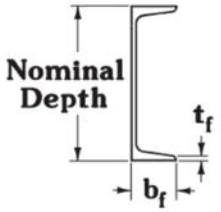
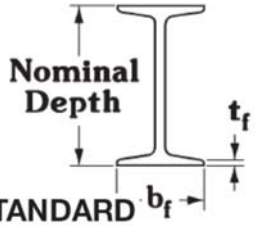
TECHNICAL DATA



AMERICAN STANDARD 'C' SHAPE CHANNELS

Designation Nominal Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X $^{lbs}/_{ft}$	mm X $^{kg}/_{m}$				
C3 X 4.1	(C75 X 6.1)	$1^3/_8$	(35)	.273	(6.9)
C3 X 5	(C75 X 7.4)	$1^1/_2$	(37)	.273	(6.9)
C3 X 6	(C75 X 8.9)	$1^5/_8$	(40)	.273	(6.9)
C4 X 5.4	(C100 X 8)	$1^9/_{16}$	(40)	.296	(7.5)
C4 X 7.25	(C100 X 10.8)	$1^3/_4$	(44)	.296	(7.5)
C5 X 6.7	(C130 X 10)	$1^3/_4$	(44)	.320	(8.1)
C5 X 9	(C130 X 13.4)	$1^7/_8$	(47)	.320	(8.1)
C6 X 8.2	(C150 X 12.2)	$1^{15}/_{16}$	(48)	.343	(8.7)
C6 X 10.5	(C150 X 15.6)	2	(51)	.343	(8.7)
C6 X 13	(C150 X 19.3)	$2^1/_8$	(54)	.343	(8.7)
C7 X 9.8	(C180 X 14.6)	$2^1/_{16}$	(53)	.366	(9.3)
C7 X 12.25	(C180 X 18.2)	$2^3/_{16}$	(55)	.366	(9.3)
C7 X 14.75	(C180 X 22)	$2^1/_4$	(57)	.366	(9.3)
C8 X 11.5	(C200 X 17.1)	$2^1/_4$	(57)	.390	(9.9)
C8 X 13.75	(C200 X 20.5)	$2^3/_8$	(59)	.390	(9.9)
C8 X 18.75	(C200 X 27.9)	$2^1/_2$	(63)	.390	(9.9)
C9 X 13.4	(C230 X 19.9)	$2^7/_{16}$	(61)	.413	(10.5)
C9 X 15	(C230 X 22)	$2^1/_2$	(63)	.413	(10.5)
C9 X 20	(C230 X 30)	$2^5/_8$	(67)	.413	(10.5)
C10 X 15.3	(C250 X 22.8)	$2^5/_8$	(67)	.436	(11.1)
C10 X 20	(C250 X 30)	$2^3/_4$	(69)	.436	(11.1)
C10 X 25	(C250 X 37)	$2^7/_8$	(73)	.436	(11.1)
C10 X 30	(C250 X 45)	3	(76)	.436	(11.1)
C12 X 20.7	(C310 X 30.8)	$2^{15}/_{16}$	(74)	.501	(12.7)
C12 X 25	(C310 X 37)	3	(76)	.501	(12.7)
C12 X 30	(C310 X 45)	$3^1/_8$	(80)	.501	(12.7)
C15 X 33.9	(C380 X 50.4)	$3^3/_8$	(86)	.650	(16.5)
C15 X 40	(C380 X 60)	$3^1/_2$	(89)	.650	(16.5)
C15 X 50	(C380 X 74)	$3^3/_4$	(94)	.650	(16.5)
C18 X 42.7	(C460 X 63.5)	4	(102)	.625	(15.9)
C18 X 45.8	(C460 X 68.1)	4	(102)	.625	(15.9)
C18 X 51.9	(C460 X 77.2)	$4^1/_8$	(106)	.625	(15.9)
C18 X 58	(C460 X 86.3)	$4^1/_4$	(112)	.625	(15.9)

Dimensions taken from ASTM A6-86.



AMERICAN STANDARD 'S' SHAPE I-BEAMS

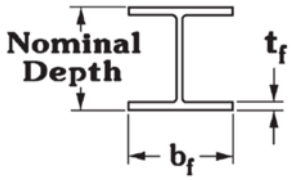
Designation Nominal Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X $^{lbs}/_{ft}$	mm X $^{kg}/_{m}$				
S3 X 5.7	(S75 X 8.5)	$2^3/_8$	(59)	.260	(6.6)
S3 X 7.5	(S75 X 11.2)	$2^1/_2$	(63)	.260	(6.6)
S4 X 7.7	(S100 X 11.5)	$2^5/_8$	(68)	.293	(7.4)
S4 X 9.5	(S100 X 14.1)	$2^3/_4$	(71)	.293	(7.4)
S5 X 10	(S130 X 15)	3	(76)	.326	(8.3)
S5 X 14.75	(S130 X 22)	$3^1/_4$	(83)	.326	(8.3)
S6 X 12.5	(S150 X 18.6)	$3^3/_8$	(85)	.359	(9.1)
S6 X 17.25	(S150 X 25.7)	$3^{11}/_{16}$	(91)	.359	(9.1)
S7 X 15.3	(S180 X 22.8)	$3^5/_8$	(93)	.392	(10.0)
S7 X 20	(S180 X 29.8)	$3^7/_8$	(98)	.392	(10.0)
S8 X 18.4	(S200 X 27.4)	4	(102)	.425	(10.8)
S8 X 23	(S200 X 34)	$4^1/_8$	(106)	.425	(10.8)
S10 X 25.4	(S250 X 37.8)	$4^5/_8$	(118)	.491	(12.5)
S10 X 35	(S250 X 52)	$4^{15}/_{16}$	(126)	.491	(12.5)
S12 X 31.8	(S310 X 47.3)	5	(127)	.544	(13.8)
S12 X 35	(S310 X 52)	$5^1/_{16}$	(129)	.544	(13.8)
S12 X 40.8	(S310 X 60.7)	$5^1/_4$	(133)	.659	(16.7)
S12 X 50	(S310 X 74)	$5^1/_2$	(139)	.659	(16.7)
S15 X 42.9	(S380 X 64)	$5^1/_2$	(140)	.622	(15.8)
S15 X 50	(S380 X 74)	$5^5/_8$	(143)	.622	(15.8)
S18 X 54.7	(S460 X 81.4)	6	(152)	.691	(17.6)
S18 X 70	(S460 X 104)	$6^1/_4$	(159)	.691	(17.6)
S20 X 66	(S510 X 98.2)	$6^1/_4$	(159)	.795	(20.2)
S20 X 75	(S510 X 112)	$6^3/_8$	(162)	.795	(20.2)
S20 X 86	(S510 X 128)	$7^1/_{16}$	(179)	.920	(23.4)
S20 X 96	(S510 X 143)	$7^3/_{16}$	(183)	.920	(23.4)
S24 X 80	(S610 X 119)	7	(178)	.870	(22.1)
S24 X 90	(S610 X 134)	$7^1/_8$	(181)	.870	(22.1)
S24 X 100	(S610 X 149)	$7^1/_4$	(184)	.870	(22.1)
S24 X 106	(S610 X 158)	$7^7/_8$	(200)	1.090	(27.7)
S24 X 121	(S610 X 180)	$8^1/_{16}$	(204)	1.090	(27.7)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

Designation Nominal Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X lbs/ft	mm X kg/m				
W4 X 13	(W100 X 19.3)	4 1/16	(103)	.345	(8.8)
W5 X 16	(W130 X 23.8)	5	(127)	.360	(9.1)
W5 X 19	(W130 X 28.1)	5	(127)	.430	(10.9)
W6 X 9	(W150 X 13.5)	3 15/16	(100)	.215	(5.5)
W6 X 12	(W150 X 18.)	4	(102)	.280	(7.1)
W6 X 16	(W150 X 24.)	4	(102)	.405	(10.3)
W6 X 20	(W150 X 29.8)	6	(152)	.365	(9.3)
W6 X 25	(W150 X 37.1)	6 1/16	(154)	.455	(11.6)
W8 X 10	(W200 X 15.)	3 15/16	(100)	.205	(5.2)
W8 X 13	(W200 X 19.3)	4	(102)	.255	(6.5)
W8 X 15	(W200 X 22.5)	4	(102)	.315	(8.0)
W8 X 18	(W200 X 26.6)	5 1/4	(133)	.330	(8.4)
W8 X 21	(W200 X 31.3)	5 1/4	(133)	.400	(10.2)
W8 X 24	(W200 X 35.9)	6 1/2	(165)	.400	(10.2)
W8 X 28	(W200 X 41.7)	6 1/2	(165)	.465	(11.8)
W8 X 31	(W200 X 46.1)	8	(203)	.435	(11.0)
W8 X 35	(W200 X 52)	8	(203)	.495	(12.6)
W8 X 40	(W200 X 59)	8 1/16	(205)	.560	(14.2)
W8 X 48	(W200 X 71)	8 1/8	(206)	.685	(17.4)
W8 X 58	(W200 X 86)	8 1/4	(210)	.810	(20.6)
W8 X 67	(W200 X 100)	8 1/4	(210)	.935	(23.7)
W10 X 12	(W250 X 17.9)	4	(102)	.210	(5.3)
W10 X 15	(W250 X 22.3)	4	(102)	.270	(6.9)
W10 X 17	(W250 X 25.3)	4	(102)	.330	(8.4)
W10 X 19	(W250 X 28.4)	4	(102)	.395	(10.0)
W10 X 22	(W250 X 32.7)	5 3/4	(146)	.360	(9.1)
W10 X 26	(W250 X 38.5)	5 3/4	(146)	.440	(11.2)
W10 X 30	(W250 X 44.8)	5 13/16	(148)	.510	(13.0)
W10 X 33	(W250 X 49.1)	7 15/16	(202)	.435	(11.0)
W10 X 39	(W250 X 58)	8	(203)	.530	(13.5)
W10 X 45	(W250 X 57)	8	(203)	.620	(15.7)
W10 X 49	(W250 X 73)	10	(254)	.560	(14.2)
W10 X 54	(W250 X 80)	10 1/16	(256)	.615	(15.6)
W10 X 60	(W250 X 89)	10 1/16	(256)	.680	(17.3)
W10 X 68	(W250 X 101)	10 1/8	(257)	.770	(19.6)
W10 X 77	(W250 X 115)	10 3/16	(259)	.870	(22.1)
W10 X 88	(W250 X 131)	10 1/4	(260)	.990	(25.1)
W10 X 100	(W250 X 149)	10 3/8	(264)	1.120	(28.4)
W10 X 112	(W250 X 167)	10 7/16	(265)	1.250	(31.8)
W12 X 14	(W310 X 21)	4	(102)	.225	(5.7)
W12 X 16	(W310 X 23.8)	4	(102)	.265	(6.7)
W12 X 19	(W310 X 28.3)	4	(102)	.350	(8.9)
W12 X 22	(W310 X 32.7)	4	(102)	.425	(10.8)
W12 X 26	(W310 X 38.7)	6 1/2	(165)	.380	(9.7)
W12 X 30	(W310 X 44.5)	6 1/2	(165)	.440	(11.2)
W12 X 35	(W310 X 52)	6 9/16	(167)	.520	(13.2)
W12 X 40	(W310 X 60)	8	(203)	.515	(13.1)
W12 X 45	(W310 X 67)	8 1/16	(205)	.575	(14.6)
W12 X 50	(W310 X 74)	8 1/16	(205)	.640	(16.3)
W12 X 53	(W310 X 79)	10	(254)	.575	(14.6)
W12 X 58	(W310 X 86)	10	(254)	.640	(16.3)
W12 X 65	(W310 X 97)	12	(305)	.605	(15.4)
W12 X 72	(W310 X 107)	12	(305)	.670	(17.0)
W12 X 79	(W310 X 117)	12 1/16	(306)	.735	(18.7)
W12 X 87	(W310 X 129)	12 1/8	(308)	.810	(20.6)
W12 X 96	(W310 X 143)	12 1/8	(308)	.900	(22.9)
W12 X 106	(W310 X 158)	12 1/4	(311)	.990	(25.1)
W12 X 120	(W310 X 179)	12 5/16	(313)	1.105	(28.1)
W12 X 136	(W310 X 202)	12 3/8	(314)	1.250	(31.8)
W12 X 152	(W310 X 226)	12 1/2	(318)	1.400	(35.6)

Designation Nominal Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X lbs/ft	mm X kg/m				
W12 X 170	(W310 X 253)	12 9/16	(319)	1.560	(39.6)
W12 X 190	(W310 X 283)	12 11/16	(322)	1.735	(44.1)
W12 X 210	(W310 X 313)	12 3/4	(324)	1.900	(48.3)
W12 X 230	(W310 X 342)	12 7/8	(327)	2.070	(52.6)
W12 X 252	(W310 X 375)	13	(330)	2.250	(57.2)
W14 X 22	(W360 X 32.9)	5	(127)	.335	(8.5)
W14 X 26	(W360 X 39)	5	(127)	.420	(10.7)
W14 X 30	(W360 X 44.8)	6 3/4	(171)	.385	(9.8)
W14 X 34	(W360 X 51)	6 3/4	(171)	.455	(11.6)
W14 X 38	(W360 X 57)	6 3/4	(171)	.515	(13.1)
W14 X 43	(W360 X 64)	8	(203)	.530	(13.5)
W14 X 48	(W360 X 72)	8	(203)	.595	(15.1)
W14 X 53	(W360 X 79)	8 1/16	(205)	.660	(16.8)
W14 X 61	(W360 X 91)	10	(254)	.645	(16.4)
W14 X 68	(W360 X 101)	10	(254)	.720	(18.3)
W14 X 74	(W360 X 110)	10 1/16	(256)	.785	(19.9)
W14 X 82	(W360 X 122)	10 1/8	(257)	.855	(21.7)
W14 X 90	(W360 X 134)	14 1/2	(368)	.710	(18.0)
W14 X 99	(W360 X 147)	14 9/16	(370)	.780	(19.8)
W14 X 109	(W360 X 162)	14 5/8	(371)	.860	(21.8)
W14 X 120	(W360 X 179)	14 11/16	(373)	.940	(23.9)
W14 X 132	(W360 X 196)	14 3/4	(375)	1.030	(26.2)
W14 X 145	(W360 X 216)	15 1/2	(394)	1.090	(27.7)
W14 X 159	(W360 X 237)	15 9/16	(395)	1.190	(30.2)
W14 X 176	(W360 X 262)	15 5/8	(397)	1.310	(33.3)
W14 X 193	(W360 X 287)	15 3/4	(400)	1.440	(36.6)
W14 X 211	(W360 X 314)	15 3/4	(400)	1.560	(39.6)
W14 X 233	(W360 X 347)	15 7/8	(403)	1.720	(43.7)
W14 X 257	(W360 X 382)	16	(406)	1.890	(48.0)
W14 X 283	(W360 X 421)	16 1/8	(410)	2.070	(52.6)
W14 X 311	(W360 X 463)	16 1/4	(413)	2.260	(57.4)
W14 X 342	(W360 X 509)	16 3/8	(416)	2.470	(62.7)
W14 X 370	(W360 X 551)	16 1/2	(419)	2.660	(67.6)
W14 X 398	(W360 X 592)	16 9/16	(421)	2.845	(72.3)
W14 X 426	(W360 X 634)	16 11/16	(424)	3.035	(77.1)
W16 X 26	(W410 X 38.8)	5 1/2	(140)	.345	(8.8)
W16 X 31	(W410 X 46.1)	5 1/2	(140)	.440	(11.2)
W16 X 36	(W410 X 53)	7	(178)	.430	(10.9)
W16 X 40	(W410 X 60)	7	(178)	.505	(12.8)
W16 X 45	(W410 X 67)	7	(178)	.565	(14.4)
W16 X 50	(W410 X 75)	7 1/16	(179)	.630	(16.0)
W16 X 57	(W410 X 85)	7 1/8	(181)	.715	(18.2)
W16 X 67	(W410 X 100)	10 1/4	(260)	.665	(16.9)
W16 X 77	(W410 X 114)	10 5/16	(262)	.760	(19.3)
W16 X 89	(W410 X 132)	10 3/8	(264)	.875	(22.2)
W16 X 100	(W410 X 149)	10 7/16	(265)	.985	(25.0)
W18 X 35	(W460 X 52)	6	(152)	.425	(10.8)
W18 X 40	(W460 X 60)	6	(152)	.525	(13.3)
W18 X 46	(W460 X 68)	6 1/16	(154)	.605	(15.4)
W18 X 50	(W460 X 74)	7 1/2	(191)	.570	(14.5)
W18 X 55	(W460 X 82)	7 1/2	(191)	.630	(16.0)
W18 X 60	(W460 X 89)	7 9/16	(192)	.695	(17.7)
W18 X 65	(W460 X 97)	7 9/16	(192)	.750	(19.1)
W18 X 71	(W460 X 106)	7 5/8	(194)	.810	(20.6)
W18 X 76	(W460 X 113)	11	(279)	.680	(17.3)
W18 X 86	(W460 X 128)	11 1/16	(281)	.770	(19.6)
W18 X 97	(W460 X 144)	11 1/8	(283)	.870	(22.1)
W18 X 106	(W460 X 158)	11 3/16	(284)	.940	(23.9)
W18 X 119	(W460 X 177)	11 1/4	(286)	1.060	(26.9)
W21 X 44	(W530 X 66)	6 1/2	(165)	.450	(11.4)



WIDE FLANGE I-BEAMS

Designation Nominal Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X lbs/ft	mm X kg/m				
W21 X 50	(W530 X 74)	6 1/2	(165)	.535	(13.6)
W21 X 57	(W530 X 85)	6 9/16	(167)	.650	(16.5)
W21 X 62	(W530 X 92)	8 1/4	(210)	.615	(15.6)
W21 X 68	(W530 X 101)	8 1/4	(210)	.685	(17.4)
W21 X 73	(W530 X 109)	8 1/4	(210)	.740	(18.8)
W21 X 83	(W530 X 123)	8 7/8	(225)	.835	(21.2)
W21 X 93	(W530 X 138)	8 7/16	(214)	.930	(23.6)
W21 X 101	(W530 X 150)	12 1/4	(311)	.800	(20.3)
W21 X 111	(W530 X 165)	12 3/8	(314)	.875	(22.2)
W21 X 122	(W530 X 182)	12 3/8	(314)	.960	(24.4)
W21 X 132	(W530 X 196)	12 7/16	(316)	1.035	(26.3)
W21 X 147	(W530 X 219)	12 1/2	(318)	1.150	(29.2)
W24 X 55	(W610 X 82)	7	(178)	.505	(12.8)
W24 X 62	(W610 X 92)	7 1/16	(179)	.590	(15.0)
W24 X 68	(W610 X 101)	8 15/16	(227)	.585	(14.9)
W24 X 76	(W610 X 113)	9	(229)	.680	(17.3)
W24 X 84	(W610 X 125)	9	(229)	.770	(19.6)
W24 X 94	(W610 X 140)	9 1/16	(230)	.875	(22.2)
W24 X 104	(W610 X 155)	12 3/4	(324)	.750	(19.1)
W24 X 117	(W610 X 174)	12 3/4	(324)	.850	(21.6)
W24 X 131	(W610 X 195)	12 7/8	(327)	.960	(24.4)
W24 X 146	(W610 X 217)	12 7/8	(327)	1.090	(27.7)
W24 X 162	(W610 X 241)	12 15/16	(329)	1.220	(31.0)
W27 X 84	(W690 X 125)	9 15/16	(252)	.640	(16.3)
W27 X 94	(W690 X 140)	10	(254)	.745	(18.9)
W27 X 102	(W690 X 152)	10	(254)	.830	(21.1)
W27 X 114	(W690 X 170)	10 1/16	(256)	.930	(23.6)
W27 X 146	(W690 X 217)	13 15/16	(354)	.975	(24.8)
W27 X 161	(W690 X 240)	14	(356)	1.080	(27.4)
W27 X 178	(W690 X 265)	14 1/16	(357)	1.190	(30.2)
W30 X 99	(W760 X 147)	10 7/16	(265)	.670	(17.0)
W30 X 108	(W760 X 161)	10 1/2	(267)	.760	(19.3)
W30 X 116	(W760 X 173)	10 1/2	(267)	.850	(21.6)
W30 X 124	(W760 X 185)	10 1/2	(267)	.930	(23.6)
W30 X 132	(W760 X 196)	10 9/16	(268)	1.000	(25.4)
W30 X 173	(W760 X 257)	15	(381)	1.065	(27.1)
W30 X 191	(W760 X 284)	15	(381)	1.185	(30.1)
W30 X 211	(W760 X 314)	15 1/8	(384)	1.315	(33.4)
W33 X 118	(W840 X 176)	11 1/2	(292)	.740	(18.8)
W33 X 130	(W840 X 193)	11 1/2	(292)	.855	(21.7)
W33 X 141	(W840 X 210)	11 1/2	(292)	.960	(24.4)
W33 X 152	(W840 X 226)	11 9/16	(294)	1.055	(26.8)
W33 X 201	(W840 X 299)	15 3/4	(400)	1.150	(29.2)
W36 X 135	(W920 X 201)	11 15/16	(303)	.790	(20.1)
W36 X 150	(W920 X 223)	12	(305)	.940	(23.9)
W36 X 160	(W920 X 238)	12	(305)	1.020	(25.9)
W36 X 170	(W920 X 253)	12	(305)	1.100	(27.9)
W36 X 182	(W920 X 271)	12 1/16	(306)	1.180	(30.0)
W36 X 194	(W920 X 289)	12 1/8	(308)	1.260	(32.0)
W36 X 210	(W920 X 313)	12 3/16	(310)	1.360	(34.5)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

Steel Pipe Data
SCHEDULE 10, 40 & 80

Pipe Size		Schedule No.	O.D.		Wall Thickness		Weight: Water lbs/ft	Water kg/m	Pipe lbs/ft	Pipe kg/m
3/8	(10)	10	0.675	(17.15)	.066	(1.68)	0.100	(0.15)	0.4325	(0.64)
		40			.091	(2.31)	0.083	(0.12)	0.567	(0.84)
		80			.126	(3.20)	0.061	(0.09)	0.738	(1.10)
1/2	(15)	10	0.84	(21.34)	.083	(2.11)	0.155	(0.23)	0.671	(1.00)
		40			.109	(2.77)	0.132	(0.20)	0.85	(1.26)
		80			.147	(3.73)	0.102	(0.15)	1.087	(1.62)
3/4	(20)	10	1.05	(26.67)	.083	(2.11)	0.266	(0.40)	0.8572	(1.28)
		40			.113	(2.87)	0.231	(0.34)	1.13	(1.68)
		80			.154	(3.91)	0.187	(0.28)	1.473	(2.19)
1	(25)	10	1.315	(33.40)	.109	(2.77)	0.410	(0.61)	1.404	(2.09)
		40			.133	(3.38)	0.375	(0.56)	1.678	(2.50)
		80			.179	(4.55)	0.312	(0.46)	2.171	(3.23)
1 1/4	(32)	10	1.66	(42.16)	.109	(2.77)	0.708	(1.05)	1.806	(2.69)
		40			.14	(3.56)	0.648	(0.96)	2.272	(3.38)
		80			.191	(4.85)	0.556	(0.83)	2.996	(4.46)
1 1/2	(40)	10	1.9	(48.26)	.109	(2.77)	0.963	(1.43)	2.085	(3.10)
		40			.145	(3.68)	0.883	(1.31)	2.717	(4.04)
		80			.2	(5.08)	0.766	(1.14)	3.631	(5.40)
2	(50)	10	2.375	(60.33)	.109	(2.77)	1.584	(2.36)	2.638	(3.93)
		40			.154	(3.91)	1.455	(2.16)	3.652	(5.43)
		80			.218	(5.54)	1.280	(1.91)	5.022	(7.47)
2 1/2	(65)	10	2.875	(73.03)	.12	(3.05)	2.364	(3.52)	3.531	(5.25)
		40			.203	(5.16)	2.076	(3.09)	5.79	(8.62)
		80			.276	(7.01)	1.837	(2.73)	7.66	(11.40)
3	(80)	10	3.5	(88.90)	.12	(3.05)	3.619	(5.39)	4.332	(6.45)
		40			.216	(5.49)	3.205	(4.77)	7.57	(11.27)
		80			.3	(7.62)	2.864	(4.26)	10.25	(15.25)
3 1/2	(90)	10	4	(101.60)	.12	(3.05)	4.814	(7.16)	4.973	(7.40)
		40			.226	(5.74)	4.286	(6.38)	9.11	(13.56)
		80			.318	(8.08)	3.853	(5.73)	12.51	(18.62)
4	(100)	10	4.5	(114.30)	.12	(3.05)	6.179	(9.20)	5.613	(8.35)
		40			.237	(6.02)	5.519	(8.21)	10.79	(16.06)
		80			.337	(8.56)	4.984	(7.42)	14.98	(22.29)

Pipe Size		Schedule No.	O.D.		Wall Thickness		Weight: Water lbs/ft	Water kg/m	Pipe lbs/ft	Pipe kg/m
5	(125)	10	5.563	(141.30)	0.134	(3.40)	9.55	(14.21)	7.77	(11.56)
		40			0.258	(6.55)	8.67	(12.91)	14.62	(21.76)
		80			0.375	(9.53)	7.89	(11.74)	20.78	(30.92)
6	(150)	10	6.625	(168.28)	0.134	(3.40)	13.76	(20.48)	9.289	(13.82)
		40			0.28	(7.11)	12.52	(18.64)	18.97	(28.23)
		80			0.432	(10.97)	11.30	(16.82)	28.57	(42.52)
8	(200)	10	8.625	(219.08)	0.148	(3.76)	23.62	(35.15)	13.4	(19.94)
		40			0.322	(8.18)	21.69	(32.28)	28.55	(42.49)
		80			0.5	(12.70)	19.80	(29.46)	43.39	(64.57)
10	(250)	10	10.75	(273.05)	0.165	(4.19)	36.97	(55.02)	18.7	(27.83)
		40			0.365	(9.27)	34.19	(50.87)	40.48	(60.24)
		80			0.593	(15.06)	31.14	(46.35)	64.4	(95.84)
12	(300)	10	12.75	(323.85)	0.18	(4.57)	52.27	(77.79)	24.2	(36.01)
		40			0.406	(10.31)	48.53	(72.21)	53.6	(79.77)
		80			0.687	(17.45)	44.06	(65.57)	88.6	(131.85)
14	(350)	10	14	(355.60)	0.25	(6.35)	62.05	(92.35)	36.71	(54.63)
		40			0.437	(11.10)	58.66	(87.30)	63	(93.75)
		80			0.75	(19.05)	53.20	(79.17)	107	(159.23)
16	(400)	10	16	(406.40)	0.25	(6.35)	81.80	(121.74)	42.05	(62.58)
		40			0.5	(12.70)	76.61	(114.01)	83	(123.52)
		80			0.843	(21.41)	69.76	(103.82)	137	(203.88)
18	(450)	10	18	(457.20)	0.25	(6.35)	104.27	(155.18)	47.39	(70.52)
		40			0.563	(14.30)	96.95	(144.27)	105	(156.26)
		80			0.937	(23.80)	88.54	(131.77)	171	(254.48)
20	(500)	10	20	(508.00)	0.25	(6.35)	129.47	(192.67)	62.73	(93.35)
		40			0.593	(15.06)	120.52	(179.36)	123	(183.04)
		80			1.031	(26.19)	109.56	(163.04)	209	(311.03)
24	(600)	10	24	(609.60)	0.25	(6.35)	188.04	(279.83)	63.41	(94.36)
		40			0.687	(17.45)	174.31	(259.40)	171	(254.48)
		80			1.218	(30.94)	158.33	(235.62)	297	(441.98)
30	(750)	20	30	(762.00)	.5	(12.70)	286.00	(425.61)	158	(235.13)
36	(900)	API	36	(914.40)	.5	(12.70)	417.00	(620.56)	190	(282.75)

Spacing of Hangers For Steel Pipe

Nominal Pipe Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
	(15)	(20)	(25)	(32)	(40)	(50)	(65)	(80)	(90)	(100)	(125)	(150)	(200)	(250)	(300)	(350)	(400)	(450)	(500)	(600)
Max. Span	7	7	7	7	9	10	11	12	13	14	16	17	19	22	23	25	27	28	30	32
	(2.13)	(2.13)	(2.13)	(2.13)	(2.74)	(3.05)	(3.35)	(3.66)	(3.96)	(4.27)	(4.88)	(5.18)	(5.79)	(6.71)	(7.01)	(7.62)	(8.23)	(8.53)	(9.14)	(9.75)
Recommended Hanger Rod Size	3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	3/4	3/4	7/8	7/8	1	1	1 1/8	1 1/4	1 1/4
																		OR TRAPEZE		

Note: *Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required.*

***Many Codes and specifications require pipe hangers to be spaced every 10 ft (3.05m) regardless of size. Check local codes.**

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

Copper Tube Data

TYPE L

Tube Size		Tubing O.D.		Wall Thickness		Weight Water lbs/ft	Weight Water kg/m	Weight Pipe lbs/ft	Weight Pipe kg/m
1/4	(6)	.375	(9.53)	.030	(0.76)	.034	(.051)	.126	(.188)
3/8	(10)	.500	(12.70)	.035	(0.89)	.062	(.092)	.198	(.295)
1/2	(15)	.625	(15.88)	.040	(1.02)	.100	(.149)	.285	(.424)
5/8	(17)	.750	(19.05)	.042	(1.07)	.151	(.225)	.362	(.539)
3/4	(20)	.875	(22.23)	.045	(1.14)	.209	(.311)	.455	(.677)
1	(25)	1.125	(28.58)	.050	(1.27)	.357	(.531)	.655	(.975)
1 1/4	(32)	1.375	(34.93)	.055	(1.40)	.546	(.813)	.884	(1.316)
1 1/2	(40)	1.625	(41.28)	.060	(1.52)	.767	(1.141)	1.140	(1.697)
2	(50)	2.125	(53.98)	.070	(1.78)	1.341	(1.996)	1.750	(2.604)
2 1/2	(65)	2.625	(66.68)	.080	(2.03)	2.064	(3.072)	2.480	(3.691)
3	(80)	3.125	(79.38)	.090	(2.29)	2.949	(4.389)	3.330	(4.956)
3 1/2	(90)	3.625	(92.08)	.100	(2.54)	3.989	(5.936)	4.290	(6.384)
4	(100)	4.125	(104.78)	.110	(2.79)	5.188	(7.721)	5.380	(8.006)
5	(125)	5.125	(130.18)	.125	(3.18)	8.081	(12.026)	7.610	(11.325)
6	(150)	6.125	(155.58)	.140	(3.56)	11.616	(17.287)	10.200	(15.179)
8	(200)	8.125	(206.38)	.200	(5.08)	20.289	(30.193)	19.260	(28.662)
10	(250)	10.125	(257.18)	.250	(6.35)	31.590	(47.011)	30.100	(44.794)
12	(300)	12.125	(307.98)	.280	(7.11)	45.426	(67.601)	40.400	(60.122)

TYPE K

Tube Size		Tubing O.D.		Wall Thickness		Weight Water lbs/ft	Weight Water kg/m	Weight Pipe lbs/ft	Weight Pipe kg/m
1/4	(6)	.375	(9.53)	.035	(0.89)	.032	(.048)	.145	(.216)
3/8	(10)	.500	(12.70)	.049	(1.24)	.055	(.082)	.269	(.400)
1/2	(15)	.625	(15.88)	.049	(1.24)	.094	(.140)	.344	(.512)
5/8	(17)	.750	(19.05)	.049	(1.24)	.144	(.214)	.418	(.622)
3/4	(20)	.875	(22.23)	.065	(1.65)	.188	(.280)	.641	(.954)
1	(25)	1.125	(28.58)	.065	(1.65)	.337	(.502)	.839	(1.249)
1 1/4	(32)	1.375	(34.93)	.065	(1.65)	.527	(.784)	1.040	(1.548)
1 1/2	(40)	1.625	(41.28)	.072	(1.83)	.743	(1.106)	1.360	(2.024)
2	(50)	2.125	(53.98)	.083	(2.11)	1.310	(1.949)	2.060	(3.066)
2 1/2	(65)	2.625	(66.68)	.095	(2.41)	2.000	(2.976)	2.920	(4.345)
3	(80)	3.125	(79.38)	.109	(2.77)	2.960	(4.405)	4.000	(5.953)
3 1/2	(90)	3.625	(92.08)	.120	(3.05)	3.900	(5.804)	5.120	(7.619)
4	(100)	4.125	(104.78)	.134	(3.40)	5.060	(7.530)	6.510	(9.688)
5	(125)	5.125	(130.18)	.160	(4.06)	8.000	(11.905)	9.670	(14.391)
6	(150)	6.125	(155.58)	.192	(4.88)	11.200	(16.667)	13.870	(20.641)
8	(200)	8.125	(206.38)	.271	(6.88)	19.500	(29.019)	25.900	(38.543)
10	(250)	10.125	(257.18)	.338	(8.59)	30.423	(45.274)	40.300	(59.973)
12	(300)	12.125	(307.98)	.405	(10.29)	43.675	(64.996)	57.800	(86.016)

Spacing of Hangers For Copper Tubing

Note: *Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required.*

Tubing Size		1/2 (15)	3/4 (20)	1 (25)	1 1/4 (32)	1 1/2 (40)	2 (50)	2 1/2 (65)	3 (80)	3 1/2 (90)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)
Span	ft	6	8	8	10	10	10	12	12	12	12	12	14	14	18	19
	m	(1.83)	(2.44)	(2.44)	(3.05)	(3.05)	(3.05)	(3.66)	(3.66)	(3.66)	(3.66)	(3.66)	(4.27)	(4.27)	(5.49)	(5.79)

Glass Pipe Data

REGULAR SCHEDULE

Nom. Pipe Size		O.D. D.I. Pipe		Wall Thick		Weight Pipe lbs/ft	Weight Pipe kg/m	Weight Water lbs/ft	Weight Water kg/m
1 1/2	(40)	1.84	(46.74)	.12	(3.05)	.64	(.95)	.89	(1.32)
2	(50)	2.34	(59.44)	.14	(3.56)	.94	(1.40)	1.45	(2.16)
3	(80)	3.41	(86.61)	.17	(4.32)	1.60	(2.38)	3.19	(4.75)
4	(100)	4.53	(115.06)	.20	(5.08)	2.60	(3.87)	5.79	(8.62)
6	(150)	6.66	(169.16)	.24	(6.10)	4.70	(6.99)	12.78	(19.02)

HEAVY SCHEDULE

1	(25)	1.31	(33.27)	.16	(4.06)	.60	(.89)	.35	(.52)
1 1/2	(40)	1.84	(46.74)	.17	(4.32)	.87	(1.29)	.76	(1.13)
2	(50)	2.34	(59.44)	.17	(4.32)	1.10	(1.64)	1.36	(2.02)
3	(80)	3.41	(86.61)	.20	(5.08)	2.00	(2.98)	3.06	(4.55)
4	(100)	4.53	(115.06)	.26	(6.60)	3.40	(5.06)	5.44	(8.10)
6	(150)	6.66	(169.16)	.33	(8.38)	6.30	(9.38)	12.42	(18.48)

Spacing of Hangers for glass pipe support every 8-10 ft (2.44 - 3.05 m).
Pad all hangers. Use only clevis or trapeze, do not tie down pipe.

AWWA Ductile Iron Pipe Data

Based on AWWA C108-70, Table 8.2.
Add flange weight for flanged cast iron pipe.

Nom. Pipe Size		Class	O.D. D.I. Pipe		Wall Thick		Weight Pipe lbs/ft	Weight Pipe kg/m	Weight Water lbs/ft	Weight Water kg/m
3	(80)	53	3.96	(100.58)	.31	(7.87)	11.2	(16.67)	3.8	(5.66)
4	(100)	53	4.80	(121.92)	.32	(8.13)	14.2	(21.13)	5.9	(8.78)
6	(150)	53	6.90	(175.26)	.34	(8.64)	22.0	(32.74)	13.1	(19.49)
8	(200)	53	9.05	(229.87)	.36	(9.14)	31.0	(46.13)	23.0	(34.23)
10	(250)	53	11.1	(281.94)	.38	(9.65)	40.4	(60.12)	36.4	(54.17)
12	(300)	53	13.2	(335.28)	.40	(10.16)	50.7	(75.45)	52.3	(77.83)
14	(350)	53	15.3	(388.62)	.42	(10.67)	62.4	(92.86)	71.1	(105.81)
16	(400)	53	17.4	(441.96)	.43	(10.92)	72.8	(108.34)	93.1	(138.55)
18	(450)	53	19.5	(495.30)	.44	(11.18)	83.6	(124.41)	117.9	(175.45)
20	(500)	53	21.6	(548.64)	.45	(11.43)	95.2	(141.67)	145.8	(216.97)
24	(600)	53	25.8	(655.32)	.47	(11.94)	119.2	(177.39)	210.2	(312.81)
30	(750)	53	32.0	(812.80)	.51	(12.95)	161.3	(240.04)	326.5	(485.89)
36	(900)	53	38.3	(972.82)	.58	(14.73)	219.5	(326.65)	469.3	(698.40)
42	(1050)	53	44.5	(1130.30)	.65	(16.51)	285.2	(424.42)	634.9	(944.84)
48	(1200)	53	50.8	(1290.32)	.72	(18.29)	360.3	(536.19)	828.9	(1233.54)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

PVC Plastic Pipe Data
SCHEDULE 40 & 80

Pipe Size		Schedule No.	O.D.		Wall Thickness		Weight Water lbs/ft	Weight Water kg/m	Weight Pipe lbs/ft	Weight Pipe kg/m
1/8	(3)	40	.405	(10.3)	.068	(1.73)	.025	(.037)	.043	(.064)
		80			.095	(2.41)	.016	(.024)	.055	(.082)
1/4	(6)	40	.540	(13.7)	.088	(2.24)	.045	(.067)	.074	(.110)
		80			.119	(3.02)	.031	(.046)	.094	(.140)
3/8	(10)	40	.675	(17.15)	.091	(2.31)	.083	(.124)	.100	(.149)
		80			.126	(3.20)	.061	(.091)	.129	(.192)
1/2	(15)	40	.840	(21.34)	.109	(2.77)	.132	(.196)	.150	(.223)
		80			.147	(3.73)	.101	(.150)	.200	(.298)
3/4	(20)	40	1.050	(26.67)	.113	(2.87)	.230	(.342)	.199	(.296)
		80			.154	(3.91)	.186	(.277)	.259	(.385)
1	(25)	40	1.315	(33.40)	.133	(3.38)	.374	(.557)	.295	(.439)
		80			.179	(4.55)	.311	(.463)	.382	(.568)
1 1/4	(32)	40	1.660	(42.16)	.140	(3.56)	.647	(.963)	.400	(.595)
		80			.191	(4.85)	.555	(.826)	.527	(.784)
1 1/2	(40)	40	1.900	(48.26)	.145	(3.68)	.882	(1.313)	.479	(.713)
		80			.200	(5.08)	.765	(1.138)	.639	(.951)
2	(50)	40	2.375	(60.33)	.154	(3.91)	1.452	(2.161)	.643	(.957)
		80			.218	(5.54)	1.279	(1.903)	.884	(1.316)

Pipe Size		Schedule No.	O.D.		Wall Thickness		Weight Water lbs/ft	Weight Water kg/m	Weight Pipe lbs/ft	Weight Pipe kg/m
2 1/2	(65)	40	2.875	(73.03)	.203	(5.16)	2.072	(3.08)	1.020	(1.518)
		80			.276	(7.01)	1.834	(2.73)	1.350	(2.009)
3	(80)	40	3.500	(88.9)	.216	(5.49)	3.20	(4.76)	1.333	(1.984)
		80			.300	(7.62)	2.86	(4.26)	1.804	(2.685)
3 1/2	(90)	40	4.000	(101.6)	.226	(5.74)	4.28	(6.37)	1.598	(2.378)
		80			.318	(8.08)	3.85	(5.73)	2.195	(3.267)
4	(100)	40	4.500	(114.3)	.237	(6.02)	5.51	(8.20)	1.899	(2.826)
		80			.337	(8.56)	4.98	(7.41)	2.636	(3.923)
5	(125)	40	5.563	(141.30)	.258	(6.55)	8.66	(12.89)	2.770	(4.122)
		80			.375	(9.53)	7.87	(11.71)	4.126	(6.140)
6	(150)	40	6.625	(168.28)	.280	(7.11)	12.51	(18.62)	3.339	(4.969)
		80			.432	(10.97)	11.92	(17.74)	5.028	(7.482)
8	(200)	40	8.625	(219.08)	.322	(8.18)	21.60	(32.14)	5.280	(7.858)
		80			.500	(12.70)	19.80	(29.47)	8.023	(11.940)
10	(250)	40	10.75	(273.05)	.365	(9.27)	34.10	(50.75)	7.505	(11.169)
		80			.593	(15.06)	31.10	(46.28)	11.894	(17.700)
12	(300)	40	12.75	(323.85)	.406	(10.31)	48.50	(72.18)	10.023	(14.916)
		80			.687	(17.45)	44.00	(65.48)	16.365	(24.354)

Spacing of Hangers For PVC Plastic Pipe

Schedule 40 Pipe Size		Support Spacing / Temperature 20°F	(-6.6°C)	40°F	(4.4°C)	60°F	(15.6°C)	80°F	(26.7°C)	100°F	(37.8°C)	110°F	(43.3°C)	120°F	(48.9°C)	130°F	(54.4°C)	140°F	(60°C)	150°F	(65.6°C)
		ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4	(15-20)	5.00	(1.52)	4.75	(1.45)	4.50	(1.37)	4.25	(1.30)	4.00	(1.22)	3.75	(1.14)	3.33	(1.01)	3.00	(.91)	2.66	(.81)	2.00	(.61)
1 - 1 1/4	(25-32)	5.50	(1.68)	5.25	(1.60)	5.00	(1.52)	4.66	(1.42)	4.33	(1.32)	4.00	(1.22)	3.75	(1.14)	3.33	(1.01)	2.80	(.85)	2.25	(.69)
1 1/2 - 2	(40-50)	5.80	(1.77)	5.50	(1.68)	5.25	(1.60)	5.00	(1.52)	4.66	(1.42)	4.33	(1.32)	3.80	(1.16)	3.50	(1.07)	3.00	(.91)	2.50	(.76)
2 1/2	(65)	6.66	(2.03)	6.33	(1.93)	6.00	(1.83)	5.50	(1.68)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.00	(1.22)	3.50	(1.07)	2.80	(.85)
3	(80)	6.80	(2.07)	6.50	(1.98)	6.25	(1.91)	5.80	(1.77)	5.50	(1.68)	5.25	(1.60)	4.75	(1.45)	4.25	(1.30)	3.66	(1.12)	3.00	(.91)
4	(100)	7.33	(2.23)	7.00	(2.13)	6.50	(1.98)	6.25	(1.91)	5.80	(1.77)	5.50	(1.68)	5.00	(1.52)	4.50	(1.37)	3.80	(1.16)	3.25	(.99)
6	(150)	7.80	(2.38)	7.50	(2.29)	7.00	(2.13)	6.80	(2.07)	6.33	(1.93)	5.80	(1.77)	5.33	(1.62)	4.80	(1.46)	4.25	(1.30)	3.50	(1.07)

Schedule 80 Pipe Size		Support Spacing / Temperature 20°F	(-6.6°C)	40°F	(4.4°C)	60°F	(15.6°C)	80°F	(26.7°C)	100°F	(37.8°C)	110°F	(43.3°C)	120°F	(48.9°C)	130°F	(54.4°C)	140°F	(60°C)	150°F	(65.6°C)
		ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4	(15-20)	5.75	(1.75)	5.50	(1.68)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.33	(1.32)	3.80	(1.16)	3.50	(1.07)	3.00	(.91)	2.50	(.76)
1	(25)	6.33	(1.93)	6.00	(1.83)	5.75	(1.75)	5.33	(1.62)	5.00	(1.52)	4.60	(1.40)	4.33	(1.32)	3.80	(1.16)	3.33	(1.01)	2.75	(.84)
1 1/4 - 1 1/2	(32-40)	6.66	(2.03)	6.33	(1.93)	6.00	(1.83)	5.66	(1.73)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.00	(1.22)	3.50	(1.07)	3.00	(.91)
2	(50)	7.00	(2.13)	6.50	(1.98)	6.25	(1.91)	6.00	(1.83)	5.50	(1.68)	5.12	(1.56)	4.75	(1.45)	4.33	(1.32)	3.66	(1.12)	3.12	(.95)
2 1/2	(65)	7.80	(2.38)	7.50	(2.29)	7.00	(2.13)	6.66	(2.03)	6.33	(1.93)	5.80	(1.77)	5.33	(1.62)	4.75	(1.45)	4.25	(1.30)	3.33	(1.01)
3	(80)	8.20	(2.50)	7.75	(2.36)	7.33	(2.23)	7.00	(2.13)	6.50	(1.98)	6.00	(1.83)	5.50	(1.68)	5.00	(1.52)	4.33	(1.32)	3.50	(1.07)
4	(100)	8.66	(2.64)	8.25	(2.51)	7.80	(2.38)	7.33	(2.23)	6.80	(2.07)	6.33	(1.93)	5.80	(1.77)	5.25	(1.60)	4.66	(1.42)	3.75	(1.14)
6	(150)	9.80	(2.99)	9.33	(2.84)	8.80	(2.68)	8.33	(2.54)	7.80	(2.38)	7.33	(2.23)	6.50	(1.98)	6.00	(1.83)	5.12	(1.56)	4.25	(1.30)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

Conduit Data

STEEL RIGID CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Appdox. Max. Weight Conduit And Conductor			
								Lead Covered		Not Lead Covered	
						lbs/ft	kg/m	lbs/ft	kg/m	lbs/ft	kg/m
1/2	(15)	.840	(21.34)	1.010	(25.65)	.80	(1.19)	1.17	(1.74)	1.04	(1.55)
3/4	(20)	1.050	(26.67)	1.250	(31.75)	1.09	(1.62)	1.75	(2.60)	1.40	(2.08)
1	(25)	1.315	(33.40)	1.525	(38.74)	1.65	(2.46)	2.62	(3.90)	2.35	(3.50)
1 1/4	(32)	1.660	(42.16)	1.869	(47.47)	2.15	(3.20)	4.31	(6.41)	3.58	(5.33)
1 1/2	(40)	1.900	(48.26)	2.155	(54.74)	2.58	(3.84)	5.89	(8.77)	4.55	(6.77)
2	(50)	2.375	(60.33)	2.650	(67.31)	3.52	(5.24)	8.53	(12.69)	7.21	(10.73)
2 1/2	(65)	2.875	(73.03)	3.250	(82.55)	5.67	(8.44)	11.51	(17.13)	10.22	(15.21)
3	(80)	3.500	(88.90)	3.870	(98.30)	7.14	(10.63)	16.51	(24.57)	14.51	(21.59)
3 1/2	(90)	4.000	(101.60)	4.500	(114.30)	8.60	(12.80)	19.05	(28.35)	17.49	(26.03)
4	(100)	4.500	(114.30)	4.875	(123.83)	10.00	(14.88)	24.75	(36.83)	21.48	(31.97)
5	(125)	5.563	(141.30)	6.000	(152.40)	13.20	(19.64)	35.87	(53.38)	30.83	(45.88)
6	(150)	6.625	(168.28)	7.200	(182.88)	17.85	(26.56)	50.69	(75.44)	43.43	(64.63)

ELECTRICAL METALLIC TUBING DATA

Nominal Size EMT Conduit		O.D. Conduit		Weight Conduit W/C Plg.		Appdox. Max. Weight Conduit And Conductor	
						Not Lead Covered	
				lbs/ft	kg/m	lbs/ft	kg/m
1/2	(15)	.706	(17.93)	.29	(0.43)	.54	(0.80)
3/4	(20)	.922	(23.42)	.45	(0.67)	1.16	(1.73)
1	(25)	1.163	(29.54)	.65	(0.97)	1.83	(2.72)
1 1/4	(32)	1.510	(38.35)	.96	(1.43)	2.96	(4.40)
1 1/2	(40)	1.740	(44.20)	1.11	(1.65)	3.68	(5.48)
2	(50)	2.197	(55.80)	1.41	(2.10)	4.45	(6.62)
2 1/2	(65)	2.875	(73.03)	2.15	(3.20)	6.41	(9.54)
3	(80)	3.500	(88.90)	2.60	(3.87)	9.30	(13.84)
3 1/2	(90)	4.000	(101.60)	3.25	(4.84)	12.15	(18.08)
4	(100)	4.500	(114.30)	3.90	(5.80)	15.40	(22.92)

Note: *2 1/2 (65) through 4" (100) EMT same as steel rigid conduit.*

INTERMEDIATE METAL CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Appdox. Max. Weight Conduit And Conductor			
								Lead Covered		Not Lead Covered	
						lbs/ft	kg/m	lbs/ft	kg/m	lbs/ft	kg/m
1/2	(15)	.815	(20.70)	1.010	(25.65)	.60	(0.89)	.97	(1.44)	.84	(1.25)
3/4	(20)	1.029	(26.14)	1.250	(31.75)	.82	(1.22)	1.48	(2.20)	1.13	(1.68)
1	(25)	1.290	(32.77)	1.525	(38.74)	1.16	(1.73)	2.13	(3.17)	1.86	(2.77)
1 1/4	(32)	1.638	(41.61)	1.869	(47.47)	1.50	(2.23)	3.66	(5.45)	2.93	(4.36)
1 1/2	(40)	1.883	(47.83)	2.155	(54.74)	1.82	(2.71)	5.13	(7.63)	3.79	(5.64)
2	(50)	2.360	(59.94)	2.650	(67.31)	2.42	(3.60)	7.43	(11.06)	6.11	(9.09)
2 1/2	(65)	2.857	(72.57)	3.250	(82.55)	4.28	(6.37)	10.12	(15.06)	8.83	(13.14)
3	(80)	3.476	(88.29)	3.870	(98.30)	5.26	(7.83)	14.63	(21.77)	12.63	(18.80)
3 1/2	(90)	3.971	(100.86)	4.500	(114.30)	6.12	(9.11)	16.57	(24.66)	15.01	(22.34)
4	(100)	4.466	(113.44)	4.875	(123.83)	6.82	(10.15)	21.57	(32.10)	18.30	(27.23)

Threaded Rod Data

Nominal Rod Dia.	Root Area Thread		Max. Rec. Load			
			650°F (343°C)		750°F (399°C)	
	$in.^2$	mm^2	lbs	kN	lbs	kN
1/4 - 20	.027	(17.42)	240	(1.07)	210	(0.93)
3/8 - 16	.068	(43.87)	730	(3.24)	572	(2.54)
1/2 - 13	.126	(81.29)	1350	(6.00)	1057	(4.70)
5/8 - 11	.202	(130.32)	2160	(9.60)	1692	(7.52)
3/4 - 10	.302	(194.84)	3230	(14.37)	2530	(11.25)
7/8 - 9	.419	(270.32)	4480	(19.93)	3508	(15.60)
1 - 8	.552	(356.13)	5900	(26.24)	4620	(20.55)
1 1/8 - 7	.693	(447.10)	7450	(33.14)	5830	(25.93)
1 1/4 - 7	.889	(573.55)	9500	(42.25)	7440	(33.09)
1 1/2 - 6	1.293	(834.19)	13800	(61.38)	10807	(48.07)
1 3/4 - 5	1.744	(1125.16)	18600	(82.73)	14566	(64.79)
2 - 4 1/2	2.300	(1483.87)	24600	(109.42)	19625	(87.29)
2 1/4 - 4	3.023	(1950.32)	32300	(143.67)	25292	(112.51)
2 1/2 - 4	3.719	(2399.35)	39800	(177.03)	31169	(138.64)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

Cast Iron Data

SERVICE WEIGHT CAST IRON SOIL PIPE DATA (Bell & Spigot Type)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs/ft	kg/m	lbs/ft	kg/m
2	(50)	2.25	(57.15)	.17	(4.32)	4.00	(5.95)	1.24	(1.85)
3	(80)	3.25	(82.55)	.17	(4.32)	6.00	(8.93)	2.88	(4.29)
4	(100)	4.25	(107.95)	.18	(4.57)	8.00	(11.91)	5.15	(7.66)
5	(125)	5.25	(133.35)	.18	(4.57)	10.40	(15.48)	8.14	(12.11)
6	(150)	6.25	(158.75)	.18	(4.57)	13.00	(19.35)	11.80	(17.57)
8	(200)	8.38	(212.85)	.23	(5.84)	20.00	(29.76)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	29.00	(43.16)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	38.00	(56.55)	48.51	(72.18)
15	(380)	15.62	(396.75)	.31	(7.87)	51.00	(75.90)	76.55	(113.92)

EXTRA WEIGHT CAST IRON SOIL PIPE DATA (Bell & Spigot Type)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs/ft	kg/m	lbs/ft	kg/m
2	(50)	2.38	(60.45)	.190	(4.83)	5.00	(7.44)	1.36	(2.03)
3	(80)	3.50	(88.90)	.250	(6.35)	9.00	(13.39)	3.06	(4.56)
4	(100)	4.50	(114.30)	.250	(6.35)	12.00	(17.86)	5.44	(8.10)
5	(125)	5.50	(139.70)	.250	(6.35)	15.00	(22.32)	8.51	(12.66)
6	(150)	6.50	(165.10)	.250	(6.35)	19.00	(28.28)	12.25	(18.23)
8	(200)	8.62	(218.95)	.310	(7.87)	30.00	(44.64)	21.78	(32.40)
10	(250)	10.75	(273.05)	.375	(9.53)	43.00	(63.99)	34.02	(50.63)
12	(300)	12.75	(323.85)	.375	(9.53)	54.00	(80.36)	48.99	(72.91)
15	(380)	15.88	(403.35)	.440	(11.18)	75.00	(111.61)	76.55	(113.92)

NO-HUB CAST IRON SOIL PIPE DATA

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs/ft	kg/m	lbs/ft	kg/m
$1^1/_2$	(40)	1.90	(48.26)	.16	(4.06)	2.70	(4.02)	0.85	(1.26)
2	(50)	2.35	(59.69)	.16	(4.06)	3.60	(5.36)	1.40	(2.09)
3	(80)	3.35	(85.09)	.16	(4.06)	5.20	(7.74)	3.12	(4.65)
4	(100)	4.38	(111.25)	.19	(4.83)	7.40	(11.01)	5.44	(8.10)
5	(125)	5.30	(134.62)	.19	(4.83)	9.60	(14.29)	8.24	(12.26)
6	(150)	6.30	(160.02)	.19	(4.83)	11.00	(16.37)	11.92	(17.74)
8	(200)	8.38	(212.85)	.23	(5.84)	18.00	(26.79)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	26.20	(38.99)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	35.50	(52.83)	48.51	(72.18)

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FINISHES

ZINC COATING

PHD offers 3 basic forms of zinc coating on its products:

1) **Electro-Galvanized** (Electro-Plated Zinc)
2) **Pre-Galvanized**
3) **Hot Dipped Galvanized**

For best results, a zinc rich paint should be applied to field cuts. The zinc rich paint will provide immediate protection for these areas and eliminate the short time period for galvanic action to "heal" the damaged coating.

Note: *The corrosion resistance of zinc is based on its thickness, the environment, and the coating process used. The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.*

Zinc offers two types of protection:

- **Barrier:** The zinc coating protects the steel substrate from direct contact with the environment
- **Sacrificial:** The zinc coating will protect scratches, cut edges, etc… through an anodic sacrificial process.

Electro-Galvanized "EG" (ASTM B633 SC1 & SC3)

This type of coating is recommended for use indoors in relatively dry areas. The steel is submersed in a bath of zinc salts, through the process of elec-trolysis, a coating of pure zinc adheres to the steel with a molecular bond. A maximum of 0.5 mils of zinc per side can be applied using this method.

SC1 (Mild) is the standard finish thickness which has a Zinc coating of 0.2 mils per side. SC3 (Severe) has a Zinc coating of 0.5 mils per side.

Pre-Galvanized "PG" (ASTM A653 COATING G90)

This type of coating is suitable for extended exposure in dry or mildly cor-rosive atmospheres but not generally recommended for use outdoors in industrial environments. Also known as "mill galvanized" or "hot-dipped mill galvanized" pre-galvanized zinc coatings are produced by rolling the steel coils or sheets through molten zinc, at the steel mill, the material is then cut or slit to size. Zinc near the uncoated edges or weld areas becomes a sacrificial anode which protects the bare areas.

The pre-galvanized material conforms to ASTM A653 with a G90 zinc coating. The zinc thickness per side is nominally 0.75 mils thick or 0.45 oz /sq ft.

Hot-Dip Galvanized "HDG" (ASTM A123)

Recommended for prolonged outdoor exposure and will usually protect steel in most atmospheric environments. After fabrication the part is im-mersed in a bath of molten zinc. A metallurgical bond is formed resulting in a zinc coating that coats all surfaces including edges. Please note that some items cannot be hot-dipped galvanized due to design, tolerances, or threaded components. Check with the PHD factory or your local representa-tive when questionable.

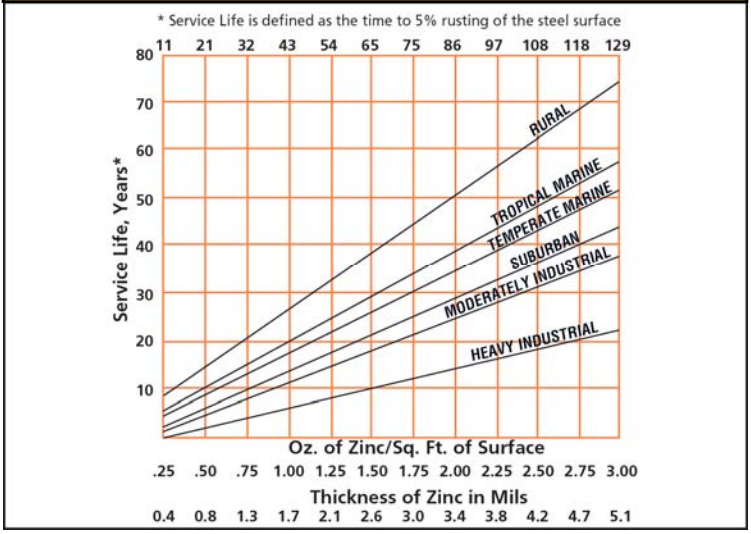
Threaded components on hot dipped galvanized products will be electro-plated.

The hot-dip galvanized coating is typically 2.6 mils or 1.5 oz/sq ft per side.

As shown in the graph, when the zinc coating is double, the service life is double under most conditions.

Comparison of Zinc Finishing	
Finish	**Zinc Thickness (mils)**
Hot-Dip Galvanized	2.6
Pre-Galvanized	0.75
Electro-Galvanized (SC1)	0.2
Electro-Galvanized (SC3)	0.5

Life of Protection vs. Thickness of Zinc



FINISHES

PLAIN "PL"

Plain finish designation means that the channel retains the oiled surface applied to the raw steel during the rolling process. The fittings have the original oiled surface of the bar-stock material.

POWDER COATING "PTD"

PHD offers a polyester powder coating that utilizes powder material conforming to ASTM D3451. It is applied by means of an electrostatic spray at ambient temperature.

PVC COATING "PVC"

PVC coating helps reduce noise and protect the pipe or tubing from the metal surface of the hanger. Corrosion resistance protection is minimal.

COPPER COLOR EPOXY FINISH "CCEF"

Designed for use with copper tubing. This coating provides a better level of corrosion resistance than the traditional copper plated finish. It also acts as a protective barrier, avoiding contact between dissimilar metals. The copper color epoxy powder is applied by an elec-trostatic method, and the coated parts are baked at 180 degrees for 20 minutes.

TECHNICAL DATA

CORROSION

The corrosion data given in this table is for general comparison only.

The presence of contaminates and the effect of temperature in chemical environments can greatly affect the corrosion of any material.

PHD strongly suggests that field service tests or simulated laboratory tests using actual environmental conditions are conducted in order to determine the proper materials and finishes to be selected.

R= Recommended

F= May be used under some conditions

NR= Not Recommended

– Information not available

Chemical	Aluminum	PVC	Type 304 Stainless	Type 316 Stainless	Zinc Coated Steel
Acetic Acid 10%	R	R	R	R	NR
Acetic Acid 2%	R	R	R	R	NR
Acetone	R	NR	R	R	R
Ammonium Hydroxide-Conc,	R	R	R	R	-
Ammonium Hydroxide 10%	F	R	R	R	-
Ammonium Hydroxide 2%	R	R	R	R	-
Benzene	R	NR	R	R	-
Bromine Water	NR	R	NR	NR	-
Butanol (Butyl Alcohol)	R	R	R	R	R
Carbon Disulfide	R	NR	R	R	-
Carbon Tetrachloride	F	F	R	R	-
Chlorine Water	R	R	NR	F	R
Cutting Oil	-	-	-	-	-
Diethanolamine	R	NR	-	-	NR
Ethanol	R	R	R	R	R
Ethyl Acetate	R	NR	-	-	R
Ethylene Dichloride	F	NR	-	-	R
Formaldehyde 20%	R	R	R	R	R
Gasoline	R	R	R	R	R
Glycerine	R	R	R	R	R
Household Detergent 10%	F	R	R	R	-
Hydrochloric Acid 40%	NR	R	NR	NR	NR
Hydrochloric Acid 10%	NR	-	NR	NR	NR
Hydrochloric Acid 2%	NR	-	NR	NR	NR
Hydrogen Peroxide 30%	R	R	R	R	-
Hydrogen Peroxide 3%	R	-	R	R	-
Hydrofen Sulfide (Gas)	R	R	F	R	-
JP-4 Jet Fuel	R	R	R	R	-
Lactic Acid 85%	F	R	NR	-	-
Latex	R	-	R	R	NR
Linseed Oil Fatty Acid	R	R	R	R	-
Methanol	R	R	R	R	R
Methyl Ethyl Ketone	R	NR	-	-	R
Methyl Isobutyl Ketone	R	NR	-	-	R
Mineral Spirits	R	-	-	-	-
Motor Oil - 10W	R	R	R	R	R
Naphtha, VM&P	R	R	R	R	R
Nitric Acid 2%	F	R	R	R	-
Perchloroethylene	R	-	-	-	NR
Petroleum Ether	-	-	R	R	R
Phenol 10%	R	NR	R	R	R
Phosophoric Acid 2%	F	R	R	R	NR
Potassium Hydroxide 50%	NR	R	R	R	-
Potassium Hydroxide 10%	NR	R	R	R	-
Potassium Hydroxide 2%	NR	R	R	R	-
Sodium Chloride 25%	F	R	R	R	F
Sodium Hydroxide 50%	NR	R	R	R	NR
Sodium Hydroxide 10%	NR	R	R	R	F
Sodium Hydroxide 2%	NR	R	-	-	-
Sodium Hypochlorite-C1. 10%	F	R	-	-	-
Sodium Hypochlorite-C1. 6%	F	R	NR	R	-
Sulfuric Acid 50%	F	R	NR	R	NR
Tall Oil Fatty Acid 50%	R	R	-	-	-
Tannic Acid 50%	F	R	R	R	-
Water-Deionized	R	R	R	R	F
Water-Sea	F	R	R	R	F
Water-Tap	R	R	F	F	R
Xyol	R	R	NR	-	-

TECHNICAL DATA

CORROSION

All metal surfaces are affected by corrosion. Depending on the physical properties of the metal and the environment to which it is exposed, chemical or electromechanical corrosion may occur.

Atmospheric Corrosion

Atmospheric corrosion occurs when metal is exposed to airborne liquids, solids or gases. Some sources of atmospheric corrosion are moisture, salt, dirt and sulphuric acid. This form of corrosion is typically more severe outdoors, especially near marine environments.

Chemical Corrosion

Chemical corrosion takes place when metal comes in direct contact with a corrosive solution. Some factors which affect the severity of chemical corrosion include: chemical concentration level, duration of contact, frequency of washing, and operating temperature.

Storage Corrosion

Wet storage stain (white rust) is caused by the entrapment of moisture between surfaces of closely packed and poorly ventilated material for an extended period. Wet storage stain is usually superficial, having no affect on the properties of the metal.

Light staining normally disappears with weathering. Medium to heavy buildup should be removed in order to allow the formation of normal protective film. Proper handling and storage will help to assure stain-free material. If product arrives wet, it should be unpacked and dried before storage. Dry material should be stored in a well ventilated "low moisture" environment to avoid condensation formation. Outdoor storage is undesirable, and should be avoided whenever possible.

Galvanic Corrosion

Galvanic corrosion occurs when two or more dissimilar metals are in contact in the presence of an electrolyte (ie. moisture). An electrolytic cell is created and the metals form an anode or a cathode depending on their relative position on the Galvanic Series Table. The anodic material will be the one to corrode. Anodic or cathodic characteristics of two dissimilar metals will depend on the type of each material. For example: If zinc and steel are in contact, the zinc acts as the anode and will corrode; the steel acts as the cathode, and will be protected. If steel and copper are in contact, the steel is now the anode and will corrode. The rate at which galvanic corrosion occurs depends on several factors:

1. The relative position on the Galvanic Series Table - the further apart materials are in the Galvanic Series Table, the greater the potential for corrosion of the anodic material.

2. The amount and concentration of electrolyte present - an indoor, dry environment will have little or no galvanic corrosion compared to a wet atmosphere.

3. The relative size of the materials – a small amount of anodic material in contact with a large cathodic material will result in greater corrosion. Likewise, a large anode in contact with a small cathode will decrease the rate of attack.

GALVANIC SERIES IN SEA WATER

Anodic End

More Anodic

- Magnesium
- Magnesium Alloys
- Zinc (Galvanized Coating)
- Beryllium
- Aluminum - Zinc Alloys
- Aluminum - Magnesium Alloys
- Aluminum
- Aluminum - Magnesium Alloys
- Aluminum - Magnesium - Silicon Alloys
- Cadmium
- Aluminum - Copper Alloys
- Low Carbon Steel, Cast Iron, Wrought Iron
- Austenitic Nickel Cast Iron
- Type 410 Stainless Steel (active)
- Type 316 Stainless Steel (active)
- Type 304 Stainless Steel (active)
- Naval Brass, Yellow Brass, Red Brass
- Tin
- Copper
- Lead-Tin Solders
- Admiralty Brass, Aluminum Brass
- Manganese Bronze
- Silicon Bronze
- Tin Bronze
- Type 410 Stainless Steel (passive)
- Nickel - Silver
- Copper Nickel Alloys
- Lead
- Nickel - Aluminum Bronze
- Silver Solder
- Nickel 200
- Silver
- Type 316 Stainless Steel (passive)
- Type 304 Stainless Steel (passive)
- Incoloy 825
- Hastelloy B
- Titanium
- Hastelloy C
- Platinum
- Graphite

Cathodic End

Metals in descending order of activity in the presence of an electrolyte.