

SPECIFICATIONS FOR WELDED AND SEAMLESS STEEL PIPE

ASTM – A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

This specification covers cold-formed welded carbon steel round, square, rectangular, or special shape structural tubing for welded, riveted, or bolted construction of bridges and buildings, and for general structural purposes. Four grades are produced each having a different chemistry and tensile requirement.

Structural Tubing is relatively low in cost, has a high strength-to-weight ratio and is easily welded, formed, punched and drilled. Its hollow shape protects and conceals wires, pipes, moving parts and it can be left exposed.

Grades B and C, being the most common stock available, can be subjected to most of the usual fabricating operations. Ductility is good. Bends well, flattens, cuts, punches, flares, flanges and welds easily.

ASTM – A1085 - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).

This specification covers cold-formed welded carbon steel hollow structural sections (HSS) for welded or bolted construction that are used in, although not limited to, buildings, bridges, towers, cranes, sign supports and poles, off-shore production and drilling platforms, roll-over protective structures (ROPS), falling object protective structures (FOPS), and amusement rides. This HSS is produced in welded sizes with a periphery of not more than 88 in. (2235 mm)

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as well as a specified nominal wall thickness of at least 0.148 in (3.8 mm) and not more than 0.875 in. (22 mm). The standard addresses areas such as ordering information, the steel-making process, HSS manufacture, heat analysis, product analysis, tensile requirements, flattening test, permissible variations in dimensions, number of tests, retests, test methods, rejection, certification, product marking, packing and loading, and government procurement.

ASTM – A252 - Standard Specification for Welded and Seamless Steel Pipe Piles.

This specification covers nominal wall cylindrical steel pipe piles in which the steel cylinder acts as a permanent load-carrying member or as a shell to form cast-in-place concrete piles. Ideally suited for application in buildings, retaining walls, and other structures needing solid, dependably, quality made steel piling pipe as its structure. Each welded pile shall be made by seamless, electric resistance welding, flash welding or fusion welding with longitudinal, helical-butt, or helical-lap seams. This specification also deals with material tensile requirements, minimum elongation values and common size and weights per unit length values. ASTM A252.

SPECIFICATIONS FOR WELDED AND SEAMLESS STEEL PIPE

BLACK AND HOT DIPPED ZINC COATED
(GALVANIZED)

FOR ORDINARY USES

These specifications cover black and hot dipped galvanized welded and seamless steel pipe. Pipe ordered under these specifications is nominal (average) wall and is intended for ordinary uses in steam, water, gas, and air lines, but is not intended for close coiling or bending, or high-temperature service. No mechanical tests are specified on pipe made to these specifications, except hydrostatic tests which shall be made at the mills, as these specifications are intended to cover pipe purchased mainly from jobber's stocks.

Note - When tension, flattening, or bend tests are required, pipe should be ordered in accordance with the Specifications for Welded and Seamless Steel Pipe (ASTM Designation: A53). In the case of galvanized pipe so ordered, the base metal shall be made and tested in accordance with the Specifications A53 and the pipe shall be galvanized and the coating tested in accordance with these specifications A 120. When specified, results of the mechanical tests on the base material shall be reported to the purchaser.

Note - When galvanized pipe, as covered by these specifications, is bent or otherwise fabricated to a degree which causes the zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

Specifications	Scope
A-120 SIZES 1/8"-12" Std, E.S. and XX	Covers BLACK and GALVANIZED WELDED SEAMLESS nominal (average) wall pipe for ordinary uses in steam, water, gas and air lines. Pipe to this specification not intended for close coiling, bending, or high-temperature service. Intended primarily to cover pipe purchased mainly from distributors' stocks.
A-53 SIZES 1/8"-24" Std, E.S. and XXX	Covers BLACK and GALVANIZED WELDED SEAMLESS nominal wall pipe for coiling, bending, flanging and other special purposes and is suitable for welding. BUTTWELDED pipe is not intended for flanging (roll back operation to form flange using pipe wall.) Purpose for which pipe is intended should be stated on order.
A-106 SIZES 1/8"-24" A.S.A. Schedules 10 through 160	Covers SEAMLESS nominal wall pipe (welded not permitted) for high-temperature service, suitable for bending, flanging, and similar forming operations. Sizes 1 1/2" and under may be either hot finished or cold drawn. Sizes 2" and larger shall be hot finished unless otherwise specified.
API 5-L SIZES 1/8"-24"	Covers WELDED and SEAMLESS pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries.



Pipe Size Chart

Nominal Pipe Size Inches	Outside Diameter Inches	Standard Pipe Schedule	Inside Diameter Inches	Wall Thickness Inches	Weight per ft. lbs. Plain End
1/2	0.840	5	0.710	0.065	0.538
		10	0.674	0.083	0.671
		40 Std.	0.622	0.109	0.851
		80 Ex Hvy	0.546	0.147	1.088
		160 XX Hvy	0.466 0.252	0.187 0.294	1.304 1.714
3/4	1.050	5	0.920	0.065	0.684
		10	0.844	0.083	0.857
		40 Std.	0.824	0.113	1.130
		80 Ex Hvy	0.742	0.154	1.474
		160 XX Hvy	0.614 0.434	0.216 0.308	1.937 2.441
1	1.315	5	1.185	0.065	0.868
		10	1.097	0.109	1.404
		40 Std.	1.049	0.133	1.679
		80 Ex Hvy	0.957	0.179	2.172
		160 XX Hvy	0.815 0.599	0.250 0.358	2.844 3.659
1 1/4	1.660	5	1.530	0.065	1.107
		10	1.442	0.109	1.806
		40 Std.	1.380	0.140	2.273
		80 Ex Hvy	1.278	0.191	2.997
		160 XX Hvy	1.160 0.896	0.250 0.382	3.765 5.214
1 1/2	1.900	5	1.770	0.065	1.274
		10	1.682	0.109	2.085
		40 Std.	1.610	0.145	2.718
		80 Ex Hvy	1.500	0.200	3.630
		160 XX Hvy	1.338 1.100	0.281 0.400	4.859 6.408
2	2.375	5	2.245	0.065	1.604
		10	2.157	0.109	2.638
		40 Std.	2.067	0.154	3.653
		80 Ex Hvy	1.939	0.218	5.022
		160 XX Hvy	1.689 1.503	0.343 0.436	7.444 9.029
2 1/2	2.875	5	2.709	0.083	2.475
		10	2.635	0.120	3.531
		40 Std.	2.469	0.203	5.793
		80 Ex Hvy	2.323	0.276	7.661
		160 XX Hvy	2.125 1.771	0.375 0.552	10.010 13.700
3	3.500	5	3.334	0.083	3.029
		10	3.260	0.120	4.332
		40 Std.	3.068	0.216	7.596
		80 Ex Hvy	2.900	0.300	10.250
		160 XX Hvy	2.624 2.300	0.437 0.600	14.320 18.580
3 1/2	4.000	5	3.834	0.083	3.472
		10	3.760	0.120	4.973
		40 Std.	3.548	0.226	9.109
		80 Ex Hvy	3.364	0.318	12.510
4	4.500	5	4.334	0.083	3.915
		10	4.260	0.120	5.613
		40 Std.	4.026	0.237	10.790
		80 Ex Hvy	3.826	0.337	14.980
		120	3.626	0.437	19.010
		160 XX Hvy	3.438 3.152	0.531 0.674	22.510 27.540
4 1/2	5.00	Std.	4.506	0.247	12.530
		Ex Hvy	4.290	0.355	17.610
		XX Hvy	3.580	0.710	17.610

Pipe Size Chart

Nominal Pipe Size Inches	Outside Diameter Inches	Standard Pipe Schedule	Inside Diameter Inches	Wall Thickness Inches	Weight per ft. lbs. Plain End
5	5.563	5	5.345	0.109	6.349
		10	5.295	0.134	7.770
		40 Std.	5.047	0.258	14.620
		80 Ex Hvy	4.813	0.375	20.780
		120	4.563	0.500	27.040
		160	4.313	0.625	32.960
		XX Hvy	4.063	0.750	38.550
6	6.625	5	6.407	0.109	7.585
		10	6.357	0.134	9.289
		40 Std.	6.065	0.280	18.970
		80 Ex Hvy	5.761	0.432	28.570
		120	5.491	0.562	36.390
		160	5.189	0.719	45.350
		XX Hvy	4.897	0.864	53.160
7	7.625	Std	7.023	0.301	23.570
		Ex Hvy	6.625	0.500	38.050
		XX Hvy	5.875	0.875	63.080
8	8.625	5	8.407	0.109	9.914
		10	8.329	0.148	13.400
		20	8.125	0.250	22.360
		40 Std.	7.981	0.322	28.550
		60	7.813	0.406	35.640
		80 Ex Hvy	7.625	0.500	43.390
		160	6.813	0.906	74.690
			XX Hvy	6.875	0.875
9	9.625	Std	8.941	0.342	33.900
		Ex Hvy	8.625	0.500	48.720
10	10.750	5	10.482	0.134	15.190
		10	10.420	0.165	18.700
		30	10.136	0.307	34.240
		40 Std.	10.020	0.365	40.480
		Ex Hvy	9.750	0.500	54.740
		140	8.750	1.000	104.130
		160	8.500	1.125	115.640
11	11.750	Std	11.000	0.375	45.550
		Ex Hvy	10.750	0.500	60.070
12	12.750	5	12.438	0.156	21.070
		20	12.250	0.250	33.410
		30	12.126	0.312	41.480
		Std	12.000	0.375	49.560
		40	11.938	0.406	53.530
		Ex Hvy	11.750	0.500	65.420
		*	11.500	0.625	81.010
		80	11.370	0.690	88.960
		*	11.250	0.750	96.210
		*	10.940	0.905	114.590
				160	10.126

*Non-scheduled wall

Pipe Size Chart

Nominal Pipe Size Inches	Outside Diameter Inches	Standard Pipe Schedule	Inside Diameter Inches	Wall Thickness Inches	Weight per ft. lbs. Plain End		
14	14.000	10	13.500	0.250	36.710		
		20	13.376	0.312	45.680		
		30 Std.	13.250	0.375	54.570		
		40	13.124	0.437	63.370		
		Ex Hvy	13.000	0.500	72.090		
		60	12.814	0.593	84.910		
		*	12.250	0.875	122.770		
		80	12.500	0.750	106.230		
		100	12.126	0.937	130.700		
		120	12.000	1.000	139.970		
		140	11.500	1.250	170.200		
		160	11.188	1.406	189.100		
		16	16.000	10	15.500	0.250	42.050
20	15.376			0.312	52.360		
30 Std.	15.250			0.375	62.580		
40 Ex Hvy	15.000			0.500	82.770		
60	14.688			0.656	107.500		
*	14.500			0.750	122.270		
80	14.250			0.875	141.480		
100	14.000			1.000	160.350		
120	13.564			1.218	192.300		
140	13.124			1.437	223.500		
160	12.814			1.593	245.100		
18	18.000			10	17.500	0.250	47.390
				20	17.376	0.312	59.030
		Std.	17.250	0.375	70.590		
		30	17.124	0.437	82.060		
		Ex Hvy	17.000	0.500	93.450		
		40	16.876	0.562	104.800		
		60	16.500	0.750	138.300		
		*	16.250	0.875	160.190		
		80	16.000	1.000	181.730		
		100	15.688	1.156	208.000		
		120	15.250	1.375	244.100		
		140	14.876	1.562	274.200		
		160	14.438	1.781	308.500		
20	20.000	10	19.500	0.250	52.730		
		20 Std.	19.250	0.375	78.600		
		30 Ex Hvy	19.000	0.500	104.100		
		40	18.814	0.593	122.900		
		*	18.500	0.750	154.340		
		60	18.376	0.812	166.400		
		*	18.250	0.875	178.890		
		80	18.000	1.000	203.110		
		100	17.438	1.281	256.100		
		120	17.000	1.500	296.400		
		140	16.500	1.750	341.100		
		160	16.064	1.968	379.000		

*Non-scheduled wall

Pipe Size Chart

Nominal Pipe Size Inches	Outside Diameter Inches	Standard Pipe Schedule	Inside Diameter Inches	Wall Thickness Inches	Weight per ft. lbs. Plain End
22	22.000	10	21.500	0.250	58.070
		20 Std.	21.250	0.375	86.610
		30 Ex Hvy	21.000	0.500	114.800
		60	20.250	0.875	197.400
		80	19.750	1.125	250.800
		100	19.250	1.375	302.900
		120	18.750	1.625	353.600
		140	18.250	1.875	403.000
		160	17.750	2.125	451.100
24	24.000	10	23.500	0.250	63.410
		20 Std.	23.250	0.375	94.710
		20 Ex Hvy	23.000	0.500	125.500
		30	23.000	0.500	125.610
		40	22.750	0.625	156.180
		*	22.500	0.750	186.410
		*	22.250	0.875	216.310
		60	22.000	1.000	245.870
		80	21.564	1.218	296.400
		100	20.938	1.531	367.400
		120	20.376	1.812	429.400
		140	19.876	2.062	483.100
28	28.00	E.H.	27.000	0.500	146.990
		*	26.750	0.625	182.900
		*	26.500	0.750	218.480
		*	26.250	0.875	253.720
		*	26.000	1.000	288.630

*Non-scheduled wall

Pipe Pile

Nominal O.D. in inches	O.D. in Inches	Nominal Wall Thickness	Weight #s/FT
8 5/8	8.625	0.250	22.382
		0.312	27.786
		0.375	33.072
		0.500	43.428
		0.625	53.401
9 5/8	9.625	0.250	25.055
		0.312	31.139
		0.375	37.081
		0.500	48.773
		0.625	60.131
10 3/4	10.750	0.250	28.061
		0.312	34.890
		0.365	40.520
		0.375	41.591
		0.500	54.786
		0.625	67.648
		0.690	74.200
12	12.000	0.250	31.373
		0.312	39.068
		0.375	46.559
		0.500	61.411
		0.625	75.929
12 3/4	12.750	0.250	33.406
		0.312	41.575
		0.375	49.608
		0.500	65.476
		0.625	81.010
		0.690	88.960
		0.750	96.210
		0.905	114.590
14	14.000	0.250	36.747
		0.312	45.753
		0.375	54.619
		0.500	72.158
		0.625	89.362
		0.750	106.230
		0.875	122.770
		1.000	138.970
16	16.000	0.250	42.092
		0.312	52.439
		0.375	62.637
		0.500	82.848
		0.625	102.724
		0.750	122.270
		0.875	141.480
		1.000	160.350
18	18.000	0.250	47.437
		0.312	59.188
		0.375	70.654
		0.500	93.538
		0.625	116.087
		0.750	138.300
		0.875	160.180
1.000	181.730		



Pipe Pile

Nominal O.D. in inches	O.D. in Inches	Nominal Wall Thickness	Weight #s/FT
20	20.000	0.250	52.782
		0.312	65.810
		0.375	78.672
		0.500	104.228
		0.625	129.449
		0.750	154.340
		0.875	178.890
		1.000	203.110
24	24.000	0.312	79.010
		0.375	94.710
		0.500	125.610
		0.625	156.170
		0.750	186.410
		0.875	216.310
		1.000	245.870
28	28.000	0.375	110.740
		0.500	146.990
		0.625	182.900
		0.750	218.480
		0.875	253.720
		1.000	288.630