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Thin-Film Solution Is Closer for the Lithium-Ion Battery

By [ERICA A. TAUB](#)

The recent recalls of [Sony](#)-manufactured laptop batteries highlighted problems with the lithium-ion technology inside them: potentially volatile materials, excess heat and a short life span. One potential competitor is the thin-film battery, a technology still in the prototype stage.

Thin-film batteries have a solid lithium core rather than a liquid one, so they are less vulnerable to overheating and catching fire. They lose virtually no power over time, and the units can be recharged thousands of times before they need to be replaced.

Now thin-film technology's prospects for making it to market are getting a financial boost. Infinite Power Solutions, a company based in Golden, Colo., plans to announce today that it has received a \$34.7 million investment from a group of private equity firms that will allow it to begin mass production of thin-film batteries next year.

Raymond R. Johnson, the company's president, said Infinite Power Solutions had "solved all the technical issues" that have stood in the way of the commercialization of thin-film batteries. It has now produced prototype units that it says can be fully charged and discharged more than 10,000 times.

With the new investment, Infinite Power will build a plant in Golden that will be able to produce millions of units a year when it opens in 2007, Mr. Johnson said.

The investor group includes Core Capital, the D. E. [Shaw Group](#), Polaris Venture Partners and Applied Ventures, the venture capital division of [Applied Materials](#).

Other companies developing thin-film battery technology include Cymbet Corporation, Excellatron Solid State and Oak Ridge Micro-Energy. Several companies expect to begin manufacturing the batteries within the next few years.

Thin-film technology could eventually replace lithium-ion batteries in laptop PC's or

cellphones, analysts say, but only after the current technology has run its course, which may not be for years. All new approaches to batteries must do battle with the entrenched infrastructure, because companies have spent so much to engineer their products to work with lithium-ion and nickel-metal hydride, or NiMH, technologies.

“There is not one piece of consumer or enterprise technology that can run on thin-film battery technology,” said Carmi Levy, senior research analyst with Info-Tech Research Group in London, Ontario. “Every piece of circuitry must be fully re-engineered. It is a Herculean engineering feat to switch over to this.”

As a result, Mr. Levy said, the thin-film industry is concentrating on winning business in markets where new electronic products are under development, like radio-frequency identification tags, or [RFID](#)'s; smart cards; military equipment; and pacemakers and other implantable surgical devices.

The industry is developing miniaturized versions of the technology. The batteries can be smaller than a postage stamp and twice its thickness, can be manufactured in various shapes, and can be attached directly to a computer chip.

Mr. Johnson of Infinite Power Solutions said a smart card powered by a thin-film battery could transmit biometric and other information about its owner without the need to swipe the card through a terminal. Once used, it could enter sleep mode and stand by for months without losing power.

That long life would be useful in implanted surgical devices, as well as in missiles that might sit in silos for years. The batteries can be recharged from a distance using radio-frequency transmissions, eliminating the need for surgery to replace failing pacemaker batteries.

Oak Ridge Micro-Energy is exploring the possibility of using the technology to power memory backup in cellphones. The batteries could also power sensors in tires that could detect manufacturing defects and monitor temperature and pressure.

Oak Ridge is “in the process of partnering with a European company” to ramp up to full-scale production, said Mark Meriwether, the company’s president. He said it decided to seek a manufacturing partner because the necessary equipment cost \$50 million to \$150 million.

While the technology is still in its formative stages, industry analysts have high hopes for its success. The market for thin-film batteries will approach 10 billion units by 2012, fueled by cellphone sales and RFID tags, said Susan Eustis, president of WinterGreen Research in Lexington, Mass.