

Safer, Thinner Batteries via Kevlar

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According to University of Michigan researchers kevlar might be key for thinner and safer batteries, acting as an advanced barrier between the electrodes in a lithium-ion battery.



The solution is inspired by the battery fires that grounded Boeing 787 Dreamliners back in 2013. Lithium-ion batteries produce power by shuttling lithium ions from one electrode to the other, with a membrane blocking the shortest path between the two electrodes. However the lithium atoms might start creating fern-like structures (or dendrites) poking through the microscopic pores in the membrane, thus shorting out the battery.

Enter the kevlar membrane. While current battery membranes feature pores a "few hundred nanometers" wide, the kevlar membrane features pores 15-20 nanometers across-- wide enough for individual lithium ions to pass through, but small enough to block the dendrites.

"The special feature of this material is we can make it very thin, so we can get more energy into the same battery cell size, or we can shrink the cell size," the researchers say. "We've seen a lot of interest from people looking to make thinner products."

The researchers are already working on commercial applications for the technology, forming an own company called Elegus Technologies to work with potential partners. Thus, if all goes to plan the first Kevlar-equipped batteries should hit the market by Q4 2014.

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