6082 Aluminum Alloy Overview

6082 aluminum alloy is a versatile and widely used material renowned for its excellent combination of strength, machinability, and corrosion resistance. As a part of the 6000 series, this alloy offers a comprehensive range of properties suitable for various applications across different industries.

Chemical Composition

- Aluminum (Al): 97.4-98.7%
- Silicon (Si): 0.6-1.2%
- Iron (Fe): 0.5% maximum
- Copper (Cu): 0.1% maximum
- Manganese (Mn): 0.4-1.0%
- Magnesium (Mg): 0.6-1.2%
- Chromium (Cr): 0.25% maximum
- Zinc (Zn): 0.2% maximum
- Other Elements: 0.05% each, 0.15% total for other elements

Physical Properties

- Density: 2.71 g/cm³ (0.0978 lb/in³)
- Melting Point: 582-652°C (1080-1206°F)

Mechanical Properties

- Tensile Strength: 270-340 MPa (39,000-49,000 psi)
- Yield Strength: 240-310 MPa (35,000-45,000 psi)
- Elongation: 8-10%
- Modulus of Elasticity: 68.9 GPa (10,000 ksi)

Applications

1. Structural Components: Used in construction for its high strength-to-weight ratio and corrosion resistance.
2. Transportation Industry: Utilized in automotive and marine industries due to its durability and resistance to harsh environments.
3. Machined Parts: Its machinability makes it suitable for producing intricate components.
4. Aerospace Applications: Employed in aircraft structures due to its lightweight and sturdy nature.
5. Welded Structures: Used for welding due to its good weldability.
6. Sports Equipment: Utilized in the manufacturing of sporting goods and equipment.

6082 aluminum alloy's exceptional properties have positioned it as a valuable material across a range of industries. Its strength, corrosion resistance, machinability, and weldability make it a preferred choice for applications requiring durability and reliability. From construction to aerospace, 6082 aluminum alloy

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continues to play a crucial role in driving innovation and progress in engineering and manufacturing.

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