

Aemion™

Energy Storage

Anion Exchange Polymer

Aemion™ is a breakthrough material that is completely stable in both strongly basic and strongly acidic environments on a continuous basis, enabling a broad range of innovative energy storage chemistries and configurations. The material has a hydrocarbon backbone, which makes it less impactful on the environment than common fluorinated materials. By using advanced stabilization techniques, Aemion™ is able to compete with the most robust of alternatives.

Ionomr's hydrocarbon membranes are significantly tougher than their counterparts in industry, leading to a longer service life and reduced levelized cost of storage. Compared to non-conductive binder materials, Aemion improves adhesion of active electrode components, reduces cell resistance, and provides protection from abrasive electrolytes for increased cycling and capacity retention.

Aemion™ integration results in improvements to lifetime cost and cycle life, enhanced energy and power densities, reduced capacity fade, and improved Coulombic & total energy efficiency.

Typical Applications

- Metal Air
- Nickel Metal Hydride
- Solid-state battery chemistries

Features & Benefits:

- Highly conductive binder material with affinity for negatively charged electrode constituents – improved electrode stability
- High concentration of functional groups for maximum anion conductivity and minimal proton transport
- Processable in low-boiling solvents for use as alkaline/acid stable electrode coating or binder for increased cycle life.
- Chemical and oxidative stability across a wide range of operating conditions to maximize cycle life.
- Highly customizable for optimized electrochemical properties, application size, and manufacturing methods.

MATERIAL PROPERTIES

Ion Transport Options	Cl ⁻ , I ⁻ , Br ⁻ , SO ₄ ²⁻ , HCO ₃ ⁻ , CO ₃ ²⁻ , OH ⁻ , Zn(OH) ₄ ²⁻
Tensile Strength ¹	60 MPa
Young's Modulus ¹	900 - 1200 MPa
Elongation at Break ¹	85-110%
pH continuous	pH 0-14 (-1 to 15)
Alkaline & Acid Stability	2M KOH, 60 °C (indefinite) >1M H ₂ SO ₄
Maximum Temperature	80 °C (strong alkaline)

¹ Coincident properties presented for the dry iodide form as produced

PRODUCT REFERENCE DATA

Product Code	Thickness µm	IEC meq/g	Conductivity ² (OH ⁻) mS/cm	Conductivity (Cl ⁻) mS/cm	Permselectivity ³ %	Water Uptake %
AP1-ENN8-00-X	-	2.1-2.5	>80	5-10	90-93%	33-37%

² Measured under in-situ conditions in CO₂-free environment

³ Measured in 0.1 / 0.5M NaCl as cast thin-film

All data should be used as a guide only, not a specification and is subject to change without notice.

Company

Ionmr is pioneering and commercializing the world's most advanced ion-exchange materials. These provide an enabling platform for clean tech solutions after more than five decades of stagnation in available materials. Using our deep knowledge of scalable electrochemical systems, we enable more efficient systems that will lead to the decarbonization of the planet for future generations.

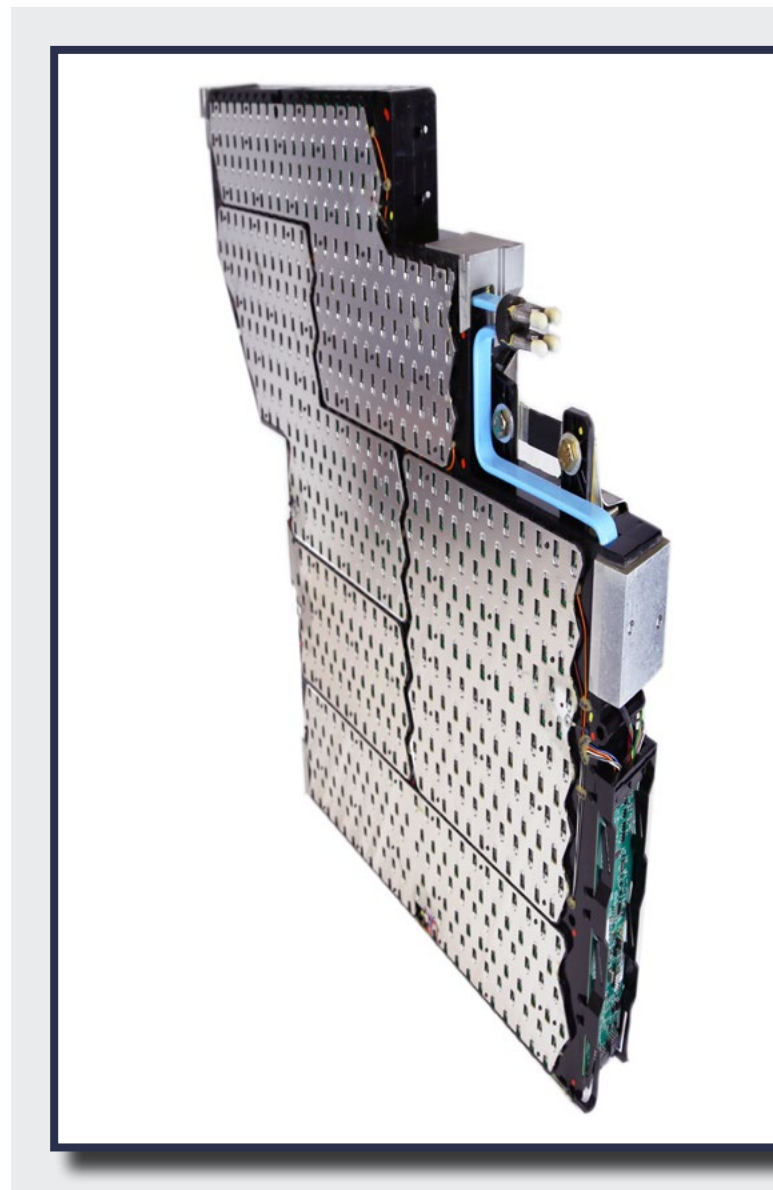
To-date, electrochemical applications in the clean tech realm use materials that contain toxic fluorinated chemicals (PFCs). PFCs leach into water sources and bioaccumulate for hundreds of years, having a dire impact on human health and the entire ecosystem. We are driven to replace these materials with our environmentally friendly hydrocarbon alternatives that reduce pollution at the source, and are proven to be more durable and efficient than incumbent materials.

Ionmr's membranes and polymers are highly processable, which allow for simple integration into electrochemical systems. We enable optimal performance in applications for chemical & water remediation, energy storage and hydrogen. We are passionate about empowering the development of resilient and sustainable systems that will underlie the future of the renewable energy and circular chemical economies.

Aemion™ Membranes

Aemion™ represents a fundamental shift in anion exchange technology. Through Aemion™, we provide a platform to enable simultaneous performance and lifetime improvements in clean technologies while further reducing their environmental impact. Some of the many benefits include:

Stable — Aemion™ is chemically and oxidatively stable across a wide range of operating conditions. It is the only commercial product that provides practical strong alkaline functionality in addition to acidic stability for use in the harshest of applications.



High Strength — Compared to previous AEMs, Aemion™ provides the strongest unsupported membranes on the market for ease of handling, longer life, and thinner, lower resistance products. Reinforced products are also in development for additional improvements in strength as well as ease of handling.

Processable — Aemion™ can be used in dry membrane form and is soluble in low-boiling solvents as an ionomer, allowing simple, consistent integration into existing products as a high strength industrial coating. It can also be used as a stable, conductive catalyst ionomer binder, enabling development of coated and 3D electrodes and potential for catalyst recovery.