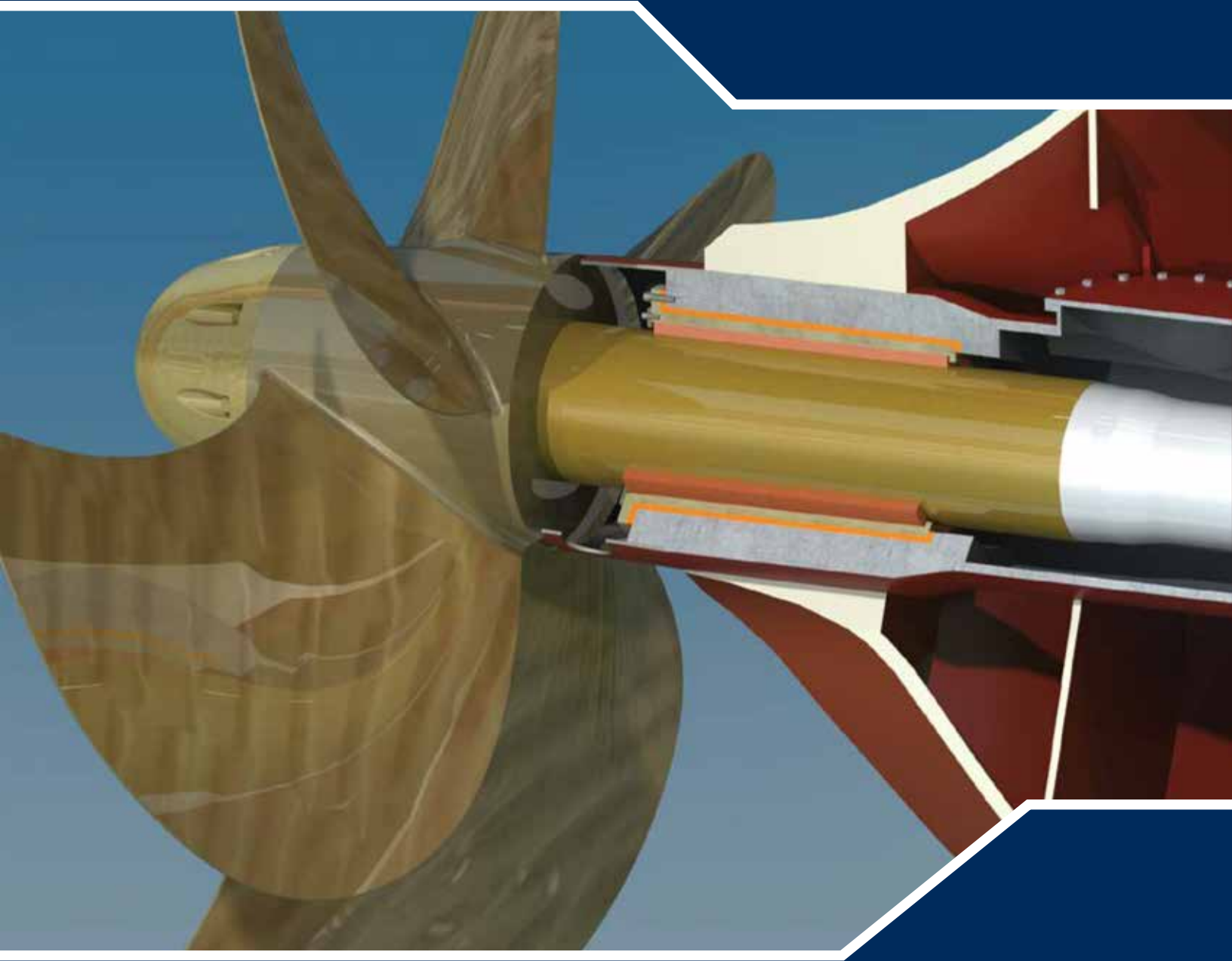


THORDON

THORDON BEARINGS INC.



COMPACT SEAWATER LUBRICATED PROPELLER SHAFT BEARING SYSTEM

COMPAC FOR LIFE

Thordon COMPAC Water Lubricated Propeller Shaft Bearing Clearance

(Avg. Clearance of Port & Starboard)



COMPAC Ship Owner Benefits

- Reduce operational costs
- Eliminate aft seal problems
- Eliminate emergency dockings
- Fewer components
- Zero environmental impact
- Polar Code compliant
- Meets U.S. VGP requirements
- Over 2000 ship references

Controlled Bearing Environment

Thordon's Water Quality Package ensures an adequate supply of clean water is consistently being delivered to both the forward seal and the stern tube bearings. Lubrication of the bearing is assured and a long predictable bearing wear life is achieved. A controlled supply of clean water allows Thordon to offer a lifetime bearing wearlife guarantee.



Easily Machined and Fitted

Thordon COMPAC machines cleanly and produces no airborne machining debris. COMPAC is much lighter than white metal bearings and can be fitted quickly and easily by freezing in liquid nitrogen or dry ice.

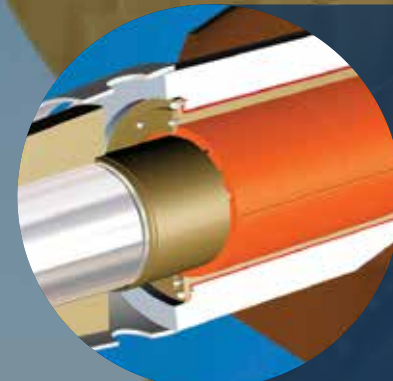
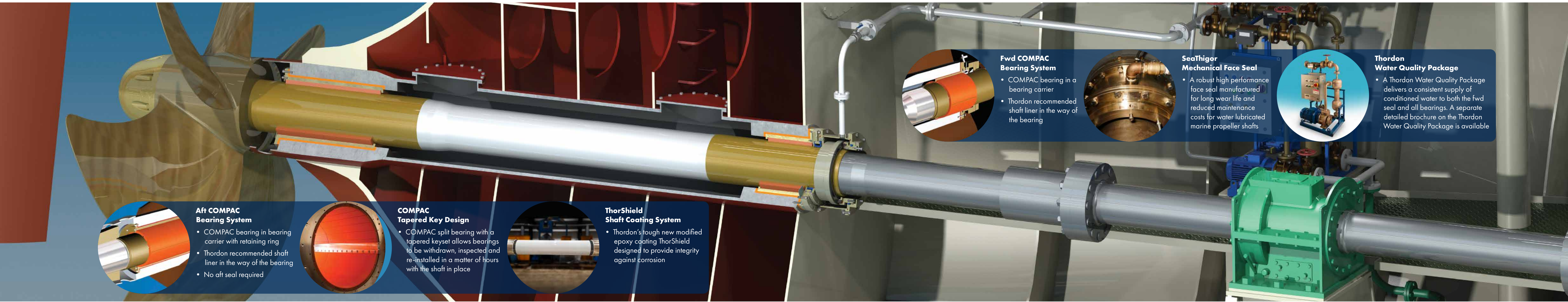
Cost Savings

The COMPAC seawater lubricated propeller shaft bearing system eliminates stern tube oil or oil-based EALs as seawater is used as the lubricant. There is no aft seal, no storage of oil, no sampling of oil, no disposal of oil, and no risk of seawater ingress contaminating the oil. Compared to synthetic EALs that are 500 - 1000% more expensive than mineral oil, seawater is free and recommended by the U.S.A. Environmental Protection Agency to meet Vessel General Permit requirements. Emergency aft seal repairs are not required, as there is no aft seal.

Compliant Operation

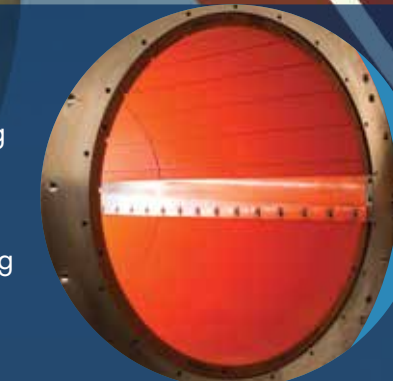
All class societies with the exception for NK and KR have modified rules for seawater lubricated propeller shaft systems, allowing the shaft to remain in place if monitoring conditions are met making the COMPAC system comparable to oil lubricated propeller shaft bearings. Thordon's COMPAC system ensures shipowners/operators that there will be no environmental violations resulting from stern tube oil leakage and meets both U.S. VGP and Polar Code regulations guaranteeing zero risk of pollution.

COMPAC SEAWATER LUBRICATED PROPELLER SHAFT BEARING SYSTEM



Aft COMPAC Bearing System

- COMPAC bearing in bearing carrier with retaining ring
- Thordon recommended shaft liner in the way of the bearing
- No aft seal required



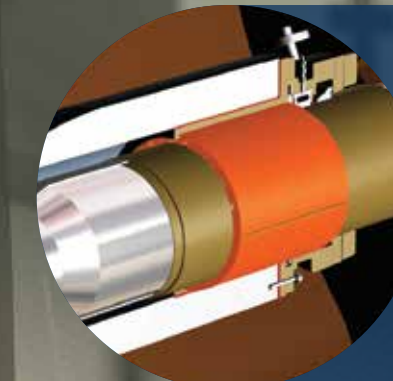
COMPAC Tapered Key Design

- COMPAC split bearing with a tapered keyset allows bearings to be withdrawn, inspected and re-installed in a matter of hours with the shaft in place



ThorShield Shaft Coating System

- Thordon's tough new modified epoxy coating ThorShield designed to provide integrity against corrosion



Fwd COMPAC Bearing System

- COMPAC bearing in a bearing carrier
- Thordon recommended shaft liner in the way of the bearing



SeaThigor Mechanical Face Seal

- A robust high performance face seal manufactured for long wear life and reduced maintenance costs for water lubricated marine propeller shafts



Thordon Water Quality Package

- A Thordon Water Quality Package delivers a consistent supply of conditioned water to both the fwd seal and all bearings. A separate detailed brochure on the Thordon Water Quality Package is available



"It's pretty clear that the end game will be no discharges allowed at all, and we have bought into a process that is externally audited by Lloyd's Register."

– Al Davies, Director of Operations, Algoma Central Corp., Canada



"Spills always come at times 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 U.S. ports."

– Marijn Berends, Newbuildings Manager, Flinter Management BV, Netherlands



"One anti-pollution measure that has proved its worth is Carnival's choice of Thordon COMPAC water-lubricated propeller shaft bearings which are, in my opinion, one of the best investments any operator can make. As well as eliminating pollution risks, they have proven to be so robust, it's likely they will outlast many of the vessels."

– Chris Joly, Principal Manager, Marine Engineering, Carnival Corp. (U.K.)



"We chose Thordon COMPAC for this vessel because these bearings are environmentally friendly, water lubricated and come with no risk of pollution."

– Captain Simon Merritt, Technical Manager, Carisbrooke Shipping Ltd. (U.K.)



"Having water-lubricated stern tube bearings not only improves a company's environmental credentials but also eliminates the costs associated with maintaining an oil system and associated equipment."

– John McMillan, Technical Director, Beltship Management Ltd. (Monaco)



"The Trillium Class design includes many industry leading efficiency and pollution reduction features. Eliminating any possible source of pollution was given a high priority when designing these vessels."

– Kevin Begley, Director -Project Management, CSL International (U.S.A.)



"We chose Thordon COMPAC for all our newbuildings because of the long experience of these seawater lubricated bearings which present no risk of oil pollution. With the elimination of aft seal maintenance and no oil required, we are expecting considerable cost savings over the life of the vessels."

– Richard Goodwin, Vice President, Engineering, Viking Ocean Cruises (U.K.)



"EPA recommends that all newbuild vessel operators endeavour to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment."

– Section 2.2.9; 2013 Vessel General Permit (VGP) effective Dec. 19, 2013 (U.S.A.)

CUSTOMER FOCUSED TO QUICKLY MEET YOUR NEEDS

Quick and Responsive Service

It takes quality products to be globally successful in the water-lubricated 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 seal and bearing 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 and shaft seal system designs and solutions.

While TG100 seals are designed as a standard product that will virtually bolt into place, global installation technical support is available for those cases where specific application engineering is required.

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 seal and bearing systems.

Your Authorized Thordon Distributor

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