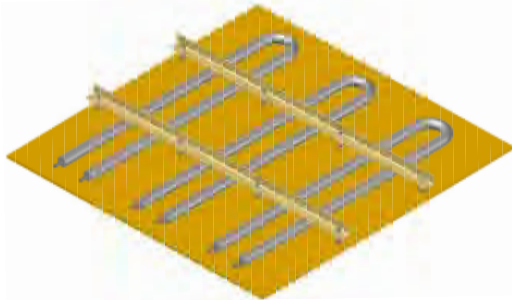


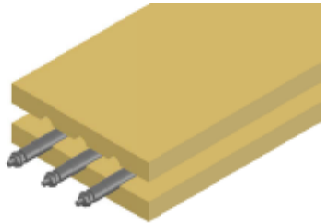
Tubular elements may be applied in a variety of ways as illustrated below.

**Clamped** — Elements clamped onto a surface establish essentially line contact. Thus this method should be used only at relatively low temperatures. Where possible, it is preferable to insert elements in machined openings as described below. When installing, follow these rules:



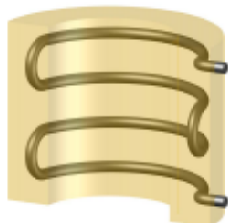
1. Clamping must be accomplished in such a way that the element is free to expand and contract as it heats up and cools down. It is generally best to clamp tightly, then back off the clamping nuts or bolts one-half turn to allow for expansion.
2. Elements should be spaced on approximately 2" centers.
3. If insulation is used, provide an air space between the elements and the insulation, as it should never be in direct contact with the element sheath.

**Inserted into Drilled Holes** — Elements may be slipped into drilled holes in metal platens or dies. However, this method is generally restricted to relatively short lengths because of the problems of drilling a straight, uniform hole in longer lengths. For longer lengths, it is often more practical to machine semi-cylindrical grooves in two matching dies or platens and sandwich the element between the two. When installing, follow these rules:



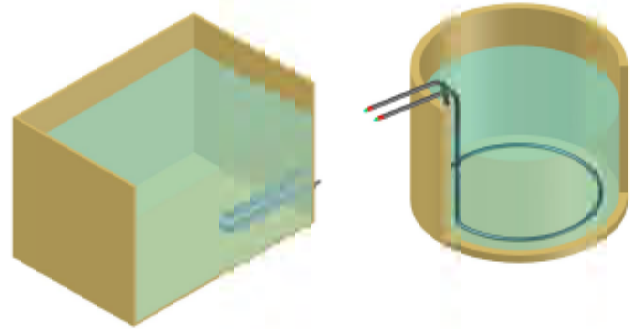
1. Holes should be drilled .003" to .005" oversized.
2. Spraying the element with a silicone or graphite lubricant before insertion will facilitate installation and removal.
3. See above for spacing and insulating instructions.

**Cast In** — Elements may be cast into a variety of metals for applications requiring uniform heat distribution. If the casting is to be machined, it is critical to hold the element precisely in position as the metal is being cast, to avoid machining into the sheath of the element heater.



**Immersion** — For immersion applications, elements are normally furnished with threaded fittings as listed in Heatrex's Immersion Catalog, or bent in such a way that the terminals protrude over the side of the vessel. When installing, following these rules:

1. The element heated section must be fully immersed.
2. Choose the proper sheath material and watt density for the liquid from Table III, Page 8-17.



**Radiant Applications** — Stainless steel or Incoloy sheathed elements may heat processes by radiation. A reflector is recommended to reduce waste heat and increase process efficiency. The element temperature will vary with the work temperature, the distance between the work and the element and atmospheric conditions. See Heatrex's Radiant Heater Catalog for fully assembled heaters.



**Air Heating** — Either finned or unfinned elements can be used in both forced and natural convection applications. Finned elements are usually preferred for heating low pressure, low temperature air and other gases, and for natural convection, since their extended surface reduces sheath operating temperatures. Unfinned elements are preferred for high temperatures (over 400°F), for compressed gases and when there are airborne particles such as lint or straw that may catch in the fins. When installing, follow these rules:

1. Elements over 24" long should be supported on two to three foot centers.
2. In forced air applications, be sure the airflow is evenly distributed. If necessary, install a pressure plate in front of the element to redistribute airflow.
3. To allow for expansion and contraction of straight elements, one end should slip freely through a rounded hole in a support bracket. Unless a two-pass element is used, the electrical connection at this end must be flexible. Elements will expand approximately 1/8" per foot of heated length.
4. See Heatrex's Process Air heating catalog for fully assembled heaters.