

Extruded Aluminum Alloy 6063



Alloy 6063, one of the most popular alloys in the 6000 series, provides good extrudability and a high quality surface finish. Alex Aluminum Extrusions produces 6063 for use in standard architectural shapes, custom solid shapes and heatsinks, as well as seamless and structural tube and pipe. This alloy is often used for electrical applications in the -T5, -T52 and -T6 conditions due to its good electrical conductivity.

In the heat-treated condition, alloy 6063 provides good resistance to general corrosion, including resistance to stress corrosion cracking. It is easily welded or brazed by various commercial methods (caution: direct contact by dissimilar metals can cause galvanic corrosion). Since 6063 is a heat-treatable alloy, strength in its -T6 condition can be reduced in the weld region. Selection of an appropriate filler alloy will depend on the desired weld characteristics. Consult the Material Safety Data Sheet (MSDS) for proper safety and handling precautions when using alloy 6063.

Alloy 6063 offers excellent response for anodizing in its -T5, -T52, -T6 tempers.

Since 6063 is the alloy of choice for aesthetic applications, special packaging may be required to protect critical exposed surfaces. Alloy 6063 is not typically ink-stenciled in order to preserve its surface finish quality. If stenciling and/or special packaging is required, it should be specified at the time of quotation.

Apex Aluminum Extrusions offers alloy 6063 in a variety of standard tempers, as well as special tempers developed for unique applications.

COMMON USES FOR ALLOY 6063

- Architectural & building products
- Electrical components & conduit
- Pipe & tube for irrigation systems
- Door & window frames
- Railings & furniture

6063 TEMPER DESIGNATIONS & DEFINITIONS

Standard Tempers	Standard Temper Definitions*
F	As fabricated. There is no special control over thermal conditions and there are no mechanical property limits.
T1	Cooled from an elevated temperature shaping process and naturally aged. ^A
T4	Solution heat-treated and naturally aged. ^{B,C}
T5, T52	Cooled from an elevated temperature shaping process and artificially aged. ^A
T6	Solution heat-treated and artificially aged. ^{B,C}

* For further details of definitions, see Aluminum Association's Aluminum Standards and Data manual and Tempers for Aluminum and Aluminum Alloy Products.

^A Applies to products that are not cold worked after cooling from an elevated temperature shaping process, or in which the effect of cold work in flattening or straightening may not be recognized in mechanical properties.

^B Applies to products that are not cold worked after solution heat-treatment, or in which the effect of cold work in flattening or straightening may not be recognized in mechanical properties.

^C The specified temper will not conform to military, Federal, ASTM, ASME and AMS specifications.

CHEMICAL COMPOSITION

Melting Temperature Range: 1140 -1210°F | Density 0.097 lb./in³

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Other	
									Each	Total
6063	0.20 - 0.60	0.35	0.10	0.10	0.45 - 0.90	0.10	0.10	0.10	0.05	0.15

Remainder is aluminum

Chemical composition in weight percent maximum unless shown as a range or minimum.

Average Coefficient of Thermal Expansion (68° to 212°F) = 13.1 x 10⁻⁶ (in./in.°F)

6063 EXTRUDED MECHANICAL & PHYSICAL PROPERTY LIMITS¹







Standard Tempers	Wall Thickness ² Inches (min.)	Tensile Strength (ksi)		Elongation ³ % (min.)	Typical Electrical Conductivity, @68°F, % IACS	Typical Thermal Conductivity, @77°F, BTU-in./ft.2 hr.°F (W/m-K@25°C)
		Ultimate (min.)	Yield - 0.2% offset (min.)			
-T1	Up thru 0.500	17.0	9.0	12	50	1340 (193)
	0.501 - 1.000	16.0	8.0	12	50	1340 (193)
-T4	Up thru 0.500	19.0	10.0	14	50	1340 (193)
	0.501 - 1.000	18.0	9.0	14	50	1340 (193)
-T5	Up thru 0.500	22.0	16.0	8	55	1450 (209)
	0.501 - 1.000	21.0	15.0	8	55	1450 (209)
-T52	Up thru 1.000	22.0 - 30.0	16.0 - 25.0	8	55	1450 (209)
-T6	Up thru 0.124	30.0	25.0	8	53	1390 (201)
	0.125 - 1.000	30.0	25.0	10	53	1390 (201)

1. Minimum property levels unless shown as a range or indicated as a maximum (max.)

2. The thickness of the cross section from which the tension test specimen is taken determines the applicable mechanical properties.

3. For materials of such dimensions that a standard test specimen cannot be taken, or for shapes thinner than .062", the test for elongation is not required. Elongation percent is minimum in 2" or 4 times specimen diameter

COMPARATIVE CHARACTERISTICS OF RELATED ALLOYS/TEMPERS¹

LEGEND	
	Formability
	Machinability
	General Corrosion Resistance
	Weldability
	Brazability
	Anodizing Response

