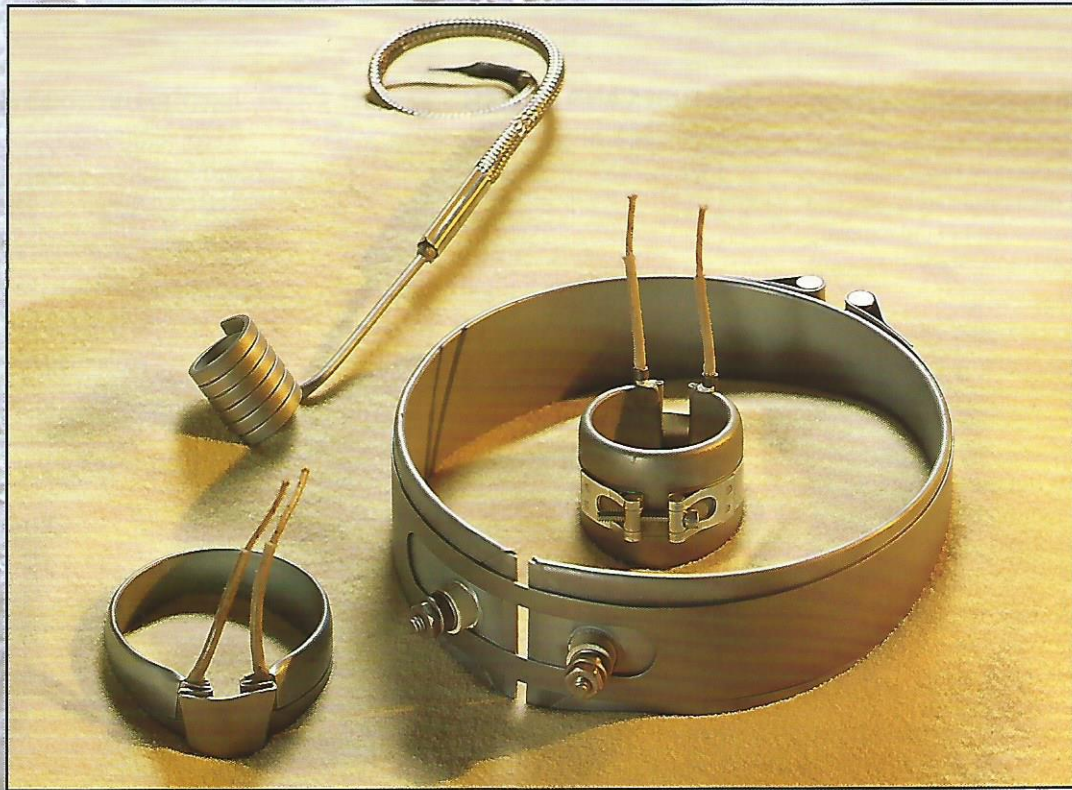
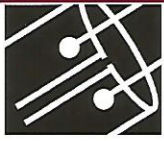


B A N D H E A T E R S



As sophisticated as the advanced resins
they work with—Fast Heat's patented
Better Band® heaters.

fast  *heat*®



BETTER BAND HEATERS

BETTER BAND®

Fast Heat, recognizing the need for a heater with operating temperature capabilities exceeding that of mica-insulated bands, pioneered the development of the mineral insulated band heater and received a patent on this technology.

In both laboratory and factory conditions, the Better Band has performed without fail in temperatures up to 1400° F (760° C) and watt densities of 100 watts per square inch (15.5 w/sq. cm). Better Bands can meet U.L./C.S.A. approval, use the chart on page 151 for reference and consult factory. If C.S.A. approval is required for lead wire, please notify Customer Service when ordering.

Better Bands are available through QuickShip and Fast Track . Refer to page 2 for a complete description of these rapid delivery programs.

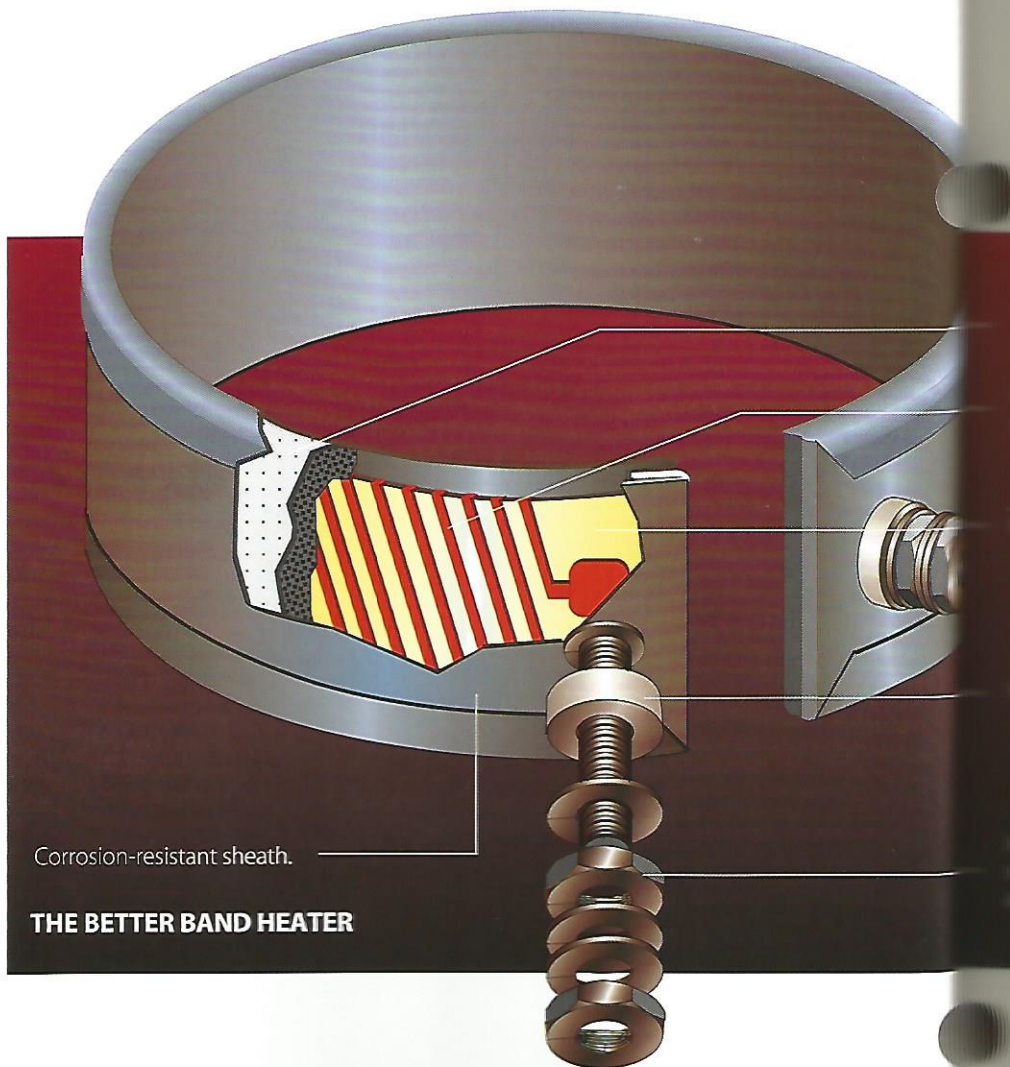
APPLICATIONS

The Better Band will consistently out-perform other bands in virtually any application. Its ability to withstand extremely high heat makes it the best choice for the plastics industry, especially when processing engineering-grade resins. Additional uses include heating pipes, chemical processing and drum heating.

In addition, Better Bands can be modified to meet the demands of virtually any special application. Our engineers can utilize a variety of alternative features and options to customize the heater to your specific needs.

FEATURES AND BENEFITS

- Maximum watt densities; far in excess of any other type of band.
- Highest application temperatures available.
- Best possible clamping and the resulting improved efficiency.
- Longest life available for any application and reduction of equipment downtime.
- High heat transfer rates and the resulting fast response.
- Rapid heat-up capabilities and no fear of heater failure.
- Reduced number and physical size of heaters required per application.
- Cost-effective performance.
- Choose a Better Band when the temperature of the heater will exceed 650° F (343° C).
- Expandable or two-piece construction.



BETTER/SEALED BETTER BAND HEATERS



MATERIAL AND CONSTRUCTION

- Precision engineered with computer-selected wound resistor element.
- Efficient low expansion clamping systems or welded-to-the-sheath clamping ears.
- Optional lead and screw termination styles.
- High temperature patented mineral insulation heat transfer media.
- High temperature oxidation-resistant sheath material commensurate with maximum operating temperature.

- Stainless steel screw terminals welded to an internal stainless steel pad effecting a positive and secure electrical connection. The surrounding area is insulated with a high temperature refractory cement and ceramic insert.
- When lead wires are specified, they are also welded to a stainless steel pad. The U.L./C.S.A. (please specify) high temperature mica tape lead wire, 842° F (450° C), is ideally suited for most applications.

BETTER BAND® SPECIFICATIONS

Optional features include a sealed low-profile cap and tube termination system for low clearance applications. The tube may be lengthened to accommodate radius bends to clear a nozzle hex or other obstructions.

Braid and armor lead wire protection is available. A 10" (25.4 cm) length is standard.

Flexible leads are 10" (25.4 cm) standard. Other leads are available upon request.

Diameters from 3/4" (19 mm) up to 36" (91.4 cm) typical.

Widths from 3/4" (19 mm) up to 6" (152.4 mm) maximum.

SEALED BETTER® BAND

The revolutionary Sealed Better Band offers the longest heater life in the most severe band heater applications. The contamination resistant construction, coupled with the high watt density capabilities, make the Sealed Better Band the obvious choice for the plastics industry.

FEATURES AND BENEFITS

- Sealed for life.
- Compact mineral insulation.
- Sealed power leads.
- Rugged lead protection.

SPECIFICATIONS

The Sealed Better Band, with its stainless steel seamless sheath and welded ends, will not allow contamination to enter the heater from points normally experienced in general band heater construction. To be completely contamination proof, this design may have leak proof convoluted armor attached over leads, which prevents contamination through the lead area. Contact Fast Heat for details.

Diameters from 3/4" (19 mm) up to 36" (91.4 cm) typical.

Widths available in: 3/4", 15/16", 1", 1 1/16", 1 1/4", 1 5/16", 1 3/8", 1 1/2", 1 3/4", 2", and 2 1/2". (19 mm, 23.8 mm, 25.4 mm, 27 mm, 31.7 mm, 33.3 mm, 34.9 mm, 38.1 mm, 44.5 mm, 50.8 mm, and 63.5mm).

Mineral insulation provides excellent insulating and heat transfer properties.

Precision engineered wound resistance element.

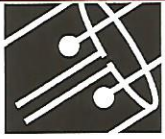
High temperature insulation.

Insulating ceramic.

In addition to screw terminations, several lead wire variations are also available.



THE SEALED BETTER BAND



MICA BAND HEATERS

MICA BAND

Fast Heat's reliable, inexpensive Mica Band heaters are best suited for uses involving low to moderate temperatures. Mica Bands also offer a wide variety of termination and clamping styles.

Fast Heat's Mica Bands feature thin construction and high quality insulation for effective heat transfer and excellent dielectric qualities. Mica Bands can meet U.L./C.S.A. approval, use the chart on page 151 for reference and consult factory. If C.S.A. approval is required for lead wire, please notify Customer Service when ordering.

Mica Bands are available through QuickShip and Fast Track. Refer to page 2 for a complete description of these rapid delivery programs.

APPLICATIONS

Ideally suited for plastics industry applications, the Mica Band can be used for heating commodity resins in injection molding machines, extruders and blow molding machines. Other applications can be found in the food and pharmaceutical industries or any situation in which efficient band heating is required.

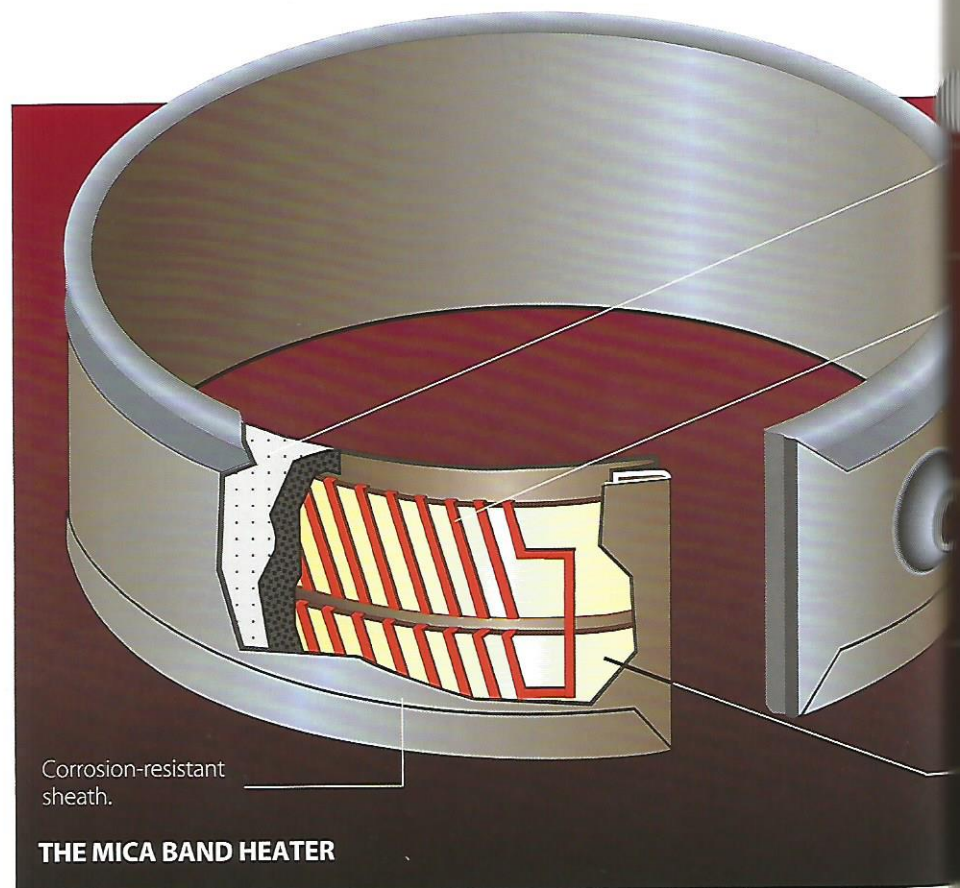
In addition, Mica Bands can be modified to meet the demands of virtually any special application. Our engineers can utilize a variety of alternative features and options to customize the heater to your specific needs.

FEATURES AND BENEFITS

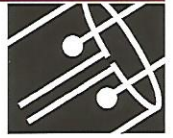
- Make a Fast Heat Mica Band your selection when price and quality is a consideration.
- Thin construction for effective heat transfer.
- Available for partial band applications.
- Reverse bands for application into rolls. Heating from the inside out.
- Expandable or two-piece construction.

MATERIAL AND CONSTRUCTION

- All heaters are computer designed.
- Designs consistently offer maximum resistor coverage.
- Ends of heaters incorporate folded-in lips to resist contamination.
- All bands are accurately rolled to the specified diameter for optimum contact.
- Reliable welded internal termination junction whether screw or lead terminals are specified.
- A variety of lead protection systems are available to protect against flexing, abrasion and contamination.
- High quality mica used in all designs.
- Oxidation-resistant metal enclosures.
- U.L. and C.S.A. (please specify) approved lead wires.



MICA/VALUE BAND HEATERS



MICA BAND SPECIFICATIONS

Designs available up to 480 volts AC.

Resistance tolerance +10% -5%. Note that the tolerance is based on the heater in operation. The resistance at room temperature is generally 5% lower than while operating.

Diameters from 1" (25.4 mm) up to 60" (152.4 cm) typical.

Widths from 3/4" (19 mm) up to 18" (45.7 cm) typical.

VALUE BAND

Fast Heat introduced the Value Band in 1993. The goal was to create an extremely low-cost, dependable nozzle band that could be used in many different applications.

In order to expedite the manufacturing process and keep costs down, the Value Band is offered in a single termination style: 10" (25.4 cm) of fiberglass-insulated, nickel lead wire. The Value Band is C.S.A. approved and is backed by a one year "no problem" warranty.

Value Bands are available through QuickShip. Refer to page 2 for a complete description of this rapid delivery program.

FEATURES AND BENEFITS

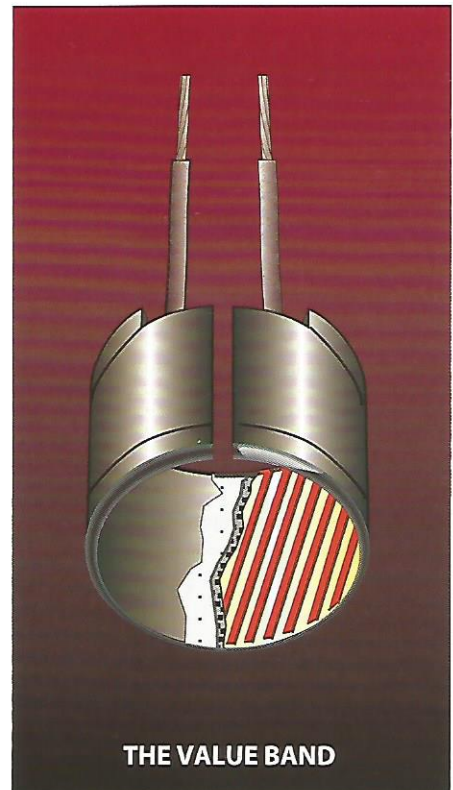
- Capable of temperatures up to 900° F (482° C)
- Leads are specially constructed so that they can be bent 90° allowing the heaters to be butted against one another in multiple band applications. The lead areas have also been reinforced to make them more durable and resistant to pull.
- Corrosion-resistant sheath to minimize oxidation.

Mica insulation.

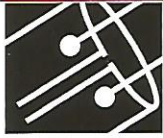
Precision engineered wound resistance element.

In addition to lead wires, several screw termination variations are also available.

Mica insulation.



THE VALUE BAND



BAND HEATERS

BAND HEATER SELECTION

Prior to selecting a band heater style for an application, there are a number of items that must be taken into consideration. These include type of application, operational temperature, controls and heat required to continually satisfy the application. All band heaters have their own physical and operational characteristics and limitations which should be reviewed prior to making a selection. For assistance with calculating the wattage requirement for an application, see the Reference Guide section of this catalog, starting on page 150. Once the total wattage requirement has been established, the number of heaters needed can be determined.

TOTAL WATTAGE

NUMBER OF HEATERS

- Knowing the maximum watts per square inch of the heater is essential when making your selection and can be calculated by:

ONE-PIECE HEATER

$$W/IN^2 = \frac{\text{Wattage of Heater}}{[(\text{Heater ID} \times 3.14) - 1/2''^*] \times \text{Heater Width}}$$

ID & WIDTH IN CM.

$$W/CM^2 = \frac{\text{Wattage of Heater}}{[(\text{Heater ID} \times 3.14) - 1.3 \text{ cm}^*] \times \text{Heater Width}}$$

TWO-PIECE HEATER

$$W/IN^2 = \frac{\text{Wattage of Heater (per half)}}{\left[\left(\frac{\text{Heater ID} \times 3.14}{2} \right) - 1/2''^* \right] \times \text{Heater Width}}$$

ID & WIDTH IN CM.

$$W/CM^2 = \frac{\text{Wattage of Heater (per half)}}{\left[\left(\frac{\text{Heater ID} \times 3.14}{2} \right) - 1.3^* \right] \times \text{Heater Width}}$$

* average gap size

Example: 1) ID = 4" (10.2 cm), Heater Width = 2" (5.1 cm), One-piece heater, wattage = 400

$$\frac{400 \text{ Watts}}{[(4'' \times 3.14) - 1/2''] \times 2''} = 16.575 \frac{\text{Watts}}{\text{Inch}^2}$$

ID & WIDTH IN CM.

$$\frac{400 \text{ Watts}}{[(10.2 \times 3.14) - 1.3] \times 5.1} = 2.55 \frac{\text{Watts}}{\text{CM}^2}$$

Example: 2) ID = 4" (10.2 cm), Heater Width = 2" (5.1 cm), Two-piece heater, wattage = 400 each half

$$\frac{400 \text{ Watts}}{\left[\frac{(4'' \times 3.14)}{2} - 1/2'' \right] \times 2''} = 34.583 \frac{\text{Watts}}{\text{Inch}^2}$$

ID & WIDTH IN CM.

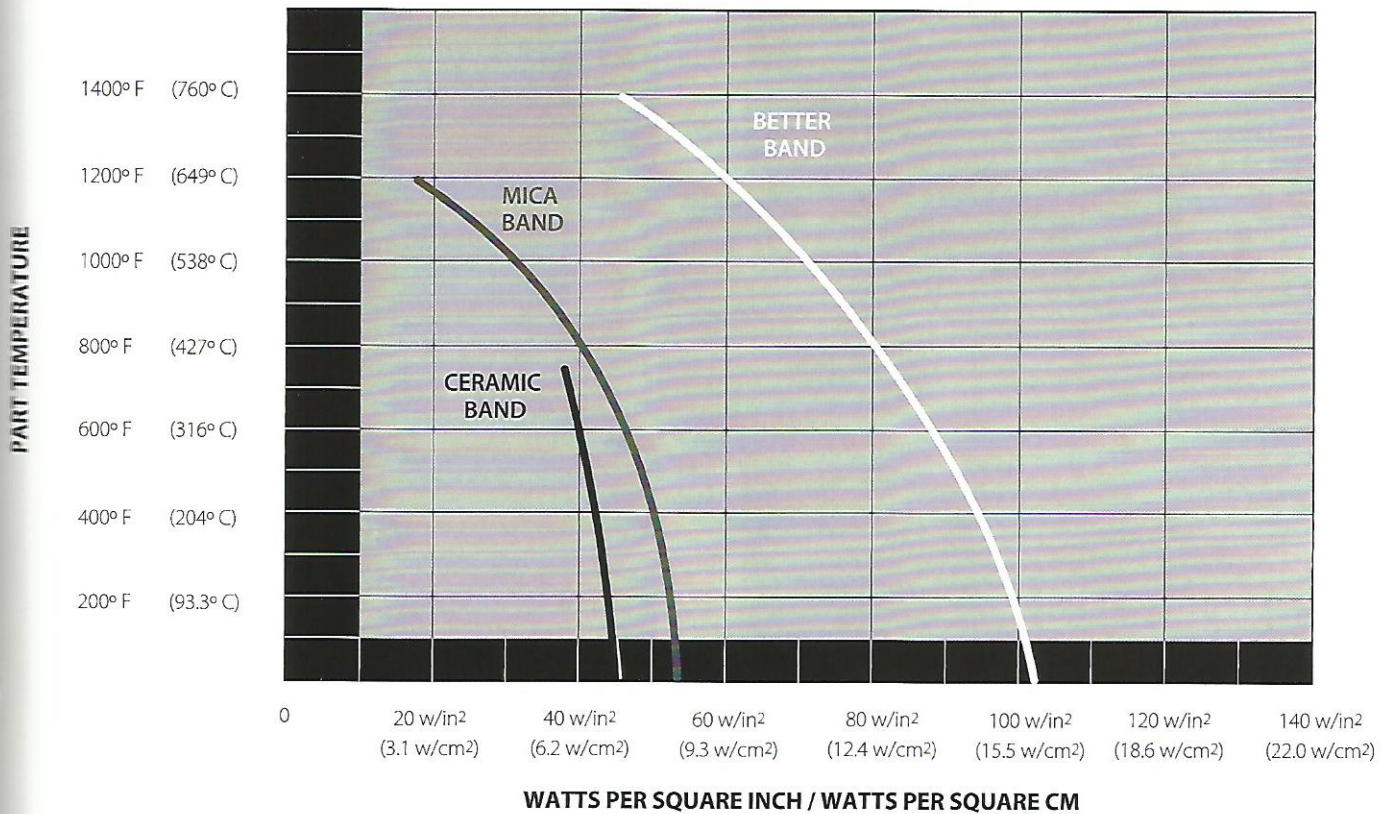
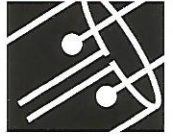
$$\frac{400 \text{ Watts}}{\left[\frac{(10.2 \times 3.14)}{2} - 1.3 \right] \times 5.1} = 5.33 \frac{\text{Watts}}{\text{CM}^2}$$

- Holes, notches, two-piece heaters and special gaps all reduce the effective heating surface of a heater and must be taken into account when estimating the heated surface used to calculate the watts per square inch of the heater.
- Factors to be considered when calculating heater area:
 - Holes
 - Notches
 - One- or two-piece
 - Special gap
- Use the accompanying graph to make sure that watt density does not exceed the normally recommended maximum.
 - Locate your established maximum cylinder or part temperature on the left side of the graph.
 - Follow the horizontal line to the intersection of the curve relating to the heater style selected and read directly down to the recommended maximum watt density.

ORDERING GUIDE

For better customer service, the following information will be needed when placing an order:

- Your customer number, if you have been assigned one.
- Your P.O. number.
- Shipping instructions.
- Our catalog number or: product line, inside diameter, width, 1 pc. or 2 pc. construction, total watts, volts (each half if applicable), type of termination and any special features you require.
- Customer Service will provide you with a configuration number. Please record this for future reference.
- Specify the quantity you wish to order and whether or not your order is taxable.



OPTIMIZE HEATER PERFORMANCE

- During the first heating cycle, it is advisable to retighten the clamping mechanism of the heater for optimum contact. (De-energize the heater, retighten and repower the heater.)
- Select your heater using the procedure outlined in the ordering guide. Verify that the wattage chosen corresponds to the application requirements. Improperly chosen wattages create temperature over-shoot, excessive cycling and a general decrease in application efficiency.
- Use several narrow band heaters rather than one wide band to obtain the most trouble-free operation. Lab tests have shown the narrow band design to be the most efficient and reliable design.
- Heater I.D. must conform to your cylinder diameter for the best possible fit. Poor fit results in decreased operating efficiency and heater life.

- Tighten heater clamps for the best heat transfer to cylinder. Poor clamping causes decreased heater life and increased heat loss.
- Ensure that your cylinder is smooth and free of foreign material for best clamping and operating results.
- Use one-piece heaters only when they can be slipped over the end of the cylinder. If opening the heater is an installation necessity, use two-piece heaters.
- Avoid possible contamination. Do not allow carbonizing materials such as plastic and oil to collect on heaters. Contamination can lead to internal electrical shorts.
- Use special care in selection of leads and terminals when physical abuse cannot be avoided. If special lead arrangements are required, contact Fast Heat.

LAB TESTED AND FIELD PROVEN CAPABILITIES

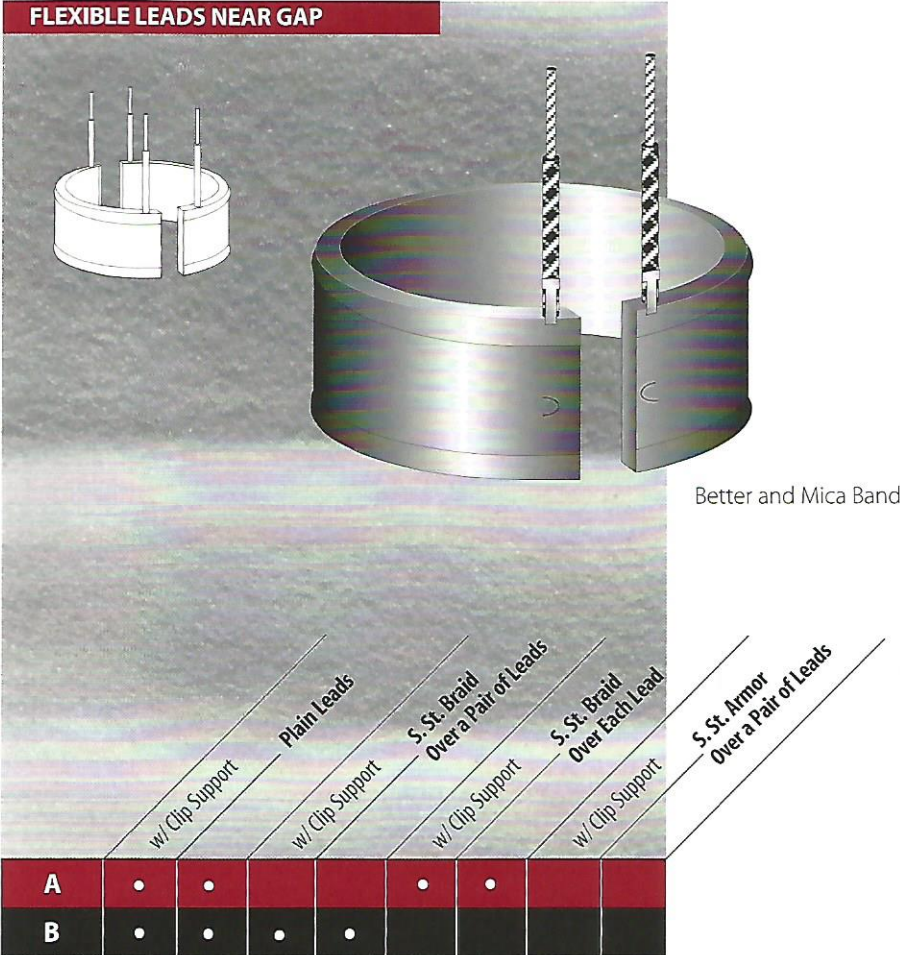
To verify total life characteristics of the Better Band, a multitude of accelerated life tests have been performed. Under severe operating conditions, including the combination of 1400° F (760° C) band temperatures and watt densities in excess of 100 w/in² (15.5 w/cm²), the Better Band has survived thousands of hours of operation without failure.

Field testing of the Better Band in typical high temperature plastic molding situations and in applications as extreme as die casting nozzles has further proven the Better Band to be the most advanced band heater available.



BETTER & MICA BAND HEATERS

FLEXIBLE LEADS NEAR GAP



Better and Mica Band

Better and Mica Band

Bands are available with leads exiting axially on each side of the gap.

Supplied with full contact clamping for longer heater life.

10" (25.4 cm) leads standard, other lengths available.

See chart A.



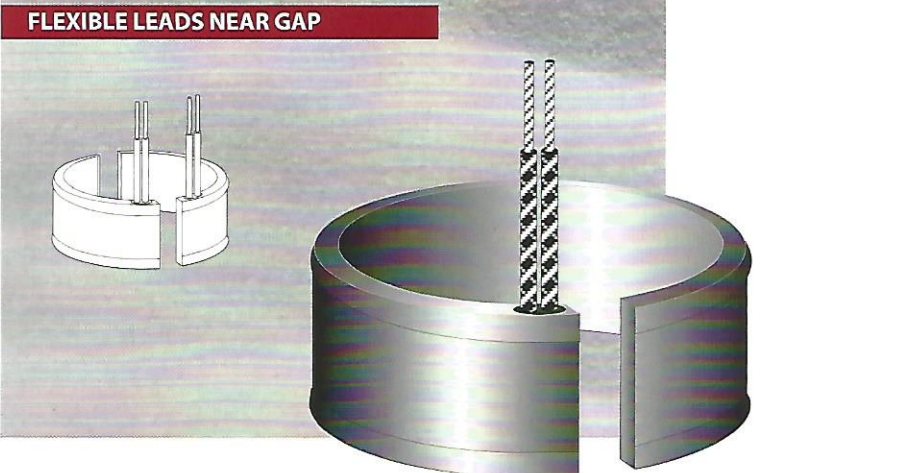
TWO-PIECE HEATERS

- Specify for easy installation/removal where projections or tandem positioned heaters are in use.
- When using two-piece heaters, each half is designed with half of the total wattage requirement. This has the capability of being used on either 120 Volts ($V_1 = V_2 = V_{Total}$) when connected in parallel or 240 Volts ($V_1 + V_2 = V_{Total}$) when connected in series.



This heater termination style available.

FLEXIBLE LEADS NEAR GAP



Leads exiting axially on one side of gap supplied with full contact clamping for longer heater life.

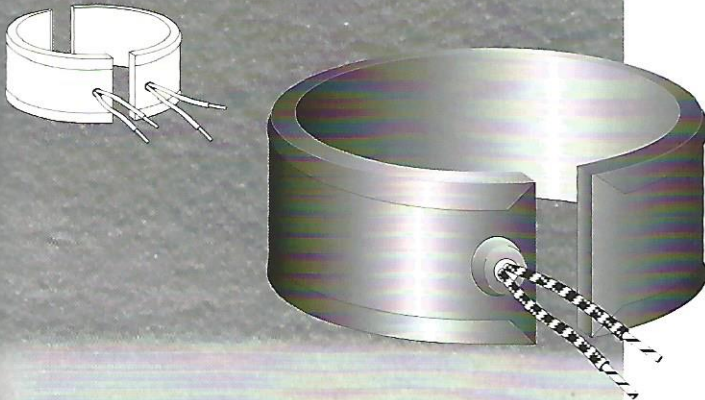
10" (25.4 cm) leads standard, other lengths available.

See chart B.

BETTER & MICA BAND HEATERS



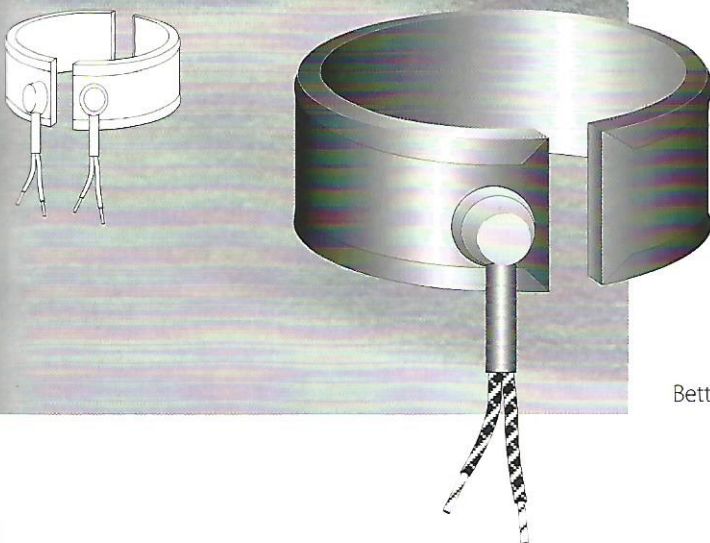
FLEXIBLE LEADS NEAR GAP



Better and Mica Band

	w/ Clip Support	Plain Leads	w/ Clip Support	S. St. Braid Over a Pair of Leads	w/ Clip Support	S. St. Braid Over Each Lead	w/ Clip Support	S. St. Armor Over a Pair of Leads
A	•	•	•	•	•	•	•	•
B	•	•	•	•	•	•	•	•

FLEXIBLE LEADS W/ CAP NEAR GAP



Better and Mica Band

Leads exit along the width on one side near the gap.

10" (25.4 cm) leads standard, other lengths available. Standard lead exit.

This style of lead exit can be selected when there is minimum clearance around the heater.

As with all lead type heaters, variations of lead protection and support are available.

See chart A.



GROUND WIRE

- A ground wire is available on most heaters where grounding is required.
- Consult Fast Heat for details.



This heater termination style available.

Low profile cap with leads exiting axially through cap and tube near the gap.

10" (25.4 cm) leads standard, other lengths available.

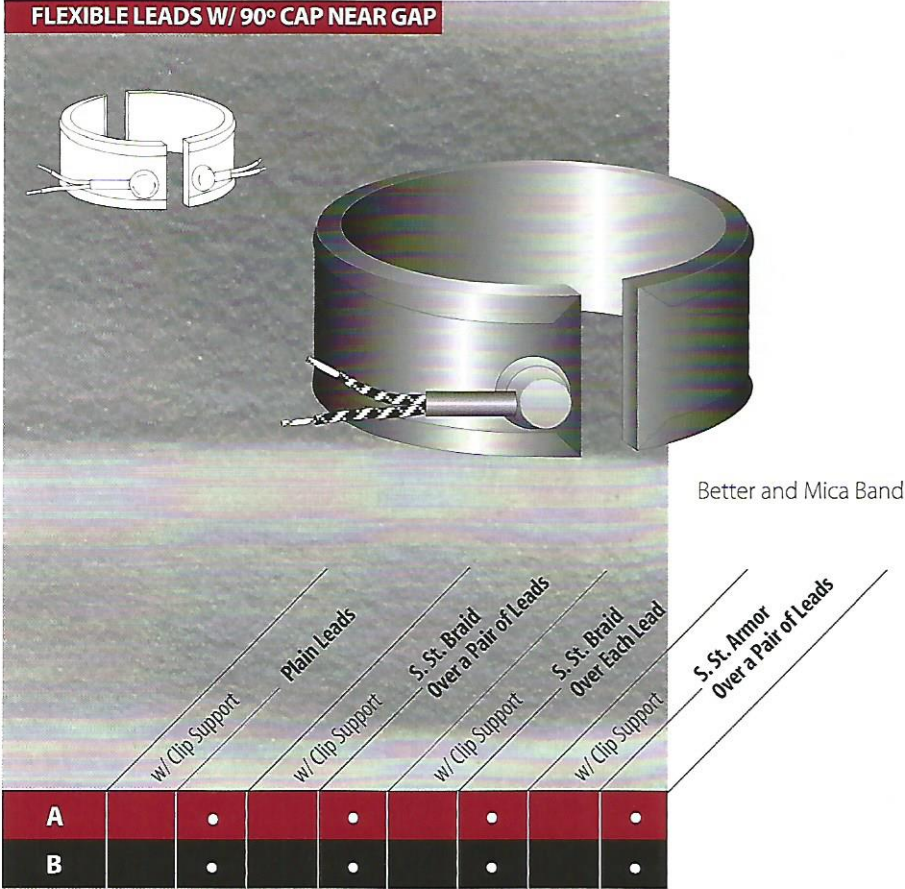
Leads exit in direction of junction/termination. If heaters are in tandem, they can be positioned next to one another.

See chart B.



BETTER & MICA BAND HEATERS

FLEXIBLE LEADS W/ 90° CAP NEAR GAP



Better and Mica Band

Low profile cap with leads exiting 90° to axis through cap and tube along length.

Ideal for installations where access is limited.

10" (25.4 cm) leads standard, other lengths available.

See chart A.



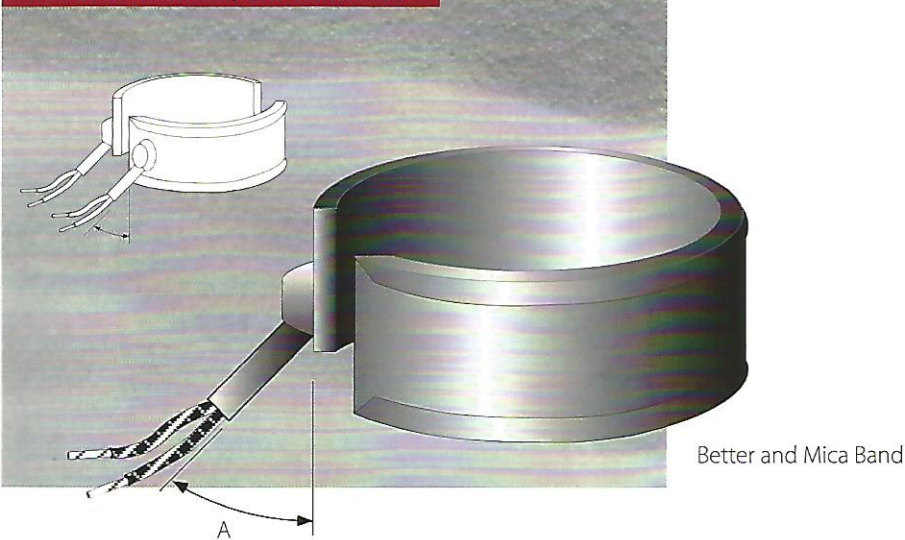
CAP AND TUBE

- Cap and tube exit of leads provides a substantial and contamination resistant exit from the heater.
- In nozzle or similar applications where heaters are close to one another, the upward angle of the tube directs the leads over the adjacent heater, thus preventing the leads from contacting the hot surface.



This heater termination style available.

FLEXIBLE LEADS W/ CAP AT ANGLE



Better and Mica Band

Leads exiting through cap and tube near gap. Angle of tube may be specified at 15°, 30° or 45°.

10" (25.4 cm) leads standard. Other lengths available.

Please specify angle (A) of tube.

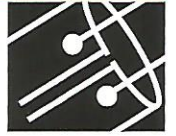
See chart B.



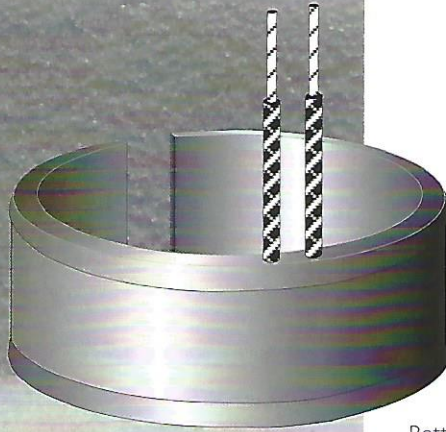
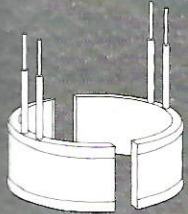
LEAD PROTECTION

- Armor and braid are accessories that may be added to protect the leads from abrasion and/or some forms of contamination.

BETTER & MICA BAND HEATERS



FLEXIBLE LEADS OPP. GAP



Better and Mica Band

	w/ Clip Support	Plain Leads	w/ Clip Support	S. St. Braid Over a Pair of Leads	w/ Clip Support	S. St. Braid Over Each Lead	w/ Clip Support	S. St. Armor Over a Pair of Leads
A	•	•	•	•	•	•	•	
B			•	•				

Leads exiting axially from thickness opposite the gap.

10" (25.4 cm) leads standard, other lengths available.

These heaters are generally specified when clearance around the heater is not adequate to allow the lead to exit from the heater pressure plate.

See chart A.



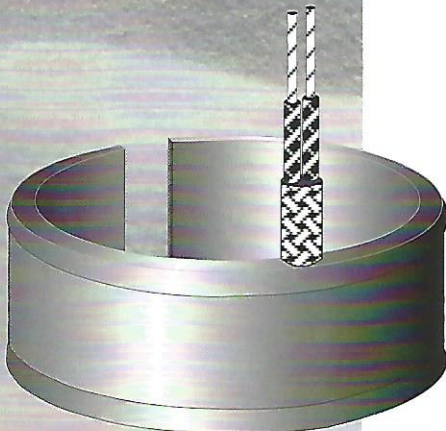
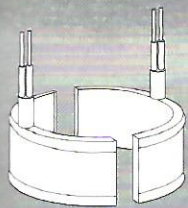
CLIP SUPPORT

- Clip supports may be specified on many lead wire exits to reduce straining of the lead junction.
- Clip supports are standard on all Better Band heaters.
- Consult Fast Heat for details.



This heater termination style available.

FLEXIBLE LEADS W/ BRAID OPP. GAP



Better and Mica Band

Two leads in one braid exiting axially from thickness opposite the gap.

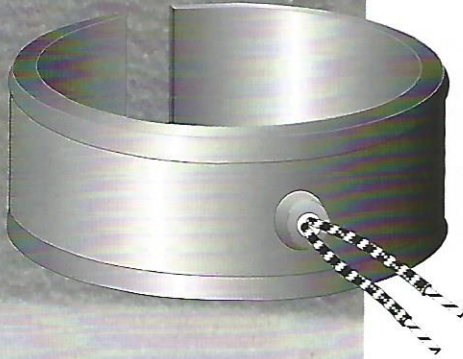
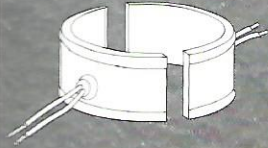
10" (25.4 cm) leads standard, other lengths available.

See chart B.



BETTER & MICA BAND HEATERS


FLEXIBLE LEADS OPP. GAP



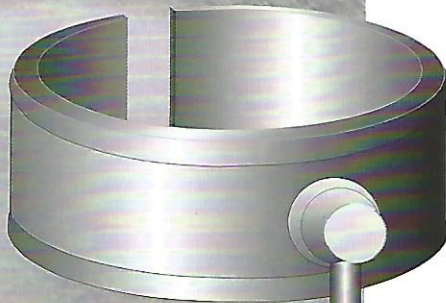
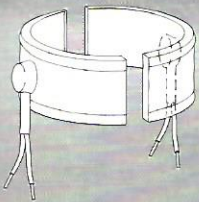
Better and Mica Band

	w/ Clip Support	Plain Leads	w/ Clip Support	S. St. Braid Over a Pair of Leads	w/ Clip Support	S. St. Braid Over Each Lead	w/ Clip Support	S. St. Armor Over a Pair of Leads
A	•	•	•	•	•	•	•	•
B		•	•	•	•	•	•	•

Standard lead exit opposite the gap.
 10" (25.4 cm) leads standard, other lengths available.
 Cap is welded onto sheath. Various lead protection options are available.
 See chart A.

 This heater termination style available.

FLEXIBLE LEADS W/ CAP OPP. GAP



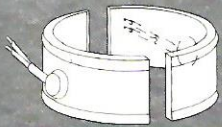
Better and Mica Band

Leads exiting axially through cap and tube opposite the gap.
 10" (25.4 cm) leads standard, other lengths available.
 Cap and tube give protection near the sheath.
 Additional protection is available.
 See chart B.

BETTER & MICA BAND HEATERS



FLEXIBLE LEADS W/ 90° CAP OPP. GAP



Better and Mica Band

Leads exiting through cap and tube along length opposite the gap.


10" (25.4 cm) leads standard, other lengths are available.

Cap and tube give protection near the sheath.

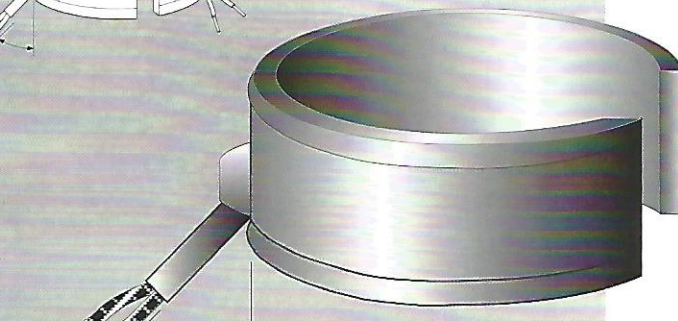
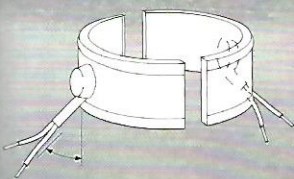
Available in both Mica and Better Band constructions.

See chart A.

	w/ Clip Support	Plain Leads	w/ Clip Support	S-St. Braid Over a Pair of Leads	w/ Clip Support	S-St. Braid Over Each Lead	w/ Clip Support	S-St. Armor Over a Pair of Leads
A	•	•	•	•	•	•	•	•
B	•	•	•	•	•	•	•	•

 This heater termination style available.

FLEXIBLE LEADS W/ CAP OPP. GAP AT ANGLE



Better and Mica Band

Leads exiting through cap and tube opposite gap.

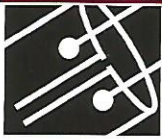
Having the lead exit/tube raised up at an angle allows heaters to be positioned immediately next to one another without having the leads come in contact with the adjacent heater.

The angle of tube may be specified at 15°, 30° or 45°.

10" (25.4 cm) lead standard. Other lengths available. Please specify angle "A" of tube.

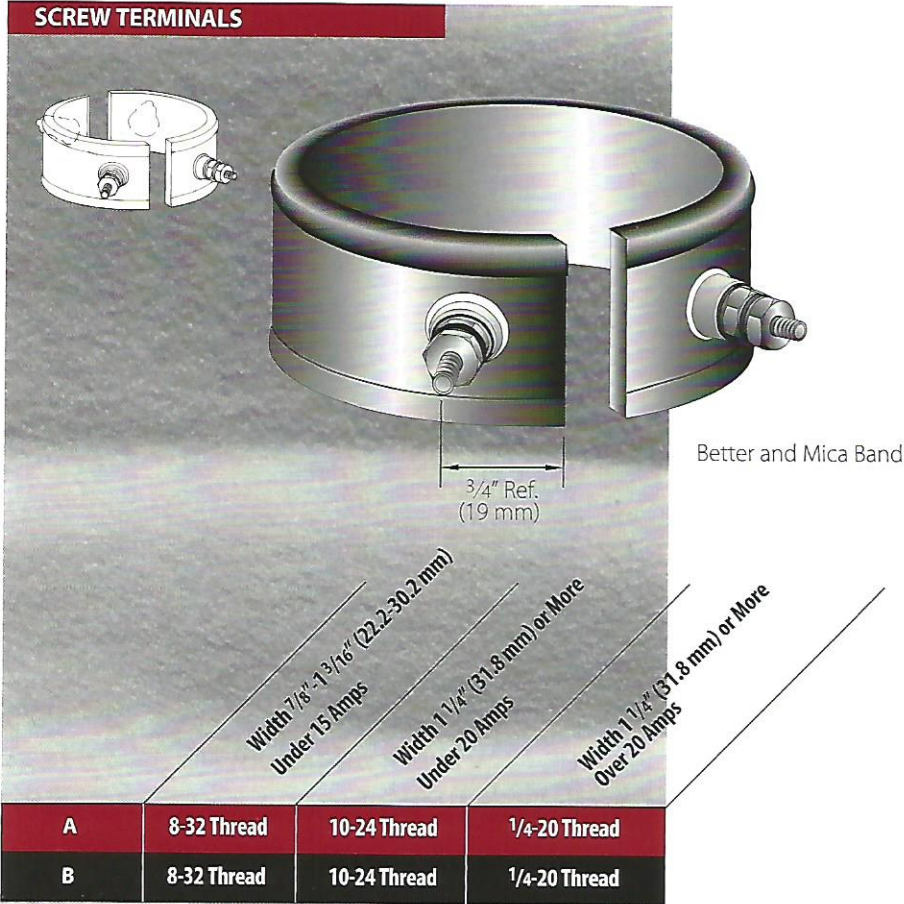
Additional protection is available.

See chart B.



BETTER & MICA BAND HEATERS

SCREW TERMINALS



Band with screw terminals on top; one on each side of gap.

This permits easy connection to power leads w/lugs.

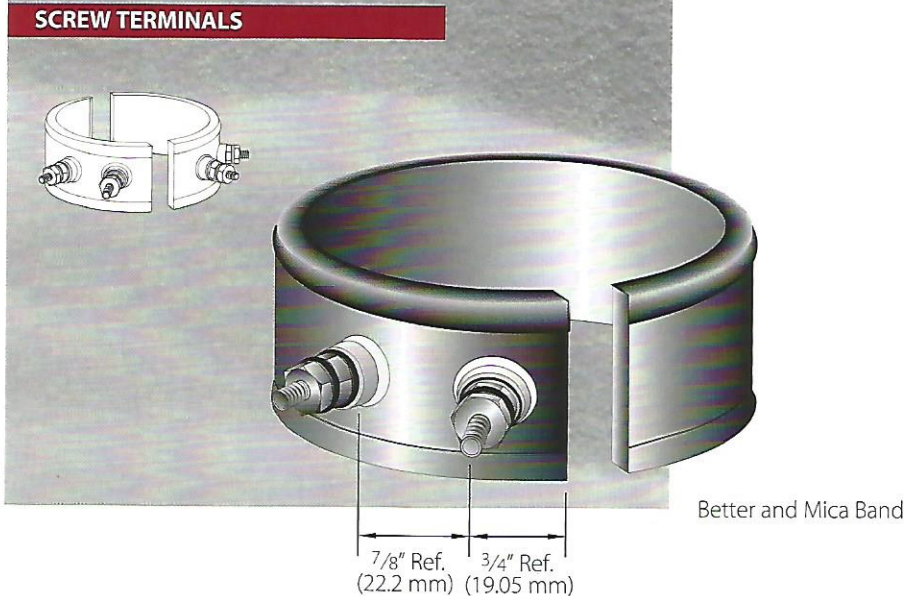
See chart A.



SCREW TERMINALS

- Screw terminals are specified when user wants to provide their own wiring harness.
- Replacement is easier in case of heater failure.
- Junction boxes can be placed over the terminals for protection.

SCREW TERMINALS



Band has two screw terminals on one side, near gap, along the length of the heater.

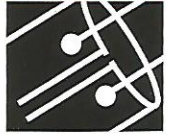
Simplifies lead wire connections.

Available in Better Band and Mica Band construction.

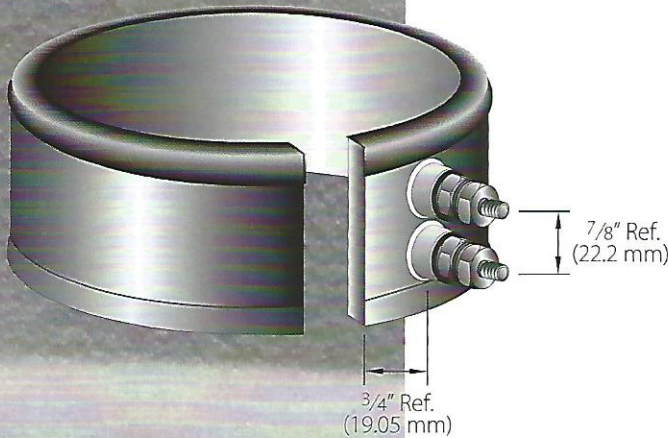
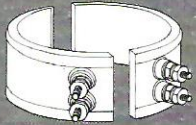
See chart B

European plug is available for bands larger than 4" (101.6mm) I.D.

BETTER & MICA BAND HEATERS



SCREW TERMINALS



Better and Mica Band

Width 2" (50.8 mm) or More
Under 20 Amps

Width 2" (50.8 mm) or
More
Over 20 Amps

A	10-24 Thread	1/4-20 Thread
B	10-24 Thread	1/4-20 Thread

Band has pair of screw terminals axially on one side, near gap, along the width of the heater.

Available in both Better Band and Mica Band constructions.

See chart A.

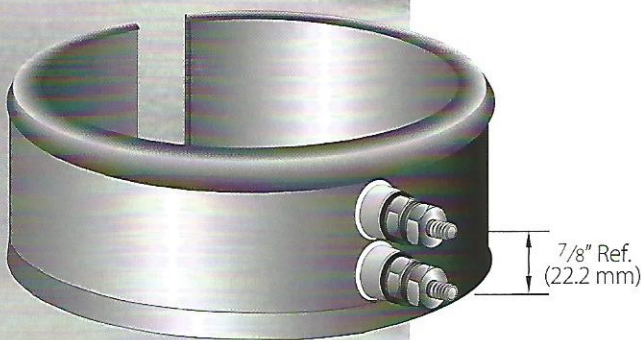
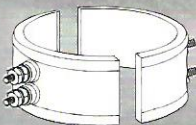
European plug is available on heaters with a minimum width of 2" (50.8mm).



GROUND STUD

- An optional ground stud is available on most bands to permit grounding wire connection.
- Consult Fast Heat for details.

SCREW TERMINALS



Better and Mica Band

Band has pair of screw terminals axially opposite gap, along the width of the heater.

Available in both Better Band and Mica Band construction.

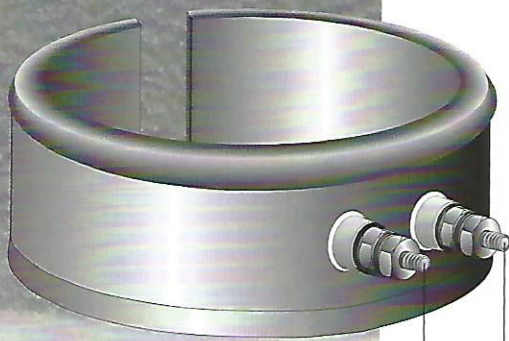
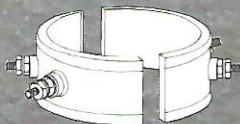
See chart B.

European plug is available on heaters with a minimum width of 2" (50.8mm).



BETTER & MICA BAND HEATERS

SCREW TERMINALS



7/8" Ref.
(22.2 mm)

Better and Mica Band

Width 7/8" - 1 3/16" (22.2-30.2 mm)
Under 15 Amps

Width 1 1/4" (31.8 mm) or More
Under 20 Amps

Width 1 1/4" (31.8 mm) or More
Over 20 Amps

A	8-32 Thread	10-24 Thread	1/4-20 Thread
---	-------------	--------------	---------------

Band has pair of screw terminals along length of heater. This permits easier wire connections.

Available in both Better Band and Mica Band construction.

See chart A.

European plug is available for bands larger than 4" (101.6mm) I.D.



THERMOCOUPLE

- Thermocouples are available as options for many of the bands shown.
- Typically type "J" thermocouples are used; however, contact Fast Heat for your special requirement.
- Thermocouples can be positioned on the sheath as required. Depending upon the heater design, the thermocouple can also be positioned within the heater.
- Contact Fast Heat with your special requirement.

OPTIONS BAND HEATERS

PLAIN LEADS



Plain: Fiberglass and Teflon® or Fiberglass and Mica Tape
Conductor Wire

Jacketed for continuous service up to 482° F (250° C) with nickel standard conductors. It is recommended to use Monel® lugs.

High temperature mica tape lead wire is suitable up to 842° F (450° C) max. with nickel stranded conductors. Outer jacket is glass Teflon® finish. The use of Monel® lugs is recommended.

Better Band comes standard with mica tape. Mica Band comes standard with fiberglass.

SLEEVING



Sleeving

Fiberglass silicone rubber coated sleeving class c -1, 392° F (200° C) service. Provides extra insulation where wire is exposed to heat, molten plastics or abrasion. Rated 1500 volts at 428° F (220° C), except 5/16" (7.9 mm) size which has no voltage rating. This size used primarily to enclose multiple insulation wires in heat and abrasion resistant covering.

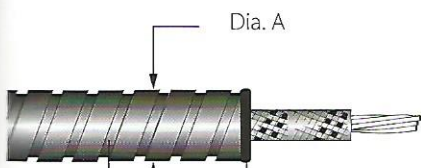
S. ST. BRAID



S. St. Braid Shrink Sleeving

Stainless steel over braid is most commonly specified in applications where leads may be subjected to abrasion due to movement of the application. Lead wires may be rubbing together or passing over sharp objects.

S. ST. ARMOR

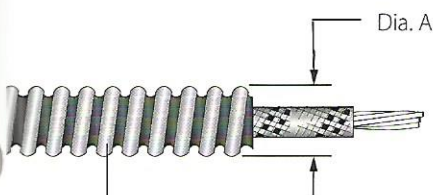


S. St. Armor Plastic Bushing

Used over leads in areas where more protection is necessary. Selected for similar applications as the stainless steel braid, in addition to applications where non-fluid contamination may come in contact with the leads. This lead protection is not as flexible as over the braid.

Stainless steel square lock construction.

CONVOLUTED ARMOR



Convoluted Armor

This is a seamless product and can be attached to the heater so that fluids do not contaminate the leads. This system of lead protection is generally associated with the Fast Heat "Sealed Band" construction. Not recommended where leads are flexed in the application.

300 VOLTS 418° F (250° C) FIBERGLASS LEAD WIRE

GAGE	MAX. CURRENT @ 392° F (200° C)
16	6.6 amps
18	5.2 amps
20	3.7 amps
22	2.8 amps

600 VOLTS 418° F (250° C) FIBERGLASS LEAD WIRE

GAGE	MAX. CURRENT @ 392° F (200° C)
8	22.1 amps
10	16.5 amps
12	12.2 amps
14	9.0 amps
16	6.6 amps
18	5.2 amps
20	3.7 amps
22	2.8 amps

600 VOLTS 778° F (450° C) MICA TAPE LEAD WIRE

GAGE	MAX. CURRENT @ 392° F (200° C)
12	15.2 amps
14	11.3 amps
16	8.3 amps
18	6.4 amps
20	4.6 amps
22	3.4 amps

300 VOLTS 778° F (450° C) MICA TAPE LEAD WIRE

GAGE	MAX. CURRENT @ 392° F (200° C)
16	8.3 amps
18	6.4 amps
20	4.6 amps
22	3.4 amps



TERMINATIONS

- Lead protection may be required where a problem of lead abrasion arises. This protection may be provided by the use of stainless steel wire braid or armor cable, both of which are firmly anchored to the heater and readily available in most sizes of heater bands.

FIBERGLASS SILICONE RUBBER COATED SLEEVING

SLEEVING SIZES (GA.)	I. D.
12	.085 in / 2.1 mm
10	.106 in / 2.6 mm
8	.133 in / 3.3 mm
6	.166 in / 4.2 mm
5	.190 in / 4.8 mm
3	.234 in / 5.9 mm
5/16	.313 in / 7.9 mm



TUBULAR NOZZLE BAND HEATERS

TUBULAR NOZZLE BAND

Designed for durability, Fast Heat's Tubular Nozzle Band can withstand almost any type of contamination, vibration and shock while still providing excellent heat transfer. The use of a tubular heating element as opposed to customary heating methods enables the heater to resist plastic drool, moisture and other contaminants.

APPLICATIONS

The Tubular Nozzle Band is most commonly selected to heat nozzles in injection molding or extruding machines, where constant contamination is a problem. The Tubular heater is also an excellent choice for most applications involving higher than normal vibration and shock. Other applications include lead, zinc and aluminum die casting.

In addition, modifications can be made to meet the demands of virtually any special application. Our engineers can utilize a variety of alternative features and options to customize the heater to your specific needs.

MATERIAL AND CONSTRUCTION

- Tubular heating element is brazed for good heat transfer to a stainless steel band.
- Ear type clamping is standard; however, other styles are available depending on the heater size.
- Leads have protective shrink sleeving at transition.
- Contamination-resistant.
- Each Tubular Band is securely attached to a stainless steel strap. The leg section that extends away from the nozzle is ductile and permits a 1/2" (12.7 mm) minimum radius bend to facilitate installation in a limited space.
- Holes can be placed in the bands. However, size of the hole and the heater width must be taken into consideration.

SPECIFICATIONS

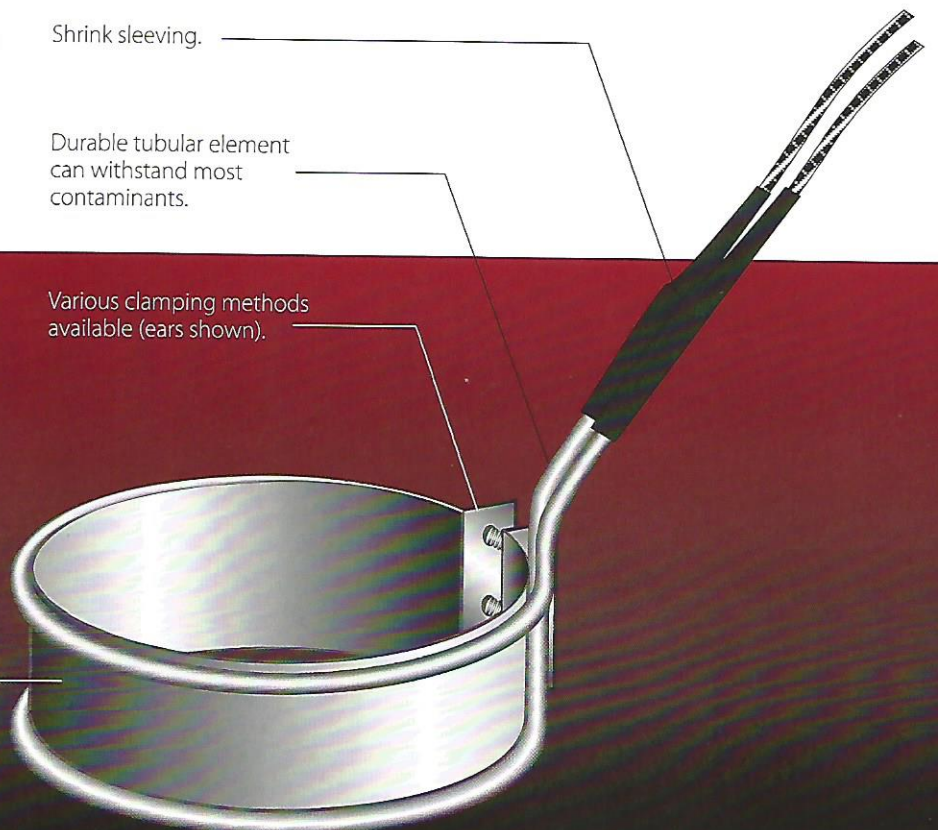
- Standard Diameters: Minimum 1 1/2" (38.1 mm)
- Standard Width: 1" (25.4 mm)
- Wattage: 40 watts/in² max. (6.2 w/cm²)
- Voltage: 240 vac
- Standard lead length: 10" (25.4 cm)
- Standard lead type: Fiberglass
- Standard leg length is 3" (76.2 mm); other lengths are available upon request.

Shrink sleeving.

Durable tubular element can withstand most contaminants.

Various clamping methods available (ears shown).

Corrosion-resistant sheath.



KNUCKLE BAND HEATERS



KNUCKLE BAND

The Knuckle Band, a segmented ceramic band heater, was designed by Fast Heat to provide evenly-distributed heat on extrusion and injection molding barrels.

Best suited for low to moderate temperatures, the Knuckle Band is constructed of precision-made segmented ceramics in order to add flexibility and allow for easy installation. The ceramics are covered with fiberglass insulation, which directs the heat toward the barrel.

The end results include a decrease in energy waste, a lower wattage requirement and longer heater life.

APPLICATIONS

The Knuckle Band is ideal for use on the barrels of extrusion and injection molding machines when processing commodity resins at low to moderate temperatures. Other applications include pipe and drum heating. Knuckle Bands are also frequently used on injection molding machines made outside the United States.

In addition, Knuckle Bands can be modified to meet the demands of virtually any special application. Our engineers can utilize a variety of alternative features and options to customize the heater to your specific needs.

MATERIAL AND CONSTRUCTION

- Flexible segmented ceramics allow for easy installation on barrel.
- Stainless steel sheath.
- Energy-saving fiberglass insulation.
- Ceramic segments brickworked so that heater remains as one unit.
- Heater can be made with holes and slots.
- Insulation: $\frac{1}{4}$ " (6.3 mm) thick ceramic fiberglass is standard; $\frac{3}{8}$ " (9.5 mm), $\frac{1}{2}$ " (12.7 mm) or no insulation is optional.
- Shroud: Stainless steel.
- Clamping Method: Ears are standard, strap ends and spring bolt clamping is optional. Clamping height of heater with $\frac{1}{4}$ " (6.3 mm) thick insulation approximately $\frac{9}{16}$ " (14.2 mm).

SPECIFICATIONS

Standard Diameters: Between $3\frac{1}{2}$ " (88.9 mm) and 12" (30 cm).
Also can be made up to 29" (73 cm) diameter in one piece heater. Larger diameters can be made using multiple segments.

- Dimensions of terminal box:
2" long x $2\frac{1}{2}$ " wide x $1\frac{7}{8}$ " high

Standard Widths: $2\frac{1}{2}$ ", 3", 4", $4\frac{1}{2}$ ", 5", 6", $7\frac{1}{2}$ ", 8", 9", & 10" (63.5 mm, 76.2 mm, 10.1 cm, 11.4 cm, 12.7 cm, 15.2 cm, 19.0 cm, 20.3 cm, 22.8 cm, 25.4 cm).

Metric Sizes: Available on special order basis.

Gap: $\frac{1}{2}$ " (12.7 mm) unless otherwise specified.

Terminations: Post terminals, opposite gap unless otherwise specified; see below for other optional terminations.

Wattage: 40 watts/in² max (6.2 w/cm²).

Voltage: 120, 240, or 480 vac. 3 phase and dual voltage optional.

TERMINATIONS

Fig. 1: Post Terminals

Fig. 2: Terminal Strip in box
Minimum width - $2\frac{1}{2}$ "

Fig. 3: Leads w/Strain Relief (shown)
Leads w/Strain Relief & S. St. Braid
Leads w/Strain Relief & S. St. Armor

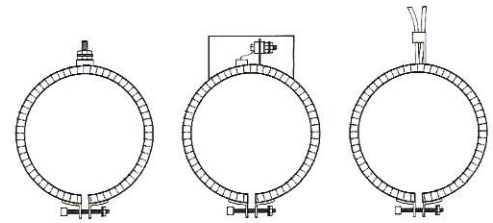
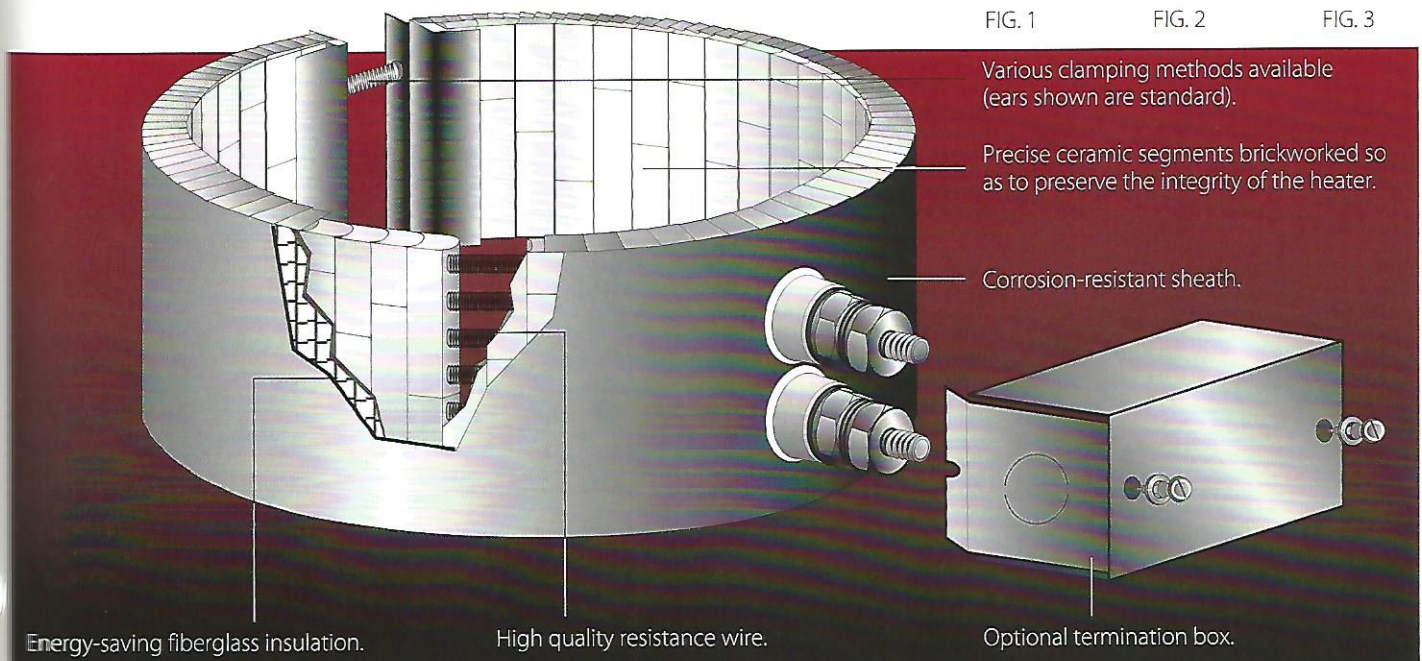


FIG. 1

FIG. 2

FIG. 3

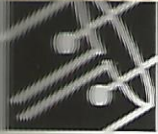


Various clamping methods available (ears shown are standard).

Precise ceramic segments brickworked so as to preserve the integrity of the heater.

Corrosion-resistant sheath.

Optional termination box.



PERMAHEAT BAND HEATERS

PERMAHEAT

Our durable Permaheat Band heater uses a tubular heating element to provide excellent heat transfer and resistance to contamination. Its aluminum body allows for better conformity to slightly irregular diameters.

The tubular elements are placed in a precisely extruded aluminum base. This aluminum base is normally sectioned to ensure a positive contact with the object being heated. The aluminum body also serves as an excellent transfer medium for rapid heat-up while providing a uniform temperature throughout the entire band.

APPLICATIONS

Permaheats can be used in many different situations, including heating barrels of extrusion and injection molding machines, especially in areas where contamination is possible.

In addition, Permaheats can be modified to meet the demands of special applications. There are a variety of alternative features and options available to customize the heater to your special needs.

MATERIAL AND CONSTRUCTION

- Aluminum extrusion allows for even heat distribution.
- Durable tubular heating element.
- Precision wound resistance wire.
- 20 Ga. St. Steel strap for added clamping strength.
- Standard high strength 1/4 - 20 clamping bar.
- Cooling tubes are available as an option on Permaheat Bands. Permaheat sizes available are 3" (76.2 mm), 4" (10.1 cm) widths and 5" (12.7 cm) to 20" (50.8 cm) I. D. bands.

TERMINATIONS

Straight threaded terminals are normally supplied on all Permaheat heaters.

Fig. 1: Terminal box protects employees from possible electric shock. High temperature braid or stainless steel can also be ordered for further protection. (Aluminum terminal box is standard).

Fig. 2: High temperature ceramic insulated quick-disconnect plug mounted in a terminal box allows quick and convenient connection. Female quick-disconnect plugs are also available.

Fig. 3: For applications requiring leads, high temperature mica tape (842° F, 450° C) lead wire is attached.

SPECIFICATIONS

MECHANICAL:

- Widths: 1 1/2", 2 1/2", 3", 4"
(38.1mm, 63.5 mm, 76.2 mm, 10.1 cm)
- Min. Dia. for 1 1/2" width: 3.5" (8.9 cm)
- Min. Dia. for all other widths: 5" (12.7 cm)
- Max. Dia.: 106" (269.2 cm)
- Standard Gap: 3/8" (9.5 mm)
[on dias. up to 14" (35.5 cm)]
- Max. Operating Temperature: 600° F (315.5° C)

- Dimensions of terminal box: 3 1/4" long x 1 7/8" wide x 2" high

ELECTRICAL:

- Max. Volts per half: 240 vac
- Standard Watt Density: 30 watts/in² (4.65 w/cm²)
- Max. Watt Density: 40 watts/in² (6.2 w/cm²)
- Std. Supply Line Voltage: 240 vac

Permaheat Band heaters are constructed as sets. The tubular heaters are rated as one-half total wattage.

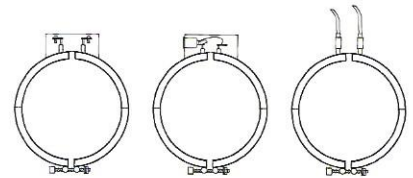


FIG. 1

FIG. 2

FIG. 3

Precision extruded aluminum body.

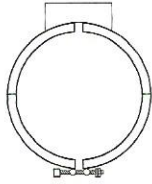
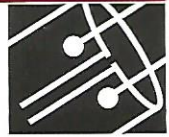
Long-life tubular heating element.

Precision wound resistance wire.

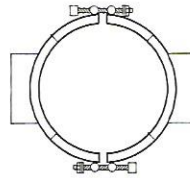
Stainless steel strap.

Optional terminal box.

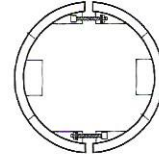
PERMAHEAT BAND HEATERS



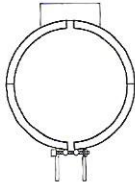
2 PIECE - PERMAHEAT BAND (1 BOX)					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
1 1/2"	38.1	3 1/2"	88.9	30"	762
2 1/2"	63.5	5"	127.0	20"	508
3"	76.2	5"	127.0	20"	508
4"	101.6	5"	127.0	20"	508



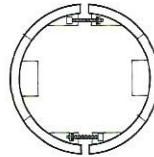
2 PIECE - PERMAHEAT BAND (2 BOXES)					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
1 1/2"	38.1	30"	762	55"	1397
2 1/2"	63.5	20"	508	50"	1270
3"	76.2	20"	508	50"	1270
4"	101.6	20"	508	50"	1270



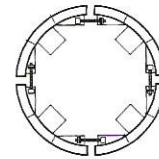
2 PIECE - REVERSE PERMAHEAT BAND					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
1 1/2"	38.1	55"	1397	110"	2794
2 1/2"	63.5	50"	1270	110"	2794
3"	76.2	50"	1270	110"	2794
4"	101.6	50"	1270	100"	2794



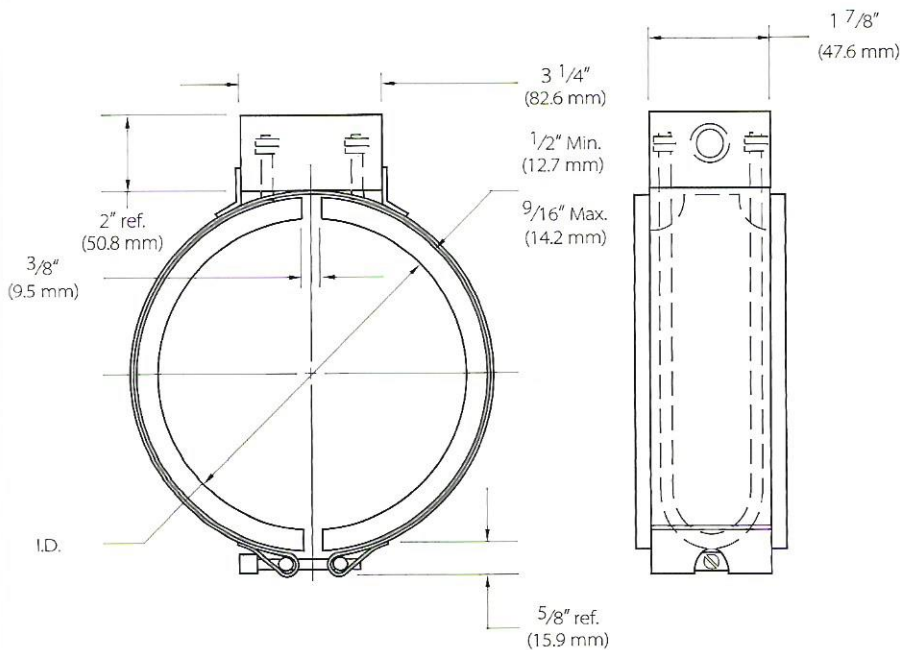
2 PIECE - COOLING TUBE PERMAHEAT BAND					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
3"	76.2	5"	127.0	25"	635
4"	101.6	5"	127.0	25"	635



2 PIECE - REVERSE PERMAHEAT BAND					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
1 1/2"	38.1	12"	304.8	50"	1270
2 1/2"	63.5	15"	381	50"	1270
3"	76.2	15"	381	50"	1270
4"	101.6	15"	381	50"	1270



4 PIECE - REVERSE PERMAHEAT BAND					
WIDTH	MM	SMALLEST DIA.	MM	LARGEST DIA.	MM
1 1/2"	38.1	50"	1270	110"	2794
2 1/2"	63.5	50"	1270	110"	2794
3"	76.2	50"	1270	110"	2794
4"	101.6	50"	1270	110"	2794



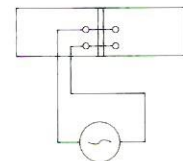
Permaheat Band heaters can be designed for either heating an external or internal surface. In either instance, the segmented aluminum heat sink construction, along with rugged clamping, afford excellent contact to the surface being heated.

Copper cooling tubes 3/8" (9.5 mm) can be incorporated into the heater when required. The adjoining chart should be referred to for cooling tube and other size parameters.

Note that the number of band sections are in relation to the diameter.

Over 20" (50 cm) in diameter, spring bolt clamping is standard.

ELECTRICAL DIAGRAM



240 VAC
parallel