

Polyfuel Bids to Speed Time to Market for Laptop Fuel Cells

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By the end of this year, fuel-cell membrane specialist, **PolyFuel**, expects to have completed a reference design for fuel cells which will, believes the company, accelerate the time to market for fuel cells for laptops.

"We expect to have achieved the reference design and a prototype by the end of the year", Jim Balcom, CEO of PolyFuel, told Electronics Weekly at the **Globalpress Summit Conference** yesterday. "We think it will then take about twelve months to go from prototype and reference design to complete the technology transfer to our customers, and we expect it will take our customers another twelve months to get manufacturing up and running."

So, in 2010, fuel-cell powered laptops will run all day. Ten hours run-time is PolyFuel's specification for its lap-top fuel cell.

The company has got the best customers in the industry: NEC, Toshiba, Sony, Sanyo, Hitachi, Samsung, Fujitsu, Sharp, Panasonic and BYD the Chinese battery company.

PolyFuel is a membrane supplier and has no immediate intention of becoming a fuel cell manufacturer but, in order to accelerate the introduction of fuel cells into the market, it set itself five tasks:

1. Develop a conceptual design for a complete fuel cell system that can outperform Lithium-ion batteries, and identify the membrane and MEA requirements to support this.
2. Engineer a membrane that has a high level of water permeability but a low level of methanol diffusivity – usually mutually-exclusive attributes.
3. Design an MEA that can recycle much of the water that is created in the fuel cell back to and through the newly engineered membrane.
4. Demonstrate the "proof of concept" by operating a fuel cell incorporating the newly-engineered membrane and MEA in perfect water balance using the conceptual system design target operating conditions.
5. Incorporate that cell into a functioning notebook PC power module and demonstrate it powering a commercially-available notebook computer.

Now it has only task number 5 to complete, and that is expected this year. Asked why, if the company has done all this work on the system, it doesn't want to produce fuel cells itself, Balcom replied: "We prefer the Intel or Goretex business model. We think if you have a unique, differentiated technology, that is well protected by patents, that is a more profitable way to go." Both Intel and Goretex are more profitable than their customers.

In order to succeed with the Intel/Goretex model, you have to have a product which customers either have to have because it is narrowly sourced, or which is clearly superior. PolyFuel's confidence in pursuing this business model is because it reckons its membranes are better than the membranes of the industry's No 1 membrane supplier, Dupont.

"The membrane needs to separate the reactants, conduct the protons and isolate the electrons", explained Balcom, "the Dupont membrane falls down on the first of those. It doesn't separate the reactants very well, the methanol seeps through, and reacts with air, and creates extra water."