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Composite Phase Change Material Heat Sinks for Enhanced Passive Thermal Management

Tunable, lightweight phase-change heat sinks extend time-to-overheat by ~36% for compact, high-power electronics.

As electronic devices become more compact they require more efficient heat sinks to maintain high performance. Phase change materials (PCMs) are promising for transient thermal management, but have had limited use due to poor thermal conductivity.

Researchers at Purdue University have developed a composite PCM heat sink for passive thermal management of electronic systems. This technology utilizes novel geometries that provide a tunable design to address specific problems and power levels encountered with high power density devices. Furthermore, this technology extends the time to reach the cut-off temperature by about 36% at a reduced weight, making it advantageous for mobile devices, aerospace platforms, power electronics, or directed energy weapons.

Advantages:

-Tunable

-Extended time before overheating

-Light weight

Potential Applications:

-Mobile devices

-Aerospace platforms

-Power electronics

TRL: 2

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Category

Materials Science & Nanotechnology/Nanomaterials & Nanostructures

Materials Science & Nanotechnology/Composites & Hybrid Materials

Materials Science & Nanotechnology/Thermal Management Materials & Solutions

Further information

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