

CARBON STEEL

90° LONG RADIUS SEAMLESS WELD ELBOWS

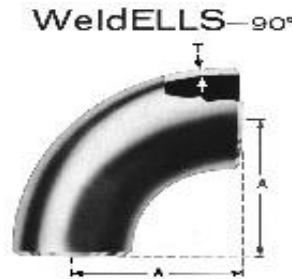
CENTER TO END DIMENSIONS , WEIGHTS AND VOLUMES

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

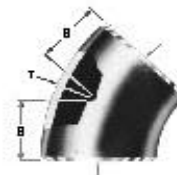
ASTM A234		STANDARD WALL	SCH40	EXTRA HEAVY	SCH80	SCH10	SCH20	SCH30	SCH60	SCH100	SCH120	SCH140	SCH160	DOUBLE EXTRA HEAVY	Volume Cubic Feet
Nominal Pipe Size	Center To End B	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx Weight Pounds	Approx 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:

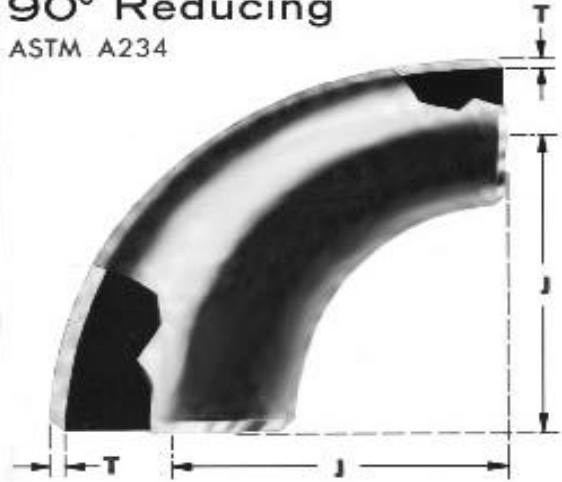
- For sizes up to and including 8".....+/-0.06
- For sizes 10" through 24".....+/-0.09
- For sizes 26" through 30".....+/-0.12
- For sizes 32" and larger+/-0.19

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	224	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".

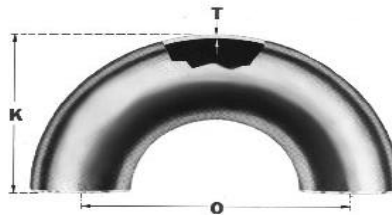
Volume(s) based on assuming each fitting being a solid cube.

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

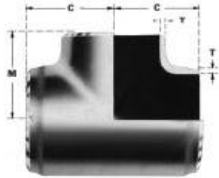
For sizes up to and including 8"+/-0.03

For sizes 10" through 24"+/-0.06

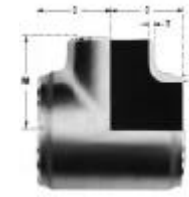
For sizes 26" and larger+/-0.09

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 , 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		
3 1/2	3 1/2	4 1/8	4 1/8	13.9	17.8	225	.13
	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		
4	4	4 7/8	4 7/8	21.6	28.2	306.3	.18
	3	4 7/8	4 5/8	18.8	24.8		
	2 1/2	4 7/8	4 1/2	18.2	24.2		
	2	4 7/8	4 3/8	17.9	23.8		
	1 1/2	4 7/8	4 1/4	17.7	23.6		
5	5	5 5/8	5 5/8	31.5	43.4	530.7	.31
	4	5 5/8	5 3/8	27.7	38.2		
	3 1/2	5 5/8	5 1/8	26.6	37.1		
	3	5 5/8	5	26.3	36.8		
	2 1/2	5 5/8	4 7/8	26.0	36.5		
6	6	6 3/4	6 3/4	47.4	65	838.5	.49
	5	6 3/4	6 1/8	47.6	68		
	4	6 3/4	6	47.6	68		
	3 1/2	6 3/4	5 5/8	47.4	68		
	3	6 3/4	5 1/2	47.4	68		
8	8	9 1/2	9 1/2	80	110	1690.5	.98
	6	9 1/2	8 5/8	70	100		
	5	9 1/2	8 3/8	69	98		
	4	9 1/2	8 1/8	68	98		
	3 1/2	9 1/2	7 7/8	68	98		

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

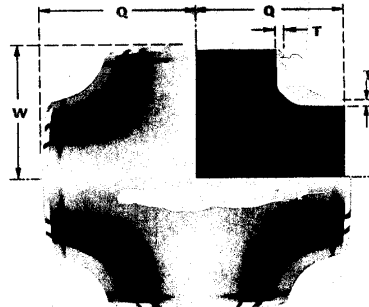
For sizes 26" through 30".....+/- 0.12

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:

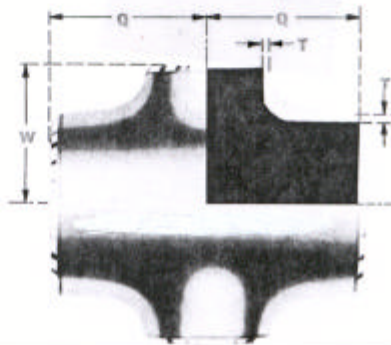
- For sizes up to and including 2 1/2" +/- 0.03
- For sizes 3" through 8" +/- 0.09
- For sizes 10" through 18" +/- 0.12
- For sizes 20" and larger +/- 0.19

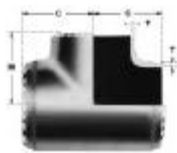
WELDING BEVEL FOR DETAILS OF BEVELS FOR BOTH WELDING FITTINGS AND WELDING NECK FLANGES, SEE DRAWINGS.

- 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

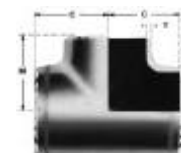
ALL DIMENSIONS ARE IN INCHES.
FOR O.D AND WALL THICKNESS SEE PIPE CHART SECTION.
FITTINGS OVER 24" MAY BE MANUFACTURED FROM WELDED PIPE WITH THE WELD SEAM 100% XRAYED.

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





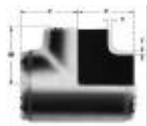
CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES



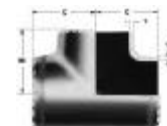
ASME/ ANSI B 16.9 TABLES 5 AND 6

ASTM 234

NOMINAL PIPE SIZE		Center Of Run	To End Of Branch	Std. Wall Apx.	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)		
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



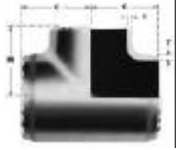
CARBON STEEL STRAIGHT AND REDUCING WELD TEES DIMENSIONS , WEIGHTS AND VOLUMES



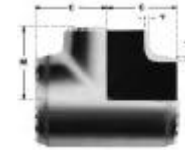
ASME/ ANSI B 16.9 TABLES 5 AND 6

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		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

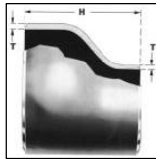
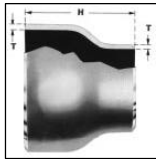
ASME/ANSI B 16.9 TABLE 9

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

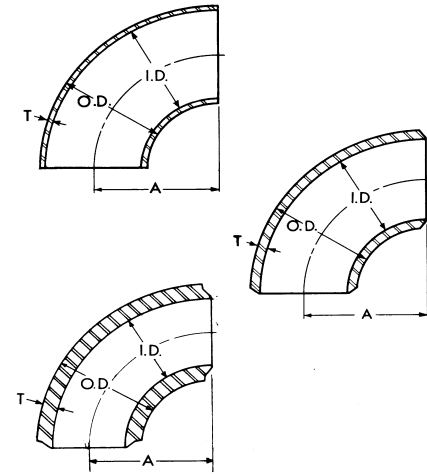
90° SHORT RADIUS SEAMLESS ELBOWS

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,

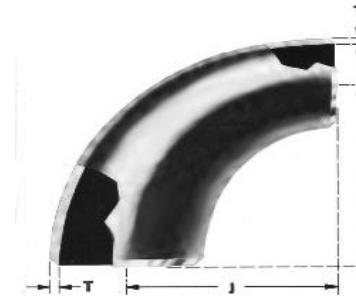
- Center To End Of Bevel:
- For sizes up to and including 8".....+/- 0.06
- For sizes 10" through 24".....+/- 0.09
- For sizes 26" through 30".....+/- 0.12
- For sizes 32" and larger.....+/- 0.19

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 Approx Weight Pounds	SCH 40 Approx Weight Pounds	XH Approx Weight Pounds	SCH 80 Approx Weight Pounds	SCH 20 Approx Weight Pounds	SCH 30 Approx Weight Pounds	SCH 60 Approx Weight Pounds	SCH 100 Approx Weight Pounds	SCH 120 Approx Weight Pounds	SCH 140 Approx Weight Pounds	SCH 160 Approx Weight Pounds	XXH Approx Weight Pounds	VOLUME CUBIC FEET	
					Max.	Min.														
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	4.593	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	60	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

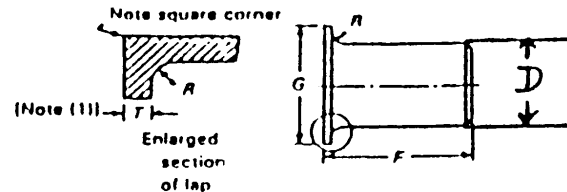
NOTES:

- (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.

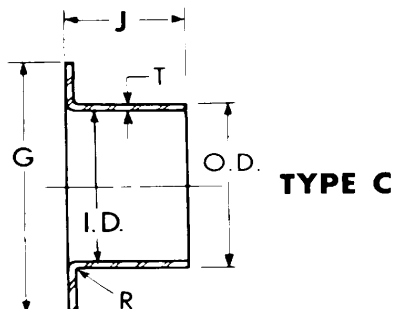
To convert pounds to kilograms divide by 2.2 .
To convert cubic feet to cubic meters divide by 35.31 .



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 +/0.06
- Thickness Of Lap:**
 For sizes up to and including 8"+0 -0.03
 For sizes 10" and larger+0 -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.

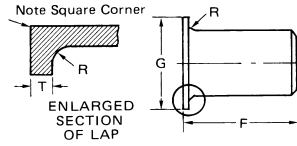
THE LAP FACE IS NOT MACHINED; IT IS FORMED TO A PLANE SURFACE WHICH IS SUITABLE FOR APPLICATIONS WHERE AN ECONOMY -TYPE STUB END IS DESIRED.

STUB ENDS

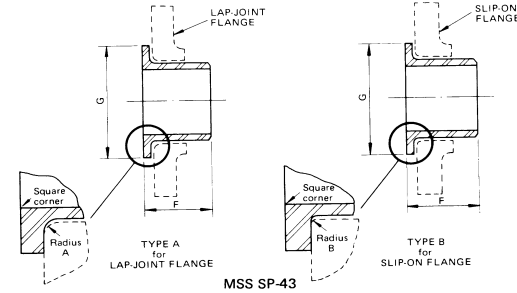
All schedules of Short (MSS Length) Stub Ends are supplied in Type A or Type B. Type A is more readily available.



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

