Submarine lifelong-lasting heat exchangers

CRITICAL SYSTEMS FOR SUBMARINES

Mission
DCNS’ sea water heat exchangers guarantee cooling performance for inboard systems such as propulsion plants and power generation.

Efficient
Low pressure drop
Compact
Reliable and long life cycle
Shock proof
Embedded leakage detection
Corrosion resistant

Compatible with all submarine designs.
**Heat Exchangers**

**KEY POINTS**

**How it works**
Sea water circulates in the heat exchanger in order to cool a closed fresh water system. Through a heat exchange, this equipment allows to simultaneously refresh both the machine and the air in the submarine.

**Wide range of highly specific equipment**
- **Power rating:**
  - 150 kW up to 3 MW.
- **Materials:**
  - NAB, titanium and stainless steel,
  - nickel alloy (IN625) or specific material for special heat exchangers.

**CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat load</strong></td>
<td>50 to 3,000 kW</td>
</tr>
<tr>
<td><strong>Tube bundle</strong></td>
<td></td>
</tr>
<tr>
<td>- Material</td>
<td>CuNi30Mn1Fe or titanium grade 2</td>
</tr>
<tr>
<td>- Tube outside diameter</td>
<td>12 to 16 mm</td>
</tr>
<tr>
<td><strong>Used materials</strong></td>
<td></td>
</tr>
<tr>
<td>- Headers</td>
<td>CuAl9Ni5Fe4 or titanium grade 2</td>
</tr>
<tr>
<td>- Tube plates</td>
<td>or titanium cast (grade C2)</td>
</tr>
<tr>
<td>- Body (fresh water side)</td>
<td>X2CrNiMo17-12-2”</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>- Overall length</td>
<td>1,000 to 4,500 mm</td>
</tr>
<tr>
<td>- Tube plate diameter</td>
<td>445 or 800 or 1,020 mm</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td></td>
</tr>
<tr>
<td>- Dry</td>
<td>600 to 8,000 kg</td>
</tr>
<tr>
<td>- In operation</td>
<td>700 to 9,500 kg</td>
</tr>
</tbody>
</table>

**DCNS know-how and wide experience**
- Over thirty years experience in design, material qualification, manufacturing, trials and maintenance on-board.
- Leading specialist of high-pressure shell and tube heat exchangers and condensers for sea water cooling systems.
- Support of DCNS’ unique material laboratory.
- Continuous production process optimisation.

**MORE THAN**

170

**HEAT EXCHANGERS MANUFACTURED**

**SELECTED BY**

8 NAVIES

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