BACKER NORTH AMERICA

Tubular Heaters

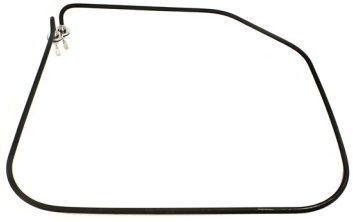
Tubular heating elements peform exceptional heat transfer by conduction, convection, or radiation to heat liquids, gases, air, and surfaces. Tubular elements have the unique ability to be designed and custom crafted to meet the specific requirements of any application, while exhibiting outstanding performance in the areas of heat transfer by convection, conduction and radiation.

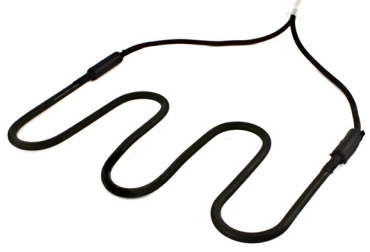
APPLICATIONS

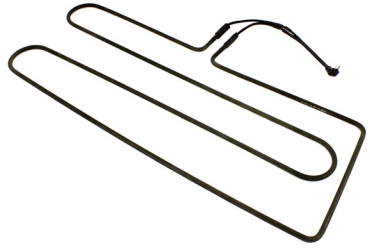
Bake/Broil/Convection
Cooktop
Air Heating (with or without fins)
Toasting
Warming

INDUSTRIES

HVAC & Comfort
Refrigeration
Transportation
Manufacturing & Processing
Energy & Advanced Technology
Residential Appliances
Commercial Food Service







Backer-Springfield's engineering staff possesses technical expertise, R&D capabilities, and the ability to work closely with our customers allowing us to meet virtually every design challenge that has been presented and to produce the most reliable and effective heater for your application.
We offer a wide range of sheath diameters, end treatments and sheath materials to ensure a cost effective and reliable design.

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Backer North America, 4700 John Bragg Hwy, Murfreesboro, TN 37127. Phone: +1 615 907 6900, Fax: +1 615 907 6948, www.backer-springfield.com
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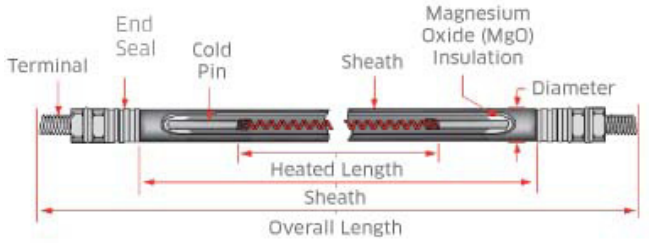
TUBULAR HEATERS



A tubular element has four basic components: a metal sheath, a helically wound coil of special resistive alloy, end seals, cold pins on each side of the coil, and magnesium oxide (MgO) insulating material. The tube is the outer casing of the heater and houses the other basic components. The cold pins protrude from the ends of the assembly to allow for power connections.

END SEAL TREATMENTS

Backer offers multiple end seal treatments. The operating temperature of the heaters, as well as the storage, operation, and end user application will determine the appropriate seal material.

LEAD WIRES AND TERMINATIONS

The power connections to the heater assembly can be provided by either splicing lead wires to or directly welding terminals on the cold pins. Multiple lead wire types and terminal pin options are available.

DESIGN OPTIONS

Sheath Materials	Max Temperature
-Copper	-350°F/177C
-Aluminum	-500°F/260C
-Cold rolled steel	-750°F/399C
-304 Stainless	-1400°F/760C
-316 Stainless	-1400°F/760C
-321 Stainless	-1400°F/760C
-Inconel 600	-1800°F/982C
-Incoloy 800	-1700°F/927C
-Incoloy 840	-1700°F/927C

Terminals (Ni or SS)	Stud Threaded Terminals
-Plated -Tab -90 Degree -Lug	-6-32 -8-32 -10-32
Wall Thickness	**Voltages**
-.018”-.049”	-Up to 600 volts AC
Cold Pins	**Sheath Diameter (+/- .005”)**
-SS or Ni-Ply -Length up to 1 1/2” Min.* *(application dep.)	-.250 -.430 -.260 -.475 -.312 -.490 -.334 -.625 -.375 -.865

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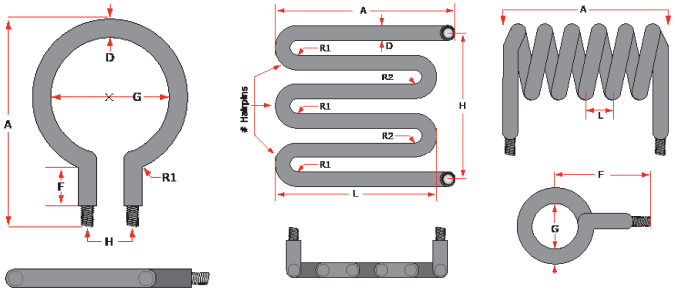
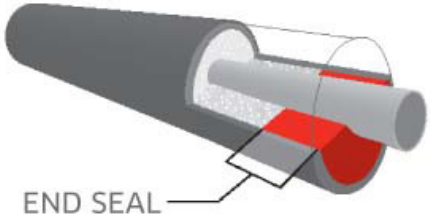


BEND FORMATIONS

Backer offers bend formations in most any shape, just submit your design folders and drawings for engineering review in order to provide the most efficient design for your application.

END SEAL TREATMENTS

Depending upon the intended use, Backer utilizes our engineering capabilites to construct a heater based on your application specifications. Moisture resistant, water resistant, and waterproof elements can be made to fit your requirements. Alternately, elements may be supplied that make the customer responsible for properly sealing the ends after additional processing.



END SEAL CONSTRUCTIONS

Primary End Seal Type*	Maximum Recommended Temperature	Standard Electrical Connections	Typical Application Conditions
Molded Neoprene Rubber	90°C	Neoprene Lead Wire	Refrigeration Defrost, etc. where heating element ends are in wet or moist environment, such as condensation (not intended for immersion).
Molded Silicone Rubber	150°C	Silicone Lead Wire	
Standard Epoxy	105°C	Welded tab, threaded stud, etc. or Leadwire using splice insulated w/UL Rec sleeve. May include cermaics or other insulators of equal or higher rating.	Appliances or equipment with element ends in dry, ambient humidity conditions, suitable for long term storage.
High-Temp Epoxy	180° C		
Hybrid Glass	315° C		
Silicone Rubber Bushing	150° C	Welded tab, threaded stud, etc. or Leadwire using splice insulated w/UL Rec sleeve. May include cermaics or other insulators of equal or higher rating.	These are known as "breathable" seals primarily for Cooking appliances or equipment with elements operating at high-watt density having ends in ambient humidity. Limited storage shelf-life, may require dehydration by customer before use if stored in humidity long term.
Teflon Bushing	180° C		
RTV Silicone	200° C		
High-Temp Silicone Bushing	250° C		
Ceramic	Up to UL Rated Sheath Temp.		

*Confirm selection with Backer engineering to ensure suitability for application.

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