

## Use of Heat-Spring® Material

**Heat-Springs®**, a soft metal alloy thermal interface material (SMA-TIM), is a compressible metal foil that is designed to be used as an interface between a heat source and a heat-sink, heat-spreader, or heat-pipe. Some of the attributes that make this unique are:

- **Heat-Springs** are clean and require no surface prep.
- **Heat-Springs** are available in custom shapes and thicknesses.
- Packaging can be altered to fit customer specifications.
- **Heat-Springs** are self-passivating and require no special storage (however, they should be kept in their sealed metallized storage bag when not in use, especially for long-term storage).

Take care in selecting the correct metal **Heat-Spring** material so that the junction temperature of the application does not exceed the melting point of the alloy. For more information or assistance with selecting the proper **Heat-Spring** for your application, please visit [www.indium.com/TIM](http://www.indium.com/TIM) or email us at [TIM@indium.com](mailto:TIM@indium.com).

### Designing a Heat-Spring for Optimal Use

**Heat-Springs** have to be compressed to at least 30psi in order to yield acceptable performance. In Figure 1 you can see how the **Heat-Spring** compares to thermal grease or a graphite foil, and how the performance of the **Heat-Spring** improves with additional pressure. For some applications, decreasing the footprint to localize the pressure yields better results.

Figure 2 is an example of an application with 4 screw holes to a heat-sink. At first the yellow rectangle appears to be the best size for the **Heat-Spring**, but after further evaluation we found that by decreasing the contact area to localize the pressure, there is better deformation of the metal interface. This decreases the surface resistance and increases the effectiveness of the **Heat-Spring**. Of course, the success of this process is dependent on the heat flux, thickness of the spreader, etc. Please contact us with your design to determine the best dimension.

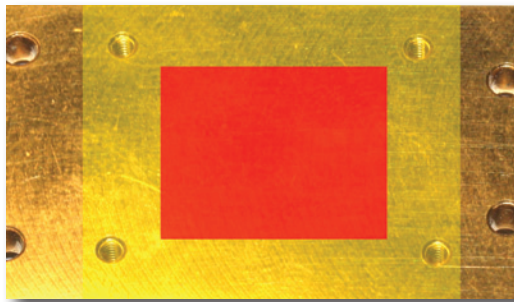
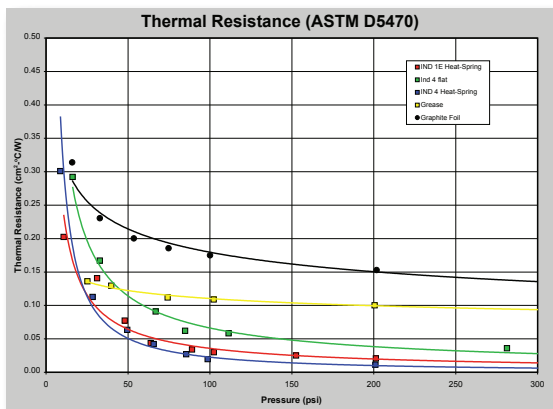


Figure 2

### Handling, Placing and Packaging

**Heat-Springs** should be handled with a degree of care, especially when using a 100% indium TIM. A **Heat-Spring** using Indalloy 1E is much more durable than pure indium. Nonetheless, we do not recommend that you handle **Heat-Springs** with your fingers. Always use tweezers or some other handling device, such as a recommended suction tool or pick & place device. Be careful not to deform the surface in any way since this damages the conformity of the **Heat-Spring**, limiting the contact in that area.

When applying pressure, start the threads on all screws before tightening to the desired torque in a star pattern. See Figure 3. When placing the **Heat-Spring**, it is ok to slide it into position or shift it to a locator. Be careful not to bend the corner causing it to fold over on itself, as that could cause a void under compression. Always handle the **Heat-Spring** at the corner if using a tweezers, or from the center if using a suction tool.

Packaging is available in both tape & reel and loose flat-packing. When handling the material from a carrier tape we recommend that you use a pick & place style suction nozzle (for recommendations on specific nozzle heads, please contact us at [TIM@indium.com](mailto:TIM@indium.com)). When removing from the carrier tape, be careful when removing the cover tape so as not to dislodge the **Heat-Springs** from their pockets. Also, be careful not to bend or crease the **Heat-Spring** when removing it from the pocket.

When removing from a flat pack, be careful not to deform the surface or crease the foil. You may re-flatten the **Heat-Spring** by placing it between two sheets of onion skin and gently rubbing it with your finger to remove any disparities. Damaged samples can be returned to Indium for reclaim.

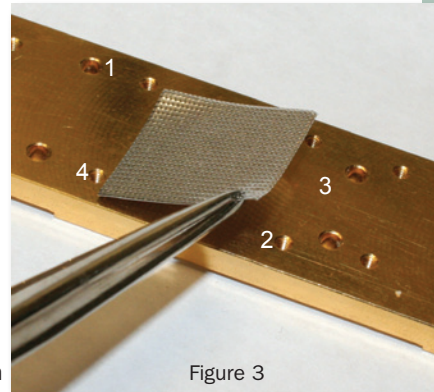


Figure 3

Form No. 98380 R1

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