

Shock absorption design of lithium-ion battery cabinet





Overview

How do vibrational and shock profiles affect lithium-ion batteries?

Lithium-ion batteries are increasingly used in mobile applications where mechanical vibrations and shocks are a constant companion. This work shows how these mechanical loads affect lithium-ion cells. Therefore pouch and cylindrical cells are stressed with vibrational and shock profiles according to the UN 38.3 standard.

Why is the design complexity of Li-ion batteries increasing?

The design complexity increased due to the high degree of modularity of the battery system and the need for scalability. In this context, Narayanaswamy et al. highlighted how manual design approaches for Li-ion batteries are time-consuming and are error-prone.

How does mechanical stress affect a lithium ion battery?

In particular, mechanical vibrations and infrequent shock loads affect all parts of a battery including its smallest energy storing part, the accumulator cell, or short cell. Mechanical stress on cell level may cause market durability failures in the long-term and, especially for lithium-ion cells, these failures might pose a safety risk.

Why do we need advanced design tools for Li-ion batteries?

Li-ion batteries require advanced design tools to satisfy all requirements and objectives due to the complexity of the subject. Heuristic methods and numerical approaches are insufficient to support the design project of future battery packs, in which optimization and advanced analysis are essential.



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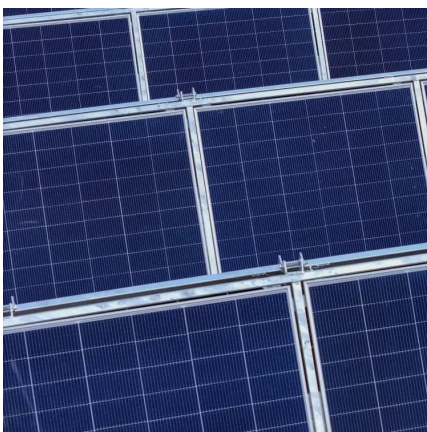


Lithium battery shock absorption requirements

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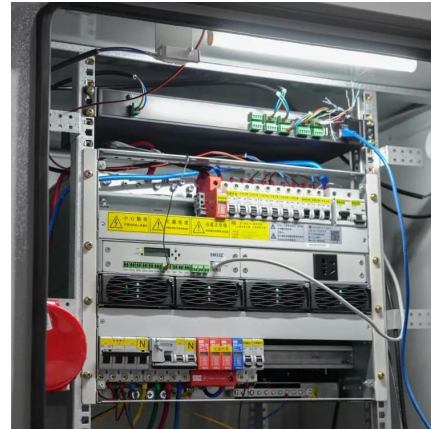


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A lithium battery shock absorb box

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[Design approaches for Li-ion battery packs: A review](#)

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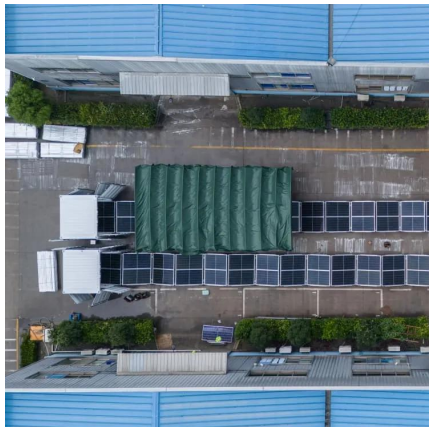
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A GUIDE TO Safer Lithium-Ion Battery Designs

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Effects of vibrations and shocks on lithium-ion cells

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