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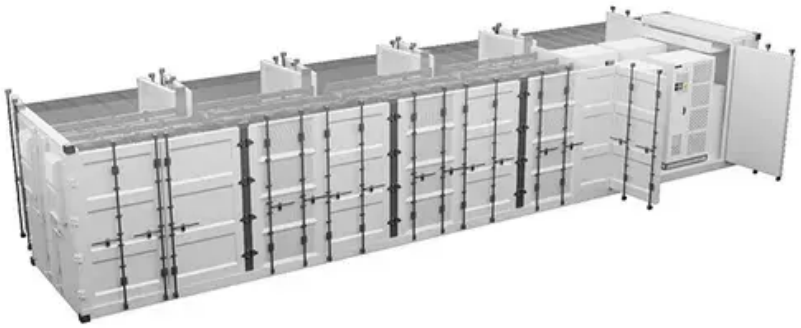
Condensed Matter Flow Battery



Overview

What is a 'condensed matter' battery?

The Chinese battery giant considers it suitable for electric aircraft but also envisions use in road vehicles, with series production to start this year. Officially referred to as “Condensed Matter” battery, the new cells exhibit high safety and precisely that high energy density, as CATL’s chief scientist Wu Kai stated at the trade show.

What is CATL 'condensed battery' technology?

CATL is showing novel ‘Condensed Battery’ technology in Shanghai, which claims an energy density of 500 Wh/kg at the cell level. The Chinese battery giant considers it suitable for electric aircraft but also envisions use in road vehicles, with series production to start this year.

What is a flow battery?

Unlike secondary battery systems using solid active materials, flow batteries decouple energy storage (i.e., the concentration of electrolyte and storage container size) and power conversion (i.e., the central electrochemical reaction energy conversion device), thus enabling relatively safe energy storage and long battery life (4, 6 – 8).

Are condensed batteries transforming the EV industry?

The battery industry is on the brink of a major transformation with the introduction of condensed batteries—a new high-energy-density technology that could redefine applications across electric vehicles (EVs), aviation, and beyond.

How does a condensed battery work?

Biomimetic Electrolyte Interfaces: Inspired by natural processes, the condensed battery incorporates biomimetic electrolyte interfaces that create a stronger protective layer to prevent dendrite formation.

Does CATL have a condensed battery?

CATL first introduced its condensed battery technology in April 2023, claiming it would achieve energy densities up to 500 Wh/kg—nearly twice the density of Tesla’s 4680 cells (~250 Wh/kg). By early 2024, the company had successfully powered a 4-ton electric aircraft with this technology, proving its viability in demanding, high-power applications.

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