ALUMINUM PRODUCTS

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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.

SECTION 1
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.

6262 – 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.

*See p. 10-6 for all applicable footnotes.

The following 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.

TYPICAL MECHANICAL PROPERTIES* (1)

	TENSION				HARDNESS	SHEAR	FATIGUE	MODULUS
	Strength ksi		Elongation percent in 2"		Brinell Number	Ultimate Shearing Strength	Endurance(2) Limit	Modulus(3) Of Elasticity ksi x 10^3
Alloy and Temper	Ultimate	Yield	1/16" Thick Specimen	1/2" Diameter Specimen	500 kg load 10 mm ball	ksi	ksi	
2011-T3	55	43	–	15	95	32	18	10.2
2011-T8	59	45	–	12	100	35	18	10.2
2014-0	27	14	–	18	45	18	13	10.6
2014-T4, T451	62	42	–	20	105	38	20	10.6
2014-T6, T651	70	60	–	13	135	42	18	10.6
2017-0	26	10	–	22	45	18	13	10.5
2017-H13	35	33	–	10	–	–	–	10.5
2017-T4, T451	62	40	–	22	105	38	18	10.5
2024-0	27	11	20	22	47	18	13	10.6
2024-H13	37	35	–	9	–	–	–	10.6
2024-T351, T4	68	47	20	19	120	41	20	10.6
2024-T361	72	57	13	–	130	42	18	10.6
2024-T851	70	65	6	–	128	43	18	10.6

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TYPICAL MECHANICAL PROPERTIES (1)

	TENSION				HARDNESS	SHEAR	FATIGUE	MODULUS
	Strength ksi		Elongation percent in 2"		Brinell Number	Ultimate Shearing Strength	Endurance(2) Limit	Modulus(3) Of Elasticity
Alloy and Temper	Ultimate	Yield	1/16" Thick Specimen	1/2" Diameter Specimen	500 kg load 10 mm ball	ksi	ksi	ksi x 10^3
6061-0	18	8	25	30	30	12	9	10.0
6061-H13	26	-	-	-	-	-	-	10.0
6061-T4, T451	35	21	22	25	65	24	14	10.0
6061-T6, T651	45	40	12	17	95	30	14	10.0
6061-T913	67	66	-	10	-	35	-	10.0
6061-T94	57	-	-	-	-	-	-	10.0
6063-0	13	7	-	-	25	10	8	10.0
6063-T4	25	13	22	-	-	16	-	10.0
6063-T6	35	31	12	-	73	22	10	10.0
6262-T6, T651	45	40	-	17	95	30	-	10.0
6262-T8	50	47	-	14	-	-	-	10.0
6262-T9	58	55	-	10	120	35	13	10.0
7075-0	33	15	17	16	60	22	17	10.4
7075-H13	40	-	-	-	-	-	-	10.4
7075-T6, T651	83	73	11	11	150	48	23	10.4
7075-T73, T7351	73	63	13	-	-	44	23	10.4

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.

2011-T3
ALUMINUM ROUNDS – COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A- 225/3

Diameter Fraction	Approx. Wt. (per lineal ft.) Round
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
7/8	.736
15/16	.845
1	.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

Diameter Fraction	Approx. Wt. (per lineal ft.) Round
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
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

2011-T3
ALUMINUM HEXAGONS – COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/3

Distances Across Flat (inches)	Approx. Weight (per lineal ft.)
Fraction	Hexagonal
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
7/8	.8130
15/16	.933
1	1.0610
1-1/16	1.1980
1-1/8	1.343
1-1/4	1.6580
1-5/16	1.8260
1-3/8	2.0000
1-7/16	2.1900
1-1/2	2.3850
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

2017-T451
ALUMINUM ROUNDS – COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
(SIZES OVER 3-1/2" IN RANDOM LENGTHS)
ASTM-B211, AMS-QQ-A-225/5

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
1	.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

*Temper T4

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
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

2017-T451
ALUMINUM HEXAGONS – COLD FINISHED STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/5

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Hexagonal
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
7/8	.8042
15/16	.9232
1	1.0504
1-1/16	1.1858
1-1/8	1.3294

*Temper T4

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Hexagonal
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
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

2017-T451
ALUMINUM SQUARES – COLD FINISHED STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/5

Size (inches)	Approx. Wt. (per lineal ft.)
Fraction	Square
1/4*	.0757
3/8*	.1704
7/16*	.2320
1/2*	.3030
9/16*	.3835
5/8	.4734
11/16	.5728
3/4	.6818

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Square
7/8	.9279
1	1.2120
1-1/8	1.5339
1-1/4	1.8938
1-1/2	2.7270
1-3/4	3.7118
2	4.8480

2024-T351
ALUMINUM ROUNDS – COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/6

Diameter Fraction	Approx. Wt. (per lineal ft.) Round
1/8*	.0147
5/32*	.0230
11/64*	.0278
3/16*	.0331
13/64*	.0389
7/32*	.0451
15/64*	.0516
1/4*	.0588
17/64*	.0664
9/32*	.0745
5/16*	.0920
11/32*	.1113
3/8*	.1324
25/64*	.1437
13/32*	.1554
7/16*	.1803
15/32*	.2070
1/2*	.2355
17/32*	.2658
9/16*	.2981
19/32*	.3319
5/8	.3679
21/32	.4056
11/16	.4452
23/32	.4867
3/4	.5298
25/32	.5749
13/16	.6219
7/8	.7212
29/32	.7736
15/16	.8279
31/32	.8841
1	.9420
1-1/16	1.0634
1-1/8	1.1923
1-3/16	1.3284
1-1/4	1.4720
1-5/16	1.6228
1-3/8	1.7809
1-7/16	1.946
1-1/2	2.1195
1-9/16	2.2998

Diameter Fraction	Approx. Wt. (per lineal ft.) Round
1-5/8	2.4877
1-11/16	2.6827
1-3/4	2.8849
1-13/16	3.0946
1-7/8	3.3117
1-15/16	3.5362
2	3.7683
2-1/16	4.0072
2-1/8	4.2537
2-3/16	4.5076
2-1/4	4.7689
2-5/16	5.0375
2-3/8	5.3135
2-7/16	5.5968
2-1/2	5.8875
2-9/16	6.1856
2-5/8	6.4909
2-3/4	7.1239
2-7/8	7.7862
3	8.4788
3-1/8	9.1992
3-1/4	9.9499
3-5/16	10.3362
3-3/8	10.7299
3-1/2	11.5395
3-3/4	13.2469
4	15.0720
4-1/4	17.0148
4-1/2	19.0755
4-3/4	21.2538
5	23.5500
5-1/4	25.9638
5-1/2	28.4955
5-3/4	31.1449
6	33.9120
6-1/4	36.7969
6-1/2	39.7995
7	46.1580
7-1/4	49.5139
7-1/2	52.9875
8*	60.2880

*Temper T4

2024-T351
ALUMINUM HEXAGONS – COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/6

Distances Across Flat (inches)	Approx. Weight (per lineal ft.)
Fraction	**Hexagonal**
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	.796
15/16	.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

2024-T4 AND 2024-T351 SQUARE ALUMINUM BAR - COLD FINISHED

STANDARD 12 FT. LENGTHS

ASTM-B211, AMS-QQ-A-225/6

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)	Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1/4	.075	0.900	1-3/4	3.675	44.100
3/8	.169	2.025	2	4.800	57.600
7/16	.230	2.756	2-1/4	5.954	71.448
1/2	.300	3.600	2-1/2	7.575	90.900
9/16	.379	4.556	2-3/4	9.185	110.220
5/8	.478	5.736	3	10.800	129.600
3/4	.675	8.100	3-1/4	12.675	152.100
7/8	.919	11.025	3-1/2	14.700	176.400
1	1.200	14.400	4	19.240	230.880
1-1/8	1.519	18.225			
1-1/4	1.875	22.500			
1-1/2	2.700	32.400			

2024-T4 AND 2024-T351 RECTANGULAR ALUMINUM BAR COLD FINISHED

STANDARD 12 FT. LENGTHS

ASTM-B211, AMS-QQ-A-225/6

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1/8 x		
1/2	.080	.960
5/8	.090	1.080
3/4	.113	1.350
1	.150	1.800
1-1/4	.180	2.160
1-1/2	.220	2.640
2	.300	3.600
3/16 x		
1/2	.113	1.350
5/8	.141	1.688
3/4	.169	2.025
1	.225	2.700
1-1/4	.281	3.375
1-1/2	.338	4.050
2	.450	5.400
1/4 x		
1/2	.150	1.800
5/8	.188	2.250
3/4	.225	2.700
7/8	.263	3.150
1	.300	3.600
1-1/4	.375	4.500
1-1/2	.450	5.400
2	.600	7.200

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1/4 x		
2-1/2	.750	9.000
3	.909	10.908
4	1.200	14.400
5/16 x		
1/2	.188	2.256
5/8	.234	2.813
3/4	.281	3.375
1	.375	4.500
1-1/2	.563	6.750
2	.750	9.000
3/8 x		
1/2	.225	2.700
5/8	.281	3.375
3/4	.338	4.050
1	.455	5.460
1-1/4	.563	6.750
1-1/2	.675	8.100
1-3/4	.788	9.450
2	.909	10.908
2-1/2	1.136	13.632
3	1.350	16.200
4	1.818	21.816
6	2.700	32.400
10	4.500	54.000

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2024-T4 AND 2024-T351 RECTANGULAR ALUMINUM BAR COLD FINISHED

STANDARD 12 FT. LENGTHS

ASTM-B211, AMS-QQ-A-225/6

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1/2 x		
5/8	.379	4.548
3/4	.455	5.460
7/8	.525	6.300
1	.606	7.272
1-1/4	.758	9.096
1-1/2	.909	10.908
1-3/4	1.061	12.732
2	1.212	14.544
2-1/4	1.350	16.200
2-1/2	1.515	18.180
3	1.818	21.816
4	2.424	29.088
6	3.636	43.632
8*	4.800	57.600
10*	6.000	72.000
5/8 x		
3/4	.551	6.612
7/8	.656	7.875
1	.758	9.096
1-1/4	.947	11.364
1-1/2	1.136	13.632
2	1.515	18.180
3/4 x		
1	.909	10.908
1-1/4	1.136	13.632
1-1/2	1.364	16.368
1-3/4	1.591	19.092
2	1.818	21.816
2-1/2	2.273	27.276
3	2.727	32.724
3-1/2	3.182	38.184
4	3.636	43.632
6	5.454	65.448
1 x		
1-1/4	1.515	18.180
1-1/2	1.818	21.816
1-3/4	2.100	25.200
2	2.424	29.088
2-1/2	3.030	36.360
3	3.636	43.632
3-1/2	4.190	50.280
4	4.848	58.176
5	5.990	71.880
6	7.272	87.264

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1-1/4 x		
1-1/2	2.250	27.000
2	3.000	36.000
2-1/4	3.375	40.500
2-1/2	3.750	45.000
3	4.500	54.000
4	6.000	72.000
1-1/2 x		
2	3.600	43.200
2-1/2	4.500	54.000
3	5.400	64.800
3-1/2	6.300	75.600
4	7.200	86.400
5	9.000	108.000
6	10.800	129.000
8	14.400	172.800
1-3/4 x		
2	4.200	50.400
3	6.300	75.600
4	8.400	100.800
2 x		
2-1/4	5.400	64.800
2-1/2	6.000	72.000
3	7.200	86.400
3-1/2	8.400	100.800
4	9.600	115.200
5	12.000	144.000
6	14.400	172.800
2-1/4 x		
4	10.800	129.600
2-1/2 x		
3	9.000	108.000
4	12.000	144.000
4-1/2	13.500	162.000
5	15.000	180.000
6	18.000	216.000
2-3/4 x		
4	13.200	158.400
3 x		
4	14.400	172.800
5	18.000	216.000
6	21.600	259.200

6061-T651
ALUMINUM ROUNDS - COLD FINISHED
STANDARD SCREW MACHINE STOCKS

STOCK LENGTHS: 12 FT.

ASTM-B211, AMS-QQ-A-225/8

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
15/16	.811
31/32	.866
1	.923
1-1/32	.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

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
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

6061-T651
ALUMINUM HEXAGONS - COLD FINISHED STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/8

Diameter Across Flat (inches)	Approx. Wt. (per lineal ft.)
Fraction	**Hexagonal**
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	.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

6262-T9
ALUMINUM ROUNDS - COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/10

Diameter	Approx. Wt. (per lineal ft.)
Fraction	**Round**
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	.98
1-1/16	1.042

Diameter	Approx. Wt. (per lineal ft.)
Fraction	**Round**
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

6262-T9
ALUMINUM HEXAGONS - COLD FINISHED STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/10

Distances Across Flat (inches)	Approx. Weight (per lineal ft.)
Fraction	**Hexagonal**
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
15/16	.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

7075-T651
SQUARE ALUMINUM BAR - COLD FINISHED
STANDARD 12 FT. LENGTHS
ASTM-B211, AMS-QQ-A-225/9

Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)	Size (inches)	Pounds (per lineal ft.)	Pounds (per 12 ft.)
1/4	.075	0.900	1-3/4	3.675	44.100
3/8	.169	2.025	2	4.800	57.600
7/16	.230	2.756	2-1/4	5.954	71.448
1/2	.300	3.600	2-1/2	7.575	90.900
9/16	.379	4.556	2-3/4	9.185	110.220
5/8	.478	5.736	3	10.800	129.600
3/4	.675	8.100	3-1/4	12.675	152.100
7/8	.919	11.025	3-1/2	14.700	176.400
1	1.200	14.400	4	19.240	230.880
1-1/8	1.519	18.225			
1-1/4	1.875	22.500			
1-1/2	2.700	32.400			

7075-T651
ALUMINUM ROUNDS - COLD FINISHED
STANDARD SCREW MACHINE STOCK

STOCK LENGTHS: 12 FT.
ASTM-B211, AMS-QQ-A-225/9

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
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

Diameter	Approx. Wt. (per lineal ft.)
Fraction	Round
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
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

ROD, BAR & WIRE COLD FINISHED STANDARD TOLERANCES

DIAMETER

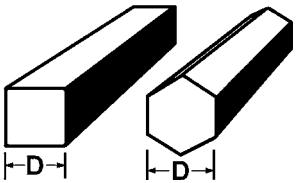
Round Wire and Rod, Cold Finished

Specified Diameter (inches)	Tolerance - Inches Plus and Minus (Allowable Deviation from Specified Diameter)			
	Drawn Wire	Cold Finished Rod	Rolled Rod	
			Plus	Minus
Up thru 0.035	.0005	–	–	–
0.036-0.064	.001	–	–	–
0.065-0.374	.0015	–	–	–
0.375-0.500	–	.0015	–	–
0.501-1.000	–	.002	–	–
1.001-1.500	–	.0025	–	–
1.501-2.000	–	.004	.006	.006
2.001-3.000	–	.006	.008	.008
3.001-3.499	–	.008	.012	.012
3.500-5.000	–	.012	.031	.016
5.001-6.000	–	.020	.062	.031
6.001-7.000	–	.025	–	–
7.001-8.000	–	.030	–	–

DISTANCE ACROSS FLATS

Square, Hexagonal, and Octagonal Wire and Bar

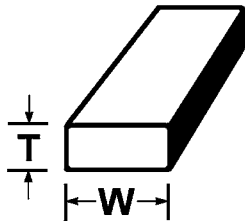
Specified Distance Across Flats - Inches	Tolerance - Inches Plus and Minus (Allowable Deviation from Specified Distance Across Flats)		
	Drawn Wire	Cold Finished Bar	Rolled Bar
Up thru 0.035	.001	–	–
0.036-0.064	.0015	–	–
0.065-0.374	.002	–	–
0.375-0.500	–.	002	–
0.501-1.000	–	.0025	–
1.001-1.500	–	.003	–
1.501-2.000	–	.005	.016
2.001-3.000	–	.008	.020
3.000-4.000	–	–	.020



ROD, BAR & WIRE COLD FINISHED STANDARD TOLERANCES

THICKNESS AND WIDTH

Rectangular Wire and Bar

Specified Thickness or Width Inches	Tolerance Inches Plus and Minus	
	Allowable Deviation from Specified Thickness and Width	
	Drawn Wire and Cold Finished Bar	
	Thickness	Width
Up thru 0.035	.001	–
0.036-0.064	.0015	–
0.065-0.500	.002	.002
0.501-0.750	.0025	.0025
0.751-1.000	.0025	.0025
1.001-1.500	.003	.003
1.501-2.000	.005	.005
2.001-3.000	.008	.008
3.001-4.000	–	.010

SECTION 2
EXTRUDED PRODUCTS
ROUND BAR • HEXAGONS • SQUARES • FLAT BAR • ANGLES CHANNELS • I-BEAMS • SQUARE TUBING • RECTANGULAR TUBING ROUND TUBING • ROUND PIPE

Extrusions
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.

6061-T6511
EXTRUDED ALUMINUM ROUNDS
ASTM-B221, AMS-QQ-A-200/8

Size (inches)	Approx. Wt. (per lineal ft.)	Size (inches)	Approx. Wt. (per lineal ft.)	Size (inches)	Approx. Wt. (per lineal ft.)
1/4	.058	2-1/2	5.773	8	59.112
5/16	.090	2-9/16	6.067	8-1/8	60.974
11/32	.109	2-5/8	6.364	8-1/4	62.864
3/8	.130	2-3/4	6.985	8-1/2	66.732
7/16	.177	2-7/8	7.635	9*	74.814
15/32	.202	3	8.313	9-1/4*	79.028
1/2	.231	3-1/8	9.020	9-1/2*	83.357
9/16	.292	3-1/4	9.756	10*	92.363
5/8	.361	3-3/8	10.521	10-1/8*	94.686
11/16	.437	3-1/2	11.314	10-1/2*	101.830
3/4	.520	3-5/8	12.137	11*	111.759
13/16	.609	3-3/4	12.989	11-1/2*	122.150
7/8	.707	3-7/8	13.869	12*	133.002
15/16	.813	4	14.778	12-1/8*	135.790
1	.924	4-1/8	15.716	12-1/2	148.966
1-1/16	1.042	4-1/4	16.683	13*	155.990
1-1/8	1.169	4-3/8	17.679	14*	181.032
1-3/16	1.304	4-1/2	18.703	15*	207.900
1-1/4	1.443	4-5/8	19.757	16*	236.500
1-5/16	1.590	4-3/4	20.839	17*	266.793
1-3/8	1.746	5	23.091	18*	299.104
1-7/16	1.910	5-1/16	23.667	19*	333.431
1-1/2	2.078	5-1/4	25.458	20*	369.452
1-9/16	2.254	5-1/2	27.940	21*	407.321
1-5/8	2.439	5-5/8	29.224	22*	447.037
1-11/16	2.632	5-3/4	30.537	23*	488.600
1-3/4	2.829	6	33.251	24*	532.011
1-13/16	3.033	6-1/8	34.650	25*	577.269
1-7/8	3.247	6-1/4	36.079	26*	624.056
1-15/16	3.494	6-3/8	37.537		
2	3.695	6-1/2	39.023		
2-1/16	4.060	6-3/4	42.083		
2-1/8	4.171	7	45.258		
2-1/4	4.676	7-1/4	48.590		
2-5/16	4.941	7-1/2	51.954		
2-3/8	5.210	7-3/4	55.475		

*Temper T6

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.

6262-T6511, 6042-T5511, 6064-T6511 EXTRUDED ALUMINUM ROUNDS

ASTM-B221

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

Rounds over 3" diameter is available on an inquiry basis.

6061-T6/T6511

EXTRUDED ALUMINUM ROUNDS VS. COLD FINISHED ALUMINUM ROUNDS

COMPARISON OF TOLERANCES*

Size	**"Close" Tolerance Extruded Rod	Cold Finished Tolerances
.375 - 0.500	.005	.0015
.501 - 1.000	.004	.0020
1.001 - 1.500	.005	.0025
1.501 - 1.938	.005	.0040
1.939 - 2.000	.008	.0040
2.001 - 3.000	.008	.0060
3.001 - 3.499	.012	.0080
3.500 - 3.750	.012	.0120
3.751 - 5.000	.017	.0200
5.001 - 5.750	.017	.0200
5.751 - 6.000	.022	.0250
6.001 - 7.000	.022	.0250
7.001 - 7.500	.022	.0300
7.501 - 8.000	.027	.0300

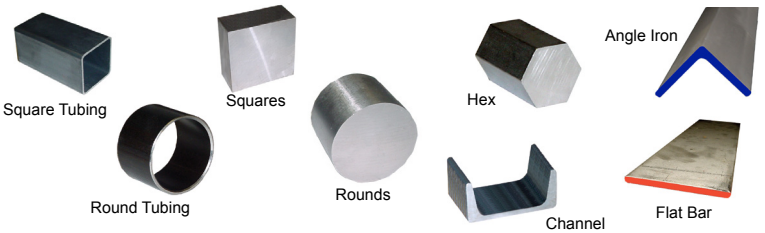
*All tolerances shown are plus or minus.
**Also available in precision tolerances 1/3 to 1/4 normal.

Alro's Production/Precision Sawing

Production/Precision Sawing to Your Specification

Your Product Cut To Precision

Length **Squareness** **Surface Finish**



Our Processing Services Produce:

- **Tighter tolerances which can reduce or eliminate machine time**
- **Square, near burr-free cuts for reduced machining clean-up**
- **Surface Finish with a Low Ra (Roughness Average)**

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 these outstanding mechanical and physical properties:

COMPARISON OF MECHANICAL PROPERTIES

		Minimum Tension			Typical Hardness	Typical Shear
		Strength, psi		Elongation Percent in 2" 1/2" diameter Specimen	Brinell Number 500 kg load 10 mm ball	Shearing Strength psi
	Alloy and Temper	Ultimate	Yield			
COMMERCIAL	6061-T6, -T6511	38,000	35,000	17	95	30,000
EXTRUSION:	6262-T6, -T6511	38,000	35,000	17	95	30,000
COLD FINISH:	6061-T6, -T651	42,000	35,000	17	95	30,000
	6262-T6, -T651	42,000	35,000	17	95	30,000

* D = specimen diameter.

6061-T6 AND 6262-T6
EXTRUDED ALUMINUM ROUNDS

TYPICAL PHYSICAL PROPERTIES

	Alloy and Temper	Specific Gravity	Density	Electrical Conductivity % IACS	Electrical Resistivity microhm.xm	Thermal Conductivity		Average coefficient of thermal expansion per F° (1 million times actual value)	
						At 77°F	At 25°C CGS units	-58° to 48°F	68° to 212°F
COMMERCIAL EXTRUSION:	6061-T6, -T6511	2.70	0.098	43	24	1160	0.40	12.2	13.1
	6262-T6, -T6511	2.72	0.098	44	24	1160	0.41	12.2	13.0
COLD FINISH:	6061-T6, -T651	2.70	0.098	43	24	1160	0.40	12.2	13.1
	6262-T6, -T651	2.72	0.098	44	24	1160	0.41	12.2	13.0

COMPARISON OF ALUMINUM ALLOYS [1]

	Alloy and Temper	Machinability[2]	Cold Forming Capacity	Anodizing Response	Brazeability	Weldability (ARC)	Corrosion Resistance	Stress Corrosion[3] Cracking Resistance
PRECISION TOLER. EXTR.	6061-T6, -T6511	C	C	A	A	A	B	A
ALUMINUM ROUNDS	6262-T6, T6511	B	C	A	A	A	B	A
COMMERCIAL	6061-T6, T6511	C	C	A	A	A	B	A
EXTRUSION:	6262-T6, -T6511	B	C	A	A	A	B	A
COLD FINISH:	6061-T6, T651	C	C	A	A	A	B	A
	6262-T6, -T651	B	C	A	A	A	B	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

6061-T6 & 6262-T6
EXTRUDED ALUMINUM HEXAGONS
STANDARD 12 FT. LENGTHS

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

OR

6262-T6511*
ASTM-B221

Size (inches)	Approx. Wt. (per lineal ft.)
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
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

Size (inches)	Approx. Wt. (per lineal ft.)
1-5/8	2.689
1-3/4	3.119
1-7/8	3.580
2	4.074
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

6061-T6511
EXTRUDED ALUMINUM SQUARES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-200/8

Size (inches)	Approx. Wt. (per 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
1-1/2	2.646
1-5/8	3.105
1-3/4	3.601
1-7/8	4.134
2	4.704

Size (inches)	Approx. Wt. (per lineal ft.)
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
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" Max Length
** .062" Raduis Corners

6061-T6511
EXTRUDED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-200/8

(ANY LISTED SIZE CAN BE ORDERED IN 6063-T52 ALLOY AND TEMPER.)

Size (inches)		Approx. Wt. (per lineal ft.)
1/8 x	1/2	.074
	5/8	.092
	3/4	.110
	1	.147
	1-1/4	.184
	1-3/8	.202
	1-1/2	.220
	1-3/4	.257
	2	.294
	2-1/2	.368
	3	.441
	3-1/2	.515
	4	.588
	5	.735
	6	.880
3/16 x	1/2	.111
	5/8	.138
	3/4	.166
	7/8	.193
	1	.221
	1-1/4	.276
	1-1/2	.332
	1-3/4	.387
	2	.442
	2-1/4	.497
	2-1/2	.553
	3	.663
	3-1/2	.774
	4	.884
	5	1.105
	6	1.327
	12	2.653
1/4 x	3/8	.110
	1/2	.147
	5/8	.184
	3/4	.220
	7/8	.257
	1	.294
	1-1/4	.368
	1-1/2	.441
	1-3/4	.514
	2	.588
	2-1/4	.662
	2-1/2	.735

Size (inches)		Approx. Wt. (per lineal ft.)
1/4 x	2-3/4	.809
	3	.882
	3-1/4	.956
	3-1/2	1.029
	4	1.176
	4-1/2	1.323
	5	1.470
	5-1/2	1.617
	6	1.764
	7	2.058
	8	2.352
	9	2.646
	9-1/2	2.793
	10	2.940
	12	3.528
5/16 x	1/2	.183
	5/8	.229
	3/4	.275
	1	.367
	1-1/4	.459
	1-1/2	.550
	1-3/4	.642
	2	.734
	2-1/2	.917
	2-3/4	1.009
	3	1.101
	4	1.468
	6	2.201
3/8 x	1/2	.221
	5/8	.276
	3/4	.331
	7/8	.386
	1	.441
	1-1/4	.551
	1-1/2	.662
	1-3/4	.772
	2	.882
	2-1/4	.992
	2-1/2	1.102
	2-3/4	1.213
	3	1.323
	3-1/4	1.433
	3-1/2	1.544
	4	1.764
	4-1/4	1.874

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6061-T6511
EXTRUDED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-200/8

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

Size (inches)		Approx. Wt. (per lineal ft.)
3/8 x	4-1/2	1.985
	5	2.205
	6	2.646
	7	3.087
	8	3.528
	9	3.969
	10	4.410
	11	4.851
	12	5.292
	14	6.174
1/2 x	5/8	.368
	3/4	.441
	1	.588
	1-1/4	.735
	1-3/8	.809
	1-1/2	.882
	1-5/8	.956
	1-3/4	1.029
	1-7/8	1.103
	2	1.176
	2-1/4	1.323
	2-1/2	1.470
	2-3/4	1.617
	3	1.764
	3-1/4	1.911
	3-1/2	2.058
	3-3/4	2.205
	4	2.352
	4-1/2	2.646
	5	2.940
	5-1/2	3.234
	6	3.528
	6-1/2	3.822
	7	4.116
	7-1/2	4.410
	8	4.704
	9	5.292
	10	5.880
	12	7.056
	14	8.232
5/8 x	3/4	.551
	1	.735
	1-1/4	.919
	1-1/2	1.102
	1-3/4	1.286
	2	1.470
	2-1/2	1.838

Size (inches)		Approx. Wt. (per lineal ft.)
5/8 x	3	2.205
	3-1/2	2.582
	4	2.940
	4-1/2	3.308
	5	3.675
	6	4.410
	7	5.145
	8	5.880
	9	6.615
	10	7.350
	12	8.820
3/4 x	1	.882
	1-1/4	1.102
	1-1/2	1.323
	1-3/4	1.544
	2	1.764
	2-1/4	1.984
	2-1/2	2.205
	2-3/4	2.426
	3	2.646
	3-1/2	3.087
	4	3.528
	4-1/2	3.969
	5	4.410
	6	5.292
	6-1/2	5.733
	7	6.174
	7-1/2	6.615
	8	7.056
	9	7.938
	10	8.820
	12	10.584
	14	12.348
1 x	1-1/4	1.470
	1-1/2	1.764
	1-3/4	2.058
	2	2.352
	2-1/4	2.646
	2-1/2	2.940
	2-3/4	3.234
	3	3.528
	3-1/4	3.822
	3-1/2	4.116
	4	4.704
	4-1/2	5.292
	5	5.880
	5-1/2	6.468

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6061-T6511
EXTRUDED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-200/8

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

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

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

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6061-T6511
EXTRUDED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-200/8

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

Size (inches)		Approx. Wt. (per lineal ft.)
2-1/2 x	2-3/4	8.085
	3	8.820
	3-1/4	9.555
	3-1/2	10.290
	4	11.760
	4-1/2	13.230
	5	14.700
	5-1/2	16.170
	6	17.640
	8	23.712
2-3/4 x	3	9.702
	3-1/4	10.511
	3-1/2	11.319
	4-1/4	13.744
	5-1/4	17.011
3 x	3-1/2	12.348
	4	14.112
	4-1/2	15.876
	5	17.640
	6	21.168
	8	28.433
3-1/2 x	4	14.464
	4-1/2	18.522

Size (inches)		Approx. Wt. (per lineal ft.)
3-1/2 x	5	20.580
	6	24.696
	7	28.812
	10	41.159
4 x	4-1/2	21.168
	5	23.520
	6	28.224
	7	32.930
	8	37.919
4-1/2 x	5	26.460
	5-1/2	29.306
	6	32.400
	8-3/4	46.623
5 x	5-1/2	32.550
	6	35.280
	7	41.430
	8	47.358
5-1/2 x	6	39.071
	8	52.078
6 x	6-1/2	46.188
	7	49.729
	8	56.846

6061-T6511 EXTRUDED ALUMINUM MANIFOLD QUALITY

DESCRIPTION

*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.

6061-T6511 EXTRUDED ALUMINUM SQUARES MANIFOLD QUALITY*

STANDARD 12 FT. LENGTHS

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

Size (inches)	Approx. Wt. (per lineal ft.)
7/8	.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
2	4.761
2-1/4	6.016
2-1/2	7.421
2-3/4	8.970

Size (inches)	Approx. Wt. (per lineal ft.)
3	10.669
3-1/4	12.513
3-1/2	14.546
3-3/4	16.740
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

6061-T6511
EXTRUDED ALUMINUM RECTANGLES
MANIFOLD QUALITY*
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-AMS-QQ-A-200/8

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

Size (inches)		Approx. Wt. (per lineal ft.)
1-3/4x	2	4.157
	2-1/2	5.190
	2-3/4	5.707
	3	6.210
	3-1/2	7.310
	3-3/4	7.783
	4-1/2	9.333
	5	10.368
	5-1/2	11.399
	6-1/2	13.476
2 x	2-1/4	5.352
	2-1/2	5.944
	3	7.127
	3-1/2	8.322
	4	9.505
	4-1/2	10.688
	5	11.871
	5-1/2	13.053
	6	14.249
	6-1/2	15.432
	8	18.816
2-1/4 x	3	8.012
	3-1/2	9.342
	4	10.656
2-1/2 x	3	8.898
	3-1/4	9.636
	3-1/2	10.390
	4	11.867
	4-1/2	13.344
	5	14.821
	5-1/2	16.297
	6	17.790
	8	23.712
2-3/4 x	3	9.783
	3-1/4	10.725
3 x	3-1/2	12.458
	4	14.229
	4-1/2	16.000
	5	17.771
	5-1/2	19.541
	6	21.331
	7	24.695
	8	28.433

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6061-T6511
EXTRUDED ALUMINUM RECTANGLES
MANIFOLD QUALITY*

STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-AMS-QQ-A-200/8

Size (inches)		Approx. Wt. (per lineal ft.)
3-1/2 x	4	16.614
	4-1/2	18.682
	5	20.750
	5-1/2	22.785
	6	24.907
	7	28.812
4 x	4-1/2	21.338
	5	23.700
	5-1/2	26.061
	6	28.448
	7	32.930
	8	37.919
4-1/2 x	5	26.650
	5-1/2	29.306
	6	31.989
	6-1/2	34.644
	7	37.300
	8-3/4	46.623
	9-1/2	50.694

Size (inches)		Approx. Wt. (per lineal ft.)
5 x	5-1/2	32.550
	6	35.530
	6-1/2	38.479
	7	41.430
	7-1/2	44.379
	8	47.358
	8-1/2	50.308
5-1/2 x	6	39.071
	8	52.078
6 x	6-1/2	46.188
	7	49.729
	8	56.846

6061-T6511 EXTRUDED ALUMINUM EXTRUDED WIDE BAR

STANDARD LENGTHS: 12 FT.
ASTM-B221, AMS-SB-221

Thick-ness (inches)	Width (inches)	Approx. Wt. per lineal ft.	Thick Tol (inches)
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

Thick-ness (inches)	Width (inches)	Approx. Wt. per lineal ft.	Thick Tol (inches)
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	37.74	+.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 - T651 Rolled Plate
Longitudinal Flatness (Up to 72 inches)	.100 inches Max Deviation	.100 inches Max Deviation
Short Span Flatness (in any 2ft. or less dimension)	.060 inches Max Deviation	.060 inches Max Deviation
Minimum Tensile Strength	42,000 psi 38,000 psi (< 3/8" thick)	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

7075-T6
COLD FINISHED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-225/9

Size (inches)		Approx. Wt. (per lineal ft.)
1/8 x	1/2	.076
	5/8	.095
	3/4	.114
	1	.152
	1-1/4	.190
	1-3/8	.209
	1-1/2	.227
	1-3/4	.265
	2	.303
	2-1/2	.379
	3	.455
	3-1/2	.531
	4	.607
	5	.758
	6	.910
3/16 x	1/2	.114
	5/8	.142
	3/4	.171
	7/8	.199
	1	.227
	1-1/4	.284
	1-1/2	.341
	1-3/4	.398
	2	.455
	2-1/4	.512
	2-1/2	.569
	3	.682
	3-1/2	.796
	4	.910
	5	1.137
	6	1.365
	12	2.730
1/4 x	3/8	.114
	1/2	.152
	5/8	.190
	3/4	.227
	7/8	.265
	1	.303
	1-1/4	.379
	1-1/2	.455
	1-3/4	.531
	2	.607
	2-1/4	.682
	2-1/2	.758
	2-3/4	.834
	3	.910

Size (inches)		Approx. Wt. (per lineal ft.)
1/4 x	3-1/4	.986
	3-1/2	1.062
	4	1.213
	4-1/2	1.365
	5	1.517
	5-1/2	1.668
	6	1.820
	7	2.123
	8	2.426
	9	2.730
	9-1/2	2.881
	10	3.033
	12	3.640
5/16 x	1/2	.190
	5/8	.237
	3/4	.284
	1	.379
	1-1/4	.474
	1-1/2	.569
	1-3/4	.663
	2	.758
	2-1/2	.948
	2-3/4	1.043
	3	1.137
	4	1.517
	6	2.275
3/8 x	1/2	.227
	5/8	.284
	3/4	.341
	7/8	.398
	1	.455
	1-1/4	.569
	1-1/2	.682
	1-3/4	.796
	2	.910
	2-1/4	1.024
	2-1/2	1.137
	2-3/4	1.251
	3	1.365
	3-1/4	1.479
	3-1/2	1.592
	4	1.820
	4-1/4	1.934
	4-1/2	2.047
	5	2.275
	6	2.730
	7	3.185

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7075-T6
COLD FINISHED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-225/9

Size (inches)		Approx. Wt. (per lineal ft.)
3/8 x	8	3.640
	9	4.095
	10	4.550
	11	5.004
	12	5.459
	14	6.369
1/2 x	5/8	.379
	3/4	.455
	1	.607
	1-1/4	.758
	1-3/8	.834
	1-1/2	.910
	1-5/8	.986
	1-3/4	1.062
	1-7/8	1.137
	2	1.213
	2-1/4	1.365
	2-1/2	1.517
	2-3/4	1.668
	3	1.820
	3-1/4	1.971
	3-1/2	2.123
	3-3/4	2.275
	4	2.426
	4-1/2	2.730
	5	3.033
	5-1/2	3.336
	6	3.640
	6-1/2	3.943
	7	4.246
	7-1/2	4.550
	8	4.853
	9	5.459
	10	6.066
	12	7.279
	14	8.492
5/8 x	3/4	.569
	1	.758
	1-1/4	.948
	1-1/2	1.137
	1-3/4	1.327
	2	1.517
	2-1/2	1.896
	3	2.275
	3-1/2	2.654
	4	3.023
	4-1/2	3.412
	5	3.791

Size (inches)		Approx. Wt. (per lineal ft.)
5/8 x	6	4.550
	7	5.308
	8	6.066
	9	6.824
	10	7.582
	12	9.099
3/4 x	1	.910
	1-1/4	1.137
	1-1/2	1.365
	1-3/4	1.592
	2	1.820
	2-1/4	2.047
	2-1/2	2.275
	2-3/4	2.502
	3	2.730
	3-1/2	3.185
	4	3.640
	4-1/2	4.095
	5	4.550
	6	5.459
	6-1/2	5.914
	7	6.369
	7-1/2	6.824
	8	7.279
	9	8.189
	10	9.099
	12	10.919
	14	12.739
1 x	1-1/4	1.517
	1-1/2	1.820
	1-3/4	2.123
	2	2.426
	2-1/4	2.730
	2-1/2	3.033
	2-3/4	3.336
	3	3.640
	3-1/2	4.246
	4	4.853
	4-1/2	5.459
	5	6.066
	6	7.279
	7	8.492
	8	9.706
	9	10.919
	10	12.132
	12	14.558
	14	16.985

Continued on next page ▶

7075-T6
COLD FINISHED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-225/9

Size (inches)		Approx. Wt. (per lineal ft.)
1-1/8 x	2	2.760
1-3/16 x	2-3/8	3.422
	2-7/8	4.142
	3-3/8	4.862
1-1/4 x	1-1/2	2.275
	1-5/8	2.464
	1-3/4	2.654
	2	3.033
	2-1/4	3.412
	2-1/2	3.791
	3	4.550
	3-1/4	4.929
	3-1/2	5.308
	3-3/4	5.687
	4	6.066
	4-1/2	6.824
	5	7.583
	5-1/2	8.341
	6	9.099
	6-1/2	9.857
	7	10.616
	7-1/2	11.374
	8	12.132
	8-1/2	12.890
	10	15.165
	12	18.198
1-1/2 x	1-3/4	3.185
	2	3.640
	2-1/4	4.095
	2-1/2	4.550
	2-3/4	5.000
	3	5.459
	3-1/4	5.914
	3-1/2	6.369
	4	7.279
	4-1/4	7.734
	4-1/2	8.189
	5	9.099
	5-1/2	10.009
	6	10.919
	6-1/2	11.829
	8	14.558
	8-1/2	15.468
	10	18.198
	12	21.838
	14	25.477

Size (inches)		Approx. Wt. (per lineal ft.)
1-3/4 x	2	4.246
	2-1/2	5.308
	3	6.369
	3-1/2	7.431
	3-3/4	7.962
	4	8.492
	4-1/2	9.554
	5	10.616
	5-1/2	11.677
	6	12.739
2 x	2-1/4	5.459
	2-1/2	6.066
	3	7.279
	3-1/2	8.492
	4	9.706
	4-1/2	10.919
	5	12.132
	6	14.558
	6-1/2	15.772
	8	19.411
	8-1/2	20.624
	10	24.264
	12	29.117
	14	33.970
2-1/4 x	2-1/2	6.824
	2-3/4	7.507
	3	8.189
	3-1/2	9.554
	4	10.919
	4-1/2	12.284
	5	13.649
	5-1/2	15.013
2-1/2 x	2-3/4	8.341
	3	9.099
	3-1/4	9.857
	3-1/2	10.616
	4	12.132
	4-1/2	13.649
	5	15.165
	5-1/2	16.682
	6	18.198
2-3/4 x	3	10.009
	3-1/4	10.843
	3-1/2	11.677
	4-1/4	14.179

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7075-T6
COLD FINISHED ALUMINUM RECTANGLES
STANDARD 12 FT. LENGTHS
ASTM-B221, AMS-QQ-A-225/9

Size (inches)		Approx. Wt. (per lineal ft.)
3 x	3-1/2	12.739
	4	14.558
	4-1/2	16.378
	5	18.198
	6	21.838
3-1/2 x	4	16.985
	4-1/2	19.108
	5	21.231
	6	25.477
	7	29.723

Size (inches)		Approx. Wt. (per lineal ft.)
4 x	4-1/2	21.838
	5	24.264
	6	29.117
4-1/2 x	5	27.297
	6	32.756
5 x	6	36.396

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.

6061-T6
EXTRUDED ALUMINUM ANGLES
AMERICAN STANDARD • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQA-200/8, ASME-SB308

EQUAL LEG

Size (inches)	Approx. Wt. (per 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

Size (inches)	Approx. Wt. (per 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

Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

6061-T6
EXTRUDED ALUMINUM ANGLES
AMERICAN STANDARD • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQA-200/8, ASME-SB308

UNEQUAL LEG

Size (inches)	Approx. Wt. (per 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 3/16	.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

Size (inches)	Approx. Wt. (per 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

Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

6063-T52
EXTRUDED ALUMINUM ANGLES
SHARP CORNER • STOCK LENGTHS: 16 FT.
ASTM-B221, AMS-QQA-200/9, ASME-SB221

EQUAL LEG

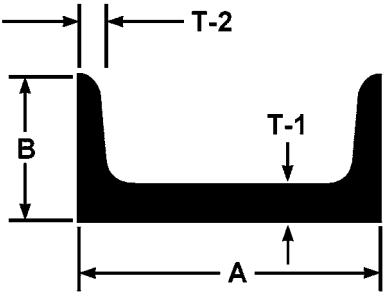
UNEQUAL LEG

Size (inches)	Approx. Wt. (per 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 1/8	.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 x3/16	1.303
3 x 3 x 1/4	1.690

Size (inches)	Approx. Wt. (per 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

Listed Sizes Can Be Ordered In 6061-T6 Alloy & Temper

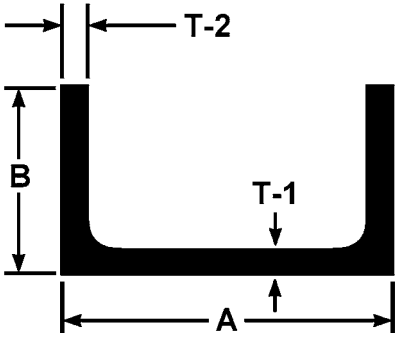
6061-T6
EXTRUDED ALUMINUM CHANNELS
AMERICAN STANDARD • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQA-200/8, ASME-5B308



A	B	T1	T2	Approx. Wt. (per lineal ft.)
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
7.00	3.500	.210	.380	4.714
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

Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

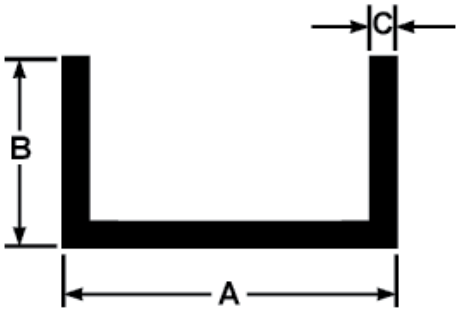
6061-T6
EXTRUDED ALUMINUM CHANNELS
ALUMINUM ASSOCIATION • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQA-200/8, ASME-SB308



A	B	T1	T2	Approx. Wt. (per lineal ft.)
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

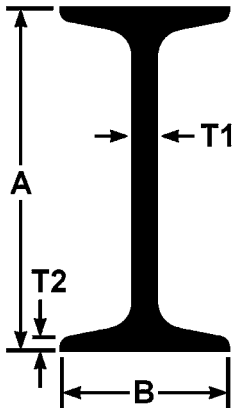
Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

6063-T52
EQUAL & UNEQUAL EXTRUDED ARCHITECTURAL CHANNEL
ASTM-B221, AMS-QQA-200/09



A	B	C	Approx. Wt. (per lineal ft.)
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	.400
1.00	2.00	.125	.691
1.25	0.50	.125	.300
1.25	1.25	.125	.509
1.50	0.50	.125	.337
1.50	0.75	.125	.400
1.50	1.00	.125	.473
1.50	1.50	.125	.618
1.75	0.75	.125	.441
1.75	1.00	.125	.510
2.00	0.50	.125	.413
2.00	1.00	.125	.546
2.00	2.00	.125	.837
2.00	2.00	.250	1.601
2.50	1.50	.125	.764
3.00	0.50	.125	.551
3.00	1.00	.125	.691
3.00	1.50	.188	1.250
5.00	2.00	.1875	1.867

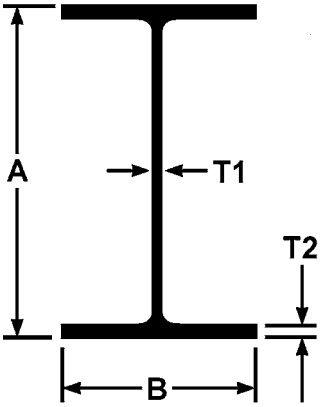
6061-T6
EXTRUDED ALUMINUM I-BEAMS
AMERICAN STANDARD • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQ-A-200/8, ASME-SB308



A	B	T1	T2	Approx. Wt. (per lineal ft.)
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

Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

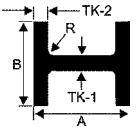
6061-T6
EXTRUDED ALUMINUM I-BEAMS
ALUMINUM ASSOCIATION • STOCK LENGTHS: 25 FT.
ASTM-B308, AMS-QQ-A-200/8, ASME-SB308



A	B	T1	T2	Approx. Wt. (per lineal ft.)
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

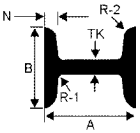
Listed Sizes Can Be Ordered In 6063-T52 Alloy & Temper

6061-T6
WIDE FLANGE BEAMS
(Structural)
ASTM B308



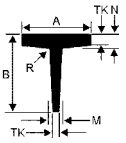
Depth A	Flange Width B	Web Tk-1	Tk-2	R	Est. Wt./Ft.	Packaging		Section No.
						Bundle Wt.	Pcs.	
6.000	4.000	.230	.279	.250	4.160	1036	10	42100D
6.000	6.000	.240	.269	.250	5.401	1074	8	42100H
8.000	8.000	.288	.433	.400	10.725	1100	4	42100G

6061-T6
H-BEAMS (STRUCTURAL)
ASTM B308



Depth A	Flange Wth B	Web Tk	N	R1	R2	Est. Wt./Ft.	Packaging		Section No.
							Bundle Wt.	Pcs.	
4.000	4.000	.313	.290	.313	.145	4.757	1058	9	3002A

6061-T6
TEES (STRUCTURAL)
ASTM B308



Flange Width A	Stem B	Tk	N	M	R	Est. Wt./Ft.	Packaging		Section No.
							Bundle Wt.	Pcs.	
2.000	2.000	.250	.312	.312	.250	1.255	521	17	853C

6061-T6 EXTRUDED ALUMINUM SQUARE TUBING (SHARP CORNERS)

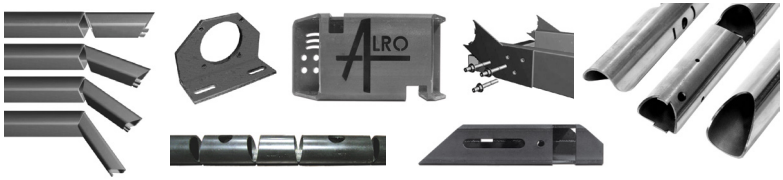
STOCK LENGTHS: 24 FT.
ASTM B221, AMS-QQ-A-200/8

Size O.D. (inches)	Nominal Wall Thickness	Approx. Wt. (per 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

Tube Laser Processing

Alro's 6-Axis Tube Lasers offer a One Step Solution to Eliminating Costly Processes

- Ability to miter cut, tap, notch, pipe joints, slot holes, tabs, etching and more
- Reduces the need for sawing, fixturing, milling, drilling, punching, bending & welding
- Dramatically reduce assembly time
- High quality cut and parts repeatability



6061-T6 EXTRUDED ALUMINUM RECTANGULAR TUBING (SHARP CORNERS)

STOCK LENGTHS: 24 FT.

ASTM B221, AMS-QQA-200/8

Size O.D. (inches)	Nominal Wall Thickness	Approx. Wt. (per lineal ft.)
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

6063-T52 EXTRUDED ALUMINUM SQUARE TUBING (SHARP CORNERS)

STOCK LENGTHS: 21 FT. 1 IN.

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

Size O.D. (inches)	Nominal Wall Thickness	Approx. Wt. (per lineal ft.)
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

Our 6063-T52 square tube is available in O.D. sizes of 3/4" through 6".

6063-T52 EXTRUDED ALUMINUM RECTANGULAR TUBING (SHARP CORNERS)

STOCK LENGTHS: 21 FT. 1 IN.
ASTM B221, AMS-QQA-200/9

Size O.D. (inches)	Nominal Wall Thickness	Approx. Wt. (per lineal ft.)
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

6061-T6 EXTRUDED ALUMINUM ROUND PIPE (STRUCTURAL)

STANDARD LENGTHS: 20 FT.

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

Pipe Size Designation	Schedule Number	Outside Dia. (inches)	Inside Dia. (inches)	Approx. Wt. (per 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

•Pipe also available in seamless tested grade.

6063-T6 EXTRUDED ALUMINUM ROUND PIPE (STRUCTURAL)

STANDARD LENGTHS: 20 FT.

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

Pipe Size Designation	Schedule Number	Outside Dia. Inches	Inside Dia. Inches	Approx. Wt. Per 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

•Pipe also available in seamless tested grade.

6061-T6 EXTRUDED ALUMINUM ROUND TUBING (STRUCTURAL)

STOCK LENGTHS: 12 FT or 24 FT
ASTM B221, AMS-QQA-200/8

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per 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	0.707
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
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

6061-T6 EXTRUDED ALUMINUM ROUND TUBING (STRUCTURAL)

STOCK LENGTHS: 12 FT or 24 FT
ASTM B221, AMS-QQA-200/8

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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
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

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6061-T6 EXTRUDED ALUMINUM ROUND TUBING (STRUCTURAL)

STOCK LENGTHS: 12 FT or 24 FT

ASTM B221, AMS-QQA-200/8

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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
8-13/20	7.875	0.388	11.829
9-1/2	8.250	0.625	20.493
10	9.500	0.250	9.005
10-1/2	9.000	0.750	25.400

6061-T6 EXTRUDED ALUMINUM ROUND TUBING (SEAMLESS)

STOCK LENGTHS: 12 FT

ASTM B241

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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
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

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6061-T6 EXTRUDED ALUMINUM ROUND TUBING (SEAMLESS)

STOCK LENGTHS: 12 FT
ASTM B241

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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

Tube Cutting & Chamfering

Benefits

- ID/OD chamfers **both** ends
- Production speeds
- Precision tolerances (+/- .005)

Cutting Capabilities

- OD: 1.500” up to 6.700”
- Wall Thickness: .049” up to 1.000”
- Min Cut Length: .750”
- Standard Bevel Features: 30°,40°,45°
  (Actual size of 30° bevel is 27.5°)
- Capable of 60° OD weld prep
- Other Features Available

Materials

- Carbon Steel
- Stainless Steel
- Aluminum
- Brass
- Bronze
- Copper
- Alloys

6061-T6 DRAWN ALUMINUM ROUND TUBING (SEAMLESS)

STOCK LENGTHS: 12 FT

ASTM B210

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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
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

Continued on next page ▶

6061-T6 DRAWN ALUMINUM ROUND TUBING (SEAMLESS)

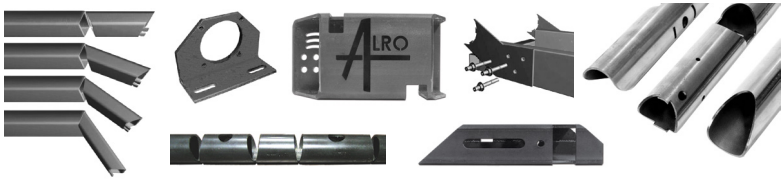
STOCK LENGTHS: 12 FT
ASTM B210

Size O.D. (inches)	Size I.D. (inches	Wall Thickness	Approx. Wt. (per lineal ft.)
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

Tube Laser Processing

Alro's 6-Axis Tube Lasers offer a One Step Solution to Eliminating Costly Processes

- Ability to miter cut, tap, notch, pipe joints, slot holes, tabs, etching and more
- Reduces the need for sawing, fixturing, milling, drilling, punching, bending & welding
- Dramatically reduce assembly time
- High quality cut and parts repeatability



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Diameter or Distance Across Flats - Round Wire and Rod - Square, Hexagonal and Octagonal Wire and Bar[1]

SPECIFIED Dimension (Inches)	Tolerance[3] - in. plus and minus							
	Allowable deviation from specified dimension across flats or diameter							
	Round Wire and Rod		Square Wire and Bar		Hexagonal Wire and Bar		Octagonal Wire and Bar	
	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	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	0.006	0.004	0.006	0.004
0.125-0.249	0.007	0.005	0.007	0.005	0.007	0.005	0.007	0.005
0.250-0.499	0.008	0.005	0.008	0.005	0.008	0.005	0.008	0.005
0.500-0.749	0.009	0.006	0.009	0.006	0.009	0.006	0.009	0.006
0.750-0.999	0.010	0.007	0.010	0.007	0.010	0.007	0.010	0.007
1.000-1.499	0.012	0.008	0.012	0.008	0.012	0.008	0.012	0.008
1.500-1.999	0.014	0.009	0.014	0.009	0.014	0.009	0.014	0.009
2.000-3.999	0.024	0.016	0.024	0.016	0.024	0.016	0.024	0.016
4.000-5.999	0.034	0.022	0.034	0.022	0.034	0.022	0.034	0.022
6.000-7.070	0.044	0.029	0.044	0.029	0.044	0.029	0.044	0.029
7.071-7.999	0.044	0.029	0.054	0.036	0.044	0.029	0.044	0.029
8.000-8.659	0.054	0.036	0.064	0.042	0.054	0.036	0.054	0.036
8.660-8.999	0.054	0.036	0.064	0.042	0.064	0.042	0.054	0.036
9.000-9.238	0.054	0.036	0.064	0.042	0.064	0.042	0.054	0.036
9.239-9.999	0.054	0.036	0.064	0.042	0.064	0.042	0.064	0.042
10.000-11.999	0.074	0.049	0.074	0.049	0.074	0.049	0.074	0.049
12.000-13.999	0.084	0.055	0.084	0.055	0.084	0.055	0.084	0.055
14.000-15.999	0.094	0.062	.0.094	0.062	0.094	0.062	.0.094	0.062

*See p. 10-67 for all applicable footnotes.

Continued on next page ▼

EXTRUDED PRODUCTS
STANDARD TOLERANCES
WIRE, ROD, BAR AND SHAPES

Thickness or Width (Distance Across Flats) - Rectangular Wire and Bar[1]

Specified Dimension (Inches)	Tolerance- in. plus and minus Allowable deviation from specified dimension across flats or diameter			
	Standard Tolerance, All Except 5XXX	Precision Tolerance, All Except 5XXX	Standard Tolerance, All Except 5XXX	Precision Tolerance,All Except 5XXX
	Alloys[11]	Alloys	Alloys[11]	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

*See p. 10-67 for all applicable footnotes.

EXTRUDED PRODUCTS
STANDARD TOLERANCES
WIRE, ROD, BAR AND SHAPES

Specified Diameter ① (Inches)	Tolerance[2] - in. plus and minus			
	Allowable deviation of mean diameter ⑤ from specified diameter (size)		Allowable deviation of diameter at any point from specified diameter ④	
	Difference between 1/2 (AA+BB) and specified diameter		**Difference between AA or BB and specified diameter**	
Col. 1	Col. 2		Col. 3	
	5XXX ≥ 4.0 nominal Mg ⑯	Other Alloys	5XXX ≥ 4.0 nominal Mg ⑯	Other Alloys
0.500-0.999		.010		.020
1.000-1.999		.012		.025
2.000-3.999		.015		.030
4.000-5.999		.025		.050
6.000-7.999		.035		.075
8.000-9.999		.045		.100
10.000-11.999		.055		.125
12.000-13.999		.065		.150
14.000-15.999		.075		.175
16.000-17.999		.085		.200
18.000-19.999		.095		.225
20.000-21.999		.105		.250
22.000-23.999		.115		.275

*See p. 10-67 for all applicable footnotes.

Continued on next page ▶

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 fl at surface. The following values are used to convert angular tolerances to linear deviation:

Tolerance, degrees	Maximum allowable linear deviation inch per inch of width
¼	0.004
½	0.009
1	0.017
1½	0.026
3	0.052
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.

CROSS-SECTIONAL DIMENSION TOLERANCES WIRE, ROD, BAR & SHAPES[1]

Except for shapes in T3510, T4510, T6510, T7351, T76510 and T8510 Tempers[7]

Col. 1	Col. 2	(11) Other Alloys	Col. 3	(11) Other Alloys	Col. 4	(11) Other Alloys	Col. 5	(11) Other Alloys	Col. 6	(11) Other Alloys	Col. 7	(11) Other Alloys	Col. 8	(11) Other Alloys	Col. 9	(11) Other Alloys
CIRCUMSCRIBING CIRCLE SIZES 10 INCHES IN DIAMETER AND OVER																
Up thru 0.124		.014				.018		.020		. .		. .		. .		. .
0.125-0.249		.015				.019		.022		.028		. .		. .		. .
0.250-0.499		.016				.020		.024		.030		.050				. .
. .																
0.500-0.749		.017				.022		.027		.040		.060		. .		. .
0.750-0.999		.018				.023		.030		.050		.070		.090		. .
1.000-1.499		.019				.024		.034		.060		.080		.100		. .
1.500-1.999		.024				.034		.044		.070		.090		.110		.170
2.000-3.999		.034				.044		.054		.080		.100		.120		.180
4.000-5.999		.044				.054		.064		.090		.110		.130		.190
6.000-7.999		.054				.064		.074		.100		.120		.140		.200
8.000-9.999		.064				.074		.084		.110		.130		.150		.210
10.000-11.999		.074				.084		.094		.120		.140		.160		.220
12.000-13.999		.084				.094		.104		.130		.150		.170		.230
14.000-15.999		.094				.104		.114		.140		.160		.180		.240
16.000-17.999		.104				.114		.124		.150		.170		.190		.250
18.000-19.999		.114				.124		.134		.160		.180		.200		.260
20.000-21.999		.124				.134		.144		.170		.190		.210		.270
22.000-24.999		.134				.144		.154		.180		.200		.220		.280

SECTION 3
ALUMINUM SHEET AND PLATE PRODUCTS

SHEET AND PLATE

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.

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.

Continued on next page ▶

SECTION 3
ALUMINUM SHEET AND PLATE PRODUCTS
ALLOY DESCRIPTIONS AND APPLICATIONS (CON'T)

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®, ATP 5™ and K100-S™) - 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®, Alca Max, Dura Mold 2®, Dura Mold 5® , M1 & M5) - 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.

3003-H14
ALUMINUM SHEET
NON-HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/2

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.025	48 x 120 *	.356
.032	48 x 96 *	.456
	48 x 120 *	.456
	48 x 144	.456
.040	48 x 96 *	.570
	48 x 120 *	.570
	48 x 144	.570
.050	36 x 96	.713
	48 x 96 *	.713
	48 x 120 *	.713
	48 x 144	.713
.063	36 x 96	.898
	48 x 96 *	.898
	48 x 120 *	.898
	48 x 144	.898
	60 x 120	.898
.080	48 x 96 *	1.141
	48 x 120 *	1.141
	48 x 144	1.141
	60 x 120	1.141
.090	48 x 96 *	1.283
	48 x 120 *	1.283
	48 x 144	1.283
	60 x 120	1.283
	60 x 144	1.283
.100	48 x 96 *	1.426
	48 x 120 *	1.426
	48 x 144	1.426
.125	36 x 120	1.782
	48 x 96 *	1.782
	48 x 120 *	1.782
	48 x 144	1.782
	60 x 120	1.782
	60 x 144	1.782
.187	48 x 144	2.639
	60 x 144	2.639
.190	48 x 96	2.709
	48 x 120	2.709
	48 x 144	2.709
	60 x 120	2.709
	60 x 144	2.709

* Size available in painted sheet (3003/3105).
(Gloss Black, Gloss White, Bright Green, Bright Red, Bright Yellow, Chevron Blue)

Continued on next page ▶

3003-H14
ALUMINUM SHEET
NON-HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/2

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.250	48 x 96	3.560
	48 x 120	3.560
	48 x 144	3.560
	60 x 96	3.560
	60 x 120	3.560
	60 x 144	3.560

* Size available in painted sheet (3003/3105).
(Gloss Black, Gloss White, Bright Green, Bright Red, Bright Yellow, Chevron Blue)

5052-H32
ALUMINUM SHEET & PLATE
NON-HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/8

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.032	48 x 96	.447
	48 x 120	.447
	48 x 144	.447
.040	48 x 96	.559
	48 x 120	.559
	48 x 144	.559
.050	48 x 96	.698
	48 x 120	.698
	48 x 144	.698
.063	48 x 96	.880
	48 x 120	.880
	48 x 144	.880
	60 x 120	.880
	60 x 144	.880
.080	48 x 96	1.117
	48 x 120	1.117
	48 x 144	1.117
	60 x 120	1.117
	60 x 144	1.117
.090	36 x 96	1.257
	48 x 96	1.257
	48 x 120	1.257
	48 x 144	1.257
	60 x 144	1.257
	72 x 144	1.257

Continued on next page ▶

5052-H32
ALUMINUM SHEET AND PLATE
NON-HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/8

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.100	48 x 96	1.397
	48 x 120	1.397
	48 x 144	1.397
	60 x 120	1.397
	60 x 144	1.397
.125	48 x 96	1.746
	48 x 120	1.746
	48 x 144	1.746
	60 x 120	1.746
	60 x 144	1.746
	72 x 144	1.746
.160	48 x 120	2.235
	48 x 144	2.235
.190	36 x 96	2.654
	48 x 96	2.654
	48 x 120	2.654
	48 x 144	2.654
	60 x 96	2.654
	60 x 120	2.654
	60 x 144	2.654
	72 x 96	2.654
	72 x 120	2.654
	72 x 144	2.654
.250	48 x 96	3.492
	48 x 120	3.492
	48 x 144	3.492
	60 x 96	3.492
	60 x 120	3.492
	60 x 144	3.492
	72 x 96	3.492
	72 x 120	3.492
	72 x 144	3.492
.375	48 x 96	5.238
	48 x 120	5.238
	48 x 144	5.238
	60 x 144	5.238
.500	48 x 96	6.984
	48 x 120	6.984
	48 x 144	6.984
.750	48 x 144	10.476

5086-H32
ALUMINUM SHEET
NON-HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/7

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.063	48 x 120	.871
	48 x 144*	.871
.090	48 x 96	1.244
	48 x 120	1.244
	48 x 144*	1.244
.100	48 x 96	1.382
	48 x 144	1.382
.125	48 x 96	1.728
	48 x 120	1.728
	48 x 144*	1.728
.190	48 x 96	2.626
	48 x 120	2.626
	48 x 144	2.626
.249	48 x 96	3.442
	48 x 120	3.442
	48 x 144	3.442

*Also available in H116 Temper.

2024-T3
ALUMINUM SHEET - HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/4

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.032	48 x 144	.465
.040	48 x 144	.582
.050	48 x 144	.727
.063	48 x 144	.916
.071	48 x 144	1.033
.080	48 x 144	1.152
.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

6061-T6
ALUMINUM SHEET - HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/11

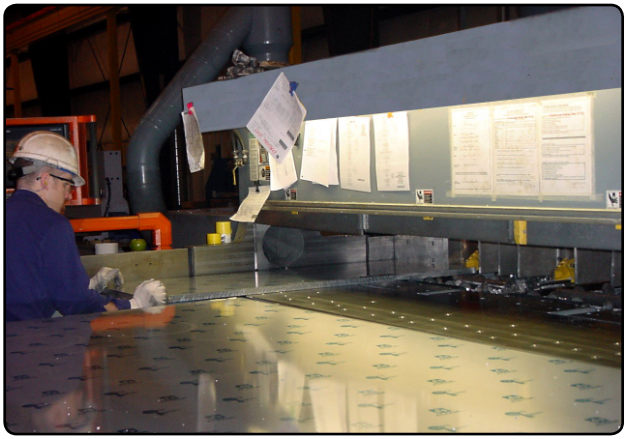
Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.032	48 x 144	.452
.040	48 x 144	.576
.050	48 x 144	.706
.063	48 x 144 60 x 144	.889 .889
.080	48 x 144	1.129
.090	48 x 144 60 x 144	1.270 1.270
.100	48 x 144	1.411
.125	36 x 96 48 x 96 48 x 120 48 x 144 60 x 144	1.764 1.764 1.764 1.764 1.764
.160	48 x 144	2.258
.190	48 x 144 60 x 144	2.681 2.681

7075-T6
ALUMINUM SHEET - HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/12

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
.063	48 x 144	.916
.080	48 x 144	1.164
.090	48 x 144	1.310
.100	48 x 144	1.454
.125	48 x 144	1.818
.190	48 x 144	2.763

2024-T351
ALUMINUM PLATE - HEAT TREATABLE (MILL FINISH)
ASTM-B209, AMS-QQ-A-250/4

Thickness (Inches)	Plate Size (Inches)	Approx. Wt. (per square ft.)
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 60.5 x 144.5	5.454 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
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



Producing square cuts with tight tolerances on aluminum plate is one of Alro's many in-house services.

6061-T651
ALUMINUM PLATE - HEAT TREATABLE
ASTM-B209, AMS-QQ-A-250/11

Thickness (Inches)	Plate Size (Inches)	Approx. Wt. (per square ft.)
1/4	36.5 x 96.5	3.634
	48.5 x 96.5	3.634
	48.5 x 144.5	3.634
	60.5 x 144.5	3.634
	60 x 120	3.634
	72.5 x 144.5	3.634
5/16	48.5 x 144.5	4.520
	60.5 x 144.5	4.520
3/8	48.5 x 96.5	5.410
	48.5 x 144.5	5.410
	60.5 x 144.5	5.433
	72.5 x 144.5	5.433
1/2	48.5 x 96.5	7.220
	48.5 x 144.5	7.220
	60.5 x 144.5	7.246
	72.5 x 144.5	7.246
5/8	48.5 x 144.5	8.982
	60.5 x 144.5	9.010
	72.5 x 144.5	9.010
3/4	48.5 x 96.5	10.810
	48.5 x 144.5	10.810
	60.5 x 144.5	10.845
	72.5 x 144.5	10.845
7/8	48.5 x 144.5	12.567
	60.5 x 144.5	12.567
	72.5 x 144.5	12.567
1	48.5 x 96.5	14.387
	48.5 x 144.5	14.387
	60.5 x 144.5	14.444
	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	17.915
	60.5 x 144.5	17.972
	72.5 x 144.5	17.972
1-3/8	48.5 x 144.5	19.679
	60.5 x 144.5	19.736
1- 1/2	48.5 x 96.5	21.443
	48.5 x 144.5	21.443
	60.5 x 144.5	21.499
	72.5 x 144.5	21.499
1- 3/4	48.5 x 96.5	25.084
	48.5 x 144.5	25.084
	60.5 x 144.5	25.084

Continued on next page ▶

6061-T651
ALUMINUM PLATE - HEAT TREATABLE
ASTM-B209, AMS-QQ-A-250/11

Thickness (Inches)	Plate Size (Inches)	Approx. Wt. (per square ft.)
2	48.5 x 96.5 48.5 x 144.5 60.5 x 144.5 72.5 x 144.5	28.612 28.612 28.647 28.647
2- 1/4	48.5 x 144.5 60.5 x 144.5	32.13 32.13
2- 1/2	48.5 x 144.5 60.5 x 144.5	35.809 35.809
2-3/4	48.5 x 144.5 60.5 x 144.5	39.337 39.337
3	48.5 x 144.5 60.5 x 144.5	42.865 42.865
3- 1/2	48.5 x 144.5 60.5 x 144.5	50.097 50.097
4	48.5 x 144.5 60.5 x 144.5	57.365 57.365
4- 1/2	48.5 x 144.5	64.421
5	48.5 x 144.5 60.5 x 144.5	71.477 71.477
5- 1/2	48.5 x 144.5 60.5 x 144.5	78.533 78.533
6	48.5 x 144.5 60.5 x 144.5	85.589 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

- See “Guide to Special Services and Processing” on p. 10-119 for information on our plate cutting capabilities.

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

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

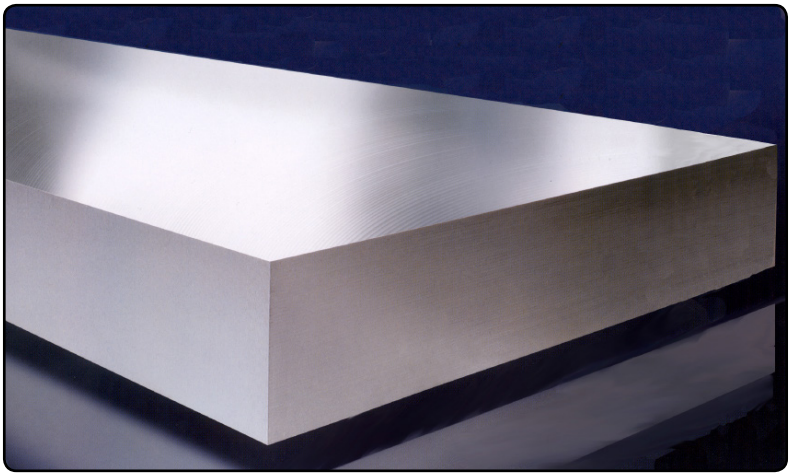
See pages 10-93 & 10-95 for commercial thickness tolerances.

7075-T651
ALUMINUM PLATE - HEAT TREATABLE
ASTM-B209, AMS-QQA-250/12

Thickness (Inches)	Sheet Size (Inches)	Approx. Wt. (per square ft.)
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 60.5 x 144.5	18.180 18.180
1-1/2	48.5 x 144.5 60.5 x 144.5	21.816 21.816
1-3/4	48.5 x 144.5	25.452
2	48.5 x 144.5 60.5 x 144.5	29.088 29.088
2-1/2	48.5 x 144.5 60.5 x 144.5	36.360 36.360
3	48.5 x 144.5 60.5 x 144.5	43.632 43.632
3-1/2	48.5 x 144.5 60.5 x 144.5	50.900 50.900
3-3/4	48.5 x 144.5 60.5 x 144.5	54.540 54.540
4	48.5 x 144.5 60.5 x 144.5	58.176 58.176
5	48.5 x 144.5 60.5 x 144.5	72.720 72.720
6	48.5 x 144.5 60.5 x 144.5	87.264 87.264
7	48.5 x 144.5	102.244
8	44.5 x 144.5 60.5 x 144.5	116.788 116.788

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 hard-coat 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 from Alro Steel. Contact your Alro sales representative today to convey your specific needs.

MIC-6®
CAST ALUMINUM TOOL & JIG PLATE
PRECISION MACHINED/PVC TWO SIDES

AVAILABLE SIZES

Standard Thicknesses	1/4" - 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 h ºF
Electrical Conductivity, IACS:	36%
Modulus of Elasticity:	10.3 x 106 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 Thickness 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" - 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 h ºF (68ºF)
Electrical Conductivity, IACS:	27% (68ºF)
Modulus of Elasticity	10.3 x 106 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 Thickness 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

K100-S ™
CAST ALUMINUM TOOL & JIG PLATE
PRECISION MACHINED/PVC TWO SIDES

AVAILABLE SIZES

Standard Thicknesses	1/4" - 8"	
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"

TYPICAL PROPERTIES

Typical Tensile Strength	38,000 psi
Typical Yield Strength	18,000 psi
Percent Elongation	10% to 12%
Brinell Hardness	60 to 65
Coefficient of Thermal Expansion (Average)	13.2 x 10^6 in/in ºF (68º - 212ºF)
Thermal Conductivity	810 English Units (77°F)
Electrical Conductivity, IACS:	29%
Modulus of Elasticity:	10.3 ksi x 10^3
Alloy	5XXX
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 ..... (+ 1/4 inch - 0)
- Length Tolerance ..... (+ 1/4 inch - 0)

Thickness Tolerance ..... Tolerance for any thickness is +/-.005

Maximum Deviation From Flat

Specified Plate Thickness Maximum Variation
- 1/4 inch to 1/2 inch ..... 0.015 inches
- 5/8 inch to 8 inch ..... 0.010 inches

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

TYPICAL APPLICATIONS

Fully stress-relieved, K100-S™ 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

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/ftxhxºF 110 - 140 W/mK
Electrical Conductivity, IACS	35%
Modulus of Elasticity	10.1 x 106 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 Thickness Maximum Variation	
Under 1/2 inch	0.015 inch
Over 1/2 inch	0.010 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® • K100-S™ • ATP-5™

Thickness (Inches)	5XXX Series Alca 5, K100-S, ATP-5 Weight. per sq. ft.	7XXX Series MIC-6 Weight. per sq. ft.
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
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	36.360
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 include:

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

- Special thicknesses over 6" are available
- Special widths available up to 120-1/2”
- Special lengths available up to 485"
- Precision sawing of aluminum plate available
  (See guide to special services and processing, p.10-118)

Flatness Tolerances:*
Sizes under 1/2" thick - up to 60-1/2" wide flat within .015"
Sizes 1/2"-6" thick - up to 60-1/2" wide flat within .010"
(*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.

Continued on next page ▶

ALCA MAX, DURAMOLD 2, M1
2000 SERIES CAST ALUMINUM MOLD PLATE

DESCRIPTION

2000 Series mold plate products are ideal for large molds requiring extensive machining.

These products are produced using the direct chill continuous cast process which offers outstanding dimensional stability, as well as excellent weldabiliy, consistent performance at high temperatures, and high strength and hardness. The low level of internal stress reduces considerably the deformation during and after machining.

AVAILABLE SIZES

Standard Thicknesses	2" to 38"	
Standard Widths & Lengths	54"x132"	64"x145.5"
	53"x150"	64x150.5"

***Non Standard thicknesses, widths and lengths may be available upon inquiry
***Widths up to 94" (2"-38" thick)-Inquiry Only

TYPICAL PROPERTIES

Typical Tensile Strength	38,000 to 43,000 psi *over 10.5 inches inquire
Typical Yield Strength	20,000 to 30,000 psi *over 10.5 inches inquire
Elongation in 2 inch E%	7% to 9%
Brinell Hardness	81
Coefficient of Thermal Expansion	12.4 µin/inx°F (68°F - 212°F) - Alca Max
	$12.4x10^{6}$ (68°F - 212°F) - Duramold - 2
	$12.9x10^{6}$ (68°F - 212°F) - M1
Thermal Conductivity	69.3 Btu/ft h ºF - Alca Max
	81 Btu/ftxhx°F - Duramold - 2
	810 English Units (77°F) - M1
Electrical Conductivity, IACS	39%
Modulus of Elasticity:	10.3x106 psi - Alca Max
	10.7x106 psi - Duramold - 2
	10.8ksi x 103 - M1
Alloy	2000 Series
Density	0.101 $lb/inch^3$

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)

MAX 5®, DURA-MOLD 5™, M-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" to 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 to 41,000 psi
Typical Yield Strength ..... 18,000 psi
Elongation in 2 inch E% 15%-16%
Brinell Hardness 70
Coefficient of Thermal Expansion .... 13.2 µin/inx°F (68°F - 212°F) - MAX 5
13.1x10^{6} (68°F - 212°F) - DURAMOLD 5
13.2x10^{6} (68°F - 212°F) - M5
Thermal Conductivity ..... 69.3 Btu/ft h ºF - MAX 5
81 Btu/ftxhx°F - DURAMOLD 5
810 English Units (77°F) - M5
Electrical Conductivity, IACS ..... 7% to 29% (68ºF)
Modulus of Elasticity ..... 10.3x106 psi - MAX 5
10.1x106 psi - DURAMOLD 5
10.3 ksi x 103 - M5
Alloy ..... 5000 Series
Density ..... 0.096 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

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)

CAST ALUMINUM MOLD PLATE
DURA-MOLD® 2 & 5
MAX 5®, ALCA MAX™
M1® & M5® (Inquire)

Thickness (Inches)	2XXX Series Alca Max, Duramold 2, M1 Approx. Wt. (per square ft.)	5XXX Series Max 5, Duramold 5, M5 Approx. Wt. (per square ft.)
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 include:

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

*See “Guide to Special Services and Processing” on p.10-119 for information on Plate Cutting Capabilities.

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" - 8" Rolled & Stress Relieved
10" - 20" Forged & Stress Relieved
Standard Widths & Lengths ..... Widths ranging from 50" to 72.5"
Lengths ranging from 64" to 144.5"
*Width and Length Combinations Depend on Thickness

TYPICAL PROPERTIES

Typical Ultimate Strength	1" - 8"	85 - 80 ksi	10" & Over	76 - 70 ksi
Typical Yield Strength	1" - 8"	78 - 73 ksi	10" & Over	67 - 60 ksi
Elongation in 2 inch E%	1" - 8"	10% - 2%	10" & Over	9% - 7%
Brinell Hardness	1" - 8"	185 - 180	10" & Over	165 - 180

Coefficient of Thermal Expansion ..... 13.2 x 10^6/in°F
Thermal Conductivity ..... 88 Btu/ft.hr/ft 2°F
Modulus of Elasticity: ..... Compressive 10.6 x 10^6 lb/in^2
Tensile 10.4 x 10^6 lb/in^2
Alloy ..... 7000 Series
Density ..... 0.102 lb/in^3

APPLICATIONS
- Injection Molds
- Blow Molds
- Thermoform Tools & Molds
- RIM & RTM Molding
- Aluminum Die Sets
- Vacuum Forming Tools
- Heating & Cooling Plates
- Rubber Molds
- Structural Foam Molds
- Lens Quality Molds

ALUMOLD® 500 ALUMINUM MOLD PLATE

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

Available pattern sizes include:
Widths ranging from 50" to 72.5"
Lengths ranging from 64" to 144.5"
*Width and length combinations depend on thickness

TOLERANCES

Mill Plate

Thickness Tolerance.....Nomimal +1/4 - 0 Rolled…+.400/ - 0 on Forged
Width Tolerance.....+1/2 inch - 0
Length Tolerance.....+1/2 inch - 0

3003-H22 BRIGHT REFLECTIVE FINISH DIAMOND TREAD ALUMINUM SHEET AND PLATE

Thickness (Inches)	Plate Size (Inches)	Approx. Wt. (per square ft.)
.063	48 x 96	1.058
	48 x 120	1.058
	48 x 192	1.058
.080	48 x 96	1.283
	48 x 192	1.283
.100	48 x 96	1.570
	48 x 120	1.570
	48 x 192	1.570
	60 x 120	1.570
.125	48 x 96	1.900
	48 x 120	1.900
	48 x 144	1.900
	48 x 192	1.900
	60 x 96	1.900
	60 x 192	1.900
.188	48 x 96	2.820
	48 x 120	2.820
	48 x 144	2.820
	48 x 192	2.820
	60 x 96	2.820
	60 x 192	2.820
.250	48 x 96	3.700
	48 x 120	3.700
	48 x 192	3.700
	60 x 120	3.700
	60 x 192	3.700

6061-T6 STANDARD MILL FINISH DIAMOND TREAD ALUMINUM SHEET AND PLATE

Thickness	Sheet Size	Appx. Wt. (per sq. ft.)
.125	48 x 96	1.90
	48 x 192	1.90
	60 x 192	1.90
.188	48 x 96	2.79
	48 x 192	2.79
	60 x 192	2.84
.250	48 x 96	3.67
	48 x 192	3.67
	60 x 192	3.67
.375	48 x 96	5.43
	48 x 192	5.43
	60 x 192	5.43
.500	48 x 192	7.20
	60 x 192	7.20

FLATNESS TOLERANCES - 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

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

*See p. 10-94 for all applicable footnotes.

STANDARD TOLERANCES - 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.

Tolerances apply to thickness in inches.

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 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 plus and minus)							
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	0.006	-	-	-
0.039	0.047	0.0025	0.0035	0.0045	0.006	0.007	0.008	-	-
0.047	0.063	0.0030	0.0035	0.0050	0.006	0.007	0.009	-	-
0.063	0.079	0.0035	0.0040	0.006	0.007	0.008	0.010	-	-
0.079	0.098	0.0035	0.0045	0.006	0.007	0.009	0.011	-	-
0.098	0.126	0.0045	0.006	0.007	0.009	0.011	0.013	-	-
0.126	0.158	0.006	0.007	0.009	0.011	0.013	0.015	-	-
0.158	0.197	0.007	0.009	0.011	0.013	0.015	0.018	-	-
0.197	0.248	0.009	0.011	0.013	0.015	0.018	0.022	0.027	-
0.248	0.315	0.012	0.014	0.015	0.018	0.022	0.027	0.035	0.043
0.315	0.394	0.015	0.017	0.020	0.023	0.027	0.033	0.041	0.051
0.394	0.630	0.023	0.023	0.027	0.032	0.035	0.043	0.053	0.065
0.630	0.984	0.031	0.031	0.037	0.043	0.047	0.058	0.070	0.085
0.984	1.575	0.039	0.039	0.047	0.055	0.065	0.075	0.090	0.105
1.575	2.362	0.055	0.055	0.060	0.070	0.085	0.100	0.155	-
2.362	3.150	0.075	0.075	0.085	0.100	0.105	0.125	-	-
3.150	3.937	0.100	0.100	0.115	0.125	0.130	0.160	-	-
3.937	6.299	0.130	0.130	0.145	0.165	-	-	-	-
6.300	8.000	0.160	0.160	0.160	0.165	-	-	-	-

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STANDARD TOLERANCES - SHEET & PLATE

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 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 plus and minus)							
0.080 -	0.249	±1/8	±1/8	±3/16	±1/4	±1/4	±5/16	±3/8	±7/16
0.250 -	6.000	±1/4	±5/16	±3/8	±1/2	±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 - SHEET, PLATE & COIL

Thicknesses 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 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 plus and minus)											
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	0.0035	0.007	-	-	-	-
0.039	0.047	0.0020	0.0020	0.0020	0.0030	0.0030	0.0035	0.0035	0.008	0.010	0.011	-	-
0.047	0.063	0.0020	0.0020	0.0030	0.0030	0.0030	0.0035	0.0035	0.009	0.011	0.013	-	-
0.063	0.079	0.0020	0.0020	0.0030	0.0035	0.0035	0.0035	0.0035	0.010	0.013	0.015	-	-
0.079	0.098	0.0025	0.0025	0.0035	0.0040	0.0040	0.0045	0.0045	0.011	0.015	0.018	-	-
0.098	0.126	0.0035	0.0035	0.0035	0.0045	0.0045	0.0045	0.0045	0.013	0.016	0.020	-	-
0.126	0.158	0.0040	0.0040	0.0045	0.007	0.007	0.009	0.009	0.015	0.018	0.022	-	-
0.158	0.197	0.0055	0.007	0.007	0.009	0.009	0.011	0.011	0.018	0.022	0.026	-	-
0.197	0.248	0.009	0.012	0.012	0.012	0.017	0.017	0.021	0.021	0.025	0.029	-	-
0.248	0.315	0.012	0.015	0.015	0.015	0.019	0.019	0.024	0.024	0.029	0.033	0.041	0.051
0.315	0.394	0.017	0.018	0.018	0.018	0.022	0.022	0.028	0.028	0.033	0.039	0.047	0.059
0.394	0.630	0.023	0.023	0.023	0.023	0.028	0.028	0.033	0.033	0.039	0.047	0.059	0.070
0.630	0.984	0.031	0.031	0.031	0.031	0.037	0.037	0.043	0.043	0.051	0.060	0.070	0.085
0.984	1.575	0.039	0.039	0.039	0.039	0.047	0.047	0.055	0.055	0.065	0.075	0.090	0.105
1.575	2.362	0.055	0.055	0.055	0.055	0.060	0.060	0.070	0.070	0.090	0.100	0.155	-
2.362	3.150	0.075	0.075	0.075	0.075	0.085	0.085	0.100	0.100	0.110	0.125	-	-
3.150	3.937	0.100	0.100	0.100	0.100	0.115	0.115	0.130	0.130	0.150	0.160	-	-
3.937	6.299	0.130	0.130	0.130	0.130	0.145	0.145	0.165	0.165	-	-	-	-
6.300	8.000	0.160	0.160	0.160	0.160	0.160	0.160	0.165	0.165	-	-	-	-

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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
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 (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.) Allowable 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

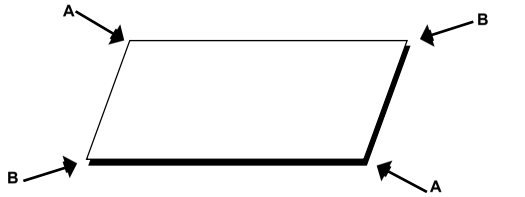
Specified Thickness [1] (inches)	Specified Width and Length (inches)							
	Up thru 30	Over 30 thru 60	Over 60 thru 120	Over 120 thru 240	Over 240 thru 360	Over 360 thru 480	Over 480 thru 600	Over 600 thru 720
	Tolerance [2] (inches)							
0.080 - 0.249	±1/8	±1/8	±3/16	±1/4	±1/4	±5/16	±3/8	±7/16
0.250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

STANDARD TOLERANCES
SHEET, PLATE

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]

Squareness Tolerances - Flat Sheet and Plate

SPECIFIED LENGTH (feet)	SPECIFIED WIDTH - ft.	
	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.

SECTION 4
TECHNICAL DATA

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 of the heat-treatable 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.

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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 magne sium-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.

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TEMPER DESIGNATION SYSTEM

SUBDIVISIONS 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)

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TEMPER DESIGNATION SYSTEM

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.

CHEMICAL COMPOSITION LIMITS OF WROUGHT ALUMINUM ALLOYS* (1)(2)

Alloy	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Zinc	Titanium	Others		Aluminum
									Each(3)	Total(4)	Min.(5)
1100	0.95		0.05-0.20	0.05	-	-	0.10	-	0.05(6)	0.15	99.00
1145(7)	0.55	0.05	0.05	0.05	-	0.05	0.03		0.03(8)	-	99.45
1350(9)	0.10	0.40	0.05	0.01	-	0.01	0.05	-	0.03(10)	0.10	99.50
2011	0.40	0.7	5.0-6.0	-	-	-	0.30	-	0.05(11)	0.15	Remainder
2014	0.50-1.2	0.7	3.9-5.0	0.40-1.2	0.20-0.8	0.10	0.25	0.15	0.05	0.15	Remainder
2017	0.20-0.8	0.7	3.5-4.5	0.40-1.0	0.40-0.8	0.10	0.25	0.15	0.05	0.15	Remainder
2024	0.50	0.50	3.8-4.9	0.30-0.9	1.2-1.8	0.10	0.25	0.15	0.05	0.15	Remainder
2117	0.8	0.7	2.2-3.0	0.20	0.20-0.50	0.10	0.25	-	0.05	0.15	Remainder
2124	0.20	0.30	3.8-4.9	0.30-0.9	1.2-1.8	0.10	0.25	0.15	0.05	0.15	Remainder
2219	0.20	0.30	5.8-6.8	0.20-0.40	0.02	-	0.10	0.02-0.10	0.05(12)	0.15	Remainder
3003	0.6	0.7	0.05-0.20	1.0-1.5	-	-	0.10	-	0.05	0.15	Remainder
3004	0.30	0.7	0.25	1.0-1.5	0.8-1.3	-	0.25	-	0.05	0.15	Remainder
3005	0.6	0.7	0.30	1.0-1.5	0.20-0.6	0.10	0.25	0.10	0.05	0.15	Remainder
3105	0.6	0.7	0.30	0.30-0.8	0.20-0.8	0.20	0.40	0.10	0.05	0.15	Remainder
4043	4.5-6.0	0.8	0.30	0.05	0.05	-	0.10	0.20	0.05(6)	0.15	Remainder
5005	0.30	0.7	0.20	0.20	0.50-1.1	0.10	0.25	-	0.05	0.15	Remainder
5050	0.40	0.7	0.20	0.10	1.1-1.8	0.10	0.25	-	0.05	0.15	Remainder
5052	0.25	0.40	0.10	0.10	2.2-2.8	0.15-0.35	0.10	-	0.05	0.15	Remainder
5056	0.30	0.40	0.10	0.05-0.20	4.5-5.6	0.05-0.20	0.10	-	0.05	0.15	Remainder
5083	0.40	0.40	0.10	0.40-1.0	4.0-4.9	0.05-0.25	0.25	0.15	0.05	0.15	Remainder

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*See p. 10-106 for all applicable footnotes.

CHEMICAL COMPOSITION LIMITS OF WROUGHT ALUMINUM ALLOYS*(1)(2)

Aluminum Alloy	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Zinc	Titanium	Others		Min.(5)
									Each(3)	Total(4)	
5086	0.40	0.50	0.10	0.20-0.7	3.5-4.5	0.05-0.25	0.25	0.15	0.05	0.15	Remainder
5154	0.25	0.40	0.10	0.10	3.1-3.9	0.15-0.35	0.20	0.20	0.05	0.15	Remainder
5183	0.40	0.40	0.10	0.50-1.0	4.3-5.2	0.05-0.25	0.25	0.15	0.05(6)	0.15	Remainder
5252	0.08	0.10	0.10	0.10	2.2-2.8		0.05	-	0.03(8)	0.10	Remainder
5356	0.25	0.40	0.10	0.05-0.20	4.5-5.5	0.05-0.20	0.10	0.06-0.2	0.05(6)	0.15	Remainder
5454	0.25	0.40	0.10	0.50-1.0	2.4-3.0	0.05-0.20	0.25	0.20	0.05	0.15	Remainder
5456	0.25	0.40	0.10	0.50-1.0	4.7-5.5	0.05-0.20	0.25	0.20	0.05	0.15	Remainder
6061	0.40-0.8	0.7	0.15-0.40	0.15	0.8-1.2	0.04-0.35	0.25	0.15	0.05	0.15	Remainder
6063	0.20-0.6	0.35	0.10	0.10	0.45-0.9	0.10	0.10	0.10	0.05	0.15	Remainder
6101(13)	0.30-0.7	0.50	0.10	0.03	0.35-0.8	0.03	0.10	-	0.03(14)	0.10	Remainder
6105	0.6-1.0	0.35	0.10	0.10	0.45-0.8	0.10	0.10	0.10	0.05	0.15	Remainder
6262	0.40-0.8	0.7	0.15-0.4	0.15	0.8-1.2	0.04-0.14	0.25	0.15	0.05(15)	0.15	Remainder
6351	0.7-1.3	0.50	0.10	0.40-0.8	0.40-0.8	-	0.20	0.20	0.05	0.15	Remainder
7005	0.35	0.40	0.10	0.20-0.7	1.0-1.8	0.06-0.2	4.0-5.0	0.01-0.06	0.05(16)	0.15	Remainder
7049	0.25	0.35	1.2-1.9	0.20	2.0-2.9	0.10-0.22	7.2-8.2	0.10	0.05	0.15	Remainder
7050	0.12	0.15	2.0-2.6	0.10	1.9-2.6	0.04	5.7-6.7	0.06	0.05(17)	0.15	Remainder
7075	0.40	0.50	1.2-2.0	0.30	2.1-2.9	0.18-0.28	5.1-6.1	0.20	0.05	0.15	Remainder
7129	0.15	0.30	0.50-0.9	0.10	1.3-2.0	0.10	4.2-5.2	0.05	0.05(18)	0.15	Remainder
7178	0.40	0.50	1.6-2.4	0.30	2.4-3.1	0.18-0.28	6.3-7.3	0.20	0.05	0.15	Remainder

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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.

*See p. 10-111 for all applicable footnotes.

COMPARATIVE CHARACTERISTICS AND APPLICATIONS*

ALLOY & TEMPER	RESISTANCE TO CORROSION		Workability (Cold) (5)	Machinability (5)	Brazeability (6)	WELDABILITY			APPLICATIONS OF ALLOYS
	General (1)	Stress-Corrosion Cracking (2)				Gas	Arc	Resistance Spot and Seam	
2011-T3	D(3)	D	C	A	D	D	D	D	Screw machine products
T4, T451	D(3)	D	B	A	D	D	D	D	
T8	D	B	D	A	D	D	D	D	
2017-T4, T451	D(3)	C	C	B	D	D	B	B	Screw machine products, fittings
2024-0	. .	. .	. .	D	D	D	D	D	Truck wheels, screw machine products, aircraft structures
T4, T3, T351, T3510, T3511	D(3)	C	C	B	D	C	B	B	
T361	D(3)	C	D	B	D	D	C	B	
T6	D	B	C	B	D	D	C	B	
T861, T81, T851, T8510, T8511	D	B	D	B	D	D	C	B	
T72	. .	. .	. .	B	D	D	C	B	
3003-0	A	A	A	E	A	A	A	B	Cooking utensils, chemical equipment, pressure vessels, sheet metal work, builder's hardware, storage tanks
H12	A	A	A	E	A	A	A	A	
H14	A	A	B	D	A	A	A	A	
H16	A	A	C	D	A	A	A	A	
H18	A	A	C	D	A	A	A	A	
H25	A	A	B	D	A	A	A	A	

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COMPARATIVE CHARACTERISTICS

*See p. 10-111 for all applicable footnotes.

COMPARATIVE CHARACTERISTICS AND APPLICATIONS*

ALLOY & TEMPER	RESISTANCE TO CORROSION					WELDABILITY			APPLICATIONS OF ALLOYS
	General (1)	Stress-Corrosion Cracking (2)	Workability (Cold) (5)	Machinability (5)	Brazeability (6)	Gas	Arc	Resistance Spot and Seam	
3105-0	A	A	A	E	A	A	A	B	Residential siding, mobile homes, rain carrying goods, sheet metal work
H12	A	A	B	E	A	A	A	A	
H14	A	A	B	D	A	A	A	A	
H16	A	A	C	D	A	A	A	A	
H18	A	A	C	D	A	A	A	A	
H25	A	A	B	D	A	A	A	A	
5005-0	A	A	A	E	B	A	A	B	Appliances, utensils, architectural, electrical conductor
H12	A	A	A	E	B	A	A	A	
H14	A	A	B	D	B	A	A	A	
H16	A	A	C	D	B	A	A	A	
H18	A	A	C	D	B	A	A	A	
H32	A	A	A	E	B	A	A	A	
H34	A	A	B	D	B	A	A	A	
H36	A	A	C	D	B	A	A	A	
H38	A	A	C	D	B	A	A	A	
5052-0	A	A	A	D	C	A	A	B	Sheet metal work, hydraulic tube, appliances
H32	A	A	B	D	C	A	A	A	
H34	A	A	B	C	C	A	A	A	
H36	A	A	C	C	C	A	A	A	
H38	A	A	C	C	C	A	A	A	

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*See p. 10-111 for all applicable footnotes.

COMPARATIVE CHARACTERISTICS AND APPLICATIONS*

ALLOY & TEMPER	RESISTANCE TO CORROSION		Workability (Cold) (5)	Machinability (5)	Brazeability (6)	WELDABILITY			APPLICATIONS OF ALLOYS
	General (1)	Stress-Corrosion Cracking (2)				Gas	Arc	Resistance Spot and Seam	
5083-0	A(4)	A(4)	B	D	D	C	A	B	Unfired, welded pressure vessels, marine, auto aircraft cryogenics, TV towers, drilling rigs, transportation equipment, missile components
H321, H116	A(4)	A(4)	C	D	D	C	A	A	
H111	A(4)	B(4)	C	D	D	C	A	A	
5086-0	A(4)	A(4)	A	D	D	C	A	B	
H32, H116	A(4)	A(4)	B	D	D	C	A	A	
H34	A(4)	B(4)	B	C	D	C	A	A	
H36	A(4)	B(4)	C	C	D	C	A	A	
H38	A(4)	B(4)	C	C	D	C	A	A	
H111	A(4)	A(4)	B	D	D	C	A	A	
6061-0	B	A	A	D	A	A	A	B	Heavy-duty structures requiring good corrosion resistance, truck and marine, railroad cars, furniture, pipelines
T4, T451, T4510, T4511	B	B	B	C	A	A	A	A	
T6, T651, T652, T6510, T6511	B	A	C	C	A	A	A	A	
6061-T6, T63	A	A	C	C	A	A	A	A	High strength bus conductors
T61, T64	A	A	B	D	A	A	A	A	

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COMPARATIVE CHARACTERISTICS

*See p. 10-111 for all applicable footnotes.

COMPARATIVE CHARACTERISTICS AND APPLICATIONS*

ALLOY & TEMPER	RESISTANCE TO CORROSION		Workability (Cold) (5)	Machinability (5)	Brazeability (6)	WELDABILITY			APPLICATIONS OF ALLOYS
	General (1)	Stress-Corrosion Cracking (2)				Gas	Arc	Resistance Spot and Seam	
6063-T1	A	A	B	D	A	A	A	A	Pipe railing, furniture, architectural extrusions
T4	A	A	B	D	A	A	A	A	
T5, T52	A	A	B	C	A	A	A	A	
T6	A	A	C	C	A	A	A	A	
T83, T831, T832	A	A	C	C	A	A	A	A	
6061-T6, T63	A	A	C	C	A	A	A	A	High strength bus conductors
T61, T64	A	A	B	D	A	A	A	A	
6262-T6, T651, T6510, T6511	B	A	C	B	B	B	B	A	Screw machine products
T9	B	A	D	B	B	B	B	A	
7075-0	. .	. .	. .	D	D	D	D	B	Aircraft and other structures
T6, T651, T652, T6510, T6511	C(3)	C	D	B	D	D	D	B	
T73, T7351	C	B	D	B	D	D	D	B	

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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.

*See p. 10-118 for all applicable footnotes.

ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
1100	Sheet and plate	B209	. .	. .	QQ-A-250/1	SB209
		B209			4001	SB209
			. .	. .	4003	
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	. .	. .	QQ-A-225/5	. .
		B211	. .	. .	4118	. .
	Rivet wire and rod	B316	. .	QQ-A-430	. .	. .
2024	Sheet and plate	B209	. .	. .	4037	. .
		B209	. .	. .	QQ-A-250/4	
		. .	. .	. .	4035	. .
		. .	. .	. .	4297	. .
		. .	. .	. .	4193	. .
	Wire, rod, and bar; rolled or cold finished	B211	. .	. .	4339	SB211
		B211	. .	. .	QQ-A-225/6	SB211
		. .	. .	. .	4120	. .
	Wire, rod, bar, shapes, and tube; extruded	B221	. .	. .	4152	SB221
		. .	. .	. .	4164	. .
		B221	. .	. .	QQ-A-200/3	SB221
	Tube; extruded, seamless	B241		. .	4165	. .
	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	. .

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*See p. 10-118 for all applicable footnotes.

ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
3003	Sheet and plate	B209	. .	. .	QQ-A-250/2	SB209
		B209	. .	. .	4006	SB209
		. .	. .	. .	4008	. .
	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	SB21O
		. .	. .	. .	4067	. .
	Tube; condenser	B234	. .	. .	. .	SB234
	Tube; condenser with integral fins	B404	. .	. .	. .	. .
	Tube; welded	B313	. .	. .	. .	. .
		B547	. .	. .	. .	. .
	Pipe	B241	MIL-P-25995	. .	. .	SB241
	Pipe; gas and oil transmission	B345	. .	. .	. .	. .
	Rivet wire and rod	B316	. .	QQ-A-430	. .	. .
	Forgings and forging stock	B247	. .	. .	. .	SB247
	Foil	. .	. .	. .	4010	. .
5052	Sheet and plate	B209	. .	. .	4015	SB209
		. .	. .	. .	4016	. .
		. .	. .	. .	4017	. .
		B209	. .	. .	QQ-A-250/8	SB209
		B211	. .	. .	4114	. .
		. .	. .	. .	QQ-A-225/7	. .

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ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
5052	Wire, rod and bar, rolled or cold finished	B211	. .	. .	QQ-A-250/8	. .
		. .	. .	. .	4114	. .
	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	SB209
		. .	. .	. .	QQ-A-250/6	. .
		. .	. .	. .	. .	. .
		. .	. .	. .	. .	. .
	Wire, rod, bar, shapes, and tube; extruded	B221	. .	. .	QQ-A-200/4	SB221
	Tube; extruded, seamless	B241	. .	. .	. .	SB241
	Tube, drawn, seamless	B210	. .	. .	. .	. .
	Tube; welded	B547	. .	. .	. .	. .
	Forgings and forging stock	B247	. .	. .	. .	SB247
	Pipe; gas and oil transmission	B345	. .	. .	. .	. .
	Armor plate	. .	MIL-A-46027	. .	. .	. .
	Extruded armor	. .	MIL-A-46083	. .	. .	. .
	Forged armor	. .	MIL-A-45225	. .	. .	. .

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*See p.10-118 for all applicable footnotes.

ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

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 and oil transmission	B345	. .	. .	. .	. .
6061	Sheet and plate	B209	. .	. .	QQ-A-250/11	SB209
		B209	. .	. .	4025	SB209
		. .	. .	. .	4026	. .
		. .	. .	. .	4027	. .
	Tread	B632	. .	. .	. .	. .
	Wire, rod, and bar; rolled or cold finished	B211	. .	. .	QQ-A-225/8	SB211
		B211	. .	. .	4115	SB211
		. .	. .	. .	4116	. .
		. .	. .	. .	4117	. .
		. .	. .	. .	4128	. .
	Wire, rod, bar, shapes, and tube; extruded	B221	. .	. .	QQ-A-200/8	SB221
		B221	. .	. .	4150	SB221
		. .	. .	. .	4060	. .
		. .	. .	. .	4061	. .
		. .	. .	. .	4172	. .
		. .	. .	. .	4173	. .
	Structural	B308	. .	. .	QQ-A-200/16	SB308
		B308	. .	. .	4113	SB308
	Tube; drawn	B483	. .	. .	. .	. .
	Tube; extruded, seamless	B241	. .	. .	. .	SB241

Continued on next page ▼

ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
6061	Tube; drawn, seamless	B210	. .	WW-T-700/6	4079	SB210
		. .	. .	. .	4080	. .
		. .	. .	. .	4082	. .
	Tube; hydraulic	. .	. .	. .	4081	. .
		. .	. .	. .	4083	. .
	Tube; condenser	B234	. .	. .	. .	SB234
	Tube; condenser with integral fins	B404	. .	. .	. .	. .
	Tube; welded	B313	. .	. .	. .	. .
	Pipe	B241	MIL-P-25995	. .	. .	SB241
	Pipe; gas and oil transmission	B345	. .	. .	. .	. .
	Forgings and forging stock	B247	MIL-A-22771	. .	4127	SB247
		. .	. .	. .	4146	. .
		. .	. .	. .	4248	. .
	Rings; forged or rolled	. .	. .	. .	4312	. .
	Rivet wire and rod	B316	. .	QQ-A-430	. .	
	Impacts	B221	. .	. .	. .	. .
	Structural pipe and tube; extruded	B429	. .	. .	. .	. .
	Foil	. .	. .	. .	4009	. .
6063	Wire, rod, bar, shapes and tube; extruded	B221	. .	. .	QQ-A-200/9	SB221
		B221	. .	. .	4156	SB221
	Tube; extruded, seamless	B241	. .	. .	. .	SB241
	Tube; extruded, coiled	B491	. .	. .	. .	. .
	Tube; drawn	B483	. .	. .	. .	. .
	Tube; drawn, seamless	B210	. .	. .	. .	. .

Continued on next page ▼

*See p. 10-118 for all applicable footnotes.

ALUMINUM MILL PRODUCT SPECIFICATIONS* (1)(2)(3)

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
6063	Pipe	B241	MIL-P-25995	. .	. .	SB241
	Pipe; gas and oil transmission	B345	. .	. .	. .	. .
	Structural pipe and tube; extruded	B429	. .	. .	. .	. .
7075	Sheet and plate	B209	. .	. .	QQ-A-250/12	. .
		. .	. .	QQ-A-250/24	4044	. .
		. .	. .	. .	4045	. .
		. .	. .	. .	4078	. .
	Wire, rod, and bar; rolled or cold finished	B211	. .	. .	QQ-A-225/9	. .
		B211	. .	. .	4122	. .
		. .	. .	. .	4123	. .
		. .	. .	. .	4124	. .
		. .	. .	. .	4186	. .
		. .	. .	. .	4187	. .
	Wire, rod, bar, shapes, and tube; extruded	B221	. .	. .	QQ-A-200/11	. .
		B211	. .	. .	4154	. .
		. .	. .	QQ-A-200/15	4166	. .
		. .	. .	. .	4167	. .
		. .	. .	. .	4168	. .
		. .	. .	. .	4169	. .
		. .	. .	. .	. .	. .
	Tube; extruded, seamless	B241	. .	. .	. .	. .
	Tube; drawn, seamless	B210	. .	WW-T-700/7	. .	. .
	Forgings and forging stock	B247	MIL-A-22771	. .	. .	. .
		. .	. .	. .	4141	. .
		. .	. .	. .	4126	. .
		. .	. .	. .	4131	. .
		. .	. .	. .	. .	. .

Continued on next page ▼

ALLOY	PRODUCT	SPECIFICATIONS				
		ASTM	Military	Federal	AMS	ASME
7075		. .	. .	. .	4147	. .
	Hand forgings	B247	. .	. .	4323	. .
	Rings, forged or rolled	B247	. .	. .	4311	. .
		. .	. .	. .	4310	. .
	Impacts	B247	. .	. .	. .	. .
	Rivet wire	B316	. .	QQ-A-430	. .	. .

(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 number, and no attempt is made to reflect the latest revision or amendment to any particular document. The appropriate specification index published by the specification 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) Copies of specifications can be obtained from:

ASTM
1916 Race Street
Philadelphia, PA 19103-1187

(AWS)
American Welding Society
550 NW LeJeune Road
Miami, FL 33126

(ASME)
American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017

(Military and Federal)
Standardization Documents
Order Desk
Building 4D
700 Robbins Avenue
Philadelphia, PA 19111-5094

(Aerospace Materials Specifications [AMS])
Society of Automotive Engineers, Inc.
400 Commonwealth Drive
Warrendale, PA 15096-0001

GUIDE TO SPECIAL SERVICES AND PROCESSING ALUMINUM PRODUCTS

- **Precision Aluminum Plate Sawing:** Alro has the ability to precision saw cut aluminum plate up to 6" in thickness. Tolerances can be held to a critical plus or minus .005" if required.

- **Plasma Burning:** Alro is capable of plasma burning aluminum plate up to 3" in thickness. Use this service to create circles, rings, or special shapes to save on machining costs.

- **Shearing:** Look to Alro to shear your aluminum sheet and plate products. Save your company time and money when shearing to blank size pieces is required.

- **Forming:** When press brake forming of aluminum sheet and plate is required, look to Alro to provide your needs accurately and on time.

- **Production Cutting:** We are ready to serve your cut to length needs. From 1 to 1000 pieces of rounds, squares, rectangles, pipe, tube or special shape extrusions, Alro has the equipment to do the job.

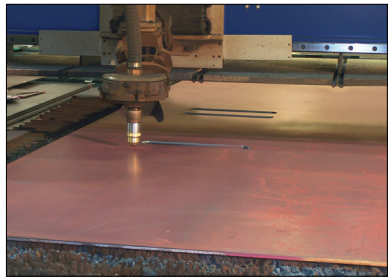
- **Custom Shape Extrusions:** Custom shape extrusions are an easy way to save on the costly forming and machining of many aluminum parts. With tooling costs that are easily justified, and with the potential to minimize scrap and waste, our extrusion sources are looking for ways to save you time and material costs.

- **Mitre Cutting**

- **Grinding**

Plasma Cutting

Alro's Plasma Cutting System provides tighter tolerances, minimizes machining on finished parts and provides greater part accuracy.



O2 Plasma means a smaller, heat affected zone and reduced edge cracking when forming.

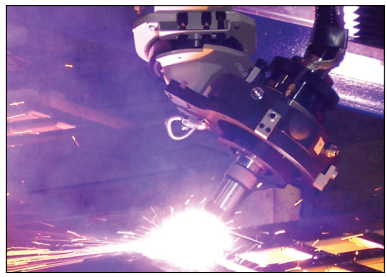
PC-based control technology increases control in shape cutting.

Our cutting system can burn materials at up to 300" per minute on a 16' x 50' bed. The result is large volume projects completed with virtually no downtime. Advantages include:

- High quality edge cuts
- Higher precision than conventional plasma
- Minimal clean up
- Smaller kerf than conventional plasma
- Small heat affected zone
- Low cost per foot of cut

Bevel Cutting

- Capable of cutting 2" thick carbon plate with less than 1 degree bevel
- Ability to adjust for bevel greater than 1 degree
- Can cut "K" bevels in 3/8" plate and up to 52 degree bevel in 2" plate
- HPR 400 Plasma torch (400 amp)
- 5 Axis bevel head
- Machining center with 2" hole capacity in 2" plate.



"V" Bevels

"Y" Bevels

"Circular" Bevels

"K" Bevels (without Land)

"K" Bevels (with Land)

To request a burning quote for your existing CAD drawing please send it along in an email, to:
burnprints@alro.com

Waterjet Processing

Advantages:

- **No heat affected zones**
- **No mechanical stress**
- **More accurate cutting in all materials**
- **Produces a near net finished part**
- **Thicker cutting with minimal distortion**
- **Reduces or eliminates secondary machining operations**
- **Tighter nesting for optimal material utilization**

Equipment	Capacity	Tolerance	Min Hole Size	Max Plate Capacity	Carbon	Alloy	Tool Steel	Aluminum	Red Metals	Stainless	Plastics
Waterjet	11 ga - 8" thick	Up to 3" +/- .005" >3" to 6" +/- .010" >6" to 8" +/- .031"	< 1/2" = .125" 1/2" to 1" = .250" >1" to 2" = .500" >2" to 3" = .750" >3" = 1.00"	120" x 240"	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Tube Laser Processing

Alro's 6-Axis Tube Lasers offer a One Step Solution to Eliminating Costly Processes

- Ability to miter cut, tap, notch, pipe joints, slot holes, tabs, etching and more
- Reduces the need for sawing, fixturing, milling, drilling, punching, bending & welding
- Dramatically reduce assembly time
- High quality cut and parts repeatability

Equipment	Capability	Grades	Bevel
Tube Laser	Round Tube 1/2" Min - 16" Max	Carbon 3/4" Wall Max	Carbon Steel 45 Degree Max
	Square Tube 1/2" Min - 10" Max	Stainless Steel 3/8" Wall Max	Stainless Steel 20 Degree Max
	Rectangular Tube 10" x 8" Max	Aluminum 1/4" Wall Max	Aluminum 0 Degree
	I-Beam/WF Beam Channel/Angle 7/8" (min) - 6" (max)		

CAD Prints

Alro has a fully integrated CAD Department to handle most file types:

Preferred:		dxf	dwg	iges			
Also Accepted:	asm X_B ipt	prt X_T dgn	dft prt asm	par sat prt	psm model sldasm	pwd iam sldprt	step stp stl

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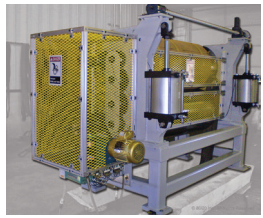

Machine Guard

Workstation

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