

5005 Aluminum Alloy: Overview and Applications

Introduction:

5005 aluminum alloy is a versatile and commonly used aluminum-magnesium alloy known for its excellent corrosion resistance, moderate strength, and weldability. Its balanced combination of properties makes it suitable for various applications in different industries.

Chemical Composition:

- Aluminum (Al): 97.0% min
- Magnesium (Mg): 0.50% - 1.10%
- Other trace elements

Physical Properties:

- Density: 2.70 g/cm³
- Melting Point: 655°C (1211°F)
- Thermal Conductivity: 120 W/m·K
- Electrical Conductivity: 34% IACS

Mechanical Properties:

- Tensile Strength: 145 - 185 MPa (21,000 - 27,000 psi)
- Yield Strength: 115 - 160 MPa (16,700 - 23,200 psi)
- Elongation: 1% - 12%
- Modulus of Elasticity: 70.3 GPa (10.2 x 10⁶ psi)

Corrosion Resistance:

5005 aluminum alloy exhibits good resistance to atmospheric corrosion, making it suitable for outdoor and marine applications.

Applications:

- Architectural Applications: 5005 alloy is used in architectural components such as facades, roofs, and siding due to its corrosion resistance and aesthetic appeal.
- Transportation Industry: Used for automotive panels, marine components, and truck/trailer bodies.
- Electronics: Suitable for electronic enclosures and chassis where corrosion resistance is required.
- General Sheet Metal Work: Employed in various sheet metal applications such as panels, cabinets, and signage.
- Utensils and Cookware: 5005 alloy is used in the manufacturing of kitchenware due to its food-safe properties.

Fabrication and Welding:

5005 aluminum alloy is readily formable, weldable, and machinable, making it suitable for various fabrication processes.

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Conclusion:

5005 aluminum alloy's corrosion resistance, moderate strength, and versatility make it a popular choice for a wide range of applications in industries such as architecture, transportation, electronics, and more. Its ability to be formed, welded, and machined contributes to its widespread use in various manufacturing processes.

