How do we thermal manage the Li-ion battery? An inside out solution

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The lithium ion battery pack (Lithium-ion battery pack) has become a staple of the automotive industry. However, unit cost and weight improvements have happened at the expense of reduced cell performance. There is a need to design better cells to improve the energy efficiency and lifetime of the battery pack.

Cell design is complex, but the core principles of thermal management are straightforward. The battery has a maximum power and an upper and lower temperature limit. If the temperature is too high, the cell will fail, and if it is too low, the efficiency and lifetime of the cell will decrease.

The key to thermal management is to ensure that the temperature is kept within the specified limits. This is achieved by controlling the heat generation and heat rejection rate. The heat generation rate is determined by the power output of the cell, while the heat rejection rate is determined by the cooling system.

There are two main methods to cool lithium ion batteries: tab cooling and surface cooling. Tab cooling involves cooling the tabs of the battery, while surface cooling involves cooling the surface of the battery. The choice of cooling method depends on the cell design and the cooling requirements.

Optimising the cell design is essential to improve thermal management. The tab thickness is particularly important, as it affects the heat rejection rate. Increasing tab thickness is extremely effective in reducing average temperature. Make tab cross-sectional area more comparable to total current collector cross-sectional area. To estimate efficiency is relatively small.

Increasing tab thickness is extremely effective in reducing average temperature. Make tab cross-sectional area more comparable to total current collector cross-sectional area. The penalty on energy density is relatively small.

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1. Larger tab thickness is extremely effective in reducing average temperature. Make tab cross-sectional area more comparable to total current collector cross-sectional area.
2. The penalty on energy density is relatively small.
3. Increasing tab thickness is extremely effective in reducing average temperature. Make tab cross-sectional area more comparable to total current collector cross-sectional area.

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