

What is a structural battery?

The structural battery uses carbon fiber for its electrodes negating need for copper or aluminum, which add weight. The developed battery concept is based on a composite material and has carbon fibre as both the positive and negative electrodes.

What is a 'structural battery'?

Researchers at Chalmers University of Technology in Sweden have developed a 'structural battery' -- a material that functions both as a battery and a load-bearing structure. This dual-function capability dramatically reduces the weight and energy consumption of vehicles, electronics and other devices. The result?

Can a structural battery be made?

The first attempt to make a structural battery was made as early as 2007, but it has so far proven difficult to manufacture batteries with both good electrical and mechanical properties. Doctor Johanna Xu with a newly manufactured structural battery cell in Chalmers' composite lab, which she shows to Leif Asp.

Can structural batteries be used in the automotive industry?

One of the most promising applications for structural batteries is in the automotive industry. With EVs already gaining momentum, reducing the weight of the car's battery is crucial for increasing driving range and lowering energy consumption. Professor Leif Asp, the research leader at Chalmers University, states:

Could a 'structural battery' transform the transportation and electronics industry?

A groundbreaking innovation in battery technology is poised to transform the transportation and electronics industries. Researchers at Chalmers University of Technology in Sweden have developed a 'structural battery' -- a material that functions both as a battery and a load-bearing structure.

Can carbon fibers be used for structural batteries?

In the case of a vehicle, this also reduces energy consumption, which translates into a higher range. A research team led by Leif Asp, a professor of Material and Computational Mechanics, Industrial and Materials Science at Chalmers, has been researching the use of carbon fibers for structural batteries.

2 Results and Discussion 2.1 Electrochemical Performance. The specific capacities and energy densities of the tested structural battery cells are presented in Table ...

Researchers at Chalmers University of Technology in Sweden saw this challenge as an opportunity to turn some of the car's structural components into batteries themselves, effectively eliminating much of the battery weight as it ...

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Technology, Gothenburg, Sweden 2Department of Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden Correspondence Johanna Xu and Leif E. Asp, Department ...

Herein, a structural battery composite with unprecedented multifunctional performance is demonstrated, ... Swedish Energy Agency grant #37712-1; the Swedish ...

Research on structural batteries has been going on for many years at Chalmers, and in some stages also together with researchers at the KTH Royal Institute of Technology in ...

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Researchers at Chalmers University of Technology have developed a structural battery that performs ten times better than previous versions. The battery uses carbon fiber as a conductor and load-bearing material, making it possible to store energy while supporting the structure of electric vehicles, for example.

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The structural battery composite demonstrates an energy density of 30 Wh kg⁻¹ and cyclic stability up to 1000 cycles with ~100% of Coulombic efficiency. Remarkably, the ...

The structural battery developed at Chalmers is made from composite material and uses carbon fibers for both positive and negative electrodes.

The technology behind electric vehicles is evolving quickly, and one of the most promising innovations is the structural battery pack. Structural battery packs are ...

One practical example of cell-level designs is the structural battery pack of the new EV model Y from Tesla (Fig. 3 (a)) [44], which leads to a 10% mass reduction, a 14% ...

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for example, in a car body. This is termed "massless" energy ...

The second generation is called "Cell-to-Pack" (CTP). The manufacturers CATL and BYD are the pioneers of this construction approach which they presented in 2019 ...

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We refer to these materials as structural battery composites. The paper reviews the current status of structural battery composites. Focus is on the activities performed ...

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battery packs, a technique that has gained popularity in the research and development of EV powertrains due to their high efficiency and providing cell-level control [17], [1]. Modular ...

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As part of their work on what they call "massless energy storage," the research team in Sweden has developed a battery made of a carbon fiber composite.

Building on the trailblazing carbon-fiber-as-a-battery work started at Sweden's Chalmers University of Technology, deep-tech startup Sinonus is working to commercialize a ...

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Researchers from Chalmers University of Technology have produced a structural battery that performs ten times better than all previous versions. It contains carbon fiber that serves simultaneously as an electrode, conductor, and load-bearing material.

As more vehicles are designed to run on electricity, and especially as batteries are required to provide longer ranges, the weight of the batteries becomes more of an issue. In ...

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