

HYS FLANGES CO. LTD.

PRODUCT CATALOGUE

**STAINLESS STEEL
PIPE FITTINGS**

INDUSTRIAL PIPING SOLUTIONS

PRECISION • PERFORMANCE • RELIABILITY

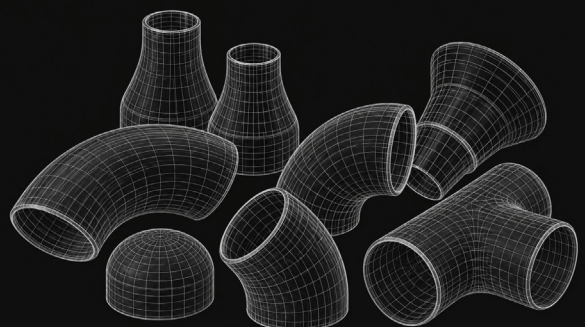


MATERIAL GRADES

WP304 | WP304L | WP316 | WP316L

STANDARDS

ASTM A403 / ASME SA-403 | ASME B16.9



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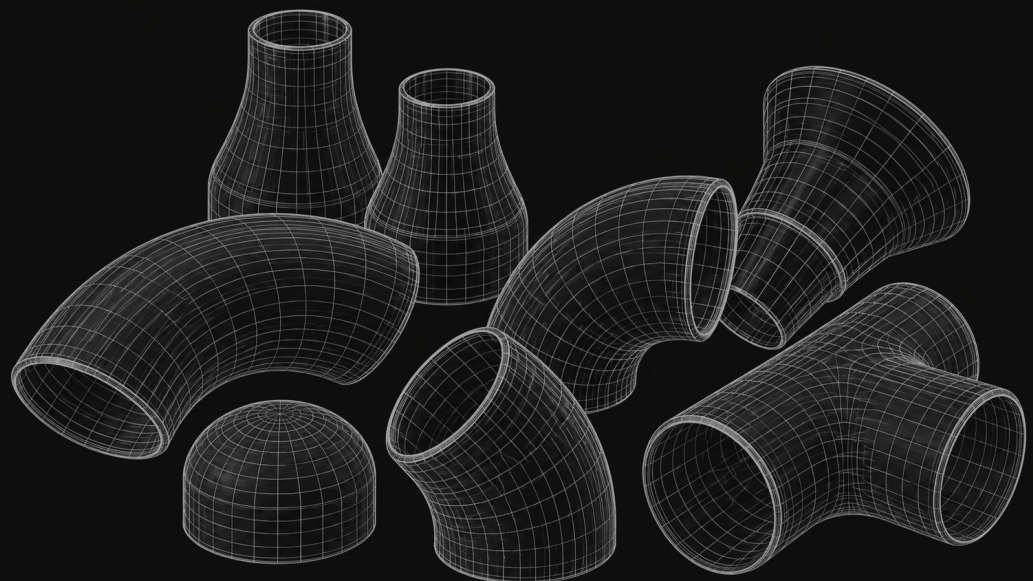
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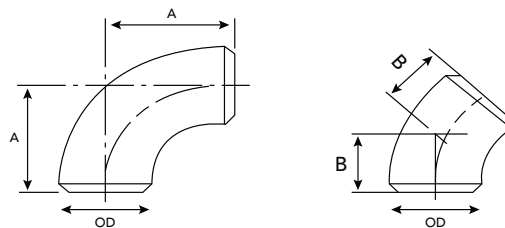


Long Radius Elbows

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

45° & 90° Elbow



Size	Outside Diameter at Bevel (OD)	Center - to - End		Approx. Weight (kg)									
		90° (A)	45° (B)	90° (Elbows)					45° (Elbows)				
		MM	MM	10S	STD	40S/40	XS	80S/80	10S	STD	40S/40	XS	80S/80
1/2"	21.3	38.00	16.00	0.06	0.08	0.08	0.10	0.10	0.03	0.04	0.04	0.05	0.05
3/4"	26.7	38.00	19.00	0.08	0.10	0.10	0.14	0.14	0.04	0.06	0.06	0.08	0.08
1"	33.4	38.00	22.00	0.13	0.15	0.15	0.20	0.20	0.09	0.11	0.11	0.10	0.10
1 1/4"	42.2	48.00	25.00	0.21	0.26	0.26	0.35	0.35	0.11	0.17	0.17	0.18	0.18
1 1/2"	48.3	57.00	29.00	0.28	0.37	0.37	0.51	0.51	0.17	0.23	0.23	0.25	0.25
2"	60.3	76.00	35.00	0.48	0.65	0.65	0.90	0.90	0.25	0.40	0.40	0.47	0.47
2 1/2"	73.0	95.00	44.00	0.81	1.37	1.37	1.79	1.79	0.48	0.77	0.77	0.90	0.90
3"	88.9	114.00	51.00	1.14	2.04	2.04	2.87	2.87	0.63	1.08	1.08	1.44	1.44
3 1/2"	101.6	133.00	57.00	1.70	2.82	2.82	4.00	4.00	0.75	1.42	1.42	2.05	2.05
4"	114.3	152.00	64.00	1.97	3.84	3.84	5.45	5.45	1.08	2.09	2.09	2.81	2.81
5"	141.3	190.00	79.00	3.42	6.48	6.48	9.69	9.69	1.81	3.43	3.43	4.85	4.85
6"	168.3	229.00	95.00	3.60	9.94	9.94	15.99	15.99	2.72	5.44	5.44	8.02	8.02
8"	219.1	305.00	127.00	10.00	20.10	20.10	31.70	31.70	5.33	10.77	10.77	16.22	16.22
10"	273.1	381.00	159.00	11.70	37.00	37.00	48.60	57.11	9.75	19.28	19.28	24.30	30.00
12"	323.9	457.00	190.00	28.00	54.00	58.15	70.00	94.82	13.61	27.00	29.57	36.80	49.94
14"	355.6	533.00	222.00	36.29	69.00	70.31	94.35	132.16	18.14	32.93	35.15	47.20	69.92
16"	406.4	610.00	254.00	47.63	91.00	91.63	124.75	204.30	23.81	43.31	45.81	62.00	102.15
18"	457.2	686.00	286.00	59.87	116.00	177.06	157.50	287.84	29.94	54.99	88.53	79.00	143.92
20"	508.0	762.00	318.00	82.09	140.00	230.00	194.30	390.90	49.90	68.13	114.00	97.16	195.67
22"	558.8	838.00	343.00	99.44	170.00	-	236.00	523.40	58.32	81.13	-	118.00	256.70
24"	609.6	914.00	381.00	135.59	206.00	384.00	268.50	667.40	70.31	98.57	192.04	141.20	333.70
26"	660.4	991.00	406.00	-	242.00	-	348.00	-	-	114.11	-	166.00	-
28"	711.2	1067.00	438.00	-	275.00	-	404.00	-	-	132.73	-	190.00	-
30"	762.0	1143.00	470.0	269.00	324.00	-	441.00	-	139.00	152.75	-	218.00	-
32"	812.8	1219.00	502.0	-	349.53	-	510.00	-	-	156.24	-	240.00	-
34"	863.6	1295.00	533.00	-	395.24	-	560.00	-	-	196.96	-	272.00	-
36"	914.4	1372.00	565.00	-	443.71	-	625.00	-	-	221.20	-	304.00	-
38"	965.2	1448.00	600.00	-	497.71	-	710.00	-	-	248.15	-	339.00	-
40"	1016.0	1524.00	632.00	-	551.98	-	745.00	-	-	257.35	-	376.00	-
42"	1066.8	1600.00	660.00	-	606.16	-	840.00	-	-	301.34	-	414.00	-
44"	1117.8	1676.00	695.00	-	669.04	-	970.00	-	-	333.68	-	456.00	-
46"	1168.4	1753.00	727.00	-	731.69	-	1055.00	-	-	365.07	-	498.00	-
48"	1219.2	1829.00	759.00	-	797.28	-	1134.00	-	-	397.69	-	542.00	-

General Notes:

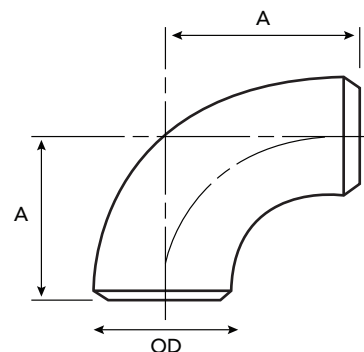
- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

Short Radius Elbows

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

90° Elbow



Size	Outside Diameter at Bevel (OD)	Center-to-End	Approx. Weight (kg)				
		90° (A)	90° Elbows				
		MM	10S	STD	40S/40	XS	80S/80
1"	33.40	25.00	0.10	0.18	0.18	0.12	0.12
1 ¼"	42.20	32.00	0.17	0.21	0.21	0.22	0.22
1 ½"	48.30	38.00	0.22	0.29	0.29	0.32	0.32
2"	60.30	51.00	0.31	0.51	0.51	0.59	0.59
2 ½"	73.00	64.00	0.52	1.02	1.02	1.13	1.13
3"	88.90	76.00	0.77	1.50	1.50	1.82	1.82
3 ½"	101.60	89.00	1.38	2.06	2.06	2.61	2.61
4"	114.30	102.00	1.72	3.12	3.12	3.56	3.56
5"	141.30	127.00	2.78	5.28	5.28	6.20	6.20
6"	168.30	152.00	4.15	7.94	7.94	10.26	10.26
8"	219.10	203.00	8.00	17.06	17.06	20.84	20.84
10"	273.10	254.00	15.88	31.15	31.15	32.94	40.00
12"	323.90	305.00	18.14	40.00	45.00	49.03	66.28
14"	355.60	356.00	23.59	52.50	55.39	63.11	93.07
16"	406.40	406.00	30.84	71.25	82.63	82.63	136.20
18"	457.20	457.00	39.01	90.00	117.59	104.87	191.60
20"	508.00	508.00	65.86	110.00	153.45	129.54	260.14
22"	558.80	559.00	76.38	132.00	-	157.00	350.50
24"	609.60	610.00	91.63	165.00	256.00	188.41	443.55

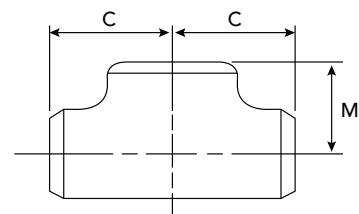
General Notes:

- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Equal Tee

Size	Outside Diameter at Bevel (mm)	Center - to - End (mm)		Approx. Weight (kg)				
		Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
1/2"	21.3	25.0	25.0	0.10	0.11	0.11	0.16	0.16
3/4"	26.7	29.0	29.0	0.15	0.17	0.17	0.21	0.21
1"	33.4	38.0	38.0	0.30	0.35	0.35	0.42	0.42
1 1/4"	42.2	48.0	48.0	0.49	0.61	0.61	0.75	0.75
1 1/2"	48.3	57.0	57.0	0.68	0.92	0.92	1.13	1.13
2"	60.3	64.0	64.0	1.01	1.34	1.34	1.69	1.69
2 1/2"	73.0	76.0	76.0	1.47	2.37	2.37	2.92	2.92
3"	88.9	86.0	86.0	2.02	3.38	3.38	4.29	4.29
3 1/2"	101.6	95.0	95.0	2.55	4.47	4.47	5.72	5.72
4"	114.3	105.0	105.0	3.18	5.72	5.72	7.45	7.45
5"	141.3	124.0	124.0	4.97	8.99	8.99	12.00	12.00
6"	168.3	143.0	143.0	6.81	13.30	13.30	19.10	19.10
8"	219.1	178.0	178.0	11.7	24.40	24.40	34.70	34.70
10"	273.1	216.0	216.0	19.19	41.40	41.40	43.00	53.60
12"	323.9	254.0	254.0	28.54	46.00	53.60	56.00	69.50
14"	355.6	279.0	279.0	35.66	53.00	61.78	80.80	99.78
16"	406.4	305.0	305.0	44.11	66.70	76.55	100.00	114.23
18"	457.2	343.0	343.0	55.88	83.90	124.32	111.00	150.00
20"	508.0	381.0	381.0	77.32	104.00	164.22	138.00	207.00
22"	558.8	419.0	419.0	93.67	126.00	-	167.00	250.00
24"	609.6	432.0	432.0	115.52	139.00	255.30	185.00	319.00
26"	660.4	495.0	495.0	-	176.00	-	234.00	-
28"	711.2	521.0	521.0	-	192.00	-	256.00	-
30"	762.0	559.0	559.0	-	228.00	-	304.00	-
32"	812.8	597.0	597.0	-	249.00	-	331.00	-
34"	863.6	635.0	635.0	-	295.00	-	393.00	-
36"	914.4	673.0	673.0	-	334.00	-	441.00	-
38"	965.2	711.0	711.0	-	358.00	-	549.00	-
40"	1016.0	749.0	749.0	-	383.00	-	511.00	-
42"	1066.8	762.0	711.0	-	416.00	-	557.00	-
44"	1117.8	813.0	762.0	-	448.00	-	597.00	-
46"	1168.4	851.0	800.0	-	483.00	-	646.00	-
48 "	1219.2	889.0	838.0	-	518.00	-	691.00	-

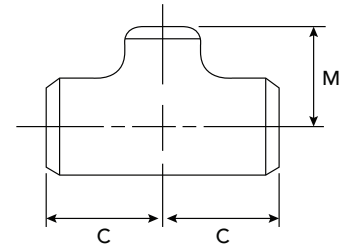
General Notes:

- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

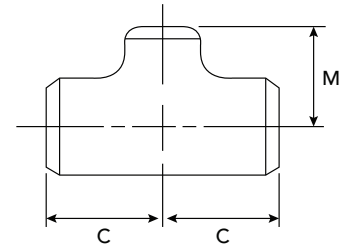
Reducing Tee

Size	Outside Diameter at Bevel (mm)		Center - to - End (mm)		Approx. Weight (kg)				
	Run	Outlet	Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
3/4" x 1/2"	26.70	21.30	29.00	29.00	0.12	0.12	0.12	0.20	0.20
1" x 3/4"	33.40	26.70	38.00	38.00	0.08	0.23	0.23	0.40	0.40
1" x 1/2"	33.40	21.30	38.00	38.00	0.08	0.10	0.10	0.39	0.39
1 1/4" x 1"	42.20	33.40	48.00	48.00	0.11	0.39	0.39	0.71	0.71
1 1/4" x 3/4"	42.20	26.70	48.00	48.00	0.11	0.37	0.37	0.67	0.67
1 1/4" x 1/2"	42.20	21.30	48.00	48.00	0.09	0.31	0.31	0.65	0.65
1 1/2" x 1 1/4"	48.30	42.20	57.00	57.00	0.43	0.57	0.57	1.10	1.10
1 1/2" x 1"	48.30	33.40	57.00	57.00	0.25	0.55	0.55	1.06	1.06
1 1/2" x 3/4"	48.30	26.70	57.00	57.00	0.25	0.52	0.52	1.00	1.00
1 1/2" x 1/2"	48.30	21.30	57.00	57.00	0.24	0.51	0.51	0.95	0.95
2" x 1 1/2"	60.30	48.30	64.00	60.00	0.59	0.83	0.83	1.63	1.63
2" x 1 1/4"	60.30	42.20	64.00	57.00	0.58	0.80	0.80	1.52	1.52
2" x 1"	60.30	33.40	64.00	51.00	0.45	0.74	0.74	1.46	1.46
2" x 3/4"	60.30	26.70	64.00	44.00	0.44	0.52	0.52	1.38	1.38
2 1/2" x 2"	73.00	60.30	76.00	70.00	0.73	1.53	1.53	2.81	2.81
2 1/2" x 1 1/2"	73.00	48.30	76.00	67.00	0.72	1.49	1.49	2.70	2.70
2 1/2" x 1 1/4"	73.00	42.20	76.00	64.00	0.61	1.38	1.38	2.64	2.64
2 1/2" x 1"	73.00	33.40	76.00	57.00	0.60	1.21	1.21	2.57	2.57
3" x 2 1/2"	88.90	73.00	86.00	83.00	1.24	2.29	2.29	4.19	4.19
3" x 2"	88.90	60.30	86.00	76.00	1.21	2.16	2.16	3.89	3.89
3" x 1 1/2"	88.90	48.30	86.00	73.00	1.19	2.05	2.05	3.78	3.78
3" x 1 1/4"	88.90	42.20	86.00	70.00	0.76	1.85	1.85	3.73	3.73
3 1/2" x 3"	101.60	88.90	95.00	92.00	1.52	2.85	2.85	5.66	5.66
3 1/2" x 2 1/2"	101.60	73.00	95.00	89.00	1.50	2.81	2.81	5.47	5.47
3 1/2" x 2"	101.60	60.30	95.00	83.00	1.48	2.78	2.78	5.18	5.18
3 1/2" x 1 1/2"	101.60	48.30	95.00	79.00	1.27	1.98	1.98	5.07	5.07
4" x 3 1/2"	114.30	101.60	105.00	102.00	2.35	4.07	4.07	7.26	7.26
4" x 3"	114.30	88.90	105.00	98.00	2.29	3.83	3.83	7.03	7.03
4" x 2 1/2"	114.30	73.00	105.00	95.00	2.26	3.70	3.70	6.73	6.73
4" x 2"	114.30	60.30	105.00	89.00	1.59	3.52	3.52	6.62	6.62
4" x 1 1/2"	114.30	48.30	105.00	86.00	1.56	3.41	3.41	6.51	6.51
5" x 4"	141.30	114.30	124.00	117.00	3.04	6.14	6.14	11.80	11.80
5" x 3 1/2"	141.30	101.60	124.00	114.00	2.98	6.05	6.05	11.40	11.40
5" x 3"	141.30	88.90	124.00	111.00	2.94	5.85	5.85	11.20	11.20
5" x 2 1/2"	141.30	73.00	124.00	108.00	2.90	5.71	5.71	10.90	10.90
5" x 2"	141.30	60.30	124.00	105.00	2.40	5.53	5.53	10.70	10.70
6" x 5"	168.30	141.30	143.00	137.00	5.37	9.21	9.21	18.50	18.50
6" x 4"	168.30	114.30	143.00	130.00	5.24	8.81	8.81	17.70	17.70
6" x 3 1/2"	168.30	101.60	143.00	127.00	5.18	8.63	8.63	17.40	17.40
6" x 3"	168.30	88.90	143.00	124.00	5.12	8.52	8.52	17.20	17.20
6" x 2 1/2"	168.30	73.00	143.00	121.00	3.11	8.32	8.32	16.90	16.90
8" x 6"	219.10	168.30	178.00	168.00	7.10	16.80	16.80	30.20	30.20
8" x 5"	219.10	141.30	178.00	162.00	6.94	16.30	16.30	29.30	29.30
8" x 4"	219.10	114.30	178.00	156.00	6.86	15.90	15.90	28.50	28.50
8" x 3 1/2"	219.10	101.60	178.00	152.00	6.78	15.64	15.64	27.90	27.90

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

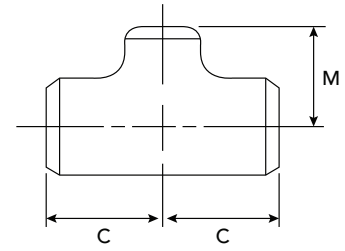
Reducing Tee

Size	Outside Diameter at Bevel (mm)		Center - to - End (mm)		Approx. Weight (kg)				
	Run	Outlet	Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
10" x 8"	273.10	219.10	216.00	203.00	13.46	28.90	28.90	58.00	71.00
10" x 6"	273.10	168.30	216.00	194.00	13.30	27.60	27.60	52.00	54.00
10" x 5"	273.10	141.30	216.00	191.00	13.15	27.10	27.10	52.00	53.00
10" x 4"	273.10	114.30	216.00	184.00	7.27	26.87	26.87	52.00	53.00
12" x 10"	323.90	273.10	254.00	241.0	23.02	63.00	67.00	85.00	103.00
12" x 8"	323.90	219.10	254.00	229.00	22.75	63.00	64.00	68.00	82.00
12" x 6"	323.90	168.30	254.00	219.00	14.08	63.00	64.00	68.00	82.00
12" x 5"	323.90	141.30	254.00	216.00	13.77	63.00	64.00	68.00	82.00
14" x 12"	355.60	323.90	279.00	270.00	33.94	110.00	114.00	127.00	143.00
14" x 10"	355.60	273.10	279.00	257.00	33.54	107.00	109.00	127.00	141.00
14" x 8"	355.60	219.10	279.00	248.00	24.09	107.00	109.00	122.00	122.00
14" x 6"	355.60	168.30	279.00	238.00	23.55	107.00	109.00	122.00	122.00
16" x 14"	406.40	355.60	305.00	305.00	42.71	119.00	167.00	167.00	200.00
16" x 12"	406.40	323.90	305.00	295.00	41.74	119.00	167.00	167.00	181.00
16" x 10"	406.40	273.10	305.00	283.00	41.25	116.00	160.00	160.00	163.00
16" x 8"	406.40	219.10	305.00	273.00	35.52	116.00	160.00	160.00	163.00
16" x 6"	406.40	168.30	305.00	264.00	34.73	116.00	160.00	160.00	163.00
18" x 16"	457.20	406.40	343.00	330.00	51.71	135.00	238.00	190.00	279.00
18" x 14"	457.20	355.60	343.00	330.00	50.80	135.00	194.00	190.00	258.00
18" x 12"	457.20	323.90	343.00	321.00	49.90	135.00	194.00	164.00	234.00
18" x 10"	457.20	273.10	343.00	308.00	49.44	129.00	194.00	164.00	225.00
18" x 8"	457.20	219.10	343.00	298.00	43.68	129.00	194.00	154.00	205.00
20" x 18"	508.00	457.20	381.00	368.00	68.95	168.00	265.00	218.00	410.00
20" x 16"	508.00	406.40	381.00	356.00	67.13	168.00	230.00	218.00	335.00
20" x 14"	508.00	355.60	381.00	356.00	65.77	163.00	224.00	214.00	324.00
20" x 12"	508.00	323.90	381.00	346.00	64.86	163.00	224.00	214.00	324.00
20" x 10"	508.00	273.10	381.00	333.00	64.41	163.00	220.00	214.00	293.00
20" x 8"	508.00	219.10	381.00	324.00	53.07	163.00	220.00	214.00	228.00
22" x 20"	558.80	508.00	419.00	406.00	92.10	220.00	-	280.00	513.00
22" x 18"	558.80	457.20	419.00	394.00	86.57	209.00	-	260.00	415.00
22" x 16"	558.80	406.40	419.00	381.00	78.77	209.00	-	260.00	415.00
22" x 14"	558.80	355.60	419.00	381.00	70.10	172.00	-	245.00	374.00
22" x 12"	558.80	323.60	419.00	371.00	67.53	172.00	-	245.00	374.00
22" x 10"	558.80	273.10	419.00	359.00	63.50	172.00	-	245.00	374.00
24" x 22"	609.60	558.80	432.00	432.00	95.34	227.00	390.00	350.00	657.00
24" x 20"	609.60	508.00	432.00	432.00	92.99	227.00	390.00	320.00	606.00
24" x 18"	609.60	457.20	432.00	419.00	90.72	227.00	390.00	320.00	533.00
24" x 16"	609.60	406.40	432.00	406.00	88.90	222.00	349.50	300.00	490.00
24" x 14"	609.60	355.60	432.00	406.00	87.54	222.00	309.00	300.00	490.00
24" x 12"	609.60	323.60	432.00	397.00	86.64	218.00	308.00	300.00	452.00
24" x 10"	609.60	273.10	432.00	384.00	85.73	204.00	308.00	300.00	452.00
26" x 24"	660.40	609.60	495.00	483.00	-	280.00	-	350.00	-
26" x 22"	660.40	558.80	495.00	470.00	-	272.00	-	340.00	-
26" x 20"	660.40	508.00	495.00	457.00	-	264.00	-	330.00	-
26" x 18"	660.40	457.20	495.00	444.00	-	253.00	-	323.00	-

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

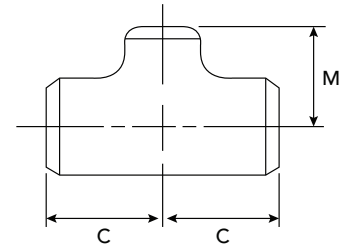
Reducing Tee

Size	Outside Diameter at Bevel (mm)		Center - to - End (mm)		Approx. Weight (kg)				
	Run	Outlet	Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
26" x 16"	660.40	406.40	495.00	432.00	-	247.00	-	309.00	-
26" x 14"	660.40	355.60	495.00	432.00	-	239.00	-	300.00	-
26" x 12"	660.40	323.90	495.00	422.00	-	231.00	-	293.00	-
28" x 26"	711.20	660.40	521.00	521.00	-	325.00	-	410.00	-
28" x 24"	711.20	609.60	521.00	508.00	-	320.00	-	400.00	-
28" x 22"	711.20	558.80	521.00	495.00	-	311.00	-	390.00	-
28" x 20"	711.20	508.00	521.00	483.00	-	302.00	-	380.00	-
28" x 18"	711.20	457.20	521.00	470.00	-	292.00	-	369.00	-
28" x 16"	711.20	406.40	521.00	457.00	-	283.00	-	357.00	-
28" x 14"	711.20	355.60	521.00	457.00	-	274.00	-	346.00	-
28" x 12"	711.20	323.90	521.00	448.00	-	260.75	-	346.00	-
30" x 28"	762.00	711.20	559.00	546.00	215.00	380.00	-	475.00	-
30" x 26"	762.00	660.40	559.00	546.00	211.00	372.00	-	463.00	-
30" x 24"	762.00	609.60	559.00	533.00	208.00	361.00	-	452.00	-
30" x 22"	762.00	558.80	559.00	521.00	205.00	351.00	-	441.00	-
30" x 20"	762.00	508.00	559.00	508.00	202.00	340.00	-	429.00	-
30" x 18"	762.00	457.20	559.00	495.00	199.00	330.00	-	417.00	-
30" x 16"	762.00	406.40	559.00	483.00	196.00	321.00	-	405.00	-
30" x 14"	762.00	355.60	559.00	483.00	193.00	312.00	-	395.00	-
30" x 12"	762.00	323.90	559.00	473.00	190.00	304.00	-	385.00	-
30" x 10"	762.00	273.10	559.00	460.00	187.00	296.00	-	377.00	-
32" x 30"	812.80	762.00	597.00	584.00	-	506.00	-	628.00	-
32" x 28"	812.80	711.20	597.00	572.00	-	493.00	-	616.00	-
32" x 26"	812.80	660.40	597.00	572.00	-	482.00	-	605.00	-
32" x 24"	812.80	609.60	597.00	559.00	-	472.00	-	591.00	-
32" x 22"	812.80	558.00	597.00	546.00	-	460.00	-	577.00	-
32" x 20"	812.80	508.00	597.00	533.00	-	448.00	-	562.00	-
32" x 18"	812.80	457.20	597.00	521.00	-	436.00	-	547.00	-
32" x 16"	812.80	406.40	597.00	508.00	-	425.00	-	535.00	-
32" x 14"	812.80	355.60	597.00	508.00	-	415.00	-	523.00	-
34" x 32"	863.60	812.80	635.00	622.00	-	506.00	-	628.00	-
34" x 30"	863.60	762.00	635.00	610.00	-	493.00	-	616.00	-
34" x 28"	863.60	711.20	635.00	597.00	-	482.00	-	605.00	-
34" x 26"	863.60	660.40	635.00	597.00	-	472.00	-	591.00	-
34" x 24"	863.60	609.60	635.00	584.00	-	460.00	-	577.00	-
32" x 22"	863.60	558.80	635.00	572.00	-	448.00	-	562.00	-
32" x 20"	863.60	508.00	635.00	559.00	-	436.00	-	547.00	-
34" x 18"	863.60	457.20	635.00	546.00	-	425.00	-	535.00	-
34" x 16"	863.60	406.40	635.00	533.00	-	415.00	-	523.00	-
36" x 34"	914.40	863.60	673.00	660.00	-	574.00	-	715.00	-
36" x 32"	914.40	812.80	673.00	648.00	-	561.00	-	700.00	-
36" x 30"	914.40	762.00	673.00	635.00	-	548.00	-	658.00	-
36" x 28"	914.40	711.20	673.00	622.00	-	537.00	-	670.00	-
36" x 26"	914.40	660.40	673.00	622.00	-	526.00	-	654.00	-
36" x 24"	914.40	609.60	673.00	610.00	-	513.00	-	643.00	-

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Reducing Tee

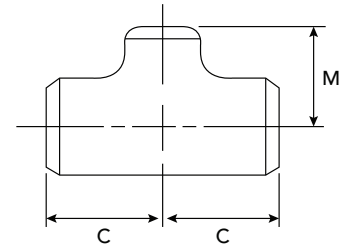
Size	Outside Diameter at Bevel (mm)		Center - to - End (mm)		Approx. Weight (kg)				
	Run	Outlet	Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
36" x 22"	914.40	558.80	673.00	597.00	-	502.00	-	622.00	-
36" x 20"	914.40	508.00	673.00	584.00	-	493.00	-	621.00	-
36" x 18"	914.40	457.20	673.00	572.00	-	483.00	-	611.00	-
36" x 16"	914.40	406.40	673.00	559.00	-	472.00	-	602.00	-
38" x 36"	965.20	914.40	711.00	711.00	-	600.00	-	700.00	-
38" x 34"	965.20	863.60	711.00	698.00	-	600.00	-	700.00	-
38" x 32"	965.20	812.80	711.00	686.00	-	600.00	-	700.00	-
38" x 30"	965.20	762.00	711.00	673.00	-	600.00	-	700.00	-
38" x 28"	965.20	711.20	711.00	648.00	-	600.00	-	700.00	-
38" x 26"	965.20	660.40	711.00	648.00	-	600.00	-	700.00	-
38" x 24"	965.20	609.60	711.00	635.00	-	600.00	-	700.00	-
38" x 22"	965.20	558.80	711.00	622.00	-	600.00	-	700.00	-
38" x 20"	965.20	508.00	711.00	610.00	-	600.00	-	700.00	-
38" x 18"	965.20	457.20	711.00	597.00	-	600.00	-	700.00	-
40" x 38"	1016.00	965.20	749.00	749.00	-	664.00	-	875.00	-
40" x 36"	1016.00	914.40	749.00	737.00	-	659.00	-	840.00	-
40" x 34"	1016.00	863.60	749.00	724.00	-	659.00	-	840.00	-
40" x 32"	1016.00	812.80	749.00	711.00	-	643.00	-	802.00	-
40" x 30"	1016.00	762.00	749.00	698.00	-	627.00	-	763.00	-
40" x 28"	1016.00	711.20	749.00	673.00	-	611.00	-	740.00	-
40" x 26"	1016.00	660.40	749.00	673.00	-	595.00	-	723.00	-
40" x 24"	1016.00	609.60	749.00	660.00	-	580.00	-	700.00	-
40" x 22"	1016.00	558.80	749.00	648.00	-	565.00	-	682.00	-
40" x 20"	1016.00	508.00	749.00	635.00	-	552.00	-	665.00	-
40" x 18"	1016.00	457.20	749.00	622.00	-	540.00	-	650.00	-
42" x 40"	1066.80	1016.00	762.00	711.00	-	920.00	-	1200.00	-
42" x 38"	1066.80	965.20	762.00	711.00	-	870.00	-	1100.00	-
42" x 36"	1066.80	914.40	762.00	711.00	-	818.00	-	1045.00	-
42" x 34"	1066.80	863.60	762.00	711.00	-	772.00	-	999.00	-
42" x 32"	1066.80	812.80	762.00	711.00	-	772.00	-	999.00	-
42" x 30"	1066.80	762.00	762.00	711.00	-	772.00	-	999.00	-
42" x 28"	1066.80	711.20	762.00	698.00	-	750.00	-	955.00	-
42" x 26"	1066.80	660.40	762.00	698.00	-	750.00	-	955.00	-
42" x 24"	1066.80	609.60	762.00	660.00	-	728.00	-	915.00	-
42" x 22"	1066.80	558.80	762.00	660.00	-	728.00	-	915.00	-
42" x 20"	1066.80	508.00	762.00	660.00	-	708.00	-	875.00	-
42" x 18"	1066.80	457.20	762.00	648.00	-	708.00	-	875.00	-
42" x 16"	1066.80	406.40	762.00	635.00	-	700.00	-	847.00	-
44" x 42"	1117.80	1066.80	813.00	762.00	-	750.00	-	1100.00	-
44" x 40"	1117.80	1016.00	813.00	749.00	-	750.00	-	1100.00	-
44" x 38"	1117.80	965.20	813.00	737.00	-	750.00	-	1100.00	-
44" x 36"	1117.80	914.40	813.00	724.00	-	750.00	-	1100.00	-
44" x 34"	1117.80	863.60	813.00	724.00	-	750.00	-	1100.00	-
44" x 32"	1117.80	812.80	813.00	711.00	-	750.00	-	1100.00	-
44" x 30"	1117.80	762.00	813.00	711.00	-	750.00	-	1100.00	-

Tee

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Reducing Tee



Size	Outside Diameter at Bevel (mm)		Center - to - End (mm)		Approx. Weight (kg)				
	Run	Outlet	Run (C)	Outlet (M)	10S	STD	40S/40	XS	80S/80
44" x 28"	117.80	711.20	813.00	698.00	-	750.00	-	1100.00	-
44" x 26"	117.80	660.40	813.00	698.00	-	750.00	-	1100.00	-
44" x 24"	117.80	609.60	813.00	698.00	-	750.00	-	1100.00	-
44" x 22"	117.80	558.80	813.00	686.00	-	750.00	-	1100.00	-
44" x 20"	117.80	508.00	813.00	686.00	-	750.00	-	1100.00	-
46" x 44"	1168.40	1117.80	851.00	800.00	-	800.00	-	1200.00	-
46" x 42"	1168.40	1066.80	851.00	787.00	-	800.00	-	1200.00	-
46" x 40"	1168.40	1016.00	851.00	775.00	-	800.00	-	1200.00	-
46" x 38"	1168.40	965.20	851.00	762.00	-	800.00	-	1200.00	-
46" x 36"	1168.40	914.40	851.00	762.00	-	800.00	-	1200.00	-
46" x 34"	1168.40	863.60	851.00	749.00	-	800.00	-	1200.00	-
46" x 32"	1168.40	812.80	851.00	749.00	-	800.00	-	1200.00	-
46" x 30"	1168.40	762.00	851.00	737.00	-	800.00	-	1200.00	-
46" x 28"	1168.40	711.20	851.00	737.00	-	800.00	-	1200.00	-
46" x 26"	1168.40	660.40	851.00	737.00	-	800.00	-	1200.00	-
46" x 24"	1168.40	609.60	851.00	724.00	-	800.00	-	1200.00	-
46" x 22"	1168.40	558.80	851.00	724.00	-	800.00	-	1200.00	-
48" x 46"	1219.20	1168.40	889.00	838.00	-	1090.00	-	1307.00	-
48" x 44"	1219.20	1117.80	889.00	838.00	-	1090.00	-	1307.00	-
48" x 42"	1219.20	1066.80	889.00	813.00	-	1067.00	-	1272.00	-
48" x 40"	1219.20	1016.00	889.00	813.00	-	1067.00	-	1272.00	-
48" x 38"	1219.20	965.20	889.00	813.00	-	1044.00	-	1238.00	-
48" x 36"	1219.20	914.40	889.00	787.00	-	1022.00	-	1203.00	-
48" x 34"	1219.20	863.60	889.00	787.00	-	1022.00	-	1203.00	-
48" x 32"	1219.20	812.80	889.00	762.00	-	1000.00	-	1170.00	-
48" x 30"	1219.20	762.00	889.00	762.00	-	1000.00	-	1170.00	-
48" x 28"	1219.20	711.20	889.00	762.00	-	980.00	-	1140.00	-
48" x 26"	1219.20	660.40	889.00	762.00	-	980.00	-	1140.00	-
48" x 24"	1219.20	609.60	889.00	737.00	-	960.00	-	1115.00	-
48" x 22"	1219.20	558.80	889.00	737.00	-	960.00	-	1115.00	-

General Notes:

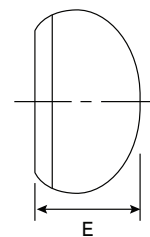
- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

End Caps

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Cap



Size	Outside Diameter at Bevel (OD)	Length E	Approx. Weight (kg)				
	mm		10S	STD	40S/40	XS	80S/80
1/2"	21.3	25	0.03	0.04	0.04	0.05	0.05
3/4"	26.7	25	0.04	0.05	0.05	0.09	0.09
1"	33.4	38	0.09	0.11	0.11	0.13	0.13
1 1/4"	42.2	38	0.11	0.14	0.14	0.22	0.22
1 1/2"	48.3	38	0.13	0.17	0.17	0.34	0.34
2"	60.3	38	0.17	0.23	0.23	0.34	0.34
2 1/2"	73.0	38	0.23	0.39	0.39	0.51	0.51
3"	88.9	51	0.37	0.66	0.66	0.84	0.84
3 1/2"	101.6	64	0.46	0.92	0.92	1.10	1.10
4"	114.3	64	0.59	1.17	1.17	1.61	1.61
5"	141.3	76	0.99	1.91	1.91	2.55	2.55
6"	168.3	89	1.39	2.90	2.90	4.24	4.24
8"	219.1	102	2.38	5.19	5.19	7.76	7.76
10"	273.1	127	4.14	9.15	9.15	13.60	16.20
12"	323.9	152	6.39	15.00	19.00	22.00	26.90
14"	355.6	165	7.98	17.00	23.00	27.00	34.70
16"	406.4	178	10.00	23.00	30.00	30.00	43.50
18"	457.2	203	12.80	29.00	39.00	32.00	72.50
20"	508.0	229	18.50	36.00	67.00	49.00	98.50
22"	558.8	254	22.60	42.00	-	51.00	120.00
24"	609.6	267	30.10	52.00	93.00	60.00	150.00
26"	660.4	267	-	-	-	-	-
28"	711.2	267	-	-	-	-	-
30"	762.0	267	-	-	-	-	-
32"	812.8	267	-	-	-	-	-
34"	863.6	267	-	-	-	-	-
36"	914.4	267	-	-	-	-	-
38"	965.2	305	-	-	-	-	-
40"	1016.0	305	-	-	-	-	-
42"	1066.8	305	-	-	-	-	-
44"	1117.8	343	-	-	-	-	-
46"	1168.4	343	-	-	-	-	-
48 "	1219.2	343	-	-	-	-	-

General Notes:

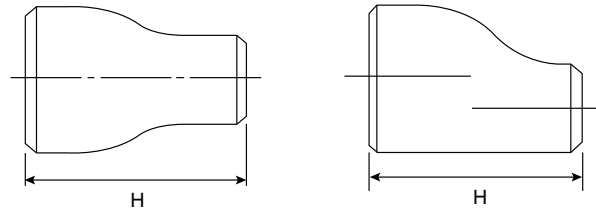
- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

Reducers

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Concentric & Eccentric Reducer



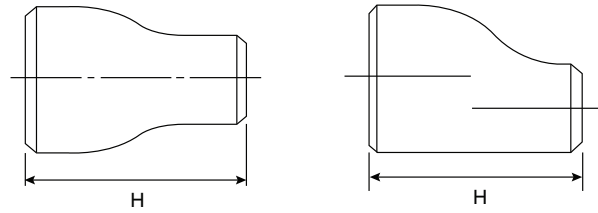
Size	Outside Diameter at Bevel (mm)		Length (mm)	Approx. Weight (kg)				
	OD1	OD2	H	10S	STD	40S/40	XS	80S/80
3/4" x 1/2"	26.7	21.3	38	0.04	0.06	0.06	0.18	0.18
1" x 3/4"	33.4	26.7	51	0.10	0.12	0.12	0.22	0.22
1" x 1/2"	33.4	21.3	51	0.09	0.11	0.11	0.22	0.22
1 1/4" x 1"	42.2	33.4	51	0.12	0.16	0.16	0.31	0.31
1 1/4" x 3/4"	42.2	26.7	51	0.11	0.14	0.14	0.30	0.30
1 1/4" x 1/2"	42.2	21.3	51	0.10	0.13	0.13	0.29	0.29
1 1/2" x 1 1/4"	48.3	42.2	64	0.18	0.24	0.24	0.44	0.44
1 1/2" x 1"	48.3	33.4	64	0.17	0.22	0.22	0.39	0.39
1 1/2" x 3/4"	48.3	26.7	64	0.15	0.20	0.20	0.35	0.35
1 1/2" x 1/2"	48.3	21.3	64	0.14	0.18	0.18	0.32	0.32
2" x 1 1/2"	60.3	48.3	76	0.27	0.37	0.37	0.58	0.58
2" x 1 1/4"	60.3	42.2	76	0.25	0.35	0.35	0.54	0.54
2" x 1"	60.3	33.4	76	0.23	0.32	0.32	0.50	0.50
2" x 3/4"	60.3	26.7	76	0.22	0.30	0.30	0.46	0.46
2 1/2" x 2"	73.0	60.3	89	0.43	0.72	0.72	0.92	0.92
2 1/2" x 1 1/2"	73.0	48.3	89	0.39	0.66	0.66	0.86	0.86
2 1/2" x 1 1/4"	73.0	42.2	89	0.37	0.63	0.63	0.78	0.78
2 1/2" x 1"	73.0	33.4	89	0.34	0.59	0.59	0.78	0.78
3" x 2 1/2"	88.9	73.0	89	0.52	0.93	0.93	1.26	1.26
3" x 2"	88.9	60.3	89	0.48	0.85	0.85	1.14	1.14
3" x 1 1/2"	88.9	48.3	89	0.45	0.78	0.78	1.07	1.07
3" x 1 1/4"	88.9	42.2	89	0.43	0.75	0.75	1.01	1.01
4" x 3"	114.3	88.9	102	0.76	1.45	1.45	2.19	2.19
4" x 2 1/2"	114.3	73.0	102	0.71	1.37	1.37	2.10	2.10
4" x 2"	114.3	60.3	102	0.67	1.27	1.27	1.93	1.93
4" x 1 1/2"	114.3	48.3	102	0.63	1.18	1.18	1.86	1.86
5" x 4"	141.3	114.3	127	1.33	2.50	2.50	3.94	3.94
5" x 3 1/2"	141.3	101.6	127	1.28	2.35	2.35	3.82	3.82
5" x 3"	141.3	88.9	127	1.22	2.27	2.27	3.63	3.63
5" x 2 1/2"	141.3	73.0	127	1.14	2.16	2.16	3.52	3.52
5" x 2"	141.3	60.3	127	1.05	1.92	1.92	3.41	3.41
6" x 5"	168.3	141.3	140	1.78	3.57	3.57	5.94	5.94
6" x 4"	168.3	114.3	140	1.65	3.30	3.30	5.78	5.78
6" x 3 1/2"	168.3	101.6	140	1.53	3.16	3.16	5.61	5.61
6" x 3"	168.3	88.9	140	1.46	3.04	3.04	5.59	5.59
6" x 2 1/2"	168.3	73.9	140	1.30	2.85	2.85	5.42	5.42
8" x 6"	219.1	168.3	152	2.72	5.71	5.71	9.33	9.33
8" x 5"	219.1	141.3	152	2.57	5.40	5.40	8.45	8.45
8" x 4"	219.1	114.3	152	2.43	5.10	5.10	7.73	7.73
8" x 3 1/2"	219.1	101.6	152	2.32	4.78	4.78	7.50	7.50
10" x 8"	273.1	219.1	178	4.49	9.78	9.78	12.90	13.70
10" x 6"	273.1	168.3	178	4.14	9.58	9.58	11.80	13.40
10" x 5"	273.1	141.3	178	3.98	8.42	8.42	11.30	13.10
10" x 4"	273.1	114.3	178	3.65	8.05	8.05	10.71	12.71
12" x 10"	323.9	273.1	203	6.78	13.60	15.64	18.00	20.50

Reducers

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Concentric & Eccentric Reducer



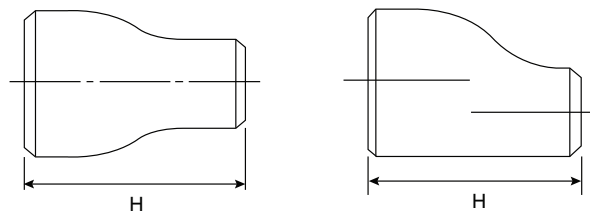
Size	Outside Diameter at Bevel (mm)		Length (mm)	Approx. Weight (kg)				
	OD1	OD2	H	10S	STD	40S/40	XS	80S/80
12" x 8"	323.9	219.1	203	6.31	12.70	14.61	16.70	19.30
12" x 6"	323.9	168.3	203	5.92	11.80	13.57	15.60	18.80
12" x 5"	323.9	141.3	203	5.50	10.55	12.13	15.00	18.24
14" x 12"	355.6	323.9	330	13.00	27.20	31.28	36.20	41.63
14" x 10"	355.6	273.1	330	12.10	26.90	30.94	35.80	41.17
14" x 8"	355.6	219.1	330	11.20	26.60	30.59	35.40	40.71
14" x 6"	355.6	168.3	330	10.05	26.30	30.25	35.00	40.25
16" x 14"	406.4	355.6	356	15.80	32.20	37.03	42.80	49.22
16" x 12"	406.4	323.9	356	15.20	31.80	36.57	42.30	48.65
16" x 10"	406.4	273.1	356	14.40	31.60	36.34	43.00	48.30
16" x 8"	406.4	219.1	356	12.90	31.10	35.77	41.40	47.61
18" x 16"	457.2	406.4	381	19.20	38.60	59.00	53.00	96.70
18" x 14"	457.2	355.6	381	18.20	38.10	59.00	53.00	96.70
18" x 12"	457.2	323.9	381	17.60	37.87	59.00	53.00	96.70
18" x 10"	457.2	273.1	381	16.25	37.20	59.00	53.00	96.70
20" x 18"	508.0	457.2	508	33.10	56.80	93.00	79.00	158.00
20" x 16"	508.0	406.4	508	31.70	56.30	93.00	79.00	158.00
20" x 14"	508.0	355.6	508	29.90	55.40	93.00	79.00	158.00
20" x 12"	508.0	323.9	508	26.78	54.50	93.00	79.00	158.00
22" x 20"	558.8	508.0	508	36.60	64.50	-	87.00	188.00
22" x 18"	558.8	457.2	508	35.00	62.70	-	87.00	188.00
22" x 16"	558.8	406.4	508	33.40	59.50	-	87.00	188.00
22" x 14"	558.8	355.6	508	31.80	55.80	-	87.00	188.00
24" x 22"	609.6	558.8	508	46.00	70.00	129.00	95.00	228.00
24" x 20"	609.6	508.0	508	44.10	68.10	129.00	95.00	228.00
24" x 18"	609.6	457.2	508	42.40	67.20	129.00	95.00	228.00
24" x 16"	609.6	406.4	508	40.10	65.80	129.00	95.00	228.00
26" x 24"	660.4	609.6	610	-	94.00	-	125.00	-
26" x 22"	660.4	558.8	610	-	91.18	-	121.25	-
26" x 20"	660.4	508.0	610	-	86.30	-	115.00	-
26" x 18"	660.4	457.2	610	-	82.60	-	110.00	-
28" x 26"	711.2	660.4	610	-	102.00	-	136.00	-
28" x 24"	711.2	609.6	610	-	98.10	-	130.00	-
28" x 20"	711.2	508.0	610	-	90.30	-	120.00	-
28" x 18"	711.2	457.2	610	-	86.00	-	114.00	-
30" x 28"	762.0	711.2	610	-	109.00	-	145.00	-
30" x 26"	762.0	660.4	610	-	105.00	-	140.00	-
30" x 24"	762.0	609.6	610	-	102.00	-	136.00	-
32" x 30"	812.8	762.0	610	-	117.00	-	156.00	-
32" x 28"	812.8	711.2	610	-	113.00	-	150.00	-
32" x 26"	812.8	660.4	610	-	109.00	-	145.00	-
32" x 24"	812.8	609.6	610	-	107.00	-	142.00	-
34" x 32"	863.6	812.8	610	-	124.00	-	165.00	-

Reducers

ASME / ASTM SA/A403-WP304/304L, WP316/316L

ASME B16.9

Concentric & Eccentric Reducer



Size	Outside Diameter at Bevel (mm)		Length (mm)	Approx. Weight (kg)				
	OD1	OD2	H	10S	STD	40S/40	XS	80S/80
34" x 30"	863.6	762.0	610	-	121.00	-	161.00	-
34" x 26"	863.6	660.4	610	-	113.00	-	150.00	-
34" x 24"	863.6	609.6	610	-	109.61	-	145.50	-
36" x 34"	914.4	863.6	610	-	132.00	-	176.00	-
36" x 32"	914.4	812.8	610	-	128.00	-	170.00	-
36" x 30"	914.4	762.0	610	-	124.00	-	165.00	-
36" x 26"	914.4	660.4	610	-	120.28	-	160.05	-
36" x 24"	914.4	609.6	610	-	116.67	-	155.25	-
38" x 36"	965.2	914.4	610	-	140.00	-	186.00	-
38" x 34"	965.2	863.6	610	-	135.00	-	180.00	-
38" x 32"	965.2	762.0	610	-	132.00	-	176.00	-
38" x 30"	965.2	711.2	610	-	129.00	-	172.00	-
38" x 28"	965.2	660.4	610	-	127.00	-	169.00	-
38" x 26"	965.2	665.2	610	-	124.00	-	165.00	-
40" x 38"	1016.0	914.4	610	-	147.00	-	196.00	-
40" x 36"	1016.0	863.6	610	-	144.00	-	192.00	-
40" x 34"	1016.0	812.8	610	-	140.00	-	186.00	-
40" x 32"	1016.0	762.0	610	-	137.00	-	182.00	-
40" x 30"	1016.0	1016.0	610	-	133.00	-	177.00	-
42" x 40"	1066.8	965.2	610	-	158.00	-	210.00	-
42" x 38"	1066.8	914.4	610	-	154.00	-	205.00	-
42" x 36"	1066.8	863.6	610	-	151.00	-	201.00	-
42" x 34"	1066.8	812.8	610	-	147.00	-	196.00	-
42" x 30"	1066.8	762.0	610	-	142.00	-	193.00	-
44" x 42"	1117.8	1066.8	610	-	163.00	-	217.00	-
44" x 40"	1117.8	1016.0	610	-	158.00	-	210.00	-
44" x 38"	1117.8	965.2	610	-	154.00	-	205.00	-
44" x 36"	1117.8	914.4	610	-	152.00	-	202.00	-
46" x 44"	1168.4	1117.8	610	-	148.00	-	263.00	-
46" x 42"	1168.4	1066.8	610	-	194.00	-	258.00	-
46" x 40"	1168.4	1016.0	610	-	189.00	-	251.00	-
46" x 38"	1168.4	965.2	610	-	185.00	-	246.00	-
48" x 44"	1219.2	1117.8	610	-	203.00	-	270.00	-
48" x 42"	1219.2	1066.8	610	-	198.00	-	263.00	-
48" x 40	1219.2	1016.0	610	-	194.00	-	258.00	-

General Notes:

- 1) All dimensions are in mm
- 2) Dimension tolerance are as per ASME B16.9

Technical Standards & Reference

ASTM Stainless, Carbon & Alloy Steel Pipes & Fittings - Cross Reference



Grade	Bar	Plate	Tube	Pipe	Fittings	Flanges
304	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F304
309	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F309
310	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F310
316	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F316
317	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F317
321	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F321
347	A276 / 479	A240	A213 / 249 / 269	A312	A403	A182 F347
410	A276 / 479	A240	A213 / 249 / 269	A268	A815	A182 F410
2205	A276 / 479	A240	A789 / 790	A789 / 790	A815	A182 F51
Carbon Steel	A105	A36		A106	A234 WPB	A105
Low Temp C.S. Gr. 1	A350 LF2	A516	A334 GR. 1	A333 GR. 1	A420 WPL1	A350 LF2
Low Temp C.S. Gr. 3	A350 LF3	A516	A334 GR. 3	A333 GR. 3	A420 WPL3	A350 LF3
Low Temp C.S. Gr. 6	A350 LF2	A516	A334 GR. 6	A333 GR. 6	A420 WPL6	A350 LF2
Cr-Mo Grade 1	A182 F1	A387 GRADE 1	A213 T1	A335 P1	A234 WP1	A182 F1
Cr-Mo Grade 5	A182 F5	A387 GRADE 5	A213 T5	A335 P5	A234 WP5	A182 F5
Cr-Mo Grade 9	A182 F9	A387 GRADE 9	A213 T9	A335 P9	A234 WP9	A182 F9
Cr-Mo Grade 11	A182 F11	A387 GRADE 11	A213 T11	A335 P11	A234 WP11	A182 F11
Cr-Mo Grade 22	A182 F22	A387 GRADE 22	A213 T22	A335 P22	A234 WP22	A182 F22
Cr-Mo Grade 91	A182 F91	A387 GRADE 91	A213 T91	A335 P91	A234 WP91	A182 F91

Technical Standards & Reference
ANSI Pipe Schedule (SCH) Chart

Wall Thickness = mm
Weight = kg/m

Nominal Pipe Size mm inch	OD (mm)	5S	10S	10	20	30	STD	40S	40	60	XS	80S	80	100	120	140	160	XXS
6 1/8	10.3		1.24 0.28				1.73 0.37	1.73 0.36	1.73 0.37		2.41 0.47	2.41 0.48	2.41 0.47					
8 1/4	13.7		1.65 0.51				2.24 0.63	2.24 0.64	2.24 0.63		3.02 0.80	3.02 0.82	3.02 0.80					
10 3/8	17.1		1.65 0.64				2.31 0.84	2.31 0.86	2.31 0.84		3.20 1.10	3.20 1.12	3.20 1.10					
15 1/2	21.3	1.65 0.82	2.11 1.01				2.77 1.27	2.77 1.30	2.77 1.27		3.73 1.62	3.73 1.65	3.73 1.62				4.78 1.95	7.47 2.55
20 3/4	26.7	1.65 1.04	2.11 1.31				2.87 1.69	2.87 1.71	2.87 1.69		3.91 2.20	3.91 2.24	3.91 2.20				5.56 2.90	7.82 3.64
25 1	33.4	1.65 1.33	2.77 2.13				3.38 2.50	3.38 2.55	3.38 2.50		4.55 3.24	4.55 3.29	4.55 3.24				6.35 4.24	9.09 5.45
32 1 1/4	42.2	1.65 1.68	2.77 2.76				3.56 3.39	3.56 3.46	3.56 3.39		4.85 4.47	4.85 4.56	4.85 4.47				6.35 5.61	9.70 7.77
40 1 1/2	48.3	1.65 1.95	2.77 3.10				3.68 4.05	3.68 4.13	3.68 4.05		5.08 5.41	5.08 5.51	5.08 5.41				7.14 7.25	10.15 9.56
50 2	60.3	1.65 2.44	2.77 4.01				3.91 5.44	3.91 5.54	3.91 5.44		5.54 7.48	5.54 7.63	5.54 7.48				8.74 11.11	11.07 13.44
65 2 1/2	73.0	2.11 3.77	3.05 5.36				5.16 8.63	5.16 8.81	5.16 8.63		7.01 11.41	7.01 11.64	7.01 11.41				9.53 14.92	14.02 20.39
80 3	88.9	2.11 4.60	3.05 6.59				5.49 11.29	5.49 11.52	5.49 11.29		7.62 15.27	7.62 15.59	7.62 15.27				11.13 21.35	15.24 27.68
90 3 1/2	101.6	2.11 5.29	3.05 7.55				5.74 13.57	5.74 13.84	5.74 13.57		8.08 18.63	8.08 19.01	8.08 18.63				-	-
100 4	114.3	2.11 5.96	3.05 8.52				6.02 16.07	6.02 16.40	6.02 16.07		8.56 22.32	8.56 22.77	8.56 22.32		11.13 28.32		13.49 33.54	17.12 41.03
125 5	141.3	2.77 9.67	3.40 11.82				6.55 21.77	6.55 22.20	6.55 21.77		9.53 30.97	9.53 31.59	9.53 30.97		12.70 40.28		15.88 49.11	19.05 57.43
150 6	168.3	2.77 11.55	3.40 14.13				7.11 28.26	7.11 28.83	7.11 28.26		10.97 42.56	10.97 43.42	10.97 42.56		14.27 54.20		18.26 67.56	21.95 79.22
200 8	219.1	2.77 15.09	3.76 20.37		6.35 33.31	7.04 36.81	8.18 42.55	8.18 43.39	8.18 42.55	10.31 53.08	12.70 64.64	12.70 65.95	12.70 64.64	15.09 75.92	18.26 90.44	20.52 100.92	23.01 111.27	22.23 107.92
250 10	273.1	3.40 23.08	4.19 28.34		6.35 41.77	7.80 51.03	9.27 60.31	9.27 61.52	9.27 60.31	12.70 81.55	12.70 81.55	12.70 83.19	12.70 81.55	15.09 96.01	18.26 114.75	21.44 133.06	25.40 155.15	28.58 172.33
300 12	323.9	3.96 31.89	4.57 36.73		6.35 49.73	8.38 65.20	9.53 73.88	9.52 75.32	10.31 79.73	14.27 108.96	12.70 97.46	12.70 99.43	17.48 132.08	21.44 159.91	25.40 186.75	28.58 208.14	33.32 238.76	25.40 186.97
350 14	355.6	3.96 35.06	4.78 42.14	6.35 54.69	7.92 67.90	9.53 81.33	9.53 81.33		11.13 94.55	15.09 126.71	12.70 107.39		19.05 158.10	23.83 194.96	27.79 224.65	31.75 253.56	35.71 281.70	
400 16	406.4	4.19 42.41	4.78 48.26	6.35 62.64	7.92 77.83	9.35 93.27	9.53 93.27		12.70 123.30	16.66 160.12	12.70 123.30		21.44 203.53	26.19 245.56	30.96 286.64	36.53 333.19	40.49 365.35	
450 18	457.2	4.10 47.77	4.78 54.36	6.35 70.57	7.92 87.71	11.13 122.38	9.53 105.16		14.27 155.80	19.05 205.74	12.70 138.15		23.88 254.55	29.36 309.62	34.93 363.56	39.67 408.26	45.24 459.37	
500 20	508.0	4.78 60.46	5.54 70.00	6.35 78.55	9.53 117.15	12.70 155.12	9.53 117.15		15.09 183.42	20.62 247.83	12.70 155.12		26.19 311.17	32.54 381.53	38.10 441.49	44.45 508.11	50.01 564.81	
550 22	558.8	4.78 66.57	5.54 77.06	6.35 86.54	9.53 129.13	12.70 171.09	9.53 129.13		-	22.23 294.25	12.70 171.09		28.58 373.83	34.93 451.42	41.28 527.02	47.63 600.63	53.98 672.26	
600 24	609.6	5.54 84.16	6.35 96.37	6.35 94.53	9.53 141.12	14.27 209.64	9.53 141.12		17.48 255.41	24.61 355.26	12.70 187.06		30.96 442.08	38.89 547.71	46.02 640.03	52.37 720.15	59.54 808.22	
650 26	660.4			7.92 127.36	12.70 202.72	-	9.53 152.87		-		12.70 202.72							
700 28	711.2			7.92 137.32	12.70 218.69	15.88 271.21	9.53 164.85		-		12.70 218.69							
750 30	762.0		7.92 150.36	7.92 147.28	12.70 234.67	15.88 292.18	9.53 176.84		-		12.70 234.67							
800 32	812.8			7.92 157.24	12.70 250.64	15.88 312.15	9.53 188.82		17.48 342.91		12.70 250.64							
850 34	863.6			7.92 167.20	12.70 266.61	15.88 332.12	9.53 200.31		17.48 364.90		12.70 266.61							
900 36	914.4			7.92 176.96	12.70 282.27	15.88 351.70	9.53 212.56		19.05 420.40		12.70 282.27							
950 38	965.2						9.53 224.54				12.70 298.24							
1000 40	1016.0						9.53 236.53				12.70 314.22							
1050 42	1066.8						9.53 248.52				12.70 330.19							
1100 44	1117.8						9.53 260.50				12.70 345.16							
1150 46	1168.4						9.53 272.25				12.70 351.82							
1200 48	1219.2						9.53 284.24				12.70 377.79							

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