Mica Insulated Strip Heaters
Are Used in Hundreds of Industrial and Commercial Heating Applications

A Specially treated rust-resistant steel sheath casing provides the best combination of physical strength, high emissivity and good thermal conductivity for sheath temperatures up to 900°F (480°C). For corrosive atmospheres and/or sheath temperatures up to 1200°F (650°C), stainless steel sheath is available.

B For maximum connecting surface, the specially designed stainless steel screw terminals are securely fastened to a connecting jumper, assuring positive contact with the windings, providing maximum current carrying capacity. For other terminal or lead arrangements, see pages 8-22 and 8-23.

C Specially selected mica grade and thickness is used to insulate the windings, providing excellent thermal conductivity and dielectric strength.

D A specific nickel-chrome resistance ribbon wire size is properly engineered to achieve the best combination of wire gauge and spacing between turns, thereby providing the lowest winding temperature possible. The ribbon wire is wound on a specially selected Mica Strip, providing even heat distribution for maximum heater life.

Typical Applications
- Food Warming Equipment
- Packaging Equipment
- Blow Molding Equipment
- Testing Equipment
- Vulcanizing Presses
- Vending Machines
- Hot Plates
- Ovens
- Molds
- Kettles
- Incubators

Agency Approvals
Mica Strip heaters are UL recognized and CSA certified in many design variations. Tempco’s UL file number is E65652 and CSA file number is 043099.

If you require UL, CSA, or other NRTL agency approvals, please specify when ordering.

View Product Inventory @ www.tempco.com
Strip Heaters

Specifications & Tolerances

Standard Specifications and Tolerances of Mica Insulated Strip Heaters
If tighter tolerances are required consult Tempco. A heater’s physical size combined with electrical ratings will determine the actual minimums and maximums.

PERFORMANCE RATINGS

Maximum Sheath Temperature
Rust resistant steel: 900°F (480°C)
Stainless Steel: 1200°F (650°C)
Nominal Watt Density: 5-45 W/in² (0.8-7.0 W/cm²)
Maximum Watt Density: Depends on operating temperature and heater size. 38 W/in² (5.9 W/cm²) Maximum when UL & CSA approval is required.

ELECTRICAL SPECIFICATIONS

Maximum Voltage: 480 Volts
Maximum Amperage: lead wire termination: 10 amp
screw terminations: 8-32UNF—20 amp; 10-32UNF—25 Amps
Resistance Tolerance: +10%, −5%
Wattage Tolerance: +5%, −10%
Formula for Calculating Watt Density

\[
\text{Watt Density} = \frac{\text{Heater Wattage}}{(\text{Heater Width} - 3/8) \times (\text{Heater Length} - \text{Cold Area}^*)}
\]

* Cold Area consists of Holes or Cutouts.

MATERIAL SPECIFICATIONS & PHYSICAL SIZES

Standard Sheath Material: Rust resistant steel
Optional: Stainless Steel or Aluminum
Nominal Thickness: 3/16" (4.76 mm)
Minimum Width: 5/8" (15.88 mm)
May vary depending on Termination
Width Tolerance: ±1/32" (0.79 mm)
Maximum Length: 72" (1829 mm)
Length Tolerance: Up to 24" (610 mm) ±1/16" (1.59 mm)
Over 24" (610 mm) ±1/8" (3.18 mm)
Screw Terminals
1" (25.4 mm) wide strips: 8-32 threads
Over 1" (25.4 mm) wide strips: 10-32 threads

Minimum Termination Distance from Edge of Heater

No Mounting Tabs

With Mounting Tabs

Installation

1 Tempco Mica Insulated Strip Heaters are available with mounting slots at each end for surface mounting applications or without mounting slots for insertion into milled slots.

2 For surface mounting installations, Mica Strip heaters must be clamped securely along their entire length to a smooth metal surface by using metal clamps 3" to 5" apart.

3 Holes along the body of the strip heater for mounting purposes are not recommended and should only be used when there is no other means of clamping the strip heater down. These holes take up valuable winding space, increasing watt density, resulting in poor heater life.

Instructions

4 When supported by mounting slots, the terminal end should be secured firmly. Opposite end should be slightly loosened to allow for linear expansion.

5 The surface being heated must be clean and smooth for efficient heat transfer. Small air gaps caused by imperfections can cause hot spots, resulting in heater failure.

6 Contaminants such as oil, plastics, and dirt should not be allowed to collect on heaters, as they will find their way into the heater windings, eventually carbonizing and causing electrical shorts.
Terminations

**Screw Terminal Terminations**

**Type T1**
- Screw terminals at opposite ends.
- Minimum Width required is 7/8”.

**Type T2**
- Screw terminals tandem at one end.
- Minimum Width required is 7/8”.

**Type T3**
- Screw terminals parallel at one end.
- Minimum Width required is 2”.

**Post Terminals**
- (center to center)
  - 8-32: A=3/4”
  - 10-32: A=7/8”

**Button Terminals**
- (center to center)
  - 6-32: A=1-1/8”
  - 10-32: A=7/8”

**Igloo™**
- High-Temperature quick-disconnect plug.
- Available on 7/8” widths (depending on termination configuration) and wider with cup and plug assembly or just cup. Type P1Q shown with 90° plug and galvanized armor cable. Other options available. Consult Tempco.

**Terminal Protection**

**Type B**
- Low-profile 10-32 button terminals with binding head screws. Same location and minimum width requirements as types T1, T2 and T3. 6-32 threads available.
  - **Type B1** Terminals at opposite ends (see T1)
  - **Type B2** Terminals same end (see T2)
  - **Type B3** Terminals same end (shown)

**Type C**
- Terminal box has one 1/2” trade size knockout (actual diameter 7/8”) for ease of wiring. It provides excellent protection against exposed terminals. Boxes can be prewired with armor cable or wire braid.
  - **Type CA** Box only
  - **Type CB** Box with galvanized cable
  - **Type CC** Box with Stainless Steel cable
  - **Type CD** Box with wire braid

**Igloo™**
- Igloo ceramic terminal covers consist of two ceramic parts. With a tight-fitting cap and a solid base, an Igloo cover will fully insulate any standard 8-32 or 10-32 terminal lug used for electrical wiring hookup. Igloo covers can be assembled onto any standard mica strips with 10-32 screw terminals. Igloo covers are available in 3 different styles: single port, double port in-line and double port 90°. See page 15-13 for specific part numbers. Heater with double port in-line Igloo cover shown here.
Type W1
Wire braid leads offer sharp bending not possible with armor cable. 10" of wire braid over 12" leads is standard. If longer braid or leads are required, specify. 
**Minimum Width** required is 7/8".

Type W2
Flexible stainless steel braided lead wires exiting at same end. 10" stainless steel braid over 12" leads is standard. If longer braid or leads are required, specify. 
**Minimum Width** required is 1-1/8".

Type W3
Flexible stainless steel braided lead wires exiting at opposite ends. 10" stainless steel braid over 12" leads is standard. If longer braid or leads are required, specify. 
**Minimum Width** required is 3/4".

Type L1
Flexible lead wire exiting from the top through a brass eyelet. 10" long leads standard; if longer leads are required, specify. 
**Minimum Width** required is 7/8".

Type L2
Flexible lead wire exiting same end. 10" long leads standard; if longer leads are required, specify. 
**Minimum Width** required is 1-1/8".

Type L3
Flexible lead wire exiting at opposite ends. 10" long leads standard; if longer leads are required, specify. 
**Minimum Width** required is 3/4".

Type R1
Armor cable provides far superior protection to lead wires where abrasion is a constant problem. Available with two- or three-prong plugs. 10" of armor cable over 12" leads is standard. If longer cable, leads or plugs are required, specify. 
**Minimum Width** required is 1".

- **Type R1A** Galvanized cable, crimped
- **Type R1B** Stainless Steel cable, crimped
- **Type R1C** Galvanized cable, tack welded
- **Type R1D** Stainless Steel cable, tack welded
- **Type R1E** Galvanized cable, full silver brazing
- **Type R1F** Stainless Steel, full silver brazing

Type R2
Right-angle armor cable can be positioned in any direction. 10" of armor cable over 12" leads is standard. If longer leads are required, specify. 
**Minimum Width** required is 1-1/4".

- **Type R2A** Galvanized cable, crimped
- **Type R2B** Stainless Steel cable, crimped
- **Type R2C** Plain leads, no cable
## Standard Sizes and Ratings — Heaters Without Mounting Slots

### Termination Types

- **L1** and **L2** have 10" leads.
- **R1** and **R2** have 10" galvanized armor cable over 12" leads.
- **W1** and **W2** have 10" stainless steel braid over 12" leads.

### Standard (Non-Stock) Sizes and Ratings

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An electric heater can be very application specific; for sizes and ratings not listed, TEMPCO will design and manufacture a Mica Insulated Heater to meet your requirements. Standard lead time is 2 weeks.

Please Specify the following:

- Width
- Termination Type
- Length
- Lead Length
- Wattage
- Cable/Braid Length
- Voltage
- Optional Features

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

**Additional Mica Strip Heater Optional Features**

**Pressure Plate**

Strip Heaters can be made with built-in pressure plate to add rigidity and minimize warping of the heater. Standard plate thickness is 1/8". Specify plate thickness and choice of mounting method 1 or mounting method 2.

**Mounting Method 1**

Built-In Pressure Plate

**Mounting Method 2**

Separate Pressure Plate

**Cross-Section-Formed**

Strip Heaters can be formed on their cross section for pipe heating applications. 2" minimum width required. Specify diameter of pipe on which heaters are to be mounted.

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**Butt Case**

Recommended for heating applications where strip heater will be placed in a milled slot between two steel plates.

**Four Sides Closed**

Mica Strip Heaters can be closed on all four sides to reduce contamination from getting inside the heater. Recommended on all strip heaters over 2-1/2" in width.
Strip Heaters

Optional Features

Additional Mica Strip Heater Optional Features

Sinuated (Serpentine) Element Design
Sinuated (Serpentine) wound coil design is used for low temperature and low watt density applications within the 3-10 amp range.

Disc Heater
When ordering Disc Heaters, specify outside diameter, electrical ratings, and termination type. If mounting holes are required, specify location and hole size.

Open Element
This economical heater design without the metal case is commonly used in laminating machines. The heater assembly can be suspended or sandwiched between non-metallic machine parts, eliminating the need for additional and expensive metal cases.

Ring Heaters
When ordering Ring Heaters, specify inside and outside diameters, electrical ratings, and termination type. If mounting holes are required, specify location and hole size.

Custom Engineered/Manufactured

Irregular Shape
Mica Strip Heaters can be made into any practical shape and electrical rating. We welcome your inquiries.

Non-Metal Sheath Custom Mica Heaters

Irregular Shape
Non-Metal Sheath Strip Heaters can be made into any practical shape and electrical rating. We welcome your inquiries.

Distributed Wattage
A mica strip heater can be designed with varying heat profile along the length for uneven heat distribution.