The BIO-SEA systems are IMO and USCG Type Approved. With one BIO-SEA system, shipowners will be able to operate under IMO or USCG mode.

BIO-SEA by BIO-UV Group is the first and only system developed and manufactured in France for the treatment of all types of ballast water. BIO-SEA is compliant with IMO D-2 (New G8) discharge standard and USCG regulation and has the best holding times on the market at full flow.

**Ballasting / De-ballasting process**

**BENEFITS**
- UV dose automatic regulation depending on water quality
- Tested in low UV water transmittance conditions with best results
- Safe: chemical free, zero by-product, zero active substances
- Not impacted by water temperature, neither by salinity
- Easy to install, operate and maintain
- Automatic operation, easy-to-use interface
- First Class marine components from reliable European suppliers
- Cost efficient solution, low OPEX
- Available in flexible and scalable skid design, semi-modular and loose components versions to fit in all ships environment
1ST STEP : MECHANICAL FILTRATION
- 20µm screen to retain suspended solids and zooplankton
- Sized to scale depending on the flow rate to treat
- Automatic backwash
- Additional suction pump as standard to allow a complete and performing backwash
- No disruption of the filtration process during the backwash cycle and no significant variation of the treated flow rate

2ND STEP : UV DISINFECTION
- Titanium reactor equipped with a single polychromatic, medium pressure, high intensity UV lamp for optimum treatment results
- High-quality quartz sleeve protecting the UV lamp
- Reactor designed with only one lamp per reactor minimizing the total number of lamps per system, resulting in lower operational costs
- Optimized design by CFD (Computational Fluid Dynamic) taking into account water quality (UV transmittance) and fluid speeds, allowing for easier cleaning and maintenance
- Lamp driven by electronic ballast allowing precise management of the UV lamp power to optimize its intensity, reduce the power consumption and prolong its life
- Monitoring through UV sensor to adjust the intensity for a compliant water treatment

MONITORING AND CONTROL
- Standard fully automated operating modes for ballasting, de-ballasting, cleaning and stripping
- Monitoring through sensors and PLC: UV and temperature sensors, flow meter, pressure transmitters, automatic valves
- Touch screen interface for easy friendly use, control and visualization
- Recording of operations and alarms covering 24 months, automatic generation of PDF reports
- Bus communication for remote control, integration to vessel automation system and control command

Option for an ultimate experience: remote control panels (7” or 15” auxiliary touch screen), RS 485 communication cabinet, BIO SEA Clean (automatic quartz sleeve cleaning system)

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Treatment Capacity</td>
<td>from 50 to 2000 m³/h</td>
</tr>
<tr>
<td>Power Supply</td>
<td>400 – 440V; 50-60 Hz; 3-phases</td>
</tr>
<tr>
<td>Power Consumption per UV reactor</td>
<td>12 kW - 22 kW</td>
</tr>
<tr>
<td>UV lamp lifetime</td>
<td>5000 hours</td>
</tr>
<tr>
<td>Environmental Operating Conditions</td>
<td>T°= 0°C - 55°C; H% ≤ 95</td>
</tr>
<tr>
<td>Global Head Loss</td>
<td>&lt; 0,55 bars</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>1,5 - 10 bars</td>
</tr>
</tbody>
</table>

Turnkey worldwide certified sales and services partners
From a simple onboard visit, or a 3D laser scanning survey, to a high-level global turnkey package, BIO-SEA works with a worldwide network of certified partners and suppliers for the whole range of BIO-SEA BWTS.

Other onboard BIO-UV Group environmental UV treatment solutions

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