 0.19	± 0.75



ALL DIMENSIONS ARE IN INCHES



ASME B16.9-1993/ASME B16.28-1994

Nominal Wall Thickness t	End Preparation
Less than x [Note(1)]	Cut square or slightly chamfer, at manufacture's option.
x to 0.88 inch (22) [Note (1)]	Plain bevel as in sketch (a) above.
More than 0.88 inch (22)	Compound bevel as in sketch (b) above.

GENERAL NOTES:

(a) See ASME B16.25 for transitions from bevel and root face into body of fitting and backing ring preparations.

(b) Dimensions in parenthesis are in millimeters.

NOTE:

(1) x =0.19(5) for carbon steel or ferritic allow steel and 0.12(3) for austentic alloy steel.

FIG. 1 WELDING BEVEL AND ROOT FACE FOR FITTING
(Without Backing Ring, or With Split Backing Ring)

ACCORDING TO ASTM A-234 SPECS

Type of the steel	ASTM Grade	Chemical Composition (%)									Mechanical Properties			
		C max	Mn	P max	S max	Si	Cr	Mo	Ni	Cu	R min. Tesile Strength MPa	S min. Yiels Strength MPa	A% min.(2"/4D) Elongation Long	Trasv.
Carbon Steel	1)2)3)WPB	0.30	0.29-1.06	0.050	0.058	0.10min					415	240	30	20
	2)3)WPC	0.35	0.29-1.06	0.050	0.058	0.10min					485	275	30	20
Alloy Steel	WP1	0.28	0.30-0.90	0.045	0.045	0.10-0.50		0.44-0.65			380	205	30	20
	WP12	0.20	0.30-0.80	0.045	0.045	0.60max	0.80-1.25	0.44-0.65			415	205	30	20
	WP11	0.20	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.50	0.44-0.65			415	205	30	20
	WP22	0.15	0.30-0.60	0.040	0.040	0.50max	1.90-2.60	0.87-1.13			415	205	30	20
	WP5	0.15	0.30-0.60	0.040	0.030	0.50max	4.00-6.00	0.44-0.65			415	205	30	20
	WP7	0.15	0.30-0.60	0.030	0.030	0.50-1.00	6.00-8.00	0.44-0.65			415	205	30	20
	WP9	0.15	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.00	0.90-1.10			415	205	30	20
	WPR	0.20	0.40-1.06	0.045	0.050				1.60-2.24	0.75-1.25	435	315	28	-

ACCORDING TO ASTM A-420 SPECS

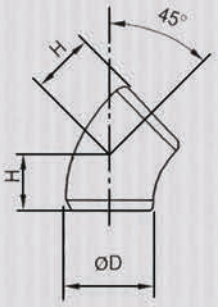
Type of the steel	ASTM Grade	Chemical Composition (%)						
		C	Mn	P	S	Si	Ni	Cu
Carbon Steel	WPL6 B.C	0.30	0.39-1.06	0.048	0.058	0.10min	-	-
2% Nickel(1%Copper)Steel	WPL9	0.20	0.40-1.06	0.045	0.050	-	1.60-2.24	0.75-1.25
3.5% Nickel Steel	WPL3 D	0.20	0.31-0.64	0.050	0.050	0.13-0.37	3.18-3.82	-
9% Nickel Steel	WPL8 E	0.13	0.90	0.045	0.045	0.13-0.37	8.40-9.60	-

Type of the steel	ASTM Grade	mechanical Properties				Impact Test				Post-Weld heat-Treatment	
		Tensile Strength MPa	Yield Strength MPa	Elongation in 2" or 50 mm.mm% Long.	Trasv.	Size of specimens mm	Min. average of 3 specimens J	Min. average of 1specimen Only J	Test temperature C	temperature C	Min . holding time min .
Carbon Steel	WPL6	415	240	30	16.5	10x10	17.6	13.6	-46.6	595-650	1h/25.4mm. 3/4h min.
						10x7.5	13.6	10.8			
						10x5	9.5	7.0			
						10x2.5	5.4	4.1			
2% Nickel (1% Copper) Steel	1 WPL9	435	315	28	18	10x10	17.6	13.6	-73.3	550-585	1h/25.4mm. 2h min.
						10x7.5	13.6	10.8			
						10x5	9.5	7.0			
						10x2.5	5.4	4.1			
3.5% Nickel Steel	WPL3	450	240	30	20	10x10	17.6	13.6	-101.1	540-620	1/4h/25.4mm. 1h min.
						10x7.5	13.6	10.8			
						10x5	9.5	7.0			
						10x2.5	5.4	4.1			
9% Nickel Steel	WPL8	690	515	22	-	10x10	33.9	27.1	-195.6	565-595	1/2h/25.4mm. 1h min.
						10x7.5	28.5	23.1			
						10x5	23.1	19.0			
						10x2.5	10.8	8.1			

TABLE 9

JIS B2311-1997

Nominal Diameter		Outside	FSGP		LG		STD		XS	
A	B	Diameter	Inside Diameter	Thickness	Inside Diameter	Thickness	Inside Diameter	Thickness	Inside Diameter	Thickness
15	1/2	21.7	16.1	2.8	-	-	-	-	-	-
20	3/4	27.2	21.6	2.8	-	-	-	-	-	-
25	1	34.0	27.6	3.2	-	-	-	-	-	-
32	1 1/4	42.7	35.7	3.5	-	-	-	-	-	-
40	1 1/2	48.6	41.6	3.5	-	-	-	-	-	-
50	2	60.5	52.9	3.8	-	-	-	-	-	-
65	2 1/2	76.3	67.9	4.2	-	-	-	-	-	-
80	3	89.1	80.7	4.2	-	-	-	-	-	-
90	3 1/2	101.6	93.2	4.2	-	-	-	-	-	-
100	4	114.3	105.3	4.5	-	-	-	-	-	-
125	5	139.8	130.8	4.5	-	-	-	-	-	-
150	6	165.2	155.2	5.0	155.2	5.0	-	-	-	-
200	8	216.3	204.7	5.8	204.7	5.8	-	-	-	-
250	10	267.4	254.2	6.6	254.2	6.6	-	-	-	-
300	12	318.5	304.7	6.9	304.7	6.9	-	-	-	-
350	14	355.6	339.8	7.9	339.8	7.9	-	-	-	-
400	16	406.4	390.6	7.9	390.6	7.9	-	-	-	-
450	18	457.2	441.4	7.9	441.4	7.9	-	-	-	-
500	20	508.0	492.2	7.9	492.2	7.9	489.0	9.5	-	-
550	22	558.0	-	-	543.0	7.9	539.8	9.5	533.4	12.7
600	24	609.6	-	-	593.8	7.9	590.6	9.5	584.2	12.7
650	28	660.4	-	-	644.6	7.9	641.4	9.5	635.0	12.7
700	28	711.2	-	-	695.4	7.9	692.2	9.5	685.8	12.7
750	30	762.0	-	-	746.2	7.9	743.0	9.5	736.6	12.7
800	32	812.8	-	-	797.0	7.9	793.8	9.5	787.4	12.7
850	34	863.6	-	-	847.8	7.9	844.6	9.5	838.2	12.7
900	36	914.4	-	-	898.6	7.9	895.4	9.5	889.0	12.7
950	38	965.2	-	-	949.4	7.9	946.2	9.5	939.8	12.7
1000	40	1016.0	-	-	1000.2	7.9	997.0	9.5	990.6	12.7
1050	42	1066.0	-	-	-	-	1047.8	9.5	1041.4	12.7
1100	44	1117.6	-	-	-	-	1098.6	9.5	1092.2	12.7
1150	46	1168.4	-	-	-	-	1149.4	9.5	1143.0	12.7
1200	48	1219.2	-	-	-	-	1200.2	9.5	1193.0	12.7



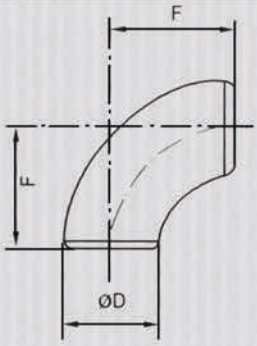
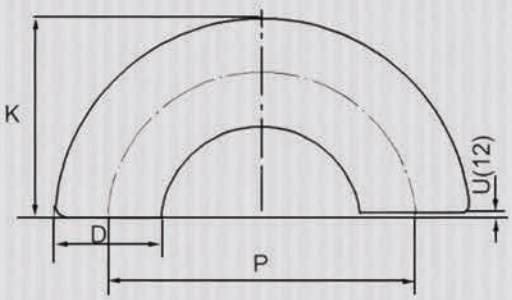


TABLE 10

JIS B2611-1997

Nominal Diameter		Outside Diameter	Dimension from the center line to the end face			Approx Weight (kg)		
			45° Elbows H	90° Elbows F		45° Elbows	90° Elbows	
A	B	D	Long	Long	Short	Long	Long	Short
15	1/2	21.7	15.8	38.1	-	0.04	0.08	-
20	3/4	27.2	15.8	38.1	-	0.05	0.10	-
25	1	34.0	15.8	38.1	25.4	0.07	0.15	0.10
32	1 1/4	42.7	19.7	47.6	31.8	0.13	0.25	0.17
40	1 1/2	48.6	23.7	57.2	38.1	0.18	0.35	0.23
50	2	60.5	31.6	76.2	50.8	0.32	0.63	0.42
65	2 1/2	76.3	39.5	95.3	63.5	0.56	1.12	0.75
80	3	89.1	47.3	114.3	76.2	0.79	1.58	1.05
90	3 1/2	101.6	55.3	133.4	88.9	1.06	2.11	1.41
100	4	114.3	63.1	152.4	101.6	1.46	2.91	1.94
125	5	139.8	78.9	190.5	127.0	2.25	4.49	2.99
150	6	165.2	94.7	228.6	152.4	3.55	7.09	4.73
200	8	216.3	126.3	304.8	203.2	7.20	14.40	9.60
250	10	267.4	157.8	381.0	254.0	12.70	25.40	16.93
300	12	318.5	189.4	457.2	304.8	19.05	38.10	25.40
350	14	355.6	220.9	533.4	355.6	28.35	56.70	37.80
400	16	406.4	252.5	609.6	406.4	37.15	74.30	49.53
450	18	457.2	284.1	685.8	457.2	47.10	94.20	62.79
500	20	508.0	315.6	762.0	508.0	59	117	78
550	22	558.8	347.2	838.2	558.8	71	141	94
600	24	609.6	378.7	914.4	609.6	84	168	112
650	26	660.4	410.3	990.6	660.4	99	198	132
700	28	711.2	441.9	1066.8	711.2	115	229	153
750	30	762.0	473.4	1143.0	762.0	132	264	176
800	32	812.8	505.0	1219.2	812.8	150	300	200
850	34	863.6	536.6	1295.4	863.6	169	338	225
900	36	914.4	568.1	1371.6	914.4	180	360	240
950	38	965.2	599.7	1447.8	965.2	212	424	283
1000	40	1016.0	631.2	1524.0	1016.0	235	470	313
1050	42	1066.8	662.8	1600.2	1066.8	259	518	345
1100	44	1117.6	694.4	1676.4	1117.6	284	569	379
1150	46	1168.4	725.9	1752.6	1168.4	311	622	415
1200	48	1219.2	757.5	1828.8	1219.2	339	677	451

GENERAL NOTE: For Wall Thickness See Table 9.



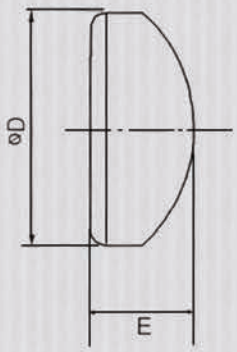


TABLE 11

JIS B2311-1997

Nominal Diameter		Outside Diameter	Centerline dimension 180° Elbows P		Dimension from the back to the end face 180° Elbows K		Caps	Approx Weight (kg) 180° Elbows K		Caps
A	B	D	Long	Short	Long	Short	E	Long	Short	E
15	1/2	21.7	76.2	-	49.0	-	25.4	0.16	-	0.05
20	3/4	27.2	76.2	-	51.7	-	25.4	0.20	-	0.06
25	1	34.0	76.2	50.8	55.1	42.4	38.1	0.29	0.20	0.10
32	1 1/4	42.7	95.2	63.6	69.0	53.2	38.1	0.50	0.34	0.14
40	1 1/2	48.6	114.4	76.2	81.5	62.4	38.1	0.70	0.47	0.16
50	2	60.5	152.4	101.6	106.5	81.1	38.1	1.27	0.85	0.23
65	2 1/2	76.3	190.6	127.0	133.5	101.7	38.1	2.24	1.49	0.30
80	3	89.1	228.6	152.4	158.9	120.8	50.8	3.16	2.11	0.49
90	3 1/2	101.6	266.8	177.8	184.2	139.7	63.5	4.22	2.81	0.70
100	4	114.3	304.8	203.2	209.6	158.8	63.5	5.82	3.88	0.87
125	5	139.8	381.0	254.0	260.4	196.9	76.2	8.98	5.96	1.31
150	6	165.2	457.2	304.8	311.2	235.0	88.9	14.18	9.45	2.05
200	8	216.3	609.6	406.4	413.0	314.4	101.6	28.80	19.20	3.64
250	10	267.4	762.0	508.0	514.7	387.7	127.0	50.80	33.86	6.46
300	12	318.5	914.4	609.6	609.6	464.1	152.4	76.20	50.79	9.70
350	14	355.6	1066.8	711.2	711.2	533.4	165.1	113.40	75.59	16.26
400	16	406.4	1219.2	812.8	812.8	609.6	177.8	148.60	95.06	16.66
450	18	457.2	-	-	-	-	203.2	-	-	21.47
500	20	508.0	-	-	-	-	228.6	-	-	27.02

GENERAL NOTE For Wall Thickness See Table 9.

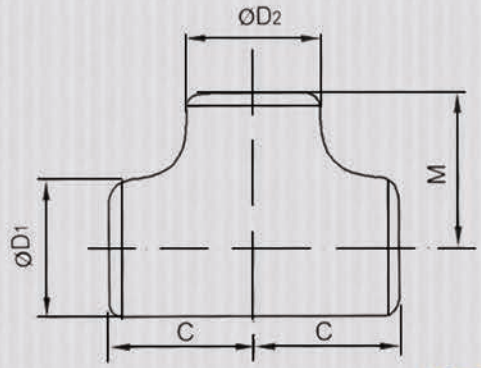


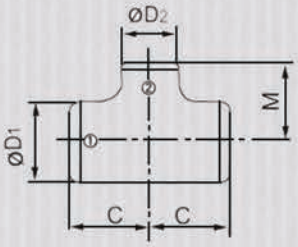
TABLE 12

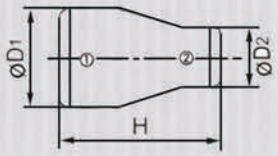
JIS B2311-1997

Nominal Diameter		Outside Diameter		Dimension from the centerline to the end face		Approx Weight (kg)
A	B	D1	D2	C	M	
15	1/2	21.7	21.7	25.4	25.4	0.12
20	3/4	27.2	27.2	28.6	28.6	0.17
25	1	34.0	34.0	38.1	38.1	0.32
32	1 1/4	42.7	42.7	47.6	47.6	0.56
40	1 1/2	48.6	48.6	57.2	57.2	0.78
50	2	60.5	60.5	63.5	63.5	1.16
65	2 1/2	76.3	76.3	76.2	76.2	1.94
80	3	89.1	89.1	85.7	85.7	2.55
90	3 1/2	101.6	101.6	95.3	95.3	3.23
100	4	114.3	114.3	104.8	104.8	4.27
125	5	139.8	139.8	123.8	123.8	6.17
150	6	165.2	165.2	142.9	142.9	9.32
200	8	216.3	216.3	177.8	177.8	17.5
250	10	267.4	267.4	215.9	215.9	29.7
300	12	318.5	318.5	254.0	254.0	32.0
350	14	355.6	355.6	279.4	279.4	44.7
400	16	406.4	406.4	304.8	304.8	55.2
450	18	457.2	457.2	342.9	342.9	70.0
500	20	508.0	508.0	381.0	381.0	86.6
550	22	558.8	558.8	419.1	419.1	106
600	24	609.6	609.6	431.8	431.8	116
650	26	660.4	660.4	495.3	495.3	147
700	28	711.2	711.2	520.7	520.7	165
750	30	762.0	762.0	558.8	558.8	190
800	32	812.8	812.8	596.9	596.9	217
850	34	863.6	863.6	635.0	635.0	245
900	36	914.4	914.4	673.1	673.1	276
950	38	965.2	965.2	711.2	711.2	308
1000	40	1016.0	1016.0	749.3	749.3	342
1050	42	1066.8	1066.8	762.0	711.2	351
1100	44	1117.6	1117.6	812.8	762.0	395
1150	46	1168.4	1168.4	850.9	800.1	433
1200	48	1219.2	1219.2	889.0	838.2	474

Remarks: The dimension M of 350 A(14B) or over in nominal diameter may be altered to smaller than that as given in the table above, subject to the agreement between the parties concerned with delivery.

GENERAL NOTE: For Wall Thickness See Table 9.

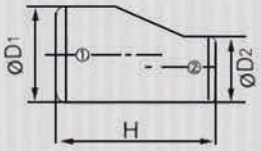
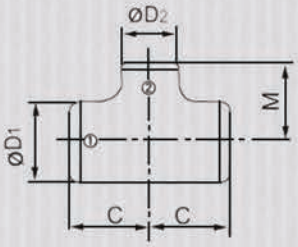



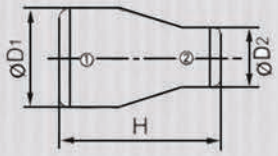
TABLE 13

JIS B2311-1997

Nominal Diameter 1 x 2		Outside Diameter		Overall Length H	Dimension from the Centerline to the end face		Approx Weight (kg)	
A	B	D1	D2		C	M	Tees	Reducers
20x15	3/4x1/2	27.2	21.7	38.1	28.6	28.6	0.16	0.06
25x20	1x3/4	34.0	27.2	50.8	38.1	38.1	0.30	0.11
25x15	1x1/2	34.0	21.7	50.8	38.1	38.1	0.29	0.10
32x25	1 1/4x1	42.7	34.0	50.8	47.6	47.6	0.53	0.15
32x20	1 1/4x3/4	42.7	27.2	50.8	47.6	47.6	0.50	0.14
32x15	1 1/4x1/2	42.7	21.7	50.8	47.6	47.6	0.49	0.13
40x32	1 1/2x1 1/4	48.6	42.7	63.5	57.2	57.2	0.76	0.23
40x25	1 1/2x1	48.6	34.0	63.5	57.2	57.2	0.72	0.21
40x20	1 1/2x3/4	48.6	27.2	63.5	57.2	57.2	0.68	0.19
40x15	1 1/2x1/2	48.6	21.7	63.5	57.2	57.2	0.67	0.18
50x40	2x1 1/2	60.5	48.6	76.2	63.5	60.3	1.08	0.36
50x32	2x1 1/4	60.5	42.7	76.2	63.5	57.2	1.04	0.34
50x25	2x1	60.5	34.0	76.2	63.5	50.8	0.99	0.32
50x20	2x3/4	60.5	27.2	76.2	63.5	44.5	0.95	0.29
65x50	2 1/2x2	76.3	60.5	88.9	76.2	69.9	1.78	0.59
65x40	2 1/2x1 1/2	76.3	48.6	88.9	76.2	66.7	1.70	0.54
65x32	2 1/2x1 1/4	76.3	42.7	88.9	76.2	63.5	1.67	0.52
65x25	2 1/2x1	76.3	34.0	88.9	76.2	57.2	1.61	0.48
80x65	3x2 1/2	89.1	76.3	88.9	85.7	82.6	2.44	0.73
80x50	3x2	89.1	60.5	88.9	85.7	76.2	2.28	0.66
80x40	3x1 1/2	89.1	48.6	88.9	85.7	73.0	2.21	0.61
80x32	3x1 1/4	89.1	42.7	88.9	85.7	69.9	2.17	0.59
90x80	3 1/2x3	101.6	89.1	101.6	95.3	92.1	3.12	0.96
90x65	3 1/2x2 1/2	101.6	76.3	101.6	95.3	88.9	3.01	0.90
90x50	3 1/2x2	101.6	60.5	101.6	95.3	82.6	2.35	0.83
90x40	3 1/2x1 1/2	101.6	48.6	101.6	95.3	79.4	2.77	0.77
90x32	3 1/2x1 1/4	101.6	42.7	101.6	-	-	-	0.74
100x90	4x3 1/2	114.3	101.6	101.6	104.8	101.6	4.09	1.17
100x80	4x3	114.3	89.1	101.6	104.8	98.4	3.98	1.10
100x65	4x2 1/2	114.3	76.3	101.6	104.8	95.3	3.87	1.04
100x50	4x2	114.3	60.5	101.6	104.8	88.9	3.71	0.97
100x40	4x1 1/2	114.3	48.6	101.6	104.8	85.7	3.63	0.91

GENERAL NOTE: For Wall Thickness See Table 9.





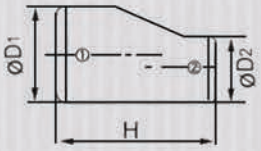
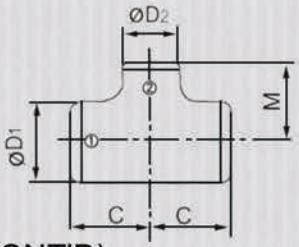


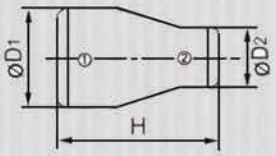
TABLE 13 (CONT'D)

JIS B2311-1997

Nominal Diameter 1 x 2		Outside Diameter		Overall Length H	Dimension from the Centerline to the end face		Approx Weight (kg)	
A	B	D1	D2		C	M	Tees	Reducers
125x100	5x4	139.8	114.3	127.0	123.8	117.5	5.86	1.74
125x90	5x3 1/2	139.8	101.6	127.0	123.8	114.3	5.68	1.65
125x80	5x3	139.8	89.1	127.0	123.8	111.1	5.56	1.58
125x65	5x2 1/2	139.8	76.3	127.0	123.8	108.0	5.45	1.50
125x50	5x2	139.8	60.5	127.0	123.8	104.8	5.32	1.41
150x125	6x5	165.2	139.8	139.7	142.9	136.5	8.80	2.55
150x100	6x4	165.2	114.3	139.7	142.9	130.2	8.49	2.36
150x90	6x3 1/2	165.2	101.6	139.7	142.9	127.0	8.31	2.27
150x80	6x3	165.2	89.1	139.7	142.9	123.8	8.19	2.18
150x65	6x2 1/2	165.2	76.3	139.7	142.9	120.7	8.08	2.09
200x150	8x6	216.3	165.2	152.4	177.8	168.3	16.2	4.17
200x125	8x5	216.3	139.8	152.4	177.8	161.9	15.7	3.87
200x100	8x4	216.3	114.3	152.4	177.8	155.6	15.4	3.67
200x90	8x3 1/2	216.3	101.6	152.4	177.8	152.4	15.2	3.56
250x200	10x8	267.4	216.3	177.8	215.9	203.2	27.8	6.87
250x150	10x6	267.4	165.2	177.8	215.9	193.7	26.6	6.32
250x125	10x5	267.4	139.8	177.8	215.9	190.5	26.1	6.06
250x100	10x4	267.4	114.3	177.8	215.9	184.2	25.8	5.80
300x250	12x10	318.5	267.4	203.2	254.0	241.3	41.5	9.97
300x200	12x8	318.5	216.3	203.2	254.0	228.6	39.6	9.29
300x150	12x6	318.5	165.2	203.2	254.0	219.1	38.3	8.69
300x125	12x5	318.5	139.8	203.2	254.0	215.9	37.9	8.39
350x300	14x12	355.6	318.5	330.2	279.4	269.9	42.7	21.2
350x250	14x10	355.6	267.4	330.2	279.4	257.2	41.2	19.7
350x200	14x8	355.6	216.3	330.2	279.4	247.7	40.0	18.3
350x150	14x6	355.6	165.2	330.2	279.4	238.1	39.0	16.9
400x350	16x14	406.4	355.6	355.6	304.8	304.8	54.2	25.9
400x300	16x12	406.4	318.5	355.6	304.8	295.3	52.2	24.7
400x250	16x10	406.4	267.4	355.6	304.8	282.6	50.7	23.2
400x200	16x8	406.4	216.3	355.6	304.8	273.1	49.4	21.7
400x150	16x6	406.4	165.2	-	304.8	263.5	48.5	-

GENERAL NOTE: For Wall Thickness See Table 9.





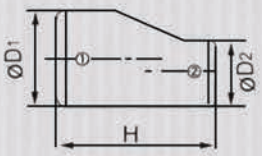
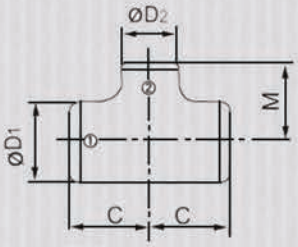


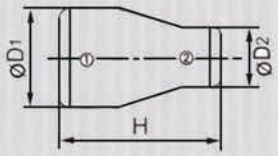
TABLE 13 (CONT'D)

JIS B2311-1997

Nominal Diameter 1 x 2		Outside Diameter		Overall Length H	Dimension from the Centerline to the end face		Approx Weight (kg)	
A	B	D1	D2		C	M	Tees	Reducers
450x400	18x16	457.2	406.4	381.0	342.9	330.2	67.9	31.5
450x350	18x14	457.2	355.6	381.0	342.9	330.2	66.9	29.8
450x300	18x12	457.2	318.5	381.0	342.9	320.7	64.9	28.6
450x250	18x10	457.2	267.4	381.0	342.9	308.0	63.4	27.1
500x450	20x18	508.0	457.2	508.0	381.0	368.8	84.2	47.0
500x400	20x16	508.0	406.4	508.0	381.0	355.6	82.1	44.7
500x350	20x14	508.0	355.6	508.0	381.0	355.6	81.1	42.4
500x300	20x12	508.0	318.5	508.0	381.0	346.1	79.1	40.8
500x250	20x10	508.0	267.4	-	381.0	333.4	77.6	-
500x200	20x8	508.0	216.3	-	381.0	323.9	76.3	-
550x500	22x20	558.8	508.0	508.0	419.1	406.4	103	52.0
550x450	22x18	558.8	457.2	508.0	419.1	393.7	101	49.7
550x400	22x16	558.8	406.4	508.0	419.1	381.0	98.9	47.5
550x350	22x14	558.8	355.6	508.0	-	-	-	45.3
600x550	24x22	609.6	558.8	508.0	431.8	431.8	115	57.1
600x500	24x20	609.6	508.0	508.0	431.8	431.8	114	54.8
600x450	24x18	609.6	457.2	508.0	431.8	419.1	111	52.6
600x400	24x16	609.6	406.4	508.0	-	-	-	50.4
650x600	26x24	660.4	609.6	609.6	495.3	482.6	144	74.5
650x550	26x22	660.4	558.8	609.6	495.3	469.9	141	71.7
650x500	26x20	660.4	508.0	609.6	495.3	457.2	138	68.9
650x450	26x18	660.4	457.2	609.6	-	-	-	66.3
700x650	28x26	711.2	660.4	609.6	520.7	520.7	164	80.5
700x600	28x24	711.2	609.6	609.6	520.7	508.0	161	77.7
700x550	28x22	711.2	558.8	609.6	520.7	495.3	158	75.0
700x500	28x20	711.2	508.0	609.6	-	-	-	72.4
750x700	30x28	762.0	711.2	609.6	558.8	546.1	188	86.6
750x650	30x26	762.0	660.4	609.6	558.8	546.1	185	83.8
750x600	30x24	762.0	609.6	609.6	558.8	533.4	182	81.1
750x550	30x22	762.0	558.8	609.6	-	-	-	78.5
800x750	32x30	812.8	762.0	609.6	596.9	584.2	213	82.6
800x700	32x28	812.8	711.2	609.6	596.9	571.5	210	89.8
800x650	32x26	812.8	660.4	609.6	596.9	571.5	208	87.2
800x600	32x24	812.8	609.6	609.6	-	-	-	84.6

GENERAL NOTE: For Wall Thickness See Table 9.





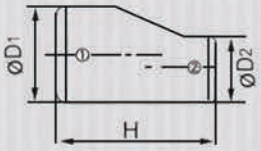


TABLE 13 (COUNT'D)

JIS B2311-1997

Nominal Diameter 1 x 2		Outside Diameter		Overall Length H	Dimension from the Centerline to the end face		Approx Weight (kg)	
A	B	D1	D2		C	M	Tees	Reducers
850x800	34x32	863.6	812.8	609.6	635.0	622.3	243	98.6
850x750	34x30	863.6	762.0	609.6	635.0	609.6	238	95.9
850x700	34x28	863.6	711.2	609.6	635.0	596.9	236	93.2
850x650	34x26	863.6	660.4	609.6	-	-	-	90.7
900x850	36x34	914.4	863.6	609.6	673.1	660.4	271	105
900x800	36x32	914.4	812.8	609.6	673.1	647.7	269	102
900x750	36x30	914.4	762.0	609.6	673.1	635.0	264	99.3
900x700	36x28	914.4	711.2	609.6	-	-	-	96.8
950x900	38x36	965.2	914.4	609.6	711.2	711.2	306	111
950x850	38x34	965.2	863.6	609.6	711.2	698.5	301	108
950x800	38x32	965.2	812.8	609.6	711.2	685.8	297	105
950x750	38x30	965.2	762.0	609.6	-	-	-	103
1000x950	40x38	1016.0	965.2	609.6	749.3	749.3	339	117
1000x900	40x36	1016.0	914.4	609.6	749.3	736.6	335	114
1000x850	40x34	1016.0	863.6	609.6	749.3	723.9	330	111
1000x800	40x32	1016.0	812.8	609.6	-	-	-	109
1050x1000	42x40	1066.8	1016.0	609.6	762.0	711.2	349	123
1050x950	42x38	1066.8	965.2	609.6	762.0	711.2	348	120
1050x900	42x36	1066.8	914.4	609.6	762.0	711.2	346	118
1050x850	42x34	1066.8	863.6	609.6	-	-	-	115
1100x1050	44x42	1117.6	1066.8	609.6	812.8	762.0	393	129
1100x1000	44x40	1117.6	1016.0	609.6	812.8	749.3	389	126
1100x950	44x38	1117.6	965.2	609.6	812.8	736.6	385	121
1100x900	44x36	1117.6	914.4	609.6	-	-	-	119
1150x1100	46x44	1168.4	1117.6	711.2	850.9	800.1	431	157
1150x1050	46x42	1168.4	1066.8	711.2	850.9	787.4	427	154
1150x1000	46x48	1168.4	1016.0	711.2	850.9	774.7	422	151
1150x950	46x38	1168.4	965.2	711.2	-	-	-	148
1200x1150	48x48	1219.2	1168.4	711.2	809.0	838.2	471	164
1200x1100	48x44	1219.2	1117.6	711.2	889.0	838.2	469	161
1200x1050	48x42	1219.2	1066.8	711.2	889.0	812.8	461	158
1200x1000	48x40	1219.2	1016.0	711.2	-	-	-	155

GENERAL NOTE: For Wall Thickness See Table 9.

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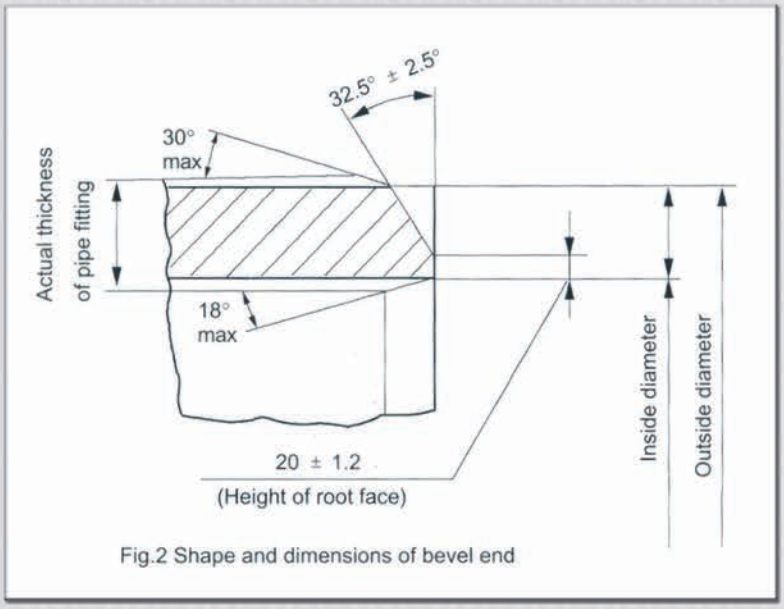


Fig.2 Shape and dimensions of bevel end

TABLE 14

JIS B2311-1997

Item	Types of pipe fittings	Nominal diameter						
		A	15-65	80-100	125-200	250-450	500-600	650-750	800-1200
		B	1/2-2 1/2	3-4	5-8	10-18	20-24	26-30	32-48
		Tolerence							
Outside diameter at end			± 2.0	± 2.5	± 3.5	+5.0 -4.5		+6.4 -4.8	
Inside diameter at end face	All types of		± 2.0	± 2.5	± 3.5	± 4.5		± 4.8	
Thickness	pipe fittings				+not specified	-15%			
Bevel angle					See Fig. 2				
Height of root face					See Fig. 2				
Dimension from centerline to end face (H F)	45° Elbows 90° Elbows		± 2.0				± 3.2		± 4.8
Centerline dimension (P)			± 6.4			± 9.5		-	
Dimension from back to end face (K)	180° Elbows				± 6.4			-	
Alignment of end faces (U) (max.)			1.6			3.2		-	
Overall length (H)	Reducers		± 2.0				± 3.2		± 4.8
Dimension from centerline to end face (C M)	Tees		± 2.0				± 3.2		± 4.8
Dimension from back to end face (E)	Caps		± 3.2			± 6.4		-	
Outer peripheral length at end	All types of pipe fittings				-			± 0.5%	

Remarks: 1. For the dimensional tolerences for H of reducers and M of reducing tees, the tolerences specified for the larger diameter side shall apply.

2. For the galvanized part of white pipe fittings, the above-mentioned tolerences shall be applicable before galvanizing.

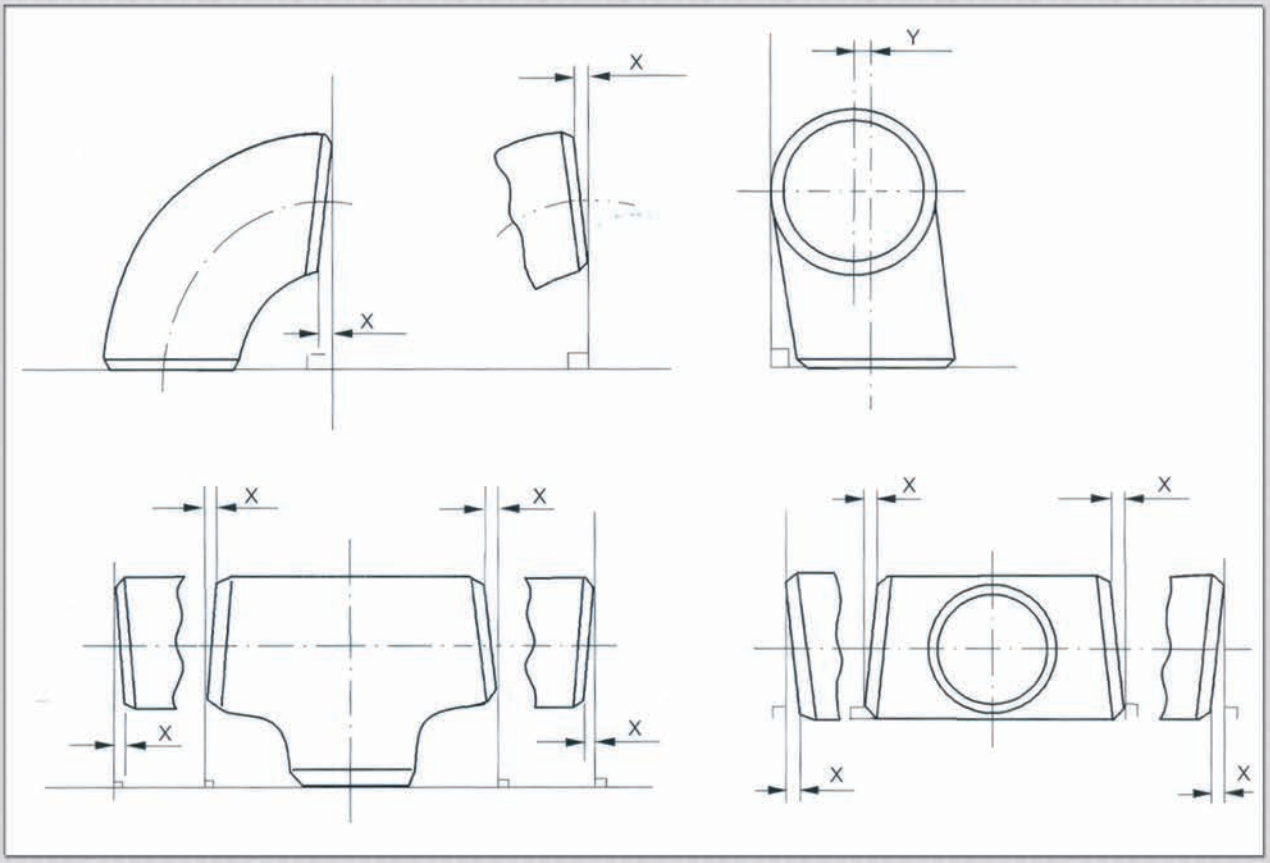


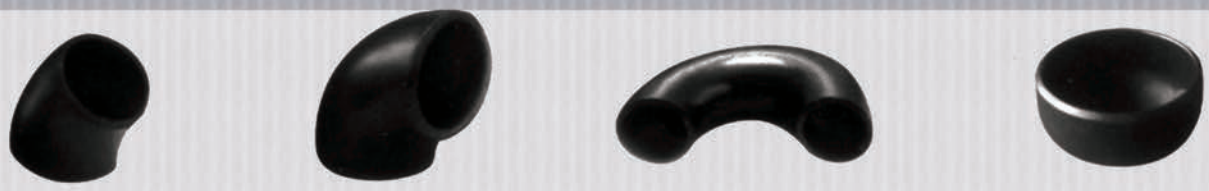
TABLE 15

JIS B2311-1997

Item	Types of pipe fittings		Nominal diameter							
		A	15-100	125-200	250-300	350-400	450-600	650-750	800-1050	1100-1200
		B	1/2-4	5-8	10-12	14-16	18-24	26-30	32-42	44-48
			Tolerance							
Off angle (X)	Elbows, reducers, tees		0.8	1.6		2.4	3.2		4.8	
Off plane (Y)	Elbows, tees		1.6	3.2	4.8	6.4		9.5	12.7	19.1

Remarks: 1. For the tolerances on alignment of reducers and reducing tees, the tolerances specified for larger diameter side shall apply.

2. For the galvanized part of white pipe fittings, the above-mentioned tolerances shall be applied before galvanzing.



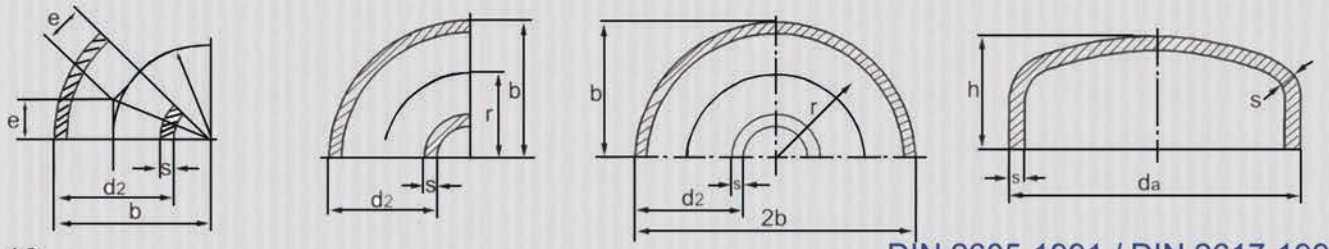


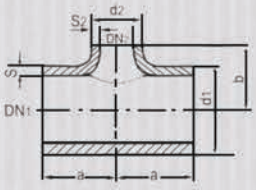
TABLE 16

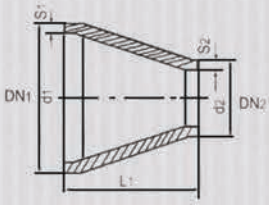
DIN 2605-1991 / DIN 2617-1991

Nominal Size DN	Outside Diameter da	Wall Thickness s, for series 3	r	b	e	h	Approx Weight (kg)			
							45° Elbows	90° Elbows	180° Bends	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	106	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	442	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	-	-	-	-

TABLE 17 TOLERANCES

Nominal Size DN	Limit Devlations for Dimension				Lower Limit Devlations for Wall Thickness			
	45° Elbows b	90° Elbows b	180° Elbows 2b	Caps h	45° Elbows	90° Elbows	180° Elbows	Caps
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				+15% -0.50mm
700	± 14.5	± 6.0	To be	± 10				
800-1200	± 19.0	± 8.0	Agreed	± 10				

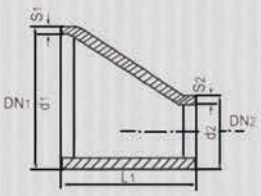
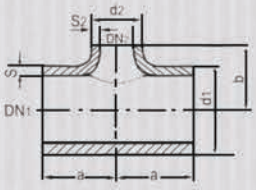
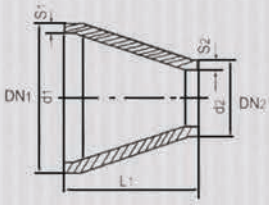



TABLE 18

DIN 2615-1992 / DIN 2616-1991

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	L1	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	0.04
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	0.10
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	0.19
40	48.3	2.6	20	26.9	2.3	57	57	64	0.65	0.17
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	124	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

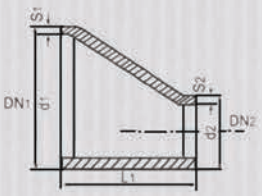
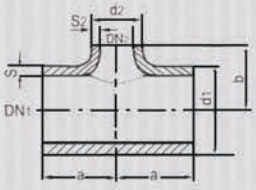
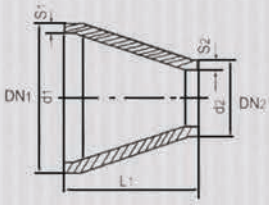



TABLE 18 (CONT'D)

DIN 2615-1992 / DIN 2616-1991

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	L1	Tees	Reducers
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
200	219.1	6.3	200	219.1	6.3	178	178	-	19.00	-
200	219.1	6.3	150	168.3	4.5	178	168	152	18.00	5.03
200	219.1	6.3	125	139.7	4.0	178	162	152	18.00	5.03
200	219.1	6.3	100	114.3	3.6	178	156	152	18.00	5.03
200	219.1	6.3	80	88.9	3.2	178	152	152	18.00	5.03
250	273	6.3	250	273	6.3	216	216	-	40.00	-
250	273	6.3	200	219.1	6.3	216	203	178	37.00	7.40
250	273	6.3	150	168.3	4.5	216	194	178	36.00	7.40
250	273	6.3	125	139.7	4.0	216	191	178	36.00	7.40
250	273	6.3	100	114.3	3.6	216	184	178	36.00	7.40
300	323.9	7.1	300	323.9	7.1	254	254	-	62.00	-
300	323.9	7.1	250	273	6.3	254	241	203	62.00	11.29
300	323.9	7.1	200	219.1	6.3	254	229	203	62.00	11.29
300	323.9	7.1	150	168.3	4.5	254	219	203	49.00	11.29
300	323.9	7.1	125	139.7	4.0	254	216	203	49.00	11.29
350	355.6	8.0	350	355.6	8.0	279	279	-	72.00	-
350	355.6	8.0	300	323.9	7.1	279	270	330	72.00	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

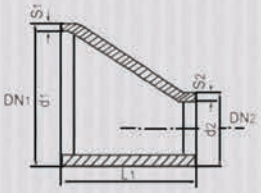



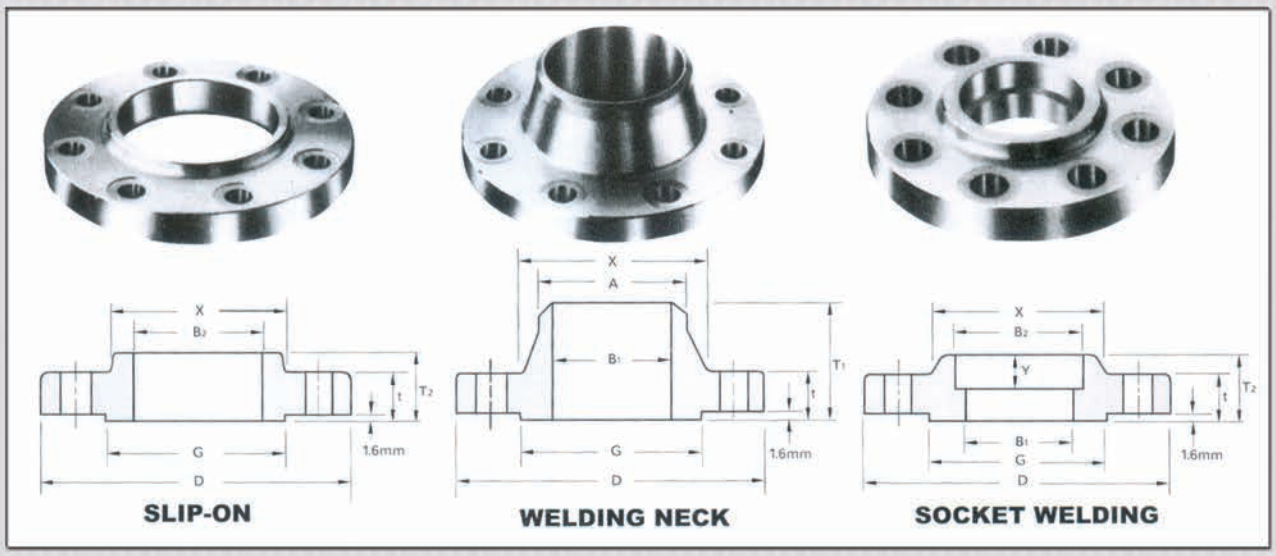
TABLE 18 (CONT'D)

DIN 2615-1992 / DIN 2626-1991

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	L1	Tees	Reducers
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	-	432	-
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	1016	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	-	-

TABLE19 TOLERANCES

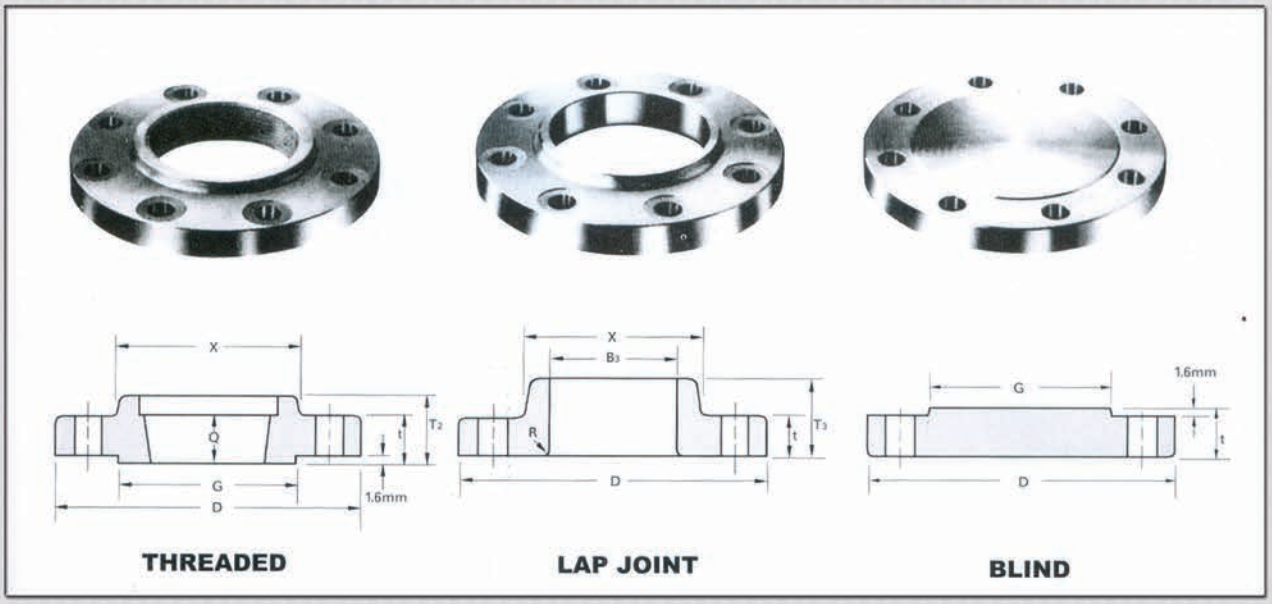
Nominal Size DN	Limit Devlations for Dimensions		Lower Limit Deviations for Wall Thickness	
	Tees a and b	Reducers L1	Tees	Reducers
15-65		+/- 2.5		
80-100	+/- 2.0	+/- 3.0	+15% -12.5%	
125-200		+/- 3.5		
250		+/- 4.0		
300-450	+/- 3.0	+/- 5.0		
500-600		+/- 6.0		
600-700			+15% -0.50mm	
800	+/- 5.0			
900-1200		+/- 8.0		



ANSI B16.5 FORGED FLANGES

Unit: mm

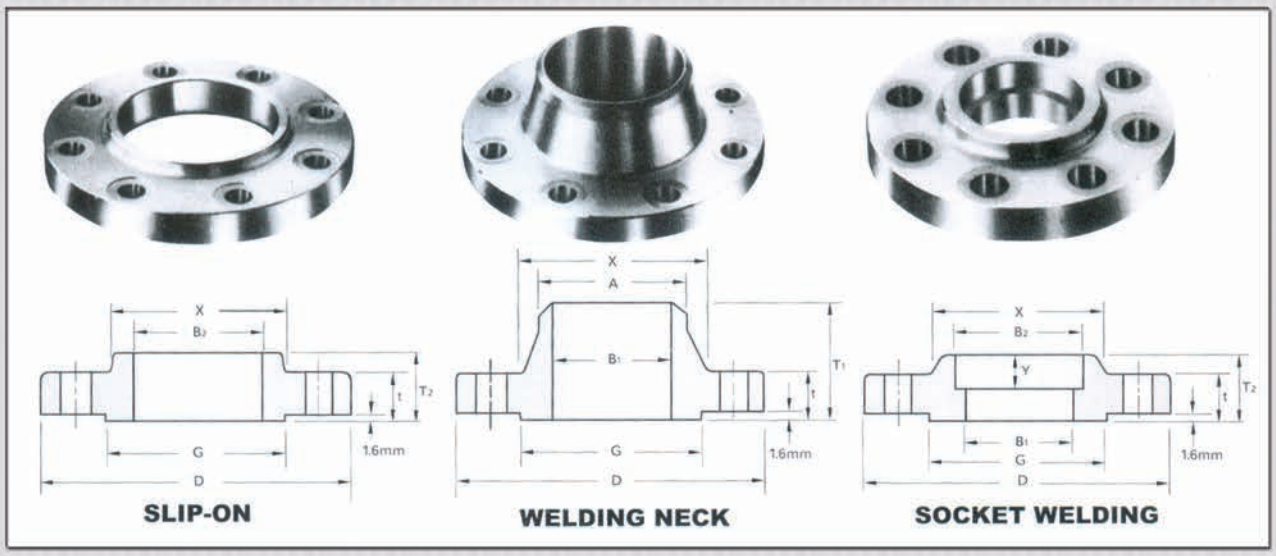
Nominal Pipe Size (NPS)	Outside Diam	O. D. of Raised Face	At Base of Hub	Thickness	BORE			LENGTH THRU HUB			Diam of Hub at Bevel	Radius of Fillet	Thread Length
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Welding Neck	Slip-on Threaded Socket Welding	Lap Joint			
	D	G	X	t	B_1	B_2	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	15.7
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



ANSI B16.5 FORGED FLANGES

Unit: mm

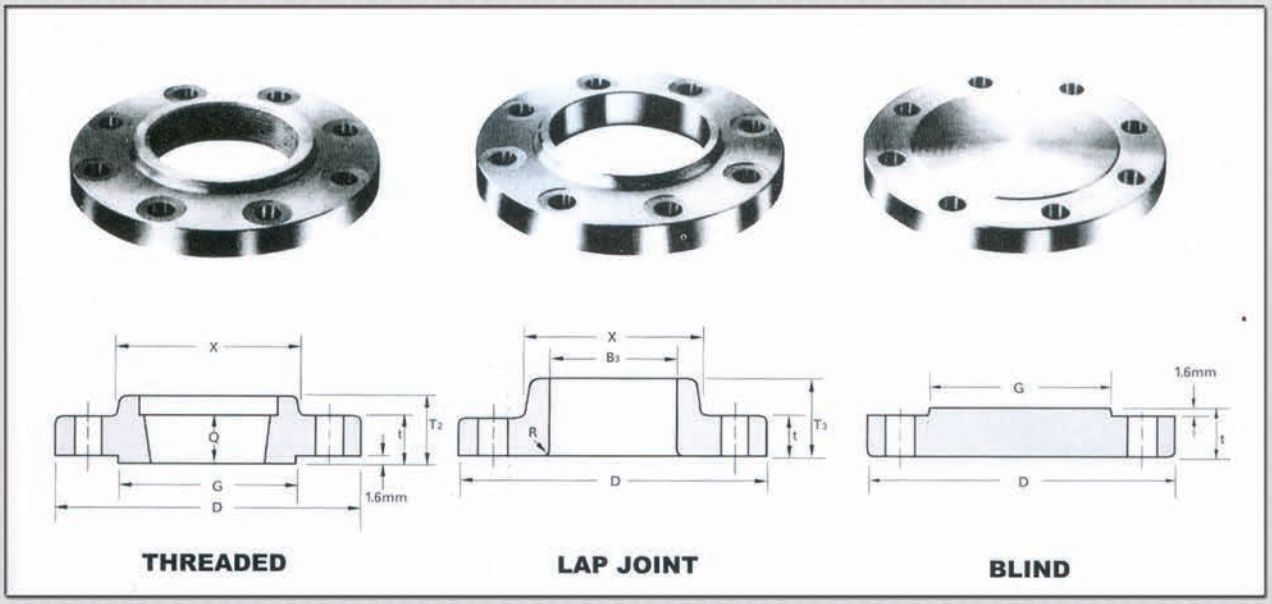
Nominal Pipe Size (NPS)	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck	Slip-on and Threaded	Lap Joint	Blind	Socket Welding
	Y					Raised Face	Raised Face	Ring Joint	Kg	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	2.80	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	20.6	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	749.0	20	35.1	1 1/4	152.4	171.5	184.2	119.66	96.00	120.00	190.00	100.75



ANSI B16.5 FORGED FLANGES

Unit: mm

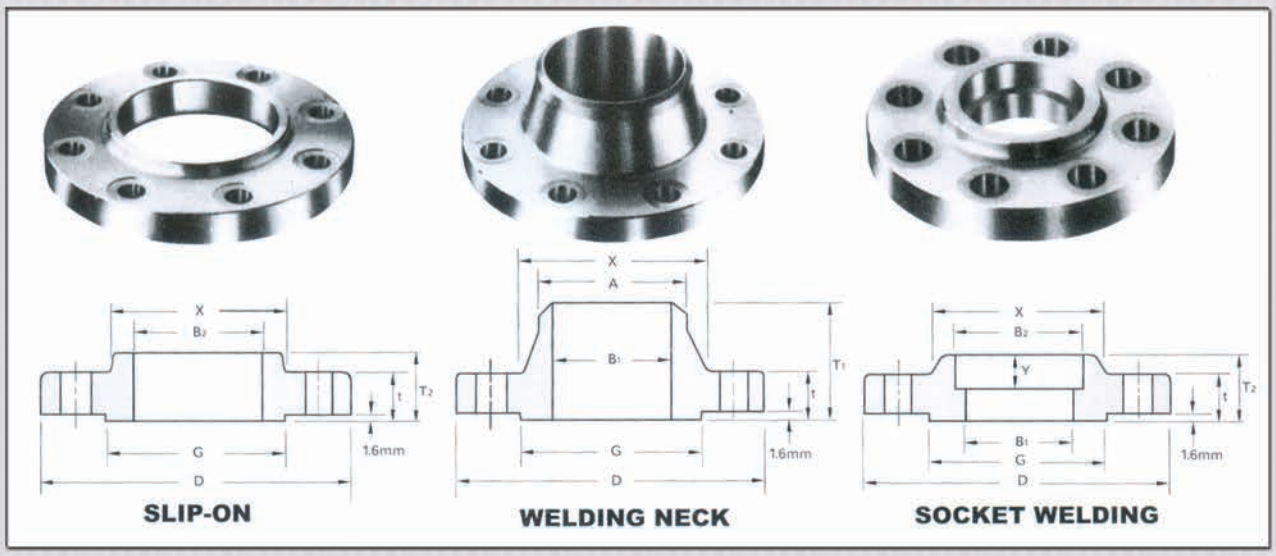
Nominal Pipe Size (NPS)	Outside Diam	Diam at Base of Hub	O. D. of Raised Face	Thick - ness	BORE				LENGTH THRU HUB			Diam of Hub at Bevel	Radius of Fillet	Threaded Length
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min. Threaded Min.	Welding Neck	Slip-on Threaded Socket 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	20.8	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	22.1	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	31.8	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	35.1	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



ANSI B16.5 FORGED FLANGES

Unit: mm

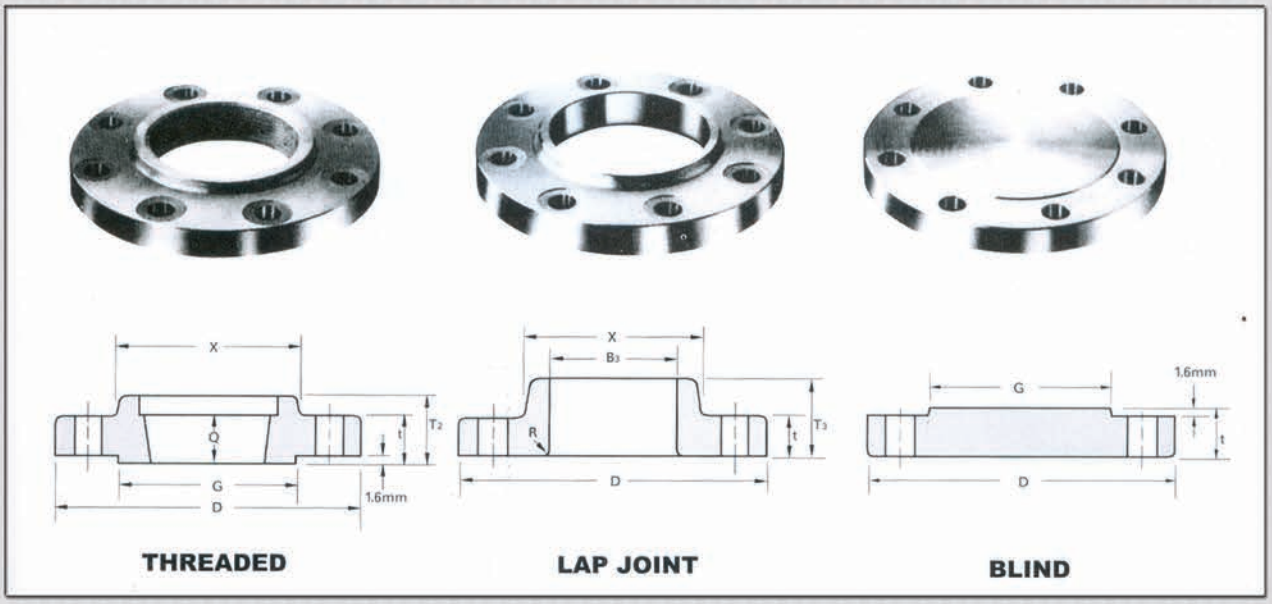
Nominal Pipe Size (NPS)	Depth of Socket	DRILLING			BOLTING				APPROXIMATE WEIGHT				
		Bolt Circle Diam	Number of Holes	Diam of Holes	Diam of Bolts (inch)	Machine Bolt Length	Stud Bolt Length		Welding Neck	Slip-on and Threaded	Lap Joint	Blind	Socket Welding
	Y					Raised Face	Raised Face	Ring Joint	Kg	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	0.40	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	2.8	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.	2.8	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	127.06	8.20	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	75.20	85.00	110.00	
16	44.5	571.5	20	35.1	1 1/4	165.1	190.5	203.2	115.00	95.00	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	685.8	24	35.8	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	



ANSI B16.5 FORGED FLANGES

Unit: mm

Nominal Pipe Size (NPS)	Outside Diam	Diam at Base of Hub	O. D. of Raised Face	Thick - ness	BORE				LENGTH THRU HUB			Diam of Hub at Bevel	Radius of Fillet	Threaded Length
					Welding Neck Socket Welding	Slip-on Socket Welding	Lap Joint	Counter Bore Min. Threaded 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	69.3	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		74.7	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	35.8
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

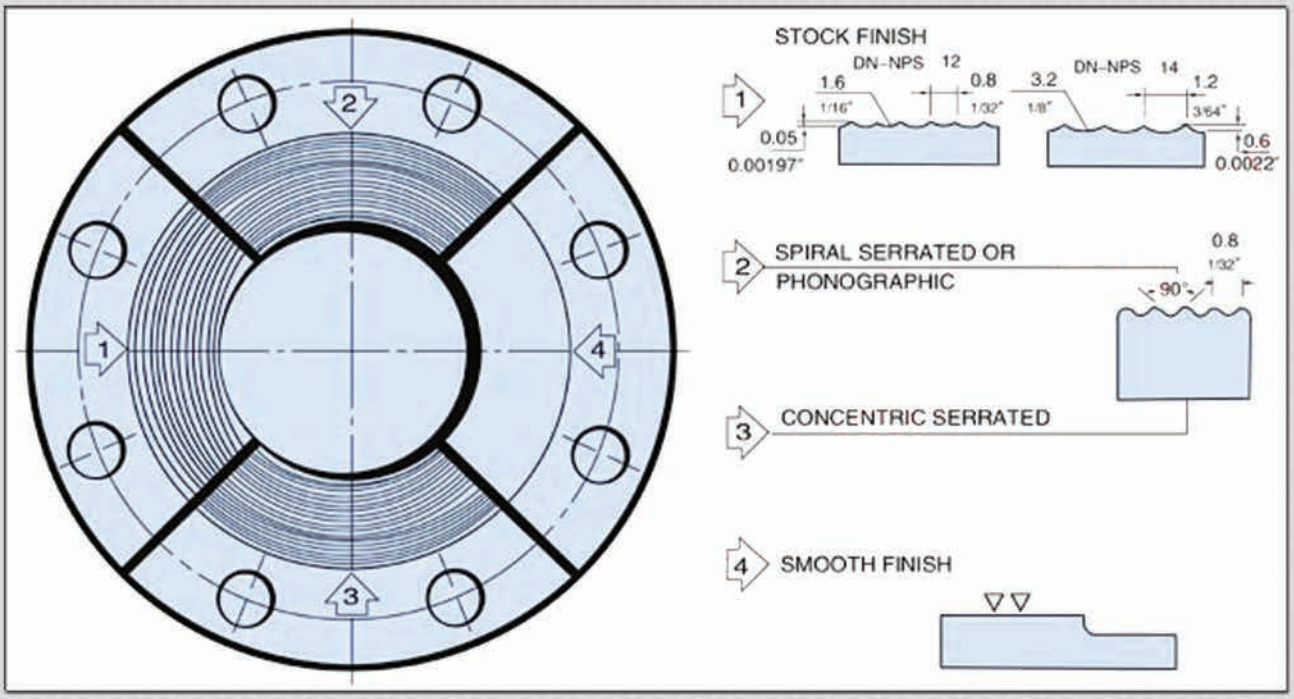


ANSI B16.5 FORGED FLANGES

Unit: mm

Nominal Pipe Size (NPS)	Depth of Socket Y	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
						0.25" Raised Face	Malefemale 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	15.7	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	114.3.6	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	196.9	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	45.5	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	292.1	267.86	231.54	260.00	365.00	
24	63.5	838.2	24	50.8	1 7/8	330.2	323.9	339.6	372.00	330.00	370.00	565.00	

STANDARD FINISHES for Face of Flange(ANSI B16. 5)



STOCK FINISH: The most widely used of any gasket finish , because , practically , is suitable for all ordinary service conditions. this is a continuous spiral groove. Flanges sizes 12" (304.8mm)nd smaller , are produced with a 1/16 round-nosed tool at a feed of 1/32" per revolution. For sizes 14:"(355.6mm) and larger . The finish is made with 1/8" round-nosed tool at a feed of 3/ 64" per revolution.

SPIRAL; SERRATED OR PHONOGRAPHIC: This finish is produced by using a 90º round-nosed tool.

CONCENTRIC SERRATED : This finish is produced by using a 90º round-nosed tool.

SMOOTH FINISH: The cutting tool employed shall have an approximate 0.60" radius. The resultant surface finish. shall have a 125µ inch to 250µ inch (ANSI B16.5 para 6.4 :4.1) .

1. RAISED FACE , AND LARGE MAKE AND FEMALE

Either a serrated-concentric or serrated -spiral finish having from 34 to 64 grooves per inch is used
The cutting tool employed has an approximate 0.06 inch radius . The resultant surface finish shall have a 125m inch (3.2µm) to 500m inch (12.5µm) approximate roughness.

2. TONGUE AND GROOVE , AND SMALL MALE AND FEMALE

The gasket contact surface does not exceed 125µ inch (3.2µm) roughness.

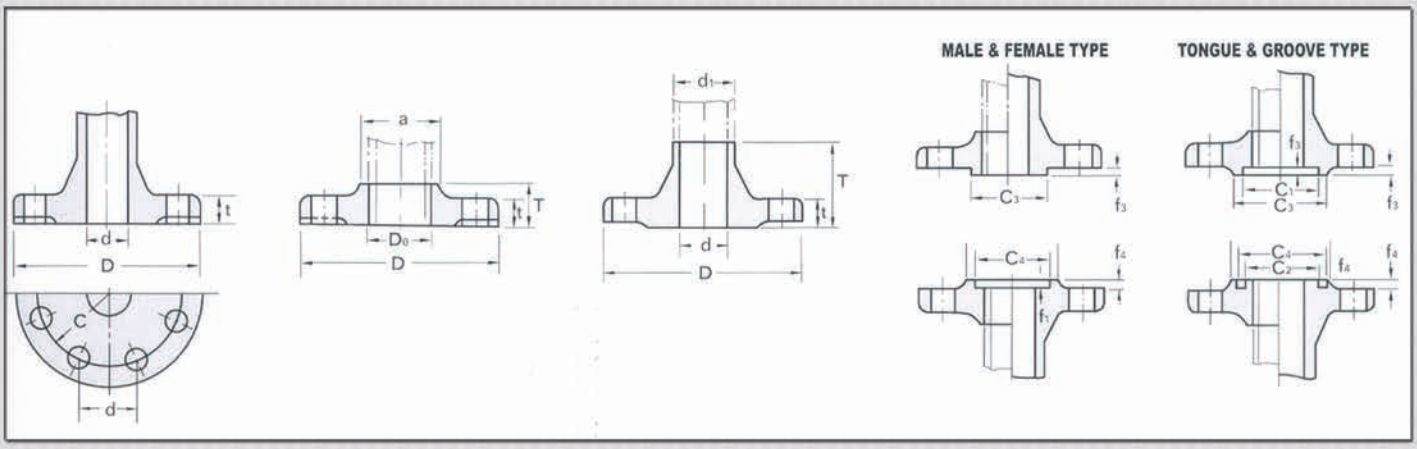
3.RING JOINT

The inside wall surface of gasket groove does not exceed 63µ inch (1.6µm) roughness

4. BLIND

Blind flanges need not be faced in the center if when this center part is raised its diameter is at least 1 inch small than the inside diameter of fittings of the corresponding pressure class. When the centre part is depressed its diameter is greater than the inside diameter of the corresponding pressure class fittings. Machining of the depressed center is mot required.

ANSI B16.5 FORGED FLANGES
SOLID FLANGE SLIP-ON FLANGE WELDING NECK FLANGE TYPE OF GASKET SURFACE



THREAD SOCKET--WELDING SLIP--ON LAP JOINT AND BLIND

Outside Diameter	When O.D. is 24" or less	± 1/16" (1.6mm)*
	When O.D. is Over 24"	± 1.8" (3.2mm)*
Inside Diameter	Threaded	Within Limits on boring gauge
	Socket--Welding Slip--on and Lap joint	10" & Smaller + 1/32" (0.8mm) -0"
		12" & Larger + 1/16" (1.6mm) -0"
Outside Diameter of Hub	5" and Smaller	+ 3/32" (2.4mm)* -1/32" (0.8mm)
	6" and Larger	+ 5/32" (4.0mm) -1/32" (0.8mm)
Diameter of Contact Face	1/16" Raised Face	±1/32" (0.8mm)
	1/4" Raised FaceTongue & Groove Male.Female	± 1/64" (0.4mm)
Diameter of Counterbore	same as for Inside Diameter	
Driling	Bolt Circle	± 1/16" (1.6mm)
	Bolt Hole Spacing	±1/32" (0.8mm)
	Eccentricity of Bolt Circle with Respect to Facing	2 1/2" Smaller 1/32" (0.8mm) Max. 2" & Larger 1/16" (1.6mm) Max.
	Eccentricity of Bolt Circle with Respect to Bore	1/32" (0.8mm) Max.
	Eccentricity of Facing with Respect to Bore	1/32" (0.8mm) Max.
Thickness	18" and Smaller	+1/8" (3.2mm) -0"
	20" and Larger	+3/16" (4.8mm) -0"
Length Thru Hub	10" and Smaller	± 1/16" (1.6mm)
	12" and Larger	± 1/8" (3.2mm)

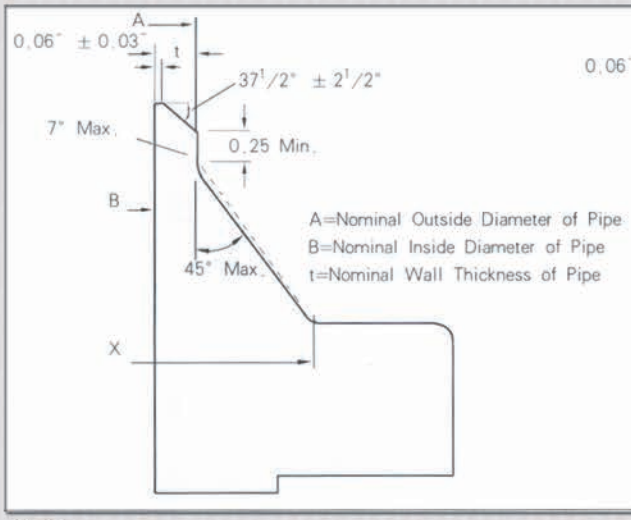
WELDING NECK

Outside Diameter	When O.D. is 24" or less	± 1/16" (1.6mm)
	When O.D. is Over 24"	± 1/8" (3.2mm)*
Inside Diameter	10" and Smaller	± 1/32" (0.8mm)
	12" thru 18"	± 1/16" (1.6mm)
	20" and Larger	+1/8" (3.2mm) -1/16" (1.6mm)
Diameter of Contact Face	1/16" Raised Face	± 1/32" (0.8mm)
	1/4" Raised Face Tongue & Groove Male.Female	± 1/64" (0.4mm)
Diameter of Hub at Base	When Hub Base is 24" or Smaller	±1/16" (1.6mm)
	When Hub Base is Over 24"	± 1/8" (3.2mm)
Diameter of Hub at Point of Welding	5" and Smaller	+ 3/32" (2.4mm) -1/32" (0.8mm)
	6" and Larger	+ 5/32" (4.0mm) -1/32" (0.8mm)
Driling	Bolt Circle	± 1/16" (1.6mm)
	Bolt Hole Spacing	± 1/32" (0.8mm)
	Eccentricity of Bolt Circle with Respect to Facing	2 1/2" & Smaller 1/32" (0.8mm) Max. 3" & Larger 1/16" (1.6mm) Max.
	Eccentricity of Bolt Circle with Respect	1/32" (0.8mm) Max*
	Eccentricity of Bolt Circle with Respect to Bore	1/32" (0.8mm) Max*
Thickness	18" and Smaller	+ 1/8" (3.2mm) -0"
	20" and Larger	+ 3/16" (4.8mm) -0"
Length Thru Hub	10" and Smaller	± 1/16" (1.6mm)
	12" and Larger	± 1/8" (3.2mm)

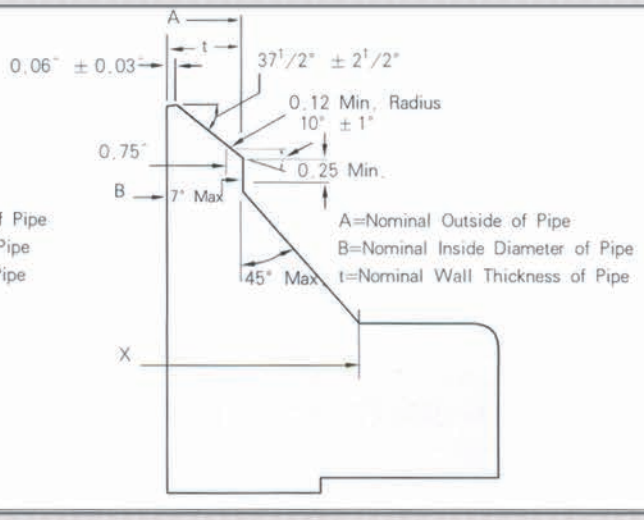
Note : * This tolerence is not covered in ANSI B16.5, but maker's option.

ANSI B16.5 FORGED FLANGES

BEVEL FOR WALLTHICKNESS(t) 0.19 INCH TO 0.88 INCH INCLUSIVE



BEVEL FOR WALL THICKNESS(t) GREATER THAN 0.88 INCH

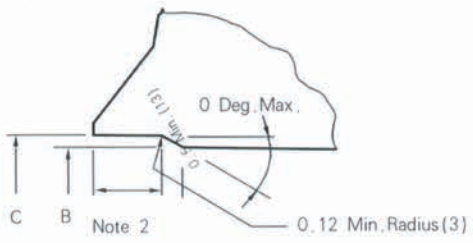


Notes

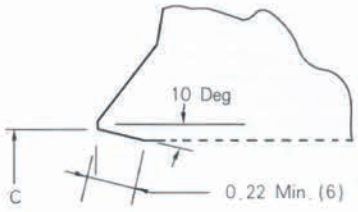
When the thickness of the hub at the bevel is greater than that of the pipe to which the flange is joined and the additional thickness is provided on the outside diameter. a taper weld having a slop not exceeding 1 to 3 may be employed or alternatively ,the greater outside diameter may be tapered at the same maximum slope or less. from a point on the welding bevel equal to the OD at the mating pipe . Similarly ,when the greater thickness is provide on the inside of the flange. it shall be taper-bored from the welding end at a slope not exceeding 1 to 3.

when flanges covered by this standard are intended for serbices with light wall. higher strength pipe. the thickness of the hub at the bevel may be greater than that of the pipe to which the flange is joined under these conditions a single taper hub may be provided and the outside diameter of the outside diameter of the hub at the base (Dimensions X) may also be modified.

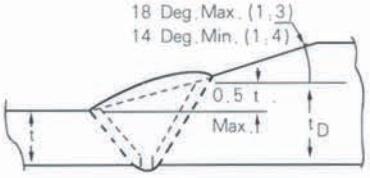
The additional thickness may be provided on either inside or outside partially on each side. but the total additional thickness shall not exceed one - half times the nominal wall thickness of intend mating pipe.



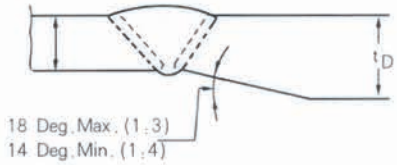
INSIDE CONTOUR FOR USE WITH RECTANGULAR BACKING RING



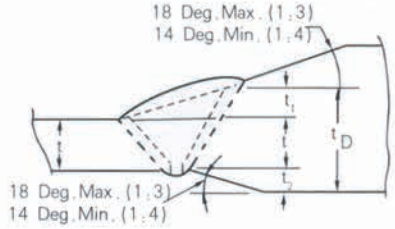
INSIDE CONTOUR FOR USE WITH TAPER BACKING RING



BEVEL FOR OUTSIDE THICKNESS



BEVEL FOR INSIDE THICKNESS



BEVEL FOR COMBINED THICKNESS

Notes:

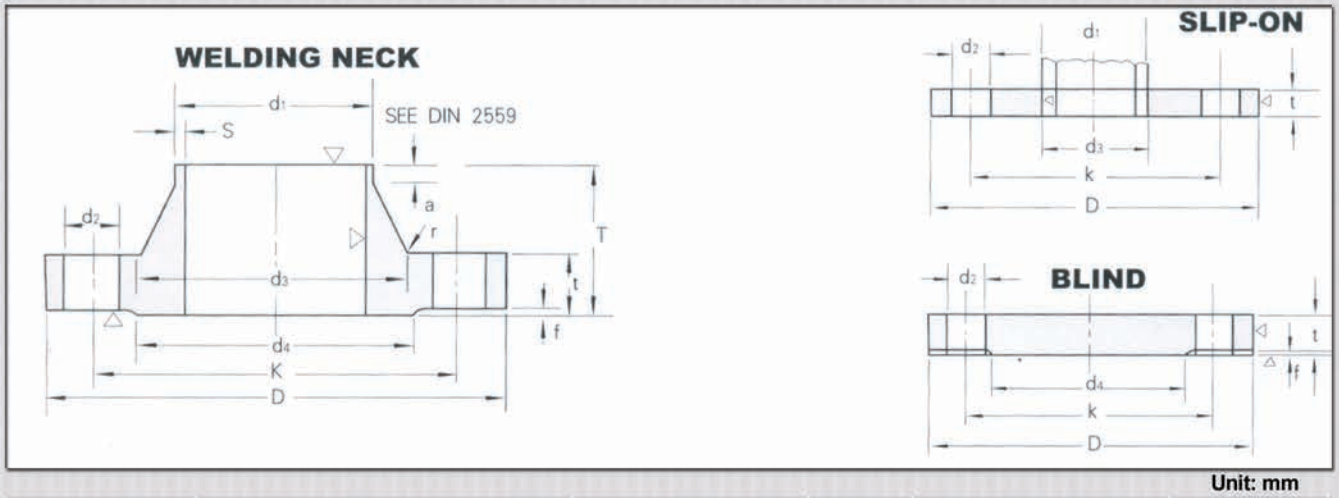
(1) when the materials jointed have equal minimum specified yield strength. there shall be no restriction on the minimum slope.
(2) Neither t1,t2 nor theor sum (t1+t2) shall exceed 0.5t
(3) When the minimum specified yield strengths of the sections to be joined are unequal , the value of to shall at least equal t times the ratio of minimum specified yield stregth of the pipe to minimum specified yield strength of the flange.

ANSI B16.5 (ASTM STANDARD)

ASTM	Grade	Classification	CHEMICAL COMPOSITION								MECHANICAL PROPERTIES				
			C %	Mn %	P Max %	S Max %	Si %	Ni %	Cr %	Mo %	T . S. Min. psi (kg/mm^2)	Y . S. Min. psi (kg/mm^2)	ELMin. %	Red Min. %	HB
A - 105*		Carbon Steel	MAX 0.35	0.60-1.05	0.040	0.050	MAX 0.35	MAX 0.40	MAX 0.30	MAX 0.12	70.000 (49.2)	36.000 (25.3)	22	30	MAX 187
A-181	60	Carbon Steel	MAX 0.35	MAX 0.90	0.050	0.050	MAX (0.35)				60.000 (42.2)	30.000 (21.1)	22	35	
A-181	70	Carbon Steel	MAX 0.35	MAX 0.90	0.050	0.050	MAX (0.35)				70.000 (49.2)	35.000 (25.3)	18	24	
A-182	F1	1/2 Mo	MAX 0.28	0.60-0.90	0.045	0.045	0.05-0.35			0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	30	143 - 192
A-182	F5	5Cr-1/2Mo	MAX 0.15	0.30-0.60	0.030	0.030	MAX0.50	MAX0.50	4.0 - 6.00	0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	35	143 - 217
A-182	F5a	5Cr-1/2Mo	MAX 0.25	MAX0.6	0.040	0.030	MAX0.50	MAX0.50	4.0 - 6.0	0.44 - 0.65	90.000 (63.3)	65.000 (45.7)	22	50	187-248
A-182	F11-1	1¼Cr-1/2Mo	0.05-0.15	0.30 - 0.60	0.030	0.030	0.5-1.00		1.00 - 1.50	0.44 - 0.65	60.000 (42.2)	30.000 (21.1)	20	45	121-174
A-182	F11-2	1¼Cr-1/2Mo	0.10-0.20	0.30 - 0.80	0.040	0.040	0.5-1.00		1.00 - 1.50	0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	30	143-207
A-182	F12-2	1Cr-1/2Mo	0.10-0.20	0.30 - 0.80	0.040	0.040	0.5-1.00		1.00 - 1.50	0.44 - 0.65	75.000 (52.7)	45.000 (31.6)	20	30	156-207
A-182	F12-1	1Cr-1/2Mo	0.05-0.15	0.30 - 0.60	0.045	0.045	MAX0.5		0.80 - 1.25	0.44 - 0.65	60.000 (42.2)	30.000 (21.1)	20	45	121-174
A-182	F12-2	1Cr-1/2Mo	0.10-0.20	0.30 - 0.80	0.040	0.040	0.10-0.60		0.80 - 1.25	0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	30	143-207
A-182	F11	1¼Cr-1/2Mo	0.10-0.20	0.30 - 0.60	0.040	0.040	0.5-1.00		1.00 - 1.50	0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	30	143-207
A-182	F12	1Cr-1/2Mo	0.10-0.20 MAX	0.3 - 0.80	0.040	0.040	0.1-0.6		0.8 - 1.25	0.44 - 0.65	70.000 (49.2)	40.000 (28.1)	20	30	143-207
A-182	F22	2¼Cr-1Mo	0.15	0.30 - 0.60	0.040	0.040	MAX0.50		2.00 - 2.50	0.87 - 1.13	75.000 (52.7)	45.000 (31.6)	20	30	156-207
A-182	F304	18Cr-8 Ni	MAX 0.08	MAX2.00	0.040	0.030	MAX1.00	8.00 - 11.00	18.00 - 20.00		75.000 (52.7)	30.000 (21.1)	30	50	
A-182	F304L	18Cr-8 Ni low	MAX 0.035	MAX2.00	0.040	0.030	MAX1.00	8.00 - 13.00	18.00 - 20.00		70.000 (49.2)	25.000 (17.6)	30	50	
A-182	F316	18Cr-8Ni Mo	MAX 0.08	MAX2.00	0.040	0.030	MAX1.00	10.00 - 14.00	16.00 - 18.00	2.00 - 3.00	75.000 (52.7)	30.000 (21.7)	30	50	
A-182	F316L	18Cr-8Ni Mo - Low	MAX 0.035	MAX2.00	0.040	0.030	MAX1.00	10.00 - 15.00	16.00 - 18.00	2.00 - 3.00	65.000 (45.7)	25.000 (17.6)	30	50	
A-182	F321	18Cr-8Ni Ti	MAX 0.08	MAX2.00	0.030	0.030	MAX1.00	9.00 - 12.00	Min17.00		75.000 (52.7)	30.000 (21.1)	30	50	
A-182	F347	18Cr-8Ni Cb	MAX 0.08	MAX2.00	0.030	0.030	MAX1.00	9.00 - 13.00	17.00 - 20.00		75.000 (52.7)	30.000 (21.1)	30	50	
A-350*	LF1	Carbon Steel	MAX 0.30	0.75 - 1.05	0.035	0.040	0.15 - 0.30	MAX0.40	MAX0.30	MAX0.12	60.000 - 85.000 (42.2-59.7)	30.000 (21.1)	25	38	
A-350*	LF2	Carbon Steel	MAX 0.30	MAX1.35	0.035	0.040	0.15 - 0.30	MAX0.40	MAX0.30	MAX0.12	70.000 - 95.000 (49.2-66.8)	36.000 (25.3)	22	30	
A-350*	LF3	3½ Ni	MAX 0.20	MAX0.90	0.035	0.040	0.20 - 0.30	3.25 - 3.75	MAX0.30	MAX0.12	70.000 - 95.000 (49.2-66.8)	37.500 (26.4)	22	38	

WOLFF Pipelines Ltd

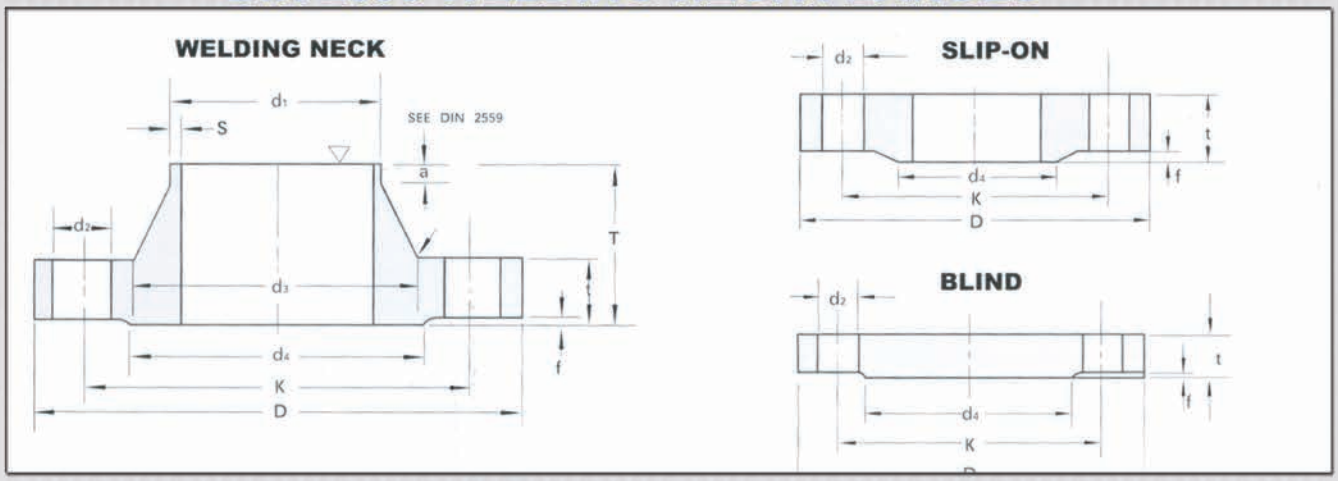
DIN 2576 SLIP-ON FLANGES
DIN 2527 BLIND FLANGES
DIN 2632 WELDING NECK FLANGES



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	4	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	6	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	216 114.3 •)	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	3	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	12	M20	(3/4")	23	20.6	23.6
400	406.4 •) 419	565	26	32	32	515	68	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	(1 1/8")	33		
900	914.4 •) 920	1115	34			1050	95	950	10.0	12	20	1005	5	28	M30	(1 1/8")	33		
1000	1016 •) 1020	1230	34			1160	95	1052	10.0	16	20	1110	5	28	M33	(1 1/4")	36		

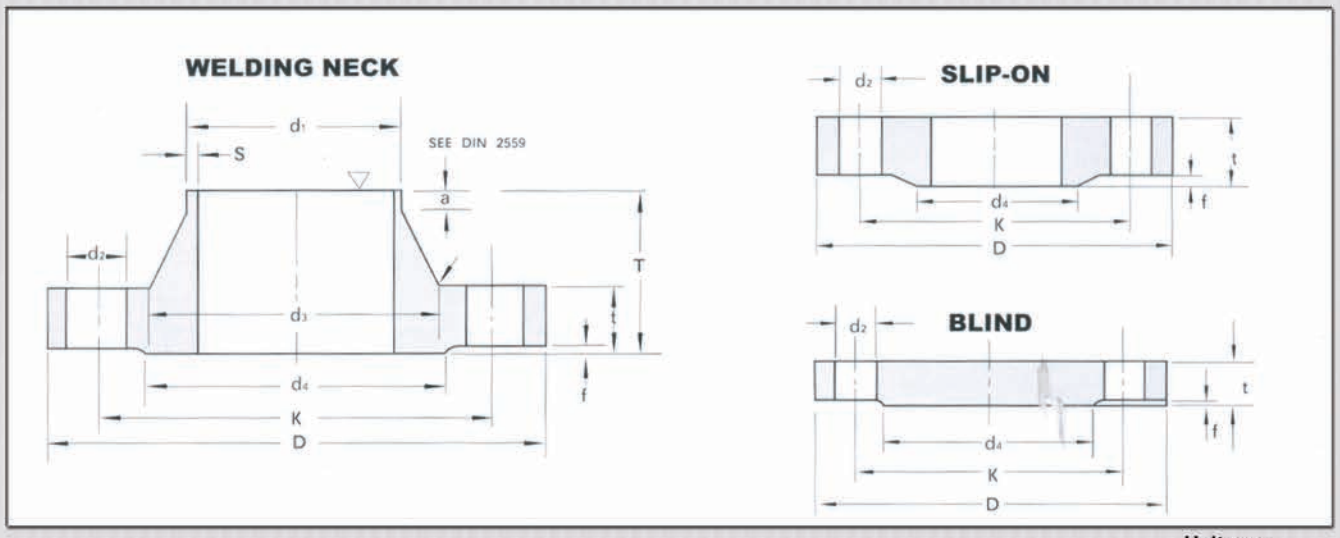
DIN 2543 SLIP-ON FLANGES
DIN 2527 BLIND FLANGES
DIN 2633 WELDING NECK FLANGES



Unit: mm

Bore			Common Dimension					Hub				Raised Face		Drilling				Approx Weight (kg)	
Nominal Bore	d1	D	t			K	T	d3	S	r	a ≈	d4	f	Number of Bolt	Dia. of Bolt		d2	DIN 2543	DIN 2633
			Welding Neck	Slip - on (No - Hub)	Blind														
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	165	18	18	18	125	45	72 75	2.9	6	8	102	3	4	M16	(5/8")	18	2.88	2.53
65	60.3*) 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	3.2	8	10	138	3	8	M16	(5/8")	18	4.77	3.70
100	108 114.8*)	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	388 344	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	(1 1/8")	33	102.0	61.0
600	609.6*) 622	840	36	40		770	95	652	8.8	12	18	725	5	20	M33	(1 1/4")	36		
700	711.2*) 720	910	36			840	100	755	8.8	12	18	795	5	24	M33	(1 1/4")	36		
800	812.8*) 820	1025	38			950	105	855	10.0	12	20	900	5	24	M36	(1 3/8")	39		
900	914.4*) 920	1125	40			1050	110	955	10.0	12	20	1000	5	28	M36	(1 3/8")	39		
1000	1016*) 1020	1255	42			1170	120	1058	10.0	16	20	1115	5	28	M39	(1 1/2")	42		

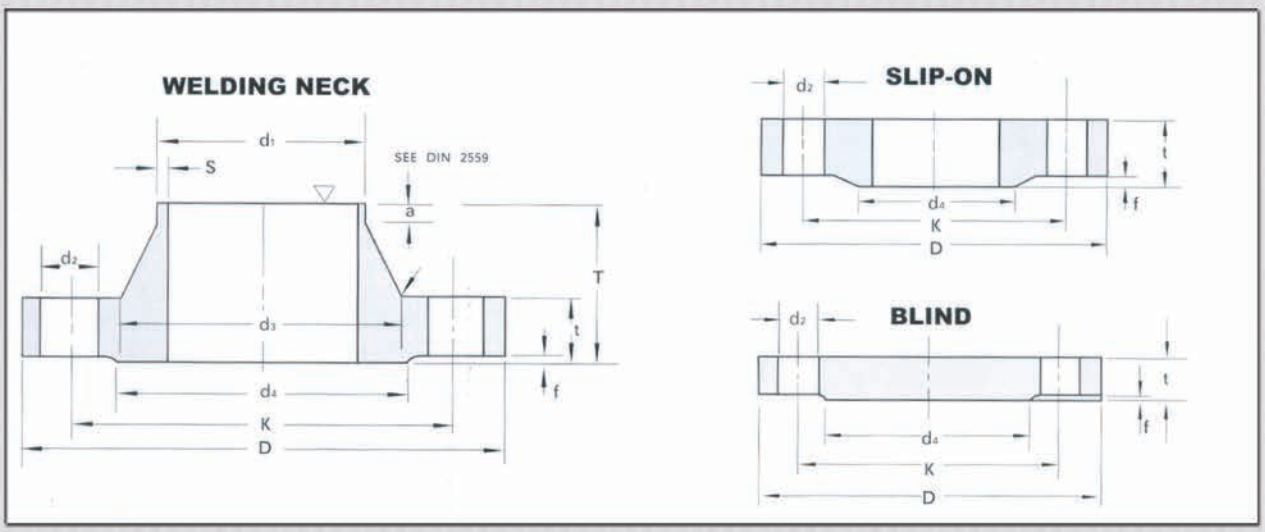
DIN 2544 SLIP-ON FLANGES
DIN 2527 BLIND FLANGES
DIN 2634 WELDING NECK FLANGES



Unit: mm

Bore		Common Dimension						Hub				Raised Face		Drilling				Approx Weight (Kg)	
Nominal Bore	d1	D	t Welding Neck	t Slip-on (No-Hub)	t Blind	K	T	d3	S	r	a ≈	d4	f	Number of Bolt	Dia. Bolt	d2		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 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")	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

DIN 2545 SLIP-ON FLANGES
DIN 2527 BLIND FLANGES
DIN 2635 WELDING NECK FLANGES



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	d3	S	r	a ≈	d4	f	Number of Bolt	Dia. of Bolt		d2	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	165	20	20	20	125	48	72 75	2.9	6	8	102	3	4	M16	(5/8")	18	3.20	2.82
65	60.3*) 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*)	236	24	24	24	190	65	128 134	3.6	8	12	162	3	8	M20	(3/4 ")	23	7.54	6.52
125	133 139.3*)	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	5.9	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	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	362 408	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	($1^3/4$")	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

Zulussige MaBabweichungen in mm

MAB	Abmessungsbereich	Ausfuhrung		
		Bearbeitet		Unbearbeitet
AuBendurchmesser D	bis 200mm	± 1		±
	uber 200 bis 300mm	± 1.5		±
	uber 300 bis 400mm	± 2		
	uber 400mm	± 2		
Mittelloch[2])	bis 100mm	OuBer VorschweiBflansche	VorschweiBflansche	
	uber 100 bis 400mm	+0.5	-1.0	±
	uber 400mm	+1	-1.5	±
		+1.5	-2.0	
Flanschdiske b	bis 10mm	Beide Flachen	Eine Flachen	+1.5
		± 0.5	± 1	-1
	uber 10 bis 20mm	± 0.8	± 1.3	+2 -1.5
	uber 20 bis 30mm	± 1	± 1.5	+3 -2
	uber 30 bis 50mm	± 1	± 1.5	+4 -3
	uber 50mm	± 1.5	± 2	+5 -4
Flanschhohe h1	bis NW 80		± 1.5	
	uber NW 80 bis NW 250		± 2	
	uber NW 250		± 3	
Ansatzdicke[3]) s	bis NW 100	+1.0		+1.5
	uber NW 100 bis 400	+1.5		+2.0
	uber NW 400	+2.0		+2.5
Dichtleistendurchmesser d4	bis NW 80	-1		
	uber NW 80 bis NW 300	-2		
	uber NW 300	-3		
Lochkreisdurchmesser K	Bei formschlussigen Dichtungen muB die konzentrizitat von Lochkreis and Mittelloch gewahrleistetsein. Die Zulassiger VlaBabweichungen fur Lockeisdurchmesser .Lochaostand and Schrautenlochdurchmesser werden durch den Spielraum Zwischen Schraubenbolzen and Scraubenlochdurchmesser begrenzt.			

MATERIAL JIS B2220 KS BI503

Available Materials

Nominal Pressure	Type of Flange	Type of Materials	Materials	
			KS	JIS
5K	Slip - On Welding	Carbon	KSD 35C3 SS41	JIS G3101 SS41
10K	Blind	Steel	KSD 3710 SF40	JIS G3201 SF40A(!)
			KSD 4122 SFVC 1	JIS G3202 SFVC 1
16K	Slip On Welding	Carbon	KSD 3710 SF 45(1)	JIS G3201 SF45A (!)
20K	Blind	Steel	KSD 4122 SFVC 2A	JIS G3202 SFVC2A
	Slip - On Welding	Carbon	KSD 3710 SF 45(1)	JIS G3201 SF45A (!)
30K	Blind	Steel	KSD 4122 SFVC 2A	JIS G3202 SFVC2A
	Welding Neck	& Molybdenum	KSD 4123 SFVAF 1	JIS G3232 SFVAF1
		Steel	KSD 4123 SFVAF 1 1A	JIS F3202 SFVAF 11A

1. The Carbon Content Shall Not be more than 0.35%.
2. S20C and S25C was alternated was SF40A or SF45A in 1984 edition.

Ubersucht

Flansche aus Stahisorte Kurzname	WerkstoffNr	Anwendungstem-peratur[1]) °C	Vormaterial[2]) 1	2	3	4	LieferZu-stand[3])	Chemische Zusammensetzung	Mechanischtechn-ologische Eigenschaften	Pruf Temperatur
			Unleguerte Atahle							
UST 37-2	1.0036	-10 bis 300	x	x	x	x	U[4])	DIN EN 10025	DIN EMN 10025[8])	Raumtemperatur
RSt37-2	1.0038	-10 bis 300	x	x	x	x	U[4])	DIN EN 10025	DIN EN 10025[8])	
St52-3	1.0570	-20 bis 300	x	x	x	x	N	DIN EN 10025	DIN EN 10025[8])	-20°C
C22.3	1.0427	-10 bis 50	x	x	x	x	N	Tabelle 3	Tabelle 4	Raumtemperatur
C21	1.0432	-10 bis 50	x	x	x	x	N	Tabelle 3	Tabelle 4	
SIE 355")	1.0562	-20 bis 300			x	x	N.V	DIN 17103		-20°C
			x	x			N	DIN 17102		
			Unlegierte warmfeste Stahle							
C22.8	1.0460	-10 bis 420	x	x	x	x	N	DIN 17243	Tabelle 4[5])	Raumtemperatur
H I	1.0345	-10 bis 480	x				N	DIN 17155		0°C
H II	1.0425	-10 bis 480	x				N	DIN 17155		0°C
WStE 355	1.0565	-20 bis 400			x	x	N	DIN 17103		-20°C
			x	x			N	DIN 17102		
			Legierte warmfeste Stahle							
15Mo3	1.5415	-10 bis 530	x				N	DIN 17155	Tabelle 4[6])	
				x	x	x	N.V	DIN 17243	Tabelle 4[5])	
13CrMo44	1.7335	-10 bis 570	x				V	DIN 17155	Tabelle 4[6])	Raumtemperatur
				x	x	x		DIN 17243	Tabelle 4[5])	
10CrMo910	1.7380	-10 bis 600	x				V	DIN 17155	Tabelle 4[6])	
				x	x	x		DIN 17243	Tabelle 4[5])	
12CrMo195	1.7362	-10 bis 650	x	x	x	x	V	Tabelle 3	Tabelle 4n.6	
			Kaltzahe Stahle							
TStE 285[9])	1.0488	-60 bis 300			x	x	N.V	DIN 17103		-50°C
			x	x			N	DIN 17102		
10Ni14	1.5637	-120 bis 50	x	x	x	x	V	DIN 17280		-120°C
TStE 355[9])	1.0566	-60 bis 300			x	x	N.V	DIN 17103		-50°C
			x	x			N	DIN 17102		

1) bis 9) siehe Seite 5

Kennwerte fur die Bemessung bei hoheren Temperaturen fur Stanhle nach DIN EN 10 025

Stahlsorte Kurzname	Blattdicke	Kennwerte K[1]) bei Berechnungstemperaur			
		100°C [2])	200°C [2])	250°C [2])	300° C [2])
		N/mm²			
Ust 37 – 2	≤ 12	187	161	143	122
	≤ 16	187	161	143	122
	> 16bis ≤ 40	180	155	136	117
	> 40bis ≤ 63	173	149	129	112
Rst 37 – 2	> 63bis ≤ 80	173	149	129	112
	> 80bis ≤ 100	173	149	129	112
	> 100bis ≤ 150	159	137	115	102
	≤ 16	254	226	206	186
	> 16bis ≤ 40	249	221	202	181
St 52 – 3	> 40bis ≤ 63	234	206	186	166
	> 63bis ≤ 80	224	196	176	156
	> 80bis ≤ 100	214	186	166	146
	> 100bis ≤ 150	194	166	146	126

1) Die angegebenen Werte sind Anhaltswerte fur die 0.2% –Dehngrenze und werden nicht nachgewiesen. Die kennwerte sind mit denen der Tafel 5 des AD – Merkblattes W9, Ausgabe 12.88, identisch, Die in den Werkstoffestlegungen oder Eignungsfeststellungen fur 20°C angegebenen kennweret gelten bis 50°C ,die fur 100°C angegbenen Werte bis 120°C ,In den ubrigen Bereiche ist zwischen den angegebenen Werten linear zu interpolieren(z.B.fur 80°C zwischen 20 und 100°C und fur 180°C zwischen 100 und 200°C),wobei eine Aufrundung nicht zulassig ist.

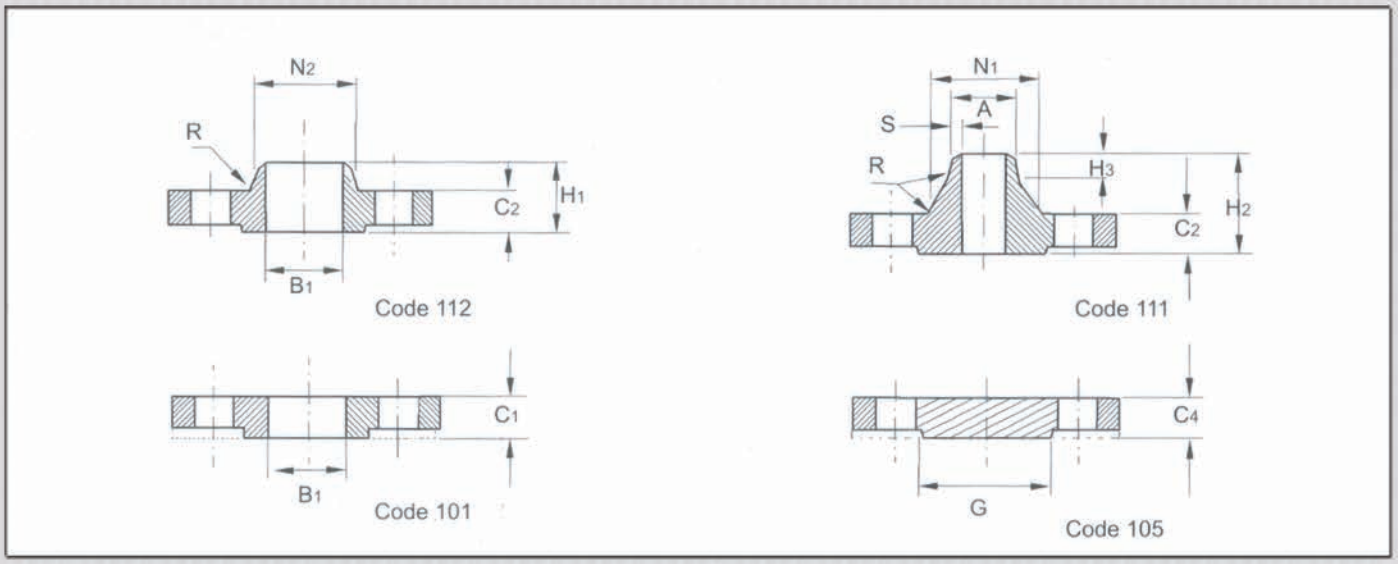
2) Fur einen Zwischenbereich uber 50°C bis ≤ 100°C ist zwischen 20°C und 100°C linear zu interpolieren .eine Aufrundung der Werte ist dabei nicht Zulassig .

Chemische Zusammensetzung

Flansche aus Stahlsorte Kurzname	Analyse		Massenanteil in %							
			C	Si	Mn	P	S	Alges	Cr	Mo
C22.3	Schmelzen–analyse	min .	0.18	0.15	0.40[1])			1.015		–
		max .	0.23	0.35	0.90	0.035	0.030		0.30	–
	Stuckanalyse	min .	0.16	0.10	0.35[1]			0.010		–
		max .	0.25	0.40	0.95	0.040	0.035		0.35	–
C21	Schmelzen–analyse	min .	0.18	0.15	0.80			1.015		–
		max .	0.23	0.35	1.35	0.035	0.030		0.30	–
	Stuckanalyse	min .	0.16	0.10	0.75			0.010		–
		max .	0.25	0.40	1.40	0.040	0.035		0.35	–
2CrMo 195	Schmelzen–analyse	min .	0.06	0.30[2])	0.30			–	4.00	0.45
		max .	0.15	0.50	0.60	0.030	0.030	–	6.00	0.65
	Stuckanalyse	min .	0.04	0.26[2])	0.26			–	3.90	0.41
		max .	0.17	0.54	0.64	0.035	0.035	–	6.10	0.69

1)Bei Dicken ≤ 100mm ist ein Manganteil in der Schmelzenanalyse von mindestens 0.30% und in der Stuckanalyse von mindestens 0.26% zulassig

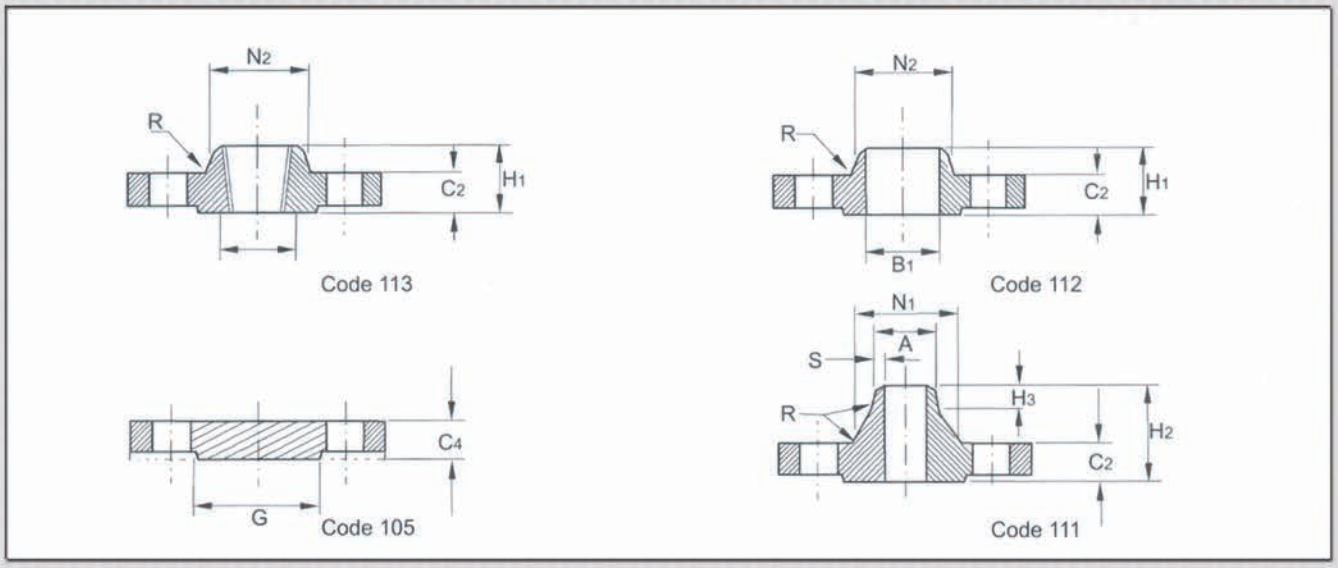
2) Beim Vakkum – Kohlenstoff – Desoxidationsverfahren entfallt der untere Grenzwert.



Dimensions of PN 10 flanges

Unit:mm

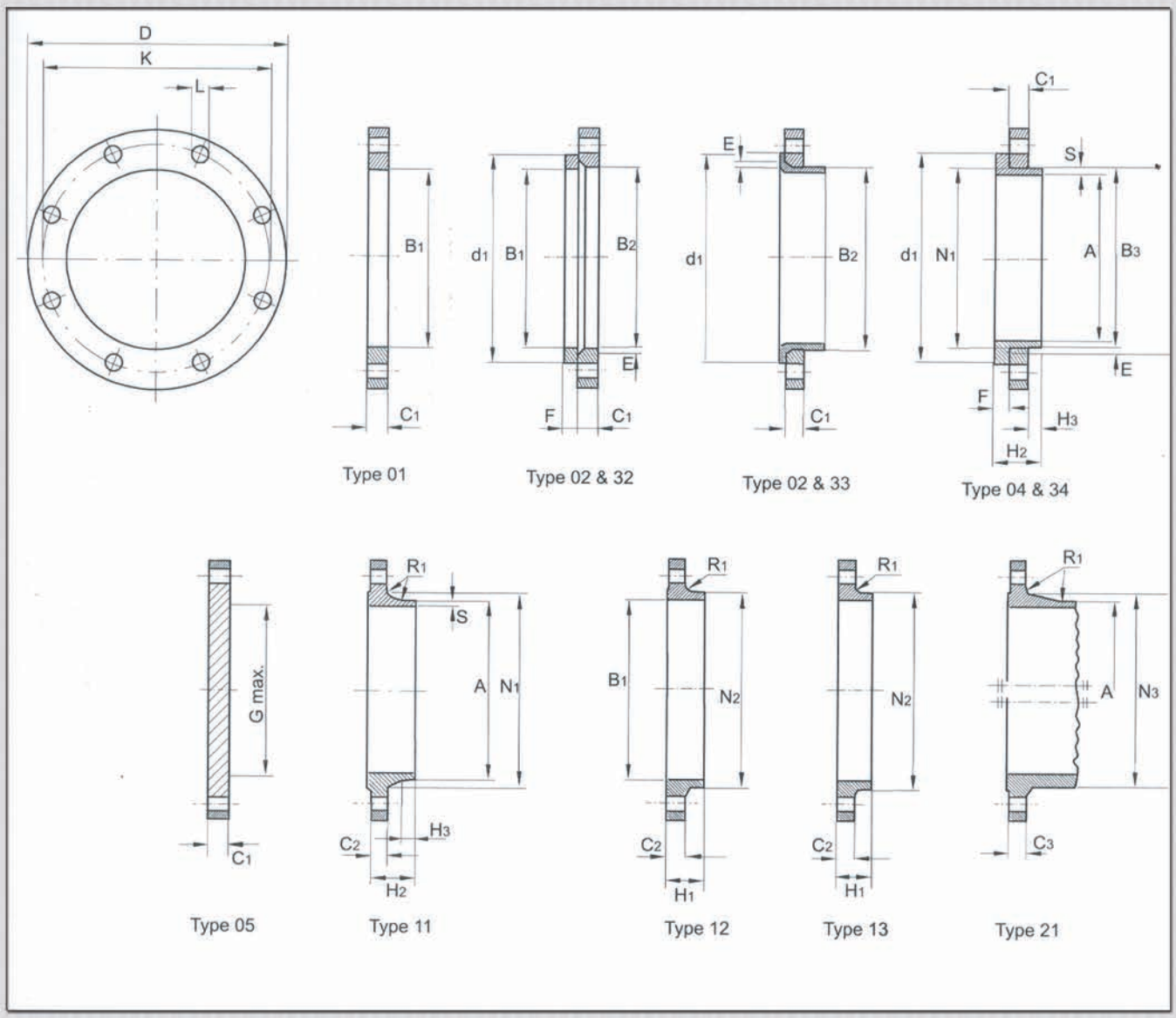
Nominal size	Mating dimensions					Outside dia. of neck	Bore dia.	Flange thickness			Dia. of shoulder	Lengths			Neck diameters		Radius	Neck Thickness
	Outside dia.	Dia. of bolt circle	Dia. of bolt hole	Bolting														
				Number	Size													
DN	D	K	L			A	B1	C1	C2	C4	G	H1	H2	H3	N1	N2	R	S
Codess 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																	
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	323.0	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	406.4	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	513.0	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	814.0	–	–	34	46	860	–	95	20	948	–	12	10.0
1000	1230	1160	36	28	M33	1016.0	–	–	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	18.0
2400	2760	2650	56	56	M52	2420.0	–	–	62	–	–	–	170	35	2478	–	18	20.0
2600	2960	2850	56	60	M52	2620.0	–	–	66	–	–	–	180	40	2680	–	18	22.0
2800	3180	3070	56	64	M52	2820.0	–	–	70	–	–	–	190	40	2882	–	18	22.0
3000	3405	3290	62	68	M56	3020.0	–	–	75	-	–	–	200	45	3085	–	18	24.0



Dimensions of PN 16 flanges

Unit: mm

Nominal Size	Mating dimensions					Outside dia. of neck	Bore dia.	Flange thickness			Dia. of sholder	Lengths			Neck diameters		Radius	Neck Thickness
	Outside dia.	Dia. of bolt circle	Dia. of bolt hole	Bolting														
				Number	Size													
DN	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
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	92	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	116.0	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	359.5	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	36	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



This diagram illustrates the arrangement but not necessarily the correct number of bolt holes.

NOTE 1. Dimensions N_1, N_2,and N_3 are measured at the intersection of the hub draft angle and the back face of the flange.

NOTE 2. Type 33, lapped pipe end without determination of thickness.

WOLFF Pipelines Ltd

BS EN 1092-1 : 2002

Dimensions of PN 10 flanges

Unit:mm

DN	Mating dimensions					Outside diameter of neck	Bore diameters			Flange thickness				Chamfer	Collar thick-ness	Diameter of shoulder	Length			Neck diameters			Corner radii	Neck thickness
	Outside diameter D	Diameter of bolt circle K	Diameter of bolt hole L	Bolting Number	Bolting Size	A	B_1	B_2	B_3	C_1	C_2	C_3	C_4	E	F	Gmax	H_1	H_2	H_3	N_1	N_2	N_3	R_1	S
	Flange type																							
	01, 02, 04, 05, 11, 12, 13, 21					11 21[a] 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34
10 to 40	Use PN40 dimensions																							
50 to 100	Use PN16 dimensions																							
200	340	295	22	8	M20	219.1	221.5	226	240	24	24	24	24	6	20	190	44	62	16	234	246	246	10	6.3
250	395	350	22	12	M20	273.0	276.5	281	294	26	26	26	26	8	22	235	46	68	16	292	298	298	12	6.3
300	445	400	22	12	M20	323.9	327.5	333	348	26	26	26	26	8	22	285	46	68	16	342	350	348	12	7.1
350	505	460	22	16	M20	335.6	359.5	365	400	28	26	26	26	8	22	330	53	68	16	385	400	408	12	7.1
400	565	515	26	16	M24	406.8	411.0	416	450	32	26	26	26	8	24	380	57	72	16	440	456	456	12	7.1
450	615	565	26	20	M24	457.0	462.0	467	498	36	28	26	28	8	24	425	63	72	16	488	502	502	12	7.1
500	670	620	26	20	M24	508.0	513.5	519	550	38	28	28	28	8	26	475	67	75	16	542	559	559	12	7.1
600	780	725	30	20	M27	610.0	616.5	622	650	42	28	34	34	8	26	575	75	80	18	642	658	658	12	7.1
700	895	840	30	24	M27	711.0	–	–	–	–	30	34	38	–	–	670	–	80	18	746	–	772	12	8.0
800	1015	950	33	24	M30	813.0	–	–	–	–	32	36	42	–	–	770	–	90	18	850	–	876	12	8.0
900	1115	1050	33	28	M30	914.0	–	–	–	–	34	38	46	–	–	860	–	95	20	950	–	976	12	10.0
1000	1230	1160	36	28	M33	1016.0	–	–	–	–	34	38	52	–	–	960	–	95	20	1052	–	1080	16	10.0
1200	1455	1380	39	32	M36	1219.0	–	–	–	–	38	44	60	–	–	1160	–	115	25	1256	–	1292	16	11.0
1400	1675	1590	42	36	M39	1422.0	–	–	–	–	42	48	–	–	–	–	–	120	25	1460	–	1496	16	12.0
1600	1915	1820	48	40	M45	1626.0	–	–	–	–	46	52	–	–	–	–	–	130	25	1666	–	1712	16	14.0
1800	2115	2020	48	44	M45	1829.0	–	–	–	–	50	56	–	–	–	–	–	140	30	1868	–	1910	16	15.0
2000	2325	2230	48	48	M45	2032.0	–	–	–	–	54	60	–	–	–	–	–	150	30	2072	–	2120	16	16.0
2200	2550	2440	56	52	M52	2235.0	–	–	–	–	58	–	–	–	–	–	–	160	35	2275	–	–	18	18.0
2400	2760	2650	56	56	M52	2438.0	–	–	–	–	62	–	–	–	–	–	–	170	35	2478	–	–	18	20.0
2600	2960	2850	56	60	M52	2620.0	–	–	–	–	66	–	–	–	–	–	–	180	40	2680	–	–	18	22.0
2800	3180	3070	56	64	M52	2820.0	–	–	–	–	70	–	–	–	–	–	–	190	40	2882	–	–	18	22.0
3000	3405	3290	62	68	M56	3020.0	–	–	–	–	75	–	–	–	–	–	–	200	45	3085	–	–	18	24.0

[a] For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

WOLFF Pipelines Ltd

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Dimensions of PN 16 flanges

Unit:mm

DN	Mating dimensions					Outside diameter of neck	Bore Diameters			Flange thickness				Chamfer	Collar thickness	Diameter of shoulder	Length			Neck diameters			Corner radii	Neck thickness
	Outside diameter	Diameter of bolt circle	Diameter of bolt hole	Bolting																				
	D	K	L	Number	Size	A	B_1	B_2	B_3	C_1	C_2	C_3	C_4	E	F	Gmax	H_1	H_2	H_3	N_1	N_2	N_3	R_1	S
	Flange type																							
	01 , 02 , 04 , 05 , 11 , 12 , 13 , 21					11 21[a] 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34
10 to 40	Use PN40 dimensions																							
50	165	125	18	4	M16	60.3	61.5	65	77	19	18	18	18	5	16	–	28	45	8	74	84	84	5	2.9
65	185	145	18	8[b]	M16	76.1	77.5	81	96	20	18	18	18	6	16	55	32	45	10	92	104	104	6	2.9
80	200	160	18	8	M16	88.9	90.5	94	108	20	20	20	20	6	16	70	34	50	10	105	118	120	6	3.2
100	220	180	18	8	M16	114.3	116.0	120	134	22	20	20	20	6	18	90	40	52	12	131	140	140	8	3.6
125	250	210	18	8	M16	139.7	141.5	145	162	22	22	22	22	6	18	115	44	55	12	156	168	170	8	4.0
150	285	240	22	8	M20	168.3	170.5	174	188	24	22	22	22	6	20	140	44	55	12	184	195	190	10	4.5
200	340	295	22	12	M20	219.1	221.5	226	240	26	24	24	24	6	20	190	44	62	16	235	246	246	10	6.3
250.	405	355	26	12	M24	273.0	276.5	281	294	29	26	26	26	8	22	235	46	70	16	292	298	296	12	6.3
300	460	410	26	12	M24	323.9	327.5	333	348	32	28	28	28	8	24	285	46	78	16	344	350	350	12	7.1
350	520	470	26	16	M24	356.6	359.5	365	400	35	30	30	30	8	26	330	57	82	16	390	400	410	12	8.0
400	580	525	30	16	M24	406.4	411.0	416	454	38	32	32	32	8	28	380	63	85	16	445	456	458	12	8.0
450	640	585	30	20	M24	457.0	462.0	467	500	42	40	40	40	8	30	425	68	87	16	490	502	516	12	8.0
500	715	650	33	20	M30	508.0	513.5	510	556	46	44	44	44	8	32	475	73	90	16	548	559	576	12	8.0
600	840	770	36	20	M33	610.0	616.5	622	660	52	54	54	54	8	32	575	83	95	18	652	658	690	12	8.8
700	910	840	36	24	M33	711.0	–	–	–	–	36	42	48	–	–	670	83	100	18	755	760	760	12	8.8
800	1025	950	39	24	M36	813.0	–	–	–	–	38	42	52	–	–	770	90	105	20	855	864	862	12	10.0
900	1125	1050	39	28	M36	914.0	–	–	–	–	40	44	58	–	–	860	94	110	20	955	968	962	12	10.0
1000	1255	1170	42	28	M39	1016.0	–	–	–	–	42	46	64	–	–	960	100	120	22	1058	1072	1076	16	10.0
1200	1485	1390	48	32	M45	1219.0	–	–	–	–	48	52	76	–	–	1160	–	130	30	1262	–	1282	16	12.5
1400	1685	1590	48	36	M45	1422.0	–	–	–	–	52	58	–	–	–	1346	–	145	30	1465	–	1482	16	14.2
1600	1930	1820	56	40	M52	1626.0	–	–	–	–	58	64	–	–	–	1546	–	160	35	1668	–	1696	16	16.0
1800	2130.	2020	56	44	M52	1829.0	–	–	–	–	62	68	–	–	–	1746	–	170	35	1870	–	1896	16	17.5
2000	2345	2230	62	48	M56	2032.0	–	–	–	–	66	70	–	–	–	1950	–	180	40	2072	–	2100	16	20.0

[a] For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

[b] According to EN092-2 (cast iron flanges) and pr EN 1092-3(copper jolly flanges) the flanges in this DN and PN may be supplied with 4 holes . where steel flanges are required with 4 holes, these may be supplied by agreement between manufacturer and purchaser.

WOLFF Pipelines Ltd

BS EN 1092-1 : 2002

Dimensions of PN 25 flanges

Unit:mm

DNA	Mating dimensions					Outside diameter of neck	Bore diameters			Flange thickness				Chamfer	Collar thick-ness	Diameter of sholder	Length			Neck diameters			Corner radii	Neck thickness
	Outside diameter	Diameter of bolt circle	Diameter of bolt hole	Bolting																				
	D	K	L	Number	Size	A	B_1	B_2	B_3	C_1	C_2	C_3	C_4	E	F	G_{max}	H_1	H_2	H_3	N_1	N_2	N_3	R_1	S
	Flange type																							
	01, 02, 04, 05, 11, 12, 13 ,21					11 21[a] 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34
10 to 150	Use PN40 dimensions																							
200	360	310	26	12	M24	219.1	221.5	226	250	32	30	30	30	6	26	190	52	80	16	244	256	252	10	6.3
250	425	370	30	12	M27	273.0	276.5	281	302	35	32	32	32	8	26	235	60	88	18	298	310	304	12	7.1
300	485	430	30	16	M27	323.9	327.5	333	356	38	34	34	34	8	28	285	67	92	18	352	364	364	12	8.0
350	555	490	33	16	M30	355.6	359.5	365	408	42	38	38	38	8	32	332	72	100	20	398	418	418	12	8.0
400	620	550	36	16	M33	406.4	411.0	416	462	46	40	40	40	8	34	380	78	110	20	452	472	472	12	8.8
450	670	600	36	20	M33	457.0	462.0	467	510	50	46	46	46	8	36	425	84	110	20	500	520	520	12	8.8
500	730	660	36	20	M33	508.0	613.5	519	568	56	48	48	48	8	38	475	90	125	20	558	580	580	12	10.0
600	845	770	39	20	M36	610.0	616.5	622	670	68	58	58	58	8	40	575	100	125	20	660	684	684	12	11.0
700	960	875	42	24	M39	711.0	–	–	–	–	46	50	–	–	–	–	–	125	20	760	–	780	12	12.5
800	1085	990	48	24	M45	813.0	–	–	–	–	50	54	–	–	–	–	–	135	22	864	–	882	12	14.2
900	1185	1090	48	28	M45	914.0	–	–	–	–	54	58	–	–	–	–	–	145	24	968	–	982	12	16.0
1000	1320	1210	56	28	M52	1016.0	–	–	–	–	58	62	–	–	–	–	–	155	24	1070	–	1086	16	17.5
1200	1530	1420	56	32	M52	1219.0	–	–	–	–	–	70	–	–	–	–	–	–	–	–	–	1296	18	–
1400	1755	1640	62	36	M56	1422.0	–	–	–	–	–	76	–	–	–	–	–	–	–	–	–	1508	18	–
1600	1975	1860	62	40	M56	1626.0	–	–	–	–	–	84	–	–	–	–	–	–	–	–	–	1726	20	–
1800	2195	2070	70	44	M64	1829.0	–	–	–	–	–	90	–	–	–	–	–	–	–	–	–	1920	20	–
2000	2425	2300	70	48	M64	2032.0	–	–	–	–	–	96	–	–	–	–	–	–	–	–	–	2150	20	–

[a] For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.

WOLFF Pipelines Ltd

Dimensions of PN 40 flanges

DN	Mating dimensions					Outside diameter of neck	Bore diameters			Flange thickness				Chamfer	Collar thick-ness	Diameter of shoulder	Length			Neck diameters			Corner radii	Neck thickness
	Outside diameter	Diameter of bolt circle	Diameter of bolt hole	Bolting																				
	D	K	L	Number	Size	A	B_1	B_2	B_3	C_1	C_2	C_3	C_4	E	F	G_{max}	H_1	H_2	H_3	N_1	N_2	N_3	R_1	S
	Flange type																							
	01, 02, 04, 05, 11, 12, 13, 21					11 21[a] 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34
10	90	60	14	4	M12	17.2	18.0	21	31	14	16		16	3	12	–	22	35	6	28	30	28	4	1.8
15	95	65	14	4	M12	21.3	22.0	25	35	14	16		16	3	12	–	22	38	6	32	35	32	4	2.0
20	105	75	14	4	M12	26.9	27.5	31	42	16	18		18	4	14	–	26	40	6	40	45	40	4	2.3
25	115	85	14	4	M12	33.7	34.5	38	49	16	18		18	4	14	–	28	40	6	46	52	50	4	2.6
32	140	100	18	4	M16	42.4	43.5	47	59	18	18		18	5	14	–	30	42	6	56	60	60	6	2.6
40	150	110	18	4	M16	48.3	49.5	53	67	18	18		18	5	14	–	32	45	7	64	70	70	6	2.6
50	165	125	18	4	M16	60.3	61.5	65	77	20	20		20	5	16	–	34	48	8	75	84	84	6	2.9
65	185	145	18	8	M16	76.1	77.5	81	96	22	22		22	6	16	55	38	52	10	90	104	104	6	2.9
80	200	160	18	8	M16	88.9	90.5	94	114	24	24		24	6	18	70	40	58	12	105	118	120	8	3.2
100	235	190	22	8	M20	114.3	116.5	120	138	26	24		24	6	20	90	44	65	12	134	145	142	8	3.6
125	270	220	26	8	M24	139.7	141.5	145	166	28	26		26	6	22	115	48	68	12	162	170	162	8	4.0
150	300	250	26	8	M24	168.3	170.5	174	194	30	28		28	6	24	140	52	75	12	192	200	192	10	4.5
200	375	320	30	12	M27	219.1	221.5	226	250	36	34		36	6	28	190	52	88	16	244	260	254	10	6.3
250	450	385	33	12	M30	279.0	276.5	281	312	42	38		38	8	30	235	60	105	18	306	312	312	12	7.1
300	515	450	33	16	M30	323.9	327.5	333	368	48	42		42	8	34	285	67	115	18	362	380	378	12	8.0
350	580	510	36	16	M33	355.6	359.5	365	418	54	46		46	8	36	330	72	125	20	408	424	432	12	8.8
400	660	585	39	16	M36	406.4	411.0	416	472	60	50		50	8	42	380	78	135	20	462	478	498	12	11.0
450	685	610	39	20	M36	457.0	462.0	467	510	66	57		57	8	46	425	84	135	20	500	522	522	12	12.5
500	755	670	42	20	M39	508.0	513.5	519	572	72	57		57	8	50	475	90	140	20	562	576	576	12	14.2
600	890	795	48	20	M45	610.0	616.5	622	676	84	72		72	8	54	575	100	150	20	666	686	686	12	16.0

[a] For flanges type 21 the outside hub diameter approximately corresponds to the outside pipe diameter.