



Thermal and Cable Solutions

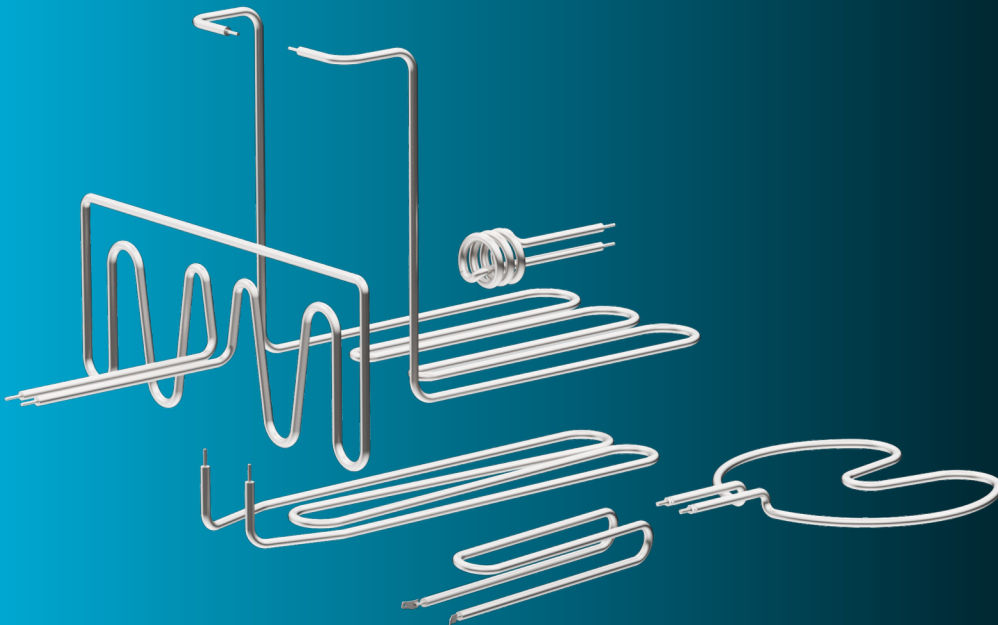
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# TUBULAR HEATER



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## TUBULAR HEATERS

Every industry in today's world is utilising the some or other form of heating applications. The heating is very much a part of our day to day life.

As the dependency on heating application grows, there is a serious concern also expressed related to safety and environmental impact as well as efficiency of the many of the heating solutions being used. While some of the systems have a risk of fire accidents, many of the other conventional system generates a lot of CO<sub>2</sub> n other gases n contaminate the environment.

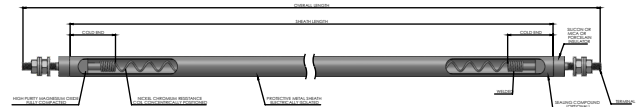
Tubular Electric heater is a one of the Best option for the modern world, which is safest way to heat any fluid or surface without creating gases or hazardous releases

Tubular heaters are typically a manufactured using a resistive coil placed inside a Metal tube and filled inside with insulating materials such as Magnesium oxide. The heating

coil placed at the centre with uniform pitches, separated from the outer metal sheath by a compacted Magnesium oxide ensures that No electric shock is transferred to the outer surface. At the same time the all the heat energy produced is transferred to the process through outer body. Hence the Heater is regarded as one of the highly efficient and safe way of heating.

Tubular heaters Known for its versatility, ruggedness and dependability, tubular heaters can. They can be designed in a wide range of electrical ratings, sizes, supply configurations, and materials. The Heaters can be formed in to any shape to suit a specific application. The heaters can be used for heating the process fluids ( gas, liquid, vapour etc) or for a surface heating of metals as well.

### Construction



1. Nickel Chromium Resistance wire. Uniformly coiled wire is stretched through the active length of the element. The ends are proved with the terminal pins to create cold ends.
2. Magnesium oxide: High purity magnesium Oxide power is filled between the coil and outer tube in a automated filling station to ensure the right insulation, conduction as well as compactness.
3. Outer sheath: a Tube (welded or seamless) which acts as a outer protection for the heating Element. Selection of outer tube depends on various factors such as temperature, pressure, fluid to be heated etc.
4. Terminal pins: Also known as terminal pins are extended ends of the heating elements. The SS rods of a specific diameter are fusion welded to the coils at both ends. The length of the rod depends on the non heating length required for any application and installation.
5. End Sealing: Sealing is done using the combination of Ceramic beads, soft seals & sealants. The sealing ensures that no moisture from the atmosphere enters the heating element and keeps it dry.

### Design Considerations

Each and every application needs a detailed analysis to ensure the systems efficiency, safety and reliability. The watt density, size, shape and sheath of each tubular heater and its related elements vary as per their application.

Sheath Material	Copper, Stainless Steel (SS304, SS316, SS321) , Incoloy, Titanium, Other alloys as per application selection
Sheath Length	Up To 10mtr
Diameter	6mm, 8mm, 11mm, 12.5, 13.7mm, 16mm and 25mm

### End Seal Options

1. Teflon Seal is used where an effective sealing is required against moisture and oil contamination.
2. Silicon Rubber Seal : Most popular and highly used sealing method. The sealing can withstand upto 200 deg C temperature and provides long lasting moisture protection.
3. Epoxy Seal : Epoxy potting forms a good moisture seal with more mechanical strength than a silicon rubber seal. Recomonded for a system assembly with large no of tubular elements.
4. Cement : recomonded for the heater which operates at very high skin temperature. Provides protection against high viscous fluids and dusts. The top layer can be provided with a additional insulation to make it moisture resistance as well.

### Applications

Material of outer sheath	Application
Copper	Water, Oil, Grease, metal surface heating
Stainless Steel	Immersion Heating's in Water, Alkaline cleaning solutions, Tars, Mild Corrosive liquids, food processing equipment, Indirect and Radiant heating Air heating/ Gas heating. Hopper & tank heatings Large process plant applications.
Alloy 800	Cleaning and degreasing solutions, Corrosive liquids / gases. High temperature / High pressure
Alloy 600 series	Plating and pickling solutions, acid
Titanium	High Corrosive liquids