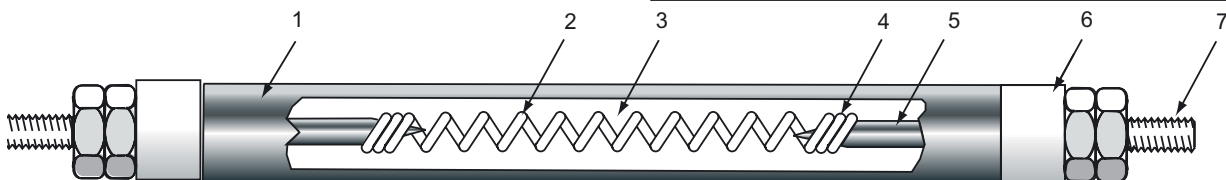
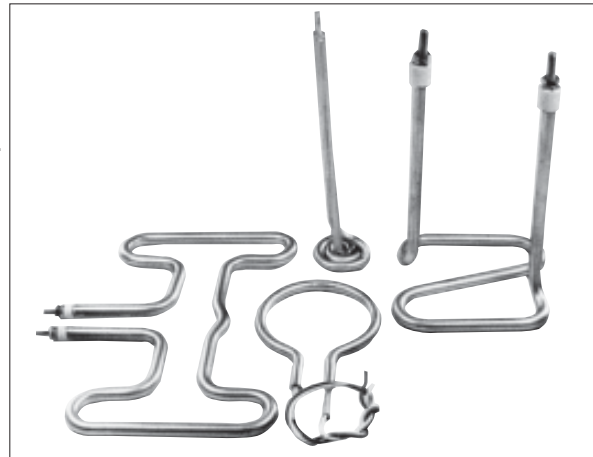


TUBULAR HEATER

CONSTRUCTION

1. Steel, stainless steel, copper, or Incoloy sheathed elements.
2. Element wire situated in proximity to outside surface for maximum heat transfer and minimum internal temperature while preserving good dielectric qualities.
3. Pure magnesium oxide compressed to an optimum density for best heat transfer and electrical insulation at elevated temperatures.
4. Weld connection.
5. Cold pin.
6. Insulator.
7. Standard post terminal



FEATURES

- Resistant to shock, vibration, and temperature extremes.
- Rapid heat transfer into medium.
- Many formations available.
- Long, trouble free service.

STANDARD SIZES & MATERIALS

The sheath materials available are stainless steel, steel, copper, and incoloy.

Standard diameters are: .260", .315", .330", .375" and .450".

Diameter tolerance is $\pm .010$ ".

Sheath Material	Maximum Temperature allowed on sheath	Maximum Length of sheath	Sheath Material
Steel	750°F	252"	96"
Copper	350°F	252"	96"
Stainless Steel	1200°F	324"	96"
Incoloy	1600°F	324"	96"

Hawco Limited

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TUBULAR HEATER

SHEATH MATERIALS AND WATT DENSITIES

Application	Approx Operating temperature	Recommended Sheath Material	Watts/sq.in of Element Surface
Clamped to Surfaces	up to 300°F	Steel	30
	500°F	Steel	20
	800°F	Incoloy	15
	1000°F	Incoloy	10
	1200°F	Incoloy	7
	1400°F	Incoloy	2.5
Clamped to Surfaces	800°F	Incoloy	7
	1000°F	Incoloy	11
	1200°F	Incoloy	14
	1400°F	Incoloy	30
Clamped into Machine grooves	500°F	Steel	25
	800°F	St. Steel	15
	900°F	Incoloy	15

FORMULA FOR DETERMINATION OF UNIT WATTAGE

Unit Wattage = Diameter x 3.142 x Heated Length x Allowable watts/ sq.in

ELECTRICAL TOLERANCES AND LIMITS

Sheath Diameter	.260"	.315"	.375"	.440"	.490"
Min OHMS / in.	.15	.05	.05	.05	.05
Max OHMS / in.	80	50	50	50	50
Max. Voltage	250	300	480	600	600
Max Amperes	20	30	40	40	40

STANDARD LENGTH TOLERANCES

Sheath Length	Length	Heated Length
Up to 20"	±1/16"	±2%
20" to 100"	±1/8"	±2%
100" to 200"	±1/4"	±2%

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TUBULAR HEATER

FORMULA FOR DETERMINATION OF UNIT WATTAGE ELECTRICAL TOLERANCES AND LIMITS

Sheath Length	Minimum Cold Ends
Up to 20"	1"
20" to 100"	1 1/2"
100" to 200"	4"

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