

MICA HEATERS

Mica insulated heaters are constructed of nickel-chrome resistance wire wound uniformly around the mica winding card and insulated by select quality mica either natural Muscovite or Heat Resistant Paper Micanite, for a maximum operating temperature of 550 °C. The main function of mica for the above applications is to support and separate heating elements and nickel-chrome resistance wire. To ensure trouble free operations, the resistance ribbon joints and terminals are either spot welded or riveted as and where required. Nickel plated eyelets are used as & where needed.



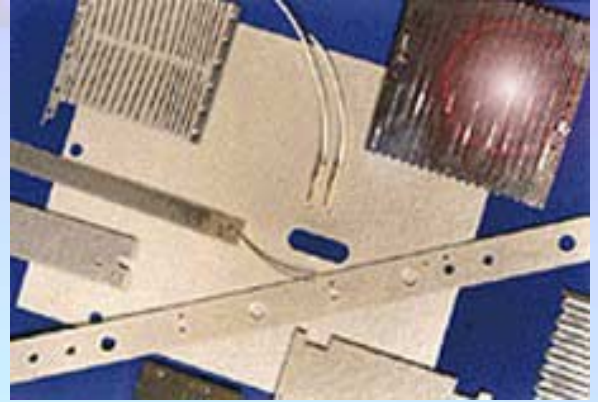
Mica insulated heaters offer a cost-effective approach for all types of heating applications because the mica construction provides for an extremely rugged heater with thermal efficiency of over 87%.

The low mass of the mica-insulated heater allows rapid heat-up and cool down thus respond rapidly to control and operate at high efficiency. The heat generated by the element in a mica-insulated heater is spread over a larger surface area which by lowering element temperature therefore gives longer lifetime of element.

Tough designs and manufactures custom mica insulated heaters with greater design flexibility. Requirements for size, wattage and voltage specifications can be precisely met with a custom designed heater. **Tough** has a proven track record of excellent customer service and on-time delivery.

SURFACE HEATERS

Surface Heater essentially consist of three pieces of natural or Heat Resisting Micanite sheet cut or punched to a specified shape conforming to the bottom plate. The upper and bottom sheets or cover are used for insulation purposes to support



and separate the mica wire winding card which is placed in the middle and is wound with a specific gauge of high grade nickel-chrome resistance ribbon wire providing even heat distribution to the flat surface and maximum heating life to the element under severe heat encountered in the service. These heating elements for surface heating applications are custom-built to fit different configurations in electric ratings ranging from 150 to 3000 watts, suitable to operate at 110/120 and 220/230 volt circuits.

Customized mounting holes are provided for easy installation. Irregular shapes are easily accommodated. Uniform heating is provided over the entire heater surface. For applications requiring heat concentrations in specific areas, the element is profiled to match the pattern.



Mica surface heaters are the most reliable and efficient heating solutions for tanks, platens and other surface heating applications, freeze and moisture protection in control cabinets, and infinite other industrial and commercial applications.



We can design or produce customized heaters exactly as per your drawings or samples and supply the perfect heat source for any surface heater application.

BAND HEATERS

Rugged construction along with high temperature and high watt density capabilities allow the Mica Band Heater to surpass all other band heaters in providing the ever increasing temperatures required for processing today's high tech materials.



Mica-insulated band heaters have proved themselves to be a reliable insulation for heating the barrels and nozzles of plastic molding and extruding machines to perform at higher operating temperatures up to 1200 °F (650 °C), providing long, efficient and dependable service life necessary for today's high productivity of plastic extruders, injection and blow molding machines, autoclaves, heating pipes, barrels and a wide range of cylinder-heating applications. They are constructed by winding a high quality nickel-chromium ribbon wound around a selected grade of sheet mica having an excellent dielectric and mechanical strength, as well as, thermo-conductivity, sandwiching the resistance element between two other mica sheets, and then folding sheet-metal around the sandwich to the desired circular shape. Mica type band heaters are constructed in either one or two piece configurations using a claming straps for easy installation by slipping the heater over the cylinder and tightening the single clamping screw to provide optimum contact throughout the operating range.

The connection systems employed are either plug pins, screw type terminals, or twin leads, insulated internally and externally with mica washers, serviced with porcelain beads or fiber-glass sleeving designed for long trouble-free service life.

STRIP HEATERS

Mica-insulated strip heaters have proven to be an economical, practical and reliable heat source, capable of providing uniform heat transfer to flat surfaces, retaining good heater life, with ability to operate at higher temperature with continuous operating temperature rating of 1200 °F (650 °C) with maximum efficiency. They are manufactured in any desired width and length ranging from 1 to 18 inches width, by 1.1/2 to 60 inches lengths, by 1/8 inch thick, using nickel-chromium ribbon wire evenly space wound on a specially selected mica strips, enclosed in a rust-resistant steel sheath casing, as per customers' requirements, with terminal at one or both ends with or without mounting holes. They are clamped securely along their entire length to a smooth metal surface to prevent distortion or unequal expansion.

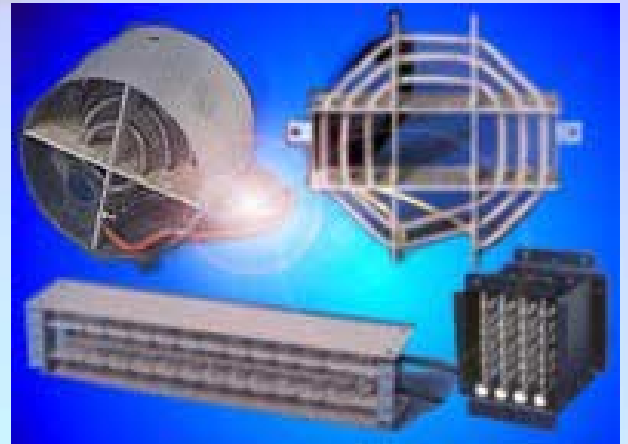


They are manufactured for electric rating ranging from 050 to 2000 watts and to operate at 115 and 220 volt circuits. Strip or finned heaters are used for process machine, dies, molds, tanks, kettles, cylinders or other applications where controlled heating is needed. Typical applications are blow molding equipment, food warming equipment, platens in hydraulic presses, incubators, plastic molds, hot plates, ovens, testing equipment, vulcanizing presses, vending machines and hundreds of industrial heating applications.

We can supply the perfect heat source for any strip heater application.

OPEN COIL HEATERS

An air heater with an open-coil element maximizes the exposure of the element to the air. This increases the efficiency of heat exchange. Response times are very fast, providing for rapid heat up and cool down times. You get the exact heater you need - not a compromise



These heaters are easy-to-install and mount directly to square axial fans, using the same mounting holes as for the fan itself. These air heaters utilize multi-purpose mounting brackets to attach directly to the exhaust of a cross flow blower without the need for additional accessories. These heaters mount directly to square axial fans, using the same mounting holes as for the fan.

These standard heaters are available in several sizes, a broad range of wattages, and with custom features. They are ideal for a wide range of drying, curing and warming applications typically found in film processing, lab and medical instruments.

These cross flow blower heaters may be tailored to meet your specific heating requirements. Size, wattage, and voltage may be matched to your specifications for optimal system performance.

The open-coil element has an extremely fast response time and efficiently transfers heat to the moving air. Wattage and voltages are easily changed to meet your specifications.

Our experienced engineers can begin involvement at any stage of development. We'll assist with design approaches, supply prototype samples, and offer cost-reduction suggestions.

FLEXIBLE HEATER

A fine gauge resistance wire is spiraled around a core produced with mica and fiberglass combination bonded with high temperature resisting silicone resin. The element is placed in a specifically designed pattern of Glass Fabric & Mica Paper combination plates and optionally vulcanized to a silicone rubber substrate.



Advantages versus etched foil elements are: Physical strength; flexibility; smaller production quantity; conforms well to small radius bends and larger possible sizes.

The Heaters are rugged, moisture and chemically resistant and are easily bonded or cemented to heat sinks or other parts to be heated. Temperatures up to 300°C and up to 20 watts per square inch are easily accommodated. The thin profile transfers heat quickly because the actual resistance element is so close to the heated part. These Heaters can be insulated with silicone sponge rubber bonded to one side. Another way to lower radiated and convected heat losses is to apply an aluminized surface to the heater back.

These heaters are particularly suited to critical oval, elliptical or round shape heating areas where several opening and closing takes place during operation cycle like Mug Transfer Presses.



We can produce and assemble the complete heater assembly with spring steel support sheaths and other hardware as per drawings and specifications required in application.

APPLIANCE HEATER

Mica heating elements are assembled from natural fabricated mica former or Reconstituted Heater Plates suitable for all types of domestic and Industrial Appliances. They provide excellent heat, thermal & flame insulation properties. Patterns and dimensions are precisely customized as per customer's drawings.

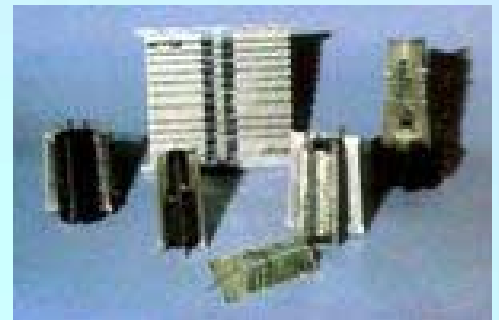


Mica Blocks Cards

- High Quality Ni-chrome Wire.
- Fabricated Ruby Mica Former.

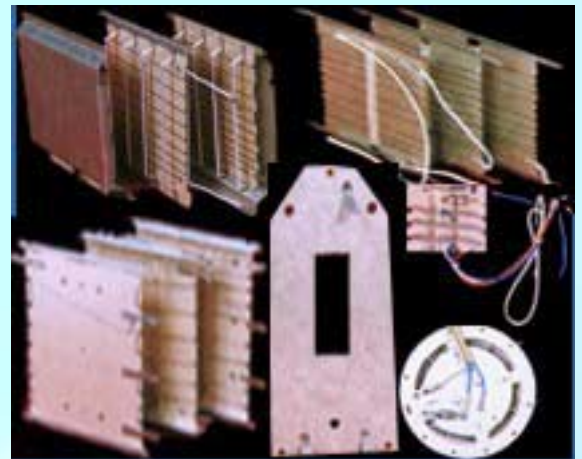
Paper Micanite Rigid Cards

- High quality Ni-chrome Wire
- Muscovite Paper Heater Laminate.



Mica Heating elements are the best selections for long lasting and most hygienic components used for Domestic appliances as:

- Flat Iron
- Bread Toaster
- Electric Kettle & Oven
- Electric Pop-corner
- Hair Driers
- Hot Plates & Milk Warmer
- Hot Air Blower
- Coffee Percolator
- Rice Cooker



All Mica heaters are customized as per customer's drawings to meet their specifications precisely. Optionally with bread guides and heat reflectors.