

# 5083 Plate Specification Datasheet

5083 is an aluminum alloy with magnesium and traces of manganese and chromium. It is known for exceptional performance in extreme environments. Aluminum 5083 is highly resistant to attack by both seawater and industrial chemical environments. It has the highest strength of the non-heat treatable alloys with an Ultimate Tensile Strength of 317 MPa and a Tensile Yield Strength of 228 MPa. It is not recommended for use in temperatures in excess of 65 °C. Alloy 5083 is best known as a plate for ship building. The alloy is also produced as extruded seamless tube and other extrusions and as forgings.

## 5083 Aluminum Plate - Technical Specification

Aluminum 5083 is a high-strength, non-heat-treatable aluminum-magnesium-manganese alloy known for its **excellent corrosion resistance**, particularly in **marine and chemical environments**. It maintains good strength after welding and performs well in **low-temperature (cryogenic) applications**.

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### Available Sizes

Parameter	Range
Thickness	3 mm - 100 mm
Width	1000 mm - 2500 mm
Length	2000 mm - 6000 mm (customizable)
Form	Sheet / Plate / Cut-to-size Blank

## 5083 Chemical Composition (% Max)

Element	Content (%)
Aluminum (Al)	Balance
Magnesium (Mg)	4.0 - 4.9
Manganese (Mn)	0.4 - 1.0
Chromium (Cr)	0.05 - 0.25
Iron (Fe)	≤ 0.40
Silicon (Si)	≤ 0.40
Copper (Cu)	≤ 0.10
Zinc (Zn)	≤ 0.25
Titanium (Ti)	≤ 0.15

## Mechanical Properties (Typical)

Temper	Thickness	Ultimate Strength Rm/MPa	Yield Strength Rp0.2/MPa	Elongation Min. %	Bend Radius (90°)
<b>O H111</b>	≥ 6.0~12.5mm	270~345	≥ 115	≥ 16%	2.5t
	≥ 12.5~50mm	270~345	≥ 115	≥ 15%	-
	≥ 50~80mm	270~345	≥ 115	≥ 14%	-
	≥ 80~120mm	≥ 260	≥ 110	≥ 12%	-
	≥ 120~150mm	≥ 255	≥ 105	≥ 12%	-
<b>H112</b>	≥ 6.0~12.5mm	≥ 275	≥ 125	≥ 12%	-
	≥ 12.5~40mm	≥ 275	≥ 125	≥ 10%	-
	≥ 40~80mm	≥ 270	≥ 115	≥ 10%	-
	≥ 80~120mm	≥ 260	≥ 110	≥ 10%	-
<b>H116 H321</b>	≥ 6.0~12.5mm	≥ 305	≥ 215	≥ 12%	4.0t
	≥ 12.5~40mm	≥ 305	≥ 215	≥ 10%	-
	≥ 40~80mm	≥ 285	≥ 200	≥ 10%	-

*H116 and H321 are recommended for marine applications due to enhanced corrosion resistance.*

## Physical Properties

Property	Value
Modulus of Elasticity	70 GPa
Coefficient of Expansion	25.8 $\mu\text{m}/\text{m} \cdot ^\circ\text{C}$
Thermal Conductivity	$\sim 121 \text{ W}/\text{m} \cdot \text{K}$
Electrical Conductivity	28% IACS
Melting Range	570 - 640 $^\circ\text{C}$

## Features of 5083 Plate

- Excellent **saltwater and chemical corrosion resistance**
- Superior **weldability** (no cracking, high post-weld strength)
- Maintains **mechanical strength at cryogenic temperatures**
- Good **workability** for bending, forming, and rolling
- Non-heat-treatable alloy; strength improved by cold working

## Applications of 5083 Plate

- **Shipbuilding:** Hulls, bulkheads, decks, superstructures
- **Cryogenic equipment:** LNG tanks and piping
- **Structural components:** Bridges, storage tanks, frames
- **Chemical & pressure vessels**

## Standards & Certifications

- ASTM B209, ASTM B928 (marine)
- EN 573-3, EN 485-2
- DNV, ABS, LR, RINA, BV **3.2 marine certifications** (on request)
- EN 10204 **3.1 / 3.2** Mill Test Certificates

