

3003 Aluminum Alloy Overview:

The 3003 aluminum alloy stands as a versatile and widely used material in various applications due to its balanced properties of strength, formability, and corrosion resistance. This alloy is part of the 3000 series of aluminum alloys, which are non-heat-treatable alloys. It finds extensive use in industries like packaging, construction, and transportation due to its excellent workability and ability to withstand various environmental conditions.

Chemical Composition:

- Aluminum (Al): 98.6-99.5%
- Copper (Cu): 0.05-0.20%
- Manganese (Mn): 1.0-1.5%
- Other elements: $\leq 0.10\%$ each, $\leq 0.15\%$ total

Physical Properties:

- Density: 2.73 g/cm³ (0.098 lb/in³)
- Melting Point: 655°C (1211°F)

Mechanical Properties:

- Tensile Strength: 110-205 MPa (16,000-30,000 psi)
- Yield Strength: 50-155 MPa (7,300-22,500 psi)
- Elongation: 20-30%
- Modulus of Elasticity: 68.9 GPa (10,000 ksi)

Applications:

1. Food and Beverage Packaging: Used for making beverage cans, containers, and foil due to its corrosion resistance.
2. Heat Exchangers: Its formability makes it suitable for heat exchanger fins.
3. Roofing and Cladding: Used in roofing and siding applications due to its corrosion resistance and durability.
4. Cooking Utensils: Its non-reactive nature makes it suitable for making cooking utensils.
5. Chemical Equipment: Used for storage tanks and chemical equipment due to its resistance to many chemicals.

The 3003 aluminum alloy's balance of properties positions it as a reliable choice for a diverse range of applications. Its combination of formability, corrosion resistance, and moderate strength makes it a valuable material across various industries.

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