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REFERENCE BOOK

ALLOY • ALUMINUM • BRASS • BRONZE
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SECTION L

ALUMINUM

1100 ALUMINUM

This grade is commercially pure aluminum. It is soft and ductile and has excellent workability. It is ideal for applications involving intricate forming because it work-hardens more slowly than other alloys. It is the most weldable of aluminum alloys, by any method. It is non-heat treatable.

It has excellent resistance to corrosion, and is widely used in the chemical and food processing industries. It responds well to decorative finishes, which makes it suitable for giftware and applications where eye appeal is a factor.

It has the highest thermal conductivity of any aluminum alloy, and its electrical conductivity is second only to the E C (electrical conductor) grade.

ANALYSIS

Cu (Max.)	Si+Fe (Max.)	Mn (Max.)	Zn (Max.)
.020	.95	0.05	0.10

SPECIFICATIONS

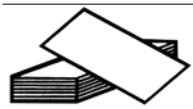
O Temper Sheet: AMS QQ-A-250/1, ASTM B 209, AMS 4001
H-14 Temper Sheet: AMS QQ-A-250/1, ASTM B 209, AMS 4003.

APPLICATIONS — Kitchenware, giftware, decorative trim, intricate formed parts, etc.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2″ .064″ Sheet	Min. 90° Cold Bend Radius for .064″ Thick
1100-O	13,000	5,000	35	0
1100-H12	16,000	15,000	12	0
1100-H14	18,000	17,000	9	0
1100-H16	21,000	20,000	6	0-1T
1100-H18	24,000	22,000	5	1-2T



1100 SHEET

Available in following Tempers

1100-O Soft Annealed

1100-H14 ½ Hard

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet	Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.012 (.183 lb. per sq. ft.)			**.063 (.914 lb. per sq. ft.)**		
	24 x 72	2.20		36 x 96	21.9
.016 (.240 lb. per sq. ft.)				120	27.4
	24 x 72	2.88		48 x144	43.9
	36 x 96	5.76	**.080 (1.16 lb. per sq. ft.)**		
.020 (.296 lb. per sq. ft.)				36 x 96	27.8
	36 x 96	7.10		48 x144	55.7
.025 (.367 lb. per sq. ft.)			**.090 (1.30 lb. per sq. ft.)**		
	36 x 96	8.81		36 x 96	31.2
.032 (.469 lb. per sq. ft.)				48 x144	62.4
	36 x 96	11.3	**.100 (1.45 lb. per sq. ft.)**		
	120	14.1		36 x 96	34.8
	48 x144	22.5		48 x144	69.6
.040 (.589 lb. per sq. ft.)			**.125 (1.80 lb. per sq. ft.)**		
	36 x 96	14.1		36 x 96	43.2
	120	17.7		48 x144	86.4
	48 x144	28.3	**.190 (2.74 lb. per sq. ft.)**		
.050 (.730 lb. per sq. ft.)				36 x 96	65.8
	36 x 96	17.5		48 x144	132
	120	21.9			
	48 x144	35.0			

3003 ALUMINUM

This is the most widely used of all aluminum alloys. It is essentially commercially pure aluminum with the addition of manganese, which increases the strength some 20% over 1100. Thus, it has all the excellent characteristics of 1100 with higher strength.

It has excellent corrosion resistance and workability, and it may be deep drawn or spun, welded, or brazed. This alloy is non-heat treatable.

ANALYSIS

Cu (Max.)	Si (Max.)	Fe (Max.)	Mn	Zn (Max.)
0.20	0.60	0.70	1.0/1.5	0.10

SPECIFICATIONS

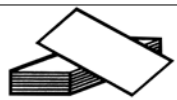
Sheet and Plate: AMS QQ-A-250/2, ASTM B 209, AMS 4006, AMS 4008.

APPLICATIONS — Cooking utensils, kitchen equipment, decorative trim, awnings, siding, storage tanks, chemical equipment, etc.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES — Clad or bare.

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" .064" Sheet	Min. 90° Cold Bend Radius for .064" Thick
3003-O	16,000	6,000	30	0
3003-H12	19,000	18,000	10	0
3003-H14	22,000	21,000	8	0
3003-H16	26,000	25,000	5	1/2-1 1/2 T
3003-H18	29,000	27,000	4	1 1/2-3 T



3003 SHEET

Available in following Tempers

3003-O Soft Annealed

3003-H14 1/2 Hard

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.016 (.242 lb. per sq. ft.)		
	24 x 72	2.90
	36 x 96	5.81
.020 (.299 lb. per sq. ft.)		
	36 x 96	7.18
	120	8.97
	48 x 96	9.57
.025 (.371 lb. per sq. ft.)		
	36 x 96	8.90
	120	11.1
	144	13.4
	48 x 96	11.9
	120	14.8
	144	17.8
.032 (.474 lb. per sq. ft.)		
	36 x 96	11.4
	120	14.2
	48 x 96	15.2
	120	19.0
	144	22.8
.040 (.595 lb. per sq. ft.)		
	30 x120	14.9
	36 x 96	14.3
	120	17.9
	48 x 96	19.0
	120	23.8
	144	28.6
	60 x144	35.7
.050 (.738 lb. per sq. ft.)		
	36 x 96	17.7
	120	22.1
	48 x 96	23.6
	120	29.5
	144	35.4
	60 x144	44.3
.063 (.923 lb. per sq. ft.)		
	36 x 96	22.2
	120	27.7
	48 x 96	29.5
	120	36.9
	144	44.3
	60 x144	55.4
.080 (1.17 lb. per sq. ft.)		
	36 x 96	28.1
	48 x 96	37.4
	120	46.8
	144	56.2
	60 x144	70.2
.090 (1.32 lb. per sq. ft.)		
	36 x 96	31.7
	48 x144	63.4
	60 x120	66.0
	144	79.2
.100 (1.46 lb. per sq. ft.)		
	36 x 96	35.0
	48 x144	70.1
.125 (1.82 lb. per sq. ft.)		
	36 x 96	43.7
	120	54.6
	48 x 96	58.2
	120	72.8
	144	87.4
	60 x144	109
.160 (2.35 lb. per sq. ft.)		
	48 x144	113
.190 (2.77 lb. per sq. ft.)		
	36 x 96	66.5
	48 x120	111
	144	133
	60 x144	166

5052 ALUMINUM

This is the highest strength alloy of the more common non-heat treatable grades. Fatigue strength is higher than most aluminum alloys. In addition, this grade has particularly good resistance to marine atmosphere and salt water corrosion.

It has excellent workability. It may be drawn or formed into intricate shapes, and its slightly greater strength in the annealed condition minimizes tearing that occurs in 1100 or 3003. The resistance welding characteristics are equal to those of 1100 and 3003. It has excellent finishing characteristics, and anodic coatings are bright and clear.

ANALYSIS

Cu (Max.)	Si (Max.)	Fe (Max.)	Mn (Max.)	Mg	Zn (Max.)	Cr
0.10	0.25	0.40	0.10	2.20/2.80	0.10	0.15/0.35

SPECIFICATIONS

Sheet and Plate:
AMS QQ-A-250/8, ASTM B 209, AMS 4015, AMS 4016, AMS 4017.

APPLICATIONS — Used in a wide variety of applications from aircraft components to home appliances, marine and transportation industry parts, heavy duty cooking utensils, and equipment for bulk processing of food.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2″ .064″ Sheet	Min. 90° Cold Bend Radius for .064″ Thick
5052-0	28,000	13,000	25	0
5052-H32	33,000	28,000	12	0
5052-H34	38,000	31,000	10	0-1T
5052-H36	40,000	35,000	8	1-2T
5052-H38	42,000	37,000	7	1½-3T

5052 SHEET and PLATE

Available in following Tempers

5052-O Soft Annealed
5052-H32 ¼ Hard
5052-H34 ½ Hard

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
	SHEET	
.020 (.300 lb. per sq. ft.)		
	36 x 96	7.20
.025 (.370 lb. per sq. ft.)		
	36 x 96	8.83
	144	13.3
.032 (.471 lb. per sq. ft.)		
	36 x 96	11.3
	48 x 96	15.1
	144	22.6
.040 (.587 lb. per sq. ft.)		
	36 x 96	14.1
	48 x 96	18.8
	144	28.2
.050 (.730 lb. per sq. ft.)		
	36 x 96	17.5
	48 x 96	23.4
	120	29.2
	144	35.0
.063 (.911 lb. per sq. ft.)		
	36 x 96	21.9
	120	27.3
	48 x 96	29.2
	120	36.4
	144	43.7
.080 (1.16 lb. per sq. ft.)		
	36 x 96	27.8
	48 x 96	37.1
	144	55.7
	60 x 144	69.6
.090 (1.30 lb. per sq. ft.)		
	36 x 96	31.2
	120	39.0
	48 x 96	41.6
	144	62.4
	60 x 144	78.0
.100 (1.45 lb. per sq. ft.)		
	48 x 120	58.0
	144	69.6
.125 (1.79 lb. per sq. ft.)		
	36 x 96	43.0
	48 x 96	57.3
	120	71.6
	144	85.9
.160 (2.30 lb. per sq. ft.)		
	48 x 144	110
.190 (2.72 lb. per sq. ft.)		
	36 x 96	65.3
	120	81.6
	48 x 144	131
	PLATE	
.250 (3.49 lb. per sq. ft.)		
	48 x 144	168

2011 ALUMINUM

Color Marking: Ends painted Brown

2011 is the most free-machining of the common aluminum alloys. It also has excellent mechanical properties. Thus, it is widely used for automatic screw machine products in parts requiring extensive machining.

It may be machined at high speeds with relatively heavy feeds. It may be resistance welded. Its corrosion resistance is good, and hardness and strength excellent.

ANALYSIS

Cu	Si (Max.)	Fe (Max.)	Zn (Max.)	Bi	Pb
5.0/6.0	0.4	0.7	0.3	0.2/0.6	0.2/0.6

SPECIFICATIONS — AMS-QQ-A-225/3, ASTM B 211.

APPLICATIONS — Parts made of automatic screw machines for various industries.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" ½" Round	Brinell Hardness
2011-T3	55,000	43,000	15	95
2011-T8	59,000	45,000	12	100

MACHINABILITY — 2011 is the standard for relative machinability of aluminum alloys for automatic screw machine operations using high-speed cutters. It is rated at 100% in both the T3 and T8 condition.

2011-T3 ROUNDS

Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/8	.015	.181
5/32	.024	.282
11/64	.028	.342
3/16	.034	.407
13/64	.040	.477
7/32	.046	.553
15/64	.053	.635
1/4	.060	.723
17/64	.068	.816
9/32	.076	.915
5/16	.094	1.13
11/32	.114	1.37
3/8	.136	1.63
25/64	.147	1.76
13/32	.159	1.91
7/16	.184	2.21
15/32	.212	2.54
1/2	.241	2.89
17/32	.272	3.26
35/64	.288	3.46
9/16	.305	3.66
19/32	.340	4.08
5/8	.376	4.52
21/32	.415	4.98
43/64	.435	5.22
11/16	.455	5.47
23/32	.498	5.97
3/4	.542	6.50
25/32	.588	7.06
13/16	.636	7.63
7/8	.738	8.85
15/16	.847	10.2
1	.964	11.6
1/32	1.02	12.3
1/16	1.09	13.1
3/32	1.15	13.8
1/8	1.22	14.6
5/32	1.29	15.5
3/16	1.36	16.3
1/4	1.51	18.1
9/32	1.58	19.0
5/16	1.66	19.9
3/8	1.82	21.9
7/16	1.99	23.9
1/2	2.17	26.0
9/16	2.35	28.2
5/8	2.54	30.5
11/16	2.74	32.9
3/4	2.95	35.4
1 13/16	3.17	38.0
7/8	3.39	40.7
15/16	3.62	43.4
2	3.85	46.3
1/16	4.10	49.2
1/8	4.35	52.2
3/16	4.61	55.3
1/4	4.88	58.5
5/16	5.15	61.8
3/8	5.44	65.2
7/16	5.73	68.7
1/2	6.02	72.3
9/16	6.33	75.9
5/8	6.64	79.7
3/4	7.29	87.5
7/8	7.97	95.6
3	8.67	104
1/16	9.04	108
1/8	9.41	113
1/4	10.2	122
3/8	11.0	132
1/2	11.8	142
5/8	12.7	152
4	15.4	185

2011-T3 HEXAGONS

Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/4	.066	.797
5/16	.104	1.25
3/8	.149	1.79
7/16	.203	2.44
1/2	.266	3.19
9/16	.336	4.03
5/8	.415	4.98
11/16	.502	6.03
3/4	.598	7.17
13/16	.701	8.42
7/8	.814	9.76
1	1.06	12.8
1/16	1.20	14.4
1/8	1.34	16.1
1/4	1.66	19.9
3/8	2.01	24.1
7/16	2.18	26.2
1/2	2.39	28.7
5/8	2.81	33.7
11/16	3.02	36.2
3/4	3.25	39.1
7/8	3.74	44.8
2	4.25	51.0

2017 ALUMINUM

Color Marking: Ends Painted Yellow

2017 combines excellent machinability and high strength with the result that it is one of the most widely used alloys for automatic screw machine work. Its strength is slightly less than that of 2014. It is a tough, ductile alloy suitable for heavy-duty structural parts.

It has good formability, and may be joined by arc or resistance welding. Brazing or gas welding is not recommended. Its corrosion resistance is fair.

ANALYSIS

Cu	Si	Fe (Max.)	Mn	Mg	Zn (Max.)	Cr (Max.)	Ti (Max.)
3.5/4.5	0.2/0.8	0.7	0.4/1.0	0.4/0.8	0.25	0.1	.15

SPECIFICATIONS — AMS-QQ-A-225/5, ASTM B 211, AMS 4110, AMS 4118.

APPLICATIONS — It is used for automatic screw machine products, for structural parts in the construction and transportation industries, etc.

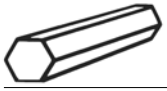
CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" ½" Round	Brinell Hardness
2017-O	26,000	10,000	22	45
2017-T4, T451	62,000	40,000	22	105

MACHINABILITY — For general automatic screw machine operations. In the T4 condition it is rated at approximately 90% of 2011; in the O condition it is rated at 60%

2017-T4 AND 2017-T451 HEXAGONS



Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Length	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Length
3/16	.037	.444	1 1/8	1.33	15.9
1/4	.065	.789	3/16	1.49	17.8
5/16	.103	1.24	1/4	1.64	19.7
3/8	.148	1.77	5/16	1.81	21.8
7/16	.201	2.42	3/8	1.99	23.9
1/2	.263	3.16	7/16	2.18	26.0
9/16	.333	3.99	1/2	2.37	28.4
5/8	.411	4.93	5/8	2.78	33.4
11/16	.497	5.97	3/4	3.22	38.7
3/4	.592	7.10	7/8	3.70	44.4
13/16	.694	8.34	2	4.21	50.5
7/8	.806	9.66	1/4	5.33	64.0
15/16	.925	11.1	1/2	6.57	78.9
1	1.05	12.7	3/4	7.96	95.4
1/16	1.19	14.3	3	9.46	114

2017-T4 AND 2017-T451 ROUNDS

Lengths 12' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	12-Ft. Length	Size In Inches	Estimated Wt., Lbs. Per Foot	12-Ft. Length
1/8	.015	.179	1 13/16	3.14	37.6
5/32	.024	.279	7/8	3.36	40.3
11/64	.028	.339	15/16	3.58	43.0
3/16	.034	.403	2	3.81	45.8
13/64	.040	.472	1/16	4.06	48.7
7/32	.046	.547	1/8	4.31	51.7
15/64	.053	.629	3/16	4.56	54.7
1/4	.059	.716	1/4	4.83	57.9
17/64	.067	.808	5/16	5.10	61.2
9/32	.075	.906	3/8	5.39	64.5
5/16	.093	1.12	7/16	5.67	68.0
3/8	.135	1.61	1/2	5.96	71.6
13/32	.157	1.89	9/16	6.27	75.1
7/16	.182	2.19	5/8	6.57	78.9
15/32	.210	2.51	3/4	7.22	86.6
1/2	.239	2.86	7/8	7.89	94.6
17/32	.269	3.23	3	8.58	103
9/16	.302	3.62	1/8	9.32	112
19/32	.337	4.04	1/4	10.1	121
5/8	.372	4.47	3/8	10.9	131
21/32	.411	4.93	1/2	11.7	141
43/64	.431	5.17	9/16	12.1	146
11/16	.450	5.42	3/4	13.5	161
23/32	.493	5.91	4	15.2	183
3/4	.537	6.44	1/16	15.7	189
25/32	.582	6.99	1/8	16.2	195
13/16	.630	7.55	1/4	17.2	207
7/8	.731	8.76	3/8	18.2	219
15/16	.839	10.1	1/2	19.3	232
1	.954	11.5	5/8	20.4	245
1/16	1.08	13.0	3/4	21.5	258
1/8	1.21	14.5	5	23.9	286
3/16	1.35	16.1	1/8	25.0	301
1/4	1.49	17.9	1/4	26.3	316
5/16	1.64	19.7	1/2	28.9	347
3/8	1.80	21.7	3/4	31.6	378
7/16	1.97	23.7	6	34.4	412
1/2	2.15	25.7	1/4	37.2	447
9/16	2.33	27.9	1/2	40.3	484
5/8	2.51	30.2	3/4	43.5	522
11/16	2.71	32.6	7	46.7	561
3/4	2.92	35.0	1/4	50.2	602
			1/2	53.6	643
			8	61.1	733

2024 ALUMINUM

Color Marking (Rod and Bar): Ends painted Red

This is one of the best known of high strength aluminum alloys. With its high strength and excellent fatigue resistance, it is an advantage on structures and parts where a good strength-to-weight ratio is desired.

It is readily machined to a high finish. 2024 in the annealed condition is easily formed and may be subsequently heat treated. Arc or gas welding is generally not recommended, although this alloy may be spot, seam, or flash welded.

Since corrosion resistance is relatively low, 2024 is commonly used with an anodized finish or in clad form ("Alclad"), with a thin surface layer of high purity aluminum.

ANALYSIS

Cu	Si	Fe (Max.)	Mn	Mg	Zn (Max.)	Cr (Max.)	Ti (Max.)
3.8/4.9	0.50	0.50	0.3/0.9	1.2/1.8	0.25	0.1	0.15

SPECIFICATIONS

Sheet and Plate:

Bare: AMS-QQ-A-250/4, ASTM B 209, AMS 4035, AMS 4037.

Alclad: AMS-QQ-A-250/5, ASTM B 209, AMS 4040, AMS 4041, AMS 4042.

Rod and Bar (Cold Finished and Extruded):

AMS-QQ-A-200/3, AMS-QQ-A-225/6, ASTM B 211, ASTM B 221, AMS 4119, AMS 4120.

APPLICATIONS — Aircraft structural components, aircraft fittings and hardware, truck wheels and parts for the transportation industry.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" .064" Sheet	Elongation % in 2" 1/2" Round	Min. 90° Cold Bend Radius for .064" Thick	Brinell Hardness
Bare: AMS QQ						
2024-O	27,000	11,000	20	22	0	47
2024-T3	70,000	50,000	18	-	3-5T	-
2024-T4, T351	68,000	47,000	20	19	3-5T	120
2024-T361	72,000	57,000	13	-	4-6T	-
Alclad: AMS QQ						
2024-O	26,000	11,000	20	-	-	-
2024-T3	65,000	45,000	18	-	-	-
2024-T4, T351	64,000	42,000	19	-	-	-
2024-T361	67,000	53,000	11	-	-	-
2024-T861	70,000	66,000	6	-	-	-

MACHINABILITY — For automatic screw machine operations, in the T4 condition it is rated at approximately 90% of 2011, and in the O condition it is rated at 50%.

2024-T4 and 2024-T351 ROUNDS

Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/8	.015	.179	1 1/4	1.49	17.9	2 3/8	5.39	64.5	4 1/4	17.2	207
3/16	.034	.403	5/16	1.64	19.7	7/16	5.67	68.0	3/8	18.2	219
1/4	.059	.716	3/8	1.80	21.7	1/2	5.96	71.6	1/2	19.3	232
5/16	.093	1.12	7/16	1.97	23.7	9/16	6.27	75.1	5/8	20.4	245
3/8	.135	1.61	1/2	2.15	25.7	5/8	6.57	78.9	3/4	21.5	258
7/16	.182	2.19	9/16	2.33	27.9	3/4	7.22	86.6	5	23.9	286
1/2	.239	2.86	5/8	2.51	30.2	7/8	7.89	94.6	1/4	26.3	316
9/16	.302	3.62	11/16	2.71	32.6	3	8.58	103	1/2	28.9	347
5/8	.372	4.47	3/4	2.92	35.0	1/8	9.32	112	3/4	31.6	378
11/16	.450	5.42	13/16	3.14	37.6	1/4	10.1	121	6	34.4	412
3/4	.537	6.44	7/8	3.36	40.3	3/8	10.9	131	1/4	37.2	447
13/16	.630	7.55	15/16	3.58	43.0	1/2	11.7	141	1/2	40.3	484
7/8	.731	8.76	2	3.81	45.8	9/16	12.1	146	3/4	43.5	522
15/16	.839	10.1	1/16	4.06	48.7	5/8	12.6	150	7	46.7	561
1	.954	11.5	1/8	4.31	51.7	3/4	13.5	161	1/2	53.7	644
1/16	1.08	13.0	3/16	4.56	54.7	7/8	14.4	172	8	61.1	733
1/8	1.21	14.5	1/4	4.83	57.9	4	15.2	183			
3/16	1.35	16.1	5/16	5.10	61.2	1/8	16.2	194			

2024-T4 and 2024-T351 HEXAGONS
Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
3/16	.037	.444
1/4	.065	.789
5/16	.103	1.24
3/8	.148	1.77
7/16	.201	2.42
1/2	.263	3.16
9/16	.333	3.99
5/8	.411	4.93
11/16	.497	5.97
3/4	.592	7.10
13/16	.694	8.34
7/8	.806	9.66
15/16	.925	11.1
1	1.05	12.7
1/16	1.19	14.3
1 1/8	1.33	15.9
3/16	1.49	17.8
1/4	1.64	19.7
5/16	1.81	21.8
3/8	1.99	23.9
7/16	2.18	26.0
1/2	2.37	28.4
5/8	2.78	33.4
3/4	3.22	38.7
7/8	3.70	44.4
2	4.21	50.5
1/4	5.33	64.0
1/2	6.57	78.9
3/4	7.96	95.4
3	9.46	114

2024-T4 and 2024-T351 SQUARES
Lengths 12' Approx.

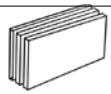
Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/4	.076	.912
3/8	.171	2.05
7/16	.233	2.79
1/2	.304	3.64
9/16	.384	4.61
5/8	.474	5.69
3/4	.683	8.20
7/8	.930	11.2
1	1.22	14.6
1/8	1.53	18.4
1/4	1.90	22.8
3/8	2.30	27.5
1 1/2	2.73	32.8
5/8	3.21	38.5
3/4	3.72	44.6
2	4.86	58.3
1/4	6.15	73.8
1/2	7.59	91.1
9/16	7.98	95.7
5/8	8.37	100
3/4	9.19	110
3	10.9	132
1/4	12.9	154
1/2	14.9	178
4	19.4	234

2024, 2024-T351 AND 2024-T3511 RECTANGLES
Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/8 x		
1/2	.076	.911
5/8	.095	1.14
3/4	.114	1.37
1	.151	1.82
1 1/4	.190	2.28
1 1/2	.228	2.73
2	.304	3.64
3/16 x		
1/2	.114	1.37
5/8	.143	1.71
3/4	.171	2.05
1	.228	2.73
1 1/4	.285	3.42
1 1/2	.342	4.10
2	.455	5.46
3	.683	8.20
1/4 x		
1/2	.151	1.82
5/8	.190	2.28
3/4	.228	2.73
1	.304	3.64
1 1/4	.379	4.55
1 1/2	.455	5.46
1 3/4	.532	6.38
2	.608	7.29
2 1/2	.759	9.11
3	.911	10.9
4	1.22	14.6
5/16 x		
1/2	.190	2.28
5/8	.237	2.84
3/4	.285	3.42
1	.379	4.55
1 1/2	.569	6.83
2	.759	9.11
3	1.14	13.7
3/8 x		
1/2	.228	2.73
5/8	.285	3.42
3/4	.342	4.10
1	.455	5.46
1 1/4	.569	6.83
1 1/2	.683	8.20
1 3/4	.797	9.56
2	.911	10.9
2 1/2	1.14	13.7
3	1.37	16.4
4	1.82	21.9
6	2.73	32.8
1/2 x		
5/8	.379	4.55
3/4	.455	5.46
7/8	.532	6.38
1	.608	7.29
1 1/4	.759	9.11
1 1/2	.911	10.9
1 3/4	1.06	12.8
2	1.22	14.6
2 1/2	1.51	18.2
3	1.82	21.9
4	2.43	29.1
6	3.64	43.8
5/8 x		
3/4	.569	6.83
7/8	.664	7.97
1	.759	9.11
1 1/4	.949	11.4
1 1/2	1.14	13.7
2	1.51	18.2
3	2.28	27.3
4	3.04	36.4
3/4 x		
1	.911	10.9
1 1/4	1.14	13.7
1 1/2	1.37	16.4
1 3/4	1.59	19.1
2	1.82	21.9
2 1/2	2.28	27.3
3	2.73	32.8
3 1/2	3.19	38.3
4	3.64	43.8
6	5.46	65.6
1 x		
1 1/4	1.51	18.2
1 1/2	1.82	21.9
1 3/4	2.13	25.5
2	2.43	29.1
2 1/2	3.04	36.4
3	3.64	43.8
3 1/2	4.25	51.0
4	4.86	58.3
5	6.08	72.9
6	7.29	87.4
1 1/4 x		
1 1/2	2.28	27.3
2	3.04	36.4
2 1/2	3.79	45.5
3	4.55	54.6
4	6.08	72.9
1 1/2 x		
2	3.64	43.8
2 1/2	4.55	54.6
3	5.46	65.6
4	7.29	87.4
6	10.9	132
2 x		
2 1/4	5.46	65.6
2 1/2	6.08	72.9
3	7.29	87.4
4	9.72	117
5	12.1	145
6	14.6	175
2 1/4 x		
4	10.9	131
2 1/2 x		
3	9.11	109
4	12.2	146
4 1/2	13.7	164
5	15.2	182
6	18.2	219
3 x		
4	14.6	175
5	18.2	219
6	21.9	262

2024 SHEETS
Bare & Alclad

Thick-ness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.016 (.251 lb. per sq. ft.)		
	36x120	7.53
	144	9.04
	48x144	12.1
.020 (.309 lb. per sq. ft.)		
	36x144	11.1
	48x144	14.8
.025 (.382 lb. per sq. ft.)		
	36x144	13.8
	48x144	18.3
	60x144	22.9
.032 (.481 lb. per sq. ft.)		
	48x120	19.2
	144	23.1
	60x144	28.9
	180	36.1
.040 (.596 lb. per sq. ft.)		
	36x144	21.5
	48x144	28.6
	60x144	35.8
	180	44.7
.050 (.749 lb. per sq. ft.)		
	48x144	36.0
	60x180	56.2
.063 (.938 lb. per sq. ft.)		
	48x120	35.7
	144	45.0
	60x180	70.4
.071 (1.05 lb. per sq. ft.)		
	48x144	50.4
.080 (1.19 lb. per sq. ft.)		
	48x144	57.1
	60x180	89.3
.090 (1.33 lb. per sq. ft.)		
	48x120	53.2
	144	63.8
	60x180	99.8
.100 (1.48 lb. per sq. ft.)		
	48x144	71.0
	60x180	111
.125 (1.84 lb. per sq. ft.)		
	48x144	88.3
	60x144	110
.160 (2.38 lb. per sq. ft.)		
	48x144	114
	60x180	179
.190 (2.81 lb. per sq. ft.)		
	48x144	135
	60x180	211



BARE 2024-T351 PLATE

Thick-ness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.250 (3.64 lb. per sq. ft.)		
	24x72	43.7
	36x96	87.4
	48x144	175
	60x180	273
	72x144	262
.313 (4.56 lb. per sq. ft.)		
	36x96	109
	48x144	219
.375 (5.45 lb. per sq. ft.)		
	24x72	65.4
	36x96	131
	48x144	262
.500 (7.27 lb. per sq. ft.)		
	24x72	87.2
	36x96	174
	48x144	349
.625 (9.09 lb. per sq. ft.)		
	24x72	109
	36x96	218
	48x144	436
.750 (10.9 lb. per sq. ft.)		
	24x72	131
	36x96	262
	48x144	523
.875 (12.7 lb. per sq. ft.)		
	24x72	152
	36x96	305
	48x144	610
1.000 (14.5 lb. per sq. ft.)		
	24x72	174
	36x96	348
	48x144	696
1.125 (16.4 lb. per sq. ft.)		
	48x144	787
1.250 (18.2 lb. per sq. ft.)		
	24x72	218
	36x96	437
	48x144	874
1.500 (21.8 lb. per sq. ft.)		
	24x72	262
	36x96	523
	48x144	1046
1.625 (23.6 lb. per sq. ft.)		
	48x144	1133
1.750 (25.5 lb. per sq. ft.)		
	24x72	306
	36x96	612
	48x144	1224
2.000 (29.1 lb. per sq. ft.)		
	24x72	349
	36x96	698
	48x144	1397
2.250 (32.7 lb. per sq. ft.)		
	36x96	785
	48x144	1570
2.500 (36.4 lb. per sq. ft.)		
	36x96	874
	48x144	1747
3.000 (43.6 lb. per sq. ft.)		
	24x72	523
	36x96	1046
	48x144	2093
3.500 (50.9 lb. per sq. ft.)		
	48x144	2443
4.000 (58.2 lb. per sq. ft.)		
	36x96	1397
	48x144	2794
5.000 (72.7 lb. per sq. ft.)		
	48x144	3490

6061 ALUMINUM

Color Marking (Rod and Bar): Ends painted Blue

This is the most versatile of the heat treatable aluminum alloys. It has most of the good qualities of aluminum, and it offers a wide range of mechanical properties and corrosion resistance. It can be fabricated by many of the commonly used techniques.

In the annealed condition it has good formability. In the T4 condition fairly severe forming operations may be accomplished. The T6 properties may be obtained by artificial aging. It is welded by all methods and can be furnace brazed.

It is available in the clad form ("Alclad") with a thin surface layer of high purity aluminum to improve both appearance and corrosion resistance.

ANALYSIS

Cu	Si	Fe (Max.)	Mn (Max.)	Mg	Zn (Max.)	Cr	Ti (Max.)
0.15/0.40	0.4/0.8	0.70	0.15	0.8/1.2	0.25	0.04/0.35	0.15

SPECIFICATIONS

Sheet and Plate: AMS QQ-A-250/11, MIL-F-17132, ASTM B 209
AMS 4025, AMS 4026, AMS 4027.
Bars: AMS QQ-A-200/8, AMS QQ-A-225/8, ASTM B 211, ASTM B 221, AMS 4150.
Structural Shapes: AMS QQ-A-200/16, ASTM B 308

APPLICATIONS — This grade is used for a wide variety of products and applications from truck bodies and frames to screw machine parts and structural components. Alclad 6061 is used where appearance and better corrosion resistance with good strength are required.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

Bare:	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" 1/16" Flat	Elongation % in 2" 1/2" Round	Min. 90° Cold Bend Radius for .064" Thick	Brinell Hardness Bars
6061-O	18,000	8,000	25	30	0	30
6061-T4, T451	35,000	21,000	22	25	1/2-1 1/2T	65
6061-T6, T651	45,000	40,000	12	17	1-2T	95
Alclad:						
6061-O	17,000	7,000	25	-	-	-
6061-T4	33,000	19,000	22	-	-	-
6061-T6	42,000	37,000	12	-	-	-

MACHINABILITY — For automatic screw machine operations, 6061 is rated between 70% and 80% of 2011 in the T4 and T6 conditions, and 50% in the O condition.

6061-T6 and 6061-T651 ROUNDS

Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth	Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 12-Ft. Lgth
1/8	.014	.174									
3/16	.033	.391	5/16	1.59	19.1	7/8	7.65	91.8	5 3/4	30.6	367
1/4	.058	.694	3/8	1.75	21.0	3	8.32	99.8	6	33.3	399
5/16	.090	1.08	7/16	1.91	22.9	1/8	9.03	108	1/8	34.7	416
3/8	.131	1.56	1/2	2.08	25.0	1/4	9.79	117	1/4	36.1	434
7/16	.177	2.12	9/16	2.26	27.1	3/8	10.5	126	1/2	39.1	469
1/2	.231	2.77	5/8	2.44	29.3	1/2	11.3	136	3/4	42.1	506
9/16	.293	3.51	11/16	2.63	31.6	5/8	12.1	145	7	45.3	544
5/8	.361	4.34	3/4	2.83	34.0	3/4	13.1	156	1/4	48.7	584
11/16	.437	5.25	13/16	3.04	35.6	4	14.8	178	1/2	52.0	624
3/4	.520	6.24	7/8	3.25	39.1	1/8	15.7	188	3/4	55.6	667
13/16	.611	7.32	15/16	3.48	41.7	1/4	16.7	201	8	59.2	710
7/8	.708	8.50	2	3.70	44.4	1/2	18.7	225	1/2	66.8	802
15/16	.813	9.76	1/8	4.18	50.1	5/8	19.8	238	9	75.0	900
1	.925	11.1	1/4	4.68	56.2	3/4	20.8	251	1/2	83.4	1001
1/16	1.05	12.6	3/8	5.22	62.6	5	23.1	277	10	92.5	1110
1/8	1.17	14.0	7/16	5.50	66.0	1/8	24.3	292	11	112	1344
3/16	1.31	15.6	1/2	5.78	69.4	1/4	25.5	306	12	113	1596
1/4	1.45	17.4	5/8	6.37	76.5	1/2	28.0	336			
			3/4	7.00	84.0	5/8	29.2	350			

Extruded Rounds available to 24" dia.

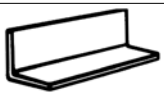
6061-T6 and 2024-T651 HEXAGONS
Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	12-Ft. Lgth
3/8	.144	1.73
1/2	.255	3.06
5/8	.398	4.78
3/4	.574	6.88
7/8	.781	9.37
1	1.020	12.3
1/8	1.310	15.7
1/4	1.590	19.1
3/8	1.930	23.1
1/2	2.290	27.6
1 1/16	2.900	34.8
3/4	3.120	37.5
2	4.070	48.8
1/4	5.170	62.0
7/16	6.060	72.7
1/2	6.380	76.5

6061-T651 SQUARES
Lengths 12' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	12-Ft. Lgth
1/4	.074	.888
3/8	.166	1.99
1/2	.295	3.53
9/16	.373	4.48
5/8	.459	5.52
3/4	.662	7.95
7/8	.901	10.8
1	1.180	14.1
1/8	1.490	17.9
1/4	1.840	22.1
3/8	2.230	26.8
1/2	2.650	31.8
3/4	3.610	43.3

Size In Inches	Est. Wt., Lbs. Per Foot	12-Ft. Lgth
2	4.710	56.5
1/4	5.950	71.4
1/2	7.360	88.3
3/4	8.900	107
3	10.60	128
1/4	11.50	138
1/2	14.40	172
3/4	16.60	199
4	19.00	228
5	29.50	354



6061-T6 ANGLES EXTRUDED
Lengths 25' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	25-Ft. Lgth
3/4x3/4x1/8	.20	5.00
1x1x1/8	.28	7.00
3/16	.40	10.0
1/4	.51	12.8
1 1/4x1 1/4x1/8	.34	8.50
3/16	.51	12.8
1/4	.66	16.5
1 1/2x1 1/4x1/8	.38	9.50
3/16	.57	14.3
1/4	.74	18.5
1 1/2x1 1/2x1/8	.42	10.5
3/16	.62	15.5
1/4	.81	20.3
1 3/4x1 1/4x1/4	.42	10.5
1 3/4x1 3/4x1/8	.51	12.8
3/16	.74	18.5
1/4	.96	24.0

Size In Inches	Est. Wt., Lbs. Per Foot	25-Ft. Lgth
2x2x1/8	.57	14.3
3/16	.85	21.3
1/4	1.11	27.8
3/8	1.59	39.8
1/2	2.07	51.6
2 1/2x1 1/2x3/16	.85	21.3
1/4	1.11	27.8
2 1/2x2x3/16	.96	24.0
1/4	1.26	31.5
2 1/2x2 1/2x1/8	.72	18.0
3/16	1.07	26.8
1/4	1.40	35.0
3/8	2.05	51.3
3x2x3/16	1.07	26.8
1/4	1.40	35.0
3/8	2.05	51.3
3x2 1/2 x1/4	1.54	38.5
3x3x3/16	1.28	32.0
1/4	1.68	42.0
3/8	2.47	61.8
1/2	3.41	85.3
3 1/2x2 1/2x1/4	1.68	42.0

Size In Inches	Est. Wt., Lbs. Per Foot	25-Ft. Lgth
3 1/2x3 1/2x1/4	1.99	49.8
5/16	2.46	61.5
3/8	2.93	73.3
1/2	3.83	95.8
4x3x1/4	1.99	49.8
3/8	2.93	73.3
1/2	3.83	95.8
4x4x1 1/4	2.28	57.0
3/8	3.38	84.5
1/2	4.41	110
5x3x3/8	3.35	83.8
1/2	4.40	110
5x3 1/2 x1/2	4.70	118
5x5x3/8	4.28	107
1/2	5.58	140
6x4x3/8	4.24	106
1/2	5.58	140
6x6x3/8	5.12	128
1/2	6.75	169
5/8	8.42	210
3/4	10.1	253
8x8x1/2	9.14	229
3/4	13.5	337

6061-T6 and 6061-T6511 RECTANGLES
Lengths 12' Approx.

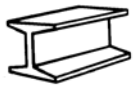
Size In Inches	Est. Wt., Lbs. Per Foot	12-Ft. Lgth
1/8 x		
1/2	.074	.888
5/8	.092	1.10
3/4	.110	1.32
1	.147	1.77
1 1/4	.184	2.21
1 1/2	.221	2.65
1 3/4	.258	3.10
2	.295	3.53
2 1/2	.368	4.42
3/16 x		
1/2	.110	1.32
3/4	.166	1.99
1	.221	2.65
1 1/4	.276	3.31
1 1/2	.331	3.97
1 3/4	.387	4.64
2	.442	5.30
2 1/2	.552	6.62
3	.663	7.95
3 1/2	.773	9.28
4	.883	10.6
1/4 x		
1/2	.147	1.77
3/4	.221	2.65
1	.295	3.53
1 1/4	.368	4.42
1 1/2	.442	5.30
1 3/4	.516	6.18
2	.589	7.07
2 1/4	.662	7.94
2 1/2	.736	8.83
2 3/4	.809	9.70
3	.883	10.6
3 1/4	.957	11.7
3 1/2	1.03	12.3
4	1.18	14.1
4 1/2	1.32	15.9
5	1.47	17.6
6	1.76	21.1
8	2.35	28.2
10	2.94	35.3
12	3.53	42.4
14	4.12	49.4
5/16 x		
1/2	.184	2.21
3/4	.276	3.31
1	.368	4.42
1 1/4	.460	5.52
1 1/2	.552	6.62
2	.736	8.83
3	1.10	13.2
3/8 x		
1/2	.221	2.65
3/4	.331	3.97
1	.442	5.30
1 1/4	.552	6.62
1 1/2	.662	7.95
1 3/4	.771	9.25
2	.883	10.6
2 1/2	1.10	13.2
3	1.32	15.9
3 1/2	1.54	18.5
4	1.77	21.2
4 1/2	1.99	23.9
5	2.20	26.4
6	2.65	31.8
7	3.10	37.2
8	3.53	42.4
10	4.42	53.0
12	5.30	63.6
14	6.18	74.2
1/2 x		
3/4	.442	5.30
1	.589	7.07
1 1/4	.736	8.83
1 1/2	.883	10.6
1 3/4	1.03	12.4
2	1.18	14.1
2 1/4	1.33	16.0
2 1/2	1.47	17.7
2 3/4	1.62	19.4
3	1.77	21.2
3 1/2	2.06	24.7
4	2.35	28.2
5	2.95	35.3
6	3.53	42.4
8	4.71	56.5
10	5.89	70.7
12	7.07	84.8
14	8.25	99.0
5/8 x		
1	.736	8.83
1 1/4	.921	11.0
1 1/2	1.10	13.2
1 3/4	1.29	15.5
2	1.47	17.7
2 1/2	1.84	22.1
3	2.20	26.4
4	3.00	36.0
5	3.75	45.0
6	4.41	52.9
3/4 x		
1	.883	10.6
1 1/4	1.10	13.2
1 1/2	1.32	15.9
1 3/4	1.57	18.9
2	1.77	21.2
2 1/4	2.02	24.2
2 1/2	2.21	26.5
2 3/4	2.43	29.2
3	2.65	31.8
3 1/2	3.09	37.2
4	3.53	42.4
5	4.41	52.9
6	5.30	63.6
8	7.07	84.8
10	8.83	106
12	10.6	128
14	12.4	149
7/8 x		
1	1.03	12.4
1 1/2	1.55	18.6
2	2.06	24.7
1 x		
1 1/4	1.47	17.7
1 1/2	1.77	21.2
1 3/4	2.06	24.7
2	2.35	28.2
2 1/4	2.65	31.8
2 1/2	2.95	35.3
2 3/4	3.24	38.9
3	3.53	42.4
3 1/2	4.12	49.4
4	4.71	56.5
5	5.87	70.5
6	7.07	84.8
8	9.43	113
10	11.8	141
12	14.1	169
14	16.5	198
1 1/4 x		
1 1/2	2.21	26.5
2	2.95	35.3
2 1/2	3.68	44.2
3	4.42	53.0
4	5.89	70.7
6	8.83	106
8	11.8	141
10	14.7	176
12	17.7	212
14	20.6	247
1 1/2 x		
2	3.53	42.4
2 1/2	4.42	53.0
3	5.30	63.6
3 1/2	6.18	74.2
4	7.07	84.8
5	8.83	106
6	10.6	128
6 1/2	11.5	138
8	14.1	169
8 1/2	15.0	180
10	17.6	212
12	21.2	254
14	24.7	297
1 3/4 x		
2	4.12	49.4
3 3/4	7.73	92.6
4 1/2	9.28	111
5 1/2	11.3	136
2 x		
2 1/2	5.89	70.7
3	7.07	84.8
3 1/2	8.24	98.9
4	9.43	113
5	11.8	142
6	14.1	169
6 1/2	15.3	184
8	18.9	226
8 1/2	20.0	240
10	23.6	283
12	28.3	339
14	33.0	396
2 1/2 x		
3	8.83	106
3 1/2	10.3	124
4	11.8	141
5	14.7	177
3 x		
4	14.1	169
5	17.6	212
6	21.2	254
4 x		
5	23.6	283

6061-T6 CHANNELS
Lengths 25' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	25-Ft. Length
3 x		
.170	1.42	35.5
.258	1.73	43.3
.356	2.08	52.0
4 x		
.180	1.85	46.3
.247	2.16	54.0
.320	2.50	62.5
5 x		
.190	2.31	57.8
.325	3.11	77.8
.472	3.97	99.3
6 x		
.200	2.83	70.8
.225	3.00	75.0
.314	3.63	90.8
.437	4.50	113
7 x		
.230	3.54	88.5
.314	4.23	106
8 x		
.190	4.15	104
.250	4.25	106
.303	4.75	119
.487	6.48	162
10 x		
.240	5.28	132
.526	8.64	216
12 x		
.300	7.41	185
.387	8.64	216

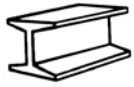
6061-T6 TEES
Lengths 25' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	25-Ft. Length
2 x 2 x 1/4	1.26	31.5
3 x 3 x 3/8	2.72	68.0



6061-T6 I BEAMS
Lengths 25' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	25-Ft. Length
3 x .170	1.96	49.0
.349	2.59	64.8
4 x .190	2.64	66.0
.326	3.28	82.0
5 x .210	3.43	85.8
.494	5.10	128
6 x .230	4.30	108
.343	5.10	128
8 x .350	6.18	155



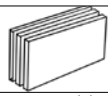
6061-T6 WIDE FLANGE
6061-T6 H BEAMS
Lengths 25' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	25-Ft. Length
WIDE FLANGE		
6 x 4 x .230	4.16	104
6 x 6 x .240	5.40	135
8 x 5¼ x .230	5.90	148
8x 6½ x .245	8.32	208
8 x 8 x .288	10.7	268
H BEAMS		
4 x .313	4.76	119
5 x .313	6.49	162
6 x .250	7.85	196
8 x .313	11.2	280

6061 SHEET

6061-O Soft Annealed
6061-T4 Heat Treated
6061-T6 Heat Treated & Aged

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.020 (.303 lb. per sq. ft.)		
	36x144	10.9
	48x144	14.5
.025 (.375 lb. per sq. ft.)		
	36x144	13.5
	48x144	18.0
.032 (.476 lb. per sq. ft.)		
	36x96	11.4
	48x144	22.8
.040 (.593 lb. per sq. ft.)		
	36x96	14.2
	48x144	28.5
.050 (.737 lb. per sq. ft.)		
	36x96	17.7
	48x144	35.4
	60x144	44.2
.063 (.921 lb. per sq. ft.)		
	36x96	22.1
	48x144	44.2
	60x144	55.3
.071 (1.04 lb. per sq. ft.)		
	48x144	49.9
.080 (1.17 lb. per sq. ft.)		
	48x144	56.2
	60x144	70.2
	72x144	84.2
.090 (1.31 lb. per sq. ft.)		
	48x144	62.9
	60x144	78.6
.100 (1.46 lb. per sq. ft.)		
	48x144	70.1
.125 (1.81 lb. per sq. ft.)		
	36x96	43.4
	144	65.2
	48x144	86.9
	60x144	109
.160 (2.33 lb. per sq. ft.)		
	36x96	55.9
	48x144	112
	60x144	140
.190 (2.75 lb. per sq. ft.)		
	36x96	66.0
	48x144	132
	60x144	165
	180	206
	72x144	198



6061-T651 PLATE

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.250 (3.53 lb. per sq. ft.)		
	36x96	84.7
	48x144	169
	60x144	212
	72x144	254
.313 (4.42 lb. per sq. ft.)		
	48x144	212
.375 (5.29 lb. per sq. ft.)		
	36x96	127
	48x144	254
	60x144	317
.500 (7.06 lb. per sq. ft.)		
	36x96	169
	48x144	339
	60x144	424
.625 (8.82 lb. per sq. ft.)		
	36x96	212
	48x144	423
	60x144	529
.750 (10.6 lb. per sq. ft.)		
	48x144	509
	60x144	636
.875 (12.3 lb. per sq. ft.)		
	48x144	590
1.000 (14.1 lb. per sq. ft.)		
	48x144	677
	60x144	846
1.250 (17.6 lb. per sq. ft.)		
	48x144	845
	60x144	1056
1.500 (21.2 lb. per sq. ft.)		
	48x144	1018
	60x144	1272
1.750 (24.7 lb. per sq. ft.)		
	48x144	1186
2.000 (28.2 lb. per sq. ft.)		
	48x144	1354
	60x144	1692
2.250 (31.8 lb. per sq. ft.)		
	48x144	1526
	60x144	1908
2.500 (35.3 lb. per sq. ft.)		
	48x144	1694
	60x144	2118
2.750 (38.8 lb. per sq. ft.)		
	48x144	1862
3.000 (42.3 lb. per sq. ft.)		
	48x144	2030
	60x144	2538
3.500 (49.4 lb. per sq. ft.)		
	48x144	2371
4.000 (56.4 lb. per sq. ft.)		
	48x144	2707
4.500 (63.6 lb. per sq. ft.)		
	48x144	3053
5.000 (70.6 lb. per sq. ft.)		
	48x144	3389
6.000 (84.7 lb. per sq. ft.)		
	48x144	4066
7.000 (98.7 lb. per sq. ft.)		
	48x144	4738
8.000 (112.8 lb. per sq. ft.)		
	48x144	5414
9.000 (126.9 lb. per sq. ft.)		
	48x144	6091

6061-T6 TREAD PLATE

Diamond Pattern

Thickness in Inches	Width and Length	Estimated Wt., Lbs. Per Sq. Ft.	Estimated Wt., Lbs. Per Plate
.100	48x192	1.55	99
.125	48x192	1.90	122
	60x192	1.90	152
.188	48x192	2.79	179
	60x192	2.79	223
.250	48x192	3.67	235
	60x192	3.67	294
.375	48x192	5.43	348
	60x192	5.43	434

6063 ALUMINUM

Color Marking: Ends painted Green and Yellow

This grade is commonly referred to as the architectural alloy. It was developed as an extrusion alloy with relatively high tensile properties, excellent finishing characteristics, and a high degree of resistance to corrosion.

6063 alloy is most often found in various interior and exterior architectural applications, such as windows, doors, store fronts, and assorted trim items. It is the alloy best suited for anodizing applications —— either plain or in a variety of colors.

ANALYSIS

Cu (Max.)	Si	Fe (Max.)	Mn (Max.)	Mg	Zn (Max.)	Cr (Max.)	Ti (Max.)
0.10	0.20/0.60	0.35	0.10	0.45/0.90	0.10	0.10	0.10

SPECIFICATIONS — AMS QQ-A-200/9, AMS 4156, ASTM B 221.

APPLICATIONS — Moldings and extruded trim for stores and homes. Used extensively for anodized parts.

TYPICAL MECHANICAL PROPERTIES

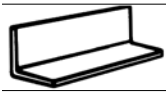
	Tensile Strength (psi)	Yield Strength (psi)	Elongation in 2"	Brinell Hardness
6063-O	13,000	7,000	——	25
6063-T1	22,000	13,000	20	42
6063-T5	27,000	21,000	12	60
6063-T52	27,000	21,000	12	60
6063-T6	35,000	31,000	12	73

MACHINABILITY — For automatic screw machine operations, 6063 is rated between 75% and 85% of 2011 in the T5 and T6 conditions. It is 60% of 2011 in the O condition, and 50% in the T42 condition.

6063-T52 RECTANGLES

Stock Lengths 16' Approx.

Size In Inches	Est. Wt., Lbs. Per Foot	Est. Wt., Lbs. 16-Ft. Length
1/8 x 1/2	.073	1.17
5/8	.091	1.45
3/4	.109	1.75
1	.145	2.33
1 1/4	.182	2.92
1 1/2	.219	3.50
1 3/4	.255	4.08
2	.292	4.66
2 1/2	.364	5.82
3/16 x 1/2	.109	1.75
3/4	.164	2.62
1	.219	3.50
1 1/4	.274	4.37
1 1/2	.328	5.24
2	.437	6.99
2 1/2	.546	8.74
1/4 x 1/2	.145	2.33
5/8	.182	2.92
3/4	.219	3.50
1	.292	4.66
1 1/4	.364	5.82
1 1/2	.437	6.99
1 3/4	.510	8.16
2	.583	9.33
2 1/2	.729	11.7
3	.874	14.0
3/8 x 1/2	.219	3.50
5/8	.274	4.37
3/4	.328	5.24
1	.437	6.99
1 1/4	.546	8.74
3/8 x 1 1/2	.656	10.5
2	.874	14.0
3	1.31	21.0
1/2 x 3/4	.437	6.99
1	.583	9.33
1 1/2	.729	11.7
1 1/2	.874	14.0
2	1.17	18.6
2 1/2	1.45	23.3
3	1.75	27.9
3/4 x 1 1/2	1.31	21.0
2	1.75	27.9
3	2.62	42.0
1x 1 1/2	1.75	27.9
2	2.33	37.3



6063-T52 ANGLES

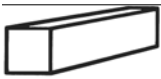
Lengths 16' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	Estimated Wt., Lbs. 16-Ft. Length
1/2 x 1/2 x 1/16	.070	1.12
1/8	.131	2.10
5/8 x 5/8 x 1/8	.168	2.69
3/4 x 3/8 x 3/32	.116	1.86
3/4 x 3/4 x 1/16	.107	1.71
1/8	.206	3.30
1 x 1/2 x 3/32	.158	2.53
1/8	.206	3.30
1 x 3/4 x 1/8	.244	3.90
1 x 1 x 1/16	.145	2.32
1/8	.281	4.50
3/16	.409	6.54
1 1/4 x 1/2 x 1/8	.244	3.90
1 1/4 x 1 x 1/8	.319	5.10
1 1/4 x 1 1/4 x 1/8	.356	5.70
3/16	.522	8.35
1 1/2 x 3/4 x 1/8	.319	5.10
1 1/2 x 1 x 1/8	.356	5.70
1 1/2 x 1 1/2 x 1/8	.431	6.90
3/16	.632	10.1
1 3/4 x 1 3/4 x 1/8	.506	8.10
2 x 1 x 1/8	.431	6.90
2 x 1 1/2 x 1/8	.506	8.10
2 x 2 x 1/8	.581	9.30
3/16	.860	13.8
1/4	1.13	18.1
2 1/2 x 1 1/2 x 1/8	.506	8.10
2 1/2 x 2 x 1/8	.656	10.5
2 1/2 x 2 1/2 x 1/8	.731	11.7
3 x 2 x 1/8	.731	11.7
3 x 3 x 1/8	.881	14.1
3/16	1.31	20.9
3 1/2 x 1 1/4 x 1/8	.694	11.1
3 1/2 x 3 1/2 x 1/8	1.03	16.5
4 x 2 x 1/8	.881	14.1
4 x 3 x 1/8	1.03	16.5
4 x 4 x 1/8	1.18	18.9

6063-T52 CHANNELS

Lengths 16' Approx. (Some 20')

Size In Inches	Estimated Wt., Lbs. Per Foot	Estimated Wt., Lbs. 16-Ft. Length
1/2 x 3/8 x 1/8	.150	2.40
1/2 x 1/2 x 3/32	.148	2.37
1/2 x 3/4 x 1/8	.263	4.21
5/8 x 5/8 x 1/8	.243	3.89
3/4 x 3/8 x 1/8	.186	2.98
3/4 x 3/4 x 1/8	.299	4.78
1 x 1/2 x 1/8	.262	4.19
1 x 1 x 1/8	.413	6.61
1 1/4 x 1/2 x 1/8	.299	4.78
1 1/4 x 1 1/4 x 1/8	.526	8.42
1 1/2 x 1/2 x 1/8	.336	5.38
1 3/4 x 1/2 x 1/8	.376	6.02
1 3/4 x 3/4 x 1/8	.450	7.20
1 3/4 x 1 x 1/8	.526	8.42
2 x 1/2 x 1/8	.413	6.61
2 x 1 x 1/8	.563	9.01
2 x 2 x 1/4	1.67	26.7
2 1/4 x 7/8 x 1/8	.562	8.99
2 1/2 x 1 1/2 x 1/8	.787	12.6
3 x 1/2 x 1/8	.563	9.01
3 x 1 x 1/8	.713	11.4
5 x 2 x 3/16	1.95	31.2



6063-T52 SQUARES

Lengths 16' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	Estimated Wt., Lbs. 16-Ft. Length
3/8	.164	2.62
1/2	.292	4.66
5/8	.455	7.29
3/4	.656	10.5
1	1.17	18.6
1/4	1.82	29.2
1/2	2.62	42.0

7075 ALUMINUM

Color Marking (Rod and Bar): Ends painted Black

This is one of the highest strength aluminum alloys available. Its strength-to-weight ratio is excellent, and it is ideally used for highly stressed parts.

It may be formed in the annealed condition and subsequently heat treated. Spot or flash welding can be used, although arc and gas welding are not recommended.

It is available in the clad ("Alclad") from to improve the corrosion resistance with the over-all high strength being only moderately affected.

ANALYSIS

Cu	Si (Max.)	Fe (Max.)	Mn (Max.)	Mg	Zn	Cr	Ti (Max.)
1.2/2.0	0.40	0.50	0.30	2.1/2.9	5.1/6.1	0.18/0.28	0.20

SPECIFICATIONS

Drawn Bars: AMS-QQ-A-225/9, AMS 4122.
Extruded Bars: AMS-QQ-A-200/11, AMS 4154.
Bare Sheet: AMS-QQ-A-250/12, AMS 4044 (O), AMS 4045 (T6)
Alclad Sheet: AMS-QQ-A-250/13, AMS 4048 (O), AMS 4049 (Tb).
Bare Plate: AMS-QQ-A-250/12, AMS 4045

APPLICATIONS — Used where highest strength is needed.

CORROSION RESISTANCE — Refer to table on Page 24 of this section.

TYPICAL MECHANICAL PROPERTIES

Bare:	Tensile Strength (psi)	Yield Strength (psi)	Elongation % in 2" 1/16" Flat	Elongation % in 2" 1/2" Round	Min. 90° Cold Bend Radius for .064" Thick	Brinell Hardness
7075-O	33,000	15,000	17	16	0-1T	60
7075-T6, T651	83,000	73,000	11	11	4-6T	150
Alclad:						
7075-O	32,000	14,000	17	-	-	-
7075-T6, T651	76,000	67,000	11	-	-	-

MACHINABILITY — For automatic screw machine operations, 7075 is rated between 75% and 85% of 2011 in the T6 condition, and 65% in the O condition.

7075-T6 and 7075-T651 ROUNDS

Lengths 12' Approx

Size In Inches	Est. Weight, Lbs. Per Foot	Est. Weight, Lbs. 12-Ft. Bar	Size In Inches	Est. Weight, Lbs. Per Foot	Est. Weight, Lbs. 12-Ft. Bar	Size In Inches	Est. Weight, Lbs. Per Foot	Est. Weight, Lbs. 12-Ft. Bar
3/16	.034	.408	1 3/4	2.92	35.0	4 1/2	19.3	232
1/4	.059	.716	7/8	3.36	40.3	3/4	21.5	258
5/16	.093	1.12	2	3.81	45.8	5	23.9	286
3/8	.135	1.61	1/8	4.31	51.7	1/4	26.3	316
1/2	.239	2.86	1/4	4.83	57.9	1/2	28.9	347
9/16	.302	3.62	3/8	5.39	64.5	3/4	31.6	378
5/8	.372	4.47	1/2	5.96	71.6	6	34.4	412
11/16	.450	5.42	5/8	6.57	78.9	1/4	37.2	447
3/4	.537	6.44	3/4	7.22	86.6	1/2	40.3	484
7/8	.731	8.76	7/8	7.89	94.6	7	46.7	561
1	.954	11.5	3	8.58	103	1/2	53.7	644
1/8	1.21	14.5	1/4	10.1	121	8	61.1	733
1/4	1.49	17.9	1/2	11.7	141			
3/8	1.80	21.7	3/4	13.5	161			
1/2	2.15	25.7	4	15.2	183			
5/8	2.51	30.2	1/4	17.2	207			

7075-T6 AND 7075-T6511 COLD FINISHED RECTANGLES

Lengths 12' Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	12-Ft. Length
3/16 x		
1	.228	2.74
1/4 x		
1	.304	3.64
1 1/2	.455	5.46
2	.608	7.28
3/8 x		
1	.455	5.46
1 1/2	.683	8.20
1 3/4	.797	9.56
2	.911	10.9
3	1.37	16.4
1/2 x		
3/4	.455	5.46
1	.608	7.29
1 1/2	.911	10.9
1 3/4	1.06	12.8
2	1.22	14.6
2 1/2	1.51	18.2
3	1.82	21.9
4	2.43	29.1
5	3.04	36.4
6	3.64	43.8
5/8 x		
1	.759	9.11
1 1/2	1.14	13.7
2	1.51	18.2
3/4 x		
1	.911	10.9
1 1/2	1.37	16.4
2	1.82	21.9
3	2.73	32.8
6	5.46	65.6
1 x		
1 1/4	1.51	18.2
1 1/2	1.82	21.9
1 3/4	2.13	25.5
2	2.43	29.1
2 1/2	3.04	36.4
3	3.64	43.8
4	4.86	58.3
6	7.29	87.4
1 1/4 x		
1 1/2	2.28	27.3
2	3.04	36.4
2 1/2	3.79	45.5
3	4.55	54.6
4	6.08	72.9
1 1/2 x		
2	3.64	43.8
2 1/2	4.55	54.6
3	5.46	65.6
4	7.29	87.4
6	10.9	132
2 x		
2 1/4	5.46	65.6
2 1/2	6.08	72.9
3	7.29	87.4
4	9.72	117
6	14.6	175
2 1/2 x		
3	9.11	109
4	12.2	146
6	18.2	219
3 x		
3	12.8	153
4	14.6	175
5	18.2	219
6	21.9	262

7075-T651 SQUARES

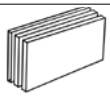
Lengths 12" Approx.

Size In Inches	Estimated Wt., Lbs. Per Foot	12-Ft. Length
1/2	.304	3.64
3/4	.683	8.20
1	1.22	14.6
1/4	1.90	22.8
3/8	2.30	27.5
1/2	2.73	32.8
3/4	3.72	44.6
2	4.86	58.3
1/2	7.59	91.1
3	10.9	132
1/2	14.9	178
4	19.4	234

7075 SHEET BARE & ALCLAD

Available in following Tempers
7075-O Soft Annealed Bare
7075-T6 Heat Treated & Aged

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.012 (.193 lb. per sq. ft.)		
	48x144	9.26
.016 (.251 lb. per sq. ft.)		
	36x144	9.04
	48x144	12.1
.020 (.309 lb. per sq. ft.)		
	36x144	11.1
	48x144	14.8
.025 (.382 lb. per sq. ft.)		
	36x144	13.8
	48x96	12.2
	48x144	18.3
.032 (.480 lb. per sq. ft.)		
	48x144	23.0
	60x180	36.0
.040 (.596 lb. per sq. ft.)		
	48x144	28.6
	60x180	44.7
.050 (.749 lb. per sq. ft.)		
	48x144	36.0
	60x180	56.2
.063 (.938 lb. per sq. ft.)		
	48x144	45.0
	60x180	70.4
.071 (1.05 lb. per sq. ft.)		
	48x144	50.4
	60x180	78.8
.080 (1.19 lb. per sq. ft.)		
	48x144	57.1
	60x180	89.3
.090 (1.33 lb. per sq. ft.)		
	48x144	63.8
	60x180	99.8
.100 (1.48 lb. per sq. ft.)		
	48x144	71.0
	60x180	111
.125 (1.84 lb. per sq. ft.)		
	48x144	88.3
	60x180	138
.160 (2.38 lb. per sq. ft.)		
	48x144	114
	60x180	179
.190 (2.81 lb. per sq. ft.)		
	48x144	135
	60x180	211
	60x240	281



BARE 7075-T651 PLATE

Thickness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.250 (3.64 lb. per sq. ft.)		
	48x144	175
.313 (4.56 lb. per sq. ft.)		
	36x96	109
	48x144	219
.375 (5.45 lb. per sq. ft.)		
	36x96	131
	48x144	262
.500 (7.27 lb. per sq. ft.)		
	36x96	174
	48x144	349
.625 (9.09 lb. per sq. ft.)		
	36x96	218
	48x144	436
.750 (10.9 lb. per sq. ft.)		
	36x96	262
	48x144	523
.875 (12.7 lb. per sq. ft.)		
	36x96	305
	48x144	610
1.000 (14.5 lb. per sq. ft.)		
	36x96	348
	48x144	696
1.250 (18.2 lb. per sq. ft.)		
	24x72	218
	36x96	437
	48x144	874
1.500 (21.8 lb. per sq. ft.)		
	24x72	262
	36x96	523
	48x144	1046
1.750 (25.5 lb. per sq. ft.)		
	36x96	612
	48x144	1224
2.000 (29.1 lb. per sq. ft.)		
	24x72	349
	36x96	698
	48x144	1397
2.250 (32.7 lb. per sq. ft.)		
	48x144	1570
2.500 (36.4 lb. per sq. ft.)		
	36x96	874
	48x144	1747
2.750 (40.0 lb. per sq. ft.)		
	48x144	1920
3.000 (43.6 lb. per sq. ft.)		
	36x96	1046
	48x144	2093
3.500 (50.9 lb. per sq. ft.)		
	48x144	2443
4.000 (58.2 lb. per sq. ft.)		
	48x144	2793
5.000 (72.7 lb. per sq. ft.)		
	48x144	3490
6.000 (84.7 lb. per sq. ft.)		
	48x144	4195

ALUMINUM TOOLING PLATE

This plate is produced from a fine-grain aluminum alloy which is free from internal stresses. This material is dimensionally stable, which assures minimum movement in machining.

Tooling plate is a machined product, with flat surfaces and a finish equal to 32 micro-inches or better. It is readily machined with very little distortion.

Aluminum tooling plate is one-third as heavy as steel plate, which usually eliminates the need for heavy handling equipment for installation and set up and reduces the load on ways and screws. It is highly resistant to corrosion, requiring no protective treatment. After the tool is obsolete, the product has a higher salvage value than steels.

Aluminum Tooling Plate is used for templates, assembly jigs and fixtures, welding fixtures, hydro press form blocks, drill jigs, and rubber and plastic molds.

Thick-ness in Inches	Width and Length	Est.Wt. Lbs. per Sheet
.250 (3.636 lb. per sq. ft.)		
	48x96	116
	144	175
	60x144	218
.313 (4.545 lb. per sq. ft.)		
	48x96	145
	144	218
.375 (5.454 lb. per sq. ft.)		
	48x96	175
	144	262
	60x144	327
.500 (7.272 lb. per sq. ft.)		
	48x96	233
	144	349
	60x144	436
.625 (9.090lb. per sq. ft.)		
	48x96	291
	144	436
	60x144	545
.750 (10.91 lb. per sq. ft.)		
	48x96	349
	144	524
	60x144	655
.875 (12.70 lb. per sq. ft.)		
	48x144	610
1.000 (14.54 lb. per sq. ft.)		
	48x96	465
	144	698
	60x144	872
1.250 (18.18 lb. per sq. ft.)		
	48x96	582
	144	873
	60x144	1091
1.500 (21.82 lb. per sq. ft.)		
	48x96	698
	144	1047
	60x144	1309
1.750 (25.45 lb. per sq. ft.)		
	48x96	814
	144	1222
	60x144	1527
2.000 (29.09 lb. per sq. ft.)		
	48x144	1396
2.500 (36.36 lb. per sq. ft.)		
	48x96	1164
	144	1745
3.000 (43.63 lb. per sq. ft.)		
	48x96	1396
	144	2094
3.500 (50.90 lb. per sq. ft.)		
	48x144	2443
4.000 (58.18 lb. per sq. ft.)		
	48x144	2792
4.500 (65.46 lb. per sq. ft.)		
	48x144	3142
5.000 (72.72 lb. per sq. ft.)		
	48x144	3491
5.500 (80.00 lb. per sq. ft.)		
	48x144	3840
	60x144	4800
6.000 (87.27 lb. per sq. ft.)		
	48x144	4189
	60x144	5236

COMPLETE ALUMINUM STOCKS

IMMEDIATE SHIPMENT

MODERN CUTTING FACILITIES

METALLURGICAL ASSISTANCE

ALUMINUM ALLOY DESIGNATIONS

The aluminum industry uses a four-digit index system for the designation of its wrought aluminum alloys.

As outlined below, the first digit indicates the alloy group according to the major alloying elements.

1xxx Series

In this group, minimum aluminum content is 99%, and there is no major alloying element.

The second digit indicates modifications in impurity limits. If the second digit is zero, there is no special control on individual impurities. Digits 1 through 9, which are assigned consecutively as needed, indicate special control of one or more individual impurities.

The last two digits indicate specific minimum aluminum content. Although the absolute minimum aluminum content in this group is 99%, the minimum for certain grades is higher than 99%, and the last two digits represent the hundredths of a percent over 99.

Thus, 1030 would indicate 99.30% minimum aluminum, without special control on individual impurities. The designations 1130, 1230, 1330, etc., indicate the same purity with special control on one or more impurities. Likewise, 1100 indicates minimum aluminum content of 99.00% with individual impurity control.

2xxx through 9xxx Series

The major alloying elements are indicated by the first digit, as follows:

2xxx	Copper
3xxx	Manganese
4xxx	Silicon
5xxx	Magnesium
6xxx	Magnesium and Silicon
7xxx	Zinc
8xxx	Other Element
9xxx	Unused Series

The second digit indicates alloy modification. If the second digit is zero, it indicates the original alloy; digits 1 through 9, which are assigned consecutively, indicate alloy modifications. The last two digits have no special significance, serving only to identify the different alloys in the group.

Experimental Alloys

Experimental alloys are designated according to the four-digit system, but they are prefixed by the letter X. The prefix is dropped when the alloy becomes standard. During development, and before they are designated as experimental, new alloys are identified by serial numbers assigned by their originators. Use of the serial number is discontinued when the X number is assigned.

ALUMINUM TEMPER DESIGNATIONS

The temper designation system used for all forms, except ingot, of aluminum and its alloys, is based on the sequence of basic treatments used to produce the various tempers. The basic temper designation consists of a letter, and subdivisions of the basic temper are indicated by one or more digits following the letter.

BASIC TEMPER DESIGNATIONS

F —— As Fabricated.
O —— Annealed.
H —— Strain Hardened.
W —— Solution Heat Treated.
T —— Thermally Treated —— to produce a stable temper other than those listed.

SUBDIVISIONS OF H TEMPER

H1 —— Strain hardened only.
H2 —— Strain hardened, then partially annealed.
H3 —— Strain hardened, then stabilized.

The degree of strain hardening is indicated by a second digit following one of the above designations:

2 —— 1/4 hard (tensile strength midway between 0 and 4).
4 —— 1/2 hard (tensile strength midway between 0 and 8).
6 —— 3/4 hard (tensile strength midway between 4 and 8).
8 —— full hard (tensile strength achieved by 75% cold reduction after anneal).
9 —— extra hard (minimum tensile 2.0 ksi higher than 8).

A third digit may be used to indicate a variation of a two digit number.

SUBDIVISIONS OF T TEMPER

— T1 Cooled from an elevated temperature shaping process and naturally aged.
— T2 Annealed.
— T3 Solution heat treated and cold worked.
— T4 Solution heat treated and naturally aged.
— T5 Cooled from an elevated temperature shaping process and artificially aged.
— T6 Solution heat treated and artificially aged.
— T7 Solution heat treated and stabilized.
— T8 Solution heat treated, cold worked, and artificially aged.
— T9 Solution heat treated, artificially aged, and cold worked.
— T10 Cooled from an elevated temperature shaping process, artificially aged and cold worked.

Additional digits are used to designate stress relieving:
— T51 Stress relieving by stretching.
— T52 Stress relieving by compressing.
T510 designates products that receive no further straightening after stretching, and T511 designates products that receive minor straightening in order to comply with standard tolerances.

RELATIVE CORROSION RESISTANCE OF ALUMINUM ALLOYS

Alloy	Non-Industrial Atmosphere	Industrial Atmosphere	Marine Atmosphere or Sea Water Service
1100	A	B	B
2011	B	C	D
2017	A	A	B
2024	B	C	D
Alclad 2024	A	A	B
3003	A	B	B
5005	A	A	A
5052	A	A	A
5083	A	A	A
5086	A	A	A
6061-T6	A	B	B
6063-T5	A	B	B
7075-T6	B	C	D
Alclad 7075-T6	A	B	C

A = Best relative resistance.

B = Good relative resistance.

C = Fair relative resistance.

D = Not usually recommended without additional surface treatment.

NOTE: This table is to be used as a general guide only, since in many applications an alloy with a D rating performs satisfactorily while in other applications an alloy with an A, B, or C rating may require additional protection.

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