

## TUBULAR HEATERS



Known for its versatility, ruggedness and dependability, tubular heaters can virtually be factory-configured to suit a variety of industrial heating applications. Tubular elements are frequently regarded as the foundation of all heating elements. The basic design consists of a resistance wire/coil precisely centered in a metal sheath. This wire/coil is surrounded by magnesium oxide to provide efficient heat transfer from coil to heating medium. Diameters are varied to give customized design and adjustable watt densities for best performance and long life. Bending radius is carefully chosen so as to give optimum performance. Tubular heating elements perform heat transfer by all three modes (conduction, convection and radiation). They are available in both single ended and double ended designs.

The single-ended tubular design has both terminals at one end. The opposite end is sealed. Flexible lead wires are 12 in. (305 mm) crimp connected to the terminal pin and have silicone-impregnated fiberglass over-sleeves. Maximum watt density is up to 45 W/square inch while the maximum operating temperature is 1200 degree F, so INCOLOY and stainless steel sheaths can be used.

The double-ended design has round cross sectional geometry, is highly adaptable for bending—especially when bending is performed in the field. Double-ended tubular elements offer several assemblages of resistor coils and thermocouples inside one sheath. They have the ability to sense the heater's internal temperature accurately every time, or offer three-phase capability in one element. Maximum watt density is up to 120 W/square inch while the maximum operating temperature is 1800 degree F, so INCOLOY and stainless steel sheaths can be used.

### SPECIFICATIONS

°F	°C	W/in <sup>2</sup>	W/cm <sup>2</sup>
1800	982	45	6.9
1600	870	45	6.9
1200	650	60	9.3
750	400	45	6.9
350	175	60	9.3

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## OPTIONS

Sheath Material	Copper, Steel, 304 Stainless steel, INCOLOY, Titanium
Watt Density	Up to 120 W/in <sup>2</sup>
Sheath Length	Up to 51 feet
Diameter	6.0 mm, 6.5 mm, 8 mm, 9.5 mm, 10 mm, 11 mm and 12 mm
Terminal Enclosure	Customized terminal boxes
Element clamp	Customized
Mounting brackets	Customized

Electric tubular heaters fits almost every industrial heating applications ranging from immersion to air heating that requires temperatures of 1382 degree F. They are made using high quality alloys to minimize physical stress and offer high efficiency. Used to heat solids, liquids and gases.

Material	Application
Copper	Water, Oil, Grease
Steel	Alkaline cleaning solutions, Tars, Asphalt or air heating
Stainless Steel	Corrosive liquids, food processing equipment, Radiant heating
Incoloy	Cleaning and degreasing solutions, Corrosive liquids
Inconel	Plating and pickling solutions, acid
Titanium	Corrosive liquids

## OPTIONS WITH TUBULAR HEATERS

### Terminations

Double ended tubular is available with a variety of terminations while single ended tubular has only flexible lead wires.

### Bend Formations

Double-ended heating elements can be formed into spirals, compounds, multi-axis and multi-planes etc. Custom bending is also available. However bending is not recommended with single ended elements.

### Mounting methods

Brackets, mounting collars, Threaded Bulkheads are available.

### Moisture Resistant Seals

It is important for the life and performance of the heater.

While selecting the ideal tubular elements for your application, please consider the following factors:

- Heating element watt density

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- Sheath material

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- Temperature of the product

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- Air velocity within the application

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- Medium to be heated

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