

USER INSTRUCTIONS FOR TYPE 3 & 4 SHRINK BANDS

Shrink bands are heat shrinkable strips of film with adhesive on both ends. They are designed to be installation aids for Thermofoil™ heaters and heater-sensors that must fit around cylinders. Type 3, polyester bands are useable from -73°C to 150°C (-100°F to 300°F); type 4, polyimide bands are useable from -73°C to 177°C (-100°F to 350°F). Both types meet outgassing requirements for space use.

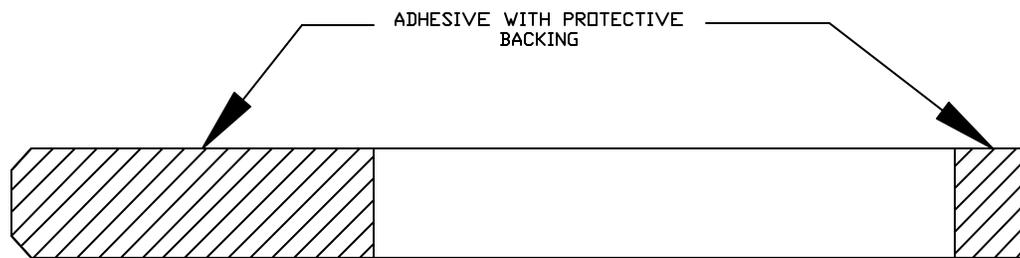


Figure 1: Band Before Assembly

1. Carefully remove the protective backing on the smaller adhesive area of the band. See Figure 1. Avoid contaminating the exposed adhesive. For example, do not let the adhesive contact dirt or allow your fingers to touch the adhesive.
2. Position the Thermofoil™ heater on the cylinder and secure the short adhesive end of the band over the heater. See Figure 2.
3. Carefully remove the protective backing from the longer adhesive area of the band. Wrap the band tightly around the heater and cylinder; overlap the long adhesive end as much as necessary. See Figure 3. Firmly press adhesive areas of the band to ensure that they bond properly.

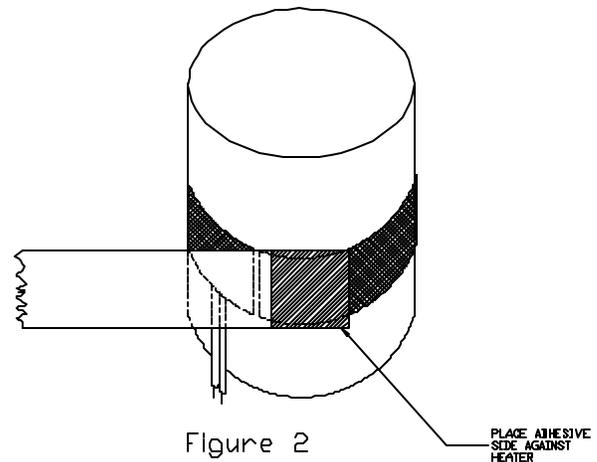


Figure 2

DR: MH 11/3/00
CHK: BHB 11/3/00
ENG JBH 11/7/00
APP: MP 11/13/00

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4. Use an oven or a heat gun to shrink the band onto the assembly. If you use an oven, heat the entire assembly at a temperature between 93°C to 107°C (200°F to 225°F) for 15 minutes to shrink the band tightly around the heater. Be sure the oven has adequate temperature control and will not exceed 107°C (225°F). If you use a heat gun, move the tip across the surface of the shrink band as you heat to uniformly shrink the band and to prevent hot spots.

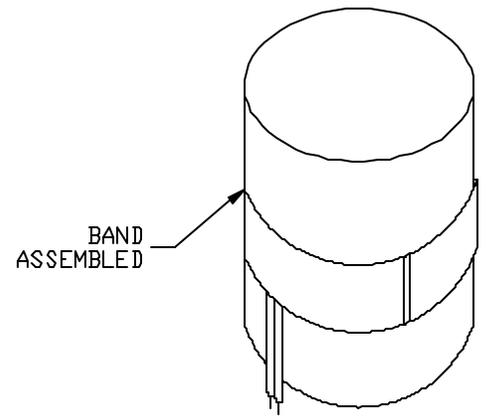


Figure 3

CAUTION: Overheating will damage the shrink band.

5. Expected shrinkage for a Type 3 band is approximately 3-5%; for a Type 4 band it is approximately 2-3%. Shrinking the band will expose some of the adhesive on the terminal end. The strip of exposed adhesive may be removed by rubbing gently with a common soft eraser. Remove any remaining particles by wiping the unit with a cloth or tissue paper lightly dampened with acetone. If the exposed adhesive is objectionable, contact Minco to design an extension tab for the application of an epoxy.

Shelf life: Use Type 3 bands within 12 months of manufacturing date code and Type 4 bands within 4 months. Usability after recommended shelf life should be determined by sample testing.

Storage conditions: Store at or below room temperature. Bands can withstand up to 38°C (100°F) only for short periods of time without shrinking.

Use in a Vacuum: Even heat sinks with a mirror finish have microscopic surface pits. In normal atmospheres, these pits are filled with air molecules that provide adequate heat transfer from the heater to heat sink. Use of a bondline adhesive or heat sink compound between the heater and the heat sink is recommended for vacuum applications. Otherwise, derate the power accordingly.

We believe this information to be reliable, but the customer must assume responsibility for heater performance in the intended application. **MINCO accepts no liability beyond our standard warranty for consequences of improper installation and/or heater or adhesive failure.**

If any questions or problems occur, contact your MINCO sales representative or the factory for assistance.