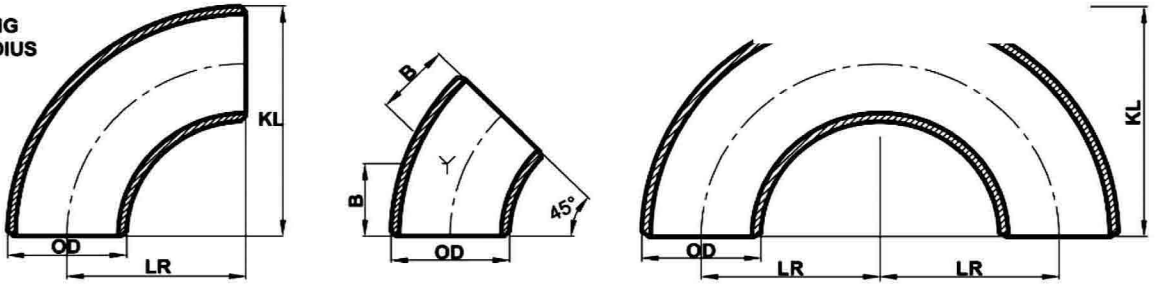
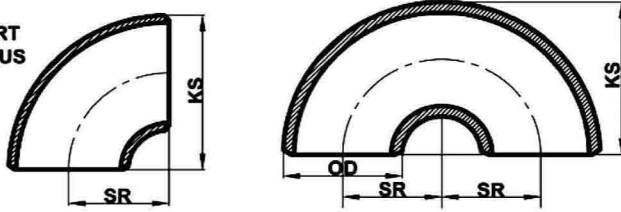


LONG RADIUS



SHORT RADIUS



ELBOWS

NPS	OD	LR (R=1.5D)	KL	SR (R=1D)	KS	B	Wall Thickness		90 LR ELBOW Weights(kg)	
							SCH.STD	SCH.XS	SCH.STD	SCH.XS
1/2"	21.34	38.10	47.60	-	-	15.90	2.77	3.73	0.07	0.10
3/4"	26.67	28.60	42.90	-	-	11.10	2.87	3.91	0.07	0.10
1"	33.40	38.10	55.60	25.40	41.30	22.20	3.38	4.55	0.15	0.19
1 1/4"	42.16	47.60	69.80	31.80	52.40	25.40	3.56	4.85	0.26	0.34
1 1/2"	48.26	57.20	82.50	38.10	61.90	28.60	3.68	5.08	0.38	0.48
2"	60.32	76.20	106.40	50.80	81.00	34.90	3.91	5.54	0.68	0.91
2 1/2"	73.02	95.20	131.80	63.50	100.00	44.40	5.16	7.01	1.30	1.73
3"	88.90	114.30	158.80	76.20	120.60	50.80	5.49	7.62	2.08	2.78
3 1/2"	101.60	133.40	184.20	88.90	139.70	57.20	5.74	8.08	2.92	3.96
4"	114.30	152.40	209.60	101.60	158.80	63.50	6.02	8.56	3.95	5.40
5"	141.30	190.50	261.90	127.00	196.80	79.40	6.55	9.53	6.67	9.34
6"	168.28	228.60	312.70	152.40	235.50	95.20	7.11	10.97	10.40	15.50
8"	219.08	304.80	414.30	203.20	312.70	127.00	8.18	12.70	20.90	31.30
10"	273.05	381.00	517.50	254.00	390.50	158.80	9.27	12.70	37.00	49.40
12"	323.85	457.20	619.10	304.80	466.70	190.50	9.52	12.70	54.00	71.20
14"	355.60	533.40	711.20	355.60	533.40	222.20	9.52	12.70	69.90	91.60
16"	406.40	609.60	812.80	406.40	609.60	254.00	9.52	12.70	91.20	120.20
18"	457.20	685.80	914.40	457.20	685.80	285.80	9.52	12.70	116.10	153.30
20"	508.00	762.00	1016.00	508.00	762.00	317.50	9.52	12.70	143.80	190.10
22"	558.80	838.20	1117.60	558.80	838.20	342.90	9.52	12.70	174.60	230.40
24"	609.60	914.40	1219.20	609.60	914.00	381.00	9.52	12.70	207.70	274.90
26"	660.40	990.60	1320.80	660.40	990.60	406.40	9.52	12.70	249.34	346.93
28"	711.20	1066.80	1422.40	711.20	1066.80	438.10	9.52	12.70	289.49	402.98
30"	762.00	1143.00	1524.00	762.00	1143.00	469.90	9.52	12.70	332.64	463.22
32"	812.00	1219.20	1625.60	812.80	1218.80	501.60	9.52	12.70	378.79	527.66
34"	863.60	1295.40	1727.20	863.80	1295.60	533.40	9.52	12.70	427.93	596.29
36"	914.40	1371.60	1828.80	914.40	1371.60	565.10	9.52	12.70	480.06	669.12
38"	965.20	1448.00	1930.60	965.20	1447.80	600.00	9.52	12.70	535.20	746.14
40"	1016.00	1524.00	2032.00	1016.00	1524.00	632.00	9.52	12.70	593.33	827.35
42"	1066.80	1600.00	2133.40	1066.80	1600.20	660.00	9.52	12.70	654.45	912.77
44"	1117.60	1676.00	2234.80	1117.60	1676.40	695.00	9.52	12.70	718.57	1002.37
46"	1168.40	1753.00	2337.20	1168.40	1752.60	727.00	9.52	12.70	785.69	1096.17
48"	1219.20	1829.00	2438.60	1219.20	1828.80	759.00	9.52	12.70	855.81	1194.16

INDUCTION PIPE BENDS

Nominal Pipe Size in.	Outside Diameter O.D.(mm)	BENDING RADIUS (mm)						Angle Bending	Tangent length at each end	Wall Thickness (mm)
		3D	4D	5D	6D	8D	10D			
3"	89.00	267.00	356.00	445.00	534.00	712.00	890.00		350.00	
4"	114.00	342.00	456.00	570.00	684.00	912.00	1140.00	90°	350.00	STD
6"	168.00	504.00	672.00	840.00	1008.00	1344.00	1680.00	60°	350.00	SCH40
8"	219.00	657.00	876.00	1095.00	1314.00	1752.00	2190.00	45°	700.00	XS
10"	273.00	819.00	1092.00	1365.00	1638.00	2184.00	2730.00	30°	700.00	SCH80
12"	325.00	975.00	1300.00	1625.00	1950.00	2600.00	3250.00	22.5°	700.00	or as
14"	356.00	1068.00	1424.00	1780.00	2136.00	2848.00	3560.00	or	700.00	per the
16"	406.00	1218.00	1624.00	2030.00	2436.00	3248.00	4060.00	as	700.00	choice of
18"	457.00	1371.00	1828.00	2285.00	2742.00	3656.00	4570.00	per	1000.00	purchaser
20"	508.00	1524.00	2032.00	2540.00	3048.00	4064.00	5080.00	the	1000.00	
22"	559.00	1677.00	2236.00	2795.00	3354.00	4472.00	5590.00	choice	1000.00	
24"	610.00	1830.00	2440.00	3050.00	3660.00	4880.00	6100.00	of	1000.00	
26"	660.00	1980.00	2640.00	3300.00	3960.00	5280.00	6600.00	purchaser		
28"	711.00	2133.00	2844.00	3555.00	4266.00	5688.00	7110.00		1D	
30"	762.00	2286.00	3048.00	3810.00	4572.00	6096.00	7620.00		(Outside diameter of bend)	
32"	813.00	2439.00	3252.00	4065.00	4878.00	6504.00	8130.00		or as	
34"	864.00	2592.00	3456.00	4320.00	5184.00	6912.00	8640.00		per the	
36"	914.00	2742.00	3656.00	4570.00	5484.00	7312.00	9140.00		choice of	
38"	965.00	2895.00	3860.00	4825.00	5790.00	7720.00	9650.00		purchaser	
40"	1016.00	3048.00	4064.00	5080.00	6096.00	8128.00	10160.00			
42"	1067.00	3201.00	4268.00	5335.00	6402.00	8536.00	10670.00			
44"	1118.00	3354.00	4472.00	5590.00	6708.00	8944.00	11180.00			
46"	1168.00	3504.00	4672.00	5840.00	7008.00	9344.00	11680.00			
48"	1219.00	3657.00	4876.00	6095.00	7314.00	9752.00	12190.00			
50"	1270.00	3810.00	5080.00	6350.00	7620.00	10160.00	12700.00			
52"	1321.00	3963.00	5248.00	6605.00	7926.00	10568.00	13210.00			
54"	1372.00	4116.00	5488.00	6860.00	8232.00	10976.00	13720.00			
56"	1422.00	4266.00	5688.00	7110.00	8532.00	11376.00	14220.00			

Bend end preparation: Welding ends to be beveled as per ASME B16.25 or as per specified by purchaser

Induction Pipe Bending Standard Bend Tolerances

Bend Angle: $\pm 1/2^\circ$

Bend Radius $\pm 1\%$

Bend Plane: $\pm 1^\circ$

End squareness

Size NPS 36" and smaller: 2.4mm(0.09")

Size Greater than NPS 36": 3.0mm(0.12")

Linear Dimensions

Size NPS 24" and smaller: ± 5 mm(0.19")

Size Greater than NPS 24": ± 6 mm(0.25")

Thinning: $< 0.10\%$ of the bend nominal wall thickness

or $\leq 50D/R$ (%) (R=bend centerline radius, D=nominal outside diameter of starter stock)

or $\leq 0.05\%$ of the nominal wall thickness of the matching pipe.

Ovality within bends : 2.5% of the mating pipe outside diameter

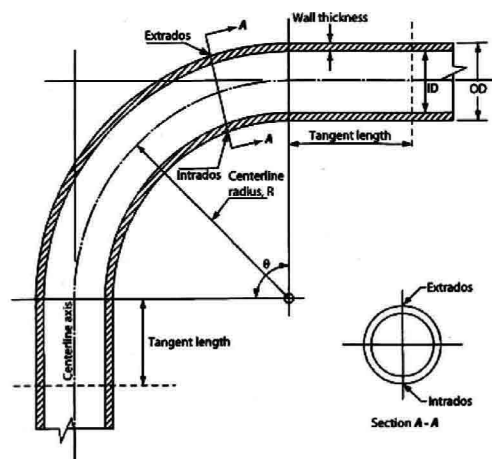
Ovality at Ends: $\leq 1\%$ of the outside diameter

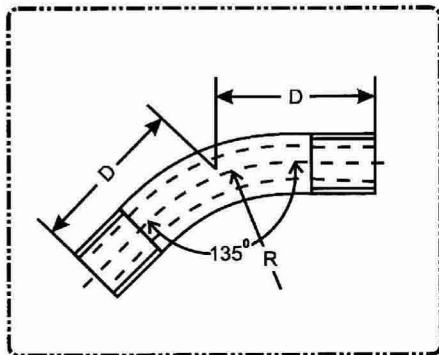
Outside diameter at each welding end: $\pm 1\%$ of the mating pipe outside diameter

Inside diameter at each welding end : Size NPS 36" and smaller: ± 2.5 mm(0.10")

Size larger than NPS 36": ± 3.0 mm(0.12")

Closer tolerance than those given above are available when required.



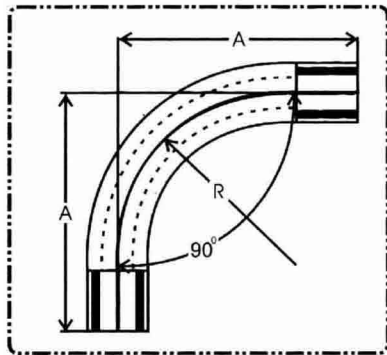


45° Long Bends 3-D Radius
As per IS:1239 (Part II) - 1982

Nominal Pipe Size (in mm)	Bends 45°, Approximate Centre to Face For spring 135° D	Approximate Radius R
006	044	032
010	064	048
015	076	057
020	089	073
025	105	089
032	127	108
040	143	127
050	175	159
065	213	197
080	248	232
100	324	308
125	457	-
150	540	-

For Bevel details see Appendix Page 56
For Dimensional Tolerances see Appendix

As per customer's drawing & specification
manufacture of special items make us
exceptional.



90° Long Bends 3-D Radius

As per IS:1239 (Part II) - 1982

(in mm)

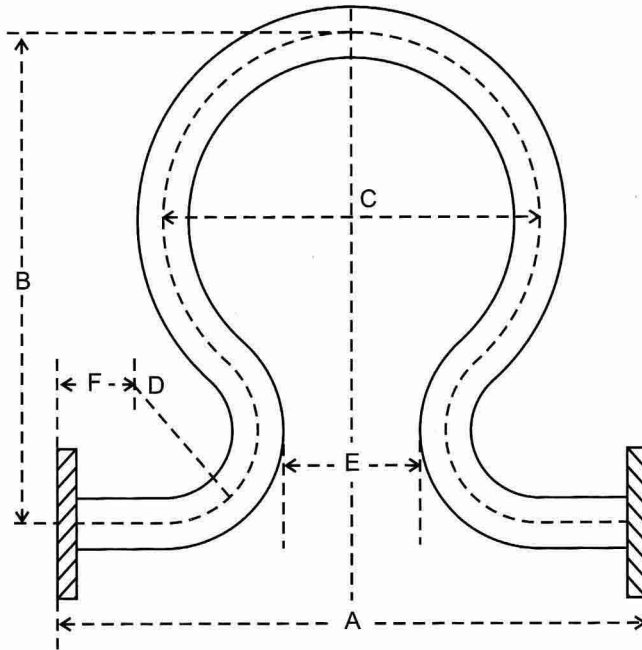
Nominal Pipe Size	Bends 90° Approximate Centre to Face A	Approximate Radius R
006	051	032
010	073	048
015	086	057
020	102	073
025	121	089
032	146	108
040	165	127
050	203	159
065	248	197
080	292	232
100	381	308
125	540	381
150	622	457

For Bevel details see Appendix Page 56
For Dimensional Tolerances see Appendix

As per customer's drawing & specification manufacture of special items make us exceptional.

BUTTWELD FITTINGS

Expansion Bend (Plain End or Flanged) Omega Type



NOM BORE M.M.	A	B	C	D	E	F
25	381	343	229	77	45	77
37 40	470	470	305	115	54	89
50	610	610	381	153	67	89
65	750	737	457	191	89	102
80	864	864	534	229	115	102
90 100	1018	1043	711	305	166	115
125	1372	1448	889	381	216	127
150	1613	1727	1067	456	254	140
175	1867	1981	1219	531	302	153
200	2112	2490	1524	686	416	153
225	2692	2923	1828	762	565	178
250	3175	3404	2133	914	718	178
275	3708	3911	2438	1067	870	204
300	4143	4521	2743	1219	972	204