## 그린홈 보급확대를 위한 건물용 연료전지 보조기기의 성능 향상

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## Performance improvement of BOP Components for 1kW Stationary Fuel Cell Systems to Promote Green-Home Dissemination Project

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According to green growth's policy, green-home dissemination's projects are promoting. Among them, stationary fuel cell systems are receiving attention due to high efficiency and clear energy. But it need absolutely to develop cost down technologies and improve system durability for commercialization of the fuel cell system. To achieve this objectives, in 2009, the Korean Government and "Korea Institute of Energy Technology Evaluation and Planning(KETEP)" launched into the strategic development project of BOP technology for practical applications and commercializations of stationary fuel cell systems, named "Technology Development on Cost Reduction of BOP Components for 1kW Stationary Fuel Cell Systems to Promote Green-Home Dissemination Project".

This paper introduces a summary of improved BOP performances that has been achieved through the 2nd year development precesses(2010.06~2011.05) base on 1st year development precesses(2009.06~2010.05). The major elements for fuel cell systems are cathode air blowers, burner air blowers, preferential oxidation air blowers, fuel blowers, cooling water pumps, reformer water pumps, heat recovery pumps, mass flow meters, electrical valves, safety valves and a low-voltage inverter. Key targets of those elements are the reduction of cost, power consumption and noise. Invert's key targets are development the low -voltage technologies in order to reduce the number of unit cell in fuel cell system's stack.

**Key words :** Blower(블로워), Pump(펌프), Mass flow meter(유량센서), Solenoid valve(전자밸브), Fuel cell system(연료전지시스템), Inverter(인버터)

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## The electrical and corrosion properties of polyphenylene sulfide/carbon composite coated stainless steel bipolar plate for PEM fuel cell

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Stainless steel bipolar plates have many advantage such as high electrical conductivity and mechanical strength and low fabrication cost. However, they need a passivation layer due to low corrosion resistance under PEM fuel cell operation condition. In this study, polyphenyene sulfide(PPS)/carbon composite coated stainless steel bipolar plates were fabricated by compression molding method after PPS/carbon composite sprayed on the stainless steel plate. PPS and carbon were chosen as the binder and conductive filler of passivation layer, respectively. The interfacial contact resistance and corrosion resistance of PPS/carbon composite coated stainless steel bipolar plates were investigated and compared to the stainless steel. The PPS/carbon composite coated stainless steel compared to stainless steel was improved interfacial contact resistance. The results of the potentiodynamic and potentiostatic measurements also showed that the PPS/carbon composite coated stainless steel did not corroded under PEM fuel cell operating conditions.

**Key words :** PEM fuel cell(고분자전해질 연료전지), bipolar plate(분리판), stainless steel(스테인레스 스틸), polymer(고분자)

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