

Deposition, Characterisation and Performance Evaluation of Carbon Film on Bipolar Plate for PEM Fuel Cell

Technology Overview

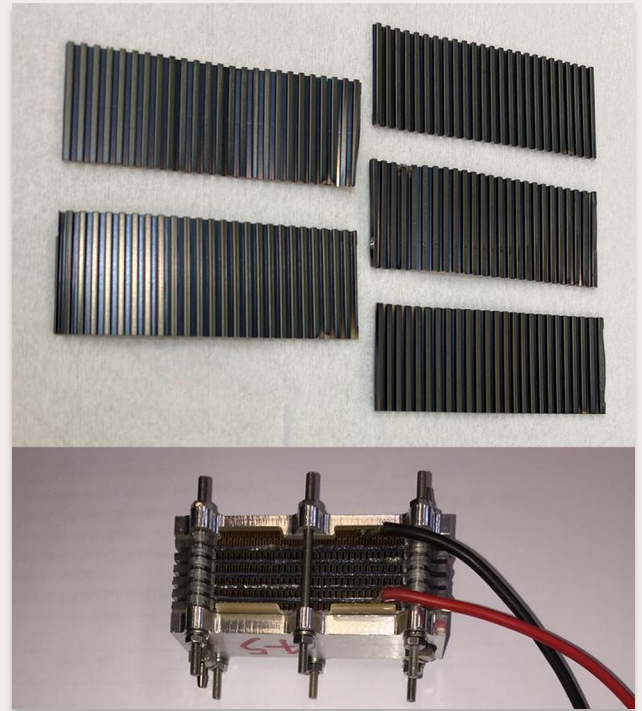
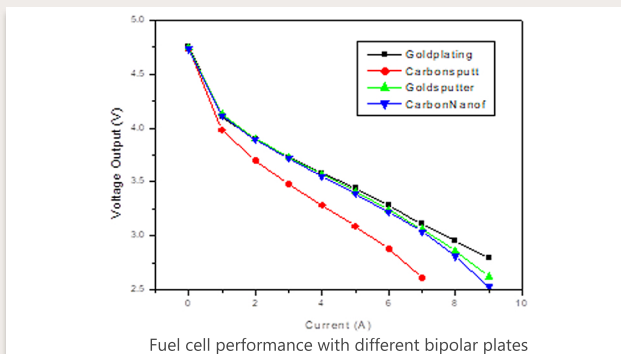
The bipolar plate functions as a physical separator and current conductor between neighbouring membrane electrode assembly (MEA), as well as support for the heat and water management throughout the fuel cell stack. Two important characteristics of the bipolar plate material are:

1. high corrosion resistance in proton-exchange membrane fuel cell (PEMFC) environment, and
2. low interfacial electrical contact resistance.

Many attempts have been carried out to prevent corrosion and increase interfacial contact by using anti-corrosion thin conductive and protective layers in coating the metal plates, including metal nitride, metal carbide, metal oxide, graphene carbon-based coating, amorphous carbon-based coating on stainless steel or other metal alloys. Our technology uses filtered vacuum arc to deposit carbon film on the bipolar plate to improve its performance.

Features & Specifications

Carbon film deposited by filtered vacuum arc technology is one of the best coating for the bipolar plate. It has very good contact resistance and excellent anti-corrosion property. This technology produce 100% pure plasma coating, which resulted in a dense carbon film with more SP² bonds inside. SP² refers to chemical bond inside the carbon film which gives it exceptional mechanical, thermal, and electrical properties.



Customer Benefits

Carbon film deposited by filtered vacuum arc technology improves the fuel cell bipolar plate performance. It has very good contact resistance and excellent anti-corrosion property, which met U.S. Department of Energy (DOE) requirements for both properties.

Improved properties of the bipolar plate increases the performance of PEMFC.

Potential Applications

Fuel cell industry – bipolar plate with carbon film coating for PEM fuel cell.