Cartridge Heaters

Since 1972

Hi-Density

Recommendations for Improving the Life of Hi-Density Cartridge Heaters

High Operating Temperature
Tempco Hi-Density heaters are designed to operate at sheath temperatures up to 1400°F (760°C). When process temperatures approach the maximum heater sheath temperature, make sure the sheath temperature doesn’t exceed its limitations. Location of the thermocouple and the type of temperature and power controls are factors that affect sheath temperature and potential overshoot conditions.

Although the heater is designed to run at temperatures up to 1400°F (760°C), heater lead wires and terminations are rated for much lower temperatures. Care should be taken to make sure that the heater lead end temperatures do not exceed their limitations. Heaters can be made longer with unheated sections at the lead end to bring the lead end out of the high temperature area. Tempco can also provide you with a high temperature wiring harness, which can withstand temperatures up to 1400°F (760°C). See page 15-5 in the accessories section for details.

Important Installation Considerations

1. For closest fit and best heat transfer, use reamed holes.
2. When possible, drill holes through the object being heated. This will make heater removal easier.
3. When using an anti-seize coating like Tempco’s BNS spray or paste, do not apply over lead wires or any other current carrying conductors.
4. When using insulated tape or sleeving, check to make sure it is rated for the temperature of the application. Lower temperature rated materials can contain an adhesive or binder that can carbonize and become electrically conductive.
5. When using heaters near their maximum recommended watt density, it is recommended that the temperature sensing probes be at maximum 1/2” from the heater sheath.
6. Lead wires should not be located in the hole containing the cartridge heater during operation. This may cause the lead wires to be exposed to temperatures above their rated temperature.
7. When used in a vacuum application, make sure the lead end of the heater is outside the vacuum. If the lead has to be in the vacuum, consult Tempco for specific recommendations.
8. Many applications will subject a heater’s electrical terminations to one or more of the following potentially damaging conditions:
   - Moisture
   - Flexing
   - Oil and other contaminants
   - Abrasion
   - High temperature

Note: As explained in the above paragraphs, the single major cause for cartridge heater failure is the selection of the wrong type of heater lead end termination for the specific application. To assist you in selecting the right termination type, pages 2-39 through 2-57 give detailed descriptions of over 40 terminations designed to solve many of the common application problems. If you need further assistance, consult Tempco.

BNS Anti-Seize Cartridge Heater Coating

This high temperature, electrically insulating and thermally conductive coating will minimize oxidation and improve heat transfer from heater to the object being heated.

Brush a thin layer of paste or spray lightly over the cartridge heater prior to inserting the heater into a hole.

Do not apply over lead wires or other bare current carrying conductors, since the water in the paste and spray can cause an electrical short circuit.

Note: Formulated to assist in the removal of cartridge heaters.

<table>
<thead>
<tr>
<th>13 oz.</th>
<th>4 oz.</th>
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<tbody>
<tr>
<td>Aerosol spray can</td>
<td>Paste w/brush applicator top</td>
</tr>
<tr>
<td>Part Number: CML00010</td>
<td>Part Number: CML00020</td>
</tr>
<tr>
<td>Temperature Range 1562°F (850°C)</td>
<td>Temperature Range 1562°F (850°C)</td>
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<tr>
<td>High Heat Transfer</td>
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