

PCM Heatsinks

High Capacity Phase Change Heat Sinks

Description: ESLI's PCM heat sinks are lightweight devices that can provide thermal inertia to dampen temperature changes caused by pulsed power systems or other periodic heat sources.

Concept: Phase change heat sinks are filled with a phase change material (PCM) and rely on its latent heat of melting for thermal storage. PCM materials such as paraffin are lightweight and have a high effective heat capacity over a small temperature range, but are poor thermal conductors. Consequently, traditional PCM heatsink enclosures must include numerous metal fins or channels to get heat in and out of the PCM material, resulting in heatsinks that are heavy, slow to react to heating, and sensitive to physical orientation or gravitational effects.

Innovation: ESLI has overcome these problems by using our unique high thermal conductivity fiber core materials to achieve fast and uniform melting of the PCM material in any orientation or in low gravity. As a result, ESLI's PCM heatsinks are compact, reliable and half the weight of traditional PCM heatsink designs. ESLI's paraffin based heatsinks can be designed to operate at or near 5, 18, 28, 37, 44, 55, or 61 °C. Non-paraffin based designs are also available for cryogenic or high temperature applications. ESLI's PCM composite heatsinks have been space flight tested on the Space Shuttle (STS-95) aboard a Hitchhiker experiment module, and will fly aboard NASA's Vegetation Canopy LIDAR experiment in 1999.

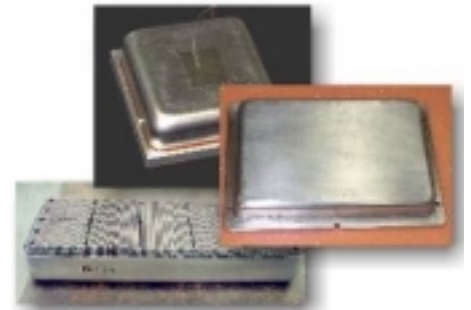
Applications: Transient thermal control for space batteries, LEO radiators, missile navigation modules, pulsed-power devices and re-entry thermal protection systems.

Advantages:

- High heat capacity
- Half the weight of traditional PCM heatsinks
- Compact & Reliable
- Insensitive to physical orientation or low gravity
- Space flight tested on Space Shuttle (STS-95)

Configurations:

- Square and cylindrical aluminum enclosures
- Low-profile or lightweight enclosures



Contact: Contact ESLI for assistance in designing the best heatsink for your application.

Timothy R. Knowles
(858) 552-2034
tknowles@esli.com