

## 6061 Aluminum Alloy Overview

6061 aluminum alloy stands as a versatile and widely used material within the aluminum alloy family. As part of the 6000 series, this alloy offers a balance of strength, machinability, and corrosion resistance, making it a favored choice across diverse industries.

### Chemical Composition

- Aluminum (Al): 97.9-98.8%
- Silicon (Si): 0.4-0.8%
- Iron (Fe): 0.7% maximum
- Copper (Cu): 0.15-0.4%
- Manganese (Mn): 0.15% maximum
- Magnesium (Mg): 0.8-1.2%
- Chromium (Cr): 0.04-0.35%
- Zinc (Zn): 0.25% maximum
- Titanium (Ti): 0.15% maximum
- Other Elements: 0.05% each, 0.15% total for other elements

### Physical Properties

- Density: 2.7 g/cm<sup>3</sup> (0.0975 lb/in<sup>3</sup>)
- Melting Point: 585-650°C (1085-1202°F)

### Mechanical Properties

- Tensile Strength: 124-290 MPa (18,000-42,000 psi)
- Yield Strength: 55-240 MPa (8,000-35,000 psi)
- Elongation: 12-25%
- Modulus of Elasticity: 68.9 GPa (10,000 ksi)

### Applications

1. Aerospace Components: Its strength-to-weight ratio makes it suitable for aircraft components.
2. Structural Components: Used in load-bearing structures for its high strength and corrosion resistance.
3. Automotive Parts: Employed in automotive manufacturing for structural and engine components.
4. Marine Hardware: Its corrosion resistance is valuable in marine environments.
5. Electrical Fittings: Used for electrical connectors and fittings due to its electrical conductivity.
6. Sporting Equipment: Utilized in bicycle frames, sports equipment, and outdoor gear.
7. Machined Parts: Its machinability makes it a preferred choice for machined components.

6061 aluminum alloy's versatility and outstanding attributes make it a key material in industries spanning aerospace, automotive, marine, and more. Its balanced composition, combining strength, corrosion resistance, and machinability, positions it as a reliable choice. From precision components to structural

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elements, 6061 aluminum alloy continues to shape innovation and engineering across diverse applications.



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