

# **Micro Fuel Cells for Mobile Applications in Samsung**

**2007. 6. 13**

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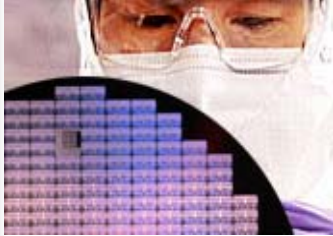
**Central R&D Institute, Samsung Electro-Mechanics**

## Financial Services



- Samsung Life Insurance
- Samsung Fire & Marine Insurance
- Samsung Card
- Samsung Securities
- Samsung Investment Trust Management
- Samsung Venture Investment

## Electronic Industries



- Samsung Electronics
- Samsung Electro-Mechanics**
- Samsung SDI
- Samsung Corning
- Samsung Corning Precision Glass
- Samsung SDS
- Samsung Networks

## Chemical Industries



- Samsung Total Petrochemicals
- Samsung Petrochemicals
- Samsung Fine Chemicals
- Samsung BP Chemicals

## Machinery & Heavy Industries



- Samsung Heavy Industries
- Samsung Techwin

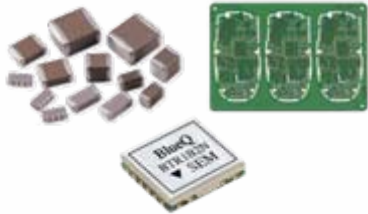
## Other Affiliated Companies



- Samsung Corporation
- Samsung Engineering Cheil Industries
- Samsung Everland
- Samsung Lions
- Cheil Communications
- S1 Corporation
- Shilla Hotels & Resorts
- Samsung Medical Center
- Samsung HR Development Institute
- Samsung Advanced Institute of Technology
- Samsung Economics Research Institute
- Samsung Foundation of Culture
- Samsung Welfare Foundation
- The Ho-Am Foundation
- Samsung Press Foundation

SAMSUNG

## Samsung Electro-Mechanics



- PCB
- Passive Components
- Precision Motors
- Digital Tuners
- Power Supplies
- Mobile RF & Network Modules
- LED & LED
- Backlight units
- Camera Modules

## Samsung SDI



- PDP
- Rechargeable Battery
- LCD
- OLED
- CPT
- CDT
- VFD
- Electronic Materials
- Future Display
- Future Energy

## Samsung Corning Precision Glass



- TFT LCD Flat Backlight
- Mobile Phones
- Computer & Related Products
- Home Appliance
- USA Business Products
- Global Business Products
- GaN Substrate
- TFT-LCD Glass Substrates

## Samsung Electronics



- Mobile Phones
- TV Video & Audio
- Computer & Related Products
- Home Appliance
- USA Business Products
- Global Business Products

## Credit Rating

### AA- (Korea Investors Service)



**Establishment**

**Nov. 1973**

**HQ**

**Suwon, Korea**

**Capital**

**U\$ 361 million (Year 2006)**

**Sales**

**U\$ 3,239 million (Year 2006)**

**Overseas Operations**

**5 Plants & 5 Sales subsidiaries**

**Employees**

**25,600 (Jan. 2006)**

**12,100 (Korea)**

**13,500 (Overseas)**



## DMFC



2001~

## MeOH PEMFC



2005~

## Water PEMFC



2006~



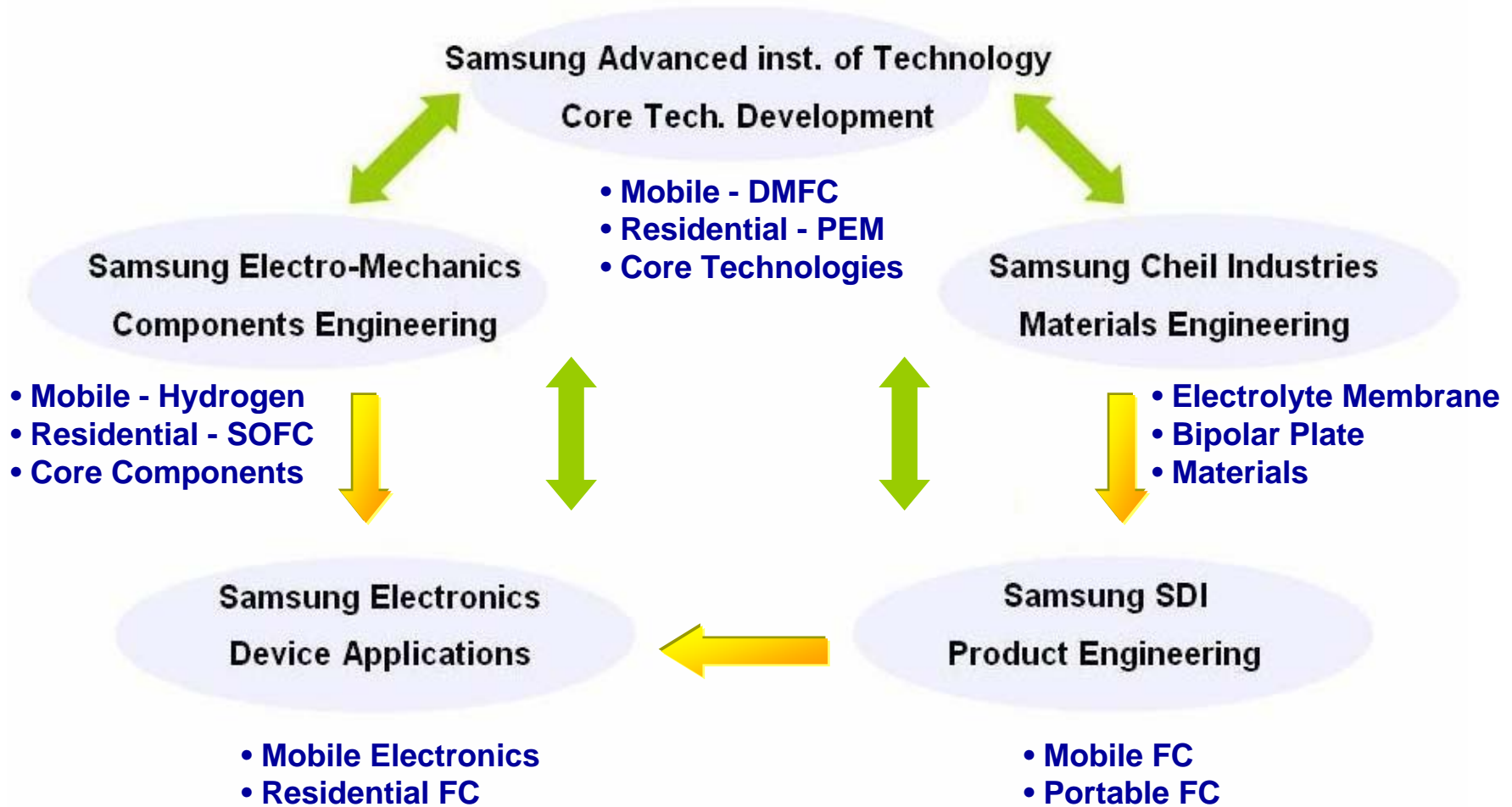
- ✓ RFID reader, 30 hr Operation
- ✓ Development Contract with Samsung Electronics



- ✓ Methanol Reforming
- ✓ Casio (Japan), Ultracell (USA)



- ✓ Water based Hydrogen
- ✓ NTT-Aquafairy (Japan), Hitachi Maxel (Japan)





2006.12

SAIT demonstrated the world's smallest fuel cell mobile devices charger. The unit comprises of an output level of 2W and has charging times that are just 1/5 that of its closest competitors. The mobile charging unit has already completed 200 successful continuous charges and is near-ready for commercialization.

The fuel cell mobile charger is an unbelievable 5mm thick and weighs a mere 5.3 ounces. It includes user-replaceable methanol cartridges to recharge the battery system in your PDA, cell phone, digital camera or PMP.

## Samsung SDI shows off fuel cell dock with one month of laptop power



2006.12

Samsung SDI has developed a prototype fuel cell for use in laptops that it claims lasts almost twice as long as other systems being readied. The Fuel cells, powered by about 200 cubic centimetres of liquid methanol, has an energy density of 200 Wh/liter. In total, the fuel cell can supply power for about 15 hours.

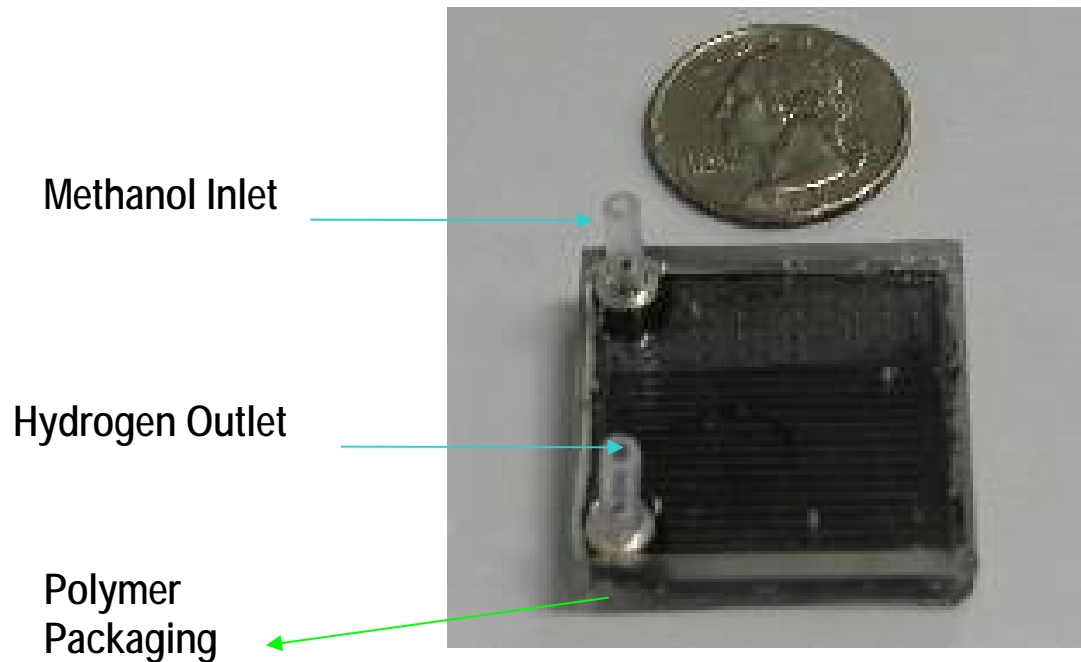
Such performance betters the 100-130Wh/liter energy densities of the fuel cells being developed by companies such as Toshiba and NEC for laptops.

Samsung is reportedly planning to start volume production of the fuel cell in 2007.

The cell measures 23 cm wide, 8.2 cm in length and 5.3 cm deep, and weighs under 1kg.



## Component : 8 cc Methanol Reformer for 2 W Fuel Cell



Hydrogen-Fuel Processor Embedded  
**40 cc Fuel Cartridge & 3 W Fuel Cell Prototype**



**Water based Fuel & No Pump**  
**Digitally On-Demand Hydrogen Supply**

2007.09  
Grove Fuel Cell Symposium  
Held in London, 27<sup>th</sup> September