Saltwater Solutions From igus

igus bearings solve undersea issues for the marine vehicle industry

Lindsey Snyder, Assistant Editor

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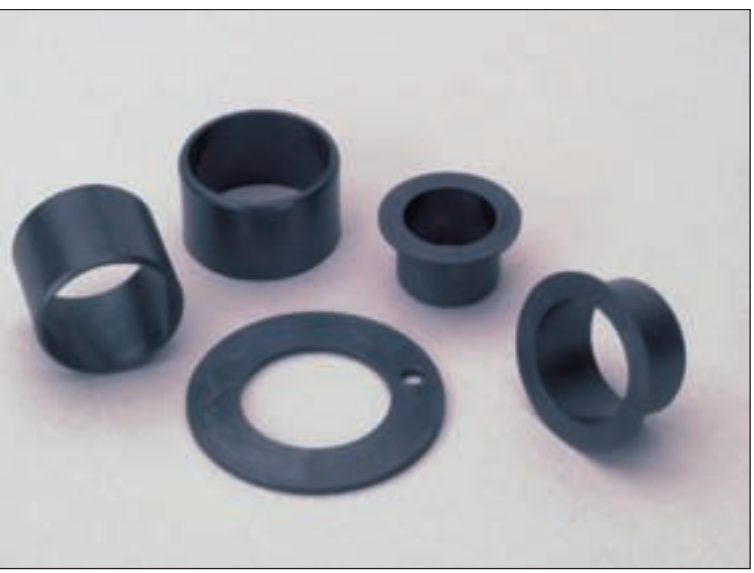

Each T-foil Island Engineering produces has 46 iglide T500 bearings.

Aquatic engineering applications take on a whole different world of physics that members of the marine vehicle industry face with each new product they develop. Companies like Island Engineering, located in Piney Point, Maryland and General Boats, based in Edenton, North Carolina, uncovered a valuable solution to circumvent the corrosive effects saltwater has on machinery by using igus plastic bearings.

"Igus bearings are ideal for water, especially saltwater, applications because they're all made of non-corrosive, high-performance plastics," says Courtney Toomey, marketing specialist for igus.

Island Engineering focuses their attention on engineering technology for advanced marine vehicles, including their vessel motion control system—Spectrum. Other company projects include a high-speed catamaran, small waterplane area twin-hull (SWATH), monohull and wave-piercing catamaran.

The marine engineering technology company used igus iglide T500 bearings with three interrelated products: T-foils, ActiveSkegs and interceptors. The T-foil is a system application that stabilizes a boat's motion using pivoting titanium flaps that are controlled by a fly-by-wire computer system. The system is ideal for fast-moving boats capable of speeds up to 50 knots. The interceptors communicate positioning information to the flaps, so a marine vehicle can counteract the normal action from waves that is primarily responsible for symptoms of seasickness passengers might experience. The ActiveSkeg is a fin designed to hold a vessel more steadily on course, reducing the extent it may stray off course from +/- 20 degrees to +/- 2 degrees.

The iglide T500 plain bearings from igus are engineered to withstand UV rays, severe chemicals and corrosive substances, like saltwater. They are made from all-polymer material—as is each member of the iglide bearing family—so there is no lubrication or maintenance needed, and they absorb minimal moisture, enabling them to perform in continuous submersion. The T500 bearings have a high compressive strength that appealed to Island Engineering. Where high radial pressures are a factor, the T500 bearings last twice as long as coated or lubricated metallic bearings, according to igus.

"T500 is what I would call a problem-solving bearing," says Rick Loheed, director of engineering for Island Engineering.

"We have been impressed with its performance and with the service provided by igus and its sales force."

Each T-foil Island Engineering produces is made with 46 iglide T500 bearings, according to igus in a press release. The bearings are available off-the-shelf, so they can be delivered overnight if any failure ever occurred, minimizing downtime and money spent on maintenance. They are ideally used for outdoor and marine equipment, in addition to power transmission, semi-conductor, textile and high heat equipment—such as ovens.

General Boats—Sailing Anyone?

In 2004 igus welcomed submissions for a unique plastic bearings competition devised to promote the benefits plastic bearings have over metal ones. While highlighting significant technological advancements made in recent years that resulted in more widespread application of plastic bearings, the manus competition drew attention to the diverse usage and cost-efficiency of plastic bearings. Several industry experts judged the competition and awarded winners during National Manufacturing Week 2004.

"The manus contest seeks original applications using plastic bearings in creative and ingenious ways to obtain technical and economic efficiency. Manus represents courage and initiative in advancing bearing technology," igus stated in an informational pamphlet describing the competition.

General Boats, a manus contestant, used iglide bearings for their signature marine vehicle. The Rhodes 22 sailboat is a trailerable, cruising vessel with several unique components made possible by the iglide J bearings.

The iglide J is designed for high-speed and low-speed applications, operating up to 1.968 feet per minute (fpm) in linear motion and 197 fpm in rotary motion, according to igus in a press release. It can be a less expensive alternative to metal-backed and custom injection-molded bearings available in sleeve, flange and thrust-washer configurations.

The Rhodes 22 is equipped with a mechanism developed by General Boats that is capable of lifting an outboard motor in vertical movements, so boat drivers can operate the device and monitor potentially heavy bow traffic simultaneously. The company gravitated towards the iglide J bearings because of their low cost, ability to rotate effectively when the offset motor applied heavy torque pressure, and they produced no noise, unlike other bearing solutions considered.

The Rhodes 22 is also fitted with an innovative inner mast furling system (IMF), a typically high-cost feature for large sailboats. A boat's sail is rolled in the mast in order to release or pull in the sail depending on wind conditions. General Boats faced a problem with this technique because the forces involved resulted in significant jams that required extensive lubrication. When the pressure involved in pulling out the sail is applied to the iglide J bearings instead of on the rotating tube responsible for rolling the sail in or out, the result is a system devoid of locking action.

"The system works flawlessly and with a bonus feature," said Stan Spitzer, owner of General Boats. "As far as we can see, no maintenance is ever needed. Our IMF main sail furling system is the major reason why buyers choose a Rhodes 22 over the competition."

The iglide J bearings are used in the DryLin R linear bearings and other linear slides; they are a signature product from igus. Many other customer applications are posted on the igus website in a section the company calls the "Application Corner." Interested customers can read about unique engineering designs from industries as far ranging as packaging, medical and agricultural, and clients can post their own stories there as well.

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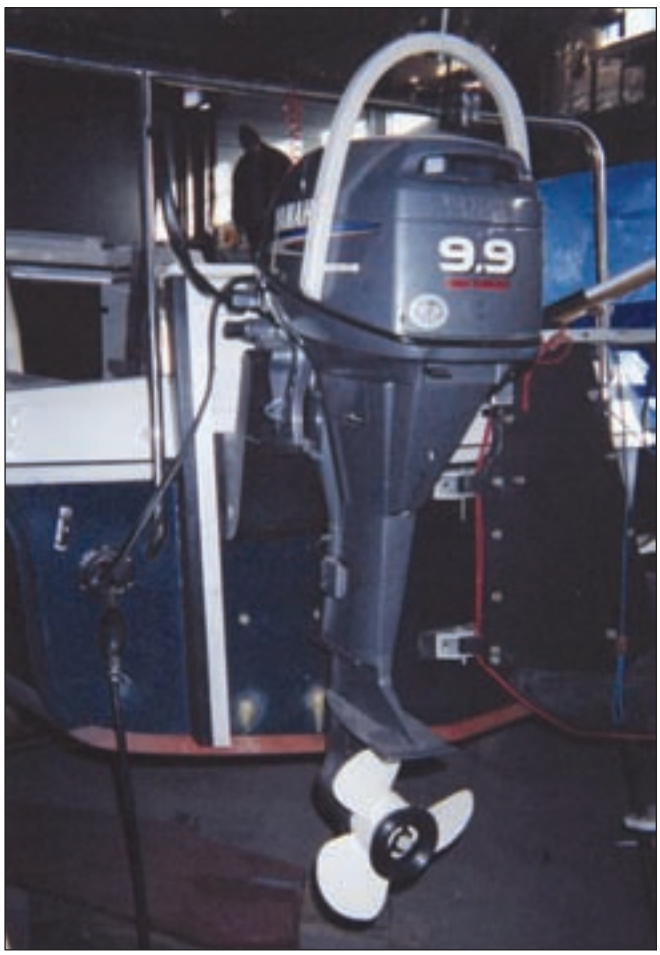

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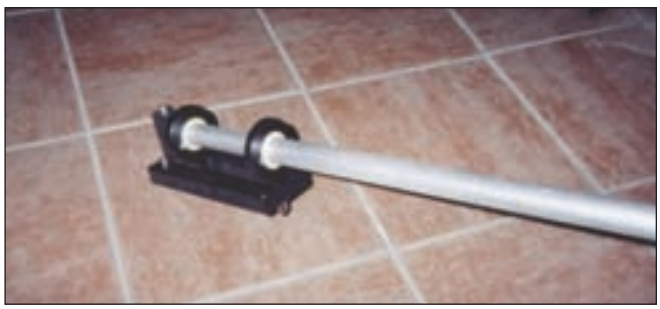

General Boats' inner mast furling system works flawlessly using igus iglide J bearings.