

# Ion Power, Inc

Turn on with Ion Power Catalyzed Membranes

Stephen Grot, PhD, Founder & President

Membrane Requirements in PEM Fuel Cell  
Applications

# Ion Power – Company Profile

- Ion Power develops, manufactures and markets value-added products using NAFION<sup>®</sup> perfluorinated ion exchange resin
- Lead Products: Catalyst Coated NAFION<sup>®</sup> membranes for fuel cells and water electrolyzers

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# Ion Power –Background

- Founded in June of 1999 in Northern Delaware
- Distribution of NAFION<sup>®</sup> products world-wide
- Investors
  - “Organic Growth” through operating profits
  - Federal Research Dollars ~ 10% of operating budget

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# MEA Challenges

- **Power Density** - High MEA power density needed, → less MEA area, less diffusion media area and less bipolar plate area per unit power
- **Material Costs** - Efficient use of expensive materials, Pt and NAFION®
- **Durability** MEA failures result in expensive field repairs, low customer ROI, → high costs
- **Processing Costs** - are insignificant in relation to material costs, using processing technologies that are similar to paper processing and cost < \$1/m<sup>2</sup>

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# Ion Power – MEA Performance Advantages

\$\$ Power Density \$\$ → 25 micron thick membrane layer → High power density & low NAFION® cost

\$\$ NAFION® Costs \$\$ → Solution cast membrane → Fast manufacturing

➤ No NAFION® in perimeter region → Strength where you need it & lower material cost

\$\$ Durability Reliability \$\$

➤ Dual membrane → Increases reliability on point defects

➤ Easy recycling of the used MEA

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# Ion Power Future

- Near Term – Work with customers to develop niche fuel cell applications with low volumes ~ 100 stacks per year, 10 to 50 kW each
- Provide customers with the most cost effective MEA solution with “here and now” NAFION<sup>®</sup> technology
- Increase production capabilities as market develops
- Longer term- Increase automation of framing technology, when volume exceeds 1000 CCMs per day

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