

# WHY ALUMINUM?

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## Here's why:

Aluminum combines lightweight, high strength, easy workability, and acceptable costs in one package. Steel is less expensive as a raw material, but by the time the extra dollars associated with handling it, forming the plates, etc., are factored-in, much of that advantage disappears. Steel takes longer to weld than aluminum and increases labour costs. It must be sandblasted before priming and painting, another expense; it's high maintenance, which translates to increased operating costs; and it's heavy, so less is left over for the 1001 other things that must go into a first class yacht—things like engines, systems, and fuel. Steel isn't a serious player in this league—leave it for only the largest yachts and commercial boats.

Yacht building in aluminum doesn't involve luck. It's a straightforward process using easily tested, time proven materials and methods. On a weight-for-weight basis, aluminum alloy is stronger than steel. Strength-for-strength, it weighs about half as much and is 10 times more resilient. Collisions that would puncture steel or composite hulls, often just dent aluminum ones. Rather than starting the pumps, the skipper has the yard cut out the dimple and weld-in a new plate the next time its' there for routine maintenance. Nobody takes an unplanned swim, nor does the yacht suffer any downtime.

Aluminum, as defined by SOLAS standards, is non-flammable and non-combustible. Because of this, aluminum yachts can be made to comply with new, stricter IMO commercial boat rules that are nevertheless appropriate for all oceangoing vessels. These rules demand structural fire protection (containment of fire in a particular compartment by the vessel's structure only without the help from firefighting systems) and multiple watertight compartments.

While these new rules are mandatory for high-speed commercial boats in international service only, a yachtsman planning long cruises far from land can see the advantage of a yacht that's sink and fire resistant.

The 5000-series alloy used to build modern aluminum boats and yachts are much more corrosion-resistant, than that used previously, because they contain no copper. In any yacht it is important to insulate every dissimilar metal fitting and fastening from the aluminum with bushings and pads of Delrin or another inert plastic. Preventing direct contact between the metals is the key to defeating corrosion.

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Below the waterline, an array of sacrificial zinc anodes will prevent galvanic corrosion; their service life is predictable, and replacing them becomes a part of regular maintenance. Owners especially concerned about galvanic corrosion can specify an on-board metering system that constantly measures corrosion potential. Checking the meter daily will immediately warn the crew of unusual circumstances underwater. However, most aluminum boats enjoy a corrosion-free life after decades of service, protected only by zinc anodes.

A proper weld in aluminum is at least as strong as the metal it joins, so an aluminum yacht, including frames, stringers, gussets, bulkheads, deck, and all the other zillion pieces, becomes essentially a one-piece structure. Welds comprise only about 3% of the structure. The other 97% is plating, framing etc., that's manufactured at the mill under strict control. Both the American Bureau of Shipping and Lloyd's insist on independent analysis of the alloy to ensure its metal content, test its strength, measure elongation under strain, and so forth.

Aluminum plate doesn't leak, doesn't soak up water, doesn't delaminate, doesn't deform under heat in normal service—it just sits there, depending on the welds to keep it in the shape of a boat. Worried about a weld being less than perfect? They're easy to inspect whenever you want, using ultrasound and X-rays. A.B.D. always spot-checks welds during construction, and ABS and Lloyd's require it. Their surveyor decides where and how much to test. Welding is a skilled craft, and learning to do it right, by laying down a weld that equals or exceeds the strength of the plate, takes time and patience.

In catastrophic mishaps, a welded aluminum hull's ruggedness can pluck your yacht from the Total Loss category, since it's easy to repair or modify an existing aluminum yacht. When you modify or repair a composite yacht, you depend on the adhesions between the new and old laminates to keep body and soul together. It's easy to make the changes look good, but will the glue hold? With Aluminum, you inspect the welds—if the welds are good, the new structure is 100% as strong as the old. No guesswork. Ditto for surveying an aluminum yacht before purchase. The Surveyor can check everything visually, hire a lab to spot-check welds and even audiogauge plate thickness, although Aluminum plate, unlike rust-prone steel, rarely loses enough gauge to worry about. Again there's no guesswork, no "We think..." or "We hope..."

Except for cosmetic purposes, 5000 series alloys don't even have to be painted above the Waterline. The unpainted metal reacts with air to form aluminum oxide, a hard, protective and, unfortunately, dull-grey coating that protects the underlying metal. Commercial aluminum workboats, whose cosmetic appearance concerns no one, are often left unpainted above the waterline. Yachts are seldom so ill treated. A.B.D. takes advantage of modern paint systems to enclose the yacht in a durable, low-maintenance linear-polyurethane shell.

Most experts endorse a non-copper-based anti-fouling on an aluminum hull, and in any event the yacht's crew should inspect the bottom regularly for damage that exposes bare metal.

A.B.D. builds all of their quality built yachts starting with only an Aluminum hull, whereas many other yacht builders use fiberglass. Aluminum is lighter and more durable than fiberglass, allowing you to operate an A.B.D. Aluminum Yacht that is faster, more fuel efficient, and able to survive longer the rigors of ocean voyages, and stand the test of time.

**FOR MORE INFORMATION, PLEASE CONTACT US.**