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MATSUSHITA BATTERY DEVELOPS NEW MICRO FUEL CELL TECHNOLOGY FOR PORTABLE ELECTRONICS DEVICES

LAS VEGAS, NV (January 4, 2006) — Matsushita Battery Industrial Co., Ltd. (MBI), a subsidiary of Matsushita Electric Industrial Co., Ltd. (NYSE: MC), has developed a new fuel supply method for fuel cells powering portable devices that makes it possible to reduce the size of the fuel cell to one half of the current industry level.

Matsushita Battery has developed this Direct Methanol Fuel Cell system by incorporating its new fuel supply technology with its stack technology, high power lithium ion battery and battery management system (which is based on previous development work for electric power sources). This cell itself is approximately 400cc (24 cubic inches), which is similar to the size of a beverage can and roughly half the size of models publicly demonstrated to date. With an average output of 13 watts, a peak output of 20 watts, and low weight that enables true mobility, a laptop PC is using this fuel cell is able to achieve up to 20 hours of runtime.

A demonstration system using this fuel supply method will be demonstrated at the 2006 International Consumer Electronics Show (CES), booth 9405 Central Hall, from Jan 5-8, 2006 in Las Vegas, Nevada.

In today's ubiquitous networked society there are increasing demands by consumers to have laptops, cell phones and digital still cameras with longer battery runtime, as well as smaller size and lighter weight. Fuel cells are a promising candidate for the next-generation of power supply. Matsushita Battery has been working to develop a micro fuel cell solution since the late 1980s to fill these market needs.

Use of this fuel supply method means that the precise amount of fuel needed by the fuel cell stack can be delivered at precisely the appropriate time. This method consists of the technologies developed by Matsushita Battery so the fuel and oxygen concentration is optimized to enable an efficient reaction.

Matsushita Battery plans to accelerate development of the Micro Fuel Cell by continuing to miniaturize the system, improve the reliability and reduce the cost.

Notes and Technology Details

1. Fuel cell stack technology which enables the use of highly concentrated methanol "Crossover" is one of the main technical hurdles facing DMFC development. "Crossover" refers to the methanol and water that travels around the membrane from the fuel electrode to the air electrode without reacting. When this occurs, fuel is exhausted and the output voltage is reduced resulting in lower

energy efficiency. Often, to reduce crossover, a lower concentration of methanol is used. Instead, MBI has added to its existing technologies by working jointly with Pennsylvania State University to develop its own MEA. Use of this MEA means greater control of the transportation of the methanol and water within the electrodes and allows the use of higher concentrations of methanol.

2. New fuel supply system

In DMFC systems, the methanol, which does not react at the fuel electrode, is either lost in the "crossover" or exhausted outside the system with the CO2. This lowers the fuel utilization rate (the ratio of actually reacted fuel to supplied fuel). If this value drops, then the runtime on the device subsequently drops and will not meet user expectations. MBI has tried to maximize fuel utilization by developing a new fuel supply system. By using its new fuel supply method, the precise amount of fuel needed by the fuel cell stack can be delivered at the appropriate time. This method consists of the following two basic technologies; (1) "power generation feedback technology" which monitors the stack output and communicates the required amount of fuel needed. (2) "Fuel supply technology" which is a highly accurate fuel delivery system providing the stack with the precise amount of fuel necessary. MBA has named this technology "optimized on-demand fuel supply method". Using this new fuel supply system, the fuel and oxygen concentration is optimized to enable an efficient reaction. MBI has achieved more than 80% fuel utilization with this technology.

3. Power management technology

Traditionally fuel cells have been used effectively in applications in which constant power was required. However, for applications in which fluctuations of power occurred, it was difficult to supply the power load of the device. In conjunction with the fuel cell technology development, MBI has developed a high output lithium ion battery and a matching battery management system, which has enabled MBI to develop a complete fuel cell system to deliver the necessary power even when demand fluctuates. MBI has achieved this while minimizing the size of the overall system.

Prototype Specs:

Applications	Laptop or other mobile devices
Maximum Output	20W (combined with Li-ion battery)
Average output	13W
Size (cc)	400cc (24.4 cubic inches)
Weight (g)	450g (1 pound) (without fuel)
Fuel type	Methanol
Runtime	Approximately 20 hours (using 200cc of fuel)

Patents: 80 patents applied.

About Matsushita Battery Industrial Co., Ltd.

Matsushita Battery Industrial Co., Ltd., a wholly owned subsidiary of Matsushita Electric Industrial Co., Ltd., is one of the world's leading full-range battery research and manufacturing companies. With 26 factories in 16 countries, including five in North America, and more than 70 years of experience in the battery marketplace, the company manufactures batteries for consumer, industrial and OEM use, and is committed to working in harmony with the global environment.
Homepage: http://panasonic.co.jp/mbi

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Editorial Contacts:

Mr. Sato
Business Strategy Group, Public Relations
Matsushita Battery Industrial, Ltd
Tel: 81-6-6994-4351

Will Safer
Panasonic
201-392-6124
saferw@us.panasonic.com

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