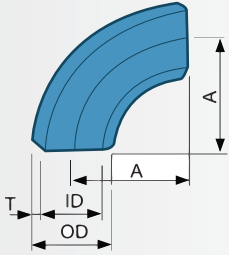


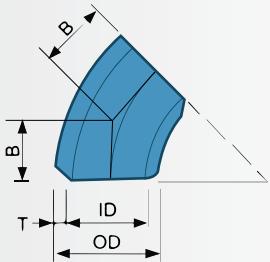
ELBOW

Long & Short Radius

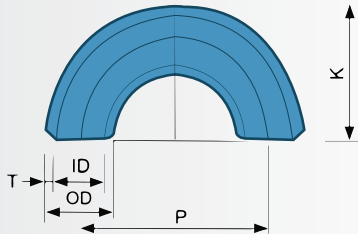
ASTM/ASME A234
ANSI B 16.9 / B 16.28
MSS SP-43



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
1/2"	0.840"	21.34	0.622"	15.80	Std/40 40s XS/80 80s 160 XXS	0.109"	2.77	A = 1.500"	A = 38.10	-	-
			0.546"	13.88		0.147"	3.73	B = 0.618"	B = 15.70		
			0.464"	11.78		0.188"	4.78	P = 3.000"	P = 76.20		
			0.252"	6.40		0.294"	7.47	K = 1.882"	K = 47.80		
3/4"	1.050"	26.67	0.824"	20.93	Std/40 40s XS/80 80s 160 XXS	0.113"	2.87	A = 1.500"	A = 38.10	-	-
			0.742"	18.85		0.154"	3.91	B = 0.752"	B = 19.10		
			0.612"	15.55		0.219"	5.56	P = 3.000"	P = 76.20		
			0.434"	11.03		0.308"	7.82	K = 2.000"	K = 50.80		
1"	1.315"	33.40	1.049"	26.64	Std/40 40s XS/80 80s 160 XXS	0.133"	3.38	A = 1.500"	A = 38.10	A = 1.000"	A = 25.40
			0.957"	24.30		0.179"	4.55	B = 0.882"	B = 22.40		
			0.815"	20.70		0.250"	6.35	P = 3.000"	P = 76.20		
			0.599"	15.22		0.358"	9.09	K = 2.189"	K = 55.60		
1 1/4"	1.660"	42.16	1.380"	35.04	Std/40 40s XS/80 80s 160 XXS	0.140"	3.56	A = 1.874"	A = 47.60	A = 1.252"	A = 31.80
			1.278"	32.46		0.191"	4.85	B = 1.000"	B = 25.40		
			1.160"	29.46		0.250"	6.35	P = 3.752"	P = 95.30		
			0.896"	22.76		0.382"	9.70	K = 2.752"	K = 69.90		
1 1/2"	1.900"	48.26	1.610"	40.90	Std/40 40s XS/80 80s 160 XXS	0.145"	3.68	A = 2.252"	A = 57.20	A = 1.500"	A = 38.10
			1.500"	38.10		0.200"	5.08	B = 1.118"	B = 28.40		
			1.338"	33.98		0.281"	7.14	P = 4.500"	P = 114.30		
			1.100"	27.94		0.400"	10.16	K = 3.252"	K = 82.60		
2"	2.375"	60.32	2.067"	52.50	Std/40 40s XS/80 80s 160 XXS	0.154"	3.91	A = 3.000"	A = 76.20	A = 2.000"	A = 50.80
			1.939"	49.24		0.218"	5.54	B = 1.382"	B = 35.10		
			1.687"	42.84		0.344"	8.74	P = 6.000"	P = 152.40		
			1.503"	38.18		0.436"	11.07	K = 4.189"	K = 106.40		

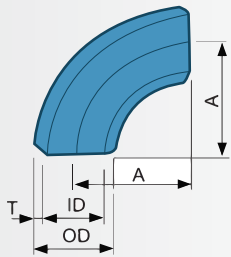
ELBOW

Long & Short Radius

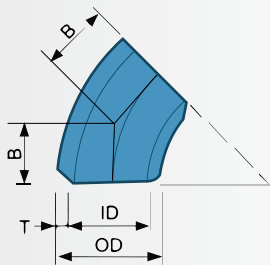
ASTM/ASME A234

ANSI B 16.9 / B 16.28

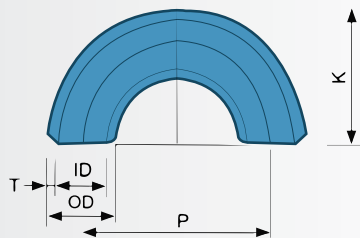
MSS SP-43



90° ELBOW



45° ELBOW



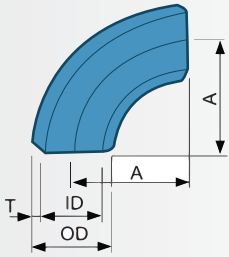
180° ELBOW

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

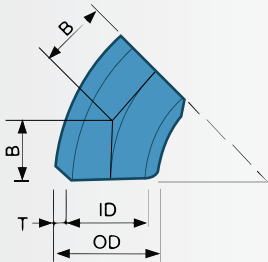
ELBOW

Long & Short Radius

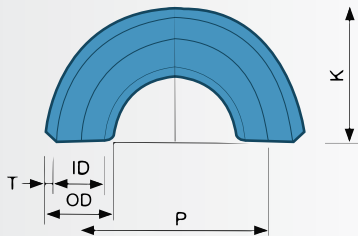
ASTM/ASME A234
ANSI B 16.9 / B 16.28
MSS SP-43



90° ELBOW



45° ELBOW



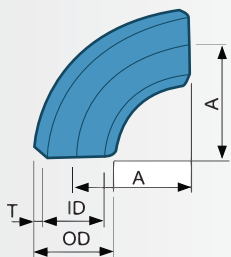
180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	inch	in	mm	in		mm	in	mm	in	mm	in
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				
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				

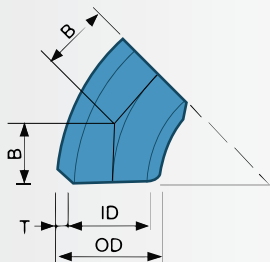
ELBOW

Long & Short Radius

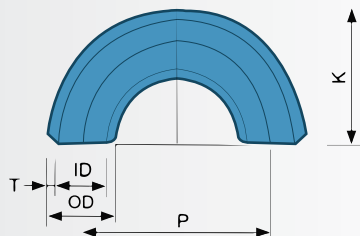
ASTM/ASME A234
ANSI B 16.9 / B 16.28
MSS SP-43



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
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				
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				

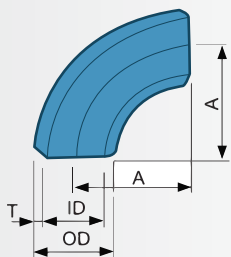
ELBOW

Long & Short Radius

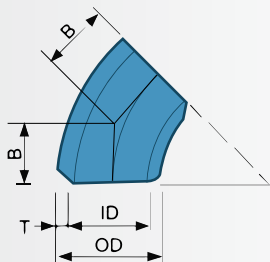
ASTM/ASME A234

ANSI B 16.9 / B 16.28

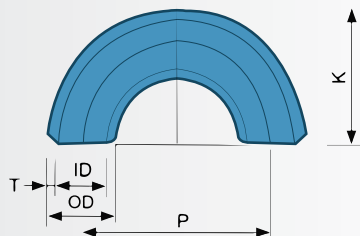
MSS SP-43



90° ELBOW



45° ELBOW



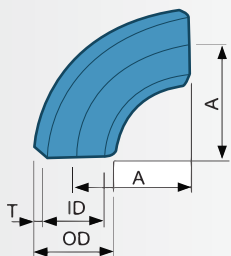
180° ELBOW

NOMINAL PIPE SIZE	OD		ID		Sch. No.	WALL THICKNESS (t)		LONG RADIUS		SHORT RADIUS	
	inch	in	mm	in		mm	in	mm	in	mm	in
20"	20.000"	508.00	19.500"	495.30	10 Std/20 XS/30 40 60 80 100 120 140 160	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		0.375"	9.52				
			19.000"	482.60		0.500"	12.70				
			18.812"	477.82		0.594"	15.09				
			18.376"	466.76		0.812"	20.62				
			17.938"	455.62		1.031"	26.19				
			17.438"	442.92		1.281"	32.54				
			17.000"	431.80		1.500"	38.10				
			16.500"	419.10		1.750"	44.45				
16.062"	407.98	1.969"	50.01								
22"	22.000"	558.80	21.500"	546.10	10 Std/20 XS/30 60 80 100 120 140 160	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		0.375"	9.52				
			21.000"	533.40		0.500"	12.70				
			20.250"	514.36		0.875"	22.22				
			19.750"	501.64		1.125"	28.58				
			19.250"	488.96		1.375"	34.92				
			18.750"	476.24		1.625"	41.28				
			18.250"	463.56		1.875"	47.62				
			17.750"	450.84		2.125"	53.98				
24"	24.000"	609.60	23.500"	596.90	10 Std/20 XS 30 40 60 80 100 120 140 160	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		0.375"	9.52				
			23.000"	584.20		0.500"	12.70				
			22.876"	581.06		0.562"	14.27				
			22.624"	574.64		0.688"	17.48				
			22.062"	560.38		0.969"	24.61				
			21.562"	547.68		1.219"	30.96				
			20.938"	531.82		1.531"	38.89				
			20.376"	517.56		1.812"	46.02				
			19.876"	504.86		2.062"	52.37				
			19.312"	490.52		2.344"	59.54				
26"	26.000"	660.40	25.376"	644.56	10 Std XS/20	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		0.375"	9.52				
			25.000"	635.00		0.500"	12.70				

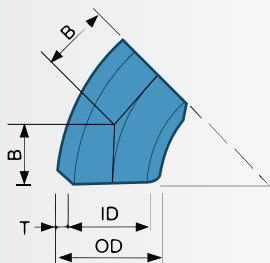
ELBOW

Long & Short Radius

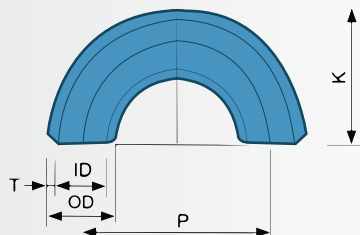
ASTM/ASME A234
ANSI B 16.9 / B 16.28
MSS SP-43



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
28"	28.000"	711.20	27.376"	695.36	10 Std XS/20 30	0.312"	7.92	A = 42.000" B = 17.252"	A = 1066.8 B = 438.2	A = 27.992"	A = 711.00
			27.250"	692.16		0.375"	9.52				
			27.000"	685.80		0.500"	12.70				
			26.750"	679.44		0.625"	15.88				
30"	30.000"	762.00	29.376"	746.16	10 Std XS/20 30	0.312"	7.92	A = 45.000" B = 18.500"	A = 1143 B = 469.9	A = 30.000"	A = 762.00
			29.250"	742.96		0.375"	9.52				
			29.000"	736.60		0.500"	12.70				
			28.750"	730.24		0.625"	15.88				
32"	32.000"	812.80	31.376"	796.96	10 Std XS/20 30 40	0.312"	7.92	A = 48.000" B = 19.752"	A = 1219.2 B = 501.7	A = 32.008"	A = 813.00
			31.250"	793.76		0.375"	9.52				
			31.000"	787.40		0.500"	12.70				
			30.750"	781.04		0.625"	15.88				
34"	34.000"	863.60	33.376"	847.76	10 Std XS/20 30 40	0.312"	7.92	A = 51.000" B = 21.000"	A = 1295.4 B = 533.4	A = 34.016"	A = 864.00
			33.250"	844.56		0.375"	9.52				
			33.000"	838.20		0.500"	12.70				
			32.750"	831.84		0.625"	15.88				
36"	36.000"	914.40	35.376"	898.56	10 Std XS/20 30 40	0.312"	7.92	A = 54.000" B = 22.252"	A = 1371.6 B = 565.2	A = 36.000"	A = 914.40
			35.250"	895.34		0.375"	9.53				
			35.000"	889.00		0.500"	12.70				
			34.750"	882.64		0.625"	15.88				
38"	38.000"	965.20	37.250"	946.16	Std/40s XS/80s	0.375"	9.52	A = 57.000" B = 23.622"	A = 1447.8 B = 600	A = 38.000"	A = 965.20
			37.000"	939.80		0.500"	12.70				
40"	40.000"	1016.00	39.250"	996.96	Std/40s XS/80s	0.375"	9.52	A = 60.000" B = 24.874"	A = 1524 B = 631.8	A = 40.000"	A = 1016.00
			39.000"	990.60		0.500"	12.70				
42"	42.000"	1066.80	41.250"	1047.76	Std/40s XS/80s	0.375"	9.52	A = 63.000" B = 23.638"	A = 1600.2 B = 600.4	A = 42.000"	A = 1066.80
			41.000"	1041.40		0.500"	12.70				
44"	44.000"	1117.60	43.250"	1098.56	Std/40s XS/80s	0.375"	9.52	A = 66.000" B = 27.374"	A = 1676.4 B = 695.3	A = 44.000"	A = 1117.60
			43.000"	1092.20		0.500"	12.70				
46"	46.000"	1168.40	45.250"	1149.36	Std/40s XS/80s	0.375"	9.52	A = 69.000" B = 28.626"	A = 1752.6 B = 727.1	A = 46.000"	A = 1168.40
			45.000"	1143.00		0.500"	12.70				
48"	48.000"	1219.20	47.250"	1200.16	Std/40s XS/80s	0.375"	9.52	A = 72.000" B = 29.874"	A = 1828.8 B = 758.8	A = 48.000"	A = 1219.20
			47.000"	1193.80		0.500"	12.70				