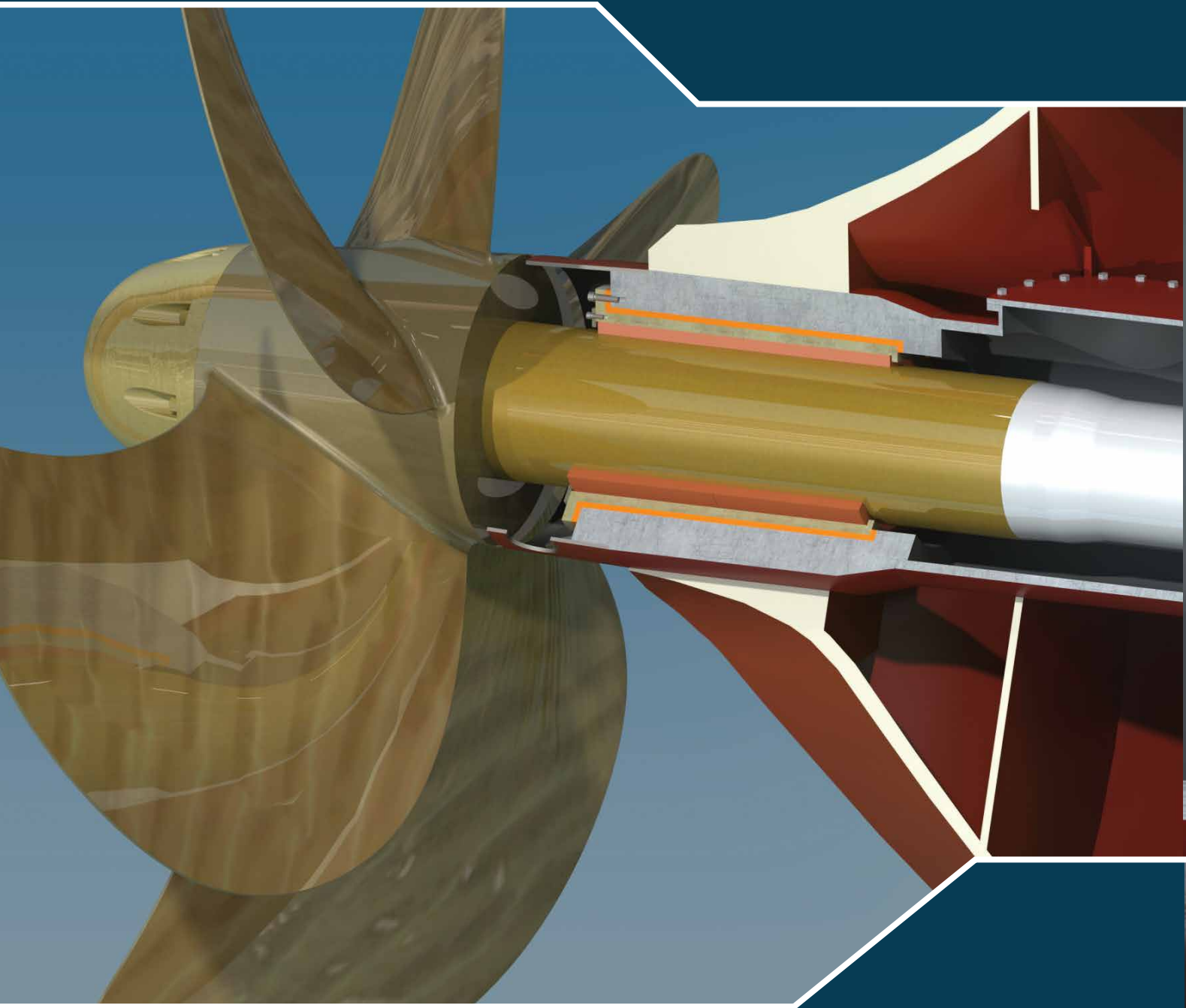
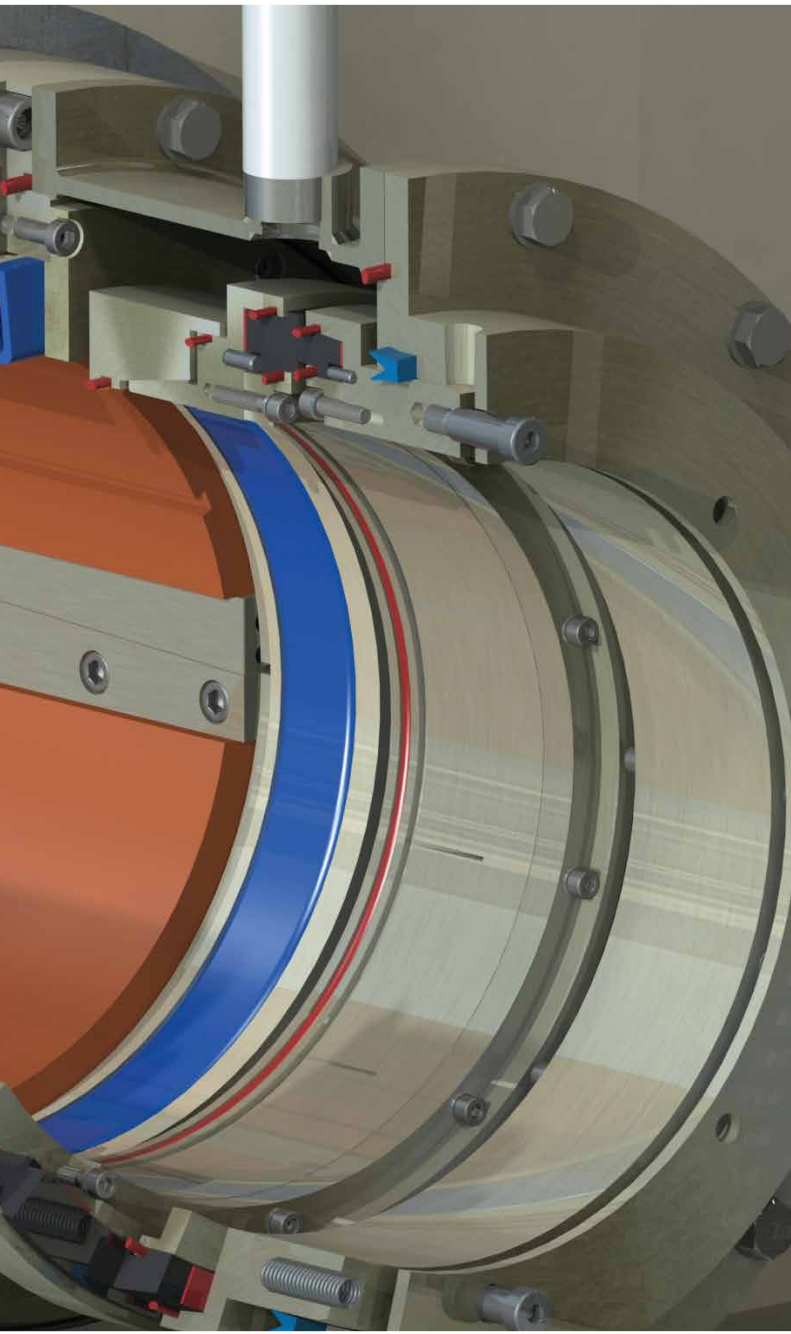


# THORDON

THORDON BEARINGS INC.



**COMPAC SEAWATER LUBRICATED  
PROPELLER SHAFT BEARING SYSTEM**



### **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

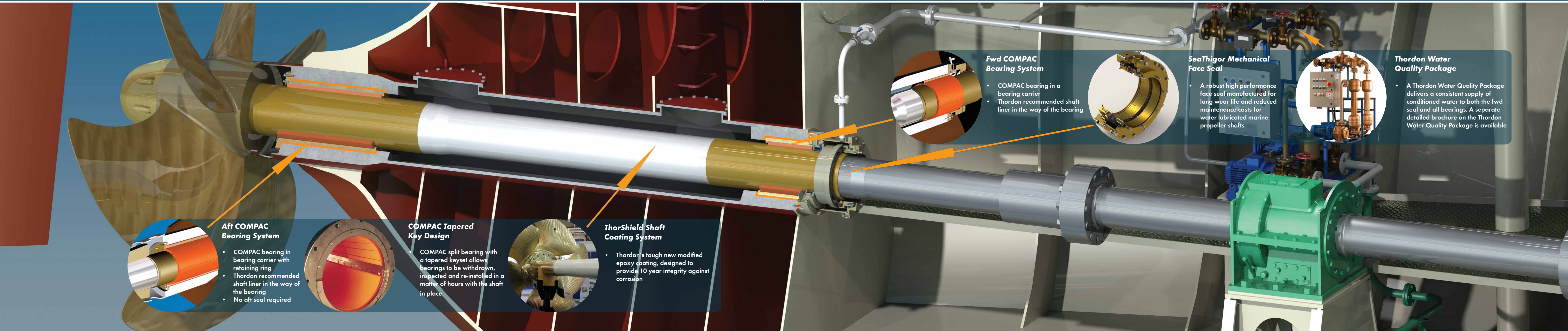
### **Cost Savings**

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**

Recently, both LR and BV 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, designed to provide 10 year 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."

- Martijn 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 of 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 Godwin, Vice President, Engineering, Viking Ocean Cruises (U.K.)



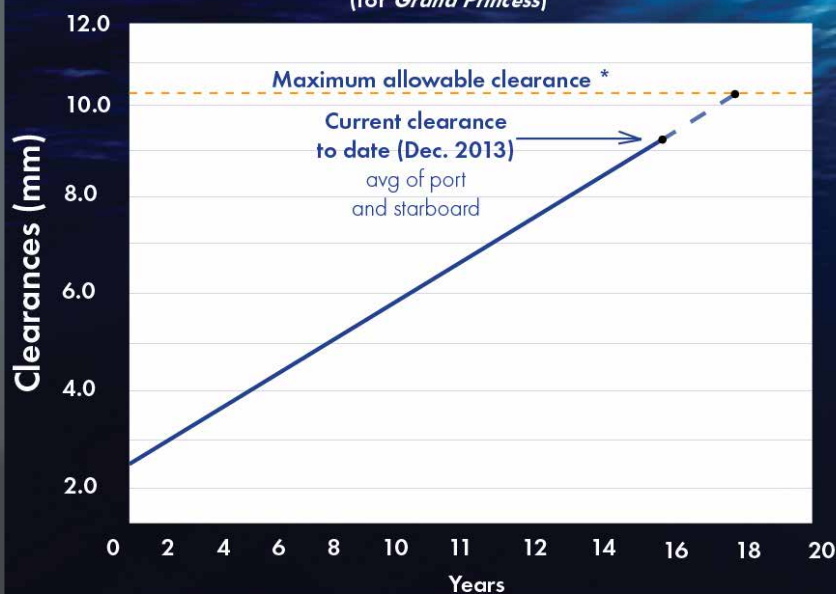
"EPA recommends that all newbuild vessel operators endeavour to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment."

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

# COMPAC For Life

## Thordon COMPAC Seawater Lubricated Propeller Shaft Bearing Clearances

(for *Grand Princess*)



\*Based on classification societies maximum clearance recommendation for 642 mm (25.25'') shafts

### 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 15 year bearing wear life 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.

**GUARANTEED  
FOR 15 YEARS\***

\*The guarantee is subject to prior approval by Thordon Bearings and limited to the supply of replacement bearing(s).

Your Authorized Thordon Distributor

## **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 is geared to responding 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 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**

Thordon Bearings is a family-owned company that manufactures to ISO 9001:2008 Quality System requirements. Contact us for references of our installations.

### **Industry-Leading Service**

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

# THORDON

THORDON BEARINGS INC.

Zero Pollution | High Performance | Bearing & Seal Systems

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