

# BUTT WELD FITTINGS TYPES

## 90° ELBOWS

The function of a 90° elbow is to change direction or flow in a piping system. Elbows are split into three groups which define the distance over which they change direction, expressed as a function of the distance from the center line of one end to the opposite face. This is known as the center to face distance and is equivalent to the radius through which the elbow is bent.

### Long Radius Elbow

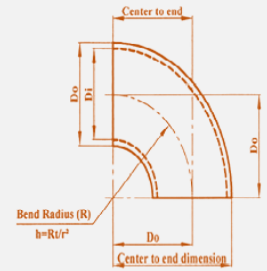
The most common is the long radius (L.R.) elbow where the center to face dimension is always 1 1/2 times the nominal pipe size of the elbow.

### Short Radius Elbow

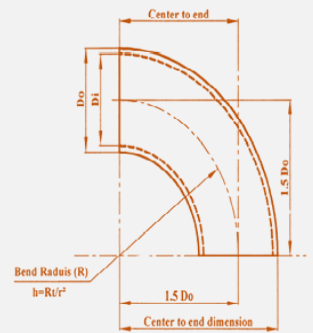
In this case the center to face dimension is the same as the nominal pipe size of the elbow.

### Extra Long Radius Elbow

This is where the center to face dimension is longer than the standard long radius type. The most common of these is where the center to face dimension is three times the nominal size. i.e., 3D.



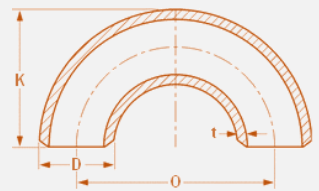
a. Short Radius Elbow



b. Long Radius Elbow

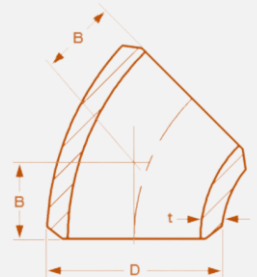
## 180° RETURN BENDS

The function of a 180° return bend is to change direction of flow through 180° and there are two basic types, long radius and short radius. Both types have a center-to-center dimension double the matching 90° elbows. The primary application for these fittings is in heater coils and heat exchangers, boilers etc.



## 45° ELBOWS

The function of a 45° elbow is the same as a 90° elbow, but the measurement of dimensions, however, is 45° different to that of the 90° elbow. The radius of a 45° elbow is the same as the radius of the 90° L.R. elbow where 'R' equals 1.5 D. However, the center to face dimension is not equivalent to the radius as in 90° L.R. elbows. This is measured from each face to the point of intersection of the center lines perpendicular to each other. This is due to the smaller degree of bend.

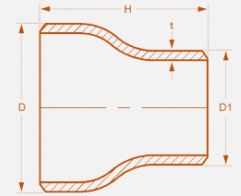


# BUTT WELD FITTINGS TYPES

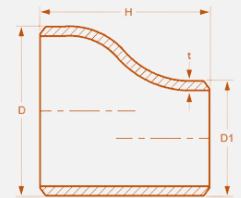
## ECCENTRIC AND CONCENTRIC REDUCERS

The function of both types of reducer is to reduce the line from a larger to a smaller pipe size, this obviously results in an increased flow pressure. With the eccentric reducer the smaller outlet end is off center to the larger end enabling it to line up with one side of the inlet and not with the other.

The concentric reducer is so manufactured that both inlet and outlet ends are on a common center line. The concentric reducer is easier and less expensive to produce but does not allow quite the same versatility as the eccentric reducer. The lengths of both types are fixed by manufacturing standards.



Reducer concentric

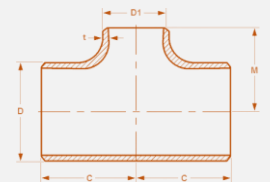
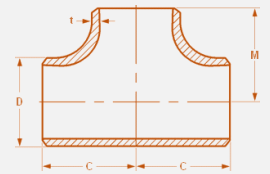


Reducer eccentric

## EQUAL AND REDUCING TEES

The function of a tee is to permit flow at 90° to the main direction of flow. The main flow passes through the 'run' whilst the 90° outlet is known as the 'branch'. The equal tee is manufactured with all three outlets being the same size.

The reducing tee is manufactured with the branch outlet smaller than the run to obtain the desired flow and pressure through the system.

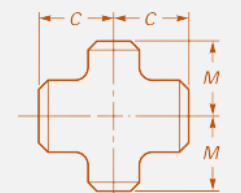
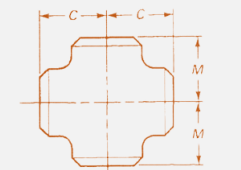


## EQUAL AND REDUCING CROSSES

The function of a cross is similar to that of a tee with the exception of providing two 90° outlets opposite each other.

Equal crosses have all four outlets of equal size.

Reducing crosses have branches that are smaller in size to that of the run to obtain the desired flow and pressure through the system.

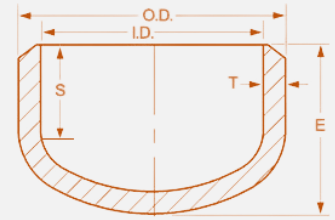


# BUTT WELD FITTINGS TYPES



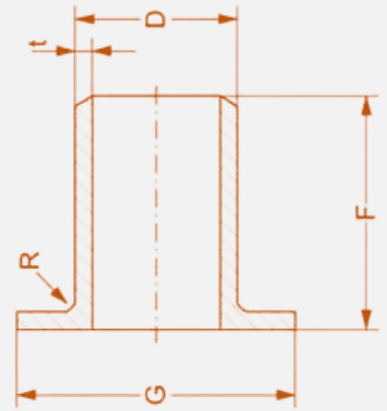
## CAPS

The function of an end cap is to block off the end of a line in piping systems. This is achieved by placing the end cap over the open line and welding around the joint.



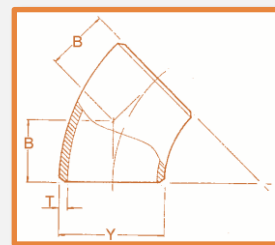
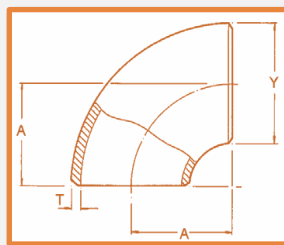
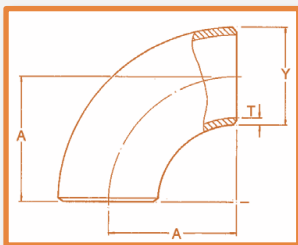
## LAP JOINT STUB ENDS

A lap joint stub end and its associated slip-on flange in a piping system allows quick disconnection of the particular section involved. Stub ends are installed in pairs and mated together with two lap joint flanges. The surface of the stub end has a phonographic serrated gasket surface which prevents leakage at the joint. Using stub ends allows sections of the line to be opened for cleaning, inspection or quick replacement etc., without the need to re-weld. There are two basic types of stub end, ANSI types A & B long barrel, and M.S.S. types short barrel. Under certain design criteria such as temperature or pressure, etc., it is not acceptable to have the joint between stub end and pipe in close proximity with the flange joint, in these applications ANSI types are used.



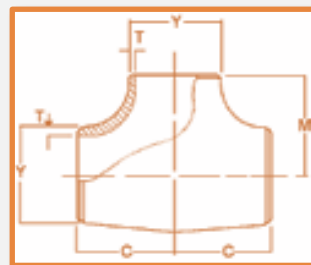
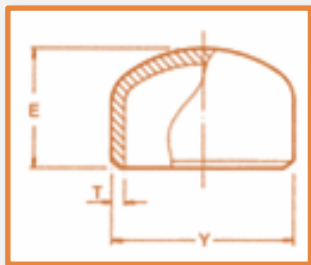
# Butt Weld Fittings to ANSI.B16.9 & BS1640: Long & Short Radius Elbows

Normal Pipe Size		Outside Diameter Y	Wall Thickness T		45 Elbow Long Radius Centre to Face B	Approx Weight	90 Elbow Long Radius Centre to Face A	Approx Weight	90 Elbow Short Radius Centre to Face A	Approx Weight
mm	in	mm	mm	Schedule	mm	kg	mm	kg	mm	kg
15	1/2"	21.3	2.78	STD	15.9	0.04	38.1	0.08	-	-
			3.73	X.S	15.9	0.05	38.1	0.1	-	-
20	3/4"	26.7	2.87	STD	11.1	0.04	28.6	0.08	-	-
			3.91	X.S	11.1	0.05	28.6	0.11	-	-
25	1"	33.4	3.38	STD	22.2	0.09	38.1	0.15	25.4	0.11
			4.55	X.S	22.2	0.11	38.1	0.19	25.4	0.14
32	1 1/4"	42.2	3.56	STD	25.4	0.14	47.6	0.28	31.75	0.18
			4.85	X.S	25.4	0.2	47.6	0.39	31.75	0.24
40	1 1/2"	48.3	3.68	STD	28.6	0.2	57.1	0.4	38.1	0.26
			5.08	X.S	28.6	0.25	57.1	0.5	38.1	0.35
50	2"	60.3	3.91	STD	34.9	0.36	76.2	0.72	50.8	0.5
			5.54	X.S	34.9	0.5	76.2	1	50.8	0.68
65	2 1/2"	73	5.16	STD	44.4	0.73	95.2	1.46	63.5	0.95
			7.01	X.S	44.4	0.91	95.2	1.82	63.5	1.27
80	3"	88.9	5.49	STD	50.8	1.1	114.3	2.18	76.2	1.45
			7.62	X.S	50.8	1.45	114.3	2.86	76.2	1.95
100	4"	114.3	6.02	STD	63.5	2.1	152.4	4.2	101.6	2.8
			8.56	X.S	63.5	2.9	152.4	5.7	101.6	3.9
125	5"	141.3	6.65	STD	79.4	3.4	190	6.8	127	4.8
			9.5	X.S	79.4	5	190	10	127	6.5
150	6"	168.3	7.11	STD	95.2	5.1	229	10.1	152.4	6.8
			10.97	X.S	95.2	7.7	229	15.3	152.4	10.2
200	8"	219.1	8.18	STD	127	10.2	305	20.4	203	13.6
			12.7	X.S	127	15.5	305	30.9	203	20.9
250	10"	273.9	9.27	STD	159	18.1	381	36.1	254	24.1
			12.7	X.S	159	24.4	381	48.8	254	32.5
300	12"	323.9	9.52	STD	190	26.6	457	53.1	305	35.4
			12.7	X.S	190	35	457	70	305	46.7
350	14"	355.6	9.52	STD	222	34.1	533	68.1	356	45.4
			12.7	X.S	222	45	533	90	356	60
400	16"	406.4	9.52	STD	254	45	610	89.3	406	59.5
			12.7	X.S	254	59	610	118	406	78.7
450	18"	457	9.52	STD	286	56.5	686	113	457	75.6
			12.7	X.S	286	75	686	150	457	100
500	20"	508	9.52	STD	318	85	762	140	508	93.5
			12.7	X.S	318	112.5	762	186	508	124
600	24"	610	9.52	STD	381	101.5	914	203	610	135
			12.7	X.S	381	134.5	914	269	610	179



# Butt Weld Fittings to ANSI.B.16.9 & BS1640: EQ Tees & Caps

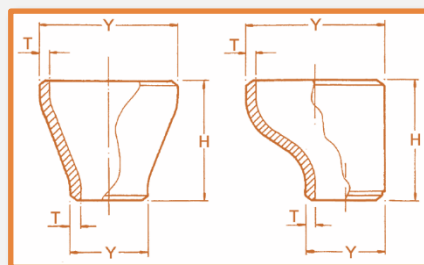
Normal Pipe Size		Outside Diameter Y	Wall Thickness T		Tees (C&M)	Approx Weight	Caps End to E	Approx Weight
mm	in		mm	Schedule				
15	1/2"	21.3	2.78	STD	25.4	0.58		
			3.73	X.S				
20	3/4"	26.7	2.87	STD	28.6	0.21		
			3.91	X.S				
25	1"	33.4	3.38	STD	38.1	0.34	38.1	0.1
			4.55	X.S				
32	1 1/4"	42.2	3.56	STD	47.6	0.64	38.1	0.14
			4.85	X.S				
40	1 1/2"	48.3	3.68	STD	57.1	0.95	38.1	0.18
			5.08	X.S				
50	2"	60.3	3.91	STD	63.5	1.45	38.1	0.27
			5.54	X.S				
65	2 1/2"	73	5.16	STD	76.2	2.45	38.1	0.41
			7.01	X.S				
80	3"	88.9	5.49	STD	85.7	3.45	50.8	0.64
			7.62	X.S				
100	4"	114.3	6.02	STD	105	5.7	63.5	1.13
			8.56	X.S				
125	5"	141.3	6.65	STD	124	9.1	76.2	1.91
			9.5	X.S				
150	6"	168.3	7.11	STD	143	13.6	88.9	2.95
			10.97	X.S				
200	8"	219.1	8.18	STD	178	25	101.6	5
			12.7	X.S				
250	10"	273	9.27	STD	216	41	127	9.1
			12.7	X.S				
300	12"	323.9	9.52	STD	254	57	152.4	13.6
			12.7	X.S				
350	14"	355.6	9.52	STD	279	73	165.1	15.9
			12.7	X.S				
400	16"	406.4	9.52	STD	305	91	178.8	20
			12.7	X.S				
450	18"	457	9.52	STD	343	127	203.2	26
			12.7	X.S				
500	20"	508	9.52	STD	381	227	228.6	33
			12.7	X.S				
600	24"	610	9.52	STD	432	345	266.7	46
			12.7	X.S				



# Butt Weld Fittings to ANSI.B16.9 & BS1640: Concentric & Eccentric Reducers

Normal Pipe Size Y		Length H	Schedule T	Approx Weight
mm	in			Kg
20 x 15	3/4" x 1/2"	38.1	STD	0.07
				X.S
25 x 15	1" x 1/2"	50.8	STD	0.14
				X.S
25 x 20	1" x 3/4"	50.8	STD	0.14
				X.S
32 x 15	1 1/4" x 1/2"	50.8	STD	0.18
				X.S
32 x 20	1 1/4" x 3/4"	50.8	STD	0.18
				X.S
32 x 25	1 1/4" x 1"	50.8	STD	0.18
				X.S
40 x 15	1 1/2" x 1/2"	63.5	STD	0.27
				X.S
40 x 20	1 1/2" x 3/4"	63.5	STD	0.27
				X.S
40 x 25	1 1/2" x 1"	63.5	STD	0.27
				X.S
40 x 32	1 1/2" x 1 1/4"	63.5	STD	0.27
				X.S
50 x 15	2" x 1/2"	76.2	STD	0.41
				X.S
50 x 20	2" x 3/4"	76.2	STD	0.41
				X.S
50 x 25	2" x 1"	76.2	STD	0.41
				X.S
50 x 32	2" x 1 1/4"	76.2	STD	0.41
				X.S
50 x 40	2" x 1 1/2"	76.2	STD	0.41
				X.S
65 x 25	2 1/2" x 1"	88.9	STD	0.68
				X.S
65 x 32	2 1/2" x 1 1/4"	88.9	STD	0.68
				X.S

Normal Pipe Size Y		Length H	Schedule T	Approx Weight
mm	in			Kg
65 x 40	2 1/2" x 1 1/2"	88.9	STD	0.68
				X.S
65 x 50	2 1/2" x 2"	88.9	STD	0.68
				X.S
80 x 40	3" x 1 1/2"	88.9	STD	0.77
				X.S
80 x 50	3" x 2"	88.9	STD	0.91
				X.S
80 x 65	3" x 2 1/2"	88.9	STD	0.91
				X.S
100 x 40	4" x 1 1/2"	101.6	STD	1.36
				X.S
100 x 50	4" x 2"	101.6	STD	1.4
				X.S
100 x 65	4" x 2 1/2"	101.6	STD	1.45
				X.S
100 x 80	4" x 3"	101.6	STD	1.59
				X.S
125 x 80	5" x 3"	127	STD	2.5
				X.S
125 x 100	5" x 4"	127	STD	2.7
				X.S
150 x 50	6" x 2"	140	STD	3.4
				X.S
150 x 65	6" x 2 1/2"	140	STD	3.4
				X.S
150 x 80	6" x 3"	140	STD	3.6
				X.S
150 x 100	6" x 4"	140	STD	3.7
				X.S
150 x 125	6" x 5"	140	STD	3.9
				X.S



# Butt Weld Fittings to ANSI.B16.9 & BS1640: Concentric & Eccentric Reducers

Normal Pipe Size Y		Length H	Schedule T	Approx Weight
mm	in			Kg
200 x 80	8" x 3"	152.4	STD	4.5
			X.S	7.2
200 x 100	8" x 4"	152.4	STD	5
			X.S	7.7
200 x 125	8" x 5"	152.4	STD	5.4
			X.S	8.2
200 x 150	8" x 6"	152.4	STD	5.9
			X.S	8.6
250 x 100	10" x 4"	178	STD	9.1
			X.S	11.8
250 x 125	10" x 5"	178	STD	9.5
			X.S	13.6
250 x 150	10" x 6"	178	STD	9.5
			X.S	13.6
250 x 200	10" x 8"	178	STD	10
			X.S	14
300 x 150	12" x 6"	203	STD	14.1
			X.S	18.1
300 x 200	12" x 8"	203	STD	14.5
			X.S	19.1
300 x 250	12" x 10"	203	STD	15.4
			X.S	20
350 x 200	14" x 8"	330	STD	26.3
			X.S	34.9
350 x 250	14" x 10"	330	STD	27.2
			X.S	36.3
350 x 300	14" x 12"	330	STD	28.6
			X.S	37.6
400 x 200	16" x 8"	356	STD	31.8
			X.S	42.6
400 x 250	16" x 10"	356	STD	33.1
			X.S	43.5
400 x 300	16" x 12"	356	STD	34.5
			X.S	45.4

Normal Pipe Size Y		Length H	Schedule T	Approx Weight
mm	in			Kg
400 x 350	16" x 14"	356	STD	35.4
			X.S	46.3
450 x 250	18" x 10"	381	STD	38
			X.S	52.1
450 x 300	18" x 12"	381	STD	39
			X.S	53.5
450 x 350	18" x 14"	381	STD	40
			X.S	54.9
450 x 400	18" x 16"	381	STD	40.8
			X.S	53.5
500 x 250	20" x 10"	508	STD	53
			X.S	79.9
500 x 300	20" x 12"	508	STD	54.4
			X.S	82
500 x 350	20" x 14"	508	STD	57.6
			X.S	80.2
500 x 400	20" x 16"	508	STD	58.9
			X.S	82
500 x 450	20" x 18"	508	STD	61.7
			X.S	82
600 x 300	24" x 12"	508	STD	63.5
			X.S	84.4
600 x 350	24" x 14"	508	STD	65.3
			X.S	86.8
600 x 400	24" x 16"	508	STD	68
			X.S	90.4
600 x 450	24" x 18"	508	STD	72.6
			X.S	96.5
600 x 500	24" x 20"	508	STD	77.1
			X.S	102.5

