

CARBON STEEL

90° LONG RADIUS SEAMLESS WELD ELBOWS

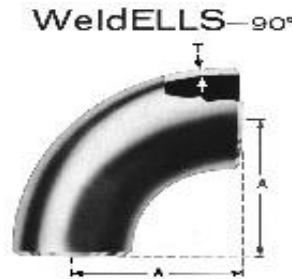
CENTER TO END DIMENSIONS , WEIGHTS AND VOLUMES

ASME/ANSI B 16.9 TABLE 2

ASTM A234		STD. WALL	SCH 40	EXTRA HEAVY	SCH 80	SCH 10	SCH 20	SCH 30	SCH 60	SCH 100	SCH 120	SCH 140	SCH 160	DOUBLE EXTRA HEAVY	VOLUME
Nominal Pipe Size	Centre To End A	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Cubic Feet
1/2	1 1/2"	0.17	0.17	0.22	0.22	0.13	-	-	-	-	-	-	0.29	0.46	0.002
3/4	1 1/8"	0.17	0.17	0.23	0.23	0.13	-	-	-	-	-	-	0.35	0.50	0.002
1	1 1/2"	0.34	0.34	0.45	0.45	0.29	-	-	-	-	-	-	0.59	0.75	0.004
1 1/4	1 7/8"	0.58	0.58	0.77	0.77	0.47	-	-	-	-	-	-	0.97	1.34	0.007
1 1/2	2 1/4"	0.84	0.84	1.12	1.12	0.64	-	-	-	-	-	-	1.5	1.98	0.011
2	3"	1.50	1.50	2.07	2.07	1.09	-	-	-	-	-	-	2.96	3.7	0.024
2 1/2	3.75"	2.98	2.98	3.95	3.95	1.82	-	-	-	-	-	-	5.17	7.06	0.045
3	4.5"	4.68	4.68	6.33	6.33	2.68	-	-	-	-	-	-	8.84	11.4	0.078
3 1/2	5.25"	6.56	6.56	9.04	9.04	3.59	-	-	-	-	-	-	-	16.5	0.12
4	6"	8.90	8.90	12.4	12.4	4.62	-	-	13	-	15.6	-	18.6	22.7	0.178
5	7.5"	15.10	15.10	21.4	21.4	8.00	-	-	-	-	27.8	-	34	39.9	0.34
6	9"	23.5	23.5	35.3	35.3	11.5	-	-	-	-	45	-	56	66	0.581
8	12"	47	47	71	71	22.2	36.5	40.5	58	84	100	111	123	120	1.328
10	15"	83	83	112	132	38.6	56.8	69.8	112	159	184	214	238	-	2.582
12	18"	123	132	162	219	59.5	82	108	182	266	311	347	397	-	4.384
14	21"	158	183	208	307	106	132	158	245	413	462	538	546	-	6.36
16	24"	207	273	273	450	139	172	207	355	593	694	814	809	-	9.5
18	27"	263	390	347	634	176	219	308	510	842	967	1102	1200	-	13.5
20	30"	323	506	428	861	217	323	428	686	1130	1329	1540	1672	-	18.5
22	33"	392	-	520	1200	262	-	-	-	-	-	-	-	-	24.6
24	36"	468	846	622	1470	314	468	702	1176	1925	1991	2511	2761	-	32
26	39"	550	-	730	-	-	-	-	-	-	-	-	-	-	40.7
30	45"	733	-	972	-	612	972	1215	-	-	-	-	-	-	62.5
36	54"	1061	-	1407	-	-	-	-	-	-	-	-	-	-	108
42	63"	1442	-	1916	-	-	-	-	-	-	-	-	-	-	171.5

ALL DIMENSIONS ARE IN INCHES
 FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20,30,100,140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE
 22" SCHEDULES 20,30,40,60,100,120,140,160 ARE NOT MADE.
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .



DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.

Outside Diameter of fittings at beginning of bevel :

- For sizes up to and including 2.5".....+0.06 -0.03
- For sizes 3" through 4".....+0.06 -0.06
- For sizes 5" through 8".....+0.09 -0.06
- For sizes 10" through 18".....+0.16 -0.12
- For sizes 20" and larger.....+0.25 -0.19

Inside Diameter of fittings at welding ends:

- For sizes up to and including 2.5".....+/-0.03
- For sizes 3" through 8"+/-0.06
- For sizes 10" through 18".....+/-0.12
- For sizes 20" and larger.....+/-0.19

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

90° ELBOWS

Centre-to-End of bevel:

- For sizes up to and including 8".....+/-0.06
- For sizes 10" through 24".....+/-0.09
- For sizes 26" through 30".....+/-0.12
- For sizes 32" and larger+/-0.19

CARBON STEEL 45° SEAMLESS WELD ELBOWS CENTER TO END DIMENSIONS, WEIGHTS AND VOLUMES

ASME/ANSI B 16.9 TABLE 2

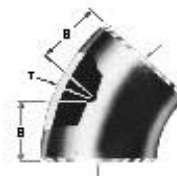
ASTM A234		STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Nominal Pipe Size	Center To End B	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	
1/2"	5/8"	0.09	0.09	0.11	0.11	-	-	-	-	-	-	-	0.14	0.24	0.001
3/4"	9/16"	0.09	0.09	0.11	0.11	0.07	-	-	-	-	-	-	0.12	0.24	0.001
1.0"	7/8"	0.17	0.17	0.22	0.22	0.14	-	-	-	-	-	-	0.29	0.38	0.002
1 1/4"	1.0"	0.29	0.29	0.39	0.39	0.23	-	-	-	-	-	-	0.49	0.67	0.004
1 1/2"	1 1/8"	0.42	0.42	0.56	0.56	0.32	-	-	-	-	-	-	0.75	0.99	0.005
2.0"	1 3/8"	0.75	0.75	1.04	1.04	0.54	-	-	-	-	-	-	1.48	1.85	0.012
2 1/2"	1 3/4"	1.49	1.49	1.98	1.98	0.91	-	-	-	-	-	-	2.59	3.53	0.023
3.0"	2.0"	2.34	2.34	3.17	3.17	1.34	-	-	-	-	-	-	4.42	5.7	0.039
3 1/2"	2 1/4"	3.28	3.28	4.52	4.52	1.79	-	-	-	-	-	-	-	8.25	0.06
4.0"	2 1/2"	4.45	4.45	6.2	6.2	2.31	-	-	6.6	-	7.8	-	9.3	11.4	0.08
5.0"	3 1/8"	7.55	7.55	10.7	10.7	4	-	-	-	-	13.9	-	17	20	0.17
6.0"	3 3/4"	11.8	11.8	17.7	17.7	5.75	-	-	-	-	22.5	-	28	33	0.59
8.0"	5.0"	23.5	23.5	35.8	35.8	11.1	18.2	20.2	29.4	42	50	55	61	60	0.66
10"	6 1/4"	41.8	41.8	56	66	19.3	28.4	34.9	56	79	92	107	119	-	1.29
12"	7 1/2"	61.5	66	81	110	29.8	41	54	91	133	156	174	199	-	2.19
14"	8 3/4"	79	91	104	154	53	66	79	123	206	231	269	273	-	3.18
16"	10"	104	137	137	225	69	86	104	178	296	347	407	405	-	4.75
18"	11 1/4"	132	195	174	317	88	110	154	255	421	483	551	600	-	6.75
20"	12 1/2"	162	253	214	431	109	162	214	343	565	664	770	836	-	9.25
22"	13 1/2"	196	-	260	-	131	-	-	-	-	-	-	-	-	12.3
24"	15"	234	423	311	735	157	234	351	588	963	996	1256	1381	-	16
26"	16"	275	-	365	-	-	-	-	-	-	-	-	-	-	20.35
30"	18 1/2"	367	-	486	-	306	486	608	-	-	-	-	-	-	31.25
36"	22 1/4"	531	-	704	-	-	-	-	-	-	-	-	-	-	54
42"	26"	721	-	958	-	-	-	-	-	-	-	-	-	-	85.75

NOTE:

ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

WeldELLS—45°
 ASA B16.9 ASTM A234



DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.

Outside Diameter of fittings at beginning of bevel :

- For sizes up to and including 2.5".....+0.06 -0.03
- For sizes 3" through 4".....+0.06 -0.06
- For sizes 5" through 8".....+0.09 -0.06
- For sizes 10" through 18".....+0.16 -0.12
- For sizes 20" and larger.....+0.25 -0.19

Inside Diameter of fittings at welding ends:

- For sizes up to and including 2.5".....+/-0.03
- For sizes 3" through 8"+/-0.06
- For sizes 10" through 18".....+/-0.12
- For sizes 20" and larger.....+/-0.19

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

45° ELBOWS

Centre-to-End of bevel:

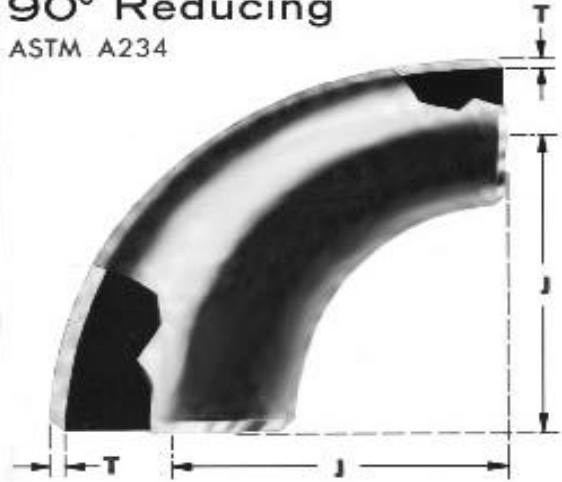
- For sizes up to and including 8".....+/-0.06
- For sizes 10" through 24".....+/-0.09
- For sizes 26" through 30".....+/-0.12
- For sizes 32" and larger+/-0.19

CARBON STEEL 90° LONG RADIUS SEAMLESS REDUCING ELBOWS CENTER TO END DIMENSIONS, WEIGHTS AND VOLUMES

WeldELLS

90° Reducing

ASTM A234



ASME/ANSI B 16.9 TABLE 3

ASTM A234 Nominal Pipe Size	Center To End A	Standard Wall	Extra Heavy	Volume Cubic Feet
		Apx. Wt (LBS)	Apx. Wt (LBS)	
2 x 1 1/2	3	1.5	2	0.024
2 x 1 1/4	3	1.37	1.75	0.024
2 x 1	3	1.25	1.5	0.024
2 1/2 x 2	3.75	2.75	3.75	0.045
2 1/2 x 1 1/2	3.75	2.5	3.5	0.045
2 1/2 x 1 1/4	3.75	2.25	3.25	0.045
3 x 2 1/2	4.5	4.25	6	0.078
3 x 2	4.5	4	5.5	0.078
3 x 1 1/2	4.5	3.75	5	0.078
3 1/2 x 3	5.25	6	8.25	0.12
3 1/2 x 2 1/2	5.25	5.5	7.75	0.12
3 1/2 x 2	5.25	5	7	0.12
4 x 3 1/2	6	8.5	11.5	0.178
4 x 3	6	8	10.75	0.178
4 x 2 1/2	6	7.5	10	0.178
4 x 2	6	7	9.25	0.178
5 x 4	7.5	14	19.5	0.34
5 x 3 1/2	7.5	13	18	0.34
5 x 3	7.5	12	16.5	0.34
5 x 2 1/2	7.5	11	15.5	0.34
6 x 5	9	21	32	0.581
6 x 4	9	20	30	0.581
6 x 3 1/2	9	19	28	0.581
6 x 3	9	17.5	26	0.581
8 x 6	12	40	61	1.328
8 x 5	12	37.5	57	1.328
8 x 4	12	35	53	1.328
10 x 8	15	76	98	2.582
10 x 6	15	67	88	2.582
10 x 5	15	62	83	2.582
12 x 10	18	110	150	4.384
12 x 8	18	102	128	4.384
12 x 6	18	90	117	4.384
14 x 12	21	158	208	6.36
14 x 10	21	158	208	6.36
14 x 8	21	158	208	6.36
16 x 14	24	207	273	9.5
16 x 12	24	207	273	9.5
16 x 10	24	207	273	9.5
18 x 16	27	263	347	13.5
18 x 14	27	263	347	13.5
18 x 12	27	263	347	13.5
18 x 10	27	263	347	13.5
20 x 18	30	323	428	18.5
20 x 16	30	323	428	18.5
20 x 14	30	323	428	18.5
20 x 12	30	323	428	18.5
20 x 10	30	323	428	18.5
24 x 22	36	468	622	24.5
24 x 20	36	468	622	24.5
24 x 18	36	468	622	24.5
24 x 16	36	468	622	32
24 x 14	36	468	622	32
24 x 12	36	468	622	32

NOTE:

SIZES 8" AND ABOVE MAY NOT BE SUPPLIED SEAMLESS. SIZES AND WALL THICKNESS OTHER THAN THOSE NOTED MAY BE SUPPLIED ON A SPECIAL ORDER BASIS. ALL DIMENSIONS ARE IN INCHES. FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION. FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH SEAM 100% XRAYED. VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the normal thickness.

Outside Diameter of fittings at beginning of bevel:

- For sizes up to and including 2.5"+0.06 -0.03
- For sizes 3" through 4"+0.06 -0.06
- For sizes 5" through 8"+0.09 -0.06
- For sizes 10" through 18"+0.16 -0.12
- For sizes 20" and larger+0.25 -0.19

Inside Diameter of fittings at weld ends:

- For sizes up to and including 2.5"±0.03
- For sizes 3" through 8"±0.06
- For sizes 10" through 18"±0.12
- For sizes 20" and larger±0.19

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

90° ELBOWS

Center - to - End of bevel:

- For sizes up to and including 8"±0.06
- For sizes 10" through 24"±0.09
- For sizes 26" through 30"±0.12
- For sizes 32" and larger±0.19

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

CARBON STEEL LONG RADIUS SEAMLESS 180° RETURN BENDS CENTER TO CENTER AND BACK TO FACE DIMENSIONS, WEIGHTS AND VOLUMES

ASME/ANSI B 16.9 TABLE 4

ASTM A234			STD. WALL	SCH 40	XH	SCH 80	SCH 10	SCH 20	SCH 30	SCH 60	SCH 100	SCH 120	SCH 140	SCH 160	XXH	Volume Cubic Feet
Nominal Pipe Size	Center to Center O	Back to Face K	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	
1/2	3	1 7/8	0.35	0.35	0.45	0.45	-	-	-	-	-	-	-	0.58	0.92	
3/4	2 1/4	1 11/16	0.35	0.35	0.46	0.46	0.27	-	-	-	-	-	-	0.7	1	0.004
1	3	2 3/16	0.69	0.69	0.89	0.89	0.58	-	-	-	-	-	-	1.17	1.51	0.008
1 1/4	3 3/4	2 3/4	1.17	1.17	1.54	1.54	0.93	-	-	-	-	-	-	1.94	2.68	0.014
1 1/2	4 1/2	3 1/4	1.68	1.68	2.24	2.24	1.29	-	-	-	-	-	-	3	3.96	0.022
2	6	4 3/16	3	3	4.14	4.14	2.18	-	-	-	-	-	-	5.92	7.4	0.048
2 1/2	7 1/2	5 3/16	5.96	5.96	7.9	7.9	3.64	-	-	-	-	-	-	10.3	14.1	0.9
3	9	6 1/4	9.36	9.36	12.7	12.7	5.36	-	-	-	-	-	-	17.7	22.8	0.156
3 1/2	10 1/2	7 1/4	13.1	13.1	18.1	18.1	7.17	-	-	-	-	-	-	-	33	0.24
4	12	8 1/4	17.8	17.8	24.8	24.8	9.24	-	-	26	-	31.2	-	37.2	45.4	0.326
5	15	10 5/16	30.2	30.2	42.8	42.8	16	-	-	-	-	55.6	-	68	79.8	0.68
6	18	12 5/16	47	47	70.6	70.6	23	-	-	-	-	90	-	112	131	1.258
8	24	16 5/16	94	94	143	143	44.3	73	81	117	168	200	222	246	240	2.656
10	30	20 3/8	167	167	224	264	77	114	140	224	318	368	428	476	-	5.164
12	36	24 3/8	246	264	324	438	119	164	216	364	532	622	694	794	-	8.768
14	42	28	316	366	416	614	212	264	316	490	826	924	1076	1092	-	12.72
16	48	32	414	546	546	900	277	344	414	710	1186	1388	1628	1618	-	19
18	54	36	526	780	694	1268	352	438	616	1020	1684	1934	2204	2400	-	27
20	60	40	646	1012	856	1722	434	-	856	1372	2260	2658	3080	3344	-	37
22	66	44	784	-	1040	-	524	-	-	-	-	-	-	-	-	62
24	72	48	936	1692	1244	2940	627	-	1404	2352	3850	3982	5022	5522	-	64
26	78	52	1100	-	1460	-	-	-	-	-	-	-	-	-	-	81.4
30	90	60	1466	-	1944	-	1223	-	2430	-	-	-	-	-	-	125
36	108	72	2122	-	3832	-	-	-	-	-	-	-	-	-	-	216

Dimensions are in inches

For O.D and wall thickness see pipe chart section

Fittings over 24" may be manufactured from welded pipe with the weld seam 100% xrayed.

Schedules 20, 30, 40, 60, 100, 120, 140, 160, are not made below 8".

5" and 6" schedules 60 and 3 1/2" SCH 160 are not made.

22" schedules 20, 30, 40, 60, 100, 120, 140, 160 are not made.

Double extra heavy is not produced above 8".

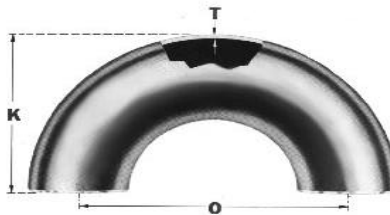
Volume(s) based on assuming each fitting being a solid cube.

Note 1:

Nominal Pipe Size (NPS)	Angularity Tol.	
	Off Angle Q	Off Angle P
1/2 to 4	0.03	0.06
5 to 8	0.06	0.12
10 to 12	0.09	0.19
14 to 16	0.09	0.25
18 to 24	0.12	0.38
26 to 30	0.19	0.38
32 to 42	0.19	0.5
44 to 48	0.19	0.75

Note 2:

"A" equals half of "O"



Centre-to-Centre:

Centre-to-Centre:

Back to Face:

Alignment of Ends:

Alignment of Ends:

Alignment of Ends:

DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the normal thickness.

Outside Diameter of fittings at beginning of bevel:

For sizes up to and including 2.5"+0.06 -0.03

For sizes 3" through 4"+0.06 -0.06

For sizes 5" through 8"+0.09 -0.06

For sizes 10" through 18"+0.16 -0.12

For sizes 20" and larger+0.25 -0.19

Inside Diameter of fittings at weld ends:

For sizes up to and including 2.5"+/-0.03

For sizes 3" through 8"+/-0.06

For sizes 10" through 18"+/-0.12

For sizes 20" and larger+/-0.19

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

180° ELBOWS

For sizes up to and including 8"+/-0.25

For sizes 10" and larger+/-0.38

For all sizes+/-0.25

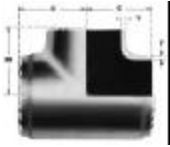
For sizes up to and including 8"+/-0.03

For sizes 10" through 24"+/-0.06

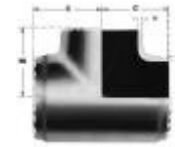
For sizes 26" and larger+/-0.09

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .

TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .



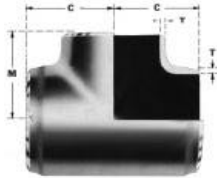
**CARBON STEEL
STRAIGHT AND REDUCING WELD TEES
DIMENSIONS , WEGHTS AND VOLUMES**



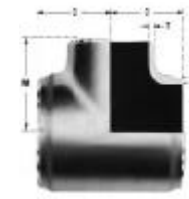
ASME/ ANSI B 16.9 TABLES 5 AND 6

ASTM 234

NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Std. Wall Apx. Wt (LBS)	SCH40 Apx. Wt (LBS)	EXTRA HEAVY	SCH80 Apx. Wt (LBS)	SCH10 Apx. Wt (LBS)	SCH20 Apx. Wt (LBS)	SCH30 Apx. Wt (LBS)	SCH60 Apx. Wt (LBS)	SCH100 Apx. Wt (LBS)	SCH120 Apx. Wt (LBS)	SCH140 Apx. Wt (LBS)	SCH160 Apx. Wt (LBS)	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Run	Branch	C	M														
1/2	1/2	1"	1"	0.35	0.35	0.45	0.45	0.21	-	-	-	-	-	-	0.38	0.60	0.001
1/2	3/8	1"	1"	0.25	0.25	0.28	0.28	0.21	-	-	-	-	-	-	0.38	0.60	0.001
1/2	1/4	1"	1"	0.25	0.25	0.28	0.28	0.21	-	-	-	-	-	-	0.38	0.60	0.001
3/4	3/4	1 1/8"	1 1/8"	0.45	0.45	0.60	0.60	0.24	-	-	-	-	-	-	0.51	0.63	0.002
3/4	1/2	1 1/8"	1 1/8"	0.50	0.50	0.50	0.50	0.23	-	-	-	-	-	-	0.47	0.59	0.002
3/4	3/8	1 1/8"	1 1/8"	0.50	0.50	0.50	0.50	0.22	-	-	-	-	-	-	-	0.59	0.002
1	1	1 1/2"	1 1/2"	0.63	0.63	0.78	0.78	0.6	-	-	-	-	-	-	0.99	1.27	0.005
1	3/4	1 1/2"	1 1/2"	0.58	0.58	0.73	0.73	0.52	-	-	-	-	-	-	0.92	1.17	0.005
1	1/2	1 1/2"	1 1/2"	0.57	0.57	0.71	0.71	0.51	-	-	-	-	-	-	0.88	1.13	0.005
1	3/8	1 1/2"	1 1/2"	0.56	0.56	0.69	0.69	0.50	-	-	-	-	-	-	1.71	1.13	0.005
1 1/4	1 1/4	1 7/8"	1 7/8"	1.16	1.16	1.44	1.44	1.01	-	-	-	-	-	-	1.61	2.31	0.010
1 1/4	1	1 7/8"	1 7/8"	1.07	1.07	1.33	1.33	0.92	-	-	-	-	-	-	1.57	2.15	0.010
1 1/4	3/4	1 7/8"	1 7/8"	1.05	1.05	1.30	1.30	0.90	-	-	-	-	-	-	1.52	2.07	0.010
1 1/4	1/2	1 7/8"	1 7/8"	1.03	1.03	1.27	1.27	0.88	-	-	-	-	-	-	2.69	2.02	0.010
1 1/2	1 1/2	2 1/4"	2 1/4"	1.70	1.70	2.12	2.12	1.43	-	-	-	-	-	-	2.51	3.44	0.016
1 1/2	1 1/4	2 1/4"	2 1/4"	1.57	1.57	2.00	2.00	1.30	-	-	-	-	-	-	2.45	3.26	0.016
1 1/2	1	2 1/4"	2 1/4"	1.55	1.55	1.93	1.93	1.28	-	-	-	-	-	-	2.39	3.13	0.016
1 1/2	3/4	2 1/4"	2 1/4"	1.52	1.52	1.89	1.89	1.25	-	-	-	-	-	-	5.00	3.03	0.016
1 1/2	1/2	2 1/4"	2 1/4"	1.49	1.49	1.86	1.86	1.22	-	-	-	-	-	-	4.55	2.96	0.016
2	2	2 1/2"	2 1/2"	4.16	4.16	4.12	4.12	3.71	-	-	-	-	-	-	4.47	5.93	0.0236
2	1 1/2	2 1/2"	2 3/8"	4.16	4.16	4.12	4.12	3.71	-	-	-	-	-	-	4.39	5.49	0.0236
2	1 1/4	2 1/2"	2 1/4"	4.16	4.16	4.12	4.12	3.71	-	-	-	-	-	-	4.34	5.44	0.0236
2	1	2 1/2"	2"	4.16	4.16	4.12	4.12	3.71	-	-	-	-	-	-	7.59	5.32	0.0236
2	3/4	2 1/2"	1 3/4"	4.16	4.16	4.12	4.12	3.71	-	-	-	-	-	-	6.94	5.07	0.0236
2 1/2	2 1/2	3"	3"	5.91	5.91	6.78	6.78	4.77	-	-	-	-	-	-	6.73	10.00	0.044
2 1/2	2	3"	2 3/4"	5.91	5.91	6.78	6.78	4.77	-	-	-	-	-	-	6.65	9.19	0.044
2 1/2	1 1/2	3"	2 5/8"	6.78	6.78	6.78	6.78	4.77	-	-	-	-	-	-	6.58	9.00	0.044
2 1/2	1 1/4	3"	2 1/2"	6.78	6.78	6.78	6.78	4.77	-	-	-	-	-	-	13.80	8.94	0.044
2 1/2	1	3"	2 1/4"	6.78	6.78	6.78	6.78	4.77	-	-	-	-	-	-	12.60	8.57	0.044
3	3	3 3/8"	3 3/8"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.40	16.80	0.049
3	2 1/2	3 3/8"	3 1/4"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.30	15.70	0.049
3	2	3 3/8"	3"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.20	15.30	0.049
3	1 1/2	3 3/8"	2 7/8"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.20	15.20	0.049
3	1 1/4	3 3/8"	2 3/4"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.20	15.10	0.049
3	1	3 3/8"	2 5/8"	8.41	8.41	9.92	9.92	6.59	-	-	-	-	-	-	12.20	15.00	0.049
3 1/2	3 1/2	3 3/4"	3 3/4"	11.4	11.4	13.6	13.6	8.85	-	-	-	-	-	-	-	21.20	0.100
3 1/2	3	3 3/4"	3 5/8"	11.4	11.4	13.6	13.6	8.85	-	-	-	-	-	-	-	20.10	0.100
3 1/2	2 1/2	3 3/4"	3 1/2"	11.4	11.4	13.6	13.6	8.85	-	-	-	-	-	-	-	19.90	0.100
3 1/2	2	3 3/4"	3 1/4"	11.4	11.4	13.6	13.6	8.85	-	-	-	-	-	-	-	19.40	0.100
3 1/2	1 1/2	3 3/4"	3 1/8"	11.4	11.4	13.6	13.6	8.85	-	-	-	-	-	-	-	18.90	0.100
4	4	4 1/8"	4 1/8"	13.2	13.2	18.6	18.6	9.65	-	-	20.9	-	23.5	-	34.3	34.20	0.129
4	3 1/2	4 1/8"	4"	13.2	13.2	18.6	18.6	9.65	-	-	20.9	-	23.5	-	34.3	34.20	0.129
4	3	4 1/8"	3 7/8"	13.2	13.2	18.6	18.6	9.65	-	-	20.9	-	23.5	-	28.5	34.20	0.129
4	2 1/2	4 1/8"	3 3/4"	13.2	13.2	18.5	18.5	9.65	-	-	20.9	-	23.5	-	28.5	34.20	0.129
4	2	4 1/8"	3 1/2"	13.2	13.2	18.5	18.5	9.65	-	-	20.9	-	23.5	-	28.5	34.20	0.129
4	1 1/2	4 1/8"	3 3/8"	13.2	13.2	18.5	18.5	9.65	-	-	20.9	-	23.5	-	28.5	34.20	0.129
5	5	4 7/8"	4 7/8"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	55.9	52.70	0.240
5	4	4 7/8"	4 5/8"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	44.5	52.70	0.240
5	3 1/2	4 7/8"	4 1/2"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	44.5	52.70	0.240
5	3	4 7/8"	4 3/8"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	44.5	52.70	0.240
5	2 1/2	4 7/8"	4 1/4"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	44.5	44.50	0.240
5	2	4 7/8"	4 1/8"	21.9	21.9	28.5	28.5	16.3	-	-	-	-	44.5	-	44.5	44.50	0.240



CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES



ASME/ ANSI B 16.9 TABLES 5 AND 6

ASTM 234

NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Standard Wall	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Run	Branch	C	M	Apx. Wt	Apx. Wt (LBS)		Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)	Apx. Wt (LBS)		
6	6	5 5/8"	5 5/8"	36.3	36.3	42.5	42.5	27.1	-	-	-	-	64	-	85	85.00	0.358
6	5	5 5/8"	5 3/8"	36.3	36.3	42.5	42.5	27.1	-	-	-	-	64	-	67	85.00	0.385
6	4	5 5/8"	5 1/8"	32.9	32.9	42.5	42.5	27.1	-	-	-	-	64	-	67	64.00	0.385
6	3 1/2	5 5/8"	5"	32.9	32.9	42.5	42.5	27.1	-	-	-	-	64	-	67	64.00	0.385
6	3	5 5/8"	4 7/8"	32.9	32.9	42.5	42.5	27.1	-	-	-	-	64	-	67	64.00	0.385
6	2 1/2	5 5/8"	4 3/4"	32.9	32.9	42.5	42.5	27.1	-	-	-	-	64	-	64	64.00	0.385
6	2	5 5/8"	4 5/8"	32.9	32.9	42.5	42.5	27.1	-	-	-	-	64	-	64	64.00	0.385
8	8	7"	7"	61	61	76	76	43.9	54	57	76	97	115	133	152	152.00	0.706
8	6	7"	6 5/8"	61	61	76	76	43.9	54	57	76	97	115	115	115	114.00	0.706
8	5	7"	6 3/8"	61	61	76	76	43.9	54	57	76	97	97	115	115	114.00	0.706
8	4	7"	6 1/8"	61	61	76	76	43.9	54	57	76	97	97	109	109	114.00	0.706
8	3 1/2	7"	6"	61	61	76	76	43.9	54	57	76	97	97	109	109	114.00	0.706
8	3	7"	6"	61	61	76	76	43.9	54	57	76	97	97	109	109	114.00	0.706
10	10	8 1/2"	8 1/2"	91	91	129	161	60	73	81	129	180	215	241	280	-	1.41
10	8	8 1/2"	8"	88	88	116	157	57	70	78	116	161	197	219	241	-	1.41
10	6	8 1/2"	7 5/8"	88	88	116	120	57	70	78	116	161	180	201	223	-	1.41
10	5	8 1/2"	7 1/2"	88	88	116	116	57	70	78	116	120	157	177	197	-	1.41
10	4	8 1/2"	7 1/4"	88	88	116	116	57	70	78	116	116	157	177	188	-	1.41
10	3	8 1/2"	7"	88	88	102	116	57	70	78	116	116	157	177	188	-	1.41
12	12	10"	10"	147	147	187	245	105	120	136	226	304	353	404	429	-	2.12
12	10	10"	9 1/2"	147	147	187	226	105	120	136	226	279	329	353	377	-	2.12
12	8	10"	9"	143	142	180	180	101	116	132	181	269	294	318	341	-	2.12
12	6	10"	8 5/8"	143	142	180	180	101	116	132	181	245	245	270	318	-	2.12
12	5	10"	8 1/2"	143	142	180	180	101	116	132	181	226	226	270	318	-	2.12
12	4	10"	8 1/4"	143	142	180	180	101	116	132	181	226	226	270	318	-	2.12
14	14	11"	11"	226	252	280	369	193	210	226	311	528	581	686	797	-	3.18
14	12	11"	10 5/8"	226	252	280	315	193	210	226	311	528	581	686	797	-	3.18
14	10	11"	10 1/8"	217	217	268	310	184	201	217	299	528	581	686	797	-	3.18
14	8	11"	9 3/4"	217	217	268	268	184	201	217	299	528	581	686	797	-	3.18
14	6	11"	9 3/8"	217	217	268	268	184	201	217	299	528	581	686	797	-	3.18
16	16	12"	12"	242	370	369	548	201	222	242	458	858	909	1058	1172	-	4.24
16	14	12"	12"	242	370	369	440	201	222	242	458	858	909	1058	1172	-	4.24
16	12	12"	11 5/8"	242	359	359	399	201	222	242	399	858	909	1058	1172	-	4.24
16	10	12"	11 1/8"	235	354	352	360	194	215	235	360	858	909	1058	1172	-	4.24
16	8	12"	10 3/4"	235	354	352	360	194	215	235	354	858	909	1058	1172	-	4.24
16	6	12"	10 3/8"	235	354	352	360	194	215	235	354	858	909	1058	1172	-	4.24
18	18	13 1/2"	13 1/2"	333	525	425	710	281	307	399	612	1244	1276	1308	1531	-	6.36
18	16	13 1/2"	13"	333	525	425	615	281	307	399	565	1244	1276	1308	1531	-	6.36
18	14	13 1/2"	13"	333	427	425	569	281	307	399	468	1244	1276	1308	1531	-	6.36
18	12	13 1/2"	12 5/8"	333	330	339	516	281	307	313	468	1244	1276	1308	1531	-	6.36
18	10	13 1/2"	12 1/8"	319	330	322	496	267	293	296	414	1244	1276	1308	1531	-	6.36
18	8	13 1/2"	11 3/4"	319	330	322	449	267	293	296	414	1244	1276	1308	1531	-	6.36
20	20	15"	15"	504	706	583	1021	439	504	583	834	1478	1654	1855	1971	-	8.47
20	18	15"	14 1/2"	504	584	504	903	439	504	504	774	1478	1654	1855	1971	-	8.47
20	16	15"	14"	504	506	504	783	439	504	504	713	1478	1654	1855	1971	-	8.47
20	14	15"	14"	493	494	493	713	428	493	493	645	1478	1654	1855	1971	-	8.47
20	12	15"	13 5/8"	493	494	493	713	428	493	493	645	1478	1654	1855	1971	-	8.47
20	10	15"	13 1/8"	482	485	482	645	417	482	482	630	1478	1654	1855	1971	-	8.47
20	8	15"	12 3/4"	482	485	482	645	417	482	482	494	1478	1654	1855	1971	-	8.47

CROSSES-STRAIGHT AND REDUCING ASTM A234 DIMENSIONS, WEIGHTS AND VOLUMES

ASME/ANSI B16.9 TABLES 5 AND 6

NOMINAL PIPE SIZE RUN	NOMINAL PIPE SIZE BRANCH	CENTER TO END		STD. WALL APPROX. WEIGHT POUNDS	XHEAVY APPROX. WEIGHT POUNDS	APPROX. VOLUME IN CUBIC INCHES	APPROX. VOLUME IN CUBIC FEET
		OF RUN	OF BRANCH				
		Q	W				
1 1/4	1 1/4	1 7/8	1 7/8	1.53	1.86	22.5	.01
	1	1 7/8	1 7/8	1.25	1.53		
	3/4	1 7/8	1 7/8	1.14	1.38		
1 1/2	1 1/2	2 1/4	2 1/4	2.33	2.84	38.5	.02
	1 1/4	2 1/4	2 1/4	1.92	2.36		
	1	2 1/4	2 1/4	1.75	2.16		
	3/4	2 1/4	2 1/4	1.64	2.03		
2	2	2 1/2	2 1/2	3.36	4.18	59.4	.03
	1 1/2	2 1/2	2 3/8	2.91	3.65		
	1 1/4	2 1/2	2 1/4	2.68	3.37		
	1	2 1/2	2	2.52	3.20		
2 1/2	2 1/2	3	3	5.87	7.16	103.5	.06
	2	3	2 3/4	4.85	5.99		
	1 1/2	3	2 5/8	4.68	5.80		
	1 1/4	3	2 1/2	4.47	5.57		
	1	3	2 1/4	4.35	5.41		
3	3	3 3/8	3 3/8	8.25	10.30	159.5	.06
	2 1/2	3 3/8	3 1/4	7.28	8.91		
	2	3 3/8	3	6.71	8.50		
	1 1/2	3 3/8	2 7/8	6.58	8.37		
	1 1/4	3 3/8	2 3/4	6.38	8.14		
	1	3 3/8	2 5/8	6.27	8.02		
3 1/2	3 1/2	3 3/4	3 3/4	10.8	13.8	225	.13
	3	3 3/4	3 5/8	9.6	12.2		
	2 1/2	3 3/4	3 1/2	9.2	11.8		
	2	3 3/4	3 1/4	8.9	11.2		
	1 1/2	3 3/4	3 1/8	8.6	11.1		
4	3 1/2	4 1/8	4 1/8	13.9	17.8	306.3	.18
	3	4 1/8	4	12.4	15.9		
	2 1/2	4 1/8	3 7/8	11.9	15.4		
	2	4 1/8	3 3/4	11.5	15.0		
	1 1/2	4 1/8	3 1/2	11.1	14.4		
5	5	4 7/8	4 7/8	21.6	28.2	530.7	.31
	4	4 7/8	4 5/8	18.8	24.8		
	3 1/2	4 7/8	4 1/2	18.2	24.2		
	3	4 7/8	4 3/8	17.9	23.8		
	2 1/2	4 7/8	4 1/4	17.7	23.6		
	2	4 7/8	4 1/8	17.2	23.1		
6	6	5 5/8	5 5/8	31.5	43.4	838.5	.49
	5	5 5/8	5 3/8	27.7	38.2		
	4	5 5/8	5 1/8	26.6	37.1		
	3 1/2	5 5/8	5	26.3	36.8		
	3	5 5/8	4 7/8	26.0	36.5		
8	2 1/2	5 5/8	4 3/4	25.8	36.4	1690.5	.98
	8	7	7	57.1	80		
	6	7	6 5/8	49.4	70		
	5	7	6 3/8	48.4	69		
	4	7	6 1/8	47.5	68		
	3 1/2	7	6	47.6	68		
3	7	6	47.4	68			

DIMENSIONAL TOLERANCES

WALL THICKNESS OF FITTINGS AT ANY POINT SHALL NOT BE LESS THAN 87.5% OF THE NOMINAL THICKNESS.

Outside diameter of fittings at beginning of bevel:

For size up to and including 2.5".....+0.06 / -0.03

For sizes 3" through 4".....+0.06 / -0.06

For sizes 5" through 8".....+0.09 / -0.06

For sizes 10" through 18".....+0.16 / -0.12

For sizes 20" and larger.....+0.25 / -0.19

INSIDE DIAMETER OF FITTINGS AT WELDING ENDS:

For sizes up to and including 2.5".....+/- 0.03

For sizes 3" through 8".....+/- 0.06

For sizes 10" through 18".....+/- 0.12

For sizes 20" and larger.....+/- 0.19

WELDING BEVEL FOR DETAILS OF BEVELS FOR BOTH

WELDING FITTINGS AND WELDING NECK FLANGES,

SEE DRAWINGS.

Center To End Of Bevel:

For sizes up to and including 8".....+/- 0.06

For sizes 10" through 24".....+/- 0.09

For sizes 26" through 30".....+/- 0.12

For sizes 32" and larger.....+/- 0.19

ALL DIMENSIONS ARE IN INCHES.

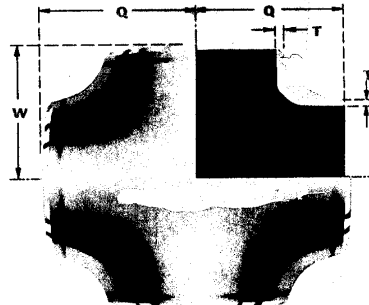
FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.

FITTINGS OVER 24" MAY BE MANUFACTURED FROM

WELDED PIPE WITH THE WELD SEAM 100% XRAYED.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2

TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31



CROSSES-STRAIGHT AND REDUCING ASTM A234 DIMENSIONS, WEIGHTS AND VOLUMES

ASME/ANSI B16.9 TABLES 5 AND 6

NOMINAL PIPE SIZE RUN	NOMINAL PIPE SIZE BRANCH	CENTER TO END		STD. WALL APPROX. WEIGHT POUNDS	XHEAVY APPROX. WEIGHT POUNDS	APPROX. VOLUME IN CUBIC INCHES	APPROX. VOLUME IN CUBIC FEET
		OF RUN	OF BRANCH				
		Q	W				
10	10	8 1/2	8 1/2	96	123	3105.8	1.80
	8	8 1/2	8	84	110		
	6	8 1/2	7 5/8	82	106		
	5	8 1/2	7 1/2	81	105		
	4	8 1/2	7 1/4	81	105		
12	12	10	10	139	174	5100	2.95
	10	10	9 1/2	123	155		
	8	10	9	118	153		
	6	10	8 5/8	117	150		
	5	10	8 1/2	116	149		
14	14	11	11	189	214	6775	3.92
	12	11	10 5/8	144	168		
	10	11	10 1/8	138	178		
	8	11	9 3/4	130	170		
	6	11	9 3/8	134	174		
16	16	12	12	218	274	9216	5.3
	14	12	12	188	240		
	12	12	11 5/8	182	234		
	10	12	11 1/8	170	230		
	8	12	10 3/4	172	226		
18	18	13 1/2	13 1/2	279	352	13,122	7.59
	16	13 1/2	13	236	300		
	14	13 1/2	13	234	300		
	12	13 1/2	12 5/8	229	296		
	10	13 1/2	12 1/8	226	292		
20	20	15	15	349	438	18,000	10.42
	18	15	14 1/2	296	380		
	16	15	14	290	370		
	14	15	14	284	364		
	12	15	13 5/8	282	362		
24	24	17	17	488	610	27,744	16.0
	20	17	17	442	562		
	18	17	16 1/2	436	558		
	16	17	16	432	554		
	14	17	16	428	548		
24	12	17	15 5/8	424	546	27,744	16.0
	10	17	15 1/8	422	544		

DIMENSIONAL TOLERANCES

WALL THICKNESS OF FITTINGS AT ANY POINT SHALL NOT BE LESS THAN 87.5% OF THE NOMINAL THICKNESS.

Outside diameter of fittings at beginning of bevel:

- For size up to and including 2 1/2" +0.06 / -0.03
- For sizes 3" through 4" +0.06 / -0.06
- For sizes 5" through 8" +0.06 / -0.06
- For sizes 10" through 18" +0.16 / -0.12
- For sizes 20" and larger +0.25 / -0.19

INSIDE DIAMETER OF FITTINGS AT WELDING ENDS:

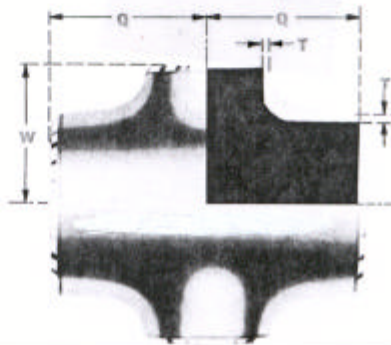
- For sizes up to and including 2 1/2" +/- 0.03
- For sizes 3" through 8" +/- 0.09
- For sizes 10" through 18" +/- 0.12
- For sizes 20" and larger +/- 0.19

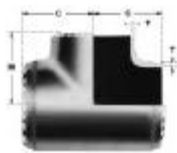
WELDING BEVEL FOR DETAILS OF BEVELS FOR BOTH WELDING FITTINGS AND WELDING NECK FLANGES, SEE DRAWINGS.

- Center To End Of Bevel:
- For sizes up to and including 8" +/- 0.06
 - For sizes 10" through 24" +/- 0.09
 - For sizes 20" through 30" +/- 0.12
 - For sizes 32" and larger +/- 0.19

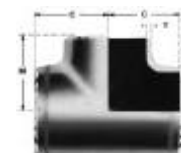
ALL DIMENSIONS ARE IN INCHES.
FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.
FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2
TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31





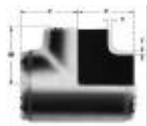
CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES



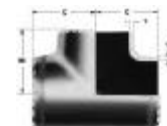
ASME/ ANSI B 16.9 TABLES 5 AND 6

ASTM 234

NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Std. Wall Apx. Wt (LBS)	SCH40 Apx. Wt (LBS)	EXTRA HEAVY	SCH80 Apx. Wt (LBS)	SCH10 Apx. Wt (LBS)	SCH20 Apx. Wt (LBS)	SCH30 Apx. Wt (LBS)	SCH60 Apx. Wt (LBS)	SCH100 Apx. Wt (LBS)	SCH120 Apx. Wt (LBS)	SCH140 Apx. Wt (LBS)	SCH160 Apx. Wt (LBS)	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Run	Branch	C	M														
22	22	16 1/2"	16 1/2"	555	-	811	1010	477	-	-	-	-	-	-	1906	-	11.60
22	20	16 1/2"	16"	555	-	811	964	477	-	-	-	-	-	-	1820	-	11.30
22	18	16 1/2"	15 1/2"	527	-	670	930	449	-	-	-	-	-	-	1756	-	11.10
22	16	16 1/2"	15"	527	-	670	910	449	-	-	-	-	-	-	1712	-	10.90
22	14	16 1/2"	15"	445	-	577	880	367	-	-	-	-	-	-	1660	-	10.90
22	12	16 1/2"	14 5/8"	445	-	577	851	367	-	-	-	-	-	-	1617	-	10.80
22	10	16 1/2"	14 1/8"	445	-	517	835	367	-	-	-	-	-	-	1575	-	10.60
24	24	17"	17"	765	1257	934	1673	677	765	977	1446	2851	3089	3245	3406	-	13.77
24	22	17"	17"	681	-	849	-	593	-	-	-	2851	3089	3245	3406	-	13.77
24	20	17"	17"	601	860	683	1361	513	601	726	1200	2851	3089	3245	3406	-	13.77
24	18	17"	16 1/2"	601	860	683	1200	513	601	726	1040	2851	3089	3245	3406	-	13.77
24	16	17"	16"	506	681	509	1106	418	506	553	941	2851	3089	3245	3406	-	13.77
24	14	17"	16"	506	681	509	1106	418	506	553	941	2851	3089	3245	3406	-	13.77
24	12	17"	15 5/8"	506	681	509	1021	418	506	553	860	2851	3089	3245	3406	-	13.77
24	10	17"	15 1/8"	424	681	509	1021	336	424	553	860	2851	3089	3245	3406	-	13.77
26	26	19 1/2"	19 1/2"	826	-	1121	-	-	-	-	-	-	-	-	-	-	19.07
26	24	19 1/2"	19"	826	-	1121	-	-	-	-	-	-	-	-	-	-	19.07
26	22	19 1/2"	18 1/2"	727	-	925	-	-	-	-	-	-	-	-	-	-	19.07
26	20	19 1/2"	18"	727	-	925	-	-	-	-	-	-	-	-	-	-	19.07
26	18	19 1/2"	17 1/2"	614	-	713	-	-	-	-	-	-	-	-	-	-	19.07
26	16	19 1/2"	17"	614	-	713	-	-	-	-	-	-	-	-	-	-	19.07
26	14	19 1/2"	17"	614	-	713	-	-	-	-	-	-	-	-	-	-	19.07
26	12	19 1/2"	16 5/8"	614	-	713	-	-	-	-	-	-	-	-	-	-	19.07
30	30	22"	22"	1130	-	1510	-	1058	1375	1517	-	-	-	-	-	-	28.25
30	26	22"	21 1/2"	1065	-	1257	-	993	1090	1232	-	-	-	-	-	-	28.25
30	24	22"	21"	1065	-	1257	-	993	1090	1232	-	-	-	-	-	-	28.25
30	22	22"	20 1/2"	921	-	1048	-	849	1090	1232	-	-	-	-	-	-	28.25
30	20	22"	20"	921	-	1048	-	849	1090	1232	-	-	-	-	-	-	28.25
30	18	22"	19 1/2"	921	-	1048	-	849	1090	1232	-	-	-	-	-	-	28.25
30	16	22"	19"	792	-	921	-	720	1090	1232	-	-	-	-	-	-	28.25
30	14	22"	19"	792	-	921	-	720	1090	1232	-	-	-	-	-	-	28.25
36	36	26 1/2"	26 1/2"	1617	-	2165	-	-	-	-	-	-	-	-	-	-	49.43
36	30	26 1/2"	25"	1524	-	1893	-	-	-	-	-	-	-	-	-	-	49.43
36	26	26 1/2"	24 1/2"	1321	-	1504	-	-	-	-	-	-	-	-	-	-	49.43
36	24	26 1/2"	24"	1321	-	1504	-	-	-	-	-	-	-	-	-	-	49.43
36	22	26 1/2"	23 1/2"	1321	-	1504	-	-	-	-	-	-	-	-	-	-	49.43
36	20	26 1/2"	23"	1321	-	1504	-	-	-	-	-	-	-	-	-	-	49.43
36	18	26 1/2"	22 1/2"	1321	-	1321	-	-	-	-	-	-	-	-	-	-	49.43
36	16	26 1/2"	22"	1136	-	1321	-	-	-	-	-	-	-	-	-	-	49.43



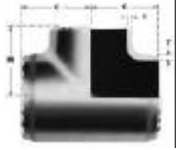
CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES



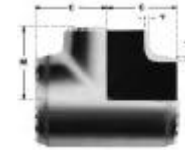
ASME/ ANSI B 16.9 TABLES 5 AND 6

ASTM 234

NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Std. Wall Apx. Wt (LBS)	SCH40 Apx. Wt (LBS)	EXTRA HEAVY	SCH80 Apx. Wt (LBS)	SCH10 Apx. Wt (LBS)	SCH20 Apx. Wt (LBS)	SCH30 Apx. Wt (LBS)	SCH60 Apx. Wt (LBS)	SCH100 Apx. Wt (LBS)	SCH120 Apx. Wt (LBS)	SCH140 Apx. Wt (LBS)	SCH160 Apx. Wt (LBS)	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Run	Branch	C	M														
38	36	28"	28"	1450	-	1650	-	-	-	-	-	-	-	-	-	-	57.9
38	34	28"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	57.9
38	32	28"	27"	-	-	-	-	-	-	-	-	-	-	-	-	-	57.9
38	30	28"	26.5"	1432	-	1595	-	-	-	-	-	-	-	-	-	-	57.9
38	28	28"	25.5"	1425	-	1556	-	-	-	-	-	-	-	-	-	-	57.9
38	26	28"	25.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	57.9
38	24	28"	25"	1410	-	1540	-	-	-	-	-	-	-	-	-	-	57.9
38	22	28"	24.5"	-	-	1485	-	-	-	-	-	-	-	-	-	-	57.9
38	20	28"	24"	1360	-	1428	-	-	-	-	-	-	-	-	-	-	57.9
38	18	28"	23.5"	1305	-	1405	-	-	-	-	-	-	-	-	-	-	57.9
40	38	29.5"	29.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	36	29.5"	29"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	34	29.5"	28.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	32	29.5"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	30	29.5"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	28	29.5"	26.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	26	29.5"	26.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	24	29.5"	26"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	22	29.5"	25.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	20	29.5"	25"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
40	18	29.5"	24.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	67.4
42	40	30"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	71.3
42	38	30"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	71.3
42	36	30"	28"	1710	-	1835	-	-	-	-	-	-	-	-	-	-	71.3
42	34	30"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	71.3
42	32	30"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	71.3
42	30	30"	28"	1690	-	1810	-	-	-	-	-	-	-	-	-	-	71.3
42	28	30"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	71.3
42	26	30"	27.5"	1685	-	1890	-	-	-	-	-	-	-	-	-	-	71.3
42	24	30"	26"	1645	-	1865	-	-	-	-	-	-	-	-	-	-	71.3
42	22	30"	26"	1630	-	1850	-	-	-	-	-	-	-	-	-	-	71.3
42	20	30"	26"	1590	-	1810	-	-	-	-	-	-	-	-	-	-	71.3
42	18	30"	25.5"	1550	-	1770	-	-	-	-	-	-	-	-	-	-	71.3
42	16	30"	25"	1529	-	1720	-	-	-	-	-	-	-	-	-	-	71.3
44	42	32"	30"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	40	32"	29.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	38	32"	29"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	36	32"	28.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	34	32"	28.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	32	32"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	30	32"	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	28	32"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	26	32"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	24	32"	27.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	22	32"	27"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
44	20	32"	27"	-	-	-	-	-	-	-	-	-	-	-	-	-	84.7
46	44	33.5"	31.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	42	33.5"	31"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	40	33.5"	30.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	38	33.5"	30"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	36	33.5"	30"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	34	33.5"	29.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	32	33.5"	29.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	30	33.5"	29"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	28	33.5"	29"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1



CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES ASME/ ANSI B 16.9 TABLES 5 AND 6



NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Std. Wall Apx.	SCH40 Apx.	EXTRA HEAVY	SCH80 Apx.	SCH10 Apx.	SCH20 Apx.	SCH30 Apx.	SCH60 Apx.	SCH100 Apx.	SCH120 Apx.	SCH140 Apx.	SCH160 Apx.	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Run	Branch	C	M	Wt (LBS)	Wt (LBS)		Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)	Wt (LBS)		
46	26	33.5"	29"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	24	33.5"	28.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
46	22	33.5"	28.5"	-	-	-	-	-	-	-	-	-	-	-	-	-	97.1
48	46	35"	33"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	44	35"	33"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	42	35"	32"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	40	35"	32"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	38	35"	32"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	36	35"	31"	2165	2510	-	-	-	-	-	-	-	-	-	-	-	109.5
48	34	35"	31"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	32	35"	31"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	30	35"	30"	2124	2475	-	-	-	-	-	-	-	-	-	-	-	109.5
48	28	35"	30"	-	-	-	-	-	-	-	-	-	-	-	-	-	109.5
48	26	35"	30"	2103	2443	-	-	-	-	-	-	-	-	-	-	-	109.5
48	24	35"	29"	2083	2420	-	-	-	-	-	-	-	-	-	-	-	109.5
48	22	35"	29"	2077	2410	-	-	-	-	-	-	-	-	-	-	-	109.5

NOTE:

BODIES OF TEES MAY BE THICKER THAN THE ENDS TO DEVELOP FULL PIPE STRENGTH .
 ALL DIMENSIONS ARE IN INCHES .
 FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED .
 SCHEDULES 20,30,100,140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2" SCH 160 ARE NOT MADE.
 22" SCHEDULE 20,30,40,60,100,120,140,160 ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES BASED ON ASSUMING EACH EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31

DIMENSIONAL TOLERANCES

WALL THICKNESS OF FITTINGS AT ANY POINT SHALL NOT BE LESS THAN 87.5% OF THE NOMINAL THICKNESS.
 Outside diameter of fittings at beginning of bevel:
 For size up to and including 2.5".....+0.06 / -0.03
 For sizes 3" through 4".....+0.06 / -0.06
 For sizes 5" through 8".....+0.09 / -0.06
 For sizes 10" through 18".....+0.16 / -0.12
 For sizes 20" and larger.....+0.25 / -0.19
 INSIDE DIAMETER OF FITTINGS AT WELDING ENDS:
 For sizes up to and including 2.5".....+/- 0.03
 For sizes 3" through 8".....+/- 0.06
 For sizes 10" through 18".....+/- 0.12
 For sizes 20" and larger.....+/- 0.19
 WELDING BEVEL FOR DETAILS OF BEVELS FOR BOTH WELDING FITTINGS AND WELDING NECK FLANGES, SEE DRAWINGS .
 Center To End Of Bevel:
 For sizes up to and including 8".....+/- 0.06
 For sizes 10" through 24".....+/- 0.09
 For sizes 26" through 30".....+/- 0.12
 For sizes 32" and larger.....+/- 0.19

CARBON STEEL WELD CAPS

ASME/ANSI B 16.9 TABLE 8



ASTM A234		STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume
Nominal Pipe Size	Length E	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Cubic Feet
1/2	1.0"	0.07	0.07	0.1	0.1	-	-	-	-	-	-	0.14	0.22	0.0004
3/4	1.5"	0.13	0.13	0.19	0.19	-	-	-	-	-	-	-	0.28	0.0006
1	1.5"	0.22	0.22	0.28	0.28	-	-	-	-	-	-	0.35	0.45	0.0015
1 1/4	1.5"	0.31	0.31	0.4	0.4	-	-	-	-	-	-	0.49	0.64	0.002
1 1/2	1.5"	0.37	0.37	0.49	0.49	-	-	-	-	-	-	0.63	0.8	0.003
2	1.5"	0.51	0.51	0.69	0.69	-	-	-	-	-	-	1.13	1.32	0.005
2 1/2	1.5"	0.81	0.81	1.03	1.03	-	-	-	-	-	-	1.77	2.19	0.007
3	2.0"	1.42	1.42	1.88	1.88	-	-	-	-	-	-	3.15	3.94	0.014
3 1/2	2.5"	2.14	2.14	2.88	2.88	-	-	-	-	-	-	-	5.81	0.023
4	2.5"	2.54	2.54	3.47	3.47	-	-	3.85	-	5.11	-	6.04	7	0.029
5	3.0"	4.19	4.19	5.84	5.84	-	-	-	-	8.6	-	10.3	11.8	0.054
6	3.5"	6.44	6.44	9.45	9.45	-	-	-	-	13.3	-	16.3	18.7	0.088
8	4.0"	11.2	11.2	16.7	16.7	8.7	9.63	14	23.8	27.9	30.8	33.6	33.3	0.172
10	5.0"	20	20	26.5	26.5	13.7	16.8	26.5	43.6	49.4	56.7	62.6	-	0.334
12	6.0"	29.5	31.7	38	59.3	19.7	26	49.3	70.6	81.1	90	100	-	0.565
14	6.5"	35.4	40.6	45.3	76.5	29.5	35.4	61	93.5	121	132	143	-	0.737
16	7.0"	44.8	57.8	57.8	105	37.3	44.8	84	132	154	182	198	-	1.04
18	8.0"	57.2	92	74	149	47.7	66.8	121	220	253	264	281	-	1.5
20	9.0"	71	121	94	201	71	94	162	303	330	385	462	-	2.08
22	10"	83	-	110	-	-	-	-	-	-	-	-	-	2.8
24	10.5"	102	205	131	342	102	147	282	402	473	523	583	-	3.5
26	10.5"	110	-	146	-	-	-	-	-	-	-	-	-	4.1
28	10.5"	-	-	-	-	-	-	-	-	-	-	-	-	4.76
30	10.5"	137	-	186	-	-	218	-	-	-	-	-	-	5.47
32	10.5"	-	-	-	-	-	-	-	-	-	-	-	-	6.22
34	10.5"	-	-	-	-	-	-	-	-	-	-	-	-	7.02
36	10.5"	165	-	260	-	-	-	-	-	-	-	-	-	7.88
38	12"	-	-	-	-	-	-	-	-	-	-	-	-	10.03
40	12"	-	-	-	-	-	-	-	-	-	-	-	-	11.11
42	12"	-	-	-	-	-	-	-	-	-	-	-	-	12.25
44	13.5"	-	-	-	-	-	-	-	-	-	-	-	-	15.13
46	13.5"	-	-	-	-	-	-	-	-	-	-	-	-	16.53
48	13.5"	-	-	-	-	-	-	-	-	-	-	-	-	18

NOTE:
CAPS ARE ELLIPSOIDAL IN SHAPE WITH 2 TO 1 AXIS RATIO PER ASME CODE.
ALL DIMENSIONS ARE IN INCHES
FOR O. D. WALL THICKNESS SEE PIPE CHART SECTION.
SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
VOLUMES ARE BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the nominal thickness

Outside Diameter of fittings at beginning of bevel :

For sizes up to and including 2.5".....	+0.06	-0.03
For sizes 3" through 4".....	+0.06	-0.06
For sizes 5" through 8".....	+0.09	-0.06
For sizes 10" through 18".....	+0.16	-0.12
For sizes 20" and larger.....	+0.25	-0.19

Inside Diameter of fittings at welding ends:

For sizes up to and including 2.5".....	+/-0.03
For sizes 3" through 8".....	+/-0.06
For sizes 10" through 18".....	+/-0.12
For sizes 20" and larger.....	+/-0.19

Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.

WELDING CAPS Overall Length:

For sizes up to and including 4".....	+/-0.12
For sizes 5" through 24".....	+/-0.25
For sizes 25" and larger.....	+/-0.38

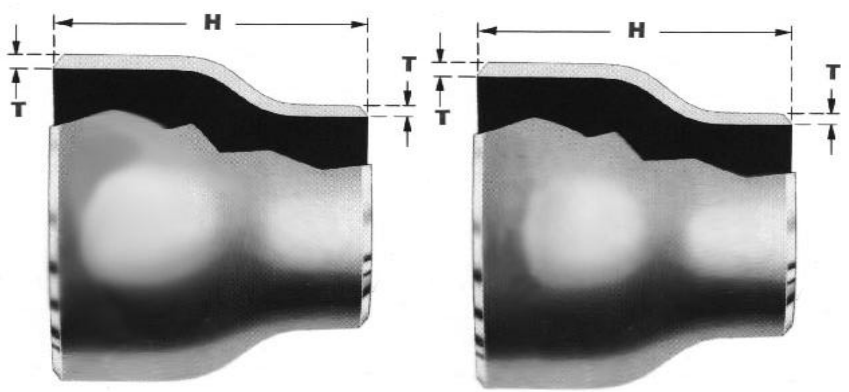
CARBON STEEL CONCENTRIC AND ECCENTRIC WELD REDUCERS DIMENSIONS , WEIGHTS AND VOLUMES ASME/ANSI B 16.9 TABLE 9

ASTM A234		STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	VOLUME
Nominal Pipe Size (NPS)	End to End H	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Cubic Feet
3/4 x 1/2	1.5"	0.15	0.15	0.22	0.22	-	-	-	-	-	-	-	0.32	0.41	0.0009
3/4 x 3/8	1.5"	0.15	0.15	0.22	0.22	-	-	-	-	-	-	-	0.32	0.41	0.0009
1 x 3/4	2.0"	0.28	0.28	0.36	0.36	-	-	-	-	-	-	-	0.47	0.61	0.002
1 x 1/2	2.0"	0.28	0.28	0.36	0.36	-	-	-	-	-	-	-	0.47	0.61	0.002
1 1/4 x 1	2.0"	0.38	0.38	0.5	0.5	-	-	-	-	-	-	-	0.63	0.87	0.319
1 1/4 x 3/4	2.0"	0.38	0.38	0.5	0.5	-	-	-	-	-	-	-	0.63	0.87	0.319
1 1/4 x 1/2	2.0"	0.38	0.38	0.5	0.5	-	-	-	-	-	-	-	0.63	0.87	0.319
1 1/2 x 1 1/4	2.5"	0.57	0.51	0.76	0.76	-	-	-	-	-	-	-	1.01	1.34	0.005
1 1/2 x 1	2.5"	0.57	0.51	0.76	0.76	-	-	-	-	-	-	-	1.01	1.34	0.005
1 1/2 x 3/4	2.5"	0.57	0.51	0.76	0.76	-	-	-	-	-	-	-	1.01	1.34	0.005
1 1/2 x 1/2	2.5"	0.57	0.51	0.76	0.76	-	-	-	-	-	-	-	1.01	1.34	0.005
2 x 1 1/2	3.0"	0.9	0.9	1.25	1.25	-	-	-	-	-	-	-	1.86	2.26	0.009
2 x 1 1/4	3.0"	0.9	0.9	1.25	1.25	-	-	-	-	-	-	-	1.86	2.26	0.009
2 x 1	3.0"	0.9	0.9	1.25	1.25	-	-	-	-	-	-	-	1.86	2.26	0.009
2 x 3/4	3.0"	0.9	0.9	1.25	1.25	-	-	-	-	-	-	-	1.86	2.26	0.009
2 1/2 x 2	3.5"	1.7	1.7	2.23	2.23	-	-	-	-	-	-	-	2.92	3.99	0.0168
2 1/2 x 1 1/2	3.5"	1.7	1.7	2.23	2.23	-	-	-	-	-	-	-	2.92	3.99	0.0168
2 1/2 x 1 1/4	3.5"	1.7	1.7	2.23	2.23	-	-	-	-	-	-	-	2.92	3.99	0.0168
2 1/2 x 1	3.5"	1.7	1.7	2.23	2.23	-	-	-	-	-	-	-	2.92	3.99	0.0168
3 x 2 1/2	3.5"	2.2	2.2	2.99	2.99	-	-	-	-	-	-	-	4.17	5.43	0.025
3 x 2	3.5"	2.2	2.2	2.99	2.99	-	-	-	-	-	-	-	4.17	5.43	0.025
3 x 1 1/2	3.5"	2.2	2.2	2.99	2.99	-	-	-	-	-	-	-	4.17	5.43	0.025
3 x 1 1/4	3.5"	2.2	2.2	2.99	2.99	-	-	-	-	-	-	-	4.17	5.43	0.025
3 1/2 x 3	4.0"	3	3	4.16	4.16	-	-	-	-	-	-	-	-	7.6	0.037
3 1/2 x 2 1/2	4.0"	3	3	4.16	4.16	-	-	-	-	-	-	-	-	7.6	0.037
3 1/2 x 2	4.0"	3	3	4.16	4.16	-	-	-	-	-	-	-	-	7.6	0.037
3 1/2 x 1 1/2	4.0"	3	3	4.16	4.16	-	-	-	-	-	-	-	-	7.6	0.037
3 1/2 x 1 1/4	4.0"	3	3	4.16	4.16	-	-	-	-	-	-	-	-	7.6	0.037
4 x 3 1/2	4.0"	3.6	3.6	5	5	-	-	-	5.5	-	6.32	-	7.52	9.2	0.047
4 x 3	4.0"	3.6	3.6	5	5	-	-	-	5.5	-	6.32	-	7.52	9.2	0.047
4 x 2 1/2	4.0"	3.6	3.6	5	5	-	-	-	5.5	-	6.32	-	7.52	9.2	0.047
4 x 2	4.0"	3.6	3.6	5	5	-	-	-	5.5	-	6.32	-	7.52	9.2	0.047
4 x 1 1/2	4.0"	3.6	3.6	5	5	-	-	-	5.5	-	6.32	-	7.52	9.2	0.047
5 x 4	5.0"	6.1	6.1	8.65	8.65	-	-	-	-	-	12.5	-	13.8	16.1	0.089
5 x 3 1/2	5.0"	6.1	6.1	8.65	8.65	-	-	-	-	-	12.5	-	13.8	16.1	0.089
5 x 3	5.0"	6.1	6.1	8.65	8.65	-	-	-	-	-	12.5	-	13.8	16.1	0.089
5 x 2 1/2	5.0"	6.1	6.1	8.65	8.65	-	-	-	-	-	12.5	-	13.8	16.1	0.089
5 x 2	5.0"	6.1	6.1	8.65	8.65	-	-	-	-	-	12.5	-	13.8	16.1	0.089
6 x 5	5.5"	8.7	8.7	13.1	13.1	-	-	-	-	-	16.7	-	20.8	24.4	0.14
6 x 4	5.5"	8.7	8.7	13.1	13.1	-	-	-	-	-	16.7	-	20.8	24.4	0.14
6 x 3 1/2	5.5"	8.7	8.7	13.1	13.1	-	-	-	-	-	16.7	-	20.8	24.4	0.14
6 x 3	5.5"	8.7	8.7	13.1	13.1	-	-	-	-	-	16.7	-	20.8	24.4	0.14
6 x 2 1/2	5.5"	8.7	8.7	13.1	13.1	-	-	-	-	-	16.7	-	20.8	24.4	0.14
8 x 6	6.0"	14.3	14.3	21.72	21.72	-	11.1	12.3	17.8	25.4	30.3	33.9	37.3	36.2	0.258
8 x 5	6.0"	14.3	14.3	21.72	21.72	-	11.1	12.3	17.8	25.4	30.3	33.9	37.3	36.2	0.258
8 x 4	6.0"	14.3	14.3	21.72	21.72	-	11.1	12.3	17.8	25.4	30.3	33.9	37.3	36.2	0.258
8 x 3 1/2	6.0"	14.3	14.3	21.72	21.72	-	11.1	12.3	17.8	25.4	30.3	33.9	37.3	36.2	0.258
10 x 8	7.0"	23.6	23.6	31.9	37.5	-	16.2	19.8	32	44.9	52	60.7	67.4	-	0.468
10 x 6	7.0"	23.6	23.6	31.9	37.5	-	16.2	19.8	32	44.9	52	60.7	67.4	-	0.468
10 x 5	7.0"	23.6	23.6	31.9	37.5	-	16.2	19.8	32	44.9	52	60.7	67.4	-	0.468
10 x 4	7.0"	23.6	23.6	31.9	37.5	-	16.2	19.8	32	44.9	52	60.7	67.4	-	0.468
12 x 10	8.0"	33.1	35.8	43.6	59	-	22	29.1	48.8	71.4	83.8	93.1	107	-	0.753
12 x 8	8.0"	33.1	35.8	43.6	59	-	22	29.1	48.8	71.4	83.8	93.1	107	-	0.753
12 x 6	8.0"	33.1	35.8	43.6	59	-	22	29.1	48.8	71.4	83.8	93.1	107	-	0.753
12 x 5	8.0"	33.1	35.8	43.6	59	-	22	29.1	48.8	71.4	83.8	93.1	107	-	0.753
14 x 12	13.0"	59.2	68.6	78.3	115	-	49.2	59	92	156	180	204	229	-	1.47
14 x 10	13.0"	59.2	68.6	78.3	115	-	49.2	59	92	156	180	204	229	-	1.47
14 x 8	13.0"	59.2	68.6	78.3	115	-	49.2	59	92	156	180	204	229	-	1.47
14 x 6	13.0"	59.2	68.6	78.3	115	-	49.2	59	92	156	180	204	229	-	1.47
16 x 14	14.0"	73	96.5	97	159	-	60.8	73	125	213	246	288	315	-	2.07
16 x 12	14.0"	73	96.5	97	159	-	60.8	73	125	213	246	288	315	-	2.07
16 x 10	14.0"	73	96.5	97	159	-	60.8	73	125	213	246	288	315	-	2.07
16 x 8	14.0"	73	96.5	97	159	-	60.8	73	125	213	246	288	315	-	2.07

NOTE:
 ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

DIMENSIONAL TOLERANCES
 Wall thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.
 Outside Diameter of fittings at beginning of bevel :
 For sizes up to and including 2.5"+0.06 -0.03
 For sizes 3" through 4"+0.06 -0.06
 For sizes 5" through 8"+0.09 -0.06
 For sizes 10" through 18"+0.16 -0.12
 For sizes 20" and larger+0.25 -0.19
 Inside Diameter of fittings at welding ends :
 For sizes up to and including 2.5"+/-0.03
 For sizes 3" through 8"+/-0.06
 For sizes 10" through 18"+/-0.12
 For sizes 20" and larger+/-0.19
 Welding Bevel for details of Bevels for both welding fittings and Welding Neck Flanges, see drawings.
REDUCER (Concentric and Eccentric)
 End to End:
 For sizes up to and including 8"+/-0.06
 For sizes 10" through 24"+/-0.09
 For sizes 26" and larger+/-0.19



CARBON STEEL CONCENTRIC AND ECCENTRIC WELD REDUCERS DIMENSIONS , WEIGHTS AND VOLUMES

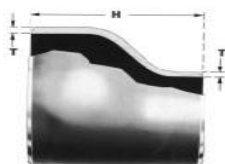
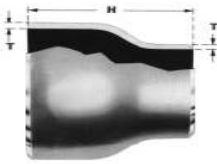
ASME/ANSI B 16.9 TABLE 9

ASTM A234		STD. WALL	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Nominal Pipe Size (NPS)	End to End H	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	
18 x 16	15"	88	131	117	213	-	73.4	103	173	283	334	377	424	-	2.81
18 x 14	15"	88	131	117	213	-	73.4	103	173	283	334	377	424	-	2.81
18 x 12	15"	88	131	117	213	-	73.4	103	173	283	334	377	424	-	2.81
18 x 10	15"	88	131	117	213	-	73.4	103	173	283	334	377	424	-	2.81
20 x 18	20"	131	205	174	348	-	131	174	278	468	543	624	693	-	4.63
20 x 16	20"	131	205	174	348	-	131	174	278	468	543	624	693	-	4.63
20 x 14	20"	131	205	174	348	-	131	174	278	468	543	624	693	-	4.63
20 x 12	20"	131	205	174	348	-	131	174	278	468	543	624	693	-	4.63
22 x 20	20"	144	-	-	-	-	-	-	-	-	-	-	-	-	5.6
22 x 18	20"	144	-	-	-	-	-	-	-	-	-	-	-	-	5.6
22 x 16	20"	144	-	-	-	-	-	-	-	-	-	-	-	-	5.6
22 x 14	20"	144	-	-	-	-	-	-	-	-	-	-	-	-	5.6
24 x 22	20"	158	285	210	494	-	158	236	397	671	781	880	990	-	6.67
24 x 20	20"	158	285	210	494	-	158	236	397	671	781	880	990	-	6.67
24 x 18	20"	158	285	210	494	-	158	236	397	671	781	880	990	-	6.67
24 x 16	20"	158	285	210	494	-	158	236	397	671	781	880	990	-	6.67
26 x 24	24"	206	-	272	-	-	-	-	-	-	-	-	-	-	9.39
26 x 22	24"	206	-	272	-	-	-	-	-	-	-	-	-	-	9.39
26 x 20	24"	206	-	272	-	-	-	-	-	-	-	-	-	-	9.39
26 x 18	24"	206	-	272	-	-	-	-	-	-	-	-	-	-	9.39
28 x 26	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	10.89
28 x 24	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	10.89
28 x 20	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	10.89
28 x 18	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	10.89
30 x 28	24"	237	-	315	-	-	315	394	-	-	-	-	-	-	12.5
30 x 26	24"	237	-	315	-	-	315	394	-	-	-	-	-	-	12.5
30 x 24	24"	237	-	315	-	-	315	394	-	-	-	-	-	-	12.5
30 x 20	24"	237	-	315	-	-	315	394	-	-	-	-	-	-	12.5
32 x 30	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22
32 x 28	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22
32 x 26	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22
32 x 24	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22
34 x 32	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	16.06
34 x 30	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	16.06
34 x 26	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	16.06
34 x 24	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	16.06
36 x 34	24"	285	-	379	-	-	-	-	-	-	-	-	-	-	18
36 x 32	24"	285	-	379	-	-	-	-	-	-	-	-	-	-	18
36 x 30	24"	285	-	379	-	-	-	-	-	-	-	-	-	-	18
36 x 26	24"	285	-	379	-	-	-	-	-	-	-	-	-	-	18
36 x 24	24"	285	-	379	-	-	-	-	-	-	-	-	-	-	18
38 x 36	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06
38 x 34	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06
38 x 32	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06
38 x 30	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06
38 x 28	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06
38 x 26	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	20.06

NOTE:

ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .



DIMENSIONAL TOLERANCES

Wall thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.
 Outside Diameter of fittings at beginning of bevel :
 For sizes up to and including 2.5".....+0.06 -0.03
 For sizes 3" through 4"+0.06 -0.06
 For sizes 5" through 8"+0.09 -0.06
 For sizes 10" through 18"+0.16 -0.12
 For sizes 20" and larger+0.25 -0.19
 Inside Diameter of fittings at welding ends :
 For sizes up to and including 2.5".....+/-0.03
 For sizes 3" through 8"+/-0.06
 For sizes 10" through 18"+/-0.12
 For sizes 20" and larger+/-0.19
 Welding Bevel for details of Bevels for both welding fittings and Welding Neck Flanges, see drawings.

REDUCERS (Concentric and Eccentric)
 End to End:
 For sizes up to and including 8"+/-0.06
 For sizes 10" through 24"+/-0.09
 For sizes 26" and larger+/-0.19

CARBON STEEL CONCENTRIC AND ECCENTRIC WELD REDUCERS DIMENSIONS , WEIGHTS AND VOLUMES

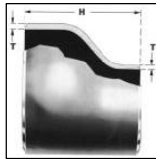
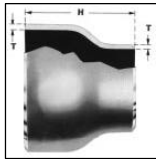
ASME/ANSI B 16.9 TABLE 9

ASTM A234		STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Nominal Pipe Size (NPS)	End to End H	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	
40 x 38	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	22.22
40 x 36	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	22.22
40 x 34	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	22.22
40 x 32	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	22.22
40 x 30	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	22.22
42 x 40	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
42 x 38	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
42 x 36	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
42 x 34	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
42 x 32	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
42 x 30	24"	334	-	443	-	-	-	-	-	-	-	-	-	-	24.5
44 x 42	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	26.89
44 x 40	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	26.89
44 x 38	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	26.89
44 x 36	24"	-	-	-	-	-	-	-	-	-	-	-	-	-	26.89
46 x 44	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	34.29
46 x 42	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	34.29
46 x 40	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	34.29
46 x 38	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	34.29
48 x 46	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	37.33
48 x 44	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	37.33
48 x 42	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	37.33
48 x 40	28"	-	-	-	-	-	-	-	-	-	-	-	-	-	37.33

NOTE:

ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .



DIMENSIONAL TOLERANCES

Wall thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.

Outside Diameter of fittings at beginning of bevel :

- For sizes up to and including 2.5"+0.06 -0.03
- For sizes 3" through 4"+0.06 -0.06
- For sizes 5" through 8"+0.09 -0.06
- For sizes 10" through 18"+0.16 -0.12
- For sizes 20" and larger+0.25 -0.19

Inside Diameter of fittings at welding ends :

- For sizes up to and including 2.5"+/-0.03
- For sizes 3" through 8"+/-0.06
- For sizes 10" through 18"+/-0.12
- For sizes 20" and larger+/-0.19

Welding Bevel for details of Bevels for both welding fittings and Welding Neck Flanges, see drawings.

REDUCER (Concentric and Eccentric)

End to End:

- For sizes up to and including 8"+/-0.06
- For sizes 10" through 24"+/-0.09
- For sizes 26" and larger+/-0.19

CARBON STEEL

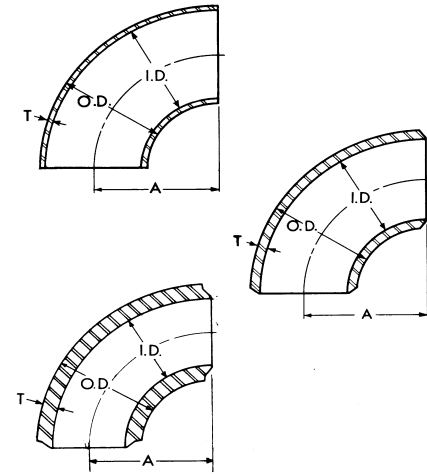
90° SHORT RADIUS SEAMLESS ELBOWS

CENTER TO END DIMENSIONS, WEIGHTS AND VOLUMES

M.SS SP-43

ASME B.16.28

ASTM A234		STANDARD WALL	SCH40	EXTRA STRONG	SCH80	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	Volume
Nominal Pipe Size	Center To End A	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Cubic Feet
1/2	-	-	-	-	-	-	-	-	-	-	-	-	-
3/4	-	-	-	-	-	-	-	-	-	-	-	-	-
1	1"	0.23	0.23	0.26	0.26	-	-	-	-	-	-	0.37	0.002
1 1/4	1 1/4"	0.39	0.39	0.95	0.95	-	-	-	-	-	-	0.76	0.004
1 1/2	1 1/2"	0.56	0.56	0.75	0.75	-	-	-	-	-	-	1.08	0.007
2	2"	1	1	1.38	1.38	-	-	-	-	-	-	2.09	0.014
2 1/2	2 1/2"	1.98	1.98	2.64	2.64	-	-	-	-	-	-	3.5	0.034
3	3"	3.12	3.12	4.22	4.22	-	-	-	-	-	-	6.2	0.046
3 1/2	3 1/2"	4.38	4.38	6.04	6.04	-	-	-	-	-	-	-	0.07
4	4"	5.9	5.9	8.25	8.25	-	-	-	-	10.4	-	13.2	0.102
5	5"	10.1	10.1	14.3	14.3	-	-	-	-	18.6	-	20.9	0.195
6	6"	15.6	15.6	23.5	23.5	-	-	-	-	30	-	33	0.332
8	8"	31.4	31.4	47.7	47.7	24.4	27	39.1	56	66	74	36.9	0.757
10	10"	55.7	55.7	75.2	88	38.2	46.8	75.2	106	123	143	-	1.479
12	12"	81.9	88	108	146	54.6	72.2	121	177	207	231	-	2.49
14	14"	105	122	139	205	87	105	163	266	305	344	-	3.57
16	16"	138	182	182	300	115	138	236	377	446	514	-	5.33
18	18"	175	259	231	422	146	205	340	541	569	715	-	7.59
20	20"	215	338	286	573	215	286	457	746	853	979	-	10.42
22	22"	-	-	-	-	-	470	-	-	-	-	-	13.86
24	24"	313	564	415	977	313	811	783	1265	1473	1650	-	18
26	26"	-	-	-	-	-	-	-	-	-	-	-	22.89
30	30"	488	-	649	-	649	-	-	-	-	-	-	35.16
36	36"	707	-	939	-	-	-	-	-	-	-	-	60.75
42	42"	1079	-	1278	-	-	-	-	-	-	-	-	96.47



NOTE:

ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTING OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8"
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4"
 5" AND 6" SCHEDULES 60 AND 3 1/2 SCH 160 ARE NOT MADE
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8"
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE
 DOUBLE EXTRA HEAVY, SCH 10 AND SCH 160 90° SHORT RADIUS ELBOWS ARE AVAILABLE ON SPECIAL ORDER BASIS.
 VOLUMES BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.

TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

DIMENSIONAL TOLERANCES

Wall thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.
 Outside diameter of fittings at beginning of bevel:
 For size up to and including 2.5".....+0.06 / -0.03
 For sizes 3" through 4".....+0.06 / -0.06
 For sizes 5" through 8".....+0.09 / -0.06
 For sizes 10" through 18".....+0.16 / -0.12
 For sizes 20" and larger.....+0.25 / -0.19

INSIDE DIAMETER OF FITTINGS AT WELDING ENDS:

For sizes up to and including 2.5".....+/- 0.03
 For sizes 3" through 8".....+/- 0.06
 For sizes 10" through 18".....+/- 0.12
 For sizes 20" and larger.....+/- 0.08

90° ELBOWS,

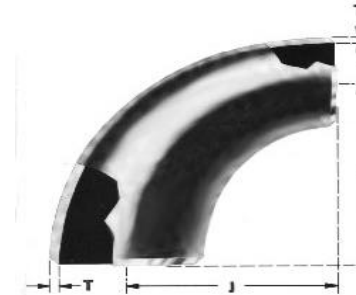
Center To End Of Bevel:
 For sizes up to and including 8".....+/- 0.06
 For sizes 10" through 24".....+/- 0.09
 For sizes 26" through 30".....+/- 0.12
 For sizes 32" and larger.....+/- 0.19

CARBON STEEL

90° SEAMLESS WELD ELBOWS WITH LONG TANGENT ONE END
CENTER TO END DIMENSIONS AND WEIGHTS.

ASTM A 234				STD WALL	EXTRA HEAVY
Nominal Pipe Size	Center To Short End	Center To Long End	Tangent Length	Approx Weight Pounds	Approx Weight Pounds
	A	B	C		
1 1/2	2 1/4"	3 1/4"	1"	1.08	1.41
2	3"	4 1/4"	1 1/4"	1.90	2.55
2 1/2	3 3/4"	5"	1 1/4"	3.62	4.63
3	4 1/2"	5 3/4"	1 1/4"	5.51	7.23
3 1/2	5 1/4"	6 3/4"	1 1/2"	7.76	10.3
4	6"	7 1/2"	1 1/2"	10.3	13.9
5	7 1/2"	9"	1 1/2"	17.0	23.4
6	9"	10 3/4"	1 3/4"	26.4	38.5
8	12"	13 3/4"	1 3/4"	51.4	75.6
10	15"	17"	2"	90	118
12	18"	20 1/2"	2 1/2"	134	171

ALL DIMENSIONS ARE IN INCHES
FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.
ALL SIZES CAN BE FURNISHED WITH LONG TANGENTS ON BOTH ENDS.
LARGER SIZE FITTINGS AND/OR HEAVIER WALLS ARE AVAILABLE ON SPECIAL ORDER BASIS .
FOR APPROXIMATE VOLUMES SEE 90° LONG RADIUS ELBOW SHEET
TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .



DIMENSIONAL TOLERANCES

Wall thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.

Outside diameter of fittings at beginning of bevel:
For sizes up to and including 2.5".....+0.06 / -0.03
For sizes 3" through 4".....+0.06 / -0.06
For sizes 5" through 8".....+0.09 / -0.06
For sizes 10" through 18".....+0.16 / 0.12
For sizes 20" and larger.....+0.25 / 0.19

Inside diameter of fittings at welding ends:

For sizes up to and including 2.5".....+/- 0.03
For sizes 3" through 8".....+/- 0.06
For sizes 10" through 18".....+/- 0.12
For sizes 20" and larger.....+/- 0.19

90° Elbows,

Center to end of bevel:

For sizes up to and including 8".....+/- 0.06
For sizes 10" through 24".....+/- 0.09
For sizes 26" through 30".....+/- 0.12
For sizes 32" and larger.....+/- 0.19

CARBON STEEL LAP JOINT STUB ENDS DIMENSIONS , WEIGHTS AND VOLUMES

ASME/ANSI B16.9 TABLE 7

A234

Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Length (2),(3)	Radius of Fillet (4)	Diameter of lap (5)	Outside Diameter of Barrel		STD WALL	SCH 40	XH	SCH 80	SCH 20	SCH 30	SCH 60	SCH 100	SCH 120	SCH 140	SCH 160	XXH	VOLUME CUBIC FEET	
					Max.	Min.														
	D	F	R	G			Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds		
1/2	0.84	3	0.12	1.38	0.896	0.809	0.3	0.3	0.32	0.32	-	-	-	-	-	-	-	-	0.68	0.003
3/4	1.05	3	0.12	1.69	1.106	1.019	0.4	0.4	0.44	0.44	-	-	-	-	-	-	-	-	0.77	0.005
1	1.32	4	0.12	2	1.376	1.284	0.66	0.66	0.85	0.85	-	-	-	-	-	-	-	1.13	1.47	0.009
1 1/4	1.66	4	0.19	2.5	1.716	1.629	0.91	0.91	1.21	1.21	-	-	-	-	-	-	-	1.51	2.13	0.014
1 1/2	1.9	4	0.25	2.88	1.965	1.869	1.22	1.22	1.49	1.49	-	-	-	-	-	-	-	2.02	2.69	0.019
2	2.38	6	0.31	3.62	2.456	2.344	2.19	2.19	3.01	3.01	-	-	-	-	-	-	-	4.51	5.5	0.046
2 1/2	2.88	6	0.31	4.12	2.966	2.844	3.45	3.45	4.59	4.59	-	-	-	-	-	-	-	6.02	8.31	0.059
3	3.5	6	0.38	5	3.596	3.469	4.71	4.71	6.27	6.27	-	-	-	-	-	-	-	8.8	11.6	0.087
3 1/2	4	6	0.38	5.5	4.096	3.969	5.54	5.54	6.58	6.58	-	-	-	-	-	-	-	-	14	0.105
4	4.5	6	0.44	6.19	4.469	4.293	6.7	6.7	9.33	9.33	-	-	-	-	11.8	-	-	14.1	17.2	0.133
5	5.56	8	0.44	7.31	5.683	5.532	11.7	11.7	16.6	16.6	-	-	-	-	21.5	-	-	26.4	31	0.247
6	6.62	8	0.5	8.5	6.743	6.594	15.2	15.2	23	23	-	-	-	-	29.2	-	-	36.4	43	0.334
8	8.62	8	0.5	10.62	8.743	8.594	23	23	35	35	17.9	19.8	28.7	40.8	48.9	55	60	58.6	58.6	0.522
10	10.75	10	0.5	12.75	10.913	10.719	40	40	53.6	63	27.1	33.3	53.3	75.2	87.3	102	113	-	-	0.793
12	12.75	10	0.5	15	12.913	12.719	49	52	65.8	87	32.8	43.2	72.2	106	125	139	160	-	-	1.302
14	14	12	0.5	16.25	14.17	13.969	64	73	89	123	53	64	99	-	-	-	-	-	-	1.834
16	16	12	0.5	18.5	16.18	15.969	72	97	96	161	60	72	127	-	-	-	-	-	-	2.38
18	18	12	0.5	21	18.19	17.969	85	126	112	205	71	99	166	-	-	-	-	-	-	3.06
20	20	12	0.5	23	20.24	19.969	94	147	125	251	94	125	198	-	-	-	-	-	-	3.67
22	22	12	0.5	25.25	22.24	21.969	105	-	139	-	-	-	-	-	-	-	-	-	-	4.43
24	24	12	0.5	27.25	24.24	23.969	113	205	151	359	113	170	288	-	-	-	-	-	-	5.16

Dimensions are in inches

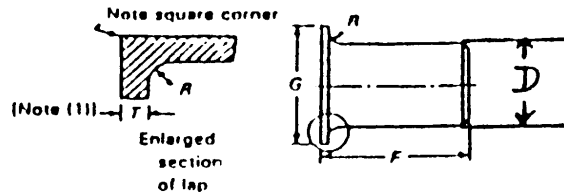
NOTES:

- (1) The minimum lap thickness T shall not be less than nominal pipe wall thickness
- (2) When used with the higher pressure flanges, it may be necessary to increase the length of stub ends in sizes NPS 12 and larger. Such increase in length shall be a matter of agreement between the manufacturer and purchaser.
- (3) When special facings such as tongue and groove, male and female, etc., are employed, additional lap thickness must be provided and such additional thickness shall be in addition to (not included in) the basic length F.
- (4) These dimensions conform to the radius established for lap joint flanges in ANSI B 16.5, Pipe Flanges and Flanged Fittings
- (5) This dimension conforms to standard machine facings shown in ANSI B 16.5. The back face of the lap shall be machined to conform to the surface on which it seats. Where ring joint facings are to be applied use dimension K as given in ANSI B 16.5.

Lap Joint Stub Ends can be furnished with any Standard facing.
Schedules 20,30,40,60,100,120,140,160, are not made.
5" and 6" schedules 60 and 3 1/2" SCH 160 are not made.
22" schedules 20,30,40,60,100,120,140,160 are not made.
Double extra heavy is not produced above 8".
Volume(s) based on assuming each fitting being a solid cube.

For O.D. and wall thicknesses see pipe chart section.

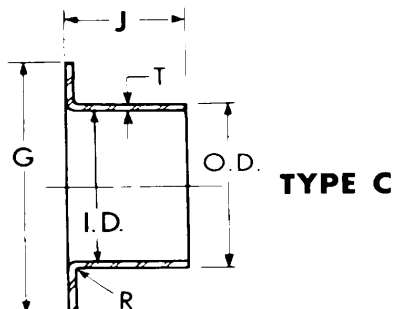
To convert pounds to kilograms divide by 2.2 .
To convert cubic feet to cubic meters divide by 35.31 .



DIMENSIONAL TOLERANCES

- Wall Thickness** of fittings at any point shall not be less than 87.5% of the normal thickness.
- Outside Diameter** of fittings at beginning of bevel:
 For sizes up to and including 2.5"+0.06 -0.03
 For sizes 3" through 4"+0.06 -0.06
 For sizes 5" through 8"+0.09 -0.06
 For sizes 10" through 18"+0.16 -0.12
 For sizes 20" and larger+0.25 -0.19
- Inside Diameter** of fittings at weld ends:
 For sizes up to and including 2.5"+/-0.03
 For sizes 3" through 8"+/-0.06
 For sizes 10" through 18"+/-0.12
 For sizes 20" and larger+/-0.19
- LAP JOINT STUB ENDS**
 For sizes up to and including 8"+/-0.06
 For sizes 10" through 24"+/-0.09
 For sizes 26" and larger+/-0.19
- Fillet Radius:**
 For sizes up to and including 3.5"+0
 For sizes 4" and larger+0
 +0.03
 +0.06
- Thickness Of Lap:**
 For sizes up to and including 8"+0
 For sizes 10" and larger+0
 -0.03
 -0.06

STUB ENDS



STAINLESS STEELS : TYPES 304L,316L,

NOM. PIPE SIZE	OUTSIDE DIAMETER (O.D.)	DIAMETER (G)	LENGTH (J)	RADIUS (R)	SCHEDULE 5S FEATHERWEIGHT			SCHEDULE 10S LIGHT I.P.S.		
					INSIDE DIAMETER (I.D.)	WALL THICKNESS (T)	APPROX. WT. IN POUNDS	INSIDE DIAMETER (I.D.)	WALL THICKNESS (T)	APPROX. WT. IN POUNDS
1/2	0.840	1 3/8	2	1/32	0.710	0.065	0.13	0.674	0.083	0.14
3/4	1.050	1 11/16	2	1/32	0.920	0.065	0.14	0.884	0.083	0.18
1	1.315	2	2	1/32	1.185	0.065	0.19	1.097	0.109	0.31
1 1/4	1.660	2 1/2	2	1/32	1.530	0.065	0.21	1.442	0.109	0.42
1 1/2	1.900	2 7/8	2	1/32	1.770	0.065	0.29	1.682	0.109	0.44
2	2.375	3 5/8	2 1/2	1/32	2.245	0.065	0.44	2.157	0.109	0.81
2 1/2	2.875	4 1/8	2 1/2	1/32	2.709	0.083	0.75	2.635	0.120	1.00
3	3.500	5	2 1/2	1/32	3.334	0.083	0.94	3.260	0.120	1.25
4	4.500	6 3/16	3	1/32	4.334	0.083	1.38	4.260	0.120	1.88
5	5.563	7 5/16	3	1/16	5.345	0.109	2.06	5.295	0.134	2.63
6	6.625	8 1/2	3 1/2	1/16	6.407	0.109	2.75	6.357	0.134	3.56
8	8.625	10 5/8	4	1/16	8.407	0.109	3.88	8.329	0.148	6.19
10	10.750	12 3/4	5	1/16	10.482	0.134	7.48	10.420	0.165	9.46
12	12.750	15	6	1/16	12.438	0.156	15.00	12.390	0.180	16.07
14	14.000	16 1/4	6	1/16	13.688	0.156	19.20	13.624	0.188	23.10
16	16.000	18 1/2	6	1/16	15.670	0.165	23.90	15.624	0.188	27.20
18	18.000	21	6	1/16	17.670	0.165	28.50	17.624	0.188	32.40
20	20.000	23	6	1/16	19.624	0.188	36.30	19.564	0.218	47.70
24	24.000	27 1/4	6	1/16	23.564	0.218	56.00	23.500	0.250	58.27

TYPE "C" STUB ENDS ARE AVAILABLE IN SHORT LENGTH ONLY ,IN SCHEDULE 5S AND 10S .

THE TYPE "C" STUB END IS MADE FROM TUBING , AND WITH THE LAP ROLLED OVER.

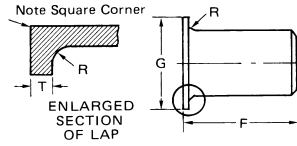
THE LAP FACE IS NOT MACHINED; IT IS FORMED TO A PLANE SURFACE WHICH IS SUITABLE FOR APPLICATIONS WHERE AN ECONOMY -TYPE STUB END IS DESIRED.

STUB ENDS

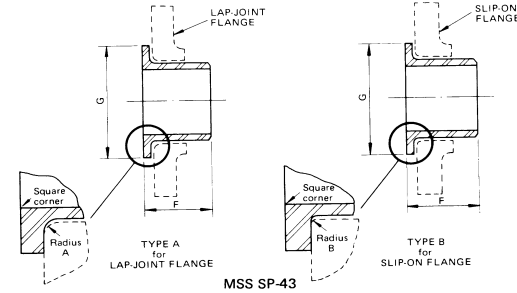
All schedules of Short (MSS Length) Stub Ends are supplied in Type A or Type B. Type A is more readily available.



Schedules 5S and 10S Stub Ends are usually supplied in Short Lengths; Long Lengths are available on special order. Schedule 40S Stub Ends are supplied in either Short or Long Lengths.



ASME B16.9



MSS SP-43

NOM. PIPE SIZE	OUTSIDE DIAMETER (O.D.)	DIAMETER (G)	LENGTH (J)	RADIUS		INSIDE DIAMETER (I.D.)	WALL THICKNESS (T)	LAP THICKNESS (t)	APPROX. WT. IN POUNDS	SCHEDULE 10S LIGHT I.P.S			SCHEDULE 40S STANDARD I.P.S				
				A	B					INSIDE DIAMETER (I.D.)	WALL THICKNESS (T)	LAP THICKNESS (t)	APPROX. WT. IN POUNDS	INSIDE DIAMETER (I.D.)	WALL THICKNESS (T)	LAP THICKNESS (t)	APPROX. WT. IN POUNDS
1/2	0.840	1 3/8	2	1/8	1/32	0.710	0.065	0.065	0.14	0.674	0.083	0.083	0.16	0.622	0.109	0.109	0.19
3/4	1.050	1 11/16	2	1/8	1/32	0.920	0.065	0.065	0.18	0.884	0.083	0.083	0.21	0.824	0.113	0.113	0.26
1	1.315	2	2	1/8	1/32	1.185	0.065	0.065	0.25	1.097	0.109	0.109	0.35	1.049	0.133	0.133	0.38
1 1/4	1.660	2 1/2	2	3/16	1/32	1.530	0.065	0.065	0.39	1.442	0.109	0.109	0.49	1.380	0.140	0.140	0.55
1 1/2	1.900	2 7/8	2	1/4	1/32	1.770	0.065	0.065	0.41	1.682	0.109	0.109	0.56	1.610	0.145	0.145	0.69
2	2.375	3 5/8	2 1/2	5/16	1/32	2.245	0.065	0.065	0.71	2.157	0.109	0.109	0.94	2.067	0.154	0.154	1.35
2 1/2	2.875	4 1/8	2 1/2	5/16	1/32	2.709	0.083	0.083	0.95	2.635	0.120	0.120	1.25	2.469	0.203	0.203	1.77
3	3.500	5	2 1/2	3/8	1/32	3.334	0.083	0.083	1.23	3.260	0.120	0.120	1.60	3.068	0.216	0.216	2.50
3 1/2	4.000	5 1/2	3	3/8	1/32	3.834	0.083	0.083	1.63	3.760	0.120	0.120	1.90	3.548	0.226	0.226	3.58
4	4.500	6 3/16	3	7/16	1/32	4.334	0.083	0.083	1.90	4.260	0.120	0.120	2.40	4.026	0.237	0.237	4.13
5	5.563	7 5/16	3	7/16	1/16	5.345	0.109	0.109	2.80	5.295	0.134	0.134	3.25	5.047	0.258	0.258	6.15
6	6.625	8 1/2	3 1/2	1/2	1/16	6.407	0.109	0.109	3.88	6.357	0.134	0.134	4.75	6.065	0.280	0.280	7.88
8	8.625	10 5/8	4	1/2	1/16	8.407	0.109	0.109	5.90	8.329	0.148	0.148	7.10	7.981	0.322	0.322	13.38
10	10.750	12 3/4	5	1/2	1/16	10.482	0.134	0.134	8.90	10.420	0.165	0.165	11.30	10.020	0.365	0.365	22.20
12	12.750	15	6	1/2	1/16	12.438	0.156	0.156	15.30	12.390	0.180	0.180	18.00	12.000	0.375	0.375	31.50
14	14.000	16 1/4	6	1/2	1/16	13.688	0.156	0.156	19.00	13.624	0.188	0.188	24.00	13.250	0.375	0.375	37.80
16	16.000	18 1/2	6	1/2	1/16	15.670	0.165	0.165	25.00	15.624	0.188	0.188	28.00	15.250	0.375	0.375	45.00
18	18.000	21	6	1/2	1/16	17.670	0.165	0.165	34.00	17.624	0.188	0.188	38.00	17.250	0.375	0.375	60.00
20	20.000	23	6	1/2	1/16	19.624	0.188	0.188	43.00	19.564	0.218	0.218	48.00	19.250	0.375	0.375	66.00
24	24.000	27 1/4	6	1/2	1/16	23.564	0.218	0.218	57.00	23.500	0.250	0.250	60.00	23.250	0.375	0.375	85.00

ALL DIMENSION ARE INCHES.

FOR WEIGHTS ,DIMENSIONS AND VOLUMES OF STAINLESS STEEL A.S.A LONG LENGTH STUB ENDS USE CARBON STEEL CHART

THE BASIC MINIMUM LAP THICKNESS IN ALL SCHEDULES SHALL BE LESS THAN SHOWN ABOVE .

CARBON STEEL

180° SHORT RADIUS SEAMLESS RETURN BENDS

CENTER TO CENTER AND BACK TO FACE DIMENSIONS, WEIGHTS AND VOLUMES

ASTM A234			M.SS SP 43										Volume Cubic Feet
Nominal Pipe Size	Center to Center U	Back to Face V	STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	
			Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds
1/2	3.0"	1 7/8"	0.26	0.26	-	-	-	-	-	-	-	-	-
3/4	2 1/4"	1 11/16"	0.41	0.41	-	-	-	-	-	-	-	-	-
1	2.0"	1 5/8"	0.46	0.46	-	-	-	-	-	-	-	-	0.004
1 1/4	2 1/2"	2 1/16"	0.78	0.78	-	-	-	-	-	-	-	-	0.008
1 1/2	3.0"	2 7/16"	1.12	1.12	1.5	1.5	-	-	-	-	-	-	0.014
2	4.0"	3 3/16"	2	2	2.76	2.76	-	-	-	-	-	-	0.028
2 1/2	5.0"	3 15/16"	3.96	3.96	5.28	5.28	-	-	-	-	-	-	0.068
3	6.0"	4 3/4"	6.24	6.24	8.44	8.44	-	-	-	-	-	-	0.092
3 1/2	7.0"	5 1/2"	8.76	8.76	12.1	12.1	-	-	-	-	-	-	0.14
4	8.0"	6 1/4"	11.9	11.9	16.5	16.5	-	-	-	-	20.8	-	0.204
5	10"	7 3/4"	20.2	20.2	28.6	28.6	-	-	-	-	37.2	-	0.39
6	12"	9 5/16"	31.2	31.2	47	47	-	-	-	-	60	-	0.664
8	16"	12 5/16"	63	63	95	95	48.8	54	78	112	133	149	1.514
10	20"	15 3/8"	111	111	150	177	76.4	94	150	212	246	286	2.942
12	24"	18 3/8"	164	176	216	292	109	145	242	354	414	462	4.98
14	28"	21"	210	244	278	410	175	210	326	532	610	688	7.14
16	32"	24"	276	364	364	600	230	276	472	754	892	1028	10.66
18	36"	27"	350	518	462	844	292	410	680	1082	1138	1430	15.18
20	40"	30"	430	676	572	1146	-	572	914	1492	1706	1958	20.84
22	-	-	-	-	-	-	-	-	-	-	-	-	27.72
24	48"	36"	626	1128	830	1954	-	940	1566	2530	2946	3300	36
26	-	-	-	-	-	-	-	-	-	-	-	-	45.89
30	60"	45"	976	-	1298	-	-	1622	-	-	-	-	70.32
36	72"	54"	1387	-	1838	-	-	-	-	-	-	-	121.5

NOTE:

ALL DIMENSIONS ARE IN INCHES
 FOR O.D. AND WALL THICKNESS SEE PIPE CHART SECTION.
 FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE
 WITH THE WELD SEAM 100% XRAYED.
 SCHEDULES 20, 30, 100, 140 ARE NOT PRODUCED BELOW 8".
 SCHEDULES 60 AND 120 ARE NOT PRODUCED BELOW 4".
 5" AND 6" SCHEDULE 60 AND 3 1/2 SCH 160 ARE NOT MADE.
 22" SCHEDULES 20, 30, 40, 60, 100, 120, 140, 160, ARE NOT MADE.
 DOUBLE EXTRA HEAVY IS NOT PRODUCED ABOVE 8".
 VOLUMES ARE BASED ON ASSUMING EACH FITTING BEING A SOLID CUBE.
 EXTRA HEAVY- 1/2"-3/4"-1"-1 1/4" NOT MADE
 SCHEDULES: 10, 160, AND DOUBLE EXTRA HEAVY IN SIZES 1/2" TO 8"
 ARE AVAILABLE ON A SPECIAL ORDER BASIS.
 "A" EQUALS HALF OF "U".

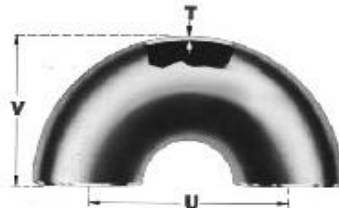
TO CONVERT POUNDS TO KILOGRAMS DIVIDE BY 2.2 .
 TO CONVERT CUBIC FEET TO CUBIC METERS DIVIDE BY 35.31 .

DIMENSIONAL TOLERANCES

Wall Thickness of fittings at any point shall not be less than 87.5% of the nominal thickness.
 Outside Diameter of fittings at beginning of bevel :
 For sizes up to and including 2.5".....+0.06 -0.03
 For sizes 3" through 4".....+0.06 -0.06
 For sizes 5" through 8".....+0.09 -0.06
 For sizes 10" through 18".....+0.16 -0.12
 For sizes 20" and larger.....+0.25 -0.19
 Inside Diameter of fittings at welding ends:
 For sizes up to and including 2.5".....+/-0.03
 For sizes 3" through 8"+/-0.06
 For sizes 10" through 18".....+/-0.12
 For sizes 20" and larger.....+/-0.19
 Welding Bevel for details of bevels for both welding fittings and Welding Neck Flanges, see drawings.






180° RETURNS

Centre-to-Centre: For sizes up to and including 8".....+/-0.25
 Centre-to-Centre: For sizes 10" and larger.....+/-0.38
 Back to Face: For all sizes.....+/-0.25
 Alignment of Ends: For sizes up to and including 8".....+/-0.03
 Alignment of Ends: For sizes 10" through 24".....+/-0.06
 Alignment of Ends: For sizes 26" and larger.....+/-0.09



Forged Steel Fittings CLASS 3000 THREADED



	NPS DN		1/8 6	1/4 8	3/8 10	1/2 15	3/4 20	1 25	1 1/4 32	1 1/2 40	2 50	2 1/2 65	3 80	4 100	
90° ELBOWS															
	A	in	0.97*	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.50	
	A	mm	25	25	28	33	38	44	51	60	64	83	95	114	
	H	in	1.00*	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	6.00	
	H	mm	25	25	33	38	46	56	62	75	84	102	121	152	
	App. Wt./100 pcs.	lb		38	38	63	88	138	225	260	490	519	1050	1444	3038
		kg		17	17	29	40	63	102	118	223	236	477	656	1381
45° ELBOWS															
	C	in	0.75*	0.75	0.88	1.00	1.12	1.31	1.38	1.69	1.72	2.06	2.50	3.12	
	C	mm	19	19	22	25	28	33	35	43	44	52	64	79	
	H	in	1.00*	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	6.00	
	H	mm	25	25	33	38	46	56	62	75	84	102	121	152	
	App. Wt./100 pcs.	lb		25	25	52	68	119	188	213	400	440	738	1178	1906
		kg		12	12	24	31	54	86	97	182	200	336	536	867
TEES															
	A	in	0.97*	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.50	
	A	mm	25	25	28	33	38	44	51	60	64	83	95	114	
	H	in	1.00*	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	6.00	
	H	mm	25	25	33	38	46	56	62	75	84	102	121	152	
	App. Wt./100 pcs.	lb		38	38	81	119	188	310	350	640	686	1313	2038	3950
		kg		17	17	37	54	86	141	159	291	312	587	927	1796
CROSSES															
	A	in	0.97*	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.50	
	A	mm	25	25	28	33	38	44	51	60	64	83	95	114	
	H	in	1.00*	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	6.00	
	H	mm	25	25	33	38	46	56	62	75	84	102	121	152	
	App. Wt./100 pcs.	lb		38	38	100	150	250	356	413	650	813	1675	1975	3200
		kg		17	17	46	69	114	162	188	296	370	762	898	1455
STREET ELBOWS															
	A	in	0.97	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.50	
	A	mm	25	25	28	33	38	44	51	60	64	83	95	114	
	G	in	1.25	1.25	1.50	1.69	1.94	2.31	2.69	2.81	3.38	-	-	-	
	G	mm	32	32	38	43	48	59	68	71	86	-	-	-	
	H	in	1.00	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	6.00	
	H	mm	25	25	33	38	46	56	62	75	84	102	121	152	
	App. Wt./100 pcs.	lb		25	25	38	55	88	144	250	425	519	-	-	-
		kg		12	12	17	25	40	66	114	194	236	-	-	-

*Larger than ASME B16.11 dimension.

FORGED STEEL FITTINGS CLASS 3000 THREADED








		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
		DN	6	8	10	15	20	25	32	40	50	65	80	100	
LATERALS															
	A	in	-	1.88	2.12	2.56	3.00	3.50	3.94	4.75	-	-	-	-	
	A	mm	-	48	54	65	76	89	100	121	-	-	-	-	
	H	in	-	1.06	1.31	1.50	1.81	2.19	2.44	2.97	-	-	-	-	
	H	mm	-	27	33	38	46	56	62	75	-	-	-	-	
	K	in	-	0.81	0.88	1.00	1.12	1.31	1.44	1.68	-	-	-	-	
	K	mm	-	21	22	25	28	33	37	43	-	-	-	-	
App. Wt./100 pcs.			lb	-	-	175	275	463	550	1081	-	-	-	-	
			kg	-	-	80	125	211	250	492	-	-	-	-	
COUPLINGS															
	D	in	0.75*	0.75	0.88	1.12	1.38	1.75	2.25	2.50	3.00	3.62	4.25	5.50	
	D	mm	19	19	22	28	35	44	57	64	76	92	108	140	
	W	in	1.25	1.38	1.50	1.88	2.00	2.38	2.62	3.12	3.38	3.62	4.25	4.75	
	W	mm	32	35	38	48	51	60	67	79	86	92	108	121	
	App. Wt./100 pcs.			lb	12	10	13	29	42	84	156	211	300	460	650
				kg	6	5	6	13	19	38	71	96	136	209	296
HALF COUPLINGS															
	D	in	0.75*	0.75	0.88	1.12	1.38	1.75	2.25	2.50	3.00	3.62	4.25	5.50	
	D	mm	19	19	22	28	35	44	57	64	76	92	108	140	
	W/2	in	0.62	0.69	0.75	0.94	1.00	1.19	1.31	1.56	1.69	1.81	2.13	2.38	
	W/2	mm	16	18	19	24	25	30	33	40	43	46	54	60	
	App. Wt./100 pcs.			lb	5	4	6	13	18	38	72	99	139	215	306
				kg	2.3	2	3	6	8	17	33	45	63	98	139
REDUCING COUPLINGS															
	D	in	0.75*	0.75	0.88	1.12	1.38	1.75	2.25	2.50	3.00	3.62	4.25	5.50	
	D	mm	19	19	22	28	35	44	57	64	76	92	108	140	
	W	in	-	1.38	1.50	1.88	2.00	2.38	2.62	3.12	3.38	3.62	4.25	4.75	
	W	mm	-	35	38	48	51	60	67	79	86	92	108	121	
		NPS	-	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/4	3/4	3/4	1 1/2	
		DN	-	6	6	6	6	6	8	8	8	20	20	40	
App. Wt./100 pcs.			lb	-	10	13	29	42	84	156	211	300	460	650	
			kg	-	5	6	13	19	38	71	96	136	209	296	
PIPE CAPS															
	D	in	0.75*	0.75	0.88	1.12	1.38	1.75	2.25	2.50	3.00	3.62	4.25	5.50	
	D	mm	19	19	22	28	35	44	57	64	76	92	108	140	
	P	in	0.75	1.00	1.00	1.25	1.44	1.62	1.75	1.75	1.88	2.38	2.56	2.69	
	P	mm	19	25	25	32	37	41	44	44	48	60	65	68	
	App. Wt./100 pcs.			lb	6	9	13	25	41	75	125	150	260	500	850
				kg	3	4	6	14	19	34	57	68	118	228	387

*Larger than ASME B16.11 dimension.

Forged Steel Fittings CLASS 6000 THREADED



		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
		DN	6	8	10	15	20	25	32	40	50	65	80	100	
90° ELBOWS															
	A	in	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.19	4.50	
	A	mm	25	28	33	38	44	51	60	64	83	95	106	114	
	H	in	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	5.75	6.00	
	H	mm	25	33	38	46	56	62	75	84	102	121	146	152	
		lb		25	63	106	163	250	325	650	725	1325	2088	3456	—
		kg		11	29	48	74	114	148	296	330	602	949	1771	—
45° ELBOWS															
	C	in	0.75	0.88	1.00	1.12	1.31	1.38	1.69	1.72	2.06	2.50	3.12	3.12	
	C	mm	19	22	25	28	33	35	43	44	52	64	79	79	
	H	in	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	5.75	6.00	
	H	mm	25	33	38	46	56	62	75	84	102	121	146	152	
		lb		25	59	88	144	219	269	469	575	950	1500	3056	—
		kg		11	27	40	66	100	123	214	262	432	682	1389	—
TEES															
	A	in	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.19	4.50	
	A	mm	25	28	33	38	44	51	60	64	83	95	106	114	
	H	in	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	5.75	6.00	
	H	mm	25	33	38	46	56	62	75	84	102	121	146	152	
		lb		50	100	138	213	363	463	763	963	1888	2806	4563	—
		kg		23	46	63	97	165	211	347	438	858	1276	2074	—
CROSSES															
	A	in	0.97	1.12	1.31	1.50	1.75	2.00	2.38	2.50	3.25	3.75	4.19	—	
	A	mm	25	28	33	38	44	51	60	64	83	95	106	—	
	H	in	1.00	1.31	1.50	1.81	2.19	2.44	2.97	3.31	4.00	4.75	5.75	—	
	H	mm	25	33	38	46	56	62	75	84	102	121	146	—	
		lb		56	119	150	275	431	563	1075	1150	2219	2750	5400	—
		kg		26	54	68	125	196	256	489	523	1009	1250	2955	—
STREET ELBOWS															
	A	in	—	1.00	1.12	1.38	1.75	2.00	2.12	2.50	—	—	—	—	
	A	mm	—	25	28	35	44	51	54	64	—	—	—	—	
	G	in	—	1.50	1.63	1.88	2.25	2.62	2.81	3.31	—	—	—	—	
	G	mm	—	38	41	48	57	67	71	84	—	—	—	—	
	H	in	—	1.25	1.50	1.75	2.00	2.44	2.75	3.31	—	—	—	—	
	H	mm	—	32	38	44	51	62	70	84	—	—	—	—	
		lb	—	37	45	100	162	250	368	644	—	—	—	—	
		kg	—	17	21	46	74	114	168	293	—	—	—	—	

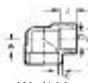

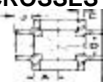

FORGED STEEL FITTINGS CLASS 6000 THREADED



		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
		DN	6	8	10	15	20	25	32	40	50	65	80	100
LATERALS														
<p>App. Wt./100 pcs.</p>	A	in	—	—	2.56	3.00	3.56	4.00	4.75	—	—	—	—	—
	A	mm	—	—	65	76	90	102	121	—	—	—	—	—
	H	in	—	—	1.50	1.81	2.19	2.44	2.88	—	—	—	—	—
	H	mm	—	—	38	46	56	62	73	—	—	—	—	—
	K	in	—	—	1.00	1.25	1.38	1.50	1.75	—	—	—	—	—
	K	mm	—	—	25	32	35	38	44	—	—	—	—	—
COUPLINGS														
<p>App. Wt./100 pcs.</p>	D	in	0.88	1.00	1.25	1.50	1.75	2.25	2.50	3.00	3.62	4.25	5.00	6.25
	D	mm	22	25	32	38	44	57	64	76	92	108	127	159
	W	in	1.25	1.38	1.50	1.88	2.00	2.38	2.62	3.12	3.38	3.62	4.25	4.75
	W	mm	32	35	38	48	51	60	67	79	86	92	108	121
		lb	18	23	40	69	95	192	230	375	537	890	1345	2425
HALF COUPLINGS														
<p>App. Wt./100 pcs.</p>	D	in	0.88	1.00	1.25	1.50	1.75	2.25	2.50	3.00	3.62	4.25	5.00	6.25
	D	mm	22	25	32	38	44	57	64	76	92	108	127	159
	W/2	in	0.62	0.69	0.75	0.94	1.00	1.19	1.31	1.56	1.69	1.81	2.13	2.38
	W/2	mm	16	18	19	24	25	30	33	40	43	46	54	60
		lb	8	10	18	33	45	86	110	180	260	430	650	1180
PIPE CAPS														
<p>App. Wt./100 pcs.</p>	D	in	0.88	1.00	1.25	1.50	1.75	2.25	2.50	3.00	3.62	4.25	5.00	6.25
	D	mm	22	25	32	38	44	57	64	76	92	108	127	159
	P	in	—	1.06	1.06	1.31	1.50	1.69	1.81	1.88	2.00	2.50	2.69	2.97
	P	mm	—	27	27	33	38	43	46	48	51	64	68	75
		lb	15	18	25	56	75	140	220	290	520	660	960	1700
REDUCING COUPLINGS														
<p>App. Wt./100 pcs.</p>	D	in	—	1.00	1.25	1.50	1.75	2.25	2.50	3.00	3.62	4.25	5.00	6.25
	D	mm	—	25	32	38	44	57	64	76	92	108	127	159
	W	in	—	1.38	1.50	1.88	2.00	2.38	2.62	3.12	3.38	3.62	4.25	4.75
	W	mm	—	35	38	48	51	60	67	79	86	92	108	121
		NPS	—	1/8	1/8	1/8	1/4	1/4	1/2	3/4	3/4	1 1/4	1 1/2	2
		DN	—	6	6	6	8	8	15	20	20	32	40	50
		lb	—	23	40	69	95	192	230	375	537	890	1345	2425
		kg	—	11	18	32	44	88	105	171	244	405	612	1103

Forged Steel Fittings CLASS 3000 SOCKET-WELDING

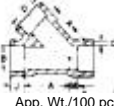
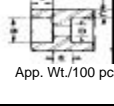
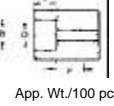
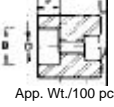
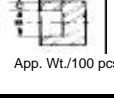


		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
		DN	6	8	10	15	20	25	32	40	50	65	80	100
COMMON DIMENSIONS		in	0.42	0.555	0.69	0.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
	B (Socket Dia.)	.440	.575	.710	.875	1.085	1.350	1.695	1.935	2.426	2.931	3.560	4.570	
		mm	10.67	14.10	17.53	21.72	27.05	33.78	42.55	48.64	61.11	73.81	89.79	115.44
		mm	11.18	14.61	18.03	22.23	27.56	34.29	43.05	49.15	61.62	74.45	90.42	116.08
	C (Min.)	in	0.13	0.13	0.14	0.16	0.17	0.20	0.21	0.22	0.24	0.30	0.33	0.37
		mm	3.30	3.30	3.56	4.06	4.32	5.08	5.33	5.59	6.10	7.62	8.38	9.40
		in	0.239	0.334	0.463	0.592	0.794	1.019	1.350	1.580	2.037	2.409	3.008	3.966
	D (Bore Dia.)	.299	.394	.523	.562	.854	1.079	1.410	1.640	2.097	2.529	3.128	4.086	
		mm	6.07	8.48	11.76	15.04	21.07	25.88	34.29	40.13	51.74	61.19	76.40	100.74
		mm	7.59	10.00	13.28	16.56	21.69	27.40	35.81	41.66	53.26	64.24	79.45	103.78
J (Min. Socket Depth)	in	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.62	0.75	
	mm	9.65	9.65	9.65	9.65	12.70	12.70	12.70	12.70	15.75	15.75	15.75	19.05	
90° ELBOWS														
	A (Nominal)	in	0.44	0.44	0.53	0.62	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.62
		mm	11	11	13	16	19	22	27	32	38	41	57	67
App. Wt./100 pcs.		lb	13	13	25	50	69	106	163	213	290	638	1088	2369
		kg	6	6	12	23	32	48	74	97	132	290	495	1077
45° ELBOWS														
	A (Nominal)	in	0.31	0.31	0.31	0.44	0.50	0.56	0.69	0.81	1.00	1.12	1.25	1.62
		mm	8	8	8	11	13	14	18	21	25	28	32	41
App. Wt./100 pcs.		in	13	13	19	38	50	88	125	163	269	675	1050	1819
		mm	6	6	9	17	23	40	57	74	123	307	478	827
CROSSES														
	A	in	0.44	0.44	0.53	0.62	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.62
		mm	11	11	13	16	19	22	27	32	38	41	57	67
App. Wt./100 pcs.		lb	25	25	34	69	88	144	213	263	444	888	1369	2844
		kg	12	12	16	32	44	66	97	120	202	404	623	1293
TEE														
	A	in	0.44	0.44	0.53	0.62	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.62
		mm	11	11	13	16	19	22	27	32	38	41	57	67
App. Wt./100 pcs.		lb	25	31	31	81	113	156	244	325	550	1581	2019	3150
		kg	12	14	14	37	52	71	111	148	250	719	918	1432

When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in. / 1.6 mm away from contact with the bottom of the socket before starting the weld.

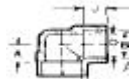



FORGED STEEL FITTINGS CLASS 3000 SOCKET-WELDING



		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
		DN	6	8	10	15	20	25	32	40	50	65	80	100
COMMON DIMENSIONS	B (Socket Dia.)	in	0.42	0.555	0.69	0.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
		mm	.440	.575	.710	.875	1.085	1.35	1.695	1.935	2.426	2.931	3.560	4.570
	C (Min.)	in	10.6	14.1	17.53	21.72	27.05	33.78	42.55	48.64	61.11	73.81	89.79	115.44
		mm	11	14.6	18.03	22.23	27.56	34.29	43.05	49.15	61.62	74.45	90.42	116.08
	D (Bore Dia.)	in	0.13	0.13	0.14	0.16	0.17	0.20	0.21	0.22	0.24	0.30	0.33	0.37
		mm	3.30	3.30	3.56	4.06	4.32	5.08	5.33	5.59	6.10	7.62	8.38	9.40
	J (Min. Socket Depth)	in	0.239	0.334	0.463	0.592	0.794	1.019	1.350	1.580	2.037	2.409	3.008	3.966
		mm	.299	.394	.523	.652	.854	1.079	1.410	1.640	2.097	2.529	3.128	4.086
		in	6.07	8.48	11.76	15.04	21.07	25.88	34.29	40.18	51.74	61.19	76.40	100.74
		mm	7.59	10.00	13.28	16.56	21.69	27.4	35.81	41.66	53.26	64.24	79.45	103.78
	in	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.62	0.75	
	mm	9.65	9.65	9.65	9.65	12.70	12.70	12.70	12.70	15.75	15.75	15.75	19.05	
LATERALS 	A (Nominal)	in	—	—	—	1.63	2.00	2.38	2.81	3.19	3.88	—	—	—
		mm	—	—	—	41	51	60	71	81	99	—	—	—
	M	in	—	—	—	0.38	0.44	.50	0.63	0.69	0.81	—	—	—
		mm	—	—	—	10	11	13	16	18	21	—	—	—
	App. Wt./100 pcs.	lb	—	—	—	100	175	238	375	500	775	—	—	—
		kg	—	—	—	46	80	109	171	228	353	—	—	—
COUPLINGS 	E	in	0.25	0.25	0.25	0.38	0.38	0.50	0.50	0.50	0.75	0.75	0.75	0.75
		mm	6	6	6	10	10	13	13	13	19	19	19	19
	App. Wt./100 pcs.	lb	10	12	20	23	39	68	84	93	161	237	313	507
		kg	5	6	9	11	18	31	38	43	74	108	143	231
HALF COUPLINGS 	F	in	0.62	0.62	0.69	0.88	0.94	1.12	1.19	1.25	1.62	1.69	1.75	1.88
		mm	16	16	18	22	24	28	30	32	41	43	45	48
	App. Wt./100 pcs.	lb	11	14	24	31	47	84	112	132	218	341	486	749
		kg	5	7	11	14	22	38	51	60	99	155	221	341
REDUCING COUPLINGS 	E	in	—	0.25	0.25	0.38	0.38	0.50	0.50	0.50	0.75	0.75	0.75	0.75
		mm	—	6	6	10	10	13	13	13	19	19	19	19
	App. Wt./100 pcs.	NPS	—	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/2	1/2	1 1/2	2
		DN	—	6	6	6	6	6	8	8	15	15	40	50
		lb	—	12	20	23	39	68	84	93	161	237	313	507
	kg	—	6	10	11	18	31	38	43	74	108	143	231	
PIPE CAPS 	K Min.	in	0.19	0.19	0.19	0.25	0.25	0.38	0.38	0.44	0.50	0.62	0.75	0.88
		mm	5	5	5	6	6	10	10	11	13	16	19	22
	App. Wt./100 pcs.	lb	6	9	17	22	35	60	93	115	192	280	475	844
		kg	3	4	8	10	16	28	43	53	88	128	216	384

FORGED STEEL FITTINGS CLASS 600 SOCKET-WELDING

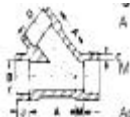
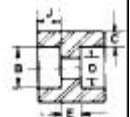
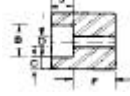
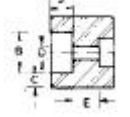
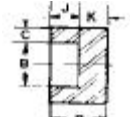


NPS		1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
DN		6	8	10	15	20	25	32	40	50	65	80	100	
COMMON DIMENSIONS														
B (Socket Dia.)	in	0.42	0.555	0.69	0.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545	
	mm	.440	.575	.710	.875	1.085	1.350	1.695	1.935	2.426	2.931	3.560	4.570	
C (Min.)	in	10.67	14.10	17.53	21.72	27.05	33.78	42.55	48.64	61.11	73.81	89.79	115.44	
	mm	11.18	14.61	18.03	22.23	27.56	34.29	43.05	49.15	61.62	74.45	90.42	116.08	
D (Bore Dia.)	in	0.14	0.16	0.17	0.20	0.24	0.27	0.27	0.31	0.37	0.41	0.48	0.58	
	mm	3.56	4.06	4.32	5.08	6.10	6.86	6.86	7.87	9.40	10.41	12.19	14.73	
J (Min. Socket Depth)	in	0.126	.220	0.329	0.434	0.582	0.785	1.130	1.308	1.657	2.056	2.564	3.378	
	mm	.189	.280	.389	.494	.642	.845	1.190	1.368	1.717	2.185	2.684	3.498	
	in	3.20	5.59	8.36	11.03	14.78	19.94	28.70	33.22	42.01	52.45	65.13	85.80	
	mm	4.80	7.11	9.88	12.55	16.31	21.46	30.23	34.77	43.61	55.50	68.17	88.85	
	in	0.38	0.38	0.38	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.62	0.75	
	mm	9.65	9.65	9.65	9.65	12.70	12.70	12.70	12.70	15.75	15.75	15.75	19.05	
90° ELBOWS														
	A (Nominal)	in	0.44	0.53	0.62	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.50	2.62
		mm	11	13	16	19	22	27	32	38	41	57	64	67
App. Wt./100 pcs.	lb	-	-	-	88	144	250	325	531	638	1200	1938	3638	
	kg	-	-	-	40	66	114	148	242	290	546	881	1654	
45° ELBOWS														
	A (Nominal)	in	0.31	0.31	0.44	0.50	0.56	0.69	0.81	1.00	1.12	1.25	1.38	1.58
		mm	8	8	11	13	14	18	21	25	28	32	35	40
App. Wt./100 pcs.	lb	-	-	-	69	131	200	263	475	588	713	1231	2700	
	kg	-	-	-	32	60	91	120	216	268	324	560	1228	
TEE														
	A	in	-	-	-	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.50	2.62
		mm	-	-	-	19	22	27	32	38	41	57	64	67
App. Wt./100 pcs.	lb	-	-	-	106	206	338	431	781	869	1663	2381	4532	
	kg	-	-	-	49	94	154	196	355	395	756	1083	2060	
CROSSES														
	A	in	-	-	-	0.75	0.88	1.06	1.25	1.50	1.62	2.25	2.50	2.62
		mm	-	-	-	19	22	27	32	38	41	57	64	67
App. Wt./100 pcs.	lb	-	-	-	125	250	400	513	900	950	1988	2950	4150	
	kg	-	-	-	57	114	182	234	409	432	904	1341	1887	

When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in. / 1.6 mm away from contact with the bottom of the socket before starting the weld.

Forged Steel Fittings CLASS 6000 SOCKET-WELDING



		NPS	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
		DN	15	20	25	32	40	50	65	80	100	
COMMON DIMENSIONS	B (Socket Dia.)	in	0.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545	
			.875	1.085	1.350	1.695	1.935	2.426	2.931	3.560	4.570	
		mm	21.72	27.05	33.78	42.55	48.64	61.11	73.81	89.79	115.44	
	C (Min.)	in	0.20	0.24	0.27	0.27	0.31	0.37	0.41	0.48	0.58	
		mm	5.08	6.10	6.86	6.86	7.87	9.40	10.41	12.19	14.73	
	D (Bore Dia.)	in	.434	.582	.785	1.13	1.308	1.657	2.065	2.564	3.378	
			.494	.642	.845	1.190	1.368	1.717	2.185	2.684	3.498	
		mm	11.02	14.78	19.94	28.70	33.22	42.09	52.45	65.13	85.80	
	J (Min. Socket Depth)	in	0.38	0.50	0.50	0.50	0.50	0.62	0.62	0.62	0.75	
		mm	9.65	12.70	12.70	12.70	12.70	15.75	15.75	15.75	19.05	
	LATERALS											
		A	in	2.00	2.38	2.81	3.19	3.88	-	-	-	-
A		mm	51	60	71	81	99	-	-	-	-	
M		in	0.44	0.50	0.63	0.69	0.81	-	-	-	-	
M		mm	11	13	16	18	21	-	-	-	-	
App. Wt./100 pcs.	lb	250	325	538	675	1281	-	-	-	-		
	kg	114	148	245	307	583	-	-	-	-		
COUPLINGS												
	E	in	0.38	0.38	0.50	0.50	0.50	0.75	0.75	0.75	0.75	
		mm	10	10	13	13	13	19	19	19	19	
App. Wt./100 pcs.	lb	46	74	136	144	222	415	533	675	1181		
	kg	21	34	62	66	101	189	243	307	537		
HALF COUPLINGS												
	F	in	0.88	0.94	1.12	1.19	1.25	1.62	1.69	1.75	1.88	
		mm	22	24	28	30	32	41	43	45	48	
App. Wt./100 pcs.	lb	54	80	136	171	262	477	652	872	1429		
	kg	26	37	62	78	119	217	297	394	650		
REDUCING COUPLINGS												
	E	in	-	0.38	0.50	0.50	0.50	0.75	0.75	0.75	0.75	
		mm	-	10	13	13	13	19	19	19	19	
		NPS	-	3/8	3/8	1/2	1/2	3/4	1 1/4	1 1/2	2	
		DN	-	10	10	15	15	20	32	40	50	
App. Wt./100 pcs.	lb	-	74	136	144	222	415	533	695	1181		
	kg	-	34	62	66	101	189	243	316	537		
PIPE CAPS												
	K (Min.)	in	0.31	0.31	0.44	0.44	0.50	0.62	0.75	0.88	1.12	
		mm	8	8	11	11	13	16	19	22	28	
App. Wt./100 pcs.	lb	41	57	117	142	217	366	494	766	1453		
	kg	19	26	54	65	99	167	225	348	661		

HIGH PRESSURE PLUGS AND BUSHINGS

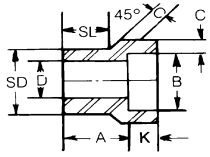
Forged Steel Fittings



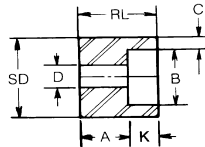
		NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	
		DN	6	8	10	15	20	25	32	40	50	65	80	100	
PLUGS															
SQUARE HEAD															
<p>App. Wt./100 pcs.</p>	A	in	0.38	0.44	0.50	0.56	0.62	0.75	0.81	0.81	0.88	1.06	1.12	1.25	
	A	mm	10	11	13	14	16	19	21	21	22	27	28	32	
	B	mm	0.25	0.25	0.31	0.38	0.44	0.50	0.56	0.62	0.69	0.75	0.81	1.00	
	B	mm	6	6	8	10	11	13	14	16	18	19	21	25	
	C	in	0.28	0.38	0.44	0.56	0.62	0.81	0.94	1.12	1.31	1.50	1.69	2.50	
	C	mm	7	10	11	14	16	21	24	28	33	38	43	64	
		lb	2	2	5	10	18	35	59	85	140	225	287	719	
		kg	1	1	3	5	8	16	27	39	64	103	131	327	
	HEX HEAD (Across Flats)														
	<p>App. Wt./100 pcs.</p>		in	0.44	0.62	0.69	0.88	1.06	1.38	1.75	2.00	2.50	3.00	3.50	4.62
		m	11	16	18	22	27	35	45	51	64	76	89	117	
A		in	0.38	0.44	0.50	0.56	0.62	0.75	0.81	0.81	0.88	1.06	1.12	1.25	
H		in	0.25	0.25	0.31	0.31	0.38	0.38	0.56	0.62	0.69	0.75	0.81	1.00	
		mm	6	6	8	8	10	10	14	16	18	19	21	25	
		lb	3	6	10	17	32	48	95	136	225	388	588	1300	
		kg	2	3	5	8	15	22	44	62	103	177	268	591	
ROUND HEAD															
<p>App. Wt./100 pcs.</p>		A	in	0.38	0.44	0.50	0.56	0.62	0.75	0.81	0.81	0.88	1.06	1.12	1.25
		A	mm	10	11	13	14	16	19	21	21	22	27	28	32
	D	in	1.38	1.62	1.62	1.75	1.75	2.00	2.00	2.00	2.50	2.75	2.75	3.00	
	D	mm	35	41	41	45	45	51	51	51	64	70	70	76	
	E	in	0.41	0.53	0.69	0.84	1.06	1.31	1.69	1.91	2.38	2.88	3.50	4.50	
	E	mm	10	13	18	21	27	33	43	49	60	73	88	114	
		lb	13	13	18	25	38	75	113	156	300	475	763	1288	
		kg	6	6	8	12	18	34	52	71	137	216	347	586	
	BUSHINGS														
	HEX HEAD														
<p>App. Wt./100 pcs.</p>	A	in	—	0.44	0.50	0.56	0.62	0.75	0.81	0.81	0.88	1.06	1.12	1.25	
	A	mm	—	11	13	14	16	19	21	21	22	27	28	32	
	F	in	—	0.62	0.69	0.88	1.06	1.38	1.75	2.00	2.50	3.00	3.50	4.62	
	F	mm	—	16	18	22	27	35	45	51	64	76	89	117	
	G	in	—	0.12	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.41	0.50	
	G	mm	—	3	4	5	6	6	7	8	9	10	10	13	
		NPS	—	1/8	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/2	1/2	1 1/2	
		DN	—	6	6	6	6	6	6	8	8	15	15	40	
		lb	—	2	5	6	13	19	39	68	163	238	350	831	
		kg	—	1	3	3	6	9	18	31	74	108	159	378	
FLUSH															
<p>Lowest Reduction</p> <p>App. Wt./100 pcs.</p>	A	in	—	0.44	0.50	0.56	0.62	0.75	0.81	0.81	0.88	1.06	1.12	1.25	
		mm	—	11	12	14	16	19	21	21	22	27	28	32	
		NPS	—	1/8	1/8	1/8	1/8	1/8	1/8	1/4	1/4	3/4	1	1 1/2	
		DN	—	6	6	6	6	6	6	8	8	20	25	40	
		lb	—	2	5	6	13	13	13	19	38	63	100	200	
		kg	—	1	3	3	6	6	6	9	18	29	46	91	

Note: Plugs and bushings are not identified by Pressure Class.
They may be used for ratings up to Pressure Class 6000 (per ASME B16.11).

SOCKET-WELDING REDUCER INSERTS



TYPE 1 REDUCER INSERT



TYPE 2 REDUCER INSERT

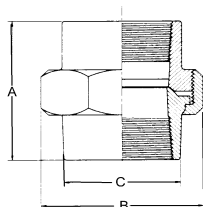
Reducer inserts comply with MSS Standard SP-79. They enable standard socket welding fittings to be used for making any combination of pipe line reductions quickly and economically. Socket-welding reducer inserts serve the same purpose as threaded reducing bushings with threaded fittings.

SOCKET				SHANK				CLASS 3000-For use with Schedule 40 and 80 Pipe						CLASS 6000-For use with Schedule 160 Pipe															
NPS	Size DN	Dia. B		Depth		Min. K	Dia. SD	Type	A		D		C Min.	SL		RL		Type	A		D		C Min.	SL		RL Min.			
		in	mm	in	mm				in	mm	in	mm		in	mm	in	mm		in	mm	in	mm		in	mm		in	mm	in
3/8 X 1/4	10 X 8	0.56	14	0.38	10	0.68	17	1	.75	19	.36	9	.149	4	.56	14	-	-	1	.81	21	.25	6	.181	5	.62	16	-	-
1/2 X 1/8	15 X 10	0.70	18	0.38	10	0.84	21	1	.81	21	.49	12	.158	4	.62	16	-	-	1	.88	22	.36	9	.198	5	.62	16	-	-
	X 1/4	0.56	14	0.38	10	0.84	21	1	.81	21	.36	9	.149	4	.62	16	-	-	1	.81	21	.25	6	.181	5	.62	16	-	-
3/4 X 1/2	20 X 15	0.86	22	0.38	10	1.05	27	1	.88	22	.62	16	.184	5	.69	18	-	-	1	1.00	25	.46	12	.235	6	.75	19	-	-
	X 3/8	0.70	18	0.38	10	1.05	27	2	.62	16	.49	12	.158	4	-	-	1.06	27	1	.88	22	.36	9	.198	5	.75	19	-	-
	X 1/4	0.56	14	0.38	10	1.05	27	2	.69	18	.36	9	.149	4	-	-	1.06	27	2	.88	22	.25	6	.181	5	-	-	1.26	32
1 X 3/4	25 X 20	1.07	27	0.50	13	1.31	33	1	.94	24	.82	21	.193	5	.75	19	-	-	1	1.12	28	.61	15	.274	7	.81	21	-	-
	X 1/2	0.86	22	0.38	10	1.31	33	2	.62	16	.62	16	.184	5	-	-	1.12	28	1	1.12	28	.46	12	.235	6	.81	21	-	-
	X 3/8	0.70	18	0.38	10	1.31	33	2	.69	18	.49	12	.158	4	-	-	1.12	28	2	.88	22	.36	9	.198	5	-	-	1.31	33
	X 1/4	0.56	14	0.38	10	1.31	33	2	.75	19	.36	9	.149	4	-	-	1.12	28	2	.94	24	.25	6	.181	5	-	-	1.31	33
1 1/4 X 1	32 X 25	1.33	34	0.50	13	1.66	42	1	1.00	25	1.05	27	.224	6	.81	21	-	-	1	1.19	30	.81	21	.312	8	.88	22	-	-
	X 3/4	1.07	27	0.50	13	1.66	42	2	.69	18	.82	21	.193	5	-	-	1.25	32	2	.81	21	.61	15	.274	7	-	-	1.37	35
	X 1/2	0.86	22	0.38	10	1.66	42	2	.75	19	.62	16	.184	5	-	-	1.25	32	2	.88	22	.46	12	.235	6	-	-	1.37	35
	X 3/8	0.70	18	0.38	10	1.66	42	2	.81	21	.49	12	.158	4	-	-	1.25	32	2	.94	24	.36	9	.198	5	-	-	1.37	35
	X 1/4	0.50	13	0.38	10	1.66	42	2	.88	22	.36	9	.149	4	-	-	1.25	32	2	1.00	25	.25	6	.181	5	-	-	1.37	35
1 1/2 X 1 1/4	40 X 32	1.68	43	0.50	13	1.90	48	1	1.12	28	1.38	35	.239	6	.88	22	-	-	1	1.38	35	1.16	29	.312	8	.100	25	-	-
	X 1	1.34	34	0.50	13	1.90	48	2	.69	18	1.05	27	.224	6	-	-	1.31	33	1	1.12	28	.81	21	.312	8	.100	25	-	-
	X 3/4	1.07	27	0.50	13	1.90	48	2	.75	19	.82	21	.193	5	-	-	1.31	33	2	1.00	25	.61	15	.274	7	-	-	1.56	40
	X 1/2	0.86	22	0.38	10	1.90	48	2	.81	21	.62	16	.184	5	-	-	1.31	33	2	1.06	27	.46	12	.235	6	-	-	1.56	40
	x3/8	0.70	18	0.38	10	1.90	48	2	.88	22	.49	12	.158	4	-	-	1.31	33	2	1.12	28	.36	9	.198	5	-	-	1.56	40
2 X 1 1/2	50 X 40	1.92	49	0.50	13	2.38	60	1	1.25	32	1.61	41	.250	6	1.00	25	-	-	1	1.81	46	1.34	34	.351	9	1.13	28	-	-
	X 1 1/4	1.68	43	0.50	13	2.38	60	2	.81	21	1.38	35	.239	6	-	-	1.50	38	2	.94	24	1.16	29	.312	8	-	-	1.62	41
	X 1	1.34	34	0.50	13	2.38	60	2	.88	22	1.05	27	.224	6	-	-	1.50	38	2	1.00	25	.82	21	.312	8	-	-	1.62	41
	X 3/4	1.07	27	0.50	13	2.38	60	2	.94	24	.82	21	.193	5	-	-	1.50	38	2	1.06	27	.61	15	.274	7	-	-	1.62	41
	X 1/2	0.86	22	0.38	10	2.38	60	2	1.00	25	.62	16	.184	5	-	-	1.50	38	2	1.12	28	.46	12	.235	6	-	-	1.62	41
2 1/2 X 2	65 X 50	2.41	61	0.62	16	2.88	73	1	1.81	46	2.07	53	.273	7	1.50	38	-	-	1	1.68	43	1.69	43	.430	11	1.25	-	-	-
	X 1 1/2	1.92	49	0.50	13	2.88	73	2	1.38	35	1.61	41	.250	6	-	-	2.12	54	-	-	-	-	-	-	-	-	-	-	-
	X 1 1/4	1.68	43	0.50	13	2.88	73	2	1.44	37	1.38	35	.239	6	-	-	2.12	54	-	-	-	-	-	-	-	-	-	-	-
	X 1	1.34	34	0.50	13	2.88	73	2	1.50	38	1.05	27	.226	6	-	-	2.12	54	-	-	-	-	-	-	-	-	-	-	-
	X 3/4	1.07	27	0.50	13	2.88	73	2	1.56	40	0.82	21	.193	5	-	-	2.12	54	-	-	-	-	-	-	-	-	-	-	-
3 X 2 1/2	80 X 65	2.91	74	0.62	16	3.50	89	1	1.50	38	2.47	63	.345	9	1.25	32	-	-	-	-	-	-	-	-	-	-	-	-	-
	X 2	2.41	61	0.62	16	3.50	89	2	1.00	25	2.07	53	.273	7	-	-	1.87	47	-	-	-	-	-	-	-	-	-	-	-
	X 1 1/2	1.92	49	0.50	13	3.50	89	2	1.12	28	1.61	41	.250	6	-	-	1.87	47	-	-	-	-	-	-	-	-	-	-	-
	X 1 1/4	1.68	43	0.50	13	3.50	89	2	1.19	30	1.38	35	.239	6	-	-	1.87	47	-	-	-	-	-	-	-	-	-	-	-
	X 1	1.34	34	0.50	13	3.50	89	2	1.25	32	1.05	27	.224	6	-	-	1.87	47	-	-	-	-	-	-	-	-	-	-	-

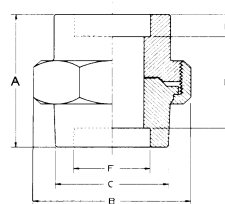
To minimize the possibility of cracking of the fillet welds, it is recommended that the shank portion of the reducer be withdrawn approximately 1/16 in. (1.6 mm) away from the contact with the bottom of the socket before starting the weld. Likewise, the pipe is to be kept away from contacting the bottom of the reducer socket before welding.

FORGED STEEL UNIONS

Class 3000 threaded and socket-weld
Class 6000 threaded and socket-weld



Threaded



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Socket-Weld

CLASS 3000

SIZE	SIZE	A	A	B	B	C*	C*	D	D	E	E	F	F	WEIGHT PER UNION	
NPS	DN	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	lb	Kg
1/8	6	1 11/16	43	1 31/64	38	53/64	21	25/32	20	7/16	11	0.420 0.440	11	0.38	0.17
1/4	8	1 11/16	43	1 31/64	38	53/64	21	25/32	20	7/16	11	0.555 0.575	14 15	0.36	0.16
3/8	10	1 27/32	47	1 11/16	43	1	25	31/32	25	7/16	11	0.690 0.710	18 18	0.50	0.23
1/2	15	2	50	1 15/16	49	1 3/16	30	1 3/32	27	7/16	11	0.855 0.875	22 22	0.695	0.32
3/4	20	2 5/16	58	2 3/8	60	1 15/32	37	1 5/32	29	9/16	14	1.065 1.085	27 28	1.175	0.53
1	25	2 7/16	62	2 25/32	71	1 25/32	45	1 3/8	35	9/16	14	1.330 1.350	34 34	1.64	0.75
1 1/4	32	2 7/8	73	3 23/64	85	2 7/32	56	1 45/64	43	9/16	14	1.675 1.695	43 43	2.59	1.18
1 1/2	40	3	76	3 23/32	85	2 35/64	65	1 7/8	48	9/16	14	1.915 1.935	49 49	3.41	1.55
2	50	3 1/2	89	4 27/64	113	3 1/16	78	2 1/16	52	11/16	17	2.406 2.426	61 62	5.12	2.33
2 1/2	65	4 1/4	106	5 15/64	131	3 9/16	90	2 3/8	60	7/8	22	2.906 2.931	74 74	8.75	3.98
3	80	4 7/16	113	6 5/32	155	4 9/32	109	2 7/16	62	1	25	3.535 3.560	90 90	12.625	5.74

CLASS 6000

SIZE	SIZE	A	A	B	B	C*	C*	D	D	E	E	F	F	WEIGHT PER UNION	
NPS	DN	In	mm	In	mm	In	mm	In	mm	In	mm	In	mm	lb	Kg
1/8	6	1 11/16	43	1 31/64	38	53/64	21	25/32	20	7/16	11	0.420 0.440	11	0.50	0.22
1/4	8	1 27/32	47	1 11/16	43	1	25	31/32	25	7/16	11	0.555 0.575	14 15	0.56	0.25
3/8	10	2	50	1 15/16	49	1 3/16	30	1 3/32	27	7/16	11	0.690 0.710	18 18	0.75	0.34
1/2	15	2 5/16	58	2 3/8	60	1 15/32	37	1 5/32	29	9/16	14	0.855 0.875	22 22	1.25	0.57
3/4	20	2 7/16	62	2 25/32	71	1 25/32	45	1 3/8	35	9/16	14	1.065 1.085	27 28	1.75	0.8
1	25	2 7/8	73	3 23/64	85	2 7/32	56	1 45/64	43	9/16	14	1.330 1.350	34 34	3.0	1.36
1 1/4	32	3	76	3 23/32	95	2 35/64	65	1 7/8	48	9/16	14	1.675 1.695	43 43	3.75	1.70
1 1/2	40	3 1/2	89	4 27/64	113	3 1/16	78	2 1/16	52	11/16	22	1.915 1.935	49 49	6.0	2.73
2	50	4 1/8	103	5 15/64	131	3 9/16	90	2 3/8	60	7/8	22	2.406 2.426	61 62	10.5	4.77

* "C" dimension measures across octagon corners or across the diameter as applicable. The 2 1/2 NPS / 65 DN and 3 NPS / 80 DN -3000 and 2 NPS / 50 DN - 6000 sizes have octagonal male and female ends; the other sizes are round.

Lug Nut Unions

Lug Nut Unions have with modified Stub-Acme threads and are ideal for applications requiring rapid assembly and/or breakdown.

Other features of the Lug Nut Union include :

- 1) 3000 psi NSCWP
- 2) Threaded and socket-weld ends
- 3) Seating characteristics of AAR unions
- 4) Available in sizes 3/8 - 4 NPS/10 - 100 DN
- 5) Twin lugs in sizes up to 3/4 NPS / 20 DN
- 6) Tri-lug design in sizes from 1 - 4 NPS/25 - 100 DN
- 7) Plated lug nut

SIZE (NPS)	SIZE (DN)	A (In)	A (mm)
3/8	10	1.950	50
1/2	15	2.065	52
3/4	20	2.375	60
1	25	2.580	66
1 1/4	32	2.950	75
1 1/2	40	3.115	79
2	50	3.575	91
2 1/2	65	4.200	107
3	80	4.475	114
4	100	8.500	216

FORGED STEEL CATOLETS

CATOLETS PROVIDE A STRONG BRANCH PIPE CONNECTION, CONSIDERABLY STRONGER THAN A WELDED PIPE-TO-PIPE CONNECTION. CONSEQUENTLY, WITH GOOD WELDING PROCEDURES, CATOLETS OFFER GREATER RESISTANCE TO DISTORTION AND BURSTING. CATOLETS READILY AND ECONOMICALLY PERMIT THE ADDING OF BRANCH CONNECTORS TO EXISTING PIPING INSTALLATION, ELIMINATING THE (RELATIVELY HIGHER COST OF) CUTTING OR DISASSEMBLY AND REASSEMBLY REQUIRED FOR THE INSTALLATION OF TEES. CATOLETS OF THE SAME OUTLET SIZE AS A HEADER OR RUN PIPE SIZE (I.E."FULL SIZE" CATOLETS) ARE SO PROPORTIONED THAT THE (ELLIPTICALLY-SHAPED) HOLE IN THE HEADER PIPE HAS THE MINIMUM WEAKENING OR DISTORTION EFFECT, AND YET PROVIDES GOOD FLUID FLOW CHARACTERISTICS.

SPECIFICATIONS

CHEMICAL AND PHYSICAL PROPERTIES ARE RIGIDLY CONTROLLED TO ENSURE CONSISTENTLY HIGH QUALITY. PHYSICAL AND TRACEABILITY OF CHEMICAL TEST REPORTS ARE AVAILABLE ON REQUEST. INDIVIDUAL CATOLETS CAN BE ESTABLISHED THROUGH THE HEAT CODE OF EACH FITTING. CATOLETS MEET THE REQUIREMENTS OF MSS STANDARD SP-97. THEY ARE FORGED FROM STEEL WHICH COMPLIES WITH ASTM A105.

THREADED CATOLETS

THREADS CONFORM WITH ASME B1.20.1.

SOCKET WELD CATOLETS

SOCKET DIMENSIONS CONFORM WITH ASME B16.11.

BUTTWELD CATOLETS

BUTTWELDING ENDS CONFORM WITH ASME B16.25.

REINFORCEMENT REQUIREMENTS

ASME B31.1 POWER PIPING CODE

ASME B31.3 REFINERY CODE

FORGING MARKINGS

CATOLETS ARE CLEARLY MARKED WITH THE FOLLOWING:

OUTLET SIZE

RANGE OF RUN PIPE SIZES THAT THE CATOLETS WILL FIT

THE WEIGHT, SCHEDULE NUMBER, OR PRESSURE CLASS

THE MATERIAL SPECIFICATION

STEEL HEAT IDENTIFICATION

INSTALLATION NOTE

CATOLETS ARE DESIGNED TO HAVE NO MORE THAN A 1/16" GAP BETWEEN THE BASE OR SKIRT OF THE CATOLET WHEN IT IS SEATED DIRECTLY UPON THE APPROPRIATE RUN PIPE. IT IS RECOMMENDED, HOWEVER, THAT THE SKIRT OF CATOLETS BE HELD SLIGHTLY ABOVE THE RUN PIPE AND TACK WELDED TO PROVIDE A SMALL CONTINUOUS ROOT GAP BETWEEN THE SKIRT AND RUN PIPE BEFORE COMPLETING THE ALL-AROUND WELDING BEADS OR FILLET.

SPECIALS

CAPEX WILL BE HAPPY TO ASSIST YOU WITH SPECIALLY MACHINED CATOLETS.

PRESSURE TEMPERATURE RATINGS

MSS STANDARD PRACTICES SP-97 GIVES THE FOLLOWING CORRELATION BETWEEN FITTING PRESSURE CLASS AND PIPE SCHEDULE NUMBER/WALL THICKNESS DESIGNATION FOR CALCULATION OF PRESSURE-TEMPERATURE RATINGS:

PRESSURE TEMPERATURE RATINGS

MSS STANDARD PRACTICE SP-97 GIVES THE FOLLOWING CORRELATION BETWEEN FITTING PRESSURE CLASS AND PIPE SCHEDULE NUMBER / WALL THICKNESS DESIGNATION FOR CALCULATION OF PRESSURE-TEMPERATURE RATINGS:

BRANCH CONNECTION TYPE	PRESSURE CLASS OF FITTING	NPS	DN	PIPE WALL FOR RATING BASES
BUTTWELD	STD	1/8 - 24	6 - 600	STD
	XS	1/8 - 24	6 - 600	XS
	SCH . 160	1/2 - 6	15 - 150	SCH . 160
THREADED	3000	1/4 - 4	8 - 100	XS
	6000	1/2 - 2	15 - 50	SCH . 160
SOCKET WELDING	3000	1/2 - 2	15 - 50	XS
	6000	1/2 - 2	15 - 50	SCH . 160

THE MAXIMUM ALLOWABLE PRESSURE OF A FITTING IS COMPUTED IN ACCORDANCE WITH THE APPLICABLE PIPING CODE OR REGULATION FOR STRAIGHT SEAMLESS HEADER (RUN) PIPE OR FOR MATERIAL OF EQUIVALENT COMPOSITION AND MECHANICAL PROPERTIES TO THE FITTING. ANY CORROSION OR MECHANICAL ALLOWANCES AND ANY REDUCTION IN ALLOWABLE STRESS DUE TO TEMPERATURE OR OTHER SERVICE CONDITIONS, MUST BE APPLIED TO THE PIPE AND FITTING ALIKE.

FORGED STEEL CATOLETS RUN SIZE CONSOLIDATION

CATOLETS ARE MANUFACTURED TO COVER AS MANY RUN SIZE AS POSSIBLE PER OUTLET SIZE.
THE RANGE OF RUN SIZES IS BASED ON A MAXIMUM GAP OF 1/16" BETWEEN THE FITTING AND
THE PIPE (ON THE LARGEST SIZE OF RUN PIPE SHOWN ON THE FITTING). THE FOLLOWING CHART
SHOWS THE RANGE OF RUN PIPE SIZES PER OUTLET SIZE.

STANDARD, EXTRA STRONG AND CLASS 3000 FITTINGS											
N P S	DN	NOMINAL PIPE SIZE		NOMINAL PIPE SIZE		N P S	DN	NOMINAL PIPE SIZE		NOMINAL PIPE SIZE	
		NPS	DN	NPS	DN			NPS	DN	NPS	DN
1/8	6	3/8 X 1/8	10 X 6	2 1/2-1 1/4X1/8	65-32X6	1 1/2	40	1 1/2X1 1/2	40X40	6-5X1 1/2	150-125X40
		1/2 X 1/8	15 X 6	36-3X1/8	900-80X6			2X1 1/2	50X40	12-8X1 1/2	300-200X40
		1-3/4 X 1/8	25-20 X 6					2 1/2X1 1/2	65X40	24-14X1 1/2	600-350X40
1/4	8	3/8 X 1/4	10 X 8	2 1/2-1 1/4X1/4	65-32X8	2	50	3X1 1/2	80X40	36-26X1 1/2	900-650X40
		1/2 X 1/4	15 X 8	36-3X1/4	900-80X8			4-3 1/2X1 1/2	100-90X40		
3/8	10	1/2 X 3/8	15 X 10	2 1/2-1 1/4X3/8	65-32X10	2	50	2X2	50X50	5X2	125X50
		1-3/4 X 3/8	25-20 X 10	36-3X3/8	900-80X10			2 1/2X2	65X50	6X2	150X50
1/2	15	1/2 X 1/2	15 X 15	2 1/2-2X1/2	65-50X15	2 1/2	65	3X2	80X50	10-8X2	250-200X50
		3/4 X 1/2	20 X 15	8-3X1/2	200-80X15			4-3 1/2X2	100-90X50	18-12X2	450-300X50
		1 X 1/2	25 X 15	36-10X1/2	900-250X15					36-20X2	900-500X50
3/4	20	1 1/2-1 1/4 X 1/2	40-32 X 15			2 1/2	65	2 1/2X2 1/2	65X65	6X2 1/2	150X65
		3/4 X 3/4	20 X 20	5-3X3/4	125-80X20			3X2 1/2	80X65	8X2 1/2	200X65
		1 X 3/4	25 X 20	12-6X3/4	300-150X20			4X2 1/2	90X65	12-10X2 1/2	300-250X65
1	25	1 1/2-1 1/4 X 3/4	40-32 X 20	36-14X3/4	900-350X20	3	80	5X2 1/2	125X65	18-14X2 1/2	450-350X65
		2 1/2-2 X 3/4	65-50 X 20					3X3	80X80	8X3	200X80
		1 X 1	25 X 25	3 1/2-3X1	90-80X25			3 1/2X3	90X80	10X3	250X80
1 1/4	32	1 1/4 X 1/4	32 X 32	5-4X1 1/4	125-100X25	3 1/2	90	4X3	100X80	14-12X3	350-300X80
		1 1/2 X 1/4	40 X 25	10-6X1	250-150X25			5X3	125X80	20-16X3	500-400X80
		2 X 1/4	50 X 25	36-12X1	900-300X25			6X3	150X80	36-24X3	900-600X80
1 1/4	32	2 1/2 X 1	65 X 25			3 1/2	90	3 1/2X3 1/2	90X90	10X3 1/2	250X90
		1 1/4 X 1 1/4	32 X 32	8-6X1 1/4	200-150X32			4X 3 1/2	100X90	14-12X3 1/2	350-300X90
		1 1/2 X 1 1/4	40 X 32	18-10X1 1/4	450-250X32			5X3 1/2	125X90	20-16X3 1/2	500-400X90
1 1/4	32	2 X 1 1/4	50 X 32	36-20X1 1/4	900-500X32	4	100	6X3 1/2	150X90	36-24X3 1/2	900-600X90
		2 1/2 X 1 1/4	65 X 32					8X3 1/2	200X90		
		3 1/2-3 X 1 1/4	90-80 X 32					4X4	100X100	10X4	250X100
								5X4	125X100	14-12X4	350-300X100
								6X4	150X100	20-16X4	500-400X100
								8X4	200X100	36-24X4	900-600X100

CLASS 6000 FITTINGS					
N P S	DN	NOMINAL PIPE SIZE		NOMINAL PIPE SIZE	
		NPS	DN	NPS	DN
1/2	15	1-3/4X1/2	25-20X15		
		2-1 1/4X1/2	50-32X15		
		6-2 1/2X1/2	150-65X15		
		36-8X1/2	900-200X15		
3/4	20	1X3/4	25X20		
		2 1/2-1 1/4X3/4	65X32X20		
		10-3X3/4	250-80X20		
		36-12X3/4	900-300X20		
1	25	1 1/2-1 1/4X1	40-32X25		
		2 1/2-2X1	65-50X25		
		10-3X1	250-80X25		
		36-12X1	900-300X25		
1 1/4	32	1 1/2X1 1/4	40X32	36-10X1 1/4	900-250X32
		2 1/2-2X1 1/4	65-50X32		
		3 1/2-3X1 1/4	90-80X32		
		8-4X1 1/4	200-100X32		
1 1/2	40	2X1 1/2	50X40	8-6X1 1/2	200-150X40
		2 1/2X1 1/2	65X40	18-10X1 1/2	450-250X40
		3 1/2-3X1 1/2	90-80X40	36-20X1 1/2	900-500X40
		5-4X1 1/2	125-100X40		
2	50	2 1/2X2	65X50	6X2	150X50
		3X2	80X50	10-8X2	250-200X50
		4X2	100X50	20-12X2	500-300X50
		5X2	125X50	36-24X2	900-600X50

SCH. 160 & XXS

N P S	DN	NOMINAL PIPE SIZE		N P S	DN	NOMINAL PIPE SIZE		N P S	DN	NOMINAL PIPE SIZE		NOMINAL PIPE SIZE	
		NPS	DN			NPS	DN			NPS	DN	NPS	DN
1/2	15	1/2X1/2	15X15	1	25	1X1	25X25	1 1/2	40	1 1/2X1 1/2	40X40	20-10X1 1/2	500-250X40
		1 1/4-3/4X1/2	32-20X15			2 1/2-1 1/4X1	65-32X25			2 1/2-2X1 1/2	65-50X40	22X 1 1/2	550X40
		36-1 1/2X1/2	900-40X15			10-3X1	250-80X25			3 1/2-3X1 1/2	90-80X40	36-24X1 1/2	900-600X40
3/4	20	1-3/4X3/4	25-20X20	1 1/4	32	1 1/2-1 1/4X1 1/4	40-32X32	2	50	2X2	50X50	8-6X2	200-150X50
		2-1 1/4X3/4	50-32X20			2 1/2-2X1 1/4	65-50X32			2 1/2X2	65X50	18-10X2	450-250X50
		6-2 1/2X3/4	150-65X20			10-3X1 1/4	250-80X32			3 1/2-3X2	90-80X50	36-20X2	900-500X50
		36-8X3/4	900-200X20			36-12X1 1/4	900-300X32			5-4X2	125-100X50		

12 NPS / 300 DN - IS THE LARGEST RUN PIPE SIZE FOR WHICH THE FITTING IS APPLICABLE.

8 NP / 200 DN - IS THE SMALLEST RUN PIPE SIZE FOR WHICH THE FITTING IS APPLICABLE.

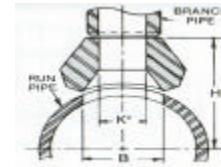
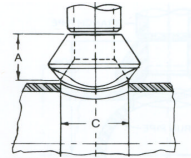
1 1/2 NPS / 90 DN - IS THE OUTLET (BRANCH) SIZE

NOTE: CLEARLY SPECIFY THE SCHEDULES OR WEIGHTS OF THE BRANCH AND RUN PIPE IF THEY DIFFER.

EXAMPLE: 3 NPS / 80 DN SCH 80 X 1 1/2 NPS / 40 DN SCH 40 BW CATOLET.

BUTTWELD CATOLETS

FULL AND REDUCING SIZES STANDARD AND EXTRA STRONG



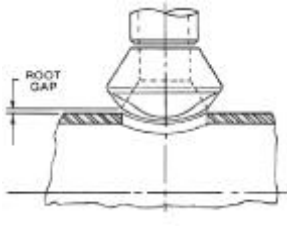
DIAMETER K OF CATOLET BORE IS THE SAME AS THE INSIDE DIAMETER OF THE BRANCH PIPE OF MATCHING WEIGHT OR SCHEDULE .

OUTLET SIZE		NOMINAL RUN PIPE SIZE		STANDARD						EXTRA STRONG						APPROX. WEIGHT			
NPS	DN	NPS	DN	A		B		C		lb	kg	A		B		C		lb	kg
				in	mm	in	mm	in	mm			in	mm	in	mm	in	mm		
1/2	15	1/2	15	3/4	19	5/8	16	15/16	24	0.16	0.07	3/4	19	5/8	16	15/16	24	0.17	0.08
1/2	15	3/4-36	20-900	3/4	19	15/16	24	15/16	24	0.17	0.08	3/4	19	15/16	24	15/16	24	0.19	0.09
3/4	20	3/4	20	7/8	22	13/16	21	1 3/16	30	0.25	0.11	7/8	22	13/16	21	1 3/16	30	0.26	0.12
3/4	20	1-36	25-900	7/8	22	1 3/16	30	1 3/16	30	0.26	0.12	7/8	22	1 3/16	30	1 3/16	30	0.3	0.14
1	25	1	25	1 1/16	27	1 1/32	26	1 7/16	37	0.42	0.21	1 1/16	27	1 1/32	26	1 7/16	37	0.44	0.20
1	25	1 1/4-36	32-900	1 1/16	27	1 7/16	37	1 7/16	37	0.5	0.23	1 1/16	27	1 7/16	37	1 7/16	37	0.53	0.24
1 1/4	32	1 1/4	32	1 1/4	32	1 3/8	35	1 3/4	44	0.75	0.34	1 1/4	32	1 3/8	35	1 3/4	44	0.77	0.35
1 1/4	32	1 1/2-36	40-900	1 1/4	32	1 3/4	44	1 3/4	44	0.82	0.37	1 1/4	32	1 3/4	44	1 3/4	44	0.88	.40
1 1/2	40	1 1/2	40	1 5/16	33	1 5/8	41	2	51	0.85	0.39	1 5/16	33	1 5/8	41	2	51	0.9	0.41
1 1/2	40	2-36	50-900	1 5/16	33	2	50	2	51	1.2	0.55	1 5/16	33	2	50	2	51	1.3	0.59
2	50	2	50	1 1/2	38	2 1/16	52	2 9/16	65	1.6	0.73	1 1/2	38	2 1/16	52	2 9/16	65	1.7	0.77
2	50	2 1/2-36	65-900	1 1/2	38	2 9/16	65	2 9/16	65	1.9	0.86	1 1/2	38	2 9/16	65	2 9/16	65	1.8	0.82
2 1/2	65	2 1/2	65	1 5/8	41	2 7/16	62	3	76	2.4	1.09	1 5/8	41	2 7/16	62	3	76	2.6	1.18
2 1/2	65	3-36	80-900	1 5/8	41	3	76	3	76	2.7	1.23	1 5/8	41	3	76	3	76	2.7	1.23
3	80	3	80	1 3/4	44	3 1/16	78	3 11/16	92	3.8	1.73	1 3/4	44	3 1/16	78	3 11/16	92	4.3	1.95
3	80	3 1/2-36	90-900	1 3/4	44	3 11/16	92	3 11/16	92	4.2	1.91	1 3/4	44	3 11/16	92	3 11/16	92	4.2	1.91
3 1/2	90	3 1/2	90	2	50	3 9/16	90	4	102	5.0	2.27	2	51	3 9/16	90	4	102	5.1	2.32
3 1/2	90	4-36	100-900	1 7/8	48	4	102	4	102	5.5	2.50	1 7/8	48	4	102	4	102	5.6	2.55
4	100	4	100	2	50	4	102	4 3/4	90	7.6	3.45	2	51	4	102	4 3/4	90	7.5	3.41
4	100	5-36	125-900	2	50	4 3/4	90	4 3/4	90	7.1	3.23	2	51	4 3/4	120	4 3/4	90	7.0	3.18
5	125	5	125	2 1/8	52	5 1/16	129	5 13/16	146	8.5	3.86	2 1/8	53	5 1/16	129	5 13/16	146	7.5	3.41
5	125	6-36	150-900	2 1/4	57	-	-	5 9/16	141	10.3	4.68	2 1/4	57	-	-	5 9/16	141	10.4	4.73
6	150	6	150	2 3/8	60	6 1/16	154	6 11/16	169	14	6.36	3 1/16	78	6 1/16	154	6 11/16	169	15	6.82
6	150	8-36	200-900	2 3/8	60	-	-	6 11/16	169	12	5.45	3 1/16	78	-	-	6 11/16	169	23	10.45
8	200	8	200	2 3/4	70	7 15/16	201	8 11/16	220	28	12.73	3 7/8	98	7 5/8	194	8 11/16	220	32	14.55
8	200	10-36	250-900	2 3/4	70	-	-	8 11/16	220	23	10.45	3 7/8	98	-	-	8 11/16	220	37	16.82
10	250	10	250	3 1/16	78	10	254	10 13/16	275	39	17.73	3 1/2	89	9 3/4	248	10 7/16	275	46	20.91
10	250	12-36	300-900	3 1/16	78	-	-	10 13/16	275	36	17.37	3 11/16	92	-	-	10 7/16	275	46	20.91
12	300	12	300	3 3/8	85	12	305	12 13/16	326	65	29.55	3 15/16	99	11 3/4	298	13	330	61	27.73
12	300	14-36	350-900	3 3/8	85	-	-	12 13/16	326	59	26.82	4 1/16	104	-	-	12 1/2	318	61	27.73
14	350	14	350	3 1/2	89	13 1/4	336	14 1/16	358	70	31.82	4 1/8	104	13	330	14 5/16	364	75	34.09
14	350	16-36	400-900	3 1/2	89	-	-	14 1/16	358	66	30.00	3 15/16	99	-	-	13 13/16	351	70	31.82
16	400	16	400	3 11/16	92	15 1/4	386	16 1/16	408	92	41.82	4 7/16	113	15	381	16 1/2	419	115	52.27
16	400	18-36	450-900	3 11/16	92	-	-	16 1/16	408	75	34.09	4 3/16	106	-	-	15 7/8	403	102	46.36
18	450	18	450	4 1/16	104	17 1/4	438	18 5/8	473	125	56.82	4 11/16	119	17	432	18 5/8	473	130	59.09
18	450	20-36	500-900	3 11/16	96	-	-	18 1/16	459	97	44.09	4 3/8	112	-	-	17 15/16	455	130	59.09
20	500	20	500	4 5/8	116	19 1/4	489	20 1/16	510	175	79.55	5	127	19	483	20 13/16	528	187	85.00
20	500	24-36	600-900	4	102	-	-	20	508	118	53.64	4 11/16	119	-	-	20 1/16	510	158	71.82
24	600	24	600	5 3/8	135	23 1/4	590	25 1/8	638	280	127.27	5 1/2	140	23	584	25 1/8	638	316	143.64
24	600	28-36	650-900	4 9/16	116	-	-	24 3/16	615	220	100.00	5 1/2	140	-	-	24 3/16	615	290	131.82

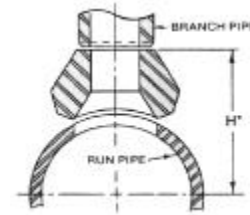
STANDARD WEIGHT: STANDARD WEIGHT BUTTWELD CATOLETS ARE USED WITH ALL SIZES OF STANDARD PIPE OR SCH.40 PIPE UP TO AND INCLUDING 10 NPS/250 DN .
 THESE CATOLETS MAY BE USED IN CONJUNCTION WITH SCH.40 AND 2000b. FITTINGS. SCH. 40 BUTTWELD CATOLETS OF OUTLET SIZE 24 NPS/600 DN AND OVER ARE AVAILABLE UPON REQUEST.
EXTRA STRONG : EXTRA STRONG BUTTWELD CATOLETS ARE USED WITH ALL SIZES OF XS PIPE AND ARE USED WITH SCH. 80 PIPE UP TO AND INCLUDING SIZES 8 NPS/200 DN .
 THESE CATOLETS MAY BE USED IN CONJUNCTION WITH SCH.80 AND 3000b. FITTINGS. SCH. 80 BUTTWELD CATOLETS OF OUTLET SIZE 24 NPS/600 DN AND OVER ARE AVAILABLE UPON REQUEST.

EACH OUTLET SIZE OF REDUCING CATOLETS LISTED ABOVE IS SUPPLIED IN SEVERAL DIFFERENT RANGES OF RUN PIPE SIZE.
 PLEASE REFER TO THE RUN PIPE SIZE CHART OF PAGE FS13.

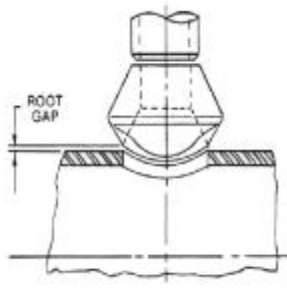
BUTTWELD CATOLETS



DIMENSION 'H'
 (Measurements shown in U.S. Dimensions)
 Dimension 'H' is the distance in inches from the center of the run pipe to the face of the catolet .
 The weld or root gap is not included in the 'H' dimension below.
 Dimension 'H' is also indicated on the diagrams shown on pages FS14 and FS17



Nominal RUN Pipe Size NPS	Pipe Weight or Schedule Number	OUTLET SIZES (NPS)																						
		1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
3/8	STD&XS	in	1																					
	1/2	in	1 1/16	1 1/16	1 3/16	1 3/16																		
3/4	STD&XS	in				1 1/2																		
	S160&XXS	in	1 3/16	1 3/16	1 1/4	1 5/8	1 7/16	1 3/4																
1	STD&XS	in	1 5/16	1 5/16	1 3/8	1 3/8	1 1/2	1 11/16																
	S160&XXS	in				1 3/4	1 7/8	2 1/8																
1 1/4	STD&XS	in	1 7/16	1 7/16	1 9/16	1 9/16	1 11/16	1 7/8	2 1/16															
	S160&XXS	in				1 15/16	2 1/16	2 5/16	2 9/16															
1 1/2	STD&XS	in	1 9/16	1 9/16	1 11/16	1 11/16	1 13/16	2	2 3/16	2 1/4														
	S160&XXS	in				2 1/16	2 3/16	2 7/16	2 11/16	2 15/16														
2	STD&XS	in	1 13/16	1 13/16	1 15/16	1 15/16	2 1/16	2 1/4	2 7/16	2 1/2	1 11/16													
	S160&XXS	in				2 5/16	2 7/16	2 11/16	2 15/16	3 3/8	3 3/8													
2 1/2	STD&XS	in	2 1/16	2 1/16	2 3/16	2 3/16	2 5/16	2 1/2	2 11/16	2 3/4	2 15/16	3 1/16												
	S160&XXS	in				2 9/16	2 11/16	2 15/16	3 3/16	3 7/16	3 5/8	3 7/8												
3	STD&XS	in	2 3/8	2 3/8	2 1/2	2 1/2	2 5/8	2 13/16	3	3 1/16	3 1/4	3 3/8												
	S160&XXS	in				2 7/8	3	3 1/4	3 1/2	3 3/4	3 15/16	4 3/16	4 5/8											
3 1/2	STD&XS	in	2 5/8	2 5/8	2 3/4	2 3/4	2 7/8	3 1/16	3 1/4	3 5/16	3 1/2	3 5/8	3 3/4	3 7/8										
	S160&XXS	in				3	3 3/8	3 1/2	3 3/4	4	4 1/4	4 7/16	5 1/8	4 1/8	4 1/4									
4	STD&XS	in	3 7/16	3 7/16	3 9/16	3 9/16	3 11/16	3 7/8	4 1/16	4 1/8	4 5/16	4 7/16	4 9/16	4 11/16	4 13/16	5 1/16								
	S160&XXS	in				3 15/16	4 1/16	4 5/16	4 9/16	4 13/16	5	5 1/4	5 11/16	-	6 1/8	6 1/2								
6	STD	in	3 15/16	3 15/16	4 1/16	4 1/16	4 3/16	4 3/8	4 9/16	4 5/8	4 13/16	4 15/16	5 1/16	5 3/16	5 5/16	5 9/16	5 11/16							
	XS	in	3 15/16	3 15/16	4 1/16	4 1/16	4 3/16	4 3/8	4 9/16	4 5/8	4 13/16	4 15/16	5 1/16	5 3/16	5 5/16	5 9/16	6 3/8							
8	STD	in	4 15/16	4 15/16	5 1/16	5 1/16	5 3/16	5 3/8	5 9/16	5 5/8	5 13/16	5 15/16	6 1/16	6 3/16	6 5/16	6 9/16	6 11/16	7 1/16						
	XS	in	4 15/16	4 15/16	5 1/16	5 1/16	5 3/16	5 3/8	5 9/16	5 5/8	5 13/16	5 15/16	6 1/16	6 3/16	6 5/16	6 9/16	7 3/8	8 3/16						
10	STD	in	6	6	6 1/8	6 1/8	6 1/4	6 7/16	6 5/8	6 11/16	6 7/8	7	7 1/8	7 1/4	7 3/8	7 5/8	7 3/4	8 1/8	8 7/16					
	XS	in	6	6	6 1/8	6 1/8	6 1/4	6 7/16	6 5/8	6 11/16	6 7/8	7	7 1/8	7 1/4	7 3/8	7 5/8	8 7/16	9 1/4	9 9/16					
12	STD	in	7	7	7 1/8	7 1/8	7 1/4	7 7/16	7 5/8	7 11/16	7 7/8	8	8 1/8	8 1/4	8 3/8	8 5/8	8 3/4	9 1/8	9 7/16	9 3/4				
	XS	in	7	7	7 1/8	7 1/8	7 1/4	7 7/16	7 5/8	7 11/16	7 7/8	8	8 1/8	8 1/4	8 3/8	8 5/8	9 7/16	10 1/4	10 1/16	10 5/16	10 1/2			
14	STD	in	7 5/8	7 5/8	7 3/4	7 3/4	7 7/8	8 1/16	8 1/4	8 5/16	8 1/2	8 5/8	8 3/4	8 7/8	9	9 1/4	9 3/8	9 3/4	10 1/16	10 3/8	10 1/2	10 5/8	11 1/8	
	XS	in	7 5/8	7 5/8	7 3/4	7 3/4	7 7/8	8 1/16	8 1/4	8 5/16	8 1/2	8 5/8	8 3/4	8 7/8	9	9 1/4	10 1/16	10 7/8	10 11/16	11 1/16	11 1/2	11 1/16		
16	STD	in	8 5/8	8 5/8	8 3/4	8 3/4	8 7/8	9 1/16	9 1/4	9 5/16	9 1/2	9 5/8	9 3/4	9 7/8	10	10 1/4	10 3/8	10 3/4	11 1/16	11 3/8	11 15/16	12 7/16		
	XS	in	8 5/8	8 5/8	8 3/4	8 3/4	8 7/8	9 1/16	9 1/4	9 5/16	9 1/2	9 5/8	9 3/4	9 7/8	10	10 1/4	11 1/16	11 7/8	12 1/16	12 1/2	12 11/16			
18	STD	in	9 5/8	9 5/8	9 3/4	9 3/4	9 7/8	10 1/16	10 1/4	10 5/16	10 1/2	10 5/8	10 3/4	10 7/8	11	11 1/4	11 3/8	11 3/4	12 1/16	12 3/8	12 15/16	13 3/16	13 11/16	
	XS	in	9 5/8	9 5/8	9 3/4	9 3/4	9 7/8	10 1/16	10 1/4	10 5/16	10 1/2	10 5/8	10 3/4	10 7/8	11	11 1/4	12 1/16	12 7/8	12 11/16	13 1/16	13 1/2	13 11/16	13 13/16	14 5/8
20	STD	in	10 5/8	10 5/8	10 3/4	10 3/4	10 7/8	11 1/16	11 1/4	11 5/16	11 1/2	11 5/8	11 3/4	11 7/8	12	12 1/4	12 3/8	12 3/4	13 1/16	13 3/8	13 15/16	14 3/16	14 3/8	15
	XS	in	10 5/8	10 5/8	10 3/4	10 3/4	10 7/8	11 1/16	11 1/4	11 5/16	11 1/2	11 5/8	11 3/4	11 7/8	12	12 1/4	13 1/16	13 7/8	13 11/16	14 1/16	15 1/2	15 11/16	16 3/16	17 3/8
24	STD	in	12 5/8	12 5/8	12 3/4	12 3/4	12 7/8	13 1/16	13 1/4	13 5/16	13 1/2	13 5/8	13 3/4	13 7/8	14	14 1/4	14 3/8	14 3/4	15 1/16	15 3/8	15 15/16	16 3/16	16 3/8	17 1/2
	XS	in	12 5/8	12 5/8	12 3/4	12 3/4	12 7/8	13 1/16	13 1/4	13 5/16	13 1/2	13 5/8	13 3/4	13 7/8	14	14 1/4	15 1/16	15 7/8	15 11/16	16 1/16				



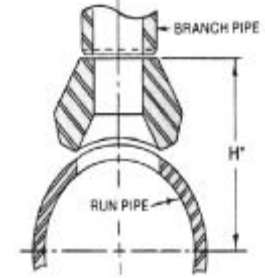
BUTTWELD CATOLETS

DIMENSION 'H'

(Measurements shown in SI Dimensions)

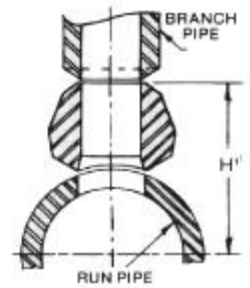
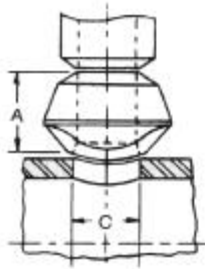
*Dimension 'H' is the distance in millimeters from the centre of the run pipe to the face of the catolet. The weld or root gap is not included in the 'H' dimension below

Dimension 'H' is also indicated on the diagrams shown on pages FS14 and FS17



Nominal RUN Pipe Size DN	Pipe Weight or Schedule Number		OUTLET SIZES (DN)																							
			6	8	10	15	20	25	32	40	50	65	80	89	100	125	150	200	250	300	350	400	450	500	600	
10	STD&XS	mm	25	25																						
	STD&XS	mm	27	29	30	30																				
15	S160&XXS	mm				38																				
	STD&XS	mm	30	30	32	32	37																			
20	S160&XXS	mm				41	45																			
	STD&XS	mm	33	33	35	35	38	43																		
25	S160&XXS	mm				45	48	54																		
	STD&XS	mm	37	37	40	40	43	48	52																	
32	S160&XXS	mm				49	52	59	65																	
	STD&XS	mm	40	40	43	43	46	51	56	57																
40	S160&XXS	mm				52	56	62	68	75																
	STD&XS	mm	46	46	49	49	52	57	62	64	43															
50	S160&XXS	mm				59	62	68	75	81	86															
	STD&XS	mm	54	54	56	56	59	64	68	70	75	78														
65	S160&XXS	mm				64	67	71	76	78	83	89														
	STD&XS	mm	60	60	64	64	67	71	76	78	83	86	89													
80	S160&XXS	mm				73	76	83	89	95	100	106	117													
	STD&XS	mm	67	67	70	70	73	78	83	84	89	92	98	105	108											
89	S160&XXS	mm				76	79	84	89	90	95	98	102	105	108											
	STD&XS	mm	73	73	76	76	79	84	89	90	95	98	102	105	108	113	119	130								
100	S160&XXS	mm				86	89	95	102	108	113	119	130	119	122	129										
	STD&XS	mm	87	87	90	90	94	98	103	105	110	113	116	119	122	129										
125	S160&XXS	mm				100	103	110	116	122	127	133	144	-	156	165										
	STD&XS	mm	100	100	103	103	106	111	116	117	122	125	129	132	135	141	144									
150	XS	mm	100	100	103	103	106	111	116	117	122	125	129	132	135	141	144									
	S160&XXS	mm				113	116	122	129	135	140	146	157	-	168	178	189									
200	STD	mm	125	125	129	129	132	137	141	143	148	151	154	157	160	167	170	179								
	XS	mm	125	125	129	129	132	137	141	143	148	151	154	157	160	167	170	179								
250	STD	mm	152	152	156	156	159	164	168	170	175	178	181	184	187	194	197	206	214							
	XS	mm	152	152	156	156	159	164	168	170	175	178	181	184	187	194	197	206	214	235	232					
300	STD	mm	178	178	181	181	184	189	194	195	200	203	206	210	213	219	222	232	240	248						
	XS	mm	178	178	181	181	184	189	194	195	200	203	206	210	213	219	220	232	240	256	262					
350	STD	mm	194	194	197	197	200	205	210	211	216	219	222	225	229	235	238	248	256	264	267					
	XS	mm	194	194	197	197	200	205	210	211	216	219	222	225	229	235	238	248	256	264	267					
400	STD	mm	219	219	222	222	225	230	235	237	241	244	248	251	254	260	264	273	281	289	292	297				
	XS	mm	219	219	222	222	225	230	235	237	241	244	248	251	254	260	264	273	281	289	292	297	306	316		
450	STD	mm	244	244	248	248	251	256	260	262	267	270	273	276	279	286	289	298	306	314	318	322	332	348		
	XS	mm	244	244	248	248	251	256	260	262	267	270	273	276	279	286	289	298	306	314	318	322	332	348		
500	STD	mm	270	270	273	273	276	281	286	287	292	295	298	302	305	311	311	324	332	340	343	348	351	371		
	XS	mm	270	270	273	273	276	281	286	287	292	295	298	302	305	311	311	324	332	340	343	348	351	371		
600	STD	mm	321	321	324	324	327	332	337	338	343	346	349	352	356	362	365	375	383	391	394	398	402	406		
	XS	mm	321	321	324	324	327	332	337	338	343	346	349	352	356	362	365	375	383	391	394	398	402	406		

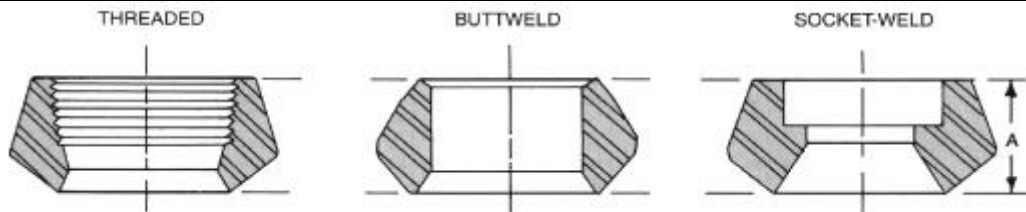
Buttweld Catolets Schedule 160 and Double Extra Strong



NOTE:
See page FS13 or FS16 for H dimensions.

SCHEDULE 160 and Double EXTRA STORNG													
Outlet Size		A				Approx. Weight		Outlet Size		Approx. Weight			
NPS	DN	in	mm	in	mm	lb	kg	NPS	DN	in	mm	lb	kg
1/2	15	1 1/8	28	9/16	14	.25	.12	3	80	2 7/8	73	6.32	2.87
3/4	20	1 1/4	32	3/4	19	.71	.33	4	100	3 5/16	84	10.50	4.77
1	25	1 1/2	32	1	25	.83	.38	5	125	3 11/16	92	14.25	6.48
1 1/4	32	1 3/4	44	1 5/16	33	1.25	.57	6	150	4 1/8	103	29.50	13.41
1 1/2	40	2	50	1 1/2	38	1.75	.80	The reducing Catolets listed above for outlet sizes 1/2-2 NPS/15-50 DN are supplied in several different ranges of run pipe size for each outlet size. Please refer to run pipe size chart on the page FS13.					
2	50	2 3/16	56	1 11/16	43	2.13	.97						
2 1/2	65	2 7/16	62	2 1/8	54	3.38	1.54						
Schedule 160 and Double Extra Strong buttweld Catolets may be used in conjunction with Class 6000 fittings.													

FLAT CATOLETS Class 3000 Threaded, Buttweld & Socket Weld



Size		A				Approx. Weight		Size		Approx. Weight			
NPS	DN	in	mm	in	mm	lb	kg	NPS	DN	in	mm	lb	kg
1/4	8	11/16	17			.11	.05	2	50	1 1/2	44	1.8	1.23
3/8	10	13/16	21			.2	.10	2 1/2	65	1 3/4		2.7	
1/2	15	1	25			.3	.14				25		1.50
3/4	20	1 1/16	27			.4	.18						
1	25	1 9/32	33			.7	.32	3	80	2		3.3	
1 1/4	32	1 11/32	34			.9	.41				38		.82
1 1/2	40	1 3/8	35			1.2	.55						

Flat Catolets are designed to facilitate welding to a flat surface for the installation of

Class 60 flat Catolets are available on application.

Socket-Weld Catolets Full and Reducing Class 3000 and 6000



CLASS 3000 REDUCING and FULL SIZES

Outlet Size		Nominal Run Pipe Size		A		B		C		D'		E		F		Approx.	Weight
NPS	DN	NPS	DN	in	mm	in	mm	in	mm	+/- .03 in	+/- .762 mm	+ .01 - .00 in	+/- .254 - .00 mm	in	mm	lb	kg
1/2	15	1/2	15	1	25	5/8	16	15/16	24	.622	16	.855	22	1 1/4	32	.2	.09
1/2	15	3/4-36	20-900	1	25	15/16	24	15/16	24	.622	16	.855	22	1 1/4	32	.35	.16
3/4	20	3/4	20	1 1/16	27	13/16	21	1 3/16	30	.824	21	1.065	27	1 7/16	37	.27	.12
3/4	20	1-36	25-900	1 1/16	27	1 3/16	30	1 3/16	30	.824	21	1.065	27	1 7/16	37	.4	.18
1	25	1	25	1 5/16	33	1 1/16	27	1 7/16	37	1.049	27	1.330	34	1 13/16	46	.6	.27
1	25	1 1/4-36	32-900	1 5/16	33	1 7/16	37	1 7/16	37	1.049	27	1.330	34	1 13/16	46	.8	.37
1 1/4	32	1 1/4	32	1 5/16	33	1 3/8	35	1 3/4	44	1.380	35	1.675	43	2 3/16	56	.8	.37
1 1/4	32	1 1/2-36	40-900	1 5/16	33	1 3/4	44	1 3/4	44	1.380	35	1.675	43	2 3/16	56	1.1	.50
1 1/2	40	1 1/2	40	1 3/8	35	1 5/8	41	2	50	1.610	41	1.915	49	2 7/16	62	1.2	.55
1 1/2	40	2-36	50-900	1 3/8	35	2	50	2	50	1.610	41	1.915	49	2 7/16	62	1.5	.68
2	50	2	50	1 1/2	38	2 1/16	52	2 9/16	64	2.067	53	2.406	61	2 15/16	74	1.8	.82
2	50	2 1/2-36	65-900	1 1/2	38	2 9/16	64	2 9/16	64	2.067	53	2.406	61	2 15/16	74	2.0	.91
2 1/2	65	2 1/2	65	1 9/16	40	2 1/2	64	3	75	2.469	63	2.906	74	3 7/16	87	2.5	1.14
2 1/2	65	3-36	80-900	1 9/16	40	3	75	3	75	2.469	63	2.906	74	3 7/16	87	3.0	1.36
3	80	3	80	1 3/4	44	3 1/16	78	3 11/16	92	3.068	78	3.535	90	4 1/8	104	3.8	1.73
3	80	3 1/2-36	90-900	1 3/4	44	3 11/16	92	3 11/16	92	3.068	78	3.535	90	4 1/8	104	4.2	1.91
3 1/2	90	3 1/2	90	2 1/8	54	3 9/16	64	4	100	3.548	90	4.040	103	4 13/16	122	4.3	1.95
3 1/2	90	4-36	100-900	2 1/8	54	4	100	4	100	3.548	90	4.040	103	4 13/16	122	4.3	1.95
4	100	4	100	1 7/8	48	4 1/16	102	4 3/4	120	4.026	102	4.545	115	5 1/8	128	7.2	3.27
4	100	5-36	125-900	1 7/8	48	4 3/4	120	4 3/4	120	4.026	102	4.545	115	5 1/8	128	8.0	3.64

CLASS 6000 REDUCING SIZES

Outlet Size		Nominal Run Pipe Size		A		C		D		E		F		Approx. Weight	
NPS	DN	NPS	DN	in	mm	in	mm	+/- .03 in	+/- .762 mm	+ .01 - .00 in	+/- .254 - .00 mm	in	mm	lb	kg
1/2	15	3/4-36	20-900	1 1/4	32	3/4	19	.464	12	.855	22	1 9/16	40	.58	.26
3/4	20	1-36	25-900	1 7/16	37	1	25	.612	16	1.065	27	1 25/32	45	.9	.41
1	25	1 1/4-36	32-900	1 9/16	40	1 5/16	33	.815	21	1.330	34	2 1/4	57	1.8	.82
1 1/4	32	1 1/2-36	40-900	1 5/8	41	1 1/2	38	1.160	29	1.675	43	2 9/16	64	2.6	1.18
1 1/2	40	2-36	50-900	1 11/16	43	1 15/16	49	1.338	34	1.915	49	3	75	3.0	1.36
2	50	2 1/2-36	65-900	2 1/16	52	2 3/4	69	1.687	43	2.406	61	3 5/8	90	5.8	2.64

Each outlet size of the reducing Catolets listed above is supplied in several different ranges of run pipe size. Please refer to the run pipe sizes chart on page FS13.

NOTE: ¹ Tolerance on sizes 2 1/2 NPS / 65 DN and larger is +/- .06.

CLASS 3000 Socket weld Catolets may be used with Std. And XS pipe.
CLASS 6000 Socket weld Catolets may be used with Sch. 160 and XXS pipe

Threaded Catolets Full and Reducing Sizes Class 3000 and 6000



CLASS 3000 REDUCING and FULL SIZES

Outlet Sizes NPS	Nominal Run Pipe Size				A mm	B mm	C mm	F mm	Approx Weight				
	DN	NPS	DN	in					lb	kg			
1/2	15	1/2	15	1	25	5/8	16	15/16	24	1 1/4	32	0.2	0.09
1/2	15	3/4-36	20-900	1	25	15/16	24	15/16	24	1 1/4	32	0.3	0.14
3/4	20	3/4	20	1 1/16	27	13/16	21	1 3/16	30	1 7/16	37	0.35	0.16
3/4	20	1-36	25-900	1 1/16	27	1 3/16	30	1 3/16	30	1 7/16	37	0.42	0.19
1	25	1	25	1 5/16	33	1 1/16	27	1 7/16	37	1 13/16	46	0.6	0.27
1	25	1 1/4-36	32-900	1 5/16	33	1 7/16	37	1 7/16	37	1 13/16	46	0.8	0.36
1 1/4	32	1 1/4	32	1 5/16	33	1 3/8	35	1 3/4	44	2 3/16	56	0.85	0.39
1 1/4	32	1 1/2-36	40-900	1 5/16	33	1 3/4	44	1 3/4	44	2 3/16	56	1.2	0.55
1 1/2	40	1 1/2	40	1 3/8	35	1 5/8	41	2	50	2 7/16	62	1.3	0.59
1 1/2	40	2-36	50-900	1 3/8	35	2	50	2	50	2 7/16	62	1.6	0.73
2	50	2	50	1 1/2	38	2 1/16	59	2 9/16	64	2 15/16	74	1.7	0.77
2	50	2 1/2-36	65-900	1 1/2	38	2 9/16	64	2 9/16	64	2 15/16	74	2.2	1.00
2 1/2	65	2 1/2	65	1 13/16	46	2 1/2	63	3	75	3 7/16	87	2.5	1.14
2 1/2	65	3-36	80-900	1 13/16	46	3	75	3	75	3 7/16	87	3.0	1.36
3	80	3	80	2	50	3 1/16	78	3 11/16	92	4 1/8	103	4.3	1.95
3	80	3 1/2-36	90-900	2	50	3 11/16	92	3 11/16	92	4 1/8	103	4.4	2.00
3 1/2	90	3 1/2	90	2 1/8	54	3 9/16	64	4	100	4 13/16	122	4.5	2.05
3 1/2	90	4-36	100-900	2 1/8	54	4	100	4	100	4 13/16	122	5.6	2.55
4	100	4	100	2 1/4	57	4 1/16	103	4 3/4	120	5 1/8	128	7.3	3.32
4	100	5-30	125-750	2 1/4	57	4 3/4	120	4 3/4	120	5 1/8	128	8.3	3.77

CLASS 6000 REDUCING SIZES

Outlet Sizes NPS	Nominal Run Pipe Size				A mm	B mm	C mm	F mm	Approx Weight				
	DN	NPS	DN	in					lb	kg			
1/2	15	3/4-36	20-900	1 1/4	32	3/4	19	3/4	19	1 9/16	40	0.6	0.27
3/4	20	1-36	25-900	1 7/16	37	1	25	1	25	1 13/16	46	0.9	0.41
1	25	1 1/4-36	32-900	1 9/16	40	1 5/16	33	1 5/16	33	2 1/4	57	2.0	0.91
1 1/4	32	1 1/2-36	40-900	1 9/16	40	1 1/2	38	1 1/2	38	2 9/16	64	3.0	1.36
1 1/2	40	2-36	50-900	1 11/16	43	1 15/16	49	1 15/16	49	3	75	3.2	1.45
2	50	2 1/2-36	65-900	2 1/16	52	2 3/4	69	2 3/4	69	3 5/8	90	6.0	2.73

Each outlet size of the reducing Catolets listed above is supplied in several different ranges of run pipe size.

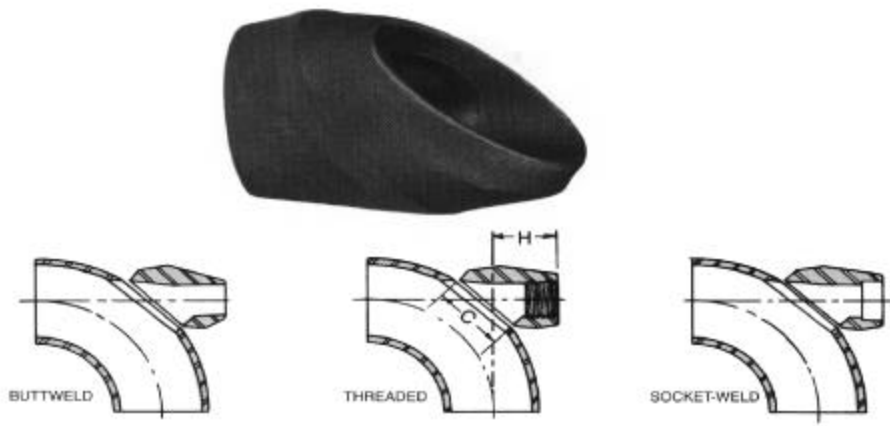
Please refer the run pipe sizes chart on page FS13.

CLASS 6000 threaded Catolets are manufactured only in the sizes shown and may be used with Sch. 160 and XXS pipe.

CLASS 3000 threaded Catolets may be used with Standard and XS pipe.

CLASS 3000

Buttweld, Threaded and Socket-Weld Elbow Catolets



CLASS 3000 THREADED and SOCKET-WELD/STANDARD and XS BUTTWELD

Outlet Size		Nominal Elbow size		C		H		Approx. weight	
NPS	DN	NPS	DN	in	mm	in	mm	lb	kg
1/4	8	36-1 1/4	900-32	1 1/2	38	1 19/32	40	.5	.23
3/8	10	36-1 1/4	900-32	1 1/2	38	1 19/32	40	.5	.23
1/2	15	36-1 1/4	900-32	1 1/2	38	1 19/32	40	.65	.30
3/4	20	36-1 1/4	900-32	1 23/32	45	1 7/8	48	.75	.34
1	25	36-2	900-50	2 1/8	54	2 3/16	55	1.15	.52
1 1/4	32	36-2	900-50	1 21/32	42	2 3/8	60	1.90	.86
1 1/2	40	36-2	900-50	3	75	2 5/8	67	2.65	1.20
2	50	36-3	900-80	4 1/8	103	3 3/16	80	5.25	2.39

STANDARD and XS BUTTWELD, ONLY

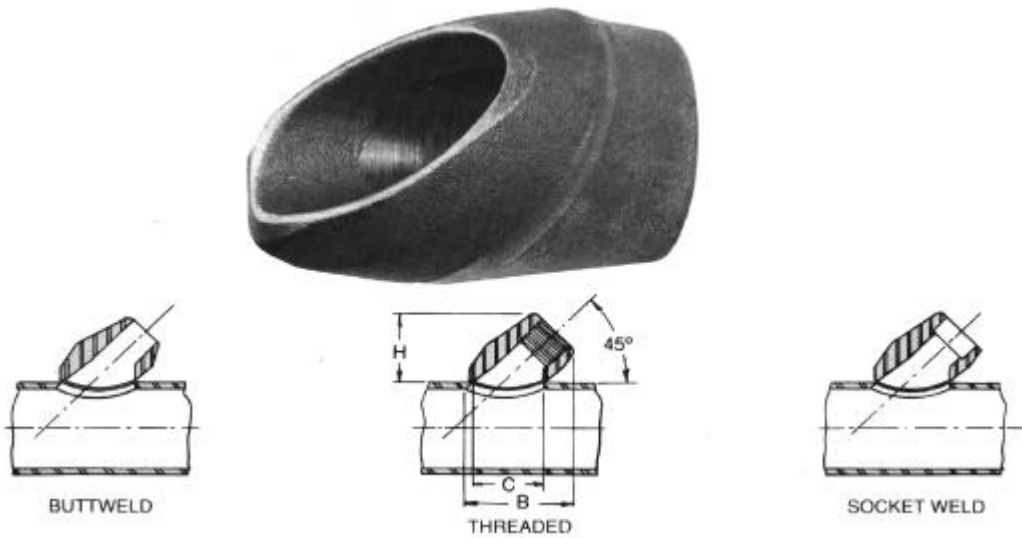
NPS	DN		in	mm	in	mm	lb	kg
2 1/2	65	As specified	4 3/16	105	3 1/4	82	5.5	2.50
3	80	As specified	4 15/16	125	3 13/16	96	6.25	2.84
4	100	As specified	6 7/16	162	4 1/2	114	11.75	5.34
6	150	As specified	9	225	6 3/16	80	.28.0	12.73

CLASS 6000 THREADED and SOCKET-WELD/SCH. 160 and XXS BUTTWELD

NPS	DN	NPS	DN	in	mm	in	mm	lb	kg
1/4	8	36-1 1/4	900-32	1 3/8	35	1 19/32	40	.75	.34
3/8	10	36-1 1/4	900-32	1 3/8	35	1 19/32	40	.75	.34
1/2	15	36-1 1/4	900-32	1 23/32	45	1 7/8	48	.85	.39
3/4	20	36-2	900-50	2 1/8	54	2 3/16	55	1.25	.57
1	25	36-2	900-50	2 21/32	42	2 3/8	60	2.2	1.00
1 1/4	32	36-2	900-50	3	75	2 5/8	67	3.9	1.77
1 1/2	40	36-3	900-80	4 1/8	103	3 3/16	80	6.2	2.82

Elbow Catolets are welded to 90° long radius elbows as branch connections for pipes and fittings. They are also used as pipe hanger or support bosses.

CLASS 3000 and 6000 Buttweld, Threaded and Socket-Weld



Laterals Catolets provide a strong, readily attached 45° lateral outlet connection.

CLASS 3000 THREADED and SOCKET-WELD/STANDARD and XS BUTTWELD

Outlet Size NPS	Outlet Size DN	Nominal Run Pipe Size		H		B		C		Approx. weight	
		NPS	DN	in	mm	in	mm	in	mm	lb	kg
1/4	8	2 1/2-1 1/4/12-3	65-32/300-80	1 1/2	38	2 1/4	57	1 7/16	37	.50	.23
3/8	10	2 1/2-1 1/4/12-3	65-32/300-80	1 1/2	38	2 1/4	57	1 7/16	37	.50	.23
1/2	15	2 1/2-1 1/4/12-3	65-32/300-80	1 1/2	38	2 1/4	57	1 7/16	37	.65	.30
3/4	20	1 1/2-1 1/4/5-2/12-6	40-32/125-50/300-150	1 13/16	46	2 3/4	70	1 23/32	44	.75	.34
1	25	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 1/8	54	3 1/4	83	2 1/8	54	1.15	.52
1 1/4	32	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 9/16	65	3 13/16	97	2 21/32	68	1.90	.86
1 1/2	40	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 3/4	70	4 1/4	108	3	76	2.65	1.20
2	50	5-4/8-6/12-10	125-100/200-150/300-250	3 3/8	86	5 3/8	137	4 1/8	105	5.25	2.30

CLASS 6000 THREADED and SOCKET-WELD/SCH. 160 and XXS BUTTWELD

NPS	DN	NPS	DN	in	mm	in	mm	in	mm	lb	kg
1/4	8	2 1/2-1 1/4/12-3	65-32/300-80	1 1/2	38	2 1/4	57	1 3/8	35	.75	.34
3/8	10	2 1/2-1 1/4/12-3	65-32/300-80	1 1/2	38	2 1/4	57	1 3/8	35	.75	.34
1/2	15	1 1/2-1 1/4/5-2/12-6	40-32/125-50/300-150	1 13/16	46	2 3/4	70	1 23/32	44	.85	.39
3/4	20	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 1/8	54	3 1/4	83	2 1/8	54	1.25	.57
1	25	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 9/16	65	3 13/16	97	2 21/32	68	2.20	1.00
1 1/4	32	2 1/2-2/5-3/12-6	65-50/125-80/300-150	2 3/4	70	4 1/4	108	3	76	2.90	1.32
1 1/2	40	5-4/8-6/12-10	125-100/200-150/300-250	3 3/8	86	5 3/8	137	4 1/8	105	6.15	2.80