

Color, Chemistry, and the Perils of Paint Selection

by Steve D'Antonio

During my 11 years of managing a boatbuilding and refit yard, my crew applied a lot of paint, primarily Awlgrip brand—the industry standard at the time. Invariably, clients wanted the rich dark colors—Super Jet Black, Vivid Red, Aristo Blue, and Jade Mist Green. And as hard as I tried to talk them out of those, I was seldom successful. Other than aesthetics, dark colors have no advantages unless you live in a cold climate and want a boat to warm up. Nat Herreshoff is reputed to have said, “There are only two colors to paint a boat—black or white. And only a fool would paint a boat black.” While those aren’t exactly my sentiments, he had a good point.

The disadvantages of glossy dark colors include an unforgiving tendency to reveal any blemish in the underlying surface, and a warmer cabin that can overwhelm marginal air-conditioning. Increased temperature also potentially encourages leaks. I’ve measured the temperature of dark-colored hulls and light-colored hulls simultaneously and side by side: While white or gray topped out at 90°F (32.2°C), black or dark blue reached 130°F (54.4°C). The heating, nearly always uneven, leads to substantial hull and deck expansion and contraction, which in turn stresses bedded hardware, and in my opinion increases the likelihood of leaks.

Perhaps the greatest concern about a darker color, even on an older GRP boat, is the post-curing phenomenon. When a hull that’s always been gray or white is painted a dark color, increased temperatures prompt the resin to cure more than it had up to that point. This causes contraction and can lead to print-through, a phenomenon wherein the warp and weft of fiberglass fabric, or the core material blocks, within the laminate, become visible on the surface as a checkerboard or weave pattern. It ruins the aesthetics we expect from a high-gloss dark hull. If a builder knows about the dark hull color

beforehand, print-through can be headed off with appropriate materials, process control, and post-curing during a boat’s construction, but dealing with it *after* the fact is almost always costly.

Beyond the actual color choice, I frequently found that owners were confused about the differences between traditional Awlgrip and Awlcraft 2000. When customers are choosing finishes, it’s important that industry professionals explain the importance of color selection as well as the advantages, disadvantages, and differences between Awlgrip and Awlcraft 2000.

A linear polyester urethane, Awlgrip is extremely wear-, abrasion-, weather-, and UV-resistant. It was originally developed for demanding applications in the aviation industry. Depending on the geographical region and weather exposure, I’ve seen light colors last and look great for more than 20 years, and dark colors for 15 years. Exceptional skill and experience are required to properly apply and repair Awlgrip. Its hard outer resin layer increases durability and protects the color’s appearance and shine; however, scratches, drips, and runs are difficult to buff out. Awlgrip repairs often require a fairing compound, sanding, and respraying.

Awlcraft 2000, an acrylic urethane, was developed by Akzo Nobel to be easier to apply by less skilled applicators and in more challenging locations, i.e., outside a dedicated paint shed. It dries rapidly, which reduces the likelihood of dust and insect entrapment. And because of its less dense molecular structure, it is softer and has a lower melting point; thus, the coating can be made to flow when buffed, making repairs easier than with traditional Awlgrip.

Polyester molecules (Awlgrip) are much smaller than acrylic molecules (Awlcraft), which means that for a given volume, the polyester coating is denser, more resistant to abrasion and chemicals, and has better color retention.

Awlgrip can be brushed; Awlcraft 2000 cannot.

Both paints stratify, leaving a resin-rich layer on top, with a pigment-rich layer beneath, which is one reason they last. Any buffing or repair that reduces the resin-film thickness will compromise longevity and durability, as well as potentially affect the warranty.

To repair a scratch in Awlgrip, buffing, sanding, or “cutting” must go deeper, to penetrate the pigment layer. The resin layer is thicker and less able to flow or melt, preventing it from filling the scratch or damage. Initially, an Awlgrip repair may look shiny; however, if it has exposed the pigment, which no longer has the protection of a clear coating, it will eventually dull. This peculiarity of Awlgrip makes the edges of a painted repair more obvious when compared to a similar repair in Awlcraft. When buffed, Awlcraft’s thinner, less dense, less cross-linked, softer surface-resin layer can melt and flow without exposing the pigment. Also, touch-up blending is easier.

A common problem is that many yards use the term *Awlgrip* when in fact they are referring to Awlcraft 2000. These coatings are very different, with their own advantages and disadvantages. If ease of repair is of the greatest importance to the customer, recommend Awlcraft 2000. If longevity and durability are more important, and especially for dark colors, recommend Awlgrip, but only if you have the skill set and infrastructure to apply it. **PBB**

About the Author: For many years a full-service yard manager, Steve now works with boatbuilders and owners and others in the industry as Steve D’Antonio Marine Consulting. He is an ABYC-certified Master Technician, and sits on that organization’s Hull and Piping Project Technical Committee. He’s also the technical editor of *Professional BoatBuilder*.