

TIBA: Topologically Interlocked Battery Assembly

Topologically interlocking battery array segments absorbs crash energy, significantly reducing necessary protection material weight while enhancing electric vehicle safety.

Current battery assemblies for electric vehicle applications introduce a substantial amount of parasitic weight to the vehicle from the battery, the encasing and, protection system. In a crash situation, that protection system is imperative to prevent the destruction of the battery and any secondary damage from fire or explosions. The potential dangers of these advanced battery arrays require car companies to add extensive safety systems, which increase weight significantly.

Researchers at Purdue University have developed a method to topologically interlock these battery array segments so that a significant amount of the mechanical energy of a crash is absorbed by the reactionary movement of the segments. By topologically interlocking the segments, the battery array becomes more flexible and can actually contribute to the safety of the crash by absorbing the energy of the impact. This greatly reduces the necessary impact protection material needed, and thus, reduces the overall weight of the vehicle.

Advantages:

- Reduces amount of protection material and overall weight
- Contributes to crash safety of vehicle

Potential Applications:

- Automobile manufacturers
- Battery manufacturers
- Electric vehicles

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Category

Automotive & Mobility
Tech/Battery Management &
Charging Technologies
Materials Science &
Nanotechnology/Composites &
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