

# SELECTING THE PROPER CIRCULATION HEATER

The longevity and trouble-free service of a Circulation Heater depend on selecting proper sheath materials, watt densities, and operation temperatures.

## Standard Element Sheath Materials

**Incolloy® 800** - A Nickel (30-35%), Chromium (19-23%), Iron alloy. The high nickel content of this alloy contributes to its resistance to scaling and corrosion. Used in air heating and immersion heating of potable water and other liquids that are not corrosive to an Incolloy 800 sheath. Sheath temperatures to 1600°F (871°C).

**Low Carbon Steel** - Applications include fluid heat transfer media, tar, high to low viscosity petroleum oils, asphalt, wax, molten salt, and other solutions not corrosive to steel sheath. Sheath temperatures to 750°F (399°C).

**316 Stainless Steel** - A Chromium (16-18%), Nickel (11-14%), Iron Alloy with Molybdenum (2-3%) added to improve corrosion resistance in certain environments, especially those which would tend to cause pitting due to the presence of chlorides. Applications include deionized water. Sheath temperatures to 1200°F (649°C).

**Copper** - Mainly used in clean water heating for washrooms, showers, rinse tanks and freeze protection of storage tanks. Sheath temperatures to 350°F (177°C).

## Optional Element Sheath Materials

**304 Stainless Steel** - A Chromium (18-20%), Nickel (8-11%), Iron Alloy used in the food industry, sterilizing solutions, air heating, and many organic and inorganic chemicals. Sheath temperatures to 1200°F (649°C).

**321 Stainless Steel** - A Chromium (17-20%), Nickel (9-13%), Iron Alloy modified with the addition of titanium to prevent carbide precipitation and resulting intergranular corrosion that can take place in certain mediums when operating in the 800-1200°F (427-649°C) temperature range. Sheath temperatures to 1200°F (649°C).

## Installation

1. Flange heaters are supplied with two drilled and tapped holes for threaded eye bolts, providing ease of handling during installation and flange removal during maintenance cleaning or heater replacement.
2. Replacement of a heater is inevitable. Therefore, provided adequate space for installation, allowing, ample room to remove the flange heater for cleaning or replacement.
3. In applications, requiring the circulation heater to be fed by an inline pump, install the pump at the inlet end.
4. To maintain the lowest possible temperature at the terminal box, place the outlet at the end opposite to the terminal box. If your process temperature is circulating at 450°F (232°C) or above (at the nozzle closest to the flange), stand off terminal box construction is recommended.
5. To prevent temperature and/or pressure buildup on closed loop circulation heater systems, adequate and strategically located thermocouples for temperature controllers and pressure relief valves should be installed. Never over-rate pressure relief valves beyond the pressure temperature rating of the flange being used.
6. During the process cycle, flow rate of the medium being heated should never be interrupted or reduced, thus creating and overheating condition. Excess temperature can result in damage to the medium being processed and premature heater failure.
7. Make sure that your circulation heater is being used. NEMA 1-General purpose, NEMA 4-Moisture resistant, and NEMA 7-Explosion resistant.