Wärtsilä’s Enviroguard M seals have been updated and improved to deliver unmatched benefits that provide real value to our customers. They come with new enhancements and features, such as the double inflatable seal that allows in-water maintenance and is designed with digital sensors, to enable condition-based monitoring (CBM).

**You spoke, we listened**

At Wärtsilä, we listen to our customers, which is why we updated the Wärtsilä Enviroguard M seals based on feedback. New enhancements include:

- Enhanced resistance to abrasive wear by an interface with improved flushing and wearing materials.
- Dynamic inflatable seal with redundancy (double barrier).
- Cooling introduced via the face carrier, enabling increased cooling efficiency.

**NEW DESIGN, NEW FUNCTIONS**

The new design features a cooling flush directly on the composite running face in addition to the bearing flush. This separation keeps abrasive particles from the running face and provides more effective cooling to the seal face. The face material has been specially developed out of a superior abrasion-resistant composite to enable the seal to perform in brown water applications.

**Improved reliability and longer lifecycles**
PROVEN DESIGN
Building on the trusted and widely used earlier versions, the upgraded Wärtsilä Enviroguard M seals are intended for both naval and commercial vessels. With its new double inflatable water lubricated seal and improved bellows clamping, it delivers even greater value than before. The seal is designed to accommodate large and repeated axial and radial shaft movements, as well as vibration.

THE SPLIT DIFFERENCE
The Wärtsilä Enviroguard M seals can be supplied either fully split, fitted with the shaft in place or partially split. The partially split option requires the shaft to be removed or split at the coupling to fit the unsplit parts, in most cases, the mounting ring and face carrier. Both options have split spare parts so they can be overhauled with the shaft in place and all other operating parameters and applications are the same.

REDUCED RISK
The Wärtsilä Enviroguard M seals are supplied with double barrier inflatable seals. This is a physical barrier to prevent water ingress composed of at least two independent blocking methods - to exclude water flow between the internal diameter of the stern tube and the outside diameter of the propeller shaft, giving redundancy in the event of a failure occurring of one of the blocking methods.

The use of a double barrier method mitigates the potential failure of one barrier method, which may occur with little or no prior warning. This reduces the risk of compartment flooding and any subsequent vessel damage.

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>ADVANTAGES</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double inflatable emergency/maintenance seal.</td>
<td>Facilitates low risk, diver free, afloat repair and maintenance.</td>
<td>Reduces through-life costs.</td>
</tr>
<tr>
<td>Improved bellows clamping.</td>
<td>Helps reduce spring fatigue.</td>
<td>Enhances operational life.</td>
</tr>
<tr>
<td>Cooling flush through face carrier.</td>
<td>Improves cooling efficiency.</td>
<td>Offers abrasive resistance.</td>
</tr>
<tr>
<td>Aramid face material.</td>
<td>Reduces abrasive wear on seal lips.</td>
<td>Improves live in brown water operations.</td>
</tr>
<tr>
<td>Temperature and wear sensors.</td>
<td>Condition based monitoring capabilities.</td>
<td>Allows for extended service periods.</td>
</tr>
<tr>
<td>Ease of installation and maintenance.</td>
<td>Keyed drive seal feature removes the need for alignment of the seat following seal assembly.</td>
<td>Reduces time spent towards installation and maintenance activities.</td>
</tr>
</tbody>
</table>
**REAL-TIME RESULTS**
Wärtsilä’s latest Enviroguard M seals provide lifecycle efficiency and lower operational costs. The temperature and wear sensors included enable real-time monitoring of the condition of the sealing interfaces. This optimises maintenance scheduling, lessens the risk of unexpected downtime and lowers maintenance costs due to the simplified procedure.

**ENGINEERING EXCELLENCE**
Our Wärtsilä Enviroguard M seals have been upgraded to ensure an extended seal life. Through extensive testing, expert knowledge and software simulation, they also deliver improved performance and extended service intervals. Minor maintenance is normally required after only five years and can be carried out at sea. Major maintenance is required after only ten years of operation.

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**Technical specifications**

**MATERIALS OF CONSTRUCTION**
- **Seal housing**: Aluminium bronze
- **Main clamp ring**: Aluminium bronze
- **Inflatable seal**: Chloroprene
- **Face assembly**: Composite material
- **Seal seat**: Phosphor bronze
- **Seal o-cord**: Chloroprene

**STANDARD OPERATING CONDITIONS**
- **Shock resistant**: On request
- **Maximum pressure**: 1.5 bar/21.8 psi (0.1MPa)

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

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<table>
<thead>
<tr>
<th>Shaft sizes</th>
<th>300</th>
<th>330</th>
<th>360</th>
<th>400</th>
<th>430</th>
<th>470</th>
<th>510</th>
<th>550</th>
<th>590</th>
<th>630</th>
<th>670</th>
<th>710</th>
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<td>720</td>
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</tbody>
</table>

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**Diagram showing:***
- New second inflatable seal
- New face insert
- Temperature and wear sensor
- New liner shaft key drive
- Additional flushing
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.