

BUTT-WELD FITTINGS



45° ELBOW



90° ELBOW



180° RETURN



CAP



ECC REDUCER



REDUCING TEE



EQUAL TEE



CONC. REDUCER

Used to allow flow of fluids, like steam, water, air, oil, etc. through the desired cross-section with diversion of flow to the desired points.



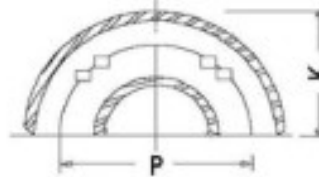
SEAMLESS BUTT-WELDING FITTINGS ■ ANSI B 16.9 - 1986



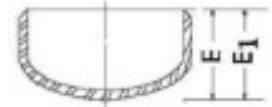
90° L. R. ELBOW



45° L. R. ELBOW



180° L. R. RETURN



CAP

ALL DIMENSIONS IN MM.

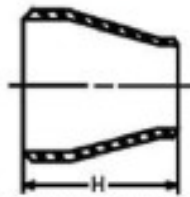
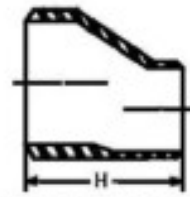
Nominal Pipe Size	90° L.R. Elbow	45° Long Radius Elbow		180° L.R. Return		Cap Length	Cap Length
	CENTRE TO FACE	Centre to Face	Centre Line Radius	Centre to Centre	Back to Face		
	A	B		P	K	E	E ₁
15	38	16	38	76	48	25	25
*20	29	11	29	57	43	25	25
25	38	22	38	76	56	38	38
32	48	25	48	95	70	38	38
40	57	29	57	114	83	38	38
50	76	35	76	152	106	38	44
65	95	44	95	191	132	38	51
80	114	51	114	229	159	51	64
90	133	57	133	267	184	64	76
100	152	64	152	305	210	64	76
125	190	79	190	381	262	76	89
150	229	95	229	457	313	89	102
200	305	127	305	610	414	102	127
250	381	159	381	762	518	127	152
300	457	190	457	914	619	152	178
350	533	222	533	1067	711	165	191
400	610	254	610	1219	813	178	203
450	686	286	686	1372	914	203	229
500	762	318	762	1524	1016	229	254
550	838	343	838	1676	1118	254	254
600	914	381	914	1829	1219	267	305

NOTES : 1. E-Length of Caps applicable to wall thickness of Schedule 40 and Schedule Extra Strong.

2. E₁ - Length of Caps applicable to all other schedule/ wall thickness higher than Schedule 40 and Schedule Extra Strong

3. *Dimensions A & B for Nominal Pipe Size 20 may be 38 & 19 respectively at the option of Manufacturer.

4. Thickness & outside diameter of above fittings shall correspond to those of appropriate nominal pipe size.

**SEAMLESS BUTT-WELDING FITTINGS ■ ANSI B 16.9 - 1986****CONCENTRIC REDUCERS****ECCENTRIC REDUCERS**

Nominal Pipe Size	Length H	Nominal Pipe Size	Length H	Nominal Pipe Size	Length H	Nominal Pipe Size	Length H
20 X 10	38	90 X 32	102	200 X 100	152	500 X 300	508
20 X 15	38	90 X 40	102	200 X 125	152	500 X 350	508
25 X 10 *	51	90 X 50	102	200 X 150	152	500 X 400	508
25 X 15	51	90 X 65	102	250 X 80 *	178	500 X 450	508
25 X 20	51	90 X 80	102	250 X 100	178	550 X 350	508
32 X 15	51	100 X 25 *	102	250 X 125	178	550 X 400	508
32 X 20	51	100 X 32 *	102	250 X 150	178	550 X 450	508
32 X 25	51	100 X 40	102	250 X 200	178	550 X 500	508
40 X 15	64	100 X 50	102	300 X 100 *	203	600 X 400	508
40 X 20	64	100 X 65	102	300 X 125	203	600 X 450	508
40 X 25	64	100 X 80	102	300 X 150	203	600 X 500	508
40 X 32	64	100 X 90	102	300 X 200	203		
50 X 20	76	125 X 50	127	300 X 250	203		
50 X 25	76	125 X 65	127	350 X 150	330		
50 X 32	76	125 X 80	127	350 X 200	330		
50 X 40	76	125 X 90	127	350 X 250	330		
65 X 25	89	125 X 100	127	350 X 300	330		
65 X 32	89	150 X 50 *	140	400 X 200	356		
65 X 40	89	150 X 65	140	400 X 250	356		
65 X 50	89	150 X 80	140	400 X 300	356		
80 X 25 *	89	150 X 90	140	400 X 350	356		
80 X 32	89	150 X 100	140	450 X 250	381		
80 X 40	89	150 X 125	140	450 X 300	381		
80 X 50	89	200 X 80 *	152	450 X 350	381		
80 X 65	89	200 X 90	152	450 X 400	381		

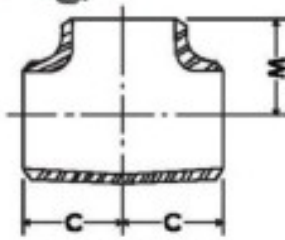
NOTES : ALL DIMENSIONS IN MM.

* Not covered by the specification.

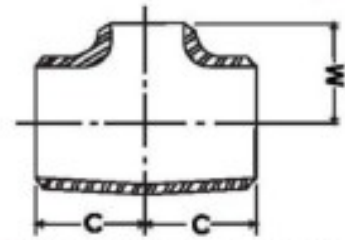
Thickness & outside diameter of reducers shall correspond to those of appropriate nominal pipe size.



SEAMLESS BUTT-WELDING FITTINGS ■ ANSI B 16.9 - 1986



EQUAL TEE



REDUCING OUTLET TEE

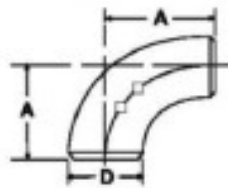
EQUAL TEE			REDUCING OUTLET TEE								
Nominal Pipe Size	Centre to End C	Centre to End M	Nominal Pipe Size	Centre to End C	Centre to End M	Nominal Pipe Size	Centre to End C	Centre to End M	Nominal Pipe Size	Centre to End C	Centre to End M
15	25	25	15 X 15 X 8	25	25	100 X 100 X 40	105	86	350 X 350 X 150	279	238
20	29	29	15 X 15 X 10	25	25	100 X 100 X 50	105	89	350 X 350 X 200	279	248
25	38	38	20 X 20 X 10	29	29	100 X 100 X 65	105	95	350 X 350 X 250	279	257
32	48	48	20 X 20 X 15	29	29	100 X 100 X 80	105	98	350 X 350 X 300	279	270
40	57	57	25 X 25 X 10*	38	38	100 X 100 X 90	105	102	400 X 400 X 150	305	264
50	64	64	25 X 25 X 15	38	38	125 X 125 X 50	124	105	400 X 400 X 200	305	273
65	76	76	25 X 25 X 20	38	38	125 X 125 X 65	124	108	400 X 400 X 250	305	283
80	86	86	32 X 32 X 15	48	48	125 X 125 X 80	124	111	400 X 400 X 300	305	295
90	95	95	32 X 32 X 20	48	48	125 X 125 X 90	124	114	400 X 400 X 350	305	305
100	105	105	32 X 32 X 25	48	48	125 X 125 X 100	124	117	450 X 450 X 200	343	298
125	124	124	40 X 40 X 15	57	57	150 X 150 X 50*	143	121	450 X 450 X 250	343	308
150	143	143	40 X 40 X 20	57	57	150 X 150 X 65	143	121	450 X 450 X 300	343	321
200	178	178	40 X 40 X 25	57	57	150 X 150 X 80	143	124	450 X 450 X 350	343	330
250	216	216	40 X 40 X 32	57	57	150 X 150 X 90	143	127	450 X 450 X 400	343	330
300	254	254	50 X 50 X 20	64	44	150 X 150 X 100	143	130	500 X 500 X 200	381	324
350	279	279	50 X 50 X 25	64	51	150 X 150 X 125	143	137	500 X 500 X 250	381	333
400	305	305	50 X 50 X 32	64	57	200 X 200 X 80*	178	152	500 X 500 X 300	381	346
450	343	343	50 X 50 X 40	64	60	200 X 200 X 90	178	152	500 X 500 X 350	381	356
500	381	381	65 X 65 X 25	76	57	200 X 200 X 100	178	156	500 X 500 X 400	381	356
550	419	419	65 X 65 X 32	76	64	200 X 200 X 125	178	162	500 X 500 X 450	381	368
600	432	432	65 X 65 X 40	76	67	200 X 200 X 150	178	168	600 X 600 X 250	432	384
			65 X 65 X 50	76	70	250 X 250 X 80*	216	184	600 X 600 X 300	432	397
			80 X 80 X 25*	86	67	250 X 250 X 90*	216	184	600 X 600 X 350	432	406
			80 X 80 X 32	86	70	250 X 250 X 100	216	184	600 X 600 X 400	432	406
			80 X 80 X 40	86	73	250 X 250 X 125	216	191	600 X 600 X 450	432	419
			80 X 80 X 50	86	76	250 X 250 X 150	216	194	600 X 600 X 500	432	432
			80 X 80 X 65	86	83	250 X 250 X 200	216	203			
			90 X 90 X 40	95	79	300 X 300 X 100*	254	216			
			90 X 90 X 50	95	83	300 X 300 X 125	254	216			
			90 X 90 X 65	95	89	300 X 300 X 150	254	219			
			90 X 90 X 80	95	92	300 X 300 X 200	254	229			
						300 X 300 X 250	254	241			

NOTES : * Not covered by specification.

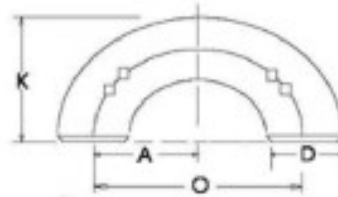
Thickness & outside diameter of tees shall correspond to those of appropriate nominal pipe size.



SEAMLESS BUTT-WELDING FITTINGS ■ ANSI B 16.28



90° SHORT RADIUS ELBOW



180° SHORT RADIUS RETURN

Nominal Pipe Size	Outside Diameter at Bevel D	Centre to End A	Centre to Centre O	Back to Face K
25	33	25	51	41
32	42	32	64	52
40	48	38	76	62
50	60	51	102	81
65	73	64	127	100
80	89	76	152	121
90	102	89	178	140
100	114	102	203	159
125	141	127	254	197
150	168	152	305	236
200	219	203	406	313
250	273	254	508	391
300	324	305	610	467
350	356	356	711	533
400	406	406	813	610
450	457	457	914	686
500	508	508	1016	762
550	559	559	1118	838
600	610	610	1219	914

NOTES : All dimensions in mm.

Thickness & outside diameter of above fittings shall correspond to those of appropriate nominal pipe size.



DIMENSIONAL TOLERANCES FOR SEAMLESS BUTT WELDING FITTINGS

■ ANSI B 16.9 & B 16.28

Nominal Pipe Size	All Fittings			45° & 90° Elbows & Tees	Caps	Reducers	180° Returns			All Fittings	
	Outside Dia. at Bevel	Inside Dia. at End	Wall Thickness	Center to End Dimensions	Overall Length	End to End	Centre to Centre Dimension	Back to Face Dimension	Align. of Ends	ANGULARITY	
										Vertical Face	Longitudinal Axis
15 to 65	± 1	± 0.8	Not less than 87.5% of nominal thickness	± 2	± 4	± 2	± 7	± 7	± 1	± 1	± 2
80 to 90	± 1	± 1.6		± 2	± 4	± 2	± 7	± 7	± 1	± 1	± 2
100	+ 2	± 1.6		± 2	± 4	± 2	± 7	± 7	± 1	± 1	± 2
	- 1			± 2	± 7	± 2	± 7	± 7	± 1	± 2	± 4
125 to 150	+ 3	± 1.6		± 2	± 7	± 2	± 7	± 7	± 1	± 2	± 4
	- 1			± 2	± 7	± 2	± 7	± 7	± 1	± 2	± 4
200	± 2	± 1.6		± 2	± 7	± 2	± 7	± 7	± 1	± 2	± 4
250	+ 4	± 3.2		± 2	± 7	± 2	± 10	± 7	± 2	± 3	± 5
	- 3			± 3	± 7	± 3	± 10	± 7	± 2	± 3	± 5
300	+ 4	± 3.2		± 3	± 7	± 3	± 10	± 7	± 2	± 3	± 5
	- 3		± 3	± 7	± 3	± 10	± 7	± 2	± 3	± 7	
350 to 400	+ 4	± 3.2	± 3	± 7	± 3	± 10	± 7	± 2	± 3	± 7	
	- 3		± 3	± 7	± 3	± 10	± 7	± 2	± 4	± 10	
450	+ 4	± 3.2	± 3	± 7	± 3	± 10	± 7	± 2	± 4	± 10	
	- 3		± 3	± 7	± 3	± 10	± 7	± 2	± 4	± 10	
500 to 600	+ 6	± 4.8	± 3	± 7	± 3	± 10	± 7	± 2	± 4	± 10	
	- 5		± 3	± 7	± 3	± 10	± 7	± 2	± 4	± 10	

NOTE : 1. Dimensions are in Millimeter.

2. Out - of - round is the sum of absolute values of Plus & Minus Tolerances.



DIMENSIONS AND WEIGHT OF M.S. TUBES ■ IS-1239 (PART 1) - 1979

N.B. and Series	Mean Outside Diameter	Wall Thickness		Nominal Weight Black Tubes				Calculated Nominal Weight Galvanised Tubes				No. of 6.1mtr. Long pieces (GI Srewed & Socketed) per Ton.	Sockets	
				Plain End		Screwed & Socketed		Plain End		Screwed & Socketed			Minimum OD	Minimum Length
mm	mm	mm	SWG	Kg/mtr.	Mtr./Ton.	Kg/mtr.	Mtr./Ton.	Kg/mtr.	Mtr./Ton.	Kg/mtr.	Mtr./Ton.	Nos.	mm	mm
15L	21.20	2.00	14	0.952	1050	0.961	1041	1.015	985	1.025	976	160		
M	21.40	2.65	12	1.220	820	1.230	813	1.28	781	1.29	775	127	27.00	37.00
H	21.40	3.25	10	1.450	690	1.460	685	1.51	662	1.52	658	108		
20L	26.65	2.35	13	1.41	709	1.42	704	1.49	671	1.50	667	109		
M	26.90	2.65	12	1.58	633	1.59	629	1.66	602	1.67	599	98	32.50	39.00
H	26.90	3.25	10	1.90	526	1.91	524	1.98	505	1.99	503	82		
25L	33.50	2.65	12	2.01	498	2.03	493	2.11	474	2.13	469	77		
M	33.75	3.25	10	2.44	410	2.46	407	2.54	394	2.56	391	64	39.50	46.00
H	33.75	4.05	8	2.97	337	2.99	334	3.07	326	3.09	324	53		
32L	42.20	2.65	12	2.58	388	2.61	383	2.70	370	2.73	366	60		
M	42.45	3.25	10	3.14	318	3.17	315	3.26	307	3.29	304	50	49.00	51.00
H	42.45	4.05	8	3.84	260	3.87	258	3.95	253	3.98	251	41		
40L	48.10	2.90	11	3.25	308	3.29	304	3.38	296	3.42	292	48		
M	48.35	3.25	10	3.81	277	3.85	274	3.74	267	3.78	265	43	56.00	51.00
H	48.35	4.05	8	4.43	226	4.47	224	4.56	219	4.60	217	36		
50L	59.90	2.90	11	4.11	243	4.18	239	4.28	234	4.35	230	38		
M	60.25	3.65	9	5.10	196	5.17	193	5.27	190	5.64	177	29	68.00	60.00
H	60.25	4.50	7	6.17	162	6.24	160	6.34	158	6.41	156	26		
65L	75.60	3.25	10	5.80	172	5.92	169	6.02	166	6.14	163	27		
M	75.95	3.65	9	6.51	154	6.63	151	6.73	149	6.85	146	24	84.00	69.00
H	75.95	4.50	7	7.90	127	8.02	125	8.11	123	8.23	122	20		
80L	88.30	3.25	10	6.81	147	6.98	143	7.06	142	7.26	138	23		
M	88.75	4.05	8	8.47	118	8.64	116	8.72	115	8.89	112	18	98.00	75.00
H	88.75	4.85	6	10.10	99	10.30	97	10.35	97	10.55	95	16		
100L	113.45	3.65	9	9.89	101	10.20	98	10.22	98	10.53	95	16		
M	114.05	4.50	7	12.10	83	12.40	81	12.43	80	12.73	79	13	124.00	87.00
H	114.05	5.40	5	14.40	69	14.70	68	14.73	68	15.03	67	11		
125M	139.65	4.85	6	16.20	62	16.70	60	16.60	60	17.10	58	10	151.00	96.00
H	139.65	5.40	5	17.80	56	18.30	55	18.20	55	18.70	53	9		
150M	165.20	4.85	6	19.20	52	19.80	51	19.68	51	20.28	49	8	178.00	96.00
H	165.20	5.40	5	21.20	47	21.80	46	21.68	46	22.28	45	7		

TOLERANCES

A. Thickness

1. Light Tubes : + not limited
 : - 8%
2. Medium and Heavy Tubes : +not limited
 : -10%

B. Weight

1. Single Tube : +10%
(Light Series) - 8%
2. Single Tube : ±10%
(Medium and Heavy Series)

C. Length : 4 to 7 metres,

unless otherwise specified.



DIMENSIONS & WEIGHTS OF SEAMLESS AND WELDED STEEL PIPES ■ ANSI B36.1

Nominal Pipe Size	Sch. 10		Sch. 20		Sch. 30		Std. Wall		Sch. 40		Sch. 60		Extra Strong		Sch. 80		Sch. 100		Sch. 120		Sch. 140		Sch. 160		XX Strong				
	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	Thick	Wt.	
3							1.73	0.36	1.73	0.36			2.41	0.47	2.41	0.47													
6							2.24	0.63	2.24	0.63			3.02	0.8	3.02	0.8													
10							2.31	0.85	2.31	0.85			3.20	1.1	3.20	1.1													
15							2.77	1.27	2.77	1.27			3.73	1.62	3.73	1.62									4.78	1.94	7.47	2.55	
20							2.87	1.69	2.87	1.69			3.91	2.19	3.91	2.19									5.56	2.9	7.82	3.63	
25							3.38	2.5	3.38	2.5			4.55	3.23	4.55	3.23									6.35	4.18	9.09	5.45	
32							3.56	3.38	3.56	3.38			4.85	4.46	4.85	4.46									6.35	5.58	9.7	7.76	
40							3.68	4.05	3.68	4.05			5.08	5.41	5.08	5.41									7.14	7.22	10.16	9.55	
50							3.91	5.44	3.91	5.44			5.54	7.49	5.54	7.49									8.74	11.1	11.07	13.45	
65							5.16	8.63	5.16	8.63			7.01	11.42	7.01	11.42									9.52	14.88	14.02	20.41	
80							5.49	11.3	5.49	11.29			7.62	15.27	7.62	15.27									11.13	21	15.24	27.67	
90							5.74	13.6	5.74	13.57			8.07	18.63	8.07	18.63													
100							6.0	16.1	6.02	16.07			8.56	22.31	8.56	22.31					11.13	28.25			13.49	33.5	17.12	41.00	
125							6.55	21.8	6.55	21.8			9.52	30.95	9.52	30.95					12.7	40.24			15.88	49.11	19.05	57.42	
150							7.11	28.3	7.11	28.26			10.97	42.56	10.97	42.56					14.27	54.2			18.26	67.22	21.95	79.18	
200							8.35	33.3	8.35	33.3			12.7	53.00	12.7	53.00					18.26	90.32	20.82	101	23.01	111.3	22.22	107.9	
250							9.27	41.7	9.27	41.7			14.27	60.3	14.27	60.3					21.44	132.7	25.4	154.9	28.58	172.1	25.4	154.9	
300							9.53	49.7	9.53	49.7			15.09	73.8	15.09	73.8					25.4	186.8	28.58	208.1	33.34	238.8	25.4	186.8	
350							9.53	54.6	9.53	54.6			16.64	81.3	16.64	81.3					27.79	224.4	31.75	253.1	35.71	281.38			
400							9.53	62.6	9.53	62.6			18.26	93.2	18.26	93.2					30.96	286.4	36.52	333.2	40.49	365.3			
450							9.53	70.5	9.53	70.5			19.05	105.1	19.05	105.1					34.92	363.2	39.69	408	45.24	459.2			
500							9.53	78.5	9.53	78.5			20.82	117.1	20.82	117.1					38.1	441	44.45	508.0	50.01	564.1			
600							9.53	94.4	9.53	94.4			24.61	140.9	24.61	140.9					46.02	639.2	52.39	719	59.54	808.20			

NOMINAL PIPE SIZE, OUTSIDE DIAMETER & THICKNESS ARE IN MM. AND WEIGHT IN KG./METRE