CoolMax
Coil-in-Coil Type Sample Cooler

<table>
<thead>
<tr>
<th>Design Code</th>
<th>ASME Section VIII, Division 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Pressure (bar)</td>
<td>80</td>
</tr>
<tr>
<td>Design Temperature (°C)</td>
<td>140</td>
</tr>
<tr>
<td>Internal Pressure (bar)</td>
<td>140</td>
</tr>
</tbody>
</table>

Shells: Tube

Made with pride in India

Cooling Water Outlet

Cooler Inlet
A number of industrial processes require sampling of various process fluids like diesel, LCO, ULSD, low pressure steam, water and alcohol to the required uniform temperature.

Improper design of heat exchangers can severely erode product quality and profitability.

The “CoolMAX” series from Forbes Marshall, is a range of compact heat exchangers with wide ranging benefits. These offer high heat transfer rates, low pressure drops, a close approach temperature with minimal cooling water requirements. A high turbulence of fluid ensures self-cleaning and longer life of the product.

Features
Available in different material to suit process conditions like multiphase slurries and petrochemical mixtures
Fully drainable inner and outer tubes
Rugged design, highly resistant to thermal and hydraulic shocks
Single continuous tube to avoid leaks
Enhanced turbulence to avoid deposits
Easy to install
High precision engineered product
Manufactured as per ASME BPE 2007
Suitable for clean steam and WFI (water for injection) processes
Stringent safety/ cleanliness norms incorporated which are especially required for pharmaceutical industry
Electro-polished models (Ra<0.6 micrometer) are available for pharmaceutical applications

Benefits
High heat transfer rates.
Very close approach temperature - upto 2°C
More compact due to increased overall heat transfer coefficient
Suitable for high heat duty application
Minimal cooling water requirement
Suitable for low flow rates at high pressure/high temperature application
Maximum counter current coefficient
Eliminates the tendency of dead spot formations
Low pressure drop on outer tube side
Forbes Marshall CoolMax Series

### Inner Tube Material
- Copper
- SS316
- Inconel
- Monel

### Outer Tube Material
- Copper
- SS316
- Inconel
- Monel

#### Sample side (Inner tube)

<table>
<thead>
<tr>
<th>Tube Material</th>
<th>Pressure Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>140 kg/cm² @ 148°C</td>
</tr>
<tr>
<td>SS 316</td>
<td>250 kg/cm² @ 560°C</td>
</tr>
<tr>
<td>Inconel</td>
<td>400 kg/cm² @ 600°C</td>
</tr>
<tr>
<td>Monel</td>
<td>140 kg/cm² @ 148°C</td>
</tr>
</tbody>
</table>

#### Cooling side (Outer tube)

<table>
<thead>
<tr>
<th>Tube Material</th>
<th>Pressure Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>86 kg/cm² @ 148°C</td>
</tr>
<tr>
<td>SS316</td>
<td>160 kg/cm² @ 560°C</td>
</tr>
</tbody>
</table>

### Recommended Parameters for Operation

**Cooling water**
- Inlet temperature: 35°C (max)
- Inlet pressure: 3.5 bar
- Outlet pressure: Open to atmosphere
- Quality/chloride content: Less than 25 ppm

### Ordering Information

**Forbes Marshall CoolMax Series**
- Series: 50H-1/4" OD inner tube
- Series: 100H-3/8" OD inner tube
- Series: 200H-1/2" OD inner tube
- Sanitary**

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<table>
<thead>
<tr>
<th>Size (MM) (Sq. meter)</th>
<th>Dimension 'A'</th>
<th>Dimension 'B'</th>
<th>Dimension 'C'</th>
<th>Dimension 'D'</th>
<th>Weight (kg)</th>
<th>High Temperature Area (square meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoolMax-50H</td>
<td>143</td>
<td>139</td>
<td>229</td>
<td>313</td>
<td>5</td>
<td>0.12</td>
</tr>
<tr>
<td>CoolMax-100H</td>
<td>176</td>
<td>148</td>
<td>273</td>
<td>320</td>
<td>7</td>
<td>0.18</td>
</tr>
<tr>
<td>CoolMax-200H</td>
<td>226</td>
<td>153</td>
<td>279</td>
<td>426</td>
<td>14</td>
<td>0.24</td>
</tr>
</tbody>
</table>
CoolMax - Sanitary

Features
Manufactured as per ASME BPE 2007
Suitable for clean steam and WFI (water for injection) processes
Electro-polished models (Ra<0.6 micrometer) are available for pharmaceutical applications

Specifications
Stainless steel (SS 316) housing
Sanitary tri-clamps: approved for pharmaceutical application
Surface finish (0.6<micrometer).
TIG welded
Single length SS tube to avoid any joints

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