

## Polymer Electrolyte Fuel Cells and Membrane Electrode Assembly

*Inhibiting flooding and possible to obtain HIGH power*

CONSEC CORPORATION offers manufacturing technology regard to Polymer Electrolyte Fuel Cells(PEFC) and Membrane Electrode Assembly(MEA) inhibiting flooding and possible to obtain high-power density using Electron Beam which is developed WASEDA University WASHIO laboratory.

### 1. Fuel Cell

Fuel Cell is made from hydrogen. It is eco-friendly energy not to emit hazardous substance, such as carbon dioxide and nitrogen oxide even convert electricity or heat. Fuel Cell is necessary power-generating equipment to supply stable energy in low carbon society as a ZERO emission distributed power generation system.

In Japan, Fuel Cell for household has started using as well as Solar Cell since 2009. Traditional PEFC has some challenges, such as low power density, low heat resistance, and so on. Thus downsizing and price-reduction of system are difficult. So it is hard to spread for many field.

WASEDA University (WASHIO laboratory office) developed manufacturing technique regard to high performance PEFC using Electron Beam technique by UV irradiation. Furthermore they also established moisture control technique which is most important factor to keep stable operation of Fuel Cell. This moisture control technique is keystone to optimize Fuel Cell performance. Because flooding, which was a factor to reduce the power output, can be minimized.

### 2 Offer technology

#### A) Manufacturing technology of PEFC

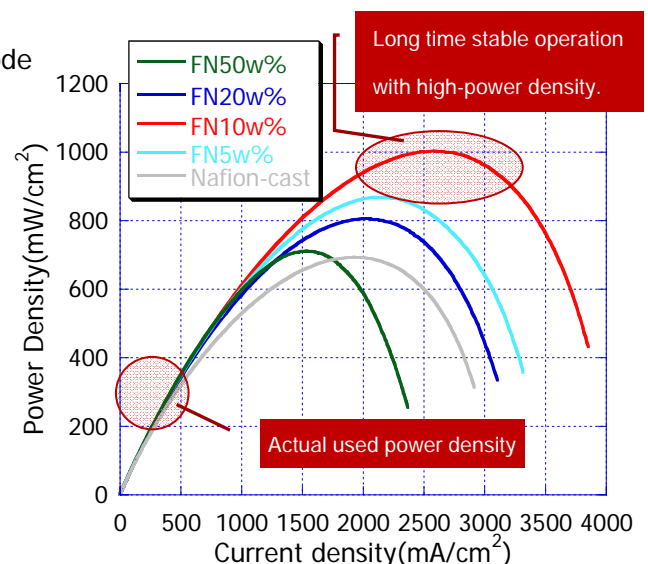
Proton Exchange Membranes(PEM) of PEFC is manufactured at low cost using by Electron Beam graft polymerization on fluorinated macromolecule. Also it has high-power density, high Ion exchange capacity and high performance heat resistance.

#### B) Moisture control technology in the Membrane Electrode Assembly

This technology can be self control for water distribution in PEM and MEA by gradient energy deposition grafting method using electron beam. It makes possible to inhibit flooding of cathode and obtain long time stable operation with high-power density.

#### C) Grafting technology between membrane and electrode.

It strongly grafts between Polymer Electrolyte Fuel Cells and Electrode. Proton movement becomes fluidity between membrane and electrode. Membrane performance is optimized.



### 3. Effect of Technology

It makes possible to produce by low cost and compact. In addition high power Fuel Cells is also possible to produce. Thus it can be used for personal computer, mobile phone, energy for car. This technology will be accelerated as zero emission energy in the low-carbon society.