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749 N. Court St. • P.O. Box 4747  
Montgomery, AL 36103

*Since 1856, and currently under 5th generation family ownership, Sabel Steel continues to offer personal service that can only come from an independent company.*

*Sabel Steel is a diversified company with six steel service centers, two scrap yards, a rebar fabrication division, and a wholesale center.*

*Being independent of large conglomerate concerns, Sabel Steel is able to maintain close, personal contact with their customers, offer better service and have more flexibility in meeting customer needs.*

*As a member of the North American Steel Alliance, Sabel Steel has benefited in their steel purchasing and operational programs, lowering internal costs, resulting in better value to our customers.*

*We pride ourselves on a tradition of focusing on customer needs, offering genuine value through quality products, availability of inventory, and always being reliable.*

*Keith Sabel  
President & CEO*



**Montgomery, AL**  
**Headquarters**



**Theodore, AL**



**Dothan, AL**



**Woodstock, AL**



**Newnan, GA**



**Baton Rouge, LA**

## DISCLAIMER

**Sabel Steel Service, Inc.** does not manufacture, melt, produce, or test any items described in this reference manual. All information contained in this publication is based on information provided by the respective mills and manufacturers of each product. This handbook is designed for general reference only, and is not intended to be used as an engineering guide or to replace professional expertise. Therefore, Sabel Steel Service, Inc. does not make or express any implied warranty regarding the information contained in this handbook.

# INDEX

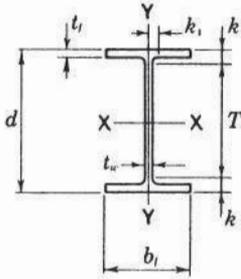
## Structurals and Bar Shapes

	PAGE
Wide Flange Beams ..... (W)	1.2
Miscellaneous Beams ..... (M)	1.10
Bearing Piles ..... (HP)	1.10
Standard Beams ..... (S)	1.11
Angles - Bar Size ..... (L)	1.12
Angles - Structural ..... (L)	1.13
Channels - Bar Size ..... (C)	1.17
Channels - Structural ..... (C)	1.18
Miscellaneous Channels ..... (MC)	1.19
Tees - Bar Size ..... (T)	1.21



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**Sabel Steel** stocks a wide range of beams, channels, and angles to ASTM A 36 specifications. Other structural grades are available upon inquiry, including ASTM A572 and ASTM A588.



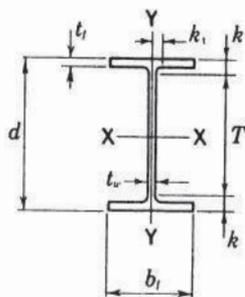
## WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d		Web			Flange				Distance		
				Thickness t <sub>w</sub>		t <sub>w</sub> 2	Width b <sub>f</sub>		Thickness t <sub>f</sub>		T	k	k <sub>1</sub>
				In.	In.		In.	In.	In.	In.	In.	In.	In.
W 4x13	3.83	4.16	4 1/8	0.280	1/4	1/8	4.060	4	0.345	3/8	2 3/4	1 1/16	7/16
W 5x16 x19	4.68	5.01	5	0.240	1/4	1/8	5.000	5	0.360	3/8	3 1/2	3/4	7/16
	5.54	5.15	5 1/8	0.270	1/4	1/8	5.030	5	0.430	7/16	3 1/2	13/16	7/16
W 6x9 x12 x16	2.68	5.90	5 7/8	0.170	3/16	1/8	3.940	4	0.215	3/16	4 3/4	9/16	3/8
	3.55	6.03	6	0.230	1/4	1/8	4.000	4	0.280	1/4	4 3/4	5/8	3/8
	4.74	6.28	6 1/4	0.260	1/4	1/8	4.030	4	0.405	3/8	4 3/4	3/4	7/16
W 6x15 x20 x25	4.43	5.99	6	0.230	1/4	1/8	5.990	6	0.260	1/4	4 3/4	5/8	3/8
	5.87	6.20	6 1/4	0.260	1/4	1/8	6.020	6	0.365	3/8	4 3/4	3/4	7/16
	7.34	6.38	6 3/8	0.320	3/16	3/16	6.080	6 1/8	0.455	7/16	4 3/4	13/16	7/16
W 8x10 x13 x15	2.96	7.89	7 7/8	0.170	3/16	1/8	3.940	4	0.205	3/16	6 5/8	5/8	7/16
	3.84	7.99	8	0.230	1/4	1/8	4.000	4	0.255	1/4	6 5/8	1 1/16	7/16
	4.44	8.11	8 1/8	0.245	1/4	1/8	4.015	4	0.315	5/16	6 5/8	3/4	1/2
W 8x18 x21	5.26	8.14	8 1/8	0.230	1/4	1/8	5.250	5 1/4	0.330	5/16	6 5/8	3/4	7/16
	6.16	8.28	8 1/4	0.250	1/4	1/8	5.270	5 1/4	0.400	3/8	6 5/8	13/16	1/2
W 8x24 x28	7.08	7.93	7 7/8	0.245	1/4	1/8	6.495	6 1/2	0.400	3/8	6 1/8	7/8	9/16
	8.25	8.06	8	0.285	5/16	3/16	6.535	6 1/2	0.465	7/16	6 1/8	15/16	9/16
W 8x31 x35 x40 x48 x58 x67	9.13	8.00	8	0.285	5/16	3/16	7.995	8	0.435	7/16	6 1/8	15/16	9/16
	10.3	8.12	8 1/8	0.310	5/16	3/16	8.020	8	0.495	1/2	6 1/8	1	9/16
	11.7	8.25	8 1/4	0.360	3/8	3/16	8.070	8 1/8	0.560	9/16	6 1/8	1 1/16	5/8
	14.1	8.50	8 1/2	0.400	3/8	3/16	8.110	8 1/8	0.685	1 1/16	6 1/8	1 3/16	5/8
	17.1	8.75	8 3/4	0.510	1/2	1/4	8.220	8 1/4	0.810	1 3/16	6 1/8	1 5/16	1 1/16
	19.7	9.00	9	0.570	9/16	5/16	8.280	8 1/4	0.935	1 5/16	6 1/8	1 7/16	1 1/16



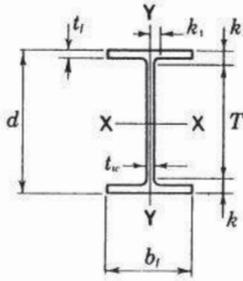
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A		Depth d		Web			Flange				Distance		
					Thickness t <sub>w</sub>		t <sub>w</sub> /2	Width b <sub>f</sub>		Thickness t <sub>f</sub>		T	k	k <sub>1</sub>
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
W 10x 12	3.54	9.87	9 <sup>7</sup> / <sub>8</sub>	0.190	3 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	3.960	4	0.210	3 <sup>1</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>16</sub>	
x 15	4.41	9.99	10	0.230	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4.000	4	0.270	1 <sup>1</sup> / <sub>4</sub>	8 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>16</sub>	
x 17	4.99	10.11	10 <sup>1</sup> / <sub>8</sub>	0.240	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4.010	4	0.330	5 <sup>1</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	
x 19	5.62	10.24	10 <sup>1</sup> / <sub>4</sub>	0.250	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	4.020	4	0.395	3 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
W 10x 22	6.49	10.17	10 <sup>1</sup> / <sub>8</sub>	0.240	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	5.750	5 <sup>3</sup> / <sub>4</sub>	0.360	3 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	
x 26	7.61	10.33	10 <sup>3</sup> / <sub>8</sub>	0.260	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	5.770	5 <sup>3</sup> / <sub>4</sub>	0.440	7 <sup>1</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	
x 30	8.84	10.47	10 <sup>1</sup> / <sub>2</sub>	0.300	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	5.810	5 <sup>3</sup> / <sub>4</sub>	0.510	1 <sup>1</sup> / <sub>2</sub>	8 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
W 10x 33	9.71	9.73	9 <sup>3</sup> / <sub>4</sub>	0.290	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	7.960	8	0.435	7 <sup>1</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>	
x 39	11.5	9.92	9 <sup>7</sup> / <sub>8</sub>	0.315	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	7.985	8	0.530	1 <sup>1</sup> / <sub>2</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>	
x 45	13.3	10.10	10 <sup>1</sup> / <sub>8</sub>	0.350	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	8.020	8	0.620	5 <sup>1</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	
W 10x 49	14.4	9.98	10	0.340	5 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	10.000	10	0.560	9 <sup>1</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>16</sub>	
x 54	15.8	10.09	10 <sup>1</sup> / <sub>8</sub>	0.370	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	10.030	10	0.615	5 <sup>1</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	
x 60	17.6	10.22	10 <sup>1</sup> / <sub>4</sub>	0.420	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	10.080	10 <sup>1</sup> / <sub>8</sub>	0.680	11 <sup>1</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>4</sub>	
x 68	20.0	10.40	10 <sup>3</sup> / <sub>8</sub>	0.470	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	10.130	10 <sup>1</sup> / <sub>8</sub>	0.770	3 <sup>3</sup> / <sub>4</sub>	7 <sup>5</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	
x 77	22.6	10.60	10 <sup>5</sup> / <sub>8</sub>	0.530	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	10.190	10 <sup>1</sup> / <sub>4</sub>	0.870	7 <sup>1</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>16</sub>	
x 88	25.9	10.84	10 <sup>7</sup> / <sub>8</sub>	0.605	5 <sup>1</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>16</sub>	10.265	10 <sup>1</sup> / <sub>4</sub>	0.990	1	7 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>16</sub>	
x100	29.4	11.10	11 <sup>1</sup> / <sub>8</sub>	0.680	11 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>8</sub>	10.340	10 <sup>3</sup> / <sub>8</sub>	1.120	1 <sup>1</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	13 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>8</sub>	
x112	32.9	11.36	11 <sup>3</sup> / <sub>8</sub>	0.755	3 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	10.415	10 <sup>3</sup> / <sub>8</sub>	1.250	1 <sup>1</sup> / <sub>4</sub>	7 <sup>5</sup> / <sub>8</sub>	17 <sup>1</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>	



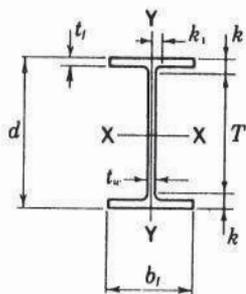
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d		Web		Flange				Distance			
				Thickness $t_w$	$\frac{t_w}{2}$	Width $b_f$		Thickness $t_f$		T	k	$k_1$	
						In.	In.	In.	In.				In.
W 12x 14	4.16	11.91	11 $\frac{7}{8}$	0.200	$\frac{3}{16}$	$\frac{1}{8}$	3.970	4	0.225	$\frac{1}{4}$	10 $\frac{1}{2}$	11 $\frac{1}{16}$	$\frac{1}{2}$
x 16	4.71	11.91	12	0.220	$\frac{1}{4}$	$\frac{1}{8}$	3.990	4	0.265	$\frac{1}{4}$	10 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$
x 19	5.57	12.16	12 $\frac{1}{8}$	0.235	$\frac{1}{4}$	$\frac{1}{8}$	4.005	4	0.350	$\frac{3}{8}$	10 $\frac{1}{2}$	13 $\frac{1}{16}$	$\frac{1}{2}$
x 22	6.48	12.31	12 $\frac{1}{4}$	0.260	$\frac{1}{4}$	$\frac{1}{8}$	4.030	4	0.425	$\frac{7}{16}$	10 $\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$
W 12x 26	7.65	12.22	12 $\frac{1}{4}$	0.230	$\frac{1}{4}$	$\frac{1}{8}$	6.490	6 $\frac{1}{2}$	0.380	$\frac{3}{8}$	10 $\frac{1}{2}$	$\frac{7}{8}$	$\frac{1}{2}$
x 30	8.79	12.34	12 $\frac{3}{8}$	0.260	$\frac{1}{4}$	$\frac{1}{8}$	6.520	6 $\frac{1}{2}$	0.440	$\frac{7}{16}$	10 $\frac{1}{2}$	15 $\frac{1}{16}$	$\frac{1}{2}$
x 35	10.3	12.50	12 $\frac{1}{2}$	0.300	$\frac{5}{16}$	$\frac{3}{16}$	6.560	6 $\frac{1}{2}$	0.520	$\frac{1}{2}$	10 $\frac{1}{2}$	1	$\frac{9}{16}$
W 12x 40	11.8	11.94	12	0.295	$\frac{5}{16}$	$\frac{3}{16}$	8.005	8	0.515	$\frac{1}{2}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	$\frac{3}{4}$
x 45	13.2	12.06	12	0.335	$\frac{5}{16}$	$\frac{3}{16}$	8.045	8	0.575	$\frac{9}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{4}$	13 $\frac{1}{16}$
x 50	14.7	12.19	12 $\frac{1}{4}$	0.370	$\frac{3}{8}$	$\frac{3}{16}$	8.080	8 $\frac{1}{8}$	0.640	$\frac{5}{8}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	13 $\frac{1}{16}$
W 12x 53	15.6	12.06	12	0.345	$\frac{3}{8}$	$\frac{3}{16}$	9.995	10	0.575	$\frac{9}{16}$	9 $\frac{1}{2}$	$\frac{1}{4}$	13 $\frac{1}{16}$
x 58	17.0	12.19	12 $\frac{1}{4}$	0.360	$\frac{3}{8}$	$\frac{3}{16}$	10.010	10	0.640	$\frac{5}{8}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	13 $\frac{1}{16}$
W 12x 65	19.1	12.12	12 $\frac{1}{8}$	0.390	$\frac{3}{8}$	$\frac{3}{16}$	12.000	12	0.605	$\frac{5}{8}$	9 $\frac{1}{2}$	15 $\frac{1}{16}$	13 $\frac{1}{16}$
x 72	21.1	12.25	12 $\frac{1}{4}$	0.430	$\frac{7}{16}$	$\frac{1}{4}$	12.040	12	0.670	11 $\frac{1}{16}$	9 $\frac{1}{2}$	1 $\frac{3}{8}$	$\frac{7}{8}$
x 79	23.2	12.38	12 $\frac{3}{8}$	0.470	$\frac{1}{2}$	$\frac{1}{4}$	12.080	12 $\frac{1}{8}$	0.735	$\frac{3}{4}$	9 $\frac{1}{2}$	17 $\frac{1}{16}$	$\frac{7}{8}$
x 87	25.6	12.53	12 $\frac{1}{2}$	0.515	$\frac{1}{2}$	$\frac{1}{4}$	12.125	12 $\frac{1}{8}$	0.810	13 $\frac{1}{16}$	9 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{7}{8}$
x 96	28.2	12.71	12 $\frac{3}{4}$	0.550	$\frac{9}{16}$	$\frac{5}{16}$	12.160	12 $\frac{1}{8}$	0.900	$\frac{7}{8}$	9 $\frac{1}{2}$	15 $\frac{1}{8}$	$\frac{7}{8}$
x106	31.2	12.89	12 $\frac{7}{8}$	0.610	$\frac{5}{8}$	$\frac{5}{16}$	12.220	12 $\frac{1}{4}$	0.990	1	9 $\frac{1}{2}$	11 $\frac{1}{16}$	15 $\frac{1}{16}$
x120	35.3	13.12	13 $\frac{1}{8}$	0.710	11 $\frac{1}{16}$	$\frac{3}{8}$	12.320	12 $\frac{3}{8}$	1.105	1 $\frac{1}{8}$	9 $\frac{1}{2}$	113 $\frac{1}{16}$	1
x136	39.9	13.41	13 $\frac{3}{8}$	0.790	13 $\frac{1}{16}$	$\frac{7}{16}$	12.400	12 $\frac{3}{8}$	1.250	1 $\frac{1}{4}$	9 $\frac{1}{2}$	115 $\frac{1}{16}$	1
x152	44.7	13.71	13 $\frac{3}{4}$	0.870	$\frac{7}{8}$	$\frac{7}{16}$	12.480	12 $\frac{1}{2}$	1.400	1 $\frac{3}{8}$	9 $\frac{1}{2}$	2 $\frac{1}{8}$	11 $\frac{1}{16}$
x170	50.0	14.03	14	0.960	15 $\frac{1}{16}$	$\frac{1}{2}$	12.570	12 $\frac{5}{8}$	1.560	19 $\frac{1}{16}$	9 $\frac{1}{2}$	2 $\frac{1}{4}$	1 $\frac{1}{8}$
x190	55.8	14.38	14 $\frac{3}{8}$	1.060	1 $\frac{1}{16}$	$\frac{9}{16}$	12.670	12 $\frac{5}{8}$	1.735	1 $\frac{3}{4}$	9 $\frac{1}{2}$	27 $\frac{1}{16}$	13 $\frac{1}{16}$
x210	61.8	14.71	14 $\frac{3}{4}$	1.180	13 $\frac{1}{16}$	$\frac{5}{8}$	12.790	12 $\frac{3}{4}$	1.900	1 $\frac{7}{8}$	9 $\frac{1}{2}$	25 $\frac{1}{8}$	1 $\frac{1}{4}$
x230	67.7	15.05	15	1.285	15 $\frac{1}{16}$	11 $\frac{1}{16}$	12.895	127 $\frac{1}{8}$	2.070	2 $\frac{1}{16}$	9 $\frac{1}{2}$	23 $\frac{1}{4}$	1 $\frac{1}{4}$
x252	74.1	15.41	15 $\frac{3}{8}$	1.395	13 $\frac{1}{8}$	11 $\frac{1}{16}$	13.005	13	2.250	2 $\frac{1}{4}$	9 $\frac{1}{2}$	215 $\frac{1}{16}$	15 $\frac{1}{16}$
x279	81.9	15.85	157 $\frac{1}{8}$	1.530	11 $\frac{1}{2}$	$\frac{3}{4}$	13.140	131 $\frac{1}{8}$	2.470	2 $\frac{1}{2}$	9 $\frac{1}{2}$	33 $\frac{1}{16}$	13 $\frac{1}{8}$
x305	89.6	16.32	163 $\frac{1}{8}$	1.625	15 $\frac{1}{8}$	13 $\frac{1}{16}$	13.235	131 $\frac{1}{4}$	2.705	211 $\frac{1}{16}$	9 $\frac{1}{2}$	37 $\frac{1}{16}$	17 $\frac{1}{16}$
x336	98.8	16.82	167 $\frac{1}{8}$	1.775	13 $\frac{1}{4}$	$\frac{7}{8}$	13.385	133 $\frac{1}{8}$	2.955	215 $\frac{1}{16}$	9 $\frac{1}{2}$	311 $\frac{1}{16}$	11 $\frac{1}{2}$



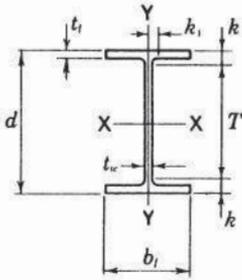
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d		Web			Flange				Distance		
				Thickness $t_w$		Width $b_f$	Thickness $t_f$		T	k	$k_1$		
				In.	In.		In.	In.				In.	In.
W 14x 22	6.49	13.74	13 $\frac{3}{4}$	0.230	$\frac{1}{4}$	$\frac{1}{8}$	5.000	5	0.335	$\frac{5}{16}$	12	$\frac{7}{8}$	$\frac{9}{16}$
x 26	7.69	13.91	13 $\frac{7}{8}$	0.255	$\frac{1}{4}$	$\frac{1}{8}$	5.025	5	0.420	$\frac{7}{16}$	12	$\frac{15}{16}$	$\frac{9}{16}$
W 14x 30	8.85	13.84	13 $\frac{7}{8}$	0.270	$\frac{1}{4}$	$\frac{1}{8}$	6.730	6 $\frac{3}{4}$	0.385	$\frac{3}{8}$	12	$\frac{15}{16}$	$\frac{5}{8}$
x 34	10.0	13.98	14	0.285	$\frac{5}{16}$	$\frac{3}{16}$	6.745	6 $\frac{3}{4}$	0.455	$\frac{7}{16}$	12	1	$\frac{5}{8}$
x 38	11.2	14.10	14 $\frac{1}{8}$	0.310	$\frac{5}{16}$	$\frac{3}{16}$	6.770	6 $\frac{3}{4}$	0.515	$\frac{1}{2}$	12	1 $\frac{1}{16}$	$\frac{5}{8}$
W 14x 43	12.6	13.66	13 $\frac{5}{8}$	0.305	$\frac{5}{16}$	$\frac{3}{16}$	7.995	8	0.530	$\frac{1}{2}$	11	1 $\frac{5}{16}$	$\frac{7}{8}$
x 48	14.1	13.79	13 $\frac{3}{4}$	0.340	$\frac{5}{16}$	$\frac{3}{16}$	8.030	8	0.595	$\frac{5}{8}$	11	1 $\frac{3}{8}$	$\frac{7}{8}$
x 53	15.6	13.92	13 $\frac{7}{8}$	0.370	$\frac{3}{8}$	$\frac{3}{16}$	8.060	8	0.660	1 $\frac{1}{16}$	11	1 $\frac{7}{8}$	1 $\frac{5}{16}$
W 14x 61	17.9	13.89	13 $\frac{7}{8}$	0.375	$\frac{3}{8}$	$\frac{3}{16}$	9.995	10	0.645	$\frac{5}{8}$	11	1 $\frac{7}{16}$	1 $\frac{5}{16}$
x 68	20.0	14.04	14	0.415	$\frac{7}{16}$	$\frac{1}{4}$	10.035	10	0.720	$\frac{3}{4}$	11	1 $\frac{1}{2}$	1 $\frac{5}{16}$
x 74	21.8	14.17	14 $\frac{1}{8}$	0.450	$\frac{7}{16}$	$\frac{1}{4}$	10.070	10 $\frac{1}{8}$	0.785	1 $\frac{3}{16}$	11	1 $\frac{9}{16}$	1 $\frac{5}{16}$
x 82	24.1	14.31	14 $\frac{1}{4}$	0.510	$\frac{1}{2}$	$\frac{1}{4}$	10.130	10 $\frac{1}{8}$	0.855	$\frac{7}{8}$	11	1 $\frac{9}{8}$	1
W 14x 90	26.5	14.02	14	0.440	$\frac{7}{16}$	$\frac{1}{4}$	14.520	14 $\frac{1}{2}$	0.710	1 $\frac{1}{16}$	11 $\frac{1}{4}$	1 $\frac{3}{8}$	$\frac{7}{8}$
x 99	29.1	14.16	14 $\frac{1}{8}$	0.485	$\frac{1}{2}$	$\frac{1}{4}$	14.565	14 $\frac{5}{8}$	0.780	$\frac{3}{4}$	11 $\frac{1}{4}$	1 $\frac{7}{16}$	$\frac{7}{8}$
x109	32.0	14.32	14 $\frac{3}{8}$	0.525	$\frac{1}{2}$	$\frac{1}{4}$	14.605	14 $\frac{5}{8}$	0.860	$\frac{7}{8}$	11 $\frac{1}{4}$	1 $\frac{9}{16}$	$\frac{7}{8}$
x120	35.3	14.48	14 $\frac{1}{2}$	0.590	$\frac{9}{16}$	$\frac{5}{16}$	14.670	14 $\frac{5}{8}$	0.940	1 $\frac{5}{16}$	11 $\frac{1}{4}$	1 $\frac{5}{8}$	1 $\frac{5}{16}$
x132	38.8	14.66	14 $\frac{5}{8}$	0.645	$\frac{5}{8}$	$\frac{5}{16}$	14.725	14 $\frac{3}{4}$	1.030	1	11 $\frac{1}{4}$	1 $\frac{11}{16}$	1 $\frac{5}{16}$



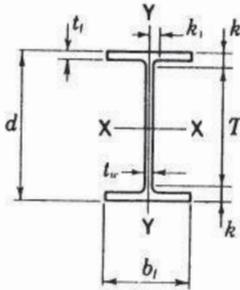
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d	Web				Flange				Distance		
			Thickness $t_w$		$\frac{t_w}{2}$	Width $b_f$		Thickness $t_f$		T	k	$k_1$	
			In.	In.		In.	In.	In.	In.				In.
W 14x145	42.7	14.78	14 $\frac{3}{4}$	0.680	1 $\frac{1}{16}$	$\frac{3}{8}$	15.500	15 $\frac{1}{2}$	1.090	1 $\frac{1}{16}$	11 $\frac{1}{4}$	1 $\frac{3}{4}$	1
x159	46.7	14.98	15	0.745	$\frac{3}{4}$	$\frac{3}{8}$	15.565	15 $\frac{5}{8}$	1.190	1 $\frac{3}{16}$	11 $\frac{1}{4}$	1 $\frac{7}{8}$	1
x176	51.8	15.22	15 $\frac{1}{4}$	0.830	1 $\frac{3}{16}$	$\frac{7}{16}$	15.650	15 $\frac{5}{8}$	1.310	1 $\frac{5}{16}$	11 $\frac{1}{4}$	2	1 $\frac{1}{16}$
x193	56.8	15.48	15 $\frac{1}{2}$	0.890	$\frac{7}{8}$	$\frac{7}{16}$	15.710	15 $\frac{3}{4}$	1.440	1 $\frac{7}{16}$	11 $\frac{1}{4}$	2 $\frac{1}{8}$	1 $\frac{1}{16}$
x211	62.0	15.72	15 $\frac{3}{4}$	0.980	1	$\frac{1}{2}$	15.800	15 $\frac{3}{4}$	1.560	1 $\frac{9}{16}$	11 $\frac{1}{4}$	2 $\frac{1}{4}$	1 $\frac{1}{8}$
x233	68.5	16.04	16	1.070	1 $\frac{1}{16}$	$\frac{9}{16}$	15.890	15 $\frac{7}{8}$	1.720	1 $\frac{3}{4}$	11 $\frac{1}{4}$	2 $\frac{3}{8}$	1 $\frac{3}{16}$
x257	75.6	16.38	16 $\frac{3}{8}$	1.175	1 $\frac{3}{16}$	$\frac{5}{8}$	15.995	16	1.890	1 $\frac{7}{8}$	11 $\frac{1}{4}$	2 $\frac{9}{16}$	1 $\frac{3}{16}$
x283	83.3	16.74	16 $\frac{3}{4}$	1.290	1 $\frac{5}{16}$	1 $\frac{1}{16}$	16.110	16 $\frac{1}{8}$	2.070	2 $\frac{1}{16}$	11 $\frac{1}{4}$	2 $\frac{3}{4}$	1 $\frac{1}{4}$
x311	91.4	17.12	17 $\frac{1}{8}$	1.410	1 $\frac{7}{16}$	$\frac{3}{4}$	16.230	16 $\frac{1}{4}$	2.260	2 $\frac{1}{4}$	11 $\frac{1}{4}$	2 $\frac{15}{16}$	1 $\frac{5}{16}$
x342	101.0	17.54	17 $\frac{1}{2}$	1.540	1 $\frac{9}{16}$	1 $\frac{3}{16}$	16.360	16 $\frac{3}{8}$	2.470	2 $\frac{1}{2}$	11 $\frac{1}{4}$	3 $\frac{1}{8}$	1 $\frac{3}{8}$
x370	109.0	17.92	17 $\frac{3}{8}$	1.655	1 $\frac{5}{8}$	1 $\frac{3}{16}$	16.475	16 $\frac{1}{2}$	2.660	2 $\frac{11}{16}$	11 $\frac{1}{4}$	3 $\frac{5}{16}$	1 $\frac{7}{16}$
x398	117.0	18.29	18 $\frac{1}{4}$	1.770	1 $\frac{3}{4}$	$\frac{7}{8}$	16.590	16 $\frac{5}{8}$	2.845	2 $\frac{7}{8}$	11 $\frac{1}{4}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$
x426	125.0	18.67	18 $\frac{5}{8}$	1.875	1 $\frac{7}{8}$	1 $\frac{5}{16}$	16.695	16 $\frac{3}{4}$	3.035	3 $\frac{1}{16}$	11 $\frac{1}{4}$	3 $\frac{11}{16}$	1 $\frac{9}{16}$
W 14x455	134.0	19.02	19	2.015	2	1	16.835	16 $\frac{7}{8}$	3.210	3 $\frac{3}{16}$	11 $\frac{1}{4}$	3 $\frac{7}{8}$	1 $\frac{5}{8}$
x500	147.0	19.60	19 $\frac{5}{8}$	2.190	2 $\frac{3}{16}$	1 $\frac{1}{8}$	17.010	17	3.500	3 $\frac{1}{2}$	11 $\frac{1}{4}$	4 $\frac{3}{16}$	1 $\frac{3}{4}$
x550	162.0	20.24	20 $\frac{1}{4}$	2.380	2 $\frac{3}{8}$	1 $\frac{3}{16}$	17.200	17 $\frac{1}{4}$	3.820	3 $\frac{13}{16}$	11 $\frac{1}{4}$	4 $\frac{1}{2}$	1 $\frac{13}{16}$
x605	178.0	20.92	20 $\frac{7}{8}$	2.595	2 $\frac{5}{8}$	1 $\frac{5}{16}$	17.415	17 $\frac{3}{8}$	4.160	4 $\frac{3}{16}$	11 $\frac{1}{4}$	4 $\frac{13}{16}$	1 $\frac{15}{16}$
x665	196.0	21.64	21 $\frac{1}{8}$	2.830	2 $\frac{13}{16}$	1 $\frac{7}{16}$	17.650	17 $\frac{5}{8}$	4.520	4 $\frac{1}{2}$	11 $\frac{1}{4}$	5 $\frac{3}{16}$	2 $\frac{1}{16}$
x730	215.0	22.42	22 $\frac{3}{8}$	3.070	3 $\frac{1}{16}$	1 $\frac{9}{16}$	17.890	17 $\frac{7}{8}$	4.910	4 $\frac{15}{16}$	11 $\frac{1}{4}$	5 $\frac{9}{16}$	2 $\frac{3}{16}$



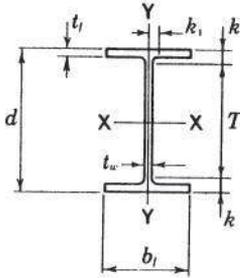
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d		Web			Flange			Distance			
				Thickness $t_w$		$\frac{t_w}{2}$	Width $b_f$		Thickness $t_f$	T	k	$k_1$	
				In.	In.		In.	In.					In.
W 16x 26	7.68	15.69	15 $\frac{3}{4}$	0.250	$\frac{1}{4}$	$\frac{1}{8}$	5.500	5 $\frac{1}{2}$	0.345	$\frac{3}{8}$	13 $\frac{3}{8}$	1 $\frac{1}{16}$	$\frac{3}{4}$
x 31	9.12	15.88	15 $\frac{7}{8}$	0.275	$\frac{1}{4}$	$\frac{1}{8}$	5.525	5 $\frac{1}{2}$	0.440	$\frac{7}{16}$	13 $\frac{3}{8}$	1 $\frac{1}{8}$	$\frac{3}{4}$
W 16x 36	10.6	15.86	15 $\frac{7}{8}$	0.295	$\frac{5}{16}$	$\frac{3}{16}$	6.985	7	0.430	$\frac{7}{16}$	13 $\frac{5}{8}$	1 $\frac{1}{8}$	$\frac{3}{4}$
x 40	11.8	16.01	16	0.305	$\frac{5}{16}$	$\frac{3}{16}$	6.995	7	0.505	$\frac{1}{2}$	13 $\frac{5}{8}$	1 $\frac{3}{16}$	13 $\frac{1}{16}$
x 45	13.3	16.13	16 $\frac{1}{8}$	0.345	$\frac{3}{8}$	$\frac{3}{16}$	7.035	7	0.565	$\frac{9}{16}$	13 $\frac{5}{8}$	1 $\frac{1}{4}$	13 $\frac{1}{16}$
x 50	14.7	16.26	16 $\frac{1}{4}$	0.380	$\frac{3}{8}$	$\frac{3}{16}$	7.070	7 $\frac{1}{8}$	0.630	$\frac{5}{8}$	13 $\frac{5}{8}$	1 $\frac{5}{16}$	13 $\frac{1}{16}$
x 57	16.8	16.43	16 $\frac{3}{8}$	0.430	$\frac{7}{16}$	$\frac{1}{4}$	7.120	7 $\frac{1}{8}$	0.715	1 $\frac{1}{16}$	13 $\frac{5}{8}$	1 $\frac{3}{8}$	$\frac{7}{8}$
W 16x 67	19.7	16.33	16 $\frac{3}{8}$	0.395	$\frac{3}{8}$	$\frac{3}{16}$	10.235	10 $\frac{1}{4}$	0.665	1 $\frac{1}{16}$	13 $\frac{5}{8}$	1 $\frac{3}{8}$	13 $\frac{1}{16}$
x 77	22.6	16.52	16 $\frac{1}{2}$	0.455	$\frac{7}{16}$	$\frac{1}{4}$	10.295	10 $\frac{1}{4}$	0.760	$\frac{3}{4}$	13 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{7}{8}$
x 89	26.2	16.75	16 $\frac{3}{4}$	0.525	$\frac{1}{2}$	$\frac{1}{4}$	10.365	10 $\frac{3}{8}$	0.875	$\frac{7}{8}$	13 $\frac{5}{8}$	1 $\frac{9}{16}$	$\frac{7}{8}$
x100	29.4	16.97	17	0.585	$\frac{9}{16}$	$\frac{5}{16}$	10.425	10 $\frac{3}{8}$	0.985	1	13 $\frac{5}{8}$	1 $\frac{11}{16}$	1 $\frac{5}{16}$
W 18x 35	10.3	17.70	17 $\frac{3}{4}$	0.300	$\frac{5}{16}$	$\frac{3}{16}$	6.000	6	0.425	$\frac{7}{16}$	15 $\frac{1}{2}$	1 $\frac{1}{8}$	$\frac{3}{4}$
x 40	11.8	17.90	17 $\frac{7}{8}$	0.315	$\frac{5}{16}$	$\frac{3}{16}$	6.015	6	0.525	$\frac{1}{2}$	15 $\frac{1}{2}$	1 $\frac{3}{16}$	13 $\frac{1}{16}$
x 46	13.5	18.06	18	0.360	$\frac{3}{8}$	$\frac{3}{16}$	6.060	6	0.605	$\frac{5}{8}$	15 $\frac{1}{2}$	1 $\frac{1}{4}$	13 $\frac{1}{16}$
W 18x 50	14.7	17.99	18	0.355	$\frac{3}{8}$	$\frac{3}{16}$	7.495	7 $\frac{1}{2}$	0.570	$\frac{9}{16}$	15 $\frac{1}{2}$	1 $\frac{1}{4}$	13 $\frac{1}{16}$
x 55	16.2	18.11	18 $\frac{1}{8}$	0.390	$\frac{3}{8}$	$\frac{3}{16}$	7.530	7 $\frac{1}{2}$	0.630	$\frac{5}{8}$	15 $\frac{1}{2}$	1 $\frac{5}{16}$	13 $\frac{1}{16}$
x 60	17.6	18.24	18 $\frac{1}{4}$	0.415	$\frac{7}{16}$	$\frac{1}{4}$	7.555	7 $\frac{1}{2}$	0.695	1 $\frac{1}{16}$	15 $\frac{1}{2}$	1 $\frac{3}{8}$	13 $\frac{1}{16}$
x 65	19.1	18.35	18 $\frac{3}{8}$	0.450	$\frac{7}{16}$	$\frac{1}{4}$	7.590	7 $\frac{5}{8}$	0.750	$\frac{3}{4}$	15 $\frac{1}{2}$	1 $\frac{7}{16}$	$\frac{7}{8}$
x 71	20.8	18.47	18 $\frac{1}{2}$	0.495	$\frac{1}{2}$	$\frac{1}{4}$	7.635	7 $\frac{5}{8}$	0.810	1 $\frac{3}{16}$	15 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{7}{8}$
W 18x 76	22.3	18.21	18 $\frac{1}{4}$	0.425	$\frac{7}{16}$	$\frac{1}{4}$	11.035	11	0.680	1 $\frac{1}{16}$	15 $\frac{1}{2}$	1 $\frac{3}{8}$	13 $\frac{1}{16}$
x 86	25.3	18.39	18 $\frac{3}{8}$	0.480	$\frac{1}{2}$	$\frac{1}{4}$	11.090	11 $\frac{1}{8}$	0.770	$\frac{3}{4}$	15 $\frac{1}{2}$	1 $\frac{7}{16}$	$\frac{7}{8}$
x 97	28.5	18.59	18 $\frac{5}{8}$	0.535	$\frac{9}{16}$	$\frac{5}{16}$	11.145	11 $\frac{1}{8}$	0.870	$\frac{7}{8}$	15 $\frac{1}{2}$	1 $\frac{9}{16}$	$\frac{7}{8}$
x106	31.1	18.73	18 $\frac{3}{4}$	0.590	$\frac{9}{16}$	$\frac{5}{16}$	11.200	11 $\frac{1}{4}$	0.940	1 $\frac{5}{16}$	15 $\frac{1}{2}$	1 $\frac{9}{8}$	1 $\frac{5}{16}$
x119	35.1	18.97	19	0.655	$\frac{5}{8}$	$\frac{5}{16}$	11.265	11 $\frac{1}{4}$	1.060	1 $\frac{1}{16}$	15 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{5}{16}$



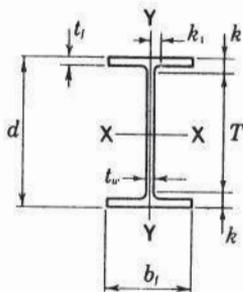
# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

Designation	Area A	Depth d	Web				Flange				Distance			
			Thickness t <sub>w</sub>		t <sub>w</sub> 2	Width b <sub>f</sub>		Thickness t <sub>f</sub>		T	k	k <sub>1</sub>		
			In.	In.		In.	In.	In.	In.				In.	In.
W 21x 44	13.0	20.66	20 <sup>5</sup> / <sub>8</sub>	0.350	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	6.500	6 <sup>1</sup> / <sub>2</sub>	0.450	7 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
x 50	14.7	20.83	20 <sup>7</sup> / <sub>8</sub>	0.380	3 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	6.530	6 <sup>1</sup> / <sub>2</sub>	0.535	9 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
x 57	16.7	21.06	21	0.405	3 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	6.555	6 <sup>1</sup> / <sub>2</sub>	0.650	9 <sup>5</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>
W 21x 62	18.3	20.99	21	0.400	3 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	8.240	8 <sup>1</sup> / <sub>4</sub>	0.615	5 <sup>5</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>8</sub>
x 68	20.0	21.13	21 <sup>1</sup> / <sub>8</sub>	0.430	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	8.270	8 <sup>1</sup> / <sub>4</sub>	0.685	11 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	17 <sup>1</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>
x 73	21.5	21.24	21 <sup>1</sup> / <sub>4</sub>	0.455	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	8.295	8 <sup>1</sup> / <sub>4</sub>	0.740	3 <sup>3</sup> / <sub>4</sub>	18 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>16</sub>
x 83	24.3	21.43	21 <sup>3</sup> / <sub>8</sub>	0.515	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	8.355	8 <sup>3</sup> / <sub>8</sub>	0.835	13 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x 93	27.3	21.62	21 <sup>5</sup> / <sub>8</sub>	0.580	9 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	8.420	8 <sup>3</sup> / <sub>8</sub>	0.930	15 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	1
W 21x101	29.8	21.36	21 <sup>3</sup> / <sub>8</sub>	0.500	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	12.290	12 <sup>1</sup> / <sub>4</sub>	0.800	13 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x111	32.7	21.51	21 <sup>1</sup> / <sub>2</sub>	0.550	9 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	12.340	12 <sup>3</sup> / <sub>8</sub>	0.875	7 <sup>5</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	15 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>
x122	35.9	21.68	21 <sup>5</sup> / <sub>8</sub>	0.600	9 <sup>5</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	12.390	12 <sup>3</sup> / <sub>8</sub>	0.960	15 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>16</sub>	1
x132	38.8	21.83	21 <sup>7</sup> / <sub>8</sub>	0.650	5 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	12.440	12 <sup>1</sup> / <sub>2</sub>	1.035	11 <sup>1</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	11 <sup>3</sup> / <sub>16</sub>	1
x147	43.2	22.06	22	0.720	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	12.510	12 <sup>1</sup> / <sub>2</sub>	1.150	11 <sup>5</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	17 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>
W 24x 55	16.2	23.57	23 <sup>5</sup> / <sub>8</sub>	0.395	3 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	7.005	7	0.505	1 <sup>1</sup> / <sub>2</sub>	21	15 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x 62	18.2	23.74	23 <sup>3</sup> / <sub>4</sub>	0.430	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	7.040	7	0.590	9 <sup>1</sup> / <sub>16</sub>	21	13 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>
W 24x 68	20.1	23.73	23 <sup>3</sup> / <sub>4</sub>	0.415	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	8.965	9	0.585	9 <sup>1</sup> / <sub>16</sub>	21	13 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>
x 76	22.4	23.92	23 <sup>7</sup> / <sub>8</sub>	0.440	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	8.990	9	0.680	11 <sup>1</sup> / <sub>16</sub>	21	17 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x 84	24.7	24.10	24 <sup>1</sup> / <sub>8</sub>	0.470	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	9.020	9	0.770	3 <sup>3</sup> / <sub>4</sub>	21	19 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x 94	27.7	24.31	24 <sup>1</sup> / <sub>4</sub>	0.515	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	9.065	9 <sup>5</sup> / <sub>8</sub>	0.875	7 <sup>5</sup> / <sub>8</sub>	21	15 <sup>5</sup> / <sub>8</sub>	1
W 24x104	30.6	24.06	24	0.500	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	12.750	12 <sup>3</sup> / <sub>4</sub>	0.750	3 <sup>3</sup> / <sub>4</sub>	21	11 <sup>1</sup> / <sub>2</sub>	1
x117	34.4	24.26	24 <sup>1</sup> / <sub>4</sub>	0.550	9 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>16</sub>	12.800	12 <sup>3</sup> / <sub>4</sub>	0.850	7 <sup>5</sup> / <sub>8</sub>	21	15 <sup>5</sup> / <sub>8</sub>	1
x131	38.5	24.48	24 <sup>1</sup> / <sub>2</sub>	0.605	5 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	12.855	12 <sup>7</sup> / <sub>8</sub>	0.960	15 <sup>1</sup> / <sub>16</sub>	21	13 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>
x146	43.0	24.74	24 <sup>3</sup> / <sub>4</sub>	0.650	5 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	12.900	12 <sup>7</sup> / <sub>8</sub>	1.090	11 <sup>1</sup> / <sub>16</sub>	21	17 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>
x162	47.7	25.00	25	0.705	11 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	12.955	13	1.220	11 <sup>1</sup> / <sub>4</sub>	21	2	11 <sup>1</sup> / <sub>16</sub>
W 27x 84	24.8	26.71	26 <sup>3</sup> / <sub>4</sub>	0.460	7 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	9.960	10	0.640	5 <sup>5</sup> / <sub>8</sub>	24	13 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>
x 94	27.7	26.92	26 <sup>7</sup> / <sub>8</sub>	0.490	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	9.990	10	0.745	3 <sup>3</sup> / <sub>4</sub>	24	17 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x102	30.0	27.09	27 <sup>1</sup> / <sub>8</sub>	0.515	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	10.015	10	0.830	13 <sup>1</sup> / <sub>16</sub>	24	19 <sup>1</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>16</sub>
x114	33.5	27.29	27 <sup>1</sup> / <sub>4</sub>	0.570	9 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	10.070	10 <sup>1</sup> / <sub>8</sub>	0.930	15 <sup>1</sup> / <sub>16</sub>	24	15 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>16</sub>
W 27x146	42.9	27.38	27 <sup>3</sup> / <sub>8</sub>	0.605	5 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	13.965	14	0.975	1	24	11 <sup>1</sup> / <sub>16</sub>	1
x161	47.4	27.59	27 <sup>5</sup> / <sub>8</sub>	0.660	11 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14.020	14	1.080	11 <sup>1</sup> / <sub>16</sub>	24	11 <sup>3</sup> / <sub>16</sub>	1
x178	52.3	27.81	27 <sup>3</sup> / <sub>4</sub>	0.725	3 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	14.085	14 <sup>1</sup> / <sub>8</sub>	1.190	13 <sup>1</sup> / <sub>16</sub>	24	17 <sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>16</sub>



# WIDE FLANGE BEAMS

ASTM A36

W SHAPES

Dimensions

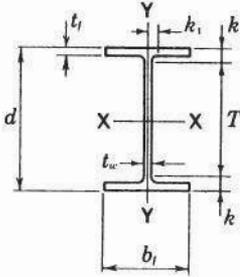
Designation	Area A	Depth d		Web			Flange				Distance		
				Thickness $t_w$	$\frac{t_w}{2}$	Width $b_f$	Thickness $t_f$		T	k	$k_1$		
							In.	In.				In.	In.
W 30x 99	29.1	29.65	29 <sup>5</sup> / <sub>8</sub>	0.520	1/2	1/4	10.450	10 <sup>1</sup> / <sub>2</sub>	0.670	1 <sup>1</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>16</sub>	1
x108	31.7	29.83	29 <sup>7</sup> / <sub>8</sub>	0.545	9/16	5/16	10.475	10 <sup>1</sup> / <sub>2</sub>	0.760	3/4	26 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1
x116	34.2	30.01	30	0.565	9/16	5/16	10.495	10 <sup>1</sup> / <sub>2</sub>	0.850	7/8	26 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1
x124	36.5	30.17	30 <sup>1</sup> / <sub>8</sub>	0.585	9/16	5/16	10.515	10 <sup>1</sup> / <sub>2</sub>	0.930	1 <sup>5</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	1
x132	38.9	30.31	30 <sup>1</sup> / <sub>4</sub>	0.615	5/8	5/16	10.545	10 <sup>1</sup> / <sub>2</sub>	1.000	1	26 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>
W 30x173	50.8	30.44	30 <sup>1</sup> / <sub>2</sub>	0.655	5/8	5/16	14.985	15	1.065	1 <sup>1</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>
x191	56.1	30.68	30 <sup>5</sup> / <sub>8</sub>	0.710	1 <sup>1</sup> / <sub>16</sub>	3/8	15.040	15	1.185	1 <sup>3</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
x211	62.0	30.94	31	0.775	3/4	3/8	15.105	15 <sup>1</sup> / <sub>8</sub>	1.315	1 <sup>5</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>
W 33x118	34.7	32.86	32 <sup>7</sup> / <sub>8</sub>	0.550	9/16	5/16	11.480	11 <sup>1</sup> / <sub>2</sub>	0.740	3/4	29 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
x130	38.3	33.09	33 <sup>1</sup> / <sub>8</sub>	0.580	9/16	5/16	11.510	11 <sup>1</sup> / <sub>2</sub>	0.855	7/8	29 <sup>3</sup> / <sub>4</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>
x141	41.6	33.30	33 <sup>1</sup> / <sub>4</sub>	0.605	5/8	5/16	11.535	11 <sup>1</sup> / <sub>2</sub>	0.960	1 <sup>5</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>
x152	44.7	33.49	33 <sup>1</sup> / <sub>2</sub>	0.635	5/8	5/16	11.565	11 <sup>5</sup> / <sub>8</sub>	1.055	1 <sup>1</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>4</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>
W 33x201	59.1	33.68	33 <sup>5</sup> / <sub>8</sub>	0.715	1 <sup>1</sup> / <sub>16</sub>	3/8	15.745	15 <sup>3</sup> / <sub>4</sub>	1.150	1 <sup>1</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>4</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
x221	65.0	33.93	33 <sup>7</sup> / <sub>8</sub>	0.775	3/4	3/8	15.805	15 <sup>3</sup> / <sub>4</sub>	1.275	1 <sup>1</sup> / <sub>4</sub>	29 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
x241	70.9	34.18	34 <sup>1</sup> / <sub>8</sub>	0.830	1 <sup>3</sup> / <sub>16</sub>	7/16	15.860	15 <sup>7</sup> / <sub>8</sub>	1.400	1 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
W 36x135	39.7	35.55	35 <sup>1</sup> / <sub>2</sub>	0.600	5/8	5/16	11.950	12	0.790	1 <sup>3</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
x150	44.2	35.85	35 <sup>7</sup> / <sub>8</sub>	0.625	5/8	5/16	11.975	12	0.940	1 <sup>5</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>
x160	47.0	36.01	36	0.650	5/8	5/16	12.000	12	1.020	1	32 <sup>1</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>
x170	50.0	36.17	36 <sup>1</sup> / <sub>8</sub>	0.680	1 <sup>1</sup> / <sub>16</sub>	3/8	12.030	12	1.100	1 <sup>1</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2	1 <sup>3</sup> / <sub>16</sub>
x182	53.6	36.33	36 <sup>3</sup> / <sub>8</sub>	0.725	3/4	3/8	12.075	12 <sup>1</sup> / <sub>8</sub>	1.180	1 <sup>3</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>
x194	57.0	36.49	36 <sup>1</sup> / <sub>2</sub>	0.765	3/4	3/8	12.115	12 <sup>1</sup> / <sub>8</sub>	1.260	1 <sup>1</sup> / <sub>4</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>
x210	61.8	36.69	36 <sup>3</sup> / <sub>4</sub>	0.830	1 <sup>3</sup> / <sub>16</sub>	7/16	12.180	12 <sup>1</sup> / <sub>8</sub>	1.360	1 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>
W 36x230	67.6	35.90	35 <sup>7</sup> / <sub>8</sub>	0.760	3/4	3/8	16.470	16 <sup>1</sup> / <sub>2</sub>	1.260	1 <sup>1</sup> / <sub>4</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>16</sub>
x245	72.1	36.08	36 <sup>1</sup> / <sub>8</sub>	0.800	1 <sup>3</sup> / <sub>16</sub>	7/16	16.510	16 <sup>1</sup> / <sub>2</sub>	1.350	1 <sup>3</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>7</sup> / <sub>16</sub>
x260	76.5	36.26	36 <sup>1</sup> / <sub>4</sub>	0.840	1 <sup>3</sup> / <sub>16</sub>	7/16	16.550	16 <sup>1</sup> / <sub>2</sub>	1.440	1 <sup>7</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	2 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>
x280	82.4	36.52	36 <sup>1</sup> / <sub>2</sub>	0.885	7/8	7/16	16.595	16 <sup>1</sup> / <sub>2</sub>	1.570	1 <sup>9</sup> / <sub>16</sub>	31 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>

# MISCELLANEOUS BEAMS

ASTM A36

M SHAPES

Dimensions



Designation	Area A	Depth d	Web			Flange			Distance			Max. Flge Fas- ten- er		
			Thickness $t_w$		$\frac{t_w}{2}$	Width $b_f$		Thickness $t_f$		T	k		Grip	
			In.	In.	In.	In.	In.	In.	In.	In.	In.			
M 4x13	3.81	4.00	4	0.254	1/4	3/8	3.940	4	0.371	3/8	23/8	13/16	3/8	3/4
M 5x18.9	5.55	5.00	5	0.316	9/16	3/16	5.003	5	0.416	7/16	31/4	7/8	7/16	7/8
M 6x4.4	1.29	6.00	6	0.114	1/8	1/16	1.844	17/8	0.171	3/16	51/8	7/16	3/16	—
M 6x20	5.89	6.00	6	0.250	1/4	1/8	5.938	6	0.379	3/8	41/4	7/8	3/8	7/8
M 8x6.5	1.92	8.00	8	0.135	1/8	1/16	2.281	21/4	0.189	3/16	7	1/2	3/16	—
M 10x9	2.65	10.00	10	0.157	3/16	1/8	2.690	23/4	0.206	3/16	87/8	9/16	3/16	—
M 12x11.8	3.47	12.00	12	0.177	3/16	1/8	3.065	31/8	0.225	1/4	107/8	9/16	1/4	—
M 14x18	5.05	14.00	14	0.215	3/16	1/8	4.000	4	0.270	1/4	123/4	5/8	1/4	3/4

## BEARING PILES

ASTM-A36 (HP Shapes) Dimensions

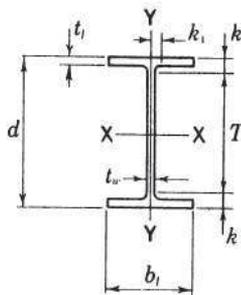
Designation	Area A	Depth d	Web			Flange			Distance				
			Thickness $t_w$		$\frac{t_w}{2}$	Width $b_f$		Thickness $t_f$		T	k	$k_1$	
			In.	In.	In.	In.	In.	In.	In.	In.	In.		
HP 8x 36	10.6	8.02	8	0.445	7/16	1/4	8.155	81/8	0.445	7/16	61/8	15/16	5/8
HP10x 42	12.4	9.70	93/4	0.415	7/16	1/4	10.075	101/8	0.420	7/16	75/8	11/16	3/4
x 57	16.8	9.99	10	0.565	9/16	5/16	10.225	101/4	0.565	9/16	75/8	13/16	13/16
HP12x 53	15.5	11.78	113/4	0.435	7/16	1/4	12.045	12	0.435	7/16	91/2	11/8	7/8
x 63	18.4	11.94	12	0.515	1/2	1/4	12.125	121/8	0.515	1/2	91/2	11/4	7/8
x 74	21.8	12.13	121/8	0.605	5/8	3/16	12.215	121/4	0.610	5/8	91/2	15/16	15/16
x 84	24.6	12.28	121/4	0.685	11/16	3/8	12.295	121/4	0.685	11/16	91/2	13/8	1
HP13x 60	17.5	12.54	121/2	0.460	7/16	1/4	12.900	127/8	0.460	7/16	101/4	11/8	7/8
x 73	21.6	12.75	123/4	0.565	9/16	5/16	13.005	13	0.565	9/16	101/4	11/4	15/16
x 87	25.5	12.95	13	0.665	11/16	3/8	13.105	131/8	0.665	11/16	101/4	13/8	15/16
x100	29.4	13.15	131/8	0.765	3/4	3/8	13.205	131/4	0.765	3/4	101/4	17/16	1
HP14x 73	21.4	13.61	135/8	0.505	1/2	1/4	14.585	145/8	0.505	1/2	111/4	13/16	7/8
x 89	26.1	13.83	137/8	0.615	5/8	5/16	14.695	143/4	0.615	5/8	111/4	15/16	15/16
x102	30.0	14.01	14	0.705	11/16	3/8	14.785	143/4	0.705	11/16	111/4	13/8	1
x117	34.4	14.21	141/4	0.805	13/16	7/16	14.885	147/8	0.805	13/16	111/4	11/2	11/16

# STANDARD BEAMS

(S SHAPES)

Dimensions

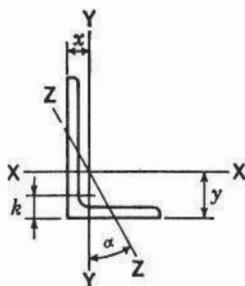
ASTM-A36



Designation	Area A	Depth d		Web			Flange			Distance		Grip	Max. Flge Fas- ten- er	
				Thickness t <sub>w</sub>	t <sub>w</sub> 2	Width b <sub>r</sub>	Thickness t <sub>r</sub>	T	k					
										In.	In.			In.
S 3x 5.7 x 7.5	1.67	3.00	3	0.170	3/16	1/8	2.330	2 3/8	0.260	1/4	1 3/4	5/8	1/4	—
	2.21	3.00	3	0.349	3/8	3/16	2.509	2 1/2	0.260	1/4	1 5/8	1 1/16	1/4	—
S 4x 7.7 x 9.5	2.26	4.00	4	0.193	3/16	1/8	2.663	2 5/8	0.293	5/16	2 1/2	3/4	5/16	—
	2.79	4.00	4	0.326	5/16	3/16	2.796	2 3/4	0.293	5/16	2 1/2	3/4	5/16	—
S 5x 10 x 14.75	2.94	5.00	5	0.214	3/16	1/8	3.004	3	0.326	5/16	3 3/8	1 3/16	5/16	—
	4.34	5.00	5	0.494	1/2	1/4	3.284	3 1/4	0.326	5/16	3 3/8	1 3/16	5/16	—
S 6x 12.5 x 17.25	3.67	6.00	6	0.232	1/4	1/8	3.332	3 3/8	0.359	3/8	4 1/4	7/8	3/8	—
	5.07	6.00	6	0.465	7/16	1/4	3.565	3 5/8	0.359	3/8	4 1/4	7/8	3/8	5/8
S 7x 15.3 x 20	4.50	7.00	7	0.252	1/4	1/8	3.662	3 5/8	0.392	3/8	5 1/8	1 5/16	3/8	5/8
	5.88	7.00	7	0.45	7/16	1/4	3.860	3 7/8	0.392	3/8	5 1/8	1 5/16	3/8	5/8
S 8x 18.4 x 23	5.41	8.00	8	0.271	1/4	1/8	4.001	4	0.426	7/16	6	1	7/16	3/4
	6.77	8.00	8	0.441	7/16	1/4	4.171	4 1/8	0.426	7/16	6	1	7/16	3/4
S 10x 25.4 x 35	7.46	10.00	10	0.311	5/16	3/16	4.661	4 5/8	0.491	1/2	7 3/4	1 1/8	1/2	3/4
	10.3	10.00	10	0.594	5/8	3/16	4.944	5	0.491	1/2	7 3/4	1 1/8	1/2	3/4
S 12x 31.8 x 35	9.35	12.00	12	0.350	3/8	3/16	5.000	5	0.544	9/16	9 5/8	1 3/16	1/2	3/4
	10.3	12.00	12	0.428	7/16	1/4	5.078	5 1/8	0.544	9/16	9 5/8	1 3/16	1/2	3/4
S 12x 40.8 x 50	12.0	12.00	12	0.462	7/16	1/4	5.252	5 1/4	0.659	1 1/16	9 1/8	1 7/16	5/8	3/4
	14.7	12.00	12	0.687	1 1/16	3/8	5.477	5 1/2	0.659	1 1/16	9 1/8	1 7/16	1 1/16	3/4
S 15x 42.9 x 50	12.6	15.00	15	0.411	7/16	1/4	5.501	5 1/2	0.622	5/8	12 1/4	1 3/8	9/16	3/4
	14.7	15.00	15	0.550	9/16	5/16	5.640	5 5/8	0.622	5/8	12 1/4	1 3/8	9/16	3/4
S 18x 54.7 x 70	16.1	18.00	18	0.461	7/16	1/4	6.001	6	0.691	1 1/16	15	1 1/2	1 1/16	7/8
	20.6	18.00	18	0.711	1 1/16	3/8	6.251	6 1/4	0.691	1 1/16	15	1 1/2	1 1/16	7/8
S 20x 66 x 75	19.4	20.00	20	0.505	1/2	1/4	6.255	6 1/4	0.795	1 3/16	16 3/4	1 5/8	1 3/16	7/8
	22.0	20.00	20	0.635	5/8	5/16	6.385	6 3/8	0.795	1 3/16	16 3/4	1 5/8	1 3/16	7/8
S 20x 86 x 96	25.3	20.30	20 1/4	0.660	1 1/16	3/8	7.060	7	0.920	1 5/16	16 3/4	1 3/4	1 5/16	1
	28.2	20.30	20 1/4	0.800	1 3/16	7/16	7.200	7 1/4	0.920	1 5/16	16 3/4	1 3/4	1 5/16	1
S 24x 80 x 90 x 100	23.5	24.00	24	0.500	1/2	1/4	7.000	7	0.870	7/8	20 1/2	1 3/4	7/8	1
	26.5	24.00	24	0.625	5/8	5/16	7.125	7 1/8	0.870	7/8	20 1/2	1 3/4	7/8	1
	29.3	24.00	24	0.745	3/4	3/8	7.245	7 1/4	0.870	7/8	20 1/2	1 3/4	7/8	1

**ANGLES - BAR SIZE****ASTM-A36****or M 1020**

Size In.	Weight Per Foot Lbs.	In Lengths Up To Feet
1/2x 1/2x1/8	.38	20
5/8x 5/8x1/8	.48	20
3/4x 3/4x1/8	.59	20
x3/16	.84	20
7/8x 7/8x1/8	.70	20
1 x 5/8x1/8	.64	20
1 x 3/4x1/8	.70	20
1 x1 x1/8	.80	40
x3/16	1.16	40
x1/4	1.49	40
1 1/4x1 1/4x1/8	1.01	40
x3/16	1.48	40
x1/4	1.92	40
1 3/8x 7/8x1/8	.91	20
x3/16	1.32	20
1 1/2x1 1/4x3/16	1.64	20
1 1/2x1 1/2x1/8	1.23	40
x3/16	1.80	40
x1/4	2.34	40
1 3/4x1 1/4x1/8	1.23	40
x3/16	1.80	40
x1/4	2.34	40
1 3/4x1 3/4x1/8	1.44	40
x3/16	2.12	40
x1/4	2.77	40
2 x1 1/4x3/16	1.96	20
x1/4	2.55	20
2 x1 1/2x1/8	1.44	40
x3/16	2.12	40
x1/4	2.77	40
2 x2 x1/8	1.65	40
x3/16	2.44	40
x1/4	3.19	40
x5/16	3.92	40
x3/8	4.70	40
2 1/4x1 1/2x3/16	2.28	40
2 1/2x1 1/2x3/16	2.44	40
x1/4	3.19	40
x5/16	3.92	40
2 1/2x2 x3/16	2.75	40
x1/4	3.62	40
x5/16	4.50	40
x3/8	5.30	40
2 1/2x2 1/2x3/16	3.07	40
x1/4	4.10	40
x5/16	5.00	40
x3/8	5.90	40
x1/2	7.70	40



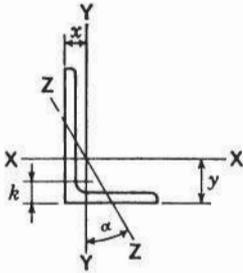
# ANGLES

Equal legs and unequal legs

Properties for designing

ASTM-A36

Size and Thickness	k	Weight per Foot	Area	AXIS X-X				AXIS Y-Y				AXIS Z-Z		
				l	S	r	y	l	S	r	x	r	Tan ok	
In.	In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	ok
L3 x2	x <sup>3</sup> / <sub>16</sub>	1/2	3.07	0.902	0.842	0.415	0.966	0.970	0.307	0.200	0.583	0.470	0.439	0.446
	x <sup>1</sup> / <sub>4</sub>	9/16	4.1	1.19	1.09	0.542	0.957	0.993	0.392	0.260	0.574	0.493	0.435	0.440
	x <sup>5</sup> / <sub>16</sub>	5/8	5.0	1.46	1.32	0.664	0.948	1.02	0.470	0.317	0.567	0.516	0.432	0.435
	x <sup>3</sup> / <sub>8</sub>	11/16	5.9	1.73	1.53	0.781	0.940	1.04	0.543	0.371	0.559	0.539	0.430	0.428
	x <sup>1</sup> / <sub>2</sub>	13/16	7.7	2.25	1.92	1.00	0.924	1.08	0.672	0.474	0.546	0.583	0.428	0.414
L3 x2 1/2	x <sup>3</sup> / <sub>16</sub>	9/16	3.39	0.996	0.907	0.430	0.954	0.888	0.577	0.310	0.761	0.638	0.533	0.688
	x <sup>1</sup> / <sub>4</sub>	5/8	4.5	1.31	1.17	0.561	0.945	0.911	0.743	0.404	0.753	0.661	0.528	0.684
	x <sup>5</sup> / <sub>16</sub>	11/16	5.6	1.62	1.42	0.688	0.937	0.933	0.898	0.494	0.744	0.683	0.525	0.680
	x <sup>3</sup> / <sub>8</sub>	3/4	6.6	1.92	1.66	0.810	0.928	0.956	1.04	0.581	0.736	0.706	0.522	0.676
	x <sup>1</sup> / <sub>2</sub>	7/8	8.5	2.50	2.08	1.04	0.913	1.00	1.30	0.744	0.722	0.750	0.520	0.667
L3 x3	x <sup>3</sup> / <sub>16</sub>	1/2	3.71	1.09	0.962	0.441	0.939	0.820	0.962	0.441	0.939	0.820	0.596	1.000
	x <sup>1</sup> / <sub>4</sub>	9/16	4.9	1.44	1.24	0.577	0.930	0.842	1.24	0.577	0.930	0.842	0.592	1.000
	x <sup>5</sup> / <sub>16</sub>	5/8	6.1	1.78	1.51	0.707	0.922	0.865	1.51	0.707	0.922	0.865	0.589	1.000
	x <sup>3</sup> / <sub>8</sub>	11/16	7.2	2.11	1.76	0.833	0.913	0.888	1.76	0.833	0.913	0.888	0.587	1.000
	x <sup>1</sup> / <sub>2</sub>	13/16	9.4	2.75	2.22	1.07	0.898	0.932	2.22	1.07	0.898	0.932	0.584	1.000
L3 1/2 x 2 1/2	x <sup>1</sup> / <sub>4</sub>	11/16	4.9	1.44	1.80	0.755	1.12	1.11	0.777	0.412	0.735	0.614	0.544	0.506
	x <sup>5</sup> / <sub>16</sub>	3/4	6.1	1.78	2.19	0.927	1.11	1.14	0.939	0.504	0.727	0.637	0.540	0.501
	x <sup>3</sup> / <sub>8</sub>	13/16	7.2	2.11	2.56	1.09	1.10	1.16	1.09	0.592	0.719	0.660	0.537	0.496
	x <sup>1</sup> / <sub>2</sub>	15/16	9.4	2.75	3.24	1.41	1.09	1.20	1.36	0.760	0.704	0.705	0.534	0.486
L3 1/2 x 3	x <sup>1</sup> / <sub>4</sub>	11/16	5.4	1.56	1.91	0.776	1.11	1.04	1.30	0.589	0.914	0.785	0.631	0.727
	x <sup>5</sup> / <sub>16</sub>	3/4	6.6	1.93	2.33	0.954	1.10	1.06	1.58	0.722	0.905	0.808	0.627	0.724
	x <sup>3</sup> / <sub>8</sub>	13/16	7.9	2.30	2.72	1.13	1.09	1.08	1.85	0.851	0.897	0.830	0.625	0.721
	x <sup>1</sup> / <sub>2</sub>	15/16	10.2	3.00	3.45	1.45	1.07	1.13	2.33	1.10	0.881	0.875	0.621	0.714
L3 1/2 x 3 1/2	x <sup>1</sup> / <sub>4</sub>	5/8	5.8	1.69	2.01	0.794	1.09	0.968	2.01	0.794	1.09	0.968	0.694	1.000
	x <sup>5</sup> / <sub>16</sub>	11/16	7.2	2.09	2.45	0.976	1.08	0.990	2.45	0.976	1.08	0.990	0.690	1.000
	x <sup>3</sup> / <sub>8</sub>	3/4	8.5	2.48	2.87	1.15	1.07	1.01	2.87	1.15	1.07	1.01	0.687	1.000
	x <sup>1</sup> / <sub>2</sub>	7/8	11.1	3.25	3.64	1.49	1.06	1.06	3.64	1.49	1.06	1.06	0.683	1.000
L4 x3	x <sup>1</sup> / <sub>4</sub>	11/16	5.8	1.69	2.77	1.00	1.28	1.24	1.36	0.599	0.896	0.736	0.651	0.558
	x <sup>5</sup> / <sub>16</sub>	3/4	7.2	2.09	3.38	1.23	1.27	1.26	1.65	0.734	0.887	0.759	0.647	0.554
	x <sup>3</sup> / <sub>8</sub>	13/16	8.5	2.48	3.96	1.46	1.26	1.28	1.92	0.866	0.879	0.782	0.644	0.551
	x <sup>1</sup> / <sub>2</sub>	15/16	11.1	3.25	5.05	1.89	1.25	1.33	2.42	1.12	0.864	0.827	0.639	0.543



## ANGLES

Equal legs and unequal legs

Properties for designing

ASTM-A36

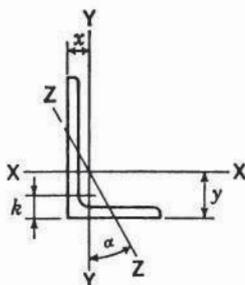
Size and Thickness	k	Weigh per Foot	Area	AXIS X-X				AXIS Y-Y				AXIS Z-Z		
				l	S	r	y	l	S	r	x	r	Tan ok	
In.	In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	ok
L 4x3½x¼	11/16	6.2	1.81	2.91	1.03	1.27	1.16	2.09	0.808	1.07	0.909	0.734	0.759	
x5/16	¾	7.7	2.25	3.56	1.26	1.26	1.18	2.55	0.994	1.07	0.932	0.730	0.757	
x¾	13/16	9.1	2.67	4.18	1.49	1.25	1.21	2.95	1.17	1.06	0.955	0.727	0.755	
x½	15/16	11.9	3.50	5.32	1.94	1.23	1.25	3.79	1.52	1.04	1.00	0.722	0.750	
x5/8	11/16	14.7	4.30	6.37	2.35	1.22	1.29	4.52	1.84	1.03	1.04	0.719	0.745	
L 4x4	x¼	5/8	6.6	1.94	3.04	1.05	1.25	1.09	3.04	1.05	1.25	1.09	0.795	1.000
x5/16	11/16	8.2	2.40	3.71	1.29	1.24	1.12	3.71	1.29	1.24	1.12	0.791	1.000	
x¾	¾	9.8	2.86	4.36	1.52	1.23	1.14	4.36	1.52	1.23	1.14	0.788	1.000	
x½	7/8	12.8	3.75	5.56	1.97	1.22	1.18	5.56	1.97	1.22	1.18	0.782	1.000	
x5/8	1	15.7	4.61	6.66	2.40	1.20	1.23	6.66	2.40	1.20	1.23	0.779	1.000	
x¾	11/8	18.5	5.44	7.67	2.81	1.19	1.27	7.67	2.81	1.19	1.27	0.778	1.000	
L 5x3	x¼	¾	6.6	1.94	5.11	1.53	1.62	1.66	1.44	0.614	0.861	0.657	0.663	0.371
x5/16	13/16	8.2	2.40	6.26	1.89	1.61	1.68	1.75	0.753	0.853	0.681	0.658	0.368	
x¾	7/8	9.8	2.86	7.37	2.24	1.61	1.70	2.04	0.888	0.845	0.704	0.654	0.364	
x½	1	12.8	3.75	9.45	2.91	1.59	1.75	2.58	1.15	0.829	0.750	0.648	0.357	
x5/8	1	15.7	4.61	11.4	3.55	1.57	1.80	3.06	1.39	0.815	0.796	0.644	0.349	
L 5x3½x¼	¾	7.0	2.06	5.39	1.57	1.62	1.56	2.23	0.830	1.04	0.814	0.770	0.492	
x5/16	13/16	8.7	2.56	6.60	1.94	1.61	1.59	2.72	1.02	1.03	0.838	0.766	0.489	
x¾	7/8	10.4	3.05	7.78	2.29	1.60	1.61	3.18	1.21	1.02	0.861	0.762	0.486	
x½	1	13.6	4.00	9.99	2.99	1.58	1.66	4.05	1.56	1.01	0.906	0.755	0.479	
x5/8	11/8	16.8	4.92	12.0	3.65	1.56	1.70	4.83	1.90	0.991	0.951	0.751	0.472	
x¾	1¼	19.8	5.81	13.9	4.28	1.55	1.75	5.55	2.22	0.977	0.996	0.748	0.464	

# ANGLES

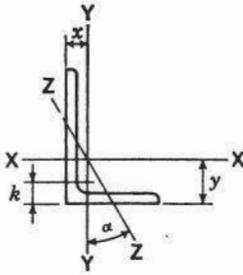
Equal legs and unequal legs

Properties for designing

ASTM-A36



Size and Thickness	k	Weigh per Foot	Area	AXIS X-X				AXIS Y-Y				AXIS Z-Z		
				l	S	r	y	l	S	r	x	r	Tan ok	
In.	In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
L5 x5	x 5/16	13/16	10.3	3.03	7.42	2.04	1.57	1.37	7.42	2.04	1.57	1.37	0.994	1.000
	x 3/8	7/8	12.3	3.61	8.74	2.42	1.56	1.39	8.74	2.42	1.56	1.39	0.990	1.000
	x 1/2	1	16.2	4.75	11.3	3.16	1.54	1.43	11.3	3.16	1.54	1.43	0.983	1.000
	x 5/8	1 1/8	20.0	5.86	13.6	3.86	1.52	1.48	13.6	3.86	1.52	1.48	0.978	1.000
	x 3/4	1 1/4	23.6	6.94	15.7	4.53	1.51	1.52	15.7	4.53	1.51	1.52	0.975	1.000
L6 x3 1/2 x	5/16	13/16	9.8	2.87	10.9	2.73	1.95	2.01	2.85	1.04	0.996	0.763	0.772	0.352
	x 3/8	7/8	11.7	3.42	12.9	3.24	1.94	2.04	3.34	1.23	0.988	0.787	0.767	0.350
	x 1/2	1	15.3	4.50	16.6	4.24	1.92	2.08	4.25	1.59	0.972	0.833	0.759	0.344
L6 x4	x 5/16	13/16	10.3	3.03	11.4	2.79	1.94	1.92	4.18	1.35	1.17	0.918	0.882	0.448
	x 3/8	7/8	12.3	3.61	13.5	3.32	1.93	1.94	4.90	1.60	1.17	0.941	0.877	0.446
	x 1/2	1	16.2	4.75	17.4	4.33	1.91	1.99	6.27	2.08	1.15	0.987	0.870	0.440
	x 5/8	1 1/8	20.0	5.86	21.1	5.31	1.90	2.03	7.52	2.54	1.13	1.03	0.864	0.435
	x 3/4	1 1/4	23.6	6.94	24.5	6.25	1.88	2.08	8.68	2.97	1.12	1.08	0.860	0.428
	x 7/8	1 3/8	27.2	7.98	27.7	7.15	1.86	2.12	9.75	3.39	1.11	1.12	0.857	0.421
L6 x6	x 5/16	13/16	12.4	3.65	13.0	2.97	1.89	1.62	13.0	2.97	1.89	1.62	1.20	1.000
	x 3/8	7/8	14.9	4.36	15.4	3.53	1.88	1.64	15.4	3.53	1.88	1.64	1.19	1.000
	x 1/2	1	19.6	5.75	19.9	4.61	1.86	1.68	19.9	4.61	1.86	1.68	1.18	1.000
	x 5/8	1 1/8	24.2	7.11	24.2	5.66	1.84	1.73	24.2	5.66	1.84	1.73	1.18	1.000
	x 3/4	1 1/4	28.7	8.44	28.2	6.66	1.83	1.78	28.2	6.66	1.83	1.78	1.17	1.000
	x 7/8	1 3/8	33.1	9.73	31.9	7.63	1.81	1.82	31.9	7.63	1.81	1.82	1.17	1.000
	x1	1 1/2	37.4	11.0	35.5	8.57	1.80	1.86	35.5	8.57	1.80	1.86	1.17	1.000



# ANGLES

Equal legs and unequal legs

Properties for designing

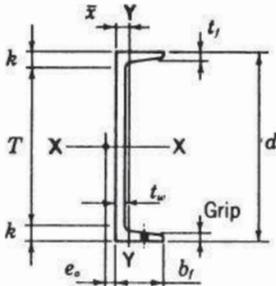
ASTM-A36

Size and Thickness	k	Weigh per Foot	Area	AXIS X-X				AXIS Y-Y				AXIS Z-Z		
				l	S	r	y	l	S	r	x	r	Tan ok	
In.	In.	Lb.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	ok
L7x4x 3/8	7/8	13.6	3.98	20.6	4.44	2.27	2.37	5.10	1.63	1.13	0.870	0.880	0.340	
x 1/2	1	17.9	5.25	26.7	5.81	2.25	2.42	6.53	2.12	1.11	0.917	0.872	0.335	
x 5/8	1 1/8	22.1	6.48	32.4	7.14	2.24	2.46	7.84	2.58	1.10	0.963	0.865	0.329	
x 3/4	1 1/4	26.2	7.69	37.8	8.42	2.22	2.51	9.05	3.03	1.09	1.01	0.860	0.324	
L8x4x 1/2	1	19.6	5.75	38.5	7.49	2.59	2.86	6.74	2.15	1.08	0.859	0.865	0.267	
x 3/4	1 1/4	28.7	8.44	54.9	10.9	2.55	2.95	9.36	3.07	1.05	0.953	0.852	0.258	
x1	1 1/2	37.4	11.0	69.6	14.1	2.52	3.05	11.6	3.94	1.03	1.05	0.846	0.247	
L8x6x 1/2	1	23.0	6.75	44.3	8.02	2.56	2.47	21.7	4.79	1.79	1.47	1.30	0.558	
x 5/8	1 1/8	28.5	8.36	54.1	9.87	2.54	2.52	26.3	5.88	1.77	1.52	1.29	0.554	
x 3/4	1 1/4	33.8	9.94	63.4	11.7	2.53	2.56	30.7	6.92	1.76	1.56	1.29	0.551	
x 7/8	1 3/8	39.1	11.5	72.3	13.4	2.51	2.61	34.9	7.94	1.74	1.61	1.28	0.547	
x1	1 1/2	44.2	13.0	80.8	15.1	2.49	2.65	38.8	8.92	1.73	1.65	1.28	0.543	
L8x8x 1/2	1 1/8	26.4	7.75	48.6	8.36	2.50	2.19	48.6	8.36	2.50	2.19	1.59	1.000	
x 5/8	1 1/4	32.7	9.61	59.4	10.3	2.49	2.23	59.4	10.3	2.49	2.23	1.58	1.000	
x 3/4	1 3/8	38.9	11.4	69.7	12.2	2.47	2.28	69.7	12.2	2.47	2.28	1.58	1.000	
x 7/8	1 1/2	45.0	13.2	79.6	14.0	2.45	2.32	79.6	14.0	2.45	2.32	1.57	1.000	
x1	1 3/8	51.0	15.0	89.0	15.8	2.44	2.37	89.0	15.8	2.44	2.37	1.56	1.000	
L9x4x 1/2	1	21.3	6.25	53.2	9.34	2.92	3.31	6.92	2.17	1.05	0.810	.854	0.220	
x 5/8	1 1/8	26.3	7.73	64.9	11.5	2.90	3.36	8.32	2.65	1.04	0.858	.847	0.216	

# CHANNELS - BAR SIZE

## ASTM-A36

Size In.	Weight Per Foot Lbs.	In Lengths Up To Feet
$\frac{3}{4} \times \frac{3}{8} \times \frac{1}{8}$	.56	20
$\frac{7}{8} \times \frac{3}{8} \times \frac{1}{8}$	.61	20
1 x $\frac{3}{8} \times \frac{1}{8}$	.68	20
1 x $\frac{1}{2} \times \frac{1}{8}$	.84	20
$1\frac{1}{4} \times \frac{1}{2} \times \frac{1}{8}$	1.01	20
$1\frac{1}{2} \times \frac{1}{2} \times \frac{1}{8}$	1.12	20
$1\frac{1}{2} \times \frac{9}{16} \times \frac{3}{16}$	1.44	20
$1\frac{1}{2} \times \frac{3}{4} \times \frac{1}{8}$	1.17	20
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	2.65	20
$1\frac{3}{4} \times \frac{1}{2} \times \frac{3}{16}$	1.55	20
2 x $\frac{1}{2} \times \frac{1}{8}$	1.43	20
2 x $\frac{9}{16} \times \frac{3}{16}$	1.86	20
2 x $\frac{5}{8} \times \frac{1}{4}$	2.28	20
2 x1 $\times \frac{1}{8}$	1.78	20
2 x1 $\times \frac{3}{16}$	2.59	20
$2\frac{1}{2} \times \frac{5}{8} \times \frac{3}{16}$	2.27	20



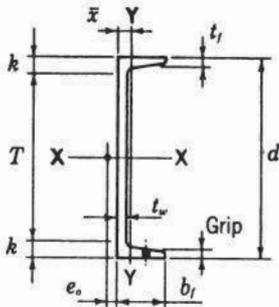
# CHANNELS

## AMERICAN STANDARD

### Dimensions

### ASTM-A36

Designation	Area A	Depth d	Web		Flange				Distance		Grip	Max Flge. Fas- ten- er	
			Thickness t <sub>w</sub>	t <sub>w</sub> 2	Width b <sub>f</sub>	Average Thickness t <sub>r</sub>		T	k				
						In.	In.			In.			In.
C 3x 4.1	1.21	3.00	0.170	3/16	1/16	1.410	13/8	0.273	1/4	15/8	11/16	—	—
x 5	1.47	3.00	0.258	1/4	1/8	1.498	1 1/2	0.273	1/4	15/8	11/16	—	—
x 6	1.76	3.00	0.356	3/8	3/16	1.596	1 5/8	0.273	1/4	1 5/8	11/16	—	—
C 4x 5.4	1.59	4.00	0.184	3/16	1/16	1.584	1 5/8	0.296	5/16	2 5/8	11/16	—	—
x 7.25	2.13	4.00	0.321	5/16	3/16	1.721	1 3/4	0.296	5/16	2 5/8	11/16	5/16	5/8
C 5x 6.7	1.97	5.00	0.190	3/16	1/8	1.750	1 3/4	0.320	5/16	3 1/2	3/4	—	—
x 9	2.64	5.00	0.325	5/16	3/16	1.885	1 7/8	0.320	5/16	3 1/2	3/4	5/16	5/8
C 6x 8.2	2.40	6.00	0.200	3/16	1/8	1.920	1 7/8	0.343	5/16	4 3/8	13/16	5/16	5/8
x10.5	3.09	6.00	0.314	5/16	3/16	2.034	2	0.343	5/16	4 3/8	13/16	3/8	5/8
x13	3.83	6.00	0.437	7/16	3/16	2.157	2 1/8	0.343	5/16	4 3/8	13/16	5/16	5/8
C 7x 9.8	2.87	7.00	0.210	3/16	1/8	2.090	2 1/8	0.366	3/8	5 1/4	7/8	3/8	5/8
x12.25	3.60	7.00	0.314	5/16	3/16	2.194	2 1/4	0.366	3/8	5 1/4	7/8	3/8	5/8
x14.75	4.33	7.00	0.419	7/16	3/16	2.299	2 1/4	0.366	3/8	5 1/4	7/8	3/8	5/8
C 8x11.5	3.38	8.00	0.220	1/4	1/8	2.260	2 1/4	0.390	3/8	6 1/8	15/16	3/8	3/4
x13.75	4.04	8.00	0.303	5/16	1/8	2.343	2 5/8	0.390	3/8	6 1/8	15/16	3/8	3/4
x18.75	5.51	8.00	0.487	1/2	1/4	2.527	2 1/2	0.390	3/8	6 1/8	15/16	3/8	3/4
C 9x13.4	3.94	9.00	0.233	1/4	1/8	2.433	2 5/8	0.413	7/16	7 7/8	15/16	7/16	3/4
x15	4.41	9.00	0.285	5/16	1/8	2.485	2 1/2	0.413	7/16	7 7/8	15/16	7/16	3/4
x20	5.88	9.00	0.448	7/16	1/4	2.648	2 5/8	0.413	7/16	7 7/8	15/16	7/16	3/4
C10x15.3	4.49	10.00	0.240	1/4	1/8	2.600	2 5/8	0.436	7/16	8	1	7/16	3/4
x20	5.88	10.00	0.379	3/8	3/16	2.739	2 3/4	0.436	7/16	8	1	7/16	3/4
x25	7.35	10.00	0.526	1/2	1/4	2.886	2 7/8	0.436	7/16	8	1	7/16	3/4
x30	8.82	10.00	0.673	11/16	5/16	3.033	3	0.436	7/16	8	1	7/16	3/4
C12x20.7	6.09	12.00	0.282	5/16	1/8	2.942	3	0.501	1/2	9 3/4	1 1/8	1/2	7/8
x25	7.35	12.00	0.387	3/8	3/16	3.047	3	0.501	1/2	9 3/4	1 1/8	1/2	7/8
x30	8.82	12.00	0.510	1/2	1/4	3.170	3 1/8	0.501	1/2	9 3/4	1 1/8	1/2	7/8
C15x33.9	9.96	15.00	0.400	3/8	3/16	3.400	3 3/8	0.650	5/8	12 7/8	1 7/16	5/8	1
x40	11.8	15.00	0.520	1/2	1/4	3.520	3 1/2	0.650	5/8	12 7/8	1 7/16	5/8	1
x50	14.7	15.00	0.716	11/16	3/8	3.716	3 3/4	0.650	5/8	12 7/8	1 7/16	5/8	1



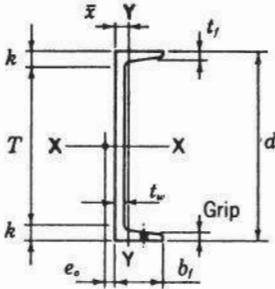
# CHANNELS

## MISCELLANEOUS

### Dimensions

### ASTM-A36

Designation	Area <i>A</i>	Depth <i>d</i>	Web			Flange				Distance		Grip	Max Flge. Fastener
			Thickness <i>t<sub>w</sub></i>	<i>t<sub>w</sub></i>		Width <i>b<sub>f</sub></i>	Average Thickness <i>t<sub>f</sub></i>		<i>T</i>	<i>k</i>			
				$\frac{1}{2}$									
In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
MC 3x7.1		3.00	0.313	$\frac{5}{16}$	$\frac{1}{8}$	1.94	$1\frac{15}{16}$	0.351					
MC 4x13.8		4.00	0.500	$\frac{1}{2}$	$\frac{1}{4}$	2.50	$2\frac{1}{2}$	0.500	$\frac{1}{2}$				
MC 6x12	3.53	6.00	0.310	$\frac{5}{16}$	$\frac{1}{8}$	2.497	$2\frac{1}{2}$	0.375	$\frac{3}{8}$	$4\frac{3}{8}$	$1\frac{3}{16}$	$\frac{3}{8}$	$\frac{5}{8}$
MC 6x15.1	4.44	6.00	0.316	$\frac{5}{16}$	$\frac{3}{16}$	2.941	3	0.475	$\frac{1}{2}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$\frac{1}{2}$	$\frac{3}{4}$
x16.3	4.79	6.00	0.375	$\frac{3}{8}$	$\frac{3}{16}$	3.000	3	0.475	$\frac{1}{2}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$\frac{1}{2}$	$\frac{3}{4}$
MC 6x15.3	4.50	6.00	0.340	$\frac{5}{16}$	$\frac{3}{16}$	3.500	$3\frac{1}{2}$	0.385	$\frac{3}{8}$	$4\frac{1}{4}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{7}{8}$
x18	5.29	6.00	0.379	$\frac{3}{8}$	$\frac{3}{16}$	3.504	$3\frac{1}{2}$	0.475	$\frac{1}{2}$	$3\frac{7}{8}$	$1\frac{1}{16}$	$\frac{1}{2}$	$\frac{7}{8}$
MC 7x19.1	5.61	7.00	0.352	$\frac{3}{8}$	$\frac{3}{16}$	3.452	$3\frac{1}{2}$	0.500	$\frac{1}{2}$	$4\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{8}$
x22.7	6.67	7.00	0.503	$\frac{1}{2}$	$\frac{1}{4}$	3.603	$3\frac{3}{8}$	0.500	$\frac{1}{2}$	$4\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{8}$
MC 8x 8.5	2.50	8.00	0.179	$\frac{3}{16}$	$\frac{1}{16}$	1.874	$1\frac{7}{8}$	0.311	$\frac{5}{16}$	$6\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{16}$	$\frac{5}{8}$
MC 8x18.7	5.50	8.00	0.353	$\frac{3}{8}$	$\frac{3}{16}$	2.978	3	0.500	$\frac{1}{2}$	$5\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{8}$
x20	5.88	8.00	0.400	$\frac{3}{8}$	$\frac{3}{16}$	3.025	3	0.500	$\frac{1}{2}$	$5\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{8}$
MC 8x21.4	6.28	8.00	0.375	$\frac{3}{8}$	$\frac{3}{16}$	3.450	$3\frac{1}{2}$	0.525	$\frac{1}{2}$	$5\frac{5}{8}$	$1\frac{3}{16}$	$\frac{1}{2}$	$\frac{7}{8}$
x22.8	6.70	8.00	0.427	$\frac{7}{16}$	$\frac{3}{16}$	3.502	$3\frac{1}{2}$	0.525	$\frac{1}{2}$	$5\frac{5}{8}$	$1\frac{3}{16}$	$\frac{1}{2}$	$\frac{7}{8}$
MC 9x23.9	7.02	9.00	0.400	$\frac{3}{8}$	$\frac{3}{16}$	3.450	$3\frac{1}{2}$	0.550	$\frac{9}{16}$	$6\frac{5}{8}$	$1\frac{3}{16}$	$\frac{9}{16}$	$\frac{7}{8}$
x25.4	7.47	9.00	0.450	$\frac{7}{16}$	$\frac{1}{4}$	3.500	$3\frac{1}{2}$	0.550	$\frac{9}{16}$	$6\frac{5}{8}$	$1\frac{3}{16}$	$\frac{9}{16}$	$\frac{7}{8}$



# CHANNELS

## MISCELLANEOUS

### Dimensions

### ASTM-A36

Designation	Area A	Depth d	Web		Flange				Distance		Grip	Max Flg. Fas- ten- er	
			Thickness t <sub>w</sub>	t <sub>w</sub> 2	Width b <sub>f</sub>	Average Thickness t <sub>r</sub>		T	k				
						In.	In.			In.			In.
MC10x 6.5	1.91	10.00	0.152	1/8	1/16	1.127	1 1/8	0.202	3/16	9 1/8	7/16	—	—
MC10x 8.4	2.46	10.00	0.170	3/16	1/16	1.500	1 1/2	0.280	1/4	8 5/8	1 1/16	—	—
MC10x22 x25	6.45	10.00	0.290	5/16	1/8	3.315	3 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
	7.35	10.00	0.380	3/8	3/16	3.405	3 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
MC10x28.5 x33.6 x41.1	8.37	10.00	0.425	7/16	3/16	3.950	4	0.575	9/16	7 1/2	1 1/4	9/16	7/8
	9.87	10.00	0.575	9/16	5/16	4.100	4 1/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
	12.1	10.00	0.796	13/16	3/8	4.321	4 3/8	0.575	9/16	7 1/2	1 1/4	9/16	7/8
MC12x10.6	3.10	12.00	0.190	3/16	1/8	1.500	1 1/2	0.309	5/16	10 5/8	1 1/16	—	—
MC12x31	9.12	12.00	0.370	3/8	3/16	3.670	3 5/8	0.700	1 1/16	9 3/8	1 5/16	1 1/16	1
MC12x35 x40 x45 x50	10.3	12.00	0.465	7/16	1/4	3.765	3 3/4	0.700	1 1/16	9 3/8	1 5/16	1 1/16	1
	11.8	12.00	0.590	9/16	5/16	3.890	3 7/8	0.700	1 1/16	9 3/8	1 5/16	1 1/16	1
	13.2	12.00	0.710	1 1/16	3/8	4.010	4	0.700	1 1/16	9 3/8	1 5/16	1 1/16	1
	14.7	12.00	0.835	13/16	7/16	4.135	4 1/8	0.700	1 1/16	9 3/8	1 5/16	1 1/16	1
MC13x31.8 x35 x40 x50	9.35	13.00	0.375	3/8	3/16	4.000	4	0.610	5/8	10 1/4	1 3/8	9/16	1
	10.3	13.00	0.447	7/16	1/4	4.072	4 1/8	0.610	5/8	10 1/4	1 3/8	9/16	1
	11.8	13.00	0.560	9/16	1/4	4.185	4 1/8	0.610	5/8	10 1/4	1 3/8	9/16	1
	14.7	13.00	0.787	13/16	3/8	4.412	4 3/8	0.610	5/8	10 1/4	1 3/8	5/8	1
MC18x42.7 x45.8 x51.9 x58	12.6	18.00	0.450	7/16	1/4	3.950	4	0.625	5/8	15 1/4	1 3/8	5/8	1
	13.5	18.00	0.500	1/2	1/4	4.000	4	0.625	5/8	15 1/4	1 3/8	5/8	1
	15.3	18.00	0.600	5/8	5/16	4.100	4 1/8	0.625	5/8	15 1/4	1 3/8	5/8	1
	17.1	18.00	0.700	1 1/16	3/8	4.200	4 1/4	0.625	5/8	15 1/4	1 3/8	5/8	1

## TEES — BAR SIZE

### ASTM-A36

Size In.	Weight Per Foot Lbs.	In Lengths Up To Feet
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$	.60	20
1 x 1 x $\frac{1}{8}$	.81	20
x $\frac{3}{16}$	1.20	20
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{8}$	1.09	20
x $\frac{3}{16}$	1.55	20
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$	1.90	20
x $\frac{1}{4}$	2.43	20
$1\frac{3}{4} \times 1\frac{3}{4} \times \frac{3}{16}$	2.26	20
x $\frac{1}{4}$	2.90	20
2 x $1\frac{1}{2} \times \frac{1}{4}$	3.10	20
2 x 2 x $\frac{1}{4}$	3.62	20
x $\frac{5}{16}$	4.30	20
$2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$	4.60	20

**Structural Tees**  
**Split From Wide Flange Beams**



# INDEX

## Plates

	PAGE
Carbon Steel, Hot Rolled .....	2.1
Pressure Vessel Quality .....	2.4
High Strength, Low Alloy .....	2.6
Abrasion Resisting .....	2.7
T-1 Alloy .....	2.9
Floor Plate .....	2.11
Plate Shapes by Sketch Number .....	2.13



## General Purpose Carbon Steel Plates

**ASTM A 36** is a common carbon structural steel used in various applications where 36,000 p.s.i. minimum yield strength and 58,000 p.s.i. tensile strength is required. It is a medium carbon steel and is often used in building construction and general structural applications.

**ASTM A 283 Grade D** is a general purpose plate specification for applications requiring only 33,000 p.s.i. minimum yield.

### Mechanical Properties

	Minimum Yield Point psi	Tensile Strength psi	Carbon Maximum
<b>A36</b> .....	36,000.....	58 to 80,000 .....	.25/.29
<b>A283 Gr. D</b> .....	33,000.....	60 to 72,000 .....	not spec.

## CARBON STEEL PLATES HOT ROLLED

For 8" widths and narrower, refer to hot rolled flats

ASTM A 36 —  $\frac{3}{16}$ " - 8"  
ASTM A 283 Gr. D — 4" - 12"

### .40/.50 Carbon Plates Available in Various Thicknesses

Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.
$\frac{3}{16}$ x 48	7.66	$\frac{7}{16}$ x 84	17.87	$\frac{7}{8}$ x 84	35.74
60	7.66	96	17.87	96	35.74
72	7.66				
84	7.66	$\frac{1}{2}$ x 9	20.42	1 x 9	40.84
96	7.66	10	20.42	10	40.84
120	7.66	12	20.42	12	40.84
		48	20.42	48	40.84
		60	20.42	60	40.84
$\frac{1}{4}$ x 9	10.21	72	20.42	72	40.84
10	10.21	84	20.42	84	40.84
12	10.21	86	20.42	90	40.84
14	10.21	90	20.42	96	40.84
18	10.21	96	20.42		
48	10.21	120	20.42	$1\frac{1}{8}$ x 60	45.95
60	10.21			90	45.95
72	10.21	$\frac{9}{16}$ x 84	22.98	96	45.95
84	10.21	96	22.98		
96	10.21				
120	10.21	$\frac{5}{8}$ x 10	25.53	$1\frac{1}{4}$ x 48	51.05
		12	25.53	60	51.05
		48	25.53	72	51.05
$\frac{5}{16}$ x 48	12.76	60	25.53	84	51.05
72	12.76	72	25.53	90	51.05
84	12.76	84	25.53	96	51.05
96	12.76	96	25.53		
120	12.76	120	25.53	$1\frac{3}{8}$ x 72	56.16
				84	56.16
$\frac{3}{8}$ x 9	15.32	$\frac{3}{4}$ x 9	30.63	90	56.16
10	15.32	10	30.63	96	56.16
11	15.32	12	30.63		
12	15.32	48	30.63	$1\frac{1}{2}$ x 12	61.26
48	15.32	60	30.63	60	61.26
60	15.32	72	30.63	72	61.26
72	15.32	84	30.63	84	61.26
84	15.32	96	30.63	90	61.26
96	15.32	120	30.63	96	61.26
120	15.32				

## CARBON STEEL PLATES HOT ROLLED

For 8" widths and narrower, refer to hot rolled flats

ASTM A 36 —  $\frac{3}{16}$ " - 8"

ASTM A 283 Gr. D — 4" - 12"

.40/.50 Carbon Plates Available in Various Thicknesses

Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.
1 $\frac{5}{8}$ x 72	66.37	4 x 84	163.36
84	66.37	96	163.36
96	66.37		
		4 $\frac{1}{2}$ x 72	183.78
1 $\frac{3}{4}$ x 84	71.47	84	183.78
96	71.47		
		5 x 72	204.2
2 x 84	81.68	84	204.2
96	81.68		
		5 $\frac{1}{2}$ x 72	224.62
2 $\frac{1}{4}$ x 72	91.89		
84	91.89	6 x 60	245.04
96	91.89	84	245.04
2 $\frac{1}{2}$ x 72	102.1	6 $\frac{1}{2}$ x 60	265.46
84	102.1	84	265.46
96	102.1		
		7 x 60	285.88
2 $\frac{3}{4}$ x 72	112.31	84	285.88
84	112.31		
85	112.31	8 x 60	326.72
		84	326.72
3 x 60	122.52		
72	122.52	10 x 60	408.4
96	122.52	72	408.4
3 $\frac{1}{4}$ x 72	132.73	12 x 60	490.08
84	132.73		
3 $\frac{1}{2}$ x 72	142.94		
84	142.94		
96	142.94		

## Pressure Vessel Quality Plates

**ASTM A285** is a moderate strength steel plate used for stationary boilers and pressure vessels. While Grades A, B, C, are available, Grade C is the most popular.

**ASTM A515 Grade 70** is an intermediate tensile strength pressure vessel quality plate suitable for welded boilers and other pressure vessels for intermediate and higher-temperature service. ASTM A516 Grade 70 is very similar to ASTM A515 is also available in Grades 55, 60, and 65.

**ASTM A516 Grade 70** is very similar to ASTM A515. It is an intermediate tensile strength pressure vessel quality plate intended for welded pressure vessels for moderate and lower-temperature service.

### Mechanical Properties

ASTM Specifications	Minimum Yield, psi	Tensile Strength, psi	Carbon Max.
A285-Gr. C	30,000	55 to 65,000	.28
A515-Gr. 55	30,000	55 to 75,000	.20/.28
Gr. 60	32,000	60 to 80,000	.24/.31
Gr. 65	35,000	65 to 77,000	.28/.33
Gr. 70	38,000	70 to 85,000	.31/.35
A516-Gr. 70	38,000	70 to 85,000	.27/.31

## PRESSURE VESSEL QUALITY PLATES HOT ROLLED Mechanical Properties

ASTM Specifications	Minimum Yield, psi	Tensile Strength, psi	Carbon Max.
A285-Gr. C .....	30,000 .....	55 to 65,000 .....	.28
A515-Gr. 55 .....	30,000 .....	55 to 75,000 .....	.20/.28
Gr. 60 .....	32,000 .....	60 to 80,000 .....	.24/.31
Gr. 65 .....	35,000 .....	65 to 77,000 .....	.28/.33
Gr. 70 .....	38,000 .....	70 to 85,000 .....	.31/.35
A516-Gr. 70 .....	38,000 .....	70 to 85,000 .....	.27/.31

Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.
$\frac{3}{16}$ x 60	7.66	$\frac{5}{8}$ x 60	25.53	$1\frac{3}{4}$ x 72	71.47
x 72	7.66	x 72	25.53	x 84	71.47
x 84	7.66	x 84	25.53	x 96	71.47
x 96	7.66	x 96	25.53	2 x 72	81.68
$\frac{1}{4}$ x 48	10.21	x120	25.53	x 84	81.68
x 60	10.21	$\frac{3}{4}$ x 60	30.63	x 96	81.68
x 72	10.21	x 72	30.63	$2\frac{1}{4}$ x 84	91.89
x 84	10.21	x 84	30.63	x 96	91.89
x 96	10.21	x 96	30.63	$2\frac{1}{2}$ x 72	102.1
x120	10.21	x120	30.63	x 84	102.1
$\frac{5}{16}$ x 72	12.76	$\frac{7}{8}$ x 72	35.74	x 96	102.1
x 84	12.76	x 84	35.74	$2\frac{3}{4}$ x 84	112.31
x 96	12.76	x 96	35.74	x 85	112.31
x120	12.76	x120	35.74	3 x 72	122.52
$\frac{3}{8}$ x 48	15.32	1 x 84	40.84	x 84	122.52
x 60	15.32	x 90	40.84	x 96	122.52
x 72	15.32	x 96	40.84	$3\frac{1}{4}$ x 96	132.73
x 84	15.32	$1\frac{1}{8}$ x 72	45.95	$3\frac{1}{2}$ x 84	142.94
x 96	15.32	x 84	45.95	x 96	142.94
x120	15.32	x 96	45.95	$3\frac{3}{8}$ x 96	153.15
$\frac{6}{16}$ x 84	17.87	$1\frac{1}{4}$ x 84	51.05	4 x 84	163.36
x 96	17.87	x 96	51.05	x 96	163.36
x120	17.87	$1\frac{3}{8}$ x 72	56.16	$4\frac{1}{4}$ x 96	173.57
$\frac{1}{2}$ x 48	20.42	x 96	56.16	$4\frac{1}{2}$ x 96	183.78
x 60	20.42	$1\frac{1}{2}$ x 72	61.26	5 x 72	204.2
x 72	20.42			x 96	204.2
x 84	20.42			$5\frac{1}{8}$ x 84	224.62

## High Strength/Low Alloy Plates

**ASTM A242 (Corten A)** was the first Corten product manufactured by U.S. Steel. It is normally furnished in plate thicknesses to 1/2" inclusive. The atmospheric corrosion resistance of A242 is four times greater than carbon steel.

**ASTM A572 Grade 50** is a high strength low alloy steel offering a yield strength of 50,000 p.s.i. minimum. This material is both workable and weldable and can provide the designer a choice to reduce weight or size of a structure. Although A572 offers improved yield and tensile properties, its atmospheric corrosion resistance is the same as that of A36 carbon steel.

**ASTM A588 (Corten B)** is available in a greater size range than A242, however, as the thickness increases over 4", the yield begins to decrease. Similar to ASTM A242, the atmospheric corrosion resistance is four times that of plain carbon steel.

### HIGH STRENGTH/LOW ALLOY PLATES

#### HOT ROLLED

#### ASTM A242 • ASTM A572 Grade 50 • ASTM A588

Various grades are available in each thickness.

Please inquire for details

Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.
3/16 x 48	7.66	1/2 x 48	20.42	1 1/2 x 84	61.26
x 60	7.66	x 72	20.42	x 96	61.26
x 72	7.66	x 84	20.42	1 3/4 x 84	71.47
x 84	7.66	x 96	20.42	2 x 84	81.68
x 96	7.66	5/8 x 48	25.53		
1/4 x 48	10.21	x 84	25.53		
x 60	10.21	x 96	25.53		
x 72	10.21	3/4 x 60	30.63		
x 84	10.21	x 72	30.63		
x 96	10.21	x 84	30.63		
5/16 x 48	12.76	x 96	30.63		
x 72	12.76	1 x 72	40.84		
x 84	12.76	x 84	40.84		
x 96	12.76	x 96	40.84		
3/8 x 48	15.32	1 1/4 x 84	51.05		
x 60	15.32	x 85	51.05		
x 72	15.32	1 3/8 x 84	56.16		
x 84	15.32				
x 96	15.32				

## **Abrasion Resistant Steel Plates**

Abrasion Resistant Plates outlast ordinary steel by a wide margin. Produced from fully killed fine-grained steels, AR plates give a more uniform product with higher hardness, greater strength, more toughness and improved service life. They can be machined, drilled, and welded.

Medium Hard Plates have a typical Brinell Hardness ranging from 200 to 250. Sabel Steel Service also offers a Quenched & Tempered Alloy Abrasion Resistant plate, AR 360, with a Brinell Hardness range of 360 to 400.

Abrasion Resistant plates are suggested wherever abrasive materials are handled or resistance to sliding or impact abrasion is required.

**ABRASION RESISTING PLATES**  
**MEDIUM HARD (Brinell Hardness: 200/250)**  
**Chemical Composition**

C	Mn	P	S	Si
.35/.50	1.2/2.0	.050 max.	.055 max.	.10/.35
Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.	
$\frac{3}{16}$ x 48	7.66	$\frac{3}{8}$ x 72	15.32	
x 60	7.66	x 84	15.32	
x 72	7.66	x 96	15.32	
x 84	7.66	$\frac{1}{2}$ x 48	20.42	
x 96	7.66	x 60	20.42	
$\frac{1}{4}$ x 48	10.21	x 72	20.42	
x 60	10.21	x 84	20.42	
x 72	10.21	x 96	20.42	
x 84	10.21	$\frac{5}{8}$ x 84	25.53	
x 96	10.21	$\frac{3}{8}$ x 60	30.63	
$\frac{5}{16}$ x 48	12.76	x 72	30.63	
x 60	12.76	x 84	30.63	
x 72	12.76	x 96	30.63	
x 84	12.76	1    x 96	40.84	
$\frac{3}{8}$ x 48	15.32			
x 60	15.32			

**ABRASION RESISTING PLATES AR360**  
**(Brinell Hardness: 360/400)**  
**Chemical Composition**

C	Mn	P	S	Si	Cr	Mo
.25/.32	.40/.60	.035 Max.	.04 Max.	.20/.35	.80/1.15	.15/.25
Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.			
$\frac{3}{16}$ x 48	7.66	$\frac{3}{8}$ x 72	15.32			
x 60	7.66	x 84	15.32			
x 72	7.66	x 96	15.32			
x 84	7.66	$\frac{1}{2}$ x 48	20.42			
x 96	7.66	x 60	20.42			
$\frac{1}{4}$ x 48	10.21	x 72	20.42			
x 60	10.21	x 84	20.42			
x 72	10.21	x 96	20.42			
x 84	10.21	$\frac{5}{8}$ x 84	25.53			
x 96	10.21	$\frac{3}{8}$ x 60	30.63			
$\frac{5}{16}$ x 48	12.76	x 72	30.63			
x 60	12.76	x 84	30.63			
x 72	12.76	x 96	30.63			
x 84	12.76	1    x 96	40.84			
$\frac{3}{8}$ x 48	15.32					
x 60	15.32					

## **Constructional Alloy Steel Plates**

U.S. Steel's T-1 Series is a low carbon quenched and tempered alloy steel offering high strength and abrasion resistance. Produced to ASTM A514 specifications, T-1 plates offer a yield strength of about 3 times that of structural carbon steel, providing the user with impact abrasion resistance and long term economy.

T-1 Plates are produced to meet either physical specifications, such as Yield Point, Tensile Point, and Elongation, or to meet a specific hardness, such as Brinell Hardness 321 to 381.

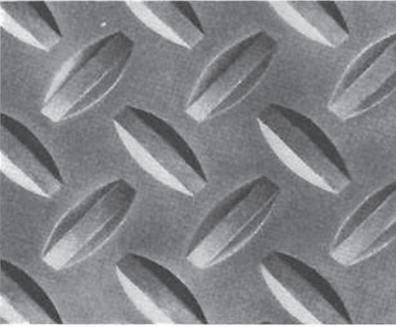
With minimum pre-heating, T-1 plates can be welded satisfactorily by all major welding processes when proper procedures are used.

**ALLOY STEEL PLATES****T-1 321 TO 381 BRINELL HARDNESS****ASTM A-514 Constructional Grade Is Also Available**

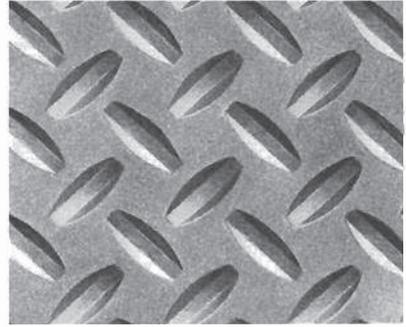
Size in Inches	Wt. per Sq. Ft. in Lbs.	Size in Inches	Wt. per Sq. Ft. in Lbs.
$\frac{3}{16}$ x 72	7.66	$1\frac{3}{4}$ x 72	71.47
x 84	7.66	x 84	71.47
x 96	7.66	x 96	71.47
$\frac{1}{4}$ x 72	10.21	2 x 72	81.68
x 84	10.21	x 84	81.68
x 96	10.21	x 96	81.68
$\frac{5}{16}$ x 72	12.76	$2\frac{1}{4}$ x 84	91.89
x 84	12.76	x 96	91.89
x 96	12.76	$2\frac{1}{2}$ x 84	102.10
$\frac{3}{8}$ x 72	15.32	x 96	102.10
x 84	15.32	$2\frac{3}{4}$ x 84	112.31
x 96	15.32	x 96	112.31
$\frac{1}{2}$ x 72	20.42	3 x 84	122.52
x 84	20.42	x 96	122.52
x 96	20.42	$3\frac{1}{4}$ x 84	132.73
$\frac{5}{8}$ x 72	25.53	x 96	132.73
x 84	25.53	$3\frac{1}{2}$ x 84	142.94
x 96	25.53	x 96	142.94
$\frac{3}{4}$ x 72	30.63	4 x 84	163.36
x 84	30.63	x 96	163.36
x 96	30.63	$4\frac{1}{2}$ x 84	183.78
$\frac{7}{8}$ x 72	35.74	x 96	183.78
x 84	35.74	5 x 84	204.20
x 96	35.74	x 96	204.20
1 x 72	40.84	$5\frac{1}{2}$ x 72	224.62
x 84	40.84	x 84	224.62
x 96	40.84	6 x 72	245.04
$1\frac{1}{4}$ x 72	51.05	x 84	245.04
x 84	51.05	$1\frac{1}{2}$ x 72	61.26
x 96	51.05	x 84	61.26
$1\frac{1}{2}$ x 72	61.26	x 96	61.26

## Hot Rolled Steel Floor Plate

Floor Plate is a commercial quality hot rolled carbon steel plate with a raised lug or diamond pattern which provides excellent traction for both feet and wheels. The lug pattern allows easy drainage and is virtually maintenance free since there are no holes to collect dirt and grease.



**Large Pattern**



**Medium Pattern**

## HOT ROLLED STEEL FLOOR PLATES

All sizes available in Medium Pattern

96" wide, 1/4" and Thicker available in Large Pattern

All Sizes 1/2" and Thicker available in Large Pattern

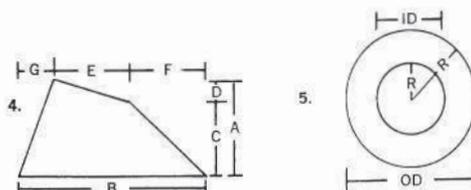
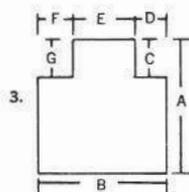
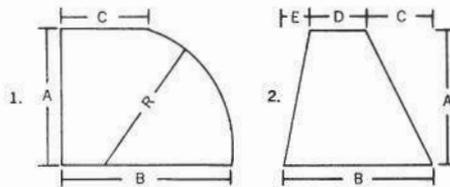
‡Thickness exclusive of projecting lugs.

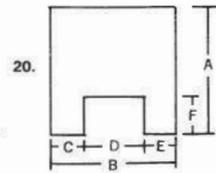
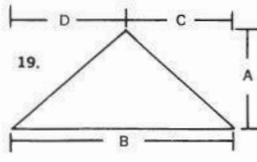
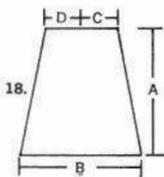
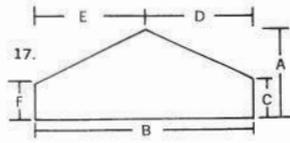
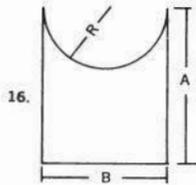
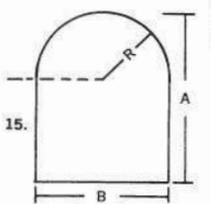
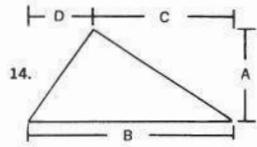
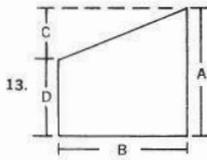
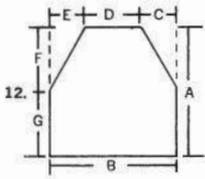
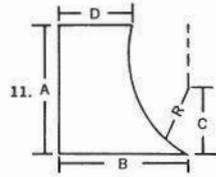
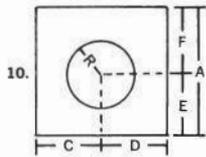
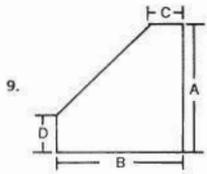
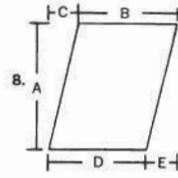
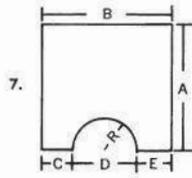
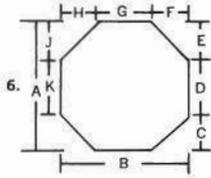
‡Nom. Ga. or Size in Inches	Weight per Ft. in Lbs.	Wt. per Sq. Ft. in Lbs.	‡Nom. Ga. or Size in Inches	Weight per Ft. in Lbs.	Wt. per Sq. Ft. in Lbs.
16 x 48	12.00	3.00	5/16 x 48	55.24	13.81
			x 60	69.05	13.81
14 x 48	15.00	3.75	x 72	82.86	13.81
x 60	18.75	3.75	x 96	110.5	13.81
12 x 48	21.00	5.25	3/8 x 48	65.48	16.37
x 60	26.25	5.25	x 60	81.85	16.37
1/8 x 36	18.48	6.16	x 72	98.22	16.37
x 48	24.64	6.16	x 96	131.0	16.37
x 60	30.80	6.16	1/2 x 48	85.88	21.47
x 72	36.96	6.16	x 60	107.4	21.47
3/16 x 36	26.13	8.71	x 72	128.8	21.47
x 48	34.84	8.71	x 96	171.8	21.47
x 60	43.55	8.71	5/8 x 48	106.3	26.58
x 72	52.26	8.71	x 60	132.9	26.58
x 96	69.68	8.71	x 72	159.5	26.58
1/4 x 48	45.04	11.26	3/4 x 48	126.7	31.68
x 60	56.30	11.26	x 60	158.4	31.68
x 72	67.56	11.26	x 72	190.1	31.68
x 96	90.08	11.26	1 x 72	251.3	41.89

## Flame Cut Plates — Order Shape By Number

Sabel's new Multi-Headed Plate Burning Machine can produce plates to practically any shape, size or thickness. It can produce one piece or one hundred pieces identical in size and shape. A sketch or blueprint clearly marked is all we need. Commonly used shapes (shown below by figure number) can be ordered by number – **you simply supply the required dimensions**. Straight shearing too can be ordered by phone. Call us for a quotation!

Call us for a quotation!





# INDEX

## Sheets

	PAGE
Hot Rolled, Commercial Quality .....	3.1
Cold Rolled, Commercial Quality .....	3.3
Galvanized, Commercial Quality .....	3.7



## Hot Rolled Sheet

**ASTM A569 Hot Rolled Commercial Quality** is a low carbon, relatively inexpensive steel sheet. It is soft enough to bend flat upon itself in any desired direction without cracking. It is also ductile enough to permit shallow drawing. Maximum carbon content is 0.15%, making these sheets suitable for welding and forming.

This product is frequently used in applications where the presence of oxide coating and normal surface defects are not objectionable.

### Chemical Requirements

Element	Composition, percent
Carbon, max .....	0.15
Manganese, max .....	0.60
Phosphorus, max .....	0.035
Sulfur, max .....	0.040
Copper, when specified, min .....	0.20

## HOT ROLLED SHEETS

### Commercial Quality A-569

Nominal Gauge	Theoretical Wt. Per Sq. Ft.	Nominal Gauge	Theoretical Wt. Per Sq. Ft.
7 GA.	7.5 Lbs.	12 GA.	4.375 Lbs.
10 GA.	5.625 Lbs.	14 GA.	3.125 Lbs.
11 GA.	5.0 Lbs.	16 GA.	2.5 Lbs.

Size (Inches)	Weight Per Sheet	Size (Inches)	Weight Per Sheet
7GAx48x 96	240.0 (Lbs.)	14GAx36x144	112.5 (Lbs.)
x48x120	300.0	x48x 96	100.0
x48x144	360.0	x48x120	125.0
x48x240	600.0	x48x144	150.0
x60x120	375.0	x60x120	156.25
x60x240	750.0	x60x144	187.5
x72x120	450.0	x72x120	187.5
x72x144	540.0	x72x144	225.0
x72x240	900.0		
		16GAx36x120	75.0 (Lbs.)
10GAx48x 96	180.0 (Lbs.)	x48x120	100.0
x48x120	225.0	x48x144	120.0
x48x144	270.0	x60x 96	100.0
x60x120	281.3	x60x120	125.0
x72x120	337.5	x60x144	150.0
x72x144	405.0		
x72x240	675.0		
11GAx48x 96	160.0 (Lbs.)		
x48x120	200.0		
x48x144	240.0		
x60x120	250.0		
x72x120	300.0		
x72x144	360.0		
x72x240	600.0		
12GAx48x 96	140.0 (Lbs.)		
x48x120	175.0		
x48x144	210.0		
x60x120	218.8		
x72x120	262.5		
x72x144	315.0		
x72x240	525.0		

## Cold Rolled Sheet

**ASTM A366** is a low carbon, commercial quality cold rolled sheet. It possesses a surface finish that is superior to a hot rolled pickled finish and is suitable for use in exposed areas requiring a good surface finish. The matte finish surface texture makes this product suitable for the application of various organic finishes such as paints, enamels or lacquers. This material is not especially suitable for electroplating where unusual surface smoothness or freedom from surface imperfections in the finished product is essential. A light oil helps protect the surface from rust.

**ASTM A366 Cold Rolled Sheets** are soft enough to bend flat upon themselves in any direction at room temperature. They are also ductile enough for many moderate drawing applications. Maximum carbon content is 0.15%, making these sheets suitable for welding and forming.

### Chemical Requirements

Element	Composition, percent
Carbon, max .....	0.15
Manganese, max .....	0.60
Phosphorus, max .....	0.035
Sulfur, max .....	0.040
Copper, when specified, min .....	0.20

## COLD ROLLED SHEETS

### ASTM A366

Ga.	Size	Decimal	Est. Wt.	Est. Wt.	Ga.	Size	Decimal	Est. Wt.	Est. Wt.	
or	In	In	per Sq. Ft.	per Sheet	or	In	In	per Sq. Ft.	per Sheet	
Decimal	Inches	Inches	In Lbs.	In Lbs.	Decimal	Inches	Inches	In Lbs.	In Lbs.	
10	36x 96	.1345	5.63	135.0	16	30x 96	.0598	2.50	40.0	
	36x120	.1345	5.63	168.8		36x 96	.0598	2.50	60.0	
	48x 96	.1345	5.63	180.0		36x120	.0598	2.50	75.0	
	48x120	.1345	5.63	225.0		36x144	.0598	2.50	90.0	
11	36x 96	.1196	5.00	120.0	18	42x120	.0598	2.50	87.5	
	36x120	.1196	5.00	150.0		48x 60	.0598	2.50	50.0	
	48x 96	.1196	5.00	160.0		48x 96	.0598	2.50	80.0	
	48x120	.1196	5.00	200.0		48x120	.0598	2.50	100.0	
	48x144	.1196	5.00	240.0		48x144	.0598	2.50	120.0	
	60x120	.1196	5.00	250.0		60x 96	.0598	2.50	100.0	
12	36x 96	.1046	4.38	105.0	20	60x120	.0598	2.50	125.0	
	36x120	.1046	4.38	131.3		60x144	.0598	2.50	150.0	
	42x120	.1046	4.38	153.1		72x120	.0598	2.50	150.0	
	48x 96	.1046	4.38	140.0		72x144	.0598	2.50	180.0	
	48x120	.1046	4.38	175.0		18	36x 96	.0478	2.00	48.0
	60x 96	.1046	4.38	175.0			36x120	.0478	2.00	60.0
	60x120	.1046	4.38	218.8			36x144	.0478	2.00	72.0
	60x144	.1046	4.38	262.5			48x 96	.0478	2.00	64.0
13	36x 96	.0897	3.75	90.0	20	48x120	.0478	2.00	80.0	
	36x120	.0897	3.75	112.5		48x144	.0478	2.00	96.0	
	48x 96	.0897	3.75	120.0		60x 96	.0478	2.00	80.0	
	48x120	.0897	3.75	150.0		60x120	.0478	2.00	100.0	
14	30x 96	.0747	3.13	62.5	20	30x 96	.0359	1.50	30.0	
	36x 96	.0747	3.13	75.0		30x120	.0359	1.50	37.5	
	36x120	.0747	3.13	93.8		30x144	.0359	1.50	45.0	
	36x144	.0747	3.13	112.5		36x 96	.0359	1.50	36.0	
	48x 96	.0747	3.13	100.0		36x120	.0359	1.50	45.0	
	48x120	.0747	3.13	125.0		36x144	.0359	1.50	54.0	
	48x144	.0747	3.13	150.0		48x 96	.0359	1.50	48.0	
	60x 96	.0747	3.13	125.0		48x120	.0359	1.50	60.0	
	60x120	.0747	3.13	156.3		48x144	.0359	1.50	72.0	
	60x144	.0747	3.13	187.5		60x120	.0359	1.50	75.0	
					60x144	.0359	1.50	90.0		

## COLD ROLLED SHEETS

### ASTM A366

Ga. or Decimal	Size In Inches	Decimal In Inches	Est. Wt. per Sq. Ft. In Lbs.	Est. Wt. per Sheet In Lbs.
22	36x 96	.0299	1.25	30.0
	36x120	.0299	1.25	37.5
	48x 96	.0299	1.25	40.0
	48x120	.0299	1.25	50.0
	60x120	.0299	1.25	62.5
24	36x 96	.0239	1.00	24.0
	36x120	.0239	1.00	30.0
	48x 96	.0239	1.00	32.0
	48x120	.0239	1.00	40.0
26	36x 96	.0179	.750	18.0
	36x120	.0179	.750	22.5
	48x 96	.0179	.750	24.0
	48x120	.0179	.750	30.0
28	36x 96	.0179	.750	15.0

## GALVANIZED SHEET

Galvanized Sheets are zinc-coated on continuous lines by a hot-dip procedure in accordance to ASTM A525. The uniform coating of zinc protects the base metal from corrosion. The sheets are normally furnished with a G90 coating class (1.25 oz. zinc per square foot). A G60 coating class (.6 to .7 oz. zinc per square foot) is also available.

Galvanized sheets produced to ASTM A526 specifications are Commercial Quality and intended for uses involving simple bending or moderate forming.

ASTM A527 specification covers galvanized sheets of Lock-Forming quality. These sheets are suitable for fabrication where they are subjected to machine lock forming. Lock-Forming Quality sheets can withstand the severity imposed by high speed machine forming.

### Chemical Requirements

Element	Composition, percent
Carbon, max .....	0.15
Manganese, max .....	0.60
Phosphorus, max .....	0.035
Sulfur, max .....	0.040
Copper, when copper steel is specified, min. ....	0.20

# GALVANIZED SHEETS

**ASTM A526 13 Ga and heavier**

**ASTM A527 14 Ga and lighter**

Ga. or Decimal	Size In Inches	Decimal In Inches	Est. Wt. per Sq. Ft. In Lbs.	Est. Wt. per Sheet In Lbs.	Ga. or Decimal	Size In Inches	Decimal In Inches	Est. Wt. per Sq. Ft. In Lbs.	Est. Wt. per Sheet In Lbs.
10	36x120	.1382	5.78	173.4	18	36x 96	.0516	2.16	51.7
	48x 96	.1382	5.78	185.0		36x120	.0516	2.16	64.7
	48x120	.1382	5.78	231.2		48x 96	.0516	2.16	69.0
	48x144	.1382	5.78	277.5		48x120	.0516	2.16	86.2
	60x120	.1382	5.78	289.1		48x144	.0516	2.16	103.5
11	48x 96	.1233	5.16	165.0		60x120	.0516	2.16	107.8
	48x120	.1233	5.16	206.2	20	36x 96	.0396	1.66	39.7
12	36x 96	.1084	4.53	108.7		36x120	.0396	1.66	49.7
	36x120	.1084	4.53	135.9		36x144	.0396	1.66	59.6
	48x 96	.1084	4.53	145.0		48x 96	.0396	1.66	53.0
	48x120	.1084	4.53	181.2		48x120	.0396	1.66	66.2
	48x144	.1084	4.53	217.5	22	36x 96	.0336	1.41	33.7
	60x120	.1084	4.53	226.6		36x120	.0336	1.41	42.2
	60x144	.1084	4.53	271.9		48x 96	.0336	1.41	45.0
14	36x 96	.0785	3.28	78.7		48x120	.0336	1.41	56.2
	36x120	.0785	3.28	98.4	24	36x 96	.0276	1.16	27.7
	48x 96	.0785	3.28	105.0		36x120	.0276	1.16	34.7
	48x120	.0785	3.28	131.2		36x144	.0276	1.16	41.6
	48x144	.0785	3.28	157.5		48x 96	.0276	1.16	37.0
	60x120	.0785	3.28	164.1		48x120	.0276	1.16	46.2
	60x144	.0785	3.28	196.9	26	30x 96	.0217	.906	18.1
16	36x 96	.0635	2.66	63.7		36x 96	.0217	.906	21.7
	36x120	.0635	2.66	79.7		36x120	.0217	.906	27.2
	48x 96	.0635	2.66	85.0		48x 96	.0217	.906	29.0
	48x120	.0635	2.66	106.2	28	48x120	.0217	.906	36.2
	48x136	.0635	2.66	120.4		36x 96	.0187	.781	18.7
	48x144	.0635	2.66	127.5		36x120	.0187	.781	23.4
	60x120	.0635	2.66	132.8	30	48x 96	.0187	.781	25.0
						48x120	.0187	.781	31.2
						30x 96	.0157	.656	15.7



# INDEX

## Expanded Metal

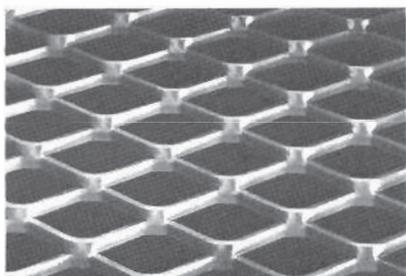
	PAGE
Expanded Metal Sheets .....	4.1
Expanded Metal Grating .....	4.4
Welded Steel Grating .....	4.5
Deck Span .....	4.7



## Expanded Metal

Expanded Metal is manufactured from solid sheets of steel by slitting and expanding them to produce an open diamond pattern. Although they weigh only a fraction of the solid sheet, the expanded sheet maintains considerable strength and rigidity. The strands of Standard Pattern Expanded Metal are set at a sharp angle to the plane of the sheet, thus providing a skid resistant surface. The Flattened Pattern Expanded Metal has been passed through flattening rolls which turn the strands and intersections into a flat smooth surface. This cold rolling operation slightly reduces the thickness of the sheet without noticeably affecting the strength. This pattern is excellent for uses requiring a smooth surface for sliding or placing objects without the risk of tipping.

Benefits of using Expanded Metal Sheets include its light weight, fabrication simplicity, and free passage of air, light, and liquids. This material has numerous applications, including shelving, machinery guards, window guards, walkways, and partitions.



Standard



Flattened

## EXPANDED METAL

Long way of diamond runs parallel to length of sheet.

### Sizes in Stock

Style Designation	Width in Inches	Length in Inches	Est. Wt. per Sq. Ft. in Lbs.	Est. Wt. per Sheet in Lbs.
<b>STANDARD</b>				
¼ No. 18	48	96	1.14	36.48
½ No. 18	48	96	0.70	22.40
½ No. 18	72	96	0.70	33.60
½ No. 16	48	96	0.86	27.52
½ No. 13	48	96	1.47	47.04
¾ No. 16	48	96	0.54	17.28
¾ No. 16	72	96	0.54	17.28
¾ No. 13	48	96	0.80	25.60
¾ No. 13	48	120	0.80	32.00
¾ No. 13	72	96	0.80	38.40
¾ No. 10	48	96	1.20	38.40
¾ No. 9	48	96	1.80	57.60
¾ No. 9	48	120	1.80	72.00
1½ No. 13	48	96	0.60	19.20
1½ No. 13	48	120	0.60	24.00
1½ No. 13	72	96	0.60	28.80
1½ No. 10	48	96	0.79	25.28
1½ No. 10	72	96	0.79	37.92
1½ No. 9	48	96	1.20	38.40
1½ No. 9	48	120	1.20	48.00
1½ No. 9	72	96	1.20	57.60
1½ No. 6	48	96	2.50	80.00

## EXPANDED METAL

**Long way of diamond runs parallel to length of sheet.**

### Sizes in Stock

Style Designation	Width in Inches	Length in Inches	Est. Wt. per Sq. Ft. in Lbs.	Est. Wt. per Sheet in Lbs.
<b>FLATTENED</b>				
¼ No. 20	48	96	0.82	26.24
¼ No. 18	48	96	1.08	34.56
½ No. 20	48	96	0.40	12.80
½ No. 18	36	96	0.66	15.84
½ No. 18	48	96	0.66	21.12
½ No. 16	36	96	0.82	19.68
½ No. 16	36	120	0.82	24.60
½ No. 16	48	96	0.82	26.24
½ No. 16	48	120	0.82	32.80
½ No. 13	48	96	1.40	44.80
½ No. 13	48	120	1.40	56.00
¾ No. 16	36	96	0.51	12.24
¾ No. 16	48	96	0.51	16.32
¾ No. 14	36	96	0.63	15.12
¾ No. 14	36	120	0.63	18.90
¾ No. 14	48	96	0.63	20.16
¾ No. 14	48	120	0.63	25.20
¾ No. 13	36	120	0.75	22.50
¾ No. 13	48	96	0.75	24.00
¾ No. 13	48	120	0.75	30.00
¾ No. 13	72	120	0.75	45.00
¾ No. 9	36	96	1.71	41.04
¾ No. 9	36	120	1.71	51.30
¾ No. 9	48	96	1.71	54.72
¾ No. 9	48	120	1.71	68.40
¾ No. 9	72	120	1.71	102.60
1½ No. 16	48	96	0.38	12.16
1½ No. 14	48	96	0.46	14.72
1½ No. 13	48	96	0.57	18.24
1½ No. 9	36	96	1.14	27.36
1½ No. 9	36	120	1.14	34.20
1½ No. 9	48	96	1.14	36.48

## Expanded Metal Grating

Expanded Metal Grating is a heavy duty expanded metal with an open mesh produced from either plate or sheet. Produced from a single piece of steel. These sheets are structurally stronger and lighter than the original sheet or plate. Expanded Metal Grating was designed to serve as an open flooring for industrial applications. The open area permits easy drainage of liquids while maintaining slip-resistance for additional safety.

### EXPANDED METAL GRATING

#### Sizes in Stock/Lengths

Size in Inches	Weight per Sq. Ft. in Lbs.	Size in Inches	Weight per Sq. Ft. in Lbs.
3.0 x48	3.000	4.27x48	4.270
72	3.000	72	4.270
3.14x48	3.140	5.0 x48	5.000
72	3.140	60	5.000
4.0 x24	4.000	72	5.000
48	4.000	6.25x48	6.250
60	4.000	72	6.250
72	4.000		

### STANDARD LOAD TABLE

Concentrated Load		Appropriate Styles for Clear Spans						
		24"	30"	36"	42"	48"	54"	60"
50 Lb.	Light or Occasional Pedestrian Traffic	3.0	3.0	3.0	3.0	4.0	5.0	6.25
		3.14	3.14	3.14	3.14	4.27	6.25	7.00
100 Lb.	Normal or Frequent Pedestrian Traffic	3.0	3.0	3.0	4.0	5.0	7.0	7.0
		3.14	3.14	3.14	4.27	6.25		
150 Lb.	Heavy or Constant Pedestrian Traffic	3.0	3.0	5.0	5.0	7.0	7.0	
		3.14	3.14	6.25	6.25			
200 Lb.	Pedestrian Traffic with Light Equipment	3.0	4.0	5.0	6.25	7.0		
		3.14	4.27	6.25	7.00			
250 Lb.		3.0	4.0	6.25	7.00			
		3.14	4.27	7.00				
300 Lb.		4.0	5.0	7.0				
		4.27	6.25					
350 Lb.		4.0	6.25	7.0				
		4.27	7.0					

## WELDED STEEL GRATING

Welded Steel Grating is an open steel flooring produced with square-edge strips for safety. This design features a non-slip surface while permitting light and air to pass through. This rigid and strong flooring is manufactured in several types, including Standard Welded, Heavy Welded, and Serrated. Stock panels are available in 24'' and 36'' widths. Standard stock is normally painted black, but can be furnished unpainted or galvanized upon request.

	STANDARD B. B.		CLOSE B. B.	
	W194	W192	W154	W152
TOP VIEW				
BEARING BARS C TO C	1 <sup>9</sup> / <sub>16</sub> ''	1 <sup>9</sup> / <sub>16</sub> ''	1 <sup>5</sup> / <sub>16</sub> ''	1 <sup>5</sup> / <sub>16</sub> ''
CROSS BARS C TO C	4''	2''	4''	2''
SPECIFY FOR:	General Duty Applications	Smaller Openings	Heavier Loads, Smaller Openings	Heaviest Loads, Smallest Openings

### WEIGHT IN LBS. PER SQ. FT.

Bearing Bars	Cross Bars	Type W194	Type W192	Type W154	Type W152
3/4 x 1/8	1/4	3.99	4.63	4.95	5.59
3/4 x 3/16	1/4	5.67	6.31	7.11	7.75
1 x 1/8	1/4	5.15	5.79	6.44	7.08
1 x 3/16	1/4	7.35	7.99	9.27	9.91
1 1/4 x 1/8	1/4	6.20	6.84	7.79	8.43
1 1/4 x 3/16	1/4	9.03	9.67	11.43	12.07
1 1/2 x 1/8	1/4	7.35	7.99	9.27	9.91
1 1/2 x 3/16	5/16	10.94	11.80	13.82	14.68
1 3/4 x 3/16	5/16	12.62	13.48	15.98	16.84
2 x 3/16	5/16	14.30	15.16	18.14	19.00
2 1/4 x 3/16	5/16	15.97	16.83	19.71	20.57

## WELDED STEEL GRATING

Bearing bars and cross bars are joined by forge-welding procedures using electric current, pressure, and controlled heat. This process produces a strong, one-piece product suitable for use in constructing walkways, decks, floors, catwalks, etc.

### Sizes in Stock/Stock Lengths: 240'' and 288''

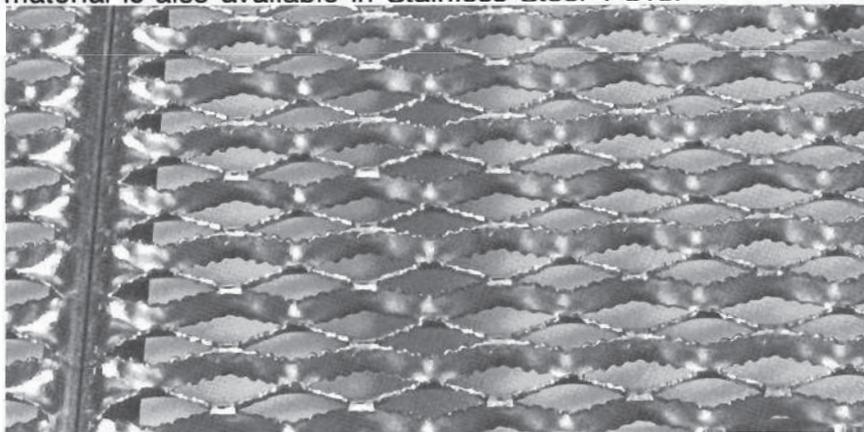
Size of Bearing Bar x Width	Weight per Sq. Ft. in Lbs.	Unpainted & Untrimmed W194	Painted & Untrimmed W194
3/4 x 1/8 x 36	3.99	X	
1 x 1/8 x 24	5.15	X	X
1 x 1/8 x 36	5.15	X	X
1 x 3/16 x 24	7.35	X	X
1 x 3/16 x 36	7.35	X	X
1 1/4 x 1/8 x 24	6.20	X	X
1 1/4 x 1/8 x 36	6.20	X	X
1 1/4 x 3/16 x 24	9.03	X	X
1 1/4 x 3/16 x 36	9.03	X	X
1 1/2 x 1/8 x 24	7.35	X	
1 1/2 x 1/8 x 36	7.35	X	
1 1/2 x 3/16 x 24	10.94	X	X
1 1/2 x 3/16 x 36	10.94	X	X
1 3/4 x 3/16 x 24	12.62	X	X
1 3/4 x 3/16 x 36	12.62	X	
2 x 3/16 x 24	14.30	X	
2 x 3/16 x 36	14.30	X	

### WIDTH OF PANELS

No. Bear- ing Bars	Bearing Bar Thickness in Inches				No. Bear- ing Bars	Bearing Bar Thickness in Inches			
	Type W194 and W192		Type W154 and W152			Type W194 and W192		Type W154 and W152	
	3/16	1/8	3/16	1/8		3/16	1/8	3/16	1/8
5	4 <sup>15</sup> / <sub>16</sub>	4 <sup>7</sup> / <sub>8</sub>			23	26 <sup>9</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>4</sub>	20 <sup>13</sup> / <sub>16</sub>	20 <sup>3</sup> / <sub>4</sub>
6	6 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>16</sub>			24	27 <sup>1</sup> / <sub>2</sub>	27 <sup>7</sup> / <sub>16</sub>	21 <sup>3</sup> / <sub>4</sub>	21 <sup>11</sup> / <sub>16</sub>
7	7 <sup>9</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>4</sub>			25	28 <sup>11</sup> / <sub>16</sub>	28 <sup>5</sup> / <sub>8</sub>	22 <sup>11</sup> / <sub>16</sub>	22 <sup>5</sup> / <sub>8</sub>
8	8 <sup>1</sup> / <sub>2</sub>	8 <sup>7</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>	6 <sup>11</sup> / <sub>16</sub>	26	29 <sup>7</sup> / <sub>8</sub>	29 <sup>13</sup> / <sub>16</sub>	23 <sup>5</sup> / <sub>8</sub>	23 <sup>9</sup> / <sub>16</sub>
9	9 <sup>11</sup> / <sub>16</sub>	9 <sup>5</sup> / <sub>8</sub>	7 <sup>11</sup> / <sub>16</sub>	7 <sup>9</sup> / <sub>8</sub>	27	31 <sup>1</sup> / <sub>16</sub>	31	24 <sup>9</sup> / <sub>16</sub>	24 <sup>1</sup> / <sub>2</sub>
10	10 <sup>7</sup> / <sub>8</sub>	10 <sup>13</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>8</sub>	8 <sup>9</sup> / <sub>16</sub>	28	32 <sup>1</sup> / <sub>4</sub>	32 <sup>9</sup> / <sub>16</sub>	25 <sup>1</sup> / <sub>2</sub>	25 <sup>7</sup> / <sub>16</sub>
11	12 <sup>1</sup> / <sub>16</sub>	12	9 <sup>9</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	29	33 <sup>7</sup> / <sub>16</sub>	33 <sup>3</sup> / <sub>8</sub>	26 <sup>7</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>8</sub>
12	13 <sup>1</sup> / <sub>4</sub>	13 <sup>9</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>2</sub>	10 <sup>7</sup> / <sub>16</sub>	30	34 <sup>5</sup> / <sub>8</sub>	34 <sup>9</sup> / <sub>16</sub>	27 <sup>3</sup> / <sub>8</sub>	27 <sup>9</sup> / <sub>16</sub>
13	14 <sup>7</sup> / <sub>16</sub>	14 <sup>3</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>8</sub>	31	35 <sup>13</sup> / <sub>16</sub>	35 <sup>3</sup> / <sub>4</sub>	28 <sup>5</sup> / <sub>16</sub>	28 <sup>1</sup> / <sub>4</sub>
14	15 <sup>5</sup> / <sub>8</sub>	15 <sup>9</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	12 <sup>9</sup> / <sub>16</sub>	32			29 <sup>1</sup> / <sub>4</sub>	29 <sup>9</sup> / <sub>16</sub>
15	16 <sup>13</sup> / <sub>16</sub>	16 <sup>3</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>16</sub>	13 <sup>1</sup> / <sub>4</sub>	33			30 <sup>3</sup> / <sub>16</sub>	30 <sup>3</sup> / <sub>8</sub>
16	18	17 <sup>15</sup> / <sub>16</sub>	14 <sup>1</sup> / <sub>4</sub>	14 <sup>9</sup> / <sub>16</sub>	34			31 <sup>1</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>16</sub>
17	19 <sup>9</sup> / <sub>16</sub>	19 <sup>1</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>16</sub>	15 <sup>1</sup> / <sub>8</sub>	35			32 <sup>1</sup> / <sub>16</sub>	32
18	20 <sup>3</sup> / <sub>8</sub>	20 <sup>9</sup> / <sub>16</sub>	16 <sup>1</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>16</sub>	36			33	32 <sup>15</sup> / <sub>16</sub>
19	21 <sup>9</sup> / <sub>16</sub>	21 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>16</sub>	17	37			33 <sup>15</sup> / <sub>16</sub>	33 <sup>7</sup> / <sub>8</sub>
20	22 <sup>3</sup> / <sub>4</sub>	22 <sup>11</sup> / <sub>16</sub>	18	17 <sup>15</sup> / <sub>16</sub>	38			34 <sup>7</sup> / <sub>8</sub>	34 <sup>13</sup> / <sub>16</sub>
21	23 <sup>15</sup> / <sub>16</sub>	23 <sup>7</sup> / <sub>8</sub>	18 <sup>15</sup> / <sub>16</sub>	18 <sup>7</sup> / <sub>8</sub>	39			35 <sup>13</sup> / <sub>16</sub>	35 <sup>3</sup> / <sub>4</sub>
22	25 <sup>1</sup> / <sub>8</sub>	25 <sup>1</sup> / <sub>16</sub>	19 <sup>7</sup> / <sub>8</sub>	19 <sup>13</sup> / <sub>16</sub>					

## Deck Span® and Grip Strut®

Deck Span® and Grip Strut® safety grating and stair treads provide an excellent alternative where slip-resistant surfaces are necessary. The open diamond pattern and serrated surface results in a design offering both light weight and strength. This design is maintenance-free permitting easy drainage of liquids, oil, grease and mud. Light weight panels increase the ease of installation. They can be quickly bolted, clamped or welded into place or fabricated to meet nearly any condition. While Galvanized and Aluminum are the most frequently ordered, this material is also available in Stainless Steel T-316.



### Serrated

#### Sizes in Stock/Stock Lengths: 10 and 12 Ft.

Gauge x Width x Length	Weight per Lineal Ft. in Lbs.	Deck Span Pre-Galvanized G-90	Deck Span Aluminum 5052-H32
14Ga x 4¾ x 1½	2.300	X	
14Ga x 7 x 1½	3.000	X	
14Ga x 9½ x 1½	3.600	X	
14Ga x 11¾ x 1½	4.200	X	
14Ga x 18¾ x 1½	6.100	X	
.080 x 4¾ x 2	.900		X
.080 x 7 x 2	1.200		X
.080 x 9½ x 2	1.400		X
.080 x 11¾ x 2	1.600		X
12Ga x 4¾ x 1½	3.200	X	
12Ga x 7 x 1½	4.100	X	
12Ga x 9½ x 1½	5.000	X	
12Ga x 11¾ x 1½	5.900	X	



# INDEX

## Hot Rolled Bars

	PAGE
Carbon Strip, commercial quality	5.1
Carbon Flat	5.2
Carbon Round	5.3
Carbon Square	5.4
Reinforcing, Concrete	5.5
Alloy Rounds	5.7



# HOT ROLLED STRIP - COMMERCIAL QUALITY

Commercial Quality Strip is produced in  $\frac{1}{8}$ " and  $\frac{3}{16}$ " thicknesses with either a rounded or mill edge. These strips are suitable for general purposes where the presence of normal surface imperfections are not objectionable. They can withstand flat bends in any direction at room temperature. Commercial Quality is normally furnished to a maximum carbon content of 0.15%.

## CARBON STRIP — HOT ROLLED

COMMERCIAL QUALITY — LOW CARBON

STOCK LENGTHS: 20'

Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar
$\frac{1}{8}$ X $\frac{1}{2}$	0.213	4.26
$\frac{5}{8}$	0.266	5.32
$\frac{3}{4}$	0.319	6.38
$\frac{7}{8}$	0.372	7.44
1	0.425	8.50
$1\frac{1}{4}$	0.531	10.62
$1\frac{1}{2}$	0.638	12.76
$1\frac{3}{4}$	0.744	14.88
2	0.850	17.00
$2\frac{1}{4}$	0.956	19.12
$2\frac{1}{2}$	1.063	21.26
3	1.275	25.50
$3\frac{1}{2}$	1.490	29.80
4	1.700	34.00
5	2.130	42.60
6	2.550	51.00
$\frac{3}{16}$ X $\frac{1}{2}$	0.319	6.38
$\frac{5}{8}$	0.398	7.96
$\frac{3}{4}$	0.478	9.56
$\frac{7}{8}$	0.558	11.16
1	0.638	12.76
$1\frac{1}{4}$	0.797	15.94
$1\frac{1}{2}$	0.956	19.12
$1\frac{3}{4}$	1.120	22.40
2	1.280	25.60
$2\frac{1}{4}$	1.430	28.60
$2\frac{1}{2}$	1.590	31.80
3	1.910	38.20
$3\frac{1}{2}$	2.230	44.60
4	2.550	51.00
5	3.190	63.80
6	3.830	76.60

## HOT ROLLED CARBON STEEL BARS

Flat bars, Round bars, and Square bars are available to ASTM A36 specifications. These carbon steel bars are intended for structural applications where minimum physical properties of 36,000 psi yield strength and 58,000 psi tensile strength are required.

### CARBON FLAT BARS — HOT ROLLED

STOCK LENGTHS 20'

Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar	Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar
1/4 x 1/2	0.425	8.50	2 1/2	3.190	63.80
5/8	0.531	10.62	2 3/4	3.510	70.20
3/4	0.638	12.76	3	3.830	76.60
1	0.850	17.00	3 1/2	4.460	89.20
1 1/4	1.060	21.20	4	5.100	102.00
1 1/2	1.280	25.60	4 1/2	5.740	114.80
1 3/4	1.490	29.80	5	6.380	127.60
2	1.700	34.00	6	7.650	153.00
2 1/4	1.910	38.20	7	8.930	178.60
2 1/2	2.130	42.60	8	10.200	204.00
3	2.550	51.00	1/2 x 3/4	1.28	25.60
3 1/2	2.980	59.60	1	1.70	34.00
4	3.400	68.00	1 1/4	2.13	42.60
4 1/2	3.830	76.60	1 1/2	2.55	51.00
5	4.250	85.00	1 3/4	2.98	59.60
5 1/2	4.680	93.60	2	3.40	68.00
6	5.100	102.00	2 1/4	3.83	76.60
7	5.950	119.00	2 1/2	4.25	85.00
8	6.800	136.00	3	5.10	102.00
5/16 x 1	1.060	21.20	3 1/2	5.95	119.00
1 1/4	1.330	26.60	4	6.80	136.00
1 1/2	1.590	31.80	4 1/2	7.65	153.00
1 3/4	1.860	37.20	5	8.50	170.00
2	2.130	42.60	5 1/2	9.35	187.00
2 1/4	2.390	47.80	6	10.20	204.00
2 1/2	2.660	53.20	7	11.90	238.00
3	3.190	63.80	8	13.60	272.00
3 1/2	3.720	74.40	5/8 x 1	2.13	42.60
4	4.250	85.00	1 1/2	3.19	63.80
5	5.310	106.20	1 3/4	3.72	74.40
5 1/2	5.840	116.80	2	4.25	85.00
6	6.380	127.60	2 1/2	5.31	106.20
3/8 x 3/4	0.956	19.12	2 3/4	5.84	116.80
1	1.280	25.60	3	6.38	127.60
1 1/4	1.590	31.80	3 1/2	7.44	148.80
1 1/2	1.910	38.20	4	8.50	170.00
1 3/4	2.230	44.60	4 1/2	9.56	191.20
2	2.550	51.00	5	10.63	212.60
2 1/4	2.870	57.40	6	12.75	255.00

## CARBON FLAT BARS — HOT ROLLED

STOCK LENGTHS: 20'

Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar	Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar
5/8 x 7	14.88	297.60	1 1/2 x 2	10.20	204.00
8	17.00	340.00	2 1/2	12.75	255.00
3/4 x 1	2.55	51.00	3	15.30	306.00
1 1/4	3.19	63.80	4	20.40	408.00
1 1/2	3.83	76.60	5	25.50	510.00
1 3/4	4.46	89.20	6	30.60	612.00
2	5.10	102.00	8	40.80	816.00
2 1/2	6.38	127.60	1 3/4 x 2	11.90	238.00
3	7.65	153.00	4	23.80	476.00
3 1/2	8.93	178.60	2 x 2 1/2	17.00	340.00
4	10.20	204.00	3	20.40	408.00
4 1/2	11.48	229.60	4	27.20	544.00
5	12.75	255.00	5	34.00	680.00
6	15.30	306.00	6	40.80	816.00
7	17.85	357.00	8	54.40	1088.00
8	20.40	408.00			
7/8 x 1 1/2	4.46	89.20			
2	5.95	119.00			
2 1/2	7.44	148.80			
3	8.93	178.30			
4	11.90	238.00			
5	14.88	297.60			
6	17.85	357.00			
8	23.80	476.00			
1 x 1 1/4	4.25	85.00			
1 1/2	5.10	102.00			
1 3/4	5.95	119.00			
2	6.80	136.00			
2 1/2	8.50	170.00			
3	10.20	204.00			
3 1/2	11.90	238.00			
4	13.60	272.00			
4 1/2	15.30	306.00			
5	17.00	340.00			
6	20.40	408.00			
7	23.80	476.00			
8	27.20	544.00			
1 1/4 x 1 1/2	6.38	127.60			
2	8.50	170.00			
2 1/2	10.63	212.60			
3	12.75	255.00			
3 1/2	14.88	297.60			
4	17.00	340.00			
5	21.25	425.00			
6	25.50	510.00			

## CARBON ROUND BARS — HOT ROLLED

STOCK LENGTHS 20' INDUSTRIAL QUALITY AND ASTM A36

Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar	Size in Inches	Weight Per Foot Pounds	Weight Per 20' Bar
1/4"	.167	3.34	2 3/4"	20.19	403.8
5/16"	.261	5.22	2 7/8"	22.07	441.4
3/8"	.376	7.52	3"	24.03	480.6
7/16"	.511	10.22	3 1/4"	28.21	564.2
1/2"	.668	13.36	3 1/2"	32.71	654.2
9/16"	.845	16.90	3 3/4"	37.55	751.0
5/8"	1.040	20.80	4"	42.73	854.6
3/4"	1.500	30.00	4 1/4"	48.23	964.6
7/8"	2.040	40.80	4 1/2"	54.08	1081.6
1"	2.670	53.40	4 3/4"	60.25	1205.0
1 1/8"	3.380	67.60	5"	66.76	1335.0
1 1/4"	4.170	83.40	5 1/4"	73.60	1472.0
1 3/8"	5.050	101.00	5 1/2"	80.78	1615.6
1 1/2"	6.010	120.20	5 3/4"	88.29	1765.8
1 5/8"	7.050	141.00	6"	96.13	1922.6
1 3/4"	8.180	163.60	6 1/4"	104.31	2086.2
1 7/8"	9.390	187.80	6 1/2"	112.80	2256.0
2"	10.680	213.60	7"	130.90	2618.0
2 1/8"	12.060	241.20	7 1/2"	150.20	3004.0
2 1/4"	13.520	270.40	8"	170.90	3418.0
2 3/8"	15.060	301.20	9"	216.30	4326.0
2 1/2"	16.690	333.80	9 1/4"	228.48	4569.6
			9 1/2"	241.00	4820.0

## CARBON SQUARE BARS — HOT ROLLED

STOCK LENGTHS 20'

1/4"	.213	4.26	1 1/2"	7.65	153.00
5/16"	.332	6.64	1 3/4"	10.41	208.20
3/8"	.478	9.56	2"	13.60	272.00
7/16"	.651	13.02	2 1/4"	17.21	344.20
1/2"	.850	17.00	2 1/2"	21.25	425.00
5/8"	1.330	26.60	3"	30.60	612.00
3/4"	1.910	38.20	3 1/2"	41.65	833.00
7/8"	2.600	52.00	4"	54.40	1088.00
1"	3.400	68.00	5"	85.00	1700.00
1 1/8"	4.300	86.00	5 1/2"	102.90	2058.00
1 1/4"	5.310	106.20	6"	122.40	2448.00

## CONCRETE REINFORCING BARS

These bars are manufactured to ASTM A615 specifications and are available in Grades 40 and 60. Grade 40 provides a minimum of 40,000 psi Yield Strength and 70,000 psi Tensile Strength; Grade 60 offers a minimum of 60,000 psi Yield Strength and 90,000 psi Tensile Strength. The intended use of this material is for reinforcement in concrete construction. Deformations in the bar's surface assist in prohibiting the movement of the bar once placed in concrete, thus providing a strong mechanical bond between the steel and the concrete. Reinforcing bars are stocked in straight lengths, but they are suitable for bending or fabricating to meet specific requirements.

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### CONCRETE REINFORCING BARS

ASTM A615 Grade 40 and Grade 60

STOCK LENGTHS: 20'

No.	Size in Inches	Weight Per Foot Pounds	Area Square Inches	Peri- Meter Inches	Weight Per 20' Bar
3	$\frac{3}{8}$	0.376	0.11	1.178	7.52
4	$\frac{1}{2}$	0.668	0.20	1.571	13.36
5	$\frac{5}{8}$	1.043	0.31	1.964	20.86
6	$\frac{3}{4}$	1.502	0.44	2.356	30.04
7	$\frac{7}{8}$	2.044	0.60	2.749	40.88
8	1	2.670	0.79	3.142	53.40

## MEDIUM CARBON ALLOY BARS

**AISI 4140** — Suitable for heavy duty service, this steel has high hardenability and good fatigue, abrasion, and impact resistance. It is a medium carbon, chromium-molybdenum alloy steel intended for use in severe stress conditions. It is not subject to temper embrittlement even after long exposure to high temperatures.

**AISI 4150 (Tufloy)** — This is a quenched and tempered, medium carbon, chromium-molybdenum alloy steel. The chromium provides good hardness penetration, while the molybdenum adds uniformity of hardness and high strength. This grade is suitable for forging. Ease of machinability is increased when heat treated. This grade is frequently used because of such features as high strength and wear resistance, toughness, ductility, and stress resistance at high temperatures.

**AISI 4340** — A nickel-chromium-molybdenum alloy steel possessing higher strength than 4140 or 4150. This grade provides much deeper hardenability which insures maximum toughness and ductility at the desired strength level. It is intended for manufacturing highly stressed parts such as heavy duty shafting, axles, dies, gears, drilling equipment and tools.

## HOT ROLLED ALLOY ROUNDS

Size In Inches	Weight Per Foot	Grade and Lengths in Stock			
		4140 QT. SR, MS, AQ	4150 (TUFLOY) RES, QT, SR, MS	4340 ANNEALED	8620
3/8"	.376	20'	20'		
1/2"	.668	20'	20'		20'
9/16"	.846	20'	20'		
5/8"	1.044	20'	20'		20'
11/16"	1.263	20'	20'	20'	20'
3/4"	1.504	20'	20'	20'	20'
7/8"	2.046	20'	20'	20'	20'
1"	2.673	20'	20'	20'	20'
1 1/16"	3.017				20'
1 1/8"	3.383	20'	20'	20'	20'
1 1/4"	4.176	20'	20'	20'	20'
1 5/16"	4.604	20'	20'	20'	20'
1 3/8"	5.053	20'	20'	20'	20'
1 7/16"	5.523	20'	20'	20'	20'
1 1/2"	6.014	20'	20'	20'	20'
1 5/8"	7.058	20'	20'	20'	20'
1 3/4"	8.186	20'	20'	20'	20'
1 7/8"	9.397	20'	20'	20'	20'
2"	10.69	20'	20'	20'	20'
2 1/8"	12.07	20'	20'	20'	20'
2 1/4"	13.53	20'	20'	20'	20'
2 3/8"	15.08	20'	20'	20'	20'
2 1/2"	16.71	20'	20'	20'	20'
2 5/8"	18.42	20'	20'	20'	20'
2 3/4"	20.21	20'	20'	20'	20'
2 7/8"	22.09	20'	20'	20'	20'
3"	24.06	20'	20'	20'	20'
3 1/8"	26.10	20'	20'	20'	20'
3 1/4"	28.23	20'	20'	20'	20'
3 3/8"	30.45	20'	20'	20'	20'
3 1/2"	32.74	20'	20'	20'	20'
3 5/8"	35.12	20'	20'	20'	20'
3 3/4"	37.59	20'	20'	20'	20'
3 7/8"	40.14	20'	20'		20'
4"	42.77	20'	20'	20'	20'
4 1/8"	45.48		20'		
4 1/4"	48.28	20'	20'	20'	20'
4 1/2"	54.13	20'	20'	20'	20'
4 5/8"	57.18	20'	20'		20'
4 3/4"	60.31	20'	20'	20'	20'
5"	66.82	20'	20'	20'	20'
5 1/8"	70.21	20'	20'		20'
5 1/4"	73.67	20'	20'	20'	20'
5 3/8"	77.22	20'	20'		
5 1/2"	80.86	20'	20'	20'	20'

## HOT ROLLED ALLOY ROUNDS (continued)

Size In Inches	Weight Per Foot	Grade and Lengths in Stock			
		4140 QT SR, MS, AQ	4150 (TUFLOY) RES. QT, SR, MS	4340 ANNEALED	8620
6"	96.22	20'	20'	20'	20'
6¼"	104.4	20'	20'	20'	20'
6½"	112.9	20'	20'	20'	20'
6¾"	121.8	20'	20'	20'	20'
7"	131.0	20'	20'	20'	20'
7¼"	140.5	20'	20'	20'	20'
7½"	150.4	20'	20'	20'	20'
7¾"	160.5	20'	20'	20'	20'
8"	171.1	20'	20'	20'	20'
8¼"	181.9	20'	20'	20'	20'
8½"	193.1	20'	20'	20'	20'
8¾"	204.6	20'	20'	20'	20'
9"	216.5	20'	20'	20'	20'
9¼"	228.7	20'	20'	20'	20'
9½"	241.2	20'	20'	20'	20'
9¾"	254.1	20'	20'	20'	20'
10"	267.3	20'	20'	20'	20'
10¼"	280.8	20'	20'		
10½"	294.7	20'	20'	20'	20'
11"	323.4	20'	20'	20'	20'
11½"	353.5	20'	20'	20'	20'
12"	384.9	20'	20'	20'	20'
12¼"	401.1	20'	20'		
12½"	417.6	20'	20'	20'	20'
13"	451.7	20'	20'	20'	20'
13½"	487.1	20'	20'	20'	20'

# INDEX

## Cold Finished Bars

	PAGE
Carbon Rounds .....	6.5
Carbon Rounds - Turned, Ground & Polished .....	6.7
Carbon Flats .....	6.8
Carbon Squares .....	6.10
Carbon Hexagons .....	6.11
Alloy Rounds .....	6.13



## COLD FINISHED CARBON STEEL

Cold Finished material offers several advantages compared to Hot Rolled bars. The finish is smooth and free of scale. In addition, it is straightened, making it suitable for use as shafts, pins, nuts, etc. The tolerances of Cold Finished bars are held much closer than are those of Hot Rolled bars. This feature makes them more applicable for uses requiring size precision. The mechanical properties of Cold Finished bars are greater than Hot Rolled bars. The tensile strength may be 20% more than Hot Rolled material, and the yield strength may be 50% greater. The machinability of Cold Finished steel is very good. The material machines faster and produces less waste, resulting in lower costs of manufactured parts.

### Grade & General Characteristics & Applications

**C-1018** — A low carbon, medium manganese steel with good case hardening properties. Excellent for bending and cold forming. Easily brazed or welded. Suitable for carburized parts, gears, shafts, bolts, etc. that do not require the strength of an alloy steel.

**C-1045** — A medium carbon steel used for heat treating, quenching, and tempering. Having only a fair response to conventional quenching, it is widely used where requirements are not very stringent. Offers fair brazing and welding properties. Satisfactory forging can be performed. Suitable for shafting, axles, gears, and connecting rods.

**C-1117** — A low carbon, resulturized steel with good machinability and surface finish. It has superior core hardening characteristics and develops an excellent core. Can be carburized. Being more ductile than grades of lower manganese content, this grade may be bent or cold formed where conditions are not extremely severe. Suitable for cutting, threading, and automatic screw machine operations at moderate speeds. Often used for shafts, gears, pins, and nuts.

**C-1141** — A medium carbon, resulfurized, free-cutting steel that can be hardened by heat treating. This grade is not generally recommended for welding operations. Frequently used for shafts, nuts, and bolts.

**C-1144** — Similar to C-1141, this grade has a slightly higher carbon and sulphur content providing superior machinability and improved response to heat treating. This grade is often used for shafts, spindles, gears, pinions, pins, screws, and bushings.

**ASTM A311 B (formerly C-1144 Century Series 100)** — A high strength, medium carbon, resulfurized, free-cutting steel. The term "100" indicates that this material has a 100,000 PSI Minimum Yield Strength. Machinability is good with minimum distortion. Suitable for manufacturing keyed shafts, arbors, gears, pinions, pins, screws, nuts, bolts, or studs.

**C-12L14 Leaded** — Offers excellent machinability and can be crimped, riveted and bent. Carburizing is possible. Provides a good surface hardness with a soft core.

**C-1215** — A low carbon, resulfurized and rephosphorized steel with very good machining qualities. Possessing a good surface finish, this grade is suitable for applications where machinability is of greater importance than mechanical properties.

**C-12L15 Leaded** — Similar to C-1215, but with the addition of lead for improved machinability. This grade will machine 10 to 30 percent faster than C-1215. Often used for studs, nuts, and fasteners.

## Cold Finished Carbon Steels

### Expected Minimum Mechanical Properties, Conventional Practice

Rounds, Squares and Hexagons

A.I.S.I. Grade Size, Inch	AS COLD DRAWN						COLD DRAWN FOLLOWED BY LOW TEMPERATURE STRESS RELIEF						COLD DRAWN FOLLOWED BY HIGH TEMPERATURE STRESS RELIEF					
	Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN		Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN		Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN	
	Tensile 1000 psi	Yield 1000 psi					Tensile 1000 psi	Yield 1000 psi					Tensile 1000 psi	Yield 1000 psi				
	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	1000 psi	
<b>18, 1025</b> to 7/8 incl. er 7/8 to 1 1/4 incl. er 1 1/4 to 2 incl. er 2 to 3 inc.	70	60	18	40	143								65	45	20	45	131	
	65	55	16	40	131								60	45	20	45	121	
	60	50	15	35	121								55	45	16	40	111	
	55	45	15	35	111								50	40	15	40	101	
<b>17, 1118</b> to 7/8 inc. er 7/8 to 1 1/4 incl. er 1 1/4 to 2 incl. er 2 to 3 incl.	75	65	15	40	149		70	15	40	163			70	50	18	45	143	
	70	60	15	40	143		75	15	40	149			65	50	16	45	131	
	65	55	13	35	131		70	13	35	143			60	50	15	40	121	
	60	50	12	30	121		65	12	35	131			55	45	15	40	111	
<b>35</b> to 7/8 incl. er 7/8 to 1 1/4 incl. er 1 1/4 to 2 incl. er 2 to 3 incl.	85	75	13	35	170		90	13	35	179			80	60	16	45	163	
	80	70	12	35	163		85	12	35	170			75	60	15	45	149	
	75	65	12	35	149		80	12	35	163			70	60	15	40	143	
	70	60	10	30	143		75	10	30	149			65	55	12	35	131	
<b>40, 1140</b> to 7/8 incl. er 7/8 to 1 1/4 incl. er 1 1/4 to 2 incl. er 2 to 3 incl.	90	80	12	35	179		95	12	35	187			85	65	15	45	170	
	85	75	12	35	170		90	12	35	179			80	65	15	45	163	
	80	70	10	30	163		85	10	30	170			75	60	15	40	149	
	75	65	10	30	149		80	10	30	163			70	55	12	35	143	

## Cold Finished Carbon Steels (continued)

### Expected Minimum Mechanical Properties, Conventional Practice Rounds, Squares and Hexagons

A.I.S.I. Grade Size, Inch	AS COLD DRAWN						COLD DRAWN FOLLOWED BY LOW TEMPERATURE STRESS RELIEF						COLD DRAWN FOLLOWED BY HIGH TEMPERATURE STRESS RELIEF					
	Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN		Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN		Strength		Elon- gation in 2'' %	Reduc- tion of Area %	BHN	
	Tensile 1000 psi	Yield 1000 psi					Tensile 1000 psi	Yield 1000 psi					Tensile 1000 psi	Yield 1000 psi				
	95	85	12	35	187		100	90	12	35	197		90	70	15	45	179	
<b>1045, 1146, 1145</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	90	80	11	30	179	95	85	11	30	187		85	70	15	45	170		
<b>1050, 1137, 1151</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	80	70	10	30	163	85	75	10	25	170		80	60	12	35	149		
<b>1050, 1137, 1151</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	100	90	11	35	197	105	95	11	35	212		95	75	15	45	187		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	95	85	11	30	187	100	90	11	30	197		90	75	15	40	179		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	90	80	10	30	179	95	85	10	30	187		85	70	15	40	170		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	85	75	10	30	170	90	80	10	25	179		80	65	12	35	163		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	105	95	11	30	212	110	100	11	30	223		100	80	15	40	197		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	100	90	10	30	197	105	95	10	30	212		95	80	15	40	187		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	95	85	10	30	187	100	90	10	25	197		90	75	15	40	179		
<b>1141</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	90	80	10	20	179	95	85	10	20	187		85	70	12	30	170		
<b>1144</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	110	100	10	30	223	115	105	10	30	229		105	85	15	40	212		
<b>1144</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	105	95	10	30	212	110	100	10	30	223		100	85	15	40	197		
<b>1144</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	100	90	10	25	197	105	95	10	25	212		95	80	15	35	187		
<b>1144</b> 5/8 to 7/8 incl. Over 7/8 to 1 1/4 incl. Over 1 1/4 to 2 incl. Over 2 to 3 incl.	95	85	10	20	187	100	90	10	20	197		90	75	12	30	179		

## COLD FINISHED CARBON ROUNDS

Size in Inches	Weight Per Foot	Grade and Lengths in Stock				
		C1018	C1045	C12L14	ASTM A311 B (formerly C1144 Century Series 100)	C1144
1/8"	.042	20'				
3/16"	.094	20'				
1/4"	.167	20'	20'		12'	
5/16"	.261	20'		12'	12'	
3/8"	.376	20'	20'	12'	12'	
7/16"	.511	20'		12'	12'	
1/2"	.668	20'	20'	12'	12'	20'
9/16"	.845	20'		12'		20'
5/8"	1.040	20'	20'	12'	12'	20'
11/16"	1.260	20'				20'
3/4"	1.500	20'	20'	12'	12'	20'
13/16"	1.760	20'		12'		
7/8"	2.040	20'	20'	12'	12'	20'
15/16"	2.350	20'	20'	12'	12'	
1"	2.670	20'	20'	12'	12'	20'
1 1/16"	3.010	20'			12'	
1 1/8"	3.380	20'	20'	12'	12'	20'
1 3/16"	3.770	20'	20'	12'	12'	20'
1 1/4"	4.170	20'	20'	12'	12'	20'
1 5/16"	4.600	20'		12'		20'
1 3/8"	5.050	20'	20'	12'	12'	20'
1 7/16"	5.520	20'	20'	12'	12'	20'
1 1/2"	6.010	20'	20'	12'	12'	20'
1 9/16"	6.520	20'				
1 5/8"	7.050	20'	20'	12'	12'	20'
1 11/16"	7.600	20'	20'			20'
1 3/4"	8.180	20'	20'	12'	12'	20'
1 13/16"	8.770	20'			12'	
1 7/8"	9.390	20'	20'		12'	20'
1 15/16"	10.020	20'	20'	12'	12'	20'
2"	10.680	20'	20'	12'	12'	20'
2 1/16"	11.360	20'				
2 1/8"	12.060	20'			12'	20'
2 3/16"	12.780	20'	20'		12'	20'
2 1/4"	13.520	20'	20'	12'	12'	20'
2 5/16"	14.280	20'				
2 3/8"	15.060	20'	20'		12'	20'
2 7/16"	15.870	20'	20'		12'	20'
2 1/2"	16.690	20'	20'	12'	12'	20'
2 9/16"	17.530	20'				
2 5/8"	18.400	20'		12'		20'
2 11/16"	19.290	20'				
2 3/4"	20.200	20'	20'	12'	12'	20'
2 13/16"	21.120	20'				
2 7/8"	22.070	20'			12'	
2 15/16"	23.040	20'	20'		12'	20'

## COLD FINISHED CARBON ROUNDS (continued)

Size in Inches	Weight Per Foot	Grade and Lengths in Stock				
		C1018	C1045	C12L14	ASTM A311 B (formerly C1144 Century Series 100)	C1144
3 1/8"	26.080	20'				
3 3/16"	27.130	20'	20'			
3 1/4"	28.210	20'		12'	12'	20'
3 5/16"	29.300	20'	20'			
3 3/8"	30.420	20'			12'	20'
3 7/16"	31.550	20'	20'		12'	20'
3 1/2"	32.710	20'	20'	12'	12'	20'
3 9/16"	33.890	20'				
3 5/8"	35.090	20'		12'		
3 11/16"	36.310	20'				
3 3/4"	37.550	20'		12'	12'	20'
3 13/16"	38.810	20'				
3 7/8"	40.100	20'				
3 15/16"	41.400	20'	20'		12'	20'
4"	42.730	20'	20'	12'	12'	20'
4 3/16"	46.830	20'				
4 1/4"	48.230	20'			12'	20'
4 5/16"	49.660	20'				
4 3/8"	51.120	20'				
4 7/16"	52.580	20'	20'			
4 1/2"	54.080	20'	20'	12'	12'	20'
4 3/4"	60.250	20'	20'			
4 15/16"	65.100	20'	20'			
5"	66.760	20'	20'	12'		
5 5/16"	75.360	20'				
5 7/16"	78.950	20'	20'			
5 1/2"	80.780	20'		12'		
5 15/16"	94.140	20'	20'			
6"	96.130	20'	20'	12'		
6 1/2"	112.820	20'		12'		
7"	130.850	10'-12'	20'			
7 1/4"	140.400	12'-24'				
7 1/2"	150.200	10'-12'				
8"	170.900	12'		12'		
8 1/2"	192.900	24'				
9"	216.300	20'				
10"	267.000	12'				
12"	384.500	12'				

# COLD FINISHED CARBON BARS

AISI-1045

Turned, Ground and Polished Rounds

Size in Inches	Weight Per Foot Pounds
1/2"	.668
3/4"	1.500
7/8"	2.040
15/16"	2.350
1"	2.670
1 3/16"	3.770
1 1/4"	4.170
1 5/16"	4.600
1 7/16"	5.520
1 1/2"	6.010
1 5/8"	7.050
1 11/16"	7.600
1 3/4"	8.180
1 7/8"	9.390
1 15/16"	10.020
2"	10.680
2 3/16"	12.780
2 1/4"	13.520
2 7/16"	15.870
2 1/2"	16.690
2 11/16"	19.290
2 3/4"	20.200
2 15/16"	23.040
3"	24.030
3 3/16"	27.130
3 7/16"	31.550
3 1/2"	32.710
3 3/4"	37.550
3 15/16"	41.400
4"	42.730
4 3/16"	46.830
4 7/16"	52.580
4 1/2"	54.080
4 15/16"	65.100
5"	66.760
5 7/16"	78.950
5 1/2"	80.780
5 3/4"	88.290
6"	96.130
7"	130.800

# COLD FINISHED CARBON FLATS

## AISI C-1018 and C-12L14

Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet	Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet		
1/8 x	1/4	.106	1/4 x	2 1/4	1.910		
	5/16	.133		2 1/2	2.130		
	3/8	.159		3	2.550		
	7/16	.186		3 1/2	2.980		
	1/2	.213		4	3.400		
	5/8	.266		4 1/2	3.830		
	3/4	.319		5	4.250		
	7/8	.372		6	5.100		
	1	.425		8	6.800		
	1 1/4	.531		10	8.500		
	1 1/2	.638		12	10.200		
	1 3/4	.744		5/16 x	1/2	.531	10'-12'
	2	.850			5/8	.664	10'-12'
	2 1/2	1.060			3/4	.797	10'-12'
	3	1.280			1	1.060	10'-12'
	3 1/2	1.490			1 1/4	1.330	10'-12'
4	1.700	1 1/2	1.590		10'-12'		
5	2.130	2	2.130		10'-12'		
6	2.550	2 1/2	2.660		10'-12'		
8	3.400	3	3.190		10'-12'		
3/16 x	1/2	.319	3 1/2		3.720	10'-12'	
	3/4	.478	4		4.250	10'-12'	
	7/8	.558	5		5.310	10'-12'	
	1	.638	6		6.380	10'-12'	
	1 1/4	.797	3/8 x		1/2	.638	10'-12'
	1 1/2	.956			5/8	.797	10'-12'
	1 3/4	1.120			3/4	.956	10'-12'
	2	1.280		7/8	1.120	10'-12'	
	2 1/4	1.430		1	1.280	10'-12'	
	2 1/2	1.590		1 1/4	1.590	10'-12'	
	3	1.910		1 1/2	1.910	10'-12'	
	3 1/2	2.230		1 3/4	2.230	10'-12'	
	4	2.550		2	2.550	10'-12'	
	5	3.190		2 1/2	3.190	10'-12'	
	6	3.820		3	3.830	10'-12'	
	1/4 x	3/8		.319	3 1/2	4.460	10'-12'
1/2		.425		4	5.100	10'-12'	
5/8		.531		5	6.380	10'-12'	
3/4		.638		6	7.650	10'-12'	
1		.850		8	10.200	10'-12'	
1 1/4		1.060	10	12.750	10'-12'		
1 1/2		1.280	12	15.300	10'-12'		
1 3/4		1.490					
2		1.700					

# COLD FINISHED CARBON FLATS

## AISI C-1018 and C-12L14 (continued)

Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet	Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet	
7/16 x 1/2	.744	10'-12'	3/4 x 1 1/4	4.460	10'-12'	
	1.120	10'-12'		5.100	10'-12'	
	1.490	10'-12'		5.740	10'-12'	
	1.860	10'-12'		6.380	10'-12'	
	2.980	10'-12'		7.650	10'-12'	
	3.720	10'-12'		8.930	10'-12'	
1/2 x 5/8	1.060	10'-12'	4	10.200	10'-12'	
	1.280	10'-12'	4 1/2	11.480	10'-12'	
	1.490	10'-12'	5	12.750	10'-12'	
	1.700	10'-12'	6	15.300	10'-12'	
	2.130	10'-12'	8	20.400	10'-12'	
	2.550	10'-12'	10	25.500	10'-12'	
	2.980	10'-12'	12	30.600	10'-12'	
	3.400	10'-12'	7/8 x 1	2.980	10'-12'	
	3.830	10'-12'		1 1/2	4.460	10'-12'
	4.250	10'-12'		2	5.950	10'-12'
	4.680	10'-12'		2 1/2	7.440	10'-12'
	5.100	10'-12'		3	8.930	10'-12'
	5.950	10'-12'		5	14.880	10'-12'
	6.800	10'-12'	1 x 1 1/4	6	17.850	10'-12'
7.650	10'-12'	1 1/2		5.100	10'-12'	
8.500	10'-12'	1 3/4		5.950	10'-12'	
10.200	10'-12'	2		6.800	10'-12'	
13.600	10'-12'	2 1/4		7.650	10'-12'	
17.000	10'-12'	2 1/2		8.500	10'-12'	
20.400	10'-12'	3		10.200	10'-12'	
5/8 x 3/4	1.590	10'-12'		3 1/2	11.900	10'-12'
	2.130	10'-12'		4	13.600	10'-12'
	2.660	10'-12'		4 1/2	15.300	10'-12'
	3.190	10'-12'	5	17.000	10'-12'	
	4.250	10'-12'	6	20.400	10'-12'	
	4.780	10'-12'	8	27.200	10'-12'	
	5.310	10'-12'	10	34.000	10'-12'	
	6.380	10'-12'	12	40.080	10'-12'	
	7.440	10'-12'	1 1/4 x 2	8.500	10'-12'	
	8.500	10'-12'		2 1/2	10.630	10'-12'
	8.500	10'-12'		3	12.750	10'-12'
	10.630	10'-12'		4	17.000	10'-12'
	12.750	10'-12'		5	21.250	10'-12'
	17.000	10'-12'		6	25.500	10'-12'
21.250	10'-12'	3/4 x 1		8	34.000	10'-12'
25.500	10'-12'					

## COLD FINISHED CARBON FLATS

AISI C-1018 and C-12L14 (continued)

Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet	Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet
1½ x 2	10.200	10'-12'	2 x 8	54.400	10'-12'
2½	12.750	10'-12'	10	68.000	10'-12'
3	15.300	10'-12'	12	81.600	10'-12'
3½	17.850	10'-12'	2¼ x 4	30.600	10'-12'
4	20.400	10'-12'	4½	34.430	10'-12'
5	25.500	10'-12'	2½ x 3½	29.750	10'-12'
6	30.600	10'-12'	4	34.000	10'-12'
8	40.800	10'-12'	5	42.500	10'-12'
10	51.000	10'-12'	6	51.000	10'-12'
12	61.200	10'-12'	8	68.000	10'-12'
1¼ x 3½	20.830	10'-12'	3 x 4	40.800	10'-12'
2 x 2½	17.000	10'-12'	4½	45.900	10'-12'
3	20.400	10'-12'	5	51.000	10'-12'
3½	23.800	10'-12'	6	61.200	10'-12'
4	27.200	10'-12'	8	81.600	10'-12'
5	34.000	10'-12'			
6	40.800	10'-12'			

## COLD FINISHED CARBON SQUARES

AISI C-1018

Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet	Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet
⅛	.053	10'-12'	1¼	5.310	10'-12'
⅜	.120	10'-12'	1⅝	6.430	10'-12'
¼	.213	10'-12'	1½	7.650	10'-12'
⅝	.332	10'-12'	1¾	10.410	10'-12'
⅜	.478	10'-12'	2	13.600	10'-12'
7/16	.652	10'-12'	2¼	17.210	10'-12'
½	.850	10'-12'	2½	21.250	10'-12'
9/16	1.080	10'-12'	2¾	25.710	10'-12'
⅝	1.330	10'-12'	3	30.600	10'-12'
11/16	1.610	10'-12'	3½	41.650	10'-12'
¾	1.910	10'-12'	4	54.400	10'-12'
13/16	2.240	10'-12'	5	85.000	10'-12'
7/8	2.600	10'-12'	5½	102.900	10'-12'
15/16	2.990	10'-12'	6	122.400	10'-12'
1	3.400	10'-12'			
1⅛	4.300	10'-12'			
13/16	4.795	10'-12'			

## COLD FINISHED CARBON HEXAGONS

### AISI C-1018, C-12L14, and C-1215

Size in Inches	Weight Per Foot Pounds	Stock Lengths Feet
1/4	.184	10'-12'
5/16	.288	10'-12'
3/8	.414	10'-12'
7/16	.564	10'-12'
1/2	.736	10'-12'
9/16	.932	10'-12'
5/8	1.150	10'-12'
11/16	1.390	10'-12'
3/4	1.660	10'-12'
13/16	1.760	10'-12'
7/8	2.250	10'-12'
1	2.940	10'-12'
1 1/16	3.320	10'-12'
1 1/8	3.730	10'-12'
1 3/16	4.152	10'-12'
1 1/4	4.600	10'-12'
1 3/8	5.570	10'-12'
1 1/2	6.630	10'-12'
1 5/8	7.780	10'-12'
1 3/4	9.020	10'-12'
1 7/8	10.350	10'-12'
2	11.780	10'-12'
2 1/4	14.910	10'-12'
2 1/2	18.400	10'-12'
2 3/4	22.270	10'-12'
3	26.500	10'-12'
3 1/4	31.100	10'-12'
3 1/2	36.070	10'-12'
3 3/4	41.410	10'-12'
4	47.110	10'-12'

## MEDIUM CARBON ALLOY BARS

**AISI 4140** — Suitable for heavy duty service, this steel has high hardenability and good fatigue, abrasion, and impact resistance. It is a medium carbon, chromium-molybdenum alloy steel intended for use in severe stress conditions. It is not subject to temper embrittlement even after long exposure to high temperatures.

**AISI 4150 (Tufloy)** — This is a quenched and tempered, medium carbon, chromium-molybdenum alloy steel. The chromium provides good hardness penetration, while the molybdenum adds uniformity of hardness and high strength. This grade is suitable for forging. Ease of machinability is increased when heat treated. This grade is frequently used because of such features as high strength and wear resistance, toughness, ductility, and stress resistance at high temperatures.

**AISI 4340** — A nickel-chromium-molybdenum alloy steel possessing higher strength than 4140 or 4150. This grade provides much deeper hardenability which insures maximum toughness and ductility at the desired strength level. It is intended for manufacturing highly stressed parts such as heavy duty shafting, axles, dies, gears, drilling equipment and tools.

## COLD FINISHED ALLOY ROUNDS

Size In Inches	Weight Per Foot	Grade and Lengths in Stock			
		4140 Annealed	4140 HT	4150 (TUFLOY) RES, QT, SR, MS	8620
3/16"	.094	12'	20'		
1/4"	1671	12'	20'	20'	12'
5/16"	.2610	12'	20'	20'	12'
3/8"	.3759	12'	20'	20'	12'
7/16"	.5116	12'	20'	20'	12'
1/2"	.6682	12'	20'	20'	12'
9/16"	.8457	12'	20'	20'	12'
5/8"	1.044	12'	20'	20'	12'
11/16"	1.263	12'	20'	20'	12'
3/4"	1.504	12'	20'	20'	12'
13/16"	1.765	12'	20'	20'	12'
7/8"	2.046	12'	20'	20'	12'
15/16"	2.349	12'	20'	20'	12'
1"	2.673	12'	20'	20'	12'
1 1/16"	3.017	12'	20'	20'	12'
1 1/8"	3.383	12'	20'	20'	12'
1 1/4"	3.769	12'	20'	20'	12'
1 1/2"	4.176	12'	20'	20'	12'
1 5/8"	4.604	12'	20'	20'	12'
1 3/4"	5.053	12'	20'	20'	12'
1 7/8"	5.523	12'	20'	20'	12'
1 9/16"	6.014	12'	20'	20'	12'
1 5/8"	6.526	12'	20'	20'	12'
1 3/4"	7.058	12'	20'	20'	12'
1 11/16"	7.612	12'	20'	20'	12'
1 3/4"	8.186	12'	20'	20'	12'
1 13/16"	8.781	12'	20'		12'
1 7/8"	9.397	12'	20'	20'	12'
1 15/16"	10.03	12'	20'	20'	12'
2"	10.69	12'	20'	20'	12'
2 1/8"	12.07	12'	20'		12'
2 1/4"	12.79	12'		20'	12'
2 1/2"	13.53	12'	20'	20'	12'
2 3/8"	15.08	12'	20'	20'	12'
2 7/16"	15.88	12'	20'		12'
2 1/2"	16.71	12'	20'	20'	12'
2 5/8"	18.42	12'	20'	20'	12'
2 3/4"	20.21	12'	20'	20'	12'
2 7/8"	22.09	12'		20'	12'
2 15/16"	23.06	12'	20'		12'
3"	24.06	12'	20'	20'	12'
3 1/8"	26.10	12'	20'		12'
3 1/4"	28.23	12'	20'	20'	12'
3 1/2"	32.74	12'	20'	20'	12'
3 3/4"	37.50	12'	20'	20'	12'

## COLD FINISHED ALLOY ROUNDS (continued)

Size In Inches	Weight Per Foot	Grade and Lengths in Stock			
		4140 Annealed	4140 HT	4150 (TUFLOY) RES. QT. SR, MS	8620
4¼"	48.28	12'		20'	12'
4½"	54.13	12'		20'	12'
5"	66.82	12'		20'	
6"	96.13			20'	

# INDEX

## Tubing and Pipe

	PAGE
Cold Drawn Buttweld .....	7.3
Cold Drawn Seamless Mechanical .....	7.3
Electric Welded - Drawn over Mandrel .....	7.3
Welded Mechanical, Round .....	7.17
Welded Mechanical, Square and Rectangular .....	7.19
Structural, Welded, Square .....	7.20
Structural, Welded, Rectangular .....	7.22
Pipe – Weights and Dimensions .....	7.26
Pipe – Specifications, Type and Grade .....	7.29



## CARBON STEEL MECHANICAL TUBING

Mechanical Tubing is frequently selected for various mechanical purposes as opposed to structural or pressure applications. It may be specifically produced to meet either static or dynamic end use requirements. Round mechanical tubing is manufactured with better finishes and closer tolerances than steel pipe. It is available in Cold Drawn Seamless, Cold Drawn Buttweld, Electric Welded Drawn-Over-Mandrel (DOM), and Hot Finished Seamless.

**Cold Drawn Seamless** — Furnished in its “as drawn” condition, this tubing offers good surface quality. The mechanical properties are superior to those of hot finished seamless tubing. Produced to ASTM A519 specifications.

**Cold Drawn Buttweld** — Produced from continuous welded pipe. This low cost drawn tubing offers an alternative for many uses not requiring high strength. Not intended for applications requiring bending, flaring, or pressure resistance.

**Electric Welded Drawn-Over-Mandrel** — A cold drawn electric welded tube with all weld flash removed. Each tube is tested for weld soundness. Possessing excellent OD and ID concentricity, this tubing is superior to seamless tubing. Improved tolerances and surface finish make this product suitable for applications requiring accuracy and precision.

**Hot Finished Seamless** — With broader tolerances and lower strength levels, this tubing offers the user substantial cost savings over cold drawn tubing. Most suitable in applications where surface quality and exact dimensions are not critical. Manufactured to ASTM A519.

## C. D. SEAMLESS MECHANICAL TUBING STANDARD MGF. TOLERANCES

G r o u p	Size O.D., Inches	Permissible Variations from:					
		Outside Diameter In Inches		Inside Diameter In Inches		Wall Thickness per cent	
		Over	Under	Over	Under	Over	Under
1	$\frac{3}{16}$ to $\frac{1}{2}$ excl.	0.004	0	a,b	a,b	a,b	a,b
2	$\frac{1}{2}$ to $1\frac{1}{2}$ excl.	0.005c	0c	0a,b	0.005a,b	10a,b	10a,b
3	$1\frac{1}{2}$ to $3\frac{1}{2}$ excl.	0.010c	0c	0a	0.010a	10a	10a
4	$3\frac{1}{2}$ to $5\frac{1}{2}$ excl.	0.015	0c	0.005a	0.015a	10a	10a
5	$5\frac{1}{2}$ to 8 excl. when wall is less than 5% of O.D.	0.030c	0.030c	0.035c	0.035c	10	10
6	$5\frac{1}{2}$ to 8 excl. when wall is 5 to 7.5% of O.D.	0.020	0.020	0.025	0.025	10	10
7	$5\frac{1}{2}$ to 8 excl. when wall is over 7.5% of O.D.	0.030	0	0.015a	0.030a	10a	10a
8	8 to $10\frac{3}{4}$ incl. when wall is less than 5% of O.D.	0.045c	0.045c	0.050c	0.050c	10	10
9	8 to $10\frac{3}{4}$ incl. when wall is 5 to 7.5% of O.D.	0.035	0.035	0.040	0.040	10	10
10	8 to $10\frac{3}{4}$ incl. when wall is over 7.5% of O.D.	0.045	0	0.15a	0.040a	10a	10a

(a) For tubes with inside diameter less than 50% of outside diameter or with wall thickness more than 25% of outside diameter or with wall thickness over  $1\frac{1}{4}$ " , or weighing more than 90 lb. per ft., which cannot be successfully drawn over a mandrel, the inside diameter may vary over or under by 10% of the wall thickness. The wall thickness may vary  $12\frac{1}{2}$ % over or under that specified.

(b) For tubes with inside diameter less than  $\frac{1}{2}$ " (or less than  $\frac{5}{8}$ " when the wall thickness is more than 20% of the outside diameter), which cannot be successfully drawn over a mandrel, the wall thickness may vary 15% over or under that specified and the inside diameter will be governed by the outside diameter and wall thickness variations.

(c) Tubing having a wall thickness less than 3% of the outside diameter cannot be straightened properly without a certain amount of distortion. Consequently such tubes, while having an average outside diameter and inside diameter within the tolerances shown in the table, will require an ovality of tolerance of  $\frac{1}{2}$ % over or under the nominal outside diameter and inside diameter in addition to the tolerances indicated in the table.

WAREHOUSE TOLERANCES LIMITED TO O.D.-AND WALL (except for Cylinder Tubing specially drawn to O.D.-I.D. dimensions.)

# MECHANICAL TUBING

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
1/8"	24	.022	.081	.0242	5/16"	14	.083	.147	.2039
	22	.028	.069	.0290		13	.095	.122	.2212
	21	.032	.061	.0318		12	.109	.095	.2375
	20	.035	.055	.0336		11	.120	.073	.2473
	18	.049	.027	.0398					
5/32"	26	.018	.120	.0266	1 1/32"	18	.049	.246	.1542
	22	.028	.100	.0384	3/8"	24	.022	.331	.0829
	21	.032	.092	.0425		23	.025	.325	.0935
3/16"	26	.018	.152	.0327	22	.028	.319	.1038	
	24	.022	.144	.0390	21	.032	.311	.1172	
	22	.028	.131	.0478	20	.035	.305	.1271	
	21	.032	.123	.0533	19	.042	.291	.1494	
	20	.035	.117	.0572	18	.049	.277	.1706	
	19	.042	.104	.0655	17	.058	.259	.1964	
	18	.049	.089	.0727	16	.065	.245	.2152	
	17	.058	.072	.0805	15	.072	.231	.2330	
	16	.065	.058	.0854	14	.083	.209	.2585	
	15	.072	.044	.0888	13	.095	.185	.2841	
1/4"	26	.018	.214	.0446	12	.109	.157	.3097	
	24	.022	.206	.0536	11	.120	.135	.3268	
	23	.025	.200	.0601	10	.134	.107	.3449	
	22	.028	.194	.0664	1 3/32"	16	.065	.276	.2367
	21	.032	.187	.0745	14	.083	.240	.2865	
	20	.035	.180	.0804	13	.095	.216	.3155	
	19	.042	.166	.0933	5/32	.156	.094	.4169	
	18	.049	.152	.1052	7/16"	24	.022	.394	.0977
	17	.058	.134	.1189		23	.025	.388	.1103
	16	.065	.120	.1284		22	.028	.381	.1226
14	.083	.084	.1480	21		.032	.374	.1388	
13	.095	.060	.1573	20		.035	.367	.1506	
5/16"	24	.022	.268	.0684	19	.042	.354	.1776	
	23	.025	.263	.0769	18	.049	.340	.2036	
	22	.028	.256	.0852	17	.058	.322	.2354	
	21	.032	.249	.0960	16	.065	.307	.2589	
	20	.035	.242	.1039	14	.083	.272	.3147	
	19	.042	.229	.1216	13	.095	.247	.3480	
	18	.049	.214	.1382	12	.109	.220	.3830	
	17	.058	.196	.1580	11	.120	.197	.4075	

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
1/2"	26	.018	.464	.0927	11/16"	17	.058	.509	.3512
	24	.022	.456	.1123		16	.065	.495	.3888
	23	.025	.450	.1268		15	.072	.481	.4252
	22	.028	.444	.1411		14	.083	.459	.4805
	21	.032	.436	.1599		13	.095	.435	.5377
	20	.035	.430	.1738		12	.109	.407	.6007
	19	.042	.416	.2054		11	.120	.385	.6472
	18	.049	.402	.2360		10	.134	.357	.7027
	17	.058	.384	.2738		5/32	.156	.312	.7814
	16	.065	.370	.3020		3/16	.188	.250	.8774
	15	.072	.356	.3291		7/32	.219	.187	.9496
	14	.083	.334	.3696		1/4	.250	.125	1.001
	13	.095	.310	.4109		24	.022	.644	.1565
	12	.109	.282	.4552		23	.025	.638	.1770
	11	.120	.260	.4870		22	.028	.632	.1974
	10	.134	.232	.5238		21	.032	.624	.2242
	5/32	.156	.187	.5731		20	.035	.617	.2441
3/16	.187	.125	.6264	18	.049	.589	.3344		
9/16"	24	.022	.519	1271	17	.058	.572	.3902	
	23	.025	.513	.1436	16	.065	.557	.4325	
	22	.028	.506	.1600	14	.083	.521	.5363	
	21	.032	.499	.1815	13	.095	.497	.6017	
	20	.035	.492	.1974	12	.109	.469	.6740	
	19	.042	.479	.2337	11	.120	.447	.7279	
	18	.049	.464	.2690	10	.134	.419	.7928	
	17	.058	.447	.3128	5/32	.156	.375	.8864	
	16	.065	.432	.3457	3/16	.188	.312	1.0040	
	14	.083	.396	.4255	7/32	.219	.250	1.0970	
	12	.109	.344	.5285	3/4"	24	.022	.706	.1711
	11	.120	.322	.5677		23	.025	.700	.1936
	10	.134	.295	.6140		22	.028	.694	.2159
5/32	.156	.250	.6781	21		.032	.686	.2454	
3/16	.188	.188	.7529	20		.035	.680	.2673	
5/8"	24	.022	.581	.1417	18	.049	.652	.3668	
	23	.025	.575	.1602	17	.058	.634	.4286	
	22	.028	.569	.1785	16	.065	.620	.4755	
	21	.032	.561	.2027	15	.072	.606	.5214	
	20	.035	.555	.2205	14	.083	.584	.5913	
	19	.042	.541	.2615	13	.095	.560	.6646	
	18	.049	.527	.3014	12	.109	.532	.7462	

# MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
3/4"	11	.120	.510	.8074	15/16"	20	.035	.868	.3375
	10	.134	.482	.8816		18	.049	.839	.4652
	5/32	.156	.437	.9897		17	.058	.822	.5451
	3/16	.188	.375	1.1280		16	.065	.807	.6060
	7/32	.219	.313	1.2420		14	.083	.772	.7579
	1/4	.250	.250	1.3350		13	.095	.748	.8553
	13/16"	24	.022	.769		.1859	12	.109	.720
22		.028	.757	.2347	11	.120	.697	1.0480	
20		.035	.742	.2908	10	.134	.669	1.1510	
18		.049	.715	.3998	5/32	.156	.625	1.3030	
17		.058	.697	.4677	3/16	.188	.562	1.5060	
16		.065	.682	.5193	7/32	.219	.500	1.6820	
14		.083	.647	.6471	1/4	.250	.438	1.8370	
13		.095	.622	.7285	9/32	.281	.376	1.9720	
12		.109	.595	.8195	5/16	.313	.312	2.0890	
11		.120	.572	.8881	1"	24	.022	.956	.2298
10		.134	.544	.9717		22	.028	.944	.3907
5/32		.156	.500	1.0950		21	.032	.936	.3308
3/16		.188	.437	1.2550		20	.035	.930	.3607
7/32		.219	.375	1.3890		18	.049	.902	.4977
1/4	.250	.312	1.5030	17		.058	.884	.5835	
7/8"	24	.022	.831	.2004		16	.065	.870	.6491
	22	.028	.819	.2533	15	.072	.856	.7136	
	21	.032	.811	.2881	14	.083	.834	.8129	
	20	.035	.805	.3140	13	.095	.810	.9182	
	18	.049	.777	.4323	12	.109	.782	1.0370	
	17	.058	.759	.5061	11	.120	.760	1.1280	
	16	.065	.745	.5623	10	.134	.732	1.2390	
	15	.072	.731	.6175	5/32	.156	.687	1.4060	
	14	.083	.709	.7021	3/16	.188	.625	1.6300	
	13	.095	.685	.7914	7/32	.219	.562	1.8270	
	12	.109	.657	.8917	1/4	.250	.500	2.0030	
	11	.120	.635	.9676	9/32	.281	.438	2.1580	
	10	.134	.607	1.0600	5/16	.313	.375	2.2970	
	5/32	.156	.562	1.1980	11/32	.344	.312	2.4100	
	3/16	.188	.500	1.3790	3/8	.375	.250	2.5030	
	7/32	.219	.437	1.5340	1 1/16"	22	.028	1.007	.3095
	1/4	.250	.375	1.6690		20	.035	.992	.3843
9/32	.281	.313	1.7830	18		.049	.964	.5306	
5/16	.313	.250	1.8790						
15/16"	24	.022	.894	.2152					

<b>MECHANICAL TUBING (continued)</b>										
<b>C.D. SEAMLESS</b>			<b>E.W.D.O.M.</b>			<b>C.D. BUTTWELD</b>				
Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
1 1/16"	14	.083	.897	.8687	1 3/16"	5/32	.156	.875	1.7190	
	13	.095	.872	.9821		3/16	.188	.812	2.0080	
	12	.109	.844	1.1110		7/32	.219	.750	2.2660	
	11	.120	.822	1.2090		1/4	.250	.687	2.5040	
	10	.134	.795	1.3300		5/16	.313	.562	2.9250	
	5/32	.156	.750	1.5110		1 1/4"	22	.028	1.194	.3654
	3/16	.188	.687	1.7570			20	.035	1.180	.4542
	7/32	.219	.625	1.9740			18	.049	1.152	.6285
	1/4	.250	.562	2.1710			17	.058	1.134	.7384
	9/32	.281	.500	2.3470			16	.065	1.120	.8826
5/16	.313	.437	2.5070	14	.083	1.084	1.0340			
1 1/8"	22	.028	1.069	.3280	13	.095	1.060	1.1720		
	21	.032	1.061	.3735	12	.109	1.032	1.3280		
	20	.035	1.055	.4074	11	.120	1.010	1.4480		
	18	.049	1.027	.5631	1/8	.125	1.000	1.5020		
	17	.058	1.009	.6609	10	.134	.982	1.5970		
	16	.065	.995	.7359	5/32	.156	.937	1.8230		
	14	.083	.959	.9237	3/16	.188	.875	2.1320		
	13	.095	.935	1.0450	7/32	.219	.812	2.4110		
	12	.109	.907	1.1830	1/4	.250	.750	2.6700		
	11	.120	.885	1.2880	9/32	.281	.687	2.9080		
	10	.134	.857	1.4180	5/16	.313	.625	3.1320		
	5/32	.156	.812	1.6140	1 1/32	.344	.562	3.3290		
	3/16	.188	.750	1.8810	3/8	.375	.500	3.5040		
	7/32	.219	.688	2.1190	7/16	.437	.375	3.7980		
	1/4	.250	.625	2.3360	1 5/16"	21	.032	1.249	.4378	
	9/32	.281	.563	2.5330		20	.035	1.242	.4777	
5/16	.313	.500	2.7140	18		.049	1.215	.6615		
3/8	.375	.375	3.0040	17		.058	1.197	.7774		
1 3/16"	22	.028	1.132	.3469	16	.065	1.182	.8664		
	21	.032	1.124	.3951	14	.083	1.147	1.0900		
	20	.035	1.117	.4310	13	.095	1.122	1.2360		
	18	.049	1.090	.5961	12	.109	1.095	1.4020		
	17	.058	1.072	.7000	11	.120	1.072	1.5290		
	16	.065	1.057	.7796	10	.134	1.044	1.6870		
	14	.083	1.022	.9795	5/32	.156	1.000	1.9280		
	13	.095	.997	1.1090	3/16	.188	.937	2.2590		
	12	.109	.970	1.2560	7/32	.219	.875	2.5590		
	11	.120	.947	1.3690	1/4	.250	.812	2.8380		
	10	.134	.920	1.5080	9/32	.281	.750	3.0970		

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
1 <sup>5</sup> / <sub>16</sub> "	5/16	.313	.688	3.3430	1 <sup>1</sup> / <sub>2</sub> "	14	.083	1.334	1.2560
	3/8	.375	.562	3.7570		13	.094	1.310	1.4260
1 <sup>3</sup> / <sub>8</sub> "	24	.022	1.331	.3179		12	.109	1.282	1.6190
	22	.028	1.319	.4028		11	.120	1.260	1.7690
	20	.035	1.305	.5009		10	.134	1.232	1.9550
	18	.049	1.277	.6939		5/32	.156	1.187	2.2390
	17	.058	1.259	.8158		3/16	.188	1.125	2.6340
	16	.065	1.245	.9094		7/32	.219	1.062	2.9960
	14	.083	1.209	1.1450		1/4	.250	1.000	3.3380
	13	.095	1.185	1.2990		9/32	.281	.938	3.6580
	12	.109	1.157	1.4740		5/16	.313	.875	3.9680
	11	.120	1.135	1.6080		1 <sup>1</sup> / <sub>32</sub>	.344	.812	4.2470
	10	.134	1.107	1.7760	3/8	.375	.750	4.5060	
	5/32	.156	1.062	2.0310	7/16	.438	.625	4.9680	
	3/16	.188	1.000	2.3830	1/2	.500	.500	5.3400	
	7/32	.219	.938	2.7040	1 <sup>9</sup> / <sub>16</sub> "	20	.035	1.493	.5712
1/4	.250	.875	3.0040	16		.065	1.432	1.0400	
9/32	.281	.813	3.2830	13		.095	1.373	1.4890	
5/16	.313	.750	3.5500	12		.109	1.345	1.6930	
3/8	.375	.625	4.0050	11		.120	1.323	1.8490	
7/16	.438	.500	4.3830	10		.134	1.295	2.0450	
1/2	.500	.375	4.6730	5/32		.156	1.250	2.3440	
1 <sup>7</sup> / <sub>16</sub> "	20	.035	1.367	.5244		3/16	.187	1.187	2.7610
	18	.049	1.339	.7269		7/32	.219	1.125	3.1440
	16	.065	1.307	.9531		1/4	.250	1.062	3.5060
	14	.083	1.271	1.2010	5/16	.313	.937	4.1790	
	13	.095	1.248	1.3630	3/8	.375	.812	4.7580	
	11	.120	1.198	1.6890	1 <sup>5</sup> / <sub>8</sub> "	20	.035	1.555	.5943
	10	.134	1.170	1.8660		18	.049	1.527	.8248
	5/32	.156	1.125	2.1360		17	.058	1.509	.9707
	3/16	.188	1.062	2.5100		16	.065	1.495	1.0830
	7/32	.219	1.000	2.8510		14	.083	1.459	1.3670
1/4	.250	.938	3.1720	13		.095	1.435	1.5520	
9/32	.281	.876	3.4720	12		.109	1.407	1.7650	
1 <sup>1</sup> / <sub>2</sub> "	22	.028	1.444	.4402		11	.120	1.385	1.9290
	20	.035	1.430	.5476		10	.134	1.357	2.1340
	18	.049	1.402	.7593		5/32	.156	1.312	2.4470
	17	.058	1.384	.8932	1 <sup>1</sup> / <sub>64</sub>	.172	1.281	2.6690	
	16	.065	1.370	.9962	3/16	.188	1.250	2.8850	

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
1 <sup>5</sup> / <sub>8</sub> "	1/4	.250	1.125	3.6710	1 <sup>7</sup> / <sub>8</sub> "	20	.035	1.805	.6878
	9/32	.281	1.063	4.0330		18	.049	1.777	.9556
	5/16	.313	1.000	4.3860		16	.065	1.745	1.2570
	3/8	.375	.875	5.0060		5/64	.078	1.719	1.4970
	7/16	.438	.749	5.5530		14	.083	1.709	1.5890
	1/2	.500	.625	6.0080		13	.095	1.685	1.8060
1 <sup>11</sup> / <sub>16</sub> "					12	.109	1.657	2.0560	
	16	.065	1.558	1.1270	11	.120	1.635	2.2490	
	11	.120	1.447	2.0100	10	.134	1.607	2.4920	
	5/32	.156	1.376	2.5520	5/32	.156	1.563	2.8640	
	3/16	.187	1.312	3.0120	3/16	.188	1.500	3.3870	
	7/32	.219	1.250	3.4360	7/32	.219	1.438	3.8730	
	1/4	.250	1.188	3.8390	1/4	.250	1.375	4.3390	
	9/32	.281	1.126	4.2230	9/32	.281	1.313	4.7840	
1 <sup>3</sup> / <sub>4</sub> "					5/16	.313	1.250	5.2220	
	20	.035	1.680	.6411	3/8	.375	1.125	6.0080	
	18	.049	1.652	.8902	13/32	.406	1.063	6.3700	
	17	.058	1.634	1.0480	7/16	.437	1.000	6.7220	
	16	.065	1.620	1.1700	1/2	.500	.875	7.3430	
	14	.083	1.584	1.4780	9/16	.563	.750	7.8890	
	13	.095	1.560	1.6790	1 <sup>15</sup> / <sub>16</sub> "	11	.120	1.698	2.3300
	12	.109	1.532	1.9100		5/32	.156	1.625	2.9690
	11	.120	1.510	2.0890		7/32	.219	1.499	4.0210
	10	.134	1.482	2.3130		1/4	.250	1.437	4.5070
	5/32	.156	1.437	2.6560		3/8	.375	1.188	6.2600
	3/16	.188	1.375	3.1360		2"	20	.035	1.930
	7/32	.219	1.312	3.5810	18		.049	1.902	1.0210
	1/4	.250	1.250	4.0050	16		.065	1.870	1.3430
9/32	.281	1.188	4.4090	14	.083		1.834	1.6990	
5/16	.313	1.125	4.8040	13	.095		1.810	1.9330	
3/8	.375	1.000	5.5070	12	.109		1.782	2.2010	
7/16	.438	.875	6.1370	11	.120		1.760	2.4090	
1/2	.500	.750	6.6750	10	.134		1.732	2.6700	
1 <sup>13</sup> / <sub>16</sub> "	9/16	.563	.625	7.1370	5/32	.156	1.687	3.0720	
	5/8	.625	.500	7.5090	3/16	.188	1.625	3.6380	
					7/32	.219	1.562	4.1660	
	16	.065	1.683	1.2130	15/64	.234	1.532	4.4130	
	11	.120	1.573	2.1700	1/4	.250	1.500	4.6730	
	5/32	.156	1.501	2.7610	.260	.260	1.480	4.860	
	3/16	.188	1.439	3.2630	9/32	.281	1.437	5.159	
	7/32	.219	1.375	3.7280					
	1/4	.250	1.313	4.1730					

# MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
2"	5/16	.313	1.375	5.639	2 1/4"	7/32	.219	1.813	4.7500	
	11/32	.344	1.313	6.084		1/4	.250	1.750	5.3400	
	3/8	.375	1.250	6.508		9/32	.281	1.688	5.9090	
	7/16	.438	1.125	7.307		5/16	.313	1.625	6.4750	
	1/2	.500	1.000	8.010		11/32	.344	1.562	7.0020	
	9/16	.563	.874	8.640		3/8	.375	1.500	7.5090	
	5/8	.625	.750	9.178		13/32	.406	1.438	7.9960	
	3/4	.750	.500	10.010		7/16	.438	1.375	8.4760	
	2 1/16"	5/32	.156	1.751		3.177	1/2	.500	1.250	9.3450
3/16		.188	1.687	3.765	9/16	.563	1.124	10.1400		
1/4		.250	1.563	4.841	5/8	.625	1.000	10.8500		
2 1/8"	18	.049	2.027	1.086	2 5/16"	1 1/16	.688	.874	11.4800	
	16	.065	1.995	1.430		3/4	.750	.750	12.0200	
	14	.083	1.959	1.810		11	.120	2.073	2.8110	
	13	.095	1.935	2.060	3/16	.188	1.937	4.2670		
	12	.109	1.907	2.347	7/32	.219	1.875	4.8980		
	11	.120	1.885	2.570	1/4	.250	1.813	5.5080		
	5/32	.156	1.813	3.281	2 3/8"	20	.035	2.305	.8747	
	3/16	.188	1.750	3.889		18	.049	2.277	1.2170	
	7/32	.219	1.687	4.458		16	.065	2.245	1.6040	
	1/4	.250	1.625	5.006		14	.083	2.209	2.0320	
	9/32	.281	1.563	5.534		13	.095	2.185	2.3130	
	5/16	.313	1.500	6.057		11	.120	2.135	2.8900	
	3/8	.375	1.375	7.009		5/32	.156	2.062	3.6970	
	7/16	.438	1.250	7.892		3/16	.188	2.000	4.3910	
	1/2	.500	1.125	8.678		7/32	.291	1.937	5.043	
9/16	.562	1.000	9.392	1/4	.250	1.875	5.674			
5/8	.625	.875	10.010	9/32	.281	1.813	6.284			
2 3/16"	13	.095	1.998	2.124	5/16	.313	1.750	6.893		
	11	.120	1.948	2.650	3/8	.375	1.625	8.010		
	1/4	.250	1.688	5.174	7/16	.438	1.500	9.061		
2 1/4"	18	.049	2.152	1.1520	1/2	.500	1.375	10.010		
	16	.065	2.120	1.5170	9/16	.563	1.249	10.900		
	14	.083	2.084	1.9210	5/8	.625	1.125	11.680		
	13	.095	2.060	2.1860	2 7/16"	1/4	.250	1.938	5.842	
	12	.109	2.032	2.4920		2 1/2"	18	.049	2.402	1.283
	11	.120	2.010	2.7300			16	.065	2.370	1.690
	10	.134	1.982	3.0280						

<b>MECHANICAL TUBING (continued)</b>											
<b>C.D. SEAMLESS</b>			<b>E.W.D.O.M.</b>			<b>C.D. BUTTWELD</b>					
Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.		
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches				
2½"	12	.109	2.282	2.783	2¾"	⅝	.156	2.437	4.322		
	11	.120	2.260	3.050		⅜	.188	2.375	5.144		
	10	.134	2.232	3.386		⅜	.219	2.312	5.920		
	⅝	.156	2.187	3.905		¼	.250	2.250	6.675		
	⅜	.188	2.125	4.642		⅝	.281	2.187	7.410		
	⅜	.219	2.062	5.335		⅝	.313	2.125	8.147		
	⅝	.234	2.032	5.663		⅜	.375	2.000	9.512		
	¼	.250	2.000	6.008		⅜	.437	1.875	10.820		
	.260	.260	1.980	6.220		½	.500	1.750	12.020		
	⅝	.281	1.937	6.659		⅝	.562	1.625	13.150		
	⅝	.313	1.875	7.311		⅝	.625	1.500	14.180		
	⅝	.344	1.812	7.921		⅝	.688	1.374	15.150		
	⅜	.375	1.750	8.511		¾	.750	1.250	16.020		
	⅜	.438	1.625	9.646		⅞	.875	1.000	17.520		
	½	.500	1.500	10.680		1	1.000	.750	18.690		
	2⅞"	⅝	.563	1.375		11.650	2⅞"	16	.065	2.745	1.951
		⅝	.625	1.250		12.520		13	.095	2.685	2.821
2⅞"	¾	.750	1.000	14.020	2⅞"	11	.120	2.635	3.531		
	2⅞"	¼	.250	2.062		6.176	⅝	.156	2.568	4.530	
16		.065	2.495	1.777	⅜	.188	2.500	5.395			
13		.095	2.435	2.567	⅜	.219	2.437	6.212			
11		.120	2.385	3.210	¼	.250	2.375	7.009			
⅝		.156	2.312	4.114	⅝	.281	2.312	7.785			
⅜		.188	2.250	4.893	⅝	.313	2.250	8.564			
⅜		.219	2.187	5.627	⅜	.375	2.125	10.010			
¼		.250	2.125	6.341	⅜	.438	2.000	11.400			
⅝		.281	2.063	7.035	½	.500	1.875	12.680			
⅝		.313	2.000	7.729	⅝	.562	1.751	13.900			
⅜		.375	1.875	9.011	⅝	.625	1.625	15.020			
⅜		.438	1.751	10.230	¾	.750	1.375	17.020			
½		.500	1.625	11.350	3"	16	.065	2.870	2.037		
⅝		.562	1.501	12.400		14	.083	2.834	2.586		
⅝		.625	1.375	13.350		13	.095	2.810	2.947		
2¾"		18	.049	2.652	1.413	2¾"	12	.109	2.782	3.365	
		16	.065	2.620	1.864		11	.120	2.760	3.691	
	14	.083	2.584	2.364	10		.134	2.732	4.102		
	13	.095	2.560	2.694	⅝		.156	2.687	4.738		
	12	.109	2.532	3.074	⅜		.188	2.625	5.646		
	11	.120	2.510	3.371	⅜		.219	2.562	6.505		
	10	.134	2.482	3.744	¼		.250	2.500	7.343		

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
3"	.260	.260	2.480	7.608	3 1/4"	11/32	.344	2.562	10.680	
	9/32	.281	2.437	8.160		3/8	.375	2.500	11.510	
	5/16	.313	2.375	8.982		13/32	.406	2.438	12.330	
	1 1/32	.344	2.312	9.758		7/16	.438	2.375	13.150	
	3/8	.375	2.250	10.510		1/2	.500	2.250	14.690	
	7/16	.437	2.125	11.980		9/16	.563	2.125	16.160	
	1/2	.500	2.000	13.350		5/8	.625	2.000	17.520	
	9/16	.563	1.875	14.650		3/4	.750	1.750	20.03	
	5/8	.625	1.750	15.850		7/8	.875	1.500	22.190	
	11/16	.687	1.625	16.990		1	1.00	1.250	24.030	
	3/4	.750	1.500	18.020		3 3/8"	16	.065	3.245	2.298
	7/8	.875	1.250	19.860			13	.095	3.185	3.328
	1	1.000	1.000	21.360			11	.120	3.135	4.172
	3 1/16"	1/4	.250	2.563			7.511	3/16	.188	3.000
5/16		.312	2.438	9.193	7/32	.219	2.937	7.382		
3/8		.375	2.312	10.770	1/4	.250	2.875	8.344		
3 1/8"	16	.065	2.995	2.124	5/16	.313	2.749	10.240		
	13	.095	2.935	3.074	3/8	.375	2.625	12.020		
	11	.120	2.885	3.851	7/16	.438	2.501	13.740		
	3/16	.188	2.750	5.897	1/2	.500	2.375	15.350		
	7/32	.218	2.687	6.797	9/16	.563	2.249	16.910		
	1/4	.250	2.625	7.676	5/8	.625	2.125	18.360		
	5/16	.313	2.499	9.400	3/4	.750	1.875	21.030		
	3/8	.375	2.375	11.010	3 1/2"	20	.035	3.430	1.295	
	7/16	.438	2.250	12.570		16	.065	3.370	2.385	
	1/2	.500	2.125	14.020		14	.083	3.334	3.029	
	9/16	.563	2.000	15.400		13	.095	3.310	3.455	
	5/8	.625	1.875	16.690		11	.120	3.260	4.332	
	3/4	.750	1.625	19.020		10	.134	3.232	4.817	
	7/8	.875	1.375	21.030		5/32	.156	3.188	5.571	
3 1/4"	16	.065	3.120	2.211		3/16	.188	3.125	6.650	
	14	.083	3.084	2.807	7/32	.219	3.063	7.674		
	13	.095	3.060	3.201	1/4	.250	3.000	8.678		
	11	.120	3.010	4.011	.260	.260	2.980	8.997		
	10	.134	2.982	4.459	9/32	.281	2.938	9.660		
	5/32	.156	2.938	5.155	5/16	.313	2.875	10.650		
	3/16	.188	2.875	6.148	11/32	.344	2.812	11.590		
	7/32	.219	2.812	7.089	3/8	.375	2.750	12.520		
	1/4	.250	2.750	8.010						

MECHANICAL TUBING (continued)									
C.D. SEAMLESS			E.W.D.O.M.			C.D. BUTTWELD			
Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
3 1/2"	9/16	.563	2.374	17.660	3 7/8"	5/16	.313	3.249	11.910
	19/32	.594	2.312	18.440		3/8	.375	3.125	14.020
	5/8	.625	2.250	19.190		7/16	.438	3.000	16.080
	3/4	.750	2.000	22.030		1/2	.500	2.875	18.020
	7/8	.875	1.750	24.530		9/16	.563	2.749	19.910
	1	1.000	1.500	26.700		5/8	.625	2.625	21.690
3 5/8"	16	.065	3.495	2.471	4"	3/4	.750	2.375	25.030
	11	.120	3.385	4.492		16	.065	3.870	2.732
	3/16	.183	3.250	6.901		14	.083	3.834	3.472
	1/4	.250	3.125	9.011		13	.095	3.810	3.962
	5/16	.313	3.000	11.070		11	.120	3.760	4.973
	3/8	.375	2.875	13.020		10	.134	3.732	5.533
	7/16	.438	2.750	14.910		5/32	.156	3.687	6.404
	1/2	.500	2.625	16.690		3/16	.188	3.625	7.654
	9/16	.563	2.501	18.410		7/32	.219	3.562	8.843
	5/8	.625	2.375	20.030		1/4	.250	3.500	10.010
3 3/4"	3/4	.750	2.125	23.030		.260	.260	3.480	10.390
	16	.065	3.620	2.558	4 1/8"	9/32	.281	3.438	11.160
	13	.095	3.560	3.708		5/16	.313	3.375	12.330
	11	.120	3.510	4.652		3/8	.375	3.250	14.520
	10	.134	3.482	5.175		7/16	.437	3.126	16.660
	5/32	.156	3.437	5.988		1/2	.500	3.000	18.690
	3/16	.188	3.375	7.152		9/16	.563	2.875	20.670
	7/32	.219	3.312	8.259		5/8	.625	2.750	22.530
	1/4	.250	3.250	9.345		11/16	.688	2.624	24.340
	9/32	.281	3.188	10.040		3/4	.750	2.500	26.030
	5/16	.313	3.125	11.490		7/8	.875	2.250	29.200
	11/32	.344	3.062	12.050		1	1.000	2.000	32.040
	3/8	.375	3.000	13.520		1 1/4	1.250	1.500	36.710
	7/16	.437	2.875	15.490		11	.120	3.885	5.133
	1/2	.500	2.750	17.360		3/16	.188	3.749	7.905
	9/16	.563	2.624	18.410		1/4	.250	3.625	10.350
5/8	.625	2.500	20.860	5/16		.313	3.500	12.740	
3/4	.750	2.250	24.030	3/8	.375	3.375	15.020		
7/8	.875	2.000	26.870	7/16	.438	3.249	17.250		
1	1.000	1.750	29.37	1/2	.500	3.125	19.360		
3 7/8"	14	.083	3.709	3.361	5/8	.625	2.875	23.360	
	11	.120	3.635	4.812	4 1/4"	13	.095	4.060	4.216
	3/16	.188	3.500	7.403		11	.120	4.010	5.293
	1/4	.250	3.375	9.679		10	.134	3.982	5.890

## MECHANICAL TUBING (continued)

C.D. SEAMLESS

E.W.D.O.M.

C.D. BUTTWELD

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
4 1/4"	5/32	.156	3.937	6.821	4 1/2"	5/8	.625	3.250	25.870	
	3/16	.188	3.875	8.156		11/16	.687	3.125	28.010	
	1/4	.250	3.750	10.680		3/4	.750	3.000	30.040	
	5/16	.313	3.625	13.160		7/8	.875	2.750	33.880	
	11/32	.344	3.562	14.350		1	1.000	2.500	37.380	
	3/8	.375	3.500	15.520		1 1/4	1.250	2.000	43.390	
	7/16	.437	3.375	17.830		1 1/2	1.500	1.500	48.060	
	1/2	.500	3.250	20.030	4 5/8"	3/16	.187	4.251	8.909	
	9/16	.563	3.124	22.170		1/4	.250	4.125	11.680	
	5/8	.625	3.000	24.200		5/16	.313	4.000	14.410	
	11/16	.688	2.875	26.170		3/8	.375	3.875	17.020	
	3/4	.750	2.750	28.040		7/16	.438	3.749	19.590	
	7/8	.875	2.500	31.540		1/2	.500	3.625	22.030	
	1	1.000	2.250	34.710		5/8	.625	3.375	26.700	
	1 1/8	1.125	2.000	3.7550		3/4	.750	3.125	31.040	
1 1/4	1.250	1.750	40.050	4 3/4"	11	.120	4.510	5.934		
4 3/8"	11	.120	4.135		5.453	3/16	.188	4.375	9.160	
	3/16	.188	4.001		8.407	1/4	.250	4.250	12.020	
	.195	.195	3.980		8.811	5/16	.313	4.125	14.830	
	1/4	.250	3.875		11.010	3/8	.375	4.000	17.520	
	5/16	.313	3.759		13.580	.380	.380	3.990	17.740	
	3/8	.375	3.625		16.020	7/16	.438	3.874	20.170	
	7/16	.438	3.500		18.420	1/2	.500	3.750	22.700	
	1/2	.500	3.375		20.690	9/16	.563	3.624	25.180	
	5/8	.625	3.125		25.030	5/8	.625	3.500	27.530	
	3/4	.750	2.875		29.040	3/4	.750	3.250	32.040	
	4 1/2"	13	.095	4.310	4.469	7/8	.875	3.000	36.210	
11		.120	4.260	5.613	1	1.000	2.750	40.050		
10		.134	4.232	6.248	4 7/8"	3/16	.188	4.499	9.411	
5/32		.156	4.188	7.237		1/4	.250	4.375	12.350	
3/16		.188	4.125	8.658		3/8	.375	4.125	18.020	
7/32		.219	4.062	10.010		7/16	.438	3.999	20.760	
1/4		.250	4.000	11.350		1/2	.500	3.875	23.360	
.260		.260	3.980	11.770		3/4	.750	3.375	33.040	
9/32		.281	3.938	12.660		5"	11	.120	4.760	6.254
5/16		.313	3.875	14.000			10	.134	4.732	6.964
3/8		.375	3.750	16.520	5 1/2		.156	4.687	8.070	
7/16		.438	3.625	19.000						
1/2		.500	3.500	21.380						

MECHANICAL TUBING (continued)										
C.D. SEAMLESS			E.W.D.O.M.			C.D. BUTTWELD				
Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
5"	1/4	.250	4.500	12.680	5 1/2"	5/8	.625	4.250	32.540	
	.260	.260	4.480	13.160		3/4	.750	4.000	38.050	
	5/16	.313	4.375	15.670		7/8	.875	3.750	43.220	
	3/8	.375	4.250	18.520		1	1.000	3.500	48.060	
	7/16	.438	4.125	21.340		1 1/4	1.250	3.000	56.740	
	1/2	.500	4.000	24.030		1 1/2	1.500	2.500	64.080	
	9/16	.562	3.876	26.680	5 5/8"	5/16	.313	5.001	17.760	
	5/8	.625	3.750	29.200		3/8	.375	4.875	21.030	
	3/4	.750	3.500	34.040		1/2	.500	4.625	27.370	
	7/8	.875	3.250	38.550		5/8	.625	4.375	33.380	
	1	1.000	3.000	42.720		5 3/4"	11	.120	5.510	7.215
	1 1/4	1.250	2.500	50.060			3/16	.188	5.375	11.170
1 1/2	1.500	2.000	56.070	1/4	.250		5.250	14.690		
				5/16	.313		5.124	18.180		
5 1/8"	5/16	.313	4.501	16.090	3/8	.375	5.000	21.530		
	3/8	.375	4.375	19.020	1/2	.500	4.750	28.040		
	1/2	.500	4.125	24.700	5/8	.625	4.500	34.210		
	5/8	.625	3.875	30.040	3/4	.750	4.250	40.050		
5 1/4"	1	1.000	3.125	44.060	7/8	.875	4.000	45.560		
	11	.120	5.010	6.575	1	1.000	3.750	50.730		
	5/32	.156	4.938	8.487	1 3/8	1.375	3.000	64.250		
	3/16	.187	4.875	10.160	6"	11	.120	5.760	7.536	
	1/4	.250	4.750	13.350		3/16	.188	5.625	11.670	
	5/16	.313	4.624	16.500		1/4	.250	5.500	15.350	
	3/8	.375	4.500	19.520		.268	.268	5.464	16.400	
	1/2	.500	4.250	25.370		5/16	.313	5.374	19.010	
	5/8	.625	4.000	30.870		3/8	.375	5.250	22.530	
	3/4	.750	3.750	36.050		7/16	.438	5.124	26.020	
7/8	.875	3.500	40.880	1/2		.500	5.000	29.370		
1	1.000	3.250	45.390	9/16		.562	4.876	32.690		
5 3/8"	3/16	.188	5.000	10.410		5/8	.625	4.750	35.880	
5 1/2"	11	.120	5.260	6.895	3/4	.750	4.500	42.050		
	3/16	.187	5.125	10.670	7/8	.875	4.250	47.890		
	1/4	.250	5.000	14.020	1	1.000	4.000	53.400		
	.268	.268	4.964	14.970	1 1/4	1.250	3.500	63.410		
	5/16	.313	4.875	17.340	1 1/2	1.500	3.000	72.090		
	1 1/32	.344	4.812	18.940	6 1/4"	11	.120	6.010	7.856	
	3/8	.375	4.750	20.530		3/16	.187	5.876	12.170	
	7/16	.438	4.624	23.680		1/4	.250	5.750	16.020	
	1/2	.500	4.500	26.700						

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
6¼"	⅝	.313	5.624	19.850	7"	1	1.000	5.000	64.08
	¾	.375	5.500	23.530		1¼	1.250	4.500	76.76
	½	.500	5.250	30.710		1½	1.500	4.000	88.11
	⅝	.625	5.000	37.550	7¼"	¼	.250	6.750	18.69
	¾	.750	4.750	44.060		⅜	.375	6.500	27.53
	1	1.000	4.250	56.070		½	.500	6.250	36.05
	1¼	1.250	3.750	66.750		⅝	.625	6.000	44.22
6½"	⅜	.187	6.125	12.670	7½"	¾	.750	5.750	52.07
	¼	.250	6.000	16.690		1	1.000	5.250	66.75
	.260	.260	5.980	17.330		¼	.250	7.00	19.36
	⅜	.375	5.750	24.530	⅜	.375	6.750	28.54	
	½	.500	5.500	32.040	½	.500	6.500	37.38	
	⅝	.625	5.250	39.220	⅝	.625	6.250	45.89	
	¾	.750	5.000	46.060	¾	.750	6.000	54.07	
	⅞	.875	4.750	52.570	1	1.000	5.500	69.42	
	1	1.000	4.500	58.740	1¼	1.250	5.000	83.44	
	1¼	1.250	4.000	70.090	1½	1.500	4.500	96.12	
	6⅝"	1½	1.500	3.500	80.100	7⅝"	⅝	.313	6.999
¼		.250	6.125	17.020	⅝		.625	6.375	46.73
.280		.280	6.065	18.970	7¾"	¼	.250	7.250	20.03
⅜		.375	5.875	25.030		⅜	.375	7.000	29.54
13/32		.406	5.813	26.970		½	.500	6.750	38.72
½		.500	5.625	32.710		¾	.750	6.250	56.07
⅝		.625	5.375	40.050	1	1.000	5.750	72.09	
¾		.750	5.125	47.060	8"	¼	.250	7.500	20.69
⅞		.875	4.875	53.730		⅜	.375	7.250	30.54
1		1.000	4.625	60.080		½	.500	7.000	40.05
6¾"	¼	.250	6.250	17.36		¾	.750	6.500	58.07
	⅜	.375	6.000	25.53	15/16	.938	6.124	70.75	
	½	.500	5.750	33.38	1	1.000	6.000	74.76	
	⅝	.625	5.500	40.88	1¼	1.250	5.500	90.11	
	¾	.750	5.250	48.06	1½	1.500	5.000	104.10	
	1	1.000	4.750	61.41	8¼"	¼	.250	7.750	21.36
7"	⅜	.187	6.625	13.68		½	.500	7.250	41.39
	¼	.250	6.500	18.02		1	1.000	6.250	77.43
	⅜	.375	6.250	26.53		8½"	¼	.250	8.000
	½	.500	6.000	34.71					

## MECHANICAL TUBING (continued)

**C.D. SEAMLESS**
**E.W.D.O.M.**
**C.D. BUTTWELD**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
8½"	¾	.750	7.000	62.08	10½"	¾	.750	9.000	78.10	
	1	1.000	6.500	80.10		1	1.000	8.500	101.50	
	1¼	1.250	6.000	96.79		1½	1.500	7.500	144.20	
	1½	1.500	5.500	112.10						
8⅝"	.322	.322	7.981	28.55	10¾"	⅜	.375	10.000	41.55	
	½	.500	7.625	43.39		½	.500	9.750	54.74	
						⅞	.563	9.624	61.25	
8¾"	⅜	.375	8.000	33.54	11"	.843	.843	9.064	89.20	
	½	.500	7.750	44.06		1	1.000	8.750	104.10	
	¾	.750	7.250	64.08		1⅛	1.125	8.500	115.60	
9"	¼	.250	8.500	23.36	11½"	1¼	1.250	8.250	126.80	
	⅜	.375	8.250	34.54		1½	1.500	7.750	148.20	
	½	.500	8.000	45.39		11"	⅜	.375	10.250	42.55
	¾	.750	7.500	66.08			½	.500	10.000	56.07
	1	1.000	7.000	85.44			¾	.750	9.500	82.10
	1½	1.500	6.000	120.20			1	1.000	9.000	106.80
9¼"	½	.500	8.250	46.73	11¼"	1	1.000	9.500	112.10	
	¾	.750	7.750	68.09	11¾"	.843	.843	10.064	98.20	
9½"	¼	.250	9.000	24.70	12"	1	1.000	9.750	114.80	
	⅜	.375	8.750	36.55		1¼	1.250	9.250	140.20	
	½	.500	8.500	48.06		¼	.250	11.500	31.37	
	¾	.750	8.000	70.09		⅜	.375	11.250	46.56	
	1	1.000	7.500	90.78		½	.500	11.000	61.41	
	1⅛	1.125	7.250	100.60		¾	.750	10.500	90.11	
9¾"	1½	1.500	6.500	128.20	1	1.000	10.000	117.50		
	½	.500	8.750	49.40	1½	1.500	9.000	168.20		
	¼	.250	9.500	26.03						
	⅜	.375	9.250	38.55						
	½	.500	9.000	50.73						
	¾	.750	8.500	74.09						
	1	1.000	8.000	96.12						
	1⅛	1.125	7.750	106.60						
	1½	1.500	7.000	136.20						
10¼"	⅜	.375	9.500	39.55						
	1	1.000	8.250	98.79						
10½"	¼	.250	10.000	27.37						
	⅝	.313	9.874	34.05						
	½	.500	9.500	53.40						

# WELDED MECHANICAL TUBING

## ELECTRIC RESISTANCE WELDED

### AISI MT 1010

Electric Resistance Welded Mechanical Tubing is a versatile product with advantages in cost and fabricating properties. It is manufactured by forming flat rolled steel into tubular shapes and welding the edges. Outside flash is always removed. Tubing with walls 16 gauge and lighter is produced from cold rolled steel, whereas Tubing with walls heavier than 16 gauge is produced from hot rolled steel. Suitable for bending, welding, machining, and other common fabrication procedures.

RANDOM LENGTHS: 20' to 24'

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches		
3/8"	20	.035	.305	.1271	1"	9	.148	.704	1.3470
	18	.049	.277	.1706	1/8"	20	.035	1.055	.4074
	17	.058	.259	.1964		18	.049	1.027	.5631
1/2"	20	.035	.430	.1738	16	16	.065	.995	.7359
	19	.042	.416	.2054		11	.120	.885	1.2880
	18	.049	.402	.2360	1 1/4"	20	.035	1.180	.4542
16	.065	.370	.3020	18		.049	1.152	.6285	
5/8"	20	.035	.555	.2205		16	.065	1.120	.8226
	18	.049	.527	.3014	14	.083	1.084	1.0340	
	16	.065	.495	.3888	13	.095	1.060	1.1720	
	14	.083	.459	.4805	12	.109	1.032	1.3280	
	13	.095	.435	.5377	11	.120	1.010	1.4480	
3/4"	20	.035	.680	.2673	7	16	.065	1.120	1.4480
	18	.049	.652	.3668		7	.180	.890	2.0570
	16	.065	.620	.4755	1 3/8"	20	.035	1.305	.5009
	11	.120	.510	.8074		18	.049	1.277	.6939
7/8"	20	.035	.085	.3140	16	.065	1.245	.9094	
	18	.049	.777	.4323	11	.120	1.135	1.6080	
	16	.065	.745	.5623	1 1/2"	20	.035	1.430	.5476
	15	.072	.731	.6175		18	.049	1.402	.7593
	14	.083	.709	.7021		16	.065	1.370	.9962
1"	20	.035	.930	.3607	14	.083	1.334	1.2560	
	18	.049	.902	.4977	11	.120	1.260	1.7690	
	16	.065	.870	.6491	1 5/8"	20	.035	1.555	.5943
	14	.083	.834	.8129		18	.049	1.527	.8248
						16	.065	1.495	1.0830

**WELDED MECHANICAL TUBING (continued)****ELECTRIC RESISTANCE WELDED****AISI MT 1010**

Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	Size O.D.	Average Wall		Nom- inal I.D.	Wt. Per Ft. In Lbs.	
	B.W. Ga.	Dec. Inches				B.W. Ga.	Dec. Inches			
1 $\frac{1}{4}$ "	20	.035	1.680	.6411	3"	14	.083	2.834	2.586	
	18	.049	1.652	.8902		13	.085	2.810	2.947	
	16	.065	1.620	1.1700		11	.120	2.760	3.691	
	14	.083	1.584	1.4780		7	.180	2.640	5.421	
	11	.120	1.510	2.0890		$\frac{1}{4}$	.250	2.500	7.343	
1 $\frac{1}{8}$ "	20	.035	1.805	.6878	3 $\frac{1}{4}$ "	16	.065	3.120	2.211	
	16	.065	1.745	1.2570		13	.095	3.060	3.201	
	14	.083	1.709	1.5890		11	.120	3.010	4.011	
	11	.120	1.635	2.2490		7	.180	2.890	5.902	
2"	20	.035	1.930	.7345	3 $\frac{1}{2}$ "	16	.065	3.370	2.385	
	18	.049	1.902	1.0210		14	.083	3.334	3.029	
	16	.065	1.870	1.3430		11	.120	3.260	4.332	
	14	.083	1.834	1.6990		7	.180	3.140	6.382	
	13	.095	1.810	1.9330		$\frac{1}{4}$	.250	3.000	8.678	
	11	.120	1.760	2.4090	3 $\frac{5}{8}$ "	16	.065	3.495	2.471	
	$\frac{5}{32}$	.156	1.687	2.0720		3 $\frac{3}{4}$ "	16	.065	3.620	2.558
	7	.180	1.640	3.4990			4"	16	.065	3.870
2 $\frac{1}{8}$ "	18	.049	2.027	1.0860	11	.120		3.760	4.973	
	2 $\frac{1}{4}$ "	18	.049	2.152	1.1520	10		.134	3.732	5.533
16		.065	2.120	1.5170	7	.180	3.640	7.344		
14		.083	2.084	1.9210	$\frac{1}{4}$	.250	3.500	10.010		
11		.120	2.010	2.7300	4 $\frac{1}{4}$ "	11	.120	4.010	5.293	
7		.180	1.875	3.9790		4 $\frac{1}{2}$ "	11	.120	4.260	5.613
2 $\frac{3}{8}$ "	14	.083	2.209	2.0320	$\frac{1}{4}$		.250	4.000	11.350	
	$\frac{5}{32}$	.156	2.062	3.6970	5"		11	.120	4.760	6.254
	7	.180	2.015	4.2200		7	.180	4.640	9.266	
2 $\frac{1}{2}$ "	18	.049	2.402	1.2830	5 $\frac{1}{2}$ "	$\frac{1}{4}$	.250	4.500	12.680	
	16	.065	2.370	1.6900		6"	11	.120	5.760	7.536
	14	.083	2.334	2.1430			7	.180	5.640	11.190
	11	.120	2.260	3.050	2 $\frac{3}{4}$ "	$\frac{1}{4}$	.250	5.500	15.350	
	7	.180	2.140	4.460		3"	18	.049	2.902	1.544
2 $\frac{3}{4}$ "	16	.065	2.620	1.864	16		.065	2.870	2.037	
	14	.083	2.584	2.364						
	13	.095	2.560	2.694						
	11	.120	2.510	3.371						

**SQUARE AND RECTANGULAR  
WELDED MECHANICAL  
STEEL TUBING      20' TO 24' RANDOM LENGTHS**

Size in Inches	BWG Wall Thickness	Weight Per Foot Pounds	Size in Inches	BWG Wall Thickness	Weight Per Foot Pounds
1/2x1/2	16	.384	2x1	16	1.268
	14	.470		14	1.599
5/8x5/8	16	.495	2x1 1/2	11	2.252
	14	.612		16	1.489
3/4x3/4	20	.340	2x2	14	1.881
	18	.467		11	2.660
	16	.605	18	1.300	
1x1	14	.753	2 1/2x1	16	1.710
	20	.459		14	2.164
	18	.634	11	3.067	
	16	.826	2 1/2x1 1/2	16	1.489
15	.920	14		1.881	
14	1.035	11		2.660	
1 1/4x1 1/4	12	1.320	2 1/2x2 1/2	16	1.710
	11	1.436		14	2.164
	20	.578	11	3.067	
	18	.800	3x1	16	2.152
	16	1.047		14	2.728
14	1.317	11		3.883	
1 1/2x1	12	1.691	3x1 1/2	16	1.710
	11	1.844		14	2.164
	20	.519	11	3.067	
	16	.937	3x2	16	1.931
14	1.176	14		2.445	
11	1.640	11		3.475	
1 1/2x1 1/2	20	.697	3x3	16	2.152
	18	.967		14	2.728
	16	1.268	3x2	12	3.544
	14	1.599		16	2.594
	12	2.062		14	3.292
1 5/8x1 5/8	11	2.252	3 1/2x3 1/2	16	2.594
	11	2.456		14	3.856
1 3/4x1 3/4	16	1.489	4x2	16	2.594
	14	1.881		14	3.292
	11	2.660		14	3.292

## **Structural Welded Square and Rectangular Tubing**

**ASTM A500 Grade B Tubing** offers a high strength-to-weight ratio while remaining economical. It can be used in applications requiring punching, drilling, forming, or welding. The outside flash is removed on all sizes which gives the product a good appearance and the hollow structural shape provides easy maintenance. Being of high strength material, this tubing is intended for applications such as structural columns, beams, storage racks, guard rails and other uses requiring superior strength.

### **Mechanical Properties Of ASTM A500 Grade B**

Tensile Strength in P.S.I.	Yield Strength in P.S.I.	% Elongation in 2''
58,000	46,000	23

# STRUCTURAL WELDED SQUARE TUBING

## ASTM A500

## GRADE B

Sizes Inches	Lbs. Per Ft.	Sizes Inches	Lbs. Per Ft.
1¼ x ¾	2.62	8 x ¾	19.65
1½ x ¾	3.22	1¼	26.04
1¼	4.11	5/16	32.33
2" x .145	3.51	¾	38.42
¾	4.49	½	50.31
1¼	5.71	10 x ¾	24.65
2½ x ⅛	3.98	1¼	32.70
¾	5.75	5/16	40.80
¼	7.41	¾	48.61
3 x ⅛	4.83	½	63.91
¾	7.04	12 x ¼	39.44
¼	9.11	5/16	48.95
3½ x ⅛	5.68	¾	58.47
¾	8.30	½	77.51
¼	10.81		
4 x ⅛	6.53		
¾	9.59		
¼	12.51		
5/16	15.33		
¾	18.02		
½	22.98		
5 x ¾	12.14		
¼	15.91		
5/16	19.58		
¾	23.12		
½	29.78		
6 x ¾	14.65		
¼	19.31		
5/16	23.83		
¾	28.22		
½	36.72		
7 x ¾	17.13		
¼	22.71		
5/16	28.08		
¾	33.32		



# Standard Tolerances For Structural Tubing

## TOLERANCES FOR OUTSIDE DIMENSIONS AND WALL THICKNESS

Largest outside dimension across flats, inches	2½ to 3½ incl.	Over 3½ 5½ incl.	Over 5½
Tolerance for outside dimensions including convexity or concavity	± .025"	± .030"	± 1%
Wall thickness tolerance*	-10%	-12½%	-12½%

\* Note: The allowable variation in wall thickness does not apply at corners.

## MAXIMUM TWIST\*

Longer outside dimensions, inches	2½ to 4 incl.	Over 4 to 5½ incl.	Over 5½ to 8 incl.	Over 8
Maximum twist per 3 feet of length, inches	.075	.087	.100	.112

\* Twist is measured by holding down the edge of one end of a square or rectangular structural hollow on a surface plate with the bottom side of the tube parallel to the surface plate, and noting the height that either corner on the opposite end of the bottom side is above the surface plate.

## LENGTHS AND PERMISSIBLE VARIATION

Tube lengths	2'0''/12'0''	12'0''/20'0''	20'0''/32'0''
Permissible variation in length	± 3/32	± 1/8"	± 1/4"

**SQUARENESS OF SIDES** Adjacent sides of structural hollow may deviate from 90 degrees by plus or minus one degree.

**VARIATION FROM EXACT STRAIGHTNESS** Permissible variations, inches (includes camber & sweep)

1/4 x number of feet of total length

# CARBON STEEL STRUCTURAL TUBING

## A 500

**ASTM A500** covers cold formed Welded and seamless carbon steel tubing. This Tubing is available in round, square, rectangular, or special structural shapes. This material is suitable for Welded, riveted or bolted construction. Applications may include buildings, bridges, or other general construction.

### CHEMICAL REQUIREMENTS FOR GRADES A AND B

	Ladle Analysis	Check Analysis
Carbon, max, per cent .....	0.26	0.30
Phosphorus, max, per cent .....	0.04	0.05
Sulfur, max, per cent .....	0.05	0.063
Copper, when copper steel is specified, min, per cent .....	0.20	0.18

### TENSILE REQUIREMENTS

#### Round Structural Tubing

	Grade A	Grade B
Tensile strength, min, psi .....	45000	58000
Yield point, min, psi .....	33000	42000
Elongation in 2 in., min, per cent .....	25a	23b

#### Shaped Structural Tubing

Tensile strength, min, psi .....	45000	58000
Yield point, min, psi .....	39000	46000
Elongation in 2 in., min, per cent .....	25a	23b

a Applies to specified wall thicknesses 0.120 in. and over. For wall thicknesses under 0.120 in., the minimum elongation shall be calculated by the formula: per cent elongation in 2 in. =  $56 + 17.5$ .

b Applies to specified wall thicknesses 0.180 in. and over. For wall thicknesses under 0.180 in., the minimum elongation shall be calculated by the formula: per cent elongation in 2 in. =  $61t + 12$ .

# CARBON STEEL STRUCTURAL TUBING

## HOT-FORMED WELDED AND SEAMLESS

### A501

**ASTM A501** covers hot formed welded and seamless carbon steel square, round, rectangular or special shape structural tubing for welded, riveted, or bolted construction of bridges, buildings, or other general structural purposes. It provides high strength with less weight than many other structural shapes. Suitable for fabricating, cutting, bending, punching, bolting, and welding.

### CHEMICAL REQUIREMENTS

	Ladle Analysis	Check Analysis
Carbon, max, per cent . . . . .	0.26	0.30
Phosphorus, max, per cent . . . . .	0.04	0.05
Sulfur, max, per cent . . . . .	0.05	0.063
Copper, when copper steel is specified, min. per cent . . . . .	0.20	0.18

### TENSILE REQUIREMENTS

#### Shaped Structural Tubing

Tensile strength, min, psi . . . . .	58000a
Yield point, min, psi . . . . .	36000
Elongation in 2 in. min, per cent c. . . . .	23
Elongation in 8 in. min, per cent c. . . . .	20b

a The maximum tensile strength shall be 80,000 psi.

b For material under  $\frac{5}{16}$  in. in thickness, a deduction from the percentage elongation of 1.25 per cent in 8 in. specified in Table 2 shall be made for each decrease of  $\frac{1}{32}$  in. of the specified thickness under  $\frac{5}{16}$  in.

c Elongation may be determined in a gauge length of either 2 in. or 8 in. at the manufacturer's option.

# WEIGHTS AND DIMENSIONS OF SEAMLESS AND WELDED PIPE

## A.S.A. PIPE SCHEDULES

PIPE SIZE	O.D. in Inches	5	10	20	30	40	STD	60	80	E.H.	100	120	140	160	Dbl E.H.
1/8	.405	.035	.049			.068	.068		.095	.095					
		.1383	.1863			.2447	.2447		.3145	.3145					
1/4	.540	.049	.065			.088	.088		.119	.119					
		.2570	.3297			.4248	.4248		.5351	.5351					
3/8	.675	.049	.065			.091	.091		.126	.126					
		.3276	.4235			.5676	.5676		.7388	.7388					
1/2	.840	.065	.083			.109	.109		.147	.147				.187	.294
		.5383	.6710			.8510	.8510		1.088	1.088				1.304	1.714
3/4	1.050	.065	.083			.113	.113		.154	.154				.218	.308
		.6838	.8572			1.131	1.131		1.474	1.474				1.937	2.441
1	1.315	.065	.109			.133	.133		.179	.179				.250	.358
		.8678	1.404			1.679	1.679		2.172	2.172				2.844	3.659
1 1/4	1.660	.065	.109			.140	.140		.191	.191				.250	.382
		1.107	1.806			2.273	2.273		2.997	2.997				3.765	5.214
1 1/2	1.900	.065	.109			.145	.145		.200	.200				.281	.400
		1.274	2.085			2.718	2.718		3.631	3.631				4.859	6.408
2	2.375	.065	.109			.154	.154		.218	.218				.343	.436
		1.604	2.638			3.653	3.653		5.022	5.022				7.444	9.029
2 1/2	2.875	.083	.120			.203	.203		.276	.276				.375	.552
		2.475	3.531			5.793	5.793		7.661	7.661				10.01	13.70
3	3.500	.083	.120			.216	.216		.300	.300				.437	.600
		3.029	4.332			7.576	7.576		10.25	10.25				14.32	18.58

# WEIGHTS AND DIMENSIONS OF SEAMLESS AND WELDED PIPE

## A.S.A. PIPE SCHEDULES

O.D. in Inches	5	10	20	30	40	STD	60	80	E.H.	100	120	140	160	Dbl E.H.
4.000	.083 3.472	.120 4.973			.226 9.109	.226 9.109		.318 12.51	.318 12.51					.636 22.85
4.500	.083 3.915	.120 5.613			.237 10.79	.237 10.79	.281 12.66	.337 14.98	.337 14.98		.437 19.01		.531 22.51	.674 27.54
5.000						.247 12.53			.355 17.61					.710 32.53
5.563	.109 6.349	.134 7.770			.258 14.62	.258 14.62		.375 20.78	.375 20.78		.500 27.04		.625 32.96	.750 38.55
6.625	.109 7.585	.134 9.289			.280 18.97	.280 18.97		.432 28.57	.432 28.57		.562 36.39		.718 45.30	.864 53.16
7.625						.301 23.57			.500 38.05					.875 63.08
8.625	.109 9.914	.148 13.40	.250 22.36	.277 24.70	.322 28.55	.322 28.55	.406 35.64	.500 43.39	.500 43.39	.593 50.87	.718 60.93	.812 67.76	.906 74.69	.875 72.42
9.625						.342 33.90			.500 48.72					
10.750	.134 15.19	.165 18.70	.250 28.04	.307 34.24	.365 40.48	.365 40.48	.500 54.74	.593 64.33	.500 54.74	.718 76.93	.843 89.20	1.000 104.1	1.125 115.7	
11.750						.375 45.55			.500 60.07					
12.750	.165 22.18	.180 24.20	.250 33.38	.330 43.77	.406 53.53	.375 49.56	.562 73.16	.687 88.51	.500 65.42	.843 107.2	1.000 125.5	1.125 139.7	1.312 160.3	

# WEIGHTS AND DIMENSIONS OF SEAMLESS AND WELDED PIPE (continued)

## A.S.A. PIPE SCHEDULES

PIPE SIZE	O.D. in Inches	5	10	20	30	40	STD	60	80	E.H.	100	120	140	160	Dbl E.H.
14	14.000	.250 36.71	.312 45.68	.375 54.57	.437 63.37	.593 84.91	.375 54.57	.593 84.91	.750 106.1	.500 72.09	.937 130.7	1.093 150.7	1.250 170.2	1.406 189.1	
16	16.000	.250 42.05	.312 52.36	.375 62.58	.500 82.77	.656 107.5	.375 62.58	.656 107.5	.843 136.5	.500 82.77	1.031 164.8	1.218 192.3	1.437 223.5	1.593 245.1	
18	18.000	.250 47.39	.312 59.03	.437 82.06	.562 104.8	.750 138.2	.375 70.59	.750 138.2	.937 170.8	.500 93.45	1.156 208.0	1.375 244.1	1.562 274.2	1.781 308.5	
20	20.000	.250 52.73	.375 78.60	.500 104.1	.593 122.9	.812 166.4	.375 78.60	.812 166.4	1.031 208.9	.500 104.1	1.280 256.1	1.500 296.4	1.750 341.1	1.968 379.0	
24	24.000	.250 63.41	.375 94.62	.562 104.8	.687 171.2	.968 238.1	.375 94.62	.968 238.1	1.218 296.4	.500 125.5	1.531 367.4	1.812 429.4	2.062 483.1	2.343 541.9	

# WELDED AND SEAMLESS STEEL PIPE

## A53

**ASTM A53** specification covers seamless and welded black and hot-dipped galvanized steel pipe. Suitable for coiling, bending, welding and other special purposes. Buttwelded pipe (Type F) is not suitable for flanging. Available in nominal sizes  $\frac{1}{8}$  to 26 inches inclusive.

### ASTM A53 CHEMICAL REQUIREMENTS

	Composition, max, %			
	Carbon	Man- ganese	Phos- phorus	Sulfur
Type S (seamless pipe)				
Open-hearth, electric-furnace or basic-oxygen:				
Grade A	0.25	0.95	0.05	0.06
Grade B	0.30	1.20	0.05	0.06
Type E (electric-resistance-welded)				
Open-hearth, electric-furnace or basic-oxygen:				
Grade A	0.25	0.95	0.05	0.06
Grade B	0.30	1.20	0.05	0.06
Type F (furnace-welded pipe)				
Open-hearth, electric-furnace, or basic oxygen			0.08	0.06

### TENSILE REQUIREMENTS

	Type F		Types E and S	
	Acid— Bessemer	Open-Hearth Basic Oxygen, or Electric- Furnace	Grade A	Grade B
Tensile strength, min, psi	50000	45000	48000	60000
Yield point, min, psi	30000	25000	30000	35000
Elongation in 8 in., min, per cent	18	20		
Elongation in 2 in., min, per cent:				
Basic minimum elongation for walls $\frac{5}{16}$ in. and over in thickness, strip tests, and for all small sizes tested in full sections				
When standard round 2 in. gage length test specimen is used		30	35	30
For strip tests the width of the gage section shall be $1\frac{1}{2}$ in. and a deduction for each $\frac{1}{32}$ in. decrease in wall thickness below $\frac{5}{16}$ in. from the			28	22

# SEAMLESS CARBON STEEL PIPE

## FOR HIGH-TEMPERATURE SERVICE

### A106

**ASTM A106** covers seamless carbon steel pipe for high temperature service. It is available in Grades A, B, or C in nominal sizes  $\frac{1}{8}$ " to 26" inclusive. This material is suitable for bending, flanging, or similar forming operations.

Supplementary requirements are provided for seamless pipe intended for use in applications requiring a superior grade of pipe. Additional testing is performed to meet the supplementary requirements.

### CHEMICAL REQUIREMENTS

	Grade A	Grade B	Grade C
Carbon, max per cent	.025	0.30	0.35
Manganese, per cent	0.27 to 0.93	0.29 to 1.06	0.29 to 1.06
Phosphorus, max, per cent	0.048	0.048	0.048
Sulfur, max, per cent	0.058	0.058	0.058
Silicon, min, per cent	0.10	0.10	0.10

### TENSILE REQUIREMENTS

	Grade A		Grade B		Grade C	
Tensile strength, min, psi	48000		60000		70000	
Yield point, min, psi	30000		35000		40000	
	Longi- tudinal	Trans- verse	Longi- tudinal	Trans- verse	Longi- tudinal	Trans- verse
Elongation in 2 in., min, per cent:						
Basic minimum elongation for walls $\frac{5}{16}$ in. and over in thickness, strip tests, and for all small sizes tested in full section	35	25	30	16.5	30	16.5
When standard round 2-in. gauge length test specimen is used	28	20	22	12	20	12
For strip tests, the width of the gauge section shall be $1\frac{1}{2}$ in. and a deduction for each $\frac{1}{32}$ in. decrease in wall thickness below $\frac{5}{16}$ in. from the basic minimum elongation of the following percentage	1.75a	1.25a	1.50a	1.00a	1.50a	1.00a

a The following table gives the computed minimum values.

## SEAMLESS CARBON STEEL PIPE (continued) FOR HIGH-TEMPERATURE SERVICE

Wall Thickness, in.	Elongation in 2 in. min, per cent			
	Grade A		Grade B and C	
	Longitudinal	Transverse	Longitudinal	Transverse
$\frac{5}{16}$ (0.312) .....	35.00	25.00	30.00	16.50
$\frac{9}{32}$ (0.281) .....	33.25	23.75	28.50	15.50
$\frac{1}{4}$ (0.250) .....	31.50	22.50	27.00	14.50
$\frac{1}{32}$ (0.219) .....	29.75		25.50	
$\frac{3}{16}$ (0.188) .....	28.00		24.00	
$\frac{5}{32}$ (0.156) .....	26.25		22.50	
$\frac{1}{8}$ (0.125) .....	24.50		21.00	
$\frac{3}{32}$ (0.094) .....	22.75		19.50	
$\frac{1}{16}$ (0.062) .....	21.00		18.00	

NOTE — The above table gives the computer minimum elongation values for each  $\frac{1}{32}$ -in. decrease in wall thickness. Where the wall thickness lies between two values shown above, the minimum elongation value is determined by the following formula:

Grade	Direction of Test	Formula	Where:
A	Longitudinal .....	$E = 56t + 17.50$	Where: E = elongation in 2 in. in per cent, and actual thickness of specimen, in inches.
A	Transverse .....	$E = 40t + 12.50$	
B and C	Longitudinal .....	$E = 48t + 15.00$	
B and C	Transverse .....	$E = 32t + 6.50$	

**WELDED AND SEAMLESS STEEL PIPE**  
**BLACK AND HOT — DIPPED ZINC — COATED**  
**(GALVANIZED)**  
**A120**

**ASTM A120** specification covers black and hot-dipped galvanized welded and seamless steel pipe in nominal sizes  $\frac{1}{8}$ " to 16" inclusive. This pipe 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 with the exception of hydrostatic tests. No mechanical tests are specified on this pipe. Primarily intended for distributor's stock and use in ordinary plumbing and heating applications.

Some flaking of the zinc coating may occur when galvanized pipe is bent or fabricated to a degree causing the zinc coating to stretch or compress beyond the limit of elasticity.

# WELDED AND SEAMLESS STEEL PIPE (continued)

## BLACK AND HOT — DIPPED ZINC — COATED (GALVANIZED)

### A120

DIMENSIONS, NOMINAL WEIGHTS (PLAIN ENDS AND THREADS AND COUPLINGS), AND TEST PRESSURE FOR "STANDARD WEIGHT" PIPE (SCHEDULE 40) AND LARGER (SCHEDULES 30 AND 40)

Note—Pipe furnished in accordance with this table will be "Standard Pipe," which is defined in the AISI Steel Products Manual covering Steel Tubular Products as welded or seamless pipe made in three classes of wall thickness: (1) standard weight, in nominal sizes 1/8 to 6 in., incl (2) extra strong, in nominal sizes 1/8 to 12 in., incl, and (3) double extra strong, in nominal sizes 1/2 to 8 in., incl.

Size, in.	Outside Diameter in.	Wall Thickness, in.	Weight per Foot, lb		Test Pressure, psi	
			Plain Ends	Threads and Couplings	Butt-Welded	Seamless and Electric Resistance Welded
1/8	0.405	0.068	0.24	0.24	700	700
1/4	0.540	0.088	0.42	0.42	700	700
3/8	0.675	0.091	0.57	0.57	700	700
1/2	0.840	0.109	0.85	0.85	700	700
3/4	1.050	0.113	1.13	1.13	700	700
1	1.315	0.133	1.68	1.68	700	700
1 1/4	1.660	0.140	2.27	2.28	1000	1000
1 1/2	1.900	0.145	2.72	2.73	1000	1000
2	2.375	0.154	3.65	3.68	1000	1000
2 1/2	2.875	0.203	5.79	5.82	1000	1000
3	3.500	0.216	7.58	7.62	1000	1000
3 1/2	4.000	0.226	9.11	9.20	1200	1200
4	4.500	0.237	10.79	10.89	1200	1200
5	5.563	0.258	14.62	14.81		1200
6	6.625	0.280	18.97	19.18		1200
8	8.625	0.277	24.70	25.55		1200
8	8.625	0.322	28.55	29.35		1300
10	10.750	0.279	31.20	32.75		1000
10	10.750	0.307	34.24	35.75		1000
10	10.750	0.365	40.48	41.85		1200
12	12.750	0.320	42.77	45.45		1000

**WELDED AND SEAMLESS STEEL PIPE (continued)**  
**BLACK AND HOT — DIPPED ZINC — COATED**  
**(GALVANIZED)**

**A120**

DIMENSIONS, NOMINAL WEIGHTS (PLAIN ENDS AND THREADS AND COUPLINGS), AND TEST PRESSURE FOR "EXTRA STRONG" PIPE (SCHEDULE 80)

Note—Pipe furnished in accordance with this table will be "Standard Pipe," which is defined in the AISI Steel Products Manual covering Steel Tubular Products as welded or seamless pipe made in three classes of wall thickness: (1) standard weight, in nominal sizes  $\frac{1}{8}$  to 6 in., incl (2) extra strong, in nominal sizes  $\frac{1}{8}$  to 12 in., incl, and (3) double extra strong, in nominal sizes  $\frac{1}{2}$  to 8 in., incl.

Size, in.	Outside Diameter in.	Wall Thickness, in.	Weight per Foot, Plain Ends, lb.	Test Pressure, psi	
				Butt-Welded	Seamless and Electric Resistance Welded
$\frac{1}{8}$ .....	0.405	0.095	0.31	850	850
$\frac{1}{4}$ .....	0.540	0.119	0.54	850	850
$\frac{3}{8}$ .....	0.675	0.126	0.74	850	850
$\frac{1}{2}$ .....	0.840	0.147	1.09	850	850
$\frac{3}{4}$ .....	1.050	0.154	1.47	850	850
1 .....	1.315	0.179	2.17	850	850
$1\frac{1}{4}$ .....	1.660	0.191	3.00	1300	1500
$1\frac{1}{2}$ .....	1.900	0.200	3.63	1300	1500
2 .....	2.375	0.218	5.02	1300	1500
$2\frac{1}{2}$ .....	2.875	0.276	7.66	1300	1500
3 .....	3.500	0.300	10.25	1300	1500
$3\frac{1}{2}$ .....	4.000	0.318	12.51	1700	1700
4 .....	4.500	0.337	14.98	1700	1700
5 .....	5.563	0.375	20.78		1700
6 .....	6.625	0.432	28.57		1700
8 .....	8.625	0.500	43.39		1700
10 .....	10.750	0.500	54.74		1600
12 .....	12.750	0.500	65.42		1600

**WELDED AND SEAMLESS STEEL PIPE (continued)**  
**BLACK AND HOT — DIPPED ZINC — COATED**  
**(GALVANIZED)**  
**A120**

DIMENSIONS, NOMINAL WEIGHTS (PLAIN ENDS AND THREADS AND COUPLINGS), AND TEST PRESSURE FOR "DOUBLE EXTRA STRONG" PIPE.

Note—Pipe furnished in accordance with this table will be "Standard Pipe," which is defined in the AISI Steel Products Manual covering Steel Tubular Products as welded or seamless pipe made in three classes of wall thickness: (1) standard weight, in nominal sizes  $\frac{1}{8}$  to 6 in., incl (2) extra strong, in nominal sizes  $\frac{1}{8}$  to 12 in., incl, and (3) double extra strong, in nominal sizes  $\frac{1}{2}$  to 8 in., incl.

Size, in.	Outside Diameter in.	Wall Thickness, in.	Weight per Foot, Plain Ends, lb.	Test Pressure, psi	
				Butt-Welded	Seamless and Electric Resistance Welded
$\frac{1}{2}$ .....	0.840	0.294	1.71	1000	1000
$\frac{3}{4}$ .....	1.050	0.308	2.44	1000	1000
1.....	1.315	0.368	3.66	1000	1000
$1\frac{1}{4}$ .....	1.660	0.382	5.21	1400	1800
$1\frac{1}{2}$ .....	1.900	0.400	6.41	1400	1800
2.....	2.375	0.436	9.03	1400	1800
$2\frac{1}{2}$ .....	2.875	0.552	13.70	1400	1800
3.....	3.500	0.600	18.58		1800
4.....	4.500	0.674	27.54		2000
5.....	5.563	0.750	38.55		2000
6.....	6.625	0.864	53.16		2000
8.....	8.625	0.875	72.42		2800



# INDEX

## Stainless Steel

	PAGE
Sheet .....	8.5
Plate .....	8.11
Round Bar .....	8.13
Hexagon Bar .....	8.16
Square Bar .....	8.16
Flat Bar .....	8.17
Angle .....	8.18
Pipe .....	8.19
Tubing .....	8.19



## STAINLESS STEEL

### Chrome-Nickel, Non-Hardening, Austenitic (Non-Magnetic)

The chromium-nickel grades possess the highest corrosion resistance of all stainless steels. In addition, these grades also offer excellent mechanical properties. Although they cannot be hardened by heat treatment, both hardness and tensile strength may be increased by cold working. These alloys are normally non-magnetic, however, they become slightly magnetic as they are cold worked. These grades are widely used in the manufacturing of sheet, plate, strip, bar, and wire products.

**AISI 303** is a chromium-nickel stainless steel modified with selenium, sulphur, and phosphorus to improve machinability. It is corrosion resistant to atmospheric exposures, most organic and inorganic chemicals, dyes, nitric acid, and foods. It is manufactured by the electric-furnace process and meets the exacting requirements of the aircraft industry. This type stainless steel is often used for parts requiring machining, grinding, or polishing where good corrosion resistance is necessary.

**AISI 304** is a low carbon stainless steel which provides good resistance to corrosion. Carbide precipitation is minimized during welding operations. Often used where corrosion resistance and good mechanical properties are of great importance. Frequently used in the food and beverage industry which requires a high degree of sanitation and cleanliness.

**AISI 304L** is a variation of Type 304 featuring a lower carbon content. This low carbon content prevents harmful carbide precipitation during welding in the 800° - 1500° F range. This type offers the same corrosion resistance as Type 304.

**AISI 309** is a high strength stainless steel. It offers excellent oxidation resistance at elevated temperatures. Suitable for spinning, drawing, forming, welding, and fabricating. Welds are strong and ductile, requiring no subsequent heat treatment. Typical applications include aircraft heaters, heat treating equipment, annealing covers, furnace parts, heat exchangers, heat treating trays, oven linings, and

**AISI 310** is more resistant to scaling and oxidation at high temperatures than Type 309. May be welded with tough and ductile welds. This type stainless steel is suitable where strength, toughness, and resistance to corrosion and oxidation are essential. Often used in heat exchangers, furnace parts, combustion chambers, gas turbines and jet engines.

**AISI 316** offers higher corrosion resistance than Types 302 or 304 due to the addition of molybdenum. This type is also highly resistant to pitting and withstands corrosive actions of acids, dyes, and salts used in the process, textile, and pulp industries. Applications include the manufacture of pumps, valves, textile and chemical equipment.

**AISI 316L** is an extra low carbon variation of Type 316. The lower carbon content assists in avoiding carbide precipitation caused by welding. This type continues to provide the excellent corrosion resistance of Type 316 and may be used in the same applications, however, this extra low carbon variety is especially suitable where extensive welding is required.

**AISI 321** is similar to Type 304, however, it includes the addition of Titanium to eliminate carbide precipitation due to welding. It is intended for use in temperatures ranging from 800° F to 1600° F. This type is highly resistant to scaling, oxidation, and many corrosive elements. Suitable for producing aircraft exhaust manifolds, boiler shells, fire walls, process equipment, and pressure vessels.

## STAINLESS STEEL

### Chrome, Hardenable, Martensitic (Magnetic)

Stainless Steel types in the martensitic group contain carbon, chromium, and occasionally nickel in such proportions that these steels will undergo the thermal transformation responsible for hardening. These grades may be heat treated and annealed. Martensitic stainless steels do not provide as much corrosion resistance as types in the austenitic group, nevertheless, they are satisfactory for moderate corrosive conditions. They are suitable for applications requiring high strength, hardness, abrasion resistance, and erosion resistance. Cold forming and hot working characteristics are fair. To prevent cracking, these types must be slowly cooled or annealed after forging.

**AISI 410** is a heat treatable stainless steel hardenable to 190,000 psi Tensile strength. Widely used in applications where corrosion is not extreme. Can be hot or cold worked and is suitable for producing cutlery, pump parts, steam turbine parts, valve parts, gun barrels, fasteners, bushings, and various parts where high mechanical properties are necessary.

**AISI 416** is a free-machining variety of Type 410 with sulphur or selenium added to facilitate high speed machining. This grade offers very good resistance to steam, mildly acidic or alkaline water, natural food acids, basic salts, and other mildly corrosive chemicals. Although a light film of rust may form on the surface, this normally remains superficial. This grade is not recommended for applications requiring welding. This type is often used in the production of nuts and bolts, golf club heads, shafts, pump parts, and screw machine parts.

**AISI 430** stainless steel contains approximately 17% chromium. It is not hardenable by heat treatment. It is highly resistant to corrosive agents and oxidation at high temperatures and is also highly ductile. It is suitable for cold forming, drawing, and bending operations. Along with Type 416, it has the greatest machinability of all the stainless grades. Applications include automotive and architectural trim, food processing equipment, cooking utensils, restaurant

**AISI 440** stainless steel is available in Grades A, B, and C. These grades are capable of achieving the greatest hardness of all the stainless steels, making them similar to tool steels in hardness and abrasion resistance. These hardenable grades have approximately 17% chromium content, while carbon ranges are .60/.75% for Grade A, .75/.95% for Grade B, and .95/1.20% for Grade C. The corrosion resistance of each grade is fairly good in the fully hardened condition. A modification to Type 440 C is type 440 F containing selenium. This grade is suitable for machining applications. All grades possess excellent edge retaining qualities which make them suitable for surgical knives and dental tools. They are also extensively used for bearings, valve parts, and oil well pump parts.

# STAINLESS STEEL SHEETS

## TYPE 304

No. 2B Finish — Cold Rolled, Annealed

\*No. 2D Finish

No. 3 Finish — Polished One Side

No. 4 Finish — Polished One Side

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>7 Ga. (.1874")</b>			<b>13 Ga. (.090")</b>		
48 x 96	7.871	251.9	36 x 120	3.780	113.4
48 x 120	7.871	314.8	48 x 120	3.780	151.2
48 x 144	7.871	377.8	<b>14 Ga. (.075")</b>		
<b>10 Ga. (.135")</b>			30 x 120	3.150	78.75
36 x 120	5.697	170.9	36 x 96	3.150	75.60
48 x 96	5.697	182.3	36 x 120	3.150	94.50
48 x 120	5.697	227.9	36 x 144	3.150	113.4
60 x 120*	5.783	289.2	42 x 120	3.150	110.3
60 x 144*	5.783	347.0	42 x 144	3.150	132.3
72 x 120*	5.906	354.4	48 x 96	3.150	100.8
<b>11 Ga. (.120")</b>			48 x 120	3.150	126.0
36 x 96	5.040	121.0	48 x 144	3.150	151.2
36 x 120	5.040	151.2	60 x 120	3.217	160.9
36 x 144	5.040	181.4	60 x 144	3.217	193.0
48 x 96	5.040	161.3	72 x 120	3.280	196.8
48 x 120	5.040	201.6	72 x 144	3.280	236.2
48 x 144	5.040	241.9	<b>16 Ga. (.060")</b>		
60 x 120	5.145	257.3	30 x 96	2.520	50.40
60 x 144	5.145	308.7	30 x 120	2.520	63.00
72 x 120*	5.250	315.0	36 x 96	2.250	60.48
72 x 144*	5.250	378.0	36 x 120	2.520	75.60
<b>12 Ga. (.105")</b>			36 x 144	2.520	90.72
36 x 96	4.410	105.8	42 x 120	2.520	88.20
36 x 120	4.410	132.3	48 x 96	2.520	80.64
36 x 144	4.410	158.8	48 x 120	2.520	100.8
42 x 120	4.410	154.4	48 x 144	2.520	121.0
48 x 96	4.410	141.1	60 x 96	2.562	102.5
48 x 120	4.410	176.4	60 x 120	2.562	128.1
48 x 144	4.410	211.7	60 x 144	2.562	153.7
60 x 96	4.511	180.4	<b>18 Ga. (.048")</b>		
60 x 120	4.511	225.6	30 x 96	2.016	40.32
60 x 144	4.511	270.7	30 x 120	2.016	50.40
72 x 120*	4.595	275.7	36 x 96	2.016	48.38
72 x 144*	4.595	330.8	36 x 120	2.016	60.48
			36 x 144	2.016	72.58

# STAINLESS STEEL SHEETS (continued)

## TYPE 304

No. 2B Finish — Cold Rolled, Annealed

No. 3 Finish — Polished One Side

No. 4 Finish — Polished One Side

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>18 Ga. (.048")</b>			<b>26 Ga. (.018")</b>		
48 x 120	2.016	80.64	48 x 96	.7560	24.19
48 x 144	2.016	96.77	48 x 120	.7560	30.24
60 x 120	2.058	102.9	<b>28 Ga. (.015")</b>		
60 x 144	2.058	123.5	36 x 96	.6340	15.22
<b>19 Ga. (.042")</b>			36 x 120	.6340	19.02
36 x 120	1.932	57.96			
<b>20 Ga. (.036")</b>					
30 x 96	1.512	30.24			
30 x 120	1.512	37.80			
36 x 96	1.512	36.29			
36 x 120	1.512	45.36			
36 x 144	1.512	54.43			
42 x 120	1.512	52.92			
48 x 96	1.512	48.38			
48 x 120	1.512	60.48			
48 x 144	1.512	72.58			
<b>22 Ga. (.030")</b>					
30 x 96	1.260	25.20			
30 x 120	1.260	31.50			
36 x 96	1.260	30.24			
36 x 120	1.260	37.80			
36 x 144	1.260	45.36			
48 x 96	1.260	40.32			
48 x 120	1.260	50.40			
<b>24 Ga. (.024")</b>					
30 x 96	1.008	20.16			
30 x 120	1.008	25.20			
36 x 96	1.008	24.19			
36 x 120	1.008	30.24			
48 x 96	1.008	32.26			
48 x 120	1.008	40.32			
<b>26 Ga. (.018")</b>					
30 x 96	.7560	15.12			
30 x 120	.7560	18.90			
36 x 96	.7560	18.14			
36 x 120	.7560	22.68			

## STAINLESS STEEL SHEETS

### TYPE 304L

Extra Low Carbon

No. 2B Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>10 Ga. (.135")</b>			<b>16 Ga. (.060")</b>		
48 x 120	5.697	227.9	36 x 120	2.520	75.60
			48 x 120	2.520	100.8
<b>11 Ga. (.120")</b>			<b>18 Ga. (.048")</b>		
48 x 120	5.040	201.6	36 x 120	2.016	60.48
<b>12 Ga. (.105")</b>			48 x 120	2.016	80.64
48 x 120	4.410	176.4	<b>20 Ga. (.036")</b>		
<b>14 Ga. (.075")</b>			48 x 120	1.512	60.48
36 x 120	3.150	94.50			
48 x 120	3.150	126.0			

## STAINLESS STEEL SHEETS

### TYPE 309

No. 2D Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>10 Ga. (.135")</b>			<b>14 Ga. (.075")</b>		
48 x 120	5.697	227.9	48 x 120	3.150	126.0
<b>11 Ga. (.120")</b>			<b>16 Ga. (.060")</b>		
48 x 120	5.040	201.6	48 x 120	2.520	100.8
<b>12 Ga. (.105")</b>					
48 x 120	4.410	176.4			

# STAINLESS STEEL SHEETS

## TYPE 316L

### Extra Low Carbon

#### No. 2B Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>7 Ga. (.1874")</b>			<b>20 Ga. (.036")</b>		
48 x 120	7.871	314.8	36 x 96	1.512	36.29
48 x 144	7.871	377.8	36 x 120	1.512	45.36
<b>10 Ga. (.135")</b>			48 x 96	1.512	48.38
36 x 120	5.697	170.9	48 x 120	1.512	60.48
48 x 120	5.697	227.9	<b>22 Ga. (.030")</b>		
48 x 144	5.697	273.5	36 x 96	1.260	30.24
60 x 144	5.783	347.0	36 x 120	1.260	37.80
<b>11 Ga. (.120")</b>			48 x 120	1.260	50.40
36 x 96	5.040	121.0	<b>24 Ga. (.024")</b>		
36 x 120	5.040	151.2	36 x 96	1.008	24.19
48 x 120	5.040	201.6	36 x 120	1.008	30.24
60 x 144	5.145	308.7	48 x 96	1.008	32.26
<b>12 Ga. (.105")</b>			48 x 120	1.008	40.32
36 x 96	4.410	105.8	<b>26 Ga. (.018")</b>		
36 x 120	4.410	132.3	36 x 96	.7560	18.14
48 x 96	4.410	141.1	36 x 120	.7560	22.68
48 x 120	4.410	176.4			
60 x 144	4.511	270.7			
<b>14 Ga. (.075")</b>					
36 x 96	3.150	75.60			
36 x 120	3.150	94.50			
48 x 96	3.150	100.8			
48 x 120	3.150	126.0			
60 x 144	3.217	193.0			
<b>16 Ga. (.060")</b>					
36 x 96	2.520	60.48			
36 x 120	2.520	75.60			
48 x 96	2.520	80.64			
48 x 120	2.520	100.8			
60 x 144	2.562	153.7			
<b>18 Ga. (.048")</b>					
36 x 96	2.016	48.38			
36 x 120	2.016	60.48			
48 x 96	2.016	64.51			
48 x 120	2.016	80.64			

## STAINLESS STEEL SHEETS

### TYPE 316

No. 2B Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>10 Ga. (.135")</b> 48 x 120	5.697	227.9	<b>16 Ga. (.060")</b> 36 x 96	2.520	60.48
<b>11 Ga. (.120")</b> 36 x 120	5.040	151.2	36 x 120	2.520	75.60
48 x 120	5.040	201.6	48 x 120	2.520	100.8
<b>12 Ga. (.105")</b> 48 x 120	4.410	176.4	<b>18 Ga. (.048")</b> 48 x 120	2.016	80.64
<b>14 Ga. (.075")</b> 48 x 120	3.150	126.0	<b>20 Ga. (.036")</b> 36 x 120	1.512	45.36
			48 x 120	1.512	60.48

## STAINLESS STEEL SHEETS

### TYPE 321

No. 2D Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>10 Ga. (.141")</b> 48 x 120	5.922	236.9	<b>18 Ga. (.050")</b> 36 x 120	2.100	63.00
<b>11 Ga. (.120")</b> 36 x 120	5.040	151.2	<b>.040"</b> 36 x 120	1.680	50.40
<b>12 Ga. (.109")</b> 36 x 120	4.578	137.3	<b>20 Ga. (.036")</b> 36 x 120	1.512	45.36
48 x 120	4.578	183.1	<b>22 Ga. (.030")</b> 36 x 120	1.260	37.80
<b>13 Ga. (.090")</b> 36 x 120	3.780	113.4	<b>24 Ga. (.025")</b> 36 x 120	1.050	31.50
48 x 120	3.780	151.2	<b>.020"</b> 36 x 120	.8400	25.20
<b>14 Ga. (.080")</b> 36 x 120	3.360	100.8	<b>.016"</b> 36 x 120	.6720	20.16
48 x 120	3.360	134.4			
<b>16 Ga. (.063")</b> 36 x 120	2.646	79.38			

# STAINLESS STEEL SHEETS

## TYPE 430

### ASTM A-240

#### No. 2B Finish — Cold Rolled, Annealed

Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet	Stainless Steel Gauge, Width, and Length	Weight Lbs. per Foot	Est. Wt. per Sheet
<b>10 Ga. (.135")</b>			<b>24 Ga. (.024")</b>		
48 x 120	5.697	227.9	30 x 120	1.008	25.20
			36 x 96	1.008	24.19
<b>11 Ga. (.120")</b>			36 x 120	1.008	30.24
36 x 120	5.040	151.2	48 x 120	1.008	40.32
48 x 120	5.040	201.6			
			<b>26 Ga. (.018")</b>		
<b>12 Ga. (.105")</b>			30 x 120	.7560	18.90
36 x 120	4.410	132.3	36 x 96	.7560	18.14
48 x 120	4.410	176.4	36 x 120	.7560	22.68
<b>14 Ga. (.075")</b>			<b>28 Ga. (.015")</b>		
36 x 120	3.150	94.50	36 x 120	.6340	19.02
48 x 120	3.150	126.0			
<b>16 Ga. (.060")</b>					
36 x 120	2.520	75.60			
48 x 96	2.520	80.64			
48 x 120	2.520	100.8			
48 x 144	2.520	121.0			
<b>18 Ga. (.048")</b>					
36 x 96	2.016	48.38			
36 x 120	2.016	60.48			
48 x 120	2.016	80.64			
<b>20 Ga. (.036")</b>					
30 x 96	1.512	30.24			
30 x 120	1.512	37.80			
36 x 96	1.512	36.29			
36 x 120	1.512	45.36			
48 x 120	1.512	60.48			
<b>22 Ga. (.030")</b>					
30 x 120	1.260	31.50			
36 x 96	1.260	30.24			
36 x 120	1.260	37.80			
48 x 120	1.260	50.40			

# STAINLESS PLATES

Types: 304, 304L, 316, and 316 L

Hot Rolled, Annealed and Pickled

Thickness and Size in Inches	Est. Wt. per Sq. Ft. in Lbs.	304	304L	316	316L
$\frac{3}{16}$ ..... 48	8.579	X	X	X	X
60	8.579	X	X		X
72	8.579	X			X
84	8.579	X			X
96	8.579	X	X	X	X
120	8.579	X			X
$\frac{1}{4}$ ..... 48	11.162	X	X	X	X
60	11.162	X	X		X
72	11.162	X	X		X
84	11.162	X	X		
96	11.162	X	X	X	X
120	11.162	X			X
$\frac{5}{16}$ ..... 48	13.746	X			
60	13.746	X			
84	13.746	X			
96	13.746	X	X	X	X
120	13.746	X			X
$\frac{3}{8}$ ..... 48	16.496	X		X	X
60	16.496	X			X
72	16.496	X			X
84	16.496	X			
96	16.496	X	X	X	X
120	16.496	X			X
$\frac{1}{2}$ ..... 48	21.663	X			X
60	21.663	X			X
72	21.663	X			X
84	21.663	X			
96	21.663	X	X	X	X
120	21.663	X			X
$\frac{5}{8}$ ..... 96	26.831	X	X	X	X
$\frac{3}{4}$ ..... 96	32.123	X	X	X	X
$\frac{7}{8}$ ..... 96	37.291	X	X		
1 ..... 60	42.665	X			
96	42.665	X	X	X	X
$1\frac{1}{8}$ ..... 96	47.833	X			
$1\frac{1}{4}$ ..... 96	52.800	X	X	X	X
$1\frac{1}{2}$ ..... 96	63.34	X	X	X	X
$1\frac{3}{4}$ ..... 96	73.67	X	X	X	X
2 ..... 96	84.44	X	X	X	X
$2\frac{1}{2}$ ..... 96	105.11	X		X	X
3 ..... 96	126.3	X	X	X	X
$3\frac{1}{4}$ ..... 96	136.6	X			
$3\frac{1}{2}$ ..... 96	147.0	X			
$3\frac{3}{4}$ ..... 96	157.3	X			

## STAINLESS DIAMOND FLOOR PLATES

### Type 304

**Hot Rolled, Annealed and Pickled**

Thickness and Size in Inches	Est. Wt. per Sq. Ft. in Lbs.	Thickness and Size in Inches	Est. Wt. per Sq. Ft. in Lbs.
1/8 ..... 48	6.150	1/4 ..... 48	11.25
3/16 ..... 48	8.700		

## STAINLESS PLATES

**Types: 309/309S, 310/310S and 321**

**Hot Rolled, Annealed and Pickled**

Thickness and Size in Inches	Est. Wt. per Sq. Ft. in lbs.	309/ 309S	310/ 310S	321
3/16 ..... 72	8.579			X
96	8.579	X	X	
1/4 ..... 72	11.162			X
96	11.162	X	X	
3/8 ..... 72	16.496			X
96	16.496	X	X	
1/2 ..... 96	21.663	X	X	

## STAINLESS PLATES

**Types: 410, 410S and 430**

**Hot Rolled, Annealed and Pickled**

Thickness and Size in Inches	Est. Wt. per Sq. Ft. in Lbs.	410	410S	430
3/16 ..... 72	8.579	X		
96	8.579	X		X
1/4 ..... 72	11.162	X		
96	11.162	X	X	X
5/16 ..... 72	13.746	X		
3/8 ..... 72	16.496	X		
96	16.496	X	X	
1/2 ..... 96	21.663	X	X	
5/8 ..... 96	26.831	X		
3/4 ..... 96	32.123	X		
1 ..... 96	42.665	X		
1 1/8 ..... 96	47.883	X		
1 1/4 ..... 72	52.800	X		
1 1/2 ..... 72	63.340	X		
1 3/4 ..... 72	73.670	X		
2 ..... 72	84.440	X		

**STAINLESS ROUNDS****TYPE 303**

Annealed

FREE MACHINING

AMS 5640 QQ-S-764 Class 303 Cond. A

 $\frac{1}{16}$ " to  $\frac{1}{2}$ " dia. ASTM A581 Cond. A (Wire Sizes) $\frac{3}{8}$ " dia. and over ASTM A582 Cond. A (Bar Sizes)

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
$\frac{1}{16}$	.0104	.1248	$\frac{13}{16}$	3.766	45.19
$\frac{5}{64}$	.0163	.1956	$\frac{1}{4}$	4.173	50.08
$\frac{3}{32}$	.0235	.2820	$\frac{15}{16}$	4.600	55.20
$\frac{7}{64}$	.0320	.3840	$\frac{1}{8}$	5.049	60.59
$\frac{1}{8}$	.0417	.5004	$\frac{17}{16}$	5.518	66.22
$\frac{9}{64}$	.0528	.6336	$\frac{1}{2}$	6.008	72.10
$\frac{5}{32}$	.0652	.7824	$\frac{19}{16}$	6.520	78.24
$\frac{11}{64}$	.0789	.9468	$\frac{5}{8}$	7.052	84.62
$\frac{3}{16}$	.0939	1.127	$1\frac{1}{16}$	7.604	91.25
$\frac{13}{64}$	.1102	1.322	$\frac{3}{4}$	8.178	98.14
$\frac{7}{32}$	.1278	1.534	$1\frac{3}{16}$	8.773	105.3
$\frac{1}{4}$	.1669	2.003	$\frac{1}{8}$	9.388	112.7
$\frac{17}{64}$	.1884	2.261	$1\frac{5}{16}$	10.02	120.2
$\frac{9}{32}$	.2113	2.536	2	10.68	128.2
$\frac{5}{16}$	.2608	3.130	$2\frac{1}{16}$	11.36	136.3
$2\frac{1}{64}$	.2875	3.450	$\frac{2}{8}$	12.06	144.7
$\frac{11}{32}$	.3156	3.787	$2\frac{3}{16}$	12.78	153.4
$\frac{3}{8}$	.3755	4.506	$\frac{2}{4}$	13.52	162.2
$2\frac{5}{64}$	.4074	4.889	$2\frac{5}{16}$	14.28	171.4
$\frac{13}{32}$	.4408	5.290	$2\frac{3}{8}$	15.06	180.7
$\frac{7}{16}$	.5111	6.133	$2\frac{7}{16}$	15.87	190.4
$\frac{15}{32}$	.5869	7.043	$2\frac{1}{2}$	16.69	200.3
$\frac{1}{2}$	.6676	8.011	$2\frac{9}{16}$	17.53	210.4
$\frac{33}{64}$	.7099	8.519	$2\frac{5}{8}$	18.40	220.8
$\frac{17}{32}$	.7538	9.046	$2\frac{11}{16}$	19.29	231.5
$\frac{9}{16}$	.8449	10.14	$2\frac{3}{4}$	20.19	242.3
$\frac{19}{32}$	.9416	11.30	$2\frac{7}{8}$	22.07	264.8
$\frac{5}{8}$	1.043	12.52	$2\frac{15}{16}$	23.04	276.5
$\frac{41}{64}$	1.096	13.15	3	24.03	288.4
$\frac{21}{32}$	1.150	13.80	$3\frac{1}{8}$	26.08	313.0
$\frac{11}{16}$	1.262	15.14	$3\frac{1}{4}$	28.21	338.5
$\frac{3}{4}$	1.502	18.02	$3\frac{3}{8}$	30.42	365.0
$\frac{49}{64}$	1.565	18.78	$3\frac{1}{2}$	32.71	392.5
$\frac{13}{16}$	1.763	21.16	$3\frac{5}{8}$	35.09	421.1
$\frac{7}{8}$	2.045	24.54	$3\frac{3}{4}$	37.55	450.6
$2\frac{9}{32}$	2.193	26.32	4	42.73	512.8
$\frac{15}{16}$	2.347	28.16	4	48.23	578.8
1	2.670	32.04	$4\frac{1}{4}$	54.08	649.0
$\frac{1}{64}$	2.754	33.05	$4\frac{1}{2}$	60.25	723.0
$\frac{1}{16}$	3.015	36.18	$4\frac{3}{4}$	66.76	801.1
			5	80.78	969.4
			$5\frac{1}{2}$		

# STAINLESS ROUNDS

## TYPE 304, 316, 440 F-Se

304 — QQ-S-763 Class 304 Cond A    ASTM A-276    ASME SA 479

316 — QQ-S-763 Class 316 Cond A    ASTM A-276    ASME SA 479

440 F-Se — AMS 5632 Type 2    17-4 PH Cond A — AMS 5643

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
1/8	.0417	.5004	3	24.03	288.4
3/16	.0939	1.127	3 1/8	26.08	313.0
1/4	.1669	2.003	3 1/4	28.21	338.5
9/32	.2113	2.536	3 3/8	30.42	365.0
5/16	.2608	3.130	3 1/2	32.71	392.5
3/8	.3755	4.506	3 3/4	37.55	450.6
7/16	.5111	6.133	4	42.73	512.8
1/2	.6676	8.011	4 1/4	48.23	578.8
9/16	.8449	10.14	4 1/2	54.08	649.0
5/8	1.043	12.52	4 3/4	60.25	723.0
1 1/16	1.262	15.14	5	66.76	801.1
3/4	1.502	18.02	5 1/2	80.78	969.4
13/16	1.763	21.16	6	96.13	1153.6
7/8	2.045	24.54	6 1/2	112.8	1353.6
15/16	2.347	28.16	7	130.9	1570.8
1	2.670	32.04	7 1/2	150.2	1802.4
1 1/16	3.015	36.18	8	170.9	2050.8
1 1/8	3.380	40.56	8 1/2	192.9	2314.8
1 3/16	3.766	45.19	9	216.2	2594.4
1 1/4	4.173	50.08	10	267.0	3204.0
1 5/16	4.600	55.20	11	323.1	3877.2
1 3/8	5.049	60.59	12	384.5	4614.0
1 7/16	5.518	66.22	14	523.4	6280.8
1 1/2	6.008	72.10	15	600.8	7209.6
1 5/8	7.052	84.62			
1 11/16	7.604	91.25			
1 3/4	8.178	98.14			
1 7/8	9.388	112.7			
1 15/16	10.02	120.2			
2	10.68	128.2			
2 1/8	12.06	144.7			
2 1/4	13.52	162.2			
2 3/8	15.06	180.7			
2 7/16	15.87	190.4			
2 1/2	16.69	200.3			
2 5/8	18.40	220.8			
2 3/4	20.19	242.3			
2 7/8	22.07	264.8			

**STAINLESS ROUNDS****TYPE 416****Annealed — Magnetic****FREE MACHINING****AMS 5610 QQ-S-764 Class 416 Cond. A** **$\frac{3}{32}$ " to  $\frac{1}{2}$ " dia. ASTM A581 Cond. A (Wire Sizes)** **$\frac{33}{64}$ " dia. and over ASTM A582 Cond. A (Bar Sizes)**

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
$\frac{3}{32}$	.0235	.2820	$\frac{1}{8}$	3.380	40.56
$\frac{7}{64}$	.0320	.3840	$\frac{13}{16}$	3.766	45.19
$\frac{1}{8}$	.0417	.5004	$\frac{1}{4}$	4.173	50.08
$\frac{9}{64}$	.0528	.6336	$\frac{15}{16}$	4.600	55.20
$\frac{5}{32}$	.0652	.7824	$\frac{13}{8}$	5.049	60.59
$\frac{11}{64}$	.0789	.9468	$\frac{17}{16}$	5.518	66.22
$\frac{3}{16}$	.0939	1.127	$\frac{1}{2}$	6.008	72.10
$\frac{13}{64}$	.1102	1.322	$\frac{19}{16}$	6.520	78.24
$\frac{7}{32}$	.1278	1.534	$\frac{19}{8}$	7.052	84.62
$\frac{1}{4}$	.1669	2.003	$\frac{11}{16}$	7.604	91.25
$\frac{17}{64}$	.1884	2.261	$\frac{13}{4}$	8.178	98.14
$\frac{9}{32}$	.2113	2.536	$\frac{113}{16}$	8.773	105.3
$\frac{5}{16}$	.2608	3.130	$\frac{17}{8}$	9.388	112.7
$\frac{21}{64}$	.2875	3.450	$\frac{115}{16}$	10.02	120.2
$\frac{11}{32}$	.3156	3.787	2	10.68	128.2
$\frac{3}{8}$	.3755	4.506	$\frac{21}{16}$	11.36	136.3
$\frac{25}{64}$	.4074	4.889	$\frac{21}{8}$	12.06	144.7
$\frac{13}{32}$	.4408	5.290	$\frac{23}{16}$	12.78	153.4
$\frac{7}{16}$	.5111	6.133	$\frac{21}{4}$	13.52	162.2
$\frac{15}{32}$	.5869	7.043	$\frac{23}{8}$	15.06	180.7
$\frac{1}{2}$	.6676	8.011	$\frac{21}{2}$	16.69	200.3
$\frac{33}{64}$	.7099	8.519	$\frac{25}{8}$	18.40	220.8
$\frac{17}{32}$	.7538	9.046	$\frac{23}{4}$	20.19	242.3
$\frac{9}{16}$	.8449	10.14	$\frac{27}{8}$	22.07	264.8
$\frac{5}{8}$	1.043	12.52	3	24.03	288.4
$\frac{41}{64}$	1.096	13.15	$\frac{31}{8}$	26.08	313.0
$\frac{21}{32}$	1.150	13.80	$\frac{31}{4}$	28.21	338.5
$\frac{11}{16}$	1.262	15.14	$\frac{31}{2}$	32.71	392.5
$\frac{3}{4}$	1.502	18.02	$\frac{33}{4}$	37.55	450.6
$\frac{49}{64}$	1.565	18.78	4	42.73	512.8
$\frac{13}{16}$	1.763	21.16	$\frac{41}{4}$	48.23	578.8
$\frac{7}{8}$	2.045	24.54	$\frac{41}{2}$	54.08	649.0
$\frac{57}{64}$	2.118	25.42	$\frac{43}{4}$	60.25	723.0
$\frac{15}{16}$	2.347	28.16	5	66.76	801.1
1	2.670	32.04	6	96.13	1153.6
$\frac{11}{4}$	3.754	45.05	7	122.00	1470.8

**STAINLESS HEXAGONS****TYPES 303, 316, 416****Annealed Cold Drawn**

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
1/8	.0460	.5520	1	2.944	35.33
3/16	.1035	1.242	1 1/16	3.324	39.89
1/4	.1840	2.208	1 1/8	3.727	44.72
5/16	.2875	3.450	1 1/4	4.601	55.21
3/8	.4141	4.969	1 5/16	5.072	60.86
7/16	.5636	6.763	1 3/8	5.567	66.80
1/2	.7361	8.833	1 1/2	6.625	79.50
9/16	.9316	11.18	1 5/8	7.775	93.30
5/8	1.150	13.80	1 3/4	9.017	108.2
11/16	1.392	16.70	1 7/8	10.35	124.2
3/4	1.656	19.87	2	11.78	141.4
13/16	1.944	23.33	2 1/4	14.91	178.9
7/8	2.254	27.05	2 1/2	18.40	220.8
15/16	2.588	31.06	3	26.50	318.0

**STAINLESS SQUARES****TYPES 303, 304, 416****Annealed Cold Drawn**

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
1/8	.0531	.6372	1 1/4	5.313	63.76
3/16	.1195	1.434	1 1/2	7.650	91.80
1/4	.2125	2.550	1 3/4	10.41	124.9
5/16	.3320	3.984	2	13.60	163.2
3/8	.4781	5.737			
7/16	.6508	7.810			
1/2	.8500	10.20			
9/16	1.076	12.91			
5/8	1.328	15.94			
3/4	1.913	22.96			
7/8	2.603	31.24			
1	3.400	40.80			
1 1/8	4.303	51.64			

# STAINLESS FLATS

## TYPES 304, 316

### Annealed and Pickled

**QQ-S-763 Class 304 Cond. A**
**ASTM A-276**
**ASME SA 479**
**QQ-S-763 Class 316 Cond. A**
**ASTM A-276**
**ASME SA 479**

Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar	Size in Inches	Est. Wt. Per Ft. Pounds	Est. Wt. 12' Bar
1/8 x 1/2	.2125	2.550	3/8 x 5	6.375	76.50
5/8	.2656	3.187	6	7.650	91.80
3/4	.3188	3.826	1/2 x 3/4	1.275	15.30
1	.4250	5.100	1	1.700	20.40
1 1/4	.5313	6.376	1 1/4	2.125	25.50
1 1/2	.6375	7.650	1 1/2	2.550	30.60
2	.8500	10.20	1 3/4	2.975	35.70
2 1/2	1.063	12.76	2	3.400	40.80
3	1.275	15.30	2 1/2	4.250	51.00
3/16 x 1/2	.3188	3.826	3	5.100	61.20
5/8	.3984	4.781	3 1/2	5.950	71.40
3/4	.4781	5.737	4	6.800	81.60
1	.6375	7.650	4 1/2	7.650	91.80
1 1/4	.7969	9.563	5	8.500	102.0
1 1/2	.9563	11.48	6	10.20	122.4
1 3/4	1.116	13.39	5/8 x 3/4	1.594	19.13
2	1.275	15.30	1	2.125	25.50
2 1/2	1.594	19.13	1 1/2	3.188	38.26
3	1.913	22.96	2	4.250	51.00
1/4 x 1/2	.4250	5.100	2 1/2	5.313	63.76
5/8	.5313	6.376	3	6.375	76.50
3/4	.6375	7.650	3 1/2	7.438	89.26
1	.8500	10.20	4	8.500	102.0
1 1/4	1.063	12.76	6	12.75	153.0
1 1/2	1.275	15.30	3/4 x 1	2.550	30.60
1 3/4	1.488	17.86	1 1/4	3.188	38.26
2	1.700	20.40	1 1/2	3.825	45.90
2 1/2	2.125	25.50	2	5.100	61.20
3	2.550	30.60	2 1/2	6.375	76.50
4	3.400	40.80	3	7.650	91.80
6	5.100	61.20	4	10.20	122.4
3/8 x 1/2	.6375	7.650	5	12.75	153.0
3/4	.9563	11.48	6	15.30	183.6
1	1.275	15.30	1 x 1 1/2	5.100	61.20
1 1/4	1.594	19.13	1 3/4	5.950	71.40
1 1/2	1.913	22.96	2	6.800	81.60
1 3/4	2.231	26.77	2 1/2	8.500	102.0
2	2.550	30.60	3	10.20	122.4
2 1/2	3.188	38.26	4	13.60	163.2
3	3.826	45.90	5	17.00	204.0

# STAINLESS PLATE FLATS

## TYPE 304 AND TYPE 316 ELC

SHEARED AND EDGE CONDITIONED  
HOT ROLLED, ANNEALED AND PICKLED

Size	Weight Per Ft.	Size	Weight Per Ft.	Size	Weight Per Ft.
1/8 x 1/2	.213	x 4	2.860	x 2	2.750
x 3/4	.315	x 4 1/2	3.218	x 2 1/2	3.438
x 1	.420	x 5	3.575	x 3	4.125
x 1 1/4	.525	x 5 1/2	3.933	x 3 1/2	4.813
x 1 1/2	.630	x 6	4.290	x 4	5.500
x 2	.840	1/4 x 1	.930	x 4 1/2	6.188
x 2 1/2	1.050	x 1 1/4	1.163	x 5	6.875
x 3	1.260	x 1 1/2	1.395	x 5 1/2	7.563
x 3 1/2	1.470	x 1 3/4	1.628	x 6	8.250
x 4	1.680	x 2	1.860	1/2 x 1	1.805
x 4 1/2	1.890	x 2 1/2	2.325	x 1 1/4	2.256
x 5	2.100	x 3	2.790	x 1 1/2	2.708
x 5 1/2	2.310	x 3 1/2	3.255	x 1 3/4	3.159
x 6	2.520	x 4	3.720	x 2	3.610
3/16 x 1	.715	x 4 1/2	4.185	x 2 1/2	4.513
x 1 1/4	.894	x 5	4.650	x 3	5.415
x 1 1/2	1.073	x 5 1/2	5.115	x 3 1/2	6.318
x 1 3/4	1.251	x 6	5.580	x 4	7.220
x 2	1.430	3/8 x 1	1.375	x 4 1/2	8.123
x 2 1/2	1.788	x 1 1/4	1.719	x 5	9.025
x 3	2.145	x 1 1/2	2.063	x 5 1/2	9.928
x 3 1/2	2.503	x 1 3/4	2.406	x 6	10.830

# STAINLESS ANGLES

Types: 304, 304L, 316, and 316L

Hot Rolled, Annealed and Pickled or Extruded, Annealed and Pickled  
Machine or Stretcher Straightened

ASTM A276, ASTM A479, ASME SA479, QQS 763, and DuPont SW300-M

Size in Inches	Est. Wt. per Ft. in Lbs.	3 0 4	3 0 4 L	3 1 6	3 1 6 L	Size in Inches	Est. Wt. per Ft. in Lbs.	3 0 4	3 0 4 L	3 1 6	3 1 6 L
3/4 x 3/4 x 1/8	.590	X				2 1/2 x 2 1/2 x 3/16	3.07	X			
1 x 1 x 1/8	.800	X				2 1/2 x 2 1/2 x 1/4	4.10	X		X	X
1 x 1 x 3/16	1.16	X			X	2 1/2 x 2 1/2 x 3/8	5.90	X		X	
1 x 1 x 1/4	1.49	X				3 x 2 x 3/16	3.07	X			
1 1/4 x 1 1/4 x 1/8	1.01	X				3 x 2 x 1/4	4.10	X			
1 1/4 x 1 1/4 x 3/16	1.48	X				3 x 3 x 1/4	4.90	X	X	X	X
1 1/4 x 1 1/4 x 1/4	1.92	X				3 x 3 x 5/16	6.10	X			
1 1/2 x 1 1/2 x 1/8	1.23	X		X		3 x 3 x 3/8	7.20	X	X	X	X
1 1/2 x 1 1/2 x 3/16	1.80	X		X	X	3 1/2 x 3 1/2 x 1/4	5.80	X			
1 1/2 x 1 1/2 x 1/4	2.34	X	X		X	4 x 3 x 1/4	5.80	X			
2 x 2 x 1/8	1.65	X				4 x 3 x 3/8	8.50	X			
2 x 2 x 3/16	2.44	X		X	X	4 x 4 x 1/4	6.60	X		X	X
2 x 2 x 1/4	3.19	X	X	X	X	4 x 4 x 3/8	9.80	X			X
2 x 2 x 3/8	4.70	X				5 x 3 x 3/8	9.85	X			

**WELDED STAINLESS PIPE****TYPE 304 TYPE 316****Schedule 40 — Standard IPS****Cold Finished, Annealed and Pickled****17-24 Ft. Random Lengths — ASTM A312**

Iron Pipe Size In.	Diameter Inches		Wall Thickness Inches	Wt. Per Ft. Lbs.	Iron Pipe Size In.	Diameter Inches		Wall Thickness Inches	Wt. Per Ft. Lbs.
	O.D.	I.D.				O.D.	I.D.		
1/8	.405	.269	.068	.2447	2	2.375	2.067	.154	3.653
1/4	.540	.364	.088	.4248	2 1/2	2.875	2.469	.203	5.793
3/8	.675	.493	.091	.5676	3	3.500	3.068	.216	7.576
1/2	.840	.622	.109	.8510	3 1/2	4.000	3.548	.226	9.109
3/4	1.050	.824	.113	1.131	4	4.500	4.026	.237	10.79
1	1.315	1.049	.133	1.679	5	5.563	5.047	.258	14.62
1 1/4	1.660	1.380	.140	2.273	6	6.625	6.065	.280	18.97
1 1/2	1.900	1.610	.145	2.718					

**WELDED EXTRA HEAVY STAINLESS PIPE****TYPE 304****Schedule 80 — Extra Heavy IPS****Cold Finished, Annealed and Pickled****17-24 Ft. Random Lengths — ASTM A312**

Ex. Hv. Pipe Size Inches	Diameter Inches		Wall Thickness Inches	Wt. Per Ft. Lbs.	Ex. Hv. Pipe Size Inches	Diameter Inches		Wall Thickness Inches	Wt. Per Ft. Lbs.
	O.D.	I.D.				O.D.	I.D.		
1/8	.405	.215	.095	.3145	2	2.375	1.939	.218	5.022
1/4	.540	.302	.119	.5351	2 1/2*	2.815	2.263	.276	7.66
3/8	.675	.423	.126	.7388	3 *	3.500	2.900	.300	10.25
1/2	.840	.546	.147	1.088	3 1/2*	4.000	3.364	.318	12.51
3/4	1.050	.742	.154	1.474	4 *	4.500	3.826	.337	14.98
1	1.315	.957	.179	2.172	5 *	5.563	4.813	.375	20.78
1 1/4	1.660	1.278	.191	2.997					
1 1/2	1.900	1.500	.200	3.631					

**SQUARE STAINLESS STEEL TUBE****WELDED TYPE 304****17-24 Ft. Random Lengths**

Size O.D.	B.W. Ga.	Wall Dec. In.	Size I.D.	Wt. per Ft. Lbs.	Size O.D.	B.W. Ga.	Wall Dec. In.	Size I.D.	Wt. per Ft. Lbs.
1"	16	.065	.870	8.265	1 1/4"	11	.120	1.260	2.252
1 1/4"	16	.065	1				.120	1.760	3.068

# STAINLESS STEEL TUBING

## WELDED TYPE 304

Cold Finished, Annealed and Pickled  
ASTM A249  
17-24 Ft. Random Lengths

Size O.D.	B.W. Ga.	Wall Dec. In.	Size I.D.	Wt. per Ft. Lbs.	Size O.D.	B.W. Ga.	Wall Dec. In.	Size I.D.	Wt. per Ft. Lbs.
1/8"	22	.028	.069	.0290	1 1/4"	18	.049	1.152	.6285
3/16"	22	.028	.132	.0478		16	.065	1.120	.8226
	20	.035	.118	.0572		14	.083	1.084	1.035
1/4"	22	.028	.194	.0664		11	.120	1.010	1.448
	20	.035	.180	.0804		1/4	.250	.750	2.670
	18	.049	.152	.1052	1 3/8"	16	.065	1.245	.9094
	16	.065	.120	.1284	1 1/2"	20	.035	1.430	.5476
5/16"	22	.028	.257	.0852		18	.049	1.402	.7593
	20	.035	.243	.1039		16	.065	1.370	.9962
	18	.049	.215	.1382		14	.083	1.334	1.256
	16	.065	.183	.1722		11	.120	1.260	1.769
3/8"	22	.028	.319	.1038		3/16	.188	1.124	2.634
	20	.035	.305	.1271		1/4	.250	1.000	3.338
	18	.049	.277	.1706	1 5/8"	16	.065	1.495	1.083
	16	.065	.245	.2152	1 3/4"	20	.035	1.680	.6411
7/16"	20	.035	.368	.1506		18	.049	1.652	.8902
	18	.049	.340	.2036		16	.065	1.620	1.170
	16	.065	.308	.2589		11	.120	1.510	2.089
1/2"	22	.028	.444	.1411		3/16	.188	1.374	3.136
	20	.035	.430	.1738	2"	20	.035	1.930	.7345
	18	.049	.402	.2360		18	.049	1.902	1.021
	16	.065	.370	.3020		16	.065	1.870	1.343
	13	.095	.310	.4109		14	.083	1.834	1.699
	11	.120	.260	.4870		11	.120	1.760	2.409
5/8"	22	.028	.569	.1785		3/16	.188	1.624	3.638
	20	.035	.555	.2205		1/4	.250	1.500	4.673
	18	.049	.527	.3014	2 1/4"	16	.065	2.120	1.517
	16	.065	.495	.3888		11	.120	2.010	2.730
	11	.120	.385	.6472		3/16	.188	1.874	4.140
3/4"	20	.035	.680	.2673		1/4	.250	1.750	5.340
	18	.049	.652	.3668	2 1/2"	18	.049	2.402	1.283
	16	.065	.620	.4755		16	.065	2.370	1.690
	13	.095	.560	.6646		11	.120	2.260	3.050
	11	.120	.510	.8074		3/16	.188	2.125	4.642
7/8"	20	.035	.805	.3140		1/4	.250	2.000	6.008
	18	.049	.777	.4323	3"	16	.065	2.870	2.038
	16	.065	.745	.5623		14	.083	2.834	2.586
	11	.120	.635	.9676		11	.120	2.760	3.691
1"	20	.035	.930	.3607		1/4	.250	2.500	7.343
	18	.049	.902	.4977	3 1/4"	11	.120	3.010	4.011
	16	.065	.870	.6491	3 1/2"	16	.065	3.370	2.385
	14	.083	.834	.8129		11	.120	3.260	4.332
	11	.120	.760	1.128	3 3/4"	11	.120	3.510	4.652
	3/16	.188	.624	1.630	4"	16	.065	3.870	2.732
1 1/8"	16	.065	.995	.7359		14	.083	3.834	3.472
1 1/4"	20	.035	1.180	.4542		11	.120	3.760	4.973

# INDEX

## Aluminum

	PAGE
Aluminum Sheet .....	9.1
Aluminum Plate .....	9.1
Aluminum Tread Plate .....	9.2
Aluminum Flat Bar .....	9.2
Aluminum Round Bar .....	9.4
Aluminum Angles .....	9.4
Aluminum Channels .....	9.5
Aluminum Beams .....	9.6
Aluminum Pipe .....	9.7



## ALUMINUM SHEET 3003-H14

Thickness In Inches	Weight Per Sq. Ft.	Thickness In Inches	Weight Per Sq. Ft.
.020	2850	.080	1.1385
.025	3564	.090	1.2870
.032	4564	.100	1.4256
.040	5700	.125	1.7820
.050	7128	.190	2.7126
.063	8979		

## ALUMINUM SHEET 5052-H32 5052-H34

Thickness In Inches	Weight Per Sq. Ft.	Thickness In Inches	Weight Per Sq. Ft.
.025	3492	.080	1.1155
.032	4470	.090	1.2610
.040	5587	.100	1.3968
.050	6984	.125	1.7460
.063	8798	.190	2.6578

## ALUMINUM SHEET 6061-T6

Thickness In Inches	Weight Per Sq. Ft.	Thickness In Inches	Weight Per Sq. Ft.
.025	3528	.080	1.1270
.032	4518	.090	1.2740
.040	5645	.100	1.4112
.050	7056	.125	1.7640
.063	8889	.190	2.6852

## ALUMINUM SHEET 5086-H116

Thickness In Inches	Weight Per Sq. Ft.
.125	1.728
.188	2.630

## ALUMINUM PLATE 3003-F

Thickness In Inches	Weight Per Sq. Ft.
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**ALUMINUM PLATE****5052-H32**

Thickness In Inches	Weight Per Sq. Ft.
.250	3.492
.375	5.238

**ALUMINUM PLATE****6061-T651**

Thickness In Inches	Weight Per Sq. Ft.	Thickness In Inches	Weight Per Sq. Ft.
.250	3.528	1.500	21.168
.313	4.400	1.750	21.443
.375	5.292	2.000	28.224
.500	7.056	2.500	35.280
.625	8.820	3.000	42.336
.750	10.584	4.000	56.448
1.000	14.112	5.000	70.560
1.250	17.640	6.000	84.672

**ALUMINUM TREAD PLATE****6061-T6**

Thickness In Inches	Weight Per Sq. Ft.	Thickness In Inches	Weight Per Sq. Ft.
.100	1.60	.250	3.67
.125	1.90	.375	5.43
.188	2.79	.500	7.20

**ALUMINUM RECTANGULAR BAR****6061-T6 6061-T6511**

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
$\frac{1}{8} \times \frac{3}{4}$	.115	$\frac{1}{4} \times 1\frac{1}{4}$	.367
x 1	.147	x $1\frac{1}{2}$	.441
x $1\frac{1}{2}$	.226	x 2	.587
x 2	.294	x $2\frac{1}{2}$	.750
$\frac{3}{16} \times \frac{3}{4}$	.165	x 4	1.175
x 1	.220	$\frac{5}{16} \times 1$	.367
x $1\frac{1}{2}$	.330	$\frac{3}{8} \times \frac{1}{2}$	.224
x 2	.441	x $\frac{3}{4}$	.330
$\frac{1}{4} \times \frac{1}{2}$	.147	x 1	.441
x $\frac{5}{8}$	.187	x $1\frac{1}{4}$	.551
x $\frac{3}{4}$	.221	x $1\frac{1}{2}$	.661
x 1	.294	x 2	.881

**ALUMINUM RECTANGULAR BAR (continued)****6061-T6 6061-T6511**

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
$\frac{3}{8}$ x 3	1.320	1 x $1\frac{1}{4}$	1.47
x 4	1.760	x $1\frac{1}{2}$	1.76
x 6	2.640	x 2	2.35
$\frac{1}{2}$ x $\frac{3}{4}$	.440	x $2\frac{1}{2}$	3.00
x 1	.587	x 3	3.53
x $1\frac{1}{2}$	.881	x 4	4.70
x 2	1.180	x 6	7.05
x $2\frac{1}{2}$	1.470	$1\frac{1}{4}$ x $2\frac{1}{2}$	3.67
x 3	1.760	x 3	4.40
x 4	2.350	$1\frac{1}{2}$ x 2	3.52
x 6	3.520	x $2\frac{1}{2}$	4.41
$\frac{5}{8}$ x $1\frac{1}{2}$	1.100	x 3	5.29
x 2	1.470	x 4	7.05
$\frac{3}{4}$ x 1	.881	x 6	10.57
x $1\frac{1}{4}$	1.100	2 x 3	7.05
x $1\frac{1}{2}$	1.320	x 4	9.40
x 2	1.760	x 6	14.10
x 3	2.640	$2\frac{1}{2}$ x 4	11.75
x 4	3.530	x 6	17.62
x 6	5.290	3 x 4	14.10
		x 6	21.15

**ALUMINUM RECTANGULAR BAR****6063-T5 6063-T52**

Size in Inches	Weight Per Ft.	Size in Inches	Weight Per Ft.
$\frac{1}{8}$ x $\frac{1}{2}$	.075	$\frac{3}{8}$ x 1	.450
x $\frac{5}{8}$	.094	x $1\frac{1}{4}$	.564
x $\frac{3}{4}$	.113	x $1\frac{1}{2}$	.675
x 1	.150	x $1\frac{3}{4}$	.771
x $1\frac{1}{4}$	.187	x 2	.900
x $1\frac{1}{2}$	.225	x 3	1.350
x 2	.300	x 4	1.760
x 3	.550	$\frac{1}{2}$ x $\frac{3}{4}$	.450
x 4	.600	x 1	.600
$\frac{3}{16}$ x $\frac{1}{2}$	.113	x $1\frac{1}{4}$	.750
x $\frac{3}{4}$	.169	x $1\frac{1}{2}$	.900
x 1	.226	x 2	1.200
x $1\frac{1}{4}$	.282	x $2\frac{1}{2}$	1.500
x $1\frac{1}{2}$	.338	x 3	1.800
x 2	.451	$\frac{3}{4}$ x $1\frac{1}{2}$	1.350
x $2\frac{1}{2}$	.564	x 2	1.800
$\frac{1}{4}$ x 2	.600	x $2\frac{1}{2}$	2.200
x $2\frac{1}{2}$	.750	x 3	2.640
x 3	.900	x 4	3.520
x 4	1.190	1 x $1\frac{1}{2}$	1.800
$\frac{3}{8}$ x $\frac{1}{2}$	.225	x 2	2.400

**ALUMINUM ROUND BAR****6061-T651 6061-T6511**

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
1/8	.014	1 7/8	3.24
3/16	.032	2	3.69
1/4	.058	2 1/8	4.17
5/16	.090	2 1/4	4.67
3/8	.130	2 1/2	5.77
7/16	.177	2 3/4	6.98
1/2	.231	3	8.30
9/16	.291	3 1/4	9.74
5/8	.360	3 1/2	11.30
3/4	.519	3 3/4	12.98
7/8	.706	4	14.76
1	.923	4 1/2	18.68
1 1/8	1.170	5	23.07
1 1/4	1.440	5 1/2	28.00
1 3/8	1.740	6	33.22
1 1/2	2.080	6 1/2	38.98
1 5/8	2.440	7	45.21
1 3/4	2.820	8	59.04

**ALUMINUM EQUAL ANGLES****6061-T6 Structural**

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
3/4 x 3/4 x 1/8	.20	2 1/2 x 2 1/2 x 3/16	1.07
1 x 1 x 1/8	.28	x 1/4	1.40
x 3/16	.40	x 5/16	1.73
x 1/4	.51	3 x 3 x 3/16	1.28
1 1/4 x 1 1/4 x 1/8	.35	x 1/4	1.68
x 3/16	.51	x 3/16	2.08
x 1/4	.66	x 3/8	2.47
1 1/2 x 1 1/2 x 1/8	.43	3 1/2 x 3 1/2 x 3/16	2.46
x 3/16	.62	4 x 4 x 1/4	2.28
x 1/4	.81	x 5/16	2.83
1 3/4 x 1 3/4 x 1/8	.51	x 3/8	3.38
x 3/16	.74	5 x 5 x 3/8	4.28
x 1/4	.96	x 1/2	5.56
2 x 2 x 1/8	.57	6 x 6 x 3/8	5.12
x 3/16	.85	x 1/2	6.75
x 1/4	1.11	8 x 8 x 1/2	9.14
x 3/8	1.59		

## ALUMINUM UNEQUAL ANGLES

### 6061-T6 Structural

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
1½ x 1¼ x ⅝	.38	3 x 2 x ⅜	1.07
x ¾	.57	x ¼	1.40
x ¼	.74	x ⅝	2.05
1¾ x 1¼ x ⅝	.42	3 x 2½ x ¼	1.54
x ¾	.62	3½ x 2½ x ¼	1.68
x ¼	.81	4 x 3 x ¼	1.99
2 x 1½ x ⅝	.50	x ⅝	2.93
x ¾	.73	5 x 3 x ⅝	3.35
x ¼	.96	x ½	4.40
2½ x 2 x ⅝	.96	6 x 4 x ⅝	4.24
x ¼	1.26	x ½	5.58
x ⅝	1.55		

## ALUMINUM ARCHITECTURAL ANGLES

### 6063-T52

Size In Inches	Weight Per Ft.	Size In Inches	Weight Per Ft.
.375 x .750 x .094	.116	1.000 x 1.000 x .188	.408
.500 x .500 x .062	.070	1.000 x 1.500 x .125	.356
.500 x .500 x .125	.131	1.000 x 2.000 x .125	.431
.500 x 1.000 x .094	.158	1.250 x 1.250 x .125	.356
.500 x 1.000 x .125	.206	1.250 x 1.250 x .188	.519
.500 x 1.250 x .125	.244	1.250 x 3.500 x .125	.694
.625 x .625 x .125	.168	1.500 x 1.500 x .125	.431
.750 x .750 x .062	.108	1.500 x 1.500 x .188	.633
.750 x .750 x .125	.206	1.750 x 1.750 x .125	.506
.750 x 1.000 x .125	.244	2.000 x 2.000 x .125	.581
.750 x 1.500 x .125	.319	2.000 x 2.000 x .188	.857
1.000 x 1.000 x .062	.145	2.000 x 2.000 x .250	1.124
1.000 x 1.000 x .125	.281		

## ALUMINUM STRUCTURAL CHANNELS

### 6061-T6 American Standard

Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.	Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.
3 x .170	1.410	1.42	6 x .225	1.945	3.00
x .258	1.498	1.73	x .314	2.034	3.63
x .356	1.596	2.07	x .437	2.157	4.48
4 x .180	1.580	1.85	7 x .230	2.110	3.54
x .247	1.647	2.16	8 x .250	2.290	4.25
x .320	1.720	2.50	x .303	2.343	4.75
5 x .190	1.750	2.32	x .487	2.527	6.48
x .325	1.885	3.11	10 x .240	2.600	5.28
x .472	2.032	3.97	12 x .300	2.960	7.41

## ALUMINUM STRUCTURAL CHANNELS

### 6061-T6 Aluminum Association

Size in Inches Web (Depth x Thickness)	Weight Per Ft.	Size in Inches Web (Depth x Thickness)	Weight Per Ft.
3 x 130	1.135	6 x .170	2.834
170	1.597	.210	4.030
4 x 150	1.728	8 x .190	4.147
190	2.332	.250	5.789
5 x 150	2.212	10 x .250	6.136
190	3.089	.310	8.360

## ALUMINUM ARCHITECTURAL CHANNELS

### 6063-T52

A Inches	B Inches	C Inches	Weight Per Ft.
.500	.375	.125	.150
.500	.500	.094	.148
.500	.750	.125	.263
.625	.625	.125	.244
.750	.375	.125	.187
.750	.750	.125	.300
1.000	.500	.125	.263
1.000	1.000	.125	.413
1.250	.500	.125	.300
1.250	1.250	.125	.526
1.438	.500	.094	.251
1.500	.500	.125	.337
1.750	.500	.125	.374
1.750	.750	.125	.450
1.750	1.000	.125	.524
2.000	.500	.125	.413
2.000	1.000	.125	.564
2.250	.875	.125	.563
2.500	1.500	.125	.787
3.000	.500	.125	.563
3.000	1.000	.125	.713

## ALUMINUM H-BEAMS-WF

### 6061-T6

Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.	Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.
4 x 313	4.000	4.76	8 x .230	5.250	5.91
5 x 313	5.000	6.49	8 x .245	6.500	8.32
6 x .250	5.938	7.85	8 x .288	8.000	10.73
6 x 240	6.000	5.40			

## ALUMINUM I-BEAMS

### 6061-T6 American Standard

Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.	Size in Inches Web (Depth x Thickness)	Flange Width Inches	Weight Per Ft.
3 x .170	2.330	1.96	5 x .494	3.284	5.10
x .349	2.509	2.59	6 x .230	3.330	4.30
4 x .190	2.660	2.64	x .343	3.443	5.10
x .326	2.796	3.28	8 x .270	4.000	6.34
5 x .210	3.000	3.43			

## ALUMINUM I-BEAM

### 6061-T6 Aluminum Association

Size in Inches	Flange Width Inches	Weight Per Ft.	Size in Inches	Flange Width Inches	Weight Per Ft.
3 x .130	2.50	1.637	6 x .190	4.00	4.030
.150	2.50	2.030	.210	4.00	4.693
4 x .150	3.00	2.310	8 x .230	5.00	6.181
.770	3.00	2.675	.250	5.00	7.023
5 x .190	3.50	3.699			

## ALUMINUM PIPE — SCHEDULE 40

### 6061-T6 6063-T6

I.P.S. in Inches	Diameter Inches		Wall Thickness Inches	Weight per Foot
	Outside	Inside		
1/8	.405	.269	.068	.085
1/4	.540	.364	.088	.147
3/8	.675	.493	.091	.196
1/2	.840	.622	.109	.294
3/4	1.050	.824	.113	.391
1	1.315	1.049	.133	.581
1 1/4	1.660	1.380	.140	.786
1 1/2	1.900	1.610	.145	.940
2	2.375	2.067	.154	1.260
2 1/2	2.875	2.469	.203	2.000
3	3.500	3.068	.216	2.620
3 1/2	4.000	3.548	.226	3.150
4	4.500	4.026	.237	3.730
5	5.563	5.047	.258	5.060
6	6.625	6.065	.280	6.560
8	8.625	7.981	.322	9.880

## ALUMINUM PIPE — SCHEDULE 80

### 6061-T6

I.P.S. in Inches	Diameter Inches		Wall Thickness Inches	Weight per Foot
	Outside	Inside		
1	1.315	.957	.179	.75
1¼	1.660	1.378	.191	1.04
1½	1.900	1.500	.200	1.25
2	2.375	1.939	.218	1.74
3	3.500	2.900	.300	3.54
3½	4.000	3.364	.318	4.33
4	4.500	3.826	.337	5.18
5	5.563	4.813	.375	7.26
6	6.625	5.761	.432	9.98
8	8.625	7.625	.500	15.16

# FRACTION AND DECIMAL EQUIVALENTS

$\frac{1}{64}$ —.015625	$\frac{33}{64}$ —.515625
$\frac{1}{32}$ —.03125	$\frac{17}{32}$ —.53125
$\frac{3}{64}$ —.046875	$\frac{35}{64}$ —.546875
$\frac{1}{16}$ —.0625	$\frac{9}{16}$ —.5625
$\frac{5}{64}$ —.078125	$\frac{37}{64}$ —.578125
$\frac{3}{32}$ —.09375	$\frac{19}{32}$ —.59375
$\frac{7}{64}$ —.109375	$\frac{39}{64}$ —.609375
$\frac{1}{8}$ —.125	$\frac{5}{8}$ —.625
$\frac{9}{64}$ —.140625	$\frac{41}{64}$ —.640625
$\frac{5}{32}$ —.15625	$\frac{21}{32}$ —.65625
$\frac{11}{64}$ —.171875	$\frac{43}{64}$ —.671875
$\frac{3}{16}$ —.1875	$\frac{11}{16}$ —.6875
$\frac{13}{64}$ —.203125	$\frac{45}{64}$ —.703125
$\frac{7}{32}$ —.21875	$\frac{23}{32}$ —.71875
$\frac{15}{64}$ —.234375	$\frac{47}{64}$ —.734375
$\frac{1}{4}$ —.25	$\frac{3}{4}$ —.75
$\frac{17}{64}$ —.265625	$\frac{49}{64}$ —.765625
$\frac{9}{32}$ —.28125	$\frac{25}{32}$ —.78125
$\frac{19}{64}$ —.296875	$\frac{51}{64}$ —.796875
$\frac{5}{16}$ —.3125	$\frac{13}{16}$ —.8125
$\frac{21}{64}$ —.328125	$\frac{53}{64}$ —.828125
$\frac{11}{32}$ —.34375	$\frac{27}{32}$ —.84375
$\frac{23}{64}$ —.359375	$\frac{55}{64}$ —.859375
$\frac{3}{8}$ —.375	$\frac{7}{8}$ —.875
$\frac{25}{64}$ —.390625	$\frac{57}{64}$ —.890625
$\frac{13}{32}$ —.40625	$\frac{29}{32}$ —.90625
$\frac{27}{64}$ —.421875	$\frac{59}{64}$ —.921875
$\frac{7}{16}$ —.4375	$\frac{15}{16}$ —.9375
$\frac{29}{64}$ —.453125	$\frac{61}{64}$ —.953125
$\frac{15}{32}$ —.46875	$\frac{31}{32}$ —.96875
$\frac{31}{64}$ —.484375	$\frac{63}{64}$ —.984375

# CONVERTING INCHES INTO DECIMALS OF A FOOT

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# CONVERTING INCHES INTO DECIMALS OF A FOOT

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# A-36 SPECIFICATION DATA

## Chemical Requirements

Product	Shapes <sup>a</sup>		Plates				Bars			
	All	To ¼ (19), incl.	Over ¼ to 1½ (19 to 38), incl.	Over 1½ to 2½ (38 to 64), incl.	Over 2½ to 4 (64 to 102), incl.	Over	To ¾ (19), incl.	Over ¼ to 1½ (19 to 38), incl.	1½ to 4 (38 to 102), incl.	Over 4 (102)
Thickness, in. (mm)										
Carbon, max. percent	0.26	0.25	0.25	0.26	0.27	0.29	0.26	0.27	0.28	0.299
Manganese, percent	—	—	0.80- 1.20	0.80- 1.20	0.85- 1.20	0.85- 1.20	—	0.60- 0.90	0.60- 0.90	0.60- 0.90
Phosphorus, max, percent	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulfur, max. percent	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Silicon, percent	—	—	—	0.15- 0.30	0.15- 0.30	0.15- 0.30	—	—	—	—
Copper, min. percent, when copper steel is specified	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

<sup>a</sup>Manganese content of 0.85-1.35% and silicon content of 0.15-0.30% is required for shapes over 426 lb/ft.

## Tensile Requirements<sup>a</sup>

Plates, Shapes,<sup>b</sup> and Bars,

Tensile strength, psi (MPa)

58 000 (400)  
80 000 (550)

Yield point, min. psi (MPa)

36 000 (250)<sup>c</sup>

Plates and Bars<sup>e,f</sup>

Elongation in 8 in. or 200 mm,  
min. %

20<sup>d</sup>

Elongation in 2 in. or 50 mm,  
min. %

23

Shapes:

Elongation in 8 in. or 200 mm,  
min. %

20<sup>d</sup>

Elongation in 2 in. or 50 mm,  
min. %

21<sup>b</sup>

<sup>a</sup>For plates wider than 24 in. (610 mm), the test specimen is taken in the transverse direction. See 11.2 of Specification A6.

<sup>b</sup>For wide flange shapes over 426 lb/ft tensile strength minimum of 58000 psi (400 MPa) only and elongation in 2 in. of 19% minimum applies.

<sup>c</sup>Yield point 32000psi (220 MPa) for plates over 8 in. in thickness.

<sup>d</sup>See 7.3

<sup>e</sup>Elongation not required to be determined for floor plate.

<sup>f</sup>For plates wider than 24 in. (610 mm), the elongation requirements is reduced two percentage points.

# CONVERSION TABLE

## Hardness

Brinell Indentation Diameter mm	Brinell Hardness Number 3000-Kg Load 10mm Tungsten Carbide Ball	Rockwell Hardness Number			Vickers Diamond Pyramid Harness Number	Tensile strength (approximate) in 1000 psi
		A-Scale 60-Kg Load Brale Penetrator	B-Scale 100-Kg Load $\frac{1}{16}$ in. Dia. Ball	C-Scale 150-Kg Load Brale Penetrator		
2.25	745	84.1	—	65.3	840	—
2.35	682	82.2	—	61.7	737	—
2.40	653	81.2	—	60.0	697	—
2.45	627	80.5	—	58.7	667	323
2.50	601	79.8	—	57.3	640	309
2.55	578	79.1	—	56.0	615	297
2.60	555	78.4	—	54.7	591	285
2.65	534	77.8	—	53.5	569	274
2.70	514	76.9	—	52.1	547	263
2.75	495	76.3	—	51.0	528	253
2.80	477	75.6	—	49.6	508	243
2.85	461	74.9	—	48.5	491	235
2.90	444	74.2	—	47.1	472	225
2.95	429	73.4	—	45.7	455	217
3.00	415	72.8	—	44.5	440	210
3.05	401	72.0	—	43.1	425	202
3.10	388	71.4	—	41.8	410	195
3.15	375	70.6	—	40.4	396	188
3.20	363	70.0	—	39.1	383	182
3.25	352	69.3	(110.0)	37.9	372	176
3.30	341	68.7	(109.0)	36.6	360	170
3.35	331	68.1	(108.5)	35.5	350	166
3.40	321	67.5	(108.0)	34.3	339	160
3.45	311	66.9	(107.5)	33.1	328	155
3.50	302	66.3	(107.0)	32.1	319	150
3.55	293	65.7	(106.0)	30.9	309	145
3.60	285	65.3	(105.5)	29.9	301	141
3.65	277	64.6	(104.5)	28.8	292	137
3.70	269	64.1	(104.0)	27.6	284	133
3.75	262	63.6	(103.0)	26.6	276	129
3.80	255	63.0	(102.0)	25.4	269	126
3.85	248	62.5	(101.0)	24.2	261	122
3.90	241	61.8	100.0	22.8	253	118

# CONVERSION TABLE (continued)

## Hardness

Brinell Indentation Diameter mm	Brinell Hardness Number 3000-Kg Load 10mm Tungsten Carbide Ball	Rockwell Hardness Number			Vickers Diamond Pyramid Hardness Number	Tensile strength (approximate) in 1000 psi
		A-Scale 60-Kg Load Brale Penetrator	B-Scale 100-Kg Load $\frac{1}{16}$ in. Dia. Ball	C-Scale 150-Kg Load Brale Penetrator		
4.05	223	—	97.3	(18.8)	234	—
4.10	217	—	96.4	(17.5)	228	105
4.15	212	—	95.5	(16.0)	222	102
4.20	207	—	94.6	(15.2)	218	100
4.25	201	—	93.8	(13.8)	212	98
4.30	197	—	92.8	(12.7)	207	95
4.35	192	—	91.9	(11.5)	202	93
4.40	187	—	90.7	(10.0)	196	90
4.45	183	—	90.0	(9.0)	192	89
4.50	179	—	89.0	(8.0)	188	87
4.55	174	—	87.8	(6.4)	182	85
4.60	170	—	86.8	(5.4)	178	83
4.65	167	—	86.0	(4.4)	175	81
4.70	163	—	85.0	(3.3)	171	79
4.80	156	—	82.9	(0.9)	163	76
4.90	149	—	80.8	—	156	73
5.00	143	—	78.7	—	150	71
5.10	137	—	76.4	—	143	67
5.20	131	—	74.0	—	137	65
5.30	126	—	72.0	—	132	63
5.40	121	—	69.8	—	127	60
5.50	116	—	67.6	—	122	58
5.60	111	—	65.7	—	117	56

The values in the foregoing table are taken from Table 2. Approximate Equivalent Hardness Numbers for Brinell Hardness Numbers, for Steel, page 108, 1963 SAE Handbook, Society of Automotive Engineers, Inc.

The values shown in parentheses are beyond the normal range of the test scale and are given for information only.

# STANDARD CHEMICAL COMPOSITIONS FOR CARBON STEELS

## Basic Open-Hearth and Acid Bessemer Carbon Steels

AISI No.	C	Mn.	P Max.	S Max.	SAE No.
C 1008	0.10 max.	0.25/0.50	0.040	0.050	1008
C 1010	0.08/0.13	0.30/0.60	0.040	0.050	1010
C 1012	0.10/0.15	0.30/0.60	0.040	0.050	—
C 1015	0.13/0.18	0.30/0.60	0.040	0.050	1015
C 1018	0.15/0.20	0.60/0.90	0.040	0.050	1018
C 1020	0.18/0.23	0.30/0.60	0.040	0.050	1020
C 1023	0.20/0.25	0.30/0.60	0.040	0.050	—
C 1025	0.22/0.28	0.30/0.60	0.040	0.050	1025
C 1030	0.28/0.34	0.60/0.90	0.040	0.050	1030
C 1035	0.32/0.38	0.60/0.90	0.040	0.050	1035
C 1040	0.37/0.44	0.60/0.90	0.040	0.050	1040
C 1045	0.43/0.50	0.60/0.90	0.040	0.050	1045
C 1050	0.48/0.55	0.60/0.90	0.040	0.050	1050
C 1055	0.50/0.60	0.60/0.90	0.040	0.050	1055
C 1060	0.55/0.65	0.60/0.90	0.040	0.050	1060
C 1065	0.60/0.70	0.60/0.90	0.040	0.050	1065
C 1070	0.65/0.75	0.60/0.90	0.040	0.050	1070
C 1080	0.75/0.88	0.60/0.90	0.040	0.050	1080
C 1085	0.80/0.93	0.70/1.00	0.040	0.050	1085
C 1095	0.90/1.03	0.30/0.50	0.040	0.050	1095
B 1010	0.13 max.	0.30/0.60	0.07/0.12	0.060	—

Acid Bessemer steels not furnished to specified silicone content.

AISI GRADE DESIGNATION

SILICON LIMITATION

Up to C 1015 Excl.

.10 Max.

C 1015 to C 1025 incl.

.10 Max. 10-20 or 15-30

Over C 1025

10-20 or 15-30

Copper: When required, copper is specified as an added element to a standard steel.

## STANDARD CHEMICAL COMPOSITIONS FOR CARBON STEELS (continued)

### Basic Open-Hearth and Acid Bessemer Resulphurized Steels

AISI No.	C	Mn.	P Max.	S Max.	SAE No.
C 1108	0.08/0.13	0.50/0.80	0.040	0.08/0.13	—
C 1110	0.08/0.13	0.30/0.60	0.040	0.08/0.13	—
C 1115	0.13/0.18	0.60/0.90	0.040	0.08/0.13	1115
C 1117	0.14/0.20	1.00/1.30	0.040	0.08/0.13	1117
C 1118	0.14/0.20	1.30/1.60	0.040	0.08/0.13	1118
C 1120	0.18/0.23	0.70/1.00	0.040	0.08/0.13	1120
C 1137	0.32/0.39	1.35/1.65	0.040	0.08/0.13	1137
C 1141	0.37/0.45	1.35/1.65	0.040	0.08/0.13	1141
B 1112	0.13 max.	0.70/1.00	0.07/0.12	0.16/0.23	1112
B 1113	0.13 max.	0.70/1.00	0.07/0.12	0.24/0.33	1113

Resulphurized steels not subject to check analysis for sulphur

Acid Bessemer steels not furnished to specified silicon content.

AISI GRADE DESIGNATION

SILICONE LIMITATIONS

Up to C 1113 Excl.

.10 Max.

C 1113 and Over

.10 Max. .10-.20 or .15-.30

### Basic Open Hearth Rephosphorized and Resulphurized Steels

AISI No.	C	Mn.	P	S	SAE No.
C 1211	0.13 max.	0.60/0.90	0.07/0.12	0.08/0.15	—
C 1212	0.13 max.	0.70/1.00	0.07/0.12	0.16/0.23	—
C 1213	0.13 max.	0.70/1.00	0.07/0.12	0.24/0.33	—

**Note:** Rephosphorized and Resulphurized steels not subject to check analysis for phosphorus and sulphur.

Rephosphorized and Resulphurized steels not furnished to specified silicon content.

# PHYSICAL PROPERTIES OF STEEL

These properties are approximate and  
are listed here only as a guide to  
what may be expected from the grades given.

A.I.S.I. No.	Condition	Tensile Strength Lb. per Sq. In.	Yield Point or Yield Strgth <sup>1</sup> Lb. per Sq. In.	Elong 2" Per Cent	Reduc- tion of Area Per Cent	Brinell
C-1008	Hot Rolled	45000/55000	26000	45	65	90/124
	Cold Drawn	52000/62000	49000	30	55	114/143
C-1010	Hot Rolled	48000/58000	30000	38	65	95/134
	Cold Drawn	55000/65000	50000	25	52	124/162
C-1015	Hot Rolled	50000/70000	32000	35	60	105/143
	Cold Drawn	62000/77000	65000	19	50	124/171
C-1016	Hot Rolled	52000/70000	32000	35	60	105/143
	Cold Drawn	65000/80000	65000	19	50	133/171
C-1017	Hot Rolled	50000/70000	32000	35	60	105/143
C-1018	Cold Drawn	72000/85000	62000	20	54	168
C-1019	Hot Rolled	52000/70000	32000	35	60	105/143
	Cold Drawn	65000/80000	65000	19	50	133/171
C-1020	Hot Rolled	54000/70000	32000	35	60	109/152
	Cold Drawn	66000/81000	67000	18	50	133/181
C-1022	Hot Rolled	55000/70000	32000	35	55	114/153
	Cold Drawn	67000/82000	69000	17	50	143/190
C-1025	Hot Rolled	60000/75000	35000	30	55	124/171
	Cold Drawn	70000/85000	70000	17	50	143/190
C-1030	Hot Rolled	65000/80000	38000	30	55	133/181
	Cold Drawn	75000/90000	75000	15	45	152/200
C-1035	<sup>3</sup> WQ 1600°F Draw 1000°F	90000	65000	20	60	162/219
	Hot Rolled	70000/85000	43000	25	50	143/190
C-1040	Cold Drawn	80000/100000	80000	12	45	171/209
	<sup>3</sup> WQ 1525°F Draw 1000°F	95000	68000	18	55	181/228
C-1045	Hot Rolled	75000/90000	48000	25	45	152/190
	Cold Drawn	85000/105000	80000	11	40	181/219
C-1050	<sup>4</sup> QQ 1550°F Draw 1000°F	100000	62000	22	50	200/247
	Hot Rolled	80000/95000	50000	25	40	162/200
C-1055	Cold Drawn	90000/110000	85000	10	40	190/228
	<sup>4</sup> QQ 1500°F Draw 1000°F	105000	65000	20	45	209/247
C-1060	Hot Rolled	90000/110000	55000	20	35	171/228
	Cold Drawn	100000/120000	90000	10	35	200/247
C-1065	<sup>4</sup> QQ 1500°F					

## PHYSICAL PROPERTIES OF STEEL (continued)

These properties are approximate and  
are listed here only as a guide to  
what may be expected from the grades given.

A.I.S.I. No.	Condition	Tensile Strength Lb. per Sq. In.	Yield Point or Yield Strgth <sup>1</sup> Lb. per Sq. In.	Elong 2'' Per Cent	Reduc- tion of Area Per Cent	Brinell
C-1095	Hot Rolled	140000	75000	8	10	296
	40Q 1475°F					
	Draw 1000°F	175000	120000	10	20	375
B-1010	Hot Rolled	50000/70000	35000	35	55	101/140
	Cold Drawn	65000/80000	60000	17	50	131/170
C-1115	Hot Rolled	55000/70000	40000	35	55	107/146
	Cold Drawn	65000/80000	60000	20	50	140/179
C-1117	Hot Rolled	52000/67000	35000	35	55	109/153
	Cold Drawn	70000/85000	65000	21	45	143/179
C-1118	Hot Rolled	55000/72000	40000	35	55	109/153
	Cold Drawn	70000/90000	65000	19	45	143/179
C-1120	Hot Rolled	55000/70000	32000	35	55	109/153
B-1112	Hot Rolled	55000/70000	35000	20	50	118/133
B-1113	Cold Drawn	80000/95000	75000	15	45	156/212

# CIRCUMFERENCE AND AREAS OF CIRCLES

OF ONE INCH				OF INCHES OR FEET				
Fract.	Circ.	Area	Dia.	Circ.	Area	Dia.	Circ.	Area
1-64	.04909	.00019	41-64	2.0127	.32232	17	53.407	226.98
1-32	.09818	.00077	21-32	2.0617	.33824	18	56.549	254.47
3-64	.14726	.00173	43-64	2.1108	.35453	19	59.690	283.53
1-16	.19635	.00307	11-16	2.1598	.37122	20	62.832	314.16
5-64	.24545	.00479	45-64	2.2090	.38828	21	65.973	346.36
3-32	.29452	.00690	23-32	2.2580	.40574	22	69.115	380.13
7-64	.34363	.00939	47-64	2.3072	.42356	23	72.257	415.48
1-8	.39270	.01227	3-4	2.3562	.44179	24	75.398	452.39
9-64	.44181	.01553	49-64	2.4054	.45253	25	78.540	490.87
5-32	.49087	.01917	24-32	2.4544	.47937	26	81.681	530.93
11-64	.53999	.02320	51-64	2.5036	.49872	27	84.823	572.56
3-16	.58905	.02761	13-16	2.5525	.51849	28	87.965	615.75
13-64	.63817	.03241	53-64	2.6017	.53862	29	91.106	660.52
7-32	.68722	.03758	27-32	2.6507	.55914	30	94.248	706.86
15-64	.73635	.04314	55-64	2.6999	.58003	31	97.389	754.77
1-4	.78540	.04909	7-8	2.7489	.60132	32	100.53	804.25
17-64	.83453	.05542	57-64	2.7981	.62298	33	103.67	855.30
9-32	.88357	.06213	29-32	2.8471	.64504	34	106.81	907.92
19-64	.93271	.06922	59-64	2.8963	.66746	35	109.96	962.11
5-16	.98175	.07670	15-16	2.9452	.69029	36	113.10	1017.88
21-64	1.0309	.08456	61-64	2.9945	.71349	37	116.24	1075.21
11-32	1.0799	.09281	31-32	3.0434	.73708	38	119.38	1134.11
23-64	1.1291	.10144	63-64	3.0928	.76097	39	112.52	1194.59
3-8	1.1781	.11045				40	125.66	1256.64
25-64	1.2273	.11984	1	3.1416	.7854	41	128.81	1320.25
13-32	1.2763	.12962	2	6.2832	3.1416	42	131.95	1385.44
27-64	1.3254	.13979	3	9.4248	7.0686	43	135.09	1452.20
7-16	1.3744	.15033	4	12.5664	12.5664	44	138.23	1520.53
29-64	1.4236	.16126	5	15.7080	19.635	45	141.37	1590.43
15-32	1.4726	.17257	6	18.850	28.274	46	144.51	1661.90
31-64	1.5218	.18427	7	21.991	38.485	47	147.65	1734.94
1-2	1.5708	.19635	8	25.133	50.266	48	150.80	1809.56
33-64	1.6199	.20880	9	28.274	63.617	49	153.94	1885.74
17-32	1.6690	.22166	10	31.416	78.540	50	157.08	1963.50
35-64	1.7181	.23489	11	34.558	95.033	51	160.22	2042.82
9-16	1.7671	.24850	12	37.699	113.1	52	163.36	2123.72
37-64	1.8163	.26248	13	40.841	132.73	53	166.30	2206.18
19-32	1.8653	.27688	14	43.982	153.94	54	169.65	2290.22
39-64	1.9145	.29164	15	47.124	176.71	55	172.79	2375.83

## CIRCUMFERENCE AND AREAS OF CIRCLES (continued)

OF ONE INCH				OF INCHES OR FEET				
Fract.	Circ.	Area	Dia.	Circ.	Area	Dia.	Circ.	Area
57	179.07	2551.76	80	251.33	5026.55	104	326.73	8494.87
58	182.21	2642.08	81	254.47	5153.00	105	329.87	8659.01
59	185.35	2733.97	82	257.61	5281.02	106	333.01	8824.73
60	188.50	2827.43	83	260.75	5410.61	107	336.15	8992.02
61	191.64	2922.47	84	263.89	5541.77	108	339.29	9160.88
62	194.78	3019.07	85	267.04	5674.50	109	342.43	9331.32
63	197.92	3117.25	86	270.18	5808.80	110	345.58	9503.32
			87	273.32	5944.68	111	348.72	9676.89
64	201.06	3216.99	88	276.46	6082.12	112	351.86	9852.03
65	204.20	3318.31	89	279.60	6221.14	113	355.00	10028.75
66	207.34	3421.19	90	282.74	6361.73	114	358.14	10207.03
67	210.49	3525.65	91	285.88	6503.88	115	361.28	10386.89
68	213.63	3631.68	92	289.03	6647.61	116	364.42	10568.32
69	216.77	3739.28	93	292.17	6792.91	117	367.57	10751.32
70	219.91	3848.45	94	295.31	6939.78	118	370.71	10935.88
71	223.05	3959.19	95	298.45	7088.22	119	373.85	11122.02
72	226.19	4071.50	96	301.59	7238.23	120	376.99	11309.73
73	229.34	4185.39	97	304.73	7389.81	121	380.13	11499.01
74	232.48	4300.84	98	307.88	7542.96	122	383.27	11689.87
75	235.62	4417.86	99	311.02	7697.69	123	386.42	11882.29
76	238.76	4536.46	100	314.16	7853.98	124	389.56	12076.28
77	241.90	4656.63	101	317.30	8011.85	125	392.70	12271.85
78	245.04	4778.36	102	320.44	8171.28	126	395.84	12468.98
79	248.19	4901.67	103	323.58	8332.29			

# ESTIMATED WEIGHTS OF STEEL CIRCLES

Thickness

	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
4	.44	.67	.89	1.11	1.33	1.55	1.78	2.01	2.23	2.45	2.67	2.90	3.12	3.34	3.57
6	1.00	1.50	2.00	2.51	3.00	3.50	4.00	4.52	5.01	5.51	6.01	6.51	7.01	7.51	8.30
8	1.77	2.66	3.55	4.45	5.33	6.22	7.11	8.03	8.91	9.80	10.69	11.58	12.47	13.36	14.28
10	2.77	4.16	5.55	6.96	8.33	9.72	11.11	12.54	13.93	15.36	16.71	18.10	19.49	20.90	22.31
12	3.99	5.99	8.00	10.02	11.99	13.99	15.99	18.06	20.05	22.05	24.06	26.06	28.06	30.09	32.12
14	5.43	8.16	10.88	13.64	16.32	19.04	21.77	24.58	26.29	30.02	32.74	35.47	38.19	40.95	43.72
16	7	11	15	18	22	25	29	32	36	39	43	46	50	53	57
18	9	14	18	23	27	32	36	41	45	50	54	59	63	68	72
20	11	17	23	28	34	39	45	50	56	61	67	72	78	83	89
22	14	21	27	34	41	48	54	61	67	74	81	88	94	101	108
24	16	25	32	41	49	57	65	72	80	88	96	104	112	120	128
26	19	29	38	47	57	66	76	85	94	103	113	122	132	141	150
28	22	33	55	55	66	77	88	98	109	120	131	142	153	164	175
30	25	38	51	63	76	88	101	113	125	138	150	163	175	188	200
32	29	43	57	72	86	100	114	128	142	157	171	185	199	214	228
34	33	49	65	81	97	113	129	145	161	177	193	209	225	241	257
36	37	55	73	91	109	127	145	163	181	199	217	234	252	270	288
38	41	61	81	101	121	141	161	181	201	221	241	261	281	301	321
40	45	67	90	112	134	156	178	201	223	248	267	289	312	334	356
42	50	74	99	123	148	173	197	222	246	271	295	319	344	468	393
44	54	81	108	135	162	189	216	243	270	297	324	351	378	405	432
46	59	89	118	148	177	206	236	265	295	324	353	383	412	441	471
48	65	97	129	161	193	225	257	289	321	353	385	417	449	481	513
50	70	105	140	174	209	244	279	313	347	383	418	452	487	522	556
54	81	122	163	203	244	284	325	365	406	447	487	527	568	608	649
56	87	131	175	219	262	306	349	393	437	480	524	567	611	654	692
60	101	151	201	251	301	351	401	451	501	551	601	651	701	751	801
62	108	161	214	268	321	375	428	482	535	589	642	695	749	802	855
64	114	171	228	285	342	399	456	513	570	627	684	741	798	855	912
66	121	182	243	303	364	425	485	546	606	667	727	788	848	909	969
68	130	194	258	322	387	451	520	580	644	709	773	836	900	965	1029
70	137	205	273	341	409	478	546	614	682	750	818	886	954	1022	1090
72	145	217	289	361	433	505	577	649	721	794	866	937	1009	1081	1154
74	153	229	305	381	457	534	610	686	762	838	914	990	1066	1142	1219
76	160	241	322	402	482	563	643	723	804	884	964	1045	1125	1205	1286
78	169	254	339	424	508	593	677	762	847	931	1016	1100	1185	1270	1354
80	177	267	357	446	535	624	712	800	889	978	1067	1156	1245	1334	1423

## ESTIMATED WEIGHTS OF STEEL CIRCLES (continued)

		Thickness															
	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1		
84	197	295	393	491	589	687	786	884	982	1080	1178	1276	1374	1472	1571		
86	206	309	412	515	618	721	823	926	1029	1132	1235	1338	1441	1543	1646		
88	215	323	431	539	647	754	862	970	1077	1184	1292	1400	1507	1615	1723		
90	225	338	451	564	676	789	902	1014	1127	1240	1352	1465	1578	1690	1803		
92	235	353	471	589	707	825	942	1060	1178	1295	1413	1531	1648	1766	1883		
94	246	369	492	615	738	861	984	1107	1229	1352	1475	1598	1721	1844	1967		
96	257	385	513	641	770	898	1026	1154	1282	1410	1539	1667	1795	1923	2052		
98	269	402	535	668	802	935	1069	1203	1336	1470	1603	1737	1870	2004	2138		
100	279	418	557	696	835	974	1113	1252	1391	1530	1669	1808	1948	2087	2226		
102	289	434	579	724	869	1013	1158	1303	1447	1592	1737	1881	2026	2171	2316		
104	503	553	603	753	903	1053	1204	1354	1505	1655	1806	1956	2106	2257	2407		
106	314	470	626	782	938	1094	1251	1407	1563	1719	1876	2032	2188	2345	2501		
108	326	488	650	812	974	1136	1298	1460	1623	1785	1947	2109	2277	2434	2596		
110	338	506	674	842	1010	1178	1347	1515	1683	1852	2020	2188	2356	2525	2693		
112	351	525	699	873	1047	1222	1396	1571	1745	1920	2094	2268	2443	2617	2492		
114	361	542	723	904	1085	1266	1446	1627	1808	1989	2169	2350	2531	2712	2892		
116	375	562	749	936	1123	1310	1498	1685	1872	2059	2246	2433	2620	2808	2995		
118	390	583	776	969	1162	1356	1550	1743	1937	2131	2324	2518	2712	2905	3099		
120	402	602	802	1002	1202	1402	1603	1803	2003	2203	2404	2604	2804	3005	3205		
122	415	622	829	1036	1243	1450	1657	1864	2071	2278	2485	2692	2899	3106	3313		
124	428	642	856	1070	1284	1497	1711	1925	2139	2353	2567	2781	2994	3208	3422		

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