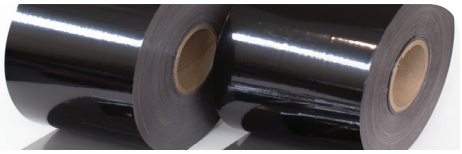
HeatSORB™



HeatSORB™ Thermal Management Material

Portable electronic devices are increasingly becoming slimmer. As a result, space between components within the device becomes more and more condensed.

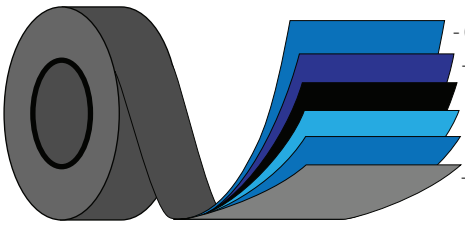
This occurrence, coupled with the desire for increased performance and the mainstream use of metal as the design material of choice, makes the management of heat a substantial challenge. HeatSORB™ proprietary phase change material addresses thermal management issues by capturing heat - allowing a device to remain cooler by delaying temperature ramps.

The effective management of heat is also important as it relates to user experience. Inefficient heat management can lead to:

- Thermal Throttling (Chipset Frequency Scaling)
- Device Shutdown
- User Discomfort Caused by Heat Emanating from the Device

HeatSORB material increases thermal efficiency and goes above and beyond traditional heat spreaders such as copper, graphite sheets, or heat pipes.

HeatSORB material was developed for the Portable Electronics market, but provides benefit to any application in which high heat of fusion and long-term, reliable thermal management are concerns - especially when real estate is limited.



- 0.007 mm (0.25 mil) Protective Film
- 0.013 mm (0.50 mil) PSA
- 0.260 mm (10.25 mils) Heat Absorbing Material
- 0.013 mm (0.50 mil) PET
- 0.007 mm (0.25 mil) PSA
- Release Liner

Thermal Issues are Typically Experienced by Components such as:

- SoC (System on Chip)
- PMIC (Power Management IC)
- Power Amplifier
- Image Sensor
- Display

Thermal Management Issues Addressed:

- Heat Surge Absorption Delays Temperature Increase
- Long Term Reliability

What causes the phase change effect within the material?

HeatSORB material leverages an immobilized compound which requires a large amount of enthalpy to transition from one physical state to another.

During that process, the material absorbs heat while preventing that heat from leaching into the electronics.

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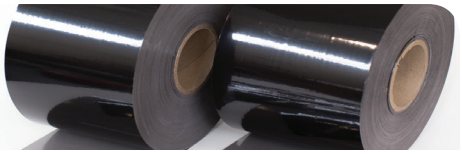

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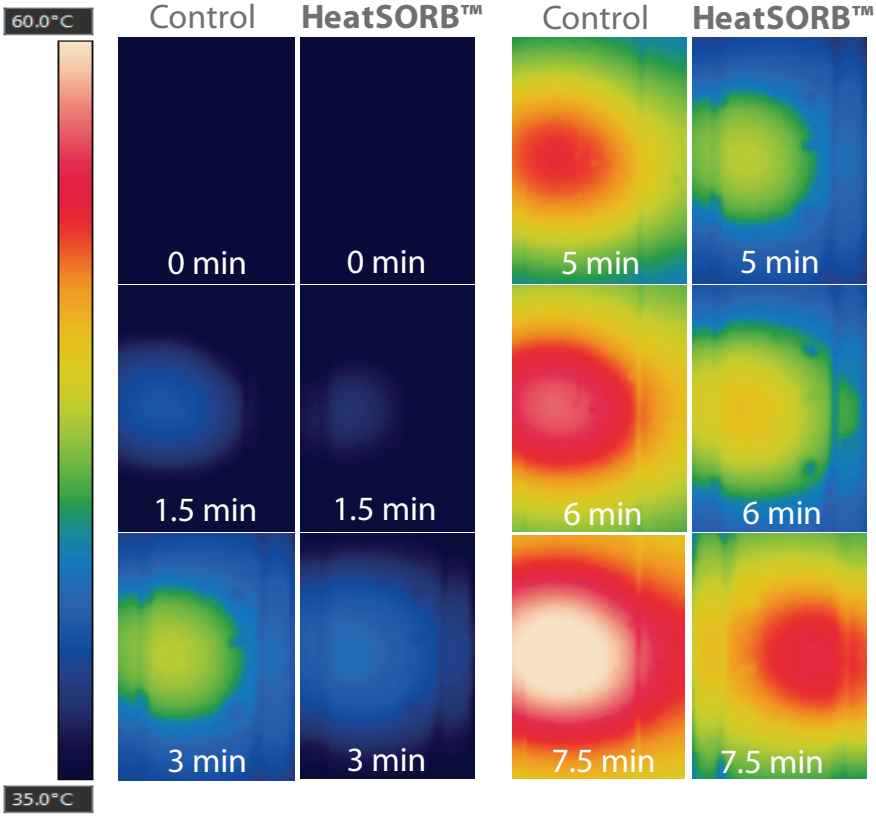
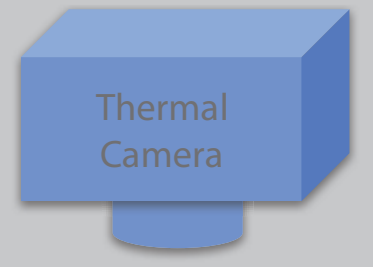


Thermal Imaging Used to Record Temperature Ramp



HeatSORB
(75mm x 125mm x 0.3mm)

Aluminum Plate
(75mm x 125mm x 0.3mm)

Heating Source
(50.8mm x 50.8mm)
Power Output: 10W

HeatSORB™ Thermal Cycling Analysis