

13/6, Silver Cinema Building,
2nd Khetwadi Back Road,
Mumbai 400004, India
info@vishalsteel.com



MATERIAL AND MANUFACTURING SPECIFICATIONS

ANSI Pressure Fittings	Corrosion Resistant Fittings	Mechanical			*Chemical									
		Tensile Strength KSI (MPa min.)	Yield Strength KSI (MPa min.)	El. 2in. 50mm % Longt.	C	Mn	P	S	SI	Ni	Cr	Mo	Ti	Co
WP 304	CR 304	75 (515)	30 (205)	35	.08	2.0	0.45	0.30	1.00	8.0-11.0	18.0-20.0			
WP 304H	CR 304H	75 (515)	30 (205)	35	.04-1.0	2.0	0.45	.030	1.00	8.0-11.0	18.0-20.0			
WP 304L	CR 304L	70 (485)	25 (170)	35	.035 ^d	2.0	.045	.030	1.00	8.0-13.0	18.0-20.0			
WP 316	CR 316	75 (515)	30 (205)	35	.08	2.0	0.45	.030	1.00	10.0-14.0	16.0-18.0	2.0-3.0		
WP 316H	CR 316H	75 (515)	30 (205)	35	.04-.10	2.0	0.45	.030	1.00	10.0-14.0	16.0-18.0	2.0-3.0		
WP 316L	CR 316L	70 (485)	25 (170)	35	.035 ^d	2.0	.045	.030	1.00	10.0-16.0	16.0-18.0	2.0-3.0		
WP 321	CR 321	75 (515)	30 (205)	35	.08	2.0	0.45	.030	1.00	9.0-13.0	17.0-20.0		e	
WP 321H	CR 321H	75 (515)	30 (205)	35	.04-.10	2.0	0.45	.030	1.00	9.0-13.0	17.0-20.0		c	
WP 347	CR 347	75 (515)	30 (205)	35	.08	2.0	0.45	.030	1.00	9.0-13.0	17.0-20.0			a
WP 347H	CR 347H	75 (515)	30 (205)	35	.04-.10	2.0	0.45	.030	1.00	9.0-13.0	17.0-20.0			b

* Maximum values except as indicated.
See appropriate spec. for exact values.

e The titanium content shall not be less than five times the carbon content and not more than .70 per cent.

a The columbium plus tantalum content shall not be less than ten times the carbon content and not more than 1.10 per cent.

c The titanium content shall not be less than four times the carbon content and not more than .70 per cent.

b The columbium plus tantalum content shall not be less than eight times the carbon content and not more than 1.0 per cent.

d For small diameter or thin walls or both, where many drawing passes are required, a carbon maximum of .040 per cent is necessary in grades WP 304L and WP 316L. Small outside diameter tubes are defined as those less than .500 in. (12.7 mm) in outside diameter and light wall tubes as those less than .049 in. (1.24 mm) in average wall thickness (.044 in. (1.12mm) in minimum wall thickness).

For the appropriate grade of stainless steel for use with corrosive liquids and gases at various temperatures and pressures, consult your nearest CCTF office.

CCTF Stainless Steel Welding Fittings also conform with one or more of the following standards:	
MSS SP-43 Schedules 5s and 10s only ASME/ANSI B16.9 Welding Fittings, except short radius	ASME/ANSI B36.19M Stainless Steel Pipe ASME/ANSI B16.28 Short Radius Elbows and Returns

37 1/2° ± 2 1/2°

0.06 in. (1.6 mm)
± 0.03 in. (0.8 mm)

T

Welding Bevel for "T"
in excess of 0.12 in. (3.2 mm)

WELDING BEVEL MSS SP-43

Fittings furnished to this standard may be finished with ends cut square for wall thicknesses 0.12in. (3.2 mm) or less. For wall thicknesses in excess of 0.12 in. (3.2 mm), they shall be beveled at 37 1/2° plus or minus 2 1/2°; with root face (land) 0.06 in. (1.6 mm) plus or minus 0.03 in. (0.8 mm).

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MATERIAL AND MANUFACTURING SPECIFICATIONS

The International System (SI) metric equivalent of British units are shown throughout this catalogue.

NPS (Nominal Pipe Size) Operating	=	DN*, (Nominal
Pressure Class	=	Diameter) PN*,
1 inch	=	(Pressure Number)
1 pound, weight	=	25.4 millimetres
1 pound, pressure	=	0.4536 kilograms
		0.06895 bars

* From the SI designations, Diamètre
Nominal and

(1) Dimensional Tolerances MSS SP-43		All Fittings		90° & 45° Elbow s, Tees, Cross Centre to End A, B, C, M	Reducer s, Lap-Joint Stub Ends Overall Length F, H,	Caps Overall Length E	(2) Lap-Joint Stub Ends	
NPS	DN	Outside Dia. at Welding	Wall Thickne ss				Fillet Radius of Lap R	Outsid e of Lap Diameter G or
1/2 - 1 1/2		±0.3	Not less than 87 1/2% of nominal thickness	±0.6	±0.6	±.12	+0 -.03	+0 -.03
15 - 40		±1		±2	±2	±4	+0 -1	+0 -1
2 - 3 1/2		±.03		±.06	±.06	±.12	+0 -.03	+0 -.03
50 - 90		±1		±2	±2	±4	+0 -1	+0 -1
4	100	±1		±.06	±.06	±.12	+0 -.06	+0 -0.3
125 - 200		±2 -1		±2	±2	±4	+0 -2	+0 -1
5 - 8		±.06 -.03		±.06	±.06	±.25	+0 -.06	+0 -.03
250 - 450		+2 -1		±2	±2	±7	+0 -2	+0 -1
10 - 18		+.09 -.03		±.09	±.09	±.25	+0 -.06	+0 -.06
20 - 24		+.12 -.03		±.09	±.09	±.25	+0 -.06	+0 -.06
500 - 600		+3 -1		±3	±3	±7	+0 -2	+0 -2

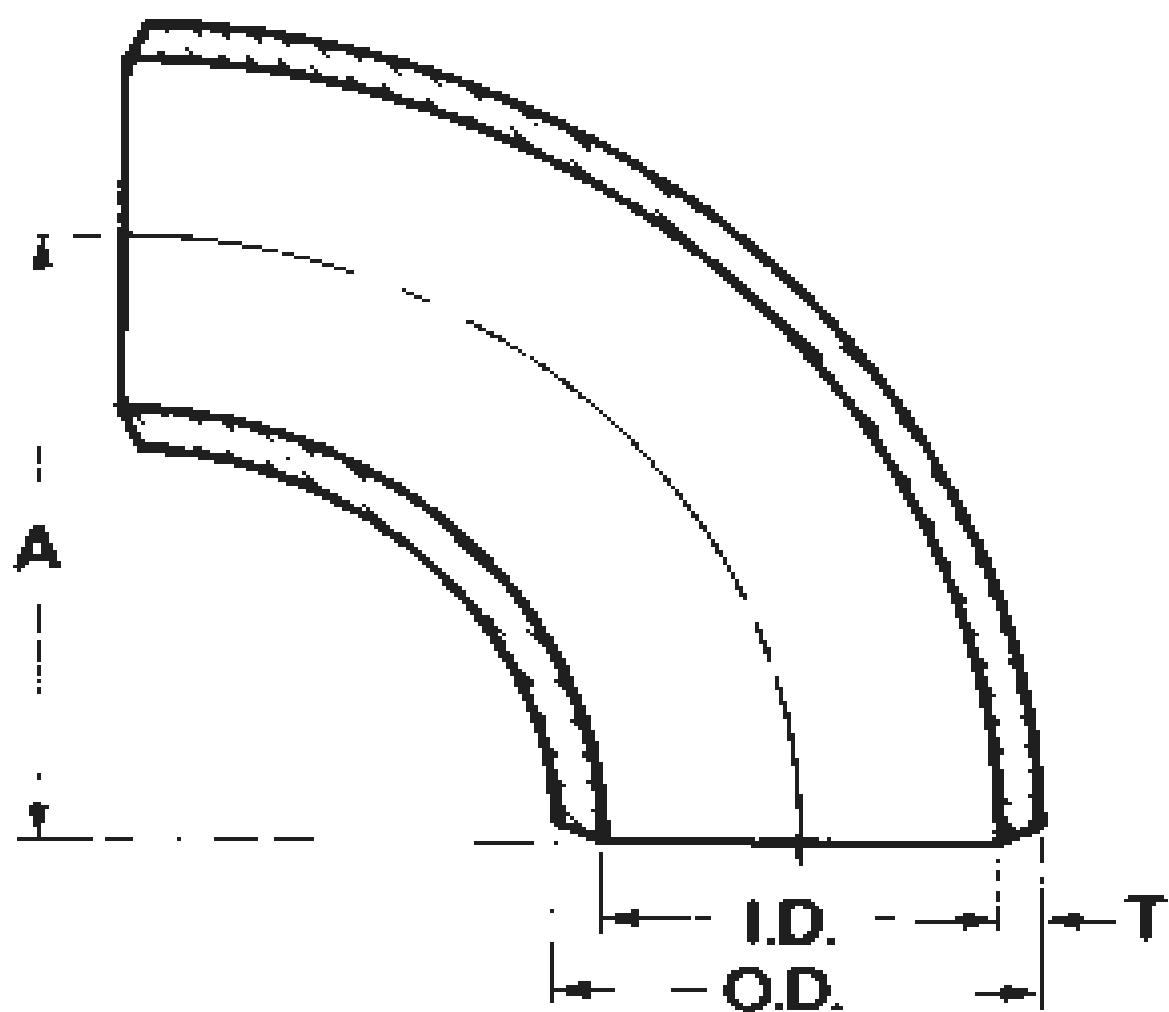
(1) The tolerances in this table are based on those of the MSS SP-43 standard. The tolerances specified by ASME/ANSI B16.9 differ slightly. For precise information on the relevant specifications should be referred to.

(2) Refer to page 15.

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90° ELBOW LONG RADIUS



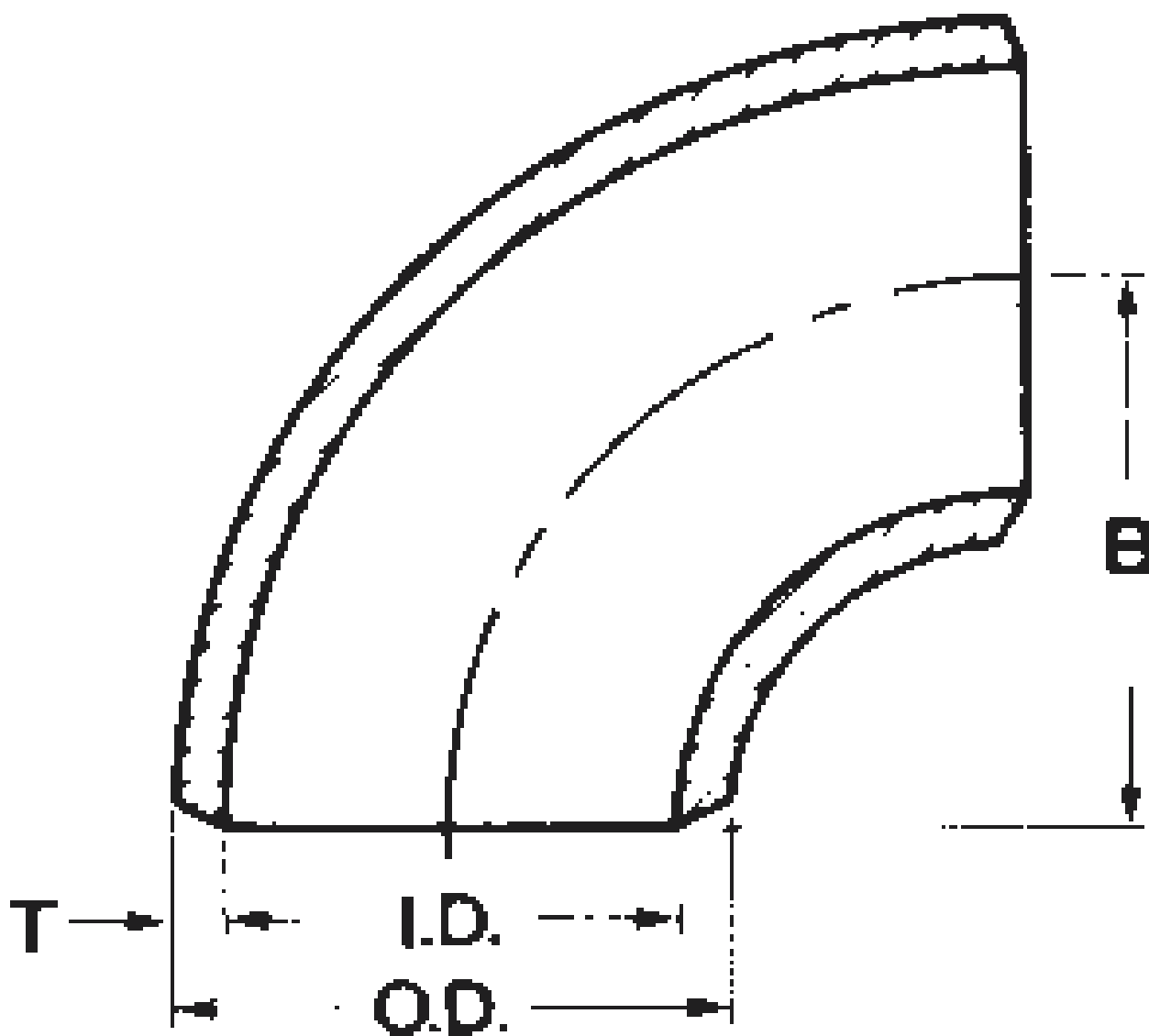
			MSS SP-43						ANSI B16.9					
			Schedule 5S			Schedule 10S			Schedule 5S			Schedule 10S		
NPS	Outside Diameter O.D.	Center To End A	Inside Diameter I.D.	Wall Thickness	Approx. WT.	Inside Diameter I.D.	Wall Thickness	Approx. WT.	Inside Diameter I.D.	Wall Thickness	Approx. WT.	Inside Diameter I.D.	Wall Thickness	Approx. WT.
DN														
1/2	.84	1.50	.710	.065	.10	.674	.083	.13	.622	.109	.18	.546	.147	.25
15	21	38	18.00	1.65	.05	17.10	2.10	.06	15.80	2.75	.08	13.90	3.75	.11
3/4	1.05	*1.1	.920	.065	.12	.884	.083	.16	.824	.113	.19	.742	.154	.25
20	27	2	23.35	1.65	.05	22.45	2.10	.07	20.95	2.85	.09	18.85	3.90	.11
		*29												
1	1.32	1.50	1.185	.065	.22	1.097	.109	.38	1.049	.133	.40	.957	.179	.50
25	33	38	30.10	1.65	.1	27.85	2.75	.17	26.65	3.40	.18	24.30	4.55	.23
1 1/4	1.66	1.88	1.530	0.65	.29	1.442	.109	.50	1.380	.140	.60	1.278	.191	.90
32	42	48	38.85	1.65	.13	36.65	2.75	.23	35.05	3.55	.27	32.45	4.85	.4
1 1/2	1.90	2.25	1.770	.065	.44	1.682	.109	.75	1.610	.145	.90	1.500	.200	1.15
40	48	57	44.95	1.65	.2	42.70	2.75	.34	40.90	3.70	.4	38.10	5.10	.5
2	2.38	3.00	2.245	.065	.66	2.157	.109	1.1	2.067	.154	1.60	1.939	.218	2.2
50	60	76	57.00	1.65	.3	54.80	2.75	.5	52.50	3.90	.7	49.25	5.55	1
2 1/2	2.88	3.75	2.709	.083	1.24	2.635	.120	.8	2.469	.203	3.25	2.323	.276	4
65	73	95	68.80	2.10	.56	66.95	3.05	1.8	62.70	5.15	1.5	59.00	7.00	1.8
3	3.50	4.50	3.334	.083	1.73	3.260	.120	2.5	3.068	.216	5.0	2.900	.300	6.5
80	89	114	84.70	2.10	.8	82.80	3.05	1.1	77.95	5.50	2.3	73.65	7.60	3
3 1/2	4.00	5.25	3.834	.083	2.35	3.760	.120	3.4	3.548	.226	6.75	3.364	.318	8.4
90	102	133	97.40	2.10	1.1	95.50	3.05	1.5	90.10	5.75	3	85.45	8.10	3.8
4	4.50	6.00	4.334	.083	2.97	4.260	.120	4.3	4.026	.237	9	3.826	.337	13.5
100	114	152	110.10	2.10	1.3	108.20	3.05	1.9	102.25	6.00	4	97.20	8.55	6.1
5	5.56	7.50	5.345	.109	6.01	5.295	.134	7.4	5.047	.258	15.5	4.813	.375	22
125	141	190	135.75	2.75	2.7	134.50	3.40	3.3	128.20	6.55	7	122.25	9.55	10
6	6.62	9.00	6.407	.109	8.94	6.357	.134	11	6.065	.280	24.5	5.761	.432	35
150	168	229	162.75	2.75	4	161.50	3.40	5	154.05	7.10	11	146.35	10.95	15.8
8	8.62	12.00	8.407	.109	15.4	8.329	.148	21	7.981	.322	50	7.625	.500	71
200	219	305	213.55	2.75	6.9	211.55	3.75	9.5	202.70	8.20	22	193.70	12.70	32
10	10.75	15.00	10.482	.134	29.2	10.420	.165	36	10.020	.365	88	9.75	.500	107
250	273	381	266.25	3.40	13.1	264.70	4.20	16	254.5	9.25	40	247.65	12.70	48
12	12.75	18.00	12.420	.156	51.2	12.390	.180	57	12.000	.375	125	11.75	.500	160
300	324	457	315.45	3.95	23	314.70	4.55	26	304.80	9.55	56	298.45	12.70	72

* Centre to end dimension A for NPS 3/4 (DN 20) may be 1.50 (38mm) at the manufacturer's option.

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90° ELBOW LONG RADIUS

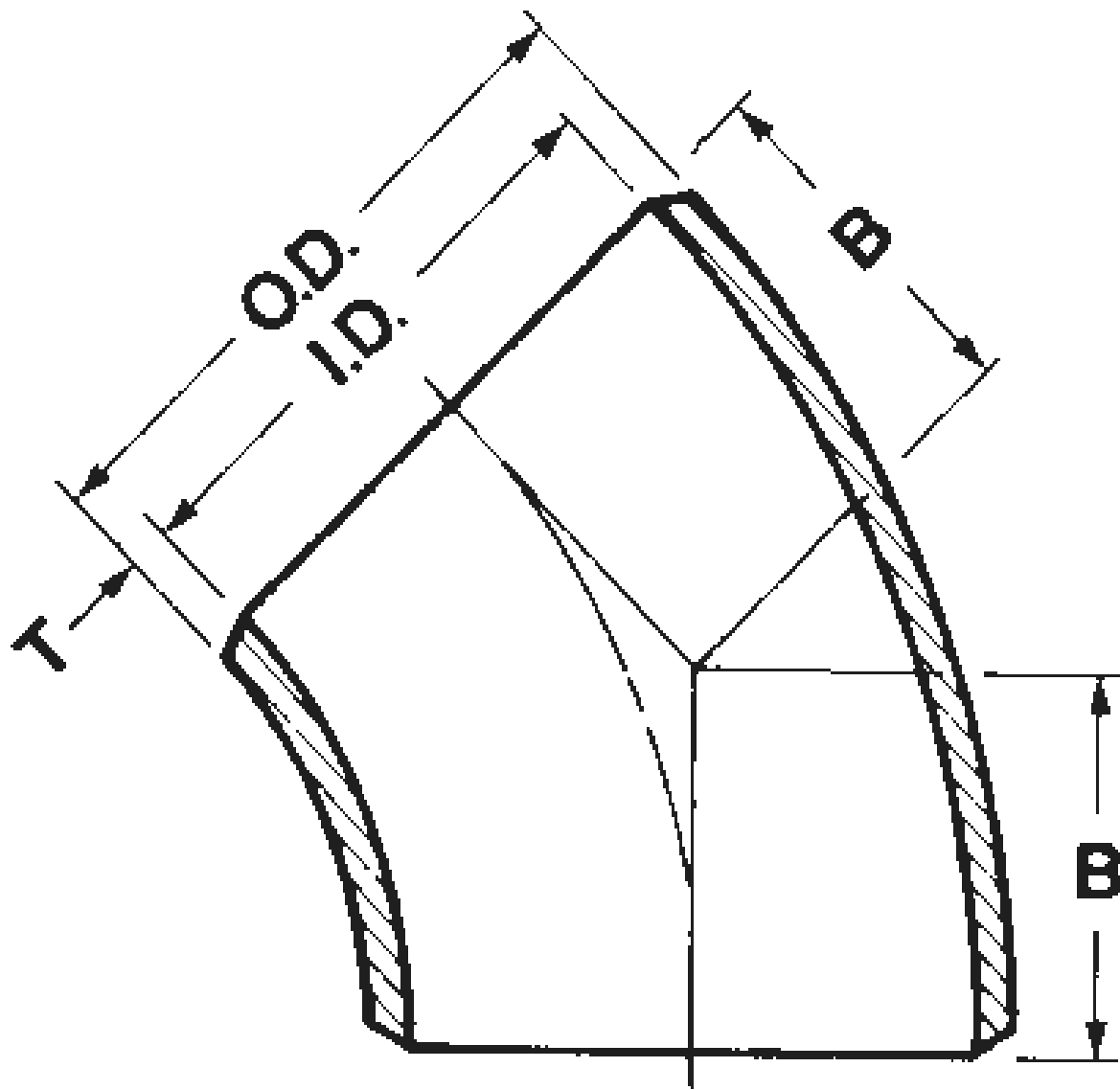


			Schedule 5S			Schedule 10S			Schedule 40S			Schedule 80S		
NPS	Outside Diameter	Center To End	Inside Diameter	Wall Thickness	Approx. WT.	Inside Diameter	Wall Thickness	Approx. WT.	Inside Diameter	Wall Thickness	Approx. WT.	Inside Diameter	Wall Thickness	Approx. WT.
DN	O.D.	B	I.D.	T	WT.	I.D.	T	WT.	I.D.	T	WT.	I.D.	T	WT.
1	1.32	1.00	1.185	.065	.12	1.097	.109	.23	1.049	.133	.25	.957	.179	.41
25	33	25	30.10	1.65	.05	27.85	2.75	.1	26.65	3.40	.11	24.30	4.55	.18
1 1/4	1.66	1.25	1.530	.065	.25	1.442	.109	.38	1.380	.140	.40	1.278	.191	.63
32	42	32	38.85	1.65	.11	36.65	2.75	.17	35.05	3.55	.18	32.45	4.85	.28
1 1/2	1.90	1.50	1.770	.065	.42	1.682	.109	.49	1.610	.145	.56	1.500	.200	.75
40	48	38	44.95	1.65	.19	42.70	2.75	.22	40.90	3.70	.25	38.10	5.10	.34
2	2.38	2.00	2.245	.065	.63	2.157	.109	.81	2.067	.154	1	1.939	.218	1.5
50	60	51	57.00	1.65	.28	54.80	2.75	.36	52.50	3.90	.45	49.25	5.55	.68
2 1/2	2.88	2.50	2.709	.083	1.22	2.635	.120	1.36	2.469	.203	2.13	2.323	.276	2.8
65	73	64	68.80	2.10	.55	66.95	3.05	.6	62.70	5.15	.96	59.00	7.00	1.3
3	3.50	3.00	3.334	.083	1.7	3.260	.120	2.17	3.068	.216	3	2.900	.300	4.25
80	89	76	84.70	2.10	.8	82.80	3.05	1.0	77.95	5.50	1.4	73.65	7.60	1.9
3 1/2	4.00	3.50	3.834	.083	2.3	3.760	.120	3.03	3.548	.226	4.5	3.364	.318	6
90	102	89	97.40	2.10	1.0	95.50	3.05	1.4	90.10	5.75	2	85.45	8.10	2.7
4	4.50	4.00	4.334	.083	2.95	4.260	.120	3.8	4.026	.237	6.25	3.826	.337	8.5
100	114	102	100.10	2.10	1.3	108.20	3.05	1.7	102.25	6.00	2.8	97.20	8.55	3.8
5	5.56	5.00	5.345	.109	4.24	5.295	.134	5.19	5.047	.258	9.6	4.813	.375	14
125	141	127	135.75	2.75	1.9	134.50	3.40	2.3	128.20	6.55	4.3	122.25	9.55	6.3
6	6.62	6.00	6.407	.109	6.09	6.357	.134	7.45	6.065	.280	18	5.761	.432	23
150	168	152	162.75	2.75	2.7	161.50	3.40	3.4	154.05	7.10	8.1	146.35	10.95	10.4

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45° ELBOW LONG RADIUS



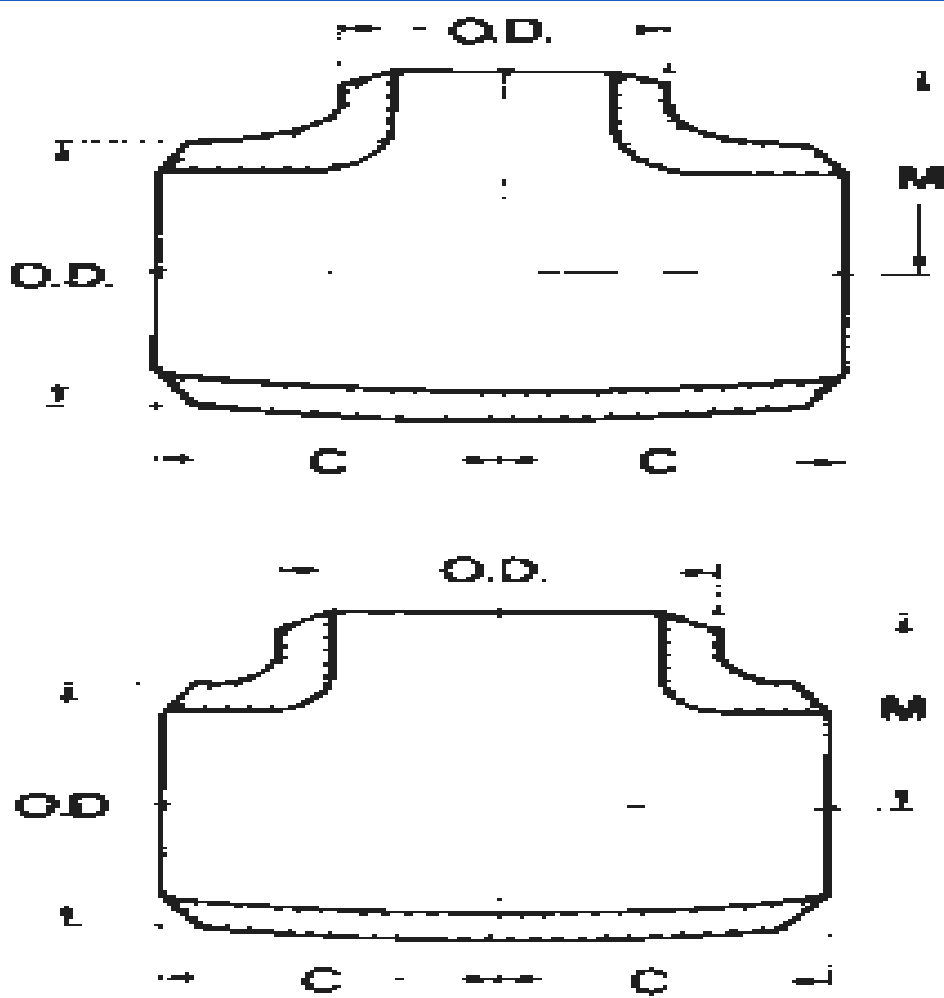
			MSS SP-43						ANSI B16.9					
			Schedule 5S			Schedule 10S			Schedule 40S			Schedule 80S		
NPS	Outside Diameter O.D.	Center To End B	Inside Diameter I.D.	Wall Thickness T	Approx. WT.	Inside Diameter I.D.	Wall Thickness T	Approx. WT.	Inside Diameter I.D.	Wall Thickness T	Approx. WT.	Inside Diameter I.D.	Wall Thickness T	Approx. WT.
DN														
1/2	.84	.62	.710	.065	.05	.674	.083	.06	.622	.109	.09	.546	.147	.19
15	21	16	18.00	1.65	.02	17.10	2.10	.03	15.80	2.75	.04	13.90	3.75	.09
3/4	1.05	*.44	.920	.065	.06	.884	.083	.08	.824	.113	.09	.742	.154	.19
20	27	*11	23.35	1.65	.03	22.45	2.10	.04	20.95	2.84	.04	18.85	3.90	.09
1	1.32	.88	1.185	.065	.14	1.097	.109	.25	1.049	.133	.25	.957	.179	.31
25	33	22	30.10	1.65	.06	27.85	2.75	.11	26.65	3.40	.11	24.30	4.55	.14
1 1/4	1.66	1.00	1.530	.065	.19	1.442	.109	.33	1.380	.140	.38	1.278	.191	.50
32	42	25	38.85	1.65	.09	36.65	2.75	.15	35.05	3.55	.17	32.45	4.85	.23
1 1/2	1.90	1.12	1.770	.065	.28	1.682	.109	.47	1.610	.145	.40	1.500	.200	.69
40	48	29	44.95	1.65	.13	42.70	2.75	.21	40.90	3.70	.18	38.10	5.10	.31
2	2.38	1.38	2.245	.065	.35	2.157	.109	.60	2.067	.154	.81	1.939	.218	1.19
50	60	35	57.00	1.65	.16	54.80	2.75	.27	52.50	3.90	.36	49.25	5.55	.54
2 1/2	2.88	1.75	2.709	.083	.69	2.635	.120	1.0	2.469	.203	1.75	2.323	.276	2.13
65	73	44	68.80	2.10	.31	66.95	3.05	.45	62.70	5.15	.8	59.00	7.00	.96
3	3.50	2.00	3.334	.083	.89	3.260	.120	1.3	3.068	.216	2.63	2.900	.300	3.5
80	89	51	84.70	2.10	.4	82.80	3.05	.6	77.95	5.50	1.2	73.65	7.60	1.6
3 1/2	4.00	2.25	3.834	.083	1.17	3.760	.120	1.7	3.548	.226	3.5	3.364	.318	4.5
90	102	57	97.40	2.10	.53	95.50	3.05	.77	90.10	5.75	1.6	85.45	8.10	2
4	4.50	2.50	4.334	.083	1.52	4.260	.120	2.2	4.026	.237	4.5	3.826	.337	6.1
100	114	64	110.10	2.10	.68	108.20	3.05	1	102.25	6.00	2	97.20	8.55	2.8
5	5.56	3.12	5.345	.109	3.09	5.295	.134	3.8	5.047	.258	7.5	4.813	.375	10.7
125	141	79	135.75	2.75	1.4	134.50	3.40	1.7	128.20	6.55	3.4	122.25	9.55	4.8
6	6.62	3.75	6.407	.109	4.5	6.357	.134	5.5	6.065	.280	12	5.761	.432	17.5
150	168	95	162.75	2.75	2	161.50	3.40	2.5	154.05	7.10	5.4	146.35	10.95	7.9
8	8.62	5.00	8.407	.109	8.1	8.329	.148	11	7.981	.322	23	7.625	.500	35
200	219	127	213.55	2.75	3.7	211.55	3.75	5	202.70	8.20	10.4	193.70	12.70	15.8
10	10.75	6.25	10.482	.134	14.6	10.420	.165	18	10.020	.365	43	9.75	.500	53
250	273	159	266.25	3.40	6.6	264.70	4.20	8	254.50	9.25	19.4	247.65	12.70	23.9
12	12.75	7.50	12.420	.156	25.5	12.390	.180	29	12.000	.375	62	11.75	.500	84
300	324	190	315.45	3.95	11.5	314.70	4.55	13	304.80	9.55	28	298.45	12.70	38

* Centre to end dimension B for NPS 3/4 (DN 20) may be 0.75 (19mm) at the manufacturer's option.

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STRAIGHT & REDUCING TEES



NPS	O.D. Outside Dia. Run	O.D. Outside Dia. Outlet	Centre to End		Approximate Weight			
			C	M	MSS SP-43		ANSI B16.9	
					SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
1/2 straight	.84	.84	1.00	1.00	.18	.20	.35	.45
15 straight	21	21	25	25	.08	.09	.16	.2
3/4 x 3/4 x 1/2	1.05	.84	1.12	1.12	.25	.28	.5	.5
20 x 20 x 15	27	21	29	29	.11	.13	.23	.23
3/4 straight	1.05	1.05	1.12	1.12	.21	.28	.45	.6
20 straight	27	27	29	29	.09	.13	.20	.27
1 x 1 x 1/2	1.32	.84	1.50	1.50	.43	.56	.88	1
25 x 25 x 15	33	21	38	38	.19	.25	.40	.45
1 x 1 x 3/4	1.32	1.05	1.50	1.50	.46	.60	.93	1
25 x 25 x 20	33	27	38	38	.21	.27	.42	.45
1 straight	1.32	1.32	1.50	1.50	.35	.60	.75	.88
25 straight	33	33	38	38	.16	.27	.34	.40
1 1/4 x 1 1/4 x 1/2	1.66	.84	1.88	1.88	.65	1.06	1.5	1.75
32 x 32 x 15	42	21	48	48	.29	.48	.68	.79
1 1/4 x 1 1/4 x 3/4	1.66	1.05	1.88	1.88	.67	1.1	1.5	1.75
32 x 32 x 20	42	27	48	48	.30	.50	.68	.79
1 1/4 x 1 1/4 x 1	1.66	1.32	1.88	1.88	.69	1.15	1.5	1.75
32 x 32 x 25	42	33	48	48	.31	.52	.68	.79
1 1/4 straight	1.66	1.66	1.88	1.88	.65	1.1	1.3	1.6
32 straight	42	42	48	48	.29	.50	.59	.72
1 1/2 x 1 1/2 x 1/2	1.90	.84	2.25	2.25	.79	1.33	2	2.5
40 x 40 x 15	48	21	57	57	.36	.60	.9	1.1
1 1/2 x 1 1/2 x 3/4	1.90	1.05	2.25	2.25	.84	1.41	2.13	2.5
40 x 40 x 20	48	27	57	57	.38	.63	.96	1.1
1 1/2 x 1 1/2 x 1	1.90	1.32	2.25	2.25	.86	1.45	2.18	2.5
40 x 40 x 25	48	33	57	57	.39	.65	.98	1.1
1 1/2 x 1 1/2 x 1 1/4	1.90	1.66	2.25	2.25	.89	1.50	2.25	2.5
40 x 40 x 32	48	42	57	57	.40	.68	1.0	1.1
1 1/2 straight	1.90	1.90	2.25	2.25	.89	1.5	2	2.25
40 straight	48	48	57	57	.40	.68	.9	1.0
2 x 2 x 3/4	2.38	1.05	2.50	1.75	.93	1.37	3.25	4
50 x 50 x 20	60	27	64	44	.42	.62	1.46	1.8
2 x 2 x 1	2.38	1.32	2.50	2.00	1.0	1.67	3.50	4.1
50 x 50 x 25	60	33	64	51	.45	.75	1.58	1.9

Continued on page 10...
For wall thicknesses, refer to page 16.

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STRAIGHT & REDUCING TEES

NPS	O.D. Outside Dia. Run	O.D. Outside Dia. Outlet	Centre to End		Approximate Weight			
			C	M	MSS SP-43		ANSI B16.9	
					SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
1/2 straight	.84	.84	1.00	1.00	.18	.20	.35	.45
15 straight	21	21	25	25	.08	.09	.16	.2
3/4 x 3/4 x 1/2	1.05	.84	1.12	1.12	.25	.28	.5	.5
20 x 20 x 15	27	21	29	29	.11	.13	.23	.23
3/4 straight	1.05	1.05	1.12	1.12	.21	.28	.45	.6
20 straight	27	27	29	29	.09	.13	.20	.27
1 x 1 x 1/2	1.32	.84	1.50	1.50	.43	.56	.88	1
25 x 25 x 15	33	21	38	38	.19	.25	.40	.45
1 x 1 x 3/4	1.32	1.05	1.50	1.50	.46	.60	.93	1
25 x 25 x 20	33	27	38	38	.21	.27	.42	.45
1 straight	1.32	1.32	1.50	1.50	.35	.60	.75	.88
25 straight	33	33	38	38	.16	.27	.34	.40
1 1/4 x 1 1/4 x 1/2	1.66	.84	1.88	1.88	.65	1.06	1.5	1.75
32 x 32 x 15	42	21	48	48	.29	.48	.68	.79
1 1/4 x 1 1/4 x 3/4	1.66	1.05	1.88	1.88	.67	1.1	1.5	1.75
32 x 32 x 20	42	27	48	48	.30	.50	.68	.79
1 1/4 x 1 1/4 x 1	1.66	1.32	1.88	1.88	.69	1.15	1.5	1.75
32 x 32 x 25	42	33	48	48	.31	.52	.68	.79
1 1/4 straight	1.66	1.66	1.88	1.88	.65	1.1	1.3	1.6
32 straight	42	42	48	48	.29	.50	.59	.72
1 1/2 x 1 1/2 x 1/2	1.90	.84	2.25	2.25	.79	1.33	2	2.5
40 x 40 x 15	48	21	57	57	.36	.60	.9	1.1
1 1/2 x 1 1/2 x 3/4	1.90	1.05	2.25	2.25	.84	1.41	2.13	2.5
40 x 40 x 20	48	27	57	57	.38	.63	.96	1.1
1 1/2 x 1 1/2 x 1	1.90	1.32	2.25	2.25	.86	1.45	2.18	2.5
40 x 40 x 25	48	33	57	57	.39	.65	.98	1.1
1 1/2 x 1 1/2 x 1 1/4	1.90	1.66	2.25	2.25	.89	1.50	2.25	2.5
40 x 40 x 32	48	42	57	57	.40	.68	1.0	1.1
1 1/2 straight	1.90	1.90	2.25	2.25	.89	1.5	2	2.25
40 straight	48	48	57	57	.40	.68	.9	1.0
2 x 2 x 3/4	2.38	1.05	2.50	1.75	.93	1.37	3.25	4
50 x 50 x 20	60	27	64	44	.42	.62	1.46	1.8
2 x 2 x 1	2.38	1.32	2.50	2.00	1.0	1.67	3.50	4.1
50 x 50 x 25	60	33	64	51	.45	.75	1.58	1.9

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STRAIGHT & REDUCING TEES

NPS	Outside Dia. Run	Outside Dia. Outlet	Centre to End		Approximate Weight			
			C	M	MSS SP-43		ANSI B16.9	
					SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
2 x 2 x 1 1/4	2.38	1.66	2.50	2.25	1.02	1.72	3.6	4.13
50 x 50 x 32	60	42	64	57	.5	.8	1.6	1.9
2 x 2 x 1 1/2	2.38	1.90	2.50	2.38	1.07	1.8	3.75	4.25
50 x 50 x 40	60	48	64	60	.5	.8	1.7	1.9
2 straight	2.38	2.38	2.50	2.50	1.07	1.8	3.5	4
50 straight	60	60	64	64	.5	.8	1.6	1.8
2 1/2 x 2 1/2 x 1	2.88	1.32	3.00	2.25	1.48	2.49	5	7
65 x 65 x 25	73	33	76	57	.7	1.1	2.3	3.2
2 1/2 x 2 1/2 x 1 1/4	2.88	1.66	3.00	2.50	1.55	2.62	5.25	7.06
65 x 65 x 32	73	42	76	64	.7	1.2	2.4	3.2
2 1/2 x 2 1/2 x 1 1/2	2.88	1.90	3.00	2.62	1.63	2.74	5.5	7.13
65 x 65 x 40	73	48	76	67	.7	1.2	2.5	3.2
2 1/2 x 2 1/2 x 2	2.88	2.38	3.00	2.75	1.78	3	6	7.19
65 x 65 x 50	73	60	76	70	.8	1.4	2.7	3.2
2 1/2 straight	2.88	2.88	3.00	3.00	2.07	3	6	7
65 straight	73	73	76	76	.9	1.4	2.7	3.2
3 x 3 x 1 1/4	3.50	1.66	3.38	2.75	2.47	3.61	6.25	7.6
80 x 80 x 32	89	42	86	70	1.1	1.6	2.8	3.4
3 x 3 x 1 1/2	3.50	1.90	3.38	2.88	2.47	3.65	6.25	7.68
80 x 80 x 40	89	48	86	73	1.1	1.6	2.8	3.5
3 x 3 x 2	3.50	2.38	3.38	3.00	2.57	3.75	6.5	8
80 x 80 x 50	89	60	86	76	1.2	1.7	2.9	3.6
3 x 3 x 2 1/2	3.50	2.88	3.38	3.25	2.69	3.9	6.75	8.25
80 x 80 x 65	89	73	86	83	1.2	1.8	3	3.7
3 straight	3.50	3.50	3.38	3.38	2.69	3.9	7	8.5
80 straight	89	89	86	86	1.2	1.8	3.2	3.8
3 1/2 x 3 1/2 x 1 1/2	4.00	1.90	3.75	3.12	3.08	4.2	8	11.5
90 x 90 x 40	102	48	95	79	1.4	1.9	3.6	5.2
3 1/2 x 3 1/2 x 2	4.00	2.38	3.75	3.25	3.19	4.49	8.3	11.8
90 x 90 x 50	102	60	95	83	1.4	2	3.7	5.3
3 1/2 x 3 1/2 x 2 1/2	4.00	2.88	3.75	3.50	3.26	4.73	8.5	12.2
90 x 90 x 65	102	73	95	89	1.5	2.1	3.8	5.5
3 1/2 x 3 1/2 x 3	4.00	3.50	3.75	3.62	3.38	4.9	8.8	12.6
90 x 90 x 80	102	89	95	92	1.5	2.2	4	5.7
3 1/2 straight	4.00	4.00	3.75	3.75	3.38	4.9	9	12
90 straight	102	102	95	95	1.5	2.2	4	5.4
4 x 4 x 1 1/2	4.50	1.90	4.12	3.38	3.7	5.38	11.1	15.2
100 x 100 x 40	114	48	105	86	1.7	2.4	5	6.8
4 x 4 x 2	4.50	2.38	4.12	3.50	3.75	5.43	11.2	15.5
100 x 100 x 50	114	60	105	89	1.7	2.4	5	7
4 x 4 x 2 1/2	4.50	2.88	4.12	3.75	3.77	5.45	11.3	15.5
100 x 100 x 65	114	73	105	95	1.7	2.5	5.1	7
4 x 4 x 3	4.50	3.50	4.12	3.88	3.88	5.6	11.6	15.6
100 x 100 x 80	114	89	105	98	1.8	2.5	5.2	7
4 x 4 x 3 1/2	4.50	4.00	4.12	4.00	3.94	5.7	11.8	15.6
100 x 100 x 90	114	102	105	102	1.8	2.6	5.3	7
4 straight	4.50	4.50	4.12	4.12	3.94	5.7	12	15.7
100 straight	114	114	105	105	1.8	2.6	5.4	7.1

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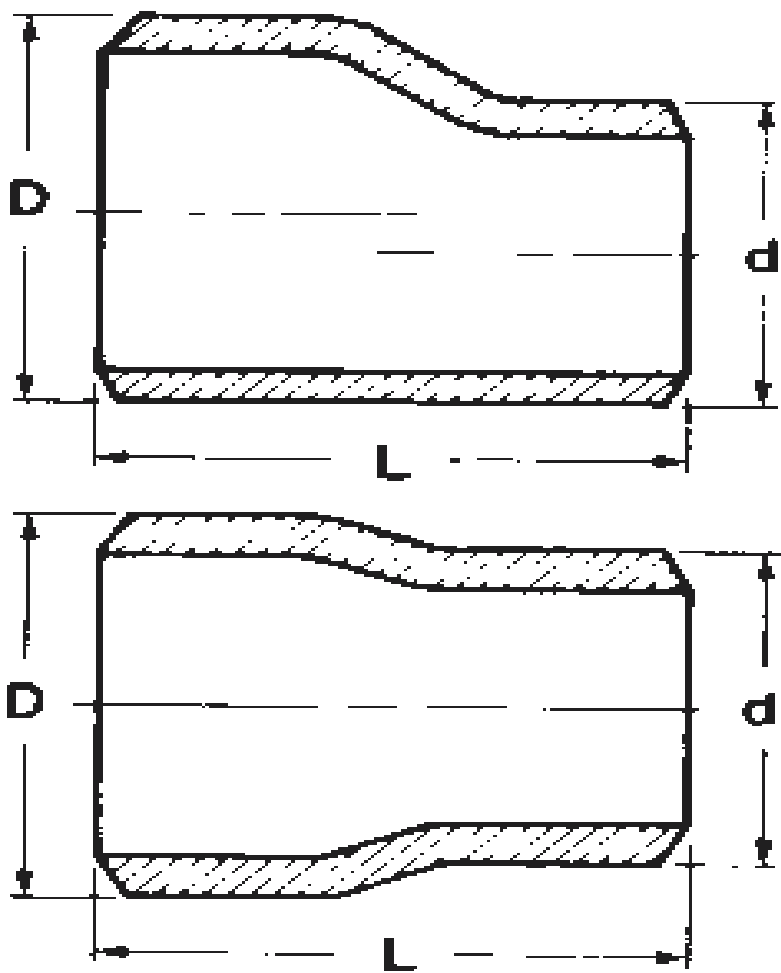
STRAIGHT & REDUCING TEES

NPS	Outside Dia. Run	Outside Dia. Outlet	Centre to End		Approximate Weight			
			C	M	MSS SP-43		ANSI B16.9	
					SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
5 x 5 x 2	5.56	2.38	4.88	4.12	7.52	10.8	19	23.5
125 x 125 x 50	141	60	124	105	3.4	4.9	8.6	10.6
5 x 5 x 2 1/2	5.56	2.88	4.88	4.25	7.7	11.1	19.5	24
125 x 125 x 65	141	73	124	108	3.5	5	8.8	10.8
5 x 5 x 3	5.56	3.50	4.88	4.38	7.91	11.4	20	24.5
125 x 125 x 80	141	89	124	111	3.6	5.1	9	11
5 x 5 x 3 1/2	5.56	4.00	4.88	4.50	8.1	11.7	20.5	25
125 x 125 x 90	141	102	124	114	3.7	5.3	9.2	11.3
5 x 5 x 4	5.56	4.50	4.88	4.62	8.29	12	21	25.5
125 x 125 x 100	141	114	124	117	3.7	5.4	9.5	11.5
5 straight	5.56	5.56	4.88	4.88	9.76	12	21	26
125 straight	141	141	124	124	4.4	5.4	9.5	11.7
6 x 6 x 2 1/2	6.62	2.88	5.62	4.75	12.7	15.7	32	36
150 x 150 x 65	168	73	143	121	5.7	7.1	14.4	16.2
6 x 6 x 3	6.62	3.50	5.62	4.88	12.9	16	32.5	37
150 x 150 x 80	168	89	143	124	5.8	7.2	14.6	16.7
6 x 6 x 3 1/2	6.62	4.00	5.62	5.00	13.1	16.2	33	38.2
150 x 150 x 90	168	102	143	127	5.9	7.3	14.9	17.2
6 x 6 x 4	6.62	4.50	5.62	5.12	13.3	16.5	33.5	39.2
150 x 150 x 100	168	114	143	130	6	7.4	15	17.6
6 x 6 x 5	6.62	5.56	5.62	5.38	13.8	17	34.5	40
150 x 150 x 125	168	141	143	137	6.2	7.7	15.5	18
6 straight	6.62	6.62	5.62	5.62	13.8	17	34	40
150 straight	168	168	143	143	6.2	7.7	15.3	18
8 x 8 x 3 1/2	8.62	4.00	7.00	6.00	19	23.4	50.7	70.5
200 x 200 x 90	219	102	178	152	8.6	10.5	22.8	31.7
8 x 8 x 4	8.62	4.50	7.00	6.12	19.4	23.9	51.7	71.7
200 x 200 x 100	219	114	178	156	8.7	10.8	23.3	32.3
8 x 8 x 5	8.62	5.56	7.00	6.38	19.9	24.5	53	73
200 x 200 x 125	219	141	178	162	9	11	23.9	32.9
8 x 8 x 6	8.62	6.62	7.00	6.62	20.3	25	54	74
200 x 200 x 150	219	168	178	168	9.1	11.3	24.3	33.3
8 straight	8.62	8.62	7.00	7.00	18.4	25	55	75
200 straight	219	219	178	178	8.3	11.3	24.8	33.8
10 x 10 x 6	10.75	6.62	8.50	7.62	26.7	36.3	83	108
250 x 250 x 150	273	168	216	194	12	16.3	37.4	48.6
10 x 10 x 8	10.75	8.62	8.50	8.00	27.2	37	84.5	109
250 x 250 x 200	273	219	216	203	12.2	16.7	38	49
10 straight	10.75	10.75	8.50	8.50	30	37	85	105
250 straight	273	273	216	216	14	16.7	38.3	47.3
12 x 12 x 6	12.75	6.62	10.00	8.62	39.6	51.7	114	165
300 x 300 x 150	324	168	254	219	17.8	23.3	51	74.3
12 x 12 x 8	12.75	8.62	10.00	9.00	40.6	53	117	175
300 x 300 x 250	324	273	254	241	18.6	24.3	53.6	83.3
12 x 12 x 10	12.75	10.75	10.00	9.50	41.4	54	119	185
300 x 300 x 250	324	273	254	241	18.6	24.3	53.6	83.3
12 straight	12.75	12.75	10.00	10.00	46.7	54	120	160
300 straight	324	324	254	254	21	24.3	54	72

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REDUCERS CONCENTRIC & ECCENTRIC



NPS	DN	Length L	Outside Diameter		Approximate Weight			
			Large End D	Small End d	MSS SP-43		ANSI B16.9	
					SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
3/4 x 1/2	20 x 15	1.5	1.05	.84	.1	/16	.17	.22
		38	27	21	.05	.07	.08	.1
1 x 1/2	25 x 15	2	1.32	.84	.2	.37	.40	.45
		51	33	21	.09	.17	.18	.2
1 x 3/4	25 x 20	2	1.32	1.05	.21	.38	.40	.45
		51	33	27	.09	.17	.18	.2
1 1/4 x 1/2	32 x 15	2	1.66	.84	.23	.39	.40	.50
		51	42	21	.1	.18	.18	.23
1 1/4 x 3/4	32 x 20	2	1.66	1.05	.24	.42	.40	.50
		51	42	27	.11	.19	.18	.23
1 1/4 x 1	32 x 25	2	1.66	1.32	.25	.44	.50	.50
		51	42	33	.11	.2	.23	.23
1 1/2 x 1/2	40 x 15	2.5	1.90	.84	.24	.49	.50	.65
		64	48	21	.11	.22	.23	.3
1 1/2 x 3/4	40 x 20	2.5	1.90	1.05	.26	.53	.54	.70
		64	48	27	.12	.24	.24	.32
1 1/2 x 1	40 x 25	2.5	1.90	1.32	.28	.56	.62	.75
		64	48	33	.13	.25	.28	.34
1 1/2 x 1 1/4	40 x 32	2.5	1.90	1.66	.32	.59	.70	.78
		64	48	42	.14	.27	.32	.35
2 x 3/4	50 x 20	3	2.38	1.05	.29	.71	.70	1.0
		76	60	27	.13	.32	.32	.45
2 x 1	50 x 25	3	2.38	1.32	.32	.78	.76	1.1
		76	60	33	.14	.35	.34	.5
2 x 1 1/4	50 x 32	3	2.38	1.66	.36	.82	.84	1.15
		76	60	42	.16	.37	.38	.62
2 x 1 1/2	50 x 40	3	2.38	1.90	.38	.85	.90	1.2
		76	60	48	.17	.38	.41	.54
2 1/2 x 1	65 x 25	3.5	2.88	1.32	.51	1.04	1.25	1.75
		89	73	33	.23	.47	.56	.79
2 1/2 x 1 1/4	65 x 32	3.5	2.88	1.66	.54	1.09	1.25	1.85
		89	73	42	.24	.49	.56	.83
2 1/2 x 1 1/2	65 x 40	3.5	2.88	1.90	.57	1.12	1.38	1.9
		89	73	48	.26	.5	.62	.86
2 1/2 x 2	65 x 50	3.5	2.88	2.38	.62	1.18	1.50	2
		89	73	60	.28	.53	.68	.9
3 x 1 1/4	80 x 32	3.5	3.50	1.66	.62	1.33	1.6	2.4
		89	89	42	.28	.62	.72	1.1
3 x 1 1/2	80 x 40	3.5	3.50	1.90	.66	1.39	1.7	2.5
		89	89	48	.3	.63	.77	1.13
3 x 2	80 x 50	3.5	3.50	2.38	.69	1.45	1.8	2.6
		89	89	60	.31	.29	.8	1.17
3 x 2 1/2	80 x 65	3.5	3.50	2.88	.76	1.53	2	2.75
		89	89	73	.34	.69	.9	1.24
3 1/2 x 1 1/2	90 x 40	4.0	4.00	1.90	.94	1.73	2.5	3.25
		102	102	48	.42	.78	1.13	1.46

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REDUCERS CONCENTRIC & ECCENTRIC

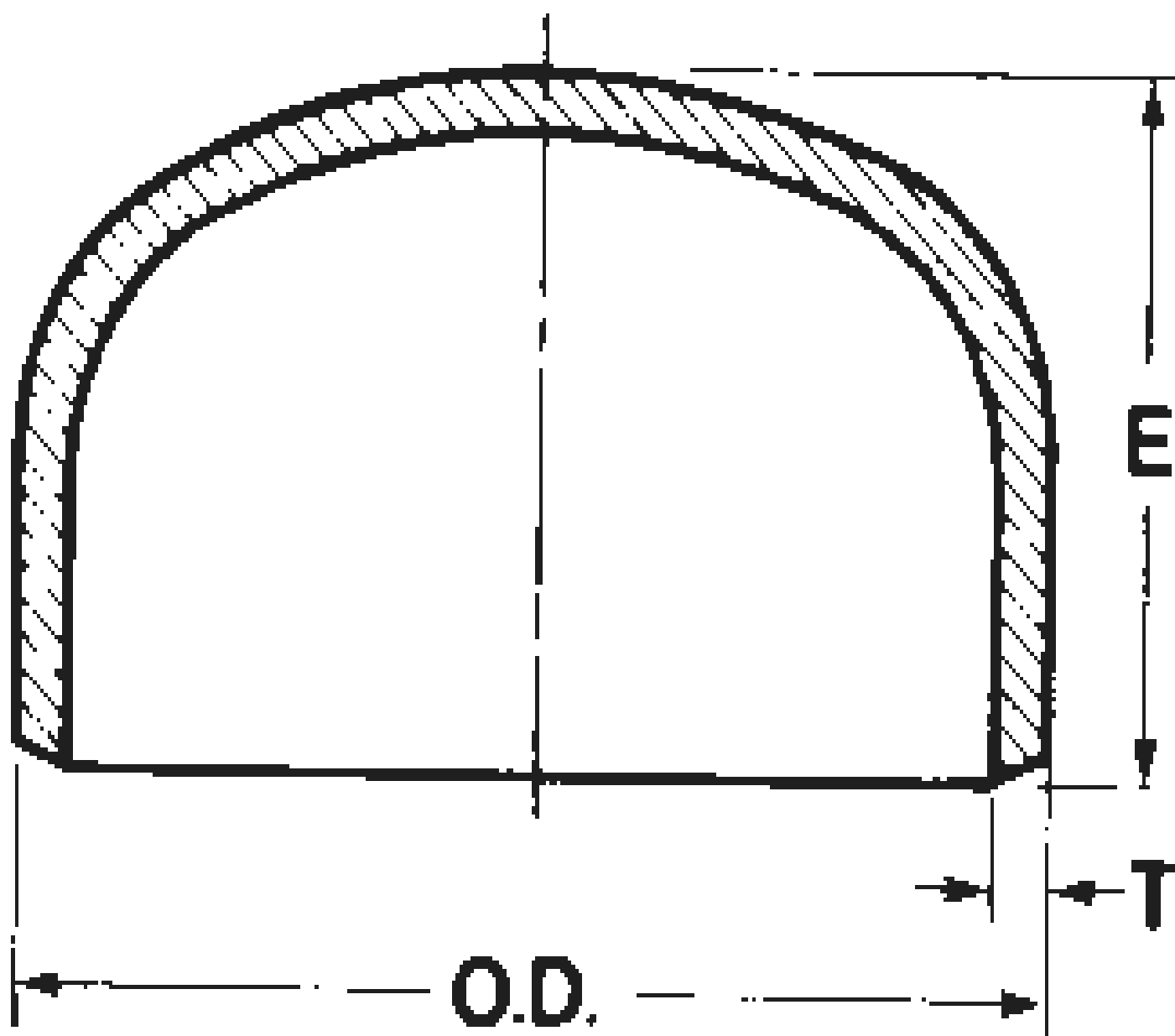
NPS	Length L	Outside Diameter		Approximate Weight			
		Large End D	Small End d	MSS SP-43		ANSI B16.9	
				SCH. 5S	SCH. 10S	SCH. 40S	SCH. 80S
3 1/2 x 2	4.0	4.00	2.38	1.04	1.86	2.75	3.5
90 x 50	102	102	60	.47	.84	1.24	1.6
3 1/2 x 2 1/2	4.0	4.00	2.88	1.09	1.96	2.88	3.5
90 x 65	102	102	73	.49	.88	1.3	1.6
3 1/2 x 3	4.0	4.00	3.50	1.19	2.12	3.15	4
90 x 80	102	102	89	.54	.95	1.42	1.8
4 x 1 1/2	4.0	4.50	1.90	1.02	2.06	2.88	4
100 x 40	102	114	48	.46	.93	1.3	1.8
4 x 2	4.0	4.50	2.38	1.05	2.16	3	4.25
100 x 50	102	114	60	.47	.97	1.35	1.9
4 x 2 1/2	4.0	4.50	2.88	1.15	2.22	3.25	4.38
100 x 65	102	114	73	.52	1.0	1.46	2
4 x 3	4.0	4.50	3.50	1.19	2.28	3.38	4.5
100 x 80	102	114	89	.54	1.03	1.52	2
4 x 3 1/2	4.0	4.50	4.00	1.23	2.41	3.5	4.75
100 x 90	102	114	102	.55	1.08	1.58	2.14
5 x 2	5.0	5.56	2.38	2.12	3.35	5	6.5
125 x 50	127	141	60	.95	1.5	2.3	2.9
5 x 2 1/2	5.0	5.56	2.88	2.22	3.64	5.25	7
125 x 65	127	141	73	1.0	1.64	2.36	3.15
5 x 3	5.0	5.56	3.50	2.33	3.90	5.5	7.5
125 x 80	127	141	89	1.05	1.76	2.48	3.38
5 x 3 1/2	5.0	5.56	4.00	2.44	4.03	5.75	7.75
125 x 90	127	141	102	1.1	1.8	2.59	3.5
5 x 4	5.0	5.56	4.50	2.54	4.29	6	8.25
125 x 100	127	141	114	1.14	1.93	2.7	3.7
6 x 2 1/2	5.5	6.62	2.88	2.83	4.79	7.25	10
150 x 65	140	168	73	1.27	2.16	3.26	4.5
6 x 3	5.5	6.62	3.50	3.12	5.04	8	10.5
150 x 80	140	168	89	1.4	2.27	3.6	4.7
6 x 3 1/2	5.5	6.62	4.00	3.22	5.28	8.25	11
150 x 90	140	168	102	1.45	2.38	3.7	5
6 x 4	5.5	6.62	4.50	3.27	5.52	8.25	11.5
150 x 100	140	168	114	1.47	2.48	3.7	5.2
6 x 5	5.5	6.62	5.56	3.31	5.76	8.5	12
150 x 125	140	168	141	1.5	2.59	3.8	5.4
8 x 3 1/2	6.0	8.62	4.00	3.8	6.9	11	16.5
200 x 90	140	219	102	1.7	3.1	5	7.4
8 x 4	6.0	8.62	4.50	3.95	7.1	11	17
200 x 100	152	219	114	1.78	3.2	5	7.65
8 x 5	6.0	8.62	5.56	4.06	7.51	12	18
200 x 125	152	219	141	1.83	3.38	5.4	8
8 x 6	6.0	8.62	6.62	4.46	7.8	13.2	18.7
200 x 150	152	219	168	2	3.5	5.9	8.4
10 x 4	7.0	10.75	4.50	7.34	10.5	20	25.5
250 x 100	178	273	114	3.3	4.7	9	11.5
10 x 5	7.0	10.75	5.56	7.71	12.6	21	28
250 x 125	178	273	141	3.5	5.7	9.5	12.6
10 x 6	7.0	10.75	6.62	7.89	13.3	21.5	29.5
250 x 150	178	273	168	3.55	6.0	9.7	13.3
10 x 8	7.0	10.75	8.62	8.08	14	22	29.5
250 x 200	178	273	219	3.64	6.3	9.9	13.3
12 x 5	8.0	12.75	5.56	12.9	18.7	30	39
300 x 125	203	324	141	5.8	8.4	13.5	17.6
12 x 6	8.0	12.75	6.62	12.9	19.2	31	40
300 x 150	203	324	168	5.8	8.6	14	18
12 x 8	8.0	12.75	8.62	13.4	20.4	32	42
300 x 200	203	324	219	6.03	9.2	14.4	19
12 x 10	8.0	12.75	10.75	14.1	20.9	34	43.5
300 x 250	203	324	273	6.35	9.4	15.3	19.6

For wall thicknesses and inside diameters refer to page 16.

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info@vishalsteel.com



CAPS



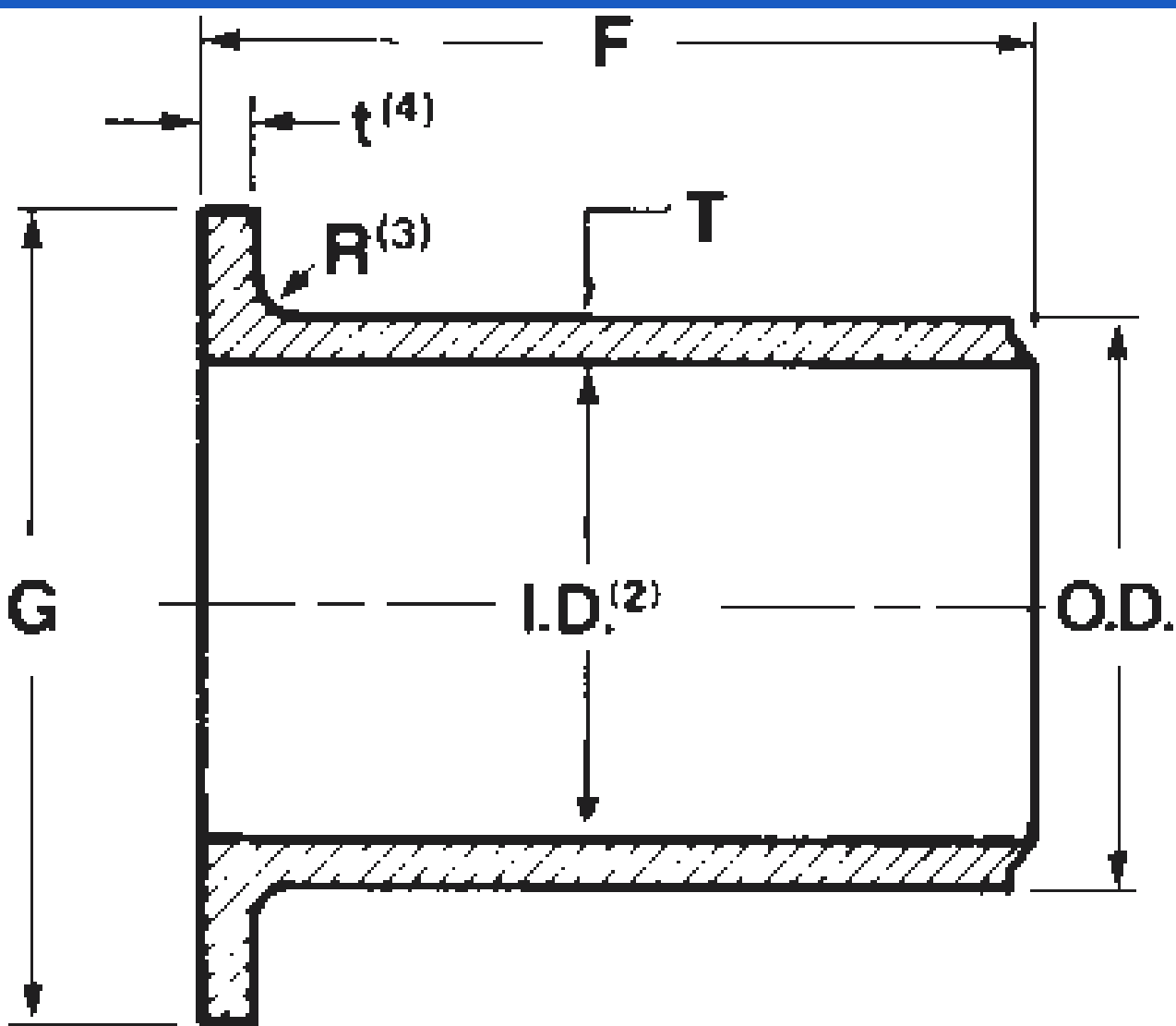
NPS	DN	Outside Diameter O.D.	Length E	MSS SP-43				ANSI B16.9			
				Schedule 5S		Schedule 10S		Schedule 40S		Schedule 80S	
				Wall Thickness T	Approx. WT.	Wall Thickness T	Approx. WT.	Wall Thickness T	Approx. WT.	Wall Thickness T	Approx. WT.
1/2		.84	1.00	.065	.08	.083	.09	.109	.10	.147	.11
	15	21	25	1.65	.04	2.10	.04	2.75	.05	3.75	.05
3/4		1.05	1.00	.065	.11	.083	.12	.113	.13	.154	.14
	20	.27	25	1.65	.05	2.10	.05	2.85	.06	3.90	.06
1		1.32	1.50	.065	.18	.109	.19	.133	.28	.179	.3
	25	33	38	1.65	.08	2.75	.09	3.40	.13	4.55	.14
1 1/4		1.66	1.50	.065	.20	.109	.28	.140	.38	.191	.4
	32	42	38	1.65	.09	2.75	.13	3.55	.17	4.85	.18
1 1/2		1.90	1.50	.065	.22	.109	.31	.145	.5	.200	.54
	40	48	38	1.65	.1	2.75	.14	3.70	.23	5.10	.24
2		2.38	1.50	.065	.36	.109	.38	.154	.6	.218	.75
	50	60	38	1.65	.16	2.75	.17	3.90	.27	5.55	.34
2 1/2		2.88	1.50	.083	.50	.120	.56	.203	1.0	.276	1.1
	65	75	38	2.10	.23	3.05	.25	5.15	.45	7.00	.5
3		3.50	2.00	.083	.86	.120	.88	.216	1.6	.300	1.9
	80	89	51	2.10	.4	3.05	.4	5.50	.72	7.60	.86
3 1/2		4.00	2.50	.083	1.2	.120	1.25	.226	2.3	.318	2.5
	90	102	64	2.10	.54	3.05	.56	5.75	1.0	8.10	1.1
4		4.50	2.50	.083	1.25	.120	1.4	.237	2.7	.337	3.5
	100	114	64	2.10	.56	3.05	.6	6.00	1.2	8.55	1.6
5		5.56	3.00	.109	2	.134	2.3	.258	4.1	.375	5.6
	125	141	76	2.75	.9	3.40	1.0	6.55	1.8	9.55	2.5
6		6.62	3.50	.109	2.75	.134	3	.280	7.1	.432	10
	150	168	89	2.75	1.24	3.40	1.4	7.10	3.2	10.95	4.5
8		8.62	4.00	.109	4.5	.148	5.5	.322	12.5	.500	16.4
	200	219	102	2.75	2	3.75	2.5	8.20	5.6	12.70	7.4
10		10.75	5.00	.134	9.5	.165	10.8	.365	20.3	.500	27.3
	250	273	127	3.40	4.3	4.20	4.9	9.25	9.1	12.70	12.3
12		12.75	6.00	.156	14	.180	14.4	.375	29	.500	37
	300	324	152	3.95	6.3	4.55	6.5	9.55	13	12.70	17

* The shape of these caps conform to the requirements as given in the ASME Boiler and Pressure Vessel Code.

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LAP JOINT STUB ENDS



NPS	Nominal Outside Diameter O.D.	(5) Lap Diameter G	Fillet Radius R (3)	Schedule 10S			Schedule 40S				
				Wall Thickness T	MSS		Wall Thickness T	MSS		ANSI	
					Length F	Approx. WT.		Length F	Approx. WT.	Length F	Approx. WT.
1/2	.84	1.38	0.12	.083	2.00	.17	.109	2.00	.25	3	.30
15	21	35	3	2.11	51	.08	2.75	51	.11	76	.14
3/4	1.05	2.69	0.12	0.83	2.00	.20	.113	2.00	.35	3	.40
20	27	43	3	2.10	51	.09	2.85	51	.16	76	.18
1	1.32	2.00	0.12	.109	2.00	.30	.133	2.00	.40	4	.65
25	33	51	3	2.75	51	.14	3.40	51	.18	102	.29
1 1/4	1.66	2.50	0.19	.109	2.00	.45	.140	2.00	.60	4	.90
32	42	64	5	2.75	51	.2	3.55	51	.27	102	.41
1 1/2	1.90	2.88	0.25	.109	2.00	.55	.145	2.00	.85	4	1.25
40	48	73	6	2.75	51	.25	3.70	51	.38	102	.56
2	2.38	3.62	0.31	.109	2.50	.85	.154	2.50	1.20	6	2.20
50	60	92	8	2.75	64	.38	3.90	64	.5	152	1
2 1/2	2.88	4.12	0.31	.120	2.50	1.05	.203	2.50	1.75	6	3.45
65	73	105	8	3.05	64	.47	5.15	64	.8	152	1.6
3	3.50	5.00	0.38	.120	2.50	1.61	.216	2.50	2.50	6	4.70
80	89	127	10	3.05	64	.72	5.50	64	1.1	152	2.1
3 1/2	4.00	5.50	0.38	.120	3.00	2.07	.226	3.00	3.25	6	5.65
90	102	140	10	3.05	76	.93	5.75	76	1.5	152	2.6
4	4.50	6.19	0.44	.120	3.00	2.52	.237	3.00	4.00	6	6.7
100	114	157	11	3.05	76	1.1	6.00	76	1.8	152	3
5	5.56	7.31	0.44	.134	3.00	3.5	.258	3.00	5.60	8	11.7
125	141	186	11	3.40	76	1.6	6.55	76	2.5	203	5.3
6	6.62	8.50	0.50	.134	3.50	4.8	.280	3.50	8.25	8	15.2
150	168	216	13	3.40	89	2.2	7.10	89	3.7	203	7
8	8.62	10.62	0.50	.148	4.00	7.7	.322	4.00	13.0	8	23.0
200	219	270	13	3.75	102	3.5	8.20	102	5.9	203	10.4
10	10.75	12.75	0.50	.165	5.00	12.1	.365	5.00	23.0	10	40.0
250	273	324	13	4.20	127	5.5	9.25	127	10	254	18
12	12.75	15.00	0.50	.180	6.00	18.0	.375	6.00	33.0	10	49.0
300	324	381	13	4.55	152	8.1	9.55	152	15	254	22

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DIMENSIONS OF WELDED & SEAMLESS STAINLESS STEEL PIPE

NPS	Outside Diameter All Schedules	Inside Diameter				Nominal Wall Thickness			
		Schedule 5S	Schedule 10S	Schedule 40S	Schedule 80S	Schedule 5S	Schedule 10S	Schedule 40S	Schedule 80S
DN									
1/2	.840	.710	.674	.622	.546	.065	.083	.109	.147
15	21.35	18.00	17.10	15.80	13.90	1.65	2.10	2.75	3.75
3/4	1.050	.920	.884	.824	.742	.065	.083	.113	.154
20	26.65	23.35	22.45	20.95	18.85	1.65	2.10	2.85	3.90
1	1.315	1.185	1.097	1.049	.957	.065	.109	.133	.179
25	33.40	30.10	27.85	26.65	24.30	1.65	2.75	3.40	4.55
1 1/4	1.660	1.530	1.442	1.380	1.278	.065	.109	.140	.191
32	42.15	38.85	36.65	35.05	32.45	1.65	2.75	3.55	4.85
1 1/2	1.900	1.770	1.682	1.610	1.500	.065	.109	.145	.200
40	48.25	44.95	42.70	40.90	38.10	1.65	2.75	3.70	5.10
2	2.375	2.245	2.157	2.067	1.939	.065	.109	.154	.218
50	60.35	57.00	54.80	52.50	49.25	1.65	2.75	3.90	5.55
2 1/2	2.875	2.709	2.635	2.469	2.323	.083	.120	.203	.276
65	73.05	68.80	66.95	62.70	59.00	2.10	3.05	5.15	7.00
3	3.500	3.334	3.260	3.068	2.900	.083	.120	.216	.300
80	88.90	84.70	82.80	77.95	73.65	2.10	3.05	5.50	7.60
3 1/2	4.000	3.834	3.760	3.548	3.364	.083	.120	.226	.318
90	101.60	97.40	95.50	90.10	85.45	2.10	3.05	5.75	8.10
4	4.500	4.334	4.260	4.026	3.826	.083	.120	.237	.337
100	114.30	110.10	108.20	102.25	97.20	2.10	3.05	6.00	8.55
5	5.563	5.345	5.295	5.047	4.813	.109	.134	.258	.375
125	141.30	135.75	134.50	128.20	122.25	2.75	3.40	6.55	9.55
6	6.625	6.407	6.357	6.065	5.761	.109	.134	.280	.432
150	168.30	162.75	161.50	154.05	146.35	2.75	3.40	7.10	10.95
8	8.625	8.407	8.329	7.981	7.625	.109	.148	.322	.500
200	219.10	213.55	211.55	202.70	193.70	2.75	3.75	8.20	12.70
10	10.750	10.482	10.420	10.020	9.75	.134	.165	.365	.500*
250	273.05	266.25	264.70	254.50	247.65	3.40	4.20	9.25	12.70
12	12.750	12.420	12.390	12.000	11.75	.156	.180	.375*	.500*
300	323.85	315.45	314.70	304.80	298.45	3.95	4.55	9.55	12.70