



COMPAC split key design for easy removal and inspection

SEAWATER IS THE **ONLY** COMMERCIALY VIABLE **EAL** FOR PROPELLER SHAFTS

Thordon Bearings Inc., the leading manufacturer of seawater lubricated bearings for the global marine industry, has questioned the rise of so-called environmentally acceptable lubricants (EALs) in oil-based stern tube seals and bearings when the industry can use the most environmentally safe lubricant there is – seawater.

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THE **ONLY** COMMERCIALY VIABLE **EAL** ...continued

The US Environmental Protection Agency is enforcing regulations introduced in December 2013 that stipulate that all vessels over 24 m (78 ft) operating in US waters must switch over to EALs in all oil-to-sea interfaces before their next drydocking. "But what is the point in shipowners investing in costly bio-lubricants when seawater is widely available and 100% free? It's akin to paying for the very air we breathe," said Craig Carter, Thordon Bearings' Director of Marketing and Customer Service.

"When used in conjunction with Thordon Bearings' COMPAC propeller shaft bearing system, seawater lubricates the bearings to ensure the smooth, effective and safe operation of the vessel. Not only do we guarantee our seawater-lubricated COMPAC system for a wear life of fifteen years, but it reduces a shipowner's annual operating and maintenance costs substantially, compared to an EAL-lubricated metal bearing and two seal system," continued Carter.



In its recently published comparative research into the operational costs of using mineral oil, approved EALs or seawater in a propeller shaft bearing system, Thordon Bearings found that EALs – vegetable oils, synthetic esters and polyalkylene glycols – are over

7 times more expensive than the mineral oils typically used in oil-lubricated propeller shaft bearing systems.

"When you take into account that between 130 million to 240 million litres (63.4 million U.S. gallons) of operational oil lubricant are leaked into the oceans each year and need to be replaced, the cost to the shipowner is simply staggering – and this is without adding any monetary penalties incurred by way of environmental fines."

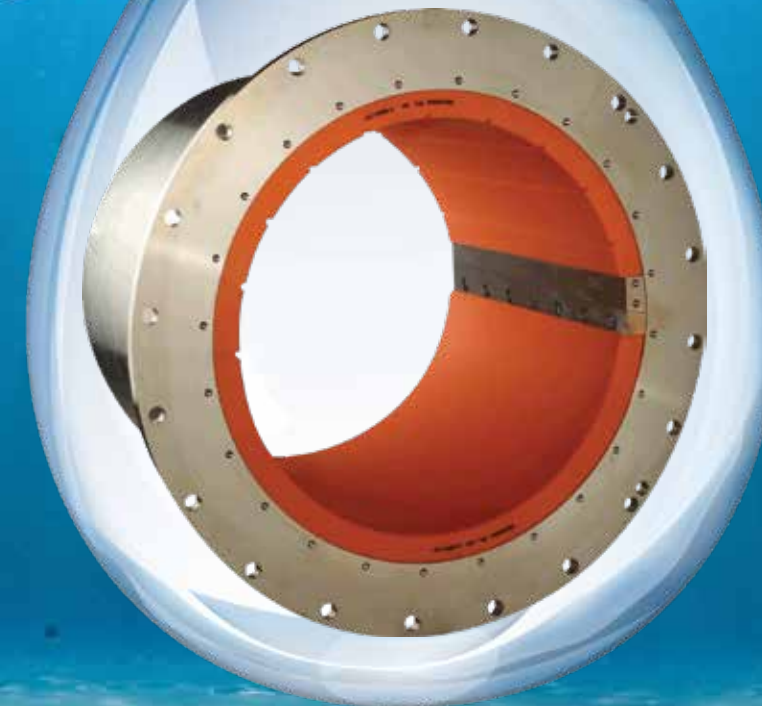
Whilst the need to limit the impact that traditional mineral oil lubricants have on the marine environment is obvious, Carter indicated that some analysts and ship owners have already questioned the performance and reliability of EALs.

In DNV GL's newsletter 12-77, the classification society states that "there are different drawbacks in the way EALs react to the challenges of lubricating machinery." More specifically, biodegradable oils deteriorate when mixed with water, and the inevitable result is that the lubricating capabilities will be adversely affected. Our seawater-lubricated COMPAC system is proven to completely avoid this problem. ○

Mineral Oil <small>(Sealed system requiring FWD and AFT seal)</small>		US\$1.25/L (\$0.33/gal)
Environmentally Acceptable Lubricants (EAL's) <small>(Sealed system requiring FWD and AFT seal)</small>		US\$10.50/L (\$2.77/gal)
Seawater <small>(Open system requiring only FWD seal)</small>		US\$0.00/L

"While strides have been taken by many EAL manufacturers to combat this issue, the technology has certainly been introduced to the market in a hurry and not thoroughly tested, so there are no guarantees about their longevity. Seawater is the ultimate EAL."

JUST ADD WATER... AND WATCH YOUR SAVINGS GROW



Specify a COMPAC Seawater Lubricated Propeller Shaft Bearing System for your newbuild.

- ◆ Seawater is free
- ◆ Lowest operational cost
- ◆ No Aft seal emergencies
- ◆ No oil leakage headaches
- ◆ Guaranteed Compliance



NEW CLASS RULES HAS SOUNDED THE **DEATH KNELL** FOR **OIL-LUBRICATED** PROPELLER SHAFTS, SAYS THORDON

Thordon Bearings has welcomed the introduction of a new classification society notation allowing extended inspection periods for propeller shafts using seawater-lubricated bearings.

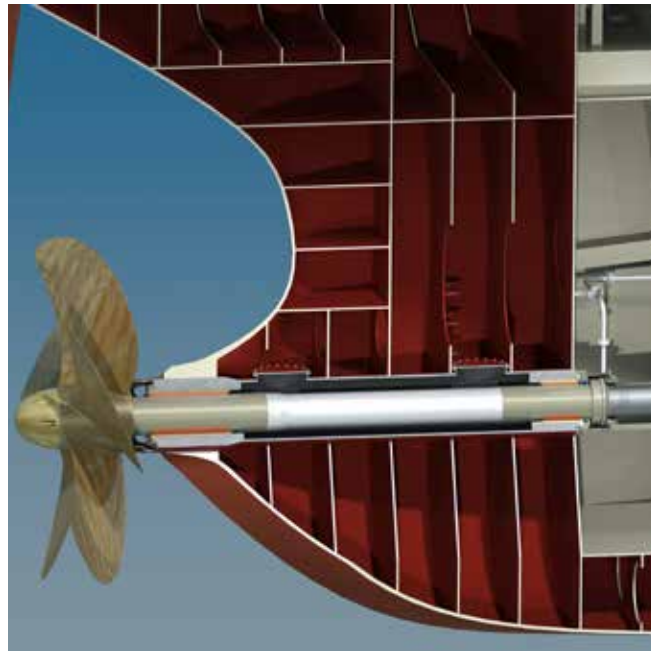


Illustration of a COMPAC Seawater Lubricated Propeller Shaft Bearing System (no aft seal)

DNV GL's new voluntary TMON notation for open loop water lubricated propeller shafts follows similar rule revisions by Lloyd's Register (LR), Bureau Veritas (BV) and the China Classification Society (CCS).

Thordon Bearing's Commercial Director, Andy Edwards, said: "As long as certain condition monitoring criteria are met, DNV GL's new rules mean that propeller shafts operating water-lubricated bearings no longer need to be withdrawn for inspection every five years. There will be no pre-determined intervals between shaft withdrawal surveys."

"The five-year shaft inspection rules previously stipulated in most shaft condition monitoring notations were a major deterrent to the wider take-up of the water lubricated system, but now that the world's leading classification society has revised its rules, we can present a viable and proven alternative and can hear the death knell ringing loudly for oil-lubricated propeller shafts."

The condition-monitoring-based survey process for no withdrawal of the shaft enables operators to consider seawater lubricated systems as a compatible alternative to meeting U.S. Environmental Protection Agency's Vessel General Permit [VGP] requirements.

According to DNV GL, the evolution of its new TMON rule has been facilitated in conjunction with a combination of:

- A continuous focus on developing reliable customer-centric classification products without compromising safety,
- In-house experience from projects, historic data and seamless discussions with the key industry stakeholders,
- Increasing focus and demand on inherently environmentally friendly systems, such as water lubricated systems and;
- Satisfactory availability of technology to support the DNV GL classification philosophy (bearing wear measurements, alternative means of inspection by boroscopes, removable bearing segments, coating quality, etc).

DNV GL recommended in the latest edition of its Technical and Regulatory News bulletin that shipowners consider the condition-based notation for water-lubricated tail shafts at their next dry-docking.

Craig Carter, Thordon Bearings' Head of Marketing and Customer Service, said: "This is a major breakthrough for the fleet-wide conversion back to the environmentally and operationally more efficient water-lubricated propeller shaft bearing. Like LR, CSS and BV's recently revised SCM rules, DNV GL's

new TMON notations are indicative of the significant advancements made in polymer technology and the ability of these seawater-lubricated bearing systems to prevent further environmental damage from operational oil leakage."

Combined, the DNV GL, LR, BV and CCS classed fleets account for more than 40,000 vessels, 95% of which continue to operate with oil-based propeller shaft bearing systems. ☺

10 REASONS TO USE SEAWATER LUBRICATED PROPELLER SHAFT BEARINGS IN YOUR SHIP

- 1** **15 YEAR WARRANTY**
Long, predictable bearing wear life
- 2** **Proven Performance**
over 2,000 ships use water lubricated propeller shaft bearings
- 3** **Water is an EAL**
(Environmentally Acceptable Lubricant) and it is FREE!
- 4** **U.S. EPA recommends**
that all new build vessel operators endeavor to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment
– See U.S. Vessel General Permit (Section 2.2.9)
- 5** **NO aft seal means NO oil leakage** from a damaged aft seal. **NO possibility of pollution & NO fines.**
- 6** **NO risk of expensive shaft seal repairs** that could cost over US\$150,000 per repair
- 7** **NO stern tube oil means NO oil discharges, ZERO impact on seabirds and aquatic life**
- 8** **Survivability**
Polymer bearings non-catastrophic failure mode allows vessels to get back to port **without being towed**
- 9** **Lower Operating Costs:**
NO aft seal maintenance
NO oil
NO disposal of oil
- 10** **Water lubricated propeller shaft bearings** **Technically Equivalent** **Oil lubricated propeller shaft bearings**
Almost all class societies have revised their rules allowing the shaft to remain in place if certain monitoring conditions are met.

THORDON BEARINGS AND DRYDOCKS WORLD **TEAM UP** TO CONVERT SHIPS TO SEAWATER LUBRICATED SHAFT LINES



Mr Mohammed Rizal (left), Chairman of the Board of Drydocks World Dubai and Mr. Terry McGowan (right), President and CEO at Thordon Bearings, sign an agreement that affirms the two companies' efforts to convert ships to seawater lubricated propeller shaft lines from oil.

Thordon Bearings and Drydocks World-Dubai (DDW-D) have signed a milestone agreement under which the UAE-based shipyard will work together with Thordon Bearings Inc. to promote the conversion of ships' oil lubricated propeller shafts to Thordon's COMPAC open seawater lubricated bearing system.

The agreement will create an action plan in which a specialist team, comprised of Drydocks World-Dubai and Thordon Bearings' personnel, offer support to ship managers and owners looking to ensure their vessels are fully compliant with environmental legislation prohibiting the discharge of oil from the oil-to-sea interface of ships' propeller shafts. Shipowners could face substantial financial penalties if their vessels are found to be non-compliant.

Mr Mohammed Rizal, COO of Drydocks World-Dubai, said: "Thordon Bearings is a pioneer in water lubricated propeller shaft bearings, with over 35 years' of experience in this technology. By entering into this partnership, we will not only have an opportunity to expand our service offering, but will also have the opportunity to provide our customers with a real, long-term solution to the environmental problems they face with oil lubricated stern tube bearings and seals.

With concerns increasingly being raised about the impact oil discharges have on the marine environment, converting an oil lubricated system to seawater is the only guaranteed solution for today and tomorrow."

Terry McGowan, President and CEO of Thordon Bearings said: "Drydocks World-Dubai is an internationally renowned shipyard with the capabilities and state-of-the-art facilities required to carry out some of the world's most specialised ship and rig repair, maintenance and conversion projects. Having the advantage of offering comprehensive, engineered solutions in partnership with an experienced bearing manufacturer, will help further strengthen Drydock World's position as one of the world's leading shiprepair yards."

Leaking shaft seals are known to be a significant contributor to on-going pollution at sea. The use of biodegradable lubricants, which are an improvement over mineral oils, are still a very expensive option for shipowners and some shipowners are experiencing seal compatibility issues. Even biodegradable lubricants still need to be reported to authorities when discharges occur. Thordon provides a solution that uses seawater as the lubricant that meets all regulations, eliminating any risk of oil pollution.

"Seawater lubricated propeller shaft bearing systems are less complicated and time-consuming

to install than oil lubricated systems, providing clear commercial advantages for Drydocks World-Dubai and its customers," said McGowan. "There are fewer components, fewer pipe-runs and no air equipment is required with a seawater lubricated system. Plus, with recent class society rule changes, seawater lubricated propeller shaft bearing systems no longer have predetermined shaft withdrawal as long as certain monitoring conditions are met."

He added: "This new partnership agreement provides a win-win situation for both parties. DDW-D will stand to benefit from having new customers and a new revenue stream with oil-to-water conversions, while Thordon Bearings will benefit from supplying the COMPAC seawater lubricated bearing equipment for upcoming conversion projects."

Under the terms of the agreement, Thordon Bearings will also provide equipment, training and guidance to Drydocks World-Dubai personnel and support the yard in carrying out propeller shaft conversion projects to the "highest standards and in the most efficient and cost effective manner".



photo credit: www.drydocks.gov.ae

TROPICAL SHIPPING NEWBUILDS OPT FOR **THORDON SEAWATER LUBRICATED PROPELLER SHAFT PACKAGE**



Thordon Bearings' Jacksonville, Florida-based Distributor, Coppedge Marine, has secured an order with Tropical Shipping for the award-winning COMPAC seawater lubricated propeller shaft bearing system.

The COMPAC systems destined for two 300TEU environmentally-compliant box ships under construction in China, at the Guangzhou Huangpu Wenchong Shipyard, will represent a first reference for COMPAC with this shipowner.

"Tropical Shipping is a long-standing customer to whom we have supplied various Thordon equipment over the years," said Ed Coppedge, Managing Director, Coppedge Marine. "We have often discussed the benefits of seawater lubricated propeller shaft systems with the shipowner so are delighted that we can now add the COMPAC system to our scope of supply.

"A key factor in us winning the order was being able

to offer a proven, reliable system capable of meeting the U.S. EPA's Vessel General Permit Rules. When these new reefer containerships join Tropical's fleet in June 2018, they will operate in US waters between Florida, the Bahamas and the Caribbean."

Erwin Holder, General Manager Vessel Construction, Tropical Shipping said: "We have an established relationship with Coppedge, which has supplied Thordon rudder bearings to a number of vessels in the Tropical fleet. Our experience with these bearings and the confidence we have in Thordon systems, in general, meant COMPAC was a no brainer for us. These new 300-TEU vessels will have a raft of equipment designed to protect the environment, so COMPAC fits well with our environmental sustainability goals. A seawater lubricated propeller shaft bearing installation means there will be zero risk of these vessels leaking oil into the sea."

In addition to the COMPAC polymer bearings, the Tropical Shipping package includes Thordon's Inconel®-equivalent shaft liners, Thor-Shield shaft coating system, Thordon Water Quality Packages and a bearing wear down poker gauge assembly.

"We were very involved in the specification to ensure that we were able to offer Thordon's 15-year bearing wear life guarantee, which was an important requirement for the owner," said Coppedge. "To offer this, Thordon has to take the lead on the shaft installation to ensure it is properly protected and that the water flowing to the bearings is of sufficient quality."

In concert with Coppedge, Thordon's Chinese distributor, CY Engineering, will work with the shipyard to ensure the system is installed correctly and optimise the solution to meet Thordon's 15-year wear life guarantee requirements.

Sam Williams, Thordon Bearings' Regional Manager, Eastern Asia", said: "Orders such as this, require close cooperation between our Florida distributor looking

after the shipowner and our Chinese distributor working with the shipbuilder. When we receive new orders, we approach both parties and work to achieve a preference on the part of the owner, and a commercial/technical agreement with the yard. This can be a process which goes through many iterations, depending on the owner's involvement and on the preferences of the shipyard.

In this case, CY Engineering will be responsible for all detailed technical/engineering work with the shipyard and supervise the installation and commissioning processes. CY is also the contract partner for Thordon and will supply all Thordon deliverables for the project"

The Guangzhou Huangpu Wenchong Shipyard will also build four 1100TEU containerships. These four vessels will all feature Thordon's COMPAC seawater lubricated shaft bearing arrangement, and will be powered by a MAN B&W 6S60ME-C8.5 main engine driving a five-bladed VBS1550-5 Mk5 CP propeller.

Tropical Shipping's new vessels will form part of a wider fleet expansion programme designed to improve service levels between West Palm Beach, Florida and Halifax, Canada, as well as the Bahamas and the Caribbean. ○



Representing Thordon's authorized Distributor in China, Mr. Gordon Lei, CY Engineering Service Engineer and Mr. Erwin Holder, Tropical's Manager of Vessel Construction oversee COMPAC installation at Guangzhou Huangpu Wenchong Shipyard, China.

THORDON'S SEATHIGOR SEAL DELIVERS NEW LEVEL OF REDUNDANCY FOR COMPAC

Thordon Bearings has unveiled what is potentially the marine industry's safest, most robust shaft seal as part of a programme of enhancements underway to optimise its award-winning COMPAC seawater lubricated propeller shaft bearing system.

Thordon recently launched its new SeaThigor forward seal – designed to offer high quality, low leakage, long life and minimum maintenance. Its outstanding technical features raise the bar in dynamic and static seal design, with an unmatched performance of the primary dynamic seal, and an ingenious secondary seal module that provides a Safe-Return-To-Port capability in the event of a face failure of the primary seal.

After several years of development and testing, the new SeaThigor safety seal design incorporates a pneumatically activated inflatable element to stop water ingress along the shaft, allowing for the repair of the main seal whilst at sea, or allows for the shaft to turn at a lower speed so the vessel can safely return to port for primary seal repair or replacement.

Providing a new level of redundancy to single screw or mission-critical vessels operating seawater-lubricated propeller shafts, SeaThigor can function as both a dynamic and static seal to provide water-tight integrity around a shaft, while allowing the propeller shaft to rotate in both directions across a range of shaft speeds.

Typically mounted on a rear bulkhead or stern tube flange, the modular design incorporates two wear-resistant silicon carbide seal faces that contact each other to provide primary static and dynamic sealing.

The seal is designed with an enclosed housing protecting the rotor components, so no moving parts are exposed, resulting in installation simplicity and requiring minimal maintenance. Its "all-metal" construction made of marine-grade bronze also guarantees corrosion resistance for life.


"The SeaThigor abrasion resistant sealing faces achieve dynamic sealing with leak and maintenance free operation," said Andy Edwards, Thordon Bearings' Commercial Director. "If there was ever a true fit-and-forget system, then SeaThigor is it."

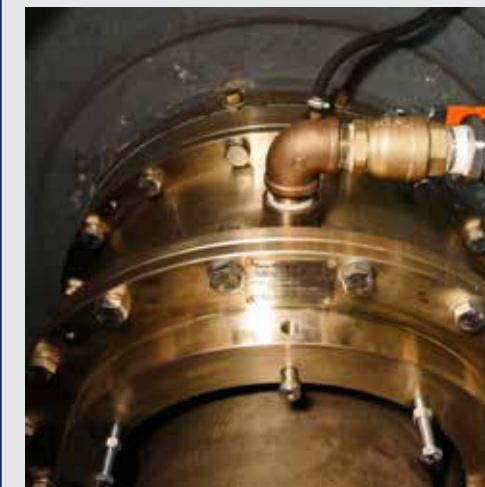
Suitable for 300 mm (11.8") to 750 mm (29.5") diameter water-lubricated propeller shafts, the seal features a series of precision compression springs that are unaffected by water temperatures, pressure or draught. These springs are used to linearly load the seal faces, ensuring that the pressure is equally distributed to the entire contact surface.

Unlike other water-lubricated stern tube seals which adopt an "inside pressurised" design, the SeaThigor is designed to operate with a hydraulically-balanced, outside pressure to better withstand higher water drafts and pressure variability in rough seas. This "outside pressurisation" design also counters the natural outflow direction through the rotating seal face, further reducing leakage.

Since both the static and safety sealing elements use Thordon's proprietary elastomer technology, shelf life concerns are allayed with a much longer service life than traditional rubber seals.

This was affirmed during Lloyd's Register Type Approval trials last year when two 443 mm (17.44") shaft diameter SeaThigor seals were tested simultaneously on the Thordon Marine Seal Test Rig, in Burlington, Canada. After extensive testing, the Safe-Return-To-Port emergency seal showed no sign of wear after 15 days of use. SeaThigor received LR and DNV GL Type Approval last summer.

"Thordon Bearings installed the SeaThigor on two ships in 2017. We are seeing a resurgence of interest in seawater lubricated propeller shaft bearing systems and the SeaThigor is an important part of this. Market interest so far has been beyond expectation, with a number of commercial ship operators making tentative enquiries," said Edwards. 



SeaThigor provides a new level of redundancy for operators of seawater-lubricated propeller shafts

SeaThigor Principal Particulars:

- Shaft diameter size: 300 mm to 750 mm (11.8" to 29.5")
- Primary sealing faces: Silicon Carbide
- Quiet operation (no vibration)
- No visible leakage
- High Water pressure: rated to 2 Bar / 30 psi (0.2MPa)
- High Shaft Surface speeds: up to 10 m/s (32.8 ft/s)
- Axial shaft movement: +/- 10 mm (+/- 3/8")
- Radial shaft movement: +/- 5 mm (+/- 1/5")
- Fully tested in Thordon Laboratory
- LR and DNV GL Type Approval

RIVERTOUGH CONVERSION SEES IMPALA OPERATIONS UNAFFECTED BY EL NIÑO RIVER LEVELS

Thordon Bearings has successfully completed the oil to water-lubricated tailshaft bearing conversions of the first four of 15 Impala Terminals Colombia-operated tug/tow boats.

Impala Zambrano, the first of 15 triple-screw and twin-screw pusher boats scheduled for oil-to-water conversion, was retrofitted in July 2015 with a Thordon RiverTough bearing and TG100 shaft seal combination.

Three triple-screw and one twin-screw pusher vessels have since been converted and Thordon's Colombian distributor Delta Marine and River Services will now work on the next vessels in the series. All 15 tug/towboats are scheduled for conversion by the end of 2018.

Axel Swanson, Thordon Bearings' Business Development Manager, explained the reason behind Impala's decision to convert to an open water tailshaft bearing system. "Impala's boats operate on

Colombia's highly abrasive Magdalena River but its existing oil-lubricated tailshaft bearing system was problematic: water ingress through the aft seal was resulting in the complete seizure of the tailshaft bearing. With El Niño approaching, the operator couldn't risk further damage to the vessel in shallow silty rivers."

The low level of water in Colombia's waterways, an effect of the drought caused by the El Niño weather phenomenon, is a major concern for Latin American owners of workboats operating on the region's rivers.

Jorge Luis Vélez, Manager, Delta Marine and River Services, said: "By far the biggest problem with the original oil-lubricated system was the small 4mm (0.157") clearance between the propeller and Kort nozzles. When silt or sand lodged between them, it prevented the circulation of lubricating oil, resulting in increased friction and high bearing temperatures. Ultimately it was destroying the bronze bearing, potentially causing catastrophic damage to the shaft.

"Since the retrofit, the RiverTough bearings and TG100 seals have been operating very successfully. The vessel has been operating in rivers with very low water levels with high sand and silt content but the Thordon Bearings' system has proven itself. We recently checked the bearing clearance as well as the whole system and all the components are in perfect working condition."

Swanson added: "We completed the *Zambrano* conversion just prior to the El Niño climate cycle, but the vessel was able to operate at shallow draught without detriment to the RiverTough bearings and TG100 seals. It would have been very difficult for the vessel to operate an oil-lubricated bearing system in these harsh, low draught conditions without enduring substantial bearing wear, at the very least."

The success of that first conversion resulted in Impala Terminals Colombia contracting Delta Marine and River Services for RiverTough/TG100 retrofits to a further fourteen Magdalena-operating vessels.

"This is a substantial order for Thordon Bearings, covering 38 shaft lines in all," said Vélez. "While

the ability of the Thordon system to negate vessel downtime was a key factor, so too were the reduced life-cycle costs associated with a water-lubricated tailshaft bearing arrangement. Since no aft seal is required – the component of an oil-based system most prone to failure – emergency drydocking and repair costs have been removed, as has the need for lubricating oil."

Andy Edwards, Commercial Director, Thordon Bearings, added: "We hear operators with traditional oil-lubricated bearing systems having to replace them every two years or so due to excessive wear, which is completely unnecessary. Data from vessels operating Thordon's RiverTough bearings show typical wear rates of 0.075mm to 0.100mm (0.003" to 0.004") in 6000 to 7000 hours of annual use. They routinely outlast rubber bearings by a factor of two or more."

Delta Marine has begun retrofitting RiverTough bearings and TG100 seals to the remaining vessels, each of which will require bearings and seals for shaft diameters ranging from 165mm (6.5") to 186mm (7.3").



Installation of Thordon Bearings' RiverTough bearing to *Impala Zambrano*



The Delta Marine and River and Thordon Service technicians installing a Thordon TG100 seal on the *Impala Zambrano*

DECK MACHINERY MUST BE ASSESSED FOR **POLAR COMPATIBILITY**, ADVISES THORDON BEARINGS



Thordon's ThorPlas-Blue range of grease-free polymer bearings can operate in temperatures as low as -50°C (-58°F)

With the Polar Code now in effect, Thordon Bearings has urged shipowners and managers to verify that their vessels' deck machinery and systems can operate safely in the extreme temperatures encountered in Arctic and Antarctic seas.

Scott Groves, Thordon Bearings' Regional Manager – Americas, said: "Conventional bronze bearings commonly found in everything from fairleads and lifeboat davits to winches and hoists require frequent maintenance and grease lubrication to ensure machinery is operationally effective. While most lubricating greases can tolerate temperatures down to -10°C (14°F), ship operators must be aware that temperatures below this can severely affect viscosity and performance, potentially resulting in the failure of critical equipment."

He added: "The length of time crew members will be able to spend on deck to carry out regular maintenance and greasing will inevitably be limited, due to cold temperatures and the potential for

frostbite. Another problem is the grease itself, which could pose a threat to the surrounding environment.


"Conventional oils and greases, even so-called environmentally acceptable lubricants, are not biodegradable in extreme temperatures where there may be little sunlight and could irrevocably damage the sensitive ecology of these areas," he said. The high cost of biodegradable lubricants is also an issue for shipowners.

Craig Carter, Thordon Bearings' Head of Marketing and Customer Service, said: "The Polar Code prohibits the discharge into Arctic waters of any oil, oily mixture and noxious substance, so any system that can negate their use completely without detriment to the performance of machinery has to be considered if shipowners are to comply.

Our ThorPlas-Blue range of polymer bearings is capable of operating in temperatures down to -50°C (-58°F) in dry conditions and -10°C (14°F) in water. There is no need for grease as they are completely self-lubricating so there is zero risk of grease polluting these ecologically sensitive areas.

Aside from the environmental benefits, costs associated with the purchase, storage, application and disposal of this potential pollutant are reduced, as is any non-budgeted expenditure resulting from bearing seizure, such as replacing expensive rope or cables," continued Carter.

Capable of operating pressures to 45MPa (6,527 psi), ThorPlas-Blue can be easily back-fitted into virtually all applications where greased bronze is currently installed.

The International Code for Ships Operating in Polar Waters, entered into force on 1 January 2017 for ships built after that date and covers all safety and structural aspects relevant to navigation in waters surrounding the two poles – including pollution prevention. It will apply to all ships from January 2018. 

THORDON COMPOSITE CUTTERHEAD SHAFT BEARING AS GOOD AS NEW **AFTER TEN YEARS OF DREDGING**

After ten years and more than 100,000 operating hours dredging up silt, sand, rocks and stones in some of the toughest marine environments imaginable, the Thordon Composite bearing installed on the *Al Mirfa's* dredge cutter head shaft has emerged unscathed.

In drydock where the NMDC-owned dredger is being upgraded, Thordon Bearings' Dubai-based distributor, Ocean Power International, expected that even the 'unbreakable' might need replacing after such demanding workloads, but it didn't. "The Composite bearing was still in perfect working condition," said Rafid Qureshi, Managing Director, Ocean Power International Inc.

Sam Williams, Thordon Bearings' Regional Manager, said: "The water-lubricated Composite bearing was installed in 2007 to the Royal IHC-built vessel, a 97 m heavy duty cutter suction dredger. These dredgers operate in some very tough environments, which require a tough, durable bearing capable of withstanding the excessive wear and tear encountered during dredging operations. These vessel types place inordinately high loads on the cutter shaft bearing which, in the past, often resulted in the replacement of traditional greased bronze and rubber bearings every six to eight months. That the Thordon solution didn't need replacing after ten years of heavy duty service is indicative of the durability and robustness of the materials we use in all our polymer bearings."

Composite bearing wear rates in the abrasive conditions most dredgers operate are typically half that of rubber bearings, reducing maintenance downtime over the life of the vessel. But performance



Composite Cutterhead Shaft Bearing installed 2007 to the Royal IHC-built dredger *Al Mirfa*

was not the only reason why the dredging sector has moved away from traditional bearing materials.

"With the emergence of more stringent environmental regulations in the late 1990s most dredgers are now fitted with water-lubricated cutter shaft bearings, said Williams. "Dredgers have to operate in some very ecologically sensitive environments and owners cannot risk polluting seas and sediments with grease and oil. For dredger owners, a water-lubricated cutter shaft bearing is often a key factor in being awarded these sensitive area projects."


continued... on back

CUTTERHEAD GOOD AS NEW ...continued

Craig Carter, Director of Marketing and Customer Service, Thordon Bearings, said: "Since their market introduction in the 1970s, the Thordon Composite bearing has consistently outperformed rubber in dredge cutterhead bearing applications."

The actual bearing surface is a black homogeneous material called GM2401 which is fused to a stiff, high strength polymer sleeve to provide unprecedented performance and environmental safety.

They are available for a wide range of shaft diameters in both tube and stave configuration.

Upgrade work includes the installation of the latest versions of the IHC Dredge Profile Monitor and Automatic Cutter Controller along with the installation of a dredge fleet monitoring system. NMDC opted to install the most recent versions of these automation systems to ensure its vessels are fully up-to-date and to enhance the efficiency of its operations.. 



Al Mirfa Dredger built in 2007

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