Water Lubricated Stern Tube Solutions
Seawater is the oldest lubrication for propeller shaft stern tube systems and has been a core part of the marine industry for over a hundred years. Water lubrication was first challenged by oil systems in 1886 and by the 1940s, oil lubrication became the standard. The only exception to this were naval vessels.

The sole reason behind selecting oil instead of water as a lubrication solution was discovered in the late 1880s, as it was noted that oil had better capability of protecting the bearings and the shaft from breaking, as well as shielding the shaft from corrosion with the use of an oil bath.

However, Wärtsilä has provided an innovative solution with its current water lubrication systems. These offer equal, or better-quality services, for protecting the shaft when compared to oil lubrication options. At the same time, they answer the need for an environmentally sound, reliable solution for lubrication.

With over 100 years’ experience in our seals and bearings business and over 60 years in the water lubrication market, Wärtsilä has a long marine engineering history with a global customer base. When it comes to water lubricated solutions, Wärtsilä has a proven track record, along with a portfolio of high-quality products and a global support network, enabling us to provide reliable, flexible and excellent solutions to customers worldwide.

Our oil-free offering is fully compliant with the requirements of the 2013 US EPA Vessel General Permit. The installation of Wärtsilä’s open water package removes all risk of pollution, particularly for vessels operating in environmentally sensitive areas. It reduces lifecycle cost by extending the operational life of the seals and bearings. Whatever the environment, our water lubricated solutions ensure consistent operation of all vessel types.

Why go water lubricated?

Wärtsilä water lubricated solutions provide a zero risk of operational oil leakage, meaning vessels are compliant with all environmental regulations. There is no need to buy oil for oil lubricated stern tubes, enabling you to invest in an environmentally sound solution which complements legislation.

Water lubrication offers a wide range of benefits and is set to be the future of stern tube solutions.
**Wärtsilä Enviroguard MG4**

To ensure low lifecycle costs for larger vessel types, Wärtsilä has specially developed the next range of the Wärtsilä Enviroguard series – the Wärtsilä Enviroguard MG4. The seal incorporates high wear resistant interface materials, corrosion resistant metal components and flexible rubber bellows. The excellent design and the use of high build quality ensures that your vessel runs smoothly even in the most challenging environments.

**Wärtsilä Worksafe PSE**

The Wärtsilä Worksafe PSE is a water lubricated, environmentally friendly inboard sealing solution which is suitable for both blue-water and abrasive water conditions. The product is available in both metallic and composite material options. The seal increases reliability for smaller vessel types such as: workboats, fishing vessels, motorised barges and super yachts, regardless of where you operate.

The Wärtsilä Enviroguard PSE has a long track record of outstanding performance in all water conditions. Partially and fully split options are available for ease of maintenance and seal replacement. Composite materials also offer easy maintenance and benefit from reduced weight for ease of handling and durability.

**An unmatched portfolio**

**Your global partners in engineering lifecycle solutions**

Wärtsilä’s products and services support you by maximising efficiency and minimising operational risks at the lowest lifecycle cost. Our water lubricated solution portfolio is designed to ensure smooth and continuous operation of all types of vessels, even in the most challenging environments. Whatever the requirement, Wärtsilä can provide a solution.

**PRODUCTS, SERVICES AND PACKAGES**

- Complete water lubricated packages
- Oil to water stern tube conversions
- Measurement and alignment services
- Underwater engineering seal repair maintenance
- Stem tubes and stem tube seals and bearings
- Water quality system (WQS)
- Ropeguard and a cutter system
- Fully split construction for seal
- Hydraulic couplings
- Environmentally friendly, pollution free, water lubricated seal
- Partially and fully split options available
- Available in both metallic and composite materials
- Ice class option available
- Retrofit and service in dry dock without shaft removal
- Suitable for both blue and brown water applications
- High abrasion resistance
- Split replaceable components available in service kits
- No shaft or sleeve wear
- Tailored designs to suit specific needs
- Shaft sizes from Ø 70 to Ø 1040mm
- Shaft sizes Ø 320 to Ø 1140 mm
- Partially and fully split options available
- Fully split version available
- Capable of working in harsh conditions
- Low spare part usage
- Proven reliability for long service
- Minimal fluid consumption and treatment costs.

The Wärtsilä Worksafe is suitable for slightly smaller shaft sizes, Ø70 to Ø320 mm. The Wärtsilä Worksafe is an outboard seal for closed loop water lubricated systems.

- Supports FPP and CPP systems
- Vibration-tolerant
- High resistance to abrasive conditions
- Partially split outboard seal.

**Wärtsilä Enviroguard MG4 outboard**

**Wärtsilä Worksafe PSE outboard**

**Who should consider a conversion?**

A conversion can be the right choice for any size of vessel, from superyacht to cruise ship. We can provide a costed proposal for conversion and assist with a lifecycle cost analysis for your vessel.

**Iceguard inboard**

**Iceguard face type seals are suitable for stern tubes operating in vessels with enclosed water lubricated stern tube systems. Typical applications include vessels operating in Arctic conditions or in environmentally sensitive areas. The seal is able to accommodate large axial and radial movements, while performance is unaffected by high frequency vibration.**

Different solutions for closed loop systems can be supplied dependent to your requirements. Our engineering team will find a solution which fits for your vessel.
Wärtsilä water quality systems

Wärtsilä water quality systems provide conditioned water for both open and closed lubricated stern tube systems. Our systems increase the life of seals and bearings products by filtering the water supply to required standards. A range of filtered supply systems are available. A control panel oversees the safe operation and full monitoring of the system.

- Dual pumps for redundancy in the event of duty pump failure
- Full monitoring control panel
- Cyclonic system automatically discharges particulate debris
- Increased longevity of seals and bearings.

Wärtsilä JetGuard

The Wärtsilä Jetguard range consists of water lubricated face type sealing solutions, specifically designed for waterjet input shafts. Available in both metallic and composite materials. This seal has been developed for demanding operating conditions, such as the high speeds and varying pressures typically seen on waterjets.

- Commercial and military options available
- Partially and fully split options
- Maintenance and seal replacement without shaft removal
- Maintenance without dewatering through inflatable seal
- Corrosion free composite materials available
- Shaft sizes from Ø 110 to Ø 410 mm

Wärtsilä Floodguard

The Wärtsilä Floodguard is a water lubricated face type seal suitable for both standard and high speed vessel solutions. If the vessel experiences a flooded compartment, the self-activating Floodguard seal ensures that vessel integrity is maintained, allowing continued passage to dock. The seal has a long track record of performance in both military and commercial applications.

- Maintenance and replacement without shaft removal due to fully split design
- Variety of materials and configurations available
- Accommodates high axial and radial movement
- Long life expectancy
- Shock resistance
- Approved by major Classification Societies
- Shaft sizes from Ø 50 to Ø 680 mm

Wärtsilä Envirosafe

The Wärtsilä Envirosafe bearing is the culmination of years of research, development and collaboration with yards and owners around the world to develop a superior composite bearing material for the marine industry.

The Wärtsilä Envirosafe range can be supplied for all water lubricated propeller shaft bearing applications, from open brackets to stern tubes. Split bearings can be supplied in a housing, or fitted directly into the stern tubes or brackets. This allows easy bearing replacement or system inspection with the shaft remaining in situ, providing cost efficient servicing.

- Environmentally friendly, pollution free, water lubricated bearing system
- Market leading wear resistance that gives long life expectancy
- Low speed hydrodynamic operation increases the lifecycle efficiency of propulsion
- Low friction, giving low wear and long life
- High abrasion resistance and low noise generation
- Low swell rate and thermally stable, equally suitable for icebreaker and tropical use
- Increased longevity of seals and bearings.

Water lubricated stern tube solutions

Wärtsilä stern tube solutions are packaged and ready to install. They can be custom designed to fit specific vessels, meeting individual customer requirements and specifications. The installation and alignment is a simple procedure when compared to older traditional methods, allowing for significant reduction in installation time and resources.

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Tail shafts, shaft journals and shaft coatings

Wärtsilä can supply complete tail shafts with shaft journals and industry leading shaft corrosion protection. Alternatively, shaft journals and coatings are available separately, along with on-site installation support.

- Readily available (stock billets)
- Suitable for both blue and brown water applications
- Future proof – fully compliant with the 2013 US EPA Vessel General Permit rules
- Approved by all major Classification Societies
- Shaft sizes from Ø 70 to Ø 1100 mm
- Wärtsilä offers a 25 year extended warranty on new build Wärtsilä Envirosafe composite stern tube bearings in Class Approved vessels.*

*Applicable when sold as part of a package.
Terms and conditions apply.
Wärtsilä thrust bearings

Wärtsilä thrust bearings are single collar, self-aligning thrust bearings. They are designed with two faces of titling pads on pivots. The standard is for axial loads only, but axial and radial loading options are available on request. The oil circulating and cooling system is available either as a self-lubricating system with integrated cooler, or as an external pump and cooler unit. Fitted with complete remote monitoring of the temperature and oil flow, the thrust veering solutions enable easy management of the product.

- Wide range of sizes
- Self-aligned thrust pads
- Split bearing allows easy serviceability.

Intermediate shaftline bearings

The Wärtsilä LineSafe bearing is an evolutionary design, which has been developed to combine the fundamentals from the existing shaft line bearing range into one simple design that meets the market needs of today and the future. The Wärtsilä LineSafe bearing offers a simplified design with a reduced number of stock parts. It can flexibly meet the demands of any customer with improved response times.

- Easier installation and alignment
- Higher radial load capacity
- Global spares and service availability
- Flexibility within the standard configuration
- Ability to compensate against higher angular misalignments.

High friction couplings

The new generation of hydraulic couplings have been created to provide solutions in areas where previously it has been impossible to ensure the maximum propulsion efficiency. This has been achieved without changing the simplicity of the shaft connection method.

Wärtsilä high friction hydraulic couplings provide a simple and quick method to connect shafts, eliminating the need for keyways, tapers or thrust rings. This can increase the torque transmission capacity, which can produce substantial shaft-line cost savings.

- Allows installations between and to a cylindrical shaft end
- Reduced coupling dimensions with higher torque transmission capacity
- Equipped with a sealing system
- No supporting ring required between connected shafts in coupling installation
- Clean, quick and trouble free process
- Hydraulic pressure avoids any damage between the contacting surfaces, resulting in reduced surface contact pressure.
Wärtsilä has an unequalled network of sales and engineering offices around the world, offering technical support 24 hours a day, 7 days a week. Our team of service engineers are available to assist on-site with all Seals & Bearings installations and repairs.

With its R&D activities, Wärtsilä Seals & Bearings continues to strengthen our position as a technology leader. In delivering advanced new products and services with an emphasis on reliability, flexibility and lifecycle efficiency, our competitive edge in the global marine and energy markets is constantly being enhanced. Product excellence is supported by high quality to ISO9001:2015, efficient manufacturing practices to OHSAS 18001, as well as adhering to the ISO14001:2015 environmental standard. Testing of all products is extensive and exceeds the required stipulations. Our strong track record in producing innovative, efficient, and environmentally sound solutions is backed by a focus on digitalisation to create maximum customer value.

**Wärtsilä Sea-Master system**

The Wärtsilä Sea-Master system is a platform that is transforming tail shaft asset management. With on-board and remote digital monitoring of tail shaft system performance, it delivers unprecedented levels of data. This all comes with a range of support and consultancy services that help you make informed decisions to optimise operations.

This revolutionary platform also enables you to meet the environmental legislations of today and tomorrow, extending the maintenance intervals for water lubricated systems. This results in a lower cost of ownership, enhanced performance and greater control. Combinations are available for installed, new build and retrofit applications.

**Delivering above expectations**

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**Wärtsilä bearing wear down gauge system**

The Wärtsilä bearing wear down gauge system remotely indicates the wear of stern tube or bracket bearings in water lubricated shaft lines, by measuring the drop of the propeller shaft.

The measurements are taken by a proximity sensor located in a fully potted submersive enclosure, which is mounted on the stern tube or bracket bearing keeper ring. The bearing wear down system can be fitted to both new build vessels and retrofitted to existing vessels with water lubricated shaft lines.

**Wärtsilä alignment and measurement services**

**Wärtsilä underwater services**

**Wärtsilä field services**
Green Award certifies ships that are ultra-clean and ultra-safe. Ships with a Green Award certificate secure various fiscal and non-fiscal advantages. By fulfilling high safety and environmental standards in shipping, the Green Award makes the highest standards of ship operation economically more attractive. Wärtsilä is an incentive provider for the Green Award. Our water lubricated offering has the Green Award stamp of approval and ensures your vessels shaftline will be compliant with the regulations of this governing body. Guaranteeing that your vessel qualifies for all of the benefits of being a part of the Green Award organisation.

**Wärtsilä's total lifecycle solutions**

Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. By emphasising technological innovation and total efficiency, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers.

[www.wartsila.com](http://www.wartsila.com)