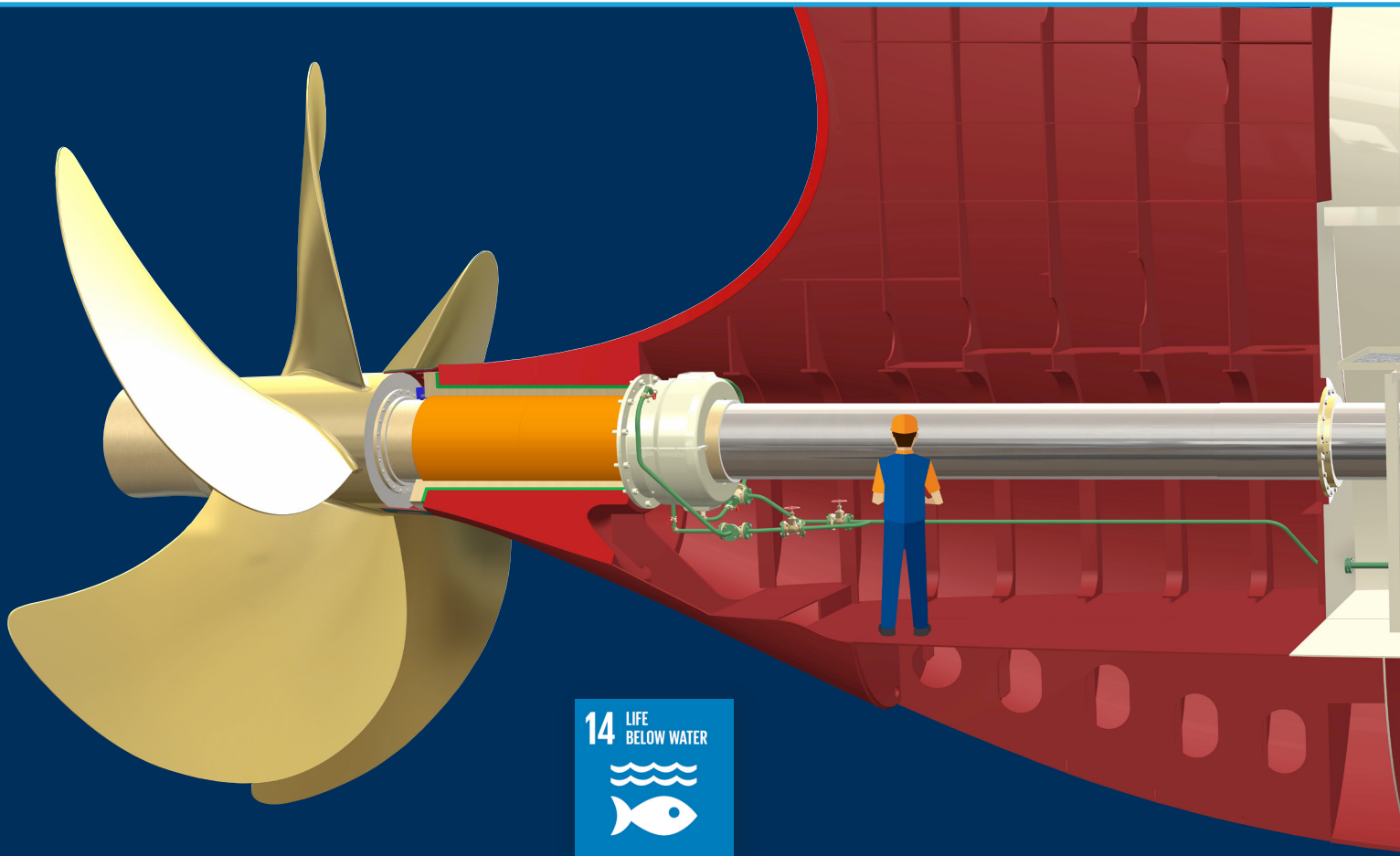


T-BOSS

THORDON BLUE OCEAN STERN SPACE

with Thordon COMPAC



THORDON
THORDON BEARINGS INC.

ZERO POLLUTION | HIGH PERFORMANCE | BEARING & SEAL SYSTEMS

REVOLUTIONARY DESIGN

This innovative solution replaces a vessel's sterntube cooling tank with a dry, irregularly shaped chamber (dry aft space) that allows for inspection and maintenance of a seawater-lubricated single bearing and seal from the inside of the ship, while the vessel is afloat, without having to withdraw the shaft in drydock.

This new design can better support simplified compliance with environmental-focused regulations, such as the Energy Efficiency Design Index (EEDI) due to the properties of the COMPAC seawater-lubricated bearing system. And it completely eliminates the need for an oil-lubricated sterntube bearing and seal system – a major source of marine pollution. The design can save shipowners hundreds of thousands of dollars in capital and operational expenditure over a vessel's lifespan.

Compared to a traditional sealed oil-lubricated shaft line, the T-BOSS concept has the following changes:

- **Sterntube is removed**
- **Forward Sterntube bearing and Aft seal is removed**
- **Propeller shaft line length can be now optimized, which can ultimately help to increase cargo space**
- **Aft Sterntube bearing is replaced with COMPAC seawater lubricated bearing with tapered key design**
- **Lubricant is seawater (no oil is used)**

Recently, ABS granted Approval in Principle (AIP) to CSSC - Shanghai Merchant Ship Design & Research Institute (SDARI) for the "sterntube-less ship" stating that the conceptual engineering as proposed is feasible for the intended application. The AIP was based on the use of Thordon's COMPAC seawater-lubricated single aft bearing.



KEY SHIP OWNER BENEFITS

Lower Shaft Line Operating Expenses vs Oil Lubrication

- **No oil/EALs**; no risky aft oil seal to maintain
- Seawater is **FREE**
- **Lower friction** with COMPAC polymer bearing in seawater = **fuel savings** compared to sealed oil/metal bearing shaftline

Zero Pollution

- Open seawater lubricated propeller shaft bearing system = **regulatory compliance worldwide**

No Propeller Shaft Withdrawals For Maintenance

- Maintain and inspect bearings, liners and seals **without drydocking** the vessel

Improved EEDI

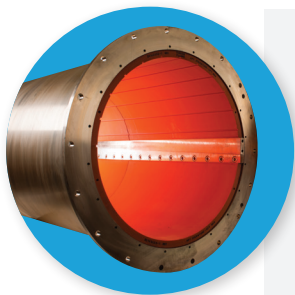
- **Reduced fuel consumption** and Main Engine emissions



T-BOSS (THORDON - BLUE OCEAN STERN SPACE) WITH THORDON COMPAC

Sterntube-less Ship Concept

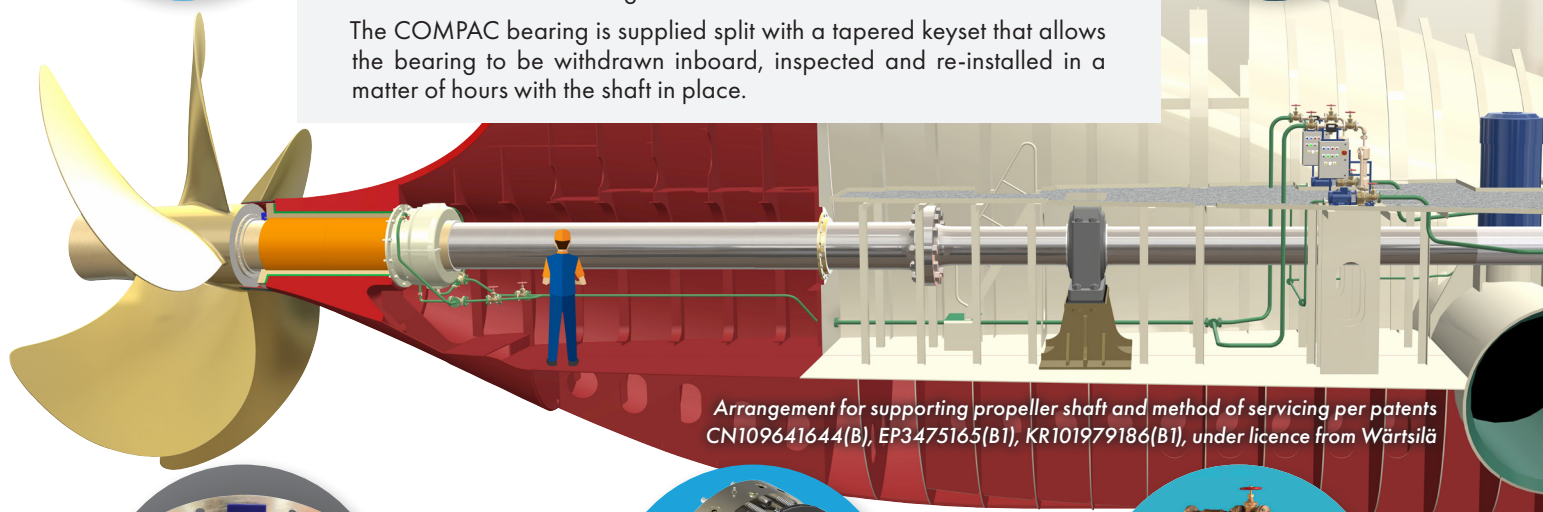
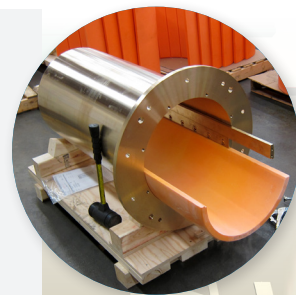
Thordon has over 35 years of experience designing long-life marine bearing systems that operate without oil. Since Thordon's bearings have zero impact on the environment, they not only meet, but exceed all environmental regulations while reducing your vessels' operating costs. The T-BOSS ship with a Thordon COMPAC propeller shaft bearing system includes the following items:



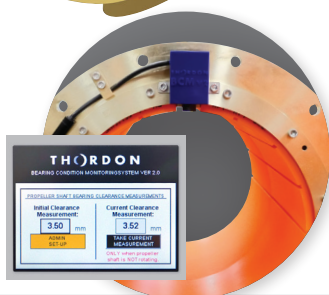
COMPAC AFT Bearing with Tapered Keyset

Non-metallic homogeneous elastomeric polymer alloy COMPAC bearing is at the heart of the award-winning seawater-lubricated propeller shaft bearing system. The COMPAC bearing has no grooves on the lower half of the bearing to promote the early formation of a hydrodynamic film between the shaft and bearing, comparable to oil. Given the unique elastomeric nature of Thordon COMPAC bearings, this concept is more tolerant to shaft misalignment with go-home capability. Thordon COMPAC bearings do not contain PFAS.

The COMPAC bearing is supplied split with a tapered keyset that allows the bearing to be withdrawn inboard, inspected and re-installed in a matter of hours with the shaft in place.



Arrangement for supporting propeller shaft and method of servicing per patents CN109641644(B), EP3475165(B1), KR101979186(B1), under licence from Wärtsilä



Thordon BCM System

The Thordon Bearing Condition Monitoring System allows bearing wear measurements to be taken from inside the ship simply by pushing a button, supporting the Classification Societies' bearing clearance monitoring requirements.



Wärtsilä Enviroguard Seal

Wärtsilä Enviroguard seals are highly engineered seals, designed to support commercial ships. With no maintenance between planned overhauls (up to 5 years), these seals support ship operators in reducing operational expenditure and vessel downtime.



Thordon Water Quality Package

A Thordon Water Quality Package delivers a consistent supply of conditioned water to the seal and bearing to ensure long predictable bearing wear life.

Today, T-BOSS with a Thordon COMPAC propeller shaft bearing system offers considerable advantages to shipowners and shipbuilders, providing easy monitoring and maintenance of bearing and seal condition, without shaft withdrawal, lower operational expenses, de-carbonization of the ship and elimination of oil emissions forever.

CUSTOMER FOCUSED TO QUICKLY MEET YOUR NEEDS

Quick and Responsive Service

It takes quality products to be globally successful in the bearing and shaft seal industry.

It also takes great service to keep customers coming back.

Thordon Bearings Inc. is geared to respond quickly to supply high-performance bearing and seal solutions.

Our products arrive quickly, fit right and last!

Extensive Distribution Network

Thordon Bearings has an extensive distribution network of more than 75 distributors in 100 countries to supply and service our global customer base. 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 & shaft seal system designs and solutions.

The Global Service and Support (GSS) team can install, commission, service and maintain the full range of Thordon Bearings' environmentally safe products.

Manufacturing Quality

Thordon Bearings Inc. is a family-owned company with manufacturing and new product development facilities in Burlington, Ontario, Canada. In addition, we operate a new leading-edge manufacturing plant in Slupsk, Poland.

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

High-Performance Bearings and Seals; Industry-Leading Service

Thordon Bearings is an industry leader in the design, manufacture, supply and installation of high-performance, pollution-free, shaft bearing and seal systems.

Your Authorized Thordon Distributor

THORDON
THORDON BEARINGS INC.

3225 Mainway, Burlington, Ontario L7M 1A6 Canada

Tel: +1.905.335.1440 Fax: +1.905.335.4033 Email: info@thordonbearings.com Website: www.ThordonBearings.com



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