

# Wärtsilä Airguard seal

**An anti-pollution and environmentally compliant solution**

**PRODUCT DATASHEET**



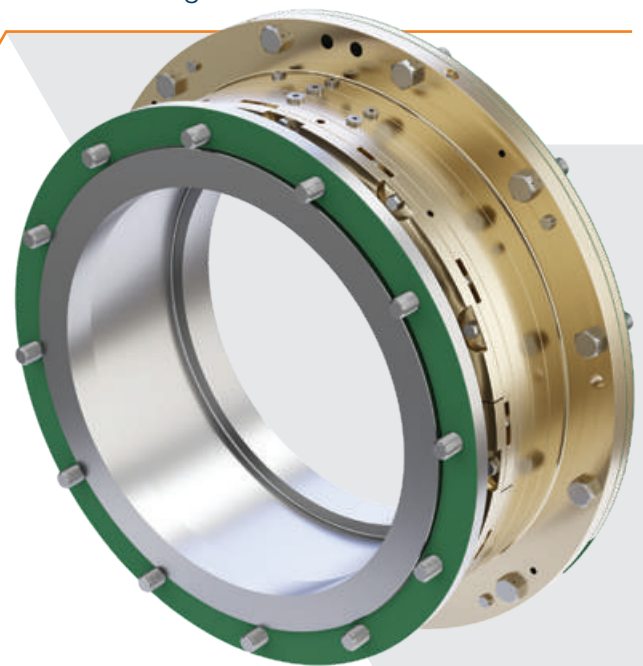
Anti-pollution and environmental regulations are key concerns in today's world. That's why at Wärtsilä, we designed the Wärtsilä Airguard seal, a special anti-pollution lip type seal that adheres to environmental regulations and addresses the concern of oil leakage.

## **A HISTORY OF GOOD PRACTICE**

Originally, the Wärtsilä Airguard seal was developed for new build vessels in 1988. To date, there has been no reported oil leakage from any vessel with a correctly installed and fully maintained Wärtsilä Airguard seal. Since its launch we have equipped 1,600 vessels with the Wärtsilä Airguard Seal, 1,000 of these installations have been performed in the last five years. We can upgrade your existing seal to this VGP compliant system, as well as retrofitting your existing stern tubes.

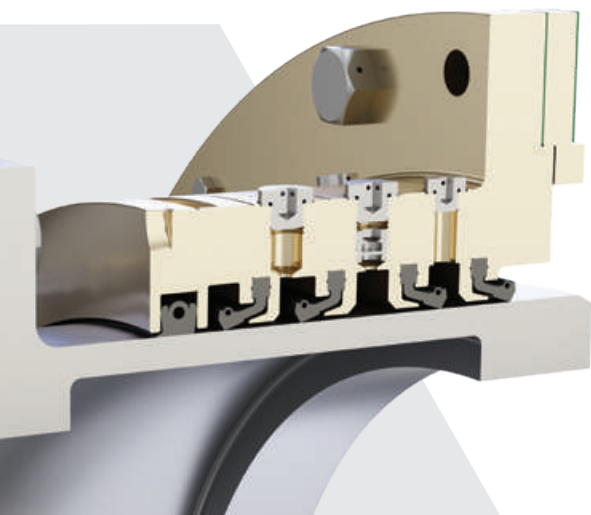
## **ANTI-POLLUTION SEALING AT ITS BEST**

To fully achieve genuine anti-pollution stern tube sealing the seawater and the stern tube oil needs to be separated by an air barrier. This can be accomplished with the Wärtsilä Airguard seal with a void space in its design that is constantly managed.



## **ENVIRONMENTALLY FRIENDLY SOLUTION**

The Wärtsilä Airguard works with compressed air, which is applied to the void space between the seal rings. This constant flow of compressed air into the void space is automatically set higher than the seawater pressure, resulting in a small amount of air forced out into the seawater. Compared to other sealing systems, the Wärtsilä Airguard seal does not require any draft sensors. The void space is connected to an inboard drain collection system. Any seawater or oil that infiltrates the void space is automatically drained inboard, preventing oil leaking outboard or seawater entering the stern tube. As the Wärtsilä Airguard seal successfully takes away the oil-to-sea interface, it can be operated with mineral oil in accordance with the 2013 Vessel General Permit.



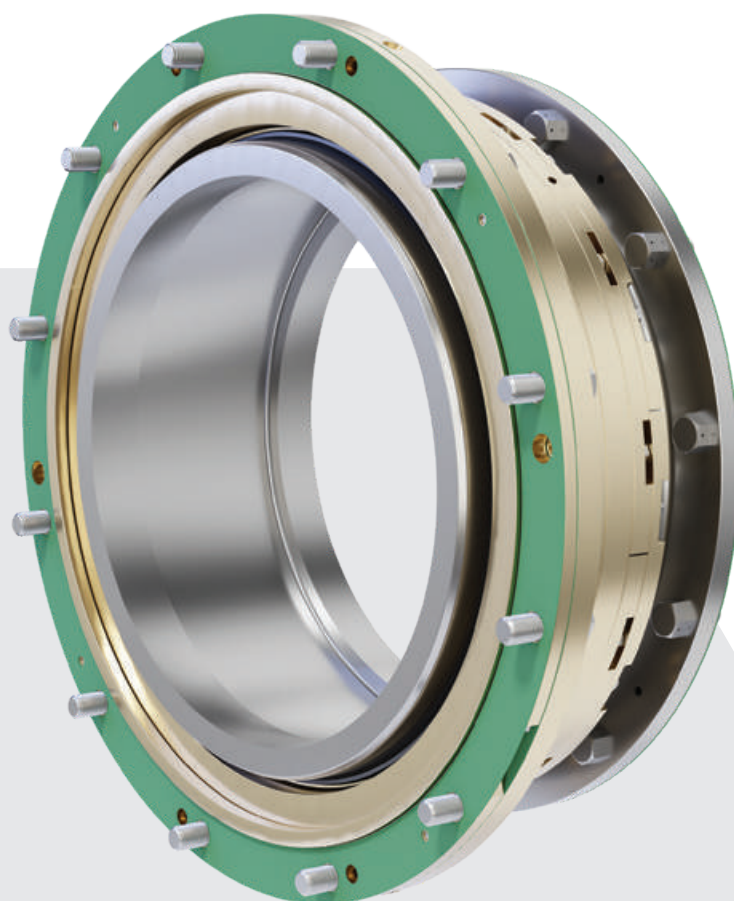
**Successful elimination of oil leakage**

| FEATURES   | ADVANTAGES  | BENEFITS   |
|--|---|--|
| Continuously pressure balanced.                            | Reduces load on seal rings.   | Extends seal and liner lifetime, reducing operational costs.   |
| Four lip seal arrangement running on chromium steel liner. | Allows extended 5–7.5* year dry docking cycles.   | Extended dry docking cycles can reduce operational costs.  |
| Continuous air flow.                                       | Continuous collection of potential oil or water leakages.   | Gives an additional level of reliability and operational safety.   |
| Air barrier between oil and seawater.                      | The vessel can be operated with mineral oil according to the VGP 2013.                            | Avoids use of costly EALs and oil treatment systems saving operational costs.  |
| Additional standby sealing ring.                           | This seal ring can be easily activated in the event of oil leakage from the engine room.          | Gives an additional level of reliability and operational safety.   |
| UNNET fishing line and net protector included as standard. | Protects efficiently against fishing lines, nets and sediments.                                   | Significantly reduces the risk of seal damages, especially when vessels are operating near the shore or in rivers. This provides increased operational safety and reduced costs. |
| Balanced, closed oil lubrication and air supply system.    | Reduces seal sensitivity for axial and radial shaft movements and hull vibrations.                | Reduces oil and water leakages, providing operational cost savings and enhanced safety.  |
| Double spacer option.                                      | Enables additional shift of the sealing position on the liner without shaft or propeller removal. | Reduces operational cost through extended liner life and simplified seal service.  |

\*7.5 years dry-docking cycle is subject to terms and conditions.

### IMPROVED SEALING DESIGN

Through years of research and development, the Wärtsilä Airguard seal has been engineered to meet customer needs and ensure a smooth installation process. The latest upgrade includes enhancements to the flexibility of the seal installation and reliability of assembly.



## CONTINUOUSLY PRESSURE BALANCED

The aft stern tube seal is a multi-barrier lip type seal which contains four seal rings running on a seal liner, to prevent grooving of the shaft. The two seal rings face the stern tube towards the oil, providing an active double security against oil spills. The other two seal rings face towards the seawater to effectively seal against seawater and sediments. The pressurised air in the central void space is dynamically controlled and monitored, based on the variations of the seawater pressure, which keeps the Wärtsilä Airguard system continuously pressure balanced. This results in less pressure and load on the four seal rings, and minimal wear on the liner. As an additional safety feature, a specially designed P-ring protects the seal ring from being damaged by fishing nets and lines.

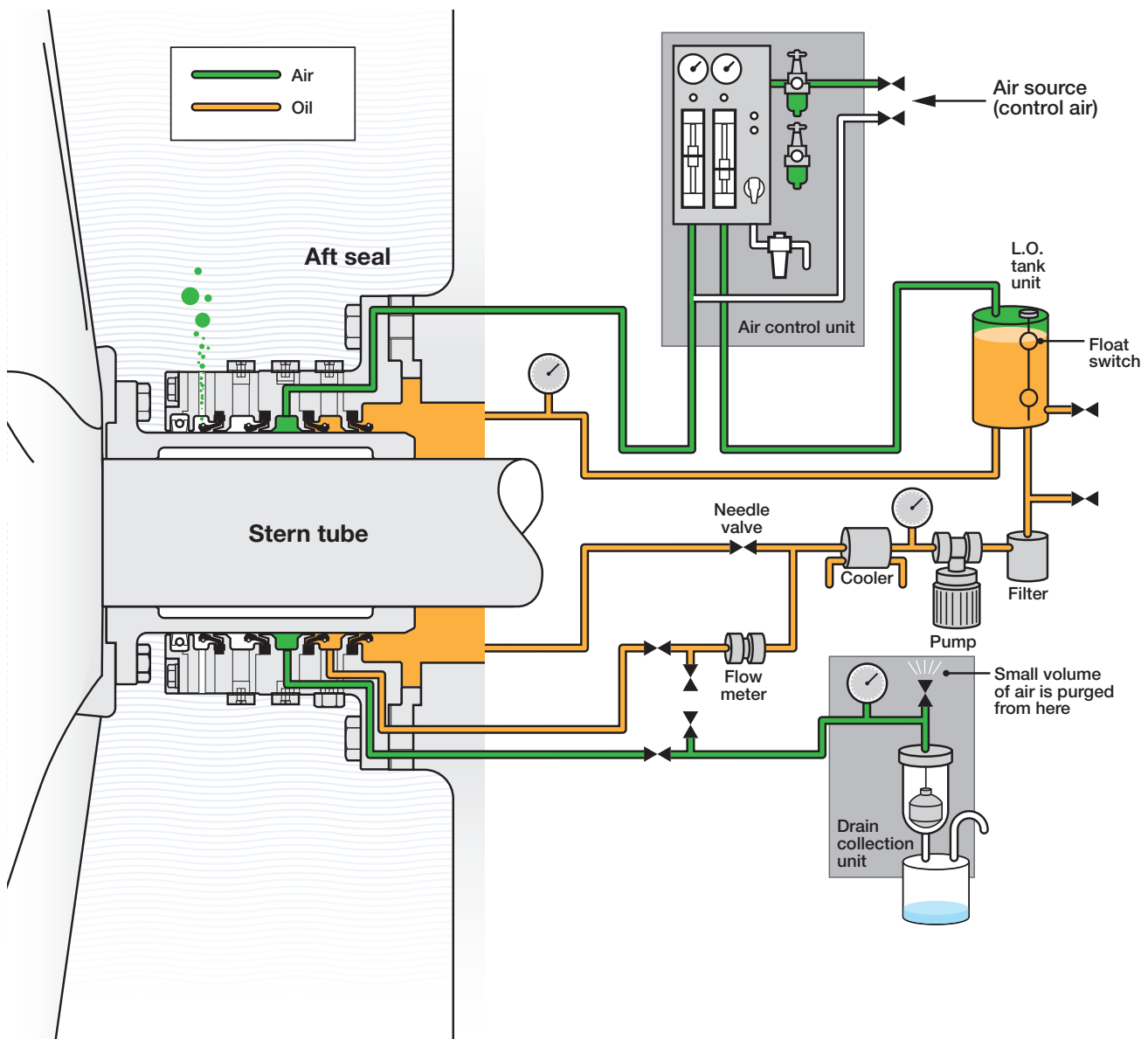
## ESSENTIAL SEAL RINGS

Our Wärtsilä Airguard seal operates with standard Viton® manufactured seal rings, which provides excellent chemical and thermal stability, and wear resistance. The seal liner is made of a special type of high nickel chromium steel, offering an optimum combination of wear and corrosion resistance.

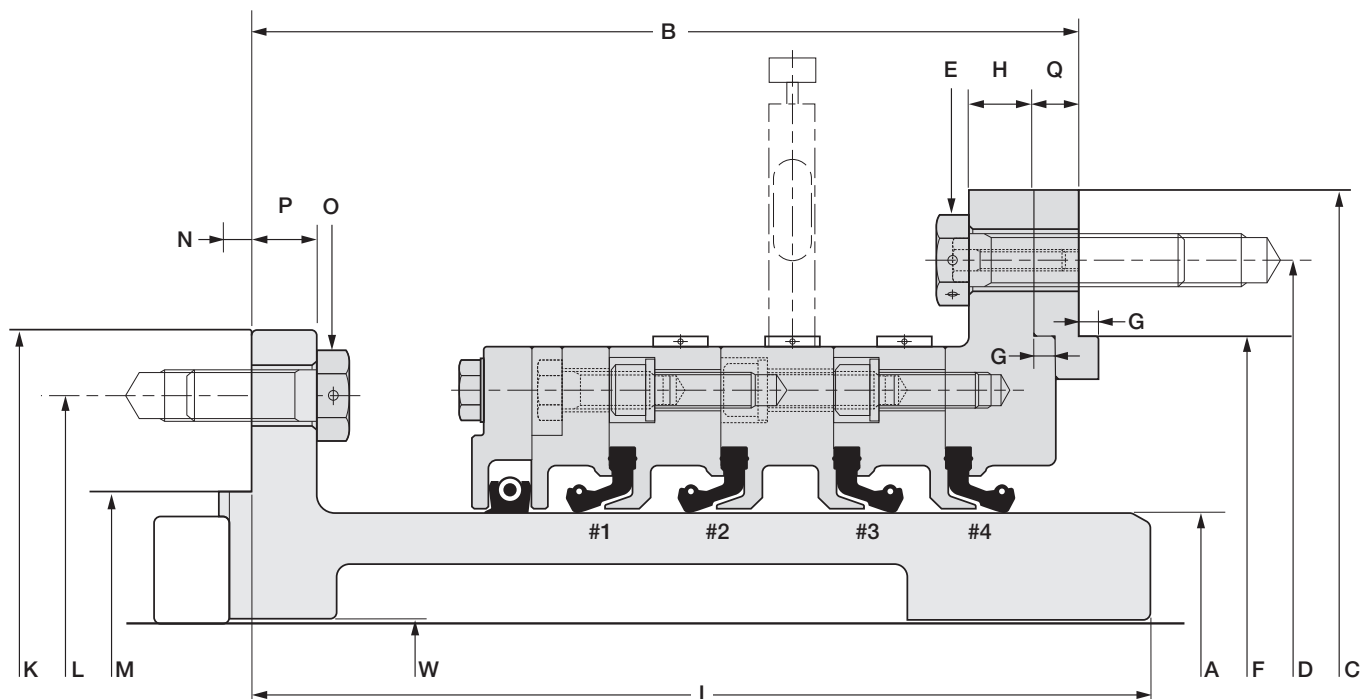
## REDUCING OPERATIONAL COSTS

Designed to enable an additional shift of the sealing position on the liner without shaft or propeller removal, the Wärtsilä Airguard seal can be provided with a double spacer ring option. This provides reduced operational cost achieved through extended liner life and simplified seal servicing.

## TYPICAL PIPING DIAGRAM OF AFT SEAL OF THE WÄRTSILÄ AIRGUARD SYSTEM



# Wärtsilä Airguard seal

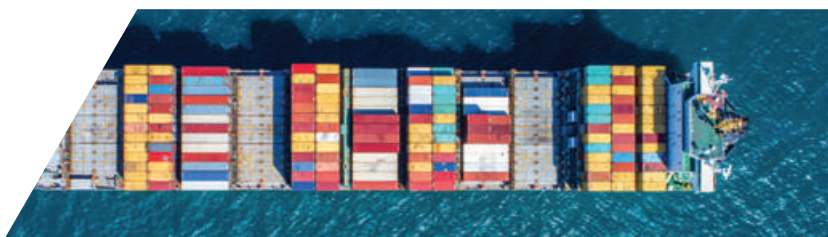


## Dimensions

| Shaft sizes                  |   | 450 | 480 | 500 | 530 | 560 | 600 | 630 | 670 | 710 | 750  | 800  | 850  | 900  | 950  | 1000 | 1030 | 1060 | 1120 | 1180 | 1250 |
|------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| Liner diameter               | A | 450 | 480 | 500 | 530 | 560 | 600 | 630 | 670 | 710 | 750  | 800  | 850  | 900  | 950  | 1000 | 1030 | 1060 | 1120 | 1180 | 1250 |
| Max. shaft diameter          | W | 428 | 457 | 476 | 504 | 532 | 570 | 598 | 635 | 672 | 710  | 756  | 803  | 850  | 896  | 942  | 968  | 998  | 1053 | 1108 | 1172 |
| Aft overall length           | B | 270 | 270 | 270 | 270 | 285 | 285 | 290 | 290 | 330 | 330  | 365  | 365  | 385  | 385  | 385  | 405  | 405  | 410  | 410  | 425  |
| Flange diameter              | C | 675 | 705 | 725 | 755 | 820 | 860 | 890 | 930 | 990 | 1030 | 1090 | 1140 | 1200 | 1250 | 1300 | 1370 | 1400 | 1460 | 1520 | 1590 |
| Pitch circle diameter        | D | 630 | 660 | 680 | 710 | 765 | 805 | 835 | 875 | 930 | 970  | 1030 | 1080 | 1135 | 1185 | 1235 | 1295 | 1325 | 1385 | 1445 | 1520 |
| No. of screws                | E | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 16  | 16   | 20   | 20   | 20   | 20   | 20   | 24   | 24   | 24   | 24   | 24   |
| Screw size                   |   | M20 | M20 | M20 | M20 | M24 | M24 | M24 | M24 | M24 | M24  | M24  | M24  | M24  | M24  | M24  | M30  | M30  | M30  | M30  | M30  |
| Aft spigot diameter          | F | 575 | 605 | 625 | 655 | 700 | 740 | 770 | 810 | 865 | 905  | 960  | 1010 | 1065 | 1115 | 1165 | 1215 | 1245 | 1305 | 1365 | 1440 |
| Aft spigot height            | G | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 7   | 10  | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   | 10   |
| Flange thickness             | H | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30  | 30   | 30   | 30   | 30   | 30   | 30   | 35   | 35   | 35   | 35   | 35   |
| Linear length                | I | 286 | 286 | 286 | 286 | 298 | 298 | 303 | 303 | 351 | 351  | 393  | 393  | 417  | 417  | 417  | 436  | 436  | 441  | 441  | 461  |
| Linear flange diameter       | K | 550 | 590 | 600 | 630 | 675 | 700 | 760 | 820 | 840 | 885  | 945  | 1000 | 1070 | 1130 | 1170 | 1200 | 1230 | 1300 | 1360 | 1430 |
| Linear pitch circle diameter | L | 510 | 550 | 560 | 590 | 630 | 660 | 710 | 750 | 790 | 836  | 890  | 950  | 1010 | 1070 | 1110 | 1140 | 1170 | 1230 | 1290 | 1360 |
| Linear spigot diameter       | M | 476 | 510 | 526 | 550 | 588 | 620 | 670 | 710 | 740 | 780  | 825  | 870  | 920  | 970  | 1040 | 1070 | 1100 | 1160 | 1220 | 1290 |
| Linear spigot height         | N | 8   | 8   | 8   | 8   | 9   | 9   | 9   | 10  | 10  | 10   | 10   | 10   | 11   | 11   | 11   | 11   | 11   | 12   | 12   | 12   |
| No. of screws                | O | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 12  | 16   | 16   | 16   | 16   | 16   | 20   | 20   | 20   | 20   | 24   | 24   |
| Screw size                   |   | M16 | M20 | M20 | M20 | M20 | M20 | M24 | M24 | M24 | M24  | M24  | M24  | M24  | M24  | M24  | M24  | M24  | M30  | M30  | M30  |
| Aft liner flange thickness   | P | 20  | 20  | 20  | 20  | 20  | 20  | 25  | 25  | 25  | 25   | 30   | 30   | 30   | 30   | 30   | 30   | 30   | 35   | 35   | 35   |
| Spacer thickness             | Q | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 16  | 20  | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   | 20   |

Dimensions in mm unless otherwise stated. All specified technical data is subject to change without notice and should be verified at the time of the order.

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.



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

WÄRTSILÄ® is a registered trademark. Copyright © 2019 Wärtsilä Corporation. Specifications are subject to change without prior notice.