Development of a High Energy Density Power System Using An Ultra-light, Open Cathode Fuel Cell

Lee Yann Mei*, Ling Chun Yu, Wang Lei, Han Ming

Clean Energy Research Centre, Engineering School of Temasek Polytechnic, Singapore 529757

*Corresponding author: yannmei@tp.edu.sg

Abstract

A 60W nominal power system using a low temperature proton exchange membrane fuel cell (LT-PEMFC) was developed and tested at the Clean Energy Research Centre of Temasek Polytechnic. The power system consists of an ultra-light, open cathode LT-PEMFC stack with attached low power fans as well as a fuel cell control board. The stack comprises of 15 cells with an estimated active area of 8cm2. The stack is designed to operate at a wide range of hydrogen pressure of 0.4bar to 2 bar gauge as opposed to industry standards of 0.3 to 0.6 bar gauge. The stack is self-humidifying and is able to operate stably with dry hydrogen input. The stack is able to achieve 1W/g peak.