

DETERMINE PROPER SHEATH MATERIAL

Information is located in each product section throughout the catalog in regards to the sheath materials available. In surface or air heating, operating at high temperatures can cause oxidation and scaling of the sheath. This impedes the transfer of heat from the element, resulting in over-heating and failure. It is always safe to specify Incoloy in these situations. The additional cost of the element will be recovered by providing longer service. In the direct heating of liquids and gasses, corrosion will be an important consideration in the selection of an immersion heater. An extensive Corrosion Resistance of Sheath Materials guideline (24T) is provided later in this section. Besides the information there, note the following:

- The effects of the solution concentration.
- As heat is a catalyst in a chemical reaction, lowering the watt density and in effect the sheath temperature will prolong the life of the element(s).
- Mineral deposits contained in a water supply can build-up on the elements, reducing the transfer of heat. Sheath temperatures can elevate to the point of failure. Stainless Steel or Incoloy sheath material will not attract the deposits as copper will and can operate at higher element temperatures should the build-up occur. This provides longer heater life.

In essence, the sheath material selected must be compatible with the process environment and the heat requirement.

Depending upon the design, many heaters have the potential to produce sheath temperatures exceeding 1400°F. This is where the heat transfer path from the element to the material becomes so important. The more efficient the heat transfer, the less the temperature difference between the heater and the process. The medium plays a key role in the design of a thermal system, as seen in more detail later. Calculating the wattage requirement, the selection of the watt density, sheath material and the heater type are integral in the decision as to how to apply the heat to a process. **OGDEN** has been instrumental in providing information and assisting in the design of thousands of process heat and control applications. If the information for a particular application is not included here, contact **OGDEN**. With over 50 years of experience on file, **OGDEN** may already have solved the problem.