

Innovative Manufacturing of Bipolar Plates for Portable PEM Fuel Cells
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The objective of the project is to develop an innovative manufacturing technique for bipolar plates used in miniaturized proton exchange membrane (PEM) fuel cells. To realize the objective, a precision stamping technique will be used to make bipolar plates of different materials (sheet metals and non-metals) in different configurations. A bipolar plate can be finished in a single stroke of stamping without post machining, which is expected to significantly improve productivity and reduce manufacturing cost in manufacturing bipolar plates. After stamping, the bipolar plate is then coated with protective layer(s) to increase corrosion resistance and enhance thermal and electrical conductivities. With the proposed technique, bipolar plates can be made from sheet metals as thin as 100 μm . It is estimated that if the proposed manufacturing technique is developed, the current PEM fuel cells can be reduced by 60% in thickness, 50% in weight and in cost. The productivity in manufacturing bipolar plates may be doubled.