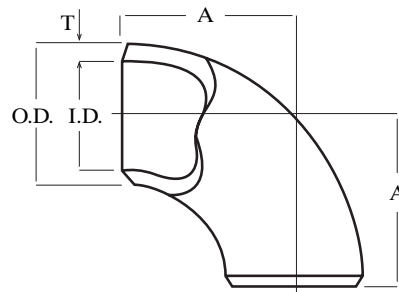


90° ELBOW LONG RADIUS



- Standard weight
- Extra strong
- Schedule 160
- Double extra strong
- ASTM A-234
- ASME / ANSI B16.9
- Carbon and ferritic alloy steel



Produced from X-rayed, stress-relieve welded pipe. Welds are 100% radiographed in accordance with the requirements of ASME Boiler & Vessel Code.

These fittings are also available in other sizes and / or wall thicknesses.

NPS DN	Outside Diameter at Bevel O.D.	Centre to End A	STANDARD WEIGHT			EXTRA STRONG			SCHEDULE 160			DOUBLE EXTRA STRONG		
			Inside Diameter I.D.	Wall Thickness T	Approx. Weight	Inside Diameter I.D.	Wall Thickness T	Approx. Weight	Inside Diameter I.D.	Wall Thickness T	Approx. Weight	Inside Diameter I.D.	Wall Thickness T	Approx. Weight
1/2	.840	1.50	.622	0.109	0.2	.546	.147	0.2	-	-	-	-	-	-
15	21	38	15.80	2.77	0.09	13.87	3.73	.09	-	-	-	-	-	-
3/4	1.050	(1) 1.12	.824	0.113	0.3	.742	.154	0.2	-	-	-	-	-	-
20	27	29	20.93	2.87	0.14	18.85	3.91	.09	-	-	-	-	-	-
1	1.315	1.50	1.049	0.133	0.4	.957	.179	0.5	0.815	.250	0.6	.599	.358	0.8
25	33	38	26.64	3.38	0.18	24.31	4.55	0.23	20.7	6.35	0.27	15.21	9.09	0.36
1 1/4	1.660	1.88	1.380	0.140	0.5	1.278	.191	0.7	1.160	.250	1.0	.896	.382	1.4
32	42	48	35.05	3.56	0.23	32.46	4.85	0.32	29.5	6.35	0.45	22.76	9.70	0.63
1 1/2	1.900	2.25	1.610	0.145	0.75	1.500	.200	1.0	1.338	.281	1.8	1.100	.400	2.0
40	48	57	40.89	3.68	0.34	38.10	5.08	0.45	34.0	7.14	0.81	27.94	10.16	0.90
2	2.375	3.0	2.067	0.154	1.5	1.939	.218	2.0	1.687	.344	3.2	1.503	.436	3.8
50	60	76	52.50	3.91	0.68	49.25	5.54	0.9	42.9	8.74	1.44	38.18	11.07	1.71
2 1/2	2.875	3.75	2.469	0.203	3.0	2.323	.276	4.0	2.125	.375	6.0	1.771	.552	7.1
65	73	95	62.71	5.16	1.35	59.00	7.01	1.6	54.0	9.53	2.70	44.96	14.02	3.20
3	3.500	4.50	3.068	0.216	4.5	2.900	.300	6.0	2.624	.438	9.0	2.300	.600	11.2
80	89	114	77.93	5.49	2.03	73.66	7.62	2.7	66.7	11.13	4.05	58.42	15.24	5.04
3 1/2	4.000	5.25	3.548	0.226	6.2	3.364	.318	8.5	-	-	-	(2) 2.728	(2) .636	16.2
90	102	133	90.12	5.74	2.8	85.45	8.08	3.83	-	-	-	69.29	16.15	7.3
4	4.500	6.00	4.026	0.237	8.5	3.826	.377	12	3.438	.531	19	3.152	.674	21.2
100	114	152	102.26	6.02	3.8	97.18	8.56	5.4	67.3	13.49	8.5	80.06	17.12	9.5
5	5.563	7.50	5.047	0.258	14.2	4.813	.375	20	4.313	.625	33	4.063	.750	38
125	141	190	128.19	6.55	6.4	122.25	9.53	9.0	109.6	15.88	15	103.20	19.05	17
6	6.625	9.00	6.065	0.280	23	5.761	.432	32	5.187	.719	59	4.897	.864	63
150	168	229	154.05	7.11	10.4	140.33	10.97	14	131.9	18.26	27	124.38	21.95	28
8	8.625	12.00	7.981	0.322	45	7.625	.500	68	6.813	.906	127	6.875	.875	120
200	219	305	202.72	8.18	20	193.68	12.70	31	173.05	23.01	57	174.63	22.23	54
10	10.750	15.00	10.02	0.365	78	9.750	.500	112	8.500	1.125	270	-	-	-
250	273	381	254.5	9.27	35	247.65	12.70	50	215.90	28.58	122	-	-	-
12	12.750	18.00	12.00	0.375	118	11.750	.500	150	10.126	1.312	460	-	-	-
300	324	457	304.6	9.53	53	298.45	12.70	68	257.20	33.53	207	-	-	-
14	14.000	21.0	13.25	0.375	147	13.00	.500	192	11.188	1.406	563	-	-	-
350	356	533	336.6	9.53	68	330.2	12.70	86	284.18	35.71	253	-	-	-
16	16.000	24.0	15.25	0.375	202	15.00	.500	258	12.812	1.594	825	-	-	-
400	406	610	386.1	9.53	91	381.0	12.70	116	325.42	40.49	371	-	-	-
18	18.000	27.0	17.25	0.375	256	17.00	.500	326	-	-	-	-	-	-
450	457	686	438.2	9.53	115	431.8	12.70	147	-	-	-	-	-	-
20	20.000	30.0	19.25	0.375	310	19.00	.500	420	-	-	-	-	-	-
500	508	62	489.0	9.53	139	482.6	12.70	189	-	-	-	-	-	-
22	22.000	33.0	21.25	0.375	394	21.00	.500	520	-	-	-	-	-	-
550	559	838	539.8	9.53	177	533.4	12.70	234	-	-	-	-	-	-
24	24.000	36.0	23.25	0.375	446	23.00	.500	606	-	-	-	-	-	-
600	616	914	590.6	9.53	201	584.2	12.70	273	-	-	-	-	-	-
26	26.000	39.0	25.25	0.375	550	25.00	.500	729	-	-	-	-	-	-
650	660	991	641.4	9.53	247	635.0	12.70	328	-	-	-	-	-	-
30	30.000	45.0	29.25	0.375	736	29.00	.500	953	-	-	-	-	-	-
750	762	1143	743.0	9.53	331	736.6	12.70	429	-	-	-	-	-	-
36	36.000	54.0	35.25	0.375	1062	35.00	.500	1412	-	-	-	-	-	-
900	914	1372	895.4	9.53	478	889.0	12.70	635	-	-	-	-	-	-
42	42.000	63.0	41.25	0.375	1370	41.00	.500	1890	-	-	-	-	-	-
1100	1067	1600	1047.6	9.53	616	1041.1	12.70	820	-	-	-	-	-	-

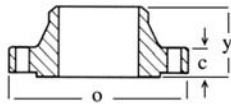
(1) May be furnished as 1.5 in (38 mm) at the manufacturer's option.
 (2) 3-1/2XXS is not specified in ASME / ANSI B36. 10M

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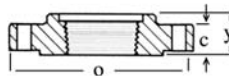
Welding Neck Flange*



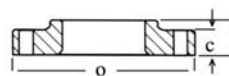
Slip-On Flange



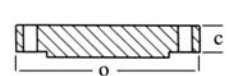
Threaded Flange



Lap Joint Flange



Blind Flange



Nom. Pipe Size	150 lb. Flanges							300 Lb. Flanges							400 lb Flanges							Nom. Pipe Size	
	O	C**	Y			No. and Size of Holes	O	C**	Y			No. and Size of Holes	O	C**	Y**			No. and Size of Holes					
			Weld Neck	Slip on Thrd.	Lap Joint				Bolt Circle	Weld Neck	Slip on Thrd.				Lap Joint	Bolt Circle	Weld Neck		Slip on Thrd.	Lap Joint	Bolt Circle		
1/2	3 1/2	7/16	1 7/8	5/8	5/8	2 3/8	4 5/8	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4 - 5/8	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4 - 5/8	1/2	
3/4	3 7/8	1/2	2 1/16	5/8	5/8	2 3/4	4 - 5/8	4 5/8	5/8	2 1/4	1	1	3 1/4	4 - 3/4	4 5/8	5/8	2 1/4	1	1	3 1/4	4 - 3/4	3/4	
1	4 1/4	9/16	2 3/16	11/16	11/16	3 1/8	4 - 5/8	4 7/8	11/16	2 7/16	1 1/16	1 1/16	3 1/2	4 - 3/4	4 7/8	11/16	2 7/16	1 1/16	1 1/16	3 1/2	4 - 3/4	1	
1 1/4	4 5/8	5/8	2 1/4	13/16	13/16	3 1/2	4 - 5/8	5 1/4	3/4	2 9/16	1 1/16	1 1/16	3 7/8	4 - 3/4	5 1/4	13/16	2 5/8	1 1/8	1 1/8	3 7/8	4 - 3/4	1 1/4	
1 1/2	5	11/16	2 7/16	7/8	7/8	3 7/8	4 - 5/8	6 1/8	13/16	2 11/16	1 3/16	1 3/16	4 1/2	4 - 7/8	6 1/8	7/8	2 3/4	1 1/4	1 1/4	4 1/2	4 - 7/8	1 1/2	
2	6	3/4	2 1/2	1	1	4 3/4	4 - 3/4	6 1/2	7/8	2 3/4	1 5/16	1 5/16	5	8 - 3/4	6 1/2	1	2 7/8	1 7/16	1 7/16	5	8 - 3/4	2	
2 1/2	7	7/8	2 3/4	1 1/8	1 1/8	5 1/2	4 - 3/4	7 1/2	1	3	1 1/2	1 1/2	5 7/8	8 - 7/8	7 1/2	1 1/8	3 1/8	1 5/8	1 5/8	5 7/8	8 - 7/8	2 1/2	
3	7 1/2	15/16	2 3/4	1 3/16	1 3/16	6	4 - 3/4	8 1/4	1 1/8	3 1/8	1 1/16	1 1/16	6 5/8	8 - 7/8	8 1/4	1 1/4	3 1/4	1 13/16	1 13/16	6 5/8	8 - 7/8	3	
3 1/2	8 1/2	15/16	2 13/16	1 1/4	1 1/4	7	8 - 3/4	9	1 3/16	3 3/16	1 3/4	1 3/4	7 1/4	8 - 7/8	9	1 3/8	3 3/8	1 15/16	1 15/16	7 1/4	8 - 1	3 1/2	
4	9	15/16	3	1 5/16	1 5/16	7 1/2	8 - 3/4	10	1 1/4	3 3/8	1 7/8	1 7/8	7 7/8	8 - 7/8	10	1 3/8	3 1/2	2	2	7 7/8	8 - 1	4	
5	10	15/16	3 1/2	1 7/16	1 7/16	8 1/2	8 - 7/8	11	1 3/8	3 7/8	2	2	9 1/4	8 - 7/8	11	1 1/2	4	2 1/8	2 1/8	9 1/4	8 - 1	5	
6	11	1	3 1/2	1 9/16	1 9/16	9 1/2	8 - 7/8	12 1/2	1 7/16	3 7/8	2 1/16	2 1/16	10 5/8	12 - 7/8	12 1/2	1 5/8	4 1/16	2 1/4	2 1/4	10 5/8	12 - 1	6	
8	13 1/2	1 1/8	4	1 3/4	1 3/4	11 3/4	8 - 7/8	15	1 5/8	4 3/8	2 7/16	2 7/16	13	12 - 1	15	1 7/8	4 5/8	2 11/16	2 11/16	13	12 - 1 1/8	8	
10	16	1 3/16	4	1 15/16	1 15/16	14 1/4	12 - 1	17 1/2	1 7/8	4 5/8	2 5/8	3 3/4	15 1/4	16 - 1 1/8	17 1/2	2 1/8	4 7/8	2 7/8	4	15 1/4	16 - 1 1/4	10	
12	19	1 1/4	4 1/2	2 3/16	2 3/16	17	12 - 1	20 1/2	2	5 1/8	2 7/8	4	17 3/4	16 - 1 1/4	20 1/2	2 1/4	5 3/8	3 1/8	4 1/4	17 3/4	16 - 1 3/8	12	
14	21	1 3/8	5	2 1/4	3 1/8	18 3/4	12 - 1 1/8	23	2 1/8	5 5/8	3	4 3/8	20 1/4	20 - 1 1/4	23	2 3/8	5 7/8	3 5/16	4 5/8	20 1/4	20 - 1 3/8	14	
16	23 1/2	1 7/16	5	2 1/2	3 7/16	21 1/4	16 - 1 1/8	25 1/2	2 1/4	5 3/4	3 1/4	4 3/4	22 1/2	20 - 1 3/8	25 1/2	2 1/2	6	3 11/16	5	22 1/2	20 - 1 1/2	16	
18	25	1 9/16	5 1/2	2 11/16	3 13/16	22 3/4	16 - 1 1/4	28	2 3/8	6 1/4	3 1/2	5 1/8	24 3/4	24 - 1 3/8	28	2 5/8	6 1/2	3 7/8	5 3/8	24 3/4	24 - 1 1/2	18	
20	27 1/2	1 11/16	5 11/16	2 7/8	4 1/16	25	20 - 1 1/4	30 1/2	2 1/2	6 3/8	3 3/4	5 1/2	27	24 - 1 3/8	30 1/2	2 3/4	6 5/8	4	5 3/4	27	24 - 1 5/8	20	
24	32	1 7/8	6	3 1/4	4 3/8	29 1/2	20 - 1 3/8	36	2 3/4	6 5/8	4 3/16	6	32	24 - 1 5/8	36	3	6 7/8	4 1/2	6 1/4	32	24 - 1 7/8	24	
600 lb. Flanges																							
1/2	3 3/4	9/16	2 1/16	7/8	7/8	2 5/8	4 - 5/8	4 3/4	7/8	2 3/8	1 1/4	1 1/4	3 1/4	4 - 7/8	4 3/4	7/8	2 3/8	1 1/4	1 1/4	3 1/4	4 - 7/8	1/2	
3/4	4 5/8	5/8	2 1/4	1	1	3 1/4	4 - 3/4	5 1/8	1	2 3/4	1 3/8	1 3/8	3 1/2	4 - 7/8	5 1/8	1	2 3/4	1 3/8	1 3/8	3 1/2	4 - 7/8	3/4	
1	4 7/8	11/16	2 7/16	1 1/16	1 1/6	3 1/2	4 - 3/4	5 7/8	1 1/8	2 7/8	1 5/8	1 5/8	4	4 - 1	5 7/8	1 1/8	2 7/8	1 5/8	1 5/8	4	4 - 1	1	
1 1/4	5 1/4	13/16	2 5/8	1 1/8	1 1/8	3 7/8	4 - 3/4	6 1/4	1 1/8	2 7/8	1 5/8	1 5/8	4 3/8	4 - 1	6 1/4	1 1/8	2 7/8	1 5/8	1 5/8	4 3/8	4 - 1	1 1/4	
1 1/2	6 1/8	7/8	2 3/4	1 1/4	1 1/4	4 1/2	4 - 7/8	7	1 1/4	3 1/4	1 3/4	1 3/4	4 7/8	4 - 1 1/8	7	1 1/4	3 1/4	1 3/4	1 3/4	4 7/8	4 - 1 1/8	1 1/2	
2	6 1/2	1	2 7/8	1 7/16	1 7/16	5	8 - 3/4	8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8 - 1	8 1/2	1 1/2	4	2 1/4	2 1/4	6 1/2	8 - 1	2	
2 1/2	7 1/2	1 1/8	3 1/8	1 5/8	1 5/8	5 7/8	8 - 7/8	9 5/8	1 5/8	4 1/8	2 1/2	2 1/2	7 1/2	8 - 1 1/8	9 5/8	1 5/8	4 1/8	2 1/2	2 1/2	7 1/2	8 - 1 1/8	2 1/2	
3	8 1/4	1 1/4	3 1/4	1 13/16	1 13/16	6 5/8	8 - 7/8	9 1/2	1 1/2	4	2 1/8	2 1/8	7 1/2	8 - 1	10 1/2	1 7/8	4 5/8	2 7/8	2 7/8	8	8 - 1 1/4	3	
3 1/2	9	1 3/8	3 3/8	1 15/16	1 5/16	7 1/4	8 - 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 1/2
4	10 3/4	1 1/2	4	2 1/8	2 1/8	8 1/2	8 - 1	11 1/2	1 3/4	4 1/2	2 3/4	2 3/4	9 1/4	8 - 1 1/4	12 1/4	2 1/8	4 7/8	3 9/16	3 9/16	9 1/2	8 - 1 3/8	4	
5	13	1 3/4	4 1/2	2 3/8	2 3/8	10 1/2	8 - 1 1/8	13 3/4	2	5	3 3/8	3 1/8	11	8 - 1 3/8	14 3/4	2 7/8	6 1/8	4 1/8	4 1/8	11 1/2	8 - 1	5	
6	14	1 7/8	4 5/8	2 5/8	2 5/8	11 1/2	12 - 1 1/8	15	2 3/16	5 1/2	3 3/8	3 3/8	12 1/2	12 - 1 1/4	15 1/2	3 1/4	6 3/4	4 11/16	4 11/16	12 1/2	12 - 1 1/2	6	
8	16 1/2	2 3/16	5 1/4	3	3	13 3/4	12 - 1 1/4	18 1/2	2 1/2	6 3/8	4	4 1/2	15 1/2	12 - 1 1/2	19	3 5/8	8 3/8	5 5/8	5 5/8	15 1/2	12 - 1 3/4	8	
10	20	2 1/2	6	3 3/8	4 3/8	17	16 - 1 3/8	21 1/2	2 3/4	7 1/4	4 1/4	5	18 1/2	16 - 1 1/2	23	4 1/4	10	6 1/4	7	19	12 - 2	10	
12	22	2 5/8	6 1/8	3 5/8	4 5/8	19 1/4	20 - 1 3/8	24	3 1/8	7 7/8	4 5/8	5 5/8	21	20 - 1 1/2	26 1/2	4 7/8	11 1/8	7 1/8	8 5/8	22 1/2	16 - 2 1/8	12	
14	23 3/4	2 3/4	6 1/2	3 11/16	5	20 3/4	20 - 1 1/2	25 1/4	3 3/8	8 3/8	5 1/8	6 1/8	22	20 - 1 5/8	29 1/2	5 1/4	11 3/4	-	9 1/2	25	16 - 2 3/8	14	
16	27	3	7	4 3/16	5 1/2	23 3/4	20 - 1 5/8	27 3/4	3 1/2	8 1/2	5 1/4	6 1/2	24 1/4	20 - 1 3/4	32 1/2	5 3/4	12 1/4	-	10 1/4	27 3/4	16 - 2 5/8	16	
18	29 1/4	3 1/4	7 1/4	4 5/8	6	25 3/4	20 - 1 3/4	31	4	9	6	7 1/2	27	20 - 2	36	6 3/8	12 7/8	-	10 7/8	30 1/2	16 - 2 7/8	18	
20	32	3 1/2	7 1/2	5	6 1/2	28 1/2	24 - 1 3/4	33 3/4	4 1/4	9 3/4	6 1/4	8 1/4	29 1/2	20 - 2 1/8	38 3/4	7	14	-	11 1/2	32 3/4	16 - 3 1/8	20	
24	37	4	8	5 1/2	7 1/4	33	24 - 2	41	5 1/2	11 1/2	8	10 1/2	35 1/2	20 - 2 5/8	46	8	16	-	13	39	16 - 3 5/8	24	
2500 lb Flanges																							
1/2	5 1/4	1 3/16	2 7/8	1 9/16	1 9/16	3 1/2	4 - 7/8																
3/4	5 1/2	1 1/4	3 1/8	1 11/16	1 11/16	3 3/4	4 - 7/8																
1	6 1/4	1 3/8	3 1/2	1 7/8	1 7/8	4 1/4	4 - 1																
1 1/4	7 1/4	1 1/2	3 3/4	2 1/16	2 1/16	5 1/8	4 - 1 1/8																
1 1/2	8	1 3/4	4 3/8	2 3/8	2 3/8	5 3/4	4 - 1 1/4																
2	9 1/4	2	5	2 3/4	2 3/4	6 3/4	8 - 1 1/8																
2 1/2	10 1/2	2 1/4	5 5/8	3 1/8	3 1/8	7 3/4	8 - 1 1/4																
3	12	2 5/8	6 5/8	3 5/8	3 5/8	9	8 - 1 3/8																
4	14	3	7 1/2	4 1/4	4 1/4	10 3/4	8 - 1 5/8																
5	16 1/2	3 5/8	9	5 1/8	5 1/8	12 3/4	8 - 1 7/8																
6	19	4 1/4	10 3/4	6	6	14 1/2	8 - 2 1/8																
8	21 3/4	5	12 1/2	7	7	17 1/4	12 - 2 1/8																
10	26 1/2	6 1/2	16 1/2	9	9	21 1/4	12 - 2 5/8																
12	30	7 1/4	18 1/4	10	10	24 3/8	12 - 2 7/8																

* Always specify bore when ordering.

** Includes 1/16" raised face in 150 lb. and 300 lb. standards.
Does not include 1/4" raised face in 400 lb. and heavier standards.

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WELDING NECK FLANGE BORES*														
Nom. Pipe Size	Outside Diam.	Light Wall **	Sched. 20	Sched. 30	Std. Wall	Sched. 40	Sched. 60	Extra Strong	Sched. 80	Sched. 100	Sched. 120	Sched. 140	Sched. 160	Double Extra Strong
1/2	0.840	0.674	-	-	0.622	0.622	-	0.546	0.546	-	-	-	0.464	0.252
3/4	1.050	0.884	-	-	0.824	0.824	-	0.742	0.742	-	-	-	0.612	0.434
1	1.315	1.097	-	-	1.049	1.049	-	0.957	0.957	-	-	-	0.815	0.599
1 1/4	1.660	1.442	-	-	1.380	1.380	-	1.278	1.278	-	-	-	1.160	0.896
1 1/2	1.900	1.682	-	-	1.610	1.610	-	1.500	1.500	-	-	-	1.338	1.100
2	2.375	2.157	-	-	2.067	2.067	-	1.939	1.939	-	-	-	1.687	1.503
2 1/2	2.875	2.635	-	-	2.469	2.469	-	2.323	2.323	-	-	-	2.125	1.771
3	3.500	3.260	-	-	3.068	3.068	-	2.900	2.900	-	-	-	2.624	2.300
3 1/2	4.00	3.760	-	-	3.548	3.548	-	3.364	3.364	-	-	-	-	2.728
4	4.500	4.260	-	-	4.026	4.026	-	3.826	3.826	-	3.624	-	3.438	3.152
5	5.563	5.295	-	-	5.047	5.047	-	4.813	4.813	-	4.563	-	4.313	4.063
6	6.625	6.357	-	-	6.065	6.065	-	5.761	5.761	-	5.501	-	5.187	4.897
8	8.625	8.329	8.125	8.071	7.981	7.981	7.813	7.625	7.625	7.437	7.187	7.001	6.813	6.875
10	10.750	10.420	10.250	10.136	10.020	10.020	9.750	9.750	9.562	9.312	9.062	8.750	8.500	8.750
12	12.750	12.390	12.250	12.090	12.000	11.938	11.626	11.750	11.374	11.062	10.750	10.500	10.126	10.750
14	14.000	13.500	13.376	13.250	13.250	13.124	12.812	13.00	12.500	12.124	11.814	11.500	11.188	-
16	16.000	15.500	15.376	15.250	15.250	15.000	14.688	15.00	14.312	13.938	13.564	13.124	12.812	-
18	18.000	17.500	17.376	17.124	17.250	16.876	16.500	17.000	16.124	15.688	15.250	14.876	14.438	-
20	20.000	19.500	19.250	19.000	19.250	18.182	18.376	19.000	17.938	17.438	17.000	16.500	16.062	-
24	24.000	23.500	23.250	22.876	23.250	22.624	22.062	23.000	21.562	20.938	20.376	19.876	19.312	-
30	30.000	29.376	29.000	28.750	29.250	-	-	29.000	-	-	-	-	-	-
36	36.000	35.376	35.000	34.750	35.250	34.500	-	35.000	-	-	-	-	-	-
42	42.000	-	-	-	41.250	-	-	41.000	-	-	-	-	-	-
48	48.000	-	-	-	47.250	-	-	47.000	-	-	-	-	-	-

* Always specify bore when ordering.
Inside pipe diameters are also provided by this table.

** Light wall diameters are identical to stainless steel Schedule 10S in sizes thru 12", and to Schedule 10 in sizes 14" and larger.

STEEL PIPE NIPPLES



THREADED UNIONS

From 1/8" To 4"



SOCKET WELDING UNIONS

From 1/8" To 4"





MATERIAL AND MANUFACTURING STANDARDS

The manufacture of welding fittings is governed by industry standards by such associations as:

- The American Society for Testing and Materials (ASTM) (ANSI)
- The American National Standards Institute
- The Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)
- The Pipe Fabrication Institute (PFI)
- The Canadian Standards Association (CSA).

They cover specifications for materials, methods of manufacture, dimensions and quality control procedures. All CCTF welding fittings conform to one or more of these standards.

ASTM STANDARDS

CCTF carbon steel welding fittings are manufactured from seamless steel tubing and furnished in accordance with ASTM Standard A-234, with material specifications in accordance with ASTM A-106, Grade B, for fittings made from pipe; ASTM A-515, Grade 65 or 70, for fittings made from plate.

CCTF alloy steel fittings are furnished in accordance with ASTM standard A-234, with materials specification including A-335. Grade P1, carbon-molybdenum, and Grade P12, P11, P22, P5, P7; P9 chromes molybdenum, for fittings made from pipe.

ASTM A-204 Grade B, carbon molybdenum, and ASTM A-387 Grades 12 / 11 / 22 / 5 / 7 / 9 chrome molybdenum for fittings made from plate.

CCTF welding fittings are also available in accordance with ASTM specification A-420 covering low-temperature service, down to -150°F (-101°C).

CCTF stainless steel welding fittings are manufactured and available in the following types: 304, 304L, 316, 316L and 347. They are furnished in accordance with ASTM Standard A-403, with material specifications to ASTM A-312 covering fittings made from pipe, and A-240 for fittings made from plate. Refer to CCTF catalogue "Stainless Steel Welding Fittings."

ANSI, MSS, ASME AND CSA STANDARDS

ASME / ANSI and MSS standards govern fitting dimensions and tolerances. ASME / ANSI B16.9 "Wrought Steel Butt-welding Fittings", is the basic standard. It covers butt-welding fittings sizes NPS 1/2 through NPS 48 (DN 15 through DN 1200).

Other ASME / ANSI and MSS standards, written to supplement B16.9, are as follows:

ASME / ANSI B16.25 : Butt-welding Ends.

ASME / ANSI B16.28 : Butt-welding short radius elbows and returns.

MSS SP-43 : Light-wall stainless steel fittings. NPS 3/4 through NPS 24 (DN 20 through DN 600).

MSS SP-75 : High test wrought welding fittings.

The following codes and standards influence the manufacture of welding fittings, where applicable.

ASME / ANSI B31.1 : Power piping.

ASME / ANSI B31.3 : Petroleum refinery piping.

ASME / ANSI B31.4 : Liquid petroleum transportation piping system.

ASME / ANSI B31.5 : Refrigeration piping.

ASME / ANSI B31.8 : Gas transmission and distribution piping systems.

ANSI / ASME B36.10M : Welded and seamless wrought steel pipe.

ANSI / ASME B36.19M: Stainless steel pipe.

CSA Z183 : Oil pipe line transportation systems.

CSA Z184 : Gas pipe line systems.

CAN3-Z245.11-M91 : Requirements for wrought steel butt welding fittings.

ASME : Boiler and pressure vessel codes.

SPECIAL METALS

High Test Steel : High test pipe line welding fittings, conforming to CSA Standard CAN3-Z245, 11-M85 or MSS SP-75, are available with physical properties to match pipe with *42 000, 46 000, 52 000, 60 000, 65 000 and over p.s.i. minimum yield strengths.

Other Ferrous Alloys: Fittings are available manufactured from ASTM alloy specifications other than those in the "ASTM Standards" above.

Non-Ferrous Metals : Fittings of relatively common metals, such as aluminum, nickel, copper, etc., can be readily furnished; production is limited only by availability of raw materials. The same is true of less common metals, such as the various grades of Hastelloy, Inconel, Incoloy, Monel, Alloy-20, rare types of stainless steel and other unusual analyses.

* Equals 290, 317, 359, 414, 448 Mpa, respectively.

METRIC EQUIVALENTS

The international systems (SI) metric equivalent of British units are shown throughout this catalogue :

NPS (Nominal Pipe Size) = DN (Nominal Diameter)

Operating Pressure Class = PN (Pressure Number)

1 inch = 25.4 millimetres

1 psi = 0.06895 bars

1 pound, weight = 0.4536 kilograms

1 psi, stress = 0.006895 megapascals (MPa)

From the SI designations, Diamètre Nominal and Pression Nominale.

ASYBCO

FORGED STEEL FITTINGS



Class 2000
Threaded



90° Elbows



45° Elbows



Tees



Crosses

ASYBCO

MANCHON EN ACIER STEEL COUPLINGS



Size	Outside Diameter (Couplings)		Length						Approx. Weight Per 100 Pieces				Carton Quantity (Full Couplings)	
			Full		Half		Threads Per Inch	Full		Half		Full	Half	
			IN	MM	IN	MM		Lb	Kg	Lb	Kg			
NPS	DN	IN	MM	IN	MM	IN	MM	Per Inch	Lb	Kg	Lb	Kg	Full	Half
1/8	6	.563	15	13/16	21	11/32	9	27	3	2	1 1/4	1	100	100
1/4	8	.719	20	1 3/16	30	17/32	13	18	7 1/4	4	43 1/4	1	100	100
3/8	10	.875	20	1 3/16	30	17/32	13	18	9 1/2	5	4 1/4	2	100	100
1/2	15	1.063	25	1 9/16	40	22/32	18	14	17 1/2	8	8	4	100	100
3/4	20	1.313	35	1 5/8	41	3/4	19	14	26	12	12	5	50	100
1	25	1.576	40	2	50	1 15/16	24	11 1/2	42	19	20	9	30	75
1 1/4	32	1.900	50	2 1/16	52	31/32	25	11 1/2	50	23	23 1/2	11	25	100
1 1/2	40	2.200	55	2 1/16	52	31/32	25	11 1/2	67	30	31 1/2	14	25	75
2	50	2.750	70	2 1/8	54	1	25	11 1/2	103	47	48 1/2	22	20	50
2 1/2	65	3.250	85	3 1/8	54	1 1/2	38	8	216	98	103 1/2	47	-	-
3	80	4.000	100	3 1/4	82	1 9/16	40	8	347	158	167	76	-	-
3 1/2	90	4.625	115	3 3/8	85	1 5/8	41	8	519	236	254	115	-	-
4	100	5.000	125	3 1/2	89	1 11/16	43	8	488	222	235	107	-	-
5	125	6.296	160	3 3/4	95	1 3/4	44	8	875	398	420	191	-	-
6	150	7.390	190	4	100	1 7/8	48	8	1188	540	550	250	-	-



ASYBCO

**BOUCHONS ET RÉDUITS
PLUGS & BUSHINGS**



HOSE MENDER

Combination Nipples



Hose Menders



PLUMBING ACCESSORIES

90° Elbow



90° Street Elbow



Street or Service Tee



Right Hand Coupling



Reducing Elbow



45° Street Elbow



Cross



Reducer



45° Elbow



Straight Tee



Lateral
450 Y-Branch

