



GOOD FOR THE SEA. GOOD FOR BUSINESS.



SEAWATER LUBRICATED PROPELLER SHAFT BEARINGS

THORDON

ZERO POLLUTION | HIGH PERFORMANCE | BEARING SYSTEMS

ADVANCED PROPELLER SHAFT BEARINGS

Reliability, long wear life and strong technical support have made Thordon the first choice for seawater lubricated propeller shaft bearing solutions. Thordon's pollution free propeller shaft bearings are easily installed in conversion or new build applications.

Thordon Bearings, a pioneer in the development of pollution free bearing designs, offers a variety of choices of seawater lubricated propeller shaft bearing systems for all water conditions. Open, seawater lubricated bearing options include Thordon COMPAC, RiverTough, SXL and XL; each offering specific advantages for different water environments and operating conditions.

Commercial owners and managers, including major cargo, tanker, bulk carrier and cruise ship operators, specify Thordon for its pollution free simplicity and reliability to replace conventional oil lubricated stern tube systems.

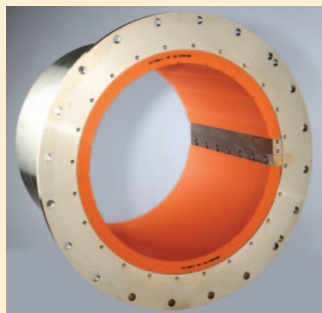
With over 35 years of experience Thordon has solid references in over 2000 marine propeller shaft bearing applications. Thordon bearings are used by over 40 Navies and Coast Guards around the world.

It doesn't matter if your bearing needs are for repair, conversion, or new build; Thordon propeller shaft bearings and bearing systems deliver proven, reliable, cost-effective performance backed up by timely delivery, superior technical support and outstanding after sales service. Thordon Bearings are available worldwide through an extensive distributor network in over 100 countries.

THORDON GRADES

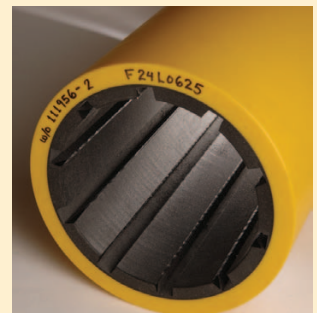
Thordon COMPAC

Thordon COMPAC is a high performance water lubricated bearing system primarily for "blue water" operating conditions. Specially formulated with a low coefficient of friction to reduce startup friction and eliminate stick-slip, COMPAC's unique configuration is designed to promote early formation of a hydrodynamic film at lower shaft rpm. The lower (loaded) portion of the bearing is smooth, while the upper half of the bearing incorporates water grooves for lubrication and cooling.



Thordon RiverTough

Specially formulated to provide superior wear life in highly abrasive water conditions such as inland river systems, Thordon RiverTough bearings operating in combination with hard coated nickel-chrome-boron shaft sleeves routinely outwear rubber propeller shaft bearings by a factor of two or more. More than 25 years experience on hundreds of push boats and other vessels operating on America's muddy Mississippi River system confirm achievable bearing wear at between 0.010" – 0.015" (0.25mm - 0.38mm) per year.





Thordon SXL

Thordon SXL offers a lower coefficient of friction for reduced break-away torque and smoother operation at lower shaft RPM, increased resistance to third particle abrasive wear and improved wear life compared to XL.



Thordon XL

Our traditional standard propeller shaft bearing grade, Thordon XL is a general purpose bearing offering superior performance compared to other bearings commonly used in propeller shaft applications. XL provides good balance between long wear life, low coefficient of friction, reasonable abrasion resistance and cost effectiveness.





Icebreaker Uses New Thordon XL Design

"We used the same XL material in a completely different configuration. The Thordon element went pretty much like clockwork and the sea trials went well, showing no signs of problems. Underwater divers were also positive about the installation."

James Happe
U.S. Coast Guard

Towboat Performance Opens More Opportunities

"Thordon RiverTough bearings have shown excellent performance... We plan on continuing to use Thordon propeller shaft bearings and we have started to specify grease-free Thordon SXL rudder and ThorPlas jockey arm bearings."

Mitch Jones, Maintenance Manager
Blessey Marine Services, Inc., Louisiana, U.S.A.



BENEFITS OF THORDON SEAWATER LUBRICATED PROPELLER SHAFT BEARINGS

Long Wear Life

With over 35 years experience supplying marine propeller shaft bearings, in use service has proven that Thordon bearings provide significantly longer wearlife compared to the bearings they replace. Thordon bearings often outlast competitive products by 50% to 100%, or more, significantly reducing overall life cycle operating costs and increasing propulsion system reliability.

Four Grades/Multiple Configurations Available

Thordon propeller shaft bearings are available in four different grades and multiple configurations for the optimal bearing solution for each owner's specific application and operating profile.

Pollution Free

Thordon water lubricated propeller shaft bearings totally eliminate the use of oil resulting in zero risk of pollution.

High Abrasion Resistance

Due to their tough, elastomeric properties, Thordon bearings can resist abrasive wear by tending to deflect, and then reject, abrasive particles allowing them to be flushed through the bearing and not become embedded.

Accommodates Edge Loading

Under edge loading conditions caused by minor shaft misalignment, elastomeric Thordon bearings deflect slightly, effectively spreading the load and reducing potential bearing wiping and shaft wear.

Low Friction

Thordon's static and dynamic coefficients of friction are both lower than other materials commonly used for water lubricated propeller shaft bearings. Lower friction leads to reduced break away torque, longer life and elimination of stick-slip and noise.

High Resilience/Impact Resistance

Elastomeric Thordon bearings tend to absorb impact loads, increasing resistance to damage from pounding during operation or in heavy seas.

Reduced Docking Time

Thordon recognizes the need for quick response to customer needs. To ensure tight docking schedules are met, Thordon provides the following advantages for shipyards and owners:

- i) **Worldwide Stock Availability** – With Thordon's network of distributors in over 100 countries around the world, inventory is available quickly at all major ports. When necessary, emergency shipment from the factory within three business days is possible.
- ii) **Easily Machined and Fitted** – Asbestos and dust free, easily machined, and one seventh the weight of metals, Thordon bearings can be quickly installed in position by freeze fitting. Lighter rigging may be used and Thordon will not chip or crack during handling while frozen.

Extensive References

With over 35 years of experience supplying water lubricated propeller shaft bearings, Thordon has developed extensive lists of references, which are available upon request.

Full Classification Society Approvals

Thordon propeller shaft bearings are approved by all major Classification Societies and can be specified and installed with confidence.

BEARING CONFIGURATIONS

Full Form Tubes

Full form Thordon tubes are typically the easiest Thordon bearing configuration to install. Using dry ice or liquid nitrogen, the bearing is cooled and quickly installed in one piece. A bearing tube can also be split with a single tapered key design. This allows the bearings to be withdrawn, inspected and re-installed in a matter of hours with the shaft in place.



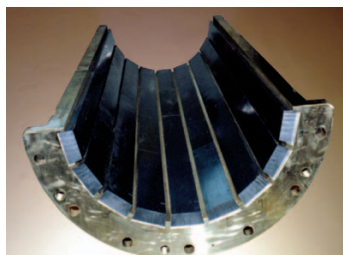
Full form SXL bearing installed in stern tube.



COMPAC with tapered key design allows the bearing to be withdrawn, inspected and re-installed or replaced in a few hours.

Staves

Thordon XL, SXL and RiverTough grades are all available in a full range of metre long (39.4") STAXL and Dovetail stave configurations. Thordon staves in split carriers can be removed with the shaft in place. Thordon staves are easily installed by freezing in dry ice or liquid nitrogen and then interference fitting them into the housing or carrier. Custom sizes are available upon request.



THORDON Bearing Grade and Configuration Selection Chart

GRADE AND CONFIGURATION	Axial Lubrication Grooves	Typical L/D Ratio* Aft Bearing	Max. Recommended Operating Time In Abrasives
COMPAC Tube	180° - Top Only	2:1	Up to 10%
XL Tube	360°	4:1	Up to 15%
XL STAXL Staves	360°	4:1	Up to 15%
XL Dovetail Staves	360°	4:1	Up to 15%
SXL Tube	360°	4:1	Up to 20%
SXL STAXL Staves	360°	4:1	Up to 20%
SXL Dovetail Staves	360°	4:1	Up to 20%
RiverTough Tube	360°	4:1	Over 20%
RiverTough STAXL Staves	360°	4:1	Over 20%
RiverTough Dovetail Staves	360°	4:1	Over 20%

*L/D ratio may vary depending on actual shaft loading and the anticipated operating profile of the vessel.



Thordon Pollution Free COMPAC Bearings

"Spills always come at a time when you do not need them, and they must be resolved as soon as possible. Prior to the switch to these seawater lubricated bearings, Flinter, like others, had been fined for oil pollution, especially in US ports."

**Martijn Berends, Newbuildings Manager
Flinter Management BV, Netherlands**

Thordon Ensures Reliable Performance for AHTS

"We needed proven, reliable bearings for the propeller shafts and stern rollers. We considered the alternatives and Thordon emerged as the best choice based on price and performance."

**Ryan Roth, Project Engineer
Bender Shipbuilding, U.S.A.**

CUSTOMER FOCUSED TO QUICKLY MEET YOUR NEEDS

Quick and Responsive Service

It takes quality products to be globally successful in the marine bearing industry. It also takes great service to keep customers coming back.

Thordon Bearings Inc. is geared to respond quickly to new shipbuilding repair and conversion projects. Thordon bearings arrive quickly, fit right and last!

Extensive Distribution Network

Thordon Bearings has an extensive distribution network to supply our global customers. More than 70 distributors in 100 countries carry extensive inventories of Thordon's common bearing sizes which are backed by large regional and head office inventories. Non-standard requests are met with responsive design, quick machining and speedy delivery.

Application Engineering

Thordon engineers work closely with customers to provide innovative bearing system designs and solutions. We offer in-house design, CAD and the proprietary Thordon Bearing Sizing Calculation Program to help correctly size our bearings.

Our decades of experience mean that we offer the right technical support during design, machining, installation and operation.

Manufacturing Quality

Thordon Bearings Inc. is a family-owned company that operates a state-of-the-art polymer processing plant and new product development facilities in Burlington, Ontario, Canada.

We manufacture to ISO 9001:2008 Quality System requirements. Contact us for references of our installations.

High Performance Bearings and Shaftline Products; Industry-Leading Service

Thordon Bearings is an industry leader in the design, manufacture, supply and installation of high performance marine bearings systems.

Your Authorized Thordon Distributor

THORDON

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