

BUTTWELDING PIPE FITTING



HEBEI METAL TRADING CO., LTD
河北迈特贸易有限公司

WROUGHT CARBON STEEL WALL THICKNESS STANDARDS



TABLE 1

ASME B36.10M-1996

Nominal Pipe Size		Outside Diameter	Nominal Wall Thickness												
A	B		ASME	SCH10	SCH20	SCH30	STD	SCH40	SCH60	XS	SCH80	SCH100	SCH120	SCH140	SCH160
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	1.000
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	1.000
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

WROUGHT CARBON STEEL WALL THICKNESS STANDARDS



TABLE 2

ASME B36.10M-1996

Nominal Pipe Size		Outside Diameter	Nominal Wall Thickness												
A	B		ASME	SCH10	SCH20	SCH30	STD	SCH40	SCH60	XS	SCH80	SCH100	SCH120	SCH140	SCH160
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	323.8	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

LONG RADIUS ELBOWS

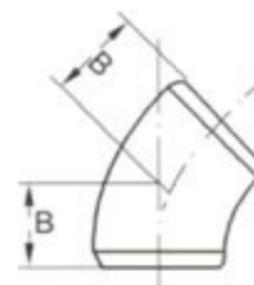
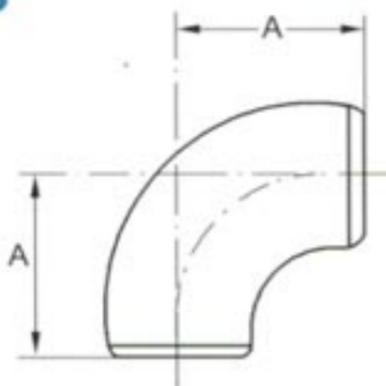


TABLE 3

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End				90° Elbows		Approx Weight (kg)			
			90° Elbows A		45° Elbows 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	-	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.

HEBEI METAL TRADING CO., LTD

LONG RADIUS RETURNS

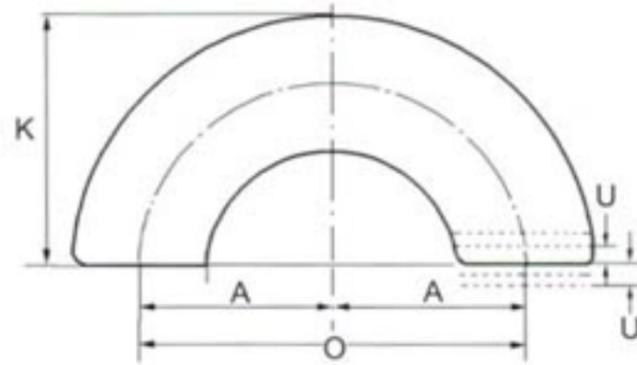


TABLE 4

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 .

SHORT RADIUS ELBOWS & 180 DEG. RETURNS



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
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.

STRAIGHT TEES & CAPS

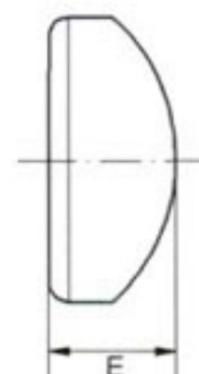
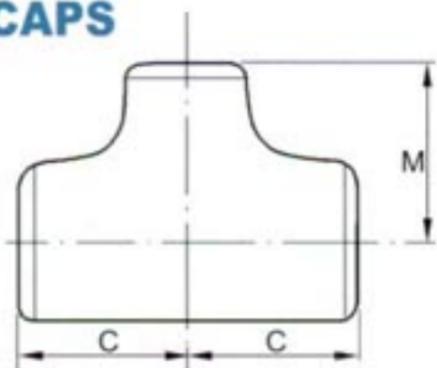


TABLE 6

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel 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.

REDUCING OUTLET TEES & REDUCERS

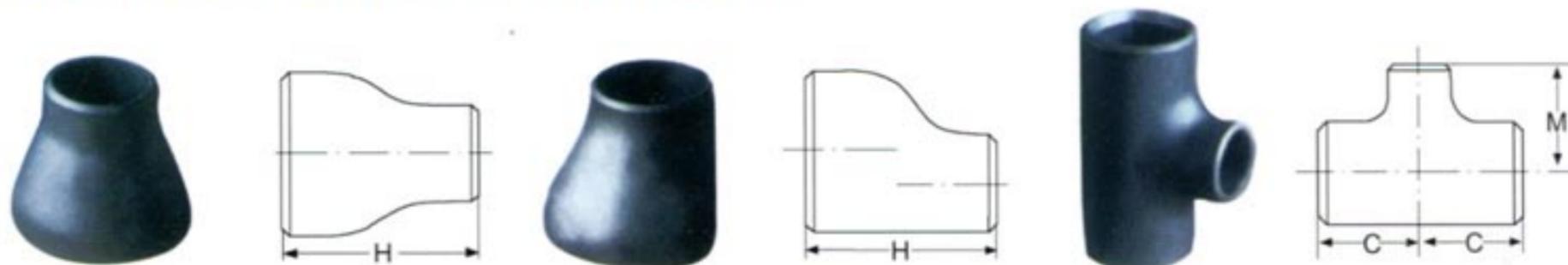


TABLE 7

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
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	7.03	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	8.21
6x2 1/2	6.62	168.3	2.88	73.0	5.62	143	4.75	121	5.50	140	11.3	16.9	-	2.91	4.36	7.83

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



REDUCING OUTLET TEES & REDUCERS

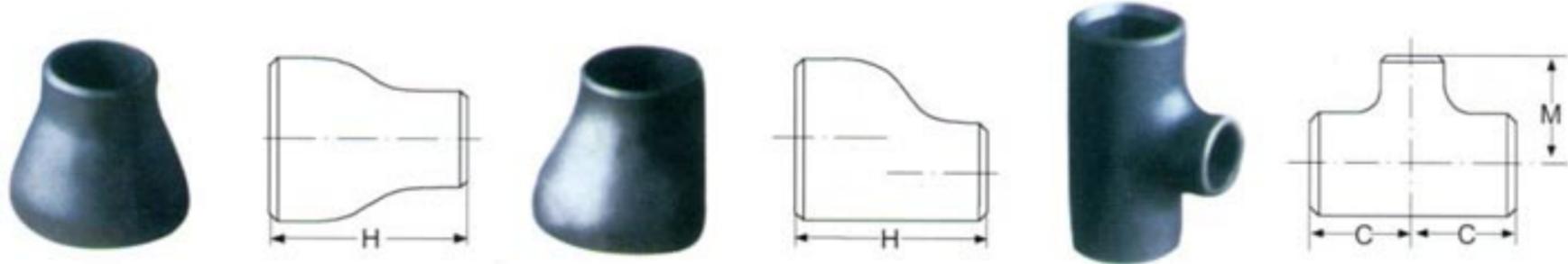


TABLE 7 (CONT ' D)

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
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	63.3	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	50.1	-
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.

REDUCING OUTLET TEES & REDUCERS

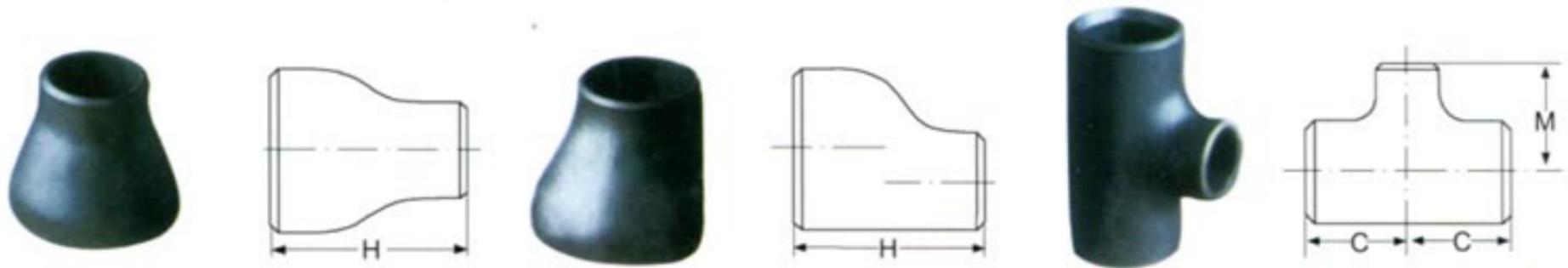


TABLE 7 (CONT ' D)

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
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 .



REDUCING OUTLET TEES & REDUCERS

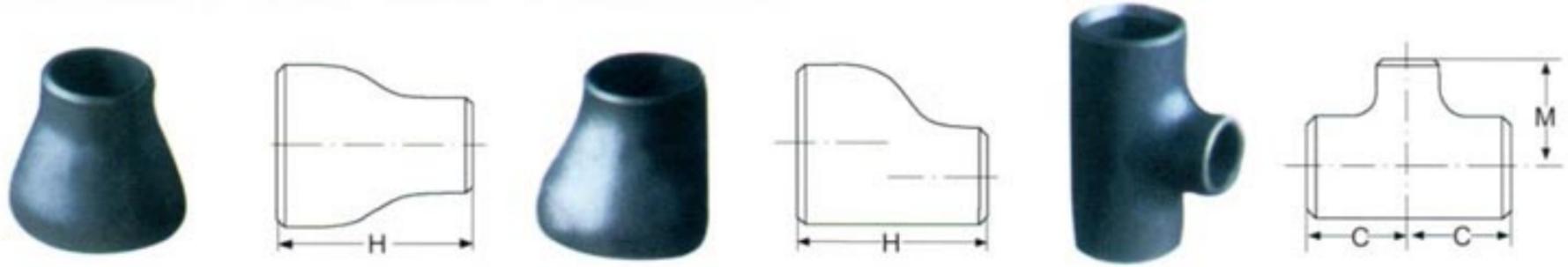


TABLE 7 (CONT ' D)

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	914.4	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: For Wall Thickness See Table 1 & Table 2 .

REDUCING OUTLET TEES & REDUCERS

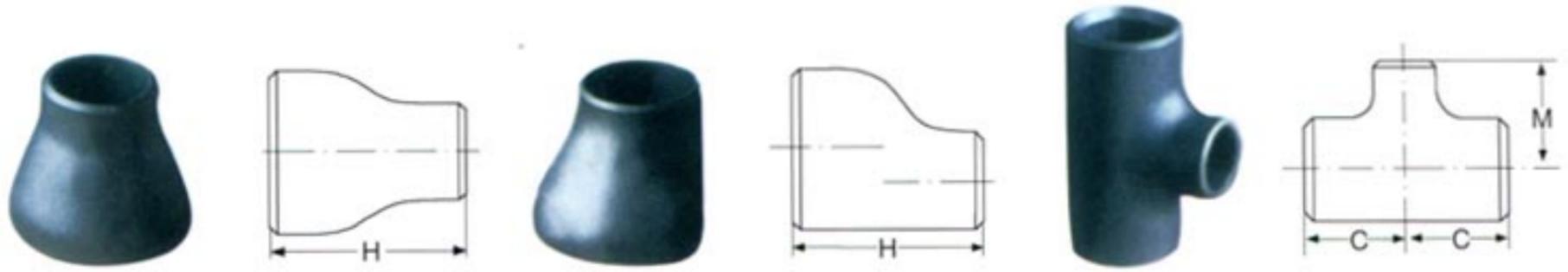


TABLE 7 (CONT ' D)

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	508.0	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: For Wall Thickness See Table 1 & Table 2 .

TOLERANCES

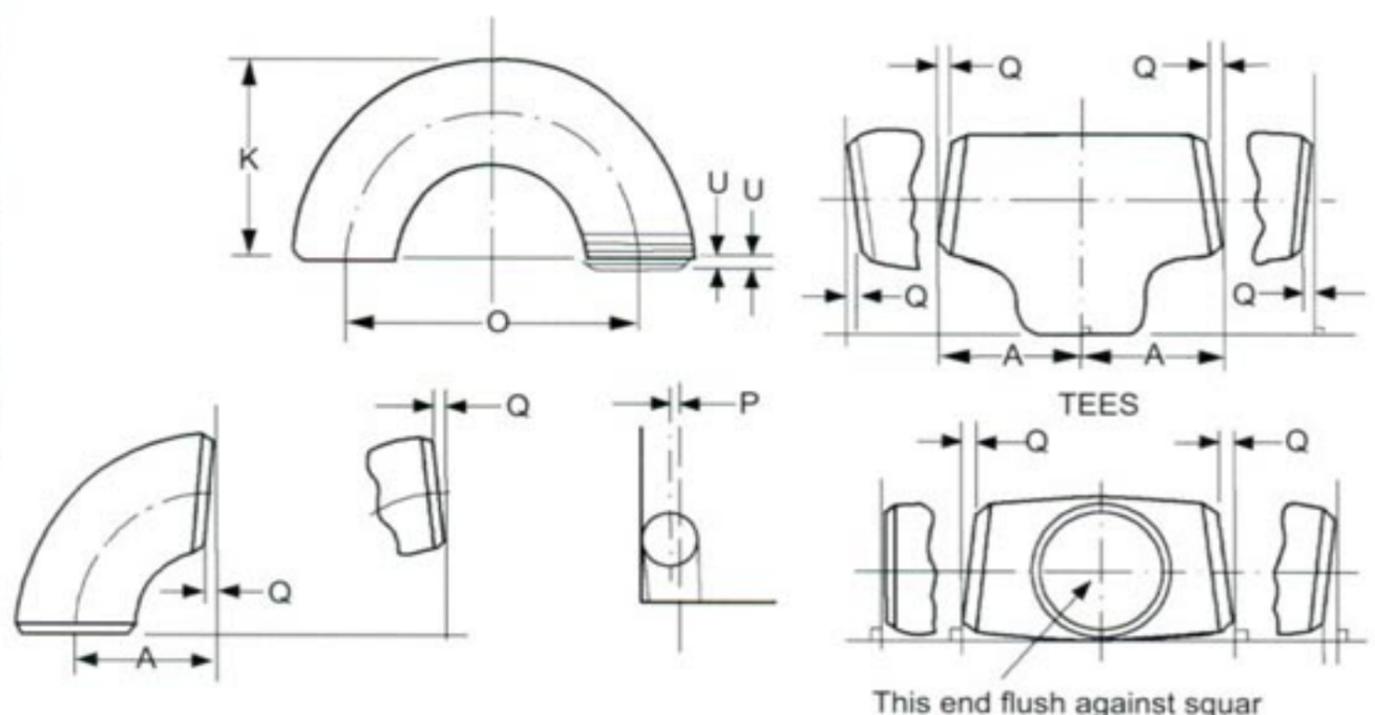
TABLE 8A

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

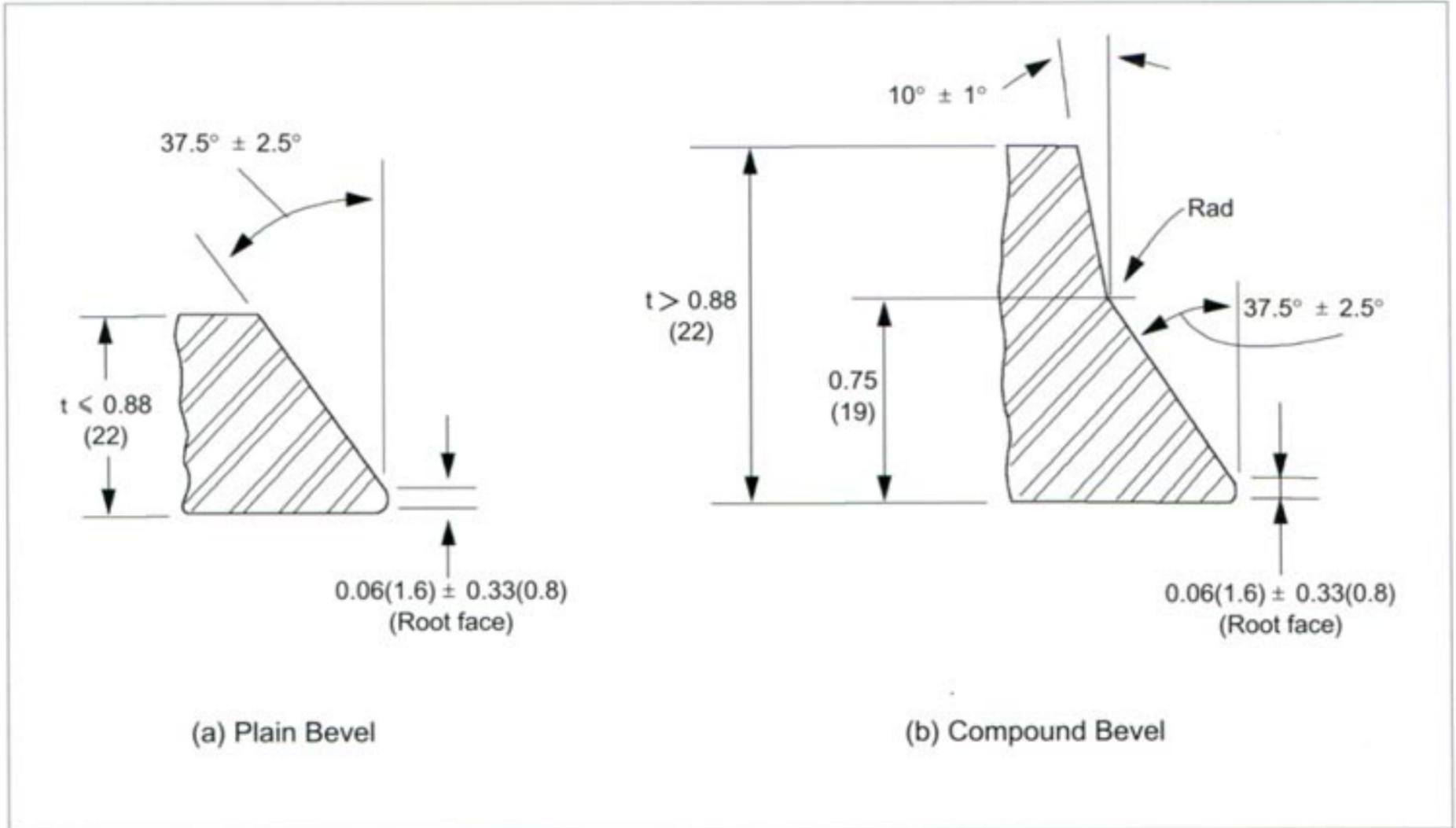
Nominal Pipe Size (NPS)	All Fittings			90° and 45° Elbows and Tees	Reducers	Caps	180° Returns		
	Outside Diameter at Bevel D	Inside Diameter at End	Wall Thickness t	Center-to-End Dimension A,B,C,M	Over all Length H	Over all Length E	Center-to-Center Dimension O	Back-to-Face Dimension K	Alignment of Ends U
1/2-2 1/2	+0.06 -0.03	± 0.03	Not less than 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



GENERAL NOTE: Dimensions are in inches. Tolerances are equal plus and minus except as noted.



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 manufacturer'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 alloy steel and $0.12(3)$ for austenitic alloy steel.

FIG. 1 WELDING BEVEL AND ROOT FACE FOR FITTING

(Without Backing Ring, or With Split Backing Ring)

CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT CARBON STEEL AND ALLOY-STEEL FOR MODERATE AND ELEVATED TEMPERATURES 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. Tensile Strength MPa	S min. Yield 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	-

CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT CARBON STEEL AND ALLOY-STEEL FOR MODERATE AND ELEVATED TEMPERATURES ACCORDING TO ASTM A-420 SPECS.

TABLE FOR ASTM A-420

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.min%		Size of specimens mm	Min. average of 3 specimens J	Min. average of 1 specimen Only J	Test temperature C	Post-Weld heat-Treatment temperature C	Min. holding time min.
				Long.	Trasv.						
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	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			

OUTSIDE AND INSIDE DIAMETERS AND THICKNESSES OF PIPE FITTINGS FSGP AND PY 400

TABLE 9

JIS B2311-1997

Nominal Diameter		Outside Diameter	FSGP		LG		STD		XS	
A	B		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	558.8	-	-	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	26	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	1066.8	-	-	-	-	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	1193.8	12.7

45° & 90° ELBOWS FSGP/LG

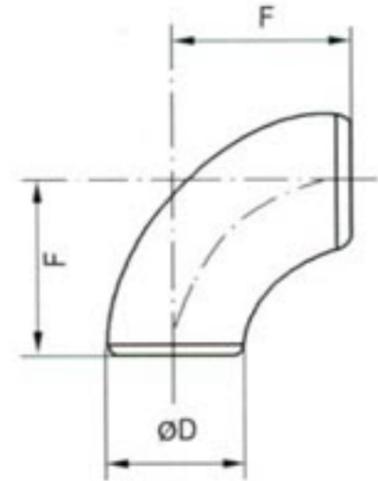
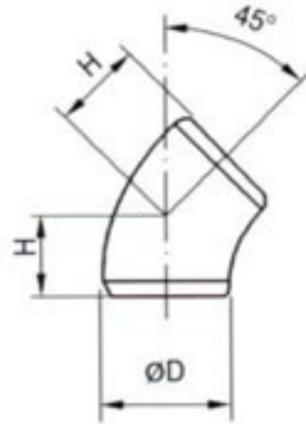


TABLE 10

JIS B2311-1997

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.

180° ELBOWS & CAPS FSGP/LG

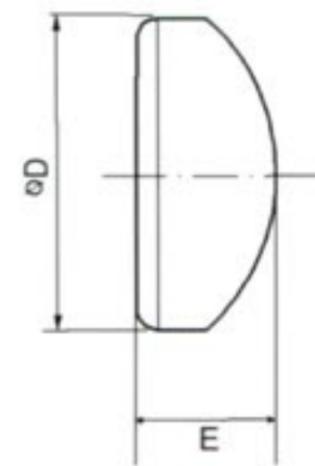
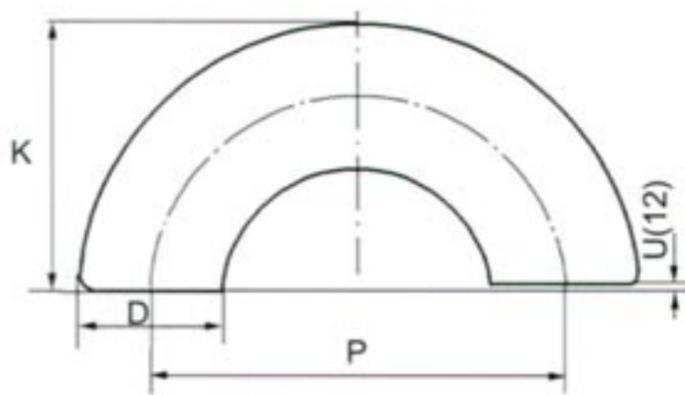


TABLE 11

JIS B2311-1997

Nominal Diameter		Outside Diameter D	Centerline dimension		Dimension from the back to the end face			Approx Weight(kg)		
			180° Elbows P		180° Elbows K		Caps E	180° Elbows K		Caps E
A	B	Long	Short	Long	Short	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	5.99	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	311.4	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	616.5	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	13.26
400	16	406.4	1219.2	812.8	812.8	609.6	177.8	148.60	99.06	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.

STRAIGHT TEES FSGP/LG

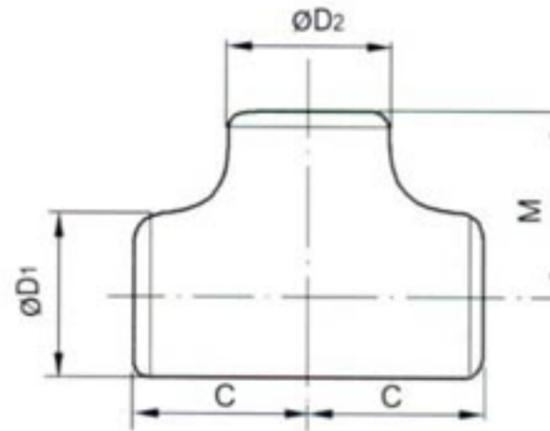


TABLE 12

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.

REDUCING TEES & REDUCERS FSGP/LG

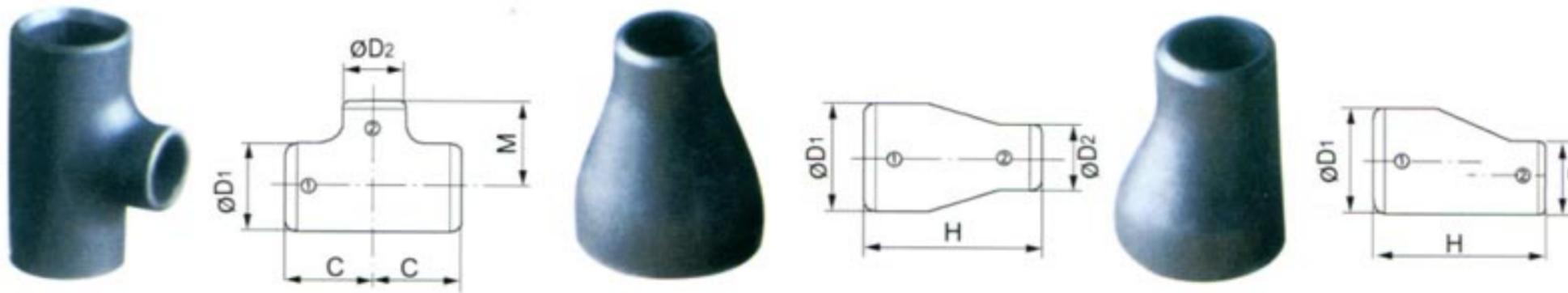


TABLE 13

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	2.85	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.



REDUCING TEES & REDUCERS FSGP/LG

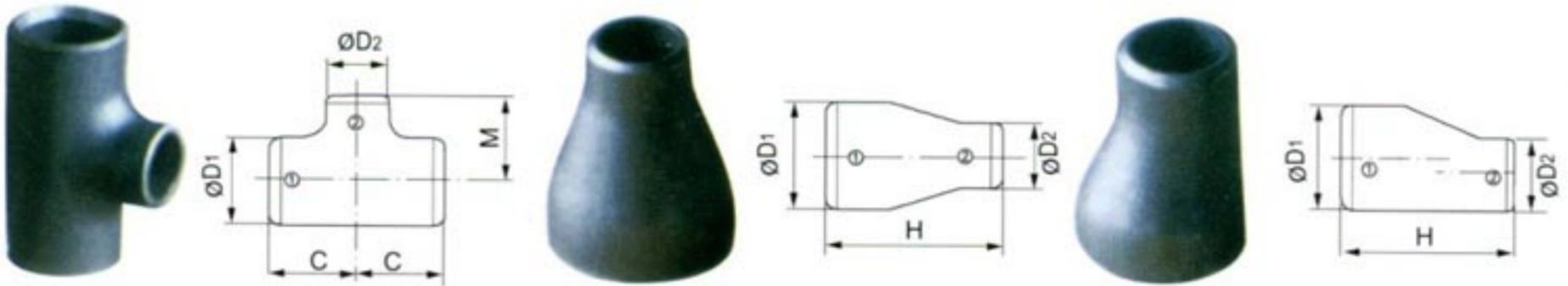


TABLE 13 (CONT ' D)

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	5x3½	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	5x2½	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	6x3½	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	6x2½	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	8x3½	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

REDUCING TEES & REDUCERS FSGP/LG

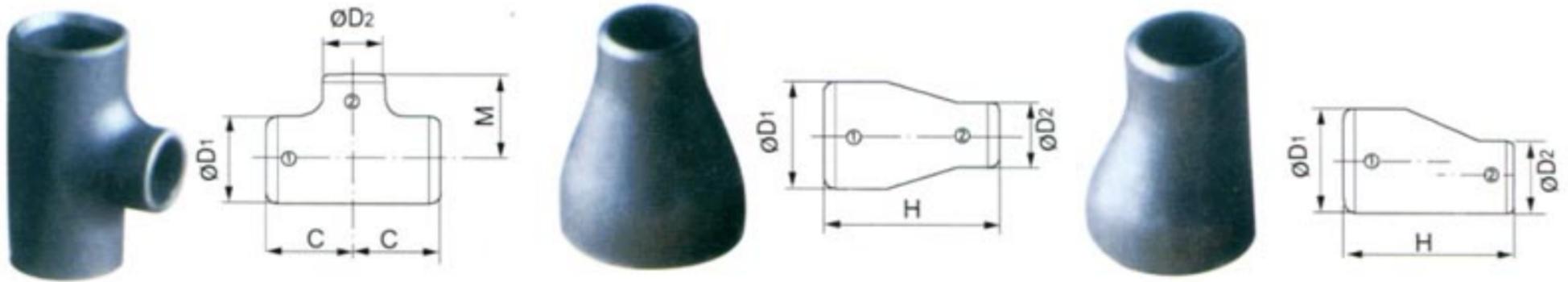


TABLE 13 (CONT ' D)

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	368.3	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	92.6
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.

REDUCING TEES & REDUCERS FSGP/LG

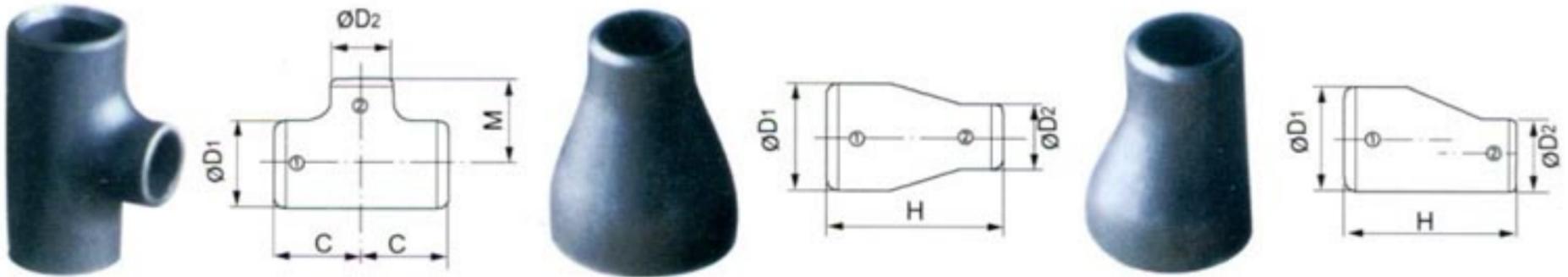


TABLE 13 (CONT ' D)

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
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	46x40	1168.4	1016.0	711.2	850.9	774.7	422	151
1150x950	46x38	1168.4	965.2	711.2	-	-	-	148
1200x1150	48x46	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.

TOLERANCES ON ALIGNMENT OF PIPE FITTINGS

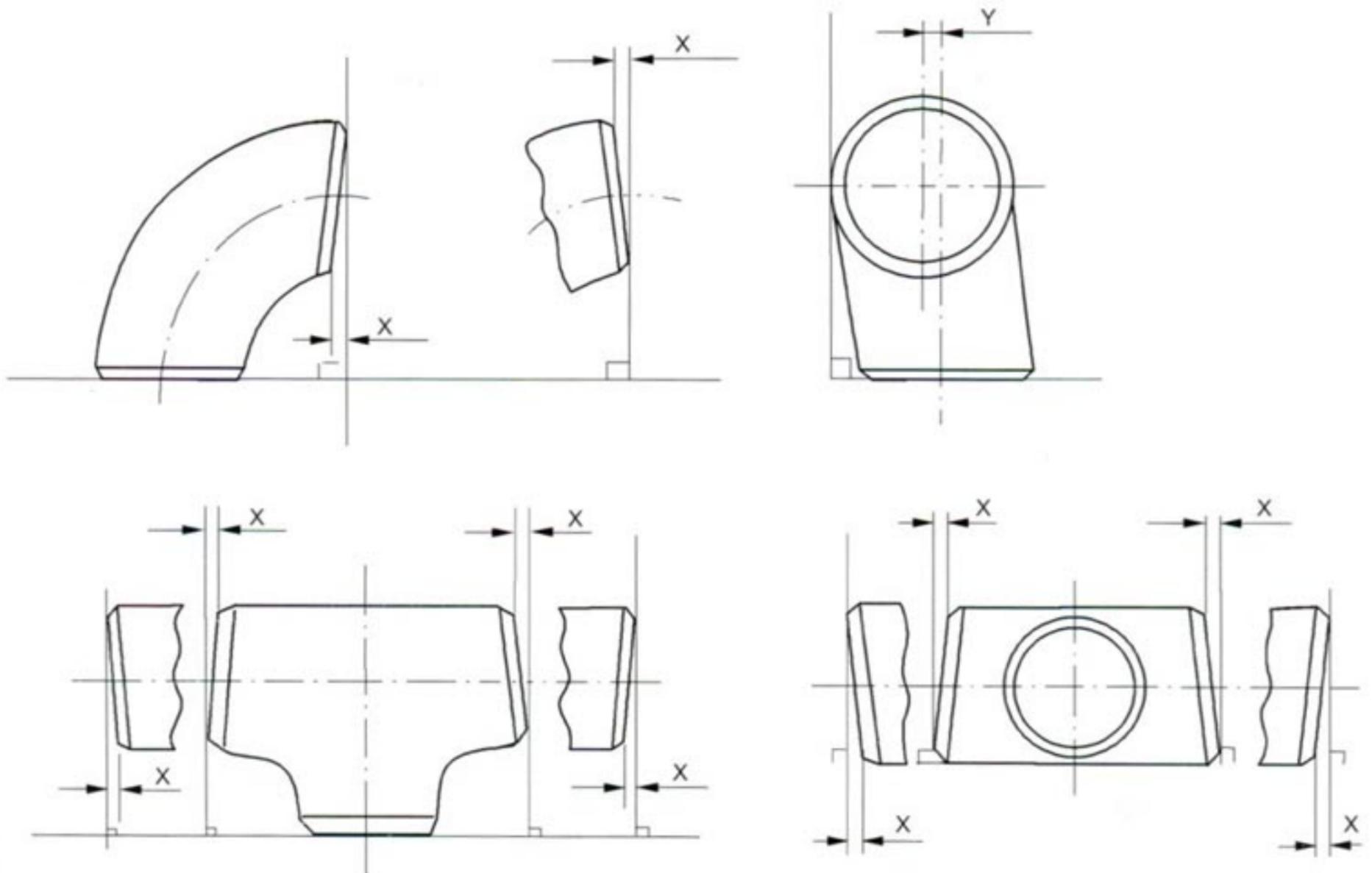


TABLE 15

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 galvanizing.

ELBOWS & CAPS

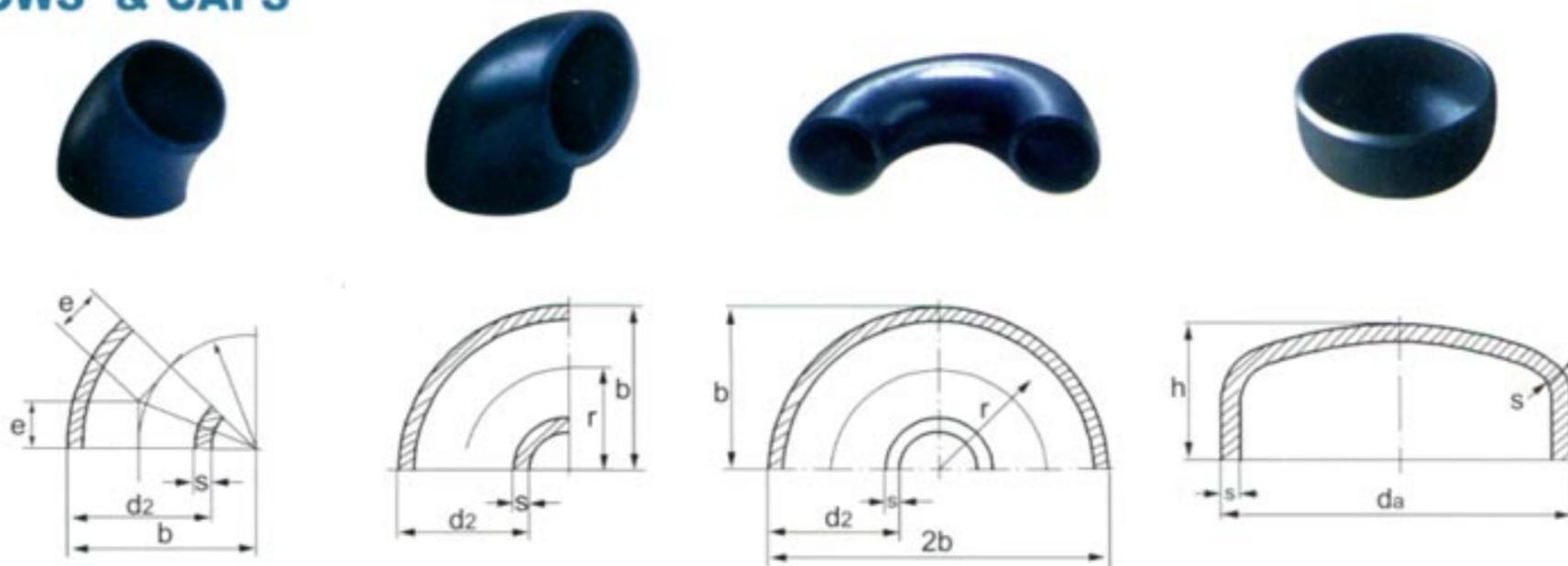


TABLE 16

DIN 2605-1991 / DIN 2617-1991

Nominal Size DN	Outside Diameter da	Wall Thickness s, for series 3	r	b	e	h	45° Elbows	Approx Weight (kg)		
								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 Deviations for Dimension				Lower Limit Deviations for Wall Thickness			
	45° Elbows b	90° Elbows b	180° Bends 2b	Caps h	45° Elbows	90° Elbows	180° Bends	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				
700	± 14.5	± 6.0	To be Agreed	± 10				
800-1200	± 19.0	± 8.0	To be Agreed	± 10				-0.50mm

TEES & REDUCERS

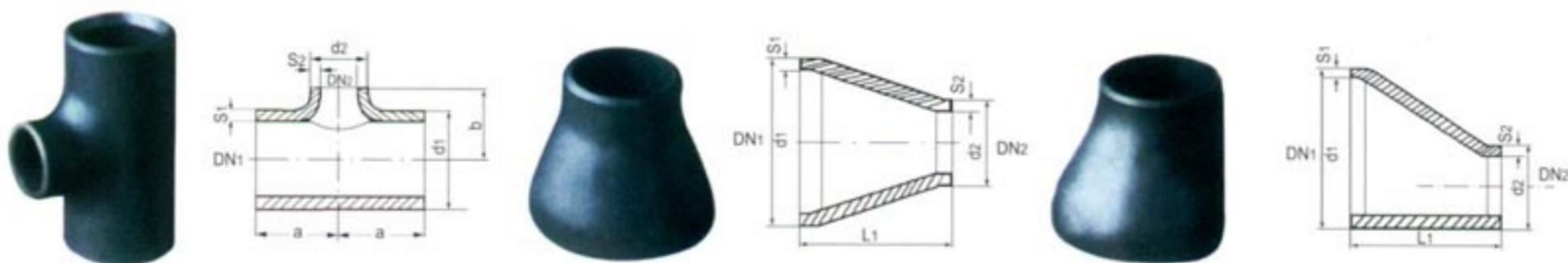


TABLE 18

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 L1	Approx Weight (kg)	
						a	b		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

TEES & REDUCERS

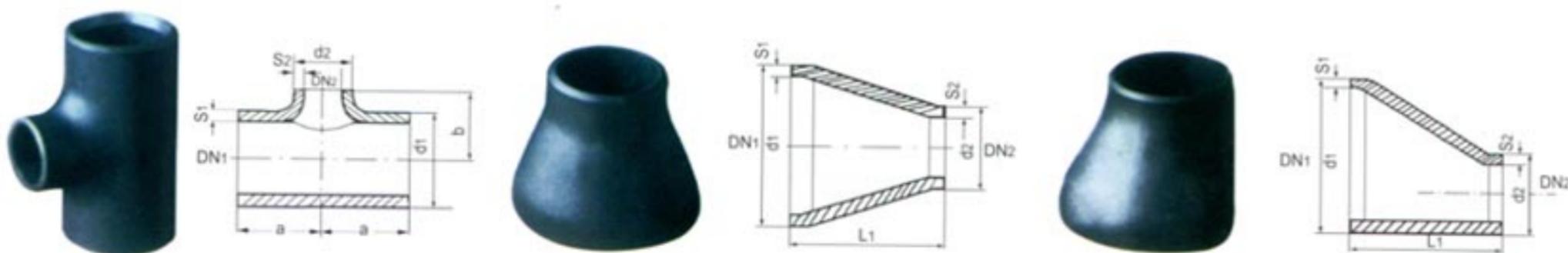


TABLE 18 (CONT ' D)

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 L1	Approx Weight (kg)	
						a	b		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	-	77.00	-
350	355.6	8.0	300	323.9	7.1	279	270	330	77.00	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



TEES & REDUCERS

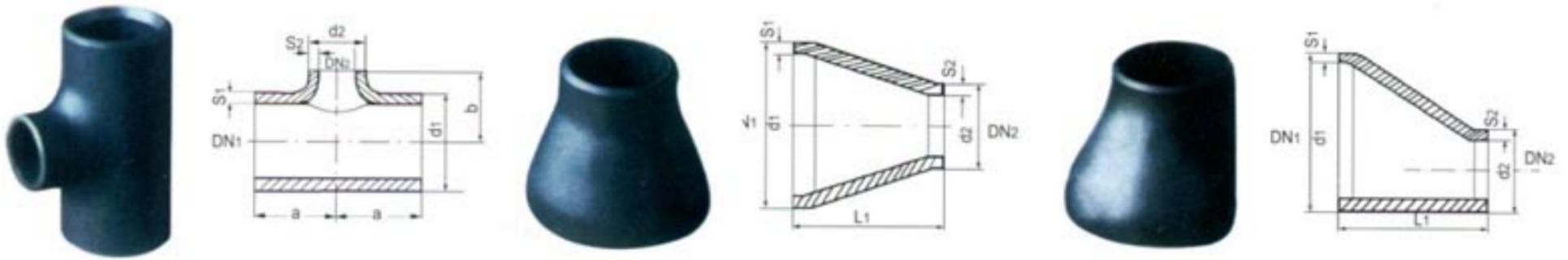


TABLE 18 (CONT ' D)

DIN 2615-1992 / DIN 2616-1991

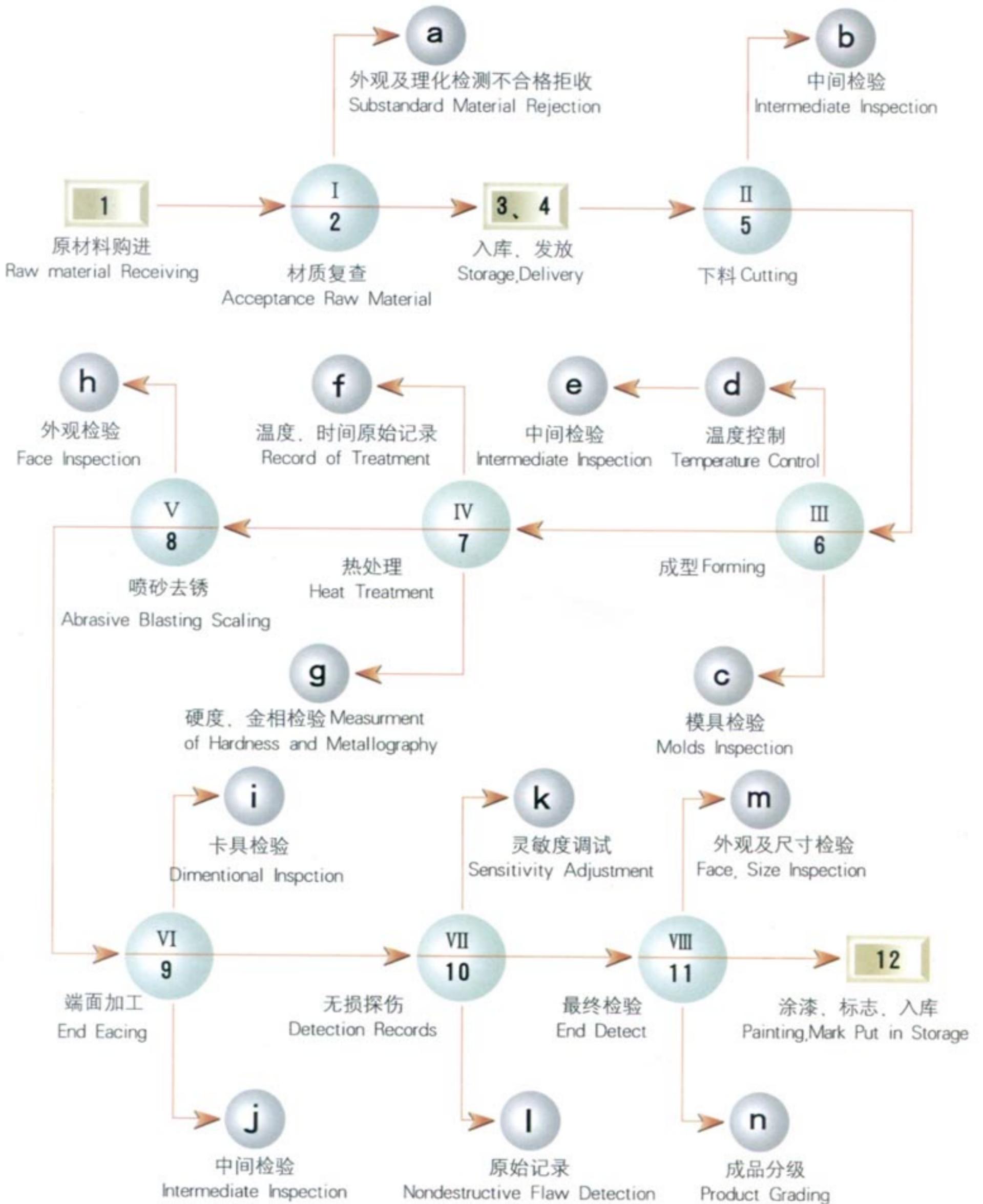
Nominal Size DN1	Outside Diameter d1	Wall Thickness s1, for series 3	Nominal Size DN2	Outside Diameter d2	Wall Thickness s2, for series 3	Tees		Reducers L1	Approx Weight (kg)	
						a	b		Tees	Reducers
500	508	11	350	355.6	8.0	381	356	508	224	68.58
500	508	11	300	323.9	7.1	381	346	508	224	68.58
500	508	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	-	-

TABLE 19 TOLERANCES

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

管件生产 QC 流程图

QUALITY CONTROL SEQUENCE OF PIPE FITTINGS



注: 1-Ⅷ 为控制环节, a-n 为质量控制点。Note: 1-Ⅷ are the control links and a-n are the quality control points.