

SPECIFICATIONS FOR CARBON STEEL STRUCTURAL TUBING

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.

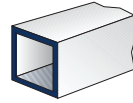
Structural Tubing is relatively low in cost, has a high strength-to-weight ratio and is easily welded, formed, punched and drilled. Its hollow shape protects and conceals wires, pipes, moving parts and it can be left exposed.

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).

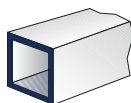
This specification covers cold-formed welded carbon steel hollow structural sections (HSS) for welded or bolted construction that are used in, although not limited to, buildings, bridges, towers, cranes, sign supports and poles, off-shore production and drilling platforms, roll-over protective structures (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) 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.

Square Tubing



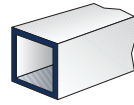
Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
1/2 x 1/2	16	0.065	0.385
	14	0.083	0.470
3/4 x 3/4	16	0.065	0.606
	14	0.083	0.753
	11	0.120	1.028
	1/8	0.125	1.030
1 x 1	16	0.065	0.827
	14	0.083	1.035
	1/8	0.125	1.436
1 1/4 x 1 1/4	16	0.065	1.048
	14	0.083	1.317
	10	0.135	1.9667
	1/8	0.125	1.844
	3/16	0.188	2.62
	1/4	0.250	4.11
1 1/2 x 1 1/2	16	0.065	1.269
	14	0.083	1.60
	1/8	0.125	2.252
	3/16	0.188	3.04
	1/4	0.250	4.11
1 3/4 x 1 3/4	16	0.065	1.49
	14	0.083	1.88
	1/8	0.125	2.66
	3/16	0.188	3.99
2 x 2	16	0.065	1.7103
	14	0.083	2.163
	1/8	0.125	3.067
	3/16	0.188	4.32
	1/4	0.250	5.41
	5/16	0.313	6.32
2 1/2 x 2 1/2	16	0.065	2.15
	14	0.083	2.73
	1/8	0.125	3.90
	3/16	0.188	5.59
	1/4	0.250	7.11
	5/16	0.313	8.43

Square Tubing



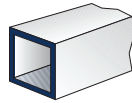
Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
3 x 3	16	0.065	2.59
	14	0.083	3.26
	1/8	0.125	4.75
	3/16	0.188	6.87
	1/4	0.250	8.81
	5/16	0.313	10.58
	3/8	0.375	12.17
3 1/2 x 3 1/2	14	0.083	3.80
	1/8	0.125	5.61
	3/16	0.188	8.15
	1/4	0.250	10.51
	5/16	0.313	12.70
	3/8	0.375	14.72
4 x 4	1/8	0.125	6.46
	3/16	0.188	9.42
	1/4	0.250	12.21
	5/16	0.313	14.83
	3/8	0.375	17.27
	1/2	0.500	21.63
4 1/2 x 4 1/2	3/16	0.188	10.70
	1/4	0.250	13.91
	5/16	0.313	16.96
	3/8	0.375	19.82
	1/2	0.500	25.03
5 x 5	3/16	0.188	11.97
	1/4	0.250	15.62
	5/16	0.313	19.08
	3/8	0.375	22.37
	1/2	0.500	28.43
	5/8	0.625	33.76
5 1/2 x 5 1/2	3/16	0.188	13.30
	1/4	0.250	17.32
	5/16	0.313	21.22
	3/8	0.375	24.93
	1/2	0.500	31.84
6 x 6	3/16	0.188	14.53
	1/4	0.250	19.02
	5/16	0.313	23.34
	3/8	0.375	27.48
	1/2	0.500	35.24
	5/8	0.625	42.30

Square Tubing



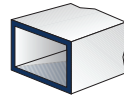
Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
7 x 7	3/16	0.188	17.08
	1/4	0.250	22.42
	5/16	0.313	27.59
	3/8	0.375	32.58
	1/2	0.500	42.05
	5/8	0.625	50.81
8 x 8	3/16	0.188	19.63
	1/4	0.250	25.82
	5/16	0.313	31.84
	3/8	0.375	37.69
	1/2	0.500	48.85
	5/8	0.625	59.32
9 x 9	1/4	0.250	29.23
	5/16	0.313	36.12
	3/8	0.375	42.79
	1/2	0.500	55.66
	5/8	0.625	67.82
10 x 10	3/16	0.188	24.73
	1/4	0.250	32.63
	5/16	0.313	40.35
	3/8	0.375	47.90
	1/2	0.500	62.46
	5/8	0.625	76.33
	3/4	0.750	89.50
12 x 12	3/16	0.188	29.84
	1/4	0.250	39.43
	5/16	0.313	48.86
	3/8	0.375	58.10
	1/2	0.500	76.07
	5/8	0.625	93.34
	3/4	0.750	109.91
14 x 14	5/16	0.313	57.36
	3/8	0.375	68.31
	1/2	0.500	89.68
	5/8	0.625	110.36
	3/4	0.750	130.33
	7/8	0.875	149.61
1	1.000	168.18	

Square Tubing

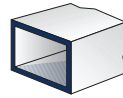


Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
16 x 16	5/16	0.313	65.87
	3/8	0.375	78.52
	1/2	0.500	103.30
	5/8	0.625	127.37
	3/4	0.750	150.75
	7/8	0.875	173.43
	1	1.000	195.40
18 x 18	3/8	0.375	88.73
	1/2	0.500	116.91
	5/8	0.625	144.39
	3/4	0.750	171.16
	7/8	0.875	197.24
	1	1.000	222.63
20 x 20	3/8	0.375	98.94
	1/2	0.500	130.52
	5/8	0.625	161.40
	3/4	0.750	191.58
	7/8	0.875	221.06
	1	1.000	249.85
22 x 22	1/2	0.500	144.13
	5/8	0.625	178.41
	3/4	0.750	212.00
	7/8	0.875	244.88
	1	1.000	277.07

Rectangular Tubing

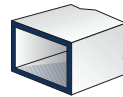


Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
1 1/2 x 1	16	0.065	1.05
	14	0.083	1.32
	1/8	0.125	1.84
2 x 1	16	0.065	1.27
	14	0.083	1.60
	1/8	0.125	2.25
	3/16	0.188	3.40
2 x 1 1/2	16	0.065	1.49
	14	0.083	1.88
	1/8	0.125	2.63
	3/16	0.188	3.68
2 1/2 x 1	16	0.065	1.49
	14	0.083	1.88
	1/8	0.125	2.66
2 1/2 x 1 1/2	16	0.065	1.69
	14	0.083	2.16
	1/8	0.125	3.06
	3/16	0.188	4.32
	1/4	0.250	5.41
3 x 1	16	0.065	1.71
	14	0.083	2.16
	1/8	0.125	3.06
	3/16	0.188	4.31
	1/4	0.250	5.41
3 x 1 1/2	16	0.065	1.93
	14	0.083	2.45
	1/8	0.125	3.48
	3/16	0.188	4.97
	1/4	0.250	6.26
3 x 2	16	0.065	2.15
	14	0.083	2.73
	1/8	0.125	3.90
	3/16	0.188	5.59
	1/4	0.250	7.11
	5/16	0.313	8.45
3 x 2 1/2	14	0.083	3.01
	1/8	0.125	4.29
	3/16	0.188	6.29
	1/4	0.250	7.96



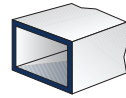
Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
3 1/2 x 1 1/2	16	0.065	2.15
	14	0.083	2.75
	1/8	0.125	3.90
	3/16	0.188	5.59
	1/4	0.250	7.11
3 1/2 x 2	14	0.083	3.01
	1/8	0.125	4.29
	3/16	0.188	6.29
3 1/2 x 2 1/2	16	0.065	2.59
	14	0.083	3.26
	1/8	0.125	4.75
	3/16	0.188	6.87
	1/4	0.250	8.81
	5/16	0.313	10.58
4 x 2	16	0.065	2.59
	14	0.083	3.29
	1/8	0.125	4.75
	3/16	0.188	6.87
	1/4	0.250	8.81
	5/16	0.313	10.58
	3/8	0.375	12.17
4 x 2 1/2	14	0.083	3.55
	1/8	0.125	5.18
	3/16	0.188	7.51
	1/4	0.250	9.66
4 x 3	14	0.083	3.80
	1/8	0.125	5.61
	3/16	0.188	8.15
	1/4	0.250	10.51
	5/16	0.313	12.70
	3/8	0.375	14.71
4 1/2 x 2	14	0.083	3.55
	1/8	0.125	5.11
	3/16	0.188	7.48
	1/4	0.250	9.65
5 x 2	14	0.083	3.80
	1/8	0.125	5.61
	3/16	0.188	8.15
	1/4	0.250	10.51
	5/16	0.313	12.70
	3/8	0.375	14.71



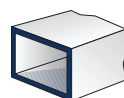
Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
5 x 2 1/2	1/8	0.125	6.03
	3/16	0.188	8.78
	1/4	0.250	11.36
5 x 3	1/8	1.250	6.46
	3/16	1.880	9.42
	1/4	0.250	12.21
	5/16	0.313	14.83
	3/8	0.357	17.27
	1/2	0.500	21.63
	5/8	0.625	25.26
5 x 4	1/8	0.125	7.31
	3/16	0.188	10.70
	1/4	0.250	13.91
	5/16	0.313	16.96
	3/8	0.375	19.82
	1/2	0.500	25.03
6 x 2	1/8	0.125	6.46
	3/16	0.188	9.42
	1/4	0.250	12.21
	5/16	0.313	14.83
	3/8	0.375	17.27
	1/2	0.500	21.63
	5/8	0.625	25.26
6 x 3	1/8	0.125	7.31
	3/16	0.188	10.70
	1/4	0.250	13.91
	5/16	0.313	16.96
	3/8	0.375	19.82
	1/2	0.500	25.03
6 x 4	1/8	0.125	8.16
	3/16	0.188	11.97
	1/4	0.250	15.62
	5/16	0.313	19.08
	3/8	0.375	22.37
	1/2	0.500	28.43
6 x 5	3/16	0.188	13.30
	1/4	0.250	17.32
	5/16	0.313	21.22
	3/8	0.375	24.93
	1/2	0.500	31.84



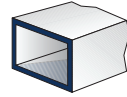
Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
7 x 3	3/16	0.188	11.97
	1/4	0.250	15.62
	5/16	0.313	19.08
	3/8	0.375	22.37
	1/2	0.500	28.43
7 x 4	3/16	0.188	13.30
	1/4	0.250	17.32
	5/16	0.313	21.22
	3/8	0.375	24.93
	1/2	0.500	31.84
7 x 5	3/16	0.188	14.53
	1/4	0.250	19.02
	5/16	0.313	23.34
	3/8	0.375	27.48
	1/2	0.500	35.24
	5/8	0.625	42.30
8 x 2	3/16	0.188	11.97
	1/4	0.250	15.62
	5/16	0.313	19.08
	3/8	0.375	22.37
8 x 3	3/16	0.188	13.30
	1/4	0.250	17.32
	5/16	0.313	21.22
	3/8	0.375	24.93
	1/2	0.500	31.81
8 x 4	3/16	0.188	14.53
	1/4	0.250	19.02
	5/16	0.313	23.34
	3/8	0.375	27.48
	1/2	0.500	35.24
	5/8	0.625	42.26
8 x 6	3/16	0.188	17.11
	1/4	0.250	22.42
	5/16	0.313	27.59
	3/8	0.375	32.58
	1/2	0.500	42.05
	5/8	0.625	50.81



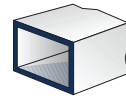
Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
9 x 3	1/4	0.250	19.02
	5/16	0.313	23.34
	3/8	0.375	27.48
	1/2	0.500	35.24
9 x 5	5/16	0.313	27.59
	3/8	0.375	32.58
	1/4	0.250	22.42
	1/2	0.500	42.05
	5/8	0.625	50.81
9 x 7	3/16	0.188	19.63
	1/4	0.250	25.82
	5/16	0.313	31.86
	3/8	0.375	37.69
	1/2	0.500	48.85
	5/8	0.625	59.32
10 x 2	3/16	0.188	14.55
	1/4	0.250	19.02
	5/16	0.313	23.34
	3/8	0.375	27.48
10 x 3	3/16	0.188	15.80
	1/4	0.250	20.72
	5/16	0.313	25.46
	3/8	0.375	30.03
10 x 4	3/16	0.188	17.08
	1/4	0.250	22.42
	5/16	0.313	27.59
	3/8	0.375	32.58
	1/2	0.500	42.05
	5/8	0.625	50.76
10 x 5	3/16	0.188	18.35
	1/4	0.250	24.12
	5/16	0.313	29.72
	3/8	0.375	35.13
	1/2	0.500	45.45
10 x 6	3/16	0.188	19.66
	1/4	0.250	25.82
	5/16	0.313	31.84
	3/8	0.375	37.69
	1/2	0.500	48.85
	5/8	0.625	59.32
10 x 8	3/16	0.188	22.22
	1/4	0.250	29.23
	5/16	0.313	36.10
	3/8	0.375	42.79
	1/2	0.500	55.66



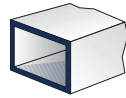
Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
12 x 2	3/16	0.188	17.11
	1/4	0.250	22.42
	5/16	0.313	27.59
	3/8	0.375	32.58
12 x 3	3/16	0.188	18.40
	1/4	0.250	24.10
	5/16	0.313	29.70
	3/8	0.375	35.13
12 x 4	3/16	0.188	19.66
	1/4	0.250	25.82
	5/16	0.313	31.84
	3/8	0.375	37.69
	1/2	0.500	48.85
	5/8	0.625	59.32
12 x 6	3/16	0.188	22.22
	1/4	0.250	29.23
	5/16	0.313	36.10
	3/8	0.375	42.79
	1/2	0.500	55.66
	5/8	0.625	67.82
12 x 8	3/16	0.188	24.77
	1/4	0.250	32.63
	5/16	0.313	40.35
	3/8	0.375	47.90
	1/2	0.500	62.46
	5/8	0.625	76.33
12 x 10	1/4	0.250	36.03
	5/16	0.313	44.70
	3/8	0.375	53.00
	1/2	0.500	69.27
14 x 4	3/16	0.188	22.22
	1/4	0.250	29.23
	5/16	0.313	36.10
	3/8	0.375	42.79
	1/2	0.500	55.66
	5/8	0.625	67.82
14 x 6	3/16	0.188	24.77
	1/4	0.250	32.63
	5/16	0.313	40.35
	3/8	0.375	47.90
	1/2	0.500	62.46
	5/8	0.625	76.33



Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
14 x 10	1/4	0.250	39.43
	5/16	0.313	48.86
	3/8	0.375	58.10
	1/2	0.500	76.07
	5/8	0.625	93.34
	3/4	0.750	109.91
	7/8	0.875	125.79
16 x 4	1/4	0.250	32.63
	5/16	0.313	40.35
	3/8	0.375	47.90
	1/2	0.500	62.46
	5/8	0.625	76.33
16 x 8	1/4	0.250	39.43
	5/16	0.313	48.86
	3/8	0.375	58.10
	1/2	0.500	76.07
	5/8	0.625	93.34
	3/4	0.750	109.91
	7/8	0.875	125.79
16 x 12	5/16	0.313	57.36
	3/8	0.375	68.31
	1/2	0.500	89.68
	5/8	0.625	110.36
	3/4	0.750	130.33
	7/8	0.875	149.61
	1	1.000	168.18
18 x 6	1/4	0.250	39.43
	5/16	0.313	48.86
	3/8	0.375	58.10
	1/2	0.500	76.07
	5/8	0.625	93.34
	3/4	0.750	109.91
20 x 4	1/4	0.250	39.43
	5/16	0.313	48.86
	3/8	0.375	58.10
	1/2	0.500	76.07
20 x 8	5/16	0.313	57.36
	3/8	0.375	68.31
	1/2	0.500	89.68
	5/8	0.625	110.36
	3/4	0.750	130.33
	7/8	0.875	149.61
	1	1.000	168.18



Rectangular Tubing

Size in Inches	Carbon Steel		Wt. Per Ft in lbs.
	Average Wall		
	Gauge	Decimal	
20 x 12	5/16	0.313	65.87
	3/8	0.375	78.52
	1/2	0.500	103.30
	5/8	0.625	127.38
	3/4	0.750	150.75
	7/8	0.875	173.43
	1	1.000	195.40
24 x 12	3/8	0.375	88.73
	1/2	0.500	116.91
	5/8	0.625	144.39
	3/4	0.750	171.16
	7/8	0.875	197.24
	1	1.000	222.63
30 x 10	1/2	0.500	130.52
	5/8	0.625	161.40
	3/4	0.750	191.58
	7/8	0.875	221.06
	1	1.000	249.85
34 x 10	5/8	0.625	178.41
	3/4	0.750	212.00
	7/8	0.875	244.88
	1	1.000	277.07