

Laser Welding Technique Effect for Proton Exchange Membrane Fuel Cell Application

Authors : Chih-Chia Lin, Ching-Ying Huang, Cheng-Hong Liu, Wen-Lin Wang

Abstract : A complete fuel cell stack comprises several single cells with end plates, bipolar plates, gaskets and membrane electrode assembly (MEA) components. Electrons generated from cells are conducted through bipolar plates. The amount of cells' components increases as the stack voltage increases, complicating the fuel cell assembly process and mass production. Stack assembly error influence cell performance. PEM fuel cell stack importing laser welding technique could eliminate transverse deformation between bipolar plates to promote stress uniformity of cell components as bipolar plates and MEA. Simultaneously, bipolar plates were melted together using laser welding to decrease interface resistance. A series of experiments as through-plan and in-plan resistance measurement test was conducted to observe the laser welding effect. The result showed that the through-plane resistance with laser welding was a drop of 97.5-97.6% when the contact pressure was about 1MPa to 3 MPa, and the in-plane resistance was not significantly different for laser welding.

Keywords : PEM fuel cell, laser welding, through-plan, in-plan, resistance

Conference Title : ICHFCT 2018 : International Conference on Hydrogen and Fuel Cells Technologies

Conference Location : Amsterdam, Netherlands

Conference Dates : December 03-04, 2018