

## ETAP 28s CONSTRUCTION DETAILS

**E**tap hulls are molded at a facility in Malle, Belgium. The plant builds more than 150 hulls a year, ranging in size from 28 to 46 feet.

**HULL:** The two-hull concept creates a volume-controlled chamber that's filled with closed-cell urethane foam, providing reserve buoyancy and insulation for the accommodations below. The outer skin is a conventional polyester E-glass laminate with an iso-NPG low-porosity gelcoat. The inner hull is reverse-molded, eliminating the need for a liner pan or other means of hiding a rough surface. Extra units of reinforcement are added to high-load regions, and the two hulls are brought together in places where the foam has been eliminated. These bonded interfaces tie the inner and outer hull structures together.

**DECK:** The deck is also made with the same double-skin approach as the hull. The side deck is coated with a TBS nonskid material that prevents slipping and is kind to human skin. Aluminum backing plates are used in high-load areas where hardware is fastened and stanchion bases are attached to the deck. Burying the backing plates between the

skins can prevent early detection of leaks. However, with good-sized alloy backing plates and careful hardware bedding, problems should be minimal.

**HULL-DECK JOINT:** The "shoe box" style hull-to-deck joint is made with a combination of mechanical fasteners and resin bonding, a process that provides additional stiffness to an already well-reinforced structure. For cosmetic reasons, and to add a rubstrake to the sheer, the seam is capped with an alloy and plastic extrusion. The transom and deck are molded as one element. Once most of the interior fabrication has been completed, the deck is aligned with the hull and fastened in place.

**SPARS AND RIGGING:** The tie-rod base that supports the chainplate structure is also molded into the inner hull. The Etap is a fairly heavy 28-footer as a significant amount of FRP material has been used to effectively create the "hull within a hull" structure.

**KEEL AND RUDDER:** Stainless steel keel bolts are used to secure the cast-iron keel, and the inner hull shape has both longitudinal and athwartship reinforcement designed into its shape. Side-by-



*The inner and outer hull skins are brought together at all through-hull penetrations. However, the decision not to use long-lived silicon bronze seacocks is a step in the wrong direction, in our opinion.*

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side keel bolts effectively spread the ballast loads into the grid-like structure incorporated into the inner hull. The rudder stock is an aluminum alloy.