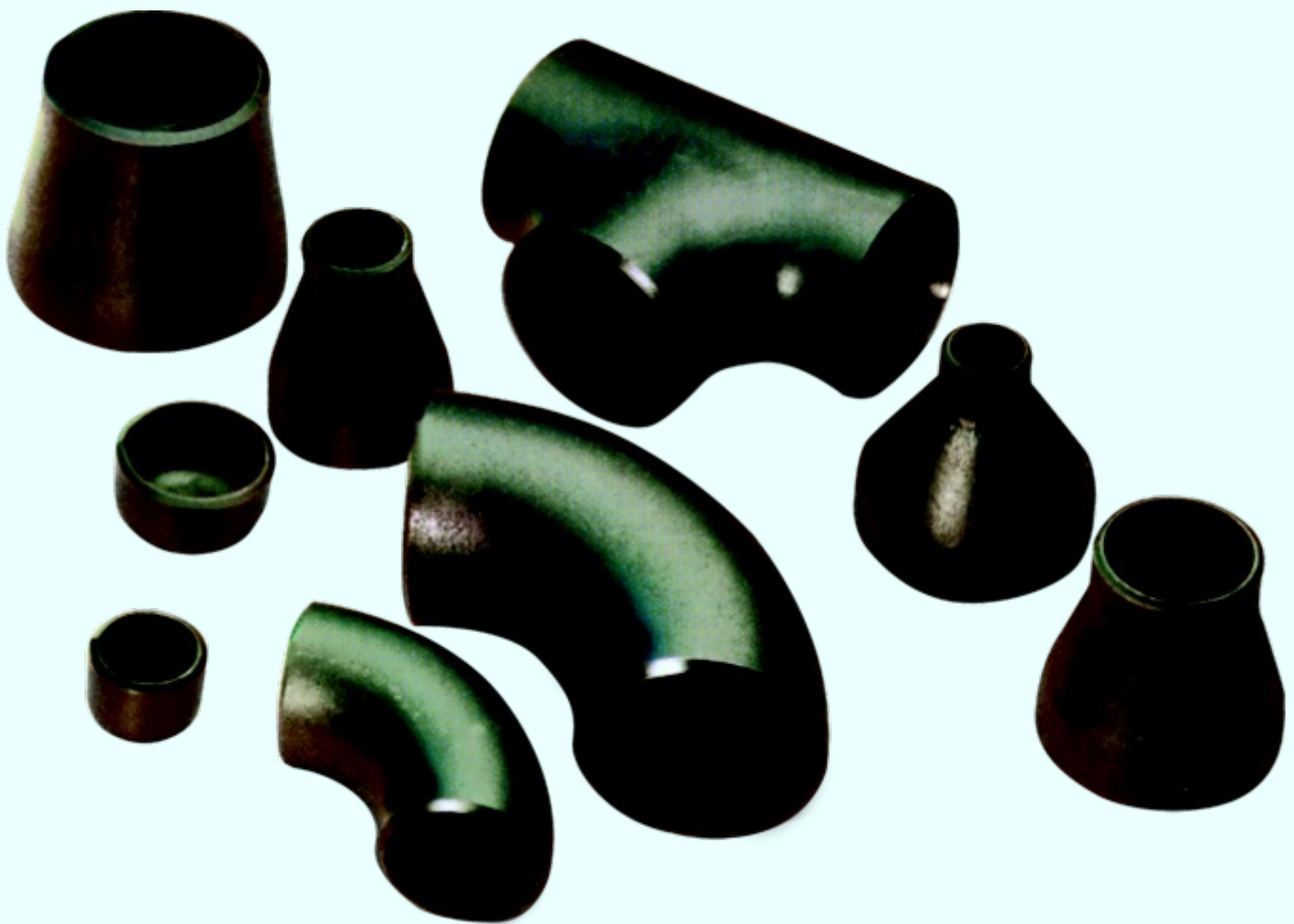
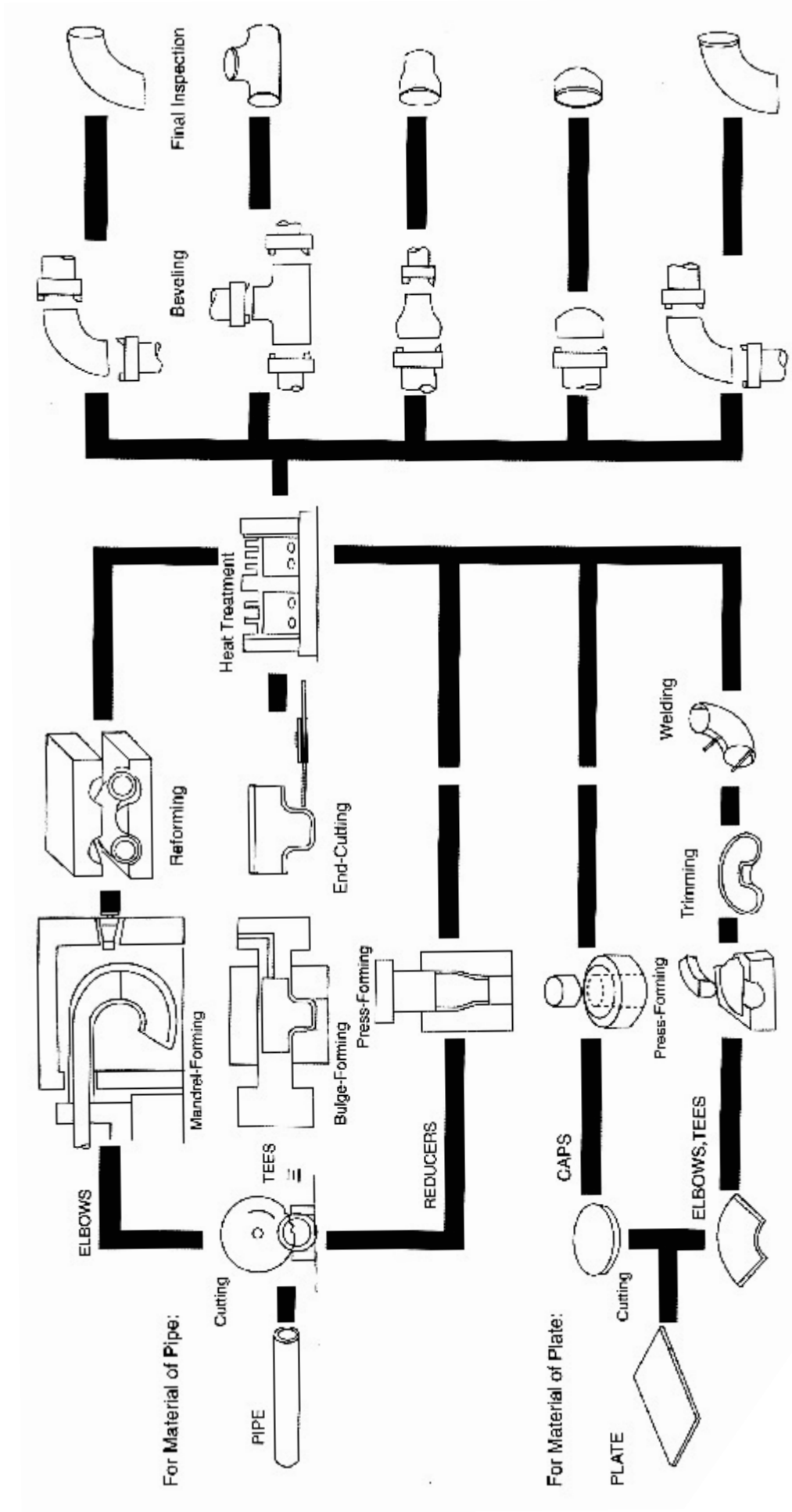


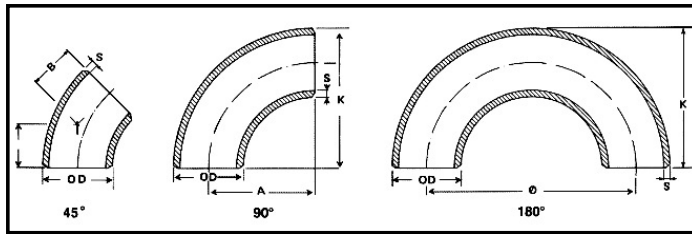
Section II : Fittings



Manufacturing Process of Fittings:



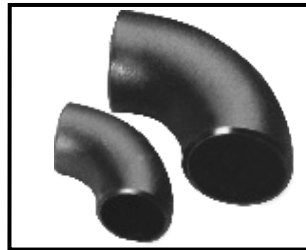
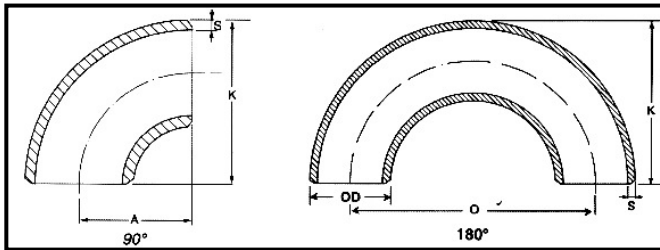
Long Radius (R=1.5D) Elbows ANSI B16.9



Ødia.	OD	A	B	O	K	S				
						SCH.STD	SCH.XS	SCH.10	SCH.20	SCH.30
1/2"	21.3	38.1	15.9	76.2	47.6	2.77	3.73	-	-	-
3/4"	26.7	28.6	11.1	57.2	42.9	2.87	3.91	-	-	-
1"	33.4	38.1	22.2	76.2	55.6	3.38	4.55	-	-	-
1-1/4"	42.2	47.6	25.4	95.2	69.8	3.56	4.85	-	-	-
1-1/2"	48.3	57.2	28.6	114.3	82.5	3.68	5.08	-	-	-
2"	60.3	76.2	34.9	152.4	106.4	3.91	5.54	-	-	-
2-1/2"	73.0	95.2	44.4	190.5	131.8	5.16	7.01	-	-	-
3"	88.9	114.3	50.8	228.6	158.8	5.49	7.62	-	-	-
3-1/2"	101.6	133.4	57.2	266.7	184.2	5.74	8.08	-	-	-
4"	114.3	152.4	63.5	304.8	209.6	6.02	8.56	-	-	-
5"	141.3	190.5	79.4	381.0	261.9	6.55	9.52	-	-	-
6"	168.3	228.6	95.2	457.2	312.7	7.11	10.97	-	-	-
8"	219.1	304.8	127.0	609.6	414.3	8.18	12.70	-	6.35	7.04
10"	273.0	381.0	158.8	762.0	517.5	9.27	12.70	-	6.35	7.80
12"	323.8	457.2	190.5	914.4	619.1	9.52	12.70	-	6.35	8.38
14"	355.6	533.4	222.2	1066.8	711.2	9.52	12.70	6.35	7.92	9.52
16"	406.4	609.6	254.0	1219.2	812.8	9.52	12.70	6.35	7.92	9.52
18"	457.2	685.8	285.8	1371.6	914.4	9.52	12.70	6.35	7.92	11.12
20"	508.0	762.0	317.5	1524.0	1016.0	9.52	12.70	6.35	9.52	12.70
22"	558.8	838.2	342.9	1676.4	1117.6	9.52	12.70	6.35	9.52	12.70
24"	609.6	914.4	381.0	1828.8	1219.2	9.52	12.70	6.35	9.52	14.25
26"	660.4	990.6	406.4	1981.2	1320.8	9.52	12.70	7.92	12.70	-
28"	711.2	1066.8	438.1	2135.6	1422.4	9.52	12.70	7.92	12.70	15.88
30"	762.0	1143.0	469.9	2286.0	1524.0	9.52	12.70	7.92	12.70	15.88
32"	812.8	1219.2	501.6	2436.4	1625.6	9.52	12.70	7.92	12.70	15.88
34"	863.6	1295.4	533.4	2590.8	1727.2	9.52	12.70	7.92	12.70	15.88
36"	914.4	1371.6	565.1	2743.2	1828.8	9.52	12.70	7.92	12.70	15.88

Ødia.	S							
	SCH.40	SCH.60	SCH.80	SCH.100	SCH.120	SCH.140	SCH.160	SCH.XXS
1/2"	2.77	-	3.73	-	-	-	4.75	7.47
3/4"	2.87	-	3.91	-	-	-	5.54	7.82
1"	3.38	-	4.55	-	-	-	6.35	9.09
1-1/4"	3.56	-	4.85	-	-	-	6.35	9.70
1-1/2"	3.68	-	5.08	-	-	-	7.14	10.16
2"	3.91	-	5.54	-	-	-	8.71	11.07
2-1/2"	5.16	-	7.01	-	-	-	9.52	14.02
3"	5.49	-	7.62	-	-	-	11.12	15.24
3-1/2"	5.74	-	8.08	-	-	-	-	-
4"	6.02	-	8.56	-	11.12	-	13.49	17.12
5"	6.55	-	9.52	-	12.70	-	15.87	19.05
6"	7.11	-	10.97	-	14.27	-	18.24	21.94
8"	8.18	10.30	12.70	15.06	18.24	20.62	23.01	22.22
10"	9.27	12.70	15.06	18.24	21.41	25.40	28.57	26.40
12"	10.31	14.30	17.45	21.41	25.40	28.57	33.32	26.40
14"	11.12	15.10	19.05	23.80	27.76	31.75	35.71	-
16"	12.70	16.70	21.41	26.19	30.94	36.52	40.46	-
18"	14.27	19.05	23.80	29.36	34.92	39.67	45.24	-
20"	15.06	20.60	26.19	32.54	38.10	44.45	49.99	-
22"	-	-	-	-	-	-	-	-
24"	17.45	24.60	30.94	38.89	46.02	52.37	59.51	-
26"	17.45	-	-	-	-	-	-	-
28"	17.45	-	-	-	-	-	-	-
30"	17.45	-	-	-	-	-	-	-
32"	17.45	-	-	-	-	-	-	-
34"	17.45	-	-	-	-	-	-	-
36"	19.05	-	-	-	-	-	-	-

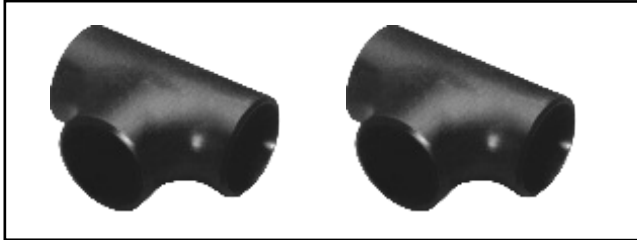
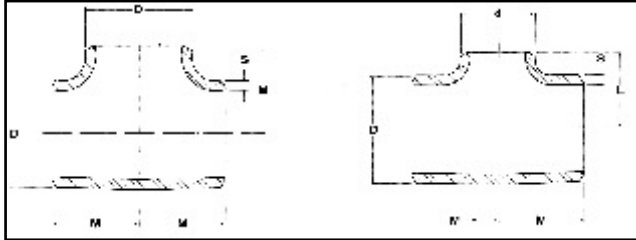
Short Radius (R=1D) Elbows ANSI B16.9



Ødia.	OD	A	O	K	S				
					SCH.STD	SCH.XS	SCH.10	SCH.20	SCH.30
1/2"	-	-	-	-	-	-	-	-	-
3/4"	-	-	-	-	-	-	-	-	-
1"	33.4	25.4	50.6	41.3	3.38	4.55	-	-	-
1-1/4"	42.2	31.8	63.5	52.4	3.56	4.85	-	-	-
1-1/2"	48.3	38.1	76.2	61.9	3.68	5.08	-	-	-
2"	60.3	50.8	101.6	81.0	3.91	5.54	-	-	-
2-1/2"	73.0	63.5	127.0	100.0	5.16	7.01	-	-	-
3"	88.9	76.2	152.4	120.6	5.49	7.62	-	-	-
3-1/2"	101.6	88.9	177.8	139.7	5.74	8.08	-	-	-
4"	114.3	101.6	203.2	158.8	6.02	8.56	-	-	-
5"	141.3	127.0	254.0	196.8	6.55	9.52	-	-	-
6"	168.3	152.4	304.8	235.5	7.11	10.97	-	-	-
8"	219.1	203.2	406.4	312.7	8.18	12.70	-	6.35	7.04
10"	273.0	254.0	508.0	390.5	9.27	12.70	-	6.35	7.80
12"	323.8	304.8	609.6	466.7	9.52	12.70	-	6.35	8.38
14"	355.6	355.6	711.2	533.4	9.52	12.70	6.35	7.92	9.52
16"	406.4	406.4	812.8	609.6	9.52	12.70	6.35	7.92	9.52
18"	457.2	457.2	914.4	685.8	9.52	12.70	6.35	7.92	11.12
20"	508.0	508.0	1016.0	762.0	9.52	12.70	6.35	9.52	12.70
22"	558.8	558.8	1117.6	838.2	9.52	12.70	6.35	9.52	12.70
24"	609.6	609.6	1219.0	914.0	9.52	12.70	6.35	9.52	14.25
26"	660.4	660.4	1320.8	990.6	9.52	12.70	7.92	12.70	-
28"	711.2	711.2	1422.4	1066.8	9.52	12.70	7.92	12.70	15.88
30"	762.0	762.0	1524.0	1143.0	9.52	12.70	7.92	12.70	15.88
32"	812.8	812.8	1625.6	1219.2	9.52	12.70	7.92	12.70	15.88
34"	863.6	863.8	1727.2	1295.4	9.52	12.70	7.92	12.70	15.88
36"	914.4	914.4	1828.8	1371.6	9.52	12.70	7.92	12.70	15.88

Ødia.	S							
	SCH.40	SCH.60	SCH.80	SCH.100	SCH.120	SCH.140	SCH.160	SCH.XXS
1/2"	-	-	-	-	-	-	-	-
3/4"	-	-	-	-	-	-	-	-
1"	3.38	-	4.55	-	-	-	6.35	9.09
1-1/4"	3.56	-	4.85	-	-	-	6.35	9.70
1-1/2"	3.68	-	5.08	-	-	-	7.14	10.16
2"	3.91	-	5.54	-	-	-	8.71	11.07
2-1/2"	5.16	-	7.01	-	-	-	9.52	14.02
3"	5.49	-	7.62	-	-	-	11.12	15.24
3-1/2"	5.74	-	8.08	-	-	-	-	-
4"	6.02	-	8.56	-	11.12	-	13.49	17.12
5"	6.55	-	9.52	-	12.70	-	15.87	19.05
6"	7.11	-	10.97	-	14.27	-	18.24	21.94
8"	8.18	10.30	12.70	15.06	18.24	20.62	23.01	22.22
10"	9.27	12.70	15.06	18.24	21.41	25.40	28.57	26.40
12"	10.31	14.30	17.45	21.41	25.40	28.57	33.32	26.40
14"	11.12	15.10	19.05	23.80	27.76	31.75	35.71	-
16"	12.70	16.70	21.41	26.19	30.94	36.52	40.46	-
18"	14.27	19.05	23.80	29.36	34.92	39.67	45.24	-
20"	15.06	20.60	26.19	32.54	38.10	44.45	49.99	-
22"	-	-	-	-	-	-	-	-
24"	17.45	24.60	30.94	38.89	46.02	52.37	59.51	-
26"	17.45	-	-	-	-	-	-	-
28"	17.45	-	-	-	-	-	-	-
30"	17.45	-	-	-	-	-	-	-
32"	17.45	-	-	-	-	-	-	-
34"	17.45	-	-	-	-	-	-	-
36"	19.05	-	-	-	-	-	-	-

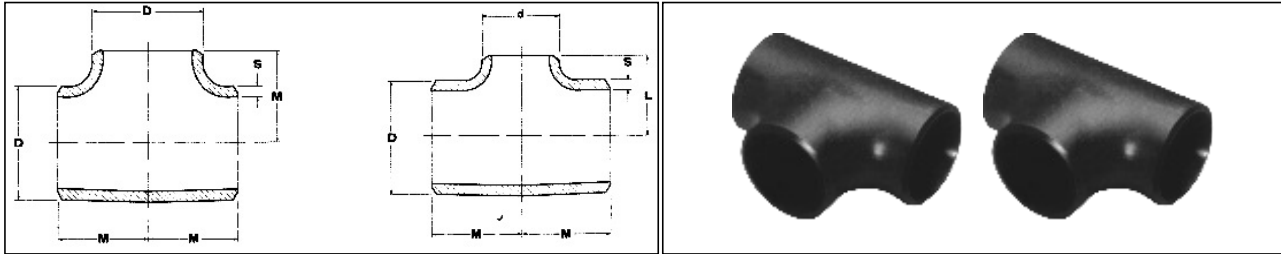
Equal and Reducing Tees



Ødia.	D	d	M	L	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
					S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
1/2"	21.3	-	25.4	25.4	2.77	-	3.73	-	-	-	-	-	-	-	2.77	-
3/4"	26.7	-	-	-	2.87	-	3.91	-	-	-	-	-	-	-	2.87	-
3/4"x 1/2"	26.7	21.3	28.5	28.5	2.87	2.77	3.91	3.73	-	-	-	-	-	-	2.87	2.77
1"	33.4	-	-	-	3.38	-	4.55	-	-	-	-	-	-	-	3.38	-
1"x 3/4"	33.4	26.7	38.1	38.1	3.38	2.87	4.55	3.91	-	-	-	-	-	-	3.38	2.87
1"x 1/2"	33.4	21.3	-	-	3.38	2.77	4.55	3.73	-	-	-	-	-	-	3.38	2.77
1-1/4"	42.2	-	-	-	3.56	-	4.85	-	-	-	-	-	-	-	3.56	-
1-1/4"x 1"	42.2	33.4	47.6	47.6	3.56	3.38	4.85	4.55	-	-	-	-	-	-	3.56	3.38
1-1/4"x 3/4"	42.2	26.7	-	-	3.56	2.87	4.85	3.91	-	-	-	-	-	-	3.56	2.87
1-1/4"x 1/2"	42.2	21.3	-	-	3.56	2.77	4.85	3.73	-	-	-	-	-	-	3.56	2.77
1-1/2"	48.3	-	-	-	3.68	-	5.08	-	-	-	-	-	-	-	3.68	-
1-1/2"x 1-1/4"	48.3	42.2	57.1	57.1	3.68	3.56	5.08	4.85	-	-	-	-	-	-	3.68	3.56
1-1/2"x 1"	48.3	33.4	-	-	3.68	3.38	5.08	4.55	-	-	-	-	-	-	3.68	3.38
1-1/2"x 3/4"	48.3	26.7	-	-	3.68	2.87	5.08	3.91	-	-	-	-	-	-	3.68	2.87
1-1/2"x 1/2"	48.3	21.3	-	-	3.68	2.77	5.08	3.73	-	-	-	-	-	-	3.68	2.77
2"	60.3	-	-	63.5	3.91	-	5.54	-	-	-	-	-	-	-	3.91	-
2"x 1-1/2"	60.3	48.3	63.5	63.5	3.91	3.68	5.54	5.08	-	-	-	-	-	-	3.91	3.68
2"x 1-1/4"	60.3	42.4	-	-	54.2	3.91	3.56	5.54	4.85	-	-	-	-	-	3.91	3.56
2"x 1"	60.3	33.4	-	-	50.8	3.91	3.38	5.54	4.55	-	-	-	-	-	3.91	3.38
2"x 3/4"	60.3	26.7	-	-	44.5	3.91	2.87	5.54	3.91	-	-	-	-	-	3.91	2.87
2"x 1/2"	60.3	21.3	-	-	44.5	3.91	2.77	5.54	3.73	-	-	-	-	-	3.91	2.77
2-1/2"	73.0	-	-	76.2	5.16	-	7.01	-	-	-	-	-	-	-	5.16	-
2-1/2"x 2"	73.0	60.3	76.2	76.2	5.16	3.91	7.01	5.54	-	-	-	-	-	-	5.16	3.91
2-1/2"x 1-1/2"	73.0	48.3	-	-	66.7	5.16	3.68	7.01	5.08	-	-	-	-	-	5.16	3.68
2-1/2"x 1-1/4"	73.0	42.2	-	-	63.5	5.16	3.56	7.01	4.85	-	-	-	-	-	5.16	3.56
2-1/2"x 1"	73.0	33.4	-	-	54.2	5.16	3.38	7.01	4.55	-	-	-	-	-	5.16	3.38
3"	88.9	-	-	85.4	5.49	-	7.62	-	-	-	-	-	-	-	5.49	-
3"x 2-1/2"	88.9	73.0	85.4	85.4	5.49	5.16	7.62	7.01	-	-	-	-	-	-	5.49	5.16
3"x 2"	88.9	60.3	-	-	76.2	5.49	3.91	7.62	5.54	-	-	-	-	-	5.49	3.91
3"x 1-1/2"	88.9	48.3	-	-	79.0	5.49	3.68	7.62	5.08	-	-	-	-	-	5.49	3.68
3"x 1-1/4"	88.9	42.2	-	-	69.0	5.49	3.56	7.62	4.85	-	-	-	-	-	5.49	3.56
3"x 1"	88.9	33.4	-	-	65.9	5.49	3.38	7.62	4.55	-	-	-	-	-	5.49	3.38
3-1/2"	101.6	-	-	95.2	5.71	-	8.08	-	-	-	-	-	-	-	5.71	-
3-1/2"x 3"	101.6	88.9	95.2	95.2	5.71	5.49	8.08	7.62	-	-	-	-	-	-	5.71	5.49
3-1/2"x 2-1/2"	101.6	73.0	-	-	88.9	5.71	5.16	8.08	7.01	-	-	-	-	-	5.71	5.16

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
1/2"	-	-	3.73	-	-	-	-	-	-	-	4.75	-	7.47	-
3/4"	-	-	3.91	-	-	-	-	-	-	-	5.54	-	7.82	-
3/4"x 1/2"	-	-	3.91	3.73	-	-	-	-	-	-	5.54	4.75	7.82	7.47
1"	-	-	4.55	-	-	-	-	-	-	-	6.35	-	9.09	-
1"x 3/4"	-	-	4.55	3.91	-	-	-	-	-	-	6.35	5.54	9.09	7.82
1"x 1/2"	-	-	4.55	3.73	-	-	-	-	-	-	6.35	4.75	9.09	7.47
1-1/4"	-	-	4.85	-	-	-	-	-	-	-	6.35	-	9.70	-
1-1/4"x 1"	-	-	4.85	4.55	-	-	-	-	-	-	6.35	6.35	9.70	9.09
1-1/4"x 3/4"	-	-	4.85	3.91	-	-	-	-	-	-	6.35	5.54	9.70	7.82
1-1/4"x 1/2"	-	-	4.85	3.73	-	-	-	-	-	-	6.35	4.75	9.70	7.47
1-1/2"	-	-	5.08	-	-	-	-	-	-	-	7.14	-	10.16	-
1-1/2"x 1-1/4"	-	-	5.08	4.85	-	-	-	-	-	-	7.14	6.35	10.16	9.70
1-1/2"x 1"	-	-	5.08	4.55	-	-	-	-	-	-	7.14	6.35	10.16	9.09
1-1/2"x 3/4"	-	-	5.08	3.91	-	-	-	-	-	-	7.14	5.54	10.16	7.82
1-1/2"x 1/2"	-	-	5.08	3.73	-	-	-	-	-	-	7.14	4.75	10.16	7.47
2"	-	-	5.54	-	-	-	-	-	-	-	8.71	-	11.07	-
2"x 1-1/2"	-	-	5.54	5.08	-	-	-	-	-	-	8.71	7.14	11.07	10.08
2"x 1-1/4"	-	-	5.54	4.85	-	-	-	-	-	-	8.71	6.35	11.07	9.70
2"x 1"	-	-	5.54	4.55	-	-	-	-	-	-	8.71	6.35	11.07	9.09
2"x 3/4"	-	-	5.54	3.91	-	-	-	-	-	-	8.71	5.54	11.07	7.82
2"x 1/2"	-	-	5.54	3.73	-	-	-	-	-	-	8.71	4.75	11.07	7.47
2-1/2"	-	-	7.01	-	-	-	-	-	-	-	9.52	-	14.02	-
2-1/2"x 2"	-	-	7.01	5.54	-	-	-	-	-	-	9.52	8.71	14.02	11.07
2-1/2"x 1-1/2"	-	-	7.01	5.08	-	-	-	-	-	-	9.52	7.14	14.02	10.08
2-1/2"x 1-1/4"	-	-	7.01	4.85	-	-	-	-	-	-	9.52	6.35	14.02	9.70
2-1/2"x 1"	-	-	7.01	4.55	-	-	-	-	-	-	9.52	6.35	14.02	9.09
3"	-	-	7.62	-	-	-	-	-	-	-	11.12	-	15.24	-
3"x 2-1/2"	-	-	7.62	7.01	-	-	-	-	-	-	11.12	9.52	15.24	14.02
3"x 2"	-	-	7.62	5.54	-	-	-	-	-	-	11.12	8.71	15.24	11.07
3"x 1-1/2"	-	-	7.62	5.08	-	-	-	-	-	-	11.12	7.14	15.24	10.16
3"x 1-1/4"	-	-	7.62	4.85	-	-	-	-	-	-	11.12	6.35	15.24	9.70
3"x 1"	-	-	7.62	4.55	-	-	-	-	-	-	11.12	6.35	15.24	9.09
3-1/2"	-	-	8.08	-	-	-	-	-	-	-	-	-	-	-
3-1/2"x 3"	-	-	8.08	7.62	-	-	-	-	-	-	-	-	-	-
3-1/2"x 2-1/2"	-	-	8.08	7.01	-	-	-	-	-	-	-	-	-	-

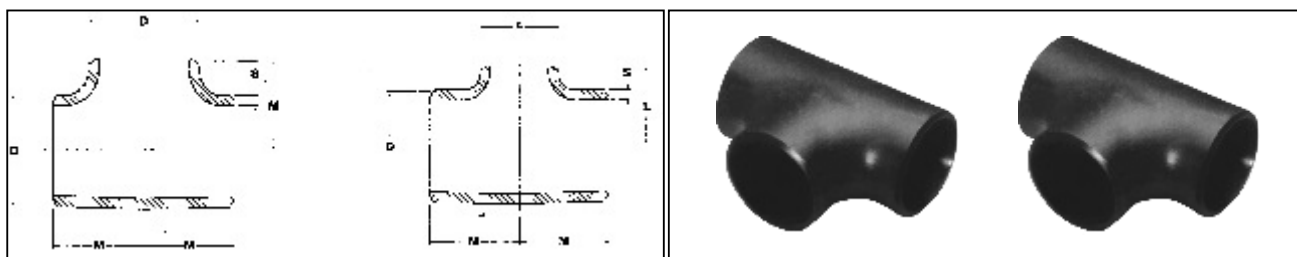
Equal and Reducing Tees



Ødia.	D	d	M	L	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
					S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
3-1/2"x 2"	101.6	60.3	95.2	82.6	5.74	3.91	8.08	5.54	-	-	-	-	-	-	5.74	3.91
3-1/2"x 1-1/2"	101.6	48.3		79.4	5.74	3.68	8.08	5.08	-	-	-	-	-	-	5.74	3.68
3-1/2"x 1-1/4"	101.6	42.2		77.4	5.74	3.56	8.08	4.85	-	-	-	-	-	-	5.74	3.56
4"	114.3	-	104.8	104.8	6.02	-	8.56	-	-	-	-	-	-	-	6.02	-
4"x 3-1/2"	114.3	101.6		101.6	6.02	5.74	8.56	8.08	-	-	-	-	-	-	6.02	5.74
4"x 3"	114.3	88.9		98.4	6.02	5.49	8.56	7.62	-	-	-	-	-	-	6.02	5.49
4"x 2-1/2"	114.3	73.0		95.2	6.02	5.16	8.56	7.01	-	-	-	-	-	-	6.02	5.16
4"x 2"	114.3	60.3		88.9	6.02	3.91	8.56	5.54	-	-	-	-	-	-	6.02	3.91
4"x 1-1/2"	114.3	48.3		85.7	6.02	3.68	8.56	5.08	-	-	-	-	-	-	6.02	3.68
4"x 1-1/4"	114.3	42.2	104.8	83.7	6.02	3.56	8.56	4.85	-	-	-	-	-	6.02	3.56	
4"x 1"	114.3	33.4		78.6	6.02	3.38	8.56	4.55	-	-	-	-	-	-	6.02	3.38
5"	141.3	-	123.8	123.8	6.55	-	9.52	-	-	-	-	-	-	6.55	-	
5"x 4"	141.3	114.3		117.4	6.55	6.02	9.52	8.56	-	-	-	-	-	-	6.55	6.02
5"x 3-1/2"	141.3	101.6		114.3	6.55	5.74	9.52	8.08	-	-	-	-	-	-	6.55	5.74
5"x 3"	141.3	88.9		111.1	6.55	5.49	9.52	7.62	-	-	-	-	-	-	6.55	5.49
5"x 2-1/2"	141.3	73.0		107.9	6.55	5.16	9.52	7.01	-	-	-	-	-	-	6.55	5.16
5"x 2"	141.3	60.3		104.7	6.55	3.91	9.52	5.54	-	-	-	-	-	-	6.55	3.91
6"	168.3	-	142.8	142.8	7.11	-	10.97	-	-	-	-	-	-	7.11	-	
6"x 5"	168.3	141.3		136.5	7.11	6.55	10.97	9.52	-	-	-	-	-	-	7.11	6.55
6"x 4"	168.3	114.3		130.1	7.11	6.02	10.97	8.56	-	-	-	-	-	-	7.11	6.02
6"x 3-1/2"	168.3	101.6		127.0	7.11	5.74	10.97	8.08	-	-	-	-	-	-	7.11	5.74
6"x 3"	168.3	88.9		123.8	7.11	5.49	10.97	7.62	-	-	-	-	-	-	7.11	5.49
6"x 2-1/2"	168.3	73.0		120.6	7.11	5.16	10.97	7.01	-	-	-	-	-	-	7.11	5.16
6"x 2"	168.3	60.3	177.8	115.9	7.11	3.91	10.97	5.54	-	-	-	-	-	7.11	3.91	
8"	219.1	-		177.8	8.18	-	12.70	-	-	-	6.35	-	7.04	-	8.18	-
8"x 6"	219.1	168.3		168.2	8.18	7.11	12.70	10.97	-	-	-	-	-	-	8.18	7.11
8"x 5"	219.1	141.3		161.9	8.18	6.55	12.70	9.52	-	-	-	-	-	-	8.18	6.55
8"x 4"	219.1	114.3		155.5	8.18	6.02	12.70	8.56	-	-	-	-	-	-	8.18	6.02
8"x 3-1/2"	219.1	101.6		152.4	8.18	5.74	12.70	8.08	-	-	-	-	-	-	8.18	5.74
8"x 3"	219.1	88.9	215.9	150.8	8.18	5.49	12.70	7.62	-	-	-	-	-	8.18	5.49	
10"	273.0	-		215.9	9.27	-	12.70	-	-	-	6.35	-	7.80	-	9.27	-
10"x 8"	273.0	219.1		203.2	9.27	8.18	12.70	12.70	-	-	6.35	6.35	7.80	7.04	9.27	8.18
10"x 6"	273.0	168.3		193.7	9.27	7.11	12.70	10.97	-	-	-	-	-	-	9.27	7.11
10"x 5"	273.0	141.3		190.5	9.27	6.55	12.70	9.52	-	-	-	-	-	-	9.27	6.55
10"x 4"	273.0	114.3		184.2	9.27	6.02	12.70	8.56	-	-	-	-	-	-	9.27	6.02

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
3-1/2"x 2"	-	-	8.08	5.54	-	-	-	-	-	-	-	-	-	-
3-1/2"x 1-1/2"	-	-	8.08	5.08	-	-	-	-	-	-	-	-	-	-
3-1/2"x 1-1/4"	-	-	8.08	4.85	-	-	-	-	-	-	-	-	-	-
4"	-	-	8.56	-	-	-	11.13	-	-	-	13.49	-	17.12	-
4"x 3-1/2"	-	-	8.56	8.08	-	-	-	-	-	-	-	-	-	-
4"x 3"	-	-	8.56	7.62	-	-	-	-	-	-	13.49	11.12	17.12	15.24
4"x 2-1/2"	-	-	8.56	7.01	-	-	-	-	-	-	13.49	9.54	17.12	14.02
4"x 2"	-	-	8.56	5.54	-	-	-	-	-	-	13.49	8.71	17.12	11.07
4"x 1-1/2"	-	-	8.56	5.08	-	-	-	-	-	-	13.49	7.14	17.12	10.16
4"x 1-1/4"	-	-	8.56	4.85	-	-	-	-	-	-	13.49	6.35	17.12	9.70
4"x 1"	-	-	8.56	4.55	-	-	-	-	-	-	13.49	6.35	17.12	9.09
5"	-	-	9.52	-	-	-	12.70	-	-	-	15.87	-	19.05	-
5"x 4"	-	-	9.52	8.56	-	-	12.70	11.12	-	-	15.87	13.49	19.05	17.12
5"x 3-1/2"	-	-	9.52	8.08	-	-	-	-	-	-	-	-	-	-
5"x 3"	-	-	9.52	7.62	-	-	-	-	-	-	15.87	11.12	19.05	15.24
5"x 2-1/2"	-	-	9.52	7.01	-	-	-	-	-	-	15.87	9.52	19.05	14.02
5"x 2"	-	-	9.52	5.54	-	-	-	-	-	-	15.87	8.71	19.05	11.07
6"	-	-	10.97	-	-	-	14.27	-	-	-	18.24	-	21.94	-
6"x 5"	-	-	10.97	9.52	-	-	14.27	12.70	-	-	18.24	15.87	21.94	19.05
6"x 4"	-	-	10.97	8.56	-	-	14.27	11.12	-	-	18.24	13.49	21.94	17.12
6"x 3-1/2"	-	-	10.97	8.08	-	-	-	-	-	-	-	-	-	-
6"x 3"	-	-	10.97	7.62	-	-	-	-	-	-	18.24	11.12	21.94	15.24
6"x 2-1/2"	-	-	10.97	7.01	-	-	-	-	-	-	18.24	9.52	21.94	14.02
6"x 2"	-	-	10.97	5.54	-	-	-	-	-	-	18.24	8.71	21.94	11.07
8"	10.31	-	12.70	-	15.09	-	18.24	-	20.62	-	23.01	-	22.22	-
8"x 6"	-	-	12.70	10.97	-	-	18.24	14.27	-	-	23.01	18.24	22.22	21.94
8"x 5"	-	-	12.70	9.52	-	-	18.24	12.70	-	-	23.01	15.87	22.22	19.05
8"x 4"	-	-	12.70	8.56	-	-	18.24	11.12	-	-	23.01	13.49	22.22	17.12
8"x 3-1/2"	-	-	12.70	8.08	-	-	-	-	-	-	-	-	-	-
8"x 3"	-	-	12.70	7.62	-	-	-	-	-	-	23.01	11.12	22.22	15.24
10"	12.70	-	15.06	-	18.24	-	21.41	-	25.40	-	28.57	-	26.40	-
10"x 8"	12.70	10.30	15.06	12.70	18.24	15.06	21.41	18.24	25.40	20.62	28.57	23.01	26.40	22.22
10"x 6"	-	-	15.06	10.97	-	-	21.41	14.27	-	-	28.57	18.24	26.40	21.94
10"x 5"	-	-	15.06	9.52	-	-	21.41	12.70	-	-	28.57	15.87	26.40	19.05
10"x 4"	-	-	15.06	8.56	-	-	21.41	11.12	-	-	28.57	13.49	26.40	17.12

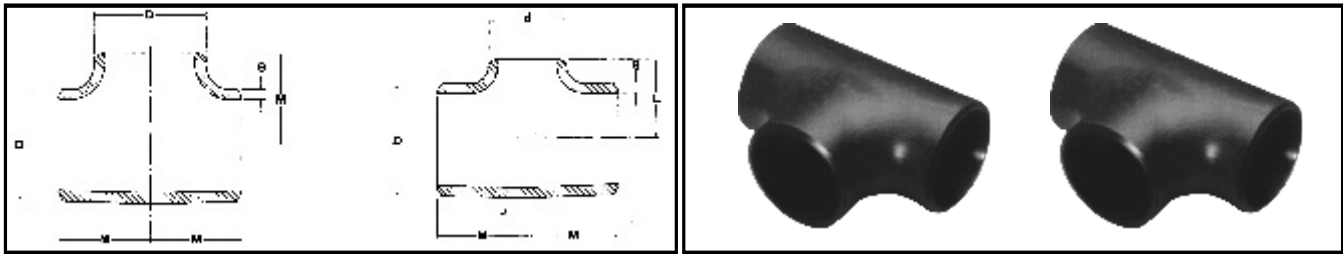
Equal and Reducing Tees



Ødia.	D	d	M	L	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
					S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
10"x 3"	273.0	88.9	215.9	-	9.27	5.49	12.70	7.62	-	-	-	-	-	-	9.27	5.49
12"	323.8	-	-	254.0	9.52	-	12.70	-	-	-	6.35	-	8.38	-	10.31	-
12"x 10"	323.8	273.0	-	241.3	9.52	9.27	12.70	12.70	-	-	6.35	6.35	8.38	7.80	10.31	9.27
12"x 8"	323.8	219.1	-	228.6	9.52	8.18	12.70	12.70	-	-	6.35	8.35	8.38	7.04	10.31	8.18
12"x 6"	323.8	168.3	-	218.1	9.52	7.11	12.70	10.97	-	-	-	-	-	-	10.31	7.11
12"x 5"	323.8	141.3	-	215.9	9.52	6.55	12.70	9.52	-	-	-	-	-	-	10.31	6.55
12"x 4"	323.8	114.3	-	214.1	9.52	6.02	12.70	8.56	-	-	-	-	-	-	10.31	6.02
14"	355.6	-	-	279.4	9.52	-	12.70	-	6.35	-	7.92	-	9.52	-	11.12	-
14"x 12"	355.6	323.8	-	269.9	9.52	9.52	12.70	12.70	-	-	7.92	6.35	9.52	8.38	11.12	10.31
14"x 10"	355.6	273.0	-	267.2	9.52	9.27	12.70	12.70	-	-	7.92	6.35	9.52	7.80	11.12	9.27
14"x 8"	355.6	219.1	-	247.7	9.52	8.18	12.70	12.70	-	-	7.92	6.35	9.52	7.04	11.12	8.18
14"x 6"	355.6	168.3	-	238.1	9.52	7.11	12.70	10.97	-	-	-	-	-	-	11.12	7.11
16"	406.4	-	-	304.9	9.52	-	12.70	-	6.35	-	7.92	-	9.52	-	12.70	-
16"x 14"	406.4	355.6	-	304.9	9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	9.52	9.52	12.70	11.12
16"x 12"	406.4	323.8	-	295.6	9.52	9.52	12.70	12.70	-	-	7.92	6.35	9.52	8.38	12.70	10.31
16"x 10"	406.4	273.0	-	282.6	9.52	9.27	12.70	12.70	-	-	7.92	6.35	9.52	7.80	12.70	9.27
16"x 8"	406.4	219.1	-	273.1	9.52	8.18	12.70	12.70	-	-	7.92	8.35	9.52	7.04	12.70	8.18
16"x 6"	406.4	168.3	-	263.5	9.52	7.11	12.70	10.97	-	-	-	-	-	-	12.70	7.11
18"	457.2	-	-	342.9	9.52	-	12.70	-	6.35	-	7.92	-	11.12	-	14.27	-
18"x 16"	457.2	406.4	-	330.2	9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	11.12	9.52	14.27	12.70
18"x 14"	457.2	355.6	-	330.2	9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	11.12	9.52	14.27	11.12
18"x 12"	457.2	323.8	-	320.7	9.52	9.52	12.70	12.70	-	-	7.92	6.35	11.12	8.38	14.27	10.31
18"x 10"	457.2	273.0	-	309.0	9.52	9.27	12.70	12.70	-	-	7.92	6.35	11.12	7.80	14.27	9.27
18"x 8"	457.2	219.1	-	298.5	9.52	8.18	12.70	12.70	-	-	7.92	6.35	11.12	7.04	14.27	8.18
20"	508.0	-	-	381.0	9.52	-	12.70	-	6.35	-	9.52	-	12.70	-	15.06	-
20"x 18"	508.0	457.2	-	368.3	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	11.12	15.06	14.27
20"x 16"	508.0	406.4	-	355.6	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	15.06	12.70
20"x 14"	508.0	355.6	-	355.6	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	15.06	11.12
20"x 12"	508.0	323.8	-	348.1	9.52	9.52	12.70	12.70	-	-	9.52	6.35	12.70	8.38	15.06	10.31
20"x 10"	508.0	273.0	-	333.4	9.52	9.27	12.70	12.70	-	-	9.52	6.35	12.70	7.80	15.06	9.27
20"x 8"	508.0	219.1	-	322.3	9.52	8.18	12.70	12.70	-	-	9.52	6.35	12.70	7.04	15.06	8.18
22"	558.8	-	-	419.1	9.52	-	12.70	-	6.35	-	9.52	-	12.70	-	-	-
22"x 20"	558.8	508.0	-	406.4	9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	12.70	12.70	-	-
22"x 18"	558.8	457.2	-	393.7	9.52	9.52	12.70	12.70	8.35	6.35	9.52	7.92	12.70	11.12	-	-
22"x 16"	558.8	406.4	-	381.0	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	-	-

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
10"x 3"	-	-	15.06	7.62	-	-	-	-	-	-	28.57	11.12	26.40	15.24
12"	14.30	-	17.45	-	21.41	-	25.40	-	28.57	-	33.32	-	26.40	-
12"x 10"	14.30	12.70	17.45	15.06	21.41	18.24	25.40	21.41	28.57	25.40	33.32	28.57	26.40	26.40
12"x 8"	14.30	10.30	17.45	12.70	21.41	15.06	25.40	18.24	28.57	20.62	33.32	23.01	26.40	22.22
12"x 6"	-	-	17.45	10.97	-	-	25.40	14.27	-	-	33.32	18.24	26.40	21.94
12"x 5"	-	-	17.45	9.52	-	-	25.40	12.70	-	-	33.32	15.87	26.40	19.05
12"x 4"	-	-	17.45	8.56	-	-	25.40	11.12	-	-	33.32	13.49	26.40	17.12
14"	15.10	-	19.05	-	23.80	-	27.76	-	31.75	-	35.71	-	-	-
14"x 12"	15.10	14.30	19.05	17.45	23.80	21.41	27.76	25.40	31.75	28.57	35.71	33.32	-	-
14"x 10"	15.10	12.70	19.05	15.06	23.80	18.24	27.76	21.41	31.75	25.40	35.71	28.57	-	-
14"x 8"	15.10	10.30	19.05	12.70	23.80	15.06	27.76	18.24	31.75	20.62	35.71	23.01	-	-
14"x 6"	-	-	19.05	10.97	-	-	27.76	14.27	-	-	35.71	18.24	-	-
16"	16.70	-	21.41	-	26.19	-	30.94	-	36.52	-	40.46	-	-	-
16"x 14"	16.70	15.10	21.41	19.05	26.19	23.80	30.94	27.76	36.52	31.75	40.46	35.71	-	-
16"x 12"	16.70	14.30	21.41	17.45	26.19	21.41	30.94	25.40	36.52	28.57	40.46	33.32	-	-
16"x 10"	16.70	12.70	21.41	15.06	26.19	18.24	30.94	21.41	36.52	25.40	40.46	28.57	-	-
16"x 8"	16.70	10.30	21.41	12.70	26.19	15.06	30.94	18.24	36.52	20.62	40.46	23.01	-	-
16"x 6"	-	-	21.41	10.97	-	-	30.94	14.97	-	-	40.46	18.24	-	-
18"	19.05	-	23.80	-	29.36	-	34.92	-	39.67	-	45.24	-	-	-
18"x 16"	19.05	16.70	23.80	21.41	29.36	26.19	34.92	30.94	39.67	36.52	45.24	40.46	-	-
18"x 14"	19.05	15.10	23.80	19.05	29.36	23.80	34.92	27.76	39.67	31.75	45.24	35.71	-	-
18"x 12"	19.05	14.30	23.80	17.45	29.36	21.41	34.92	25.40	39.67	28.57	45.24	33.32	-	-
18"x 10"	19.05	12.70	23.80	15.06	29.36	18.24	34.92	21.41	39.67	25.40	45.24	28.57	-	-
18"x 8"	19.05	10.30	23.80	12.70	29.36	15.06	34.92	18.24	39.67	20.62	45.24	23.01	-	-
20"	20.60	-	26.19	-	32.54	-	38.10	-	44.45	-	49.99	-	-	-
20"x 18"	20.60	19.05	26.19	23.80	32.54	29.36	38.10	34.92	44.45	39.67	49.99	45.24	-	-
20"x 16"	20.60	16.70	26.19	21.41	32.54	26.19	38.10	30.94	44.45	36.52	49.99	40.46	-	-
20"x 14"	20.60	15.10	26.19	19.05	32.54	23.80	38.10	27.76	44.45	31.75	49.99	35.71	-	-
20"x 12"	20.60	14.30	26.19	17.45	32.54	21.41	38.10	25.40	44.45	28.57	49.99	33.32	-	-
20"x 10"	20.60	12.70	26.19	15.06	32.54	18.24	38.10	21.41	44.45	25.40	49.99	28.57	-	-
20"x 8"	20.60	10.30	26.19	12.70	32.54	15.06	38.10	18.24	44.45	20.62	49.99	23.01	-	-
22"	22.22	-	28.58	-	34.92	-	41.28	-	47.63	-	53.98	-	-	-
22"x 20"	22.22	20.60	28.58	26.19	34.92	32.54	41.28	38.10	47.63	44.45	53.98	49.99	-	-
22"x 18"	22.22	19.05	28.58	23.83	34.92	29.36	41.28	34.92	47.63	39.67	53.98	45.24	-	-
22"x 16"	22.22	16.66	28.58	21.44	34.92	26.19	41.28	30.94	47.63	36.52	53.98	40.46	-	-

Equal and Reducing Tees

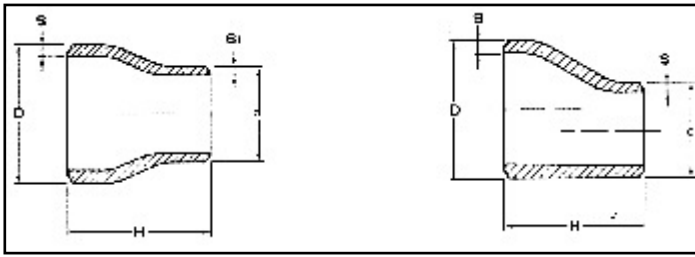


Ødia.	D	d	M	L	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
					S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
22"x 14"	558.8	355.6	419.1	381.0	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	-	-
22"x 12"	558.8	323.8		371.5	9.52	9.52	12.70	12.70	-	-	9.52	6.35	12.70	8.38	-	-
24"	609.6	-	431.8	431.8	9.52	-	12.70	-	6.35	-	9.52	-	14.25	-	17.45	-
24"x 22"	609.6	558.8		431.8	9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	14.25	12.70	-	-
24"x 20"	609.6	508.8		431.8	9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	14.25	12.70	17.45	15.06
24"x 18"	609.6	457.2		419.1	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	11.12	17.45	14.27
24"x 16"	609.6	406.4		406.4	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	9.52	17.45	12.70
24"x 14"	609.6	355.6		406.4	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	9.52	17.45	11.12
24"x12"	609.6	323.8		396.9	9.52	9.52	12.70	12.70	-	-	9.52	6.35	14.25	8.38	17.45	10.31
26"	660.4	-		495.3	495.3	9.52	-	12.70	-	7.92	-	12.70	-	-	-	-
26"x 24"	660.4	609.6	482.6		9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	-	-	-	-
26"x 22"	660.4	558.8	489.9		9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	-	-	-	-
26"x 20"	660.4	508.0	457.2		9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	-	-	-	-
26"x 18"	660.4	457.2	444.5		9.52	9.52	12.70	12.70	7.92	6.35	12.70	7.92	-	-	-	-
26"x 16"	660.4	406.4	431.8		9.52	9.52	12.70	12.70	7.92	6.35	12.70	7.92	-	-	-	-
26"x 14"	660.4	355.6	431.8		9.52	9.52	12.70	12.70	7.92	6.35	12.70	7.92	-	-	-	-
28"	711.2	-	520.7		520.7	9.52	-	12.70	-	7.92	-	12.70	-	15.88	-	-
28"x 26"	711.2	660.4		520.7	9.52	9.52	12.70	12.70	7.92	7.92	12.70	12.70	-	-	-	-
28"x 24"	711.2	609.6		508.0	9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	15.88	14.25	-	-
28"x 22"	711.2	558.8		495.3	9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	15.88	12.70	-	-
28"x 20"	711.2	508.0		482.6	9.52	9.52	12.70	12.70	7.92	6.35	12.70	9.52	15.88	12.70	-	-
28"x 18"	711.2	457.2		469.9	9.52	9.52	12.70	12.70	7.92	6.35	12.70	7.92	15.88	11.12	-	-
28"x 16"	711.2	406.4		457.2	9.52	9.52	12.70	12.70	7.92	6.35	12.70	7.92	15.88	9.52	-	-

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
22"x 14"	22.22	15.10	28.58	19.05	34.92	23.83	41.28	27.78	47.63	31.75	53.98	35.71	-	-
22"x 12"	22.22	14.30	28.58	17.45	34.92	21.41	41.28	25.40	47.63	28.57	53.98	33.32	-	-
24"	24.60	-	30.94	-	38.89	-	46.02	-	52.37	-	59.51	-	-	-
24"x 22"	24.60	22.22	30.94	28.58	38.89	34.92	46.02	41.28	52.37	47.63	59.51	53.98	-	-
24"x 20"	24.60	20.60	30.94	26.19	38.89	32.54	46.02	38.10	52.37	44.45	59.51	49.99	-	-
24"x 18"	24.60	19.05	30.94	23.80	38.89	29.63	46.02	34.92	52.37	39.67	59.51	45.24	-	-
24"x 16"	24.60	16.70	30.94	21.41	38.89	26.19	46.02	30.94	52.37	36.52	59.51	40.46	-	-
24"x 14"	24.60	15.10	30.94	19.05	38.89	23.80	46.02	27.78	52.37	31.75	59.51	35.71	-	-
24"x12"	24.60	14.30	30.94	17.45	38.89	21.41	46.02	25.40	52.37	28.57	59.51	33.32	-	-
26"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 24"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 22"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 20"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 18"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 16"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26"x 14"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 26"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 24"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 22"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 20"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 18"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28"x 16"	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tees with special thicknesses and sizes, are made on request.

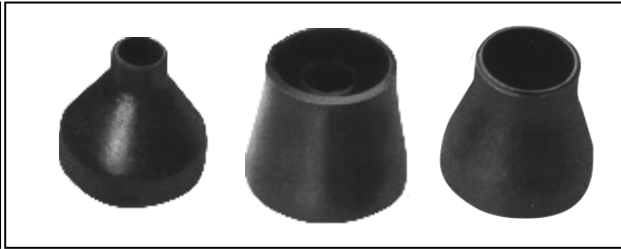
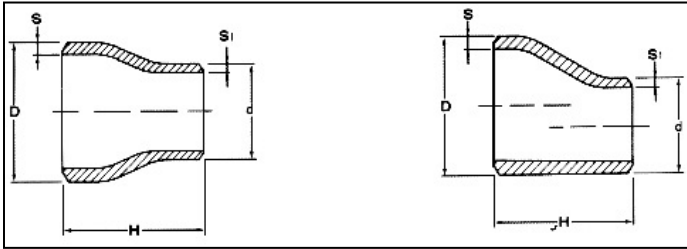
Concentric and Eccentric Reducers



Ødia.	D	d	H	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
				S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
3/4"x 1/2"	26.7	21.3	38	2.87	2.77	3.91	3.73	-	-	-	-	-	-	2.87	2.77
1"x 3/4"	33.4	26.7		3.38	2.87	4.55	3.91	-	-	-	-	-	-	3.38	2.87
1"x 1/2"	33.4	21.3	51	3.38	2.77	4.55	3.73	-	-	-	-	-	-	3.38	2.77
1-1/4"x 1"	42.2	33.4		3.56	3.38	4.85	4.55	-	-	-	-	-	-	3.56	3.38
1-1/4"x 3/4"	42.2	26.7	51	3.56	2.87	4.85	3.91	-	-	-	-	-	-	3.56	2.87
1-1/4"x 1/2"	42.2	21.3		3.56	2.77	4.85	3.73	-	-	-	-	-	-	3.56	2.77
1-1/2"x 1-1/4"	48.3	42.2		3.68	3.56	5.08	4.85	-	-	-	-	-	-	3.68	3.56
1-1/2"x 1"	48.3	33.4	64	3.68	3.38	5.08	4.55	-	-	-	-	-	-	3.68	3.38
1-1/2"x 3/4"	48.3	26.7		3.68	2.87	5.08	3.91	-	-	-	-	-	-	3.68	2.87
1-1/2"x 1/2"	48.3	21.3		3.68	2.77	5.08	3.73	-	-	-	-	-	-	3.68	2.77
2"x 1-1/2"	60.3	48.3		3.91	3.68	5.54	5.08	-	-	-	-	-	-	3.91	3.68
2"x 1-1/4"	60.3	42.2		3.91	3.56	5.54	4.85	-	-	-	-	-	-	3.91	3.56
2"x 1"	60.3	33.4	76	3.91	3.38	5.54	4.55	-	-	-	-	-	-	3.91	3.38
2"x 3/4"	60.3	26.7		3.91	2.87	5.54	3.91	-	-	-	-	-	-	3.91	2.87
2"x 1/2"	60.3	21.3		3.91	2.77	5.54	3.73	-	-	-	-	-	-	3.91	2.77
2-1/2"x 2"	73.0	60.3		5.16	3.91	7.01	5.54	-	-	-	-	-	-	5.16	3.91
2-1/2"x 1-1/2"	73.0	48.3		5.16	3.68	7.01	5.08	-	-	-	-	-	-	5.16	3.68
2-1/2"x 1-1/4"	73.0	42.2	89	5.16	3.56	7.01	4.85	-	-	-	-	-	-	5.16	3.56
2-1/2"x 1"	73.0	33.4		5.16	3.38	7.01	4.55	-	-	-	-	-	-	5.16	3.38
3"x 2-1/2"	88.9	73.0		5.49	5.16	7.62	7.01	-	-	-	-	-	-	5.49	5.16
3"x 2"	88.9	60.3		5.49	3.91	7.62	5.54	-	-	-	-	-	-	5.49	3.91
3"x 1-1/2"	88.9	48.3	89	5.49	3.68	7.62	5.08	-	-	-	-	-	-	5.49	3.68
3"x 1-1/4"	88.9	42.2		5.49	3.56	7.62	4.85	-	-	-	-	-	-	5.49	3.56
3"x 1"	88.9	33.4		5.49	3.38	7.62	4.55	-	-	-	-	-	-	5.49	3.38
3-1/2"x 3"	101.6	88.9		5.74	5.49	8.08	7.62	-	-	-	-	-	-	5.74	5.79
3-1/2"x 2-1/2"	101.6	73.0		5.74	5.16	8.08	7.01	-	-	-	-	-	-	5.74	5.16
3-1/2"x 2"	101.6	60.3	102	5.74	3.91	8.08	5.54	-	-	-	-	-	-	5.74	3.91
3-1/2"x 1-1/2"	101.6	48.3		5.74	3.68	8.08	5.08	-	-	-	-	-	-	5.74	3.68
3-1/2"x 1-1/4"	101.6	42.2		5.74	3.56	8.08	4.85	-	-	-	-	-	-	5.74	3.56
4"x 3-1/2"	114.3	101.6		6.02	5.74	8.56	8.08	-	-	-	-	-	-	6.02	5.74
4"x 3"	114.3	88.9		6.02	5.49	8.56	7.62	-	-	-	-	-	-	6.02	5.49
4"x 2-1/2"	114.3	73.0		6.02	5.16	8.56	7.01	-	-	-	-	-	-	6.02	5.16
4"x 2"	114.3	60.3	102	6.02	3.91	8.56	5.54	-	-	-	-	-	-	6.02	3.91
4"x 1-1/2"	114.3	48.3		6.02	3.68	8.56	5.08	-	-	-	-	-	-	6.02	3.68
4"x 1-1/4"	114.3	42.2		6.02	3.56	8.56	4.85	-	-	-	-	-	-	6.02	3.56

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
3/4"x 1/2"	-	-	3.91	3.73	-	-	-	-	-	-	5.54	4.75	7.82	7.47
1"x 3/4"	-	-	4.55	3.91	-	-	-	-	-	-	6.35	5.54	9.09	7.82
1"x 1/2"	-	-	4.55	3.73	-	-	-	-	-	-	6.35	4.75	9.09	7.47
1-1/4"x 1"	-	-	4.85	4.55	-	-	-	-	-	-	6.35	6.35	9.70	9.09
1-1/4"x 3/4"	-	-	4.85	3.91	-	-	-	-	-	-	6.35	5.54	9.70	7.82
1-1/4"x 1/2"	-	-	4.85	3.73	-	-	-	-	-	-	6.35	4.75	9.70	7.47
1-1/2"x 1-1/4"	-	-	5.08	4.85	-	-	-	-	-	-	7.14	6.35	10.16	9.70
1-1/2"x 1"	-	-	5.08	4.55	-	-	-	-	-	-	7.14	6.35	10.16	9.09
1-1/2"x 3/4"	-	-	5.08	3.91	-	-	-	-	-	-	7.14	5.54	10.16	7.82
1-1/2"x 1/2"	-	-	5.08	3.73	-	-	-	-	-	-	7.14	4.75	10.16	7.47
2"x 1-1/2"	-	-	5.54	5.08	-	-	-	-	-	-	8.71	7.14	11.07	10.16
2"x 1-1/4"	-	-	5.54	4.85	-	-	-	-	-	-	8.71	6.35	11.07	9.70
2"x 1"	-	-	5.54	4.55	-	-	-	-	-	-	8.71	6.35	11.07	9.09
2"x 3/4"	-	-	5.54	3.91	-	-	-	-	-	-	8.71	5.54	11.07	7.82
2"x 1/2"	-	-	5.54	3.73	-	-	-	-	-	-	8.71	4.75	11.07	7.47
2-1/2"x 2"	-	-	7.01	5.54	-	-	-	-	-	-	9.52	8.71	14.02	11.07
2-1/2"x 1-1/2"	-	-	7.01	5.08	-	-	-	-	-	-	9.52	7.14	14.02	10.16
2-1/2"x 1-1/4"	-	-	7.01	4.85	-	-	-	-	-	-	9.52	6.35	14.02	9.70
2-1/2"x 1"	-	-	7.01	4.55	-	-	-	-	-	-	9.52	6.35	14.02	9.70
3"x 2-1/2"	-	-	7.62	7.01	-	-	-	-	-	-	11.12	9.52	15.24	14.02
3"x 2"	-	-	7.62	5.54	-	-	-	-	-	-	11.12	8.71	15.24	11.07
3"x 1-1/2"	-	-	7.62	5.08	-	-	-	-	-	-	11.12	7.14	15.24	10.16
3"x 1-1/4"	-	-	7.62	4.85	-	-	-	-	-	-	11.12	6.35	15.24	9.70
3"x 1"	-	-	7.62	4.55	-	-	-	-	-	-	11.12	6.35	15.24	9.09
3-1/2"x 3"	-	-	8.08	7.62	-	-	-	-	-	-	-	-	-	-
3-1/2"x 2-1/2"	-	-	8.08	7.01	-	-	-	-	-	-	-	-	-	-
3-1/2"x 2"	-	-	8.08	5.54	-	-	-	-	-	-	-	-	-	-
3-1/2"x 1-1/2"	-	-	8.08	5.08	-	-	-	-	-	-	-	-	-	-
3-1/2"x 1-1/4"	-	-	8.08	4.85	-	-	-	-	-	-	-	-	-	-
4"x 3-1/2"	-	-	8.56	8.08	-	-	-	-	-	-	13.49	11.12	17.12	15.24
4"x 3"	-	-	8.56	7.62	-	-	-	-	-	-	13.49	9.54	17.12	14.02
4"x 2-1/2"	-	-	8.56	7.01	-	-	-	-	-	-	13.49	8.71	17.12	11.07
4"x 2"	-	-	8.56	5.54	-	-	-	-	-	-	13.49	7.14	17.12	10.16
4"x 1-1/2"	-	-	8.56	5.08	-	-	-	-	-	-	13.49	6.35	17.12	9.70
4"x 1-1/4"	-	-	8.56	4.85	-	-	-	-	-	-	13.49	6.35	17.12	9.70

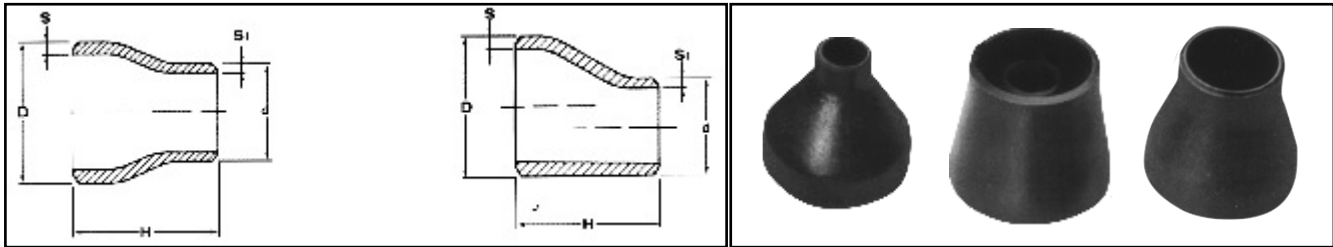
Concentric and Eccentric Reducers



Ødia.	D	d	H	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
				S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
4"x 1"	114.3	33.4	102	6.02	3.38	8.56	4.55	-	-	-	-	-	-	6.02	3.38
5"x 4"	141.3	114.3	127	6.55	6.02	9.52	8.56	-	-	-	-	-	-	6.55	6.02
5"x 3-1/2"	141.3	101.6		6.55	5.74	9.52	8.08	-	-	-	-	-	-	6.55	5.74
5"x 3"	141.3	88.9		6.55	5.49	9.52	7.62	-	-	-	-	-	-	6.55	5.49
5"x 2-1/2"	141.3	73.0		6.55	5.16	9.52	7.01	-	-	-	-	-	-	6.55	5.16
5"x 2"	141.3	60.3		6.55	3.91	9.52	5.54	-	-	-	-	-	-	6.55	3.91
6"x 5"	168.3	141.3	140	7.11	6.55	10.97	9.52	-	-	-	-	-	-	7.11	6.55
6"x 4"	168.3	114.3		7.11	6.02	10.97	8.56	-	-	-	-	-	-	7.11	6.02
6"x 3-1/2"	168.3	101.6		7.11	5.74	10.97	8.08	-	-	-	-	-	-	7.11	5.74
6"x 3"	168.3	88.9		7.11	5.49	10.97	7.62	-	-	-	-	-	-	7.11	5.49
6"x 2-1/2"	168.3	73.0		7.11	5.16	10.97	7.01	-	-	-	-	-	-	7.11	5.16
6"x 2"	168.3	60.3	7.11	3.91	10.97	5.54	-	-	-	-	-	-	7.11	3.91	
8"x 6"	219.1	168.3	152	8.18	7.11	12.70	10.97	-	-	-	-	-	-	8.18	7.11
8"x 5"	219.1	141.3		8.18	6.55	12.70	9.52	-	-	-	-	-	-	8.18	6.55
8"x 4"	219.1	114.3		8.18	6.02	12.70	8.56	-	-	-	-	-	-	8.18	6.02
8"x 3-1/2"	219.1	101.6		8.18	5.74	12.70	8.08	-	-	-	-	-	-	8.18	5.74
8"x 3"	219.1	88.9		8.18	5.49	12.70	7.62	-	-	-	-	-	-	8.18	5.49
10"x 8"	273.0	219.1	178	9.27	8.18	12.70	12.70	-	-	6.35	6.35	7.80	7.04	9.27	8.18
10"x 6"	273.0	168.3		9.27	7.11	12.70	10.97	-	-	-	-	-	-	9.27	7.11
10"x 5"	273.0	141.3		9.27	6.55	12.70	9.52	-	-	-	-	-	-	9.27	6.55
10"x 4"	273.0	114.3		9.27	6.02	12.70	8.56	-	-	-	-	-	-	9.27	6.02
10"x 3"	273.0	88.9		9.27	5.49	12.70	7.62	-	-	-	-	-	-	9.27	5.49
12"x 10"	323.8	273.0	203	9.52	9.27	12.70	12.70	-	-	6.35	6.35	8.38	7.80	10.31	9.27
12"x 8"	323.8	219.1		9.52	8.18	12.70	12.70	-	-	6.35	6.35	8.38	7.04	10.31	8.18
12"x 6"	323.8	168.3		9.52	7.11	12.70	10.97	-	-	-	-	-	-	10.31	7.11
12"x 5"	323.8	141.3		9.52	6.55	12.70	9.52	-	-	-	-	-	-	10.31	6.55
12"x 4"	323.8	114.3		9.52	6.02	12.70	8.56	-	-	-	-	-	-	10.31	6.02
14"x 12"	355.6	323.0	330	9.52	9.52	12.70	12.70	-	-	7.92	6.35	9.52	8.38	11.12	10.31
14"x 10"	355.6	273.0		9.52	9.27	12.70	12.70	-	-	7.92	6.35	9.52	7.80	11.12	9.27
14"x 8"	355.6	219.1		9.52	8.18	12.70	12.70	-	-	7.92	6.35	9.52	7.04	11.12	8.18
14"x 6"	355.6	168.3		9.52	7.11	12.70	10.97	-	-	-	-	-	-	11.12	7.11
16"x 14"	406.4	355.6		9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	9.52	9.52	12.70	11.12
16"x 12"	406.4	323.8	9.52	9.52	12.70	12.70	-	-	7.92	6.35	9.52	8.38	12.70	10.31	
16"x 10"	406.4	273.0	9.52	9.27	12.70	12.70	-	-	7.92	6.35	9.52	7.80	12.70	9.27	
16"x 8"	406.4	219.1	9.52	8.18	12.70	12.70	-	-	7.92	6.35	9.52	7.04	12.70	8.18	

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
4"x 1"	-	-	8.56	4.55	-	-	-	-	-	-	13.49	8.35	17.12	9.09
5"x 4"	-	-	9.52	8.56	-	-	12.70	11.20	-	-	15.87	13.49	19.05	17.12
5"x 3-1/2"	-	-	9.52	8.08	-	-	-	-	-	-	-	-	-	-
5"x 3"	-	-	9.52	7.62	-	-	-	-	-	-	15.87	11.12	19.05	15.24
5"x 2-1/2"	-	-	9.52	7.01	-	-	-	-	-	-	15.87	9.52	19.05	14.02
5"x 2"	-	-	9.52	6.54	-	-	-	-	-	-	15.87	8.71	19.05	11.07
6"x 5"	-	-	10.97	9.52	-	-	14.27	12.70	-	-	18.24	15.87	21.94	19.05
6"x 4"	-	-	10.97	8.56	-	-	14.27	11.12	-	-	18.24	13.49	21.94	17.12
6"x 3-1/2"	-	-	10.97	8.08	-	-	-	-	-	-	-	-	-	-
6"x 3"	-	-	10.97	7.62	-	-	-	-	-	-	18.24	11.12	21.94	15.44
6"x 2-1/2"	-	-	10.97	7.01	-	-	-	-	-	-	18.24	9.52	21.94	14.02
6"x 2"	-	-	10.97	6.54	-	-	-	-	-	-	18.24	8.71	21.94	11.07
8"x 6"	-	-	12.70	10.97	-	-	18.24	14.27	-	-	23.01	18.24	22.22	21.94
8"x 5"	-	-	12.70	9.52	-	-	18.24	12.70	-	-	23.01	15.87	22.22	19.05
8"x 4"	-	-	12.70	8.56	-	-	18.24	11.12	-	-	23.01	13.49	22.22	17.12
8"x 3-1/2"	-	-	12.70	8.08	-	-	-	-	-	-	-	-	-	-
8"x 3"	-	-	12.70	7.62	-	-	-	-	-	-	23.01	11.12	22.22	15.24
10"x 8"	12.70	10.30	15.06	12.70	18.24	15.06	21.41	18.24	25.40	20.62	28.57	23.01	26.40	22.22
10"x 6"	-	-	15.06	10.97	-	-	21.41	14.27	-	-	28.57	18.24	26.40	21.94
10"x 5"	-	-	15.06	9.52	-	-	21.41	12.70	-	-	28.57	15.87	26.40	19.05
10"x 4"	-	-	15.06	8.56	-	-	21.41	11.12	-	-	28.57	13.49	26.40	17.12
10"x 3"	-	-	15.06	7.62	-	-	-	-	-	-	28.57	11.12	26.40	15.24
12"x 10"	14.30	12.70	17.45	15.06	21.41	18.24	25.40	21.41	28.57	25.40	33.32	28.57	26.40	28.40
12"x 8"	14.30	10.30	17.45	12.70	21.41	15.06	25.40	18.24	28.57	20.62	33.32	23.01	26.40	22.22
12"x 6"	-	-	17.45	10.97	-	-	25.40	14.27	-	-	33.32	18.24	26.40	21.94
12"x 5"	-	-	17.45	9.52	-	-	25.40	12.70	-	-	33.32	15.87	26.40	19.05
12"x 4"	-	-	17.45	8.56	-	-	25.40	11.12	-	-	33.32	13.49	26.40	17.12
14"x 12"	15.10	14.30	19.05	17.45	23.80	21.41	27.76	25.40	31.75	28.57	35.71	33.32	-	-
14"x 10"	15.10	12.70	19.05	15.06	23.80	18.24	27.76	21.41	31.75	25.40	35.71	28.57	-	-
14"x 8"	15.10	10.30	19.05	12.70	23.80	15.06	27.76	18.24	31.75	20.62	35.71	23.01	-	-
14"x 6"	-	-	19.05	10.97	-	-	27.76	14.27	-	-	35.71	18.24	-	-
16"x 14"	16.70	15.10	21.41	19.05	26.19	23.80	30.94	27.76	36.52	31.75	40.46	35.71	-	-
16"x 12"	16.70	14.30	21.41	17.45	26.19	21.41	30.94	25.40	36.52	28.57	40.46	33.32	-	-
16"x 10"	16.70	12.70	21.41	15.06	26.19	18.24	30.94	21.41	36.52	25.40	40.46	28.57	-	-
16"x 8"	16.70	10.30	21.41	12.70	26.19	15.06	30.94	18.24	36.52	20.62	40.46	23.01	-	-

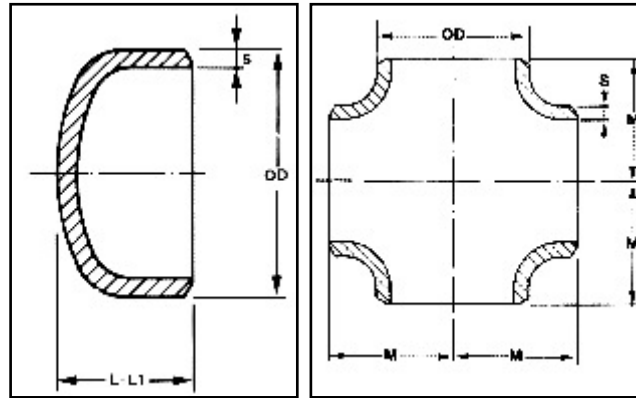
Concentric and Eccentric Reducers



Ødia.	D	d	H	SCH.STD		SCH.XS		SCH.10		SCH.20		SCH.30		SCH.40	
				S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
16"x 6"	406.4	168.3	356	9.52	7.11	12.70	10.97	-	-	-	-	-	-	12.70	7.11
16"x 16"	457.2	406.4	381	9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	11.12	9.52	14.27	12.70
18"x 14"	457.2	355.6		9.52	9.52	12.70	12.70	6.35	6.35	7.92	7.92	11.12	9.52	14.27	11.12
18"x 12"	457.2	323.8		9.52	9.52	12.70	12.70	-	-	7.92	6.35	11.12	8.38	14.27	10.31
18"x 10"	457.2	273.0		9.52	9.27	12.70	12.70	-	-	7.92	6.35	11.12	7.80	14.27	9.27
18"x 8"	457.2	219.1		9.52	8.18	12.70	12.70	-	-	7.92	6.35	11.12	7.04	14.27	8.18
20"x 18"	508.0	457.2	508	9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	11.12	15.06	14.27
20"x 16"	508.0	406.4		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	15.06	12.70
20"x 14"	508.0	355.6		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	15.06	11.12
20"x 12"	508.0	323.8		9.52	9.52	12.70	12.70	-	-	9.52	6.35	12.70	8.38	15.06	10.31
20"x 10"	508.0	273.0		9.52	9.27	12.70	12.70	-	-	9.52	6.35	12.70	7.80	15.06	9.27
20"x 8"	508.0	219.1		9.52	8.18	12.70	12.70	-	-	9.52	6.35	12.70	7.04	15.06	8.18
22"x 20"	558.8	508.0	508	9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	12.70	12.70	-	-
22"x 18"	558.8	457.2		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	11.12	-	-
22"x 16"	558.8	406.4		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	-	-
22"x 14"	558.8	355.6		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	12.70	9.52	-	-
24"x 22"	609.6	558.8	508	9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	14.25	12.70	-	-
24"x 20"	609.6	508.0		9.52	9.52	12.70	12.70	6.35	6.35	9.52	9.52	14.25	12.70	17.45	15.06
24"x 18"	609.6	457.2		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	11.12	17.45	14.27
24"x 16"	609.6	406.4		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	9.52	17.45	12.70
24"x 14"	609.6	355.6		9.52	9.52	12.70	12.70	6.35	6.35	9.52	7.92	14.25	9.52	17.45	11.12

Ødia.	SCH.60		SCH.80		SCH.100		SCH.120		SCH.140		SCH.160		SCH.XXS	
	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1	S	S1
16"x 6"	-	-	21.41	10.07	-	-	30.94	14.27	-	-	40.46	18.24	-	-
18"x 16"	19.05	16.70	23.80	21.41	29.36	26.19	34.92	30.94	39.67	36.52	45.24	40.46	-	-
18"x 14"	19.05	15.10	23.80	19.05	29.36	23.80	34.92	27.76	39.67	31.75	45.24	35.71	-	-
18"x 12"	19.05	14.30	23.80	17.45	29.36	21.41	34.92	25.40	39.67	28.57	45.24	33.32	-	-
18"x 10"	19.05	12.70	23.80	15.06	29.36	18.24	34.92	21.41	39.67	25.40	45.24	28.57	-	-
18"x 8"	19.05	10.30	23.80	12.70	29.36	15.06	34.92	18.24	39.67	20.62	45.24	23.01	-	-
20"x 18"	20.60	19.05	26.19	23.80	32.54	29.36	38.10	34.92	44.45	39.67	49.99	45.24	-	-
20"x 16"	20.60	16.70	26.19	21.41	32.54	26.19	38.10	30.94	44.45	36.52	49.99	40.46	-	-
20"x 14"	20.60	15.10	26.19	19.05	32.54	23.80	38.10	27.76	44.45	31.75	49.99	35.71	-	-
20"x 12"	20.60	14.30	26.19	17.45	32.54	21.41	38.10	25.40	44.45	28.57	49.99	33.32	-	-
20"x 10"	20.60	12.70	26.19	15.06	32.54	18.24	38.10	21.41	44.45	25.40	49.99	28.57	-	-
20"x 8"	20.60	10.30	26.19	12.70	32.54	15.06	38.10	18.24	44.45	20.62	49.99	23.01	-	-
22"x 20"	22.22	20.60	28.58	26.19	34.92	32.54	41.28	38.10	47.63	44.45	53.98	49.99	-	-
22"x 18"	22.22	19.05	28.58	23.80	34.92	29.36	41.28	34.92	47.63	39.67	53.98	45.24	-	-
22"x 16"	22.22	16.70	28.58	21.41	34.92	26.19	41.28	30.94	47.63	36.52	53.98	40.46	-	-
22"x 14"	22.22	15.10	28.58	19.05	34.92	23.80	41.28	27.76	47.63	31.75	53.98	35.71	-	-
24"x 22"	24.60	22.22	30.94	28.58	38.89	34.92	46.02	41.28	52.37	47.63	59.51	53.98	-	-
24"x 20"	24.60	20.60	30.94	26.19	38.89	32.54	46.02	38.10	52.37	44.45	59.51	49.99	-	-
24"x 18"	24.60	19.05	30.94	23.80	38.89	29.36	46.02	34.92	52.37	39.67	59.51	45.24	-	-
24"x 16"	24.60	16.70	30.94	21.41	38.89	26.19	46.02	30.94	52.37	34.52	59.51	40.46	-	-
24"x 14"	24.60	15.10	30.94	19.05	38.89	23.80	46.02	27.76	52.37	31.75	59.51	35.71	-	-



ANSI Caps and Equal Cross



Ødia.	OD	L	L1	S=SCHEDULE													
				STD	XS	10	20	30	40	60	80	100	120	140	160	XXS	
1/2"	21.3	25.9	25.9	2.77	3.73	-	-	-	2.77	-	3.73	-	-	-	4.75	7.47	
3/4"	26.7	31.7	31.7	2.87	3.91	-	-	-	2.87	-	3.91	-	-	-	5.54	7.82	
1"	33.4	38.1	38.1	3.38	4.55	-	-	-	3.38	-	4.55	-	-	-	6.35	9.09	
1-1/4"	42.4	38.1	38.1	3.56	4.85	-	-	-	3.56	-	4.85	-	-	-	6.35	9.70	
1-1/2"	48.3	38.1	38.1	3.68	5.08	-	-	-	3.68	-	5.08	-	-	-	7.14	10.16	
2"	60.3	38.1	44.4	3.91	5.54	-	-	-	3.91	-	5.54	-	-	-	8.71	11.07	
2-1/2"	73.0	38.1	50.8	5.16	7.01	-	-	-	5.16	-	7.01	-	-	-	9.52	14.02	
3"	88.9	50.8	63.5	5.49	7.62	-	-	-	5.49	-	7.62	-	-	-	11.12	15.24	
3-1/2"	101.6	63.5	76.2	5.74	8.08	-	-	-	5.74	-	8.08	-	-	-	-	-	
4"	114.3	63.5	76.2	6.02	8.56	-	-	-	6.02	-	8.56	-	11.12	-	13.49	17.12	
5"	141.3	76.2	88.9	6.55	9.52	-	-	-	6.55	-	9.52	-	12.70	-	15.87	19.05	
6"	168.3	88.9	101.6	7.11	10.97	-	-	-	7.11	-	10.97	-	14.27	-	18.24	21.94	
8"	219.1	101.6	127.0	8.18	12.70	-	6.35	7.04	8.18	10.30	12.70	15.06	18.24	20.62	23.01	22.22	
10"	273.0	127.0	152.4	9.27	12.70	-	6.35	7.80	9.27	12.70	15.06	18.24	21.41	25.40	28.57	26.40	
12"	323.8	152.4	177.8	9.52	12.70	-	6.35	8.38	10.31	14.30	17.45	21.41	25.40	28.57	33.32	26.40	
14"	355.6	165.1	190.5	9.52	12.70	6.35	7.92	9.52	11.12	15.10	19.05	23.80	27.76	31.75	35.71	-	
16"	406.4	177.8	203.2	9.52	12.70	6.35	7.92	9.52	12.70	16.70	21.41	26.19	30.94	36.52	40.46	-	
18"	457.2	203.2	228.6	9.52	12.70	6.35	7.92	11.12	14.27	19.05	23.80	29.36	34.92	39.67	45.24	-	
20"	508.0	228.6	254.0	9.52	12.70	6.35	9.52	12.70	15.06	20.60	26.19	32.54	38.10	44.45	49.99	-	
22"	558.8	254.0	279.4	9.52	12.70	6.35	9.52	12.70	-	-	-	-	-	-	-	-	
24"	609.6	266.7	304.8	9.52	12.70	6.35	9.52	14.25	17.45	24.60	30.94	38.89	46.02	52.37	59.51	-	
26"	660.4	266.7	266.7	9.52	12.70	7.92	12.70	-	-	-	-	-	-	-	-	-	
28"	711.2	266.7	266.7	9.52	12.70	7.92	12.70	15.88	-	-	-	-	-	-	-	-	
30"	762.0	266.7	266.7	9.52	12.70	7.92	12.70	15.88	-	-	-	-	-	-	-	-	
32"	812.8	266.7	266.7	9.52	12.70	7.92	12.70	15.88	17.45	-	-	-	-	-	-	-	
34"	863.6	266.7	266.7	9.52	12.70	7.92	12.70	15.88	17.45	-	-	-	-	-	-	-	
36"	914.4	266.7	266.7	9.52	12.70	7.92	12.70	15.88	19.05	-	-	-	-	-	-	-	

Ødia.	OD	M	S=SCHEDULE													
			STD	XS	10	20	30	40	60	80	100	120	140	160	XXS	
1/2"	21.3	25	2.77	3.73	-	-	-	2.77	-	3.73	-	-	-	4.75	7.47	
3/4"	26.7	30	2.87	3.91	-	-	-	2.87	-	3.91	-	-	-	5.54	7.82	
1"	33.4	38	3.38	4.55	-	-	-	3.38	-	4.55	-	-	-	6.35	9.09	
1-1/4"	42.4	48	3.56	4.85	-	-	-	3.56	-	4.85	-	-	-	6.35	9.70	
1-1/2"	48.3	57	3.68	5.08	-	-	-	3.68	-	5.08	-	-	-	7.14	10.16	
2"	60.3	64	3.91	5.54	-	-	-	3.91	-	5.54	-	-	-	8.71	11.07	
2-1/2"	73.0	76	5.16	7.01	-	-	-	5.16	-	7.01	-	-	-	9.52	14.02	
3"	88.9	86	5.49	7.62	-	-	-	5.49	-	7.62	-	-	-	11.12	15.24	
3-1/2"	101.6	95	5.74	8.08	-	-	-	5.74	-	8.08	-	-	-	-	-	
4"	114.3	105	6.02	8.56	-	-	-	6.02	-	8.56	-	11.12	-	13.49	17.12	
5"	141.3	124	6.55	9.52	-	-	-	6.55	-	9.52	-	12.70	-	15.87	19.05	
6"	168.3	143	7.11	10.97	-	-	-	7.11	-	10.97	-	14.27	-	18.24	21.94	
8"	219.1	178	8.18	12.70	-	6.35	7.04	8.18	10.30	12.70	15.06	18.24	20.62	23.01	22.22	
10"	273.0	216	9.27	12.70	-	6.35	7.80	9.27	12.70	15.06	18.24	21.41	25.40	28.57	26.40	
12"	323.8	254	9.52	12.70	-	6.35	8.38	10.31	14.30	17.45	21.41	25.40	28.57	33.32	26.40	
14"	355.6	279	9.52	12.70	6.35	7.92	9.52	11.12	15.10	19.05	23.80	27.76	31.75	35.71	-	
16"	406.4	305	9.52	12.70	6.35	7.92	9.52	12.70	16.70	21.41	26.19	30.94	36.52	40.46	-	
18"	457.2	343	9.52	12.70	6.35	7.92	11.12	14.27	19.05	23.80	29.36	34.92	39.67	45.24	-	
20"	508.0	381	9.52	12.70	6.35	9.52	12.70	15.06	20.60	26.19	32.54	38.10	44.45	49.99	-	
22"	558.8	419	9.52	12.70	6.35	9.52	12.70	-	-	-	-	-	-	-	-	
24"	609.6	419	9.52	12.70	6.35	9.52	14.25	17.45	24.60	30.94	38.89	46.02	52.37	59.51	-	
26"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
28"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
32"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36"	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	






Weights of Fittings (Kg.)

Type	DIAM.	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"	5"	6"	8"	
	<small>mm</small> SCH	21.3	26.7	33.4	42.2	48.3	60.3	73.0	88.9	101.6	114.3	141.3	168.3	219.1	
 ANSI L.R. 90° R=1.5D	STD	0.08	0.08	0.15	0.16	0.36	0.65	1.30	2	3	4	7	10	21	
	XS	0.10	0.10	0.19	0.34	0.49	0.90	1.71	2.75	4	5	9	15	31	
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	13
	30	-	-	-	-	-	-	-	-	-	-	-	-	-	18
	40	0.08	0.08	0.15	0.26	0.36	0.65	1.30	2	3	4	7	10	21	21
	60	-	-	-	-	-	-	-	-	-	-	-	-	-	26
	80	0.10	0.10	0.19	0.34	0.49	0.90	1.71	2.75	4	5	9	15	15	31
	100	-	-	-	-	-	-	-	-	-	-	-	-	-	37
	120	-	-	-	-	-	-	-	-	-	-	7	12	20	44
	140	-	-	-	-	-	-	-	-	-	-	-	-	-	49
	180	0.12	0.13	0.25	0.42	0.65	1.35	2.25	4	-	8	15	25	25	55
	XXS	0.15	0.17	0.33	0.60	0.86	1.62	3	5	-	10	18	29	29	62
	 ANSI S.R. 90° R=1D	STD	-	-	0.10	0.17	0.24	0.44	0.87	1.35	1.90	2.60	4.40	7	14
XS		-	-	0.13	0.22	0.32	0.60	1.15	1.83	2.65	3.60	6.20	10	21	
10		-	-	-	-	-	-	-	-	-	-	-	-	-	
20		-	-	-	-	-	-	-	-	-	-	-	-	11	
30		-	-	-	-	-	-	-	-	-	-	-	-	12	
40		-	-	0.10	0.17	0.24	0.44	0.87	1.35	1.90	2.60	4.40	7	14	
60		-	-	-	-	-	-	-	-	-	-	-	-	17	
80		-	-	0.13	0.22	0.32	0.60	1.15	1.83	2.65	3.60	6.20	10	21	
100		-	-	-	-	-	-	-	-	-	-	-	-	25	
120		-	-	-	-	-	-	-	-	-	-	4.60	8	13	29
140		-	-	-	-	-	-	-	-	-	-	-	-	33	
160		-	-	0.17	0.28	0.43	0.90	1.50	2.60	-	5.40	9.90	16	36	
XXS		-	-	0.21	0.39	0.57	1.10	2.05	3.10	-	6.60	11.50	19	35	

Weights of Fittings (Kg.)

10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	DIAM.
273.0	323.8	355.6	406.4	457.2	508.0	558.8	609.6	660.4	711.2	762.0	812.8	863.6	914.4	
10	15	30	37	45	68	72	77	100	105	110	125	130	135	
14	19	36	48	58	86	93	100	130	140	145	150	158	175	
-	-	25	33	40	62	67	70							
9	13	28	35	42	68	72	77	130	140					
20	14	30	37	54	86	93	115	-						
10	16	34	48	68	105	130	143	-	-	-				
14	23	47	62	90	140		205	-	-	-	-	-	-	
18	29	60	82	110	173		257	-	-	-	-	-	-	
22	35	72	98	132	210		315	-	-	-	-	-	-	
26	41	82	114	150	240		380	-	-	-	-	-	-	
30	46	92	131	172	275		440	-	-	-	-	-	-	
32	56	104	145	195	310	450	480	-	-	-	-	-	-	
34	48	-	-	-	-	-	-	-	-	-	-	-	-	
30	47	80	75	105	125	165	185	250	300	345	410	460	520	
48	77	95	103	125	160	205	235	320	380	435	500	580	650	
-	-													
30	49	85	103	170	250	300	330	-	-	-				
52	80	125	195	235	330	490	550	-	-	-	-	-	-	
88	145	270	360	500	700	1130	1180	-	-	-	-	-	-	
95	130	-	-	-	-	-	-	-	-	-	-	-	-	
39	61	78	97	136	163	189	215							
62	101	124	134	163	208	241	267							
-	-													
39	68													
111	182													
10	14	17	23	28	35	44	51	56	60	65	71	80	85	
12	18	23	30	32	46	54	80	70	75	85	95	100	110	
-	-													
10	14	23	30	43	60	85	98	-	-	-				
17	31	42	55	75	100	130	155	-	-	-	-	-	-	
34	55	77	100	110	175	240	285	-	-	-	-	-	-	
30	42	-	-	-	-	-	-	-	-	-	-	-	-	

Weights of Fittings (Kg.)

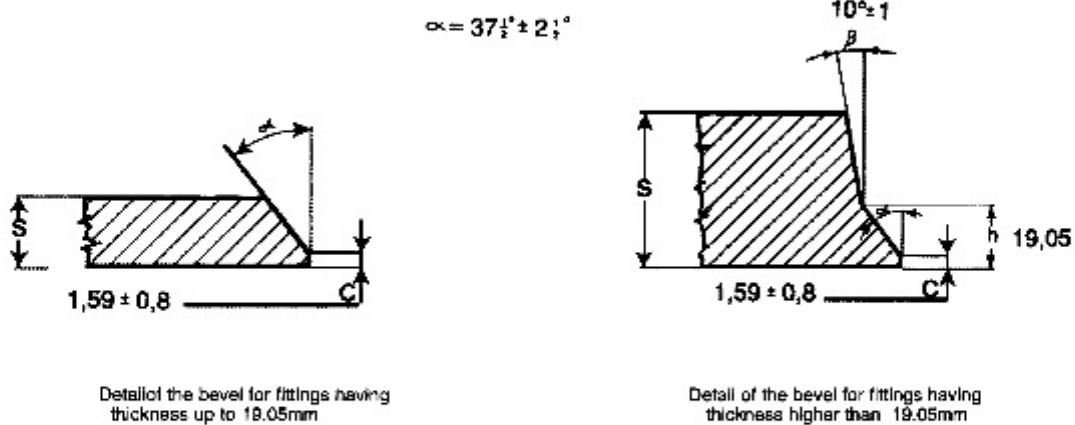
Type	DIAM.	1/2'	3/4'	1'	1-1/4'	1-1/2'	2'	2-1/2'	3'	3-1/2'	4'	5'	6'	8'
	SCH / mm	21.3	26.7	33.4	42.2	48.3	60.3	73.0	88.0	101.6	114.3	141.3	168.3	219.1
	STD		0.09	0.10	0.20	0.30	0.40	0.80	1.00	1.40	1.60	2.80	4.00	6.50
	XS		0.16	0.20	0.30	0.40	0.60	1.00	1.40	2.00	2.20	4.00	6.00	9.90
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	5.60
	30	-	-	-	-	-	-	-	-	-	-	-	-	6.20
	40		0.09	0.10	0.20	0.30	0.40	0.80	1.00	1.40	1.60	2.80	4.00	6.50
	60	-	-	-	-	-	-	-	-	-	-	-	-	8.60
	80		0.16	0.20	0.30	0.40	0.60	1.00	1.40	2.00	2.20	4.00	6.00	9.90
	100	-	-	-	-	-	-	-	-	-	-	-	-	12.60
	120	-	-	-	-	-	-	-	-	-	3.00	5.60	8.30	15
	140	-	-	-	-	-	-	-	-	-	-	-	-	17
	160			0.25	0.30	0.50	1.10	1.60	2.00	2.80	4.00	7.00	10.50	18
	XXS			0.35	0.45	0.70	1.30	2.10	2.60	3.70	4.70	8.00	12.30	18
	STD	0.10	0.16	0.36	0.50	0.70	1.00	1.80	2.70	3.55	4.40	7.00	10	19
	XS	0.16	0.22	0.47	0.70	0.90	1.40	2.20	3.00	4.89	6.40	9.30	15	28.90
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	0.10	0.16	0.36	0.50	0.70	1.00	1.80	2.70	3.55	4.40	7.00	10	19
	60	-	-	-	-	-	-	-	-	-	-	-	-	-
	80	0.16	0.22	0.47	0.70	0.90	1.40	2.20	3.00	4.89	6.40	9.30	15	28.90
	100	-	-	-	-	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-
	140	-	-	-	-	-	-	-	-	-	-	-	-	-
	160	0.25	0.35	0.80	1.00	1.50	2.50	4.00	6.00	8.00	10	20	25	52
	XXS	0.30	0.45	1.00	1.20	1.80	3.00	6.00	8.00	11	13	24	30	52
	STD	0.13	0.20	0.47	0.65	0.91	1.30	2.35	3.50	4.60	5.70	9.10	13	24.70
	XS	0.20	0.30	0.61	0.91	1.17	1.85	2.90	3.90	6.35	8.30	12	19.50	37.60
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	0.13	0.20	0.47	0.65	0.91	1.30	2.35	3.50	4.60	5.70	9.10	13	24.70
	60	-	-	-	-	-	-	-	-	-	-	-	-	-
	80	0.20	0.30	0.61	0.91	1.17	1.85	2.90	3.90	6.35	8.30	12	19.50	37.60
	100	-	-	-	-	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-
	140	-	-	-	-	-	-	-	-	-	-	-	-	-
	160	0.32	0.45	1.04	1.30	1.95	3.25	5.20	7.80	10.40	13	26	32.5	67.60
	XXS	0.40	0.60	1.30	1.56	2.35	3.90	7.80	10.40	14.30	16.90	31.20	39	37.60
	STD	0.03	0.06	0.10	0.20	0.25	0.30	0.40	0.60	1.10	1.20	2.10	3.60	5.50
	XS	0.05	0.10	0.15	0.25	0.30	0.35	0.50	0.90	1.70	2.00	3.00	5.00	7.00
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	0.03	0.06	0.10	0.20	0.25	0.30	0.40	0.60	1.10	1.20	2.10	3.60	5.50
	60	-	-	-	-	-	-	-	-	-	-	-	-	-
	80	0.05	0.10	0.15	0.25	0.30	0.35	0.50	0.90	1.70	2.00	3.00	5.00	7.00
	100	-	-	-	-	-	-	-	-	-	-	-	-	-
	120	-	-	-	-	-	-	-	-	-	-	-	-	-
	140	-	-	-	-	-	-	-	-	-	-	-	-	-
160	0.10	0.10	0.15	0.25	0.30	0.55	0.90	1.40	2.50	3.00	5.50	7.50	18	
XXS	0.15	0.15	0.20	0.30	0.40	0.60	1.00	1.80	2.70	4.00	7.00	9.00	18	

Weights of Fittings (Kg.)

10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	DIAM
273.0	323.8	355.6	406.4	457.2	508.0	558.8	609.6	660.4	711.2	762.0	812.8	863.6	914.4	mm SCH
37	54	69	90	114	141	171	203	240	280	318	363	410	460	STD
49	71	91	119	151	186	226	270	318	370	422	481	545	670	XS
-	-	46	61	77	95	115	136	200	232	265	302	342	382	10
25	36	57	75	95	141	171	203	317	368	422	482	544	610	20
31	47	69	90	133	186	226	302	405	458	526	600	680	760	30
37	58	80	120	170	220	-	370	-	-	-	660	745	910	40
50	80	108	155	223	300	390	512	-	-	-	-	-	-	60
58	95	133	196	275	375	495	640	-	-	-	-	-	-	80
70	115	195	240	335	460	595	790	-	-	-	-	-	-	100
80	135	180	276	395	530	695	920	-	-	-	-	-	-	120
95	150	215	320	440	610	795	1035	-	-	-	-	-	-	140
105	175	240	360	500	680	890	1165	-	-	-	-	-	-	160
94	135	-	-	-	-	-	-	-	-	-	-	-	-	XXS
24	36	46	60	76	94	114	136	-	-	-	-	-	-	STD
33	47	61	79	100	124	151	180	-	-	-	-	-	-	XS
-	-	31	40	51	63	77	91	-	-	-	-	-	-	10
17	24	39	50	64	94	114	136	-	-	-	-	-	-	20
21	32	46	60	88	124	151	202	-	-	-	-	-	-	30
24	39	53	79	113	147	-	245	-	-	-	-	-	-	40
33	53	71	103	148	200	260	341	-	-	-	-	-	-	60
39	64	90	130	185	250	330	424	-	-	-	-	-	-	80
46	77	110	157	223	305	400	526	-	-	-	-	-	-	100
54	90	126	184	262	353	464	614	-	-	-	-	-	-	120
62	100	142	213	300	408	530	691	-	-	-	-	-	-	140
70	115	160	235	332	452	591	775	-	-	-	-	-	-	160
62	90	-	-	-	-	-	-	-	-	-	-	-	-	XXS

ANSI B16.9

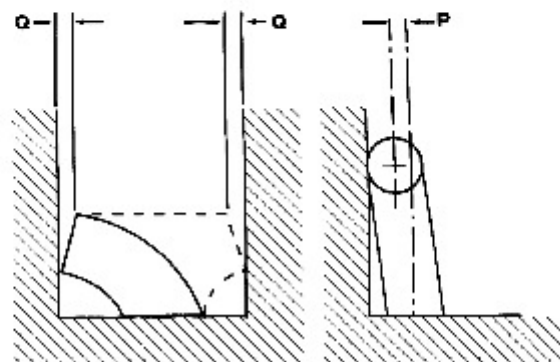
DIMENSIONAL TOLERANCES ACCORDING TO ANSI B 16.9 STANDARDS



For all fittings				45°-90° elbows / Tees	Reducers	180° Elbows	Caps		
Pipe nominal size	Outside dia. at the bevel	Inside diam. at end.	Thickness	Center to end	Length	centre to centre	Height	Alignment of ends	Height
1/2" - 2-1/2"	+1.59 -0.59	±0.79	Not less than 87.5% of the nom. thickness	±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
3" - 3-1/2"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
4"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
5" - 8"	+2.38 -1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±6.35
10" - 18"	+3.97 -3.17	±3.17		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
20" - 24"	+6.35 -4.76	±4.76		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
26" - 32"	+6.35 -4.76	±4.76		±3.2	±4.76	±9.53	±6.35	±1.59	±9.53
34" - 36"	+6.35 -4.76	±4.76		±4.76	±4.76	±9.53	±6.35	±1.59	±9.53

Angularity Tolerances, ANSI B16.9 (mm)

NOMINAL PIPE SIZE NPS DN	OFF ANGLE Q	OFF PLANE P
1/2-4 15-100	± 1	± 2
5-8 125-200	± 2	± 4
10-12 250-300	± 3	± 5
14-16 350-400	± 3	± 7
18-24 450-600	± 4	± 10
28-30 650-750	± 5	± 10
32-36 800-900	± 5	± 13



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.

ASTM A234

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.	Transv.
Carbon Steel	1) 2) 3) WPB	0.30	0.29-1.06	0.050	0.058	0.10 min.					415	240	30	20
	2) 3) WPC	0.35	0.29-1.06	0.050	0.058	0.10 min.					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	0.60 max	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	0.50 max	1.90-2.60	0.87-1.13			415	205	30	20
	WP5	0.15	0.30-0.80	0.040	0.030	0.50 max	4.00-8.00	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.

ASTM A420

Type of the steel	ASTM Grade	Chemical Composition (%)						
		C	Mn	P	S	Si	Ni	Cu
Carbon steel	^{B,C} WPL6	0.30	0.39-1.06	0.048	0.058	0.10 min.	-	-
2% Nickel (1% Copper) Steel	WPL9	0.20	0.40-1.06	0.045	0.060	-	1.60-2.24	0.75-1.25
3.5% Nickel Steel	^D WPL3	0.20	0.31-0.64	0.05	0.05	0.13-0.37	3.18-3.82	-
9% Nickel Steel	^E WPL8	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	Minimum average of 3 specimens J	Minimum average on one specimen only J	Test temperature °C	Temperature °C	Min. holding time min.
				Longitudinal	Transverse						
Carbon steel	WPL6	415	240	30	18.5	10X10	17.6	13.6	-48.6	595-850	1 h/25.4 mm. 3/4 h 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	13.8	-79.3	560-595	1 h/25.4 mm. 2 h 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	540-520	1/4 h/25.4 mm. 1 h 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	-186.6	565-595	1/2 h/25.4 mm. 1 h min.
						10X7.5	28.5	23.1			
						10X5	23.1	18.0			
						10X2.5	10.8	8.1			