



Your Formula for Success
RESINS | GEL COATS | COLORANTS

CASE HISTORY

Modern Twist on Classic Boat

Market Segments:	Marine
Composite Applications:	Hulls, decks, tops, soles & bulkheads
Resin:	Altek H834-R Low-profile Laminating
Manufacturing	Hand Lay-up Resin Infusion
Lengths:	18 to 37 Feet (5.5 to 11.3 meters)

The tug boat is steeped in mystique and revered in folklore and fact as a sturdy vessel ready for work. In a unique marketing twist, Nordic Tugs® offers the charm, performance and fuel efficiency of the seafaring classic by building tug boat cruisers ready for pleasure. Nordic Tugs meets its high standards of form and function with help from Altek® resin technology developed by AOC.

While worthy of traditional tug boat chores, the closest a Nordic Tug comes to being a work boat is when it is used for charter service. Nordic Tugs are used by charter fleets in the U.S., Canada and British Virgin Islands, with the largest charter fleet in Alaska.

The majority of Nordic Tugs owners are individual pleasure boaters who take advantage of the tug boat's inherently spacious interior, fitted with amenities that are common to yachting.

Nordic Tugs' success has spread around the world. The company's first international dealer, Nordic Tugs UK, Ltd., Southampton, UK, signed on about a year ago to represent the line in Western Europe. The second Nordic Tugs international dealer signed on recently for Russia, an emerging boat market. Inquiries from other countries are handled directly by the factory.



Nordic Tugs 54



Nordic Tugs 32

Resin Comparison

Resin Type	Traditional Ortho	Altek® H834-R Series
Styrene content	42-44%	<35%
Emissions (wt. of resin)	4-8%	2-4%
Gel-to-peak exotherm	45 minutes	15 minutes
Peak exotherm temperature	284-354°F (140-175°C)	300°F (149°C)
Heat distortion temperature	153°F (67°C)	176-203°F (80-95°C)

How tugs are made

A great measure of Nordic Tugs' international reputation comes from paying close attention to boat construction details and quality. The hulls are a solid laminate manufactured in an open mold. After applying a gel coat and vinyl ester skin coat, workers build layers of fiberglass reinforcing materials in an Altek® H834-R Series unsaturated polyester resin.

Nordic Tugs also uses the open mold process to manufacture deck laminates, which encapsulate urethane foam cores in strategic locations to add stiffness and reduce weight. The company manufactures tops, soles, and for two models, bulkheads using the resin infusion process.

AOC chemists designed the Altek H834-R Series to incorporate dicyclopentadiene (DCPD) technology to achieve a low-styrene, low-profile resin. Altek H834-R Series products offer exceptional processability in a formulation that complies with U.S. Environmental Protection Agency standards that call for less than 35% styrene content. Compared to conventional orthophthalic polyesters, the H834-R Series provides lower process emissions, faster cure rates, higher heat distortion temperatures, and smoother surface finishes.

"Wetting is very important to our process, and the AOC product wets out our 32-ounce stitched material very well," says Brian Flemming, lamination manager. "AOC has provided us with a consistent, quality product from truck-load to truck-load. This consistency contributes to our overall quality and durability."

Nordic Tugs Purchasing Manager Al Womac points out the service that comes with AOC resins. "AOC Sales Representative Herb Knudson goes the extra mile for us," Womac says. "Any questions that I have are answered in the timely fashion. AOC has always provided prompt,

on-time delivery, the day that's noted on the purchase order. We have used AOC resin for eight years now. It has proven to be a very good resin for us."

About Nordic Tugs

Nordic Tugs manufactures cruising boats of the highest quality for the North American and international midsize trawler markets. The company strives to exceed customer requirements and expectations for safety, reliability and cruising enjoyment by making the finest product, backed by the best customer service and warranty protection in the industry. For more details, contact Bob Shamek, Dealer Sales Manager, by phoning (360) 757-8847 or e-mailing bobs@nordictugs.com.

About AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic material systems for composites and cast polymers. For more information on AOC technology, quality and service, e-mail sales@aoc-resins.com, phone (866) 319-8827, or go to AOC-RESINS.com.