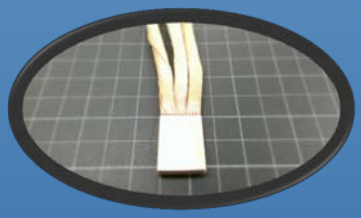
# Flexible Thermal Straps

-Transporting Heat in Applications from the Laboratory to Space

## - Features-

- *High effective thermal conductance*
- *Available in aluminum or copper*
- *Straps can be made with thin layers of foil or copper braid*
- *Reliable fabrication methods allow straight forward conduction calculations*



Flexible copper braid

Flexible aluminum foil

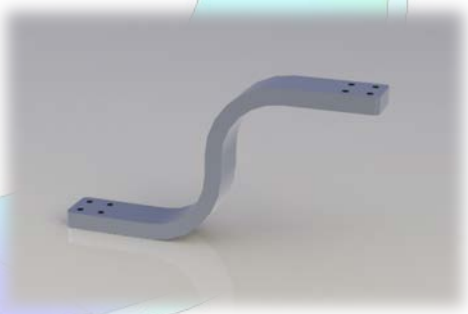
Flexible copper foil

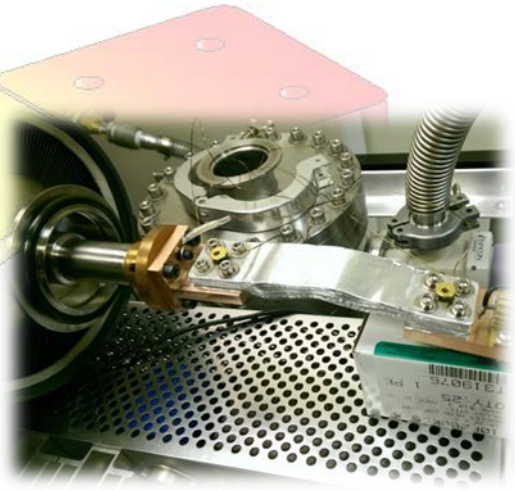
## Straight-forward, high thermal conductance and flexible hardware to thermally connect components to cooling sources

### Flexible Thermal Straps

TMT is committed producing quality products and services at a reasonable price to support customer thermal management needs. Our team has developed methods to fabricate reliable flexible, metallic thermal straps to facilitate the transfer of heat with reduced stiffness between components. Thermal straps constructed of copper or aluminum can be produced to meet customer requirements.

TMT has developed a standard set of thermal straps to provide customers easy access at an affordable cost. Custom units of various thermal conductance, operating temperature, size, and end connections can also be designed, fabricated and tested.





-Aluminum thermal strap in test-

### Applications:

Flexible thermal straps are used in a wide variety of applications to provide a passive means of transporting heat from source to thermal sink. Applications for flexible thermal straps include, but are not limited to:

| | |
|---|---|
| *Cryogenic shrouds* | *Cryocoolers* |
| *Infrared instruments* | *Superconductors* |
| *Electronic cooling* | *Cross hinge-cooling* |
| *Thermoelectrics* | *Heat sinks* |
| *Component testing* | *Spacecraft* |

### Thermal Strap Design:

Thermal straps are relatively simple to implement but require careful system considerations. Typical considerations include cost, operating temperature, thermal conductance, mass, stiffness, geometry, and contamination. When mass is a driver, the optimal material choices depend on specific conductivity (k/ρ) and temperature. TMT has a limited number of standard sizes and configurations for faster delivery.

TMT engineers have designed and fabricated a variety of thermal straps from very small instrument thermal straps at 1.6 K/W to large ~50 cm long 90 K chamber heat spreaders at 0.67 K/W. With this in mind, let TMT work with you to make your project successful!

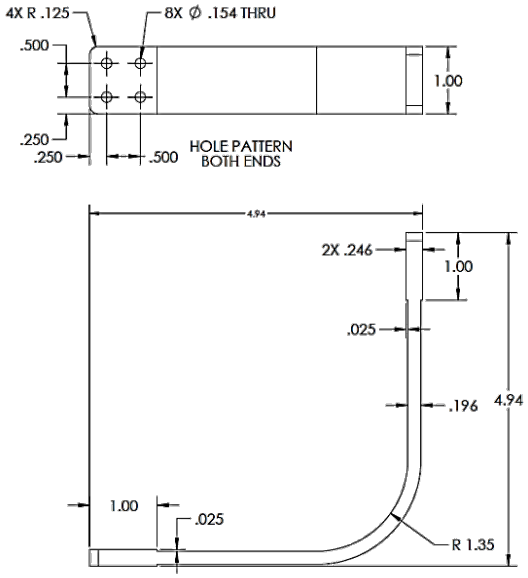
Contact TMT for price quotes

Custom and standard straps available

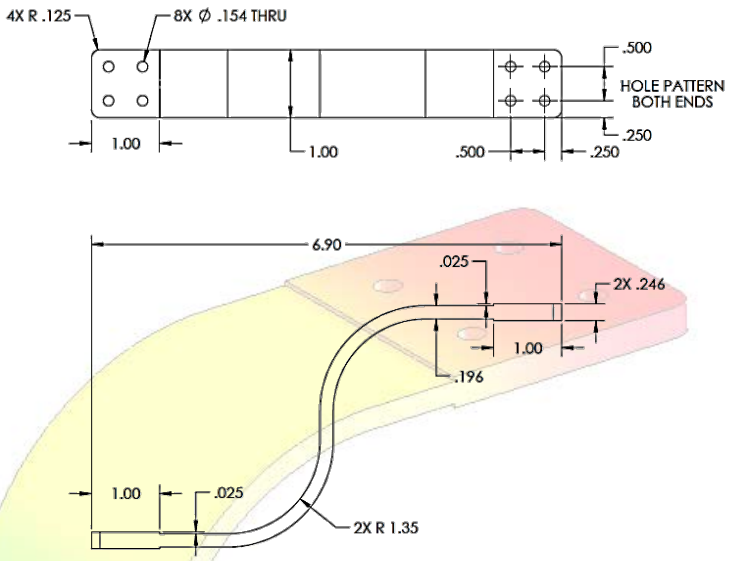
# Flexible Thermal Straps Can Be Configured for Your Application

## Standard Strap Configurations (*all dimensions in inches) (**custom bolt patterns available)

### Copper foil (flexible braid versions also available)

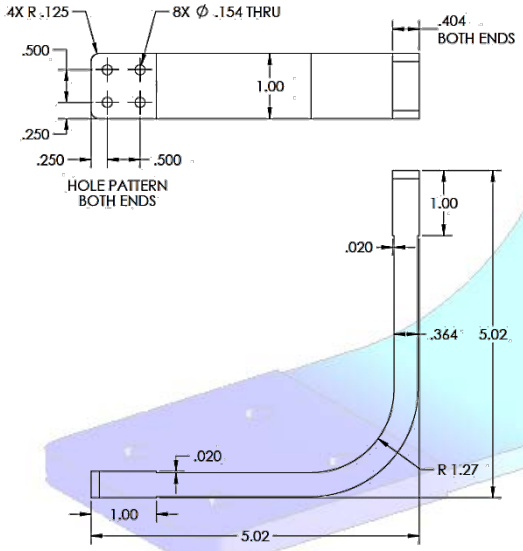



*L-strap: 3. K/W at 77 K (0.59 lb (0.27 kg))*

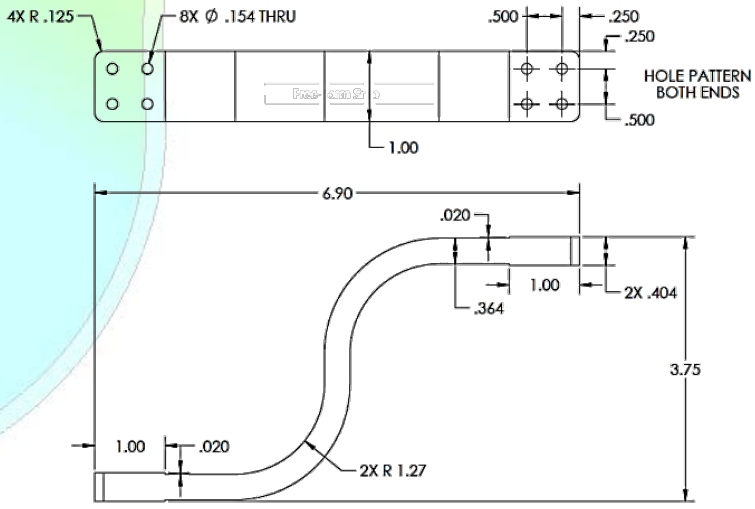



*S-strap: 3. K/W at 77 K (0.59 lb (0.27 kg))*

### Aluminum foil (1100 series)




*L-strap: 3. K/W at 77 K (0.32 lb (0.15 kg))*




*S-strap: 3. K/W at 77 K (0.32 lb (0.15 kg))*

**Testing** TMT can perform a wide variety of analysis and testing on thermal straps and thermal systems as an added service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