

LEE SUPPLY

CARBON STEEL BUTT-WELD FITTINGS



Technical Specifications

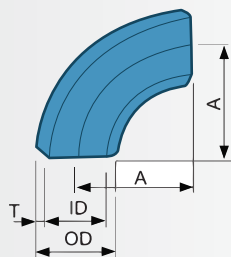
ELBOW

Long & Short Radius

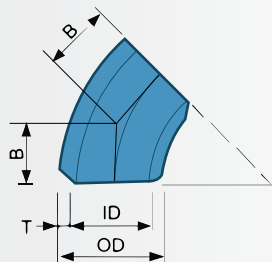
ASTM/ASME A234

ANSI B 16.9 / B 16.28

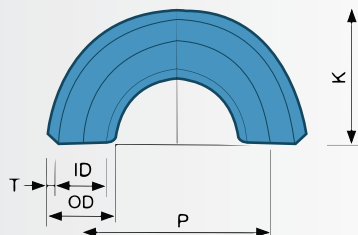
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	inch	in	mm	in	mm	in	mm	in	mm	in	mm
1/2"	0.840"	21.34	0.622" 0.546" 0.464" 0.252"	15.80 13.88 11.78 6.40	Std/40 40s XS/80 80s 160 XXS	0.109" 0.147" 0.188" 0.294"	2.77 3.73 4.78 7.47	A = 1.500" B = 0.618" P = 3.000" K = 1.882"	A = 38.10 B = 15.70 P = 76.20 K = 47.80	-	-
3/4"	1.050"	26.67	0.824" 0.742" 0.612" 0.434"	20.93 18.85 15.55 11.03	Std/40 40s XS/80 80s 160 XXS	0.113" 0.154" 0.219" 0.308"	2.87 3.91 5.56 7.82	A = 1.500" B = 0.752" P = 3.000" K = 2.000"	A = 38.10 B = 19.10 P = 76.20 K = 50.80	-	-
1"	1.315"	33.40	1.049" 0.957" 0.815" 0.599"	26.64 24.30 20.70 15.22	Std/40 40s XS/80 80s 160 XXS	0.133" 0.179" 0.250" 0.358"	3.38 4.55 6.35 9.09	A = 1.500" B = 0.882" P = 3.000" K = 2.189"	A = 38.10 B = 22.40 P = 76.20 K = 55.60	A = 1.000" P = 2.000" K = 1.618"	A = 25.40 P = 50.80 K = 41.10
1 1/4"	1.660"	42.16	1.380" 1.278" 1.160" 0.896"	35.04 32.46 29.46 22.76	Std/40 40s XS/80 80s 160 XXS	0.140" 0.191" 0.250" 0.382"	3.56 4.85 6.35 9.70	A = 1.874" B = 1.000" P = 3.752" K = 2.752"	A = 47.60 B = 25.40 P = 95.30 K = 69.90	A = 1.252" P = 2.500" K = 2.059"	A = 31.80 P = 63.50 K = 52.30
1 1/2"	1.900"	48.26	1.610" 1.500" 1.338" 1.100"	40.90 38.10 33.98 27.94	Std/40 40s XS/80 80s 160 XXS	0.145" 0.200" 0.281" 0.400"	3.68 5.08 7.14 10.16	A = 2.252" B = 1.118" P = 4.500" K = 3.252"	A = 57.20 B = 28.40 P = 114.30 K = 82.60	A = 1.500" P = 3.000" K = 2.441"	A = 38.10 P = 76.20 K = 62.00
2"	2.375"	60.32	2.067" 1.939" 1.687" 1.503"	52.50 49.24 42.84 38.18	Std/40 40s XS/80 80s 160 XXS	0.154" 0.218" 0.344" 0.436"	3.91 5.54 8.74 11.07	A = 3.000" B = 1.382" P = 6.000" K = 4.189"	A = 76.20 B = 35.10 P = 152.40 K = 106.40	A = 2.000" P = 4.000" K = 3.189"	A = 50.80 P = 101.60 K = 81.00

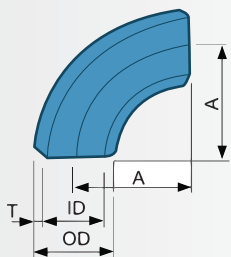
ELBOW

Long & Short Radius

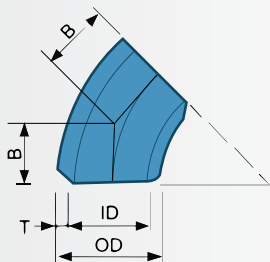
ASTM/ASME A234

ANSI B 16.9 / B 16.28

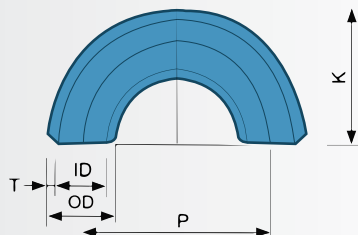
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	in	mm	in	mm		in	mm	in	mm	in	mm
2 1/2"	2.875"	73.03	2.469" 2.323" 2.126" 1.771"	62.71 59.01 53.99 44.99	Std/40 40s XS/80 80s 160 XXS	0.203" 0.276" 0.375" 0.552"	5.16 7.01 9.52 14.02	A = 3.752" B = 1.752" P = 7.500" K = 5.189"	A = 95.30 B = 44.50 P = 190.50 K = 131.80	A = 2.500" P = 5.000" K = 3.941"	A = 63.50 P = 127.00 K = 100.01
3"	3.500"	88.9	3.068" 2.900" 2.624" 2.300"	77.92 73.66 66.66 58.42	Std/40 40s XS/80 80s 160 XXS	0.216" 0.300" 0.438" 0.600"	5.49 7.62 11.12 15.24	A = 4.500" B = 2.000" P = 9.000" K = 6.252"	A = 114.30 B = 50.80 P = 228.60 K = 158.80	A = 3.000" P = 6.000" K = 4.752"	A = 76.20 P = 152.40 K = 120.70
3 1/2"	4.000"	101.6	3.548" 3.364" - - -	90.12 85.44 - - -	Std/40 40s XS/80 80s 120 160 XXS	0.226" 0.318" - - -	5.74 8.08 - - -	A = 5.252" B = 2.252" P = 10.500" K = 7.252"	A = 133.40 B = 57.20 P = 266.70 K = 184.20	A = 3.500" P = 7.000" K = 5.500"	A = 88.90 P = 177.80 K = 139.70
4"	4.500"	114.3	4.026" 3.826" 3.624" 3.438" 3.152"	102.26 97.18 92.06 87.32 80.06	Std/40 40s XS/80 80s 120 160 XXS	0.237" 0.337" 0.438" 0.531" 0.674"	6.02 8.56 11.12 13.49 17.12	A = 6.000" B = 2.500" P = 12.000" K = 8.252"	A = 152.40 B = 63.50 P = 304.80 K = 209.60	A = 4.000" P = 8.000" K = 6.252"	A = 101.60 P = 203.20 K = 158.80
5"	5.563"	141.3	5.047" 4.813" 4.563" 4.313" 4.063"	128.2 122.24 115.90 109.54 103.20	Std/40 40s XS/80 80s 120 160 XXS	0.258" 0.375" 0.500" 0.625" 0.750"	6.55 9.53 12.70 15.88 19.05	A = 7.500" B = 3.118" P = 15.000" K = 10.311"	A = 190.50 B = 79.20 P = 381.00 K = 261.90	A = 5.000" P = 10.000" K = 7.752"	A = 127.00 P = 254.00 K = 196.90
6"	6.626"	168.3	6.066" 5.762" 5.502" 5.188" 4.898"	154.08 146.36 139.76 131.78 124.42	Std/40 40s XS/80 80s 120 160 XXS	0.280" 0.432" 0.562" 0.719" 0.864"	7.11 10.97 14.27 18.26 21.94	A = 9.000" B = 3.752" P = 18.000" K = 12.311"	A = 228.6 B = 95.3 P = 457.2 K = 312.7	A = 6.000" P = 12.000" K = 9.311"	A = 152.40 P = 304.80 K = 236.50

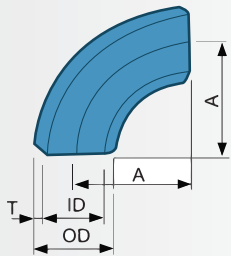
ELBOW

Long & Short Radius

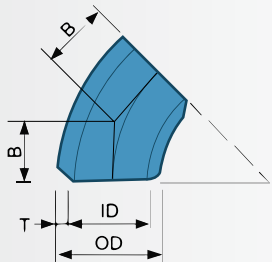
ASTM/ASME A234

ANSI B 16.9 / B 16.28

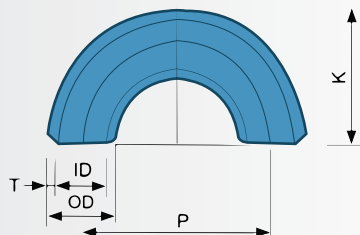
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	inch	in	mm	in		in	mm	in	mm	in	mm
8"	8.625"	219.08	8.125"	206.38	20	0.250"	6.35	A = 12.000" B = 5.000" P = 24.000" K = 16.311"	A = 304.80 B = 127.00 P = 609.60 K = 414.30	A = 8.000" P = 16.000" K = 12.311"	A = 203.20 P = 406.40 K = 312.70
			8.071"	205.00	30	0.277"	7.04				
			7.981"	202.72	Std/40 40s	0.322"	8.18				
			7.813"	198.46	60	0.406"	10.31				
			7.625"	193.68	XS/80 80s	0.500"	12.70				
			7.437"	188.90	100	0.594"	15.09				
			7.187"	182.56	120	0.719"	18.26				
			7.002"	177.84	140	0.812"	20.62				
			6.813"	173.06	160	0.906"	23.01				
			6.876"	174.64	XXS	0.875"	22.22				
10"	10.750"	273.05	10.250"	260.35	20	0.250"	6.35	A = 15.000" B = 6.252" P = 30.000" K = 20.382"	A = 381.00 B = 158.80 P = 762.00 K = 517.70	A = 10.000" P = 20.000" K = 15.382"	A = 254.00 P = 508.00 K = 390.70
			10.136"	257.45	30	0.307"	7.80				
			10.020"	254.51	Std/40 40s	0.365"	9.27				
			9.750"	247.65	XS/60 80s	0.500"	12.70				
			9.562"	242.87	80	0.594"	15.09				
			9.312"	236.53	100	0.719"	18.26				
			9.062"	230.17	120	0.844"	21.44				
			8.750"	222.25	140/XXS	1.000"	25.40				
			8.500"	215.89	160	1.125"	28.58				
12"	12.748"	323.80	12.248"	311.10	20	0.250"	6.35	A = 18.000" B = 7.500" P = 36.000" K = 24.382"	A = 457.20 B = 190.50 P = 914.40 K = 619.30	A = 12.000" P = 24.000" K = 18.382"	A = 304.80 P = 609.60 K = 466.90
			12.088"	307.04	30	0.330"	8.38				
			11.998"	304.76	Std/40s	0.375"	9.52				
			11.936"	303.18	40	0.406"	10.31				
			11.748"	298.40	XS/80s	0.500"	12.70				
			11.624"	295.26	60	0.562"	14.27				
			11.372"	288.84	80	0.688"	17.48				
			11.060"	280.92	100	0.844"	21.44				
			10.748"	273.00	120/XXS	1.000"	25.40				
			10.498"	266.64	140	1.125"	28.58				
			10.124"	257.16	160	1.311"	33.3				

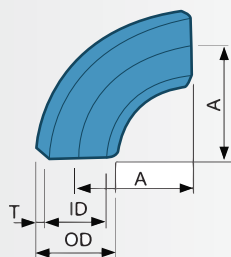
ELBOW

Long & Short Radius

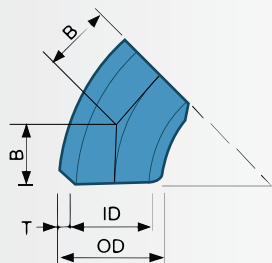
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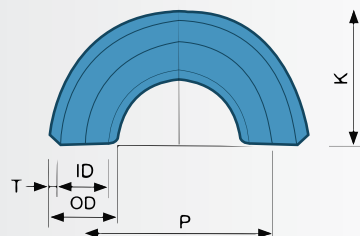
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
inch	in	mm	in	mm		in	mm	in	mm	in	mm
14"	14.000"	355.60	13.500"	342.90	10	0.250"	6.35	A = 21.000" B = 8.752" P = 42.000" K = 28.000"	A = 533.40 B = 222.30 P = 1066.80 K = 711.20	A = 14.000" P = 28.000" K = 21.000"	A = 355.60 P = 711.20 K = 533.40
			13.376"	339.76	20	0.312"	7.92				
			13.250"	336.56	Std/30	0.375"	9.52				
			13.124"	333.34	40	0.438"	11.13				
			13.000"	330.20	XS	0.500"	12.70				
			12.812"	325.42	60	0.594"	15.09				
			12.500"	317.50	80	0.750"	19.05				
			12.124"	307.94	100	0.938"	23.83				
			11.812"	300.02	120	1.094"	27.79				
			11.500"	292.10	140	1.250"	31.75				
			11.188"	284.18	160	1.406"	35.71				
16"	16.000"	406.40	15.500"	393.70	10	0.250"	6.35	A = 23.150" B = 10.000" P = 48.000" K = 32.000"	A = 588.00 B = 254.00 P = 1219.20 K = 812.80	A = 16.000" P = 32.000" K = 24.000"	A = 406.40 P = 812.80 K = 609.60
			15.376"	390.56	20	0.312"	7.92				
			15.250"	387.36	Std/30	0.375"	9.52				
			15.000"	381.00	XS/40	0.500"	12.70				
			14.688"	373.08	60	0.656"	16.66				
			14.312"	363.52	80	0.844"	21.44				
			13.938"	354.02	100	1.031"	26.19				
			13.562"	344.48	120	1.219"	30.96				
			13.124"	333.36	140	1.438"	36.52				
			12.812"	325.42	160	1.594"	40.49				
18"	18.000"	457.20	17.500"	444.50	10	0.250"	6.35	A = 27.000" B = 11.252" P = 54.000" K = 36.000"	A = 685.80 B = 285.80 P = 1371.60 K = 914.40	A = 18.000" P = 36.000" K = 27.000"	A = 457.20 P = 914.40 K = 685.80
			17.376"	441.36	20	0.312"	7.92				
			17.124"	434.96	30	0.438"	11.12				
			17.250"	438.16	Std	0.375"	9.52				
			17.000"	431.80	XS	0.500"	12.70				
			16.876"	428.66	40	0.562"	14.27				
			16.500"	419.10	60	0.750"	19.05				
			16.124"	409.56	80	0.938"	23.82				
			15.688"	398.48	100	1.156"	29.36				
			15.250"	387.36	120	1.375"	34.92				
			14.876"	377.86	140	1.562"	39.67				
			14.438"	366.72	160	1.781"	45.24				

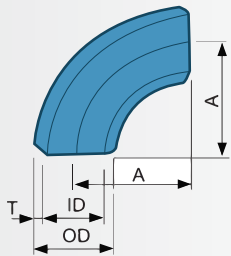
ELBOW

Long & Short Radius

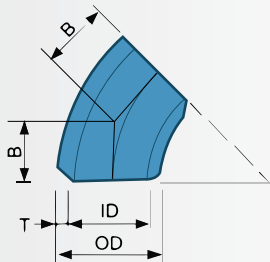
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ANSI B 16.9 / B 16.28

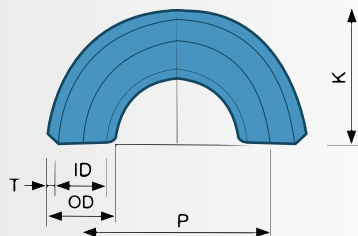
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	in	mm	in	mm		in	mm	in	mm	in	mm
20"	20.000"	508.00	19.500"	495.30	10	0.250"	6.35	A = 30.000" B = 12.500" P = 60.000" K = 40.000"	A = 762.00 B = 317.50 P = 1524.00 K = 1016.00	A = 20.000" P = 40.000" K = 30.000"	A = 508.00 P = 1016.00 K = 762.00
			19.250"	488.96	Std/20	0.375"	9.52				
			19.000"	482.60	XS/30	0.500"	12.70				
			18.812"	477.82	40	0.594"	15.09				
			18.376"	466.76	60	0.812"	20.62				
			17.938"	455.62	80	1.031"	26.19				
			17.438"	442.92	100	1.281"	32.54				
			17.000"	431.80	120	1.500"	38.10				
			16.500"	419.10	140	1.750"	44.45				
			16.062"	407.98	160	1.969"	50.01				
22"	22.000"	558.80	21.500"	546.10	10	0.250"	6.35	A = 33.000" B = 13.500" P = 66.000" K = 44.000"	A = 838.20 B = 342.90 P = 1676.40 K = 1117.60	A = 22.000" P = 4.630" K = 33.000"	A = 558.80 P = 117.60 K = 838.20
			21.250"	539.76	Std/20	0.375"	9.52				
			21.000"	533.40	XS/30	0.500"	12.70				
			20.250"	514.36	60	0.875"	22.22				
			19.750"	501.64	80	1.125"	28.58				
			19.250"	488.96	100	1.375"	34.92				
			18.750"	476.24	120	1.625"	41.28				
			18.250"	463.56	140	1.875"	47.62				
			17.750"	450.84	160	2.125"	53.98				
24"	24.000"	609.60	23.500"	596.90	10	0.250"	6.35	A = 36.000" B = 15.000" P = 72.000" K = 48.000"	A = 914.40 B = 381.00 P = 1828.80 K = 1219.20	A = 24.000" P = 48.000" K = 36.000"	A = 609.60 P = 1219.20 K = 914.40
			23.250"	590.56	Std/20	0.375"	9.52				
			23.000"	584.20	XS	0.500"	12.70				
			22.876"	581.06	30	0.562"	14.27				
			22.624"	574.64	40	0.688"	17.48				
			22.062"	560.38	60	0.969"	24.61				
			21.562"	547.68	80	1.219"	30.96				
			20.938"	531.82	100	1.531"	38.89				
			20.376"	517.56	120	1.812"	46.02				
			19.876"	504.86	140	2.062"	52.37				
			19.312"	490.52	160	2.344"	59.54				
26"	26.000"	660.40	25.376"	644.56	10	0.312"	7.92	A = 39.000" B = 16.000"	A = 990.60 B = 406.40	A = 26.000"	A = 660.40
			25.369"	644.36	Std	0.375"	9.52				
			25.000"	635.00	XS/20	0.500"	12.70				

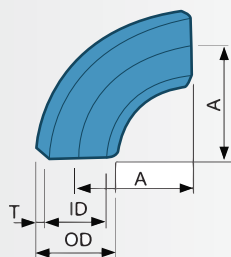
ELBOW

Long & Short Radius

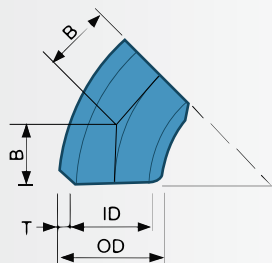
ASTM/ASME A234

ANSI B 16.9 / B 16.28

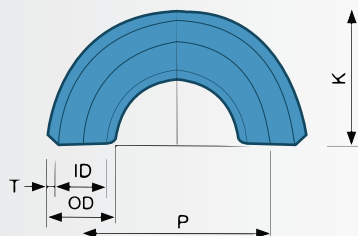
MSS SP-43



90° ELBOW



45° ELBOW



180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	inch	in	mm	in	mm	in	mm	in	mm	in	mm
28"	28.000"	711.20	27.376" 27.250" 27.000" 26.750"	695.36 692.16 685.80 679.44	10 Std XS/20 30	0.312" 0.375" 0.500" 0.625"	7.92 9.52 12.70 15.88	A = 42.000" B = 17.252"	A = 1066.8 B = 438.2	A = 27.992"	A = 711.00
30"	30.000"	762.00	29.376" 29.250" 29.000" 28.750"	746.16 742.96 736.60 730.24	10 Std XS/20 30	0.312" 0.375" 0.500" 0.625"	7.92 9.52 12.70 15.88	A = 45.000" B = 18.500"	A = 1143 B = 469.9	A = 30.000"	A = 762.00
32"	32.000"	812.80	31.376" 31.250" 31.000" 30.750" 30.624"	796.96 793.76 787.40 781.04 777.84	10 Std XS/20 30 40	0.312" 0.375" 0.500" 0.625" 0.688"	7.92 9.52 12.70 15.88 17.48	A = 48.000" B = 19.752"	A = 1219.2 B = 501.7	A = 32.008"	A = 813.00
34"	34.000"	863.60	33.376" 33.250" 33.000" 32.750" 32.624"	847.76 844.56 838.20 831.84 828.64	10 Std XS/20 30 40	0.312" 0.375" 0.500" 0.625" 0.688"	7.92 9.52 12.70 15.88 17.48	A = 51.000" B = 21.000"	A = 1295.4 B = 533.4	A = 34.016"	A = 864.00
36"	36.000"	914.40	35.376" 35.250" 35.000" 34.750" 34.500"	898.56 895.34 889.00 882.64 876.30	10 Std XS/20 30 40	0.312" 0.375" 0.500" 0.625" 0.750"	7.92 9.53 12.70 15.88 19.05	A = 54.000" B = 22.252"	A = 1371.6 B = 565.2	A = 36.000"	A = 914.40
38"	38.000"	965.20	37.250" 37.000"	946.16 939.80	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 57.000" B = 23.622"	A = 1447.8 B = 600	A = 38.000"	A = 965.20
40"	40.000"	1016.00	39.250" 39.000"	996.96 990.60	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 60.000" B = 24.874"	A = 1524 B = 631.8	A = 40.000"	A = 1016.00
42"	42.000"	1066.80	41.250" 41.000"	1047.76 1041.40	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 63.000" B = 23.638"	A = 1600.2 B = 600.4	A = 42.000"	A = 1066.80
44"	44.000"	1117.60	43.250" 43.000"	1098.56 1092.20	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 66.000" B = 27.374"	A = 1676.4 B = 695.3	A = 44.000"	A = 1117.60
46"	46.000"	1168.40	45.250" 45.000"	1149.36 1143.00	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 69.000" B = 28.626"	A = 1752.6 B = 727.1	A = 46.000"	A = 1168.40
48"	48.000"	1219.20	47.250" 47.000"	1200.16 1193.80	Std/40s XS/80s	0.375" 0.500"	9.52 12.70	A = 72.000" B = 29.874"	A = 1828.8 B = 758.8	A = 48.000"	A = 1219.20

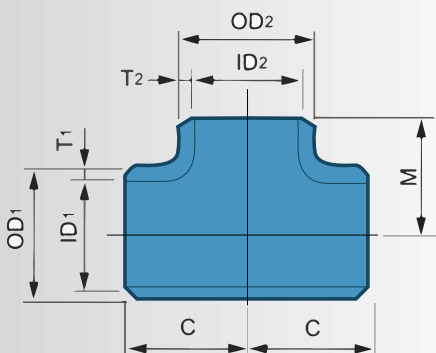
TEE

Straight and Reducing Outlet Tees

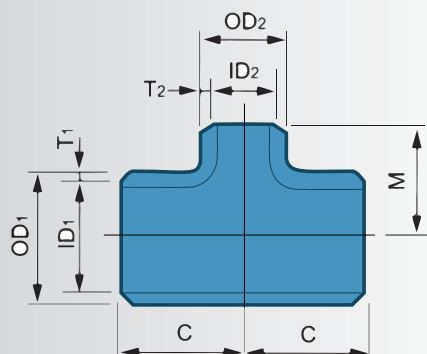
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		Center to End		Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
1/2" x 1/2"	0.840"	0.840"	1.000"	1.000"	—	—	—	—	0.109"	0.109"	0.109"	0.109"	—	—
3/4" x 3/4"	1.050"	1.050"	1.122"	1.122"	—	—	—	—	0.113"	0.113"	0.113"	0.113"	—	—
3/4" x 1/2"	1.050"	0.840"	1.122"	1.122"	—	—	—	—	0.113"	0.109"	0.113"	0.109"	—	—
1" x 1"	1.315"	1.315"	1.500"	1.500"	—	—	—	—	0.133"	0.133"	0.133"	0.133"	—	—
1" x 3/4"	1.315"	1.050"	1.500"	1.500"	—	—	—	—	0.133"	0.113"	0.133"	0.113"	—	—
1" x 1/2"	1.315"	0.840"	1.500"	1.500"	—	—	—	—	0.133"	0.109"	0.133"	0.109"	—	—
1 1/4" x 1 1/4"	1.660"	1.660"	1.882"	1.882"	—	—	—	—	0.140"	0.140"	0.140"	0.140"	—	—
1 1/4" x 1"	1.660"	1.315"	1.882"	1.882"	—	—	—	—	0.140"	0.133"	0.140"	0.133"	—	—
1 1/4" x 3/4"	1.660"	1.050"	1.882"	1.882"	—	—	—	—	0.140"	0.113"	0.140"	0.113"	—	—
1 1/2" x 1 1/2"	1.900"	1.900"	2.252"	2.252"	—	—	—	—	0.145"	0.145"	0.145"	0.145"	—	—
1 1/2" x 1 1/4"	1.900"	1.660"	2.252"	2.252"	—	—	—	—	0.145"	0.140"	0.145"	0.140"	—	—
1 1/2" x 3/4"	1.900"	1.315"	2.252"	2.252"	—	—	—	—	0.145"	0.133"	0.145"	0.133"	—	—
1 1/2" x 1"	1.900"	1.050"	2.252"	2.252"	—	—	—	—	0.145"	0.113"	0.145"	0.113"	—	—
1 1/2" x 1/2"	1.900"	0.840"	2.252"	2.252"	—	—	—	—	0.145"	0.109"	0.145"	0.109"	—	—
2" x 2"	2.375"	2.375"	2.500"	2.500"	—	—	—	—	0.154"	0.154"	0.154"	0.154"	—	—
2" x 1 1/2"	2.375"	1.900"	2.500"	2.382"	—	—	—	—	0.154"	0.145"	0.154"	0.145"	—	—
2" x 1 1/4"	2.375"	1.660"	2.500"	2.252"	—	—	—	—	0.154"	0.140"	0.154"	0.140"	—	—
2" x 1"	2.375"	1.315"	2.500"	2.000"	—	—	—	—	0.154"	0.133"	0.154"	0.133"	—	—
2" x 3/4"	2.375"	1.050"	2.500"	1.752"	—	—	—	—	0.154"	0.113"	0.154"	0.113"	—	—
2 1/2" x 2 1/2"	2.875"	2.875"	3.000"	3.000"	—	—	—	—	0.203"	0.203"	0.203"	0.203"	—	—
2 1/2" x 2"	2.875"	2.375"	3.000"	2.752"	—	—	—	—	0.203"	0.154"	0.203"	0.154"	—	—
2 1/2" x 1 1/2"	2.875"	1.900"	3.000"	2.622"	—	—	—	—	0.203"	0.145"	0.203"	0.145"	—	—
2 1/2" x 1 1/4"	2.875"	1.660"	3.000"	2.500"	—	—	—	—	0.203"	0.140"	0.203"	0.140"	—	—
2 1/2" x 1"	2.875"	1.315"	3.000"	2.252"	—	—	—	—	0.203"	0.133"	0.203"	0.133"	—	—
3" x 3"	3.500"	3.500"	3.374"	3.374"	—	—	—	—	0.216"	0.216"	0.216"	0.216"	—	—
3" x 2 1/2"	3.500"	2.875"	3.374"	3.252"	—	—	—	—	0.216"	0.203"	0.216"	0.203"	—	—
3" x 2"	3.500"	2.375"	3.374"	3.000"	—	—	—	—	0.216"	0.154"	0.216"	0.154"	—	—
3" x 1 1/2"	3.500"	1.900"	3.374"	2.882"	—	—	—	—	0.216"	0.145"	0.216"	0.145"	—	—
3" x 1 1/4"	3.500"	1.660"	3.374"	2.752"	—	—	—	—	0.216"	0.140"	0.216"	0.140"	—	—
4" x 4"	4.500"	4.500"	4.122"	4.122"	—	—	—	—	0.237"	0.237"	0.237"	0.237"	—	—
4" x 3"	4.500"	3.500"	4.122"	3.882"	—	—	—	—	0.237"	0.216"	0.237"	0.216"	—	—
4" x 2 1/2"	4.500"	2.875"	4.122"	3.752"	—	—	—	—	0.237"	0.203"	0.237"	0.203"	—	—
4" x 2"	4.500"	2.375"	4.122"	3.500"	—	—	—	—	0.237"	0.154"	0.237"	0.154"	—	—
4" x 1 1/2"	4.500"	1.900"	4.122"	3.382"	—	—	—	—	0.237"	0.145"	0.237"	0.145"	—	—

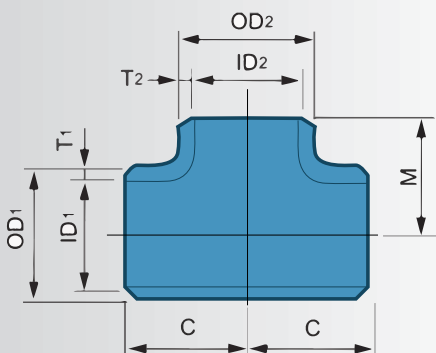
TEE

Straight and Reducing Outlet Tees

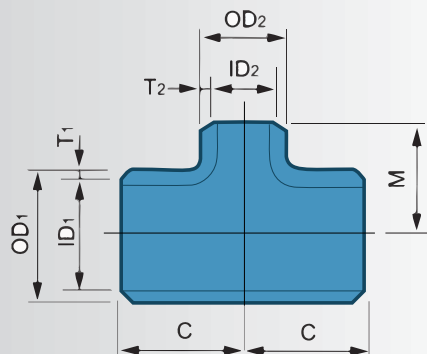
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
1/2" x 1/2"	0.147"	0.147"	0.147"	0.147"	—	—	—	—	—	—	0.188"	0.188"	0.294"	0.294"
3/4" x 3/4"	0.154"	0.154"	0.154"	0.154"	—	—	—	—	—	—	0.219"	0.219"	0.308"	0.308"
3/4" x 1/2"	0.154"	0.147"	0.154"	0.147"	—	—	—	—	—	—	0.219"	0.188"	0.308"	0.294"
1" x 1"	0.179"	0.179"	0.179"	0.179"	—	—	—	—	—	—	0.250"	0.250"	0.358"	0.358"
1" x 3/4"	0.179"	0.154"	0.179"	0.154"	—	—	—	—	—	—	0.250"	0.219"	0.358"	0.308"
1" x 1/2"	0.179"	0.147"	0.179"	0.147"	—	—	—	—	—	—	0.250"	0.188"	0.358"	0.294"
1 1/4" x 1 1/4"	0.191"	0.191"	0.191"	0.191"	—	—	—	—	—	—	0.250"	0.250"	0.382"	0.382"
1 1/4" x 1"	0.191"	0.179"	0.191"	0.179"	—	—	—	—	—	—	0.250"	0.250"	0.382"	0.358"
1 1/4" x 3/4"	0.191"	0.154"	0.191"	0.154"	—	—	—	—	—	—	0.250"	0.219"	0.382"	0.308"
1 1/2" x 1 1/2"	0.200"	0.200"	0.200"	0.200"	—	—	—	—	—	—	0.281"	0.281"	0.400"	0.400"
1 1/2" x 1 1/4"	0.200"	0.191"	0.200"	0.191"	—	—	—	—	—	—	0.281"	0.250"	0.400"	0.382"
1 1/2" x 3/4"	0.200"	0.179"	0.200"	0.179"	—	—	—	—	—	—	0.281"	0.250"	0.400"	0.358"
1 1/2" x 1"	0.200"	0.154"	0.200"	0.154"	—	—	—	—	—	—	0.281"	0.219"	0.400"	0.308"
1 1/2" x 1/2"	0.200"	0.147"	0.200"	0.147"	—	—	—	—	—	—	0.281"	0.188"	0.400"	0.294"
2" x 2"	0.218"	0.218"	0.218"	0.218"	—	—	—	—	—	—	0.344"	0.344"	0.436"	0.436"
2" x 1 1/2"	0.218"	0.200"	0.218"	0.200"	—	—	—	—	—	—	0.344"	0.281"	0.436"	0.400"
2" x 1 1/4"	0.218"	0.191"	0.218"	0.191"	—	—	—	—	—	—	0.344"	0.250"	0.436"	0.382"
2" x 1"	0.218"	0.179"	0.218"	0.179"	—	—	—	—	—	—	0.344"	0.250"	0.436"	0.358"
2" x 3/4"	0.218"	0.154"	0.218"	0.154"	—	—	—	—	—	—	0.344"	0.219"	0.436"	0.308"
2 1/2" x 2 1/2"	0.276"	0.276"	0.276"	0.276"	—	—	—	—	—	—	0.375"	0.375"	0.552"	0.552"
2 1/2" x 2"	0.276"	0.218"	0.276"	0.218"	—	—	—	—	—	—	0.375"	0.344"	0.552"	0.436"
2 1/2" x 1 1/2"	0.276"	0.200"	0.276"	0.200"	—	—	—	—	—	—	0.375"	0.281"	0.552"	0.400"
2 1/2" x 1 1/4"	0.276"	0.191"	0.276"	0.191"	—	—	—	—	—	—	0.375"	0.250"	0.552"	0.382"
2 1/2" x 1"	0.276"	0.179"	0.276"	0.179"	—	—	—	—	—	—	0.375"	0.250"	0.552"	0.358"
3" x 3"	0.300"	0.300"	0.300"	0.300"	—	—	—	—	—	—	0.438"	0.438"	0.600"	0.600"
3" x 2 1/2"	0.300"	0.276"	0.300"	0.276"	—	—	—	—	—	—	0.438"	0.375"	0.600"	0.552"
3" x 2"	0.300"	0.218"	0.300"	0.218"	—	—	—	—	—	—	0.438"	0.344"	0.600"	0.436"
3" x 1 1/2"	0.300"	0.200"	0.300"	0.200"	—	—	—	—	—	—	0.438"	0.281"	0.600"	0.400"
3" x 1 1/4"	0.300"	0.191"	0.300"	0.191"	—	—	—	—	—	—	0.531"	0.250"	0.600"	0.382"
4" x 4"	0.337"	0.337"	0.337"	0.337"	—	—	0.438"	0.438"	—	—	0.531"	0.531"	0.674"	0.674"
4" x 3"	0.337"	0.300"	0.337"	0.300"	—	—	—	—	—	—	0.531"	0.438"	0.674"	0.600"
4" x 2 1/2"	0.337"	0.276"	0.337"	0.276"	—	—	—	—	—	—	0.531"	0.375"	0.674"	0.552"
4" x 2"	0.337"	0.218"	0.337"	0.218"	—	—	—	—	—	—	0.531"	0.344"	0.674"	0.436"
4" x 1 1/2"	0.337"	0.200"	0.337"	0.200"	—	—	—	—	—	—	0.531"	0.281"	0.674"	0.400"

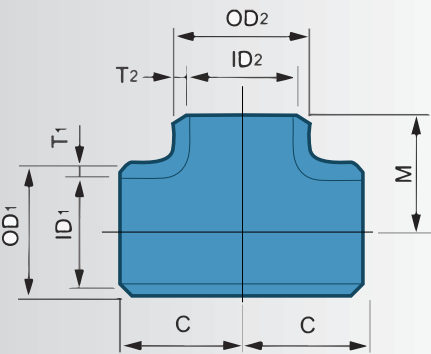
TEE

Straight and Reducing Outlet Tees

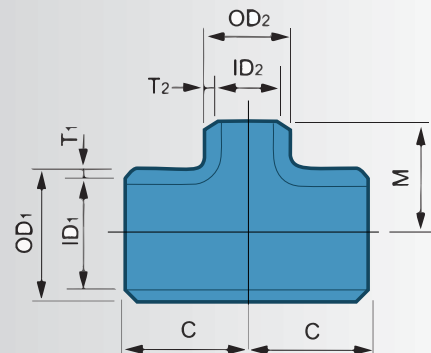
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		Center to End		Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
5" x 5"	5.563"	5.563"	4.882"	4.882"	-	-	-	-	0.258"	0.258"	0.258"	0.258"	-	-
5" x 4"	5.563"	4.500"	4.882"	4.618"	-	-	-	-	0.258"	0.237"	0.258"	0.237"	-	-
5" x 3"	5.563"	3.500"	4.882"	4.382"	-	-	-	-	0.258"	0.216"	0.258"	0.216"	-	-
5" x 2 1/2"	5.563"	2.875"	4.882"	4.252"	-	-	-	-	0.258"	0.203"	0.258"	0.203"	-	-
5" x 2"	5.563"	2.375"	4.882"	4.118"	-	-	-	-	0.258"	0.154"	0.258"	0.154"	-	-
6" x 6"	6.626"	6.626"	5.622"	5.622"	-	-	-	-	0.280"	0.280"	0.280"	0.280"	-	-
6" x 5"	6.626"	5.563"	5.622"	5.382"	-	-	-	-	0.280"	0.258"	0.280"	0.258"	-	-
6" x 4"	6.626"	4.500"	5.622"	5.118"	-	-	-	-	0.280"	0.237"	0.280"	0.237"	-	-
6" x 3"	6.626"	3.500"	5.622"	4.882"	-	-	-	-	0.280"	0.216"	0.280"	0.216"	-	-
6" x 2 1/2"	6.626"	2.875"	5.622"	4.752"	-	-	-	-	0.280"	0.203"	0.280"	0.203"	-	-
8" x 8"	8.625"	8.625"	7.000"	7.000"	0.250"	0.250"	0.277"	0.277"	0.322"	0.322"	0.322"	0.322"	0.406"	0.406"
8" x 6"	8.625"	6.626"	7.000"	6.618"	-	-	-	-	0.322"	0.280"	0.322"	0.280"	-	-
8" x 5"	8.625"	5.563"	7.000"	6.382"	-	-	-	-	0.322"	0.258"	0.322"	0.258"	-	-
8" x 4"	8.625"	4.500"	7.000"	6.118"	-	-	-	-	0.322"	0.237"	0.322"	0.237"	-	-
10" x 10"	10.750"	10.750"	8.500"	8.500"	0.250"	0.250"	0.307"	0.307"	0.365"	0.365"	0.365"	0.365"	0.500"	0.500"
10" x 8"	10.750"	8.625"	8.500"	8.000"	0.250"	0.250"	0.307"	0.277"	0.365"	0.322"	0.365"	0.322"	0.500"	0.406"
10" x 6"	10.750"	6.626"	8.500"	7.618"	-	-	-	-	0.365"	0.280"	0.365"	0.280"	-	-
10" x 5"	10.750"	5.563"	8.500"	7.500"	-	-	-	-	0.365"	0.258"	0.365"	0.258"	-	-
10" x 4"	10.750"	4.500"	8.500"	7.252"	-	-	-	-	0.365"	0.237"	0.365"	0.237"	-	-
12" x 12"	12.748"	12.748"	10.000"	10.000"	0.250"	0.250"	0.330"	0.330"	0.375"	0.375"	0.406"	0.406"	0.562"	0.562"
12" x 10"	12.748"	10.750"	10.000"	9.500"	0.250"	0.250"	0.330"	0.307"	0.375"	0.365"	0.406"	0.365"	0.562"	0.500"
12" x 8"	12.748"	8.625"	10.000"	9.000"	0.250"	0.250"	0.330"	0.277"	0.375"	0.322"	0.406"	0.322"	0.562"	0.406"
12" x 6"	12.748"	6.626"	10.000"	8.618"	-	-	-	-	0.375"	0.280"	0.406"	0.280"	-	-
12" x 5"	12.748"	5.563"	10.000"	8.500"	-	-	-	-	0.375"	0.258"	0.406"	0.258"	-	-
14" x 14"	14.000"	14.000"	11.000"	11.000"	0.312"	0.312"	0.375"	0.375"	0.375"	0.375"	0.438"	0.438"	0.594"	0.594"
14" x 12"	14.000"	12.752"	11.000"	10.618"	0.312"	0.250"	0.375"	0.330"	0.375"	0.375"	0.438"	0.406"	0.594"	0.562"
14" x 10"	14.000"	10.750"	11.000"	10.118"	0.312"	0.250"	0.375"	0.307"	0.375"	0.365"	0.438"	0.365"	0.594"	0.500"
14" x 8"	14.000"	8.625"	11.000"	9.752"	0.312"	0.250"	0.375"	0.277"	0.375"	0.322"	0.438"	0.322"	0.594"	0.406"
14" x 6"	14.000"	6.626"	11.000"	9.382"	-	-	-	-	0.375"	0.280"	0.438"	0.280"	-	-
16" x 16"	16.000"	16.000"	12.000"	12.000"	0.312"	0.312"	0.375"	0.375"	0.375"	0.375"	0.500"	0.500"	0.656"	0.656"
16" x 14"	16.000"	14.000"	12.000"	12.000"	0.312"	0.312"	0.375"	0.375"	0.375"	0.375"	0.500"	0.438"	0.656"	0.594"
16" x 12"	16.000"	12.748"	12.000"	11.618"	0.312"	0.250"	0.375"	0.330"	0.375"	0.375"	0.500"	0.406"	0.656"	0.562"
16" x 10"	16.000"	10.750"	12.000"	11.118"	0.312"	0.250"	0.375"	0.307"	0.375"	0.365"	0.500"	0.365"	0.656"	0.500"
16" x 8"	16.000"	8.625"	12.000"	10.752"	0.312"	0.250"	0.375"	0.277"	0.375"	0.322"	0.500"	0.322"	0.656"	0.406"
16" x 6"	16.000"	6.626"	12.000"	10.382"	-	-	-	-	0.375"	0.280"	0.500"	0.280"	-	-

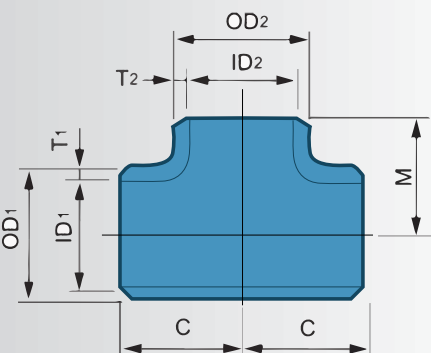
TEE

Straight and Reducing Outlet Tees

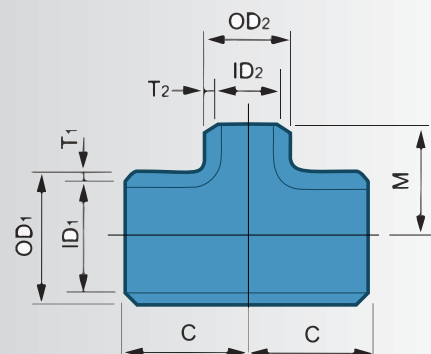
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
5" x 5"	0.375"	0.375"	0.375"	0.375"	-	-	0.500"	0.500"	-	-	0.625"	0.625"	0.750"	0.750"
5" x 4"	0.375"	0.337"	0.375"	0.337"	-	-	0.500"	0.438"	-	-	0.625"	0.531"	0.750"	0.674"
5" x 3"	0.375"	0.300"	0.375"	0.300"	-	-	-	-	-	-	0.625"	0.438"	0.750"	0.600"
5" x 2 1/2"	0.375"	0.276"	0.375"	0.276"	-	-	-	-	-	-	0.625"	0.375"	0.750"	0.552"
5" x 2"	0.375"	0.218"	0.375"	0.218"	-	-	-	-	-	-	0.625"	0.344"	0.750"	0.436"
6" x 6"	0.432"	0.432"	0.432"	0.432"	-	-	0.562"	0.562"	-	-	0.719"	0.719"	0.864"	0.864"
6" x 5"	0.432"	0.375"	0.432"	0.375"	-	-	0.562"	0.500"	-	-	0.719"	0.625"	0.864"	0.750"
6" x 4"	0.432"	0.337"	0.432"	0.337"	-	-	0.562"	0.438"	-	-	0.719"	0.531"	0.864"	0.674"
6" x 3"	0.432"	0.300"	0.432"	0.300"	-	-	-	-	-	-	0.719"	0.438"	0.864"	0.600"
6" x 2 1/2"	0.432"	0.276"	0.432"	0.276"	-	-	-	-	-	-	0.719"	0.375"	0.864"	0.552"
8" x 8"	0.500"	0.500"	0.500"	0.500"	0.594"	0.594"	0.719"	0.719"	0.812"	0.812"	0.906"	0.906"	0.875"	0.875"
8" x 6"	0.500"	0.432"	0.500"	0.432"	-	-	0.719"	0.562"	-	-	0.906"	0.719"	0.875"	0.864"
8" x 5"	0.500"	0.375"	0.500"	0.375"	-	-	0.719"	0.500"	-	-	0.906"	0.625"	0.875"	0.750"
8" x 4"	0.500"	0.337"	0.500"	0.337"	-	-	0.719"	0.438"	-	-	0.906"	0.531"	0.875"	0.674"
10" x 10"	0.500"	0.500"	0.594"	0.594"	0.719"	0.719"	0.844"	0.844"	1.000"	1.000"	1.125"	1.125"	1.000"	1.000"
10" x 8"	0.500"	0.500"	0.594"	0.500"	0.719"	0.594"	0.844"	0.719"	1.000"	0.812"	1.125"	0.906"	1.000"	0.875"
10" x 6"	0.500"	0.432"	0.594"	0.432"	-	-	0.844"	0.562"	-	-	1.125"	0.719"	1.000"	0.864"
10" x 5"	0.500"	0.375"	0.594"	0.375"	-	-	0.844"	0.500"	-	-	1.125"	0.625"	1.000"	0.750"
10" x 4"	0.500"	0.337"	0.594"	0.337"	-	-	0.844"	0.438"	-	-	1.125"	0.531"	1.000"	0.674"
12" x 12"	0.500"	0.500"	0.688"	0.688"	0.844"	0.844"	1.000"	1.000"	1.125"	1.125"	1.312"	1.312"	1.000"	1.000"
12" x 10"	0.500"	0.500"	0.688"	0.594"	0.844"	0.719"	1.000"	0.844"	1.125"	1.000"	1.312"	1.125"	1.000"	1.000"
12" x 8"	0.500"	0.500"	0.688"	0.500"	0.844"	0.594"	1.000"	0.719"	1.125"	0.812"	1.312"	0.906"	1.000"	0.875"
12" x 6"	0.500"	0.432"	0.688"	0.432"	-	-	1.000"	0.562"	-	-	1.312"	0.719"	1.000"	0.864"
12" x 5"	0.500"	0.375"	0.688"	0.375"	-	-	1.000"	0.500"	-	-	1.312"	0.625"	1.000"	0.750"
14" x 14"	0.500"	0.500"	0.750"	0.750"	0.938"	0.938"	1.094"	1.094"	1.250"	1.250"	1.406"	1.406"	-	-
14" x 12"	0.500"	0.500"	0.750"	0.688"	0.938"	0.844"	1.094"	1.000"	1.250"	1.125"	1.406"	1.312"	-	-
14" x 10"	0.500"	0.500"	0.750"	0.594"	0.938"	0.719"	1.094"	0.844"	1.250"	1.000"	1.406"	1.125"	-	-
14" x 8"	0.500"	0.500"	0.750"	0.500"	0.938"	0.594"	1.094"	0.719"	1.250"	0.812"	1.406"	0.906"	-	-
14" x 6"	0.500"	0.432"	0.750"	0.432"	-	-	1.094"	0.562"	-	-	1.406"	0.719"	-	-
16" x 16"	0.500"	0.500"	0.844"	0.844"	1.031"	1.031"	1.219"	1.219"	1.438"	1.438"	1.594"	1.594"	-	-
16" x 14"	0.500"	0.500"	0.844"	0.750"	1.031"	0.938"	1.219"	1.094"	1.438"	1.250"	1.594"	1.406"	-	-
16" x 12"	0.500"	0.500"	0.844"	0.688"	1.031"	0.844"	1.219"	1.000"	1.438"	1.125"	1.594"	1.312"	-	-
16" x 10"	0.500"	0.500"	0.844"	0.594"	1.031"	0.719"	1.219"	0.844"	1.438"	1.000"	1.594"	1.125"	-	-
16" x 8"	0.500"	0.500"	0.844"	0.500"	1.031"	0.594"	1.219"	0.719"	1.438"	0.812"	1.594"	0.906"	-	-
16" x 6"	0.500"	0.432"	0.844"	0.432"	-	-	1.219"	0.562"	-	-	1.594"	0.719"	-	-

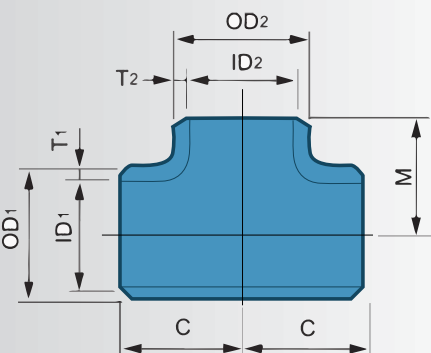
TEE

Straight and Reducing Outlet Tees

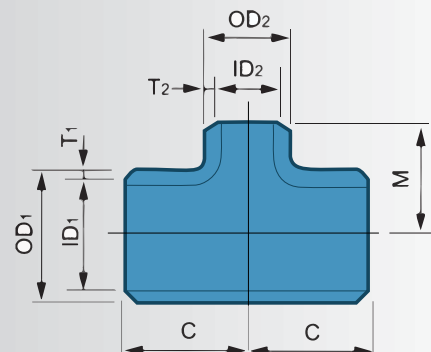
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		Center to End		Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
18" x 18"	18.000"	18.000"	13.500"	13.500"	0.312"	0.312"	0.438"	0.438"	0.375"	0.375"	0.562"	0.562"	0.750"	0.750"
18" x 16"	18.000"	16.000"	13.500"	13.000"	0.312"	0.312"	0.438"	0.375"	0.375"	0.375"	0.562"	0.500"	0.750"	0.656"
18" x 14"	18.000"	14.000"	13.500"	13.000"	0.312"	0.312"	0.438"	0.375"	0.375"	0.375"	0.562"	0.438"	0.750"	0.594"
18" x 12"	18.000"	12.748"	13.500"	12.622"	0.312"	0.250"	0.438"	0.375"	0.375"	0.375"	0.562"	0.406"	0.750"	0.562"
20" x 20"	20.000"	20.000"	15.000"	15.000"	0.375"	0.375"	0.500"	0.500"	0.375"	0.375"	0.594"	0.594"	0.812"	0.812"
20" x 18"	20.000"	18.000"	15.000"	14.500"	0.375"	0.312"	0.500"	0.438"	0.375"	0.375"	0.594"	0.562"	0.812"	0.750"
20" x 16"	20.000"	16.000"	15.000"	14.000"	0.375"	0.312"	0.500"	0.375"	0.375"	0.375"	0.594"	0.500"	0.812"	0.656"
20" x 14"	20.000"	14.000"	15.000"	14.000"	0.375"	0.312"	0.500"	0.375"	0.375"	0.375"	0.594"	0.438"	0.812"	0.594"
22" x 22"	22.000"	22.000"	16.500"	16.500"	0.375"	0.375"	0.500"	0.500"	0.375"	0.375"	-	-	0.875"	0.875"
22" x 20"	22.000"	20.000"	16.500"	16.000"	0.375"	0.375"	0.500"	0.500"	0.375"	0.375"	-	-	0.875"	0.812"
22" x 18"	22.000"	18.000"	16.500"	15.500"	0.375"	0.312"	0.500"	0.438"	0.375"	0.375"	-	-	0.875"	0.750"
22" x 16"	22.000"	16.000"	16.500"	15.000"	0.375"	0.312"	0.500"	0.375"	0.375"	0.375"	-	-	0.875"	0.656"
24" x 24"	24.000"	24.000"	17.000"	17.000"	0.375"	0.375"	0.562"	0.562"	0.375"	0.375"	0.688"	0.688"	0.969"	0.969"
24" x 22"	24.000"	22.000"	17.000"	17.000"	0.375"	0.375"	0.562"	0.500"	0.375"	0.375"	-	-	0.969"	0.875"
24" x 20"	24.000"	20.000"	17.000"	17.000"	0.375"	0.375"	0.562"	0.500"	0.375"	0.375"	0.688"	0.594"	0.969"	0.812"
24" x 18"	24.000"	18.000"	17.000"	16.500"	0.375"	0.312"	0.562"	0.438"	0.375"	0.375"	0.688"	0.562"	0.969"	0.750"
26" x 26"	26.000"	26.000"	19.500"	19.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
26" x 22"	26.000"	22.000"	19.500"	18.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
26" x 18"	26.000"	18.000"	19.500"	17.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
26" x 16"	26.000"	16.000"	19.500"	17.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
28" x 28"	28.000"	28.000"	20.500"	20.500"	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
28" x 24"	28.000"	24.000"	20.500"	20.000"	-	-	0.625"	0.562"	0.375"	0.375"	-	-	-	-
28" x 20"	28.000"	20.000"	20.500"	19.000"	-	-	0.625"	0.500"	0.375"	0.375"	-	-	-	-
28" x 18"	28.000"	18.000"	20.500"	18.500"	-	-	0.625"	0.438"	0.375"	0.375"	-	-	-	-
30" x 30"	30.000"	30.000"	22.000"	22.000"	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
30" x 26"	30.000"	26.000"	22.000"	21.500"	-	-	0.625"	-	0.375"	0.375"	-	-	-	-
30" x 22"	30.000"	22.000"	22.000"	20.500"	-	-	0.625"	0.500"	0.375"	0.375"	-	-	-	-
30" x 20"	30.000"	20.000"	22.000"	20.000"	-	-	0.625"	0.500"	0.375"	0.375"	-	-	-	-
32" x 32"	32.000"	32.000"	23.500"	23.500"	-	-	0.625"	0.625"	0.375"	0.375"	0.688"	0.688"	-	-
32" x 28"	32.000"	28.000"	23.500"	22.500"	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
32" x 24"	32.000"	24.000"	23.500"	22.000"	-	-	0.625"	0.562"	0.375"	0.375"	-	-	-	-
32" x 22"	32.000"	22.000"	23.500"	21.500"	-	-	0.625"	0.500"	0.375"	0.375"	-	-	-	-

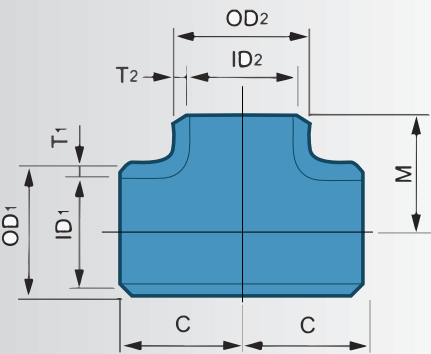
TEE

Straight and Reducing Outlet Tees

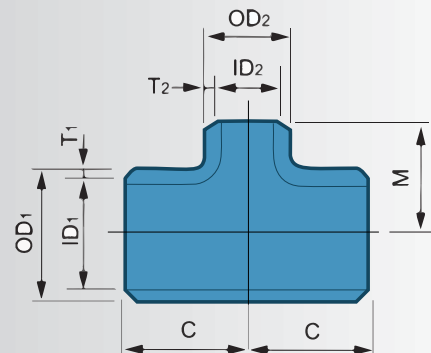
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
18" x 18"	0.500"	0.500"	0.938"	0.938"	1.156"	1.156"	1.375"	1.375"	1.562"	1.562"	1.781"	1.781"	-	-
18" x 16"	0.500"	0.500"	0.938"	0.844"	1.156"	1.031"	1.375"	1.219"	1.562"	1.438"	1.781"	1.594"	-	-
18" x 14"	0.500"	0.500"	0.938"	0.750"	1.156"	0.938"	1.375"	1.094"	1.562"	1.250"	1.781"	1.406"	-	-
18" x 12"	0.500"	0.500"	0.938"	0.688"	1.156"	0.844"	1.375"	1.000"	1.562"	1.125"	1.781"	1.312"	-	-
20" x 20"	0.500"	0.500"	1.031"	1.031"	1.281"	1.281"	1.500"	1.500"	1.750"	1.750"	1.969"	1.969"	-	-
20" x 18"	0.500"	0.500"	1.031"	0.938"	1.281"	1.156"	1.500"	1.375"	1.750"	1.562"	1.969"	1.781"	-	-
20" x 16"	0.500"	0.500"	1.031"	0.844"	1.281"	1.031"	1.500"	1.219"	1.750"	1.438"	1.969"	1.594"	-	-
20" x 14"	0.500"	0.500"	1.031"	0.750"	1.281"	0.938"	1.500"	1.094"	1.750"	1.250"	1.969"	1.406"	-	-
22" x 22"	0.500"	0.500"	1.125"	1.125"	1.375"	1.375"	1.625"	1.625"	1.875"	1.875"	2.125"	2.125"	-	-
22" x 20"	0.500"	0.500"	1.125"	1.031"	1.375"	1.281"	1.625"	1.500"	1.875"	1.750"	2.125"	1.969"	-	-
22" x 18"	0.500"	0.500"	1.125"	0.938"	1.375"	1.156"	1.625"	1.375"	1.875"	1.562"	2.125"	1.781"	-	-
22" x 16"	0.500"	0.500"	1.125"	0.844"	1.375"	1.031"	1.625"	1.219"	1.875"	1.438"	2.125"	1.594"	-	-
24" x 24"	0.500"	0.500"	1.219"	1.219"	1.531"	1.531"	1.812"	1.812"	2.062"	2.062"	2.344"	2.344"	-	-
24" x 22"	0.500"	0.500"	1.219"	1.125"	1.531"	1.375"	1.812"	1.625"	2.062"	1.875"	2.344"	2.125"	-	-
24" x 20"	0.500"	0.500"	1.219"	1.031"	1.531"	1.281"	1.812"	1.500"	2.062"	1.750"	2.344"	1.969"	-	-
24" x 18"	0.500"	0.500"	1.219"	0.938"	1.531"	1.156"	1.812"	1.375"	2.062"	1.562"	2.344"	1.781"	-	-
26" x 26"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
26" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
26" x 18"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
26" x 16"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 20"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 18"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 26"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 20"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-

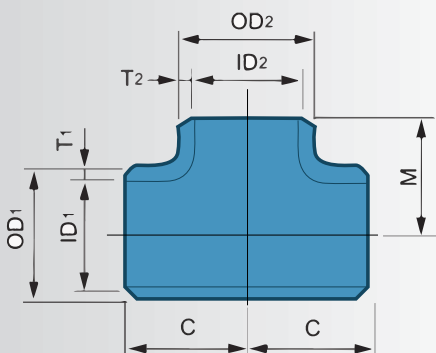
TEE

Straight and Reducing Outlet Tees

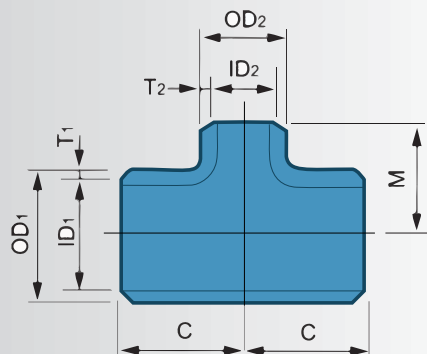
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		Center to End		Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
34" x 34"	34.000"	34.000"	25.000"	25.000"	-	-	0.625"	0.625"	0.375"	0.375"	0.688"	0.688"	-	-
34" x 32"	34.000"	32.000"	25.000"	-	-	-	0.625"	0.625"	0.375"	0.375"	0.688"	0.688"	-	-
34" x 30"	34.000"	30.000"	25.000"	24.000"	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
34" x 28"	34.000"	28.000"	25.000"	-	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
36" x 36"	36.000"	36.000"	26.500"	26.500"	-	-	0.625"	0.625"	0.375"	0.375"	0.750"	0.750"	-	-
36" x 34"	36.000"	34.000"	26.500"	-	-	-	0.625"	0.625"	0.375"	0.375"	0.750"	0.686"	-	-
36" x 32"	36.000"	32.000"	26.500"	25.500"	-	-	0.625"	0.625"	0.375"	0.375"	0.750"	0.686"	-	-
36" x 30"	36.000"	30.000"	26.500"	-	-	-	0.625"	0.625"	0.375"	0.375"	-	-	-	-
38" x 38"	38.000"	38.000"	28.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
38" x 36"	38.000"	36.000"	28.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
38" x 34"	38.000"	34.000"	28.000"	27.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
38" x 32"	38.000"	32.000"	28.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 40"	40.000"	40.000"	29.500"	29.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 38"	40.000"	38.000"	29.500"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 36"	40.000"	36.000"	29.500"	29.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 34"	40.000"	34.000"	29.500"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 42"	42.000"	42.000"	30.000"	30.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 40"	42.000"	40.000"	30.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 38"	42.000"	38.000"	30.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 36"	42.000"	36.000"	30.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 44"	44.000"	44.000"	32.000"	32.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 42"	44.000"	42.000"	32.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 40"	44.000"	40.000"	32.000"	29.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 38"	44.000"	38.000"	32.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 46"	46.000"	46.000"	33.500"	33.500"	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 44"	46.000"	44.000"	33.500"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 42"	46.000"	42.000"	33.500"	31.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 40"	46.000"	40.000"	33.500"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 48"	48.000"	48.000"	35.000"	35.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 46"	48.000"	46.000"	35.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 44"	48.000"	44.000"	35.000"	33.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 42"	48.000"	42.000"	35.000"	-	-	-	-	-	0.375"	0.375"	-	-	-	-

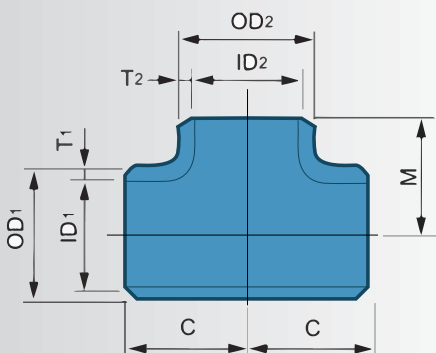
TEE

Straight and Reducing Outlet Tees

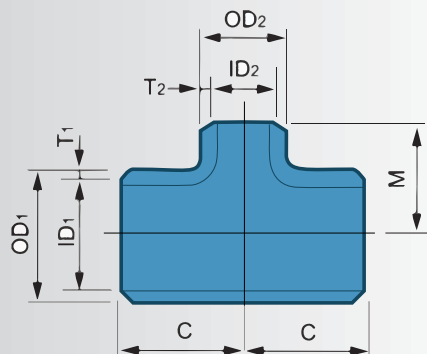
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
34" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 42"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 44"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 42"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 46"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 44"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 42"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 48"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 46"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 44"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 42"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-

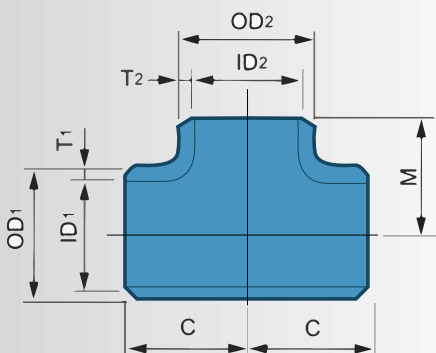
TEE

Straight and Reducing Outlet Tees

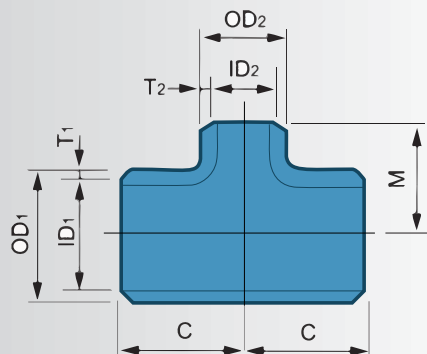
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS							
	Outside Diameter at Bevel: D1/D2		Center to End		5s		10s		40s		80s	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
1/2" x 1/2"	0.840"	0.840"	1.000"	1.000"	0.065"	0.065"	0.083"	0.083"	0.109"	0.109"	0.147"	0.147"
3/4" x 3/4"	1.050"	1.050"	1.122"	1.122"	0.065"	0.065"	0.083"	0.083"	0.113"	0.113"	0.154"	0.154"
3/4" x 1/2"	1.050"	0.840"	1.122"	1.122"	0.065"	0.065"	0.083"	0.083"	0.113"	0.109"	0.154"	0.147"
1" x 1"	1.315"	1.315"	1.500"	1.500"	0.065"	0.065"	0.109"	0.109"	0.133"	0.133"	0.179"	0.179"
1" x 3/4"	1.315"	1.050"	1.500"	1.500"	0.065"	0.065"	0.109"	0.083"	0.113"	0.113"	0.179"	0.154"
1" x 1/2"	1.315"	0.840"	1.500"	1.500"	0.065"	0.065"	0.109"	0.083"	0.113"	0.109"	0.179"	0.147"
1 1/4" x 1 1/4"	1.660"	1.660"	1.882"	1.882"	0.065"	0.065"	0.109"	0.109"	0.140"	0.140"	0.191"	0.191"
1 1/4" x 1"	1.660"	1.315"	1.882"	1.882"	0.065"	0.065"	0.109"	0.109"	0.140"	0.113"	0.191"	0.179"
1 1/4" x 3/4"	1.660"	1.050"	1.882"	1.882"	0.065"	0.065"	0.109"	0.083"	0.140"	0.109"	0.191"	0.154"
1 1/2" x 1 1/2"	1.900"	1.900"	2.252"	2.252"	0.065"	0.065"	0.109"	0.109"	0.145"	0.145"	0.228"	0.200"
1 1/2" x 1 1/4"	1.900"	1.660"	2.252"	2.252"	0.065"	0.065"	0.109"	0.109"	0.145"	0.140"	0.228"	0.191"
1 1/2" x 3/4"	1.900"	1.315"	2.252"	2.252"	0.065"	0.065"	0.109"	0.109"	0.145"	0.113"	0.228"	0.179"
1 1/2" x 1/2"	1.900"	1.050"	2.252"	2.252"	0.065"	0.065"	0.109"	0.083"	0.145"	0.109"	0.228"	0.154"
2" x 2"	2.375"	2.375"	2.500"	2.500"	0.065"	0.065"	0.109"	0.109"	0.154"	0.154"	0.218"	0.218"
2" x 1 1/2"	2.375"	1.900"	2.500"	2.382"	0.065"	0.065"	0.109"	0.109"	0.154"	0.145"	0.218"	0.200"
2" x 1 1/4"	2.375"	1.660"	2.500"	2.252"	0.065"	0.065"	0.109"	0.109"	0.154"	0.140"	0.218"	0.191"
2" x 1"	2.375"	1.315"	2.500"	2.000"	0.065"	0.065"	0.109"	0.109"	0.154"	0.133"	0.218"	0.179"
2 1/2" x 2 1/2"	2.875"	2.875"	3.000"	3.000"	0.083"	0.065"	0.120"	0.120"	0.203"	0.203"	0.276"	0.276"
2 1/2" x 2"	2.875"	2.375"	3.000"	2.752"	0.083"	0.065"	0.120"	0.109"	0.203"	0.154"	0.276"	0.218"
2 1/2" x 1 1/2"	2.875"	1.900"	3.000"	2.622"	0.083"	0.083"	0.120"	0.109"	0.203"	0.145"	0.276"	0.200"
2 1/2" x 1 1/4"	2.875"	1.660"	3.000"	2.500"	0.083"	0.065"	0.120"	0.109"	0.203"	0.140"	0.276"	0.191"
3" x 3"	3.500"	3.500"	3.374"	3.374"	0.083"	0.083"	0.120"	0.120"	0.216"	0.216"	0.300"	0.300"
3" x 2 1/2"	3.500"	2.875"	3.374"	3.252"	0.083"	0.083"	0.120"	0.120"	0.216"	0.203"	0.300"	0.276"
3" x 2"	3.500"	2.375"	3.374"	3.000"	0.083"	0.065"	0.120"	0.109"	0.216"	0.154"	0.300"	0.218"
3" x 1 1/2"	3.500"	1.900"	3.374"	2.882"	0.083"	0.065"	0.120"	0.109"	0.216"	0.145"	0.300"	0.200"
3 1/2" x 3 1/2"	4.000"	4.000"	3.752"	3.752"	0.083"	0.083"	0.120"	0.120"	0.226"	0.226"	0.318"	0.318"
3 1/2" x 3"	4.000"	3.500"	3.752"	3.622"	0.083"	0.083"	0.120"	0.120"	0.226"	0.216"	0.318"	0.300"
3 1/2" x 2 1/2"	4.000"	2.875"	3.752"	3.500"	0.083"	0.083"	0.120"	0.120"	0.226"	0.203"	0.318"	0.276"
3 1/2" x 2"	4.000"	2.375"	3.752"	3.252"	0.083"	0.065"	0.120"	0.109"	0.226"	0.154"	0.318"	0.218"
3 1/2" x 1 1/2"	4.000"	1.900"	3.752"	3.122"	0.083"	0.065"	0.120"	0.109"	0.226"	0.145"	0.318"	0.200"
4" x 4"	4.500"	4.500"	4.122"	4.122"	0.083"	0.083"	0.120"	0.120"	0.237"	0.237"	0.337"	0.337"
4" x 3 1/2"	4.500"	4.000"	4.122"	4.000"	0.083"	0.083"	0.120"	0.120"	0.237"	0.226"	0.337"	0.318"
4" x 3"	4.500"	3.500"	4.122"	3.882"	0.083"	0.083"	0.120"	0.120"	0.237"	0.216"	0.337"	0.300"
4" x 2 1/2"	4.500"	2.875"	4.122"	3.752"	0.083"	0.083"	0.120"	0.120"	0.237"	0.203"	0.337"	0.276"
4" x 2"	4.500"	2.375"	4.122"	3.500"	0.083"	0.065"	0.120"	0.109"	0.237"	0.154"	0.337"	0.218"

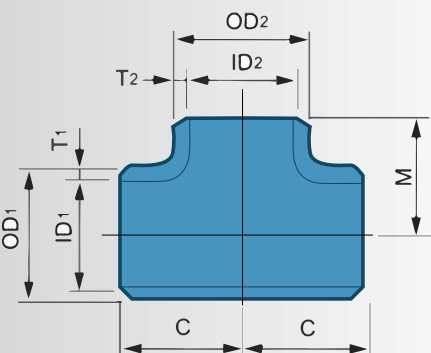
TEE

Straight and Reducing Outlet Tees

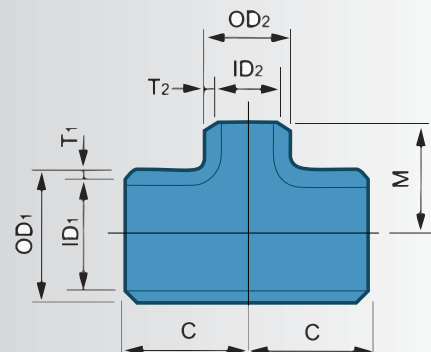
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS											
	Outside Diameter at Bevel: D1/D2		Center to End		5s		10s		40s/STD		40		80s/XH		80	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
5" x 5"	5.563"	5.563"	4.882"	4.882"	0.109"	0.109"	0.134"	0.134"	0.258"	0.258"	0.258"	0.258"	0.375"	0.375"	0.375"	0.375"
5" x 4"	5.563"	4.500"	4.882"	4.618"	0.109"	0.083"	0.134"	0.120"	0.258"	0.237"	0.258"	0.237"	0.375"	0.337"	0.375"	0.337"
5 x 3 1/2"	5.563"	4.000"	4.882"	4.500"	0.109"	0.083"	0.134"	0.120"	0.258"	0.226"	0.258"	0.226"	0.375"	0.318"	0.375"	0.318"
5" x 3"	5.563"	3.500"	4.882"	4.382"	0.109"	0.083"	0.134"	0.120"	0.258"	0.216"	0.258"	0.216"	0.375"	0.300"	0.375"	0.300"
5" x 2 1/2"	5.563"	2.875"	4.882"	4.252"	0.109"	0.083"	0.134"	0.120"	0.258"	0.203"	0.258"	0.203"	0.375"	0.276"	0.375"	0.276"
6" x 6"	6.626"	6.626"	5.622"	5.622"	0.109"	0.109"	0.134"	0.134"	0.280"	0.280"	0.280"	0.280"	0.432"	0.432"	0.432"	0.432"
6" x 5"	6.626"	5.563"	5.622"	5.382"	0.109"	0.109"	0.134"	0.134"	0.280"	0.258"	0.280"	0.258"	0.432"	0.375"	0.432"	0.375"
6" x 4"	6.626"	4.500"	5.622"	5.118"	0.109"	0.083"	0.120"	0.120"	0.280"	0.237"	0.280"	0.237"	0.432"	0.337"	0.432"	0.337"
6" x 3 1/2"	6.626"	4.000"	5.622"	5.000"	0.109"	0.083"	0.120"	0.120"	0.280"	0.226"	0.280"	0.226"	0.432"	0.318"	0.432"	0.318"
6" x 3"	6.626"	3.500"	5.622"	4.882"	0.109"	0.083"	0.120"	0.120"	0.280"	0.216"	0.280"	0.216"	0.432"	0.300"	0.432"	0.300"
8" x 8"	8.625"	8.625"	7.000"	7.000"	0.109"	0.109"	0.148"	0.148"	0.322"	0.322"	0.322"	0.322"	0.500"	0.500"	0.500"	0.500"
8" x 6"	8.625"	6.626"	7.000"	6.618"	0.109"	0.109"	0.148"	0.134"	0.322"	0.280"	0.322"	0.280"	0.500"	0.432"	0.500"	0.432"
8" x 5"	8.625"	5.563"	7.000"	6.382"	0.109"	0.109"	0.148"	0.134"	0.322"	0.258"	0.322"	0.258"	0.500"	0.375"	0.500"	0.375"
8" x 4"	8.625"	4.500"	7.000"	6.122"	0.109"	0.083"	0.148"	0.120"	0.322"	0.237"	0.322"	0.237"	0.500"	0.337"	0.500"	0.337"
10" x 10"	10.750"	10.750"	8.500"	8.500"	0.134"	0.134"	0.165"	0.165"	0.365"	0.365"	0.365"	0.365"	0.500"	0.500"	0.594"	0.594"
10" x 8"	10.750"	8.625"	8.500"	8.000"	0.134"	0.109"	0.165"	0.148"	0.365"	0.322"	0.365"	0.322"	0.500"	0.500"	0.594"	0.500"
10" x 6"	10.750"	6.626"	8.500"	7.618"	0.134"	0.109"	0.165"	0.134"	0.365"	0.280"	0.365"	0.280"	0.500"	0.432"	0.594"	0.432"
10" x 5"	10.750"	5.563"	8.500"	7.500"	0.134"	0.109"	0.165"	0.134"	0.365"	0.258"	0.365"	0.258"	0.500"	0.375"	0.594"	0.375"
12" x 12"	12.748"	12.748"	10.000"	10.000"	0.156"	0.156"	0.180"	0.180"	0.375"	0.375"	0.406"	0.406"	0.500"	0.500"	0.688"	0.688"
12" x 10"	12.748"	10.750"	10.000"	9.500"	0.156"	0.134"	0.180"	0.165"	0.375"	0.365"	0.406"	0.365"	0.500"	0.500"	0.688"	0.567"
12" x 8"	12.748"	8.625"	10.000"	9.000"	0.156"	0.109"	0.180"	0.148"	0.375"	0.322"	0.406"	0.322"	0.500"	0.500"	0.688"	0.500"
12" x 6"	12.748"	6.626"	10.000"	8.622"	0.156"	0.109"	0.180"	0.134"	0.375"	0.280"	0.406"	0.280"	0.500"	0.432"	0.688"	0.432"
14" x 14"	14.000"	14.000"	11.000"	11.000"	0.156"	0.156"	0.188"	0.188"	0.375"	0.375"	0.438"	0.438"	0.500"	0.500"	0.750"	0.750"
14" x 12"	14.000"	12.748"	11.000"	10.618"	0.156"	0.156"	0.188"	0.180"	0.375"	0.375"	0.438"	0.406"	0.500"	0.500"	0.750"	0.688"
14" x 10"	14.000"	10.750"	11.000"	10.118"	0.156"	0.134"	0.188"	0.165"	0.375"	0.365"	0.438"	0.365"	0.500"	0.500"	0.750"	0.594"
14" x 8"	14.000"	8.625"	11.000"	9.752"	0.156"	0.109"	0.188"	0.148"	0.375"	0.322"	0.438"	0.322"	0.500"	0.500"	0.750"	0.500"
16" x 16"	16.000"	16.000"	12.000"	12.000"	0.165"	0.165"	0.188"	0.188"	0.375"	0.375"	0.500"	0.500"	0.500"	0.500"	0.844"	0.844"
16" x 14"	16.000"	14.000"	12.000"	12.000"	0.165"	0.156"	0.188"	0.188"	0.375"	0.375"	0.500"	0.438"	0.500"	0.500"	0.844"	0.750"
16" x 12"	16.000"	12.748"	12.000"	11.618"	0.165"	0.156"	0.188"	0.180"	0.375"	0.375"	0.500"	0.406"	0.500"	0.500"	0.844"	0.688"
16" x 10"	16.000"	10.750"	12.000"	11.118"	0.165"	0.134"	0.188"	0.165"	0.375"	0.365"	0.500"	0.365"	0.500"	0.500"	0.844"	0.594"
18" x 18"	18.000"	18.000"	13.500"	13.500"	0.165"	0.165"	0.188"	0.188"	0.375"	0.375"	0.562"	0.562"	0.500"	0.500"	0.938"	0.938"
18" x 16"	18.000"	16.000"	13.500"	13.000"	0.165"	0.165"	0.188"	0.188"	0.375"	0.375"	0.562"	0.500"	0.500"	0.500"	0.938"	0.844"
18" x 14"	18.000"	14.000"	13.500"	13.000"	0.165"	0.156"	0.188"	0.188"	0.375"	0.375"	0.562"	0.438"	0.500"	0.500"	0.938"	0.750"
18" x 12"	18.000"	12.748"	13.500"	12.622"	0.165"	0.156"	0.188"	0.180"	0.375"	0.375"	0.562"	0.406"	0.500"	0.500"	0.938"	0.688"
20" x 20"	20.000"	20.000"	15.000"	15.000"	0.188"	0.188"	0.218"	0.218"	0.375"	0.375"	0.594"	0.594"	0.500"	0.500"	1.031"	1.031"
20" x 18"	20.000"	18.000"	15.000"	14.500"	0.188"	0.165"	0.218"	0.188"	0.375"	0.375"	0.594"	0.562"	0.500"	0.500"	1.031"	0.938"
20" x 16"	20.000"	16.000"	15.000"	14.000"	0.188"	0.165"	0.218"	0.188"	0.375"	0.375"	0.594"	0.500"	0.500"	0.500"	1.031"	0.844"
20" x 14"	20.000"	14.000"	15.000"	14.000"	0.188"	0.156"	0.218"	0.188"	0.375"	0.375"	0.594"	0.438"	0.500"	0.500"	1.031"	0.750"

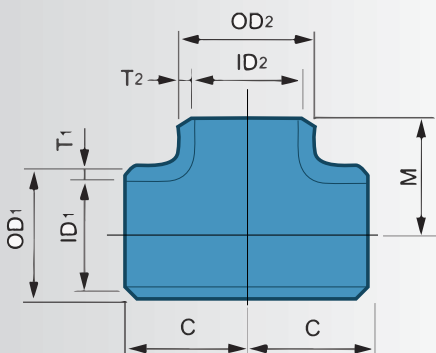
TEE

Straight and Reducing Outlet Tees

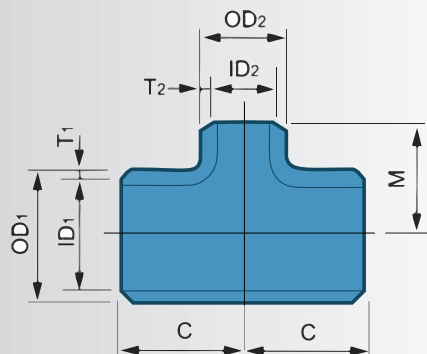
ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



STRAIGHT



REDUCING

NOMINAL PIPE SIZE	DIMENSIONS				WALL THICKNESS							
	Outside Diameter at Bevel: D1/D2		Center to End		5s		10s		40s		80s	
inch	OD1 in	OD2 in	C in	M in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
22" x 22"	22.000"	22.000"	16.500"	16.500"	0.188"	0.188"	0.218"	0.218"	0.375"	0.375"	0.500"	0.500"
22" x 20"	22.000"	20.000"	16.500"	16.000"	0.188"	0.188"	0.218"	0.218"	0.375"	0.375"	0.500"	0.500"
22" x 18"	22.000"	18.000"	16.500"	15.500"	0.188"	0.165"	0.218"	0.188"	0.375"	0.375"	0.500"	0.500"
22" x 16"	22.000"	16.000"	16.500"	15.000"	0.188"	0.165"	0.218"	0.188"	0.375"	0.375"	0.500"	0.500"
24" x 24"	24.000"	24.000"	17.000"	17.000"	0.218"	0.218"	0.250"	0.250"	0.375"	0.375"	0.500"	0.500"
24" x 22"	24.000"	22.000"	17.000"	17.000"	0.218"	0.188"	0.250"	0.218"	0.375"	0.375"	0.500"	0.500"
24" x 20"	24.000"	20.000"	17.000"	17.000"	0.218"	0.188"	0.250"	0.218"	0.375"	0.375"	0.500"	0.500"
24" x 18"	24.000"	18.000"	17.000"	16.500"	0.218"	0.165"	0.250"	0.188"	0.375"	0.375"	0.500"	0.500"
30" x 30"	30.000"	30.000"	22.000"	22.000"	0.250"	0.250"	0.312"	0.312"	0.375"	0.375"	0.500"	0.500"
30" x 24"	30.000"	24.000"	22.000"	21.000"	0.250"	0.218"	0.312"	0.250"	0.375"	0.375"	0.500"	0.500"
30" x 22"	30.000"	22.000"	22.000"	20.500"	0.250"	0.188"	0.312"	0.218"	0.375"	0.375"	0.500"	0.500"
30" x 20"	30.000"	20.000"	22.000"	20.000"	0.250"	0.188"	0.312"	0.218"	0.375"	0.375"	0.500"	0.500"

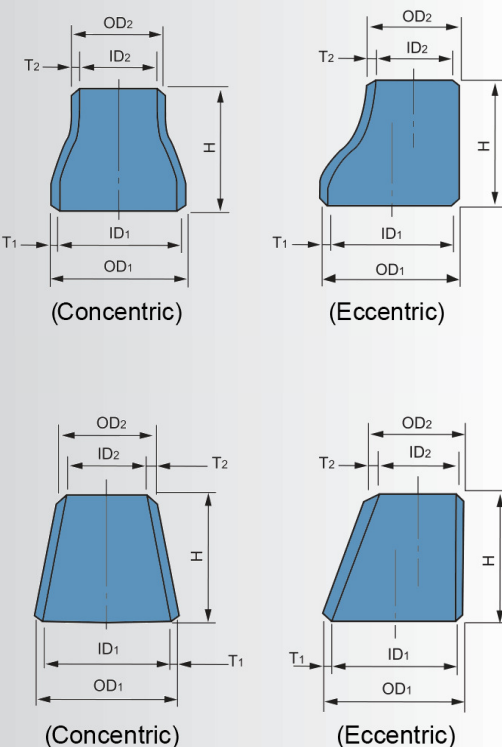
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS			WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		End to End	Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	H in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
1" x 3/4"	1.315"	1.050"	2.000"	-	-	-	-	0.133"	0.113"	0.133"	0.113"	-	-
1 1/2" x 1 1/4"	1.900"	1.660"	2.500"	-	-	-	-	0.145"	0.140"	0.145"	0.140"	-	-
1 1/2" x 1"	1.900"	1.315"	2.500"	-	-	-	-	0.145"	0.133"	0.145"	0.133"	-	-
1 1/2" x 3/4"	1.900"	1.050"	2.500"	-	-	-	-	0.145"	0.113"	0.145"	0.113"	-	-
2" x 1 1/2"	2.375"	1.900"	3.000"	-	-	-	-	0.154"	0.145"	0.154"	0.145"	-	-
2" x 1 1/4"	2.375"	1.660"	3.000"	-	-	-	-	0.154"	0.140"	0.154"	0.140"	-	-
2" x 1"	2.375"	1.315"	3.000"	-	-	-	-	0.154"	0.133"	0.154"	0.133"	-	-
2 1/2" x 2"	2.875"	2.375"	3.500"	-	-	-	-	0.203"	0.154"	0.203"	0.154"	-	-
2 1/2" x 1 1/2"	2.875"	1.900"	3.500"	-	-	-	-	0.203"	0.145"	0.203"	0.145"	-	-
2 1/2" x 1 1/4"	2.875"	1.660"	3.500"	-	-	-	-	0.203"	0.140"	0.203"	0.140"	-	-
3" x 2 1/2"	3.500"	2.875"	3.500"	-	-	-	-	0.216"	0.203"	0.216"	0.203"	-	-
3" x 2"	3.500"	2.375"	3.500"	-	-	-	-	0.216"	0.154"	0.216"	0.154"	-	-
3" x 1 1/2"	3.500"	1.900"	3.500"	-	-	-	-	0.216"	0.145"	0.216"	0.145"	-	-
4" x 3"	4.500"	3.500"	4.000"	-	-	-	-	0.237"	0.216"	0.237"	0.216"	-	-
4" x 2 1/2"	4.500"	2.875"	4.000"	-	-	-	-	0.237"	0.203"	0.237"	0.203"	-	-
4" x 2"	4.500"	2.375"	4.000"	-	-	-	-	0.237"	0.154"	0.237"	0.154"	-	-
5" x 4"	5.563"	4.500"	5.000"	-	-	-	-	0.258"	0.237"	0.258"	0.237"	-	-
5" x 3"	5.563"	3.500"	5.000"	-	-	-	-	0.258"	0.216"	0.258"	0.216"	-	-
5" x 2 1/2"	5.563"	2.875"	5.000"	-	-	-	-	0.258"	0.203"	0.258"	0.203"	-	-
6" x 5"	6.626"	5.563"	5.500"	-	-	-	-	0.280"	0.258"	0.280"	0.258"	-	-
6" x 4"	6.626"	4.500"	5.500"	-	-	-	-	0.280"	0.237"	0.280"	0.237"	-	-
6" x 3"	6.626"	3.500"	5.500"	-	-	-	-	0.280"	0.216"	0.280"	0.216"	-	-
8" x 6"	8.625"	6.626"	6.000"	-	-	-	-	0.322"	0.280"	0.322"	0.280"	-	-
8" x 5"	8.625"	5.563"	6.000"	-	-	-	-	0.322"	0.258"	0.322"	0.258"	-	-
8" x 4"	8.625"	4.500"	6.000"	-	-	-	-	0.322"	0.237"	0.322"	0.237"	-	-
10" x 8"	10.750"	8.625"	7.000"	0.250"	0.250"	0.307"	0.277"	0.365"	0.322"	0.365"	0.322"	0.500"	0.406"
10" x 6"	10.750"	6.626"	7.000"	-	-	-	-	0.365"	0.280"	0.365"	0.280"	-	-
10" x 5"	10.750"	5.563"	7.000"	-	-	-	-	0.365"	0.258"	0.365"	0.258"	-	-
12" x 10"	12.748"	10.750"	8.000"	0.250"	0.250"	0.330"	0.307"	0.375"	0.365"	0.406"	0.365"	0.562"	0.500"
12" x 8"	12.748"	8.625"	8.000"	0.250"	0.250"	0.330"	0.277"	0.375"	0.322"	0.406"	0.322"	0.562"	0.406"
12" x 6"	12.748"	6.626"	8.000"	-	-	-	-	0.375"	0.280"	0.406"	0.280"	-	-
14" x 12"	14.000"	12.748"	13.000"	0.312"	0.250"	0.375"	0.330"	0.375"	0.375"	0.438"	0.406"	0.594"	0.562"
14" x 10"	14.000"	10.750"	13.000"	0.312"	0.250"	0.375"	0.307"	0.375"	0.365"	0.438"	0.365"	0.594"	0.500"
14" x 8"	14.000"	8.625"	13.000"	0.312"	0.250"	0.375"	0.277"	0.375"	0.322"	0.438"	0.322"	0.594"	0.406"

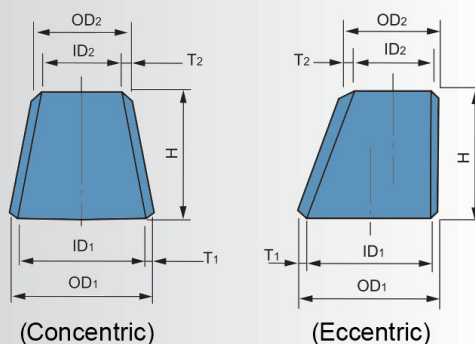
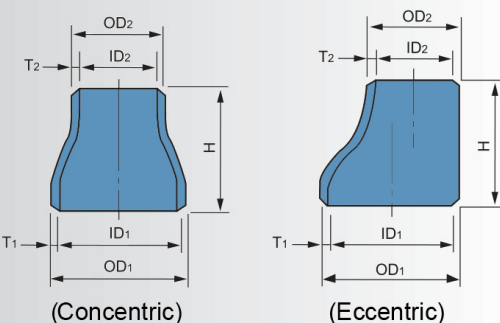
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS			WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		End to End	Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	H in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
16" x 14"	16.000"	14.000"	14.000"	0.312"	0.312"	0.375"	0.375"	0.375"	0.375"	0.500"	0.438"	0.656"	0.594"
16" x 12"	16.000"	12.748"	14.000"	0.312"	0.250"	0.375"	0.330"	0.375"	0.375"	0.500"	0.406"	0.656"	0.562"
16" x 10"	16.000"	10.750"	14.000"	0.312"	0.250"	0.375"	0.307"	0.375"	0.365"	0.500"	0.365"	0.656"	0.500"
16" x 8"	16.000"	8.625"	14.000"	0.312"	0.250"	0.375"	0.277"	0.375"	0.322"	0.500"	0.322"	0.656"	0.406"
18" x 16"	18.000"	16.000"	15.000"	0.312"	0.312"	-	-	0.375"	0.375"	0.562"	0.500"	0.750"	0.656"
18" x 14"	18.000"	14.000"	15.000"	0.312"	0.312"	-	-	0.375"	0.375"	0.562"	0.438"	0.750"	0.594"
18" x 12"	18.000"	12.748"	15.000"	0.312"	0.250"	-	-	0.375"	0.375"	0.562"	0.406"	0.750"	0.562"
20" x 18"	20.000"	18.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	0.594"	0.562"	0.812"	0.750"
20" x 16"	20.000"	16.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	0.594"	0.500"	0.812"	0.656"
20" x 14"	20.000"	14.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	0.594"	0.438"	0.812"	0.594"
22" x 20"	22.000"	20.000"	20.000"	0.375"	0.375"	-	-	0.375"	0.375"	-	-	0.875"	0.812"
22" x 18"	22.000"	18.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	-	-	0.875"	0.750"
22" x 16"	22.000"	16.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	-	-	0.875"	0.656"
24" x 22"	24.000"	22.000"	20.000"	0.375"	0.375"	-	-	0.375"	0.375"	0.688"	-	0.969"	0.875"
24" x 20"	24.000"	20.000"	20.000"	0.375"	0.375"	-	-	0.375"	0.375"	0.688"	0.594"	0.969"	0.812"
24" x 18"	24.000"	18.000"	20.000"	0.375"	0.312"	-	-	0.375"	0.375"	0.688"	0.562"	0.969"	0.750"
26" x 22"	26.000"	22.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
26" x 18"	26.000"	18.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
26" x 16"	26.000"	16.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
28" x 24"	28.000"	24.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
28" x 24"	28.000"	20.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
28" x 18"	28.000"	18.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
30" x 26"	30.000"	26.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
30" x 22"	30.000"	22.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
30" x 20"	30.000"	20.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
32" x 28"	32.000"	28.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
32" x 24"	32.000"	24.000"	24.000"	-	-	-	-	0.375"	0.375"	0.688"	0.688"	-	-
32" x 22"	32.000"	22.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
34" x 30"	34.000"	30.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
34" x 26"	34.000"	26.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
34" x 22"	34.000"	22.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
36" x 32"	36.000"	32.000"	24.000"	-	-	-	-	0.375"	0.375"	0.750"	0.688"	-	-
36" x 28"	36.000"	28.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
36" x 24"	36.000"	24.000"	24.000"	-	-	-	-	0.375"	0.375"	0.750"	0.688"	-	-

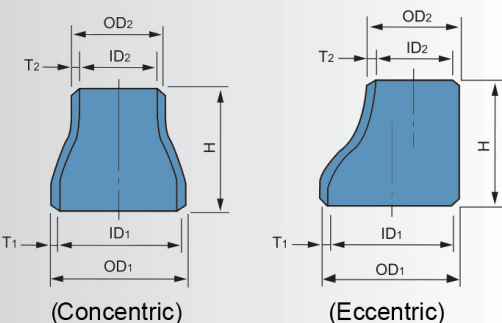
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS			WALL THICKNESS									
	Outside Diameter at Bevel: D1/D2		End to End	Sch. 20		Sch. 30		Std		Sch. 40		Sch. 60	
inch	OD1 in	OD2 in	H in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
38" x 34"	38.000"	34.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
38" x 30"	38.000"	30.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
38" x 26"	38.000"	26.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 36"	40.000"	36.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 32"	40.000"	32.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
40" x 28"	40.000"	28.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 38"	42.000"	38.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 34"	42.000"	34.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
42" x 30"	42.000"	30.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 40"	44.000"	40.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 36"	44.000"	36.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
44" x 32"	44.000"	32.000"	24.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 42"	46.000"	42.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 38"	46.000"	38.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
46" x 34"	46.000"	34.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 44"	48.000"	44.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 40"	48.000"	40.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-
48" x 36"	48.000"	36.000"	28.000"	-	-	-	-	0.375"	0.375"	-	-	-	-

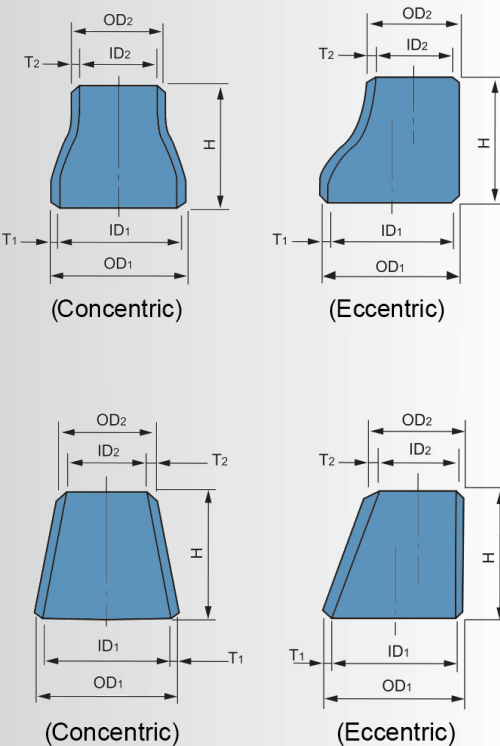
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
1" x 3/4"	0.179"	0.154"	0.179"	0.154"	-	-	-	-	-	-	0.250"	0.219"	0.358"	0.308"
1 1/2" x 1 1/4"	0.200"	0.191"	0.200"	0.191"	-	-	-	-	-	-	0.281"	0.250"	0.400"	0.382"
1 1/2" x 1"	0.200"	0.179"	0.200"	0.179"	-	-	-	-	-	-	0.281"	0.250"	0.400"	0.358"
1 1/2" x 3/4"	0.200"	0.154"	0.200"	0.154"	-	-	-	-	-	-	0.281"	0.219"	0.400"	0.308"
2" x 1 1/2"	0.218"	0.200"	0.218"	0.200"	-	-	-	-	-	-	0.344"	0.281"	0.436"	0.400"
2" x 1 1/4"	0.218"	0.191"	0.218"	0.191"	-	-	-	-	-	-	0.344"	0.250"	0.436"	0.382"
2" x 1"	0.218"	0.179"	0.218"	0.179"	-	-	-	-	-	-	0.344"	0.250"	0.436"	0.358"
2 1/2" x 2"	0.276"	0.218"	0.276"	0.218"	-	-	-	-	-	-	0.375"	0.344"	0.552"	0.436"
2 1/2" x 1 1/2"	0.276"	0.200"	0.276"	0.200"	-	-	-	-	-	-	0.375"	0.281"	0.552"	0.400"
2 1/2" x 1 1/4"	0.276"	0.191"	0.276"	0.191"	-	-	-	-	-	-	0.375"	0.250"	0.552"	0.382"
3" x 2 1/2"	0.300"	0.276"	0.300"	0.276"	-	-	-	-	-	-	0.438"	0.375"	0.600"	0.552"
3" x 2"	0.300"	0.218"	0.300"	0.218"	-	-	-	-	-	-	0.438"	0.344"	0.600"	0.436"
3" x 1 1/2"	0.300"	0.200"	0.300"	0.200"	-	-	-	-	-	-	0.438"	0.281"	0.600"	0.400"
4" x 3"	0.337"	0.300"	0.337"	0.300"	-	-	-	-	-	-	0.531"	0.438"	0.674"	0.600"
4" x 2 1/2"	0.337"	0.276"	0.337"	0.276"	-	-	-	-	-	-	0.531"	0.375"	0.674"	0.552"
4" x 2"	0.337"	0.218"	0.337"	0.218"	-	-	-	-	-	-	0.531"	0.344"	0.674"	0.436"
5" x 4"	0.375"	0.337"	0.375"	0.337"	-	-	0.500"	0.438"	-	-	0.625"	0.531"	0.750"	0.674"
5" x 3"	0.375"	0.300"	0.375"	0.300"	-	-	-	-	-	-	0.625"	0.438"	0.750"	0.600"
5" x 2 1/2"	0.375"	0.276"	0.375"	0.276"	-	-	-	-	-	-	0.625"	0.375"	0.750"	0.552"
6" x 5"	0.432"	0.375"	0.432"	0.375"	-	-	0.562"	0.500"	-	-	0.719"	0.625"	0.864"	0.750"
6" x 4"	0.432"	0.337"	0.432"	0.337"	-	-	0.562"	0.438"	-	-	0.719"	0.531"	0.864"	0.674"
6" x 3"	0.432"	0.300"	0.432"	0.300"	-	-	-	-	-	-	0.719"	0.438"	0.864"	0.600"
8" x 6"	0.500"	0.432"	0.500"	0.432"	-	-	0.719"	0.562"	-	-	0.906"	0.719"	0.875"	0.864"
8" x 5"	0.500"	0.375"	0.500"	0.375"	-	-	0.719"	0.500"	-	-	0.906"	0.625"	0.875"	0.750"
8" x 4"	0.500"	0.337"	0.500"	0.337"	-	-	0.719"	0.438"	-	-	0.906"	0.531"	0.875"	0.674"
10" x 8"	0.500"	0.500"	0.594"	0.500"	0.719"	0.594"	0.844"	0.719"	1.000"	0.812"	1.125"	0.906"	1.000"	0.875"
10" x 6"	0.500"	0.432"	0.594"	0.432"	-	-	0.844"	0.562"	-	-	1.125"	0.719"	1.000"	0.864"
10" x 5"	0.500"	0.375"	0.594"	0.375"	-	-	0.844"	0.500"	-	-	1.125"	0.625"	1.000"	0.750"
12" x 10"	0.500"	0.500"	0.688"	0.594"	0.844"	0.719"	1.000"	0.844"	1.125"	1.000"	1.312"	1.125"	1.000"	1.000"
12" x 8"	0.500"	0.500"	0.688"	0.500"	0.844"	0.594"	1.000"	0.719"	1.125"	0.812"	1.312"	0.906"	1.000"	0.875"
12" x 6"	0.500"	0.432"	0.688"	0.432"	-	-	1.000"	0.562"	-	-	1.312"	0.719"	1.000"	0.864"
14" x 12"	0.500"	0.500"	0.750"	0.688"	0.938"	0.844"	1.094"	1.000"	1.250"	1.125"	1.406"	1.312"	-	-
14" x 10"	0.500"	0.500"	0.750"	0.594"	0.938"	0.719"	1.094"	0.844"	1.250"	1.000"	1.406"	1.125"	-	-
14" x 8"	0.500"	0.500"	0.750"	0.500"	0.938"	0.594"	1.094"	0.719"	1.250"	0.812"	1.406"	0.906"	-	-

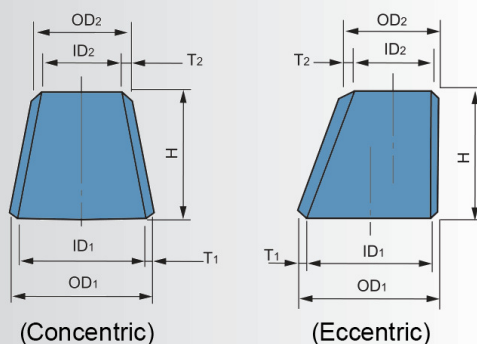
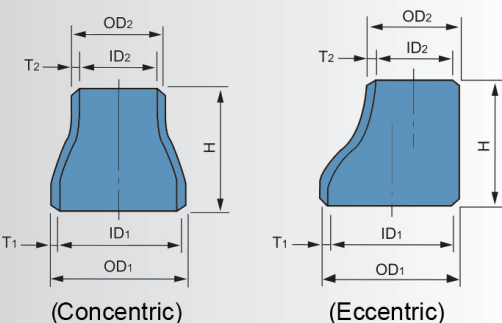
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
16" x 14"	0.500"	0.500"	0.844"	0.750"	1.031"	0.938"	1.219"	1.094"	1.438"	1.250"	1.594"	1.406"	-	-
16" x 12"	0.500"	0.500"	0.844"	0.688"	1.031"	0.844"	1.219"	1.000"	1.438"	1.125"	1.594"	1.312"	-	-
16" x 10"	0.500"	0.500"	0.844"	0.594"	1.031"	0.719"	1.219"	0.844"	1.438"	1.000"	1.594"	1.125"	-	-
16" x 8"	0.500"	0.500"	0.844"	0.500"	1.031"	0.594"	1.219"	0.719"	1.438"	0.812"	1.594"	0.906"	-	-
18" x 16"	0.500"	0.500"	0.938"	0.844"	1.156"	1.031"	1.375"	1.219"	1.562"	1.438"	1.781"	1.594"	-	-
18" x 14"	0.500"	0.500"	0.938"	0.750"	1.156"	0.938"	1.375"	1.094"	1.562"	1.250"	1.781"	1.406"	-	-
18" x 12"	0.500"	0.500"	0.938"	0.688"	1.156"	0.844"	1.375"	1.000"	1.562"	1.125"	1.781"	1.312"	-	-
20" x 18"	0.500"	0.500"	1.031"	0.938"	1.281"	1.156"	1.500"	1.375"	1.750"	1.562"	1.969"	1.781"	-	-
20" x 16"	0.500"	0.500"	1.031"	0.844"	1.281"	1.031"	1.500"	1.219"	1.750"	1.438"	1.969"	1.594"	-	-
20" x 14"	0.500"	0.500"	1.031"	0.750"	1.281"	0.938"	1.500"	1.094"	1.750"	1.250"	1.969"	1.406"	-	-
22" x 20"	0.500"	0.500"	1.125"	1.031"	1.375"	1.281"	1.625"	1.500"	1.875"	1.750"	2.125"	1.969"	-	-
22" x 18"	0.500"	0.500"	1.125"	0.938"	1.375"	1.156"	1.625"	1.375"	1.875"	1.562"	2.125"	1.781"	-	-
22" x 16"	0.500"	0.500"	1.125"	0.844"	1.375"	1.031"	1.625"	1.219"	1.875"	1.438"	2.125"	1.594"	-	-
24" x 22"	0.500"	0.500"	1.219"	1.125"	1.531"	1.375"	1.812"	1.625"	2.062"	1.875"	2.344"	2.125"	-	-
24" x 20"	0.500"	0.500"	1.219"	1.031"	1.531"	1.281"	1.812"	1.500"	2.062"	1.750"	2.344"	1.969"	-	-
24" x 18"	0.500"	0.500"	1.219"	0.938"	1.531"	1.156"	1.812"	1.375"	2.062"	1.562"	2.344"	1.781"	-	-
26" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
26" x 18"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
26" x 16"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
28" x 18"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 26"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
30" x 20"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
32" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 26"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
34" x 22"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
36" x 24"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-

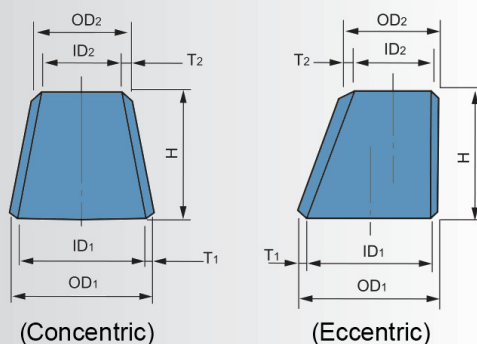
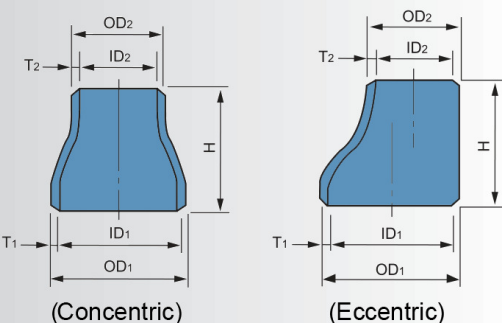
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	WALL THICKNESS													
	XS		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XXS	
inch	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
38" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
38" x 26"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
40" x 28"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
42" x 30"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
44" x 32"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 42"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 38"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
46" x 34"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 44"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 40"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-
48" x 36"	0.500"	0.500"	-	-	-	-	-	-	-	-	-	-	-	-

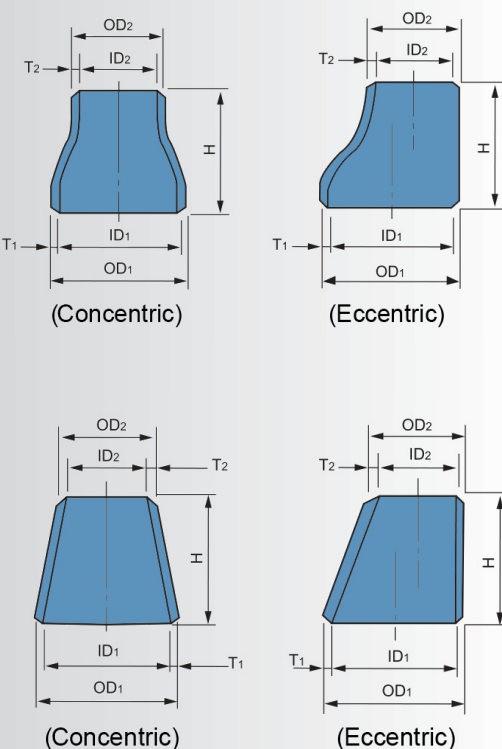
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS			WALL THICKNESS			
	Outside Diameter at Bevel: D1/ D2		End to End	40s		80s	
inch	OD1 in	OD2 in	H in	t1 in	t2 in	t1 in	t2 in
3/4" x 1/2"	1.050"	0.840"	1.500"	0.113"	0.109"	0.154"	0.147"
1" x 3/4"	1.315"	1.050"	2.000"	0.133"	0.113"	0.179"	0.154"
1" x 1/2"	1.315"	0.840"	2.000"	0.133"	0.109"	0.179"	0.147"
1 1/4" x 1"	1.660"	1.315"	2.000"	0.140"	0.133"	0.191"	0.179"
1 1/4" x 3/4"	1.660"	1.050"	2.000"	0.140"	0.113"	0.191"	0.154"
1 1/4" x 1/2"	1.660"	0.840"	2.000"	0.140"	0.109"	0.191"	0.147"
1 1/2" x 1 1/4"	1.900"	1.660"	2.500"	0.145"	0.140"	0.200"	0.191"
1 1/2" x 1"	1.900"	1.315"	2.500"	0.145"	0.133"	0.200"	0.179"
1 1/2" x 3/4"	1.900"	1.050"	2.500"	0.145"	0.113"	0.200"	0.154"
1 1/2" x 1/2"	1.900"	0.840"	2.500"	0.145"	0.109"	0.200"	0.147"
2" x 1 1/2"	2.375"	1.900"	3.000"	0.154"	0.145"	0.218"	0.200"
2" x 1 1/4"	2.375"	1.660"	3.000"	0.154"	0.140"	0.218"	0.191"
2" x 1"	2.375"	1.315"	3.000"	0.154"	0.133"	0.218"	0.179"
2" x 3/4"	2.375"	1.050"	3.000"	0.154"	0.113"	0.218"	0.154"
2 1/2" x 2"	2.875"	2.375"	3.500"	0.203"	0.154"	0.276"	0.218"
2 1/2" x 1 1/2"	2.875"	1.900"	3.500"	0.203"	0.145"	0.276"	0.200"
2 1/2" x 1 1/4"	2.875"	1.660"	3.500"	0.203"	0.140"	0.276"	0.191"
3" x 2 1/2"	3.500"	2.875"	3.500"	0.216"	0.203"	0.300"	0.276"
3" x 2"	3.500"	2.375"	3.500"	0.216"	0.154"	0.300"	0.218"
3" x 1 1/2"	3.500"	1.900"	3.500"	0.216"	0.145"	0.300"	0.200"
3" x 1 1/4"	3.500"	1.660"	3.500"	0.216"	0.140"	0.300"	0.191"
3 1/2" x 3"	4.000"	3.500"	4.000"	0.226"	0.216"	0.318"	0.300"
3 1/2" x 2 1/2"	4.000"	2.875"	4.000"	0.226"	0.203"	0.318"	0.276"
3 1/2" x 2"	4.000"	2.375"	4.000"	0.226"	0.154"	0.318"	0.218"
4" x 3 1/2"	4.500"	4.000"	4.000"	0.237"	0.226"	0.337"	0.318"
4" x 3"	4.500"	3.500"	4.000"	0.237"	0.216"	0.337"	0.300"
4" x 2 1/2"	4.500"	2.875"	4.000"	0.237"	0.203"	0.337"	0.276"
4" x 2"	4.500"	2.375"	4.000"	0.237"	0.154"	0.337"	0.218"
5" x 4"	5.563"	4.500"	5.000"	0.258"	0.237"	0.375"	0.337"
5" x 3 1/2"	5.563"	4.000"	5.000"	0.258"	0.226"	0.375"	0.318"
5" x 3"	5.563"	3.500"	5.000"	0.258"	0.216"	0.375"	0.300"
5" x 2 1/2"	5.563"	2.875"	5.000"	0.258"	0.203"	0.375"	0.276"

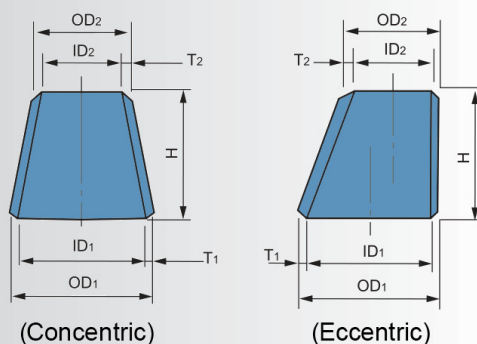
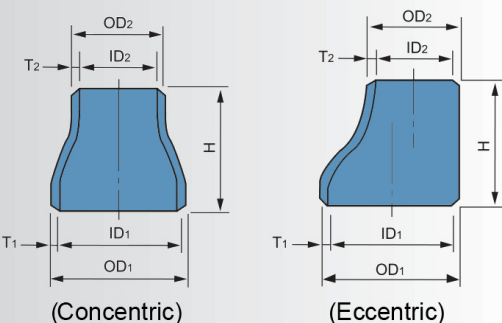
REDUCER

Concentric & Eccentric Reducer

ASTM/ASME A234

ANSI B 16.9 / B 16.28

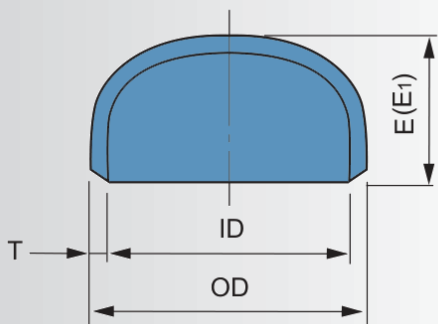
MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS			WALL THICKNESS							
	Outside Diameter at Bevel: D1/D2		End to End	40s/STD		40		80s/XH		80	
inch	OD1 in	OD2 in	H in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in	t1 in	t2 in
6" x 5"	6.626"	5.563"	5.500"	0.280"	0.258"	0.280"	0.258"	0.432"	0.375"	0.432"	0.375"
6" x 4"	6.626"	4.500"	5.500"	0.280"	0.237"	0.280"	0.237"	0.432"	0.337"	0.432"	0.337"
6" x 3 1/2"	6.626"	4.000"	5.500"	0.280"	0.226"	0.280"	0.226"	0.432"	0.318"	0.432"	0.318"
6" x 3"	6.626"	3.500"	5.500"	0.280"	0.216"	0.280"	0.216"	0.432"	0.300"	0.432"	0.300"
8" x 6"	8.625"	6.626"	6.000"	0.322"	0.280"	0.322"	0.280"	0.500"	0.432"	0.500"	0.432"
8" x 5"	8.625"	5.563"	6.000"	0.322"	0.258"	0.322"	0.258"	0.500"	0.375"	0.500"	0.375"
8" x 4"	8.625"	4.500"	6.000"	0.322"	0.237"	0.322"	0.237"	0.500"	0.337"	0.500"	0.337"
10" x 8"	10.750"	8.625"	7.000"	0.365"	0.322"	0.365"	0.322"	0.500"	0.500"	0.594"	0.500"
10" x 6"	10.750"	6.626"	7.000"	0.365"	0.280"	0.365"	0.280"	0.500"	0.432"	0.594"	0.432"
10" x 5"	10.750"	5.563"	7.000"	0.365"	0.258"	0.365"	0.258"	0.500"	0.375"	0.594"	0.375"
12" x 10"	12.748"	10.750"	8.000"	0.375"	0.365"	0.375"	0.365"	0.500"	0.500"	0.688"	0.594"
12" x 8"	12.748"	8.625"	8.000"	0.375"	0.322"	0.375"	0.322"	0.500"	0.500"	0.688"	0.500"
12" x 6"	12.748"	6.626"	8.000"	0.375"	0.280"	0.375"	0.280"	0.500"	0.432"	0.688"	0.432"
14" x 12"	14.000"	12.748"	13.000"	0.375"	0.375"	0.438"	0.406"	0.500"	0.500"	0.750"	0.688"
14" x 10"	14.000"	10.750"	13.000"	0.375"	0.365"	0.438"	0.365"	0.500"	0.500"	0.750"	0.594"
14" x 8"	14.000"	8.625"	13.000"	0.375"	0.322"	0.438"	0.322"	0.500"	0.500"	0.750"	0.500"
16" x 14"	16.000"	14.000"	14.000"	0.375"	0.375"	0.500"	0.438"	0.500"	0.500"	0.844"	0.750"
16" x 12"	16.000"	12.748"	14.000"	0.375"	0.375"	0.500"	0.406"	0.500"	0.500"	0.844"	0.688"
16" x 10"	16.000"	10.750"	14.000"	0.375"	0.365"	0.500"	0.365"	0.500"	0.500"	0.844"	0.594"
18" x 16"	18.000"	16.000"	15.000"	0.375"	0.375"	0.562"	0.500"	0.500"	0.500"	0.938"	0.844"
18" x 14"	18.000"	14.000"	15.000"	0.375"	0.375"	0.562"	0.438"	0.500"	0.500"	0.938"	0.750"
18" x 12"	18.000"	12.748"	15.000"	0.375"	0.375"	0.562"	0.406"	0.500"	0.500"	0.938"	0.688"
20" x 18"	20.000"	18.000"	20.000"	0.375"	0.375"	0.594"	0.562"	0.500"	0.500"	1.031"	0.938"
20" x 16"	20.000"	16.000"	20.000"	0.375"	0.375"	0.594"	0.500"	0.500"	0.500"	1.031"	0.844"
20" x 14"	20.000"	14.000"	20.000"	0.375"	0.375"	0.594"	0.438"	0.500"	0.500"	1.031"	0.750"
22" x 20"	22.000"	20.000"	20.000"	0.375"	0.375"	-	-	0.500"	0.500"	1.125"	1.031"
22" x 18"	22.000"	18.000"	20.000"	0.375"	0.375"	-	-	0.500"	0.500"	1.125"	0.938"
22" x 16"	22.000"	16.000"	20.000"	0.375"	0.375"	-	-	0.500"	0.500"	1.125"	0.844"
24" x 22"	24.000"	22.000"	20.000"	0.375"	0.375"	-	-	0.500"	0.500"	1.219"	1.125"
24" x 20"	24.000"	20.000"	20.000"	0.375"	0.375"	0.688"	0.594"	0.500"	0.500"	1.219"	1.031"
24" x 18"	24.000"	18.000"	20.000"	0.375"	0.375"	0.688"	0.562"	0.500"	0.500"	1.219"	0.938"
30" x 26"	30.000"	24.000"	24.000"	0.375"	0.375"	-	-	0.500"	0.500"	-	-
30" x 22"	30.000"	22.000"	24.000"	0.375"	0.375"	-	-	0.500"	0.500"	-	-
30" x 20"	30.000"	20.000"	24.000"	0.375"	0.375"	-	-	0.500"	0.500"	-	-

CAP

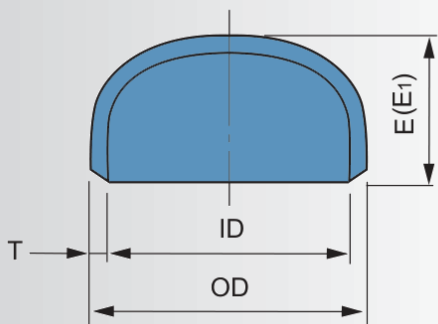
ASTM/ASME A234
ANSI B 16.9 / B 16.28
MSS SP-43



NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E			
inch	inch	mm	inch	mm	mm	mm	mm		inch	mm
1/2"	0.840"	21.34	0.622" 0.546" 0.464" 0.252"	15.80 13.88 11.78 6.40	25.4	4.57	25.4	Std/40 40s XS/80 80s 160 XXS	0.109" 0.147" 0.188" 0.294"	2.77 3.73 4.78 7.47
3/4"	1.050"	26.67	0.824" 0.742" 0.612" 0.434"	20.93 18.85 15.55 11.03	25.4	3.81	25.4	Std/40 40s XS/80 80s 160 XXS	0.113" 0.154" 0.219" 0.308"	2.87 3.91 5.56 7.82
1"	1.315"	33.4	1.049" 0.957" 0.815" 0.599"	26.64 24.30 20.70 15.22	38.1	4.57	38.1	Std/40 40s XS/80 80s 160 XXS	0.133" 0.179" 0.250" 0.358"	3.38 4.55 6.35 9.09
1 1/4"	1.660"	42.16	1.380" 1.278" 1.160" 0.896"	34.86 32.46 29.46 22.76	38.1	4.83	38.1	Std/40 40s XS/80 80s 160 XXS	0.140" 0.191" 0.250" 0.382"	3.56 4.85 6.35 9.70
1 1/2"	1.900"	48.26	1.610" 1.500" 1.338" 1.100"	40.90 38.10 33.98 27.94	38.1	5.08	38.1	Std/40 40s XS/80 80s 160 XXS	0.145" 0.200" 0.281" 0.400"	3.68 5.08 7.14 10.16
2"	2.375"	60.32	2.067" 1.939" 1.687" 1.503"	52.50 49.24 42.84 38.18	38.1	5.59	38.1	Std/40 40s XS/80 80s 160 XXS	0.154" 0.218" 0.344" 0.436"	3.91 5.54 8.74 11.07

CAP

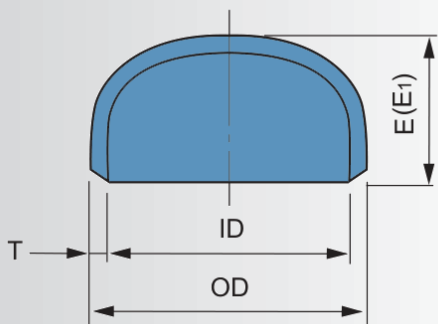
ASTM/ASME A234
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NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E			
inch	inch	mm	inch	mm	mm	mm	mm		inch	mm
2 1/2"	2.875"	73.02	2.469" 2.323" 2.125" 1.771"	62.70 59.00 53.98 44.98	38.1	7.11	50.8	Std/40 40s XS/80 80s 160 XXS	0.203" 0.276" 0.375" 0.552"	5.16 7.01 9.52 14.02
3"	3.500"	88.90	3.068" 2.900" 2.624" 2.300"	77.92 73.66 66.66 58.42	50.8	7.62	63.5	Std/40 40s XS/80 80s 160 XXS	0.216" 0.300" 0.438" 0.600"	5.49 7.62 11.12 15.24
4"	4.500"	114.30	4.026" 3.726" 3.624" 3.438" 3.125"	102.26 97.18 92.06 87.32 80.06	63.5	8.64	76.2	Std/40 40s XS/80 80s 120 160 XXS	0.237" 0.387" 0.438" 0.531" 0.674"	6.02 8.56 11.12 13.49 17.12
5"	5.563"	141.30	5.047" 4.813" 4.563" 4.313" 4.063"	128.20 122.24 115.90 109.54 103.20	76.2	9.65	88.9	Std/40 40s XS/80 80s 120 160 XXS	0.258" 0.375" 0.500" 0.625" 0.750"	6.55 9.53 12.70 15.88 19.05
6"	6.625"	168.30	6.065" 5.761" 5.501" 5.187" 4.897"	154.08 146.36 139.76 131.78 124.40	88.9	10.92	101.6	Std/40 40s XS/80 80s 120 160 XXS	0.280" 0.432" 0.562" 0.719" 0.864"	7.11 10.97 14.27 18.26 21.95

CAP

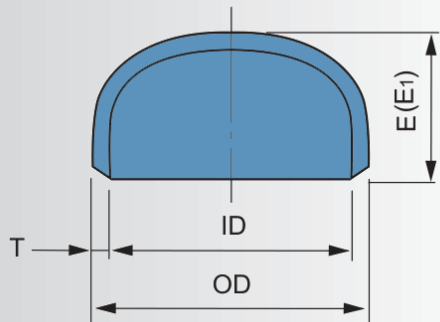
ASTM/ASME A234
ANSI B 16.9 / B 16.28
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NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E			
inch	inch	mm	inch	mm	mm	mm	mm		inch	mm
8"	8.625"	219.08	7.981"	202.72	101.6	12.70	127.0	STD/40 40s XS/80 80s 20 60 100 120 140 160 XXS	0.322"	8.18
			7.625"	193.68					0.500"	12.70
			8.125"	206.38					0.250"	6.35
			7.813"	198.46					0.406"	10.31
			7.437"	188.90					0.594"	15.09
			7.187"	182.56					0.719"	18.26
			7.001"	178.54					0.812"	20.62
			6.813"	173.06					0.906"	23.01
			6.875"	174.64					0.875"	22.22
10"	10.750"	273.05	10.020"	254.51	127.0	12.70	152.4	STD/40 40S XS/80S 60 80 20 100 120 140/XXS 160	0.365"	9.27
			9.750"	247.65					0.500"	12.70
			9.562"	242.87					0.594"	15.09
			10.250"	260.35					0.250"	6.35
			9.312"	236.53					0.719"	18.26
			9.062"	230.17					0.844"	21.44
			8.750"	222.25					1.000"	25.40
			8.500"	215.89					1.125"	28.58
12"	12.750"	323.80	12.000"	304.76	152.4	12.70	177.8	STD 40S XS/80S 20 40 80 100 120 140 160	0.375"	9.52
			11.750"	298.40					0.500"	12.70
			12.250"	311.10					0.250"	6.35
			11.938"	303.18					0.406"	10.31
			11.374"	288.84					0.688"	17.48
			11.062"	280.92					0.844"	21.44
			10.750"	273.00					1.000"	25.40
			10.500"	266.64					1.125"	28.58
			10.126"	257.16					1.312"	33.32

CAP

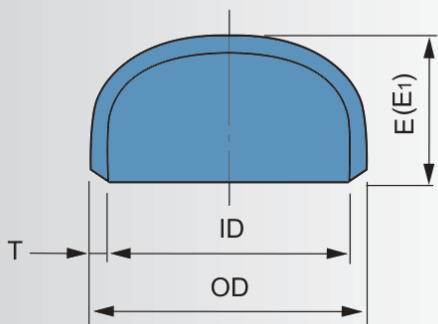
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NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E			
inch	inch	mm	inch	mm	mm	mm	mm		inch	mm
14"	14.000"	355.60	13.250"	336.56	165.1	12.70	190.5	STD	0.375"	9.52
			13.376"	339.76				20	0.312"	7.92
			13.124"	333.34				40	0.438"	11.13
			13.000"	330.20				XS	0.500"	12.70
			12.812"	325.42				60	0.594"	15.09
			12.500"	317.50				80	0.750"	19.05
			12.124"	307.94				100	0.938"	23.83
			11.812"	300.02				120	1.094"	27.79
			11.500"	292.10				140	1.250"	31.75
			11.188"	284.18				160	1.406"	35.71
16"	16.000"	406.40	15.250"	387.36	177.8	12.70	203.2	STD	0.375"	9.52
			15.000"	381.00				XS/40	0.500"	12.70
			15.376"	390.56				20	0.312"	7.92
			14.688"	373.08				60	0.656"	16.66
			14.312"	363.52				80	0.844"	21.44
			13.938"	354.02				100	1.031"	26.19
			13.562"	344.48				120	1.219"	30.96
			13.124"	333.36				140	1.438"	36.52
			12.812"	325.42				160	1.594"	40.49
18"	18.000"	457.20	17.250"	438.16	203.2	12.70	228.6	STD	0.375"	9.52
			17.000"	431.80				XS	0.500"	12.70
			17.736"	441.36				20	0.132"	7.92
			16.876"	428.66				40	0.562"	14.27
			16.500"	419.10				60	0.750"	19.05
			16.124"	409.56				80	0.938"	23.82
			15.688"	398.48				100	1.156"	29.36
			15.250"	387.36				120	1.375"	34.92
			14.876"	377.86				140	1.562"	39.67
			14.438"	366.72				160	1.781"	45.24

CAP

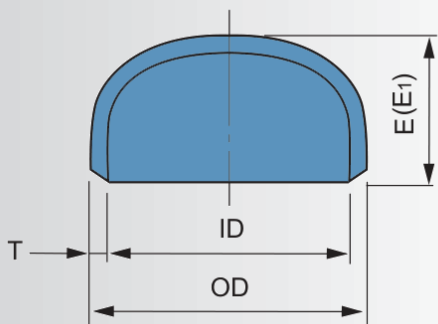
ASTM/ASME A234
ANSI B 16.9 / B 16.28
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NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E		inch	mm
inch	inch	mm	inch	mm	mm	mm	mm			
20"	20.000"	508.0	19.250"	488.96	228.6	12.70	254.0	STD/20	0.375"	9.52
			19.000"	482.60				XS	0.500"	12.70
			18.812"	477.82				40	0.594"	15.09
			18.376"	466.76				60	0.812"	20.62
			17.938"	455.62				80	1.031"	26.19
			17.438"	442.92				100	1.281"	32.54
			17.000"	431.80				120	1.500"	38.10
			16.500"	419.10				140	1.750"	44.45
			16.062"	407.98				160	1.969"	50.01
22"	22.000"	558.80	21.250"	539.76	254.0	12.70	254.0	STD/20	0.375"	9.52
			21.000"	533.40				XS	0.500"	12.70
			20.250"	514.36				60	0.875"	22.22
			19.750"	501.64				80	1.125"	28.58
			19.250"	488.96				100	1.375"	34.92
			18.750"	476.24				120	1.625"	41.28
			18.250"	463.56				140	1.875"	47.62
			17.750"	450.84				160	2.125"	53.98
24"	24.000"	609.60	23.250"	590.56	266.7	12.70	304.8	STD/20	0.375"	9.52
			23.000"	584.20				XS	0.500"	12.70
			22.624"	574.64				40	0.688"	17.48
			22.062"	560.38				60	0.969"	24.61
			21.562"	547.68				80	1.219"	30.96
			20.938"	531.82				100	1.531"	38.89
			20.376"	517.56				120	1.812"	46.02
			19.876"	504.86				140	2.062"	52.37
			19.312"	490.52				160	2.344"	59.54

CAP

ASTM/ASME A234
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NOMINAL PIPE SIZE	DIMENSIONS							WALL THICKNESS		
	Outside Diameter at Bevel:D OD		Inside Diameter at Bevel:D ID		Length			Sch. No.	t	
					E	Limiting Wall Thickness For Length	E			
inch	inch	mm	inch	mm	mm	mm	mm		inch	mm
26"	26.000"	660.40	25.250" 25.000"	641.36 635.00	266.7	-	-	STD XS	0.375" 0.500"	9.52 12.70
28"	28.000"	711.20	27.250" 27.000"	692.56 685.80	266.7	-	-	STD XS	0.375" 0.500"	9.32 12.70
30"	30.000"	762.00	29.500" 29.376" 29.250" 29.000"	749.30 746.16 742.96 736.60	266.7	-	-	STD XS	0.375" 0.500"	9.52 12.70
32"	32.000"	812.80	31.250" 31.200" 30.624"	793.76 787.40 777.84	266.7	-	-	STD XS 40	0.375" 0.500" 0.688"	9.52 12.70 17.48
34"	34.000"	863.60	33.250" 33.000" 32.624"	844.54 838.20 828.64	266.7	-	-	STD XS 40	0.375" 0.500" 0.688"	9.52 12.70 17.48
36"	36.000"	914.00	35.250" 35.000" 34.500"	894.96 888.60 875.90	266.7	-	-	STD XS 40	0.375" 0.500" 0.750"	9.52 12.70 19.05
38"	38.000"	965.20	37.250" 37.000"	946.16 939.80	304.8	-	-	STD XS	0.375" 0.500"	9.52 12.70
40"	40.000"	1016.00	39.250" 39.000"	996.96 990.60	304.8	-	-	STD XS	0.375" 0.500"	9.52 12.70
42"	42.000"	1066.80	41.250" 41.000"	1047.76 1041.40	304.8	-	-	STD XS	0.375" 0.500"	9.52 12.70
44"	44.000"	1117.60	43.250" 43.000"	1098.56 1092.20	342.9	-	-	STD XS	0.375" 0.500"	9.52 12.70
46"	46.000"	1168.40	45.250" 45.000"	1149.36 1143.00	342.9	-	-	STD XS	0.375" 0.500"	9.52 12.70
48"	48.000"	1219.20	47.250" 47.000"	1200.16 1193.80	342.9	-	-	STD XS	0.375" 0.500"	9.52 12.70