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Serving The Tri-State Area

The Warren Company

"Your One Stop Steel Service Center"

Call Toll Free 800-562-0357

HOT ROLLED CARBON STEEL BARS

GUIDE TO SELECTION

ASTM A-36

One of the most widely used carbon steel bar specifications for constructional purposes, with good mechanical and weldable properties. Minimum physical properties of 36,000 PSI yield strength and 58,000 PSI tensile strength.

COMPARISON CHART

Est. Min. Mechanical Properties
Based on 3/4" - 1 1/4" Rd. Bars

Analysis or Trade Name	Tensile Strength psi	Yield Strength psi	Elong. in 2"	Red. of Area	Brinell Hardness	Machinability Rating
ASTM A36	58,000	36,000	23	21		
M1020	55,000	30,000	25	50	111	50
1018, 1020	58,000	32,000	25	50	116	52
1042, 1045	82,000	45,000	16	40	163	56

MBQ

M-1020

MERCHANT QUALITY

A low carbon, general purpose, merchant quality steel, produced to wider carbon and manganese ranges than standard steels. Suitable for forming and welding.

SBQ

C-1020

SPECIAL QUALITY

A low carbon, general purpose, special quality machinery steel, suitable for ordinary hammer forging and case hardening. Readily weldable.

Organizations with Recognized Metal Standard Designation Systems

AISI - American Iron and Steel Institute

ASME - American Society of Mechanical Engineers

ASTM - American Society for Testing and Materials

SAE - Society of Automotive Engineers

HOT ROLLED ROUNDS

Standard Lengths 20 Ft. A-36



Size in Inches	Lbs./Ft.	Size in Inches	Lbs./Ft.
1/4	.17	1	2.67
5/16	.26	1 1/4	4.17
3/8	.38	1 1/2	6.01
7/16	.51	1 3/4	8.18
1/2	.67	2	10.68
5/8	1.04	2 1/2	16.69
3/4	1.50	3	24.03
7/8	2.04		

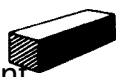
Standard Lengths 20 Ft. C1018/1020

Several sizes available in 1045

Size in Inches	Lbs./Ft.	Size in Inches	Lbs./Ft.
3 1/4	28.21	7 1/2	150.21
3 1/2	32.71	8	170.90
3 3/4	37.55	8 1/2	192.93
4	42.73	9	216.30
4 1/2	54.08	9 1/2	241.00
5	66.76	10	267.04
5 1/4	73.60	11	323.10
5 1/2	80.78	12	384.50
6	96.13	13	460.00
6 1/4	104.31	14	523.39
6 1/2	112.82	15	610.90
7	130.82	16	694.30
7 1/4	140.40		

HOT ROLLED SQUARES

Standard Lengths 20 Ft. A-36/Merchant



Size in Inches	Lbs./Ft.	Size in Inches	Lbs./Ft.
3/8	.48	2	13.60
1/2	.85	2 1/4	17.21
5/8	1.33	2 1/2	21.25
3/4	1.91	3	30.60
1	3.40	3 1/2	41.65
1 1/4	5.31	4	54.40
1 1/2	7.65	4 1/2	68.85
1 3/4	10.41		

REINFORCING BARS

FOR CONCRETE REINFORCEMENT

ASTM A-615 BARS



This specification covers deformed and plain billet-steel concrete-reinforcement bars. A deformed bar is defined as a bar that is intended for use as reinforcement in reinforced concrete construction. The surface of the bar is provided with lugs or protrusions (*deformations*) which inhibit longitudinal movement of the bar relative to the concrete which surrounds the bar in such construction and conform to the provisions of this specification.

Bar No.	Size	Grade	Lbs./ft.
3	.375	60	.38
4	.500	60	.67
5	.625	60	1.04
6	.750	60	1.50
7	.875	60	2.04
8	1.000	60	2.67

HOT ROLLED STRIP

MILD CARBON

Pickled & Oiled

Standard Lengths 20 Ft.



Size in Inches	Lbs./Ft.	Size in Inches	Lbs./Ft.
1/8 x 1/2	.21	3/16 x 1/2	.32
5/8	.27	5/8	.40
3/4	.32	3/4	.48
1	.43	7/8	.56
1 1/4	.53	1	.64
1 1/2	.64	1 1/8	.72
1 3/4	.74	1 1/4	.80
2	.85	1 1/2	.96
2 1/2	1.06	1 3/4	1.12
3	1.28	2	1.28
4	1.70	2 1/2	1.59
5	2.13	3	1.91
6	2.55	3 1/2	2.23
		4	2.55
		5	3.18
		6	3.82

Mill Edge HR Strip available in some sizes.

HOT ROLLED FLATS

Square Edge

Standard Lengths 18/20 Ft. A-36



Size in Inches		Lbs./Ft.	Size in Inches		Lbs./Ft.	
1/4	x 1/2	.43	1/2	x 3/4	1.28	
		3/4			1	1.70
		1			1 1/4	2.13
		1 1/4			1 1/2	2.55
		1 1/2			1 3/4	2.98
		1 3/4			2	3.40
		2			2 1/4	3.83
		2 1/4			2 1/2	4.25
		2 1/2			3	5.10
		3			3 1/2	5.95
		3 1/2			4	6.80
		4			4 1/2	7.65
		5			5	8.50
		6			5 1/2	9.35
	8		6	10.20		
5/16	x 1	1.06		7	11.90	
		1 1/2		8	13.60	
		2	5/8	x 1	2.12	
		2 1/2			1 1/2	3.19
		3			2	4.25
		3 1/2			2 1/2	5.31
		4			3	6.38
		5			4	8.50
	6			5	10.62	
				7	14.88	
3/8	x 3/4	.96		6	12.75	
		1	3/4	x 1	2.55	
		1 1/4			1 1/4	3.19
		1 1/2			1 1/2	3.83
		1 3/4			1 3/4	4.46
		2			2	5.10
		2 1/2			2 1/4	5.74
		3			2 1/2	6.38
		3 1/2			3	7.65
		4			3 1/2	8.92
		5			4	10.20
		6			5	12.75
		7			6	15.30
		8			7	17.85
				8	20.40	

Continued on next page.

Call Toll Free 800-562-0357

HOT ROLLED FLATS



Square Edge

Standard Lengths 18/20 Ft. A-36 (Continued)

<i>Size in Inches</i>		<i>Lbs./Ft.</i>	<i>Size in Inches</i>		<i>Lbs./Ft.</i>
1	x 1¼	4.25	1½	x 2	10.20
		5.10			2½
	2	6.50		3	15.30
	2½	8.50		3½	17.85
	3	10.20		4	20.40
	4	13.60		5	25.50
1	x 5	17.00	6	30.60	
		20.40			
		27.20	1¾	x 2½	14.88
		34.00		5	29.75
		40.80			
1¼	x 2	8.5	2	x 2½	17.00
		10.63	3	20.40	
		12.75	3½	23.80	
		17.00	4	27.20	
		21.25	5	34.00	
		25.50	6	40.80	
			2½	x 4	34.00
				6	51.00
			3	x 4	40.80
				5	51.00



BAR SIZE ANGLES

Standard Lengths 20 Ft. A-36



<i>Size in Inches</i>					<i>Lbs./Ft.</i>
1/2	x	1/2	x	1/8	.36
3/4	x	3/4	x	1/8	.69
1	x	3/4	x	1/8	.70
1	x	1	x	1/8	.80
1	x	1	x	3/16	1.16
1	x	1	x	1/4	1.49
1 1/4	x	1 1/4	x	1/8	1.01
1 1/4	x	1 1/4	x	3/16	1.48
1 1/4	x	1 1/4	x	1/4	1.92
1 1/2	x	1 1/2	x	1/8	1.23
1 1/2	x	1 1/2	x	3/16	1.80
1 1/2	x	1 1/2	x	1/4	2.34
1 3/4	x	1 3/4	x	3/16	2.12
1 3/4	x	1 3/4	x	1/4	2.77
2	x	1 1/2	x	3/16	2.12
2	x	1 1/2	x	1/4	2.77
2	x	2	x	1/8	1.65
2	x	2	x	3/16	2.44
2	x	2	x	1/4	3.19
2	x	2	x	5/16	3.92
2	x	2	x	3/8	4.70
2 1/2	x	2	x	3/16	2.75
2 1/2	x	2	x	1/4	3.62
2 1/2	x	2	x	3/8	5.30
2 1/2	x	2 1/2	x	3/16	3.07
2 1/2	x	2 1/2	x	1/4	4.10
2 1/2	x	2 1/2	x	5/16	5.00
2 1/2	x	2 1/2	x	3/8	5.90
2 1/2	x	2 1/2	x	1/2	7.70

GALVANIZED ANGLES/ CHANNELS

Standard Lengths 20 Ft.

Size in Inches

Lbs./Ft.

1	x	1	x	1/8	.80
1 1/4	x	1 1/4	x	1/8	1.01
1 1/4	x	1 1/4	x	3/16	1.48
1 1/2	x	1 1/2	x	1/8	1.23
1 1/2	x	1 1/2	x	3/16	1.80
1 1/2	x	1 1/2	x	1/4	2.34
1 3/4	x	1 3/4	x	3/16	2.12
2	x	2	x	1/8	1.65
2	x	2	x	3/16	2.44
2	x	2	x	1/4	3.19
2 1/2	x	2 1/2	x	1/4	4.10
3	x	3	x	1/4	4.90
3 1/2	x	3 1/2	x	1/4	5.80
5	x	3 1/2	x	1/4	7.00
3" Channel					4.10
4" Channel					5.40

STRUCTURAL ANGLES

20 Ft. & 40 Ft. Lengths A-36



Size in Inches

Lbs./Ft.

3	x	2	x	3/16	3.07
3	x	2	x	1/4	4.10
3	x	2	x	5/16	5.00
3	x	2	x	3/8	5.90
3	x	2 1/2	x	1/4	4.50
3	x	2 1/2	x	3/8	6.60
3	x	3	x	3/16	3.71
3	x	3	x	1/4	4.90
3	x	3	x	5/16	6.10
3	x	3	x	3/8	7.20
3	x	3	x	1/2	9.40
3 1/2	x	2 1/2	x	1/4	4.90

STRUCTURAL ANGLES

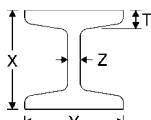
20 Ft. & 40 Ft. Lengths A-36 (Continued)



<i>Size in Inches</i>					<i>Lbs./Ft.</i>
3½	x	3	x	¼	5.40
3½	x	3	x	⅝	6.60
3½	x	3	x	¾	7.90
3½	x	3½	x	¼	5.80
3½	x	3½	x	⅝	7.20
3½	x	3½	x	¾	8.50
4	x	3	x	¼	5.80
4	x	3	x	⅝	7.20
4	x	3	x	¾	8.50
4	x	3	x	½	11.10
4	x	3½	x	⅝	7.70
4	x	3½	x	¾	9.10
4	x	4	x	¼	6.60
4	x	4	x	⅝	8.20
4	x	4	x	¾	9.80
4	x	4	x	½	12.80
5	x	3	x	¼	6.60
5	x	3	x	⅝	8.20
5	x	3	x	¾	9.80
5	x	3	x	½	12.80
5	x	3½	x	¼	7.00
5	x	3½	x	⅝	8.70
5	x	3½	x	¾	10.40
5	x	5	x	¾	12.30
5	x	5	x	½	16.20
6	x	3½	x	⅝	9.80
6	x	3½	x	¾	11.70
6	x	4	x	⅝	10.30
6	x	4	x	¾	12.30
6	x	4	x	½	16.20
6	x	6	x	¾	14.90
6	x	6	x	½	19.60
7	x	4	x	¾	13.60
8	x	4	x	½	19.60

STRUCTURAL I-BEAMS

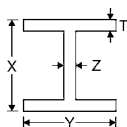
Standard Lengths 20 & 40 Ft. ASTM A36



Type	Lbs./Ft.	"X" Depth of Section	"Y" Flange Width	"T" Flange Thick- ness	"Z" Web Thick- ness
S-3	5.7	3	2.330	.260	.170
	7.5	3	2.509	.260	.349
S-4	7.7	4	2.660	.293	.190
	9.5	4	2.796	.293	.326
S-5	10.0	5	3.000	.326	.210
S-6	12.5	6	3.330	.359	.230
	17.25	6	3.565	.359	.465
S-7	15.3	7	3.660	.392	.250
S-8	18.4	8	4.000	.426	.270
	23.0	8	4.171	.426	.441
S-10	25.4	10	4.660	.491	.310
	35.0	10	4.944	.491	.594
S-12	31.8	12	5.000	.544	.350
S-15	42.9	15	5.550	.622	.410
S-18	54.7	18	6.000	.691	.460

WIDE FLANGE BEAMS

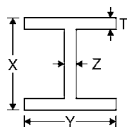
Standard Lengths 20, 40 & 60 Ft. ASTM A36



Type	Lbs./Ft.	"X" Depth of Section	"Y" Flange Width	"T" Flange Thick- ness	"Z" Web Thick- ness
W-4	13.0	4.16	4.060	.345	.280
W-5	16.0	5.01	5.000	.360	.240
	19.0	5.15	5.030	.430	.270
W-6	9.0	5.90	3.940	.215	.170
	12.0	6.03	4.000	.280	.230

WIDE FLANGE BEAMS

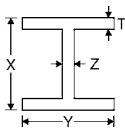
Standard Lengths 20, 40 & 60 Ft. ASTM A36 (Cont.)



Type	Lbs./Ft.	"X" Depth of Section	"Y" Flange Width	"T" Flange Thick- ness	"Z" Web Thick- ness
W-6	15.0	5.99	5.990	.260	.230
	20.0	6.20	6.020	.365	.260
	25.0	6.38	6.080	.455	.320
W-8	10.0	7.89	3.940	.205	.170
	13.0	7.99	4.000	.255	.230
	15.0	8.11	4.015	.315	.245
	18.0	8.14	5.250	.330	.230
	21.0	8.28	5.270	.400	.250
	24.0	7.93	6.495	.400	.245
	28.0	8.06	6.535	.465	.285
	31.0	8.00	7.995	.435	.285
	35.0	8.12	8.020	.495	.310
	40.0	8.25	8.070	.560	.360
	48.0	8.50	8.110	.690	.400
	58.0	8.75	8.220	.810	.510
W-10	12.0	9.87	3.960	.210	.190
	15.0	9.99	4.000	.270	.230
	19.0	10.24	4.020	.395	.250
	22.0	10.17	5.750	.360	.240
	26.0	10.33	5.770	.440	.260
	30.0	10.47	5.81	.510	.300
	33.0	9.73	7.960	.435	.290
	39.0	9.92	7.985	.530	.315
	45.0	10.10	8.020	.620	.350
	49.0	9.98	10.000	.560	.340
68.0	10.40	10.13	.770	.470	
W-12	14.0	11.91	3.970	.225	.200
	16.0	11.99	3.990	.265	.220
	19.0	12.16	4.005	.350	.235
	22.0	12.31	4.030	.425	.260
	26.0	12.22	6.490	.380	.230
	30.0	12.34	6.520	.440	.260
	35.0	12.50	6.560	.520	.300
	40.0	11.94	8.005	.515	.295
	50.0	12.19	8.080	.640	.370
	58.0	12.19	10.010	.640	.360
	65.0	12.12	12.000	.610	.390
W-14	22.0	13.74	5.000	.335	.230
	26.0	13.91	5.025	.420	.255
	30.0	13.84	6.730	.385	.270
	34.0	13.98	6.750	.460	.290
	43.0	13.66	7.995	.530	.305
	53.0	13.92	8.060	.660	.370

WIDE FLANGE BEAMS

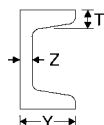
Standard Lengths 20, 40 & 60 Ft. ASTM A36 (Cont.)



Type	Lbs./Ft.	"X" Depth of Section	"Y" Flange Width	"T" Flange Thick- ness	"Z" Web Thick- ness
W-16	26.0	15.69	5.500	.345	.250
	31.0	15.88	5.530	.440	.280
	36.0	15.86	6.990	.430	.300
	40.0	16.01	6.995	.505	.305
	50.0	16.26	7.070	.630	.380
W-18	35.0	17.70	6.000	.430	.300
	40.0	17.90	6.015	.525	.315
	46.0	18.06	6.060	.605	.360
W-21	44.0	20.66	6.500	.450	.350

STRUCTURAL CHANNELS

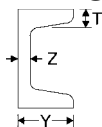
Standard Lengths 20 & 40 Ft. A-36



* Galvanized Available

Type	Lbs./Ft.	Flange Width "Y"	Flange Thick- ness "T"	Web Thick- ness "Z"
C-3	* 4.10	1.410	.273	.170
	5.00	1.498	.273	.258
C-4	* 5.40	1.584	.296	.184
	7.25	1.721	.296	.321
C-5	6.70	1.750	.320	.190
	9.00	1.885	.320	.325
C-6	8.20	1.920	.343	.200
	10.50	2.034	.343	.314
	13.00	2.157	.343	.437
C-7	9.80	2.090	.366	.210
	12.25	2.194	.366	.314
C-8	11.50	2.260	.390	.220
	13.75	2.343	.390	.303
	18.75	2.527	.390	.487
C-9	13.40	2.433	.413	.233
	15.00	2.485	.413	.285
C-10	15.30	2.600	.436	.240
	20.00	2.739	.436	.379
	25.00	2.886	.436	.526
	30.00	3.030	.440	.670
C-12	20.70	2.942	.501	.282
	25.00	3.050	.500	.390
C-15	33.90	3.400	.650	.400
	40.00	3.520	.650	.520

SHIP & CAR CHANNEL A-36



Type	Lbs./Ft.	"Y" Flange Width	"T" Flange Thick- ness	"Z" Web Thick- ness
MC 4	13.8	2.500	.530	.500
MC 6	12.0	2.497	.375	.310
MC 10	8.4	1.500	.260	.170
MC 12	10.6	1.500	.309	.190

Also Available:

HP Shapes • Crane Rail

BAR SIZE CHANNELS

A36 Standard Lengths 20 Ft.

Size in Inches					Lbs./Ft.
1	x	1/2	x	1/8	.80
1 1/2	x	1/2	x	1/8	1.12
2	x	1/2	x	1/8	1.43
2	x	5/8	x	1/4	2.28
2	x	1	x	1/8	1.78
2	x	1	x	3/16	2.57

Structural Processing Services

- Band Sawing
- Miter Cutting
- Flame Cutting
- Bending & Forming
- Rolling
- Drilling
- Punching
- Structural Fabrication
- Beam Splitting to Make "T" Shapes
- House Beam Setting (43' Reach)

Note: See Equipment and Services on pages 66-68 for details.

HOT ROLLED SHEETS

Low Carbon Standard Lengths 96 & 120 Inches

Nominal Gauge	Widths in Inches	Lbs./Sq. Ft.
10 (.134)	48, 60, 72	5.62
11 (.119)	48, 60, 72	5.00
12 (.104)	48, 60, 72	4.38
14 (.074)	48, 60	3.12
16 (.059)	48, 60	2.50

Note: We can shear full sheets to your required dimensions.

HOT ROLLED SHEETS

Pickled and Oiled

Nominal Gauge	Size in Inches	Lbs./Sq. Ft.
7 (.179)	60 x 120 72 x 120	7.50
8 (.164)	48 x 120	6.87
10 (.134)	60 x 120	5.62
11 (.119)	48 x 96 48 x 120 60 x 120 72 x 96	5.00
13 (.089)	48 x 96 48 x 120 48 x 144 60 x 120	3.75
14 (.074)	48 x 96 48 x 120	3.12
16 (.059)	48 x 120 60 x 120	2.50 2.61

COLD ROLLED SHEETS

Low Carbon

Nominal Gauge	Size in Inches	Lbs./Sq. Ft.
11 (.119)	48 x 96	5.00
	48 x 120	
	60 x 120	
12 (.104)	48 x 96	4.38
	48 x 120	
	60 x 120	
13 (.089)	48 x 96	3.75
	48 x 120	
	60 x 120	
14 (.074)	48 x 96	3.12
	48 x 120	
	60 x 120	
16 (.059)	48 x 96	2.50
	48 x 120	
	60 x 96	
	60 x 120	
18 (.047)	48 x 96	2.00
	48 x 120	
	48 x 144	
	60 x 120	
20 (.035)	48 x 120	1.50
	48 x 144	
22 (.029)	48 x 96	1.25
	48 x 120	
24 (.023)	48 x 96	1.00
26 (.017)	30 x 96	.75
28 (.015)	24 x 120	.62

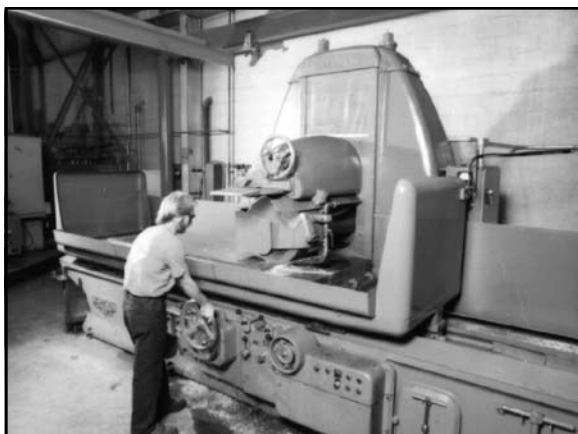
Note: We can shear full sheets to your required dimensions.

Looking for a specific material, grade, or size that's not listed in our Material Selection Guide?
Call and inquire!

GALVANIZED STEEL SHEETS

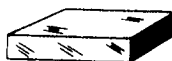


<i>Nominal Gauge</i>	<i>Size in Inches</i>	<i>Lbs./Sq. Ft.</i>
10 (.138)	48 x 120	5.78
11 (.123)	48 x 120	5.15
12 (.108)	48 x 120	4.53
14 (.078)	48 x 96 48 x 120	3.28
16 (.063)	48 x 96 48 x 120	2.65
18 (.051)	48 x 120	2.15
20 (.039)	48 x 96 48 x 120	1.65
22 (.033)	48 x 96 48 x 120	1.40
24 (.027)	48 x 96 48 x 120	1.15
26 (.021)	48 x 96 48 x 120	.91
28 (.018)	36 x 96	.78
30 (.015)	36 x 96	.65



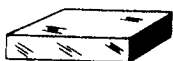
HOT ROLLED PLATES

A36 & Mild Carbon C1008/1010



Std. Size in Inches	Std. Widths in Inches	Std. Lengths in Inches	Lbs./Sq. Ft.
3/16	48, 60	96, 120, 240	7.66
	72, 96	240	
1/4	48, 60	96, 120, 240	10.21
	72, 96	240	
5/16	48, 60	120, 144	12.76
	96	240	
3/8	48, 60	96, 120, 144	15.32
	72, 96	240	
7/16	call for current stock size		
1/2	48	96, 120, 144	20.42
	60, 72	240	
	96	240	
5/8	96	240	25.53
3/4	96	240	30.63
7/8	96	240	35.74
1	96	240	40.84
1 1/8	96	240	45.90
1 1/4	96	240	51.00
1 3/8	96	240	56.10
1 1/2	96	240	61.20
1 3/4	96	240	71.40
2	96	240	81.60
2 1/8	96	240	86.60
2 1/4	96	240	91.80
2 1/2	96	240	102.00
2 3/4	96	240	112.20
3	96	240	122.40
3 1/4	96	120	132.60
3 1/2	96	120	142.80
3 3/4	96	192	153.00
4	96	120	163.20
4 1/4	96	120	173.40
4 1/2	96	120	183.60
4 3/4	96	120	193.99
5	96	120	204.00
5 1/2	96	120	224.40
6	96	120	244.80

HOT ROLLED PLATES



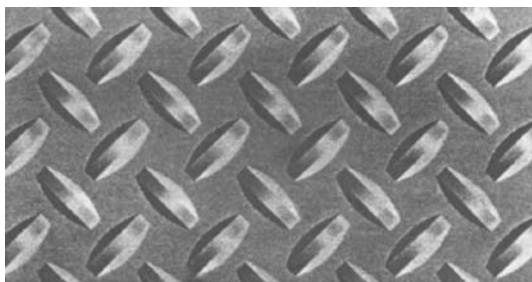
Mild Carbon C1008/1010 Pickled and Oiled

Std. Size

<i>in Inches</i>	<i>Size in Inches</i>	<i>Lbs./Sq. Ft.</i>
$\frac{3}{16}$	48 x 96, 120	7.66
$\frac{1}{4}$	48 x 120 60 x 120	10.21
$\frac{3}{8}$	60 x 120	15.32
$\frac{1}{2}$	48 x 120	20.42

HOT ROLLED FLOOR PLATES

(Diamond Plate)



<i>Thickness</i>	<i>Size</i>	<i>Lbs./Sq. Ft.</i>
14 gauge	48 x 96	3.75
$\frac{1}{8}$	48 x 96, 120 60 x 120, 240 72 x 120	6.15
$\frac{3}{16}$	48 x 96, 120 60 x 240 72 x 240, 288	8.70
$\frac{1}{4}$	48 x 96, 120 60 x 240 72 x 240	11.25
$\frac{3}{8}$	48 x 96, 120 60 x 120, 240	16.35
$\frac{1}{2}$	48 x 96, 120 60 x 240 72 x 240	21.45

COLD FINISH CARBON STEEL

BAR SPECIFICATION

C - 1018 - COLOR CODE - BLACK

General Purpose, low carbon, suited to Cold Forming and Welding. Machinability 76%.

C - 1045 - COLOR CODE - BRONZE

Medium carbon that has advantages in strength over lower carbon steels - important for shafting. Good heat treatment which is useful for studs and special bolts. Machines to a smoother finish than 1018. Machinability 57%.

C - 1117 - COLOR CODE - RED

Ideal for use in manufacture of parts subject to shock or vibrations, as it is readily case carbonized. Machinability 90%.

C - 1215 - COLOR CODE - BLUE

Low carbon screw stock, produces smooth and bright finish. Machinability 136%.

C - 12L14 - COLOR CODE - BROWN (LED "A")

Recommended for high speed automatic screw machining. Produces a smooth machined surface. Provides longer tool life and increased production. Contains lead. Machinability 180%.

C - 12L15X - COLOR CODE - RED AND GREEN

Ledloy "A" with Selenium added. Provides faster machining than Led "A". Produces excellent surface finish and longer tool life. Machinability 300%.

STANDARD MANUFACTURING TOLERANCES

(Undersize variation in inches) COLD FINISHED CARBON BARS

<i>Size and Shape</i>	<i>Carbon to .28% Max.</i>	<i>Carbon over .28% to .55%</i>
ROUNDS		
1½" or under	.002"	.003"
Over 1½" to 2½" Incl.	.003"	.004"
Over 2½" to 4" Incl.	.004"	.005"
Over 4" to 6" Incl.	.005"	.006"
Over 6" to 8" Incl.	.006"	.007"
Over 8" to 9" Incl.	.007"	.008"
HEXAGONS		
Up to ¾" Incl.	.002"	.003"
Over ¾" to 1½" Incl.	.003"	.004"
Over 1½" to 2½" Incl.	.004"	.005"
Over 2½" to 3⅞" Incl.	.005"	.006"
SQUARES		
Up to ¾" Incl.	.002"	.004"
Over ¾" to 1½" Incl.	.003"	.005"
Over 1½" to 2½" Incl.	.004"	.006"
Over 2½" to 3⅞" Incl.	.006"	.006"
FLATS		
To ¾" Incl.	.003"	.004"
Over ¾" to 1½" Incl.	.004"	.005"
Over 1½" to 3" Incl.	.005"	.006"
Over 3" to 4" Incl.	.006"	.006"
Over 4" to 6" Incl.	.006"	.010"
Over 6"	.013"	

COLD DRAWN FLATS

Standard Lengths 10/12 Ft. C-1018



<i>Size in Inches</i>		<i>Lbs./Ft.</i>	<i>Size in Inches</i>		<i>Lbs./Ft.</i>		
1/8	x	1/4	.11	1/4	x	2 3/4	2.34
		3/8	.16			3	2.55
		1/2	.21			3 1/2	2.98
		5/8	.27			4	3.40
		3/4	.32			5	4.25
		7/8	.37			5 1/2	4.67
		1	.43			6	5.10
		1 1/4	.53			7	5.95
		1 1/2	.64			8	6.80
		1 3/4	.74			10	8.50
		2	.85			12	10.20
		2 1/2	1.06				
		3	1.28				
		3 1/2	1.49				
4	1.70						
5	2.13						
6	2.55						
3/16	x	1/2	.32	5/16	x	5/8	.66
		5/8	.40			3/4	.80
		3/4	.48			1	1.06
		7/8	.56			1 1/4	1.33
		1	.64			1 3/8	1.46
		1 1/4	.80			2	2.13
		1 1/2	.96			2 1/4	2.39
		1 3/4	1.12			3	3.19
		2	1.28			4	4.25
		2 1/2	1.59				
		3	1.91				
		3 1/2	2.23				
		4	2.55				
		5	3.19				
6	3.83						
1/4	x	1/2	.43	3/8	x	1/2	.64
		5/8	.53			5/8	.80
		3/4	.64			3/4	.96
		7/8	.74			7/8	1.11
		1	.85			1	1.28
		1 1/8	.96			1 1/4	1.59
		1 1/4	1.06			1 1/2	1.91
		1 1/2	1.28			1 3/4	2.23
		1 3/4	1.49			2	2.55
		2	1.70			2 1/2	3.19
		2 1/4	1.91			2 3/4	3.50
		2 1/2	2.13			3	3.83
						4	5.10
						5	6.38
		6	7.65				
		8	10.20				
		10	12.75				
		12	15.30				
1/4	x	1/2	.43	1/2	x	5/8	1.06
		5/8	.53			3/4	1.28
		3/4	.64			7/8	1.49
		7/8	.74			1	1.70
		1	.85			1 1/4	2.13
		1 1/8	.96				

COLD DRAWN FLATS



Standard Lengths 10/12 Ft. C-1018 (Cont'd.)

<i>Size in Inches</i>				<i>Size in Inches</i>					
		<i>Lbs./Ft.</i>				<i>Lbs./Ft.</i>			
1/2	x	1 1/2	2.55	3/4	x	4 1/2	11.48		
		1 3/4	2.98			5	12.75		
		2	3.40			6	15.30		
		2 1/4	3.83			8	20.40		
		2 1/2	4.25			10	25.50		
		3	5.10			12	30.60		
		3 1/2	5.95						
		4	6.80			7/8	x	2	5.95
		4 1/2	7.65						
		5	8.50			1	x	1 1/4	4.25
		5 1/2	9.35					1 1/2	5.10
		6	10.20					1 3/4	5.95
		7	11.90					2	6.80
		8	13.60					2 1/2	8.50
10	17.00			2 3/4	9.35				
12	20.40			3	10.20				
				3 1/2	11.90				
5/8	x	3/4	1.59	4	13.60				
		1	2.12	4 1/2	15.30				
		1 1/2	3.19	5	17.00				
		2	4.25	6	20.40				
		2 1/2	5.31	7	23.80				
		3	6.38	8	27.20				
		4	8.50	10	34.00				
		6	12.75	12	40.80				
		8	17.00						
		10	21.25	1 1/4	x	1 1/2	6.38		
12	25.50			1 3/4	7.44				
				2	8.50				
3/4	x	1	2.55	2 1/4	9.56				
		1 1/4	3.19	2 1/2	10.63				
		1 1/2	3.83	3	12.75				
		1 3/4	4.46	3 1/2	14.88				
		2	5.10	4	17.00				
		2 1/4	5.73	4 1/2	19.13				
		2 1/2	6.38	5	21.25				
		2 3/4	7.01	5 1/2	23.38				
		3	7.65	6	25.50				
		3 1/4	8.29	8	34.00				
		3 1/2	8.93	10	42.50				
		4	10.20	12	51.00				

Looking for a specific material, grade, or size that's not listed in our Material Selection Guide?
Call and inquire!

COLD DRAWN FLATS



Standard Lengths 10/12 Ft. C-1018 (Cont'd.)

<i>Size in Inches</i>	<i>Lbs./Ft.</i>	<i>Size in Inches</i>	<i>Lbs./Ft.</i>
1½ x 1¾	8.93	2 x 2¼	15.30
2	10.20	2½	17.00
2¼	11.48	3	20.40
2½	12.75	3½	23.80
3	15.30	4	27.20
3½	17.85	4½	30.60
4	20.40	5	34.00
4½	22.95	6	40.80
5	25.50	8	54.40
5½	28.05	10	68.00
6	30.60	12	81.60
8	40.80		
10	51.00	2½ x 3	25.50
12	61.20	3½	29.75
		4	34.00
1¾ x 2	11.90	5	42.50
2½	14.88	6	51.00
3	17.85		
6	35.70	3 x 3½	35.70
		4	40.80
		5	51.00
		6	61.20
		8	81.60

For Specifications See Page 27.

T G & P ROUNDS



12 - 24 Ft. Random Lengths C-1045

Call for current available stock length

<i>Size in Inches</i>	<i>Lbs./Ft.</i>	<i>Size in Inches</i>	<i>Lbs./Ft.</i>
½	.67	1½	6.01
⅝	1.04	1⅝	7.05
¾	1.50	1 ¹⁵ / ₁₆	10.02
⅞	2.04	2	10.68
1	2.67	2 ³ / ₁₆	12.78
1⅛	3.38	2 ⁷ / ₁₆	15.87
1 ³ / ₁₆	3.77	2½	16.96
1¼	4.17	2 ¹⁵ / ₁₆	23.04
1 ⁷ / ₁₆	5.52	3	24.03

COLD DRAWN ROUNDS



Std. Lengths
10/12 Ft.

		AISI TYPE					
<i>Size in Inches</i>	<i>Lbs./Ft.</i>	C1018	C1117	C1215	C12L15X	C12L14	C1045
1/8	.04	X					
5/32	.07	X			X	X	
3/16	.09	X				X	
1/4	.17	X				X	
5/16	.26	X				X	
.322	.27				X		
11/32	.32			X			
3/8	.38	X	X			X	
7/16	.51	X				X	
1/2	.67	X		X		X	X*
9/16	.85	X				X	
5/8	1.04	X	X	X		X	X
11/16	1.26	X				X	
3/4	1.50	X		X		X	X*
13/16	1.76					X	
7/8	2.04	X		X		X	
15/16	2.35	X				X	
1	2.67	X*		X		X	X*
11/16	3.01	X*		X		X	
1 1/8	3.38	X*		X		X	
1 3/16	3.77	X*				X	
1 1/4	4.17	X*		X		X	X*
1 5/16	4.60	X*				X	
1 3/8	5.05	X*				X	
1 7/16	5.52	X				X	X*
1 1/2	6.01	X*		X		X	X*
1 9/16	6.52					X	
1 5/8	7.05			X		X	X*
1 11/16	7.60	X*				X	
1 3/4	8.18	X*				X	X*
1 7/8	9.39	X*				X	
1 15/16	10.02	X*				X	
2	10.68	X*		X		X	X*
2 1/8	12.06	X*				X	
2 3/16	12.78	X*				X	
2 1/4	13.52	X*				X	X*
2 5/16	14.28	X		X			
2 3/8	15.06	X*				X	
2 7/16	15.87	X*				X	X*
2 1/2	16.96	X*		X		X	X*
2 5/8	18.40					X	

* Also Available In 20 Ft. Lengths

COLD DRAWN ROUNDS



Std. Lengths

10/12 Ft.

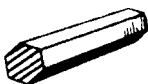
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Size in Inches	Lbs./Ft.	AISI TYPE					
		C1018	C1117	C1215	C12L15X	C12L14	C1045
2 ¹¹ / ₁₆	19.29					X	
2 ³ / ₄	20.20	X*				X	X*
2 ⁷ / ₈	22.07	X*				X	
2 ¹⁵ / ₁₆	23.04	X*					
3	24.03	X*				X	X*
3 ¹ / ₄	28.21	X*				X	
3 ³ / ₈	30.42					X	
3 ¹ / ₂	32.71	X*				X	
3 ⁵ / ₈	35.09	X*					
3 ³ / ₄	37.55	X*				X	
3 ⁷ / ₈	40.10					X	
4	42.73	X*				X	X*
4 ¹ / ₂	54.08	X*				X	
4 ³ / ₄	60.25					X	
5	66.76	X*				X	X*
5 ¹ / ₂	80.78	X*					
6	96.13	X*				X	X*
6 ¹ / ₄	104.30	X*					
6 ¹ / ₂	112.82	X*					

* Also Available In 20 Ft. Lengths

COLD DRAWN HEXAGONS

Std. Lengths 10/12 Ft.



Size in Inches	Lbs./Ft.	AISI TYPE		
		C1018	C1215	C12L14
5 ¹⁶ / ₁₆	.29	X		X
3 ⁸ / ₈	.41			X
7 ¹⁶ / ₁₆	.56	X		X
1 ² / ₂	.74			X
9 ¹⁶ / ₁₆	.93		X	
5 ⁸ / ₈	1.15			X
3 ⁴ / ₄	1.66			X
7 ⁸ / ₈	2.25			X
1	2.94			X
1 ³ / ₁₆	4.15		X	
1 ¹¹ / ₁₆	8.40	X		

COLD DRAWN SQUARES

Standard Lengths 10/12 Ft. C-1018



<i>Size in Inches</i>	<i>Lbs./Ft.</i>	<i>Size in Inches</i>	<i>Lbs./Ft.</i>
3/16	.12	1 1/4	5.31
1/4	.21	1 1/2	7.65
5/16	.32	1 3/4	10.41
3/8	.48	2	13.60
7/16	.65	2 1/2	21.25
1/2	.85	3	30.60
5/8	1.33	3 1/2	41.65
3/4	1.91	4	54.50
7/8	2.60	5	85.00
1	3.40	6	122.40
1 1/8	4.30		

Also Available

5/16 (C-12L14)	.32
7/8 (C-1042)	2.60
1 (C-1215)	3.40

BARS & FLATS PROCESSING SERVICES

- Production Cutting, Shearing
- Sawing
- Miter Cutting
- Bending & Forming
- Fabrication
- Welding

Note: See Equipment and Services on pages 66-68 for details.

STAINLESS STEEL

GUIDE TO SELECTION

303

Excellent free machining characteristics suited for automatic screw machines. Type 303 has a machinability rated at approximately 60% compared to C-1212 Carbon Steel rated 100%.

304

General Purpose Alloy - High resistance to corrosion. Welds, forms - suitable for restaurant equipment. Type 304 is recommended for welded construction of lighter sections where annealing is not practical.

304 L

Same as 304 - except lower carbon.

316

One of the highest corrosion resistant alloys, forms and welds; suitable for chemical tanks, photographic processing equipment.

316 L

Same as 316 - except lower carbon.

STAINLESS STEEL SQUARES

12 Ft. Random Length



<i>Size in Inches</i>	<i>Lbs./Ft.</i>	<i>Type</i>		
		<i>303</i>	<i>304</i>	<i>316</i>
3/16	.12	X		
1/4	.21		X	X
3/8	.48		X	X
1/2	.85		X	X
5/8	1.33		X	X
3/4	1.91		X	X
1	3.40		X	
1 1/4	5.31		X	
1 1/2	7.65		X	
2			X	

Looking for a specific material, grade, or size that's not listed in our Material Selection Guide? Call and inquire!

STAINLESS STEEL ROUNDS

12 Ft. Random Length



Size in Inches	Lbs./Ft.	Type		
		303	304/304L	316/316L
1/8	.04	X	X	X
5/32	.07	X	X	
3/16	.09	X	X	X
1/4	.17	X	X	X
5/16	.26	X	X	X
3/8	.38	X	X	X
7/16	.51	X	X	
1/2	.67	X	X	X
9/16	.85	X	X	
5/8	1.04	X	X	X
3/4	1.50	X	X	X
7/8	2.04	X	X	X
1	2.67	X	X	X
1 1/16	3.01		X	
1 1/8	3.38		X	
1 3/16	3.77	X	X	
1 1/4	4.17	X	X	X
1 5/16	4.60		X	
1 3/8	5.05	X	X	
1 7/16	5.52	X	X	
1 1/2	6.01	X	X	X
1 5/8	7.05		X	
1 3/4	8.17		X	
1 7/8	9.33	X		
1 15/16	10.02		X	
2	10.68	X	X	X
2 1/8	12.06	X		
2 1/4	13.52		X	
2 1/2	16.69	X	X	
3	24.03		X	
3 1/2	32.71		X	
4	42.73		X	
4 1/2	54.07			X
5	66.76		X	
6	96.13		X	
7	130.90		X	

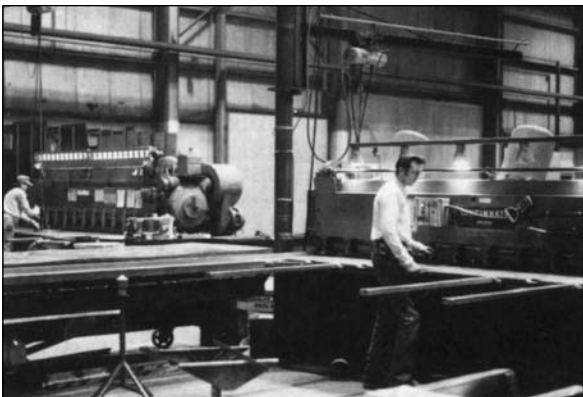
If you don't see what you need,
give us a call!
Other grades and sizes are available.

STAINLESS STEEL FLATS

Type 304 12 Ft. Random Length



<i>Size in Inches</i>			<i>Lbs./Ft.</i>	<i>Size in Inches</i>			<i>Lbs./Ft.</i>
1/8	x	1/2	.21	3/8	x	3/4	.96
		5/8	.27			1	1.28
		3/4	.32			1 1/4	1.58
		1	.43			1 1/2	1.92
		1 1/4	.53			2	2.55
		1 1/2	.64			2 1/2	3.19
		2	.85			3	3.82
		2 1/2	1.06			4	5.10
		3	1.27			6	7.64
3/16	x	3/4	.48	1/2	x	3/4	1.27
		1	.64			1	1.70
		1 1/4	.80			1 1/4	2.14
		1 1/2	.96			1 1/2	2.55
		2	1.28			1 3/4	2.97
		2 1/2	1.60			2	3.40
		3	1.91			2 1/2	4.25
		4	2.56			3	5.10
						4	6.80
1/4	x	1/2	.43			6	10.20
		3/4	.64			8	13.60
		1	.85				
		1 1/4	1.07				
		1 1/2	1.28				
		1 3/4	1.48				
		2	1.70				
		2 1/2	2.13				
		3	2.55				
		4	3.40				
		6	5.08				



STAINLESS STEEL ANGLES

Type 304 18/22 Ft. Random Length

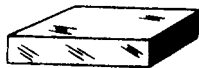


<i>Size in Inches</i>					<i>Lbs./Ft.</i>
3/4	x	3/4	x	1/8	.59
1	x	1	x	1/8	.80
1	x	1	x	3/16	1.16
1	x	1	x	1/4	1.49
1 1/4	x	1 1/4	x	1/8	1.01
1 1/4	x	1 1/4	x	3/16	1.48
1 1/4	x	1 1/4	x	1/4	2.02
1 1/2	x	1 1/2	x	1/8	1.23
1 1/2	x	1 1/2	x	3/16	1.80
1 1/2	x	1 1/2	x	1/4	2.34
2	x	2	x	1/8	1.65
2	x	2	x	3/16	2.44
2	x	2	x	1/4	3.19
2 1/2	x	2 1/2	x	3/16	3.07
2 1/2	x	2 1/2	x	1/4	4.10
3	x	3	x	1/4	4.90
3	x	3	x	3/8	7.20
4	x	4	x	1/4	6.60
4	x	4	x	3/8	9.80



STAINLESS STEEL PLATES

Type 304L & 316L



<i>Thickness in Inches</i>	<i>Size in Inches</i>	<i>Lbs./Sq. Ft.</i>
$\frac{3}{16}$	48 x 240	8.57
$\frac{1}{4}$	48 x 240	11.16
$\frac{5}{16}$	48 x 144	13.75
$\frac{3}{8}$	48 x 240	16.49
$\frac{1}{2}$	48 x 240	21.66
$\frac{5}{8}$	48 x 96	26.83
$\frac{3}{4}$	48 x 96	32.12
1	48 x 96	42.67

Note: Check for availability of additional sizes when ordering.

Stainless Steel Sheet & Plate Processing Services

- Miter Cutting
- Shearing
- Plasma Cutting
- Laser Cutting
- Waterjet Cutting
- Forming & Bending
- Welding
- Fabrication

Note: See Equipment and Services on pages 66-68 for details.

STAINLESS STEEL SHEETS

Type 304-2B OR 304L



<i>Gauge</i>	<i>Decimal</i>	<i>Size in Inches</i>	<i>Lbs./ Sq. Ft.</i>	<i>304 #3 or #4 Finish</i>	<i>316/ 316L 2B</i>	<i>304/ 304L 2B</i>
7	(.187)	48 x 144	7.87			X
8	(.165)	48 x 96	6.93			X
10	(.135)	48 x 96	5.67			X
		48 x 120			X	X
		60 x 144				X
11	(.120)	36 x 96	5.04			X
		48 x 96		X		X
		48 x 120		X	X	X
		48 x 144				X
		60 x 120				X
		60 x 144				X
12	(.105)	48 x 96	4.43			X
		48 x 120			X	X
		48 x 144				X
		60 x 120				X
13	(.090)	36 x 120	3.78			X
		48 x 96				X
		48 x 120				X
14	(.075)	36 x 96	3.15			X
		48 x 96		X		X
		48 x 120		X		X
		60 x 144				X
16	(.059)	48 x 96	2.52			X
		48 x 120		X	X	X
		48 x 144				X
		60 x 120				X
		60 x 144				X
18	(.048)	36 x 120	2.02			X
		48 x 96		X		X
		48 x 120		X		X
20	(.036)	48 x 96	1.51			X
		48 x 120		X		X
22	(.030)	48 x 96	1.26	X		X
		48 x 120		X		
24	(.024)	48 x 120	1.01	X		X
26	(.018)	36 x 120	.75			X
		48 x 96				X
		48 x 120				X

ALUMINUM SHEET/PLATES

GUIDE TO SELECTION

1100 (UNS A91100) is commercially pure aluminum (99.00% minimum). Excellent corrosion resistance, workability and weldability; high thermal conductivity. Tensile strength range 14,000 to 24,000 psi. Users include deep drawing, spinning, sheet metal work, decorative and architectural applications, air ducts, name plates, fan blades, etc. Conforms to Federal specification QQ-A-250/1 and ASTM B-209.

3003 (UNS A93003) is alloyed with 1.2% manganese to provide a tensile strength range of 17,000 to 30,000 psi. Excellent workability, weldability and corrosion resistance. Used for drawing, spinning, fuel tanks, sheet metal work and other applications where slightly higher strength than 1100 is required. Conforms to Federal specification QQ-A-250/2 and ASTM B-209.

5052 (UNS A95052) is alloyed with 2.5% magnesium. Tensile strength range 31,000 to 44,000 psi. Very good corrosion resistance, good workability, weldability and strength. Used for aircraft fuel tanks, storm shutters, refrigerator liners, utensils, electronic mounting plates and panels, fan blades, etc. Conforms to Federal specification QQ-A-250/8 and ASTM B-209.

6061 (UNS A96061) is alloyed with 1.0% magnesium and .6% silicon. Tensile strength range 20,000 to 42,000 psi. Good formability, weldability and corrosion resistance. Used for engineering and structural applications, boats, furniture, transportation equipment, etc. Conforms to Federal specification QQ-A-250/11 and ASTM B-209.

2024 (UNS A92024), is alloyed with 4.5% copper. Tensile strength range 30,000 to 63,000 psi. Fair weldability and corrosion resistance. Forming operations are limited. Used for high strength structural and aircraft applications. 2024 conforms to Federal specification QQ-A-250/4 and ASTM B-209.

Cast Plate (Aluminum Cast Machined Plate) is a general purpose cast tool and jig plate featuring many unique characteristics. It is a high-quality, accurately machined product that has received a thermal stress-relieving treatment to provide dimensional stability during machining.

7075 (UNS A97075) is heavily alloyed with zinc with lesser amounts of magnesium, copper and chromium. One of the strongest of the aluminum alloys, its use parallels that of 2024 with 7075 selected when higher mechanical properties are desired. Forming operations are limited. All 7075 flat products conform to ASTM B-209; 7075 Bare conforms to Federal specification QQ-A-250/12.

ALUMINUM SHEETS

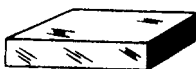


<i>Size in Inches</i>	<i>Lbs./Sq. Ft.</i>	3003-H14	6061-T6	2024-T351	5052-H32
.025 48 x 120	.36	X			
.032 48 x 96	.44	X			
48 x 120		X			X
48 x 144			X	X	
.040 48 x 96	.58	X			
48 x 120		X			X
48 x 144				X	
.050 48 x 96	.71	X			
48 x 120		X			X
48 x 144		X	X	X	X
.063 48 x 96	.91	X			X
48 x 120		X			X
48 x 144		X	X	X	X
.080 48 x 96	1.13	X			X
48 x 120		X			
48 x 144		X	X		
.090 48 x 96	1.28	X			X
48 x 120		X			X
48 x 144		X	X		
.100 48 x 144	1.42	X			X
.125 48 x 96	1.77	X			
48 x 120		X			
48 x 144		X	X	X	X
60 x 144			X		
.190 48 x 144	2.66	X	X	X	X

Looking for a specific material, grade, or size that's not listed in our Material Selection Guide?
Call and inquire!

ALUMINUM PLATES

We cut to your exact needs



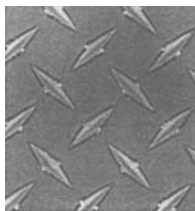
			2024-T351	6061-T651	Cast Plate
<i>Size in Inches</i>		<i>Lbs./Sq. Ft.</i>			
1/4	48 x 96	3.60			X
	48 x 144*		X	X	X
	60 x 144			X	X
5/16	48 x 144	4.49	X	X	X
3/8	48 x 96	5.40			X
	48 x 144**		X	X	X
	60 x 144			X	X
1/2	48 x 96	7.20			X
	48 x 144		X	X	X
	60 x 144			X	X
5/8	48 x 144	9.00	X	X	
	60 x 144			X	X
3/4	48 x 144	10.80	X	X	X
	60 x 144			X	X
7/8	48 x 144	12.60		X	
1	48 x 144	14.40	X	X	X
	60 x 144			X	X
1 1/4	48 x 144	18.90	X	X	X
	60 x 144				X
1 1/2	48 x 144	22.50	X	X	
	60 x 144				X
1 3/4	48 x 144	24.70		X	
2	48 x 144	29.70	X	X	X
	60 x 144				X
2 1/2	48 x 144	36.00		X	
	60 x 144				X
3	48 x 144	43.20	X	X	
4	48 x 144	57.60		X	
4 1/2	48 x 48	64.44		X	

*Also available in 3003-H14.

**Also available in 5052-H32

ALUMINUM TREAD PLATE

6061-T651 and 3003-H22 Brite



Size in Inches		Lbs./Sq. Ft.	Type
1/8	48 x 192 Brite	1.95	3003-H22
	48 x 192	1.95	6061-T6
	60 x 192 Brite		3003-H22
3/16	48 x 192	2.80	6061-T6
	48 x 192 Brite	1.95	3003-H22
	60 x 192 Brite		3003-H22
1/4	48 x 192	3.70	6061-T6
	60 x 192		6061-T6

ALUMINUM BAR GUIDE TO SELECTION

All bars are ordered to rigid specs for highest quality. When available, bars are ordered cold finished for improved machinability and stretch stress-relieved to provide optimum stability during machining or cutting operations.

2011 (UNS A92011) *screw machine stock* is the best machining aluminum bar stock. Fine chips mean faster feeds and longer tool life. Machines to an excellent finish, has good strength, average formability. QQ-A-225/3 and ASTM-B-211.

2024 (UNS A92024) *screw machine stock* is slightly more difficult to machine than 2011 or 2017, but has enough strength for aircraft fittings, bolts, and fastening devices. Conforms to QQ-A-225/6 and ASTM B-211.

6061 (UNS A96061) is one of the most versatile screw machine alloys with good strength, workability, corrosion resistance and ease of joining. Less machinable than 2000 series. Cold finished rounds and hexes conform to QQ-A-225/8 and ASTM B-211. Extruded rounds, squares and rectangles to QQ-A-200/8 and ASTM B-221. Most extruded round items are specially ordered to restricted diameter tolerances for ready use in screw machines.

7075 (UNSA97075) provides the greatest strength available in aluminum bar. Widely used in aircraft applications where light weight plus strength are required. Conforms to QQ-A-225/9 and ASTM B-211.

6063 extruded (UNSA96063) for architectural and ornamental applications. Highly corrosion resistant, with good formability, it is one of the most joinable alloys. Finish is pleasing and is the most suitable for anodizing. Conforms to QQ-A-200/9 and ASTM B-221.

BAR COMPARISON GUIDE

Alloy	<i>in psi</i> Machinability	Typical Strength		Corrosion Resistance
		Ultimate	Yield	
2011-T3	A++	55,000	43,000	C
6262-T9	A+	58,000	55,000	A
2017-T4,T451	A	62,000	40,000	C
2024-T4,T351	A	68,000	47,000	C
6061-T6,T651	B	45,000	40,000	A
7075-T6,T651	A	83,000	73,000	C
5086-H111	C	36,000	21,000	A
6063-T6	B-	35,000	31,000	A
6063-T5	C	27,000	21,000	A

ALUMINUM ROUNDS

12 Ft. Lengths



Size in Inches	Lbs./Ft.	2011-T3	2024-T351	6061-T651
1/8	.01		X	X
3/16	.03		X	X
1/4	.06		X	X
5/16	.09	X		X
3/8	.13	X	X	X
7/16	.18	X		X
1/2	.23	X	X	X
5/8	.36		X	X
3/4	.52		X	X
7/8	.71	X	X	X
1	.92	X	X	X
1 1/8	1.16		X	X
1 1/4	1.44		X	X
1 3/8	1.74		X	X
1 1/2	2.07	X	X	X
1 5/8	2.43	X		X
1 3/4	2.82	X	X	X
1 7/8	3.24		X	X
2	3.69	X	X	X
2 1/4	4.67	X	X	X
2 3/8	5.20			X
2 1/2	5.76	X	X	X
2 3/4	6.97		X	X
3	8.30		X	X

ALUMINUM ROUNDS

12 Ft. Lengths
(Continued)



<i>Size in Inches</i>	<i>Lbs./Ft.</i>	2024-T351	6061-T651
3¼	9.74		X
3½	11.30	X	X
3¾	12.97		X
4	14.76	X	X
4½	18.68		X
5	23.06		X
5¼	25.43	X	
5½	27.99		X
6	33.21		X
6½	38.98		X
7	45.21		X
8	59.05		X
10⅛	98.47		X
12⅛	138.56		X

ALUMINUM SQUARE

12 Ft. Lengths



<i>Size in Inches</i>	<i>Lbs./Ft.</i>	2024-T351	6061-T651
¼	.07		X
⅜	.17	X	X
½	.29	X	X
⅝	.46		X
¾	.66	X	X
1	1.20	X	X
1¼	1.83		X
1½	2.64		X
1¾	3.72		X
2	4.80		X
2½	7.35		X
3	10.80		X
3½	14.90		X
4	19.40		X
5	29.38		X
6	42.33		X

Looking for a specific material, grade, or size that's not listed in our Material Selection Guide? Call and inquire!

ALUMINUM RECTANGULAR BARS 12 Ft. Lengths



<i>Size in Inches</i>			<i>Lbs./Ft.</i>	2024-T351	6061-T651
1/8	x	1/2*	.17		X
		3/4	.11	X	X
		1	.18	X	X
		1 1/4	.18		X
		1 1/2	.23	X	X
		2	.29	X	X
		2 1/2	.38		X
		3	.45		X
3/16	x	1/2	.11		X
		3/4	.17		X
		1	.22	X	X
		1 1/4	.28		X
		1 1/2	.33		X
		2	.44		X
		2 1/2	.56		X
		3	.67		X
1/4	x	1/2	.15	X	X
		3/4	.22	X	X
		1	.29		X
		1 1/4	.37		X
		1 1/2	.44	X	X
		1 3/4	.52		X
		2	.59	X	X
		2 1/2	.73		X
		3	.88	X	X
		4	1.17		X
3/8	x	1/2	.22	X	X
		3/4	.33	X	X
		1	.44		X
		1 1/4	.55		X
		1 1/2	.66	X	X
		1 3/4	.77		X
		2	.88		X
		2 1/2	1.10		X
		3	1.32		X
		4	1.76		X
1/2	x	3/4	.44	X	X
		1	.59	X	X
		1 1/4	.73		X
		1 1/2	.88	X	X

* Also available in 6063-T52

ALUMINUM RECTANGULAR

BARS 12 Ft. Lengths

(Continued)



<i>Size in Inches</i>			<i>Lbs./Ft.</i>	2024-T351	6061-T651
1/2	x	1 3/4	1.02		X
		2	1.17	X	X
		2 1/2	1.46		X
		3	1.76	X	X
		4	2.34	X	X
		5	2.93		X
		6	3.52	X	X
		8	4.71		X
5/8	x	1	.73		X
		1 1/4	.92		X
		1 1/2	1.10		X
		2	1.46		X
		4	2.92		X
3/4	x	1	.88	X	X
		1 1/4	1.10		X
		1 1/2	1.32	X	X
		2	1.76	X	X
		2 1/2	2.20		X
		3	2.53	X	X
		4	3.52		X
		5	4.29		X
		6	5.28		X
1	x	1 1/4	1.46		X
		1 1/2	1.76	X	X
		2	2.35	X	X
		2 1/2	2.73	X	X
		3	3.52	X	X
		3 1/2	4.11		X
		4	4.70	X	X
		5	5.87		X
		6	7.04		X
1 1/4	x	1 1/2	2.20		X
		2	2.93		X
		3	4.41		X
		4	6.08		X
1 1/2	x	2	3.52		X
		2 1/2	4.40		X
		3	5.28		X
		4	7.04		X
		5	8.83		X
		6	10.80		X
2	x	3	7.04		X
		4	9.39	X	X
2 1/2	x	4	12.20		X
3	x	4	14.09		X
		5	17.62		X
		6	21.14		X

ALUMINUM STRUCTURAL ANGLES

25 Ft. - 6061-T6



<i>Size in Inches</i>					<i>Lbs./Ft.</i>
3/4	x	3/4	x	1/8	.20
1	x	1	x	1/8	.28
1	x	1	x	3/16	.40
1	x	1	x	1/4	.51
1 1/4	x	1 1/4	x	1/8	.35
1 1/4	x	1 1/4	x	3/16	.51
1 1/4	x	1 1/4	x	1/4	.66
1 1/2	x	1 1/2	x	1/8	.43
1 1/2	x	1 1/2	x	3/16	.62
1 1/2	x	1 1/2	x	1/4	.81
2	x	1 1/2	x	1/4	.96
2	x	2	x	1/8	.57
2	x	2	x	3/16	.84
2	x	2	x	1/4	1.11
2	x	2	x	3/8	2.05
2 1/2	x	2 1/2	x	3/16	1.07
2 1/2	x	2 1/2	x	1/4	1.40
2 1/2	x	2 1/2	x	3/8	2.05
3	x	2	x	1/4	1.40
3	x	3	x	1/4	1.68
3	x	3	x	3/8	2.47
3	x	3	x	1/2	3.41
3 1/2	x	3 1/2	x	3/8	2.93
4	x	3	x	1/4	1.99
4	x	4	x	1/4	2.28
5	x	3	x	3/8	3.35
8	x	8	x	1/2	9.14

AMERICAN STANDARD ALUMINUM CHANNEL

25 Ft. 6061-T6



<i>Size in Inches</i>					<i>Lbs./Ft.</i>
		<i>Thick</i>		<i>Flange</i>	
3	x	.170	x	1.41	1.420
3	x	.258	x	1.50	1.730
4	x	.180	x	1.58	1.850
4	x	.320	x	1.72	2.500
5	x	.190	x	1.75	2.320
5	x	.325	x	1.89	3.110
6	x	.200	x	1.92	2.830
8	x	.250	x	2.29	4.250
10	x	.526	x	2.89	8.640

ALUMINUM DRAWN TUBING

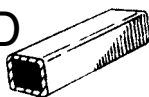
12 Ft. 6061-T6



<i>Size in Inches</i>			<i>Lbs./Ft.</i>
.750 O.D.	x	.065 wall	.160
.750 O.D.	x	.125 wall seamless	.289
1.000 O.D.	x	.125 wall	.404
1.500 O.D.	x	.065 wall	.344
2.000 O.D.	x	.125 wall	.870
3.000 O.D.	x	.250 wall	2.600

ALUMINUM EXTRUDED TUBING

21 Ft. 1 In. - 6063-T52



<i>Size in Inches</i>				<i>Lbs./Ft.</i>	
3/4	x	3/4	x	.062 wall	.214
3/4	x	3/4	x	.125 wall	.376
1	x	1	x	.062 wall	.280
1	x	1	x	.125 wall	.526
1 1/4	x	1 1/4	x	.125 wall	.676
1 1/2	x	1 1/2	x	.125 wall	.825
1 3/4	x	1 3/4	x	.125 wall	.974
2	x	2	x	.125 wall	1.112
3	x	3	x	.125 wall	1.720
4	x	4	x	.125 wall	2.320
1/2	x	1	x	.125 wall	.375
3/4	x	1 1/2	x	.125 wall	.604
1	x	2	x	.125 wall	.824
1 1/2	x	2	x	.125 wall	.971
2	x	3	x	.125 wall	1.410

ALUMINUM PIPE

20 Ft. 6061-T6



<i>Size in Inches</i>	<i>Schedule 40</i>	<i>Schedule 80</i>
1.00	X	X
1.50	X	

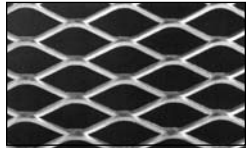
Aluminum I Beams, Tees, and Custom Extrusions are also available.

EXPANDED METAL SHEETS

Raised Style

Size in Inches

1/4 #18	48 x 96
1/2 #16	48 x 96
1/2 #13	48 x 96
3/4 #13	48 x 96
3/4 #9	48 x 96
3/4 #9	48 x 120
1 1/2 #16	48 x 96
1 1/2 #13	48 x 96
1 1/2 #9	48 x 96
1 1/2 #6	48 x 96



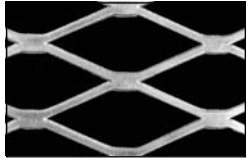
STANDARD

3/4" No. 9

Flattened Style

Size in Inches

1/4 #18	48 x 96
1/2 #18	36 x 96
	48 x 96
	48 x 120
1/2 #16	48 x 96
	48 x 120
1/2 #13	48 x 96
	48 x 120
3/4 #16	36 x 120
	48 x 96
	48 x 120
3/4 #13	48 x 96
3/4 #9	48 x 96
	48 x 120
1 #16	48 x 96
1 1/2 # 16	48 x 96
1 1/2 #13	48 x 96
1 1/2 #9	48 x 96



FLATTENED

1/2" No. 18

Note: We also stock Expanded Aluminum and Stainless Steel Sheets, please call our sales department for more information.

Grate-X Style

Size in Inches

3#	48 x 96
	72 x 144
3.14#	48 x 96
	48 x 120
	72 x 120
4.0#	48 x 96
	48 x 120
	60 x 120
4.27#	48 x 96
	72 x 120
5#	48 x 96
	48 x 120
	72 x 120
6.25#	48 x 96



GRATE-X

BRASS SHEET



Size

in Inches

Thickness Width

Length

.020	x	36	x	96	HH Brass
.032	x	36	x	96	HH Brass
.040	x	36	x	96	HH Brass
.050	x	36	x	96	HH Brass
.062	x	36	x	96	HH Brass
.125	x	36	x	96	HHBrass
.187	x	36	x	96	HH Brass
.250	x	36	x	96	HH Brass

COPPER



16 Oz. Cu. Sht. 36 x 96 .0216

NON STANDARD ITEMS AVAILABLE UPON REQUEST

BRASS ROUNDS

Type CA360



Size in Inches

.125 Dia.

.187 Dia.

.250 Dia.

.312 Dia.

.375 Dia.

.437 Dia.

.500 Dia.

.562 Dia.

.625 Dia.

.750 Dia.

.875 Dia.

1.000 Dia.

Size in Inches

1.062 Dia.

1.125 Dia.

1.250 Dia.

1.375 Dia.

1.500 Dia.

1.750 Dia.

2.000 Dia.

2.500 Dia.

3.000 Dia.

4.000 Dia.

4.500 Dia.

We also stock some sizes of Brass Squares and Hex. Call our Sales Department for more information.

TOOL STEEL SPECIFICATIONS

GUIDE TO SELECTION

O1 General purpose nondeforming, oil hardening tool steel for applications where maximum dimensional accuracy is required during hardening.

A2 Air hardening tool steel with superior abrasion resistance for long service. Inherent toughness make it particularly adaptable for use in dies and punches. Excellent nondeforming characteristics.

D2 High carbon, high chromium tool steel with outstanding wear resistance. Applications include lamination dies - also widely used for reamer blades, knurls, brass turning tools, cutters, brick molds, punches and spinning, forming and seaming tools.

S7 Air hardening shock steel with excellent toughness, combined with good resistance to softening at temperatures up to 1,000° F. Suitable for both hot and cold work tooling applications that involve shock.

H13 An excellent hot work steel with an outstanding combination of shock resistance, red hardness, and abrasion resisting properties. Especially suitable as a die steel for aluminum and magnesium die casting.

420ESR High chromium stainless steel grade - an air or oil hardening mold steel having superior internal cleanliness combined with good corrosion resistance. Supplied in the Annealed Condition

P20 is a prehardened, general purpose mold steel suitable for production of machined or EDM'd plastic mold and zinc die casting die components.

Marshallloy MQ Mold quality steel supplied in the prehardened condition. A uniform product with exceptional cleanliness able to be polished to an extremely high finish required for plastic molding. The balanced alloy composition ensures a uniform cross-sectional hardness similar to P20.

4140HT Direct hardening alloy steel that can be quenched and tempered to obtain a wide range of hardness, ductility and strength levels.

DECARB FREE Mill finished, free from "mill scale," and ready to use.

TOOL STEEL ROUNDS



10/12 Ft. Random Length (Decarb Free)

Size in Inches (Diam.)	Lbs./Ft.	AISI TYPE						
		O1	A2	D2	S7	P20	H13	420ESR
1/2	.67	X	X	X	X		X	
5/8	1.04	X	X	X	X			
3/4	1.50	X	X	X	X		X	
7/8	2.04	X			X			
1	2.67	X	X	X	X	X	X	X
1 1/8	3.38	X	X	X	X			
1 1/4	4.17	X	X	X	X	X		X
1 3/8	5.05	X	X	X	X			
1 1/2	6.01	X	X	X	X	X	X	X
1 5/8	7.05	X	X		X		X	
1 3/4	8.18	X	X	X	X	X	X	X
2	10.68	X	X	X	X	X	X	X
2 1/8	12.06		X		X			
2 1/4	13.52	X	X		X	X	X	X
2 1/2	16.69	X	X	X	X	X	X	X
2 3/4	20.20		X	X	X		X	
3	24.03	X	X	X	X	X	X	X
3 1/4	28.21				X		X	
3 1/2	32.71	X	X	X	X		X	X
4	42.27	X	X	X	X	X	X	X
4 1/2	54.08	X			X		X	X
5	66.76	X	X	X	X	X	X	X
5 1/2	80.78				X			
6	96.13	X	X	X	X	X	X	X
6 1/2	112.82		X				X	
7	130.80						X	X
8	170.79			X			X	X
8 1/2	192.96						X	
9	216.30							X

CUT TO: ANY LENGTH UP TO MAX.

TOLERANCE: DIAMETER +.010" TO +.150"

Typical Chemistry	Marshallloy	P-20	4140HT
Carbon	.36 / .42	.37	.36 / .44
Manganese	1.10 / 1.30	1.40	.70 / 1.00
Silicon	.35 / .45	.30	.15 / .30
Chromium	1.00 / 1.20	2.00	.80 / 1.15
Molybdenum	.15 / .35	.20	.15 / .25
Nickel	.25 / .50	1.00	
Sulphur	.002 Max.	.008	.040 Max.
Phosphorous	.010 Max.		.035 Max.

TOOL STEEL PLATES

(Decarb Free)



Size in Inches	Lbs./Sq.Ft.	AISI TYPE											
		O1	O6	A2	A6	D2	S7	P20	H13	4140HT*	420ESR	MARSH- ALLOY MQ-FM	
1/4	11.20												X
3/8	16.70	X		X*				Δ		Δ			X
1/2	21.89	X		X			X	Δ		Δ	X		X
5/8	26.93	X		X			X	Δ		Δ	X		X
3/4	32.11	X	X	X		X	X	Δ		Δ	X		X
7/8	37.15	X						Δ		Δ			X
1	42.19	X		X	X*	X	X	Δ	X	Δ	X		X
1 1/8	47.38												X
1 1/4	52.42	X*		X	X	X	X	Δ	X	Δ	X		X
1 3/8	57.60							Δ		Δ	X		X
1 1/2	62.64	X		X	X	X	X	Δ	X	Δ	X		X
1 3/4	72.86			X	X	X	X	Δ		Δ	X		X
2	83.09	X		X	X		X	Δ	X	Δ	X		X
2 1/4	93.31							Δ		Δ			X
2 1/2	103.39			X	X		X	Δ	X	Δ	X		X
3	123.82			X		X	X	Δ	X	Δ	X		X
3 1/2	144.29							Δ		Δ	X		X
4	167.04		X				X	Δ		Δ			X
4 1/2	188.64							Δ		Δ			X
5	208.80							Δ		Δ			X
6	249.12							Δ		Δ			X
7	289.44												X

STOCKED IN: 32" x 72" PLATE

CUT TO: ANY LENGTH OR WIDTH AVAILABLE

TOLERANCE: THICKNESS +.015" TO +.035"

WIDTH +.062" TO +.125"

LENGTH +.125" TO +.250"

* Stocked in widths 15" to 16" X 72" long

Δ We stock Marshalloy MQ-FM as an equivalent to items marked with a triangle (Δ).

✦ 4140HT Manufactured to Alloy Steel Tolerance.

NOTE: Call salesperson regarding availability of random drops.

DRILL ROD

36" Lengths

Size in Inches	AISI TYPE			
	W-1	O-1	A-2	S-7
.062	X			
.125	X	X	X	
.140	X			
.156	X	X		
.172	X			
.187	X	X	X	
.250	X	X	X	X
.281		X		
.312	X	X	X	X
.375	X	X	X	
.438	X	X	X	
.500	X	X	X	
.563	X			
.625	X	X	X	
.687		X		
.750	X	X	X	
.875		X	X	
.937	X	X		
1.000	X	X	X	
1.062	X	X		
1.125	X	X		
1.250	X	X	X	
1.375		X	X	
1.500		X		
1.750		X		

Tool Steel Type	Prefix	Specific Types
Cold Work	W = Water Hardening O = Oil Hardening A = Medium Alloy Air Hardening D = High Carbon, High Chromium	W1, W2, W5 O1, O2, O6, O7 A2, A4, A6, A7, A8, A9, A10, A11 D2, D3, D4, D5, D7
Shock Resisting	S	S1, S2, S4, S5, S6, S7
Hot Work	H	H10 - H19 Chromium Types H20 - H39 Tungsten Types H40 - H59 Molybdenum Types
High Speed	M T	Molybdenum Types (M1, M2, M3-1, M3-2, M4, M6, M7, M10, M33, M34, M36, M41, M42, M46, M50 Tungsten Types (T1, T4, T5, T6, T8, T15)
Mold Steels	P	P6, P20, P21
Special Purpose	L and F Series	L2, L6

4140/4142 H.T. ALLOY ROUNDS

Size in Inches (Diam.)	Lbs./Ft.	AISITYPE	
		HR 18-24'	CF 10-13'
1/2	.67		X
5/8	1.04		X
3/4	1.50	X	X
7/8	2.05	X	X
1	2.67	X	X
1 1/8	3.38	X	
1 1/4	4.18	X	X
1 5/16	4.60		X
1 3/8	5.05	X	X
1 7/16	5.52		X
1 1/2	6.01	X	X
1 5/8	7.06	X	
1 3/4	8.19	X	X
2	10.69	X	X
2 1/4	13.53	X	X
2 3/8	15.08		X
2 1/2	16.71	X*	X
2 3/4	20.21	X	X
3	24.06	X	X*
3 1/4	28.23	X	X
3 3/8	30.42		X
3 1/2	32.74	X	X
4	42.77	X	X
4 1/2	54.13	X	X
5	66.82	X	X
5 1/4	73.60	X	
5 1/2	80.86	X	
6	96.22	X	
6 1/2	112.93	X	
6 1/4	104.31	X	
6 3/4	121.67	X	
7	130.97	X	
7 1/2	150.35	X	
8 1/2	193.12	X	
10	267.29	X	

CUT TO: ANY LENGTH UP TO MAX.

*Also available in Annealed Condition

FLAT GROUND STOCK

18"/36" Lengths



Size in Inches	AISI TYPE			
	O-1	S-7	A-2	24" Low Carbon
.015 x 1.000	X			
.031 x 6.000	X			
.062 x .750	X			
1.000	X		X	
2.000			X	
.094 x .500	X			
1.000	X			
.125 x .500	X			
.750	X			
1.000	X		X	X
1.250	X			
1.500	X			X
2.000	X		X	X
2.500	X	X		
3.000	X			X
4.000	X			
6.000	X			
8.000	X			
.187 x 1.000	X	X	X	X
1.500	X	X	X	X
1.750	X			
2.000	X		X	X
3.000	X	X		X
4.000				X
.250 x .250	X			
.750	X	X	X	
1.000	X	X	X	X
1.250	X			
1.500	X	X	X	X
1.750	X			
2.000	X	X	X	X
2.500	X	X		
3.000			X	X
3.500				
4.000			X	X
5.000				X
6.000			X	X

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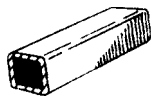
FLAT GROUND STOCK

18"/36" Lengths

(Continued)

Size in Inches	AISI TYPE			
	0-1	S-7	A-2	24" Low Carbon
.312 x .312	X			
.750	X			
1.000	X		X	
1.500	X			
2.500		X		
6.000	X			
.375 x .375	X			
.500	X			
.750	X			
1.000	X		X	X
1.250	X			X
1.500	X	X	X	X
2.000	X	X	X	X
2.500	X			
3.000	X	X		X
3.500	X			X
4.000	X		X	X
6.000	X		X	X
.500 x .500	X		X	X
.625	X			
1.000	X		X	X
1.500	X		X	X
2.000	X		X	X
2.500				X
3.000			X	X
4.000				X
5.000				X
6.000			X	X
.625 x 2.000				X
4.000				X
.750 x .750	X			
6.000				X
1.000 x 1.000	X			
2.000				X

SQUARE WELDED CARBON STEEL TUBING



20' TO 24' Random Length

Size in Inches				Lbs./Ft.
1/2	x	1/2	x	.065 wall .384
3/4	x	3/4	x	.065 wall .605
3/4	x	3/4	x	.120 wall 1.028
1	x	1	x	.065 wall .827
1	x	1	x	.083 wall 1.035
1	x	1	x	.120 wall 1.436
1 1/4	x	1 1/4	x	.065 wall 1.047
1 1/4	x	1 1/4	x	.083 wall 1.317
1 1/4	x	1 1/4	x	.120 wall 1.844
1 1/4	x	1 1/4	x	.187 wall 2.400
1 1/2	x	1 1/2	x	.065 wall 1.268
1 1/2	x	1 1/2	x	.083 wall 1.599
1 1/2	x	1 1/2	x	.120 wall 2.252
1 1/2	x	1 1/2	x	.188 wall 3.350
1 1/2	x	1 1/2	x	.250 wall 4.000
1 3/4	x	1 3/4	x	.083 wall 1.881
1 3/4	x	1 3/4	x	.120 wall 2.660
2	x	2	x	.065 wall 1.710
2	x	2	x	.083 wall 2.164
2	x	2	x	.120 wall 3.050
*2	x	2	x	.188 wall 4.320
*2	x	2	x	.250 wall 5.410
2 1/2	x	2 1/2	x	.120 wall 3.900
*2 1/2	x	2 1/2	x	.188 wall 5.590
*2 1/2	x	2 1/2	x	.250 wall 7.110
3	x	3	x	.083 wall 3.290
3	x	3	x	.120 wall 4.750
*3	x	3	x	.188 wall 6.870
*3	x	3	x	.250 wall 8.810
*3	x	3	x	.375 wall 12.170
3 1/2	x	3 1/2	x	.188 wall 8.150
3 1/2	x	3 1/2	x	.250 wall 10.510
*4	x	4	x	.120 wall 6.460
*4	x	4	x	.188 wall 9.420
*4	x	4	x	.250 wall 12.210
*4	x	4	x	.312 wall 14.830
*4	x	4	x	.375 wall 17.270
4	x	4	x	.500 wall 21.630

* Also available in 40' lengths.

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SQUARE WELDED CARBON

STEEL TUBING (Continued)



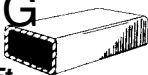
<i>Size in Inches</i>				<i>Lbs./Ft.</i>	
*5	x	5	x	.188 wall	11.970
5	x	5	x	.250 wall	15.642
5	x	5	x	.313 wall	19.080
5	x	5	x	.375 wall	22.370
5	x	5	x	.500 wall	28.430
6	x	6	x	.188 wall	14.530
*6	x	6	x	.250 wall	19.020
6	x	6	x	.312 wall	23.340
*6	x	6	x	.375 wall	27.480
*6	x	6	x	.500 wall	35.240
7	x	7	x	.250 wall	22.420
7	x	7	x	.312 wall	27.590
*8	x	8	x	.250 wall	25.820
*8	x	8	x	.312 wall	31.840
*8	x	8	x	.375 wall	37.690
8	x	8	x	.500 wall	48.850
10	x	10	x	.250 wall	32.630
10	x	10	x	.500 wall	62.460
12	x	12	x	.312 wall	48.860

* Also available in 40' lengths.

RECTANGULAR WELDED

CARBON STEEL TUBING

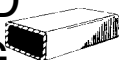
20' TO 24' Random Length



<i>Size in Inches</i>				<i>Lbs./Ft.</i>	
1½	x	1	x	.120 wall	1.844
2	x	1	x	.065 wall	1.268
2	x	1	x	.083 wall	1.599
2	x	1	x	.120 wall	2.252
2	x	1¼	x	.083 wall	1.741
2	x	1½	x	.120 wall	2.660
2½	x	1½	x	.120 wall	3.050
2½	x	1½	x	.188 wall	4.320
3	x	1	x	.120 wall	3.050
3	x	1½	x	.120 wall	3.480
3	x	1½	x	.188 wall	4.960
3	x	2	x	.083 wall	2.730
*3	x	2	x	.120 wall	3.900
*3	x	2	x	.188 wall	5.590
3	x	2	x	.250 wall	7.110
3½	x	2½	x	.250 wall	8.810

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RECTANGULAR WELDED CARBON STEEL TUBING

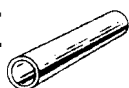


20' TO 24' Random Length (Continued)

<i>Size in Inches</i>				<i>Lbs./Ft.</i>	
4	x	2	x	.083 wall	3.290
*4	x	2	x	.120 wall	4.750
*4	x	2	x	.188 wall	6.870
*4	x	2	x	.250 wall	8.810
*4	x	2	x	.312 wall	10.580
*4	x	3	x	.120 wall	5.610
4	x	3	x	.188 wall	8.150
4	x	3	x	.250 wall	10.510
4	x	3	x	.375 wall	14.720
5	x	2	x	.120 wall	5.610
*5	x	2	x	.188 wall	8.150
*5	x	2	x	.250 wall	10.510
*5	x	2½	x	.125 wall	5.924
*5	x	2½	x	.188 wall	8.780
*5	x	3	x	.188 wall	9.420
5	x	3	x	.250 wall	12.210
*5	x	3	x	.375 wall	17.270
6	x	2	x	.120 wall	6.460
6	x	2	x	.187 wall	9.240
6	x	2	x	.250 wall	12.210
6	x	3	x	.187 wall	10.700
6	x	3	x	.250 wall	13.910
*6	x	4	x	.187 wall	11.970
*6	x	4	x	.250 wall	15.620
*6	x	4	x	.312 wall	19.080
*6	x	4	x	.375 wall	22.370
*6	x	4	x	.500 wall	28.430
8	x	2	x	.188 wall	11.970
8	x	3	x	.188 wall	13.250
8	x	3	x	.250 wall	17.320
8	x	3	x	.375 wall	24.930
8	x	4	x	.188 wall	14.530
8	x	4	x	.250 wall	19.020
*8	x	4	x	.375 wall	27.480
8	x	6	x	.250 wall	22.420
10	x	4	x	.188 wall	17.080
10	x	4	x	.250 wall	22.420

* Also available in 40' lengths.

WELDED CARBON PIPE



**Nominal Pipe
Size in Inches**

ASA PIPE SCHEDULE
10 40

1/8		X
1/4		X
3/8		X
1/2		X
3/4		X
1		X
1 1/4		X
1 1/2		X
2		X
2 1/2		X
3		X
3 1/2	X	X
4		X
5		X
6		X
8		X

ACRYLIC (PLEXIGLAS®)

Size in Inches



.098	48	x	96
.118	48	x	96
.177	48	x	96
.220	48	x	96
.375	48	x	96

Also available.

.060	x	48	x	96 Polycarbonate (Lexan®)
.125	x	48	x	96 Polycarbonate (Lexan®)
.187	x	48	x	96 Polycarbonate (Lexan®)
.220	x	48	x	96 Polycarbonate (Lexan®)



THREADED ROD

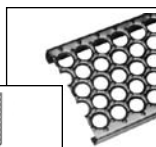
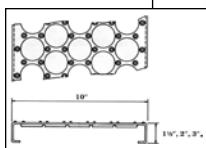
Size in Inches (Diam.)	Ft.	TYPE			
		Light Oil	Zinc Plated	Hi Strength Alloy	304 SS
.250 - 20	12	X	X		X
.312 - 18	12	X	X		X
.375 - 16	12	X	X	X	X
.437 - 14	12	X			X
.500 - 13	12	X	X	X	X
.625 - 11*	12	X	X	X	X
.750 - 10*	12	X	X	X	
.875 - 9*	12	X	X		
1.000 - 8*	12	X	X	X	
1.250 - 7	12	X		X	
.500 - 20 NF-RH	6	X			
.375 - 16 NC-LH	6	X			
.750 - 16 NF-RH	12	X			

Note: SS is supplied in 6' Lengths



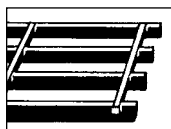
SHUR GRIP

2.0 - 13 Ga.	10 In. DM Galv.
2.0 - 13 Ga.	12 In. DM Galv.
2.0 - .125	10 In. DM Alum.
2.0 - .125	12 In. DM Alum.



BAR GRATING

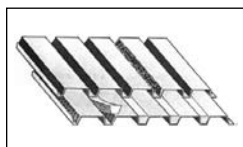
1.000 - .187	24	x	288 PTD 19W4
1.000 - .187	36	x	288 PTD 19W4
1.250 - .187	24	x	288 PTD 19W4
1.250 - .187	36	x	288 PTD 19W4
1.500 - .187	24	x	288 PTD 19W4
1.500 - .187	36	x	288 PTD 19W4
1.750 - .187	36	x	288 PTD 19W4
2.000 - .187	24	x	288 PTD 19W4
2.000 - .187	36	x	288 PTD 19W4



ROOF DECK

Wide Rib 22 Gauge Painted

36" Wide x Random Length



CONCRETE REINFORCING WIRE MESH

6 x 6 10/10

60" Wide x 10' long sheet
60" Wide x 150' long roll

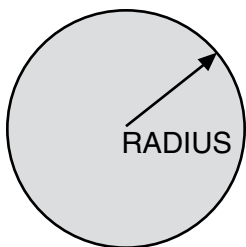
PERIMETERS AND AREAS OF COMMON SHAPES

Circle

Perimeter = $2 \times \text{PI} \times \text{RADIUS}$

Area = $\text{PI} \times \text{RADIUS}^2$

PI = 3.1416



Rectangle

Perimeter = $2 \times (\text{LENGTH} + \text{WIDTH})$

Area = $\text{LENGTH} \times \text{WIDTH}$

LENGTH



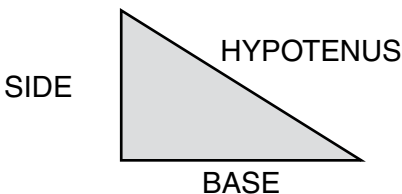
WIDTH

Right Triangle

Perimeter = $\text{BASE} + \text{SIDE} + \text{HYPOTENUSE}$

Area = $1/2 \times \text{BASE} \times \text{SIDE}$

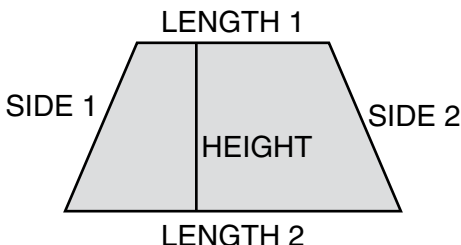
HYPOTENUSE = $\text{SQR ROOT of } \text{BASE}^2 + \text{SIDE}^2$



Trapezoid

Perimeter = $\text{LENGTH1} + \text{LENGTH2} + \text{SIDE1} + \text{SIDE2}$

Area = $\text{HEIGHT}/2 \times (\text{LENGTH1} + \text{LENGTH2})$



COMMON CONVERSION FACTORS

Multiply	By	To Obtain
Acres	43,560	Square feet
Acres	4,047	Square meters
Acres	0.001562	Square miles
Acres	4,840	Square yards
Ampere-hours	3,600	Coulombs
Ampere-hours	0.03731	Faradays
Atmospheres	1.01325	Bars
Atmospheres	76	Cm of mercury
Atmospheres	33.90	Feet of water
Atmospheres	101,325	Pascals
Atmospheres	14.70	Pounds/square inch
Bags (cement)	94	Pounds
Barrels (cement)	376	Pounds
Barrels (dry)	7,056	Cubic inches
Barrels (dry)	105	Quarts
Barrels (liquid)	32	Gallons
Barrels (oil)	42	Gallons
Bars	0.9869	Atmospheres
Bars	14.50	Pounds/square inch
Bars	750	Millimeters of mercury
Board feet	144	Cubic inches
BTU	778.2	Foot-pounds
BTU	3.93x10 ⁽⁻⁴⁾	Horsepower-hours
BTU	1,055	Joules
BTU	2.931x10 ⁽⁻⁴⁾	Kilowatt-hours
BTU/hour	0.2162	Foot-pounds/second
BTU/hour	0.2931	Watts
Bushels	2,150.4	Cubic inches
Bushels	4	Pecks
Bushels	32	Quarts (dry)
Calories (gram)	0.003966	BTU
Calories (gram)	1.559x10 ⁽⁻⁶⁾	Horsepower-hours
Candela/square inch	0.4869	Lamberts
Carats	3.086	Grains
Centimeters	0.03281	Feet
Centimeters	0.3937	Inches
Centimeters per second	1.969	Feet per second
Centipoise	0.001	Pascal-seconds
Chains	792	Inches
Circular mils	7.854x10 ⁽⁻⁷⁾	Square inches
Circular mils	5.067x10 ⁽⁻⁶⁾	Square centimeters
Cubic centimeters	3.531x10 ⁽⁻⁵⁾	Cubic feet
Cubic centimeters	2.642x10 ⁽⁻⁴⁾	Gallons
Cubic centimeters	0.001	Liters
Cubic feet	7.48052	Gallons
Cubic feet	62.43	Pounds of water
Cubic feet	1,728	Cubic inches
Cubic yards	27	Cubic feet
Cubic yards	46,656	Cubic inches
Cubic yards	202	Gallons
Cycles per second	1	Hertz
Days	86,400	Seconds
Degrees (angle)	60	Minutes
Degrees (angle)	0.01745	Radians
Degrees (angle)	3,600	Seconds
Degrees (celsius)	((0)Cx9/5)+32	Degrees (fahrenheit)
Degrees (fahrenheit)	((0)F-32)x5/9	Degrees (celsius)
Degrees (celsius)	(0)C + 273.15	Degrees Kelvin
Drams	27.34375	Grains
Drams	1.771845	Grams
Dynes	10 ⁽⁻⁷⁾	Joules/centimeter
Dynes	10 ⁽⁻⁵⁾	Newtons
Dynes/sq centimeter	10 ⁽⁻⁶⁾	Bars
Ergs	7.376x10 ⁽⁻⁸⁾	Foot-pounds
Ergs/second	1.341x10 ⁽⁻¹⁰⁾	Horsepower
Faradays	26.8	Ampere-hours
Faradays/second	96,490	Amperes

Multiply	By	To Obtain
Fathoms	1.8288	Meters
Fathoms	6	Meters
Feet	30.48	Centimeters
Feet	12	Inches
Feet	1.894x10 ⁽⁻⁴⁾	Miles
Feet/minute	0.5080	Centimeters/second
Feet/minute	0.01136	Miles/hour
Feet/sec/sec	30.48	Centimeters/sec/sec
Foot candles	10.764	Lumens/sq meter
Furlongs	660	Feet
Furlongs	40	Rods
Gallons	0.1337	Cubic feet
Gallons	0.004951	Cubic yards
Gallons	1	Imperial gallons
Gallons	3.785	Liters
Gallons	8.3453	Pounds of water
Gallons	8	Pints
Gallons/minute	8.0208	Cubic feet/hour
Gallons/minute	0.06308	Liters/second
Gills	0.1183	Liters
Grains	0.0648	Grams
Grams	0.03527	Ounces
Grams	0.002205	Pounds
Hands	4	Inches
Hectares	2.471	Acres
Hertz	1	Cycles/second
Hogsheads	63	Gallons
Horsepower	550	Foot-pounds/second
Horsepower	0.7457	Kilowatts
Inches	2.54	Centimeters
Inches	1,000	Mils
Inches of mercury	0.03342	Atmospheres
Inches of mercury	70.73	Pounds/square foot
Inches of water	0.07355	Inches of mercury
Inches of water	25.4	Kilograms/square meter
Inches of water	0.03613	Pounds/square inch
Joules	2.778E(-7)	Kilowatt-hours
Kilograms	1,000	Grams
Kilograms	2.205	Pounds
Kilograms/square meter	0.001422	Pounds/square inch
Kilometers	3,281	Feet
Kilometers	0.6214	Miles
Kilometers/hour	0.6214	Miles/hour
Kilowatt-hours	3,412	BTU
Kilowatt-hours	2,665,000	Foot-pounds
Kilowatts	1.341	Horsepower
Knots	1.151	Miles/hour
Knots	1	Nautical miles/hour
Lamberts	0.3183	Candela/sq cm
Lamberts	2.054	Candela/sq inch
Leagues	3	Nautical miles
Light years	5.9E(12)	Miles
Links (surveyors)	7.92	Inches
Liters	1,000	Cubic centimeters
Liters	61	Cubic inches
Liters	0.2642	Gallons
Lumens	0.07958	Spherical candle power
Lumens	0.001496	Watts
Lumens/sq foot	1	Foot-candles
Lux	0.0929	Foot-candles
Meters	3.281	Feet
Microns	10 ⁽⁻⁶⁾	Meters
Miles	5,280	Feet
Miles	1.609	Kilometers
Miles	0.8684	Nautical Miles
Miles/gallon	0.4251	Kilometers/liter
Miles/hour	88	Feet/minute
Miles/hour	1.609	Kilometers/hour
Miles/hour	0.8684	Knots
Milligrams	0.01543	Grains
Millimeters	0.03937	Inches

Multiply	By	To Obtain
Millimeters of mercury	0.01934	Pounds/sq inch
Miner's inches	1.5	Cubic feet/minute
Minutes (angle)	0.01667	Degrees
Minutes (angle)	2.909E(-4)	Radians
Minutes (angle)	60	Seconds
Newtons	0.102	Kilograms
Newtons	0.2248	Pounds
Newtons/sq meter	1	Pascals
Ounces	28.35	Grams
Ounces	0.0625	Pounds
Ounces	0.9115	Troy ounces
Ounces (fluid)	1.805	Cubic inches
Pecks	0.25	Bushels
Pecks	537.605	Cubic inches
PI	1	3.14159
Pints	0.125	Gallons
Points	0.01384	Inches
Pound-foot	0.1383	Meter-kilograms
Poundals	0.03108	Pounds
Pounds	453.59	Grams
Pounds	4.448	Newtons
Pounds	16	Ounces
Pounds of water	0.1198	Gallons
Pounds/cubic inch	27.68	Grams/cu centimeter
Pounds/sq foot	4.883	Kilograms/square meter
Pounds/sq inch	0.06804	Atmospheres
Pounds/sq inch	2.036	Inches of mercury
Pounds/sq inch	6,897	Pascals
Quadrants (angle)	90	Degrees
Quarts (dry)	1.164	Quartz (liquid)
Quarts (liquid)	0.9463	Liters
Quintals	220.5	Pounds
Quires	25	Sheets
Radians	57.3	Degrees
Radians	3,438	Minutes
Reams	500	Sheets
Revolutions	360	Degrees
Revolutions/second	360	Degrees/second
Rods	0.25	Chains
Rods	16.5	Feet
Scruples	20	Grains
Slugs	15	Kilograms
Square centimeters	197,300	Circular mils
Square centimeters	0.155	Square inches
Square feet	144	Square inches
Square feet	0.1111	Square yards
Square inches	1,273,000	Circular mils
Square inches	6	Square centimeters
Square inches	0.006944	Square feet
Square kilometers	247.1	Acres
Square kilometers	0.3861	Square miles
Square meters	10.76	Square feet
Square miles	640	Acres
Square miles	27,878,400	Square feet
Square millimeters	0.01	Square centimeters
Square mils	1.273	Circular mils
Square yards	9	Square feet
Stokes	0.0001	Square meters/second
Tons	907.18	Kilograms
Tons	2,000	Pounds
Tons	0.89286	Long tons
Tons	0.90718	Metric tons
Torr	0.001333	Bars
Torr	133.3	Pascals
Watt-hours	3.412	BTU
Watt-hours	860.4	Calories (gram)
Watts	0.001341	Horsepower
Watts	0.7376	Foot-pounds/second
Yards	3	Feet
Yards	0.9144	Meters

THE WARREN WORK TABLE

Size - 24" x 30" x 36"

- *Height is adjustable 30" to 36"*

Weight capacity - 800 lbs.

Top - $\frac{5}{16}$ " HR Steel

Frame - 2" x 2" x $\frac{1}{4}$ " angle

Shelf - 11 gauge HR Steel

Wheels - Casters With Hard Rubber Wheels

- 2-5" straight
- 2-5" swivel

Call for a brochure or visit

www.thewarrencompany.com to order online.



THE WARREN PORTABLE INDUSTRIAL WORK BENCH

Size - 48" wide x 30" deep x 36" high

Weight capacity - Designed and built for heavy duty use, the unit has a 2,000 lb. overall capacity with 200 lbs. maximum per drawer.

Top - $\frac{5}{16}$ " Steel Plate

Body - 16 Gauge Cold Rolled Steel

Drawers - 14 Gauge Galvanized Steel Drawers, 40" Wide x 24" Deep in 4" and 8" heights

Custom Options - Available in quantity

Choice of Color (standard finish - green enamel)

Top - Sizes; Thickness; Finish; Border

Drawers - Combination of 4", 8" and 12" heights

Call for a brochure or visit

www.thewarrencompany.com to order online.



THE WARREN ERGONOMIC POWER WORK TABLE



Model 3660-24

- Standard top 36" x 60" (custom designs available)
- Nominal load capacity 2,500 lbs.
- Maximum tilt capacity 2,500 lbs. at 36" from pivot point
- Height of top in lowered position 24½"
- Height of top in raised position 35"
- Motor one hp, 120 volt, single phase
- Tilt up time 29 seconds, tilt down 26 seconds
- Table raise time 11 seconds, lower 10 seconds
- Shipping weight, standard unit 1,200 lbs.
- Call for a brochure.

THE WARREN INDUSTRIAL MAN-COOLER

TRUFLO® Fan



FAN AND GUARD SPECIFICATIONS

- Pedestal, Column, Wall and Caster Mounted Models
- Propeller Sizes Include 24", 30" and 36"
- Also 12" & 18" Crane Cab Fans

TRUFLO® propellers are designed for maximum efficiency and service, constructed of the highest quality materials proved by engineering test. Lightweight, rustproof, injection molded, engineered thermoplastic propellers are mounted directly on an aluminum hub. They are balanced to operate smoothly at rated speeds.

Guards are sturdily constructed in three pieces - front, back and scroll from 1/2" x 1/2" mesh. 10 gauge wire welded to angle scroll front and back, meets OSHA requirements.

Motors are available in open type, totally enclosed air over, totally enclosed fan cooled, and explosion proof, all ball bearing equipped.

Call for more information and a complete brochure or visit our web site, www.truflofans.com for product information or to order online.

EQUIPMENT AND SERVICES

Shearing

- Three shears, Cincinnati and Lodge & Shipley Models, for cutting materials from 30 gauge sheet through ½" mild steel plate
- Whitney Angle Shear to 6" x 6" x ¾" capacity

Saws

- Twelve Amada, Do-All and Marvel saws to 18" x 18" for bar, angle, tube, structural shapes, and tool steel
- Tysaman plate saw for aluminum, plastic and non-ferrous materials up to 4½" thick

HyDefinition Plasma

- One microprocessor based dual head cutting system with individually driven 200 amp Hypertherm torches. Cutting capabilities ¾" thick with bed capacity of 96" x 288"

Burning

- Two CNC multiple head flame cutters having a maximum capacity of 156" x 504" travel to 10" depth
- Plasma - Arc cutting with a 400 amp Hypetherm having stainless steel and aluminum cutting capability to ½" thick

Grinding

- Three Blanchard grinders, 36" diameter x 11" thickness capacity, 42" diameter x 22" thickness capacity and 60" diameter x 36" thickness, +/- .002 accuracy held on most parts
- Mattison surface grinder, 72" length x 20" width capacity +/- .001 accuracy held on most parts, maximum weight - 4,000 lbs.
- Mattison edge grinder 18" x 27" x 72" capacity, +/- .002 accuracy held on most parts, maximum weight - 4,000 lbs.
- Mattison surface grinder, 96" length x 36" width capacity
- Two Harig 6.12 surface grinders

Stamping - Progressive Die

- Mechanical and hydraulic presses, with capacities ranging from 5 Tons on an Emerpac "H" Frame Press to a 250 Ton Pacific Hydraulic.

Bending

- Seven hydraulic and mechanical press brakes with capacity from 50 Ton through 400 Ton Dreis & Krump able to form ½" mild steel 10 feet wide

Continued on next page.

EQUIPMENT AND SERVICES

Rolling

- Sheet and plate capabilities including Webb Plate Rolls to rolls ½" mild steel cylinders 12 feet long, angle rolling through 2" x 2" x ¼" angle rings

Machining

- Mazak CNC Horizontal Machining Center - Max. Piece size 35" x 35" x 37", position accuracy .0002", with pallet changer
- 5" Lucas Horizontal Boring Mill, 25HP, table 48" x 108" (72 vertical)
- 4 Lathes 9", 12", 16" and 24", Bridgeport Mill
- Landis Threading, Harig Surface Grinder, various drill presses, tapping heads and related accessories

Welding & Fastening

- Complete welding facilities including Mig, Tig, Innershield, and Spot Welding
- Robotic Welding
- 2 Baltec Riveters
- AWS Certified Welding Staff

Finishing

- Deburring, belt sanding, vibratory finishing and tumbling

Laser Cutting - Two Laser Cutting Machines

- 6000 watt machine capable of cutting up to ¾" mild steel on a 60" x 120" table
- 2800 watt machine capable of cutting up to ½" mild steel on a 60" x 120" table
- Typical Laser tolerances are as follows:
.002" to .250" (+/- .005), .250" to .500" (+/- .010)
.500" to .750" (+/- .015) Tighter tolerances are available upon request
- Also capable of cutting stainless steel, aluminum brass, copper and plexiglass
- Rotary laser cutting of tubing up to 16" diameter also available

Waterjet Cutting - Dual Head CNC Machine

- Capabilities include the cutting of virtually any thickness of tool steel, stainless, aluminum, brass, copper, plexiglass, rubber, stone, wood, and more, on a 48" x 96" table

Measuring

- Brown & Sharpe Coordinate Measuring Machine housed in a climate controlled testing cell, measures parts up to 36" width x 55" length x 24" thickness. Volumetric accuracy specification .00043"

Continued on next page.

EQUIPMENT AND SERVICES

Area

- 158,000 sq. ft. total, with 130,000 sq. ft. currently serviced by cranes that have a max capacity of 20 tons

NOTES

NOTES