

LARGEST SLOOP EVER USES THORDON

Mirabella V will break new technological barriers as the largest single masted yacht ever constructed. With a carbon mast nearly 90 m (300 ft.) high, the sailing yacht will be built in composite materials that will stun the world in both looks and performance. American yachtsman Joe Vittoria, formerly CEO and Chairman of Avis (car rentals) has commissioned UK warship builder, Vosper Thornycraft Shipbuilding to build the 75.2 m (245 ft.) long superyacht.

Because of the vessel's size, much of the machinery and many of the fittings of the yacht have been developed uniquely for *Mirabella V*. One of the biggest production challenges was the custom built retractable keel designed

by Ron Holland Design of Ireland. The keel weighs 150 tonnes (330,600 lbs.) with a 6 m (20 ft.) reach and is raised by powerful hydraulics in order to reduce the vessel's draught. The seven minute cycle to hoist the keel to its up position reduces the draft to 4 m (13 ft.) allowing the vessel to go anywhere a 25 m (80 ft.) race boat can go. "The design of this vertical lift keel was totally different than the swing keels, traditionally used in this application", says John Stott, Naval Architect with Ron Holland Design. "In order to design the keel support pads, we searched for materials that had very specific requirements, specifically high load carrying capability and good wear resistance," says Stott. After reviewing some composite materials, Stott discovered Thordon and made contact with Thordon's Chief Design Engineer, Dr. Keith Laskey.

"Dr. Laskey supplied me with some possible approaches for the design methodology of these pads which were very helpful," says Stott. Given the bearing pressure design criteria, Thordon SXL wear pads were specified for the lateral guide components of the keel, as well as Thordon split SXL bearings for the front and back guide components.

After the initial design work for the keel was passed on to Vosper Thornycraft, the builder reviewed more bearing applications with Thordon's distributor in the U.K., Stephenson Engineering. This led to specifications for Thordon SXL TRAXL bearings including Thorseal, a self lubricating polymer lip seal, for the location ram bearings in the keel locking arrangement.

"SXL TRAXL is able to withstand high operating pressures and absorb impact making them more resistant to damage than stiffer bearings and the Thorseal internal lubricants reduce the cylinder wear," says Chris Beech, Sales Manager for Stephenson.



Mirabella V will be the world's largest marine composite structure

Beech added, "Noise was also a concern for Vosper when the 150 tonne keel is raised and lowered. Since Thordon dampens and reduces operating noise compared to metals, the guests aboard *Mirabella V* won't hear any sliding metal noises, when that keel moves up and down."

Mirabella V has been designed for performance, ocean going voyaging. Her sail inventory includes the world's largest sail - a 1,900 m² (20,450 ft²) reacher. She can, however, in addition power at 16 knots with her twin MTU's driving the 1.5 m (5 ft.) KaMeWa Ulstein XF5 controllable pitch propellers. The propulsion system supplier, Rolls-Royce KaMeWa, specified Thordon's water lubricated COMPAC propeller shaft bearings making Thordon's oil-and grease-free bearings quite prevalent throughout this dramatic vessel. Delivery of *Mirabella V* is scheduled for winter 2003. 

