MEGABAND* MICA INSULATED BAND HEATERS

MEGABAND mica insulated band heaters are efficient and economical solutions to the heating requirements of many applications. Although their maximum sheath temperature is limited to 900° F, with different electrical termination styles, clamping mechanisms, and ability to accommodate holes and cutouts, **MEGABAND**s are successfully used in many applications, but are mostly sought for in the plastics industry.

- **Construction overview**
- **Clamping mechanisms**
- **Termination styles**
- **Construction styles**
- **Watt density information**

MEGABAND MICA INSULATED BAND HEATERS

- *Injection molding machines*
- *Plastic extruders*
- *The food industry*
- *Blow-molding machines*
- *Container, pipe or tank heating*
- *The pharmaceutical industry*

Construction and features

- Economical
- Dependable and efficient
- High quality mica and resistance wire
- Versatile design
- CSA and CE certified

MEGABANDs utilize different types of top grade mica. The thickness of each mica layer is carefully selected to balance between the insulating characteristics of Mica and the ease of heat transfer from the resistance ribbon to the machine barrel.

The resistance ribbon used in a **MEGABAND** is not restricted to the capabilities of Nichrome wire. Different alloys are considered for different applications. The internal winding is carefully designed to ensure uniform heat distribution throughout the heater.

To maximize the surface-to-surface contact, **MEGABAND**s are carefully rounded and formed to optimize the grip on a machine barrel. The external metallic protective sheath of a **MEGABAND** is made of a special alloy, which expands less than the barrel when heated. This difference in thermal expansion makes the heater grip the barrel firmly once it is energized, and this improves heat transfer. Poor heat transfer acts like a throttle and makes the resistance element inside the heater function at elevated temperatures, which eventually leads to the premature failure of the heater.

MEGABANDs are made in different construction styles, clamping mechanisms, and terminal types. Holes, cutouts, slots, thermocouple or mounting brackets can be accommodated in the design.

MEGABAND MICA INSULATED BAND HEATERS

Clamping mechanisms

- Independent strap
- Built-in barrel nut
- Spotwelded straps
- Flange lock-up
- Wedge lock
- Latch and trunion
- Hinges
- Spring-loaded barrel nuts
- Clamping pads

The longevity of a band heater is directly related to the heat transfer rate from the heater to the cylinder it is intended to heat. One factor affecting the quality of heat transfer is the clamping mechanism of the band heater.

MEGABANDs come with different styles of clamping mechanisms. Each style has unique characteristics and advantages. Selection is based on the specific requirement of the application.

Independent strap

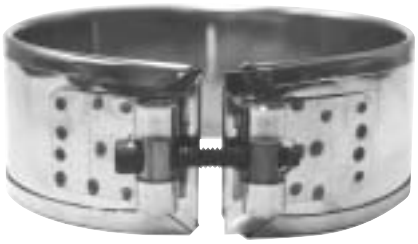
These straps evenly distribute the drawing force around the band heater by clamping the heater tightly around the surface of the cylinder. This distributed force is transferred to the internal windings, improving heat transfer through effective surface contact and elimination of air gaps.

Built-in barrel nuts

This clamping mechanism combines the drawing quality of an independent strap with ease of installation. The top sheet is transformed into a strap by incorporating barrel nut fasteners at both sides of the gap. Recommended when holes and cut-outs prevent the usage of an independent strap.

Spot-welded straps

This construction is similar to the built-in barrel nut style. The fastener section of an independent strap is spot welded on the top sheet on both sides of the gap. This construction allows for a heated section under the fastener.



Flange lock-up

The most economical fastening style, flange lock-up is used mostly on narrow heaters.

MEGABAND MICA INSULATED BAND HEATERS

Wedge lock

Low profile clamp. Used when clearance above the heater is limited. A wedge-like clamp slides on the lips of the heater located on both sides of the gap. The normal height from the inner diameter (ID) to the highest point of the wedge lock is 5/16”.

Latch and trunion

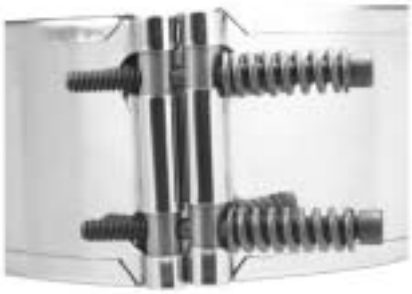
Ideal when fast detachment is required. The clamp is released with a flip of the thumb, eliminating the usage of any tools. The spring loaded 1/4-20 bolt absorbs thermal expansion in the fastened position.

Hinges

Used when a heater band has two sections. A piano hinge is incorporated on one side of the heater, while the other side can have any kind of clamp. The clearance between the two sections on the side of the hinge is 5/16“.

Spring-loaded barrel nuts

Independent straps, built-in barrel nuts and spot welded straps can have longer screws with incorporated die springs. These springs help to keep the band heater tight during thermal expansion. Only available in 1/4-20 screws.



Clamping pads

Mostly used in two section partial heaters. When an obstruction prevents the usage of a complete band heater, it becomes necessary to create a large gap and fasten the heater to the cylinder on both sides of the gap. It is not advisable to have clamping pads on both sides of the same section of a heater, because thermal expansion might detach the heater from the cylinder.

Electrical terminations

MEGABANDs are available with various types of electrical terminations. Each termination has its own unique characteristics, advantages and limitations. When selecting a termination style, the following factors must be taken into consideration: diameter, width, voltage, amperage, operating temperature, electrical safety and cost.

Termination categories

- Screw terminals
- Lead wire terminals
- European plugs

Screw terminals

Stainless steel screw terminals are the most convenient and economical means to connect a heater to an electrical power source. They are mostly recommended when high amperages (up to 30 amps) are involved. The temperature limitation is 840° F.

Styles

- Separate on opposite sides of gap (A)
- Along the width side by side (B1)
- Along the length side by side (B2)
- With protective terminal box (G)
- With ceramic protective cover (V)

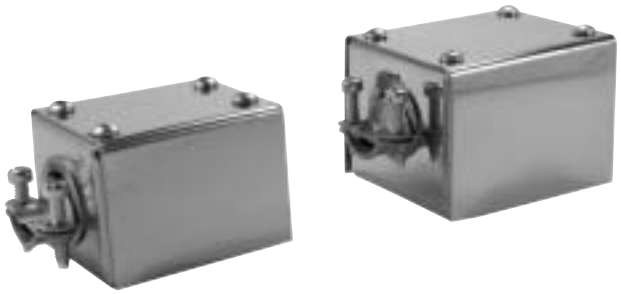
A Style - Separate on opposite sides of gap

B1 Style - Along the width side by side

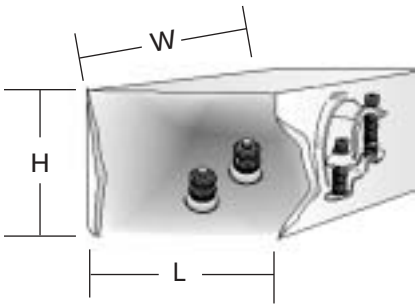
B2 Style - Along the length side by side

MEGABAND MICA INSULATED BAND HEATERS

G Style - Terminal box



Terminal boxes eliminate the risk of electrical shock and electrical short by enclosing the terminals in a heavy duty stainless steel box.
Cover boxes come in two sizes, G1 and G2.
For three-phase and dual voltage applications, special boxes are used.

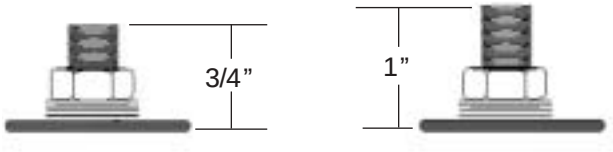


	W	L	H
G1	1 5/8”	2”	1 5/8”
G2	2”	2 1/4”	1 3/4”

V Style - Ceramic terminal Covers

Ceramic terminal covers provide a cost effective means of reducing the risk of electrical shock and electrical shorts.

MEGABAND standard screw size is #10-32. For finer applications, #8-32 screws are available. Screws have 3/4” height above the barrel with A, B1, and B2 styles. When ceramic covers (V) are used, the terminals are 1” long.



Heaters that are three-phase, dual voltage, have two independent circuits or a ground terminal, require an additional third or fourth screw.

Lead wire terminals

High temperature wire is internally connected to the heater. This provides a safer electrical connection. However, it is physically impossible to conceal heavy gauge wire under the top metallic sheet. This limits the maximum amperage applicable to 20 Amps.

Styles

- **Armor cable**
- **Stainless steel braid**
- **Plain lead wire**

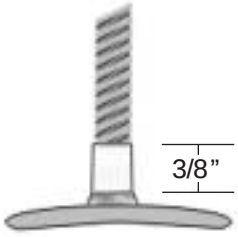
Within each style, there are different models of lead wire exit.

Armor cable

Armor cable provides the best protection against abrasion where a great deal of flexibility is not required. Straight lead exit or a 90° bend are the available options for this lead type. Brass fittings are used to secure the termination.

H Style - Straight lead exit

GM Style - 90° bend



MEGABAND MICA INSULATED BAND HEATERS

Stainless steel braid

In applications where there is frequent movement or risk of abrasion, stainless steel braided leads are recommended. Heat shrink sleeving at the end of the leads prevents the braid from fraying.

E Style - Straight lead exit

LP Style - Low profile terminal cover

C Style - Used mostly with nozzle heaters

I Style - 180° from gap

Plain lead wire

Plain leads are used where there is no risk of abrasion or contamination. High temperature wire with fiberglass insulation (840° F) is standard. Teflon insulated wire is also available.

EF Style - Straight lead exit

F Style - Exiting on both sides of the gap

CF Style - Used mostly with nozzle heaters

IF Style - 180° from gap

European plugs

European plugs are safe and simple to use. They provide a quick solution in applications where the electrical termination has to be disconnected frequently. They can be used on all our construction and clamping styles. EP terminals provide practical electrical connections when a failed heater has to be replaced. European plugs are available either with two round prongs (6 mm.) or three flat prongs (one of which is a ground).

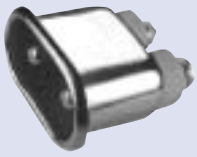
K90 Style - Tangential with box

K00 Style - Vertical with box

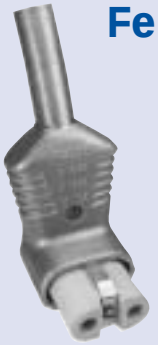
K45 Style - At 45°

K3P Style - 3 Prong with ground

Female receptacles & male plugs



16A-250V



25A-380V

10A-250V

10A-250V

MEGABAND MICA INSULATED BAND HEATERS

Construction styles

Maximum performance and ease of installation are two major considerations when selecting the construction style of a **MEGABAND**. The following are the most common construction styles.

- One piece
- Two piece or more
- Partial
- One piece flexible
- Conical
- Square/Rectangular
- Reverse

One piece

One-piece construction is used when a heater can be installed on a barrel without extensively expanding it.
Diameter: 5/8” min; 22” max
Width: 5/8” min; 14” max

Two piece or more

Two or more pieces are for ease of installation. A practical choice when the barrel diameter is large.
Diameter: 2” min; 44” max
Width: 5/8” min; 14” max

Partial

Partial heaters are recommended where obstructions or complicated holes prevent having complete coverage on the surface of the barrel.

One piece flexible

One-piece flexible heaters are used in applications where two-piece construction is not practical, and expanding the heater is necessary during installation. These heaters should not be opened more than twice.

MEGABAND MICA INSULATED BAND HEATERS

Conical

Conical or irregular shaped heaters are made to fit unconventional forms. Heat transfer considerations impose limitations on the overall design and construction of these heaters. Our engineers are available to discuss the requirements of each application.

Square and rectangular

Mica bands can be made square, rectangular or multi-sided to suit your specific requirements.

Reverse

Reverse heaters are used in applications where heating from inside the barrel is required. The outside shell of these heaters is the heating surface and all the terminations and clamps are located on the inside of the heater.
Diameter: 3”min; 36” max
Width: 1”min; 12” max

Installation tips

- The cylinder should be clean from any contaminants and foreign materials.
- The heater should be tightened firmly on the cylinder. The rims should be gently tapped with a plastic mallet and the heater re-tightened.
- Energize the heater for a short period of time and then re-tighten the fasteners.
- To compensate for thermal expansion, large diameter heaters should have spring-loaded fasteners.
- One-piece construction heaters should be opened only slightly, and made to slide on a cylinder. Two-piece construction or flexible heaters should be used when a heater has to be fully opened.

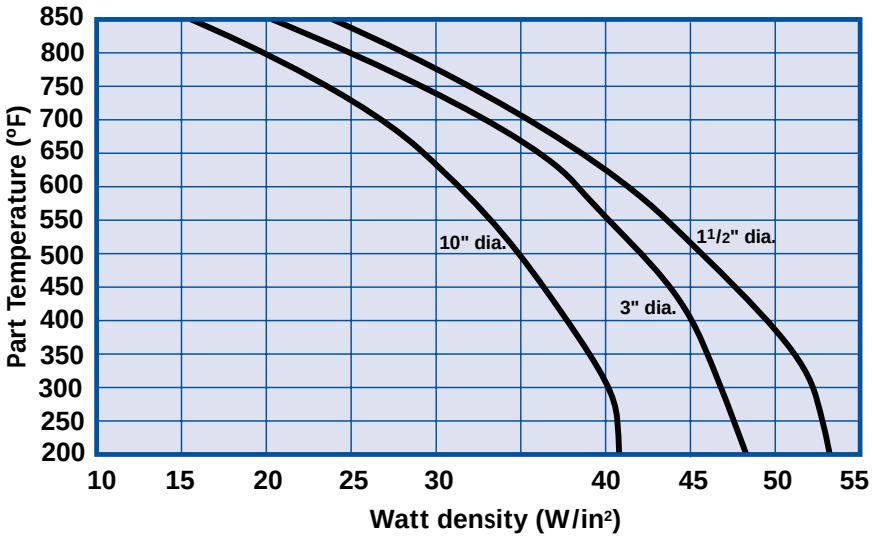
MEGABAND MICA INSULATED BAND HEATERS

Watt density information

The durability and performance of a heater depends on selecting the appropriate wattage. Exceeding the maximum allowable watt density for the specified heater size will result in premature heater failure. While calculating watt densities, we should remove the area of the cold section from the overall calculated surface area of the heater.

$$\text{Watt Density } (W/in^2) = \frac{\text{Wattage}}{(3.14 \times ID \times Width) - (\text{Cold Section})}$$

CONSTRUCTION	COLD SECTION
One piece	1” x width
Two piece	2” x width
Holes, Cutouts	(Size + 1/2”) x width



Maximum allowable watt densities for heaters 2” wide or less

Points to consider while selecting watt density

- Select narrower heaters where possible, as their heat transfer is superior to wide heaters. 1” to 2.5” wide heaters are ideal.
- The watt density should be selected in accordance with the operating temperature. A table that shows the maximum allowable watt density is provided as a guideline.
- To avoid short cycling and inefficient operation, select a wattage as close to the needed capacity as possible.
- The wattage should be in accordance with the voltage and current rating of the controls.
- The safe heating pattern of the material heated, thermal conductivity and coefficient of expansion of the cylinder are other factors that should be taken into consideration while deciding wattage.