



Best-Ever Power Density for Portable Methanol Fuel Cell Stack Shown by PolyFuel

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Company Reveals Significant Expertise "Outside the Membrane" as

Tiny 111cc DMFC Stack Delivers 56 Watts -- More Than 2X the Requirement of a Typical Laptop -- for an Unprecedented 500 Watts per

Liter

MOUNTAIN VIEW, Calif.--(BUSINESS WIRE)--September 25, 2007--

Fuel cell membrane leader PolyFuel announced today the development of a fuel cell stack that is capable of delivering an unprecedented 500 watts per liter of stack volume, significantly advancing the state of the art for "direct methanol" fuel cells (DMFC). The tiny stack -- which easily fits in the palm of the hand -- delivers a peak power of 56 watts -- more than twice that needed to power a typical laptop computer. The announcement marks PolyFuel's first public disclosure of its significant and growing expertise in fuel cell technology outside the membrane.

"PolyFuel's breakthrough is important for portable electronics -- particularly laptop computers," said Henry Voss, vice president of engineering for PolyFuel and holder of 27 fuel cell patents. "It is the first time, to my knowledge, that anyone has demonstrated a Direct Methanol Fuel Cell stack with this high a power density." In layman's terms, explained Voss, this means that long-running fuel cell power supplies of a size and weight attractive to consumers, and that physically integrate with a laptop in the same fashion as today's Lithium ion batteries, are technically within reach.

Fuel cells can be thought of as "refillable" batteries. But unlike a battery, which when exhausted must be recharged or discarded, fuel cells will run continuously, as long as there is fuel available. As conceived by most consumer electronics manufacturers, many of whom have aggressive fuel cell development programs, the consumer would simply "pop in" a replacement cartridge of methanol fuel when necessary. Spare, lightweight, plastic cartridges -- made readily available in convenience stores -- could be carried in ones pocket or purse. Eight to ten hours of laptop runtime per cartridge is a common industry goal.

The fuel cell "stack" is a precisely-engineered, dense "sandwich" of repeated thin layers of fuel cell membranes, electrodes, and bipolar plates. The membrane is the heart of the fuel cell, and the various layers of the sandwich are designed to deliver fuel and air to as much membrane surface area as possible, while diffusing away moisture and CO₂ byproducts. Certain layers additionally provide a current path to carry off electrons produced at the membrane's surface. This current is used to power the portable device. PolyFuel's 56 Watt stack has a volume of just over 111 cubic centimeters (see photo).

PolyFuel has been quietly but aggressively designing fuel cell stacks and other fuel cell system components over the years to best understand the properties that need to be engineered into its membranes. In addition, it has increasingly shared its growing expertise with its customers to assist them in optimizing their fuel cell development efforts, particularly around PolyFuel's popular hydrocarbon membranes. Although the company believes that the new stack is the highest-performing direct methanol fuel cell stack ever developed, its purpose remains to provide developers of fuel cells or fuel cell components with tangible examples of how a consumer-acceptable fuel cell design can be accomplished, particularly with PolyFuel's hydrocarbon membranes.

A pent-up demand for long-running, portable power supplies has been developing in the last few years as portable electronics devices increasingly gain additional functionality -- particularly motion video -- and consumers are essentially "eating up" emerging, power-hungry applications. Improvements in lithium-ion batteries -- the benchmark for portable power sources -- are slow and measured, about 8% per year in terms of energy density, and are being pushed to their limits, as evidenced in part by the many recent Li-ion battery safety recalls.

By contrast, with PolyFuel's latest results, the power density of direct methanol fuel cell stacks can now be shown to be increasing at a much faster rate -- more in line with the rising power demand of portable devices (see chart). However, industry observers have often commented that until the amount of power produced by a portable fuel cell power pack can meet or exceed that produced by a lithium ion battery pack of the same size, fuel cell adoption would be limited to those consumers -- such as traveling executives -- for whom "unlimited" run times might justify some inconvenience in terms of size. Now, with PolyFuel's latest stack development, that performance threshold is finally attainable.

About PolyFuel

PolyFuel (www.polyfuel.com) is a world leader in fuel cell technology, particularly engineered membranes, that provides significantly improved performance in both direct methanol and hydrogen fuel cells, especially for portable electronic and automotive applications. The state of the art in fuel cells is closely tied to the membrane, and PolyFuel's best in class, hydrocarbon-based membranes enable a new generation of fuel cells that for the first time can deliver on the long-awaited promise of clean, long-running, and cost-effective portable power.

PolyFuel has an unmatched capability to rapidly translate the system-level requirements of fuel cell designers and manufacturers into engineered polymer nano-architectures. Such capability -- based on PolyFuel's more than 150 combined years of fuel cell experience, world-class polymer nano-architects, and a fundamental patent position covering more than 25 different inventions -- also makes PolyFuel an essential development partner and supplier to any company seeking to advance the state of the art in fuel cells. Fuel cells built with PolyFuel's hydrocarbon membranes, as the Company's own performance-leading reference designs have demonstrated, can be smaller, lighter, longer-running, more efficient, less expensive and more robust than those made with other membrane materials.

PolyFuel is working with most of the world's leading portable fuel cell system developers, the majority of whom are household brand name consumer electronics manufacturers. Several of the largest Japanese and Korean consumer electronics companies rank PolyFuel's hydrocarbon membrane as the best portable fuel cell membrane available in the world today, and its DMFC stack technology, which it readily shares with its customers, is unsurpassed.

PolyFuel was spun out of SRI International (formerly the Stanford Research Institute) in 1999, after 14 years of applied membrane research. The company is based in Mountain View, California, and is publicly listed on the AIM market of the London Stock Exchange.

Editors, note: The photo and graph mentioned in the text are available in high-resolution, online, as follows:

"Fuel Cell Stack Progress, 2003-2007", www.roeder-johnson.com/RJDocs/POStackChart.html

"PolyFuel Fuel Cell Stack Photo", www.roeder-johnson.com/RJDocs/POStackPhoto1.html

Additional background information is available at www.roeder-johnson.com. See also Wikipedia for a cutaway drawing of a fuel cell stack.

This news release may contain forward-looking statements, including with respect to the development of the fuel cell market. Readers are cautioned that such forward-looking statements involve risks and uncertainties, including, without limitation, risks inherent in the development and commercialization of potential products. Actual results may differ materially from the results anticipated in these forward-looking statements.

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CONTACT: Roeder-Johnson Corporation

Abigail Johnson or Paul Michelson, +1-650-802-1850
<http://email.roeder-johnson.com>

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