



GREASE-FREE RUDDER BEARINGS

THORNDON

ZERO POLLUTION | HIGH PERFORMANCE | BEARING & SEAL SYSTEMS

WEAR LIFE GUARANTEED GREASE-FREE SXL RUDDER BEARINGS

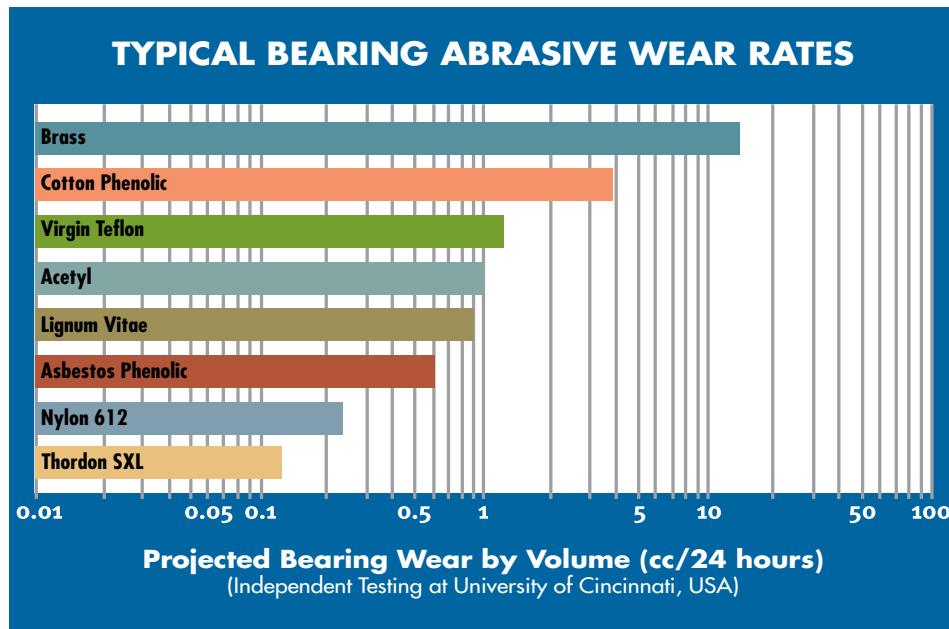
Thordon Bearings is a pioneer in manufacturing high performance, long lasting rudder bearing systems that include a 15-Year Rudder Bearing Wear Life Guarantee for Classed newbuild vessels.

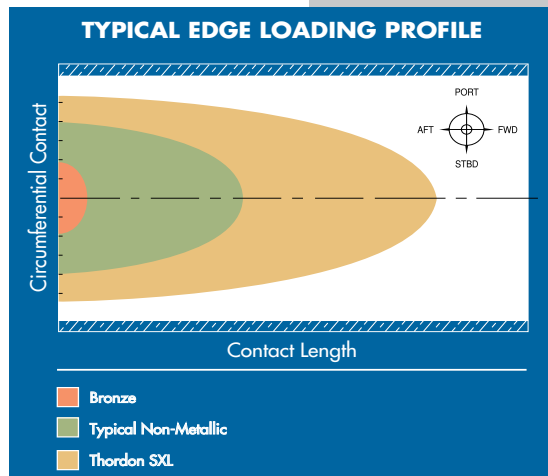
Our polymers offer the best combination of strength and stiffness with flexibility and elasticity, along with high abrasion resistance. Thordon SXL rudder bearings operate without grease or oil lubrication in dry or wet environments in pintle, stock, and carrier disc applications.

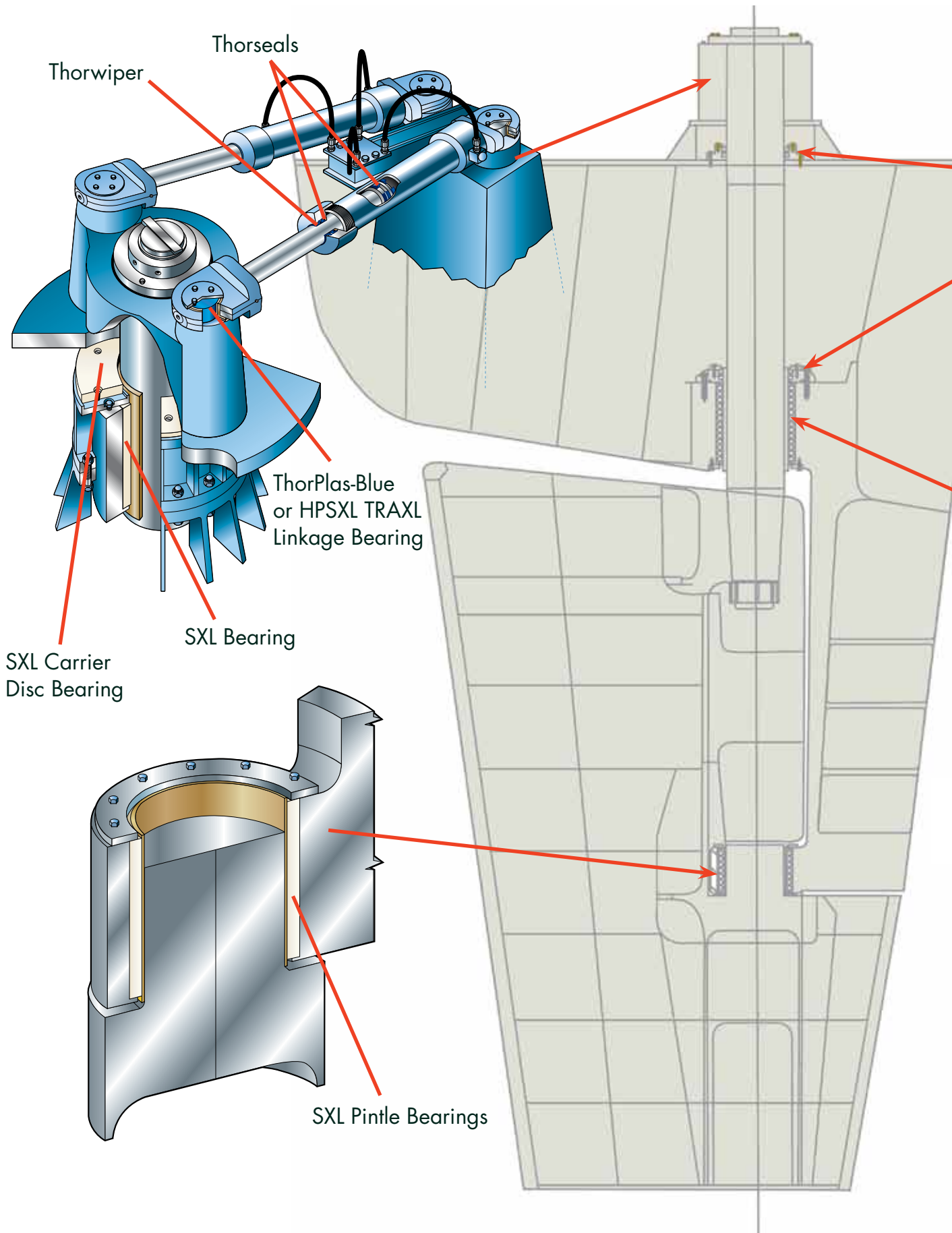
Thordon SXL rudder bearings have been fitted to over 4,000 vessels globally.

Why Choose Thordon SXL Rudder Bearings:

- Long Wear Life Guarantee
 - 15-Year wear life guarantee for newbuilds
 - Twice the life of replaced bearing to a maximum of 10 years for conversions
- More abrasive resistant than phenolics and other non-metallics
- High tolerance to edge loading
- High shock absorption
- Self-lubricated: operates wet or dry without grease
- Easy to machine and fit
- Global technical and customer support available





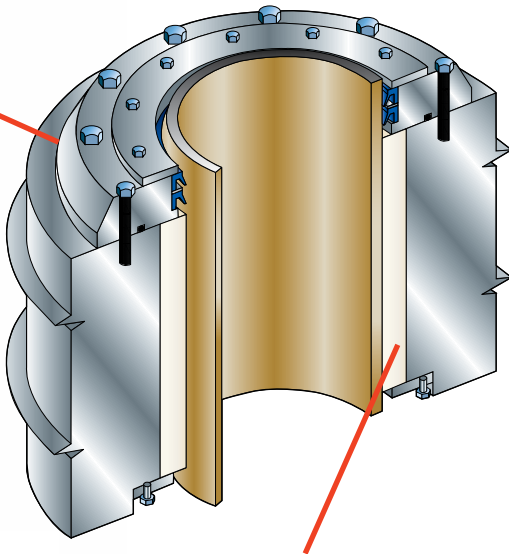


ZERO POLLUTION | HIGH PERFORM

15-YEAR NEWBUILD GUARANTEE & UP TO 10 YEARS IN CONVERSIONS



Thorseal Rudder Stock Seals



SXL Upper Stock Bearing

Better Performance

Thordon SXL has a lower modulus of elasticity (440 MPa or 68,817 psi) than other non-metallic bearings, resulting in significantly increased vibration dampening, accommodation of edge loading, and better impact resistance than other non-metallic materials.

- Industry-leading wear life guarantees
- Tolerance to edge loading
- Wet or dry operation eliminates the use of grease
- Transient shock loading absorption
- High abrasion resistance
- Quick delivery

Easy to Machine & Fit

Thordon SXL bearings are easy to machine and produce no dust. In comparison, other non-metallic materials require dust extraction and tight machining tolerances that may result in product rejection or repair delays.

With Thordon SXL, machining tolerance is less critical and because of the relatively large interference on the bearings, it is usually possible to adjust dimensions to compensate for small machining errors.

15-Year Rudder Bearing Wear Life Guarantee*

Thordon's 15-Year Rudder Bearing Wear Life Guarantee ensures provision of a replacement if a Thordon SXL rudder bearing wears out and requires renewal before the 15 year period is up.

Newbuilds - The guarantee covers pintle, rudder stock, and carrier disc bearings above and below the waterline in Classed newbuild vessels. It applies to the original owner of the ship and is non-transferable. Engineering details such as Classification Society, vessel name, shipowner's name, and rudder specifications will be required prior to issuing the guarantee.

Conversions - In conversion pintle, stock, or carrier disc applications, Thordon SXL rudder bearings are guaranteed to meet Classification Society wear specifications for twice the life of the non-Thordon bearing replaced, up to a maximum of ten years, or Thordon Bearings will supply a new rudder bearing free of charge.

*The guarantee is subject to prior approval by Thordon Bearings Inc. and limited to the supply of replacement bearings.



*Certain conditions may apply. Please contact Thordon Bearings Inc. for further information.

HIGH PERFORMANCE BEARINGS & SEALS

Zero Pollution Bearings & Seals

Thordon SXL rudder bearings offer low friction, operating pressures up to 12 MPa (1,740 psi), and do not require grease or greasing systems. Thordon SXL can also withstand high shock loads and edge loading.

In addition to SXL pintle, stock, and carrier disc bearings, HPSXL TRAXL or ThorPlas-Blue can be specified in steering and linkage applications, as well as fin stabilizers. Both products operate grease-free – saving you time, money and the risk of pollution.

To complete the package, Thordon offers self-lubricating rudder stock seals that provide positive sealing and exceptional wear life.

Thorseal Rudder Stock Seals

- Prevent ingress of water into the hull
- Manufactured from tough, self-lubricating Thorseal polymer
- Designed to accommodate larger bearing clearances and movements inherent to rudders
- High performance positive sealing and long wear life
- Standard seals available for 200 mm (8") to 1,200 mm (47") shaft diameters
- Special designs available to solve difficult sealing challenges

Thorseal Hydraulic Seals

- Keep abrasives away from bearing surface
- Pressures from 0-100 MPa (0-15,000 psi)
- Tough – won't cut or tear
- Low friction and self-lubricating
- Long wear life and reduced maintenance costs
- Can be custom designed to solve difficult sealing challenges

ThorPlas-Blue Steering & Linkage Bearings

- Engineered thermoplastic for high pressure applications to 45 MPa (6,527 psi)
- Wet or dry operation
- Very low wear in non-abrasive environments
- Lifetime lubricated homogeneous polymer



ThorPlas-Blue self-aligning bearing



ThorPlas-Blue steering and linkage bearings installed

Thordon Bearings Outlive Life of Ship

"Wear down of both shaft and rudder stock bearings has been minimal and experience of Thordon fitted vessels since 1998 indicates that the bearings will outlive the planned 30 year life of the ship.

We are using Thordon materials in more and more applications where in the past we have had costly failures and difficult maintenance which has significantly reduced replacement costs. These materials are not only saving us money but are significantly reducing management concerns over pollution as well."

**Chris Joly, Principal Manager Marine
Carnival Corporation**

CUSTOMER FOCUSED TO QUICKLY MEET YOUR NEEDS

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

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. Our bearings arrive quickly, fit right and last!

Extensive Distribution Network

Thordon Bearings has an extensive distribution network to supply our global customers. More than 85 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

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

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, pollution-free, marine bearing and seal systems.

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