

Direct Methanol PEM Fuel Cells for Soldier Systems  
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Tri-layer membrane, membrane electrode assemblies (MEAs) for both liquid phase (< 80 oC) and vapor phase (> 100 oC, higher temperature should provide improved anode kinetics) direct methanol/air proton exchange membrane (PEM) fuel cells will be developed and performance tested in 60 to 90 watt commercially available stack hardware. It is anticipated that the power output (performance) will be increased over presently available direct methanol membrane electrode assemblies (MEAs) by 30% thereby reducing the cost, weight and volume by 30%. Optimized MEAs will be developed and first tested in single elemental size research fuel cells (5, 25 and/or 50 cm<sup>2</sup> in electrode active area, approximately 5 watts) in research test stands built for this program. As appropriate the membranes will be scaled up for use in the prototype portable direct methanol fuel cell.