

## 5182 Aluminum Alloy: Overview and Applications

### Introduction:

5182 aluminum alloy is a versatile and widely used aluminum-magnesium alloy known for its excellent strength, corrosion resistance, and formability. It is commonly utilized in various industries due to its combination of mechanical properties and surface finish.

### Chemical Composition:

- Aluminum (Al): 95.2% - 96.7%
- Magnesium (Mg): 4.0% - 5.0%
- Manganese (Mn): 0.2% - 0.5%
- Chromium (Cr): 0.1% max
- Iron (Fe): 0.35% max
- Silicon (Si): 0.2% max

### Physical Properties:

- Density: 2.68 g/cm<sup>3</sup>
- Melting Point: 575°C (1067°F)
- Thermal Conductivity: 127 W/m-K
- Electrical Conductivity: 29% IACS

### Mechanical Properties:

- Tensile Strength: 305 - 370 MPa (44,200 - 53,700 psi)
- Yield Strength: 215 - 270 MPa (31,200 - 39,100 psi)
- Elongation: 12% - 18%
- Modulus of Elasticity: 72.4 GPa (10.5 x 10<sup>6</sup> psi)

### Corrosion Resistance:

5182 aluminum alloy offers good corrosion resistance, making it suitable for applications that require exposure to various environments and weather conditions.

### Applications:

1. Automotive Industry: Used in the manufacturing of automotive parts such as auto body panels, doors, hoods, and structural components due to its strength, formability, and corrosion resistance.
2. Packaging Industry: Utilized for manufacturing beverage cans and other packaging materials due to its excellent formability and surface quality.
3. Construction Industry: Used for roofing, siding, and architectural applications where a combination of strength and aesthetics is required.
4. Marine Applications: Suitable for marine components that require corrosion resistance and structural integrity.

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5. General Industrial Use: Utilized in various industrial applications that require a balance of strength and corrosion resistance.

**Fabrication and Welding:**

5182 aluminum alloy is highly formable and can be easily welded, making it suitable for various fabrication processes.

5182 aluminum alloy's combination of strength, formability, and corrosion resistance makes it a versatile material that finds applications in automotive, packaging, construction, and other industries. Its ability to withstand various environments and its ease of fabrication contribute to its popularity as a reliable material for a wide range of applications.

