The Even Keel

Where Technology Meets Passion

Fall / Winter 2008

20 Ton Shark Attack by MarsKeel Technology!

MarsKeel Technology™ has produced the first 20 ton shark in captivity! The creation is a 46,271 lb. keel for Southern Wind Shipyard of Cape Town, South Africa. The keel, by MarsKeel Technology™, is #5 produced for their amazing, semi-custom, production SWS 100 ft yacht. The keel is comprised of a 5100 lb. fabricated fin section attached to a 41,171 lb. cast lead bulb by means of a vertical bolting system utilizing custom manufactured High Strength Duplex 2205 Stainless Steel fasteners.

The above "Shark Keel" is their T-keel version, a performance-style keel designed by Farr Yacht Design which is also available in a light and heavy version. In addition, SWS, in conjunction with Farr Yacht Design, also offers a cruising version (see photo on page 2) which is an "L" keel design also constructed with a fabricated fin at 4530 lbs. with an attached lead, flared bulb design weighing 43,670 lbs. for a total combined weight of 48,200 lbs. The same custom machined 2205 High Strength Duplex Stainless Steel vertical bolting system also applies to the "L" keel for bulb attachment.

The fabricated fin is constructed of A-36 mild steel pre-formed port and starboard shell halves on our 1000 ton press. We then incorporate vertical and horizontal internal stiffeners welded in place along with custom machined top and base plates. The 1 5/8" (40mm) top fin plate, which marries keel to hull, is predrilled to incorporate the High Strength Duplex keel bolts then notched and base welded in place. Once the fin is internally and externally welded by our certified welding staff it goes to final inspection and is air tight tested. The fairing process is comprised of a 5 step finishing process. The fin is high-pressure bead blasted and primed with self-etching metal primer. Three coats of Interprotect 2000 are then applied, and the fin is faired utilizing our Epoxy Based fairing compound. Then 6 coats of Interprotect 2000E Epoxy Based primer are applied up to the recommended 10 mil. plus thickness.The bulb design versions are all quality cast from our MarsKeel Ceramicast Tooling System™, which we have developed over the last three decades, providing our customers with low-cost tooling along with the highest of dimensional accuracy, quality and mold longevity.

Once the fin is complete, per the above process, and the lead bulb is cast with the fairing complete, it is then dry fitted together and quality checked. The finished keel is then disassembled for custom crating and shipping in our overseas 20 ft, open top container to Cape Town, South Africa by ocean-going freight. Our partnership with Southern Wind Shipyard has grown over the years and MarsKeel Technology™ is now their single credited keel supplier.

At MarsKeel Technology™ we collectively work with Southern Wind engineering and Farr Yacht Design to supply to them the most up-to-date engineered keel systems available today. MarsKeel Technology™ is currently working with Southern Wind and Farr Design on their new SWS 110. We have been granted this contract with SWS 110 Keel #1 which is to be completed and shipped in early 2009.

Southern Wind Shipyard, established in 1991, is the builder of quality yachts 100 feet plus, and they supply to customers worldwide.
www.southernwindshipyard.com

SWS 100 Cruising Version Keel

Tech Talk

By Bill Souter
Sales and Technical Advisor

Fabricated Fins

Are you looking for higher performance keel options for your yachts, other then the standard all-lead casting? The next step up could be a fabricated fin with an attached lead bulb. The fabricated fin offers both the designer, and the builder, options that are not possible with a lead casting and much more economical than the fully CNC machined fin.

The fabricated fin option can offer better performance than a lead keel through the overall lightening of the keel and/or the lowering of the CG as compared to an all-lead casting. In terms of production, this method lowers the tooling cost for the keel. A pattern and mold have to be made for the cast bulb only, not for the entire keel. The timing for production is almost as fast as an all-lead casting, especially for custom keels. For production keels, the cost of the fabrication can be lowered by multiple orders. Based on the range of metals available for a fabrication, everything from mild steel, A-36, to armour plate, CHT 100, to high strength Stainless Steel, 2205 Duplex is possible in a fabrication. (There is a minimum foil thickness that can be achieved for both styles for any given design and material, the fabricated fin would generally require a higher strength material to reach the level of the cast alloy fin.)

Apart from the production flexibility, the fin can be part of a fixed keel or dagger board or even a CB style keel. The internal volume of the fin has, and can be used for, tanks, or to house the hydraulics. This could lower the CG even more, adding to space savings in the hull and sailing performance. Some examples of a combination of the fabricated fin and cast bulb are, as shown above, the SWS 100 T Keel and the Hinckley SW 42 lifting keel. The completed fins can be faired to a racing finish right from the production level, fabrication, or if required they can be CNC machined to achieve very high tolerance is required. This option would require higher material costs in terms of a larger casting, or thicker plate in the fabrication which would allow for the machining.
In terms of pricing, the cast fin is slightly higher then the fabrication, based on the tooling required and the amount to material used in making a casting. Both the casting and fabrication are less expensive than the fully machined fin.

If you would like to see some projects completed by MarsKeel, visit our web site, **marskeel.com**
And please do not hestate to contact me with any questions regarding materials or options at:
1-800-381-5335 or **bsouter@marsmetal.com**

Our Technology

MarsKeel Technology™ is the largest producer of custom and production keels in North America. We specialize in customized projects and incorporate many different metals into our cast fins and fabricated metal fins. We have lead keel and bulb casting capabilities in excess of 200,000 lbs. (91,000 kgs). Our three decades of experience allows us to work closely with leading yacht designers, sharing our state-of-the-art techniques and incorporating them into the latest designs. We offer comprehensive service with on-site CAD Design consultation, pattern construction, custom one-off sand molding, production molding, welding and fabrication. We offer full CNC machining of keel fins and bulbs along with metallurgical testing. Our finishing and fairing division provides diverse solutions to suit our customers' needs.

At MarsKeel Technology™ we continue to embrace growth as we move into the future with the changing and challenging requirements of designers, builders, and the sailors themselves.

Our Production Capacity

Pattern Construction
- Production and Custom Patterns and Plugs produced from prints or IGES Files
- Patterns for High Production runs and one-off custom
- Patterns on Match Plates for Iron, Stainless Steel and Bronze Castings
- Pattern Construction up 50 ft. in length and 16 ft. in height
- CNC Machined part tooling and fixtures available

Molding Capabilities
- MarsKeel Lifetime Ceramicast Tooling System™ available for Production Keel Accounts
- One-off Custom Molding from our MarsKeel Accusand™
- In-house Molding Capacity for keels up to 200,000 lbs

Lead Alloy Casting
- Keel casting up to 200,000 lbs

Production and Custom One-Off Castings
- Design Consultation for High Performance Custom keels
- CNC Machined finishes
- Custom Coating Applications
- Total Project Management available

Ferrous and Non Ferrous Castings
- Lloyds Register Certified Foundry

Ferrous
- Up to 4500 lbs net cast weight
- Heat resistant stainless steels
- Corrosion resistant stainless steels
- Carbon, low alloy and tool steel

Non-Ferrous
- Up to 9000 lbs net cast weight
- Beryllium copper
- High conductivity copper
- Bronze
- Aluminum

Major Machining Available

CNC Turning
- 8 Units, 3-Axis Capability c\w Live Tooling
- Maximum Swing: 38"
- Between Centers: 165"
- Bar Feeder: to 1.75" Dia.

CNC Horizontal Mills
- 5 Units, 5 axis.
- Max. Spindle Dia: 6" (152.4 mm)
- Max. Travel: 110" x 360"
- Max. Table Size: 96" x 320"
- Equipped with Gun-Drilling attachment

Conventional Turning
- 4 Units
- Max. Swing: 50"
- Between centers: 360"

Fabrication Available
- CWB Approved, to CSA Standard W47.1 in Division 3.
- Custom Fabrications in Steel, Stainless Steel and Aluminum
- Welding processes, MIG, TIG and Stick

Plate Forming and Straightening Available
- Plate Shear, 20' long x 1.25".
- Bending Forming, 1000 ton x 24", 800 ton x 31'
- Plate Rolling, largest is 16' x 22.5"

MARSKEEL
TECHNOLOGY

GLOBAL LEADER IN KEEL TECHNOLOGY

KZ-7 Keel by MarsKeel Technology, Photography by Onne van der Wal Photography Inc.

Where Technology Meets Passion

www.marskeel.com

1-800-381-5335

Over 30 Years Of Excellence