New material battery heat sink

Which heat sinks are used to study the thermal regulation of batteries?
Three heat sinks,one sans fins,and the other two with 130 and 260 fins,respectively,are considered to perform experiments. Phase Change Material (PCM) named Eicosane(Ei) with an addition of 0,10,20,25,and 30% weight fractions of EG is filled in the heat sinks to study the effect of composite PCM on the thermal regulation of the battery.

Which heat sink is used for thermal management of Li-ion batteries?
Introduced fin-PCM-EG composite heat sinkfor thermal management of Li-ion batteries. Newman P2D model is used to calculate the heat generation for 2,3,and 4C rates. Compared performance of different heat sinks for 2,3,and 4C rates experimentally. Heat sink with 260 fins and 70% Ei - 30% EG outperforms all other combinations.

Are heat sinks a better thermal management solution?
Three heat sinks, one having no fins, and the other two having having 130 and 260 fins, were considered and compared to propose a better thermal management solution when the battery discharge at higher C-rates. The effect of 10, 20, 25, and 30% weight fractions of EG added to PCM are also studied in detail.

How does a battery heat sink work?
In view of this,to replicate the practical scenario of the battery,the profile of heat generation is repeated till the battery reaches 60 °C when studying a particular C-rate. An effective heat sink regulates the rise in average temperature as well as the thermal gradients along with the battery.

What is a heat sink made of?
The combination of heater and stem are kept in a housing,and the heat sink is closed with top and bottom acrylic plates using a nut and screw. The housing and the stem are made of aluminum,whereas the fins are made of copper. The space between the stem and the housing is filled with PCM.

Is a hybrid heat sink better than a plate-finned heat sink?
Krishnan et al. propose immersing a hybrid heat sink,which is a plate-finned heat sink with fin tips,in PCM. The hybrid heat sink is finer in thermal performancecompared to heat sink consisting of fins under the exposure of ambient as illustrated in the computational analysis.

The material selection principles for heat sinks are generally as follows: 1. Good thermal conductivity: The heat sink needs good thermal conductivity to quickly transfer ...

In this study, a phase change material based heat sink (PCMHS) for power electronics such as DC/DC converter cooling for an underwater battery power system was first ...

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Phase Change Material Heat Sink for an ISS Flight Experiment Gregory Quinn1, ... characterizing a new PCM heat sink that incorporates a novel phase management approach ... locally high ...

Phase Change Material (PCM) based heat sink is a state-of-the-art cooling technique for the effective thermal management of Lithium-ion batteries (LIBs). The low ...

In this paper, all of us focus on design heat sink size that suitable for the battery pack to dissipate heat from the battery into the surrounding air. First calculating battery internal temperature for ...

A heat sink design for battery modules that improves space utilization and reduces pressure drops in the cooling system. The heat sink has separate sections on each ...

@article{Hadi2024InnovativeTM, title={Innovative Thermal Management System for Electric Vehicle Batteries: Phase Change Material, Heat Pipe and Heat Sink Box ...

Moreover, when combining the heat sink box with soy wax phase change material and heat pipe, the temperature dropped by about 66% under maximum heat load conditions. ...

A new thermal analysis of the single battery cell is conducted to identify the most critical zone of the cell in terms of heat generation. ... and NX100 materials are selected ...

The objective of this technique is to enhance thermoelectric efficiency by enhancing the material"s capacity to convert heat into ... illuminating its merits and limitations. ...

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