

MARINE-GRADE ALUMINUM COMPARISON

5083-H116 vs. 5086 vs. 5052-H36

Selecting the right alloy is the most critical decision in aluminum boat construction. While many manufacturers utilize 5052-H36 for its cost-effectiveness, professional-grade vessels demand superior materials. We exclusively utilize **5083-H116**—a premium, high-strength alloy engineered for the most demanding saltwater environments.

Technical Specifications Overview

Feature	5052-H36 (Recreational)	5086 (Mid-Grade)	5083-H116 (Premium Class)
Yield Strength	Approx. 240 MPa	Approx. 195 MPa	Approx. 215–230 MPa*
Ultimate Tensile Strength	Approx. 270 MPa	Approx. 290 MPa	Approx. 310 MPa
Corrosion Resistance	Good	Very Good	Excellent (Saltwater Optimized)
Weldability	High	Excellent	Excellent (High Joint Strength)
Relative Material Cost	Lowest	Moderate	Highest
Primary Application	Small lake boats, tanks	Custom offshore, workboats	High-speed hulls, Class vessels

**Note: While 5052-H36 is highly work-hardened, 5083-H116 provides significantly better performance after welding, which is where the structural integrity of a boat matters most.*

Understanding the Hierarchy

5086: The "Mid-Grade" Bridge

5086 is frequently used by custom builders as a step up from 5052. It offers improved strength and corrosion resistance over standard recreational alloys. However, it sits below 5083-H116 in terms of ultimate tensile strength and the specific intergranular corrosion protection provided by the H116 temper.

5083-H116: The Gold Standard

The -H116 temper is specifically engineered to prevent **intergranular corrosion**. This is critical for vessels that remain in saltwater for extended periods, ensuring maximum hull life and minimal structural degradation. Furthermore, 5083 is the standard for "Class Approved" commercial vessels worldwide (Lloyd's Register, BV).

Critical Considerations for Vessel Comparison

- **Total Cost of Ownership:** While 5052 or 5086 vessels may have a lower initial purchase price, the superior corrosion resistance of 5083-H116 typically leads to lower long-term maintenance costs.
- **Operational Environment:** For any coastal or offshore operations, the specific resistance of 5083-H116 is non-negotiable for safety and longevity.
- **Resale Value:** Savvy buyers look for "Class Material" construction, making 5083-built vessels a more liquid and valuable asset over time.

Summary for the Discriminating Buyer

Choosing 5083-H116 is an investment in the highest tier of maritime engineering. It ensures your vessel is built with the strongest, most corrosion-resistant material available in the commercial industry, providing peace of mind and enduring performance.