

Light Weight, Low-Cost PEM Fuel Cell Stacks (Topic 5)

Case Western Reserve University

- Funding

DOE Cost Share	Recipient Cost Share	TOTAL
\$846,847	\$211,708	\$1,058,555
80%	20%	100%

- Project Description: A light-weight, low-cost polymer electrolyte membrane (PEM) stack design is proposed. Case Western Reserve University (CWRU) will develop edge collected stack designs that are responsive to DOE performance and cost goals and that are substantially simpler in design and construction. Gas diffusion media and current collectors will be fabricated by a printing process (developed under previous DARPA-funded efforts at CWRU in the area of microfabricated fuel cells), that provides intimate contact between the various components, eliminating the need for compressive forces currently used to ensure low resistance contacts. As a result, numerous components of conventional stacks including bi-polar plates, tie-rods and cell-level seals are eliminated, greatly reducing the parts count, weight, and assembly complexity. Adiabatic operation with very low pressure drop will allow for extremely low parasitic power losses, the elimination of the compressor and substantially simpler humidification requirements. Commercially available, state of the art catalyst coated membranes will be used in the fuel cell fabrication, allowing for a direct comparison of the stack performance versus conventional stack configurations. An intensive computational fluid dynamics (CFD) modeling effort will be included to evaluate proposed designs for water and thermal management and reactant distribution issues.
- Timeframe: 2 year project, starting in FY07

Sub-Contractors

Institutions
Endura Plastics Inc.