

What is 5083 H116 Aluminum Plate

5083-H116 is a non-heat-treatable aluminum-magnesium alloy (5xxx series) containing approximately 4.0–4.9% magnesium and 0.4–1.0% manganese. This composition provides high strength, excellent corrosion resistance, and superior performance in marine and harsh environments. The H116 temper indicates strain hardening and specific corrosion resistance treatment, ensuring stable tensile strength and durability under seawater exposure.

Overview of 5083 H116 Aluminum Plate

As a leading aluminum plate manufacturer in China, GNEE supplies **5083-H116 aluminum plates** certified by major classification societies (CCS, BV, DNV, etc.). With excellent corrosion resistance, weldability, and moderate strength, these plates are widely used in **shipbuilding, pressure vessels, LNG storage tanks, and transportation equipment**.

We offer **customized sizes** with thicknesses ranging from **0.15 mm to 600 mm** and widths up to **2.5 meters**, ensuring fast delivery and compliance with **international quality standards** to support lightweight marine structures and efficient industrial production.

Chemical Composition of 5083 H116 Aluminum Alloy

Element	Content (wt%)
Magnesium (Mg)	4.0–4.9
Manganese (Mn)	0.4–1.0
Chromium (Cr)	0.05–0.25
Silicon (Si)	≤ 0.4
Iron (Fe)	≤ 0.4
Zinc (Zn)	≤ 0.25
Titanium (Ti)	≤ 0.15
Others (each)	≤ 0.05
Others (total)	≤ 0.15
Aluminum (Al)	Balance

This optimized alloy balance ensures both **high strength and corrosion resistance**, ideal for long-term use in marine environments.

Temper and Delivery Condition

In the **H116 temper**, 5083 aluminum plate undergoes **strain hardening and corrosion-resistance testing**. The alloy is specifically evaluated for **intergranular and exfoliation corrosion**, guaranteeing consistent mechanical performance at temperatures up to **66°C (150°F)**.

Unlike heat-treatable alloys, H116 temper is achieved through **mechanical work hardening and controlled low-temperature processing**, not through solution heat treatment.

Mechanical Properties of 5083 H116 Aluminum Plate

Property	Typical Value
Yield Strength (0.2% offset)	≥ 215 MPa
Ultimate Tensile Strength	≈ 305 MPa
Elongation (50 mm gauge)	≥ 10%
Brinell Hardness	≈ 85 HBW

These values represent the **highest strength among non-heat-treatable aluminum alloys**, combining **durability and formability**—ideal for heavy-duty structural applications.

Physical Properties

Property	Value
Density	≈ 2.66 g/cm ³
Melting Range	570 – 645°C
Thermal Expansion Coefficient	24.2 μm/m·K (20–100°C)
Elastic Modulus	≈ 70 GPa
Electrical Conductivity	≈ 29% IACS

These characteristics give 5083-H116 **excellent dimensional stability** under temperature changes and **efficient heat dissipation**, making it suitable for precision and load-bearing components.

Advantages of GNEE 5083 H116 Aluminum Plate

Advantage	Description
Outstanding Corrosion Resistance	5083 H116 forms a dense oxide film in marine and saline environments, protecting against chloride ion corrosion. Anodizing further enhances hardness and appearance, making it ideal for hulls, decks, and marine platforms exposed to seawater.
Superior Weldability	Compatible with TIG and MIG welding processes, 5083 H116 maintains excellent strength and ductility in the heat-affected zone . Weld joints exhibit high integrity and resistance to cracking, ensuring long-term reliability in marine structures .
Excellent Formability	The alloy shows great plasticity during bending, rolling, stamping, and stretching , enabling the manufacture of large, complex, and high-precision ship components with minimal risk of cracking.
Exceptional Low-Temperature Performance	Even in extremely cold environments, 5083 H116 retains high toughness and ductility, preventing brittle failure. This makes it a preferred material for LNG tanks, cryogenic vessels, refrigerated ships, and polar equipment .

Applications of 5083 H116 Aluminum Plate

Shipbuilding: Hulls, decks, superstructures, bulkheads, and engine bases

Marine Engineering: Offshore platforms, gangways, and underwater pipelines

Transportation: Tanker trucks, rail cars, and lightweight vehicle structures

Cryogenic Equipment: LNG storage tanks and refrigerated containers

Pressure Vessels: For storing gases and liquids under extreme conditions

Conclusion

With its outstanding combination of **strength, corrosion resistance, and weldability**, the **GNEE 5083 H116 aluminum plate** is an ideal solution for demanding marine, transportation, and cryogenic applications. Its proven performance under harsh environments and compliance with international certifications make it one of the most trusted materials for modern shipbuilding and industrial engineering.