

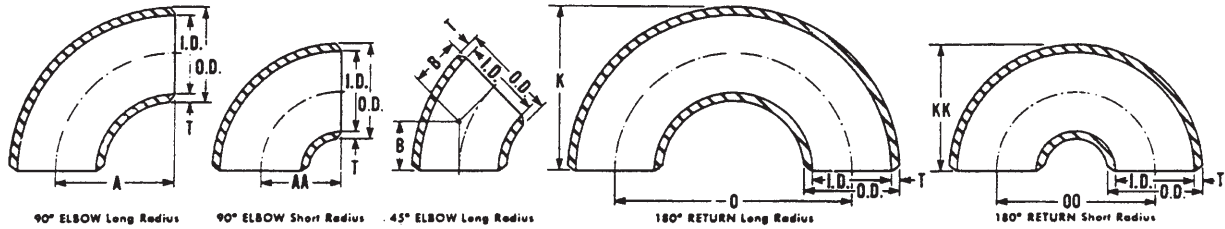
Stainless Steel I.P.S. Butt Welding Fittings

ALSO AVAILABLE IN ALUMINUM, & NICKEL ALLOYS

MSS SP-43 ASA B16.9**

Schedules 5S, 10S, 40S and 80S

(other thicknesses on request)



NOMINAL PIPE SIZE	OUTSIDE DIAMETER O.D.	SCHEDULE 5S		SCHEDULE 10S		SCHEDULE 40S		SCHEDULE 80S		90° ELBOW		45° ELBOW
		WALL THICKNESS T	INSIDE DIAMETER I.D.	WALL THICKNESS T	INSIDE DIAMETER I.D.	WALL THICKNESS T	INSIDE DIAMETER I.D.	WALL THICKNESS T	INSIDE DIAMETER I.D.	LONG RADIUS A	SHORT RADIUS* AA	LONG RADIUS B
1/2	0.840	.065	.710	.083	.674	.109	.622	.147	.546	1 1/2	...	3/8
3/4	1.050	.065	.920	.083	.884	.113	.824	.154	.742	1 1/8	...	7/16
1	1.315	.065	1.185	.109	1.097	.133	1.049	.179	.957	1 1/2	1	3/8
1 1/4	1.660	.065	1.530	.109	1.442	.140	1.380	.191	1.278	1 7/8	1 1/4	1
1 1/2	1.900	.065	1.770	.109	1.682	.145	1.610	.200	1.500	2 1/4	1 1/2	1 1/8
2	2.375	.065	2.245	.109	2.157	.154	2.067	.218	1.939	3	2	1 3/8
2 1/2	2.875	.083	2.709	.120	2.635	.203	2.469	.276	2.323	3 3/4	2 1/2	1 3/4
3	3.500	.083	3.334	.120	3.260	.216	3.068	.300	2.900	4 1/2	3	2
3 1/2	4.000	.083	3.834	.120	3.760	.226	3.548	.318	3.364	5 1/4	3 1/2	2 1/4
4	4.500	.083	4.334	.120	4.260	.237	4.026	.337	3.826	6	4	2 1/2
5	5.563	.109	5.345	.134	5.295	.258	5.047	.375	4.813	7 1/2	5	3 1/8
6	6.625	.109	6.407	.134	6.357	.280	6.065	.432	5.761	9	6	3 3/4
8	8.625	.109	8.407	.148	8.329	.322	7.981	.500	7.625	12	8	5
10	10.750	.134	10.482	.165	10.420	.365	10.020	.500	9.750	15	10	6 1/4
12	12.750	.156	12.438	.180	12.390	.375	12.000	.500	11.750	18	12	7 1/2
14	14.000	.156	13.688	.188	13.624	.375+	13.250	.500+	13.000	21	14	8 3/4
16	16.000	.165	15.670	.188	15.624	.375+	15.250	.500+	15.000	24	16	10
18	18.000	.165	17.670	.188	17.624	.375+	17.250	.500+	17.000	27	18	11 1/4
20	20.000	.188	19.624	.218	19.564	.375+	19.250	.500+	19.000	30	20	12 1/2
24	24.000	.218	23.564	.250	23.500	.375+	23.250	.500+	23.000	36	24	15
30	30.000	.250	29.500	.312	29.376	.375+	29.250	.500+	29.000	45	30	18 1/2
36	36.000	TO BE SPECIFIED				.375+	35.250	.500+	35.000	54	36	22 1/4

**Dimensions are in accordance with MSS SP-43 and where applicable to A.S.A. B16.9. Short Radius Elbows are not included in either of these standards.

*Not available in Schedules 5S and 10S in sizes through 4". Sizes 14" through 36" are not covered by A.S.A. B36.19-1957.

Wall thicknesses shown represent nominal or average wall dimensions as established in A.S.A. B36-19-1957. Wall thicknesses are

subject to a minus 12 1/2% mill tolerance. Wall thickness for Schedules 5S and 10S in sizes 12" through 30" are tentative and subject to change.

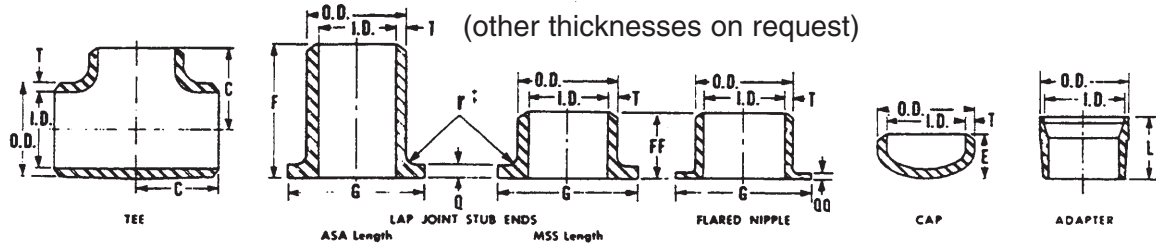
+ These wall thicknesses correspond respectively to Standard Weight and Extra Strong.

OTHER SCHEDULES AND WALL THICKNESSES ARE AVAILABLE.

Stainless Steel I.P.S. Butt Welding Fittings (cont'd)

ALSO AVAILABLE IN ALUMINUM, & NICKEL ALLOYS

MSS SP-43** ASA B16.9 Schedules 5S, 10S, 40S and 80S



NOMINAL PIPE SIZE	180° RETURN				TEE C	LAP JOINT STUB ENDS ASA LENGTH AND MSS LENGTH						FLARED NIPPLE† QO	CAP E	ADAPTER‡ L
	LONG RADIUS		SHORT RADIUS*			F	FF	G*		F‡				
	K	O	KK	OO				SCH. 5S	SCH. 10S		G				F‡
1/2	1 1/16	3	...	...	1	3	2	.084	.095	1 3/8	1/8	1	...
3/4	1 1/16	2 1/4	...	...	1 1/8	3	2	.086	.097	1 11/16	1/8	1	1 1/8
1	2 3/16	3	1 5/8	2	1 1/2	4	2	.093	.120	2	1/8	1 1/2	1 3/4	
1 1/4	2 3/4	3 3/4	2 1/16	2 1/2	1 7/8	4	2	.095	.124	2 1/2	3/16	1 1/2	1 3/4	
1 1/2	3 1/4	4 1/2	2 7/16	3	2 1/4	4	2	.097	.126	2 7/8	1/4	1 1/2	1 3/4	
2	4 3/16	6	3 3/16	4	2 1/2	6	2 1/2	.100	.130	3 3/8	5/16	1 1/2	1 13/16	
2 1/2	5 3/16	7 1/2	3 15/16	5	3	6	2 1/2	.130	.156	4 1/8	5/16	1 1/2	2 5/16	
3	6 1/4	9	4 3/4	6	3 3/8	6	2 1/2	.134	.161	5	3/8	2	2 1/2	
3 1/2	7 1/4	10 1/2	5 1/2	7	3 3/4	6	3	.137	.165	5 1/2	3/8	2 1/2	2 9/16	
4	8 1/4	12	6 1/4	8	4 1/8	6	3	.140	.169	6 3/16	7/16	2 1/2	2 9/16	
5	10 5/16	15	7 3/4	10	4 7/8	8	3	.168	.186	7 5/16	7/16	3	...	
6	12 3/16	18	9 5/16	12	5 5/8	8	3 1/2	.175	.194	8 1/2	1/2	3 1/2	...	
8	16 3/16	24	12 3/16	16	7	8	4	.187	.218	10 5/8	1/2	4	...	
10	20 3/8	30	15 3/8	20	8 1/2	10	5	.221	.245	12 3/4	1/2	5	...	
12	24 3/8	36	18 3/8	24	10	10	6	.249	.260	15	1/2	6	...	
14	28	42	21	28	11	12	7	.375	.375	16 1/4	1/2	6 1/2	...	
16	32	48	24	32	12	12	8	.375	.375	18 1/2	1/2	7	...	
18	36	54	27	36	13 1/2	12	9	.375	.375	21	1/2	8	...	
20	40	60	30	40	15	12	10	.375	.375	23	1/2	9	...	
24	48	72	36	48	17	12	12	.375	.375	27 1/4	1/2	10 1/2	...	
30	60	90	45	60	...	...	...	...	...	...	...	...	...
36	72	108	54	72	...	...	...	...	...	...	...	...	...

For O.D., I.D. and wall thickness T, see facing page.

**Dimensions are in accordance with MSS SP.43 and where applicable to A.S.A. B16.9.

*Not available in Schedules 5S and 10S in sizes through 4".

LAP JOINT STUB ENDS—MSS length available in Schedules 5S, 10S and 40S. A.S.A. length in Schedules 40S and 80S.

*Lap thickness Q for Schedule 40S and 80S in sizes through 12" is equal to wall thickness T. In sizes 14" and larger, the lap thickness for Schedules 40S and 80S is .375" and .500" respectively.

‡ Type B, Lap Joint Stub End (fillet radius "r" decreased to accommodate Slip-On Flange) available in Schedules 5S, 10S and 40S. A.S.A. and MSS length Lap Joint Stub Ends are furnished with a

modified serrated face. Face of Flared Nipple is not serrated.

FLARED NIPPLES are available in Schedules 5S and 10S.

† Flared nipple has same FF and G dimensions as MSS length Lap Joint Stub End.

Caps have semi-ellipsoidal shape with minor axis at least one half of major axis.

+ WELDING ADAPTER (from Schedule 5S or 10S to NPT thread) available in Type 316 only. For Schedule 40S and 80S, use Standard Weight or Extra Strong Short Nipple threaded one end only.

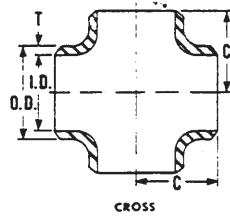
OTHER SCHEDULES AND WALL THICKNESSES ARE AVAILABLE.

Stainless Steel I.P.S. Butt Welding Fittings (cont'd)

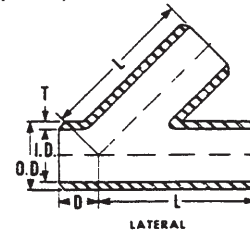
ALSO AVAILABLE IN ALUMINUM, & NICKEL ALLOYS

Schedules 5S, 10S, 40S and 80S

(other thicknesses on request)



CROSS



LATERAL

NOMINAL PIPE SIZE	OUTSIDE DIAMETER	SCHEDULE 5S		SCHEDULE 10S		SCHEDULE 40S		SCHEDULE 80S		CROSS C	Lateral			
		WALL THICKNESS	INSIDE DIAMETER	WALL THICKNESS	INSIDE DIAMETER	WALL THICKNESS	INSIDE DIAMETER	WALL THICKNESS	INSIDE DIAMETER		SCHEDULES 5S, 10S, 40S		SCHEDULE 80S	
		T	I.D.	T	I.D.	T	I.D.	T	I.D.		D	L	D	L
3/4	1.050	.065	.920	.083	.884	.113	.824	.154	.742	1 1/8	1	5	...	...
1	1.315	.065	1.185	.109	1.097	.133	1.049	.179	.957	1 1/2	1 3/4	5 3/4	2	6 1/2
1 1/4	1.660	.065	1.530	.109	1.442	.140	1.380	.191	1.278	1 7/8	1 3/4	6 1/4	2 1/4	7 1/4
1 1/2	1.900	.065	1.770	.109	1.682	.145	1.610	.200	1.500	2 1/4	2	7	2 1/2	8 1/2
2	2.375	.065	2.245	.109	2.157	.154	2.067	.218	1.939	2 1/2	2 1/2	8	2 1/2	9
2 1/2	2.875	.083	2.709	.120	2.635	.203	2.469	.276	2.323	3	2 1/2	9 1/2	2 1/2	10 1/2
3	3.500	.083	3.334	.120	3.260	.216	3.068	.300	2.900	3 3/8	3	10	3	11
3 1/2	4.000	.083	3.834	.120	3.760	.226	3.548	.318	3.364	3 3/4	3	11 1/2	3	12 1/2
4	4.500	.083	4.334	.120	4.260	.237	4.026	.337	3.826	4 1/8	3	12	3	13 1/2
5	5.563	.109	5.345	.134	5.295	.258	5.047	.375	4.813	4 7/8	3 1/2	13 1/2	3 1/2	15
6	6.625	.109	6.407	.134	6.357	.280	6.065	.432	5.761	5 5/8	3 1/2	14 1/2	4	17 1/2
8	8.625	.109	8.407	.148	8.329	.322	7.981	.500	7.625	7	4 1/2	17 1/2	5	20 1/2
10	10.750	.134	10.482	.165	10.420	.365	10.020	.500	9.750	8 1/2	5	20 1/2	5 1/2	24
12	12.750	.156	12.438	.180	12.390	.375	12.000	.500	11.750	10	5 1/2	24 1/2	6	27 1/2
14	14.000	.156	13.688	.188	13.624	.375†	13.250	.500†	13.000	11	6	27	6 1/2	31
16	16.000	.165	15.670	.188	15.624	.375†	15.250	.500†	15.000	12	6 1/2	30	7 1/2	34 1/2
18	18.000	.165	17.670	.188	17.624	.375†	17.250	.500†	17.000	13 1/2	7	32	8	37 1/2
20	20.000	.188	19.624	.218	19.564	.375†	19.250	.500†	19.000	15	8	35	8 1/2	40 1/2
24	24.000	.218	23.564	.250	23.500	.375†	23.250	.500†	23.000	17	9	40 1/2	10	47 1/2

Sizes 14" through 24" are not covered by A.S.A. B36.19-1957.
 Wall thicknesses shown represent nominal or average wall dimensions as established in A.S.A. B36.19-1957. Wall thicknesses are subject to a minus 12 1/2% mill tolerance.
 Wall thicknesses for Schedule 5S and 10S in sizes 12" are tentative and subject to change.

†These wall thickness correspond respectively to Standard Weight and Extra Strong.

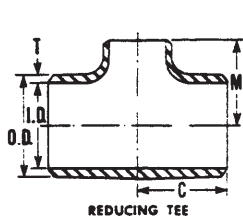
Center to face dimensions of the Cross correspond to that of the Tee in A.S.A. B16.9.
 Reducing Laterals are available with the same center to end dimensions as Straight Laterals of the same size run.
 OTHER SCHEDULES AND WALL THICKNESSES ARE AVAILABLE.

Stainless Steel I.P.S. Butt Welding Fittings (cont'd)

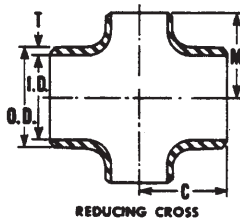
ALSO AVAILABLE IN ALUMINUM, & NICKEL ALLOYS

M.S.S. SP-43**
A.S.A. B16.9

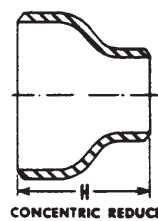
Schedules 5S, 10S, 40S and 80S (other thicknesses on request)



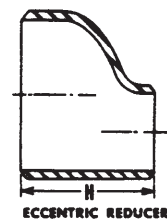
REDUCING TEE



REDUCING CROSS



CONCENTRIC REDUCER



ECCENTRIC REDUCER

NOMINAL PIPE SIZE	REDUCING TEE AND REDUCING CROSS		REDUCERS—CONCENTRIC ECCENTRIC
	C	M	H
3/4 x 1/2	1 1/8	1 1/8	1 1/2
1 x 1/2	1 1/2	1 1/2	2
	1 1/2	1 1/2	2
1 1/4 x 3/4	1 7/8	1 7/8	2
	1 7/8	1 7/8	2
	1 7/8	1 7/8	2
1 1/2 x 1	2 1/4	2 1/4	2 1/2
	2 1/4	2 1/4	2 1/2
	2 1/4	2 1/4	2 1/2
	2 1/4	2 1/4	2 1/2
2 x 1 1/4	2 1/2	1 3/4	3
	2 1/2	2	3
	2 1/2	2 1/4	3
	2 1/2	2 3/8	3
2 1/2 x 1 1/2	3	2 1/4	3 1/2
	3	2 1/2	3 1/2
	3	2 5/8	3 1/2
	3	2 3/4	3 1/2
3 x 2	3 3/8	2 3/4	3 1/2
	3 3/8	2 7/8	3 1/2
	3	3 1/8	3 1/2
	3 3/8	3 1/4	3 1/2
3 1/2 x 2 1/2	...	...	4
	3 3/4	3 1/8	4
	3 3/4	3 1/4	4
	3 3/4	3 1/2	4
4 x 3	4 1/8	3 3/8	4
	4 1/8	3 1/2	4
	4 1/8	3 3/4	4
	4 1/8	3 7/8	4
	4 1/8	4	4
5 x 4	4 7/8	4 1/8	5
	4 7/8	4 1/4	5
	4 7/8	4 3/8	5
	4 7/8	4 1/2	5
	4 7/8	4 5/8	5

NOMINAL PIPE SIZE	REDUCING TEE AND REDUCING CROSS		REDUCERS—CONCENTRIC ECCENTRIC
	C	M	H
6 x 5	5 5/8	4 3/4	5 1/2
	5 5/8	4 7/8	5 1/2
	5 5/8	5	5 1/2
	5 5/8	5 1/8	5 1/2
	5 5/8	5 3/8	5 1/2
8 x 6	7	6	6
	7	6 1/8	6
	7	6 3/8	6
	7	6 5/8	6
10 x 8	8 1/2	7 1/4	7
	8 1/2	7 1/2	7
	8 1/2	7 5/8	7
	8 1/2	8	7
12 x 10	10	8 1/2	8
	10	8 5/8	8
	10	9	8
	10	9 1/2	8
14 x 12	11	9 3/4	13
	11	10 1/8	13
	11	10 5/8	13
16 x 14	12	10 3/4	14
	12	11 1/8	14
	12	11 5/8	14
	12	12	14
18 x 16	13 1/2	12 1/8	15
	13 1/2	12 5/8	15
	13 1/2	13	15
	13 1/2	13	15
20 x 18	15	13 1/8	20
	15	13 5/8	20
	15	14	20
	15	14	20
	15	14 1/2	20
24 x 20	17	15 5/8	20
	17	16	20
	17	16	20
	17	16 1/2	20
	17	17	20

** Dimensions are in accordance with MSS SP-43 and where applicable to ASA B16.9. Reducing Cross is not included in either of these standards. O.D., I.D. and wall thickness for each end of a reducer correspond to dimensions for pipe of the same size, see facing page. Sizes 14" through 24" are not covered by ASA B36.19-1957.

Reductions other than those listed are available on application. Reducers 8" and larger will be furnished conical or contour design at option. In 12" and smaller sizes, Reducers with reductions beyond those shown are available in conical shapes with increased lengths. OTHER SCHEDULES AND WALL THICKNESSES ARE AVAILABLE.