

Wärtsilä Sternguard in-water serviceable seal

**Minimise downtime, reduce costs
and meet environmental regulations**

PRODUCT DATASHEET



Our fully underwater serviceable seal is ideal for vessels in any sector, including commercial, cruise and ferry, merchant and in-land waterway vessels, helping to reduce downtime and lower costs.

EXPERIENCE LEADS TO EXCELLENCE

Wärtsilä Shaft Line Solutions have been performing in-water service since 1998 and continue to provide services and products that are designed to last. Since performing overhauls and retrofits underwater in wet conditions, not only have we completed hundreds of jobs using our expert engineers, but we also have enhanced the Wärtsilä Sternguard in-water serviceable seal, fit for a wide range of areas including merchant, offshore and cruise and ferry vessels.

EASY INSTALLATION, MINIMAL DOWNTIME

As the Wärtsilä Sternguard in-water serviceable seal does not need to be installed during dry docking nor is there a need for shaft withdrawal, it means you can benefit from reduced costs and minimal downtime. It is not necessary to drain the stern tube oil, unload cargo or dry dock – it can be all done underwater by our diving engineers.

Sealing solutions designed for you

We know it's important that you can get the right part at the right time. That's why our Wärtsilä Sternguard in-water serviceable seal:

- can be fully installed or serviced whether you're in dry dock or in-situ;
- comes either fully split or partially split to fit your requirements and;
- reduces risks, minimises downtime and lowers costs.

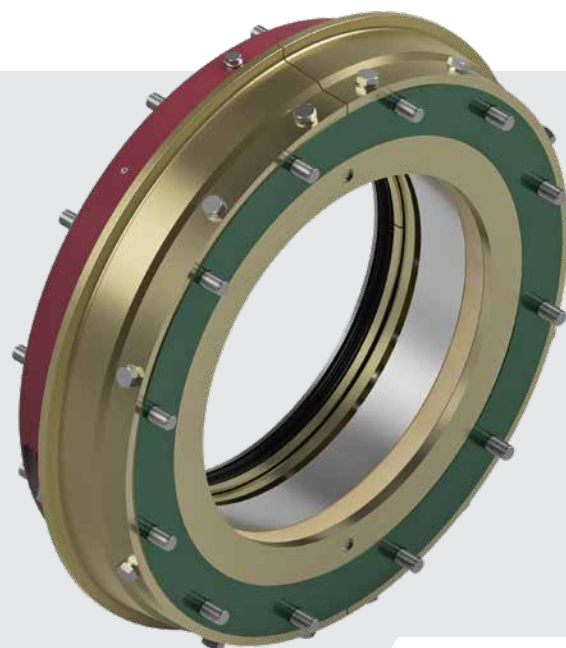


Fig.1 The Wärtsilä Sternguard in-water serviceable seal

Award-winning sealing technology

FEATURES	ADVANTAGES	BENEFITS
25 years of proven dependency in thousands of applications.	Ideal for rugged and reliable service in medium sized vessels.	Meets classification society extension survey requirements for wear and corrosion protection.
Reliable and simple design.	Maximum sealing system security.	Leakage virtually eliminated and easily accommodates high and low frequency vibrations, along with absorbing axial and radial movements.
Versatile and easy adaptability.	Can be checked without dry-docking.	Reduces maintenance downtime and increases productivity.
Sealing occurs between the face and seat.	Simple installation.	No special tools required.
Economical to run.	Competitive price initially and in the long run.	Operating costs reduced because shaft liner wear is eliminated.

PARTIALLY OR FULLY SPLIT

The Wärtsilä Sternguard in-water serviceable seal comes in two different versions. The partially split version is tailored for installations with shaft removals in dry dock, while the fully split version can be installed without shaft removals in-water. It can also be installed in dry dock.

Bolt-on rope guards are also available to complement the seal. They aid in reducing downtime and cost even further during in-water overhauls, as they eliminate any underwater cutting and welding.

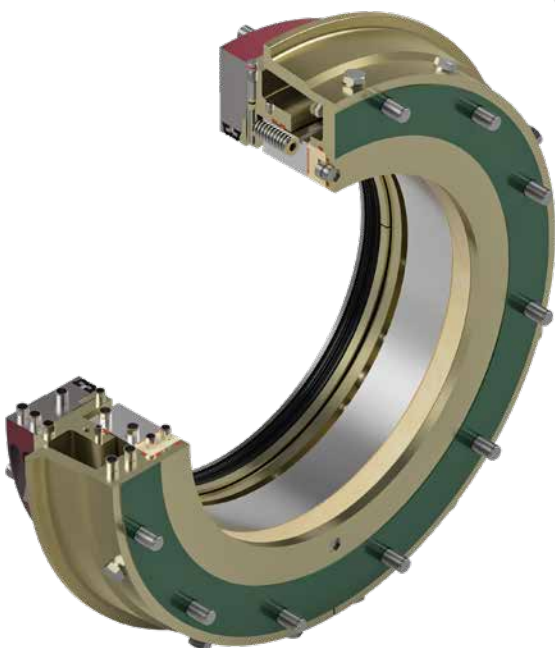
DESIGNED TO FIT

The Wärtsilä Sternguard in-water serviceable seal can be retrofitted to any other seal type for vessels running on mineral or Environmentally Acceptable Lubricants (EALs). The pressure springs allow for a continuous pressure between the lapped surfaces, enabling axial movement of the static section. Inside this section is a sealing device which prevents lubricant leakage during axial movement.

ENHANCED SERVICEABILITY

Equipped with an inflatable seal, the need for draining the whole stern tube during overhaul is eliminated. It can also be used while overhauling the seal in dry-dock. As there is no need for draining and filling oil, this will exponentially reduce maintenance time. The inflatable seal also minimises the risk of lubricant leakage during the service.

We use Wärtsilä's qualified divers, all of whom are fully trained to service the seal under water. With operations across the globe, we provide easy-to-ship diving support so we can help when you need us, wherever you are.



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HOW IT WORKS

The Wärtsilä Sternguard in-water serviceable seal is based on the face seal principle. The basis for a face seal is two lapped surfaces, one rotating surface and one static surface. When the two lapped surfaces rotate against each other, a thin stationary lubricant film develops in the interface. The presence of a stationary lubricant film results in low friction and thus limited wear during the seal lifetime.

The aft mounted in-water serviceable seal consists of three main sections, the static section, the rotating section and the pneumostop seal section. The rotating and combined static and pneumostop seal sections are separated by the interface components of the seal.

The seal ring moves in axial direction to compensate for axial travel caused by thermal expansion of the shaft line and possible gaps in the thrust bearing. During axial travel of the seal ring, the pressure springs ensure that the interface of the seal is adequately pressurised to maintain sealing effect and a suitable stationary lubricant film in the face seal is maintained.

The Wärtsilä Sternguard in-water serviceable seal uses two O-rings in a secondary sealing layout on the OD of the seal ring for this purpose. These O-rings close the space between the seal ring and the seal ring housing or O-ring holder to prevent loss of lubricant under axial movements.

The inner rope guard is fastened to the rotor housing by screws located at the outer diameter of the inner rope guard. The inner rope guard, together with a conventional rope guard provides enhanced protection against ropes and fishing nylon. Wärtsilä recommends a bolted conventional rope guard, equipped preferably with cutting knives, to increase future ease of underwater serviceability of the seal.

The Wärtsilä Sternguard in-water serviceable seal is designed with a wide sealing interface which enables high radial movements with a fully maintained interface contact. This is not only beneficial from a vibration point of view, it also means that when the bearings wear down and the position of the shaft drops, the sealing interface will still have full contact.

Fig.2 A common Sterntube setup with IWSS fitment location displayed

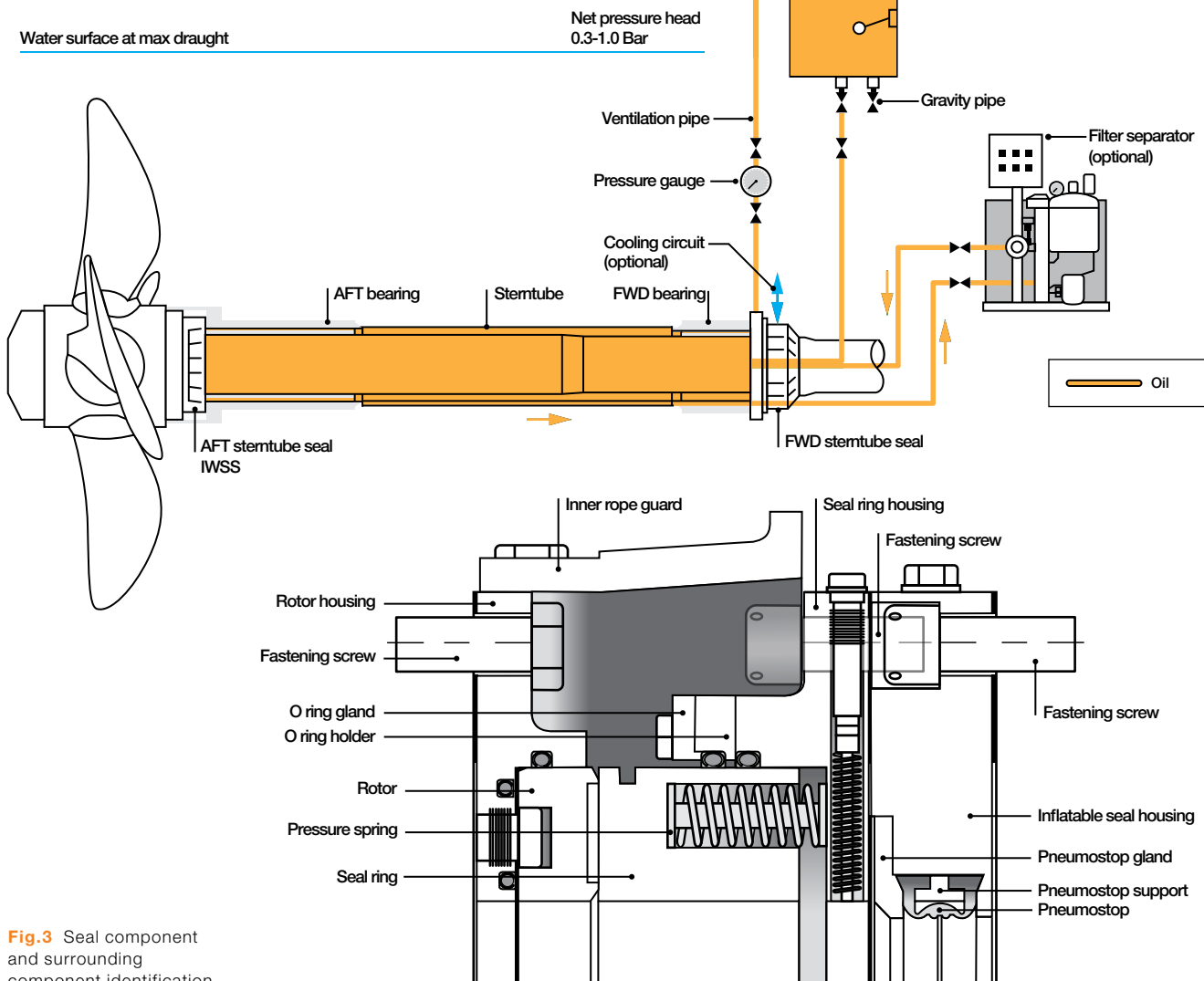


Fig.3 Seal component and surrounding component identification

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Technical specifications

FEATURES

Oil pressure	Up to 4 bar
Pressure gradient	0.3-1.0 bar
Periphery speed	Up to 10m/s
Shaft diameter	98mm up to >1000mm
Shaft elongation	27mm (optional)
Operating temperature	-5°C up to 65°C

All specified technical data above is subject to change without notice and should be verified at the time of order.

List of awards

Seatrade Maritime Awards,
Technical and Operational 2016
- Winner

Fathom Ship Efficiency Awards,
Environmental Technology 2016
- Winner

IHS DPC Innovation Awards,
Dredging Equipment 2016
- Winner

European Marine Engineering
Award 2016
- Runner-up

Lloyds List Global Award, Marine
Engineering Innovation 2016
- Runner-up

An industry leader in shaft line components Wärtsilä Shaft Line Solutions delivers a portfolio of end-to-end services and integrated solutions for the marine markets that builds on our core values: lifecycle efficiency, risk reduction, environmental leadership and design excellence. As an original equipment manufacturer operating in 75 countries, we have the capabilities to support customers on a global scale, and remain committed to providing in-country and round-the-clock expertise.

[wartsila.com/shaft-line-solutions](https://www.wartsila.com/shaft-line-solutions)

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