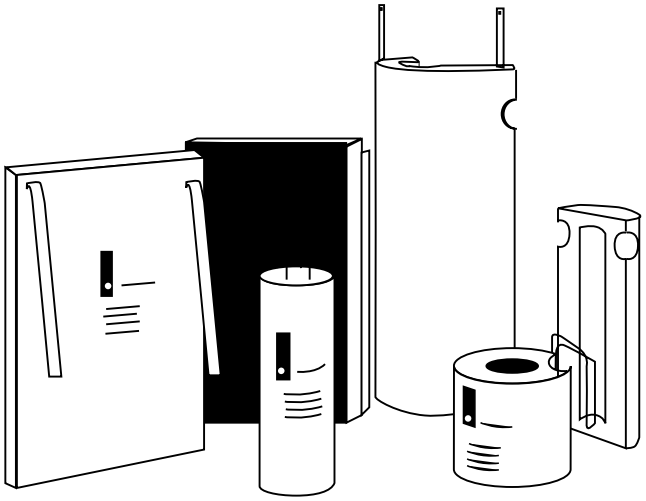
"Heated Insulation" Package



The ceramic fiber heater product line offers some of the highest temperature heating element capabilities in the Watlow family of heaters. Ceramic fiber heaters are made by integrating an iron-chrome-aluminum (ICA) heating element and ceramic fiber insulation for a new concept in application problem solving… "heated insulation!"

Heating units constructed of ceramic fiber insulation isolate the heating chamber from the outside. Ceramic fiber heaters are extremely low mass, high insulation value units with self-supported heating elements. Many applications can benefit from the convenience of the heating element and insulation combined into one package.

Ceramic fiber is an insulation made of an alumina-silica composition, held together by an inorganic binder. It's commonly used as a refractory material. Its lightweight, low-density properties make it ideally suited for high temperature applications requiring low thermal mass.

Applications

- High temperature furnaces
- Metal melting, holding and transfer
- Semiconductor processing
- Glass, ceramic and wire processing
- Analytical instrumentation
- Fluidized beds
- Laboratory and R&D
- Other high temperature process apllications
- Optimum performance for high temperature, enclosed furnace chambers
- Coiled elements readily conform to complex curved surfaces, especially small custom chamber shapes
- Coiled element design works best in higher voltage, lower current situations
- Use where lower watt density requirements and low duty cycle operations are expected
- Available in stock and standard units of medium watt density, rated up to 2000˚F (1093˚C)

Features and Benefits

High temperature iron-chrome-aluminum (ICA) resistance elements

- Available in five element configurations

Lightweight, low-density alumina-silica composition

- Assures a firm, thermal shock resistant, self-supporting unit

Operating temperatures to 2200˚F (1204˚C)

- Provide high temperature performance

Low mass ceramic fiber insulation of 10 to 15 lb/ft^3 (160 to 240 kg/m^3)

- Allows heater to reach process temperature quickly—energy is used to heat the load instead of wasting energy on itself

Works directly off common power-line voltages

- Need for expensive transformers or complex power control systems eliminated - compatible with full range of Watlow temperature controls and power switching devices

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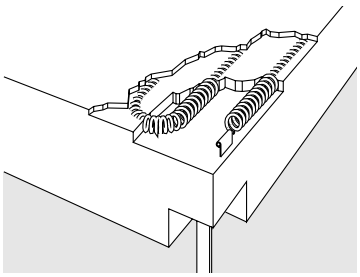
C E R A M I C F I B E R H E A T E R S

Embedded Coil Elements



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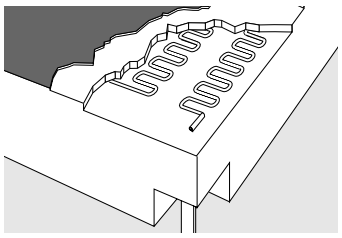
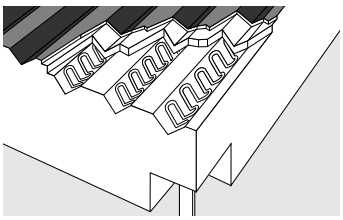
Embedded Sinuated Elements



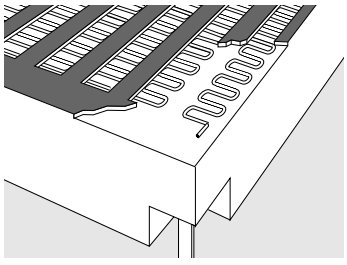
Flat Sinuated



V-Sinuated

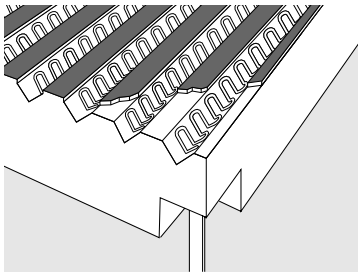
- Available in either flat or V-sinuated element configurations.
- Advanced V-sinuated element configuration allows up to 27 percent additional watt density over that of embedded flat sinuated elements.
- Performs best at medium to high temperatures at medium watt density power requirements.
- Use in partially enclosed to fully enclosed applications.
- Especially well suited for large, flat units; semi-cylindrical units above five inches (125 mm) I.D.; and full cylinders above four inches (100 mm) I.D.
- Offers greater effective insulation thickness than coiled element designs.
- Enhances “heated insulation” concept of operational use.
- Features high emissivity coating on new high watt density series units.

Exposed Sinuated Elements



Flat Sinuated

- Available in either flat or V-sinuated element configurations.
- Advanced V-sinuated element configuration allows up to 20 percent additional watt density over that of exposed flat sinuated elements.
- Offers the lowest possible wire-to-chamber temperature difference for maximum heater life.
- Provides the optimum heat-up/ cool-down and recovery times as well as maximum efficiency of operation.



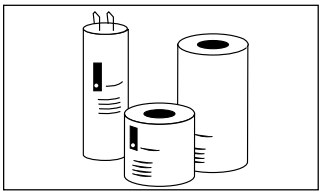
V-Sinuated

- Makes possible higher current handling capabilities.
- Minimizes the number of circuits and connections in large furnaces.
- Especially well suited for large, flat surface area units and large I.D. curved unit.
- Exposed elements are available on special order as a variation of the embedded sinuated element normally provided on stock and standard units.

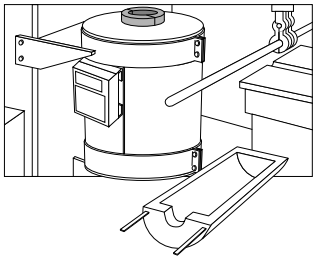
Mounting Methods

The Watlow ceramic fiber heater product line presents a wide range of heater shapes and configurations for solving high temperature process applications. The modularity and range of sizes and wattages provides the greatest possible flexibility when using these heaters. At the same time, this requires many different mounting solutions. Watlow has developed or can recommend many appropriate specific and generalized mounting systems for solving your mounting problem. Watlow has arranged the ceramic fiber heaters into seven major mounting categories or heater system configurations, shown in the following illustrations.

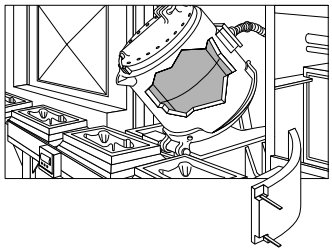
1. Full Cylinder Heaters



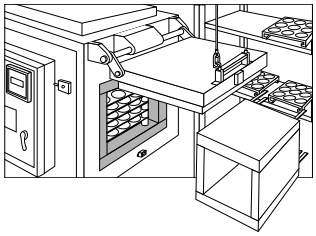
2. Semi-Cylindrical (180 degree section) Heaters



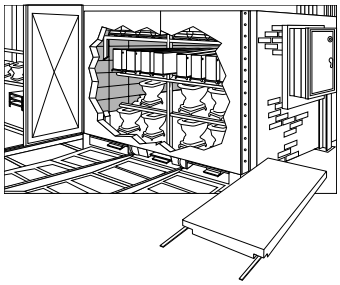
3. Arc-Section Arrays of Heaters (3 or more units of 120 degree or less each)



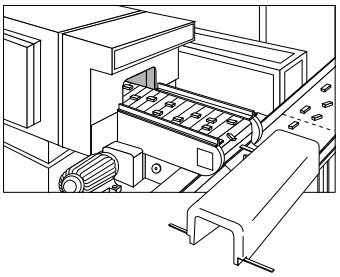
4. Flat Panels, with One Panel on Each Side



5. Flat Wall Array with Minimum Two-by-Two Units per Wall



6. Made-to-Order Molded Shapes with up to Five Sides of a Box Molded as One Piece, Including Complex Curves



7. MODULE-MOUNT® System

The Watlow MODULE-MOUNT® system is more than a mounting method. It's a design solution that integrates ceramic fiber heaters with a shell for mounting on an optional steel "space-frame" structure.

Combining the heaters and mounting assembly in one unique package provides ease of installation—and makes the heater more accessible for maintenance—minimizing downtime.

The MODULE-MOUNT system consists of four basic components: a ceramic fiber heater, additional insulation blanket, a sheet metal shell to hold the heater and insulation blanket, and the spaceframe.

The back side of the ceramic fiber heater is slotted to accept cemented-in tubes for connecting the heater to the shell. The reusable shell can be made of the most appropriate sheet metal to meet operating environment conditions. Several layers of reusable ceramic fiber blanket are placed between the shell and heater adding insulation value.

Performance Capabilities

- Holds ceramic fiber heaters capable of operating up to 2200˚F (1205˚C)
- Watt densities up to 25 W/in^2 (4 W/cm^2)

Features and Benefits

"Hot change"

- Allows individual heater replacement without total system shutdown or disassembly

"Spaceframe" structure

- Designed to hold from four to more than 18 heaters. Accommodates heater sizes as small as 4 to 12 inches (102-305 mm) wide and up to 48 inches (1220 mm) tall

Design flexibility

- Ideal for flat and curved wall heaters. The Spaceframe can be customized to hold any heaters that conform with size, shape and electrical rating limitation

Operates off powerline sources

- Rated from 120 to 600V~(ac), single or three-phase

How to Order

To order your stock/standard units, please specify:

- Quantity—including consideration of extras or spares
- Watlow unit code number (from Watlow Heater's catalog), and reconfirm the rated volts/watts
- Lead length and orientation (lead style A, B or C) 12 inch lead is standard
- Stock/standard modifications (more details available in Watlow Heater's catalog) Provide modification sketches as required.

To help reduce ordering errors, please double check:

- Specifications—heated area width and length, overall width and length, thickness, electrical ratings, etc.

Availability

Stock: Same or next working day shipment. No set up charges.

Stock with modifications: two to three working days shipment. Nominal set up charges only for specific modifications, not for the basic heater.

Standard: Shipment normally within four weeks. No set up charges.