# EFFECT OF INTERDIGITATED LEAF CHANNEL BIPOLARPLATE ON THE PERFORMANCE OF PEM FUEL CELL

Srinivasa Reddy Badduri[1*], G. Naga Srinivasulu[2], S. Srinivasa Rao[3]

*Department of Mechanical Engineering, NIT Warangal, Telangana, India-506004*

** E-mail- bsreddynitw@gmail.com*

## Abstract:

Fuel cell is an electrochemical device, which converts chemical energy of a fuel into electrical energy. Fuel cell has many advantages like less emissions, fast start-up, high efficiency and cleanliness. Flow field geometry plays active role to improve the performance of fuel cell. In the recent literature it has been observed that bio inspired channel designs gives better performance than conventional channels. The relevant examples are plant leaves and human lung structure. In this paper the bipolar plates with three designs such as Triple serpentine, Leaf and Interdigitated flow channels are designed for analyzing the PEM fuel cell performance. By incorporating these bipolar plates in the fuel cell and experimental studies are carried out at 333 K operating temperature, 100% RH and at 1 atm operating pressure. The experimental results show that the bio inspired interdigitated channel design improve the performance by 7% compared with non-interdigitated leaf channel design, and 25% when compared with triple serpentine flow channel design.

**Key words:** Chemical energy, Flow field geometry, Interdigitated, Performance, Conventional.