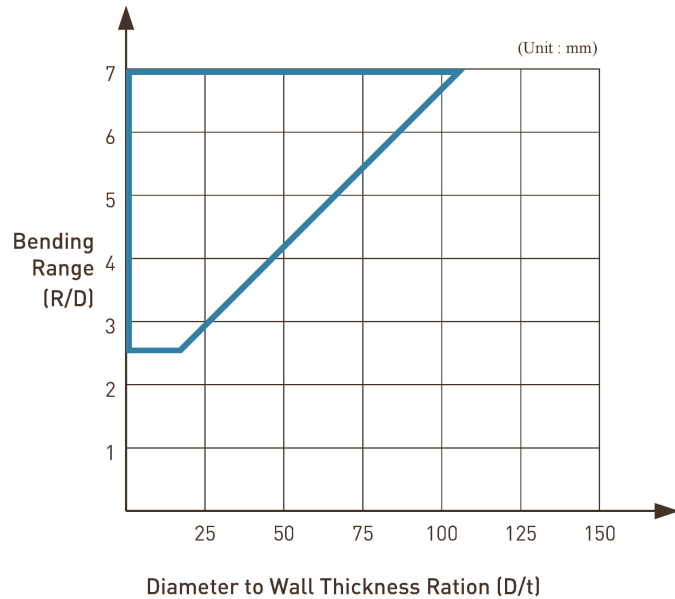


General Bending Range



Where :

D = Pipe Outside Diameter in mm

t = Pipe Wall Thickness in mm

R = Bending Radius in mm

※ Bending Capacity (Carbon Steel)

• Min. OD = 320mm, Max. OD = 2,500mm

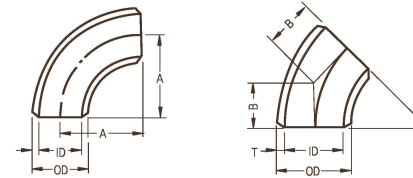
• Max. Wall Thickness : 200mm at Min. OD of 500mm



WROUGHT STAINLESS STEEL BUTT WELD PIPE FITTINGS

90° Elbow (Long, Short)
45° Elbow (Long)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Center to End			5S	
		Long		Short	T	I.D
		A	B	A		
1/2	21.3	38	16		1.65	18.0
3/4	26.7	38	19		1.65	23.4
1	33.4	38	22	25	1.65	30.1
1-1/4	42.2	48	25	32	1.65	38.9
1-1/2	48.3	57	29	38	1.65	45.0
2	60.3	76	35	51	1.65	57.0
2-1/2	73.0	95	44	64	2.11	68.8
3	88.9	114	51	76	2.11	84.7
3-1/2	101.6	133	57	89	2.11	97.4
4	114.3	152	64	102	2.11	110.1
5	141.3	190	79	127	2.77	135.8
6	168.3	229	95	152	2.77	162.8
8	219.1	305	127	203	2.77	213.6
10	273.0	381	159	254	3.40	266.2
12	323.8	457	190	305	3.96	315.9
14	355.6	533	222	356	3.96	347.7
16	406.4	610	254	406	4.19	398.0
18	457.0	686	286	457	4.19	448.6
20	508.0	762	318	508	4.78	498.4
22	559.0	838	343	559	4.78	549.4
24	610.0	914	381	610	5.54	598.9
30	762.0	1143	470		6.35	749.3

(Unit : mm)

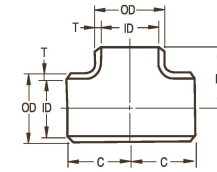
10S		40S		80S		Nominal Pipe Size
T	I.D	T	I.D	T	I.D	
2.11	17.1	2.77	15.8	3.73	13.8	1/2
2.11	22.5	2.87	21.0	3.91	18.9	3/4
2.77	27.9	3.38	26.6	4.55	24.3	1
2.77	36.7	3.56	35.1	4.85	32.5	1-1/4
2.77	42.8	3.68	40.9	5.08	38.1	1-1/2
2.77	54.8	3.91	52.5	5.54	49.2	2
3.05	66.9	5.16	62.7	7.01	59.0	2-1/2
3.05	82.8	5.49	77.9	7.62	73.7	3
3.05	95.5	5.74	90.1	8.08	85.4	3-1/2
3.05	108.2	6.02	102.3	8.56	97.2	4
3.40	134.5	6.55	128.2	9.53	122.2	5
3.40	161.5	7.11	154.1	10.97	146.4	6
3.76	211.6	8.18	202.7	12.70	193.7	8
4.19	264.6	9.27	254.5	12.70	247.6	10
4.57	314.7	9.53	304.7	12.70	298.4	12
4.78	346.0	9.53	336.5	12.70	330.2	14
4.78	396.8	9.53	387.3	12.70	381.0	16
4.78	447.4	9.53	437.9	12.70	431.6	18
5.54	496.9	9.53	488.9	12.70	482.6	20
5.54	547.9					22
6.35	597.3	9.53	590.9	12.70	584.6	24
7.92	746.2					30

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- Wall Thickness Conform to ASME B 36.19M Specifications

ASME (mm)

Tee (Straight)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter O.D	Center to End		5S	
		Run C	Outlet M	T	I.D
1/2	21.3	25	25	1.65	18.0
3/4	26.7	29	29	1.65	23.4
1	33.4	38	38	1.65	30.1
1-1/4	42.2	48	48	1.65	38.9
1-1/2	48.3	57	57	1.65	45.0
2	60.3	64	64	1.65	57.0
2-1/2	73.0	76	76	2.11	68.8
3	88.9	86	86	2.11	84.7
3-1/2	101.6	95	95	2.11	97.4
4	114.3	105	105	2.11	110.1
5	141.3	124	124	2.77	135.8
6	168.3	143	143	2.77	162.8
8	219.1	178	178	2.77	213.6
10	273.0	216	216	3.40	266.2
12	323.8	254	254	3.96	315.9
14	355.6	279	279	3.96	347.7
16	406.4	305	305	4.19	398.0
18	457.0	343	343	4.19	448.6
20	508.0	381	381	4.78	498.4
22	559.0	419	419	4.78	549.4
24	610.0	432	432	5.54	598.9
30	762.0	559	559	6.35	749.3

(Unit : mm)

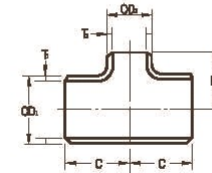
Nominal Pipe Size	10S		40S		80S	
	T	I.D	T	I.D	T	I.D
1/2	2.11	17.1	2.77	15.8	3.73	13.8
3/4	2.11	22.5	2.87	21.0	3.91	18.9
1	2.77	27.9	3.38	26.6	4.55	24.3
1-1/4	2.77	36.7	3.56	35.1	4.85	32.5
1-1/2	2.77	42.8	3.68	40.9	5.08	38.1
2	2.77	54.8	3.91	52.5	5.54	49.2
2-1/2	3.05	66.9	5.16	62.7	7.01	59.0
3	3.05	82.8	5.49	77.9	7.62	73.7
3-1/2	3.05	95.5	5.74	90.1	8.08	85.4
4	3.05	108.2	6.02	102.3	8.56	97.2
5	3.40	134.5	6.55	128.2	9.53	122.2
6	3.40	161.5	7.11	154.1	10.97	146.4
8	3.76	211.6	8.18	202.7	12.70	193.7
10	4.19	264.6	9.27	254.5	12.70	247.6
12	4.57	314.7	9.53	304.7	12.70	298.4
14	4.78	346.0	9.53	336.5	12.70	330.2
16	4.78	396.8	9.53	387.3	12.70	381.0
18	4.78	447.4	9.53	437.9	12.70	431.6
20	5.54	496.9	9.53	488.9	12.70	482.6
22	5.54	547.9				
24	6.35	597.3	9.53	590.9	12.70	584.6
30	7.92	746.2				

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- Wall Thickness Conform to ASME B 36.19M Specifications

ASME (mm)

Tee (Reducing)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9, MSS SP-43

(Unit : mm)

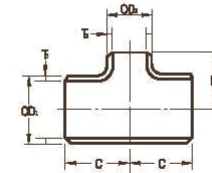
Nominal Pipe Size	Outside Diameter		Center to End		5S	
	OD1	OD2	Run C	Outlet M	T1	T2
3/4 X 3/4 X 1/2	26.7	21.3	29	25	1.65	1.65
1 X 1 X 3/4	33.4	26.7	38	29	1.65	1.65
1 X 1 X 1/2	33.4	21.3	38	25	1.65	1.65
1-1/4 X 1-1/4 X 1	42.2	33.4	48	38	1.65	1.65
1-1/4 X 1-1/4 X 3/4	42.2	26.7	48	29	1.65	1.65
1-1/2 X 1-1/2 X 1-1/4	48.3	42.2	57	48	1.65	1.65
1-1/2 X 1-1/2 X 1	48.3	33.4	57	38	1.65	1.65
1-1/2 X 1-1/2 X 3/4	48.3	26.7	57	29	1.65	1.65
2 X 2 X 1-1/2	60.3	48.3	64	57	1.65	1.65
2 X 2 X 1-1/4	60.3	42.2	64	48	1.65	1.65
2 X 2 X 1	60.3	33.4	64	38	1.65	1.65
2-1/2 X 2-1/2 X 2	73.0	60.3	76	64	2.11	1.65
2-1/2 X 2-1/2 X 1-1/2	73.0	48.3	76	57	2.11	1.65
2-1/2 X 2-1/2 X 1-1/4	73.0	42.2	76	48	2.11	1.65
3 X 3 X 2-1/2	88.9	73.0	86	76	2.11	2.11
3 X 3 X 2	88.9	60.3	86	64	2.11	1.65
3 X 3 X 1-1/2	88.9	48.3	86	57	2.11	1.65
3-1/2 X 3-1/2 X 3	101.6	88.9	95	86	2.11	2.11
3-1/2 X 3-1/2 X 2-1/2	101.6	73.0	95	76	2.11	2.11
3-1/2 X 3-1/2 X 2	101.6	60.3	95	64	2.11	1.65
3-1/2 X 3-1/2 X 1-1/2	101.6	48.3	95	57	2.11	1.65
4 X 4 X 3-1/2	114.3	101.6	105	95	2.11	2.11
4 X 4 X 3	114.3	88.9	105	86	2.11	2.11
4 X 4 X 2-1/2	114.3	73.0	105	76	2.11	2.11
4 X 4 X 2	114.3	60.3	105	64	2.11	1.65

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
3/4 X 3/4 X 1/2	2.11	2.11	2.87	2.77	3.91	3.73
1 X 1 X 3/4	2.77	2.11	3.38	2.87	4.55	3.91
1 X 1 X 1/2	2.77	2.11	3.38	2.77	4.55	3.73
1-1/4 X 1-1/4 X 1	2.77	2.77	3.56	3.38	4.85	4.55
1-1/4 X 1-1/4 X 3/4	2.77	2.11	3.56	2.87	4.85	3.91
1-1/2 X 1-1/2 X 1-1/4	2.77	2.77	3.68	3.56	5.08	4.85
1-1/2 X 1-1/2 X 1	2.77	2.77	3.68	3.38	5.08	4.55
1-1/2 X 1-1/2 X 3/4	2.77	2.11	3.68	2.87	5.08	3.91
2 X 2 X 1-1/2	2.77	2.77	3.91	3.68	5.54	5.08
2 X 2 X 1-1/4	2.77	2.77	3.91	3.56	5.54	4.85
2 X 2 X 1	2.77	2.77	3.91	3.38	5.54	4.55
2-1/2 X 2-1/2 X 2	3.05	2.77	5.16	3.91	7.01	5.54
2-1/2 X 2-1/2 X 1-1/2	3.05	2.77	5.16	3.68	7.01	5.08
2-1/2 X 2-1/2 X 1-1/4	3.05	2.77	5.16	3.56	7.01	4.85
3 X 3 X 2-1/2	3.05	3.05	5.49	5.16	7.62	7.01
3 X 3 X 2	3.05	2.77	5.49	3.91	7.62	5.54
3 X 3 X 1-1/2	3.05	2.77	5.49	3.68	7.62	5.08
3-1/2 X 3-1/2 X 3	3.05	3.05	5.74	5.49	8.08	7.62
3-1/2 X 3-1/2 X 2-1/2	3.05	3.05	5.74	5.16	8.08	7.01
3-1/2 X 3-1/2 X 2	3.05	2.77	5.74	3.91	8.08	5.54
3-1/2 X 3-1/2 X 1-1/2	3.05	2.77	5.74	3.68	8.08	5.08
4 X 4 X 3-1/2	3.05	3.05	6.02	5.74	8.56	8.08
4 X 4 X 3	3.05	3.05	6.02	5.49	8.56	7.62
4 X 4 X 2-1/2	3.05	3.05	6.02	5.16	8.56	7.01
4 X 4 X 2	3.05	2.77	6.02	3.91	8.56	5.54

ASME (mm)

Tee (Reducing)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter		Center to End		5S	
	OD1	OD2	Run C	Outlet M	T1	T2
5X5X4	141.3	114.3	124	105	2.77	2.11
5X5X3-1/2	141.3	101.6	124	95	2.77	2.11
5X5X3	141.3	88.9	124	86	2.77	2.11
5X5X2-1/2	141.3	73.0	124	76	2.77	2.11
6X6X5	168.3	141.3	143	124	2.77	2.77
6X6X4	168.3	114.3	143	105	2.77	2.11
6X6X3-1/2	168.3	101.6	143	95	2.77	2.11
6X6X3	168.3	88.9	143	86	2.77	2.11
8X8X6	219.1	168.3	178	143	2.77	2.77
8X8X5	219.1	141.3	178	124	2.77	2.77
8X8X4	219.1	114.3	178	105	2.77	2.11
10X10X8	273.0	219.1	216	178	3.40	2.77
10X10X6	273.0	168.3	216	143	3.40	2.77
10X10X5	273.0	141.3	216	124	3.40	2.77
12X12X10	323.8	273.0	254	216	3.96	3.40
12X12X8	323.8	219.1	254	178	3.96	2.77
12X12X6	323.8	168.3	254	143	3.96	2.77
14X14X12	355.6	323.8	279	254	3.96	3.96
14X14X10	355.6	273.0	279	216	3.96	3.40
14X14X8	355.6	219.1	279	178	3.96	2.77
16X16X14	406.4	355.6	305	279	4.19	3.96
16X16X12	406.4	323.8	305	254	4.19	3.96
16X16X10	406.4	273.0	305	216	4.19	3.40
18X18X16	457.0	406.4	343	305	4.19	4.19
18X18X14	457.0	355.6	343	279	4.19	3.96

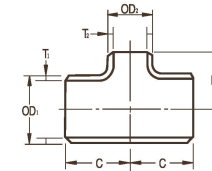
(Unit : mm)

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
5X5X4	3.40	3.05	6.55	6.02	9.53	8.56
5X5X3-1/2	3.40	3.05	6.55	5.74	9.53	8.08
5X5X3	3.40	3.05	6.55	5.49	9.53	7.62
5X5X2-1/2	3.40	3.05	6.55	5.16	9.53	7.01
6X6X5	3.40	3.40	7.11	6.55	10.97	9.53
6X6X4	3.40	3.05	7.11	6.02	10.97	8.56
6X6X3-1/2	3.40	3.05	7.11	5.74	10.97	8.08
6X6X3	3.40	3.05	7.11	5.49	10.97	7.62
8X8X6	3.76	3.40	8.18	7.11	12.70	10.97
8X8X5	3.76	3.40	8.18	6.55	12.70	9.53
8X8X4	3.76	3.05	8.18	6.02	12.70	8.56
10X10X8	4.19	3.76	9.27	8.18	12.70	12.70
10X10X6	4.19	3.40	9.27	7.11	12.70	10.97
10X10X5	4.19	3.40	9.27	6.55	12.70	9.53
12X12X10	4.57	4.19	9.53	9.27	12.70	12.70
12X12X8	4.57	3.76	9.53	8.18	12.70	12.70
12X12X6	4.57	3.40	9.53	7.11	12.70	10.97
14X14X12	4.78	4.57	9.53	9.53	12.70	12.70
14X14X10	4.78	4.19	9.53	9.27	12.70	12.70
14X14X8	4.78	3.76	9.53	8.18	12.70	12.70
16X16X14	4.78	4.78	9.53	9.53	12.70	12.70
16X16X12	4.78	4.57	9.53	9.53	12.70	12.70
16X16X10	4.78	4.19	9.53	9.27	12.70	12.70
18X18X16	4.78	4.78	9.53	9.53	12.70	12.70
18X18X14	4.78	4.78	9.53	9.53	12.70	12.70

ASME (mm)

Tee (Reducing)

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter		Center to End		5S	
	OD1	OD2	Run C	Outlet M	T1	T2
18 X 18 X 12	457.0	323.8	343	254	4.19	3.96
20 X 20 X 18	508.0	457.0	381	343	4.78	4.19
20 X 20 X 16	508.0	406.4	381	305	4.78	4.19
20 X 20 X 14	508.0	355.6	381	279	4.78	3.96
22 X 22 X 20	559.0	508.0	419	381	4.78	4.78
22 X 22 X 18	559.0	457.0	419	343	4.78	4.19
22 X 22 X 16	559.0	406.4	419	305	4.78	4.19
24 X 24 X 22	610.0	559.0	432	419	5.54	4.78
24 X 24 X 20	610.0	508.0	432	381	5.54	4.78
24 X 24 X 18	610.0	457.0	432	343	5.54	4.19
30 X 30 X 24	762.0	610.0	559	432	6.35	5.54
30 X 30 X 22	762.0	559.0	559	419	6.35	4.78
30 X 30 X 20	762.0	508.0	559	381	6.35	4.78

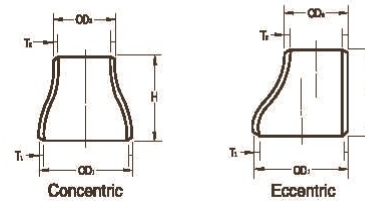
(Unit : mm)

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
18 X 18 X 12	4.78	4.57	9.53	9.53	12.70	12.70
20 X 20 X 18	5.54	4.78	9.53	9.53	12.70	12.70
20 X 20 X 16	5.54	4.78	9.53	9.53	12.70	12.70
20 X 20 X 14	5.54	4.78	9.53	9.53	12.70	12.70
22 X 22 X 20	5.54	5.54		9.53		12.70
22 X 22 X 18	5.54	4.78		9.53		12.70
22 X 22 X 16	5.54	4.78		9.53		12.70
24 X 24 X 22	6.35	5.54	9.53		12.70	
24 X 24 X 20	6.35	5.54	9.53	9.53	12.70	12.70
24 X 24 X 18	6.35	4.78	9.53	9.53	12.70	12.70
30 X 30 X 24	7.92	6.35		9.53		12.70
30 X 30 X 22	7.92	5.54				
30 X 30 X 20	7.92	5.54		9.53		12.70

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- Wall Thickness Conform to ASME B 36.19M Specifications

Reducer

Sch5s, Sch10s, Sch40s, Sch80s



ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter		End to End	5S	
	OD1	OD2	H	T1	T2
3/4 X 1/2	26.7	21.3	38	1.65	1.65
1 X 3/4	33.4	26.7	51	1.65	1.65
1 X 1/2	33.4	21.3	51	1.65	1.65
1-1/4 X 1	42.2	33.4	51	1.65	1.65
1/4 X 3/4	42.2	26.7	51	1.65	1.65
1-1/4 X 1/2	42.2	21.3	51	1.65	1.65
1-1/2 X 1-1/4	48.3	42.2	64	1.65	1.65
1-1/2 X 1	48.3	33.4	64	1.65	1.65
1-1/2 X 3/4	48.3	26.7	64	1.65	1.65
1-1/2 X 1/2	48.3	21.3	64	1.65	1.65
2 X 1-1/2	60.3	48.3	76	1.65	1.65
2 X 1-1/4	60.3	42.2	76	1.65	1.65
2 X 1	60.3	33.4	76	1.65	1.65
2 X 3/4	60.3	26.7	76	1.65	1.65
2-1/2 X 2	73.0	60.3	89	2.11	1.65
2-1/2 X 1-1/2	73.0	48.3	89	2.11	1.65
2-1/2 X 1-1/4	73.0	42.2	89	2.11	1.65
3 X 2-1/2	88.9	73.0	89	2.11	2.11
3 X 2	88.9	60.3	89	2.11	1.65
3 X 1-1/2	88.9	48.3	89	2.11	1.65
3 X 1-1/4	88.9	42.2	89	2.11	1.65
3-1/2 X 3	101.6	88.9	102	2.11	2.11
3-1/2 X 2-1/2	101.6	73.0	102	2.11	2.11
3-1/2 X 2	101.6	60.3	102	2.11	1.65
4 X 3-1/2	114.3	101.6	102	2.11	2.11
4 X 3	114.3	88.9	102	2.11	2.11

(Unit : mm)

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
3/4 X 1/2	2.11	2.11	2.87	2.77	3.91	3.73
1 X 3/4	2.77	2.11	3.38	2.87	4.55	3.91
1 X 1/2	2.77	2.11	3.38	2.77	4.55	3.73
1-1/4 X 1	2.77	2.77	3.56	3.38	4.85	4.55
1/4 X 3/4	2.77	2.11	3.56	2.87	4.85	3.91
1-1/4 X 1/2	2.77	2.11	3.56	2.77	4.85	3.73
1-1/2 X 1-1/4	2.77	2.77	3.68	3.56	5.08	4.85
1-1/2 X 1	2.77	2.77	3.68	3.38	5.08	4.55
1-1/2 X 3/4	2.77	2.11	3.68	2.87	5.08	3.91
1-1/2 X 1/2	2.77	2.11	3.68	2.77	5.08	3.73
2 X 1-1/2	2.77	2.77	3.91	3.68	5.54	5.08
2 X 1-1/4	2.77	2.77	3.91	3.56	5.54	4.85
2 X 1	2.77	2.77	3.91	3.38	5.54	4.55
2 X 3/4	2.77	2.11	3.91	2.87	5.54	3.91
2-1/2 X 2	3.05	2.77	5.16	3.91	7.01	5.54
2-1/2 X 1-1/2	3.05	2.77	5.16	3.68	7.01	5.08
2-1/2 X 1-1/4	3.05	2.77	5.16	3.56	7.01	4.85
3 X 2-1/2	3.05	3.05	5.49	5.16	7.62	7.01
3 X 2	3.05	2.77	5.49	3.91	7.62	5.54
3 X 1-1/2	3.05	2.77	5.49	3.68	7.62	5.08
3 X 1-1/4	3.05	2.77	5.49	3.56	7.62	4.85
3-1/2 X 3	3.05	3.05	5.74	5.49	8.08	7.62
3-1/2 X 2-1/2	3.05	3.05	5.74	5.16	8.08	7.01
3-1/2 X 2	3.05	2.77	5.74	3.91	8.08	5.54
4 X 3-1/2	3.05	3.05	6.02	5.74	8.56	8.08
4 X 3	3.05	3.05	6.02	5.49	8.56	7.62

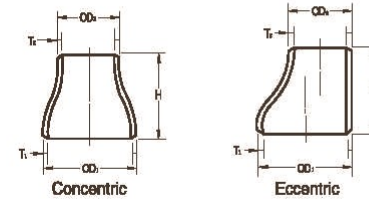
ASME (mm)

Reducer

Sch5s, Sch10s, Sch40s, Sch80s

ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter		End to End	5S	
	OD1	OD2	H	T1	T2
4X2-1/2	114.3	73.0	102	2.11	2.11
4X2	114.3	60.3	102	2.11	1.65
5X4	141.3	114.3	127	2.77	2.11
5X3-1/2	141.3	101.6	127	2.77	2.11
5X3	141.3	88.9	127	2.77	2.11
5X2-1/2	141.3	73.0	127	2.77	2.11
6X5	168.3	141.3	140	2.77	2.77
6X4	168.3	114.3	140	2.77	2.11
6X3-1/2	168.3	101.6	140	2.77	2.11
6X3	168.3	88.9	140	2.77	2.11
8X6	219.1	168.3	152	2.77	2.77
8X5	219.1	141.3	152	2.77	2.77
8X4	219.1	114.3	152	2.77	2.11
10X8	273.0	219.1	178	3.40	2.77
10X6	273.0	168.3	178	3.40	2.77
10X5	273.0	141.3	178	3.40	2.77
12X10	323.8	273.0	203	3.96	3.40
12X8	323.8	219.1	203	3.96	2.77
12X6	323.8	168.3	203	3.96	2.77
14X12	355.6	323.8	330	3.96	3.96
14X10	355.6	273.0	330	3.96	3.40
14X8	355.6	219.1	330	3.96	2.77
16X14	406.4	355.6	356	4.19	3.96
16X12	406.4	323.8	356	4.19	3.96
16X10	406.4	273.0	356	4.19	3.40
18X16	457.0	406.4	381	4.19	4.19



(Unit : mm)

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
4X2-1/2	3.05	3.05	6.02	5.16	8.56	7.01
4X2	3.05	2.77	6.02	3.91	8.56	5.54
5X4	3.40	3.05	6.55	6.02	9.53	8.56
5X3-1/2	3.40	3.05	6.55	5.74	9.53	8.08
5X3	3.40	3.05	6.55	5.49	9.53	7.62
5X2-1/2	3.40	3.05	6.55	5.16	9.53	7.01
6X5	3.40	3.40	7.11	6.55	10.97	9.53
6X4	3.40	3.05	7.11	6.02	10.97	8.56
6X3-1/2	3.40	3.05	7.11	5.74	10.97	8.08
6X3	3.40	3.05	7.11	5.49	10.97	7.62
8X6	3.76	3.40	8.18	7.11	12.70	10.97
8X5	3.76	3.40	8.18	6.55	12.70	9.53
8X4	3.76	3.05	8.18	6.02	12.70	8.56
10X8	4.19	3.76	9.27	8.18	12.70	12.70
10X6	4.19	3.40	9.27	7.11	12.70	10.97
10X5	4.19	3.40	9.27	6.55	12.70	9.53
12X10	4.57	4.19	9.53	9.27	12.70	12.70
12X8	4.57	3.76	9.53	8.18	12.70	12.70
12X6	4.57	3.40	9.53	7.11	12.70	10.97
14X12	4.78	4.57	9.53	9.53	12.70	12.70
14X10	4.78	4.19	9.53	9.27	12.70	12.70
14X8	4.78	3.76	9.53	8.18	12.70	12.70
16X14	4.78	4.78	9.53	9.53	12.70	12.70
16X12	4.78	4.57	9.53	9.53	12.70	12.70
16X10	4.78	4.19	9.53	9.27	12.70	12.70
18X16	4.78	4.78	9.53	9.53	12.70	12.70

ASME (mm)

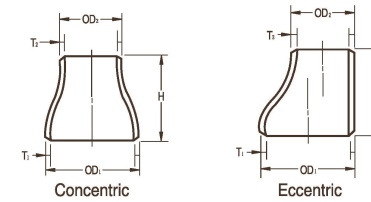
Reducer

Sch5s, Sch10s, Sch40s, Sch80s

ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter		End to End	5S	
	OD1	OD2	H	T1	T2
18 X 14	457.0	355.6	381	4.19	3.96
18 X 12	457.0	323.8	381	4.19	3.96
20 X 18	508.0	457.0	508	4.78	4.19
20 X 16	508.0	406.4	508	4.78	4.19
20 X 14	508.0	355.6	508	4.78	3.96
22 X 20	559.0	508.0	508	4.78	4.78
22 X 18	559.0	457.0	508	4.78	4.19
22 X 16	559.0	406.4	508	4.78	4.19
24 X 22	610.0	559.0	508	5.54	4.78
24 X 20	610.0	508.0	508	5.54	4.78
24 X 18	610.0	457.0	508	5.54	4.19
30 X 24	762.0	610.0	610	6.35	5.54
30 X 22	762.0	559.0		6.35	4.78
30 X 20	762.0	508.0	610	6.35	4.78

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- Wall Thickness Conform to ASME B 36.19M Specifications



(Unit : mm)

Nominal Pipe Size	10S		40S		80S	
	T1	T2	T1	T2	T1	T2
18 X 14	4.78	4.78	9.53	9.53	12.70	12.70
18 X 12	4.78	4.57	9.53	9.53	12.70	12.70
20 X 18	5.54	4.78	9.53	9.53	12.70	12.70
20 X 16	5.54	4.78	9.53	9.53	12.70	12.70
20 X 14	5.54	4.78	9.53	9.53	12.70	12.70
22 X 20	5.54	5.54		9.53		12.70
22 X 18	5.54	4.78		9.53		12.70
22 X 16	5.54	4.78		9.53		12.70
24 X 22	6.35	5.54	9.53		12.70	
24 X 20	6.35	5.54	9.53	9.53	12.70	12.70
24 X 18	6.35	4.78	9.53	9.53	12.70	12.70
30 X 24	7.92	6.35		9.53		12.70
30 X 22	7.92	5.54				
30 X 20	7.92	5.54		9.53		12.70

ASME (mm)

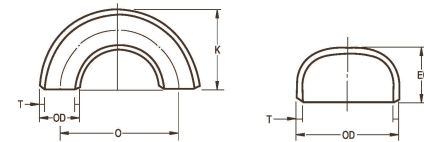
180° Elbow (Long, Short) Cap

Sch5s, Sch10s, Sch40s, Sch80s

ASME B16.9, MSS SP-43

Nominal Pipe Size	Outside Diameter O.D	Wall Thickness				Length E
		5S	10S	40S	80S	
1/2	21.3	1.65	2.11	2.77	3.73	25
3/4	26.7	1.65	2.11	2.87	3.91	25
1	33.4	1.65	2.77	3.38	4.55	38
1-1/4	42.2	1.65	2.77	3.56	4.85	38
1-1/2	48.3	1.65	2.77	3.68	5.08	38
2	60.3	1.65	2.77	3.91	5.54	38
2-1/2	73.0	2.11	3.05	5.16	7.01	38
3	88.9	2.11	3.05	5.49	7.62	51
3-1/2	101.6	2.11	3.05	5.74	8.08	64
4	114.3	2.11	3.05	6.02	8.56	64
5	141.3	2.77	3.40	6.55	9.53	76
6	168.3	2.77	3.40	7.11	10.97	89
8	219.1	2.77	3.76	8.18	12.70	102
10	273.0	3.40	4.19	9.27	12.70	127
12	323.8	3.96	4.57	9.53	12.70	152
14	355.6	3.96	4.78	9.53	12.70	165
16	406.4	4.19	4.78	9.53	12.70	178
18	457.0	4.19	4.78	9.53	12.70	203
20	508.0	4.78	5.54	9.53	12.70	229
22	559.0	4.78	5.54			254
24	610.0	5.54	6.35	9.53	12.70	267
30	762.0	6.35	7.92			267

- Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length E."
- Length E1 applies for thickness greater than that given in column "Limiting Wall Thickness" for NPS 24 and smaller for NPS 26 and larger, length E1 shall be by agreement between manufacturer and Purchaser.



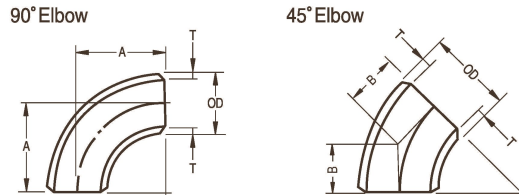
(Unit : mm)

Nominal Pipe Size	Limiting Wall Thickness for Length E	Length E1	180° Elbow			
			Long		Short	
			O	K	O	K
1/2	4.57	25		48		
3/4	3.81	25		51		
1	4.57	38		56	51	41
1-1/4	4.83	38	95	70	64	52
1-1/2	5.08	38	114	83	76	62
2	5.59	44	152	106	102	81
2-1/2	7.11	51	190	132	127	100
3	7.62	64	229	159	152	121
3-1/2	8.13	76	267	184	178	140
4	8.64	76	305	210	203	159
5	9.65	89	381	262	254	197
6	10.92	102	457	313	305	237
8	12.70	127	610	414	406	313
10	12.70	152	762	518	508	391
12	12.70	178	914	619	610	467
14	12.70	191	1067	711	711	533
16	12.70	203	1219	813	813	610
18	12.70	229	1372	914	914	686
20	12.70	254	1524	1016	1016	762
22	12.70	254	1676	1118	1118	838
24	12.70	305	1829	1219	1219	914
30						

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- Wall Thickness Conform to ASME B 36.19M Specifications

ASME (mm)

Special Fittings
Elbow (90°,45°)

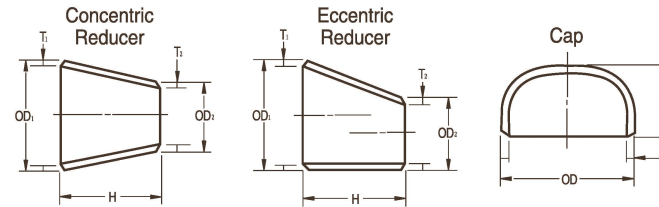


(Unit : mm)

Nominal Pipe Size	ELBOW					
	OD	Wall Thickness		LONG		SHORT
		STD	X-S	A	B	A
50	1270.0	9.53	12.70	1905.0	789.1	1270.0
52	1320.8	9.53	12.70	1981.2	820.6	1320.8
54	1371.6	9.53	12.70	2057.4	852.2	1371.6
56	1422.4	9.53	12.70	2133.6	883.8	1422.4
58	1473.2	9.53	12.70	2209.8	915.3	1473.2
60	1524.0	9.53	12.70	2286.0	946.9	1524.0
62	1574.8	9.53	12.70	2362.2	978.5	1574.8
64	1625.6	9.53	12.70	2438.4	1010.0	1625.6
66	1676.4	9.53	12.70	2514.6	1041.6	1676.4
68	1727.2	9.53	12.70	2590.8	1073.2	1727.2
70	1778.0	9.53	12.70	2667.0	1104.7	1778.0
72	1828.8	9.53	12.70	2743.2	1136.3	1828.8
74	1879.6	9.53	12.70	2819.4	1167.8	1879.6
76	1930.4	9.53	12.70	2895.6	1199.4	1930.4
78	1981.2	9.53	12.70	2971.8	1231.0	1981.2
80	2032.0	9.53	12.70	3048.0	1211.7	2032.0
82	2082.8	9.53	12.70	3124.2	1294.1	2082.8

- For Bevel Details See Page 356
- For Dimensional Tolerances See Page 362
- For Approx Weight See Page 394-421
- Wall Thickness Conform to ASME B 36.19M Specifications

Special Fittings
Reducer, Cap



(Unit : mm)

Nominal Pipe Size	REDUCER / CAP		
	OD	Wall Thickness	
		STD	X-S
50	1270.0	9.53	12.70
52	1320.8	9.53	12.70
54	1371.6	9.53	12.70
56	1422.4	9.53	12.70
58	1473.2	9.53	12.70
60	1524.0	9.53	12.70
62	1574.8	9.53	12.70
64	1625.6	9.53	12.70
66	1676.4	9.53	12.70
68	1727.2	9.53	12.70
70	1778.0	9.53	12.70
72	1828.8	9.53	12.70
74	1879.6	9.53	12.70
76	1930.4	9.53	12.70
78	1981.2	9.53	12.70
80	2032.0	9.53	12.70
82	2082.8	9.53	12.70

- Reducer for 50" and above shall be Conical shape.
- Dimension 'H' to be provided by customer or agreed.
- Dimension 'M' for caps for 50" and above o be provided by customer or agreed.