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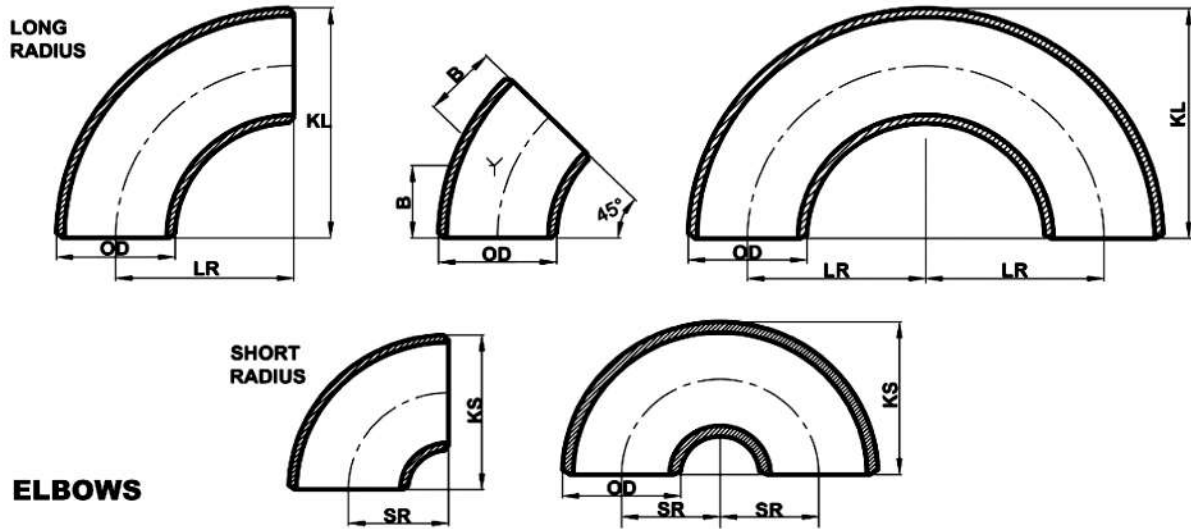
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SECTION II : FITTINGS

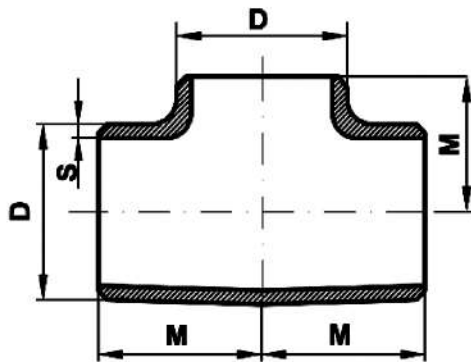




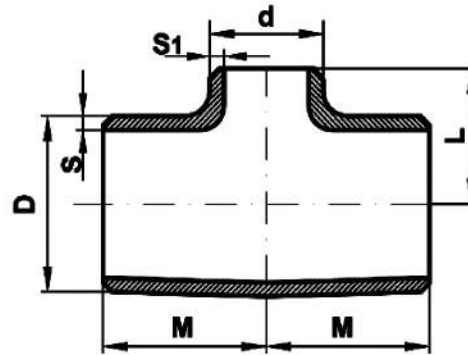
ELBOWS

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

EQUAL TEES

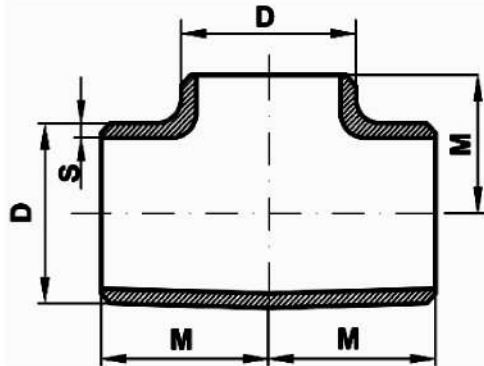


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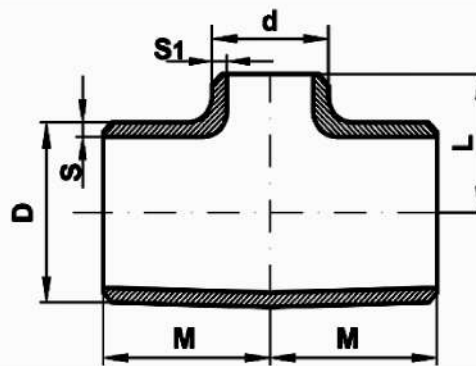


NPS	D	d	M	L	Wall Thickness				Weights(kg)	
					SCH STD		SCH XS		SCH STD	SCH XS
					S	S1	S	S1		
1/2"	21.3	-	25.4	25.4	2.77	-	3.73	-	0.16	0.18
3/4"	26.7	-	28.5	28.5	2.87	-	3.91	-	0.2	0.25
3/4"X1/2"		21.3			2.77	3.91	3.73	0.2	0.25	
1"	33.4	-	38.1	38.1	3.38	-	4.55	-	0.34	0.32
1"X3/4"		26.7			2.87	4.55	3.91	0.34	0.32	
1"X1/2"		21.3			2.77	4.55	3.73	0.34	0.32	
1 1/4"	42.2	-	47.6	47.6	3.56	-	4.85	-	0.63	0.73
1 1/4"X1"		33.4			3.38	4.85	4.55	0.63	0.73	
1 1/4"X3/4"		26.7			2.87	4.85	3.91	0.63	0.73	
1 1/4"X1/2"		21.3			2.77	4.85	3.73	0.63	0.73	
1 1/2"	48.3	-	57.1	57.1	3.68	-	5.08	-	0.92	1.18
1 1/2"X1 1/4"		42.2			3.68	3.56	5.08	4.85	0.92	1.18
1 1/2"X1"		33.4			3.68	3.38	5.08	4.55	0.92	1.18
1 1/2"X3/4"		26.7			3.68	2.87	5.08	3.91	0.92	1.18
1 1/2"X1/2"		21.3			3.68	2.77	5.08	3.73	0.92	1.18
2"	60.3	-	63.5	63.5	3.91	-	5.54	-	1.49	1.67
2"X1 1/2"		48.3			3.91	3.68	5.54	5.08	1.49	1.67
2"X1 1/4"		42.4			3.91	3.56	5.54	4.85	1.49	1.67
2"X1"		33.4			3.91	3.38	5.54	4.55	1.49	1.67
2"X3/4"		26.7			3.91	2.87	5.54	3.91	1.49	1.67
2"X1/2"		21.3			3.91	2.77	5.54	3.73	1.49	1.67
2 1/2"	73	-	76.2	76.2	5.16	-	7.01	-	2.68	2.88
2 1/2"X2"		60.3			5.16	3.91	7.01	5.54	2.68	2.88
2 1/2"X1 1/2"		48.3			5.16	3.68	7.01	5.08	2.68	2.88
2 1/2"X1 1/4"		42.2			5.16	3.56	7.01	4.85	2.68	2.88
2 1/2"X1"		33.4			5.16	3.38	7.01	4.55	2.68	2.88
3"	88.9	-	85.7	85.7	5.49	-	7.62	-	3.75	4.19
3"X2 1/2"		73			5.49	5.16	7.62	7.01	3.75	4.19
3"X2"		60.3			5.49	3.91	7.62	5.54	3.75	4.19
3"X1 1/2"		48.3			5.49	3.68	7.62	5.08	3.75	4.19
3"X1 1/4"		42.2			5.49	3.56	7.62	4.85	3.75	4.19
3"X1"		33.4			5.49	3.38	7.62	4.55	3.75	4.19
3 1/2"	101.6	-	95.2	95.2	5.74	-	8.08	-	5	6.15
3 1/2"X3"		88.9			5.74	5.49	8.08	7.62	5	6.15
3 1/2"X2 1/2"		73			5.74	5.16	8.08	7.01	5	6.15
3 1/2"X2"		60.3			5.74	3.91	8.08	5.54	5	6.15
3 1/2"X1 1/2"		48.3			5.74	3.68	8.08	5.08	5	6.15
3 1/2"X1 1/4"		42.2			5.74	3.56	8.08	4.85	5	6.15

EQUAL TEES

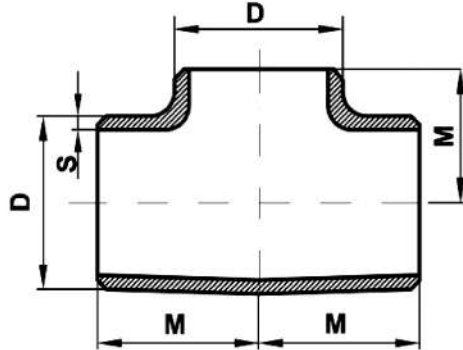


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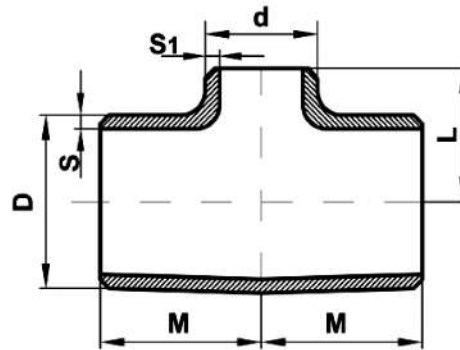


NPS	D	d	M	L	Wall Thickness				Weights(kg)	
					SCH STD		SCH XS		SCH STD	SCH XS
					S	S1	S	S1		
4"		-		104.8	6.02	-	8.56	-	6.5	7.12
4"X3 1/2"		101.6		101.6	6.02	5.74	8.56	8.08	6.5	7.12
4"X3"		88.9		98.4	6.02	5.49	8.56	7.62	6.5	7.12
4"X2 1/2"		73		95.2	6.02	5.16	8.56	7.01	6.5	7.12
4"X2"	114.3	60.3	104.8	88.9	6.02	3.91	8.56	5.54	6.5	7.12
4"X1 1/2"		48.3		85.7	6.02	3.68	8.56	5.08	6.5	7.12
4"X1 1/4"		42.2		83.7	6.02	3.56	8.56	4.85	6.5	7.12
4"X1"		33.4		78.6	6.02	3.38	8.56	4.55	6.5	7.12
5"		-		123.8	6.55	-	9.52	-	10	11.6
5"X4"		114.3		117.4	6.55	6.02	9.52	8.56	10	11.6
5"X3 1/2"		101.6		114.3	6.55	5.74	9.52	8.08	10	11.6
5"X3"	141.3	88.9	123.8	111.1	6.55	5.49	9.52	7.62	10	11.6
5"X2 1/2"		73		107.9	6.55	5.16	9.52	7.01	10	11.6
5"X2"		60.3		104.7	6.55	3.91	9.52	5.54	10	11.6
6"		-		142.8	7.11	-	10.97	-	15	15
6"X5"		141.3		136.5	7.11	6.55	10.97	9.52	15	15
6"X4"		114.3		130.1	7.11	6.02	10.97	8.56	14	15
6"X3 1/2"		101.6		127	7.11	5.74	10.97	8.08	14	15
6"X3"	168.3	88.9	142.8	123.8	7.11	5.49	10.97	7.62	14	15
6"X2 1/2"		73		120.6	7.11	5.16	10.97	7.01	14	15
6"X2"		60.3		115.9	7.11	3.91	10.97	5.54	14	15
8"		-		177.8	8.18	-	12.7	-	24.5	29
8"X6"		168.3		168.2	8.18	7.11	12.7	10.97	24.5	29
8"X5"		141.3		161.9	8.18	6.55	12.7	9.52	24.5	29
8"X4"	219.1	114.3	177.8	155.5	8.18	6.02	12.7	8.56	24.5	29
8"X3 1/2"		101.6		152.4	8.18	5.74	12.7	8.08	24.5	29
8"X3"		88.9		150.8	8.18	5.49	12.7	7.62	24.5	29
10"		-		215.9	9.27	-	12.7	-	31.3	48
10"X8"		219.1		203.2	9.27	8.18	12.7	12.7	31.3	48
10"X6"		168.3		193.7	9.27	7.11	12.7	10.97	31.3	48
10"X5"	273	141.3	215.9	190.5	9.27	6.55	12.7	9.52	31.3	48
10"X4"		114.3		184.2	9.27	6.02	12.7	8.56	31.3	48
10"X3"		88.9		-	9.27	5.49	12.7	7.62	31.3	48
12"		-		254	9.52	-	12.7	-	47	68
12"X10"		273		241.3	9.52	9.27	12.7	12.7	47	68
12"X8"		219.1		228.6	9.52	8.18	12.7	12.7	47	68
12"X6"	323.8	168.3	254	219.1	9.52	7.11	12.7	10.97	47	68
12"X5"		141.3		215.9	9.52	6.55	12.7	9.52	47	68
12"X4"		114.3		214.1	9.52	6.02	12.7	8.56	47	68

EQUAL TEES

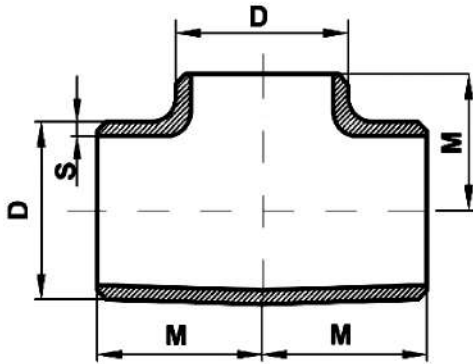


REDUCING TEES

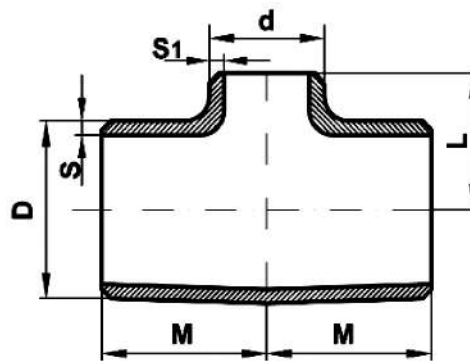


NPS	D	d	M	L	Wall Thickness				Weights(kg)	
					SCH STD		SCH XS		SCH STD	SCH XS
					S	S1	S	S1		
14"		-		279.4	9.52	-	12.7	-	60	85
14"X12"		323.8		269.9	9.52	9.52	12.7	12.7	60	85
14"X10"	355.6	273	279.4	257.2	9.52	9.27	12.7	12.7	60	85
14"X8"		219.1		247.7	9.52	8.18	12.7	12.7	60	85
14"X6"		168.3		238.1	9.52	7.11	12.7	10.97	60	85
16"		-		304.9	9.52	-	12.7	-	75	103
16"X14"		355.6		304.9	9.52	9.52	12.7	12.7	75	103
16"X12"	406.4	323.8	304.8	295.6	9.52	9.52	12.7	12.7	75	103
16"X10"		273		282.6	9.52	9.27	12.7	12.7	75	103
16"X8"		219.1		273.1	9.52	8.18	12.7	12.7	75	103
16"X6"		168.3		263.5	9.52	7.11	12.7	10.97	75	103
18"		-		342.9	9.52	-	12.7	-	105	125
18"X16"		406.4		330.2	9.52	9.52	12.7	12.7	105	125
18"X14"	457.2	355.6	342.9	330.2	9.52	9.52	12.7	12.7	105	125
18"X12"		323.8		320.7	9.52	9.52	12.7	12.7	105	125
18"X10"		273		308	9.52	9.27	12.7	12.7	105	125
18"X8"		219.1		298.5	9.52	8.18	12.7	12.7	105	125
20"		-		381	9.52	-	12.7	-	125	150
20"X18"		457.2		368.3	9.52	9.52	12.7	12.7	125	150
20"X16"	508	406.4	381	355.6	9.52	9.52	12.7	12.7	125	150
20"X14"		355.6		355.6	9.52	9.52	12.7	12.7	125	150
20"X12"		323.8		346.1	9.52	9.52	12.7	12.7	125	150
20"X10"		273		333.4	9.52	9.27	12.7	12.7	125	150
20"X8"		219.1		322.3	9.52	8.18	12.7	12.7	125	150
22"		-		419.1	9.52	-	12.7	-	158.8	205.3
22"X20"		508		406.4	9.52	9.52	12.7	12.7	158.80	205.3
22"X18"	558	457.2	419.1	393.7	9.52	9.52	12.7	12.7	158.80	205.3
22"X16"		406.4		381	9.52	9.52	12.7	12.7	158.80	205.3
22"X14"		355.6		381	9.52	9.52	12.7	12.7	158.80	205.3
22"X12"		323.8		371.5	9.52	9.52	12.7	12.7	158.80	205.3
24"		-		431.8	9.52	-	12.7	-	185	235
24"X22"		558.8		431.8	9.52	9.52	12.7	12.7	185	235
24"X20"	609.6	508.8	431.8	431.8	9.52	9.52	12.7	12.7	185	235
24"X18"		457.2		419.1	9.52	9.52	12.7	12.7	185	235
24"X16"		406.4		406.4	9.52	9.52	12.7	12.7	185	235
24"X14"		355.6		406.4	9.52	9.52	12.7	12.7	185	235
24"X12"		323.8		396.9	9.52	9.52	12.7	12.7	185	235

EQUAL TEES

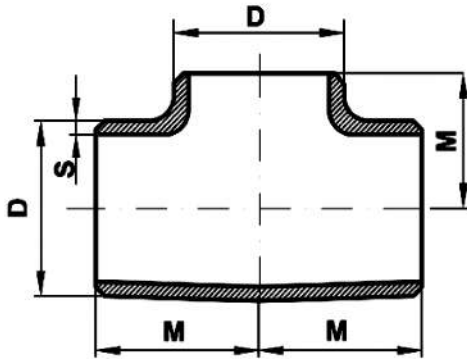


REDUCING TEES

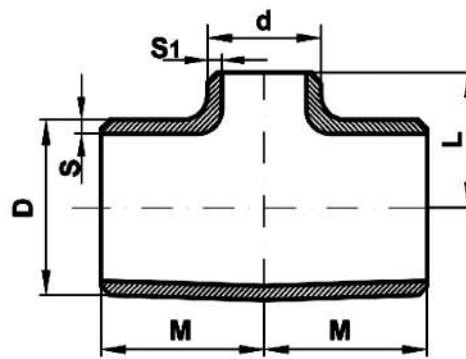


NPS	D	d	M	L	Wall Thickness				Weights(kg)	
					SCH STD		SCH XS		SCH STD	SCH XS
					S	S1	S	S1		
26"		-		495.3	9.52	-	12.7	-	222.3	287.65
26"X24"		609.6		482.6	9.52	9.52	12.7	12.7	222.3	287.65
26"X22"		558.8		469.9	9.52	9.52	12.7	12.7	222.3	287.65
26"X20"	660.4	508	495.3	457.2	9.52	9.52	12.7	12.7	222.3	287.65
26"X18"		457.2		444.5	9.52	9.52	12.7	12.7	222.3	287.65
26"X16"		406.4		431.8	9.52	9.52	12.7	12.7	222.3	287.65
26"X14"		355.6		431.8	9.52	9.52	12.7	12.7	222.3	287.65
28"		-		520.7	9.52	-	12.7	-	250.57	324.35
28"X26"		660.4		520.7	9.52	9.52	12.7	12.7	250.57	324.35
28"X24"		609.6		508	9.52	9.52	12.7	12.7	250.57	324.35
28"X22"	711.2	558.8	520.7	495.3	9.52	9.52	12.7	12.7	250.57	324.35
28"X20"		508		482.6	9.52	9.52	12.7	12.7	250.57	324.35
28"X18"		457.2		469.9	9.52	9.52	12.7	12.7	250.57	324.35
28"X16"		406.4		457.2	9.52	9.52	12.7	12.7	250.57	324.35
30"		-			9.52	-	12.7	-	288.45	373.48
30"X26"		660		546	9.52	9.52	12.7	12.7	288.45	373.48
30"X24"		610		533	9.52	9.52	12.7	12.7	288.45	373.48
30"X22"	762	559	559	521	9.52	9.52	12.7	12.7	288.45	373.48
30"X20"		508		508	9.52	9.52	12.7	12.7	288.45	373.48
30"X18"		457		495	9.52	9.52	12.7	12.7	288.45	373.48
30"X16"		406		483	9.52	9.52	12.7	12.7	288.45	373.48
30"X14"		356		483	9.52	9.52	12.7	12.7	288.45	373.48
32"		-			9.52	-	12.7	-	329	426.08
32"X30"		762		584	9.52	9.52	12.7	12.7	329	426.08
32"X28"		711		572	9.52	9.52	12.7	12.7	329	426.08
32"X26"	813	660	597	572	9.52	9.52	12.7	12.7	329	426.08
32"X24"		610		559	9.52	9.52	12.7	12.7	329	426.08
32"X20"		508		533	9.52	9.52	12.7	12.7	329	426.08
32"X18"		457		521	9.52	9.52	12.7	12.7	329	426.08
32"X16"		406		508	9.52	9.52	12.7	12.7	329	426.08
34"		-			9.52	-	12.7	-	372.2	518.6
34"X16"		406		533	9.52	9.52	12.7	12.7	372.2	518.6
34"X18"		457		546	9.52	9.52	12.7	12.7	372.2	518.6
34"X20"		508		559	9.52	9.52	12.7	12.7	372.2	518.6
34"X24"	864	610	635	584	9.52	9.52	12.7	12.7	372.2	518.6
34"X26"		660		597	9.52	9.52	12.7	12.7	372.2	518.6
34"X28"		711		597	9.52	9.52	12.7	12.7	372.2	518.6
34"X30"		762		610	9.52	9.52	12.7	12.7	372.2	518.6
34"X32"		813		622	9.52	9.52	12.7	12.7	372.2	518.6

EQUAL TEES



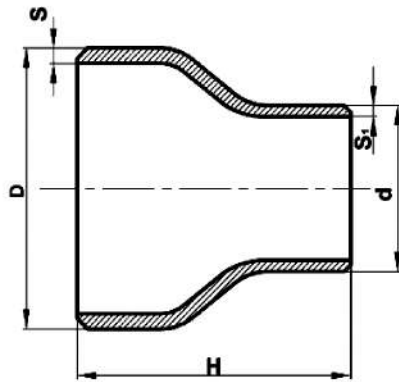
REDUCING TEES



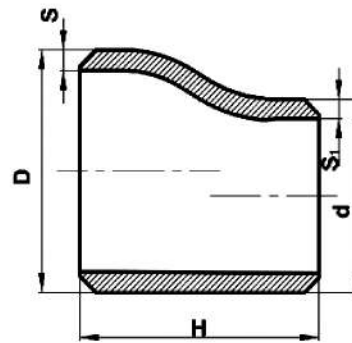
NPS	D	d	M	L	Wall Thickness				Weights(kg)	
					SCH STD		SCH XS		SCH STD	SCH XS
					S	S1	S	S1		
36"		-		-	9.52	-	12.7	-	418.05	582.68
36"x16"		406		559	9.52	9.52	12.7	12.7	418.05	582.68
36"x18"		457		572	9.52	9.52	12.7	12.7	418.05	582.68
36"x20"		508		584	9.52	9.52	12.7	12.7	418.05	582.68
36"x24"	914	610	673	610	9.52	9.52	12.7	12.7	418.05	582.68
36"x26"		660		622	9.52	9.52	12.7	12.7	418.05	582.68
36"x28"		771		622	9.52	9.52	12.7	12.7	418.05	582.68
36"x30"		762		635	9.52	9.52	12.7	12.7	418.05	582.68
36"x32"		813		648	9.52	9.52	12.7	12.7	418.05	582.68
36"x34"		864		660	9.52	9.52	12.7	12.7	418.05	582.68
38"		-		-	9.52	-	12.7	-	466.58	650.48
38"x18"		457		597	9.52	9.52	12.7	12.7	466.58	650.48
38"x20"		508		610	9.52	9.52	12.7	12.7	466.58	650.48
38"x24"		610		635	9.52	9.52	12.7	12.7	466.58	650.48
38"x26"	965	660	711	648	9.52	9.52	12.7	12.7	466.58	650.48
38"x28"		711		648	9.52	9.52	12.7	12.7	466.58	650.48
38"x30"		762		673	9.52	9.52	12.7	12.7	466.58	650.48
38"x32"		813		686	9.52	9.52	12.7	12.7	466.58	650.48
38"x34"		864		698	9.52	9.52	12.7	12.7	466.58	650.48
38"x36"		914		711	9.52	9.52	12.7	12.7	466.58	650.48
40"		-		-	9.52	-	12.7	-	517.77	722.00
40"x20"		508		635	9.52	9.52	12.7	12.7	517.77	722.00
40"x24"		610		660	9.52	9.52	12.7	12.7	517.77	722.00
40"x26"		660		673	9.52	9.52	12.7	12.7	517.77	722.00
40"x28"	1016	711	749	673	9.52	9.52	12.7	12.7	517.77	722.00
40"x30"		752		698	9.52	9.52	12.7	12.7	517.77	722.00
40"x32"		813		711	9.52	9.52	12.7	12.7	517.77	722.00
40"x34"		864		724	9.52	9.52	12.7	12.7	517.77	722.00
40"x36"		914		737	9.52	9.52	12.7	12.7	517.77	722.00
40"x38"		965		749	9.52	9.52	12.7	12.7	517.77	722.00
42"		-		-	9.52	-	12.7	-	532.22	742.29
42"x24"		610		660	9.52	9.52	12.7	12.7	532.22	742.29
42"x26"		660		698	9.52	9.52	12.7	12.7	532.22	742.29
42"x28"		711		698	9.52	9.52	12.7	12.7	532.22	742.29
42"x30"	1067	762	762	711	9.52	9.52	12.7	12.7	532.22	742.29
42"x32"		813		711	9.52	9.52	12.7	12.7	532.22	742.29
42"x34"		864		711	9.52	9.52	12.7	12.7	532.22	742.29
42"x36"		914		711	9.52	9.52	12.7	12.7	532.22	742.29
42"x38"		965		711	9.52	9.52	12.7	12.7	532.22	742.29
42"x40"		1016		711	9.52	9.52	12.7	12.7	532.22	742.29



CONCENTRIC REDUCERS



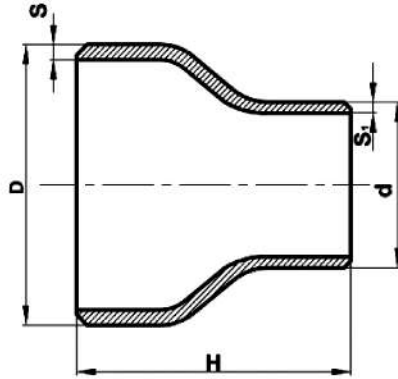
ECCENTRIC REDUCERS



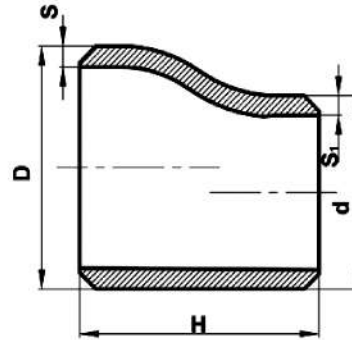
NPS	D	d	H	Wall Thickness				Weights(kg)	
				SCH STD		SCH XS		SCH STD	SCH XS
				S	S1	S	S1		
3/4"X1/2"	26.7	21.3	38	2.87	2.77	3.91	3.73	0.10	0.15
1"X3/4"	33.4	26.7	51	3.38	2.87	4.55	3.91	0.14	0.17
1"X1/2"		21.3		3.38	2.77	4.55	3.73	0.14	0.16
1-1/4"X1"	42.2	33.4	51	3.56	3.38	4.85	4.55	0.20	0.24
1-1/4"X3/4"		26.7		3.56	2.87	4.85	3.91	0.20	0.23
1-1/4"X1/2"		21.3		3.56	2.77	4.85	3.73	0.19	0.22
1-1/2"X1-1/4"	48.3	42.2	64	3.68	3.56	5.08	4.85	0.26	0.33
1-1/2"X1"		33.4		3.68	3.38	5.08	4.55	0.24	0.31
1-1/2"X3/4"		26.7		3.68	2.87	5.08	3.91	0.22	0.27
1-1/2"X1/2"		21.3		3.68	2.77	5.08	3.73	0.20	0.26
2"X1-1/2"	60.3	48.3	76	3.91	3.68	5.54	5.08	0.41	0.54
2"X1-1/4"		42.4		3.91	3.56	5.54	4.85	0.39	0.53
2"X1"		33.4		3.91	3.38	5.54	4.55	0.37	0.48
2"X3/4"		26.7		3.91	2.87	5.54	3.91	0.33	0.46
2"X1/2"		21.3		3.91	2.77	5.54	3.73	0.31	0.42
2-1/2"X2"	73	60.3	89	5.16	3.91	7.01	5.54	0.73	0.94
2-1/2"X1-1/2"		48.3		5.16	3.68	7.01	5.08	0.68	0.86
2-1/2"X1-1/4"		42.2		5.16	3.56	7.01	4.85	0.67	0.79
2-1/2"X1"		33.4		5.16	3.38	7.01	4.55	0.59	0.79
3"X2-1/2"	88.9	73	89	5.49	5.16	7.62	7.01	0.98	1.29
3"X2"		60.3		5.49	3.91	7.62	5.54	0.91	1.18
3"X1-1/2"		48.3		5.49	3.68	7.62	5.08	0.86	1.04
3"X1-1/4"		42.2		5.49	3.56	7.62	4.85	0.77	1.04
3"X1"		33.4		5.49	3.38	7.62	4.55	0.73	1.04
3-1/2"X3"	101.6	88.9	102	5.74	5.49	8.08	7.62	1.38	1.85
3-1/2"X2-1/2"		73		5.74	5.16	8.08	7.01	1.34	1.75
3-1/2"X2"		60.3		5.74	3.91	8.08	5.54	1.23	1.61
3-1/2"X1-1/2"		48.3		5.74	3.68	8.08	5.08	1.14	1.43
3-1/2"X1-1/4"		42.2		5.74	3.56	8.08	4.85	1.14	1.43
4"X3-1/2"	114.3	101.6	102	6.02	5.74	8.56	8.08	1.64	2.21
4"X3"		88.9		6.02	5.49	8.56	7.62	1.59	2.13
4"X2-1/2"		73		6.02	5.16	8.56	7.01	1.52	2.01
4"X2"		60.3		6.02	3.91	8.56	5.54	1.44	1.78
4"X1-1/2"		48.3		6.02	3.68	8.56	5.08	1.24	1.73
4"X1-1/4"		42.2		6.02	3.56	8.56	4.85	1.20	1.71
4"X1"		33.4		6.02	3.38	8.56	4.55	1.12	1.70
5"X4"	141.3	114.3	127	6.55	6.02	9.52	8.56	2.72	3.78
5"X3-1/2"		101.6		6.55	5.74	9.52	8.08	2.65	3.65



CONCENTRIC REDUCERS



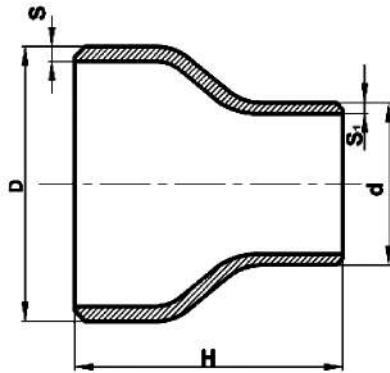
ECCENTRIC REDUCERS



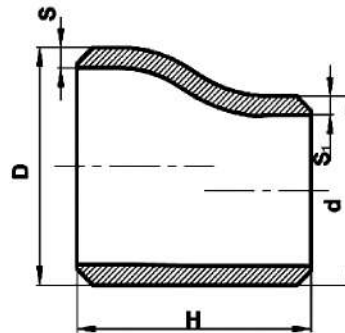
NPS	D	d	H	Wall Thickness				Weights(kg)	
				SCH STD		SCH XS		SCH STD	SCH XS
				S	S1	S	S1		
5"X3" 5"X2-1/2" 5"X2"	141.3	88.9	127	6.55	5.49	9.52	7.62	2.60	3.55
73		6.55		5.16	9.52	7.01	2.51	3.30	
60.3		6.55		3.91	9.52	5.54	2.29	3.00	
6"X5" 6"X4" 6"X3-1/2" 6"X3" 6"X2-1/2" 6"X2"	168.3	141.3	140	7.11	6.55	10.97	9.52	3.93	5.72
114.3		7.11		6.02	10.97	8.56	3.72	5.45	
101.6		7.11		5.74	10.97	8.08	3.69	5.27	
88.9		7.11		5.49	10.97	7.62	3.63	5.04	
73		7.11		5.16	10.97	7.01	3.45	4.52	
60.3		7.11		3.91	10.97	5.54	3.30	4.45	
8"X6" 8"X5" 8"X4" 8"X3-1/2" 8"X3"	219.1	168.3	152	8.18	7.11	12.7	10.97	6.31	9.26
141.3		8.18		6.55	12.7	9.52	6.08	8.85	
114.3		8.18		6.02	12.7	8.56	5.95	8.44	
101.6		8.18		5.74	12.7	8.08	5.81	7.31	
88.9		8.18		5.49	12.7	7.62	5.81	7.31	
10"X8" 10"X6" 10"X5" 10"X4" 10"X3"	273	219.1	178	9.27	8.18	12.7	12.7	10.50	14.20
168.3		9.27		7.11	12.7	10.97	10.10	13.50	
141.3		9.27		6.55	12.7	9.52	9.90	13.00	
114.3		9.27		6.02	12.7	8.56	9.58	11.50	
88.9		9.27		5.49	12.7	7.62	9.30	11.0	
12"X10" 12"X8" 12"X6" 12"X5" 12"X4"	323.8	273	203	9.52	9.27	12.7	12.7	15.20	19.80
219.1		9.52		8.18	12.7	12.7	14.60	19.08	
168.3		9.52		7.11	12.7	10.97	14.10	18.40	
141.3		9.52		6.55	12.7	9.52	13.80	17.70	
114.3		9.52		6.02	12.7	8.56	13.30	17.2	
14"X12" 14"X10" 14"X8" 14"X6"	355.6	323.8	330	9.52	9.52	12.7	12.7	28.80	37.70
273		9.52		9.27	12.7	12.7	27.40	36.10	
219.1		9.52		8.18	12.7	12.7	26.00	34.90	
168.3		9.52		7.11	12.7	10.97	25.30	33.70	
16"X14" 16"X12" 16"X10" 16"X8" 16"X6"	406.4	355.6	356	9.52	9.52	12.7	12.7	35.2	46.3
323.8		9.52		9.52	12.7	12.7	34.3	45	
273		9.52		9.27	12.7	12.7	33.1	43.7	
219.1		9.52		8.18	12.7	12.7	31.9	42.6	
168.3		9.52		7.11	12.7	10.97	31.9	42.6	
18"X16" 18"X14" 18"X12" 18"X10"	457.2	406.4	381	9.52	9.52	12.7	12.7	42.70	55.80
355.6		9.52		9.52	12.7	12.7	41.30	54.50	
323.8		9.52		9.52	12.7	12.7	40.50	53.60	
273		9.52		9.27	12.7	12.7	39.40	51.80	



CONCENTRIC REDUCERS



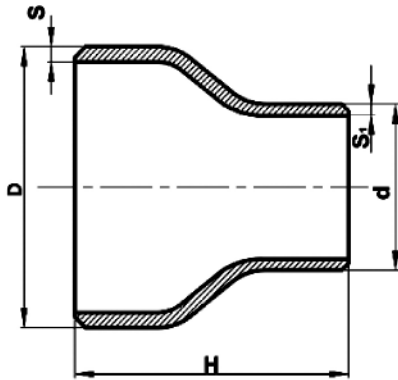
ECCENTRIC REDUCERS



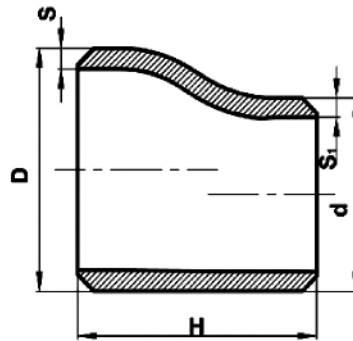
NPS	D	d	H	Wall Thickness				Weights(kg)	
				SCH STD		SCH XS		SCH STD	SCH XS
				S	S1	S	S1		
18"X8"	457.2	219.1	381	9.52	8.18	12.7	12.7	39.4	51.8
20"X18"	508	457.2	508	9.52	9.52	12.7	12.7	64.50	84.40
20"X16"		406.4		9.52	9.52	12.7	12.7	62.60	82.60
20"X14"		355.6		9.52	9.52	12.7	12.7	61.30	81.30
20"X12"		323.8		9.52	9.52	12.7	12.7	60.80	79.90
20"X10"		273		9.52	9.27	12.7	12.7	60.80	79.90
20"X8"		219.1		9.52	8.18	12.7	12.7	60.8	79.9
22"X20"	558	508	508	9.52	9.52	12.7	12.7	71.3	94
22"X18"		457.2		9.52	9.52	12.7	12.7	69.9	91.7
22"X16"		406.4		9.52	9.52	12.7	12.7	68.5	89.9
22"X14"		355.6		9.52	9.52	12.7	12.7	67.2	88.5
24"X22"	609.6	558.8	508	9.52	9.52	12.7	12.7	75.80	99.90
24"X20"		508.8		9.52	9.52	12.7	12.7	75.80	99.90
24"X18"		457.2		9.52	9.52	12.7	12.7	74.00	97.60
24"X16"		406.4		9.52	9.52	12.7	12.7	72.60	95.80
24"X14"		355.6		9.52	9.52	12.7	12.7	72.60	95.80
26"X24"	660	609.6	610	9.52	9.52	12.7	12.7	98.00	123
26"X22"		558.8		9.52	9.52	12.7	12.7	98.00	123
26"X20"		508		9.52	9.52	12.7	12.7	98.00	123
26"X18"		457.2		9.52	9.52	12.7	12.7	98.00	123
26"X16"		406.4		9.52	9.52	12.7	12.7	98.00	123
26"X14"		355.6		9.52	9.52	12.7	12.7	98.00	123
28"X26"	711	660.4	610	9.52	9.52	12.7	12.7	105	132
28"X24"		609.6		9.52	9.52	12.7	12.7	105	132
28"X22"		558.8		9.52	9.52	12.7	12.7	105	132
28"X20"		508		9.52	9.52	12.7	12.7	105	132
28"X18"		457.2		9.52	9.52	12.7	12.7	105	132
28"X16"		406.4		9.52	9.52	12.7	12.7	105	132
30"X26"	762	660	610	9.52	9.52	12.7	12.7	113	143
30"X24"		610		9.52	9.52	12.7	12.7	113	143
30"X22"		559		9.52	9.52	12.7	12.7	113	143
30"X20"		508		9.52	9.52	12.7	12.7	113	143
30"X18"		457		9.52	9.52	12.7	12.7	113	143
30"X16"		406		9.52	9.52	12.7	12.7	113	143
30"X14"		356		9.52	9.52	12.7	12.7	113	143



CONCENTRIC REDUCERS



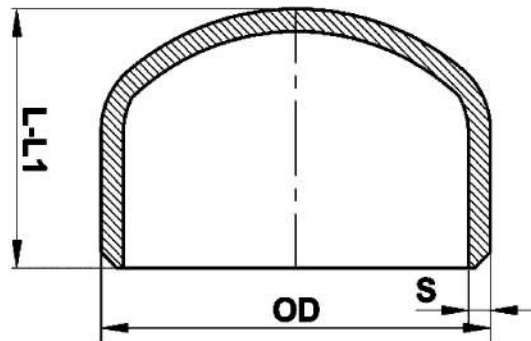
ECCENTRIC REDUCERS



NPS	D	d	H	Wall Thickness				Weights(kg)	
				SCH STD		SCH XS		SCH STD	SCH XS
				S	S1	S	S1		
32"x16"	813	406	610	9.52	9.52	12.7	12.7	115	150
32"x18"		457		9.52	9.52	12.7	12.7	115	150
32"x20"		508		9.52	9.52	12.7	12.7	115	150
32"x24"		610		9.52	9.52	12.7	12.7	115	150
32"x26"		660		9.52	9.52	12.7	12.7	115	150
32"x28"		711		9.52	9.52	12.7	12.7	115	150
32"x30"		762		9.52	9.52	12.7	12.7	115	150
34"x16"		864		406	610	9.52	9.52	12.7	12.7
34"x18"	457		9.52	9.52		12.7	12.7	122	157
34"x20"	508		9.52	9.52		12.7	12.7	122	157
34"x22"	559		9.52	9.52		12.7	12.7	122	157
34"x24"	610		9.52	9.52		12.7	12.7	122	157
34"x26"	660		9.52	9.52		12.7	12.7	122	157
34"x28"	711		9.52	9.52		12.7	12.7	122	157
34"x30"	762		9.52	9.52		12.7	12.7	122	157
34"x32"	813	9.52	9.52	12.7	12.7	122	157		
36"x16"	914	406	610	9.52	9.52	12.7	12.7	136	172
36"x18"		457		9.52	9.52	12.7	12.7	136	172
36"x20"		508		9.52	9.52	12.7	12.7	136	172
36"x22"		559		9.52	9.52	12.7	12.7	136	172
36"x24"		610		9.52	9.52	12.7	12.7	136	172
36"x26"		660		9.52	9.52	12.7	12.7	136	172
36"x28"		711		9.52	9.52	12.7	12.7	136	172
36"x30"		762		9.52	9.52	12.7	12.7	136	172
36"x32"		813		9.52	9.52	12.7	12.7	136	172
36"x34"		864		9.52	9.52	12.7	12.7	136	172
38"x18"	965	457	610	9.52	9.52	12.7	12.7	143	186
38"x20"		508		9.52	9.52	12.7	12.7	143	186
38"x24"		610		9.52	9.52	12.7	12.7	143	186
38"x26"		660		9.52	9.52	12.7	12.7	143	186
38"x28"		711		9.52	9.52	12.7	12.7	143	186
38"x30"		762		9.52	9.52	12.7	12.7	143	186
38"x32"		813		9.52	9.52	12.7	12.7	143	186
38"x34"		864		9.52	9.52	12.7	12.7	143	186
38"x36"		914		9.52	9.52	12.7	12.7	143	186



END CAPS



NPS	OD	L	L1	Wall Thickness		Weights(kg)	
				SCH STD	SCH XS	SCH STD	SCH XS
				S	S		
1/2"	21.34	25.90	25.90	2.77	3.73		
3/4"	26.67	31.70	31.70	2.87	3.91		
1"	33.40	38.10	38.10	3.38	4.55	0.10	0.13
1 1/4"	42.16	38.10	38.10	3.56	4.85	0.14	0.19
1 1/2"	48.26	38.10	38.10	3.68	5.08	0.20	0.23
2"	60.32	38.10	44.40	3.91	5.54	0.25	0.30
2 1/2"	73.02	38.10	50.80	5.16	7.01	0.35	0.45
3"	88.90	50.80	63.50	5.49	7.62	0.70	0.85
3 1/2"	101.60	63.50	76.20	5.74	8.08	1.00	1.30
4"	114.30	63.50	76.20	6.02	8.56	1.10	1.60
5"	141.30	76.20	88.90	6.55	9.53	2.00	2.70
6"	168.28	88.90	101.60	7.11	10.97	3.00	4.40
8"	219.08	101.60	127.00	8.18	12.70	5.50	6.35
10"	273.05	127.00	152.40	9.27	12.70	9.00	13.60
12"	323.85	152.40	177.80	9.52	12.70	15.00	22.50
14"	355.60	165.10	190.50	9.52	12.70	16.00	27.00
16"	406.40	177.80	203.20	9.52	12.70	21.00	31.50
18"	457.20	203.20	228.60	9.52	12.70	26.00	36.00
20"	508.00	228.60	254.00	9.52	12.70	32.00	42.00
22"	558.80	254.00	279.40	9.52	12.70	39.00	51.00
24"	609.60	266.70	304.80	9.52	12.70	46.00	60.00
26"	660.40	266.70	266.70	9.52	12.70	49.80	66.10
28"	711.20	266.70	266.70	9.52	12.70	56.00	74.81
30"	762.00	266.70	266.70	9.52	12.70	62.00	82.80
32"	812.00	266.70	266.70	9.52	12.70	68.00	93.40
34"	863.60	266.70	266.70	9.52	12.70	72.60	96.91
36"	914.40	266.70	266.70	9.52	12.70	79.40	107.00
38"	965.20			9.52	12.70	86.20	124.70
40"	1016.00			9.52	12.70	95.30	129.30
42"	1066.80			9.52	12.70	104.00	136.00
44"	1117.60			9.52	12.70	120.20	167.80
46"	1168.40			9.52	12.70	136.00	186.00
48"	1219.20			9.52	12.70	159.00	215.50

L for thicknesses up to XS.
L1 for thicknesses over XS.



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	
32"	813.00	2439.00	3252.00	4065.00	4878.00	6504.00	8130.00		diameter	
34"	864.00	2592.00	3456.00	4320.00	5184.00	6912.00	8640.00		of bend)	
36"	914.00	2742.00	3656.00	4570.00	5484.00	7312.00	9140.00		or as	
38"	965.00	2895.00	3860.00	4825.00	5790.00	7720.00	9650.00		per the	
40"	1016.00	3048.00	4064.00	5080.00	6096.00	8128.00	10160.00		choice of	
42"	1067.00	3201.00	4268.00	5335.00	6402.00	8536.00	10670.00		purchaser	
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 $\pm 50D/R$ (%) (R=bend centerline radius, D=nominal outside diameter of starter stock)
- or $\pm 0.05\%$ of the nominal wall thickness of the matching pipe.

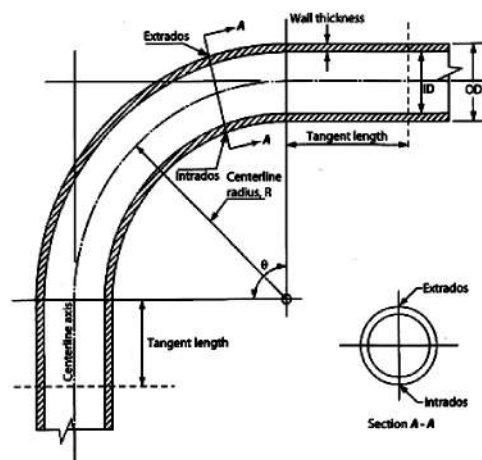
Ovality within bends : 2.5% of the mating pipe outside diameter

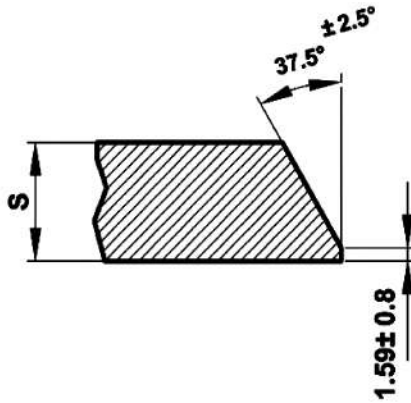
Ovality at Ends: $\leq 1\%$ of the outside diameter

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

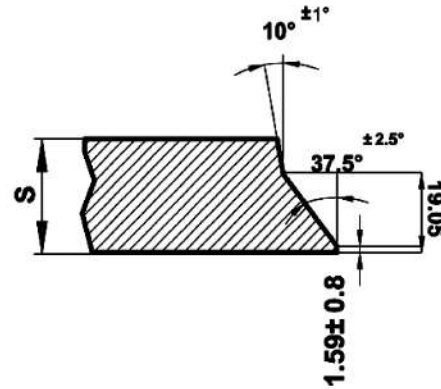
Inside diameter at each welding end : Size NPS 36" and smaller: ± 2.5 mm(0.10")
Size larger than NPS 36": ± 3.0 mm(0.12")

Closer tolerance than those given above are available when required.





Detail of the bevel for fittings having thickness up to 19.05mm



Detail of the bevel for fittings having thickness higher than 19.05mm

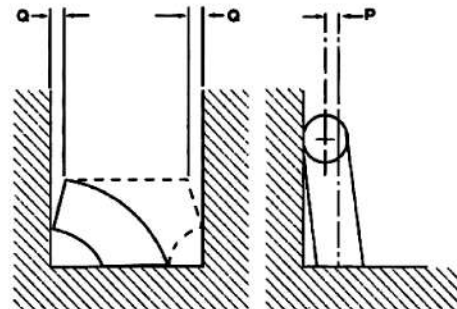
DIMENSIONAL TOLERANCES ACCORDING TO ANSI B16.9 STANDARD

For all fittings				45-90 elbows / tees	Reducer	180deg elbows		Caps	
Pipe nominal size	Outside dia. at the bevel	Inside diam. at end.	Thickness	Centre to end	Length	centre to centre	Height	Alignment of ends	Height
1/2"-2-1/2"	+1.59 -0.59	±0.79	Not less than 87.5% of the nom.thickness	±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
3"-3-1/2"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
4"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
5"-8"	+2.38 -1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±6.35
10"-18"	+3.97 -3.17	±3.17		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
20"-24"	+6.35 -4.76	±4.76		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
26"-32"	+6.35 -4.76	±4.76		±3.2	±4.76	±9.53	±6.35	±1.59	±9.53
34"-36"	+6.35 -4.76	±4.76		±4.76	±4.76	±9.53	±6.35	±1.59	±6.35

Angularity tolerances,ANSI B16.9

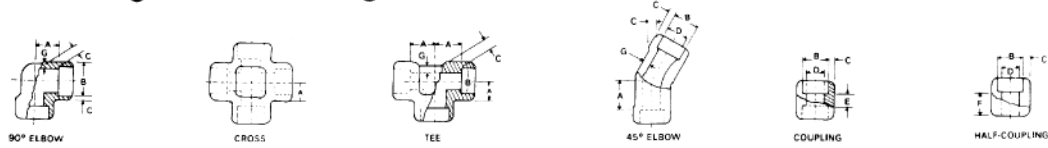
Unit (mm)

NOMINAL PIPE SIZE		OFF ANGLE Q	OFF PLANE P
NPS	DN		
1/2"-4"	15-100	±1	±2
5"-8"		±2	±4
10"-12"	250-300	±3	±5
14"-16"		±3	±7
18"-24"	450-600	±4	±10
26"-30"		±5	±10
32"-36"	800-900	±5	±13





American National Standard Forged Steel Fittings Socket-Welding and Threaded



Nom. Pipe Size	Socket Bore Dia. B ²	Bore Diameter of Fitting D ²			Socket Wall Thickness G						Body Wall G			Center to Bottom of Socket — A						Laying Lengths			Tolerances:		
		Pressure Class Designation			Pressure Class Designation						Pressure Class Designation			Pressure Class Designation						couplings E.B.	Half Couplings I	A	E	F	
		3000 lb	6000 lb	9000 lb	3000 lb		6000 lb		9000 lb		3000 lb	6000 lb	9000 lb	3000 lb	6000 lb	9000 lb	3000 lb	6000 lb	9000 lb						
		Ave.	Min.		Ave.	Min.	Ave.	Min.	Ave.	Min.	Min.	Min.	Min.	Min.	Min.	Min.	Min.	Min.	Min.	Min.					
1/8	0.430	0.299	0.189	0.125	0.125	0.156	0.135			0.095	0.124		0.38	0.44	0.44		0.31	0.31		0.25	0.62	0.03	0.06	0.03	
1/4	0.420	0.239	0.126	0.149	0.130	0.181	0.158			0.119	0.145		0.38	0.44	0.53	0.31	0.31	0.31		0.25	0.62	0.03	0.06	0.03	
3/8	0.565	0.394	0.280	0.158	0.138	0.198	0.172			0.126	0.158		0.38	0.53	0.62		0.31	0.44		0.25	0.69	0.06	0.12	0.06	
1/2	0.700	0.523	0.389	0.184	0.161	0.235	0.204	0.368	0.322	0.147	0.188	0.294	0.38	0.62	0.75	1.00	0.44	0.50	0.62	0.38	0.88	0.06	0.12	0.06	
3/4	0.690	0.463	0.329	0.193	0.168	0.274	0.238	0.385	0.337	0.154	0.219	0.308	0.50	0.75	0.88	1.12	0.50	0.56	0.75	0.38	0.94	0.06	0.12	0.06	
1	0.865	0.652	0.494	0.224	0.196	0.312	0.273	0.448	0.392	0.179	0.250	0.358	0.50	0.88	1.06	1.25	0.56	0.69	0.81	0.50	1.12	0.08	0.16	0.08	
1 1/4	1.330	1.019	0.785	0.239	0.208	0.312	0.273	0.478	0.418	0.191	0.250	0.382	0.50	1.06	1.25	1.38	0.69	0.81	0.88	0.50	1.19	0.08	0.16	0.08	
1 1/2	1.685	1.410	1.190	0.250	0.218	0.351	0.307	0.500	0.438	0.200	0.281	0.400	0.50	1.25	1.50	1.50	0.81	1.00	1.00	0.50	1.25	0.08	0.16	0.08	
2	1.675	1.350	1.130	0.273	0.238	0.430	0.374	0.545	0.477	0.218	0.344	0.436	0.62	1.50	1.62	2.12	1.00	1.12	1.12	0.75	1.62	0.08	0.16	0.08	
2 1/2	2.416	2.097	1.717	0.345	0.302					0.276			0.62	1.62			1.12			0.75	1.69	0.10	0.20	0.10	
3	2.906	2.529		0.375	0.327					0.300			0.62	2.25			1.25			0.75	1.75	0.10	0.20	0.10	
4	3.550	3.128		0.421	0.368					0.337			0.75	2.62			1.62			0.75	1.88	0.10	0.20	0.10	
	3.535	3.008																							
	4.560	4.086																							
	4.545	3.966																							

1. Average of Socket Wall Thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.
2. Upper and lower values for each size are the respective maximum and minimum dimensions.

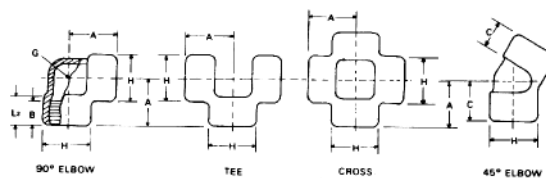


Table Forged Steel Threaded Fittings

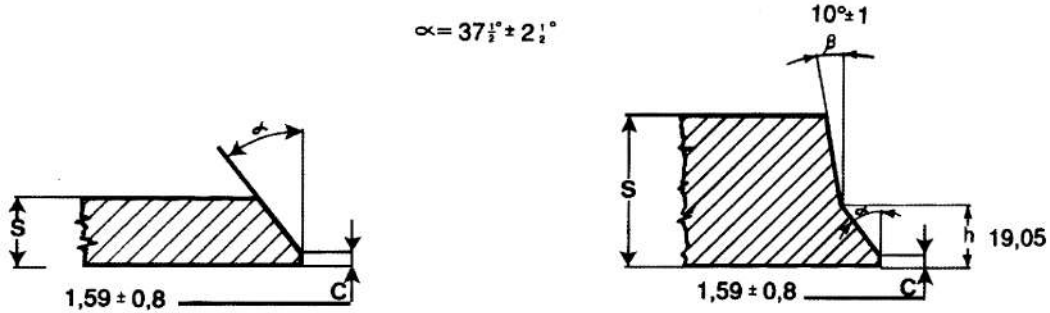
Nom. Pipe Size	Center to End Elbows, Tees, Crosses			Center to End 45° Elbow			Outside Diameter of Band			Minimum Wall Thickness			Length of Thread, Min.	
	2000 lb	3000 lb	6000 lb	2000 lb	3000 lb	6000 lb	2000 lb	3000 lb	6000 lb	2000 lb	3000 lb	6000 lb	lb	B
1/8	0.81	0.81	0.97	0.69	0.69	0.75	0.88	0.88	1.00	0.125	0.125	0.250	0.25	0.2639
1/4	0.81	0.97	1.12	0.69	0.75	0.88	0.88	1.00	1.31	0.125	0.130	0.260	0.32	0.4018
3/8	0.97	1.12	1.31	0.75	0.83	1.00	1.00	1.31	1.50	0.125	0.138	0.275	0.36	0.4078
1/2	1.12	1.31	1.50	0.88	1.00	1.12	1.31	1.50	1.81	0.125	0.161	0.321	0.43	0.5337
3/4	1.31	1.50	1.75	1.00	1.12	1.31	1.50	1.81	2.19	0.125	0.170	0.336	0.50	0.5457
1	1.50	1.75	2.00	1.12	1.31	1.38	1.81	2.19	2.44	0.145	0.196	0.391	0.58	0.6828
1 1/4	1.75	2.00	2.38	1.31	1.38	1.69	2.19	2.44	2.97	0.153	0.208	0.417	0.67	0.7068
1 1/2	2.00	2.38	3.00	1.38	1.69	1.72	2.44	2.97	3.31	0.158	0.219	0.436	0.70	0.7235
2	2.38	2.50	3.25	1.69	1.72	2.06	2.97	3.31	4.00	0.168	0.281	0.476	0.75	0.7565
2 1/2	3.00	3.25	3.75	2.06	2.06	2.50	3.62	4.00	4.75	0.221	0.301	0.602	0.93	1.138
3	3.38	3.75	4.19	2.50	2.50	3.12	4.31	4.75	5.75	0.236	0.348	0.655	1.02	1.200
4	4.19	4.50	4.50	3.12	3.12	3.12	5.75	6.00	6.00	0.258	0.440	0.735	1.09	1.300

* Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ANSI B2.1)



ANSI B16.9

DIMENSIONAL TOLERANCES ACCORDING TO ANSI B 16.9 STANDARDS



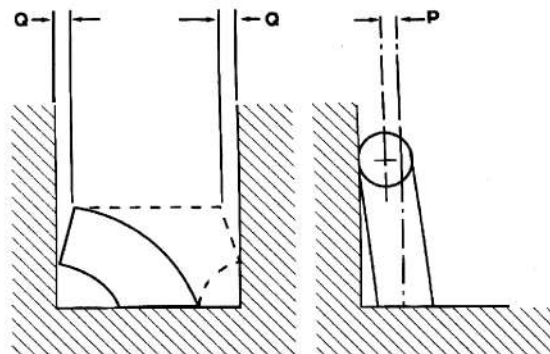
Detail of the bevel for fittings having thickness up to 19.05mm

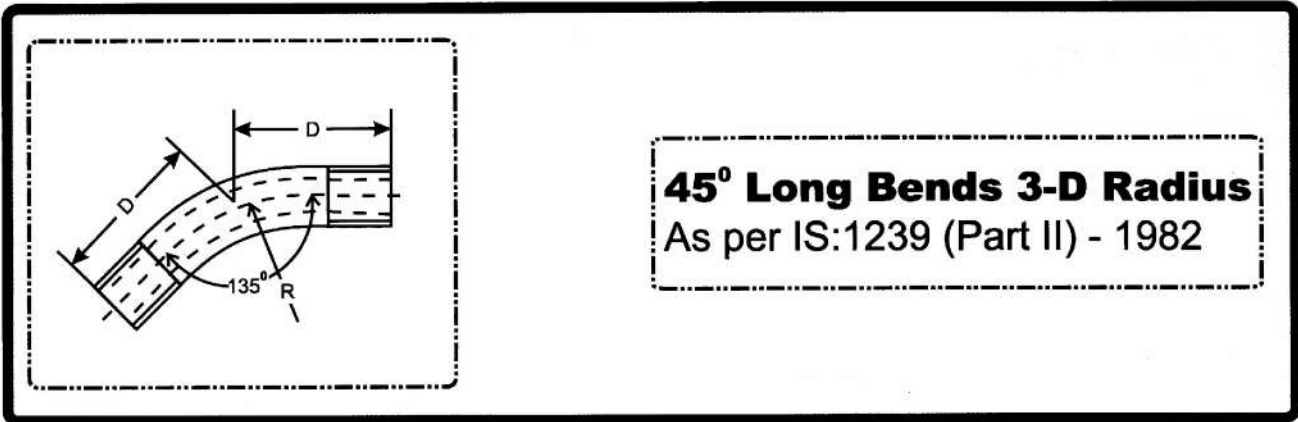
Detail of the bevel for fittings having thickness higher than 19.05mm

For all fittings				45° - 90° elbows / Tees	Reducers		180° Elbows		Caps
Pipe nominal size	Outside dia. at the bevel	Inside diam. at end.	Thickness	Center to end	Length	centre to centre	Height	Alignment of ends	Height
1/2" - 2-1/2"	+1.59 -0.59	±0.79	Not less than 87.5% of the nom. thickness	±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
3" - 3-1/2"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
4"	+1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±3.17
5" - 8"	+2.38 -1.59	±1.59		±1.59	±1.59	±6.35	±6.35	±0.79	±6.35
10" - 18"	+3.97 -3.17	±3.17		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
20" - 24"	+6.35 -4.76	±4.76		±2.38	±2.38	±9.53	±6.35	±1.59	±6.35
26" - 32"	+6.35 -4.76	±4.76		±3.2	±4.76	±9.53	±6.35	±1.59	±9.53
34" - 36"	+6.35 -4.76	±4.76		±4.76	±4.76	±9.53	±6.35	±1.59	±9.53

Angularity Tolerances, ANSI B16.9 (mm)

NOMINAL PIPE SIZE NPS DN	OFF ANGLE Q	OFF PLANE P
1/2-4 15-100	± 1	± 2
5-8 125-200	± 2	± 4
10-12 250-300	± 3	± 5
14-16 350-400	± 3	± 7
18-24 450-600	± 4	± 10
26-30 650-750	± 5	± 10
32-36 800-900	± 5	± 13



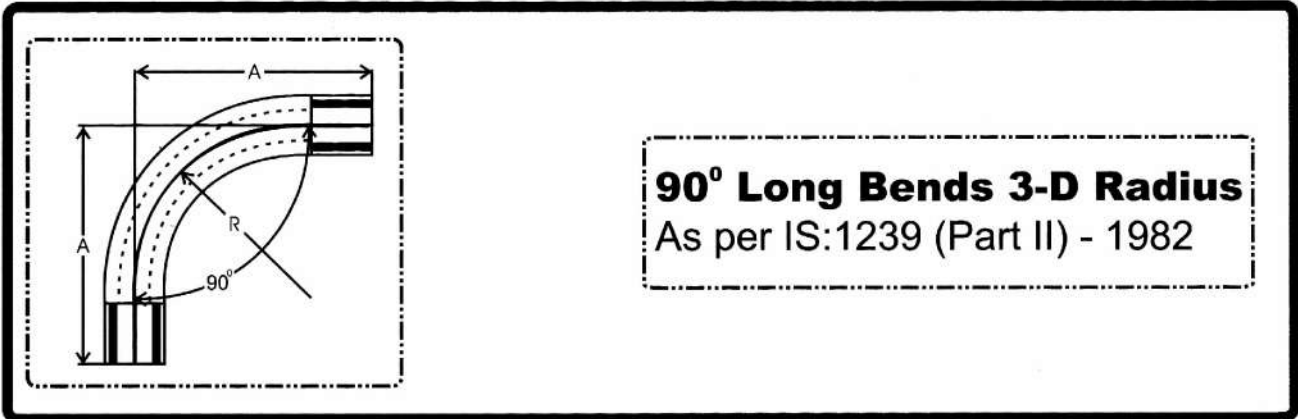


45° Long Bends 3-D Radius
As per IS:1239 (Part II) - 1982

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

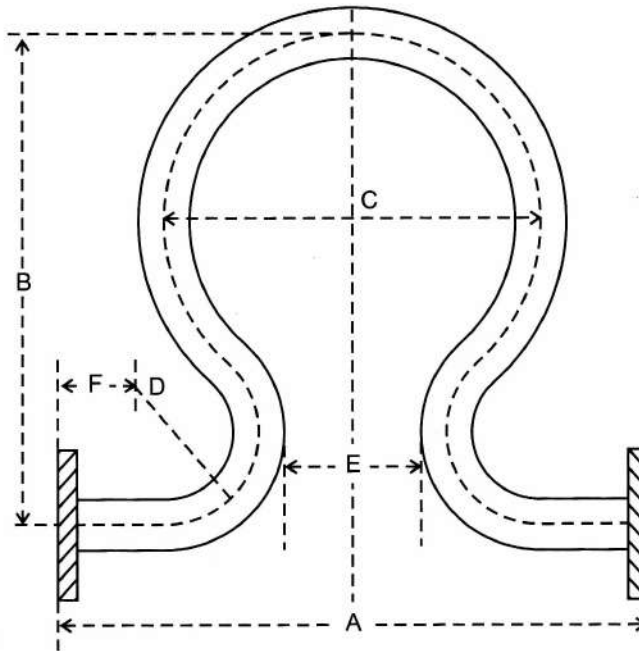
(in mm)

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