Aluminum

Bar, Sheet, Plate, Structurals, Tube & Pipe

NOTE: Typical properties shown for alloys are not guaranteed by publication herein. In most cases, the values are averages for various sizes, product forms and manufacturing practices. The typical properties do not exactly represent particular products or sizes. The data is intended only as a basis for comparing alloys and tempers and should not be specified as engineering requirements or used for design purposes.

Aluminum

Rod, Bar and Wire (Cold Finished)

Rounds • Flats • Hexagons • Squares

Alloy Descriptions and Applications

2011 – This free machining alloy compares favorably with free cutting brass. It is the most suitable alloy for machining on automatics, milling machines, lathes, planers, shapers and other machine tools, and is the most widely used alloy for all types of screw machine parts. It can be machined at high speeds and comparatively heavy feeds. Machined surfaces are bright and smooth. Mechanical finishes readily match joined parts. Mechanical properties and hardness are excellent; corrosion resistance fair. Weldability by resistance method is fair; other welding is not recommended.

2014 – One of the strongest of heat-treatable alloys, 2014 is used in heavy duty applications. Machinability is good to excellent when high rakes and clearances, adequate coolant, sharp tools, fast speeds, and light-to-medium cuts and feeds are employed. Machined surfaces are very smooth. Weldability is good with arc and resistance methods. Corrosion resistance is fair. This is the most widely used forging alloy.

2017 – Like 2011, this is also a general-purpose alloy for automatic screw machine work. It is stronger than 2011, but harder to machine and does not have the fine chip associated with 2011. It is recommended for heavy-duty parts because of its high strength. Workability is fair, with ductility and formability considered better than 2014. Arc and resistance weldability are satisfactory. Corrosion resistance is fair. It is used for rivets, fasteners, and aircraft components.

2024 – Known as the “aircraft alloy” in machining rod, this alloy has properties higher than 2017 and 2014. Though formability is generally considered only fair in the cold state, it is one of the most popular alloys for cold heading and roll threading applications. Can be machined to a high finish. Corrosion resistance is fair. Applications include Phillips head screws, wood screws, hydraulic fittings and small parts in clocks and meters. It is also the basic alloy for cold finished rectangular bar where strength and machinability are essential for precision fittings and parts.

6061 – Generally selected where welding or brazing is required, or for its particularly high corrosion resistance in all tempers. Formability is excellent in 0 temper, good in T4. Machining is more difficult than with other machining alloys; it is particularly gummy in 0 condition, fair in hard tempers. Corrosion resistance and appearance after anodizing are highest of screw machine alloys, though properties are generally lower. Applications include railway car components, bridge components, pipe fittings, wheels and various transportation end uses.

Aluminum

Rod, Bar and Wire (Cold Finished)

Rounds • Flats • Hexagons • Squares

Alloy Descriptions and Applications

6262 – 6262 aluminium alloy is an alloy in the wrought aluminium-magnesium-silicon family (6000 or 6xxx series). It is related to 6162 aluminium alloy (Aluminum Association designations that only differ in the second digit are variations on the same alloy), but sees much more widespread use. It is notably distinct from 6162, and most other aluminium alloys, in that it contains lead in its alloy composition. Has excellent machinability, is readily welded, and has good corrosion resistance. Formability is fair in T6 temper, difficult in T9. Bright, smooth finish is easy to obtain.

7075/7175 – 7075 has been the strongest and hardest alloy sold commercially for decades. 7175 is more pure, but may not be suitable for fracture toughness applications. The superior stress corrosion resistance of the T73 and T7351 tempers of 7075 rolled or cold finished rod have made them a logical replacement for alloys 2014, 2017 and 2024 in many of the most critical applications. In machined parts and forgings it is used primarily in aircraft, ordnance, highly stressed structural applications, keys, small gears, etc. It is more difficult to forge than other alloys, but is often selected because of its properties. Machinability is good, resistance welding satisfactory, finishing characteristics excellent, and corrosion resistance fair.

Aluminum

Rod, Bar and Wire (Cold Finished)

Typical Mechanical Properties

Alloy & Temper	Tension			
	Strength (ksi)		Elongation % in 2"	
	Ultimate	Yield	1/16" thk	1/2" dia.
2011-T3	55	43	---	15
2011-T8	59	45	---	12
2014-0	27	14	---	18
2014-T4, T451	62	42	---	20
2014-T6, T651	70	60	---	13
2017-0	26	10	---	22
2017-H13	35	33	---	10
2017-T4, T451	62	40	---	22
2024-0	27	11	20	22
2024-H13	37	35	---	0
2024-T351, T4	68	47	20	19
2024-T361	72	57	13	---
2024-T851	70	65	6	---
6061-0	18	8	25	30
6061-H13	26	---	---	---
6061-T4, T451	35	21	22	25
6061-T6, T651	45	40	12	17
6061-T913	67	66	---	10
6061-T94	57	---	---	---
6063-0	13	7	---	---
6063-T4	25	13	22	---
6063-T6	35	31	12	---
6262-T6, T651	45	40	---	17
6262-T8	50	47	---	14
6262-T9	58	55	---	10
7075-0	33	15	17	16
7075-H13	40	---	---	---
7075-T6, T651	83	73	11	11
7075-T73, T7351	73	63	13	---

Two page chart, continues on next page

The above typical properties are not guaranteed since in most cases they are averages for various sizes, product forms and methods of manufacture and may not be exactly representative of any particular product or size. This data is intended only as a basis for comparing alloys and tempers and should not be specified as engineering requirements or used for design purposes.

Aluminum

Rod, Bar and Wire (Cold Finished)

Typical Mechanical Properties

Hardness	Shear	Fatigue	Modulus
Brinell # 500 kg load 10 mm ball	Ultimate Shearing Strength (ksi)	Endurance Limit[2] (ksi)	Mod of Elasticity[3] (ksi x 10^{-3})
95	32	18	10.2
100	35	18	10.2
45	18	13	10.6
105	38	20	10.6
135	42	18	10.6
45	18	13	10.5
---	---	---	10.5
105	38	18	10.5
47	18	13	10.6
---	---	---	10.6
120	41	20	10.6
130	42	18	10.6
128	43	18	10.6
30	12	9	10.0
---	---	---	10.0
65	24	14	10.0
95	30	14	10.0
---	35	---	10.0
---	---	---	10.0
25	10	8	10.0
---	16	---	10.0
73	22	10	10.0
95	30	---	10.0
---	---	---	10.0
120	35	13	10.0
60	22	17	10.4
---	---	---	10.4
150	48	23	10.4
---	44	23	10.4

Two page chart, continued from previous page

Notes:

(1) The indicated typical mechanical properties for all except 0 temper material are higher than the specified minimum properties. For O temper products typical ultimate and yield values are slightly lower than specified (maximum) values.

(2) Based on 500,000,000 cycles of completely reversed stress using the R.R. Moore type of machine and specimen.

(3) Average of tension and compression moduli. Compression modulus is about 2% greater than tension modulus.

Aluminum Rounds, 2011-T3

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/3 • Stock Lengths: 12 foot

Diameter (inches)	Approx Wt. (lbs./foot)
1/8	.015
5/32	.023
3/16	.034
7/32	.046
1/4	.060
9/32	.076
5/16	.094
11/32	.114
3/8	.135
13/32	.158
7/16	.184
15/32	.211
1/2	.240
17/32	.271
9/16	.304
19/32	.339
5/8	.376
21/32	.414
11/16	.454
23/32	.496
3/4	.542
25/32	.586
13/16	.636
27/32	.684

Diameter (inches)	Approx Wt. (lbs./foot)
7/8	0.736
15/16	0.845
1	0.961
1-1/16	1.085
1-1/8	1.217
1-3/16	1.356
1-1/4	1.502
1-5/16	1.656
1-3/8	1.818
1-7/16	1.990
1-1/2	2.163
1-9/16	2.347
1-5/8	2.539
1-11/16	2.736
1-3/4	2.942
1-13/16	3.156
1-7/8	3.380
1-15/16	3.620
2	3.845
2-1/16	4.087
2-1/8	4.339
2-3/16	4.620
2-1/4	4.864
2-5/16	5.150

Diameter (inches)	Approx Wt. (lbs./foot)
2-3/8	5.420
2-7/16	5.730
2-1/2	6.008
2-9/16	6.316
2-5/8	6.624
2-11/16	6.960
2-3/4	7.270
2-13/16	7.623
2-7/8	7.946
2-15/16	8.320
3	8.652
3-1/8	9.388
3-1/4	10.154
3-5/16	10.548
3-3/8	10.950
3-1/2	11.776
3-3/4	13.518
4	15.381
4-1/4	17.364
5	24.103
6	34.708
8	61.704

Aluminum Hexagons, 2011-T3

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/3 • Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1/4	.0662
5/16	.1035
3/8	.1491
7/16	.2029
1/2	.2660
9/16	.3354
5/8	.4141
11/16	.5010
3/4	.5980
13/16	.7000

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
7/8	.8130
15/16	.9330
1	1.061
1-1/16	1.198
1-1/8	1.343
1-1/4	1.658
1-5/16	1.826
1-3/8	2.000
1-7/16	2.190
1-1/2	2.385

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1-5/8	2.7990
1-3/4	3.2462
1-7/8	3.7265
2	4.2399
2-1/4	5.3662
2-1/2	6.6249
2-3/4	8.0161
3	9.5399

Aluminum Rounds, 2017-T451

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/5

Stock Lengths: 12 foot (sizes over 3-1/2" Dia. in random lengths)

Diameter (inches)	Approx Wt. (lbs./foot)
1/8*	.0148
5/32*	.0232
3/16*	.0334
7/32*	.0455
1/4*	.0594
9/32*	.0752
5/16*	.0929
11/32*	.1124
3/8*	.1338
13/32*	.1569
7/16*	.1821
15/32*	.2091
1/2*	.2410
17/32*	.2685
9/16*	.3010
19/32*	.3354
5/8	.3640
21/32	.4097
11/16	.4497
23/32	.4915
3/4	.5370
13/16	.6281
7/8	.7284
15/16	.8362

Diameter (inches)	Approx Wt. (lbs./foot)
1	0.9514
1-1/16	1.0741
1-1/8	1.2041
1-3/16	1.3500
1-1/4	1.4570
1-5/16	1.6060
1-3/8	1.7988
1-7/16	1.9270
1-1/2	2.0980
1-9/16	2.3228
1-5/8	2.5123
1-11/16	2.7093
1-3/4	2.9137
1-13/16	3.1256
1-7/8	3.3448
1-15/16	3.5715
2	3.6700
2-1/16	4.0473
2-1/8	4.2963
2-3/16	4.5527
2-1/4	4.8166
2-5/16	5.0879
2-3/8	5.3666
2-7/16	5.6528

Diameter (inches)	Approx Wt. (lbs./foot)
2-1/2	5.9600
2-9/16	6.2474
2-5/8	6.5559
2-3/4	7.1951
2-7/8	7.8641
3	8.5628
3-1/8	9.2912
3-1/4	10.0494
3-5/16	10.4396
3-3/8	10.8373
3-1/2	11.4230
3-5/8	12.5023
3-3/4	13.3793
4	15.2227
4-1/4	17.1850
4-1/2	19.2663
4-3/4	21.4664
5	23.7855
5-1/4	26.2235
5-1/2	28.2240
5-3/4	31.4563
6	34.2511
7	46.6196
8*	60.8909

**Temper T4*

Aluminum Hexagons, 2017-T451

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/5 • Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1/4*	.0656
5/16*	.1026
11/32*	.1241
3/8*	.1477
7/16*	.2010
1/2*	.2626
9/16*	.3324
5/8	.4103
11/16	.4965
3/4	.5909
13/16	.6934

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
7/8	.8042
15/16	.9232
1	1.0504
1-1/16	1.1858
1-1/8	1.3294
1-3/16	1.4812
1-1/4	1.6413
1-5/16	1.8095
1-3/8	1.9859
1-7/16	2.1706
1-1/2	2.3634

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1-9/16	2.5645
1-5/8	2.7737
1-11/16	2.9912
1-3/4	3.2169
1-7/8	3.6928
2	4.2016
2-1/4	5.3177
2-1/2	6.5565
2-3/4	7.9436
3	9.4536

**Temper T4*

Aluminum Square Bars, 2017-T451

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/5 • Stock Lengths: 12 foot

Size (inches)	Approx Wt. (lbs./lineal ft.)	Size (inches)	Approx Wt. (lbs./lineal ft.)	Size (inches)	Approx Wt. (lbs./lineal ft.)
1/4*	.0757	5/8	.4734	1-1/8	1.5339
3/8*	.1704	11/16	.5728	1-1/4	1.8938
7/16*	.2320	3/4	.6818	1-1/2	2.7270
1/2*	.3030	7/8	.9279	1-3/4	3.7118
9/16*	.3835	1	1.2120	2	4.8480

**Temper T4*

Aluminum Rounds, 2024-T351

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/6 • Stock Lengths: 12 foot

Diameter (inches)	Approx Wt. (lbs./foot)	Diameter (inches)	Approx Wt. (lbs./foot)	Diameter (inches)	Approx Wt. (lbs./foot)
1/8*	.0147	7/8	0.7212	2-1/2	5.8875
5/32*	.0230	29/32	0.7736	2-9/16	6.1856
11/64*	.0278	15/16	0.8279	2-5/8	6.4909
3/16*	.0331	31/32	0.8841	2-3/4	7.1239
13/64*	.0389	1	0.9400	2-7/8	7.7862
7/32*	.0451	1-1/16	1.0634	3	8.4788
15/64*	.0516	1-1/8	1.1923	3-1/8	9.1992
1/4*	.0588	1-3/16	1.3284	3-1/4	9.9499
17/64*	.0664	1-1/4	1.4720	3-5/16	10.3362
9/32*	.0745	1-5/16	1.6228	3-3/8	10.7299
5/16*	.0920	1-3/8	1.7809	3-1/2	11.5395
11/32*	.1113	1-7/16	1.9460	3-3/4	13.2469
3/8*	.1324	1-1/2	2.1195	4	15.0720
25/64*	.1437	1-9/16	2.2998	4-1/4	17.0148
13/32*	.1554	1-5/8	2.4877	4-1/2	19.0755
7/16*	.1803	1-11/16	2.6828	4-3/4	21.2538
15/32*	.2070	1-3/4	2.8849	5	23.5300
1/2*	.2355	1-13/16	3.0946	5-1/4	25.9638
17/32*	.2658	1-7/8	3.3117	5-1/2	28.4955
9/16*	.2981	1-15/16	3.5362	5-3/4	31.1449
19/32*	.3319	2	3.7683	6	33.9120
5/8	.3679	2-1/16	4.0072	6-1/4	36.7969
21/32	.4056	2-1/8	4.2537	6-1/2	39.7995
11/16	.4452	2-3/16	4.5076	7	46.1580
23/32	.4867	2-1/4	4.7689	7-1/4	49.5139
3/4	.5298	2-5/16	5.0375	7-1/2	52.9875
25/32	.5749	2-3/8	5.3135	8*	60.2880
13/16	.6219	2-7/16	5.5968		

**Temper T4*

Aluminum Hexagons, 2024-T351

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/6 • Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
3/16	.037
1/4*	.065
5/16*	.101
11/32*	.122
3/8*	.146
7/16*	.199
1/2*	.260
9/16*	.329
5/8	.406
11/16	.492
3/4	.585
13/16	.686
7/8	0.796
15/16	0.914
1	1.040
1-1/16	1.174
1-1/8	1.316
1-3/16	1.466
1-1/4	1.625
1-5/16	1.792
1-3/8	1.966
1-7/16	2.150
1-1/2	2.340
1-9/16	2.539
1-5/8	2.746
1-11/16	2.962
1-3/4	3.185
1-7/8	3.656
2	4.160
2-1/4	5.259
2-7/16	6.160
2-1/2	6.500
2-5/8	7.158
2-3/4	7.865
3	9.349

**Temper T4*

Aluminum Squares, 2024-T4 & 2024-T351

Cold Finished Square Bar

ASTM-B211, AMS-QQ-A-225/6 • Stock Lengths: 12 foot

Size (inches)	Approx Wt. (lbs./lineal ft.)
1/4	.075
3/8	.169
7/16	.230
1/2	.300
9/16	.379
5/8	.478
3/4	.675
7/8	0.919
1	1.200
1-1/8	1.519
1-1/4	1.875
1-1/2	2.700
1-3/4	3.675
2	4.800
2-1/4	5.954
2-1/2	7.575
2-3/4	9.185
3	10.800
3-1/4	12.675
3-1/2	14.700
4	19.240

Aluminum Rect. Bar, 2024-T4 & 2024-T351

Cold Finished Rectangular Bars

ASTM-B211, AMS-QQ-A-225/6 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
1/8 x 1/2	0.080
1/8 x 5/8	0.090
1/8 x 3/4	0.113
1/8 x 1	0.150
1/8 x 1-1/4	0.180
1/8 x 1-1/2	0.220
1/8 x 2	0.300
3/16 x 1/2	0.113
3/16 x 5/8	0.141
3/16 x 3/4	0.169
3/16 x 1	0.225
3/16 x 1-1/4	0.281
3/16 x 1-1/2	0.338
3/16 x 2	0.450
1/4 x 1/2	0.150
1/4 x 5/8	0.188
1/4 x 3/4	0.225
1/4 x 7/8	0.263
1/4 x 1	0.300
1/4 x 1-1/4	0.375
1/4 x 1-1/2	0.450
1/4 x 2	0.600
1/4 x 2-1/2	0.750
1/4 x 3	0.909
1/4 x 4	1.200
5/16 x 1/2	0.188
5/16 x 5/8	0.234
5/16 x 3/4	0.281
5/16 x 1	0.375
5/16 x 1-1/2	0.563
5/16 x 2	0.750
3/8 x 1/2	0.225
3/8 x 5/8	0.281
3/8 x 3/4	0.338
3/8 x 1	0.455
3/8 x 1-1/4	0.563
3/8 x 1-1/2	0.675
3/8 x 1-3/4	0.788
3/8 x 2	0.909
3/8 x 2-1/2	1.136
3/8 x 3	1.350

Bar Size (inches)	Weight (lbs./foot)
1/2 x 5/8	0.379
1/2 x 3/4	0.455
1/2 x 7/8	0.525
1/2 x 1	0.606
1/2 x 1-1/4	0.758
1/2 x 1-1/2	0.909
1/2 x 1-3/4	1.061
1/2 x 2	1.212
1/2 x 2-1/4	1.350
1/2 x 2-1/2	1.515
1/2 x 3	1.818
1/2 x 4	2.424
1/2 x 6	3.363
5/8 x 3/4	0.551
5/8 x 7/8	0.656
5/8 x 1	0.758
5/8 x 1-1/4	0.947
5/8 x 1-1/2	1.136
5/8 x 2	1.515
3/4 x 1	0.909
3/4 x 1-1/4	1.136
3/4 x 1-1/2	1.364
3/4 x 1-3/4	1.591
3/4 x 2	1.818
3/4 x 2-1/2	2.273
3/4 x 3	2.727
3/4 x 3-1/2	3.182
3/4 x 4	3.636
3/4 x 6	5.454
1 x 1-1/4	1.515
1 x 1-1/2	1.818
1 x 1-3/4	2.100
1 x 2	2.424
1 x 2-1/2	3.030
1 x 3	3.636
1 x 3-1/2	4.190
1 x 4	4.848
1 x 5	5.990
1 x 6	7.272

Bar Size (inches)	Weight (lbs./foot)
1-1/4 x 1-1/2	2.250
1-1/4 x 2	3.000
1-1/4 x 2-1/4	3.375
1-1/4 x 2-1/2	3.750
1-1/4 x 3	4.500
1-1/4 x 4	6.000
1-1/2 x 2	3.600
1-1/2 x 2-1/2	4.500
1-1/2 x 3	5.400
1-1/2 x 3-1/2	6.300
1-1/2 x 4	7.200
1-1/2 x 5	9.000
1-1/2 x 6	10.800
1-1/2 x 8	14.400
1-3/4 x 2	4.200
1-3/4 x 3	6.300
1-3/4 x 4	8.400
2 x 2-1/4	5.400
2 x 2-1/2	6.000
2 x 3	7.272
2 x 3-1/2	8.400
2 x 4	9.600
2 x 5	12.000
2 x 6	14.400
2-1/4 x 4	10.80
2-1/2 x 3	9.00
2-1/2 x 4	12.00
2-1/2 x 4-1/2	13.50
2-1/2 x 5	15.00
2-1/2 x 6	18.00
2-3/4 x 4	13.20
3 x 4	14.40
3 x 5	18.00
3 x 6	21.60

Aluminum Rounds, 6061-T651

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/8 • Stock Lengths: 12 foot

Diameter (inches)	Approx Wt. (lbs./foot)
1/8*	.014
5/32*	.023
11/64*	.027
3/16*	.033
13/64*	.038
7/32*	.044
15/64*	.051
1/4*	.058
17/64*	.065
9/32*	.073
5/16*	.090
11/32*	.109
3/8*	.130
25/64*	.141
13/32*	.152
7/16*	.177
15/32*	.203
1/2	.231
17/32	.261
35/64	.276
9/16	.292
19/32	.325
5/8	.361
21/32	.398
11/16	.436
23/32	.477
3/4	.519
25/32	.564
13/16	.609
7/8	.707
29/32	.758

Diameter (inches)	Approx Wt. (lbs./foot)
15/16	0.811
31/32	0.866
1	0.923
1-1/32	0.982
1-1/16	1.042
1-3/32	1.104
1-1/8	1.168
1-5/32	1.234
1-3/16	1.302
1-7/32	1.371
1-1/4	1.442
1-9/32	1.515
1-5/16	1.590
1-3/8	1.745
1-7/16	1.908
1-1/2	2.077
1-9/16	2.254
1-5/8	2.438
1-11/16	2.629
1-3/4	2.827
1-13/16	3.033
1-7/8	3.245
1-15/16	3.465
2	3.693
2-1/16	3.927
2-1/8	4.169
2-3/16	4.417
2-1/4	4.673
2-5/16	4.937
2-3/8	5.207
2-7/16	5.485

Diameter (inches)	Approx Wt. (lbs./foot)
2-1/2	5.770
2-9/16	6.062
2-5/8	6.361
2-3/4	6.981
2-7/8	7.630
3	8.308
3-1/8	9.015
3-1/4	9.751
3-5/16	10.130
3-3/8	10.515
3-1/2	11.309
3-3/4	12.982
4	14.771
4-1/4	16.675
4-1/2	18.694
4-3/4	20.828
5	23.079
5-1/4	25.445
5-1/2	27.926
5-3/4	30.522
6	33.234
6-1/8	34.633
6-1/4	36.061
6-1/2	39.004
6-3/4	42.061
7	45.235
7-1/2	51.928
8	59.082

**Temper T6*

Aluminum Hexagons, 6061-T651

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/8 • Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1/4*	.064
9/32	.081
3/8*	.143
7/16*	.195
1/2	.255
9/16	.322
5/8	.398
11/16	.482
3/4	.573
13/16	.673
7/8	.780
15/16	0.896
1	1.019
1-1/16	1.151
1-1/8	1.290
1-3/16	1.437
1-1/4	1.593
1-5/16	1.756
1-3/8	1.927
1-7/16	2.106
1-1/2	2.293
1-9/16	2.488
1-5/8	2.691
1-11/16	2.902
1-3/4	3.121
1-7/8	3.583
2	4.077
2-1/8	4.602
2-1/4	5.160
2-1/2	6.370
2-3/4	7.708
3	9.173

**Temper T6*

Aluminum Rounds, 6262-T9

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/10 • Stock Lengths: 12 foot

Diameter (inches)	Approx Wt. (lbs./foot)
1/8	.014
5/32	.023
11/64	.027
3/16	.032
13/64	.038
7/32	.044
15/64	.051
1/4	.058
17/64	.065
9/32	.073
5/16	.090
11/32	.109
3/8	.130
25/64	.141
13/32	.152
7/16	.177
15/32	.203
1/2	.231
17/32	.261
35/64	.276
9/16	.292
19/32	.325
5/8	.361
21/32	.398
11/16	.436
23/32	.477
3/4	.519
25/32	.563
13/16	.609
7/8	.707
29/32	.758
15/16	.811
31/32	.866
1	.923
1-1/32	.980
1-1/16	1.042
1-3/32	1.104
1-1/8	1.168
1-5/32	1.234
1-3/16	1.302
1-7/32	1.371
1-1/4	1.442
1-9/32	1.515
1-5/16	1.590
1-3/8	1.745
1-7/16	1.908
1-1/2	2.077
1-9/16	2.254
1-5/8	2.438
1-11/16	2.629
1-3/4	2.827
1-13/16	3.033
1-7/8	3.245
1-15/16	3.465
2	3.693
2-1/16	3.927
2-1/8	4.169
2-3/16	4.417
2-1/4	4.673
2-5/16	4.937
2-3/8	5.207
2-7/16	5.485
2-1/2	5.770
2-9/16	6.062
2-5/8	6.361
2-3/4	6.981
2-7/8	7.630
3	8.308
3-1/8	9.015
3-1/4	9.751
3-5/16	10.130
3-3/8	10.515

Aluminum Hexagons, 6262-T9

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/10 • Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1/4	.064
3/8	.143
7/16	.195
1/2	.255
9/16	.322
5/8	.398
11/16	.482
3/4	.573
13/16	.673
7/8	.780

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
15/16	0.896
1	1.019
1-1/16	1.151
1-1/8	1.290
1-3/16	1.437
1-1/4	1.593
1-5/16	1.756
1-3/8	1.927
1-7/16	2.106
1-1/2	2.293

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1-9/16	2.488
1-5/8	2.691
1-11/16	2.902
1-3/4	3.121
1-7/8	3.583
2	4.077

Aluminum Squares, 7075-T651

Cold Finished Square Bar

ASTM-B211, AMS-QQ-A-225/9 • Stock Lengths: 12 foot

Size (inches)	Approx Wt. (lbs./lineal ft.)
1/4	.075
3/8	.169
7/16	.230
1/2	.300
9/16	.379
5/8	.478
3/4	.675

Size (inches)	Approx Wt. (lbs./lineal ft.)
7/8	0.919
1	1.200
1-1/8	1.519
1-1/4	1.875
1-1/2	2.700
1-3/4	3.675
2	4.800

Size (inches)	Approx Wt. (lbs./lineal ft.)
2-1/4	5.954
2-1/2	7.575
2-3/4	9.185
3	10.800
3-1/4	12.675
3-1/2	14.700
4	19.240

Aluminum Rounds, 7075-T651

Standard Screw Machine Stock, Cold Finished

ASTM-B211, AMS-QQ-A-225/9 • Stock Lengths: 12 foot

Diameter (inches)	Approx Wt. (lbs./foot)
1/8*	.0150
5/32*	.0232
11/64*	.0281
3/16*	.0334
13/64*	.0393
7/32*	.0455
15/64*	.0523
1/4*	.0595
17/64*	.0671
9/32*	.0753
5/16*	.0929
11/32*	.1124
3/8*	.1338
25/64*	.1452
13/32*	.1570
7/16*	.1821
15/32*	.2091
1/2*	.2379
17/32*	.2685
35/64*	.2845
9/16*	.3010
19/32*	.3354
5/8	.3716
21/32	.4097
11/16	.4497
23/32	.4915
3/4	.5352
25/32	.5807
13/16	.6281
7/8	.7284

Diameter (inches)	Approx Wt. (lbs./foot)
29/32	.7814
15/16	.8362
31/32	.8929
1	.9514
1-1/32	1.0120
1-1/16	1.0741
1-3/32	1.1382
1-1/8	1.2041
1-5/32	1.2720
1-3/16	1.3417
1-7/32	1.4132
1-1/4	1.4866
1-9/32	1.5618
1-5/16	1.6390
1-3/8	1.7988
1-7/16	1.9660
1-1/2	2.1407
1-9/16	2.3228
1-5/8	2.5123
1-11/16	2.7093
1-3/4	2.9137
1-13/16	3.1256
1-7/8	3.3448
1-15/16	3.5715
2	3.8057
2-1/16	4.0473
2-1/8	4.2963
2-3/16	4.5527
2-1/4	4.8166
2-5/16	5.0879

Diameter (inches)	Approx Wt. (lbs./foot)
2-3/8	5.3666
2-7/16	5.6528
2-1/2	5.9464
2-9/16	6.2474
2-5/8	6.5559
2-3/4	7.1951
2-7/8	7.8641
3	8.5628
3-1/8	9.2912
3-1/4	10.0494
3-5/16	10.4396
3-3/8	10.8373
3-1/2	11.6549
3-5/8	12.5023
3-3/4	13.3793
4	15.2227
4-1/4	17.1850
4-1/2	19.2663
4-3/4	21.4664
5	23.7855
5-1/4	26.2235
5-1/2	28.7805
5-3/4	31.4563
6	34.2511
6-1/2	40.1980
7	46.6196
7-1/2	53.5170
8	60.8909

**Temper T6*

Aluminum Rectangles, 7075-T6

Cold Finished Rectangular Bar Stock

ASTM-B221, AMS-QQ-A-225/9 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
1/8 x 1/2	.076
1/8 x 5/8	.095
1/8 x 3/4	.114
1/8 x 1	.152
1/8 x 1-1/4	.190
1/8 x 1-3/8	.209
1/8 x 1-1/2	.227
1/8 x 1-3/4	.265
1/8 x 2	.303
1/8 x 2-1/2	.379
1/8 x 3	.455
1/8 x 3-1/2	.531
1/8 x 4	.607
1/8 x 5	.758
1/8 x 6	.910
3/16 x 1/2	.114
3/16 x 5/8	.142
3/16 x 3/4	.171
3/16 x 7/8	.199
3/16 x 1	.227
3/16 x 1-1/4	.284
3/16 x 1-1/2	.341
3/16 x 1-3/4	.398
3/16 x 2	.455
3/16 x 2-1/4	.512
3/16 x 2-1/2	.569
3/16 x 3	.682
3/16 x 3-1/2	.796
3/16 x 4	.910
3/16 x 5	1.137
3/16 x 6	1.365
3/16 x 12	2.730
1/4 x 3/8	.114
1/4 x 1/2	.152
1/4 x 5/8	.190
1/4 x 3/4	.227
1/4 x 7/8	.265
1/4 x 1	.303
1/4 x 1-1/4	.379
1/4 x 1-1/2	.455
1/4 x 1-3/4	.531
1/4 x 2	.607
1/4 x 2-1/4	.682
1/4 x 2-1/2	.758
1/4 x 2-3/4	.834
1/4 x 3	.910
1/4 x 3-1/4	.986
1/4 x 3-1/2	1.062
1/4 x 4	1.213

Bar Size (inches)	Weight (lbs./foot)
1/4 x 4-1/2	1.365
1/4 x 5	1.517
1/4 x 5-1/2	1.668
1/4 x 6	1.820
1/4 x 7	2.123
1/4 x 8	2.426
1/4 x 9	2.730
1/4 x 9-1/2	2.881
1/4 x 10	3.033
1/4 x 12	3.640
5/16 x 1/2	.190
5/16 x 5/8	.237
5/16 x 3/4	.284
5/16 x 1	.379
5/16 x 1-1/4	.474
5/16 x 1-1/2	.569
5/16 x 1-3/4	.663
5/16 x 2	.758
5/16 x 2-1/2	.948
5/16 x 2-3/4	1.043
5/16 x 3	1.137
5/16 x 4	1.517
5/16 x 6	2.275
3/8 x 1/2	.227
3/8 x 5/8	.284
3/8 x 3/4	.341
3/8 x 7/8	.398
3/8 x 1	.455
3/8 x 1-1/4	.569
3/8 x 1-1/2	.682
3/8 x 1-3/4	.796
3/8 x 2	.910
3/8 x 2-1/4	1.024
3/8 x 2-1/2	1.137
3/8 x 2-3/4	1.251
3/8 x 3	1.365
3/8 x 3-1/4	1.479
3/8 x 3-1/2	1.592
3/8 x 4	1.820
3/8 x 4-1/4	1.934
3/8 x 4-1/2	2.047
3/8 x 5	2.275
3/8 x 6	2.730
3/8 x 7	3.185
3/8 x 8	3.640
3/8 x 9	4.095
3/8 x 10	4.550
3/8 x 11	5.004
3/8 x 12	5.459
3/8 x 14	6.369

Bar Size (inches)	Weight (lbs./foot)
1/2 x 1	.607
1/2 x 1-1/4	.758
1/2 x 1-3/8	.834
1/2 x 1-1/2	.910
1/2 x 1-5/8	.986
1/2 x 1-3/4	1.062
1/2 x 1-7/8	1.137
1/2 x 2	1.213
1/2 x 2-1/4	1.365
1/2 x 2-1/2	1.517
1/2 x 2-3/4	1.668
1/2 x 3	1.820
1/2 x 3-1/4	1.971
1/2 x 3-1/2	2.123
1/2 x 3-3/4	2.275
1/2 x 4	2.426
1/2 x 4-1/2	2.730
1/2 x 5	3.033
1/2 x 5-1/2	3.336
1/2 x 6	3.640
1/2 x 6-1/2	3.943
1/2 x 7	4.246
1/2 x 7-1/2	4.550
1/2 x 8	4.853
1/2 x 9	5.459
1/2 x 10	6.066
1/2 x 12	7.279
1/2 x 14	8.492
5/8 x 3/4	.569
5/8 x 1	.758
5/8 x 1-1/4	.948
5/8 x 1-1/2	1.137
5/8 x 1-3/4	1.327
5/8 x 2	1.517
5/8 x 2-1/2	1.896
5/8 x 3	2.275
5/8 x 3-1/2	2.654
5/8 x 4	3.023
5/8 x 4-1/2	3.412
5/8 x 5	3.791
5/8 x 6	4.550
5/8 x 7	5.308
5/8 x 8	6.066
5/8 x 9	6.824
5/8 x 10	7.582
5/18 x 12	9.099

Aluminum Rectangles, 7075-T6

Cold Finished Rectangular Bar Stock

ASTM-B221, AMS-QQ-A-225/9 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
3/4 x 1	0.910
3/4 x 1-1/4	1.137
3/4 x 1-1/2	1.365
3/4 x 1-3/4	1.592
3/4 x 2	1.820
3/4 x 2-1/4	2.047
3/4 x 2-1/2	2.275
3/4 x 2-3/4	2.502
3/4 x 3	2.730
3/4 x 3-1/2	3.185
3/4 x 4	3.640
3/4 x 4-1/2	4.095
3/4 x 5	4.550
3/4 x 6	5.459
3/4 x 6-1/2	5.914
3/4 x 7	6.369
3/4 x 7-1/2	6.824
3/4 x 8	7.279
3/4 x 9	8.189
3/4 x 10	9.099
3/4 x 12	10.919
3/4 x 14	12.739
1 x 1-1/4	1.517
1 x 1-1/2	1.820
1 x 1-3/4	2.123
1 x 2	2.426
1 x 2-1/4	2.730
1 x 2-1/2	3.033
1 x 2-3/4	3.336
1 x 3	3.640
1 x 3-1/2	4.246
1 x 4	4.853
1 x 4-1/2	5.459
1 x 5	6.066
1 x 6	7.279
1 x 7	8.492
1 x 8	9.706
1 x 9	10.919
1 x 10	12.132
1 x 12	14.558
1 x 14	16.985
1-1/8 x 2	2.760
1-3/16 x 2-3/8	3.422
1-3/16 x 2-7/8	4.142
1-3/16 x 3-3/8	4.862
1-1/4 x 1-1/2	2.275
1-1/4 x 1-5/8	2.464
1-1/4 x 1-3/4	2.654
1-1/4 x 2	3.033
1-1/4 x 2-1/4	3.412

Bar Size (inches)	Weight (lbs./foot)
1-1/4 x 2-1/2	3.791
1-1/4 x 3	4.550
1-1/4 x 3-1/4	4.929
1-1/4 x 3-1/2	5.308
1-1/4 x 3-3/4	5.687
1-1/4 x 4	6.066
1-1/4 x 4-1/2	6.824
1-1/4 x 5	7.583
1-1/4 x 5-1/2	8.341
1-1/4 x 6	9.099
1-1/4 x 6-1/2	9.857
1-1/4 x 7	10.616
1-1/4 x 7-1/2	11.374
1-1/4 x 8	12.132
1-1/4 x 8-1/2	12.890
1-1/4 x 10	15.165
1-1/4 x 12	18.198
1-1/2 x 1-3/4	3.185
1-1/2 x 2	3.640
1-1/2 x 2-1/4	4.095
1-1/2 x 2-1/2	4.550
1-1/2 x 2-3/4	5.000
1-1/2 x 3	5.459
1-1/2 x 3-1/4	5.914
1-1/2 x 3-1/2	6.369
1-1/2 x 4	7.279
1-1/2 x 4-1/4	7.734
1-1/2 x 4-1/2	8.189
1-1/2 x 5	9.099
1-1/2 x 5-1/2	10.009
1-1/2 x 6	10.919
1-1/2 x 6-1/2	11.829
1-1/2 x 8	14.558
1-1/2 x 8-1/2	15.468
1-1/2 x 10	18.198
1-1/2 x 12	21.838
1-1/2 x 14	25.477
1-3/4 x 2	4.246
1-3/4 x 2-1/2	5.308
1-3/4 x 3	6.369
1-3/4 x 3-1/2	7.431
1-3/4 x 3-3/4	7.962
1-3/4 x 4	8.492
1-3/4 x 4-1/2	9.554
1-3/4 x 5	10.616
1-3/4 x 5-1/2	11.677
1-3/4 x 6	12.739
2 x 2-1/4	5.459
2 x 2-1/2	6.066
2 x 3	7.279

Bar Size (inches)	Weight (lbs./foot)
2 x 3-1/2	8.492
2 x 4	9.706
2 x 4-1/2	10.919
2 x 5	12.132
2 x 6	14.558
2 x 6-1/2	15.772
2 x 8	19.411
2 x 8-1/2	20.624
2 x 10	24.264
2 x 12	29.117
2 x 14	33.970
2-1/4 x 2-1/2	6.824
2-1/4 x 2-3/4	7.507
2-1/4 x 3	8.189
2-1/4 x 3-1/2	9.554
2-1/4 x 4	10.919
2-1/4 x 4-1/2	12.284
2-1/4 x 5	13.649
2-1/4 x 5-1/2	15.013
2-1/2 x 2-3/4	8.341
2-1/2 x 3	9.099
2-1/2 x 3-1/4	9.857
2-1/2 x 3-1/2	10.616
2-1/2 x 4	12.132
2-1/2 x 4-1/2	13.649
2-1/2 x 5	15.165
2-1/2 x 5-1/2	16.682
2-1/2 x 6	18.198
2-3/4 x 3	10.009
2-3/4 x 3-1/4	10.843
2-3/4 x 3-1/2	11.677
2-3/4 x 4-1/4	14.179
3 x 3-1/2	12.739
3 x 4	14.558
3 x 4-1/2	16.378
3 x 5	18.198
3 x 6	21.838
3-1/2 x 4	16.985
3-1/2 x 4-1/2	19.108
3-1/2 x 5	21.231
3-1/2 x 6	25.477
3-1/2 x 7	29.723
4 x 4-1/2	21.838
4 x 5	24.264
4 x 6	29.117
4-1/2 x 5	27.297
4-1/2 x 6	32.756
5 x	36.396

Rod, Bar & Wire - Cold Finished

Standard Tolerances

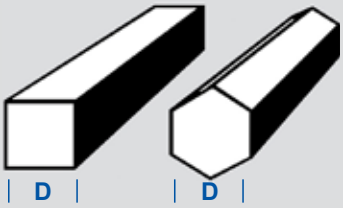
Diameter Tolerances

Cold Finished Round Wire and Rod

Specified Dia. (inches)	Tolerance - Plus and Minus (in inches) Allowable Deviation from Specified Diameter			
	Drawn Wire	Cold Finish Rod	Rolled Rod	
			Plus	Minus
Up thru 0.035	.0005	---	---	---
0.036 - 0.064	.0010	---	---	---
0.065 - 0.374	.0015	---	---	---
0.375 - 0.500	---	.0015	---	---
0.501 - 1.000	---	.0020	---	---
1.001 - 1.500	---	.0025	---	---
1.501 - 2.000	---	.0040	.006	.006
2.001 - 3.000	---	.0060	.008	.008
3.001 - 3.499	---	.0080	.012	.012
3.500 - 5.000	---	.0120	.031	.016
5.001 - 6.000	---	.0200	.062	.031
6.001 - 7.000	---	.0250	---	---
7.001 - 8.000	---	.0300	---	---

Distance Across Flats

Square, Hexagonal and Octagonal Wire and Bar

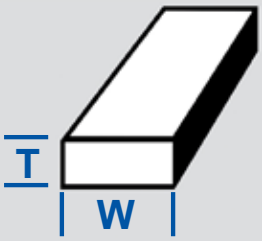
Specified Distance Across Flats (inches)	Tolerances (inches) Plus or Minus (Allowable Deviation from Specified Distance Across Flats)		
	Drawn Wire	Cold Finished Bar	Rolled Bar
Up thru 0.035	.0010	---	---
0.036 - 0.064	.0015	---	---
0.065 - 0.374	.0020	---	---
0.375 - 0.500	---	.0020	---
0.501 - 1.000	---	.0025	---
1.001 - 1.500	---	.0030	---
1.501 - 2.000	---	.0050	.0016
2.001 - 3.000	---	.0080	.0020
3.001 - 4.000	---	---	.0020

Rod, Bar & Wire - Cold Finished

Standard Tolerances

Thickness & Width Tolerances

Rectangular Wire and Bar

Specified Thickness or Width (inches) 	Tolerance Plus and Minus (inches)	
	Allowable Deviation from Specified Thickness and Width	
	Drawn Wire and Cold Finished Bar	
	Thickness	Width
Up thru 0.035	.0010	---
0.036 - 0.064	.0015	---
0.065 - 0.500	.0020	.0020
0.501 - 0.750	.0025	.0025
0.751 - 1.000	.0025	.0025
1.001 - 1.500	.0030	.0030
1.501 - 2.000	.0050	.0050
2.001 - 3.000	.0080	.0080
3.001 - 4.000	---	.0100

Aluminum

Extruded Product Offerings

- Round Bar
- Hexagons
- Squares
- Flat Bar
- Angles
- Channels
- I-Beams
- Square Tubing
- Rectangular Tubing
- Round Pipe
- Round Tubing

Alloy Descriptions and Applications

2024 – Used principally for structural members in aircraft construction for high-strength tube. Similar to 2014 in behavior and strength. Can be spot welded.

6061 – Transportation, structural pipe, furniture applications. Most versatile of heat-treatable group. Will take considerable forming in T4 temper. Good resistance to corrosion. Widely used for structural tube, handrails and baggage racks where moderate strength is required.

6063 – Has best all-around extruding properties. Can be used for comparatively intricate sections; excellent for hollow extrusions and architectural applications. Takes a good surface finish, is corrosion resistant and can be anodized. Its strength, as extruded, is somewhat higher than that of 3003. It can be precipitation heat-treated to strengths just under 6061 alloy. In tube form it is used for irrigation pipe, furniture, electrical conduit, and handrails.

6262 – High machinability and finishability with good chip-forming characteristics; substitute for 2011 in some applications; strength same as 6061.

7075 – Used for aircraft structural members when extra strength is required. Can be formed by regular methods but requires more care and precision. Can be spot welded but not fusion welded.

Aluminum Rounds, 6061-T6511

Extruded Aluminum Rounds

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths:

Diameter (inches)	Approx Wt. (lbs./foot)
1/4	.058
5/16	.090
11/32	.109
3/8	.130
7/16	.177
15/32	.202
1/2	.231
9/16	.292
5/8	.361
11/16	.437
3/4	.520
13/16	.609
7/8	.707
15/16	.813
1	.924
1-1/16	1.042
1-1/8	1.169
1-3/16	1.304
1-1/4	1.443
1-5/16	1.590
1-3/8	1.746
1-7/16	1.910
1-1/2	2.078
1-9/16	2.254
1-5/8	2.439
1-11/16	2.632
1-3/4	2.829
1-13/16	3.033
1-7/8	3.247
1-15/16	3.494
2	3.695
2-1/16	4.060
2-1/8	4.171
2-1/4	4.676

Diameter (inches)	Approx Wt. (lbs./foot)
2-5/16	4.941
2-3/8	5.210
2-1/2	5.773
2-9/16	6.067
2-5/8	6.364
2-3/4	6.985
2-7/8	7.635
3	8.313
3-1/8	9.020
3-1/4	9.756
3-3/8	10.521
3-1/2	11.314
3-5/8	12.137
3-3/4	12.989
3-7/8	13.869
4	14.778
4-1/8	15.716
4-1/4	16.683
4-3/8	17.679
4-1/2	18.703
4-5/8	19.757
4-3/4	20.839
5	23.091
5-1/16	23.667
5-1/4	25.458
5-1/2	27.940
5-5/8	29.224
5-3/4	30.537
6	33.251
6-1/8	34.650
6-1/4	36.079
6-3/8	37.537
6-1/2	39.023
6-3/4	42.083

Diameter (inches)	Approx Wt. (lbs./foot)
7	45.258
7-1/4	48.590
7-1/2	51.954
7-3/4	55.475
8	59.112
8-1/8	60.974
8-1/4	62.864
8-1/2	66.732
9*	74.814
9-1/4*	79.028
9-1/2*	83.357
10*	92.363
10-1/8*	94.686
10-1/2*	101.830
11*	111.759
11-1/2*	122.150
12*	133.002
12-1/8*	135.790
12-1/2*	148.966
13*	155.990
14*	181.032
15*	207.900
16*	236.500
17*	266.793
18*	299.104
19*	333.431
20*	369.452
21*	407.321
22*	447.037
23*	488.600
24*	532.011
25*	577.269
26*	624.056

**Temper T6*

Aluminum Rounds, Extruded

6262-T6511, 6042-T5511 and 6064-T6511

ASTM-B221

6042 and 6064 are Rohs compliant extruded 6000 series alloys.
6042 and 6064 are controlled lead alloys that offer improved machinability ratings over 6061 as well as good corrosion resistance. Both have similar machinability characteristics when compared to 6262, but are Rohs and IMDS/ELV compliant and can be used in place of 6262 extruded products.

Diameter (inches)	Approx Wt. (lbs./foot)	Diameter (inches)	Approx Wt. (lbs./foot)	Diameter (inches)	Approx Wt. (lbs./foot)
5/16	.090	1	.923	1-3/4	2.829
3/8	.129	1-1/32	.982	1-7/8	3.247
7/16	.177	1-1/16	1.042	2	3.695
1/2	.230	1-1/8	1.168	2-1/8	4.171
9/16	.292	1-3/16	1.304	2-1/4	4.676
5/8	.361	1-1/4	1.443	2-3/8	5.210
11/16	.437	1-9/32	1.516	2-1/2	5.773
3/4	.519	1-5/16	1.590	2-5/8	6.364
13/16	.609	1-3/8	1.746	2-3/4	6.985
7/8	.707	1-1/2	2.078	3	8.313
15/16	.813	1-5/8	2.439		

Note: Rounds over 3" diameter are availble by request, please inquire with your Alro representative.

Aluminum Rounds, 6061-T6/T6511

Extruded Rounds vs Cold Finished Rounds

Comparison of Tolerances*

Diameter Sizes (inches)	** Close Tolerance Extruded Rod	Cold Finished Tolerances	Diameter Sizes (inches)	** Close Tolerance Extruded Rod	Cold Finished Tolerances
.375 - .500	.005	.005	3.500 - 3.750	.012	.0120
.501 - 1.000	.004	.004	3.751 - 5.000	.017	.0200
1.001 - 1.500	.005	.005	5.001 - 5.750	.017	.0200
1.501 - 1.938	.005	.005	5.751 - 6.000	.022	.0250
1.939 - 2.000	.008	.008	6.001 - 7.000	.022	.0250
2.001 - 3.000	.008	.008	7.001 - 7.500	.022	.0300
3.001 - 3.499	.012	.012	7.501 - 8.000	.027	.0300

All tolerances shown are plus or minus.
****Also available in precision tolerances 1/3 to 1/4 normal.***

Aluminum Rounds, Extruded

6061-T6/T6511 and 6262-T6511

Comparison of Mechanical Properties

	Alloy and Temper	Minimum Tension		
		Strength (psi)		Elongation % in 2"
		Ultimate	Yield	
Commercial	6061-T6, -T6511	38,000	35,000	17*
Extrusion :	6262-T6, -T6511	38,000	35,000	17*
Cold Finish :	6061-T6, -T651	42,000	35,000	17*
	6262-T6, -T651	42,000	35,000	17*

** 1/2" diameter specimen*

Typical Physical Properties

	Alloy and Temper	Specific Gravity	Density	Electrical Conductivity % IACS
Commercial	6061-T6, -T6511	2.70	0.098	43
Extrusion :	6262-T6, -T6511	2.72	0.098	44
Cold Finish :	6061-T6, -T651	2.70	0.098	43
	6262-T6, -T651	2.72	0.098	44

Two page charts, continues on next page

Precision Tolerance Extruded Rounds are produced in 6061 and 6262 alloys, both fully certified and available in a choice of -T6 or -T6511 tempers. Chamfer available on one end. Precision Tolerance Extruded Rounds are designed to perform with outstanding mechanical and physical properties, please refer to above charts for results.

Aluminum Rounds, Extruded

6061-T6/T6511 and 6262-T6511

Comparison of Mechanical Properties

	Alloy and Temper	Typical Hardness Brinell #, 500 kg load, 10 mm ball	Typical Shear Shearing Strength (psi)
Commercial	6061-T6, -T6511	95	30,000
Extrusion :	6262-T6, -T6511	95	30,000
Cold Finish :	6061-T6, -T651	95	30,000
	6262-T6, -T651	95	30,000

Typical Physical Properties

	Electrical Resistivity microhm.xm	Thermal Conductivity		Average coefficient of thermal expansion per oF (1 million times actual value)	
		at 77°F	at 25°C CGS Units	-58° to 48°F	68° to 212°F
Commercial	24	1160	0.40	12.20	13.10
Extrusion :	24	1160	0.41	12.20	13.00
Cold Finish :	24	1160	0.40	12.20	13.10
	24	1160	0.41	12.20	13.00

Two page charts, continued from previous page

Precision Tolerance Extruded Rounds are produced in 6061 and 6262 alloys, both fully certified and available in a choice of -T6 or -T6511 tempers. Chamfer available on one end. Precision Tolerance Extruded Rounds are designed to perform with outstanding mechanical and physical properties, please refer to above charts for results.

Aluminum Rounds, Extruded

6061-T6/T6511 and 6262-T6511, Precision Tolerance

Comparison of Aluminum Alloys[1]

	Alloy and Temper	Machinability[2]	Cold Forming Capacity	Anodizing Response
Precision Tolerance Extruded Rounds	6061-T6, -T6511 6262-T6, -T6511	C B	C C	A A
Commercial Extrusion :	6061-T6, -T6511 6262-T6, -T6511	C B	C C	A A
Cold Finish :	6061-T6, -T651 6262-T6, -T651	C B	C C	A A

	Alloy and Temper	Brazeability	Weldability (ARC)	Corrosion Resistance	Stress Corrosion[3] Crack Resist.
Prec. Tolerance Ext. Rounds	6061-T6, -T6511 6262-T6, -T6511	A A	A A	B B	A A
Commercial Extrusion :	6061-T6, -T6511 6262-T6, -T6511	A A	A A	B B	A A
Cold Finish :	6061-T6, -T651 6262-T6, -T651	A A	A A	B B	A A

(1) Except for machinability and resistance to stress-corrosion cracking, the relative ratings are indicated as follows: A - Excellent thru E - Poor ratings are based on aluminum base alloys as a group and are not to be used in comparison with other metals.

(2) A: Free cutting, very small broken chips and excellent finish
B: Curied or easily broken chips and good to excellent finish
C: Continuous chips and good finish

(3) A = No known instances of failure in service or in laboratory tests
B = No known instance of failure in service: laboratory failures only under special conditions
C = Service and laboratory failures under special conditions

Aluminum Hexagons, Extruded

6061-T6/T6511 and 6262-T6511

6061-T6511*, ASTM-B221, AMS-QQ-A-200/8 or 6262-T6511*, ASTM-B221

Stock Lengths: 12 foot

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
3/8	.143
1/2	.250
9/16	.321
5/8	.398
11/16	.482
3/4	.573
13/16	.671
7/8	.780
15/16	.896
1	1.018

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
1-1/16	1.149
1-1/8	1.289
1-1/4	1.591
1-3/8	1.925
1-7/16	2.106
1-1/2	2.292
1-5/8	2.689
1-3/4	3.119
1-7/8	3.580
2	4.074

Distances Across Flat (inches)	Approx Wt. (lbs./foot)
2-1/4	5.156
2-3/8	5.745
2-7/16	6.053
2-1/2	6.365
2-5/8	7.018
2-3/4	7.702
2-7/8	8.418
3	9.166

**Available in T6 Temper*

Aluminum Squares, Extruded

6061-T6511

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths: 12 foot

Size (inches)	Approx Wt. (lbs./lineal ft.)
1/4	.074
5/16	.114
3/8	.165
1/2	.294
5/8	.459
3/4	.662
7/8	.900
1	1.176
1-1/8	1.488
1-1/4	1.838
1-3/8	2.223

Size (inches)	Approx Wt. (lbs./lineal ft.)
1-1/2	2.646
1-5/8	3.105
1-3/4	3.601
1-7/8	4.134
2	4.704
2-1/4	5.954
2-1/2	7.350
2-3/4	8.894
3	10.584
3-1/4	12.422
3-1/2	14.406

Size (inches)	Approx Wt. (lbs./lineal ft.)
3-3/4	16.538
4	18.816
4-1/2	23.814
5	29.400
5-1/2	35.574
6	42.336
6-1/2	49.686
7	57.624
8	75.264
9*	95.252

** 84" maximum length and .062" radius corners.*

Aluminum Rectangles, Extruded

6061-T6511 Rectangular Bars

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
1/8 x 1/2	0.074
1/8 x 5/8	0.092
1/8 x 3/4	0.110
1/8 x 1	0.147
1/8 x 1-1/4	0.184
1/8 x 1-3/8	0.202
1/8 x 1-1/2	0.220
1/8 x 1-3/4	0.257
1/8 x 2	0.294
1/8 x 2-1/2	0.368
1/8 x 3	0.441
1/8 x 3-1/2	0.515
1/8 x 4	0.588
1/8 x 5	0.735
1/8 x 6	0.880
3/16 x 1/2	0.111
3/16 x 5/8	0.138
3/16 x 3/4	0.166
3/16 x 7/8	0.193
3/16 x 1	0.221
3/16 x 1-1/4	0.276
3/16 x 1-1/2	0.332
3/16 x 1-3/4	0.387
3/16 x 2	0.442
3/16 x 2-1/4	0.497
3/16 x 2-1/2	0.553
3/16 x 3	0.663
3/16 x 3-1/2	0.774
3/16 x 4	0.884
3/16 x 5	1.105
3/16 x 6	1.327
3/16 x 12	2.653
1/4 x 3/8	0.110
1/4 x 1/2	0.147
1/4 x 5/8	0.184
1/4 x 3/4	0.220
1/4 x 7/8	0.257
1/4 x 1	0.294
1/4 x 1-1/4	0.368
1/4 x 1-1/2	0.441
1/4 x 1-3/4	0.514
1/4 x 2	0.588
1/4 x 2-1/4	0.662
1/4 x 2-1/2	0.735
1/4 x 2-3/4	0.809

Bar Size (inches)	Weight (lbs./foot)
1/4 x 3	0.882
1/4 x 3-1/4	0.956
1/4 x 3-1/2	1.029
1/4 x 4	1.176
1/4 x 4-1/2	1.323
1/4 x 5	1.470
1/4 x 5-1/2	1.617
1/4 x 6	1.764
1/4 x 7	2.058
1/4 x 8	2.352
1/4 x 9	2.646
1/4 x 9-1/2	2.793
1/4 x 10	2.940
1/4 x 12	3.528
5/16 x 1/2	0.183
5/16 x 5/8	0.229
5/16 x 3/4	0.275
5/16 x 1	0.367
5/16 x 1-1/4	0.459
5/16 x 1-1/2	0.550
5/16 x 1-3/4	0.642
5/16 x 2	0.734
5/16 x 2-1/2	0.917
5/16 x 2-3/4	1.009
5/16 x 3	1.101
5/16 x 4	1.468
5/16 x 6	2.201
3/8 x 1/2	0.221
3/8 x 5/8	0.276
3/8 x 3/4	0.331
3/8 x 7/8	0.386
3/8 x 1	0.441
3/8 x 1-1/4	0.551
3/8 x 1-1/2	0.662
3/8 x 1-3/4	0.772
3/8 x 2	0.882
3/8 x 2-1/4	0.992
3/8 x 2-1/2	1.102
3/8 x 2-3/4	1.213
3/8 x 3	1.323
3/8 x 3-1/4	1.433
3/8 x 3-1/2	1.544
3/8 x 4	1.764
3/8 x 4-1/4	1.874
3/8 x 4-1/2	1.985

Bar Size (inches)	Weight (lbs./foot)
3/8 x 5	2.205
3/8 x 6	2.646
3/8 x 7	3.087
3/8 x 8	3.528
3/8 x 9	3.969
3/8 x 10	4.410
3/8 x 11	4.851
3/8 x 12	5.292
3/8 x 14	6.174
1/2 x 5/8	0.368
1/2 x 3/4	0.441
1/2 x 1	0.588
1/2 x 1-1/4	0.735
1/2 x 1-3/8	0.809
1/2 x 1-1/2	0.882
1/2 x 1-5/8	0.956
1/2 x 1-3/4	1.029
1/2 x 1-7/8	1.103
1/2 x 2	1.176
1/2 x 2-1/4	1.323
1/2 x 2-1/2	1.470
1/2 x 2-3/4	1.617
1/2 x 3	1.764
1/2 x 3-1/4	1.911
1/2 x 3-1/2	2.058
1/2 x 3-3/4	2.205
1/2 x 4	2.352
1/2 x 4-1/2	2.646
1/2 x 5	2.940
1/2 x 5-1/2	3.234
1/2 x 6	3.528
1/2 x 6-1/2	3.822
1/2 x 7	4.116
1/2 x 7-1/2	4.410
1/2 x 8	4.704
1/2 x 9	5.292
1/2 x 10	5.880
1/2 x 12	7.056
1/2 x 14	8.232
5/8 x 3/4	0.551
5/8 x 1	0.735
5/8 x 1-1/4	0.919
5/8 x 1-1/2	1.102
5/8 x 1-3/4	1.286
5/8 x 2	1.470

(Any listed size can be ordered in 6063-T52 alloy and temper.)

Aluminum Rectangles, Extruded

6061-T6511 Rectangular Bars

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
5/8 x 2-1/2	1.838
5/8 x 3	2.205
5/8 x 3-1/2	2.582
5/8 x 4	2.940
5/8 x 4-1/2	3.308
5/8 x 5	3.675
5/8 x 6	4.410
5/8 x 7	5.145
5/8 x 8	5.880
5/8 x 9	6.615
5/8 x 10	7.350
5/8 x 12	8.820
3/4 x 1	0.882
3/4 x 1-1/4	1.102
3/4 x 1-1/2	1.323
3/4 x 1-3/4	1.544
3/4 x 2	1.764
3/4 x 2-1/4	1.984
3/4 x 2-1/2	2.205
3/4 x 2-3/4	2.426
3/4 x 3	2.646
3/4 x 3-1/2	3.087
3/4 x 4	3.528
3/4 x 4-1/2	3.969
3/4 x 5	4.410
3/4 x 6	5.292
3/4 x 6-1/2	5.733
3/4 x 7	6.174
3/4 x 7-1/2	6.615
3/4 x 8	7.056
3/4 x 9	7.938
3/4 x 10	8.820
3/4 x 12	10.584
3/4 x 14	12.348
1 x 1-1/4	1.470
1 x 1-1/2	1.764
1 x 1-3/4	2.058
1 x 2	2.352
1 x 2-1/4	2.646
1 x 2-1/2	2.940
1 x 2-3/4	3.234
1 x 3	3.528
1 x 3-1/4	3.822
1 x 3-1/2	4.116
1 x 4	4.704
1 x 4-1/2	5.292
1 x 5	5.880
1 x 5-1/2	6.468

Bar Size (inches)	Weight (lbs./foot)
1 x 6	7.056
1 x 6-1/2	7.644
1 x 7	8.232
1 x 8	9.408
1 x 9	10.584
1 x 10	11.760
1 x 12	14.112
1 x 14	16.464
1-1/8 x 2	2.646
1-3/16 x 2-3/8	3.319
1-3/16 x 2-7/8	4.017
1-3/16 x 3-3/8	4.711
1-1/4 x 1-1/2	2.205
1-1/4 x 1-5/8	2.389
1-1/4 x 1-3/4	2.572
1-1/4 x 2	2.940
1-1/4 x 2-1/4	3.307
1-1/4 x 2-1/2	3.675
1-1/4 x 3	4.410
1-1/4 x 3-1/4	4.778
1-1/4 x 3-1/2	5.145
1-1/4 x 3-3/4	5.512
1-1/4 x 4	5.880
1-1/4 x 4-1/2	6.615
1-1/4 x 5	7.350
1-1/4 x 5-1/2	8.085
1-1/4 x 6	8.820
1-1/4 x 6-1/2	9.555
1-1/4 x 7	10.289
1-1/4 x 7-1/2	11.025
1-1/4 x 8	11.760
1-1/4 x 8-1/2	12.495
1-1/4 x 10	14.700
1-1/4 x 12	17.640
1-1/2 x 1-3/4	3.087
1-1/2 x 2	3.528
1-1/2 x 2-1/4	3.969
1-1/2 x 2-1/2	4.410
1-1/2 x 2-3/4	4.851
1-1/2 x 3	5.292
1-1/2 x 3-1/4	5.733
1-1/2 x 3-1/2	6.174
1-1/2 x 4	7.056
1-1/2 x 4-1/4	7.497
1-1/2 x 4-1/2	7.938

Bar Size (inches)	Weight (lbs./foot)
1-1/2 x 5	8.820
1-1/2 x 5-1/2	9.702
1-1/2 x 6	10.584
1-1/2 x 6-1/2	11.466
1-1/2 x 7	12.350
1-1/2 x 8	14.112
1-1/2 x 8-1/2	14.994
1-1/2 x 9	15.876
1-1/2 x 10	17.640
1-1/2 x 12	21.168
1-1/2 x 14	24.696
1-3/4 x 2	4.116
1-3/4 x 2-1/2	5.145
1-3/4 x 3	6.174
1-3/4 x 3-1/2	7.203
1-3/4 x 3-3/4	7.717
1-3/4 x 4	8.232
1-3/4 x 4-1/2	9.261
1-3/4 x 5	10.290
1-3/4 x 5-1/2	11.319
1-3/4 x 6	12.348
2 x 2-1/4	5.292
2 x 2-1/2	5.880
2 x 3	7.056
2 x 3-1/2	8.232
2 x 4	9.408
2 x 4-1/2	10.584
2 x 5	11.760
2 x 6	14.100
2 x 6-1/2	15.288
2 x 7	16.464
2 x 8	18.816
2 x 8-1/2	19.992
2 x 9	21.168
2 x 10	23.520
2 x 12	28.224
2 x 14	32.928
2-1/4 x 2-1/2	6.615
2-1/4 x 2-3/4	7.276
2-1/4 x 3	7.938
2-1/4 x 3-1/2	9.261
2-1/4 x 4	10.584
2-1/4 x 4-1/2	11.907
2-1/4 x 5	13.230
2-1/4 x 5-1/2	14.553

(Any listed size can be ordered in 6063-T52 alloy and temper.)

Aluminum Rectangles, Extruded

6061-T6511 Rectangular Bars

ASTM-B221, AMS-QQ-A-200/8 • **Stock Lengths: 12 foot**

Bar Size (inches)	Weight (lbs./foot)
2-1/2 x 2-3/4	8.085
2-1/2 x 3	8.820
2-1/2 x 3-1/4	9.555
2-1/2 x 3-1/2	10.290
2-1/2 x 4	11.760
2-1/2 x 4-1/2	13.230
2-1/2 x 5	14.700
2-1/2 x 5-1/2	16.170
2-1/2 x 6	17.640
2-1/2 x 8	23.712
2-3/4 x 3	9.702
2-3/4 x 3-1/4	10.511
2-3/4 x 3-1/2	11.319
2-3/4 x 4-1/4	13.744
2-3/4 x 5-1/4	17.011

Bar Size (inches)	Weight (lbs./foot)
3 x 3-1/2	12.348
3 x 4	14.112
3 x 4-1/2	15.876
3 x 5	17.640
3 x 6	21.168
3 x 8	28.433
3-1/2 x 4	14.464
3-1/2 x 4-1/2	18.522
3-1/2 x 5	20.580
3-1/2 x 6	24.696
3-1/2 x 7	28.812
3-1/2 x 10	41.159
4 x 4-1/2	21.168
4 x 5	23.520
4 x 6	28.224
4 x 7	32.930
4 x 8	37.919

Bar Size (inches)	Weight (lbs./foot)
4-1/2 x 5	26.460
4-1/2 x 5-1/2	29.306
4-1/2 x 6	32.400
4-1/2 x 8-3/4	46.623
5 x 5-1/2	32.550
5 x 6	35.280
5 x 7	41.430
5 x 8	47.358
5-1/2 x 6	39.071
5-1/2 x 8	52.078
6 x 6-1/2	46.188
6 x 7	49.729
6 x 8	56.846

(Any listed size can be ordered in 6063-T52 alloy and temper.)

Aluminum 6061-T6511, Extruded

Manifold Quality

Manifold quality is a precision extruded aluminum product for high speed machining, offering extra tight tolerances, improved straightness, reduced twist, and elevated minimum mechanical properties. Typical applications include fluid power, hydraulic & pneumatic manifolds, machinery & equipment and fixturing devices.

Manifold Tolerances

- Elevated mechanical properties - 44 minimum ksi UTS
- 1/2 commercial twist and straightness
- 1/2 commercial dimension tolerance all on the plus side

Thickness & Width (inches)	Manifold Tolerances
1.000 - 1.499	+.012 / -.000
1.500 - 1.999	+.014 / -.000
2.000 - 3.999	+.024 / -.000
4.000 - 5.999	+.034 / -.000
6.000 - 7.999	+.044 / -.000
8.000	+.054 / -.000

Aluminum Squares, Extruded

6061-T6511, Manifold Quality

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths: 12 foot

Manifold quality is a precision extruded aluminum product for high speed machining, offering extra tight tolerances, improved straightness, reduced twist, and elevated minimum mechanical properties. Typical applications include fluid power, hydraulic & pneumatic manifolds, machinery & equipment and fixturing devices.

Size (inches)	Approx Wt. (lbs./lineal ft.)
7/8	0.911
1	1.190
1-1/8	1.507
1-1/4	1.855
1-3/8	2.270
1-1/2	2.671
1-5/8	3.132
1-3/4	3.630

Size (inches)	Approx Wt. (lbs./lineal ft.)
2	4.761
2-1/4	6.016
2-1/2	7.421
2-3/4	8.970
3	10.669
3-1/4	12.513
3-1/2	14.546
3-3/4	16.740

Size (inches)	Approx Wt. (lbs./lineal ft.)
4	18.976
4-1/2	23.994
5	29.400
5-1/2	35.574
6	42.647
6-1/2	49.686
8*	75.886

** Available in T6 Temper Only*

Aluminum Rectangles, Extruded

6061-T6511, Manifold Quality

ASTM-B221, AMS-QQ-A-200/8 • Stock Lengths: 12 foot

Bar Size (inches)	Weight (lbs./foot)
1 x 1-1/4	1.490
1 x 1-1/2	1.783
1 x 1-3/4	2.081
1 x 2	2.383
1 x 2-1/4	2.675
1 x 2-1/2	2.940
1 x 2-3/4	3.260
1 x 3	3.563
1 x 3-1/4	3.859
1 x 3-1/2	4.155
1 x 4	4.752
1 x 4-1/2	5.349
1 x 5	5.935
1 x 5-1/2	6.530
1 x 6	7.131
1 x 7	8.310
1 x 8	9.506
1-1/4 x 1-1/2	2.280
1-1/4 x 1-3/4	2.597
1-1/4 x 2	2.971
1-1/4 x 2-1/4	3.390
1-1/4 x 2-1/2	3.710
1-1/4 x 3	4.449
1-1/4 x 3-1/2	5.187
1-1/4 x 3-3/4	5.557
1-1/4 x 4-1/2	6.672
1-1/4 x 5	7.416
1-1/4 x 5-1/2	8.155
1-1/4 x 6	8.900
1-1/2 x 1-3/4	3.110
1-1/2 x 2	3.566
1-1/2 x 2-1/2	4.452
1-1/2 x 3	5.337
1-1/2 x 3-1/2	6.233
1-1/2 x 4	7.119
1-1/2 x 4-1/2	8.005
1-1/2 x 5	8.891
1-1/2 x 5-1/2	9.776
1-1/2 x 6	10.672
1-1/2 6-1/2	11.558
1-1/2 x 7	12.443
1-1/2 x 8	14.820
1-1/2 x 8-1/2	15.112

Bar Size (inches)	Weight (lbs./foot)
1-3/4 x 2	4.157
1-3/4 x 2-1/2	5.190
1-3/4 x 2-3/4	5.707
1-3/4 x 3	6.210
1-3/4 x 3-1/2	7.310
1-3/4 x 3-3/4	7.783
1-3/4 x 4-1/2	9.333
1-3/4 x 5	10.368
1-3/4 x 5-1/2	11.399
1-3/4 x 6-1/2	13.476
2 x 2-1/4	5.352
2 x 2-1/2	5.944
2 x 3	7.127
2 x 3-1/2	8.322
2 x 4	9.505
2 x 4-1/2	10.688
2 x 5	11.871
2 x 5-1/2	13.053
2 x 6	14.249
2 x 6-1/2	15.432
2 x 8	18.816
2-1/4 x 3	8.012
2-1/4 x 3-1/2	9.342
2-1/4 x 4	10.656
2-1/2 x 3	8.898
2-1/2 x 3-1/4	9.636
2-1/2 x 3-1/2	10.390
2-1/2 x 4	11.867
2-1/2 x 4-1/2	13.344
2-1/2 x 5	14.821
2-1/2 x 5-1/2	16.297
2-1/2 x 6	17.790
2-1/2 x 8	23.712
2-3/4 x 3	9.783
2-3/4 x 3-1/4	10.725

Bar Size (inches)	Weight (lbs./foot)
3 x 3-1/2	12.458
3 x 4	14.229
3 x 4-1/2	16.000
3 x 5	17.771
3 x 5-1/2	19.541
3 x 6	21.331
3 x 7	24.695
3 x 8	28.433
3-1/2 x 4	16.614
3-1/2 x 4-1/2	18.682
3-1/2 x 5	20.750
3-1/2 x 5-1/2	22.785
3-1/2 x 6	24.907
3-1/2 x 7	28.812
4 x 4-1/2	21.338
4 x 5	23.700
4 x 5-1/2	26.061
4 x 6	28.448
4 x 7	32.930
4 x 8	37.919
4-1/2 x 5	26.650
4-1/2 x 5-1/2	29.306
4-1/2 x 6	31.989
4-1/2 x 6-1/2	34.644
4-1/2 x 7	37.300
4-1/2 x 8-3/4	46.623
4-1/2 x 9-1/2	50.694
5 x 5-1/2	32.550
5 x 6	35.530
5 x 6-1/2	38.479
5 x 7	41.430
5 x 7-1/2	44.379
5 x 8	47.358
5 x 8-1/2	50.308
5-1/2 x 6	39.071
5-1/2 x 8	52.078
6 x 6-1/2	46.188
6 x 7	49.729
6 x 8	56.846

Aluminum Wide Bar, Extruded

6061-T6511, Extruded Wide Bar

ASTM-B221, AMS-SB-221 • Stock Lengths: 12 foot

Thickness (inches)	Width (inches)	Weight (lbs./ ft)	Thickness Tolerance
1/4	12	3.667	+.016
1/4	14	4.343	+.016
3/8	12	5.457	+.016
3/8	14	6.348	+.016
3/8	16	7.386	+.016
1/2	12	7.262	+.022
1/2	14	8.470	+.022
1/2	16	9.753	+.022
5/8	12	9.038	+.022
5/8	14	10.541	+.022
5/8	16	12.045	+.022
3/4	12	10.871	+.030
3/4	14	12.680	+.030
3/4	16	14.488	+.030
3/4	18	16.296	+.030
7/8	12	12.648	+.030
7/8	14	14.760	+.030
7/8	16	16.964	+.030
7/8	18	18.959	+.030
1	12	14.481	+.038
1	14	16.890	+.038
1	16	19.298	+.038
1	18	21.707	+.038

Thickness (inches)	Width (inches)	Weight (lbs./ ft)	Thickness Tolerance
1-1/4	12	18.034	+.038
1-1/4	14	21.033	+.038
1-1/4	16	24.033	+.038
1-1/4	18	27.033	+.038
1-1/2	12	21.587	+.038
1-1/2	14	25.177	+.038
1-1/2	16	28.767	+.038
1-1/2	18	32.358	+.038
1-3/4	12	25.210	+.048
1-3/4	14	29.040	+.048
1-3/4	16	33.596	+.048
2	12	28.805	+.054
2	14	33.597	+.054
2	16	38.388	+.054
2-1/4	14	37.740	+.054
2-1/2	10	30.116	+.074
3	10	35.979	+.074
4	10	48.158	+.130

Comparative Properties	6061-T6511 Extruded Wide Bar	6061-T6511 Extruded Wide Bar
Longitudinal Flatness (up to 72 inches)	.100 inches (max deviation)	.100 inches (max deviation)
Short Span Flatness (in any 2 ft. or less dimension)	.060 inches (max deviation)	.060 inches (max deviation)
Minimum Tensile Strength	42,000 psi 38,000 psi (< 3/8" thk)	42,000 psi
Minimum Yield Strength	35,000 psi	35,000 psi
Elongation %	10%	8%
Typical Brinell Hardness	95	95
Surface Finish	90 Micro-inch (max)	90 Micro-inch (max)
Stress Relieved	Yes	Yes
Specifications	ASTM-B-221 ASME-SB-221	ASTM-B-209 ASME-SB-209 QQ-A-250/11

Aluminum Structural Shapes

Selection Guide

Aluminum Structural Shapes are available in a variety of cross sections to meet your needs. As noted in each of the following sections, you will find each structural product is stocked in one of the following shapes:

American Standard - Similar in cross section to rolled steel angles, channels and beams with traditional tapered flanges and rounded ends.

Aluminum Association - The new design with flanges that are straight instead of tapered and thicker than the web. This results in easier joining and improved section properties.

Sharp Corner - Flanges and webs are uniformly thick and all corners are sharp, with nearly invisible radii.

We can also special order the cross section, size and alloy you may desire for your application.

Aluminum Angles, 6061-T6

EQUAL LEG

American Standard, Extruded Angles

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot

Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
3/4 x 3/4 x 1/8	.202
1 x 1 x 1/8	.275
1 x 1 x 3/16	.400
1 x 1 x 1/4	.514
1-1/4 x 1-1/4 x 1/8	.350
1-1/4 x 1-1/4 x 3/16	.494
1-1/4 x 1-1/4 x 1/4	.662
1-1/2 x 1-1/2 x 1/8	.423
1-1/2 x 1-1/2 x 3/16	.623
1-1/2 x 1-1/2 x 1/4	.809
1-1/2 x 1-1/2 x 3/8	1.158
1-3/4 x 1-3/4 x 1/8	.498
1-3/4 x 1-3/4 x 3/16	.733
1-3/4 x 1-3/4 x 1/4	.956
2 x 2 x 1/8	.578
2 x 2 x 3/16	.850
2 x 2 x 1/4	1.110
2 x 2 x 3/8	1.606
2-1/2 x 2-1/2 x 3/16	1.070
2-1/2 x 2-1/2 x 1/4	1.404
2-1/2 x 2-1/2 x 3/8	2.047

Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
3 x 3 x 3/16	1.283
3 x 3 x 1/4	1.684
3 x 3 x 5/16	2.080
3 x 3 x 3/8	2.474
3 x 3 x 1/2	3.227
3-1/2 x 3-1/2 x 1/4	1.988
3-1/2 x 3-1/2 x 3/8	2.925
3-1/2 x 3-1/2 x 1/2	3.826
4 x 4 x 1/4	2.282
4 x 4 x 3/8	3.366
4 x 4 x 1/2	4.414
5 x 5 x 3/8	4.237
5 x 5 x 1/2	5.578
6 x 6 x 3/8	5.119
6 x 6 x 1/2	6.754
6 x 6 x 5/8	8.853
6 x 6 x 3/4	9.915
8 x 8 x 1/2	9.142
8 x 8 x 5/8	11.328
8 x 8 x 3/4	13.478
8 x 8 x 1	17.668

Aluminum Angles, 6061-T6

American Standard, Extruded Angles

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot

UNEQUAL LEG

Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
1-1/2 x 1 x 1/8	.347
1-1/2 x 1 x 1/4	.662
1-1/2 x 1-1/4 x 3/16	.567
1-1/2 x 1-1/4 x 1/4	.736
1-3/4 x 1-1/4 x 1/8	.421
1-3/4 x 1-1/4 x 316	.620
1-3/4 x 1-1/4 x 1/4	.809
2 x 1-1/2 x 1/8	.494
2 x 1-1/2 x 3/16	.729
2 x 1-1/2 x 1/4	.953
2-1/2 x 1-1/2 x 1/8	.570
2-1/2 x 1-1/2 x 1/4	1.105
2-1/2 x 2 x 3/16	.964
2-1/2 x 2 x 1/4	1.258
3 x 2 x 3/16	1.068
3 x 2 x 1/4	1.399
3 x 2 x 3/8	2.046
3 x 2-1/2 x 1/4	1.537

Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
3-1/2 x 2-1/2 x 1/4	1.684
3-1/2 x 2-1/2 x 3/8	2.474
3-1/2 x 3 x 1/4	1.846
4 x 2 x 1/4	1.696
4 x 3 x 1/4	1.989
4 x 3 x 3/8	2.926
4 x 3 x 1/2	3.826
5 x 3 x 1/4	2.278
5 x 3 x 3/8	3.349
5 x 3 x 1/2	4.396
5 x 3-1/2 x 1/2	4.704
6 x 3 x 3/8	3.768
6 x 4 x 3/8	4.237
6 x 4 x 1/2	5.578
8 x 6 x 3/4	11.679

Aluminum Angles, 6063-T52

Sharp Corner, Extruded Angles

ASTM-B221, AMS-QQ-A-200/9, ASME-SB221

Stock Lengths: 16 foot

EQUAL LEG

UNEQUAL LEG

Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
1/2 x 1/2 x 1/16	.069
1/2 x 1/2 x 1/8	.128
3/4 x 3/4 x 1/16	.105
3/4 x 3/4 x 18	.202
1 x 1 x 1/16	.141
1 x 1 x 1/8	.276
1 x 1 x 3/16	.401
1-1/4 x 1-1/4 x 1/8	.349
1-1/4 x 1-1/4 x 3/16	.511
1-1/2 x 1-1/2 x 1/16	.216
1-1/2 x 1-1/2 x 1/8	.422
1-1/2 x 1-1/2 x 3/16	.622
1-1/2 x 1-1/2 x 1/4	.808
1-3/4 x 1-3/4 x 1/8	.496
2 x 2 x 1/8	.570
2 x 2 x 3/16	.843
2 x 2 x 1/4	1.102
3 x 3 x 1/8	.864
3 x 3 x 3/16	1.303
3 x 3 x 1/4	1.690

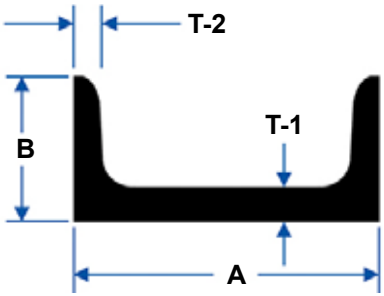
Angle Size (inches)	Approx. Wt. (lbs./lineal ft.)
1 x 1/2 x 1/8	.202
1 x 3/4 x 1/8	.239
1-1/4 x 1/2 x 1/8	.239
1-1/2 x 3/4 x 1/8	.313
1-1/2 x 1 x 1/8	.349
2 x 1 x 1/8	.423
2 x 1-1/2 x 1/8	.496
2 x 1-1/2 x 3/16	.732
2-1/2 x 1-1/2 x 1/8	.570
2-1/2 x 2 x 1/8	.643
3 x 1 x 1/8	.570
3 x 2 x 1/8	.716
3 x 2 x 1/4	1.397
3-1/2 x 1-1/4 x 1/8	.680
4 x 2 x 1/8	.864
4 x 2 x 1/4	1.690

Aluminum Channels, 6061-T6

American Standard, Extruded Channels

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot



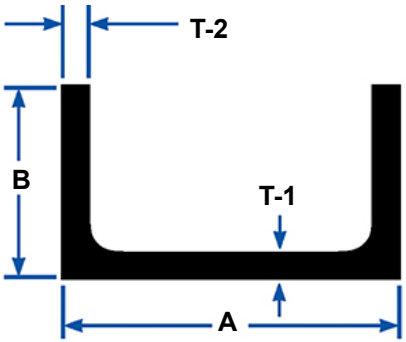
A	B	T-1	T-2	Approx. Wt. (lbs./lineal foot)
3.00	1.410	.170	.170	1.418
3.00	1.498	.258	.170	1.729
3.00	1.596	.356	.170	2.070
4.00	1.580	.180	.180	1.846
4.00	1.647	.247	.180	2.163
4.00	1.720	.320	.180	2.505
5.00	1.750	.190	.190	2.316
5.00	1.885	.325	.190	3.110
5.00	2.032	.472	.190	3.974
6.00	1.920	.200	.200	2.826
6.00	1.945	.225	.200	3.002
6.00	2.034	.314	.200	3.630
6.00	2.157	.437	.200	4.505
7.00	2.110	.230	.210	3.541
8.00	2.290	.250	.220	4.252
8.00	2.527	.488	.220	6.482
9.00	2.648	.448	.230	6.911
10.00	2.600	.240	.240	5.279
10.00	2.886	.526	.240	8.642
12.00	2.960	.300	.280	7.411
12.00	3.047	.387	.280	8.639
12.00	3.170	.510	.280	10.374

Aluminum Channels, 6061-T6

Aluminum Association, Extruded Channels

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot



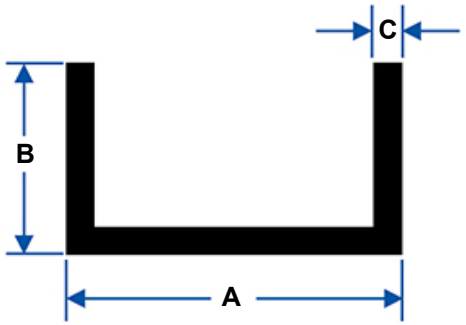
A	B	T-1	T-2	Approx. Wt. (lbs./lineal foot)
2.00	1.000	.130	.130	.577
2.00	1.250	.170	.260	1.071
3.00	1.500	.130	.200	1.134
3.00	1.750	.170	.260	1.597
4.00	2.000	.150	.230	1.738
4.00	2.250	.190	.290	2.330
5.00	2.250	.150	.260	2.211
5.00	2.750	.190	.320	3.089
6.00	2.500	.170	.290	2.834
6.00	3.250	.210	.350	4.030
7.00	2.750	.170	.290	3.204
7.00	3.50	.210	.380	4.714
8.00	3.000	.190	.350	4.146
8.00	3.750	.250	.410	5.789
9.00	3.250	.230	.350	4.982
9.00	4.000	.290	.440	6.970
10.00	3.500	.250	.410	6.136
10.00	4.250	.310	.500	8.360
12.00	4.000	.290	.470	8.274
12.00	5.000	.350	.620	11.822

Aluminum Channels, 6063-T52

Equal & Unequal Extruded Architectural Channels

ASTM-B221, AMS-QQ-A-200/9

Stock Lengths: n/a



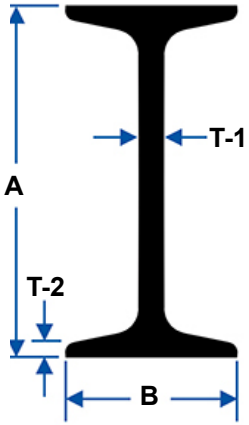
A	B	C	Approx. Wt. (lbs./lineal foot)
0.50	0.75	.125	.263
0.625	0.625	.125	.236
0.75	0.375	.125	.184
0.75	0.75	.125	.300
1.00	0.50	.125	.263
1.00	1.00	.125	.404
1.00	2.00	.125	.691
1.25	0.50	.125	.300
1.25	1.25	.125	.515
1.50	0.50	.125	.337
1.50	0.75	.125	.404
1.50	1.00	.125	.478
1.50	1.50	.125	.618
1.75	0.75	.125	.441
1.75	1.00	.125	.514
2.00	0.50	.125	.413
2.00	1.00	.125	.551
2.00	2.00	.125	.845
2.00	2.00	.250	1.616
2.50	1.50	.125	.772
3.00	0.50	.125	.551
3.00	1.00	.125	.698
3.00	1.50	.188	1.250
5.00	2.00	.1875	1.940

Aluminum I-Beams, 6061-T6

American Standard, Extruded I-Beams

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot



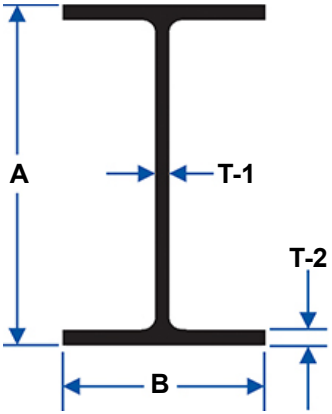
A	B	T-1	T-2	Approx. Wt. (lbs./lineal foot)
3.000	2.330	.170	.170	1.963
3.000	2.509	.349	.170	2.599
4.000	2.660	.190	.190	2.646
4.000	2.796	.326	.190	3.281
5.000	3.000	.210	.210	3.430
5.000	3.284	.494	.210	5.099
6.000	3.330	.230	.230	4.303
6.000	3.443	.343	.230	5.104
7.000	3.755	.345	.250	6.052
8.000	4.000	.270	.270	6.350
12.000	5.000	.350	.350	10.996

Aluminum I-Beams, 6061-T6

Aluminum Association, Extruded I-Beams

ASTM-B308, AMS-QQ-A-200/8, ASME-SB308

Stock Lengths: 25 foot

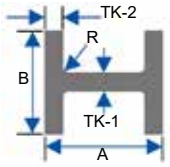


A	B	T-1	T-2	Approx. Wt. (lbs./lineal foot)
3.000	2.500	.130	.200	1.637
3.000	2.500	.150	.260	2.030
4.000	3.000	.170	.290	2.793
5.000	3.500	.190	.320	3.700
6.000	4.000	.190	.290	4.030
6.000	4.000	.210	.350	4.692
7.000	4.500	.230	.380	5.800
8.000	5.000	.230	.350	6.181
8.000	5.000	.250	.410	7.023
10.000	6.000	.250	.410	8.646
10.000	6.000	.290	.500	10.287
12.000	7.000	.290	.470	11.671
12.000	7.000	.310	.620	14.292

Aluminum Beams, 6061-T6

Wide Flange Beams (Structural)

ASTM-B308 • **Stock Lengths: n/a**

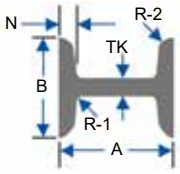


A Depth	B Flange Width	TK-1 Web	TK-2	R	Est. Wgt. (lbs./foot)	Packaging		Section No.
						Bundle Wt.	Pcs.	
6.000	4.000	.230	.279	.250	4.160	1036	10	42100D
6.000	6.000	.240	.269	.250	5.401	1074	8	42100H
8.000	8.000	.288	.433	.400	10.725	1100	4	42100G

Aluminum H-Beams, 6061-T6

H-Beams (Structural)

ASTM-B308 • **Stock Lengths: n/a**

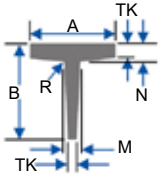


A Depth	B Flange Width	TK Web	N	R1	R2	Est. Wgt. (lbs./foot)	Packaging		Section No.
							Bundle Wt.	Pcs.	
4.000	4.000	.313	.290	.313	.145	4.757	1058	9	3002A

Aluminum Tees, 6061-T6

Tees (Structural)

ASTM-B308 • **Stock Lengths: n/a**



A Flange Width	B Stem	TK	N	M	R	Est. Wgt. (lbs./foot)	Packaging		Section No.
							Bundle Wt.	Pcs.	
2.000	2.000	.250	.312	.312	.250	1.255	521	17	853C

Aluminum Square Tubing, 6061-T6

Sharp Corner, Square Tubing

ASTM-B221, AMS-QQ-A-200/8

Stock Lengths: 24 foot

Size O.D.* (inches)	Nominal Wall Thickness	Approx. Wgt. (lbs./lineal ft.)
1	.125	.515
1-1/4	.125	.654
1-1/2	.125	.809
1-1/2	.250	1.470
1-3/4	.125	.974
2	.125	1.102
2	.188	1.636
2	.250	2.058
2-1/2	.125	1.383
2-1/2	.250	2.646
3	.125	1.691
3	.188	2.487
3	.250	3.234
4	.125	2.279
4	.188	3.371
4	.250	4.410
4	.500	8.232
6	.250	6.762
6	.500	13.200

** O.D. refers to Outside Dimensions on Square and Rectangular Tubing*

Aluminum Rectangular Tubing, 6061-T6

Sharp Corner, Extruded Rectangular Tubing

ASTM-B221, AMS-QQ-A-200/8

Stock Lengths: 24 foot

Size O.D.* (inches)	Nominal Wall Thickness	Approx. Wgt. (lbs./lineal foot)
1/2 x 1	.125	.367
3/4 x 1-1/2	.125	.588
1 x 1-1/2	.125	.661
1 x 2	.062	.428
1 x 2	.125	.809
1 x 3	.125	1.102
1 x 4	.125	1.430
1-1/4 x 2-1/2	.125	1.029
1-1/2 x 2	.125	.956
1-1/2 x 2-1/2	.125	1.103
1-1/2 x 3	.125	1.250
1-1/2 x 3	.187	1.824
1-1/2 x 4	.125	1.544
1-3/4 x 3	.125	1.323
1-3/4 x 4	.125	1.617
2 x 3	.125	1.397
2 x 3	.250	2.646
2 x 4	.125	1.690
2 x 4	.250	3.201
2 x 5	.125	1.985
2 x 5	.188	2.929
2 x 6	.125	2.279
2 x 6	.188	3.372
2 x 6	.250	4.410
3 x 4	.125	1.985
3 x 5	.125	2.279
3 x 5	.250	4.410
3 x 6	.188	3.814
4 x 6	.188	4.256
4 x 6	.250	5.586
4 x 6	.500	10.584
4 x 8	.250	6.762

** O.D. refers to Outside Dimensions on Square and Rectangular Tubing*

Aluminum Square Tubing, 6063-T52

Sharp Corner, Extruded Square Tubing

ASTM-B221, AMS-QQ-A-200/9

Stock Lengths: 21 feet - 1 inch (253")

Size O.D.* (inches)	Nominal Wall Thickness	Approx. Wgt. (lbs./lineal foot)
3/4	.062	.201
3/4	.125	.368
1	.062	.271
1	.125	.515
1-1/4	.065	.343
1-1/4	.125	.654
1-1/2	.062	.420
1-1/2	.125	.809
1-1/2	.188	1.161
1-3/4	.125	.955
2	.125	1.126
2	.188	1.598
2	.250	2.058
2-1/2	.125	1.383
2-1/2	.250	2.646
2-3/4	.188	2.266
3	.125	1.691
3	.188	2.487
3	.250	3.234
3-1/2	.125	1.984
4	.125	2.279
4	.250	4.410
4	.375	6.395
4	.500	8.232
6	.125	3.455

** O.D. refers to Outside Dimensions on Square and Rectangular Tubing*

Aluminum Rectangular Tubing, 6063-T52

Sharp Corner, Extruded Rectangular Tubing

ASTM-B221, AMS-QQ-A-200/9

Stock Lengths: 21 feet - 1 inch (253")

Size O.D.* (inches)	Nominal Wall Thickness	Approx. Wgt. (lbs./lineal foot)
1/2 x 1	.125	.367
3/4 x 1-1/2	.125	.588
1 x 1-1/2	.125	.661
1 x 2	.062	.428
1 x 2	.125	.809
1 x 3	.125	1.102
1 x 4	.125	1.430
1-1/4 x 2-1/2	.125	1.029
1-1/2 x 2	.125	.956
1-1/2 x 2-1/2	.125	1.103
1-1/2 x 3	.125	1.250
1-1/2 x 3	.187	1.824
1-1/2 x 4	.125	1.544
1-3/4 x 3	.125	1.323
1-3/4 x 4	.125	1.617
2 x 3	.125	1.397
2 x 3	.250	2.646
2 x 4	.125	1.690
2 x 4	.250	3.201
2 x 5	.125	1.985
2 x 5	.188	2.929
2 x 6	.125	3.279
2 x 6	.188	3.372
2 x 6	.250	4.410
2 x 8	.125	2.837
3 x 4	.125	1.985
3 x 5	.125	2.279
3 x 5	.250	4.410
3 x 6	.188	3.814
4 x 6	.188	4.256
4 x 6	.250	5.586
4 x 6	.500	10.584
4 x 8	.250	6.762

** O.D. refers to Outside Dimensions on Square and Rectangular Tubing*

Aluminum Round Pipe, 6061-T6

Extruded (Structural) Round Pipe

ASTM-B429, AMS-QQ-A-200/8

Stock Lengths: 20 foot

Pipe Size Designation	Schedule Number	Outside Dia. (inches)	Inside Dia. (inches)	Approx. Wgt. (lbs./lineal ft.)
1/2	40	.840	.622	.294
1/2	80	.840	.546	.376
3/4	40	1.050	.824	.391
3/4	80	1.050	.742	.510
1	40	1.315	1.049	.581
1	80	1.315	.957	.751
1-1/4	40	1.660	1.380	.786
1-1/4	80	1.660	1.278	1.037
1-1/2	40	1.900	1.610	.940
1-1/2	80	1.900	1.500	1.256
2	10	2.375	2.157	.913
2	40	2.375	2.067	1.264
2	80	2.375	1.939	1.737
2-1/2	40	2.875	2.469	2.004
2-1/2	80	2.875	2.323	2.650
3	40	3.500	3.068	2.621
3	80	3.500	2.900	3.547
3-1/2	40	4.000	3.548	3.151
3-1/2	80	4.000	3.364	4.326
4	40	4.500	4.026	3.733
4	80	4.500	3.826	5.183
5	40	5.563	5.047	5.057
5	80	5.563	4.813	7.188
6	40	6.625	6.065	6.564
6	80	6.625	5.761	9.884
8	40	8.625	7.981	9.878
8	80	8.625	7.625	15.010
10	40	10.750	10.020	14.004

Note: Pipe also available in seamless tested grade.

Aluminum Round Pipe, 6063-T6

Extruded (Structural) Round Pipe

ASTM-B429, AMS-QQ-A-200/9

Stock Lengths: 20 foot

Pipe Size Designation	Schedule Number	Outside Dia. (inches)	Inside Dia. (inches)	Approx. Wgt. (lbs./lineal ft.)
1/2	40	.840	.622	.294
1/2	80	.840	.546	.376
3/4	40	1.050	.824	.391
3/4	80	1.050	.742	.510
1	40	1.315	1.049	.581
1	80	1.315	.957	.751
1-1/4	40	1.660	1.380	.786
1-1/4	80	1.660	1.278	1.037
1-1/2	40	1.900	1.610	.940
1-1/2	80	1.900	1.500	1.256
2	10	2.375	2.157	.913
2	40	2.375	2.067	1.264
2	80	2.375	1.939	1.737
2-1/2	40	2.875	2.469	2.004
2-1/2	80	2.875	2.323	2.650
3	40	3.500	3.068	2.621
3	80	3.500	2.900	3.547
3-1/2	40	4.000	3.548	3.151
3-1/2	80	4.000	3.364	4.326
4	40	4.500	4.026	3.733
4	80	4.500	3.826	5.183
5	40	5.563	5.047	5.057
5	80	5.563	4.813	7.188
6	40	6.625	6.065	6.564
6	80	6.625	5.761	9.884
8	40	8.625	7.981	9.878
8	80	8.625	7.625	15.010
10	40	10.750	10.020	14.004

Note: Pipe also available in seamless tested grade.

Aluminum Round Tubing, 6061-T6

Extruded (Structural) Round Tubing

ASTM-B221, AMS-QQ-A-200/8

Stock Lengths: 12 foot & 24 foot

Size O.D. (inches)	Size I.D. (inches)	Wall Thickness	Approx. Wgt. (lbs./lineal ft.)
1	0.870	0.065	0.225
1	0.750	0.125	0.405
1	0.624	0.188	0.564
1	0.500	0.250	0.693
1-1/8	0.995	0.065	0.255
1-1/8	0.875	0.125	0.462
1-1/4	1.152	0.049	0.217
1-1/4	1.134	0.058	0.255
1-1/4	1.120	0.065	0.285
1-1/4	1.000	0.125	0.520
1-1/4	0.874	0.188	0.740
1-1/4	0.750	0.250	0.920
1-3/8	1.125	0.125	0.577
1-1/2	1.430	0.035	0.189
1-1/2	1.384	0.058	0.309
1-1/2	1.370	0.065	0.345
1-1/2	1.334	0.083	0.434
1-1/2	1.250	0.125	0.635
1-1/2	1.124	0.188	0.911
1-1/2	1.000	0.250	1.155
1-1/2	0.750	0.375	1.559
1-5/8	1.555	0.035	0.206
1-5/8	1.125	0.250	1.270
1-3/4	1.620	0.065	0.405
1-3/4	1.500	0.125	0.750
1-3/4	1.374	0.188	1.082
1-3/4	1.250	0.250	1.385
1-3/4	1.000	0.375	1.905
1-7/8	1.759	0.058	0.389
2	1.884	0.058	0.416
2	1.750	0.125	0.866
2	1.624	0.188	1.260
2	1.500	0.250	1.617
2	1.250	0.375	2.251
2	1.000	0.500	2.771
2-1/8	2.055	0.035	0.273

Aluminum Round Tubing, 6061-T6

Extruded (Structural) Round Tubing

ASTM-B221, AMS-QQ-A-200/8

Stock Lengths: 12 foot & 24 foot

Size O.D. (inches)	Size I.D. (inches)	Wall Thickness	Approx. Wgt. (lbs./lineal ft.)
2-1/4	2.120	0.065	0.525
2-1/4	2.084	0.083	0.665
2-1/4	2.000	0.125	0.981
2-1/4	1.874	0.188	1.429
2-1/4	1.750	0.250	1.847
2-1/4	1.500	0.375	2.598
2-1/4	1.250	0.500	3.232
2-3/8	1.875	0.250	1.963
2-1/2	2.250	0.125	1.096
2-1/2	2.124	0.188	1.602
2-1/2	2.000	0.250	2.078
2-1/2	1.750	0.375	2.944
2-1/2	1.500	0.500	3.695
2-1/2	1.000	0.750	4.849
2-3/4	2.250	0.250	2.308
2-3/4	2.000	0.375	3.290
2-3/4	1.750	0.500	4.156
3	2.834	0.083	0.895
3	2.750	0.125	1.328
3	2.624	0.188	1.944
3	2.500	0.250	2.540
3	2.408	0.296	2.957
3	2.250	0.375	3.637
3	2.000	0.500	4.618
3	1.874	0.563	4.620
3	1.500	0.750	6.234
3-1/16	2.501	0.281	2.827
3-1/4	3.016	0.117	1.360
3-1/4	2.750	0.250	2.827
3-1/4	2.500	0.375	3.983
3-1/4	2.250	0.500	5.083
3-1/2	3.250	0.125	1.558
3-1/2	3.000	0.250	3.002
3-1/2	2.750	0.375	4.330
3-1/2	2.500	0.500	5.541
3-1/2	1.500	1.000	9.236
3-1/2	1.000	1.250	10.390

Aluminum Round Tubing, 6061-T6

Extruded (Structural) Round Tubing

ASTM-B221, AMS-QQ-A-200/8

Stock Lengths: 12 foot & 24 foot

Size O.D. (inches)	Size I.D. (inches)	Wall Thickness	Approx. Wgt. (lbs./lineal ft.)
3-3/4	3.250	0.250	3.232
3-3/4	2.750	0.500	6.004
4	3.870	0.065	0.945
4	3.750	0.125	1.789
4	3.500	0.250	3.463
4	3.250	0.375	5.022
4	3.000	0.500	6.465
4	2.500	0.750	9.005
4-1/4	4.000	0.125	1.905
4-1/4	3.750	0.250	3.695
4-1/4	3.250	0.500	6.927
4-1/2	4.250	0.125	2.020
4-1/2	4.000	0.250	3.925
4-1/2	3.500	0.500	7.389
4-3/4	4.375	0.188	3.160
4-3/4	3.750	0.500	7.850
5	4.500	0.250	4.388
5	4.000	0.500	8.313
5	3.500	0.750	11.776
5-1/2	5.000	0.250	4.849
5-1/2	4.500	0.500	9.236
6	5.750	0.125	2.713
6	5.500	0.250	5.311
6	5.250	0.375	7.793
6	5.000	0.500	10.160
6	4.000	1.000	18.473
6-1/2	5.500	0.500	11.084
7	6.250	0.375	9.179
7	6.000	0.500	12.007
7	5.000	1.000	22.167
8	7.750	0.125	3.637
8	7.500	0.250	7.158
8	6.000	1.000	25.861
8-1/2	6.500	1.000	27.709
9-1/2	8.250	0.625	20.493
10	9.500	0.250	9.005
10-1/2	9.000	0.750	24.400

Aluminum Round Tubing, 6061-T6

Extruded (Seamless) Round Tubing

ASTM-B241

Stock Lengths: 12 foot

O.D. (inches)	I.D. (inches)	Wall Thickness	Weight (lbs./foot)
1-1/4	1.084	0.083	0.365
1-1/4	0.750	0.250	0.923
1-1/2	1.334	0.083	0.434
1-1/2	1.250	0.125	0.635
1-1/2	1.000	0.250	1.155
1-3/4	1.250	0.250	1.385
2	1.750	0.125	0.866
2	1.500	0.250	1.616
2-1/8	1.055	0.535	3.142
2-1/4	2.000	0.125	0.981
2-1/4	1.750	0.250	1.867
2-1/4	1.250	0.500	3.266
2-1/2	2.250	0.125	1.100
2-1/2	2.000	0.250	2.078
2-1/2	1.906	0.297	2.417
2-1/2	1.750	0.375	2.944
2-1/2	1.062	0.719	4.731
2-1/2	1.000	0.750	4.849
2-5/8	1.625	0.500	3.925
2-11/16	1.282	0.703	5.154
2-3/4	2.500	0.125	1.225
2-3/4	2.250	0.250	2.333
2-3/4	1.750	0.500	4.200
2-16/21	1.378	0.692	5.292
3	2.870	0.065	0.704
3	2.750	0.125	1.342
3	2.500	0.250	2.540
3	1.376	0.812	6.564

O.D. (inches)	I.D. (inches)	Wall Thickness	Weight (lbs./foot)
3-1/2	3.000	0.250	3.002
3-1/2	2.500	0.500	5.541
3-1/2	2.000	0.750	7.620
3-1/2	1.500	1.000	9.236
3-3/4	2.750	0.500	6.004
3-7/8	2.875	0.500	6.234
4	3.750	0.125	1.789
4	3.000	0.500	6.465
4	2.000	1.000	11.083
4-1/2	3.500	0.500	7.389
4-1/2	2.375	1.063	13.493
4-11/20	3.695	4.275	6.553
4-3/4	2.375	1.188	15.629
5	4.000	0.500	8.313
5	3.500	0.750	11.776
5	3.000	1.000	14.778
5-1/10	3.250	0.925	14.267
5-1/2	3.500	1.000	16.964
6	4.000	1.000	18.473
6-1/2	5.000	0.750	15.930
7	6.000	0.500	12.007
7	5.500	0.750	17.317
8	6.500	0.750	20.089
10	8.000	1.000	33.300
12	11.000	0.500	22.100
12	10.000	1.000	40.640

Aluminum Round Tubing, 6061-T6

Drawn (Seamless) Round Tubing

ASTM-B210

Stock Lengths: 12 foot

O.D. (inches)	I.D. (inches)	Wall Thickness	Weight (lbs./foot)
1/4	0.180	0.035	0.028
1/4	0.152	0.049	0.036
5/16	0.197	0.058	0.054
3/8	0.305	0.035	0.044
3/8	0.277	0.049	0.059
3/8	0.259	0.058	0.067
3/8	0.245	0.065	0.075
7/16	0.3395	0.049	0.071
7/16	0.308	0.065	0.089
1/2	0.430	0.035	0.060
1/2	0.402	0.049	0.082
1/2	0.384	0.058	0.095
1/2	0.370	0.065	0.105
1/2	0.334	0.083	0.128
1/2	0.260	0.120	0.168
5/8	0.527	0.049	0.104
5/8	0.495	0.065	0.135
5/8	0.375	0.125	0.229
3/4	0.680	0.035	0.092
3/4	0.652	0.049	0.127
3/4	0.620	0.065	0.164
3/4	0.584	0.083	0.205
3/4	0.500	0.125	0.289
7/8	0.805	0.035	0.109
7/8	0.777	0.049	0.150
7/8	0.759	0.058	0.175
7/8	0.745	0.065	0.195
7/8	0.685	0.095	0.274
7/8	0.635	0.120	0.335

O.D. (inches)	I.D. (inches)	Wall Thickness	Weight (lbs./foot)
1	0.902	0.049	0.172
1	0.884	0.058	0.206
1	0.834	0.083	0.281
1	0.750	0.125	0.405
1-1/8	1.009	0.058	0.229
1-1/8	0.995	0.065	0.255
1-1/4	1.152	0.049	0.217
1-1/4	1.120	0.065	0.285
1-1/4	1.084	0.083	0.365
1-1/4	1.010	0.120	0.501
1-3/8	1.277	0.049	0.245
1-3/8	1.259	0.058	0.282
1-3/8	1.245	0.065	0.315
1-1/2	1.402	0.049	0.263
1-1/2	1.370	0.065	0.345
1-31/54	1.150	0.212	1.066
1-5/8	1.509	0.058	0.336
1-5/8	1.375	0.125	0.693
1-3/4	1.652	0.049	0.308
1-3/4	1.634	0.058	0.362
1-3/4	1.500	0.125	0.750
2	1.902	0.049	0.353
2	1.870	0.065	0.465
2-1/2	2.370	0.065	0.585
2-1/2	2.334	0.083	0.741

Aluminum Products, Extruded

Standard Tolerances

Wire, Rod, Bar and Shapes

Diameter or Distance Across Flats

Round Wire & Rod - Square, Hexagonal and Octagonal Wire & Bar[1]

Specified Dimension (inches)	Tolerance[3] - plus/minus (inches) Allowable deviation from specified dimension across flats or diameter			
	Round Wire and Rod		Square Wire and Rod	
	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys
Up thru 0.124	0.006	0.004	0.006	0.004
0.125 - 0.249	0.007	0.005	0.007	0.005
0.250 - 0.499	0.008	0.005	0.008	0.005
0.500 - 0.749	0.009	0.006	0.009	0.006
0.750 - 0.999	0.010	0.007	0.010	0.007
1.000 - 1.499	0.012	0.008	0.012	0.008
1.500 - 1.999	0.014	0.009	0.014	0.009
2.000 - 3.999	0.024	0.016	0.024	0.016
4.000 - 5.999	0.034	0.022	0.034	0.022
6.000 - 7.070	0.044	0.029	0.044	0.029
7.071 - 7.999	0.044	0.029	0.054	0.036
8.000 - 8.659	0.054	0.036	0.064	0.042
8.660 - 8.999	0.054	0.036	0.064	0.042
9.000 - 9.238	0.054	0.036	0.064	0.042
9.239 - 9.999	0.054	0.036	0.064	0.042
10.000 - 11.999	0.074	0.049	0.074	0.049
12.000 - 13.999	0.084	0.055	0.084	0.055
14.000 - 15.999	0.094	0.062	0.094	0.062

Note: Shaded tolerances denote products with a circumscribing circle size of 10 inches in diameter and over.

Please refer to pg. 6-55 for all applicable footnotes.

Two page chart, continues on next page

Aluminum Products, Extruded

Standard Tolerances

Wire, Rod, Bar and Shapes

Diameter or Distance Across Flats

Round Wire & Rod - Square, Hexagonal and Octagonal Wire & Bar[1]

Specified Dimension (inches)	Tolerance[3] - plus/minus (inches) Allowable deviation from specified dimension across flats or diameter			
	Hexagonal Wire and Rod		Octagonal Wire and Rod	
	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys
Up thru 0.124	0.006	0.004	0.006	0.004
0.125 - 0.249	0.007	0.005	0.007	0.005
0.250 - 0.499	0.008	0.005	0.008	0.005
0.500 - 0.749	0.009	0.006	0.009	0.006
0.750 - 0.999	0.010	0.007	0.010	0.007
1.000 - 1.499	0.012	0.008	0.012	0.008
1.500 - 1.999	0.014	0.009	0.014	0.009
2.000 - 3.999	0.024	0.016	0.024	0.016
4.000 - 5.999	0.034	0.022	0.034	0.022
6.000 - 7.070	0.044	0.029	0.044	0.029
7.071 - 7.999	0.044	0.029	0.044	0.029
8.000 - 8.659	0.054	0.036	0.054	0.036
8.660 - 8.999	0.064	0.042	0.054	0.036
9.000 - 9.238	0.064	0.042	0.054	0.036
9.239 - 9.999	0.064	0.042	0.064	0.042
10.000 - 11.999	0.074	0.049	0.074	0.049
12.000 - 13.999	0.084	0.055	0.084	0.055
14.000 - 15.999	0.094	0.062	0.094	0.062

Note: Shaded tolerances denote products with a circumscribing circle size of 10 inches in diameter and over.

Please refer to pg. 6-55 for all applicable footnotes.

Two page chart, continued from previous page

Aluminum Products, Extruded

Standard Tolerances

Wire, Rod, Bar and Shapes

Thickness or Width Distance Across Flats

Rectangular Wire & Bar[1]

Specified Dimension (inches)	Tolerance[3] - plus/minus (inches) Allowable deviation from specified dimension across flats or diameter			
	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys	Standard Tolerance, All Except 5XXX Alloys [11]	Precision Tolerance, All Except 5XXX Alloys
Up thru 0.124	0.006	0.004	0.014	0.009
0.125 - 0.249	0.007	0.005	0.015	0.010
0.250 - 0.499	0.008	0.005	0.016	0.011
0.500 - 0.749	0.009	0.006	0.017	0.011
0.750 - 0.999	0.010	0.007	0.018	0.012
1.000 - 1.499	0.012	0.008	0.019	0.013
1.500 - 1.999	0.014	0.009	0.024	0.016
2.000 - 3.999	0.024	0.016	0.034	0.022
4.000 - 5.999	0.034	0.022	0.044	0.029
6.000 - 7.999	0.044	0.029	0.054	0.036
8.000 - 9.999	0.054	0.036	0.064	0.042
10.000 - 11.999	---	---	0.074	0.049
12.000 - 13.999	---	---	0.084	0.055
14.000 - 15.999	---	---	0.094	0.062
16.000 - 17.999	---	---	0.104	0.069
18.000 - 19.999	---	---	0.114	0.075
20.000 - 21.999	---	---	0.124	0.082
22.000 - 24.000	---	---	0.134	0.088

Note: Shaded tolerances denote products with a circumscribing circle size of 10 inches in diameter and over.

Please refer to pg. 6-55 for all applicable footnotes.

Aluminum Products, Extruded

Standard Tolerances

Wire, Rod, Bar and Shapes

Footnotes

(1) When outside diameter, inside diameter, and wall thickness (or their equivalent dimensions in other than round tube) are all specified, standard tolerances are applicable to any two of these dimensions, but not to all three. When both outside and inside diameters or inside diameter and wall thickness are specified, the tolerance applicable to the specified or calculated O.D. dimension shall also apply to the I.D. dimension.

(2) When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applied to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(3) Mean diameter is the average of two diameter measurements taken at right angles to each other at any point along the length.

(4) Not applicable in the annealed (O) temper of if wall thickness is less than 2½ percent of outside diameter of a circle having a circumference equal to the perimeter of the tube.

(5) The mean wall thickness of round tube is the average of two measurements taken opposite each other. The mean wall thickness of other-thanround tube is the average of two measurements taken opposite each other at approximate center line of tube and perpendicular to the longitudinal axis of the cross section.

(6) When dimensions specified are outside and inside, rather than wall thickness itself, allowable deviation at any point (eccentricity) applies to mean wall thickness.

(7) Tolerances for O, T3510, T4510, T6510, T73510, T76510 and T8510 tempers shall be as agreed upon between purchaser and vendor at the time the contract or order is entered.

(8) TX510 and TX511 are general designations for the following stressrelieved tempers: T3510, T4510, T6510, T8510, T73510, T76510; and T3511, T4511, T6511, T8511, T73511, T76511, respectively.

(9) When weight of piece on flat surface minimizes deviation.

(10) The circumscribing circle diameter is the diameter of the smallest circle that will completely enclose the cross section of the extruded product.

(11) Twist is normally measured by placing the extruded tube on a flat surface and at any point along its length measuring the maximum distance between the bottom surface of the extruded tube and the fl at surface. From this measurement, the actual deviation from straightness of the extruded tube at that point is subtracted. The remainder is the twist. To convert the standard twist tolerance (degrees) to an equivalent linear value, the sine of the standard tolerance is multiplied by the width of the surface of the section that is on the flat surface. The following values are used to convert angular tolerances to linear deviation:

Tolerance, degrees	Maximum allowable linear deviation per inch of width
1/4	0.004"
1/2	0.009"
1	0.017"
1-1/2	0.026"
3	0.052"

Tolerance, degrees	Maximum allowable linear deviation per inch of width
5	0.087"
7	0.122"
9	0.156"
15	0.259"
21	0.358"

(12) Tolerances not applicable to TX510, or TX511 temper tube having a wall thickness less than 0.095 in.

(13) Conditions include die lines, mandrel lines and handling marks.

(14) For tube over 12.750 in. O.D. the 2000 and 7000 series alloys and 5000 series alloys with nominal magnesium content of 3 percent or more are excluded.

(15) Not applicable to O temper tube.

(16) Tolerances apply to 5xxx alloys with ≥4.0% Mg.

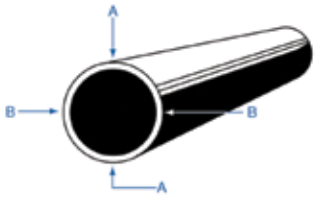
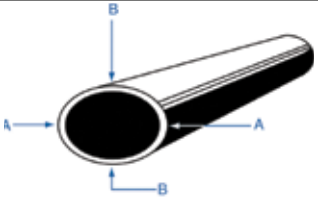
(17) Not applicable to 2219 alloy tube. Most tubes in 2219 alloy will have die lines about twice the depth shown in the table; however, for each tube size the supplier should be contacted for the roughness value to apply.

(18) If unspecified, the radius shall be Q-ew in. maximum including tolerances.

Aluminum Tolerances

Extruded Tube Tolerances

Diameter Round Tube

Specified Diameter (inches)	Tolerance[2] (inches, plus and minus)	
	Allowable Deviation of Mean Diameter[3] from Specified Diameter (size)	Allowable Deviation of Diameter at Any Point from Specified Diameter[4]
		
	Difference between 1/2 (AA + BB) and Specified Diamete Alloys[7]	Difference between AA or BB and Specified Diameter Alloys[7]
0.500 - 0.999	0.010	0.020
1.000 - 1.999	0.012	0.025
2.000 - 3.999	0.015	0.030
4.000 - 5.999	0.025	0.050
6.000 - 7.999	0.035	0.075
8.000 - 9.999	0.045	0.100
10.000 11.999	0.055	0.125
12.000 - 13.999	0.065	0.150
14.000 - 15.999	0.075	0.175
16.000 - 17.999	0.085	0.200
18.000 - 19.999	0.095	0.225
20.000 - 21.999	0.105	0.250
22.000 - 23.999	0.115	0.275

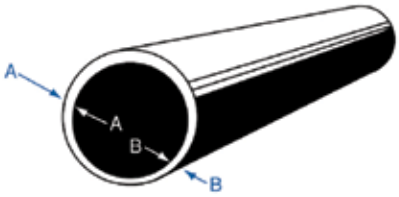
Footnotes

1. When outside diameter, inside diameter, and wall thickness (or their equivalent dimensions in other than round tube) are all specified, standard tolerances are applicable to any two of these dimensions, but not to all three. When both outside and inside diameters or inside diameter and wall thickness are specified, the tolerance applicable to the specified or calculated O.D. dimension shall also apply to the I.D. dimension.
2. When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which would apply to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.
3. Mean diameter is the average of two diameter measurements taken at right angles to each other at any point along the length.
4. Not applicable in the annealed (0) temper or if wall thickness is less than 2-1/2 percent of the outside diameter or equivalent round diameter.The equivalent round diameter is the diameter of a circle having a circumference equal to the perimeter of the tube.
5. The mean wall thickness of round tube is the average of two measurements taken opposite each other. The mean wall thickness of other-than-round tube is the average of two measurements taken opposite each other at approximate center line of tube and perpendicular to the longitudinal axis of the cross section.
6. When dimensions specified are outside and inside, rather than wall thickness itself, allowable deviation at any point (eccentricity) applies to mean wall thickness.
7. Limited to the following alloys: 6005, 6061, 6063, 6101, 6262.

Aluminum Tolerances

Extruded Tube Tolerances

Wall Thickness Round Tube

Specified Wall Thickness[6] (inches)	Tolerance[1,2] (inches, plus and minus)			
	Allowable Deviation of Mean Wall Thickness[5] from Specified Wall Thickness  Difference between 1/2 (AA + BB) and Specified Wall Thickness			
	Outside Diameter (inches)			
	Under 1.250" Alloys[7]	1.250" - 2.999" Alloys[7]	3.000" - 4.999" Alloys[7]	5.000" & Over Alloys[7]
Under 0.047	0.006	---	---	---
0.047 - 0.061	0.007	0.008	0.008	0.010
0.062 - 0.077	0.008	0.008	0.009	0.012
0.078 - 0.124	0.009	0.009	0.010	0.015
0.125 - 0.249	0.009	0.009	0.013	0.020
0.250 - 0.374	0.011	0.011	0.016	0.025
0.375 - 0.499	---	0.015	0.021	0.035
0.500 - 0.749	---	0.020	0.028	0.045
0.750 - 0.999	---	---	0.035	0.055
1.000 - 1.499	---	---	0.045	0.065
1.500 - 2.000	---	---	---	0.075
2.001 - 2.499	---	---	---	0.085
2.500 - 2.999	---	---	---	0.095
3.000 - 3.499	---	---	---	
3.500 - 4.000	---	---	---	0.115

Please refer to previous page (6-56) for all applicable footnotes.

Aluminum

Sheet and Plate Products

Alloy Descriptions and Applications

1100 – This low-strength alloy has excellent corrosion resistance, satisfactory anodizing and conversion coating finishing characteristics, and is unmatched by any other commercial aluminum alloy in workability. It lends itself readily to welding, brazing, and soldering, but tends toward gumminess when machined. Typical end uses are spun holloware, fin stock, chemical storage and processing equipment, kitchen utensil items, and general sheet metal work.

3003 – About 20% higher in strength than 1100 but retaining an excellent workability rating. May show some slight discoloration when anodized, but reacts well to mechanical and organic finishings. Is easily welded and brazed, but soldering is limited to the torch method. Like 1100, tends to be gummy when machined, but will perform somewhat satisfactorily in the higher tempers with the proper set-up and maximum speeds. Typical end uses include food and chemical handling equipment, appliance components, truck/trailer roofing, heat exchangers, pipe jacketing, and lawn furniture components.

5052 – For many years, until the advent of 5083 and 5086, this alloy was the highest strength non-heat-treatable alloy commercially available. Although easily welded, it is not recommended for brazing and soldering applications. Excellent corrosion resistance, particularly in marine applications. Adapts to most mechanical and finishing processes although the heavier anodic films may take on a yellowish cast. Fair machining with the proper set-up. Typical end uses include fuel tanks, truck/trailer side panels, small boat hulls, truck cabs, bumpers, storage tanks, and pressure vessels.

5083 – With excellent corrosion resistance and weldability together with high strength, this alloy was designed for welded structures requiring maximum joint strength and efficiency. Can be anodized for increased corrosion resistance, but does not lend itself to decorative applications. Not meant to be a machining alloy, but can be machined fairly well with proper preparation. Because of its relatively high magnesium content, the workability rating is fair. Typical end uses are large marine craft, containers, railroad cars, structurals, and elevator cars.

5086 – Sister alloy to 5083 with comparable characteristics but slightly less strength.

2024 – Thought of as the "aircraft alloy" because of its strength, 2024 has only fair corrosion resistance but good machinability. Lends itself only to resistance welding as a hot joining process and is not recommended for brazing or soldering. In the annealed state, 2024 has good workability but is only fair to poor in tempers. Typical end uses are aircraft skins and cowls and truck and aircraft structurals.

6061 – This is a popular general-purpose alloy. Very good corrosion resistance and finishability plus excellent weldability and a strength level approximating that of mild steel. Machinability is good and, in the annealed state, its workability carries a high rating, staying at the “good” level if heat-treated without aging. Typical end uses are aircraft landing mats, large and small marine vessels, structural architectural parts, storage tanks, and highway signs.

Aluminum

Sheet and Plate Products

Alloy Descriptions and Applications

7075 – One of the highest strength, commercially available alloys with fair corrosion resistance and machinability. Low workability rating and welded only by the resistance process. Typically used as aircraft skins, cowls, and structures.

Alumold® 500 - A high strength 7XXX series aluminum mold plate product produced by Alcan. Alumold is rolled and stretched in thicknesses 1" through 8" and compression forged in 10" through 20"+Alumold 500 is a heat treated and stress relieved product that will bring you superior hardness and strength with better thermal conductivity when compared to other aluminum products. You will find Alumold 500 a terrific product to mill, polish, engrave/etch and weld. Altogether Alumold 500 will allow you to create a mold that has increased durability which will result in longer tool life, which makes this product a great option for a number of mold applications such as production and prototype injection and blow molds, foam molds, RIM molds or aluminum die sets.

Cast Tool and Jig Plate (Mic-6®, Alca 5® and ATP 5™) - When dimensional stability and flatness is critical, consider Cast Aluminum Tool and Jig Plate. This product has very low internal residual stress levels and as a result machines relatively stress free. It is also fully weldable, has superior corrosion resistance, and has an outstanding surface condition at 20 RMS or better allowing for excellent anodizability. Cast Aluminum Tool and Jig Plate is suitable for jigs, fixtures, mounting plates and low-strength/low-pressure mold applications such as vacuum form mold.

Cast Aluminum Mold Plate (Max 5®) - This direct chill cast plate product is virtually residual stress free due to a proprietary thermal treatment process and as a result exhibits uniformly consistent machinability and polishability throughout the thickness of the plate. It is also weldable and is ultrasonically inspected prior to shipment to ensure product quality. Cast Aluminum Mold Plate is suitable for use in blow molds, prototype injection molds, structural foam molds and investment cast molds.

Note: Alca Max, Dura Mold 2®, Dura Mold 5®, M1, M5 and K100-S™ are other produced cast plate trade names , but these items are not stocked at **Alro Steel.**

Aluminum Sheet, 3003-H14

Non-Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/2

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.025	48 x 120*	0.365
.032	48 x 96*	0.456
.032	48 x 120*	0.456
.032	48 x 144	0.456
.040	48 x 96*	0.570
.040	48 x 120*	0.570
.040	48 x 144	0.570
.050	36 x 96	0.713
.050	48 x 96*	0.713
.050	48 x 120*	0.713
.050	48 x 144	0.713
.063	36 x 96	0.898
.063	48 x 96*	0.898
.063	48 x 120*	0.898
.063	48 x 144	0.898
.063	60 x 120	0.898
.080	48 x 96*	1.141
.080	48 x 120	1.141
.080	48 x 144	1.141
.080	60 x 120	1.141
.090	48 x 96*	1.283
.090	48 x 120*	1.283
.090	48 x 144	1.283
.090	60 x 120	1.283
.090	60 x 144	1.283

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.100	48 x 96*	1.426
.100	48 x 120*	1.426
.100	48 x 144	1.426
.125	36 x 120	1.782
.125	48 x 96*	1.782
.125	48 x 120*	1.782
.125	48 x 144	1.782
.125	60 x 120	1.782
.125	60 x 144	1.782
.187	48 x 144	2.639
.187	60 x 144	2.639
.190	48 x 96	2.709
.190	48 x 120	2.709
.190	48 x 144	2.709
.190	60 x 120	2.709
.190	60 x 144	2.709
.250	48 x 96	3.560
.250	48 x 120	3.560
.250	48 x 144	3.560
.250	60 x 96	3.560
.250	60 x 120	3.560
.250	60 x 144	3.560

*** Size available in painted sheet (3003/3105).**

(Gloss Black, Gloss White, Bright Green, Bright Red, Bright Yellow, Chevron Blue)

Aluminum Sheet & Plate, 5052-H32

Non-Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/8

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.032	48 x 96	0.447
.032	48 x 120	0.447
.032	48 x 144	0.447
.040	48 x 96	0.559
.040	48 x 120	0.559
.040	48 x 144	0.559
.050	48 x 96	0.698
.050	48 x 120	0.698
.050	48 x 144	0.698
.063	48 x 96	0.880
.063	48 x 120	0.880
.063	48 x 144	0.880
.063	60 x 120	0.880
.063	60 x 144	0.880
.080	48 x 96	1.117
.080	48 x 120	1.117
.080	48 x 144	1.117
.080	60 x 120	1.117
.080	60 x 144	1.117
.090	36 x 96	1.257
.090	48 x 96	1.257
.090	48 x 120	1.257
.090	48 x 144	1.257
.090	60 x 144	1.257
.090	72 x 144	1.257
.100	48 x 96	1.397
.100	48 x 120	1.397
.100	48 x 144	1.397
.100	60 x 120	1.397
.100	60 x 144	1.397
.125	48 x 96	1.746
.125	48 x 120	1.746
.125	48 x 144	1.746
.125	60 x 120	1.746
.125	60 x 144	1.746
.125	72 x 144	1.746

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.160	48 x 120	2.235
.160	48 x 144	2.235
.190	36 x 96	2.654
.190	48 x 96	2.654
.190	48 x 120	2.654
.190	48 x 144	2.654
.190	60 x 96	2.654
.190	60 x 120	2.654
.190	60 x 144	2.654
.190	72 x 96	2.654
.190	72 x 120	2.654
.190	72 x 144	2.654
.250	48 x 96	3.492
.250	48 x 120	3.492
.250	48 x 144	3.492
.250	60 x 96	3.492
.250	60 x 120	3.492
.250	60 x 144	3.492
.250	72 x 96	3.492
.250	72 x 120	3.492
.250	72 x 144	3.492
.375	48 x 96	5.238
.375	48 x 120	5.238
.375	48 x 144	5.238
.375	60 x 144	5.238
.500	48 x 96	6.984
.500	48 x 120	6.984
.500	48 x 144	6.984
.750	48 x 144	10.476

Aluminum Sheet, 5086-H32

Non-Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/7

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.063	48 x 120	0.871
.063	48 x 144*	0.871
.090	48 x 96	1.244
.090	48 x 120	1.244
.090	48 x 144*	1.244
.100	48 x 96	1.382
.100	48 x 144	1.382
.125	48 x 96	1.728
.125	48 x 120	1.728
.125	48 x 144*	1.728

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.190	48 x 96	2.626
.190	48 x 120	2.626
.190	48 x 144	2.626
.249	48 x 96	3.442
.249	48 x 120	3.442
.249	48 x 144	3.442

** Also available in H116 Temper.*

Aluminum Sheet, 2024-T3

Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/4

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.032	48 x 144	0.465
.040	48 x 144	0.582
.050	48 x 144	0.727
.063	48 x 144	0.916
.071	48 x 144	1.033
.080	48 x 144	1.152

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.090	48 x 144	1.296
.100	48 x 144	1.440
.125	48 x 144	1.800
.160	48 x 144	2.304
.190	48 x 144	2.736

Aluminum Sheet, 6061-T6

Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/11

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.032	48 x 144	0.452
.040	48 x 144	0.576
.050	48 x 144	0.706
.063	48 x 144	0.889
.063	60 x 144	0.889
.080	48 x 144	1.129
.090	48 x 144	1.270
.090	60 x 144	1.270
.100	48 x 144	1.411

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.125	36 x 96	1.764
.125	48 x 96	1.764
.125	48 x 120	1.764
.125	48 x 144	1.764
.125	60 x 144	1.764
.160	48 x 144	2.258
.190	48 x 144	2.681
.190	60 x 144	2.681

Aluminum Sheet, 7075-T6

Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/12

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.063	48 x 144	0.916
.080	48 x 144	1.164
.090	48 x 144	1.310

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.100	48 x 144	1.454
.125	48 x 144	1.818
.190	48 x 144	2.763

Aluminum Plate, 2024-T351

Heat Treatable (Mill Finish)

ASTM-B209, AMS-QQ-A-250/4

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
1/4	48.5 x 144.5	3.636
5/16	48.5 x 144.5	4.417
3/8	48.5 x 144.5	5.454
3/8	60.5 x 144.5	5.454
1/2	48.5 x 144.5	7.272
5/8	48.5 x 144.5	9.090
3/4	48.5 x 144.5	10.908
7/8	48.5 x 144.5	12.726
1	48.5 x 144.5	14.544
1-1/4	48.5 x 144.5	18.180
1-1/2	48.5 x 144.5	21.816

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
1-3/4	48.5 x 144.5	25.452
2	48.5 x 144.5	29.088
2-1/4	48.5 x 144.5	32.750
2-1/2	48.5 x 144.5	36.360
2-3/4	48.5 x 144.5	39.996
3	48.5 x 144.5	43.632
3-1/2	48.5 x 144.5	50.400
4	48.5 x 144.5	58.176
5	48.5 x 144.5	72.720
6	48.5 x 144.5	87.264

Aluminum Plate, 6061-T651

Heat Treatable

ASTM-B209, AMS-QQ-A-250/11

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
1/4	36.5 x 96.5	3.634
1/4	48.5 x 96.5	3.634
1/4	48.5 x 144.5	3.634
1/4	60 x 120	3.634
1/4	60.5 x 144.5	3.634
1/4	72.5 x 144.5	3.634
5/16	48.5 x 144.5	4.520
5/16	60.5 x 144.5	4.520
3/8	48.5 x 96.5	5.433
3/8	48.5 x 144.5	5.433
3/8	60.5 x 144.5	5.433
3/8	72.5 x 144.5	5.433
1/2	48.5 x 96.5	7.246
1/2	48.5 x 144.5	7.246
1/2	60.5 x 144.5	7.246
1/2	72.5 x 144.5	7.246
5/8	48.5 x 144.5	9.010
5/8	60.5 x 144.5	9.010
5/8	72.5 x 144.5	9.010
3/4	48.5 x 96.5	10.845
3/4	48.5 x 144.5	10.845
3/4	60.5 x 144.5	10.845
3/4	72.5 x 144.5	10.845
7/8	48.5 x 144.5	12.567
7/8	60.5 x 144.5	12.567
7/8	72.5 x 144.5	12.567
1	48.5 x 96.5	14.444
1	48.5 x 144.5	14.444
1	60.5 x 144.5	14.444
1	72.5 x 144.5	14.444
1-1/8	48.5 x 144.5	16.145
1-1/4	48.5 x 144.5	17.972
1-1/4	60.5 x 144.5	17.972
1-1/4	72.5 x 144.5	17.972
1-3/8	48.5 x 144.5	19.736
1-3/8	60.5 x 144.5	19.736

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
1-1/2	48.5 x 96.5	21.499
1-1/2	48.5 x 144.5	21.499
1-1/2	60.5 x 144.5	21.499
1-1/2	72.5 x 144.4	21.499
1-3/4	48.5 x 96.5	25.084
1-3/4	48.5 x 144.5	25.084
1-3/4	60.5 x 144.5	25.084
2	48.5 x 96.5	28.647
2	48.5 x 144.5	28.647
2	60.5 x 144.5	28.647
2	72.5 x 144.5	28.647
2-1/4	48.5 x 144.5	32.130
2-1/4	60.5 x 144.5	32.130
2-1/2	48.5 x 144.5	35.809
2-1/2	60.5 x 144.5	35.809
2-3/4	48.5 x 144.5	39.337
2-3/4	60.5 x 144.5	39.337
3	48.5 x 144.5	42.865
3	60.5 x 144.5	42.865
3-1/2	48.5 x 144.5	50.097
3-1/2	60.5 x 144.5	50.097
4	48.5 x 144.5	57.365
4	60.5 x 144.5	57.365
4-1/2	48.5 x 144.5	64.421
5	48.5 x 144.5	71.477
5	60.5 x 144.5	71.477
5-1/2	48.5 x 144.5	78.533
5-1/2	60.5 x 144.5	78.533
6	48.5 x 144.5	85.589
6	60.5 x 144.5	85.589
7	60.5 x 144.5	101.112
8	60.5 x 144.5	115.224
9	60.5 x 144.5	129.336
10	60.5 x 144.5	143.801
12	60.5 x 144.5	172.025
14	60.5 x 144.5	200.249

Note: T651 temper is available up through and including 10" thick.
T6 temper only, 10.01" thick and above.

Aluminum Plate, 7075-T651

Heat Treatable

ASTM-B209, AMS-QQ-A-250/12

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
1/4	48.5 x 144.5	3.636
3/8	48.5 x 144.5	5.454
1/2	48.5 x 144.5	7.272
5/8	48.5 x 144.5	9.090
3/4	48.5 x 144.5	10.908
7/8	48.5 x 144.5	12.726
1	48.5 x 144.5	14.544
1-1/4	48.5 x 144.5	18.180
1-1/4	60.5 x 144.5	18.180
1-1/2	48.5 x 144.5	21.816
1-1/2	60.5 x 144.5	21.816
1-3/4	48.5 x 144.5	25.452
2	48.5 x 144.5	29.088
2	60.5 x 144.5	29.088
2-1/2	48.5 x 144.5	36.360
2-1/2	60.5 x 144.5	36.360

Thickness (inches)	Plate Size (inches)	Approx. Wt. (lbs./sqft.)
3	48.5 x 144.5	43.632
3	60.5 x 144.5	43.632
3-1/2	48.5 x 144.5	50.900
3-1/2	60.5 x 144.5	50.900
3-3/4	48.5 x 144.5	54.540
3-3/4	60.5 x 144.5	54.540
4	48.5 x 144.5	58.176
4	60.5 x 144.5	58.176
5	48.5 x 144.5	72.720
5	60.5 x 144.5	72.720
6	48.5 x 144.5	87.264
6	60.5 x 144.5	87.264
7	48.5 x 144.5	102.244
8	44.5 x 144.5	116.788
8	60.5 x 144.5	116.788

Alro stocked Aluminum Plate thickness tolerances:		
6061	1.00" & under:	+/- full commercial tolerance
	Over 1" thick:	Half commercial tolerance, all to the plus side (+1/2 commercial / -0)
2024	Under 3" thick:	+/- full commercial tolerance
	3.00" & over:	+.030" min, then 1/2 commercial, all to the plus side.
7075	Under 3" thick:	+/- full commercial tolerance
	3.00" & over:	+.030" min, then 1/2 commercial, all to the plus side.

Note: See pages 6-77 thru 6-79 for commercial thickness tolerances.

Cast Aluminum Tool & Jig Plate

Characteristics

- Dimensional Stability
- Elongation - a remarkable 10% to 12%
- Identical, consistent hardness throughout its entire thickness range
- Identical, consistent mechanical properties throughout its entire thickness range, regardless of size
- The closest flatness and thickness tolerances available
- Fully weldable
- Superior anodizability, including hardcost anodizing
- Can be nickel plated
- Surface finish is the finest and smoothest of any aluminum plate produced, an 18-20 RMS, perfect for almost all finished product applications

Precision finished Cast Aluminum Tool and Jig Plate is readily available from Alro Steel. Contact your Alro sales representative today to discuss your specific needs.

Mic-6®

Cast Aluminum Tool & Jig Plate

Precision Machined / PVC Two Sides

Available Sizes

Standard Thicknesses	1/4" through 4"	
Standard Widths & Lengths	48.5" x 96.5"	60.5" x 96.5"
	48.5" x 120.5"	60.5" x 120.5"
	48.5" x 144.5"	60.5" x 144.5"

** Non-standard thicknesses, widths and lengths may be available upon inquiry*

Typical Properties

Typical Tensile Strength	24 ksi / 166 Mpa
Typical Yield Strength	15 ksi / 105 Mpa
Percent Elongation	3%
Brinell Hardness	65
Coefficient of Thermal Expansion (Average)	13.1 x 10^6 in./in./ºF (68º - 212ºF) 13.6 x 10^6 in./in./ºF (68º - 392ºF)
Thermal Conductivity	0.34 cal./cm./s./ºC 142 W/m K 82 Btu/ft./hr./ºF
Electrical Conductivity, IACS:	36%
Modulus of Elasticity:	10.3 x 10^6 psi / 71,000 Mpa
Alloy	7XXX
Density	0.101 lb./inch^3

Tolerances

Surface	Each side is machined to a maximum 20 microinch or 0.50 micron smoothness
Edge Condition	
Width	Milled or Saw Cut
Length	Saw Cut
Mill Plate	
Width Tolerance	(+ 1/4 inch / - 0)
Length Tolerance	(+ 1/2 inch / - 0)
Thickness Tolerance	Tolerance for any thickness is +/-.005 Maximum Deviation From Flat
Specified Plate Flatness Maximum Variation	
1/4 inch to 5/8 inch	.015 inches
3/4 inch and over	.005 inches

Flatness Tolerances apply to standard mill plates and saw cut blanks when proper equipment and techniques are used.

Typical Applications

Fully stress-relieved, MIC-6 is a free cutting aluminum alloy with excellent machining characteristics, producing small, uniform chips in a variety of high speed operations. Excellent for:

- Tooling
- Checking Fixtures
- Routing Tables
- Medical Instrumentation
- Packaging Machinery
- Printing Machinery
- Robotics
- Vacuum Chambers/Chucks

Alca 5®

Cast Aluminum Tool & Jig Plate

Precision Machined / PVC Two Sides

Available Sizes

Standard Thicknesses	1/4" through 4-1/2"		
Standard Widths & Lengths	48.5" x 96.5"	60.5" x 96.5"	72.5" x 96.5"
	48.5" x 120.5"	60.5" x 120.5"	72.5" x 120.5"
	48.5" x 144.5"	60.5" x 144.5"	72.5" x 144.5"

** Non Standard thicknesses, widths and lengths may be available upon inquiry*

Typical Properties

Typical Tensile Strength	41,000 psi
Typical Yield Strength	18,000 psi
Elongation in 2 inch E%	16%
Brinell Hardness	70
Coefficient of Thermal Expansion	13.2 micro in./in./ºF (68º - 212ºF)
Thermal Conductivity	69.3 Btu/ft./hr./ºF (68ºF)
Electrical Conductivity, IACS:	27% (68ºF)
Modulus of Elasticity	10.3 x 10^6 psi
Alloy	5083
Density	0.096 lb./$inch^3$

Tolerances

Surface	Each side is machined to a maximum 20 microinch or 0.50 micron smoothness
Edge Condition	
Width	Milled or Saw Cut
Length	Saw Cut
Mill Plate	
Width Tolerance	(+ 1/8 inch / - 0)
Length Tolerance	(+ 1/8 inch / - 0)
Thickness Tolerance	Tolerance for any thickness is +/-.005" Maximum Deviation From Flat
Specified Plate Flatness Maximum Variation	
1/4 inch to 1/2 inch	.015 inches max
5/8 inch to 4 1/2 inch	.005 inches max

Flatness Tolerances apply to standard mill plates and saw cut blanks when proper equipment and techniques are used.

Typical Applications

Alca 5® is a precision plate product that is characterized by excellent dimensional stability offering a low level of internal stress that reduces after machining deformation considerably. Excellent for:

- Fixtures
- Reference Plates
- Machine Construction
- Molds
- Jigs
- Construction Equipment

ATP-5™

Cast Aluminum Tool & Jig Plate

Precision Machined / PVC Two Sides

Available Sizes

Standard Thicknesses	3/8" - 4"		
Standard Widths & Lengths	48.5" x 96.5"	60.5" x 96.5"	72.5" x 96.5"
	48.5" x 120.5"	60.5" x 120.5"	72.5" x 120.5"
	48.5" x 144.5"	60.5" x 144.5"	72.5" x 144.5"

** Non Standard thicknesses, widths and lengths may be available upon inquiry*

Typical Properties

Typical Tensile Strength	41,000 ksi
Typical Yield Strength	18,000 ksi
Percent Elongation in 2 inches	15%
Brinell Hardness	70
Coefficient of Thermal Expansion(Average)	13.1 x 10^6 in./in./ºF (68º - 212ºF) 13.4 x 10^6 in./in./ºF (68º - 392ºF)
Thermal Conductivity	63-81 Btu/ft./hr./ºF 110 - 140 W/mK
Electrical Conductivity, IACS	35%
Modulus of Elasticity	10.1 x 10^6 psi / 70,000 Mpa
Alloy	5XXX
Density	0.096 lb./inch^3

Tolerances

Surface	Each side is machined to a maximum 20 microinch
Edge Condition	
Width	Milled or Saw Cut
Length	Saw Cut
Mill Plate	
Width Tolerance	(+ 1/4 inch / - 0)
Length Tolerance	(+ 1/4 inch / - 0)
Thickness Tolerance	Tolerance for any thickness is +/-.005 Maximum Deviation From Flat
Specified Plate Flatness Maximum Variation	
Under 1/2 inch	0.015 inch
Over 1/2 inch	0.005 inch

Flatness Tolerances apply to standard mill plates and saw cut blanks when proper equipment and techniques are used.

Typical Applications

ATP-5™ has outstanding machinability, excellent high speed cutting & feed rates, offers dimensional control & outstanding flatness characteristics. Excellent For:

- Computer & Electronic Work
- Machining Fixtures
- Index Tables
- Packaging Machinery
- Vacuum Chucks
- Printing Machinery
- Food Machinery Molds
- Heating & Cooling Plates

Cast Aluminum Tool & Jig Plate

Precision Finished

Two Sides Machined to a Typical 20 RMS max.

Includes: Mic 6® • Alca 5® • ATP-5™

Thick (inches)	5XXX Series Alca 5, ATP-5, (lbs./ sqft.)	7XXX Series MIC-6 (lbs./ sqft.)
1/4	3.460	3.636
5/16	4.325	4.545
3/8	5.189	5.454
1/2	6.920	7.272
5/8	8.649	9.090
3/4	10.379	10.908
7/8	12.109	12.726
1	12.838	14.544
1-1/8	15.568	16.376
1-1/4	17.298	18.180
1-1/2	20.758	21.816

Thick (inches)	5XXX Series Alca 5, ATP-5, (lbs./ sqft.)	7XXX Series MIC-6 (lbs./ sqft.)
1-5/8	22.487	23.634
1-3/4	24.217	25.452
2	27.677	29.088
2-1/4	31.136	32.724
2-1/2	34.596	36.630
2-3/4	38.056	39.996
3	41.515	43.632
3-1/2	48.434	50.904
4	55.354	58.185
4-1/2	62.273	66.357

Available Pattern Sizes

48-1/2 x 96-1/2	60-1/2 x 96-1/2	62 x 96-1/2	72-1/2 x 96-1/2
48-1/2 x 120-1/2	60-1/2 x 120-1/2	62 x 120-1/2	72-1/2 x 120-1/2
48-1/2 x 144-1/2	60-1/2 x 144-1/2	62 x 144-1/2	72-1/2 x 144-1/2

- Extra Wide and Extra Long Cast Tool & Jig plate available on RFQ basis.
- Special thicknesses over 6" are available
- Special widths available up to 120-1/2”
- Special lengths available up to 288"
- Precision sawing of aluminum plate available

Flatness Tolerances:*

Sizes under 1/2" thick - up to 60-1/2" wide flat within .015"

Sizes 3/4" to 4-1/2" thick - up to 60-1/2" wide flat within .005"

*(*When checked on a precision surface plate measured with a feeler gauge.)*

Brinell Hardness: 64 - 74

Weldability is excellent:

Use conventional TIG or MIG methods and 4043 (5% silicon) welding wire or rod.

Max 5®

5000 Series Cast Aluminum Mold Plate

Description

5000 Series mold plate is a modified 5083 alloy that provides strength, good anodizing response, weldability and machinability. Produced using the direct chill continuous cast process, these products also exhibit excellent dimensional stability. The low density of the 5000 series is an advantage over other aluminum mold plates.

Available Sizes

Standard Thicknesses	2" through 30"
Standard Widths & Lengths	64" x 145.5"
	64" x 150.5"

** Non-standard thicknesses, widths and lengths may be available upon inquiry*

Typical Properties

Typical Tensile Strength	38,000 - 41,000 psi
Typical Yield Strength	18,000 psi
Percent Elongation	15% - 16%
Brinell Hardness	70
Coefficient of Thermal Expansion (Average)	13.2 µin./in./°F (68°F - 212°F) - Max 5®
	13.1 x 10^6 (68°F - 212°F) - Duramold 5™
Thermal Conductivity	69.3 Btu/ft./hr./ºF - Max 5®
	81.0 Btu/ft./hr./°F - Duramold 5™
Electrical Conductivity, IACS:	7% to 29% (68ºF)
Modulus of Elasticity:	10.3 x 10^6 psi - Max 5®
	10.7 x 10^6 psi - Duramold 5™
Alloy	5000 Series
Density	0.096 lb./inch^3

Tolerances

Surface	Precision sawed top and bottom
Edge Condition	Precision sawed width and length
Mill Plate	
Thickness Tolerance	(+ 1/8 inch / - 0)
Width Tolerance	(+ 1/4 inch / - 0)
Length Tolerance	(+ 1/4 inch / - 0)

Typical Applications

- Injection Molds
- Blow Molds
- Thermoform Tools & Molds
- RIM & RTM Molding
- Vacuum Forming Tools
- Heating & Cooling Plates
- Rubber Molds
- Structural Foam Molds

Cast Aluminum Mold Plate

Includes: Max 5®

		Max 5®
Thickness (inches)	2XXX Series Approx. Wgt. (lbs./ sqft.)	5XXX Series Approx. Wgt. (lbs./ sqft.)
3	43.632	42.509
3-1/2	50.904	49.392
5	74.538	70.848
6	89.082	84.672
7	103.626	98.496
8	118.170	112.320
9	132.714	126.144
10	147.258	139.968
11	161.802	153.792
12	176.346	167.616
13	190.890	181.440
14	205.434	195.264
15	219.978	209.088
16	234.522	222.912
17	249.066	241.688
18	263.610	250.560
20	292.698	278.208

Available Pattern Sizes

54" x 132" • 53" x 150" • 64" x 145.5" • 64" x 150.5"

Alro has the capability to cut Aluminum Mold Plate up to 30" thick.

Alumold® 500

7000 Series Aluminum Mold Plate

Description

Alumold® 500 is a high strength aluminum mold plate product that offers exceptional thermal conductivity for an aluminum alloy, which can improve cycle times and molding efficiencies when compared to typical mold steels such as P-20. Alumold® also has excellent machining, polishing, and hardness characteristics as well as being easily weldable. This 7000 series alloy accepts a wide range of surface treatments and has consistent through thickness hardness qualities.

Available Sizes

Standard Thicknesses ..... 1" through 8" Rolled & Stress Relieved
10" through 20" Forged & Stress Relieved
Standard Widths & Lengths ..... Widths ranging from 50" up to 72.50"
Lengths ranging from 64" up to 144.50"

** Width and length combinations depend on thickness*

Typical Properties

Typical Ultimate Strength ..... 80 - 85 ksi (1" - 8") and 70 - 76 ksi (10" & over)
Typical Yield Strength..... 73 - 78 ksi (1" - 8") and 60 - 67 ksi (10" & over)
Elongation in 2" E%..... 2% - 10% (1" - 8") and 7% - 9% (10" & over)
Brinell Hardness..... 180 - 185 (1" - 8") and 165 - 180 (10" & over)
Coefficient of Thermal Expansion ... 13.2 x 10^6
Thermal Conductivity..... 88 Btu/ft./hr./ºF - Max 5®
Modulus of Elasticity:..... Compressive: 10.6 x 10^6 psi
Tensile: 10.4 x 10^6 psi
Alloy ..... 7000 Series
Density ..... 0.102 lb./inch^3

Typical Applications

Injection Molds
Blow Molds
Thermoform Tools & Molds
RIM & RTM Molding
Vacuum Forming Tools
Heating & Cooling Plates
Rubber Molds
Structural Foam Molds

Thickness (inches)	Approx. Wt. (lbs./sqft.)	Thickness (inches)	Approx. Wt. (lbs./sqft.)	Thickness (inches)	Approx. Wt. (lbs./sqft.)
1	15.628	4	61.029	12*	176.256
1-1/2	22.972	5	75.717	14*	205.632
2	30.551	6	90.625	16*	235.008
2-1/2	38.189	7	104.358	18*	264.384
3	45.533	8	119.046	20*	293.760
3-1/2	53.317	10*	146.880		

**Width and length combinations depend on thickness*

Tolerances - Mill Plate

Thickness Tolerance..... Nominal +1/4" / -0" Rolled.
+.400" / -0" on Forged
Width Tolerance..... +1/2" / -0"
Length Tolerance..... +1/2" / -0"

Aluminum Sheet & Plate, 3003-H22

Diamond Tread, Reflective Finish

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.063	48 x 96	1.058
.063	48 x 120	1.058
.063	48 x 192	1.058
.080	48 x 96	1.283
.080	48 x 192	1.283
.100	48 x 96	1.570
.100	48 x 120	1.570
.100	48 x 192	1.570
.100	60 x 120	1.570
.125	48 x 96	1.900
.125	48 x 120	1.900
.125	48 x 144	1.900
.125	48 x 192	1.900
.125	60 x 96	1.900
.125	60 x 192	1.900

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.188	48 x 96	2.820
.188	48 x 120	2.820
.188	48 x 144	2.820
.188	48 x 192	2.820
.188	60 x 96	2.820
.188	60 x 192	2.820
.250	48 x 96	3.700
.250	48 x 120	3.700
.250	48 x 192	3.700
.250	60 x 120	3.700
.250	60 x 192	3.700

Aluminum Sheet & Plate, 6061-T6

Diamond Tread, Standard Mill Finish

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.125	48 x 96	1.900
.125	48 x 192	1.900
.125	60 x 192	1.900
.188	48 x 96	2.79
.188	48 x 192	2.79
.188	60 x 192	2.79
.250	48 x 96	3.67
.250	48 x 192	3.67
.250	60 x 192	3.67

Thickness (inches)	Sheet Size (inches)	Approx. Wt. (lbs./sqft.)
.375	48 x 96	5.43
.375	48 x 192	5.43
.375	60 x 192	5.43
.500	48 x 192	7.20
.500	60 x 192	7.20

Flatness Tolerances

Aluminum Sawed or Sheared Plate

Longitudinal Flatness

Specified Thickness (inches)	Tolerance① in. – Allowable Deviation from Flat	
	TX51 tempers②	Other than TX51 tempers②⑦
0.250 - 3.000	3/16in in any 6ft ③	1/4” in any 6’ or less
3.001 - 8.000	1/8” in any 6’ or less	1/4” in any 6’ or less

TRANSVERSE FLATNESS

SPECIFIED THICKNESS (inches)	TOLERANCE 1 in.–Allowable Deviation from Flat				
	Widths over 4ft thru 6ft ④		Widths over 2ft thru 4ft		Widths 2ft and less
	TX51 tempers②	Other than TX51 tempers②⑦	TX51 tempers②	Other Than TX51 tempers②⑦	All tempers⑦
0.250 - 0.624	3/8	1/2	5/16	3/8	
0.625 - 1.500	5/16	3/8	3/16	1/4	
1.501 - 3.000	3/16	1/4	3/16	3/16	
3.001 - 8.000	1/8	1/4	1/8	3/16	

SHORT-SPAN FLATNESS ⑤

Specified Thickness (inches)	Tolerance⑥ in. – Allowable Deviation from Flat	
	TX51 tempers②	Other than TX51 tempers②⑦
0.250 - 0.624	.100	.125
0.625 - 8.000	.075	.090

①As measured with plate resting on a flat surface concave side upward, using a straightedge and a feeler gauge, dial gauge or scale.
②TX51 is a general designation for the following stress-relieved tempers: T351, T451, T651, T851, T7351 and T7651.
③For pieces ordered to less than 6ft length, the tolerance is 1/8” for the total length.
④For widths over 6ft, these tolerances apply for any 6ft of total width.
⑤Short-span flatness is the deviation from flat over full span for spans 2ft and less.
⑥As measured with the plate resting on a flat surface
⑦Not applicable to O, F, and HX8 and harder tempers.

Standard Tolerances

Aluminum Sheet, Plate & Coil

Thickness - Applicable to all alloys not included in the Aerospace Alloys table or specified for Aerospace applications. Also applicable to alloys when supplied as Alclad.

Specified Thickness[1] (inches)		Specified Width (inches)			
		Up thru 39.37	Over 39.37 thru 59.06	Over 59.06 thru 78.74	Over 78.74 thru 98.43
Over	Thru	Tolerances +/- (inches)			
0.0059	0.010	0.0010	0.0015	---	---
0.010	0.016	0.0010	0.0015	---	---
0.016	0.025	0.0015	0.0020	0.0030	0.0035
0.025	0.032	0.0020	0.0025	0.0035	0.0040
0.032	0.039	0.0020	0.0030	0.0035	0.0045
0.039	0.047	0.0025	0.0035	0.0045	0.006
0.047	0.063	0.0030	0.0035	0.0050	0.006
0.063	0.079	0.0035	0.0040	0.006	0.007
0.079	0.098	0.0035	0.0045	0.006	0.007
0.098	0.126	0.0045	0.006	0.007	0.009
0.126	0.158	0.006	0.007	0.009	0.011
0.158	0.197	0.007	0.009	0.011	0.013
0.197	0.248	0.009	0.011	0.013	0.015
0.248	0.315	0.012	0.014	0.015	0.018
0.315	0.394	0.015	0.017	0.020	0.023
0.394	0.630	0.023	0.023	0.027	0.032
0.630	0.984	0.031	0.031	0.037	0.043
0.984	1.575	0.039	0.039	0.047	0.055
1.575	2.362	0.055	0.055	0.060	0.070
2.362	3.150	0.075	0.075	0.085	0.100
3.150	3.937	0.100	0.100	0.115	0.125
3.937	6.299	0.130	0.130	0.145	0.165
6.300	8.000	0.160	0.160	0.160	0.165

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.

(1) When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Tolerances applicable at ambient mill temperatures. A change in dimension of 0.013 in. per 10°F must be recognized.

Two page chart, continues on next page

Standard Tolerances

Aluminum Sheet, Plate & Coil

Thickness - Applicable to all alloys not included in the Aerospace Alloys table or specified for Aerospace applications. Also applicable to alloys when supplied as Alclad.

Specified Thickness[1] (inches)		Specified Width (inches)			
		Over 98.43 thru 118.11	Over 118.11 thru 137.80	Over 137.80 thru 157.48	Over 157.48 thru 177.17
Over	Thru	Tolerances +/- (inches)			
0.0059	0.010	---	---	---	---
0.010	0.016	---	---	---	---
0.016	0.025	---	---	---	---
0.025	0.032	---	---	---	---
0.032	0.039	0.006	---	---	---
0.039	0.047	0.007	0.008	---	---
0.047	0.063	0.007	0.009	---	---
0.063	0.079	0.008	0.010	---	---
0.079	0.098	0.009	0.011	---	---
0.098	0.126	0.011	0.013	---	---
0.126	0.158	0.013	0.015	---	---
0.158	0.197	0.015	0.018	---	---
0.197	0.248	0.018	0.022	0.027	---
0.248	0.315	0.022	0.027	0.035	0.043
0.315	0.394	0.027	0.033	0.041	0.051
0.394	0.630	0.035	0.043	0.053	0.065
0.630	0.984	0.047	0.058	0.070	0.085
0.984	1.575	0.065	0.075	0.090	0.105
1.575	2.362	0.085	0.100	0.155	---
2.362	3.150	0.105	0.125	---	---
3.150	3.937	0.130	0.160	---	---
3.937	6.299	---	---	---	---
6.300	8.000	---	---	---	---

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.

(1) When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Tolerances applicable at ambient mill temperatures. A change in dimension of 0.013 in. per 10°F must be recognized.

Two page chart, continued from previous page

Standard Tolerances

Aluminum Sheet, Plate & Coil

Thickness for Sheet and Plate for Aerospace Alloys - Alloys 2014, 2024, 2124, 2219, 7049, 7050, 7075, 7150, 7178 and 7475 and other alloys when specified for aerospace applications. Also applicable to alloys when supplied as Alclad.

Specified Thickness[1] (inches)		Specified Width (inches)					
		Up thru 39.37	Over 39.37 thru 47.24	Over 47.24 thru 55.12	Over 55.12 thru 59.06	Over 59.06 thru 70.87	Over 70.87 thru 78.84
Over	Thru	Tolerances +/- (inches)					
0.0059	0.010	0.0010	0.0020	0.0020	0.0020	---	---
0.010	0.016	0.0015	0.0025	0.0025	0.0025	---	---
0.016	0.025	0.0015	0.0025	0.0025	0.0025	---	---
0.025	0.032	0.0015	0.0015	0.0020	0.0030	0.0030	---
0.032	0.039	0.0015	0.0015	0.0020	0.0030	0.0030	0.0035
0.039	0.047	0.0020	0.0020	0.0020	0.0030	0.0030	0.0035
0.047	0.063	0.0020	0.0020	0.0030	0.0030	0.0030	0.0035
0.063	0.079	0.0020	0.0020	0.0030	0.0035	0.0035	0.0035
0.079	0.098	0.0025	0.025	0.0035	0.0040	0.0040	0.0045
0.098	0.126	0.0035	0.035	0.0035	0.0045	0.0045	0.0045
0.126	0.158	0.0040	0.040	0.0045	0.007	0.007	0.009
0.158	0.197	0.0055	0.007	0.007	0.009	0.009	0.011
0.197	0.248	0.009	0.012	0.012	0.012	0.017	0.017
0.248	0.315	0.012	0.015	0.015	0.015	0.019	0.019
0.315	0.394	0.017	0.018	0.018	0.018	0.022	0.022
0.394	0.630	0.023	0.023	0.023	0.023	0.028	0.028
0.630	0.984	0.031	0.031	0.031	0.031	0.037	0.037
0.984	1.575	0.039	0.039	0.039	0.039	0.047	0.047
1.575	2.362	0.055	0.055	0.055	0.055	0.060	0.060
2.362	3.150	0.075	0.075	0.075	0.075	0.085	0.085
3.150	3.937	0.100	0.100	0.100	0.100	0.115	0.115
3.937	6.299	0.130	0.130	0.130	0.130	0.145	0.145
6.300	8.000	0.160	0.160	0.160	0.160	0.160	0.160

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.
(1)When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Capability to provide tighter tolerances may vary with suppliers

Standard Tolerances

Aluminum Sheet, Plate & Coil

Thickness for Sheet and Plate for Aerospace Alloys - Alloys 2014, 2024, 2124, 2219, 7049, 7050, 7075, 7150, 7178 and 7475 and other alloys when specified for aerospace applications. Also applicable to alloys when supplied as Alclad.

Specified Thickness[1] (inches)		Specified Width (inches)					
		Over 78.74 thru 86.61	Over 86.61 thru 98.43	Over 98.43 thru 118.11	Over 118.11 thru 137.80	Over 137.80 thru 157.48	Over 157.48 thru 177.17
Over	Thru	Tolerances +/- (inches)					
0.0059	0.010	---	---	---	---	---	---
0.010	0.016	---	---	---	---	---	---
0.016	0.025	---	---	---	---	---	---
0.025	0.032	---	---	---	---	---	---
0.032	0.039	0.0035	0.007	---	---	---	---
0.039	0.047	0.0035	0.008	0.010	0.011	---	---
0.047	0.063	0.0035	0.009	0.011	0.013	---	---
0.063	0.079	0.0035	0.010	0.013	0.015	---	---
0.079	0.098	0.0045	0.011	0.015	0.018	---	---
0.098	0.126	0.0045	0.013	0.016	0.020	---	---
0.126	0.158	0.009	0.015	0.018	0.022	---	---
0.158	0.197	0.011	0.018	0.022	0.026	---	---
0.197	0.248	0.021	0.021	0.025	0.029	---	---
0.248	0.315	0.024	0.024	0.029	0.033	0.041	0.051
0.315	0.394	0.028	0.028	0.033	0.039	0.047	0.059
0.394	0.630	0.033	0.033	0.039	0.047	0.059	0.070
0.630	0.984	0.043	0.043	0.051	0.060	0.070	0.085
0.984	1.575	0.055	0.055	0.065	0.075	0.090	0.105
1.575	2.362	0.070	0.070	0.090	0.100	0.155	---
2.362	3.150	0.100	0.100	0.110	0.125	---	---
3.150	3.937	0.130	0.130	0.150	0.160	---	---
3.937	6.299	0.165	0.165	---	---	---	---
6.300	8.000	0.165	0.165	---	---	---	---

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.
(1)When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Capability to provide tighter tolerances may vary with suppliers

Standard Tolerances

Aluminum Sheet, Plate & Coil

Width and Length - Sawed Flat Sheet and Plate

Specified Thickness(1) (inches)			Specified Width (inches)			
			Up thru 39.37	Over 39.37 thru 59.06	Over 59.06 thru 78.74	Over 78.74 thru 98.43
Over		Thru	Tolerances +/- (inches)			
0.080	-	0.249	+/- 1/8	+/- 1/8	+/- 3/16	+/- 1/4
0.250	-	6.000	+/- 1/4	+/- 5/16	+/- 3/8	+/- 1/2

Specified Thickness(1) (inches)			Specified Width (inches)			
			Over 98.43 thru 118.11	Over 118.11 thru 137.80	Over 137.80 thru 157.48	Over 157.48 thru 177.17
Over		Thru	Tolerances +/- (inches)			
0.080	-	0.249	+/- 1/4	+/- 5/16	+/- 3/8	+/- 7/16
0.250	-	6.000	+/- 9/16	+/- 5/8	+/- 3/4	+/- 7/8

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.

(1) When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Tolerances applicable at ambient mill temperatures. A change in dimension of 0.013 in. per 10°F must be recognized.

Standard Tolerances

Aluminum Sheet, Plate & Coil

Width Tolerances - Sheared Flat Sheet and Plate

Specified Thickness[1] (inches)	Specified Width (inches)					
	Up thru 6	Over 6 thru 24	Over 24 thru 60	Over 60 thru 96	Over 96 thru 132	Over 132 thru 168
	Tolerance[2] (inches)					
0.006 - 0.124	±1/16	±3/32	±1/8	±1/8	±5/32	-
0.125 - 0.249	±3/32	±3/32	±1/8	±5/32	±3/16	-
0.250 - 0.499	±1/4	±5/16	±3/8	±3/8	±7/16	±1/2

Length Tolerances - Sheared Flat Sheet and Plate

Specified Thickness[1] (inches)	Specified Width (inches)							
	Up thru 30	Over 30 thru 60	Over 60 thru 120	Over 120 thru 240	Over 240 thru 360	Over 360 thru 480	Over 480 thru 600	Over 600 thru 720
	Tolerance[2] (inches)							
0.006 - 0.125	±1/16	±3/32	±1/8	±5/32	±3/16	±7/32	±9/32	-
0.125 - 0.249	±3/32	±3/32	±1/8	±5/32	±7/32	±1/4	±5/16	-
0.250 - 0.499	±1/4	±3/8	±7/16	±1/2	±9/16	±5/8	±11/16	3/4

Width Tolerances - Slit Coiled Sheet

Specified Thickness[1] (inches)	Specified Width (inches)					
	Up thru 6	Over 6 thru 12	Over 12 thru 24	Over 24 thru 48	Over 48 thru 60	Over 60 thru 96
	Tolerance[2] (inches)					
0.006 - 0.125	0.010	1/64	1/32	3/64	1/16	1/8
0.126 - 0.186	0.012	1/32	1/32	1/16	3/32	-
0.187 - 0.249	0.016	1/32	3/64	3/32	1/8	-

Lateral Bow Tolerances - Coiled Sheet

Specified Thickness[1] (inches)	Specified Width (inches)				
	1/2 thru 6	Over 1 thru 2	Over 2 thru 4	Over 4 thru 10	Over 10
	Tolerance (inches in 6 ft.) - Available Deviation of a Side Edge from a Straight Line				
0.006 - 0.064	3/4	9/16	3/8	1/4	3/16
0.065 - 0.125	-	-	3/8	1/4	3/16

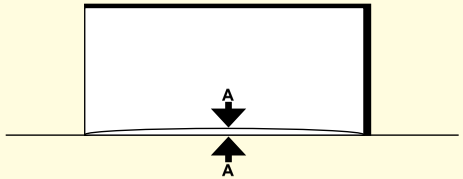
Width and Length Tolerances - Sawed Flat Sheet and Plate

Specified Thickness[1] (inches)	Specified Width and Length (inches)							
	Up thru 30	Over 30 thru 60	Over 60 thru 120	Over 120 thru 240	Over 240 thru 360	Over 360 thru 480	Over 480 thru 600	Over 600 thru 720
	Tolerance[2] (inches)							
0.080 - 0.249	±1/8	±1/8	±3/16	±1/4	±1/4	±5/16	±3/8	±7/16
0.250 - 8.000	±1/4	±5/16	±3/8	±1/2	±9/16	±5/8	±3/4	±7/8

Standard Tolerances

Aluminum Sheet, Plate & Coil

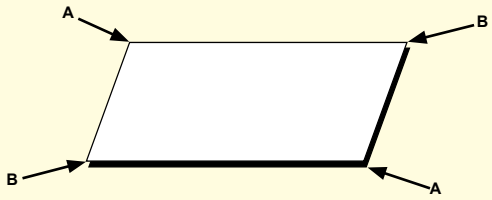
Lateral Bow Tolerances - Flat Sheet and Plate

Specified Thickness (inches)	Specified Width (inches)	ALLOWABLE DEVIATION OF A SIDE EDGE FROM A STRAIGHT LINE  Maximum allowable value of AA						
		Specified Length (inches)						
		Up thru 60	Over 60 thru 90	Over 90 thru 120	Over 120 thru 150	Over 150 thru 180	Over 180 thru 210	Over 210 thru 240
		Tolerance[2] (inches)						
0.006 - 0.125	**Up thru 4**	0.250	0.563	1.000	1.563	2.250	3.000	4.000 ⑤
	Over 4 Thru 10	0.094	0.219	0.375	0.563	0.875	1.156	1.500 ⑤
	Over 10 thru 35	0.063	0.125	0.188	0.250	0.375	0.500	0.750 ⑤
	Over 35	0.032	0.063	0.125	0.188	0.250	0.375	0.500 ⑤
0.126 - 0.249	**Over 4 Thru 15**	0.063	0.125	0.250	0.375	0.563	0.750	1.000 ⑤
	Over 15	0.032	0.063	0.125	0.188	0.250	0.375	0.500 ⑤
0.250 - 8.000	Up thru 10	0.250	0.563	1.000	1.563	2.250	3.000	4.000 ⑤
	Over 10 thru 18	0.063	0.125	0.250	0.406	0.594	0.781	1.000 ⑤
	Over 18	0.032	0.094	0.125	0.219	0.312	0.438	0.562 ⑤

Standard Tolerances

Aluminum Sheet and Plate

Squareness Tolerances

Specified Length (feet)	Specified Width - (feet)	
	Up thru 3	Over 3
	Allowable Difference in Length of Diagonals ④ (inches)  Maximum difference between AA and BB	
Up thru 12	3/32 x width, ft ③	5/64 x width, ft ③
Over 12	9/64 x width, ft ③	7/64 x width, ft ③

Notes: The above standards are those published by the Aluminum Association, Aluminum Standards & Data 2009.

(1) When a dimension tolerance is specified other than as an equal bilateral tolerance, the value of the standard tolerance is that which applies to the mean of the maximum and minimum dimensions permissible under the tolerance for the dimension under consideration.

(2) Tolerances applicable at ambient mill temperatures. A change in dimension of 0.013 in. per 10°F must be recognized.

(3) If specified width is other than an exact multiple of 12", tolerance is determined by using the next largest exact multiple. For example, if specified width is 53" and specified length is 72", the tolerance is 5/64" x 5 = 25/64". This result is then rounded to 7/16" in accordance with footnote (4).

(4) Use values for calculating only. Round result upward to nearest 1/16".

(5) Also applicable to any 240-inch increment of longer sheet or plate.

Technical Data

Aluminum Products

Alloy Designation System

A system for designating wrought aluminum and wrought aluminum alloys established by the Aluminum Association. Specific limits for chemical compositions to which conformance is required are provided by applicable product standards.

Wrought Aluminum and Aluminum Alloy Designation System

A system of four-digit numerical designations is used to identify wrought aluminum and wrought aluminum alloys. The first digit indicates the alloy group as follows:

Aluminum, 99.00% minimum and greater 1XXX
Aluminum alloys grouped by major alloying elements:
Copper (Cu) 2XXX
Manganese (Mn) 3XXX
Silicon (Si) 4XXX
Magnesium (Mg) 5XXX
Magnesium and Silicon (Mg and Si) 6XXX
Zinc (Zn) 7XXX
Other element 8XXX
Unused series 9XXX

Aluminum

In the 1XXX group for minimum aluminum purities of 99.00% and greater, the last two of the four digits in the designation indicate the minimum aluminum percentage. These digits are the same as the last two digits to the right of the decimal point in the minimum aluminum percentage when it is expressed to the nearest 0.01%. The second digit in the designation indicates unalloyed aluminum having natural impurity limits; integers 1 through 9, which are assigned consecutively as needed, indicate special control of one or more individual impurities or alloying elements.

Aluminum Alloys

In the 2XXX through 8XXX alloy groups the last two of the four digits in the designation have no special significance but serve only to identify the different aluminum alloys in the group. The second digit in the alloy designation indicates alloy modifications. If the second digit is zero, it indicates the original alloy; integers 1 through 9, which are assigned consecutively, indicate alloy modifications.

Temper Designation System

The Aluminum Association's established temper designation system is used for all forms of wrought and cast aluminum and aluminum alloys except ingot. It is based on the sequence of basic treatments used to produce various tempers. The temper designation follows the alloy designation with the two separated by a hyphen. Basic designations consist of a letter while the subdivisions of those basic tempers, where required, are indicated by one or more digits following those letters. The system is designed to set down specific sequences of fabrication processes, but only those operations that are recognized as significantly influencing the characteristics of the product are involved. Should some other variation of the same sequence of basic operations be applied to the same alloy, resulting in different characteristics, then additional digits will be added to the numerical designation.

Basic Temper Designations

F **as fabricated.** Denotes metal that has been fabricated to ordered dimensions without any attempt on the part of the producer to control the results of either strain-hardening operations or thermal treatments. There are no mechanical property limits and the strength levels may vary from lot to lot and from shipment to shipment.

O **annealed.** Applies to wrought products that have undergone a thermal treatment to reduce their mechanical property levels to their minimums. Often described as "dead soft" metal.

W **solution heat-treated.** An unstable temper applying to certain heat-treat able alloys that, after heat treatment, spontaneously age harden at room temperature. Only when the period of natural aging is indicated (W 1 hr for example) is this a specific and complete designation.

H **strain-hardened.** Applies to those wrought products which have had an increase in strength by reduction through strain-hardening, or cold-working, operations. The "H" is always followed by two or more digits.

T **thermally treated to produce tempers other than F, O or H.** Applies to those products which have had an increase in strength due to thermal treatments, with or without supplementary strain-hardening operations. The "T" is always followed by one or more digits.

Temper Designation System

Subdivisions of Basic Tempers

Subdivision of "H" Temper-Non-Heat-Treatable Alloys

H1 **strain-hardened only.** Applies to products which are strain-hardened or cold worked to obtain the desired strength level without supplementary thermal treatments. The number following this designation indicates the degree of strain-hardening.

H2 **strain-hardened and partially annealed.** Applies to products strain-hardened or cold worked more than the desired final amount and then reduced in strength to that desired level by partial annealing. The number following this designation indicates the degree of strain-hardening remaining after the partial annealing operation.

H3 **strain-hardened and stabilized.** Applies to products in the magnesium-aluminum class which will age-soften at room temperature after strain-hardening. These products are strain-hardened to the desired amount and then subjected to a low temperature thermal operation which results in a stable but slightly lower tensile strength and improved ductility. The number following this designation indicates the degree of strain-hardening remaining after the stabilization treatment.

The digit following the designation H1, H2 or H3 indicates the degree of strain-hardening as follows:

H_1 1/8 hard
H_2 1/4 hard
H_3 3/8 hard
H_4 1/2 hard
H_5 5/8 hard
H_6 3/4 hard
H_7 7/8 hard
H_8 full hard (approximately 75% reduction after a full anneal)
H_9 extra hard (limited to certain alloys and/or product forms)

The third digit, when used, indicates a variation of the two-digit temper.

It is used when the degree of control of temper or the mechanical properties are different from but close to the two-digit designation to which it is added, or when some other characteristic is significantly affected.

The following three-digit H temper designations have been assigned for wrought products in all alloys:

H_11 Applies to products which incur such sufficient strain hardening the after final anneal that they fail to qualify as annealed but not enough to qualify as H-1.

H_12 Applies to products which may acquire some temper from working at an elevated temperature and for which there are mechanical property limits.

Temper Designation System

Subdivisions of Basic Tempers

Subdivision of "T" Temper-Heat-Treatable Alloys

T1 **cooled from an elevated temperature shaping process and naturally aged to a substantially stable condition.** Usually associated with extruded products and limited to certain of the 6XXX series alloys.

T2 **cooled from an elevated temperature shaping process, cold worked, and naturally aged to a substantially stable condition.** Usually associated with cast products.

T3 **solution heat-treated, cold worked, and naturally aged to a substantially stable condition.** The working serves to increase the strength. (T4+cold work)

T4 **solution heat-treated and naturally aged to a substantially stable condition.**

T5 **cooled from an elevated temperature shaping process and artificially aged.** Usually associated with extruded products in certain of the 6XXX series alloys. (T1 + artificial age)

T6 **solution heat-treated and artificially aged.** A stable temper. (T4 + artificial age)

T7 **solution heat-treated and overaged/stabilized.** Applies to alloy products which are thermally over-aged after solution heat-treatment to carry them beyond the point of maximum strength to provide control of some special characteristic. A stable temper.

T8 **solution heat-treated, cold worked, and artificially aged.** A stable temper. (T3+ artificial age)

T9 **solution heat-treated, artificially aged, and cold worked.** A stable temper. (T6 + cold work)

T10 **cooled from an elevated temperature shaping process, cold worked, and artificially aged.** Usually associated with cast products. A stable temper. (T2 + artificial age)

Temper Designation System

Subdivisions of Basic Tempers

Subdivision of "T" Temper-Heat-Treatable Alloys

Additional digits, the first of which shall not be zero, may be added to the basic desIgnatIons to indicate a variation in treatment which significantly alters the characteristics of the product.

The following specific additional digits have been assigned for stress-relieved tempers of wrought products:

T_51 Applies to certain products when stress-relieved by stretching the indicated amount. Stretching is performed after solution heat treatment or after cooling from an elevated temperature shaping process. No straightening takes place after stretching.

Plate ..... 1-1/2 to 3% permanent set
Rolled or cold finished rod or bar ..... 1 to 3% permanent set
Die or ring forgings ..... 1 to 5% permanent set

T_510 Applies to extruded products and to drawn tube when stress-relieved by stretching the indicated amount. Stretching is performed after solution heat treatment or after cooling from an elevated temperature shaping process. No straightening takes place after stretching.

Rod, bar, shapes and tube ..... 1 to 3% permanent set
Drawn tube ..... 1/2 to 3% permanent set

T_511 Applies to extruded products, and to drawn tube when stress-relieved by stretching the indicated amount. Stretching is performed after solution heat treatment or after cooling from an elevated temperature shaping process. These products ***may*** receive minor straightening after stretching to comply with standard tolerances.

Bar, shapes and tube ..... 1 to 3% permanent set
Drawn tube ..... 1/2 to 3% permanent set

T_52 Applies to products stress-relieved by compressing.

T_54 Applies to die forgings stress-relieved by restriking cold.

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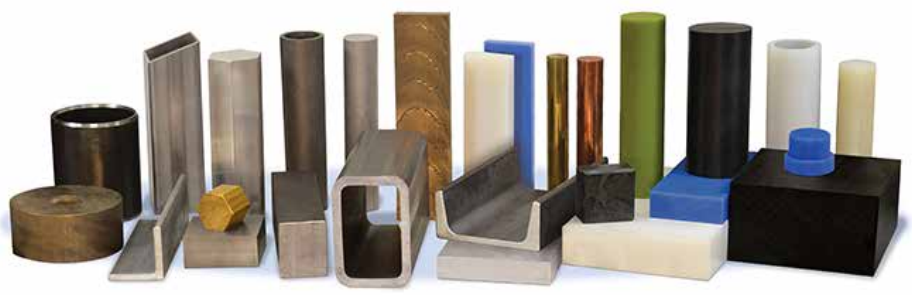

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- Pipe & Tubing
- Full lengths
- Remnants
- Cut-offs & Drops
- Saw Cutting
- Shearing

SCAN ME

Wrought Aluminum Alloys(1)(2)

Chemical Composition Limits

** Please refer to pg.6-92 for all applicable footnotes*

Alloy	Silicon	Iron	Copper	Manganese	Magnesium
1100	0.95	---	0.05 - 0.20	0.05	---
1145(7)	0.55	0.05	0.05	0.05	---
1350(9)	0.10	0.40	0.05	0.01	---
2011	0.40	0.70	5.00 - 6.00	---	---
2014	0.50 - 1.20	0.70	3.90 - 5.00	0.40 - 1.20	0.20 - 0.80
2017	0.20 - 0.80	0.70	3.50 - 4.50	0.40 - 1.00	0.40 - 0.80
2024	0.50	0.50	3.80 - 4.90	0.30 - 0.90	1.20 - 1.80
2117	0.80	0.70	2.20 - 3.00	0.20	0.20 - 0.50
2124	0.20	0.30	3.80 - 4.90	0.30 - 0.90	1.20 - 1.80
2219	0.20	0.30	5.80 - 6.80	0.20 - 0.40	0.02
3003	0.60	0.70	0.05 - 0.20	1.00 - 1.50	---
3004	0.30	0.70	0.25	1.00 - 1.50	0.80 - 1.30
3005	0.60	0.70	0.30	1.00 - 1.50	0.20 - 0.60
3105	0.60	0.70	0.30	0.30 - 0.80	0.20 - 0.80
4043	4.50 - 6.00	0.80	0.30	0.05	0.05
5005	0.30	0.70	0.20	0.20	0.50 - 1.10
5050	0.40	0.70	0.20	0.10	1.10 - 1.80
5052	0.25	0.40	0.10	0.10	2.20 - 2.80
5056	0.30	0.40	0.10	0.05 - 0.20	4.50 - 5.60
5083	0.40	0.40	0.10	0.40 - 1.00	4.00 - 4.90
5086	0.40	0.50	0.10	0.20 - 0.70	3.50 - 4.50
5154	0.25	0.40	0.10	0.10	3.10 - 3.90
5183	0.40	0.40	0.10	0.50 - 1.00	4.30 - 5.20
5252	0.08	0.10	0.10	0.10	2.20 - 2.80
5356	0.25	0.40	0.10	0.05 - 0.20	4.50 - 5.50
5454	0.25	0.40	0.10	0.50 - 1.00	2.40 - 3.00
5456	0.25	0.40	0.10	0.50 - 1.00	4.70 - 5.50
6061	0.40 - 0.80	0.70	0.15 - 0.40	0.15	0.80 - 1.20
6063	0.20 - 0.60	0.35	0.10	0.10	0.45 - 0.90
6101(13)	0.30 - 0.70	0.50	0.10	0.03	0.35 - 0.80
6105	0.60 - 1.00	0.35	0.10	0.10	0.45 - 0.80
6262	0.40 - 0.80	0.70	0.15 - 0.40	0.15	0.80 - 1.20
6351	0.70 - 1.30	0.50	0.10	0.40 - 0.80	0.40 - 0.80
7005	0.35	0.40	0.10	0.20 - 0.70	1.00 - 1.80
7049	0.25	0.35	1.20 - 1.90	0.20	2.00 - 2.90
7050	0.12	0.15	2.00 - 2.60	0.10	1.90 - 2.60
7075	0.40	0.50	1.20 - 2.00	0.30	2.10 - 2.90
7129	0.15	0.30	0.50 - 0.90	0.10	1.30 - 2.00
7178	0.40	0.50	1.60 - 2.40	0.30	2.40 - 3.10

Two page chart, continues on next page

Wrought Aluminum Alloys[1][2]

Chemical Composition Limits

** Please refer to pg.6-92 for all applicable footnotes*

Chromium	Zinc	Titanium	Others		Aluminum Minimum[5]
			Each[3]	Total[4]	
---	0.10	---	0.05[6]	0.15	99.00
0.05	0.03	---	0.03[8]	---	99.45
0.01	0.05	---	0.03[10]	0.10	99.50
---	0.30	---	0.05[11]	0.15	Remainder
0.10	0.25	0.15	0.05	0.15	Remainder
0.10	0.25	0.15	0.05	0.15	Remainder
0.10	0.25	0.15	0.05	0.15	Remainder
0.10	0.25	---	0.05	0.15	Remainder
0.10	0.25	0.15	0.05	0.15	Remainder
---	0.10	0.02 - 0.10	0.05[12]	0.15	Remainder
---	0.10	---	0.05	0.15	Remainder
---	0.25	---	0.05	0.15	Remainder
0.10	0.25	0.10	0.05	0.15	Remainder
0.20	0.40	0.10	0.05	0.15	Remainder
---	0.10	0.20	0.05[6]	0.15	Remainder
0.10	0.25	---	0.05	0.15	Remainder
0.10	0.25	---	0.05	0.15	Remainder
0.15 - 0.35	0.10	---	0.05	0.15	Remainder
0.05 - 0.20	0.10	---	0.05	0.15	Remainder
0.05 - 0.25	0.25	0.15	0.05	0.15	Remainder
0.05 - 0.25	0.25	0.15	0.05	0.15	Remainder
0.15 - 0.35	0.20	0.20	0.05	0.15	Remainder
0.05 - 0.25	0.25	0.15	0.05[6]	0.15	Remainder
---	0.05	---	0.03[8]	0.10	Remainder
0.05 - 0.20	0.10	0.06 - 0.20	0.05[6]	0.15	Remainder
0.05 - 0.20	0.25	0.20	0.05	0.15	Remainder
0.05 - 0.20	0.25	0.20	0.05	0.15	Remainder
0.04 - 0.35	0.25	0.15	0.05	0.15	Remainder
0.10	0.10	0.10	0.05	0.15	Remainder
0.03	0.10	---	0.03[14]	0.10	Remainder
0.10	0.10	0.10	0.05	0.15	Remainder
0.04 - 0.14	0.25	0.15	0.05[15]	0.15	Remainder
---	0.20	0.20	0.05	0.15	Remainder
0.06 - 0.20	4.00 - 5.00	0.01 - 0.06	0.05[16]	0.15	Remainder
0.10 - 0.22	7.20 - 8.20	0.10	0.05	0.15	Remainder
0.04	5.70 - 6.70	0.06	0.05[17]	0.15	Remainder
0.18 - 0.28	5.10 - 6.10	0.20	0.05	0.15	Remainder
0.10	4.20 - 5.20	0.05	0.05[18]	0.15	Remainder
0.18 - 0.28	6.30 - 7.30	0.20	0.05	0.15	Remainder

Two page chart, continued from previous page

Chemical Composition Limits

NOTE:

The preceding tables do not include all active alloys registered with the Aluminum Association.

(1) Composition in percent by weight maximum unless shown as a range or a minimum.
(2) Except for "aluminum" and "others," analysis normally is made for elements for which specific limits are shown. For purposes of determining conformance to these limits, an observed value or a calculated value obtained from analysis is rounded off to the nearest unit in the last right-hand place of figures used in expressing the specified limit, in accordance with ASTM Recommended Practice E 29.

(3) In addition to those alloys referencing footnote (6), a 0.0008 weight percent maximum beryllium is applicable to any alloy to be used as welding electrode or welding rod.

(4) The sum of those "others" metallic elements 0.010% or more each, expressed to the second decimal before determining the sum.

(5) The aluminum content for unalloyed aluminum not made by a refining process is the difference between 100.00% and sum of all other metallic elements present in amounts of 0.010% or more each, expressed to the second decimal before determining the sum.

(6) Beryllium 0.0008% maximum for welding electrode and welding rod only.

(7) Foil.

(8) Vanadium 0.05% maximum.

(9) Electric conductor. Formerly designated EC.

(10) Vanadium plus titanium 0.02% maximum; boron 0.05% maximum; gallium 0.03% maximum.

(11) Also contains 0.20-0.6% each of lead and bismuth.

(12) Vanadium 0.05-0.15%; zirconium 0.10-0.25%.

(13) Bus conductor.

(14) Boron 0.06% maximum.

(15) Also contains 0.40-0.7% each of lead and bismuth.

(16) Zirconium 0.08-0.20%.

(17) Zirconium 0.08-0.15%.

(18) Vanadium 0.05% maximum; gallium 0.03% maximum.

Comparative Characteristics

** Please refer to pg.6-97 for all applicable footnotes*

ALLOY & TEMPER	RESISTANCE TO CORROSION		Workability (Cold) (5)	Machinability (5)	Brazeability (6)
	General (1)	Stress-Corrosion Cracking (2)			
2011-T3	D(3)	D	C	A	A
T4, T451	D(3)	D	B	A	A
T8	D	B	D	A	A
2017-T4, T451	D(3)	C	C	B	B
2024-0	---	---	---	D	D
T4, T3, T351, T3510, T3511	D(3)	C	C	B	B
T361	D(3)	C	D	B	B
T6	D	B	C	B	B
T861, T81, T851, T8510, T8511	D	B	D	B	B
T72	---	---	---	B	B
3003-0	A	A	A	E	E
H12	A	A	A	E	E
H14	A	A	B	D	D
H16	A	A	C	D	D
H18	A	A	C	D	D
H25	A	A	B	D	D
3105-0	A	A	A	E	A
H12	A	A	B	E	A
H14	A	A	B	D	A
H16	A	A	C	D	A
H18	A	A	C	D	A
H25	A	A	B	D	A
5005-0	A	A	A	E	B
H12	A	A	A	E	B
H14	A	A	B	D	B
H16	A	A	C	D	B
H18	A	A	C	D	B
H32	A	A	A	E	B
H34	A	A	B	D	B
H36	A	A	C	D	B
H38	A	A	C	D	B
5052-0	A	A	A	D	C
H32	A	A	B	D	C
H34	A	A	B	C	C
H36	A	A	C	C	C
H38	A	A	C	C	C

Two page chart, continues on next page

Comparative Characteristics

** Please refer to pg.6-97 for all applicable footnotes*

ALLOY & TEMPER	WELDABILITY			APPLICATIONS OF ALLOYS
	Gas	Arc	Resistance Spot and Seam	
2011-T3	D	D	D	Screw machine products
T4, T451	D	D	D	
T8	D	D	D	
2017-T4, T451	D	B	B	Screw mach. products, fittings
2024-0	D	D	D	Truck wheels, screw machine products, aircraft structures
T4, T3, T351, T3510, T3511	C	B	B	
T361	D	C	B	
T6	D	C	B	
T861, T81, T851, T8510, T8511	D	C	B	
T72	D	C	B	
3003-0	A	A	B	Cooking utensils, chemical equipment, pressure vessels, sheet metal work, builder's hardware, storage tanks
H12	A	A	A	
H14	A	A	A	
H16	A	A	A	
H18	A	A	A	
H25	A	A	A	
3105-0	A	A	B	Residential siding, mobile homes, rain carrying goods, sheet metal work
H12	A	A	A	
H14	A	A	A	
H16	A	A	A	
H18	A	A	A	
H25	A	A	A	
5005-0	A	A	B	Appliances, utensils, electrical conductor, architectural
H12	A	A	A	
H14	A	A	A	
H16	A	A	A	
H18	A	A	A	
H32	A	A	A	
H34	A	A	A	
H36	A	A	A	
H38	A	A	A	
5052-0	A	A	B	Sheet metal work, hydraulic tube, appliances
H32	A	A	A	
H34	A	A	A	
H36	A	A	A	
H38	A	A	A	

Two page chart, continued from previous page

Comparative Characteristics

** Please refer to pg.6-97 for all applicable footnotes*

ALLOY & TEMPER	RESISTANCE TO CORROSION		Workability (Cold) (5)	Machinability (5)	Brazeability (6)
	General (1)	Stress-Corrosion Cracking (2)			
5083-0	A(4)	A(4)	B	D	D
H321, H116	A(4)	A(4)	C	D	D
H111	A(4)	B(4)	C	D	D
5086-0	A(4)	A(4)	A	D	D
H32, H116	A(4)	A(4)	B	D	D
H34	A(4)	B(4)	B	C	D
H36	A(4)	B(4)	C	C	D
H38	A(4)	B(4)	C	C	D
H111	A(4)	A(4)	B	D	D
6061-0	B	A	A	D	A
T4, T451, T4510, T4511	B	B	B	C	A
T6, T651, T652, T6510, T6511	B	A	C	C	A
6061-T6, T63	A	A	C	C	A
T61, T64	A	A	B	D	A
6063-T1	A	A	B	D	A
T4	A	A	B	D	A
T5, T52	A	A	B	C	A
T6	A	A	C	C	A
T83, T831, T832	A	A	C	C	A
6262-T6, T651, T6510, T6511	B	A	C	B	B
T9	B	A	D	B	B
7075-0,	---	---	---	D	D
T6, T651, T652, T6510, T6511	C(3)	C	D	B	D
T73, T7351	C	B	D	B	D

Two page chart, continues on next page

Comparative Characteristics

** Please refer to pg.6-97 for all applicable footnotes*

ALLOY & TEMPER	WELDABILITY			APPLICATIONS OF ALLOYS
	Gas	Arc	Resistance Spot and Seam	
5083-0	C	A	B	Unfired, welded pressure vessels, marine, auto, aircraft, cryogenics, TV towers, drilling rigs, transportation equipment, missle components
H321, H116	C	A	A	
H111	C	A	A	
5086-0	C	A	B	
H32, H116	C	A	A	
H34	C	A	A	
H36	C	A	A	
H38	C	A	A	
H111	C	A	A	
6061-0	A	A	B	Heavy-duty structures requiring good corrosion resistance, truck and marine, railroad cars, furniture, pipelines
T4, T451, T4510, T4511	A	A	A	
T6, T651, T652, T6510, T6511	A	A	A	
6061-T6, T63	A	A	A	High strength bus conductors
T61, T64	A	A	A	
6063-T1	A	A	A	Pipe railing, furniture, architectural extrusions
T4	A	A	A	
T5, T52	A	A	A	
T6	A	A	A	
T83, T831, T832	A	A	A	
6262-T6, T651, T6510, T6511	B	B	A	Screw machine products
T9	B	B	A	
7075-0,	D	D	B	Aircraft and other structures
T6, T651, T652, T6510, T6511	D	D	B	
T73, T7351	D	D	B	

Two page chart, continued from previous page

Comparative Characteristics

(1) Ratings A through E are relative ratings in decreasing order of merit, based on exposures to sodium chloride solution by intermittent spraying or immersion. Alloys with A and B ratings can be used in industrial and seacoast atmospheres without protection. Alloys with C, D and E ratings generally should be protected at least on faying surfaces.

(2) Stress-corrosion cracking ratings are based on service experience and on laboratory tests of specimens exposed to the 3.5% sodium chloride alternate immersion test.

A = No known instance of failure in service or in laboratory tests.

B = No known instance of failure in service; limited failures in laboratory tests of short transverse specimens.

C = Service failures with sustained tension stress acting in short transverse direction relative to grain structure; limited failures in laboratory tests of long transverse specimens.

D = Limited service failures with sustained longitudinal or long transverse areas.

(3) In relatively thick sections the rating would be E.

(4) This rating may be different for material held at elevated temperature for long periods.

(5) Ratings A through D for Workability (cold), and A through E for Machinability, are relative ratings in decreasing order of merit.

(6) Ratings A through D for Weldability and Brazeability are relative ratings defined as follows:

A = Generally weldable by all commercial procedures and methods.

B = Weldable with special techniques or for specific applications that justify preliminary trials or testing to develop welding procedure and weld performance.

C = Limited weldability because of crack sensitivity or loss in resistance to corrosion and mechanical properties.

D = No commonly used welding methods have been developed.

(7) T74 type tempers, although not previously registered, have appeared in various literature and specifications as T736 type tempers.

Specification Cross Reference

* Please refer to pg.6-102 for all applicable footnotes

Aluminum Mill Product Specifications*(1)(2)(3)(4)

Alloy	Product	Specifications				
		ASTM	Military	Federal	AMS	ASME
1100	Sheet and plate	B209	---	---	4001,4003 QQ-A-250/1	SB209
2011	Tube; drawn, seamless	B210	---	---	---	---
	Wire, rod, and bar; rolled or cold finished	B211	---	---	QQ-A-225/3	---
2017	Wire, rod, and bar; rolled or cold finished	B211	---	---	4118 QQ-A-225/5	---
	Rivet wire and rod	B316	---	QQ-A-430	---	---
2024	Sheet and plate	B209	---	---	4035,4037 4193, 4297 QQ-A-250/4	---
	Wire, rod, and bar; rolled or cold finished	B211	---	---	4120, 4339 QQ-A-225/6	SB211
	Wire, rod, bar, shapes, and tube; extruded	B221	---	---	4152, 4164, 4165 QQ-A-250/3	SB221
	Tube; extruded, seamless	B241	---	---	---	---
	Tube; drawn, seamless	B210	MIL-T-50777	WW-T-700/3	4087, 4088	---
	Tube; hydraulic	---	---	---	4086	---
	Rivet wire and rod	B316	---	QQ-A-430	---	---
	Foil	---	---	---	4007 QQ-A-81596	---
3003	Sheet and plate	B209	---	---	4006,4008 QQ-A-250/2	SB209 ---
	Wire, rod and bar; rolled or cold finished	B211	---	---	QQ-A-225/2	---
	Wire, rod, bar, shapes and tube; extruded	B221	---	---	QQ-A-200/1	SB221
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; extruded, coiled	B491	---	---	---	---
	Tube; drawn	B483	---	---	---	---
	Tube; drawn, seamless	B210	---	WW-T-700/2	4065, 4067	SB210
	Tube; condenser	B234	---	---	---	SB234
	Tube; condenser with integral fins	B404	---	---	---	---
	Tube; welded	B313 B547	--- ---	--- ---	--- ---	--- ---

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Specification Cross Reference

** Please refer to pg.6-102 for all applicable footnotes*

Aluminum Mill Product Specifications*(1)(2)(3)(4)

Alloy	Product	Specifications				
		ASTM	Military	Federal	AMS	ASME
3003	Pipe	B241	MIL-P-25995	---	---	SB241
	Pipe; gas and oil trans.	B345	---	---	---	---
	Rivet wire and rod	B316	---	QQ-A-430	---	---
	Forgings & forging stock	B247	---	---	---	SB247
	Foil	---	---	---	4010	---
5052	Sheet and plate	B209	---	---	4015, 4016, 4017 QQ-A-250/8	SB209
	Sheet and plate	B211	---	---	4114 QQ-A-225/7	---
	Wire, rod and bar rolled or cold finished	B211	---	---	4114 QQ-A-250/8	---
	Tube; drawn	B483	---	---	---	---
	Tube; drawn, seamless	B210	---	WW-T-700/4	4069, 4070	SB210
	Tube; hydraulic	B221	---	---	4071	---
	Tube; extruded	B221	---	---	---	---
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; condenser	B234	---	---	---	SB234
	Tube; condenser with integral fins	B404	---	---	---	---
	Tube; welded	B313 B547	---	---	---	---
	Rivet wire and rod	B316	---	QQ-A-430	---	---
	Foil	---	---	---	4004	
5083	Sheet and plate	B209	---	---	4056 QQ-A-250/6	SB209
	Wire, rod, bar, shapes	B221	---	---	QQ-A-200/4	SB221
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; drawn, seamless	B210	---	---	---	---
	Tube; welded	B547	---	---	---	---
	Forgings & forging stock	B247	---	---	---	SB247
	Pipe; gas & oil trans.	B345	---	---	---	---
	Armor Plate	---	MIL-A-46027	---	---	---
	Extruded armor	---	MIL-A-46083	---	---	---
	Forged armor	---	MIL-A-45225	---	---	---

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Specification Cross Reference

** Please refer to pg.6-102 for all applicable footnotes*

Aluminum Mill Product Specifications*(1)(2)(3)(4)

Alloy	Product	Specifications				
		ASTM	Military	Federal	AMS	ASME
5086	Sheet and plate	B209	---	---	QQ-A-250/7	SB209
	Wire, rod, bar, shapes, and tube; extruded	B221	---	---	QQ-A-200/5	SB221
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; drawn, seamless	B210	---	WW-T-700/5	---	---
	Tube; welded	B313 B547	---	---	---	---
	Pipe; gas & oil trans.	B345	---	---	---	---
6061	Sheet and plate	B209	---	---	4025,4026, 4027 QQ-A-250/11	SB209
	Tread	B632	---	---	---	---
	Wire, rod, and bar; rolled or cold finished	B211	---	---	4115, 4116, 4117, 4128 QQ-A-225/8	SB211
	Wire, rod, bar, shapes, and tube; extruded	B221	---	---	4150, 4060, 4061, 4172, 4173 QQ-A-200/8	SB221
	Structural	B308	---	---	4113 QQ-A-200/16	SB308
	Tube; drawn	B483	---	---	---	---
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; drawn, seamless	B210	---	WW-T-700/6	4079, 4080, 4082	SB210
	Tube; hydraulic	---	---	---	4081, 4083	---
	Tube; condenser	B234	---	---	---	SB234
	Tube; condenser with integral fans	B404	---	---	---	---
	Tube; welded	B313	---	---	---	---
	Pipe	B241	MIL-P-25995	---	---	SB241
	Pipe; gas & oil trans.	B345	---	---	---	---
	Forgings & forging stock	B247	MIL-A-22771	---	4127, 4248, 4146(5)	SB247
	Rings; forged or rolled	---	---	---	4312	---
	Rivet wire and rod	B316	---	QQ-A-430	---	---
	Impacts	B221	---	---	---	---
	Structural pipe and tube; extruded	B429	---	---	---	---
	Foil	---	---	---	4009(5)	---

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Specification Cross Reference

** Please refer to pg.6-102 for all applicable footnotes*

Aluminum Mill Product Specifications*(1)(2)(3)(4)

Alloy	Product	Specifications				
		ASTM	Military	Federal	AMS	ASME
6063	Wire, rod, bar, shapes, and tube; extruded	B221	---	---	4156 QQ-A-200/9	SB221
	Tube; extruded, seamless	B241	---	---	---	SB241
	Tube; extruded, coiled	B491	---	---	---	---
	Tube; drawn	B483	---	---	---	---
	Tube; drawn, seamless	B210	---	---	---	---
	Pipe	B241	MIL-P-25995	---	---	SB241
	Pipe; gas & oil trans.	B345	---	---	---	---
	Structural pipe and tube; extruded	B429	---	---	---	---
7075	Sheet and plate	B209	---	---	4044, 4045, 4078 QQ-A-250/12 QQ-A-250/24	SB209
	Wire, rod and bar rolled or cold finished	B211	---	---	4122, 4123, 4124, 4186, 4187(5) QQ-A-225/9	---
	Wire, rod, bar, shapes,	B221 B211	---	---	4154, 4166, 4167, 4168, 4169 QQ-A-200/11 QQ-A-200/15	---
	Tube; extruded, seamless	B241	---	---	---	---
	Tube; drawn, seamless	B210	---	WW-T-700/7	---	---
	Forgings & forging stock	B247	MIL-A-22771	---	4126, 4131, 4141, 4147	---
	Hand forgings	B247	---	---	4323	---
	Rings, forged or rolled	B247	---	---	4310, 4311	---
	Impacts	B221	---	---	---	---
	Rivet wire	B316	---	QQ-A-430	---	---

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Specification Cross Reference

Footnotes for pages 6-98 thru 6-101

NOTE:

(1) The Aluminum Association and its members assume no responsibility for use of this index, for errors, for omissions, or for failure to advise of subsequent revisions or amendments.

(2) This cross-reference index lists the basic specification or standard num-ber and no attempt is made to reflect the latest revision or amendment to any particular document. The appropriate specification index published by the specifi cation issuing body should be consulted to determine the latest issue of any particular specification or standard. The aluminum industry generally prefers to use the latest issue of any given specification or standard.

(3) Different organizations' specifications for the same alloy and product may contain different requirements.

(4) Copies of specifications can be obtained from:

AMS /Aerospace Material Specifications
SAE, Inc.
400 Commonwealth Drive
Warrendale, PA 15096-0001

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Standardization Documents Order Desk
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ASME
American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017

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(5) Noncurrent