



BUTT WELDING PIPE FITTING

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	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	1.000
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	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	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

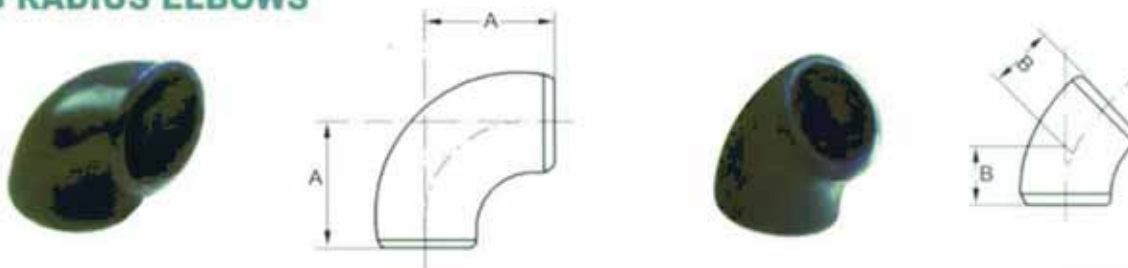


TABLE 3

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End				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 .

LONG RADIUS RETURNS

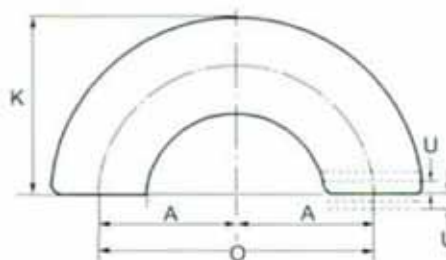


TABLE 4

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	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.

STRAIGHT TEES & CAPS

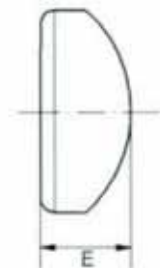
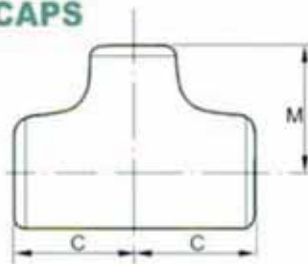


TABLE 6

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

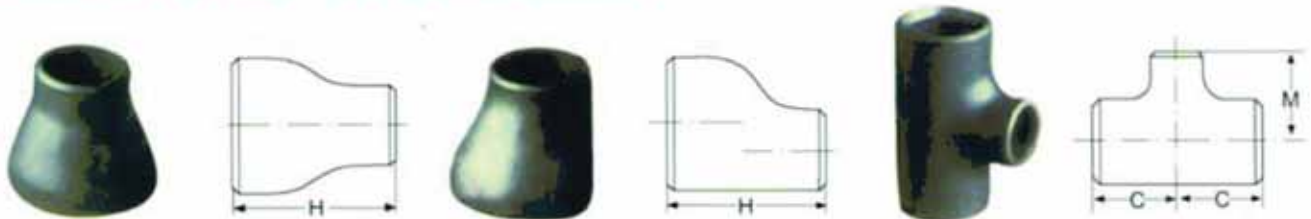


TABLE 7

ASME B16.9-1993

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End		Approx Weight (kg)					
	D ₁		D ₂		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	7.03	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

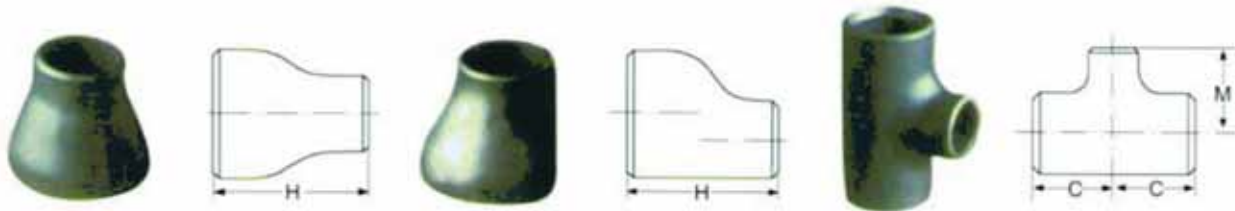


TABLE 7 (CONT 'D)

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
8x3½	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

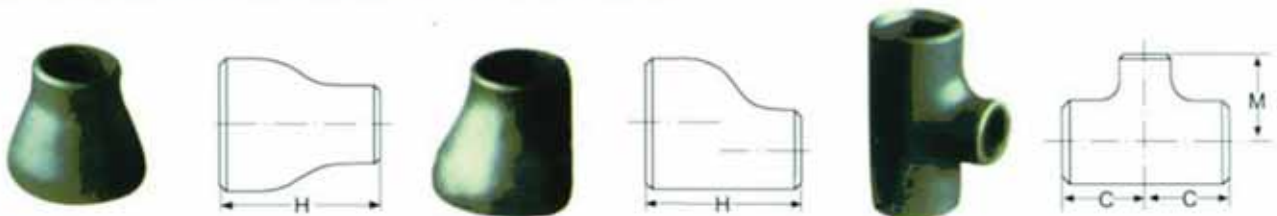


TABLE 7 (CONT 'D)

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

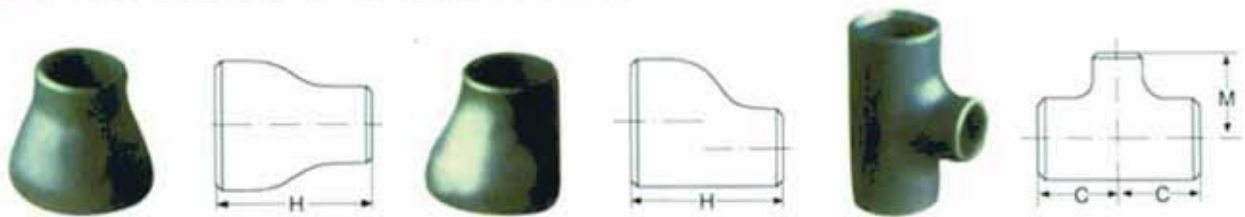


TABLE 7 (CONT'D)

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

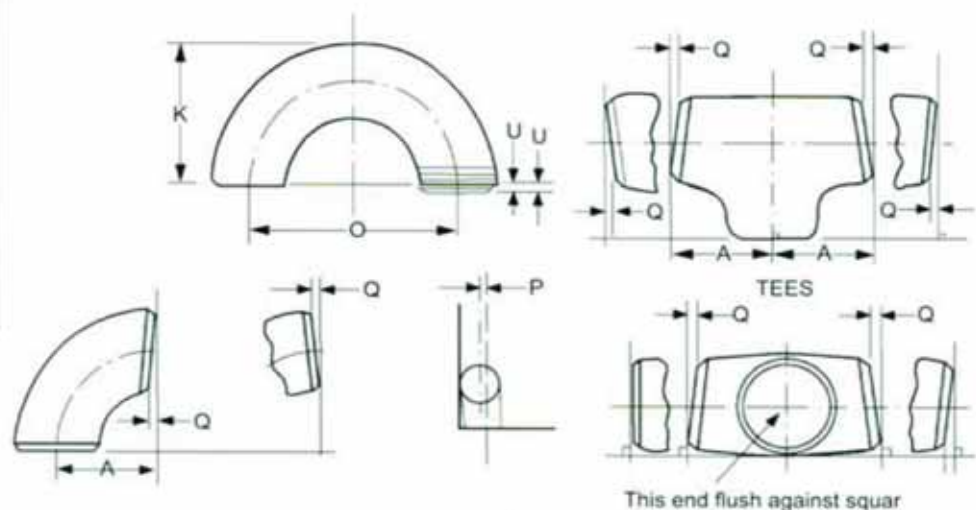
TABLE 8A

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

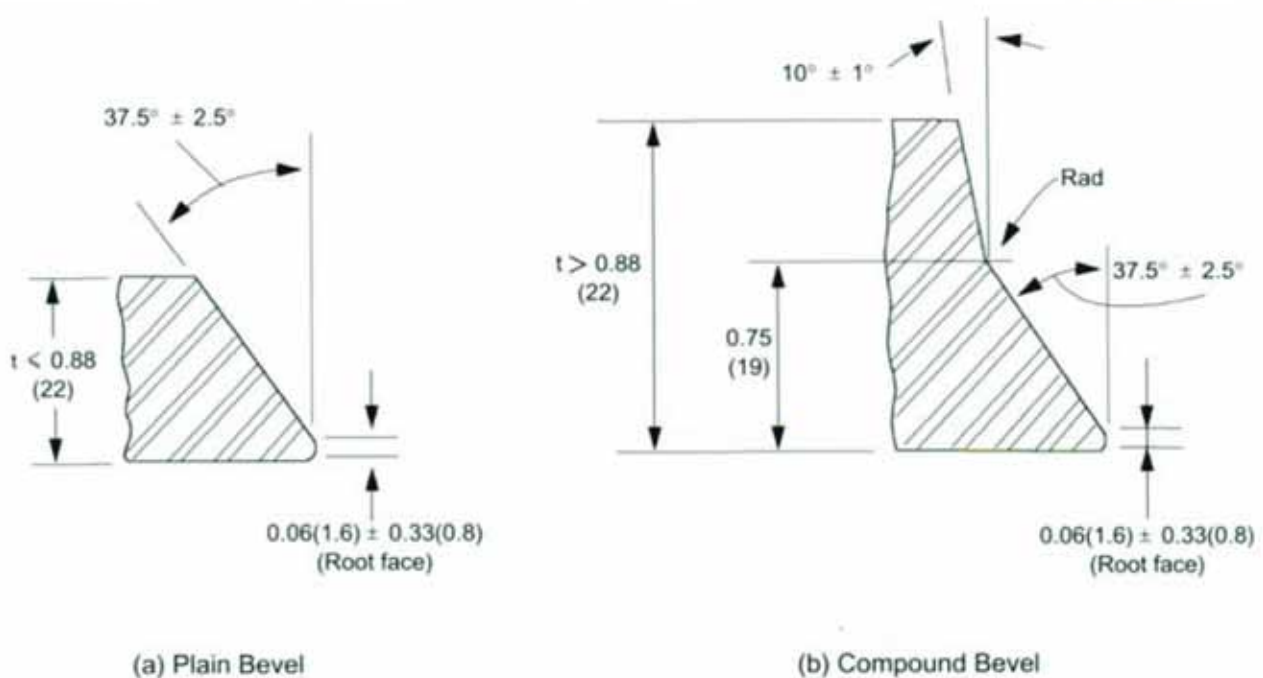
	All Fittings			90° and 45° Elbows and Tees	Reducers	Caps	180° Returns		
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Inside Diameter at End	Wall Thickness t	Center-to-End Dimension A,B,C,M	Over all Length H	Over all Length E	Center-to-Center Dimension O	Back-to-Face Dimension K	Alignment of Ends U
1/2-2 1/2	+0.06 -0.03	± 0.03	Not less 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 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 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	Mn	P	S	Si	Cr	Mo	Ni	Cu	R min. Tensile Strength MPa	S min. Yield Strength MPa	A% min.(2"/4D) Elongation	
		max		max	max								Long	Transv.
Carbon Steel	1) 233 WPB	0.30	0.29-1.06	0.050	0.058	0.10min					415	240	30	20
	233 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 ASTMA-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	WPL8	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	temperature C	Min. holding time min.
				Long.	Transv.						
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			



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