

Startup Claims Breakthrough in Fuel Cells

PolyFuel claims its fuel-cell membrane, based on hydrocarbon direct methanol, has passed the 5,000-hour mark in durability testing.

By Mark LaPedus, [EE Times](#)

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SAN JOSE, Calif. — Startup PolyFuel Inc. on Monday (Oct. 31) said that it has achieved a critical milestone that could propel the mass adoption of fuel cells in PDAs, cellular phones and notebook computers.

PolyFuel (Mountain View, Calif.) claimed that its hydrocarbon direct methanol fuel cell (DMFC) membrane has passed the 5,000-hour mark in durability testing. Industry observers believe that commercially viable portable fuel cells must demonstrate lifetimes in the 2,000-to-3,000 hour range, a market barrier that PolyFuel claims to have eliminated for fuel cell manufacturers.

"Membrane durability has always been one of the key technical challenges faced by fuel cell manufacturers, as it translates directly to the lifetime of a fuel cell," said Jim Balcom, president and CEO of PolyFuel, in a statement. "In applications targeted for portable fuel cells, consumers are acclimatized to battery lifetimes in the 2,000-to-3,000 hour range for their portable devices. Quite understandably, electronics manufacturers and fuel cell developers see this as a crucial benchmark."

PolyFuel was spun out of SRI International (formerly Stanford Research Institute) in 1999, after 14 years of applied membrane research. The U.S. company is publicly listed on the AIM stock exchange in London.

According to a new report from market researcher NanoMarkets LLC, 2006 is projected to be the big year for mobile fuel cells, leading to a projected market size of \$1.1 billion by 2009.

Fuel cells are aimed to replace batteries in mobile applications. For example, the runtime of a typical 4-hour laptop battery drops to only about 2.5 hours after 3,000 hours of use.

In the case of portable electronics, the methanol fuel — a type of alcohol — will come in the form of small, lightweight, snap-in cartridges that will share shelf space the world over with batteries and cigarette lighters.

Fuel cell membranes are engineered films of various plastic polymers — resembling stiff cellophane — that when covered with a catalyst material, enable fuels such as methanol or hydrogen to generate an electric current capable of powering electronic devices, or even automobiles. Unlike batteries, which must be recharged from a wall outlet, fuel cells are simply "resupplied" with a new fuel cartridge.

PolyFuel's hydrocarbon DMFC membranes have since been demonstrated to provide higher performance than the older fluorocarbon membrane technology, enabling portable fuel cell developers to design smaller, lighter, and less expensive fuel cell power supplies for portable electronics products, according to the company. PolyFuel's DMFC membrane passed PolyFuel's previous durability milestone — 3,000 hours — in June 2005.

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