

Break-away Busbar Current Interrupt Device (CID)

A multifunction busbar acts as an electrical conductor and current interrupt device that prevents battery overcharge and explosions during a crash while reducing production costs through direct welding with clad metal.

Currently, the automotive industry is facing increased pressure from consumer demand of more fuel-efficient vehicles. To meet these requirements and new regulations enforced by the Environmental Protection Agency, automotive manufacturers have increasingly relied on battery power for automobile power. Unfortunately, the cost of manufacturing batteries is still relatively high, and each battery increases the risk of an overcharge and explosion during accidents. Therefore, there is great need to both reduce the cost of manufacturing car batteries and increase the safety of the batteries.

Researchers at Purdue University have developed a multifunction busbar (electrical conductor) that serves as electricity transmission and a current interrupt device (CID). Under normal operation, the busbar connects battery cells and functions as a simple busbar. On the other hand, upon impact from mechanical loading conditions, such as a vehicle crash, the battery busbar breaks away, preventing the current flow, battery overcharge, and explosion. Furthermore, using clad metal (aluminum and copper), manufacturers can directly weld the aluminum and copper ends to the cathode and anode battery terminals, respectively. Using direct welding eliminates the need for machine screws that are typically used, reducing the cost and weight of battery packs.

Advantages:

- Prevents overcharging and explosions of batteries during a crash
- Reduction in the overall production cost of batteries
- Functions under mechanical impact and shock loading

Potential Applications:

Technology ID

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Category

Automotive & Mobility
Tech/Battery Management &
Charging Technologies
Materials Science &
Nanotechnology/Materials
Testing & Characterization Tools

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-Battery manufacturers

-Automobile manufacturers

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