

# Aluminum 6061 Fact Sheet

Do you need custom fasteners created with 6061 Aluminum? Since our inception, Elgin Fastener Group has met every challenge of providing quality, timely, cost-effective solutions for specialty fastener applications. Every product is built to your specifications, using your prints if necessary.

Below are the aluminum material properties and technical specifications of the 6061 Aluminum Bar Stock we have available to meet your needs.

## Aluminum 6061-0

**Subcategory:** 6000 Series Aluminum Alloy; Aluminum Alloy; Metal; Nonferrous Metal

**Close Analogs:** None

**Composition Notes:**

Aluminum content reported is calculated as remainder.

Composition information provided by the Aluminum Association and is not for design.

**Key Words:** al6061, UNS A96061; ISO AlMg1SiCu; Aluminium 6061-0, AD-33 (Russia); AA6061-0

Component	Wt. %
Al	95.8 - 98.6
Cr	0.04 - 0.35
Cu	0.15 - 0.4
Fe	Max 0.7
Mg	0.8 - 1.2
Mn	Max 0.15
Other, each	Max 0.05
Other, total	Max 0.15
Si	0.4 - 0.8
Ti	Max 0.15
Zn	Max 0.25

**Material Notes:**

Aluminum composition calculated as remainder. Information provided by Alcoa and the references. General 6061 characteristics and uses: Excellent joining characteristics, good acceptance of applied coatings.

Combines relatively high strength, good workability, and high resistance to corrosion; widely available. The T8 and T9 tempers offer better chipping characteristics over the T6 temper.

**Uses:** Aircraft fittings, camera lens mounts, couplings, marines fittings and hardware, electrical fittings and connectors, decorative or misc. hardware, hinge pins, magneto parts, brake pistons, hydraulic pistons, appliance fittings, valves and valve parts.

Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.

Physical Properties	Metric	English	Comments
Density	2.7 g/cc	0.0975 lb/in <sup>3</sup>	AA; Typical
<b>Mechanical Properties</b>			
Hardness, Brinell	30	30	AA; Typical; 500 g load; 10 mm ball
Ultimate Tensile Strength	124 MPa	18000 psi	AA; Typical
Tensile Yield Strength	55.2 MPa	8000 psi	AA; Typical
Elongation at Break	25 %	25 %	AA; Typical; 1/16 in. (1.6 mm) Thickness
Elongation at Break	30 %	30 %	AA; Typical; 1/2 in. (12.7 mm) Diameter
Modulus of Elasticity	68.9 GPa	10000 ksi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile modulus.
Ultimate Bearing Strength	228 MPa	33100 psi	Edge distance/pin diameter = 2.0
Bearing Yield Strength	103 MPa	14900 psi	Edge distance/pin diameter = 2.0
Poisson's Ratio	0.33	0.33	Estimated from trends in similar Al alloys.
Fatigue Strength	62.1 MPa	9000 psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen
Machinability	30 %	30 %	0-100 Scale of Aluminum Alloys
Shear Modulus	26 GPa	3770 ksi	Estimated from similar Al alloys.
Shear Strength	82.7 MPa	12000 psi	AA; Typical
<b>Electrical Properties</b>			
Electrical Resistivity	3.66e-006 ohm-cm	3.66e-006 ohm-cm	AA; Typical at 68°F
<b>Thermal Properties</b>			
CTE, linear 68°F	23.6 μm/m-°C	13.1 μin/in-°F	AA; Typical; Average over 68-212°F range.
CTE, linear 250°C	25.2 μm/m-°C	14 μin/in-°F	Estimated from trends in similar Al alloys. 20-300°C.

Heat Capacity	0.896 J/g- °C	0.214 BTU/lb-°F	
Thermal Conductivity	180 W/m- K	1250 BTU- in/hr-ft <sup>2</sup> -°F	AA; Typical at 77°F
Melting Point	582 - 652 °C	1080 - 1205 °F	AA; Typical range based on typical composition for wrought products 1/4 inch thickness or greater; Eutectic melting can be completely eliminated by homogenization.
Solidus	582 °C	1080 °F	AA; Typical
Liquidus	652 °C	1205 °F	AA; Typical
<b>Processing Properties</b>			
Solution Temperature	529 °C	985 °F	
Aging Temperature	160 °C	320 °F	Rolled or drawn products; hold at temperature for 18 hr
Aging Temperature	177 °C	350 °F	Extrusions or forgings; hold at temperature for 8 hr

**References** are available for this material.