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*Technology announcement*

## **Advanced Membrane Systems Announces Lithium Ion Separator With Multiple Performance Advancements**

**Philadelphia, PA. June 14, 2004**—Advanced Membrane Systems (AMS), a leading battery separator company located in Billerica, MA, today announced at the 41<sup>st</sup> Power Sources Conference, an important advancement in lithium ion battery separator technology. UltraLith, a new separator material developed by the R&D Company, offers significant improvements in performance power density compared to lithium ion separators currently on the market.

“Three factors make us believe this is the right product at the right time,” said Abbas Samii, president and chief scientist of AMS. “First, there is a worldwide shortage of quality lithium separator material due to the growing popularity of portable devices. Second, virtually the only source of such material is Japan, a market where electronics and battery manufacturers want to consume more and more of the separators they make. Third, high performance, affordable separators offer battery manufacturers a competitive advantage. We think UltraLith is just what the market needs,” added Samii.

Designed specifically for lithium ion battery applications that require maximum performance while maintaining mass market cost structures, this patent pending technology introduces:

- the highest porosity (>70%) ever commercially offered in microporous membrane technology, in addition to the highest air permeability (<10 Gurley seconds). Together these capabilities yield a lower electrical resistance, more electrolyte uptake, and improved battery cycle life;

- the industry's highest resistance to temperature ( $> 180\text{ }^{\circ}\text{C}$ ), combined with shutdown behavior at  $135\text{ }^{\circ}\text{C} - 140\text{ }^{\circ}\text{C}$ . This unsurpassed thermal stability helps to inhibit loss of mechanical integrity, which can lead to thermal runaway situations;
- a minimal thickness range of just 15-25 microns, which frees up space for more active materials that can mean increased battery power density;
- an inherent material mechanical strength and packaging configuration that simplifies the replacement of other separators in battery assembly lines.

UltraLith is competitively priced with comparable products on the market and will be available for sampling in Q4, 2004. In addition to manufacturing in Billerica, MA, AMS will also make the technology available for licensing to third parties. For additional information, please contact Garrin Samii at (978) 439-9261.

#### **About Advanced Membrane Systems**

Established in 1996, Advanced Membrane Systems (AMS) is a privately held company specializing in the development and commercialization of improved microporous membranes (separators) for advanced battery systems. Due to limited efforts (particularly in the US battery separator industry) to develop truly new, performance-enhancing membranes that would improve battery life and lower manufacturing cost, AMS felt that alkaline and lithium battery companies were desperate for new separator materials. Consequently, AMS spent its initial years conducting basic research for new membrane technologies, writing patents, generating samples, evaluating lab and battery test results with customers, defining critical customer requirements, and installing and optimizing certain lab and pilot scale process equipment.

Today, AMS is in the process of launching an array of new membranes for certain alkaline and lithium battery and fuel cell applications, which represent the first significant improvement in separators in many years. This includes projects with government agencies such as the USABC (consisting of the Big Three U.S car manufacturers and the Department of Energy), U.S. Air Force, U.S Navy, NASA, etc.