**PRESS RELEASE Durham, United States, 06.09.2016**

Freudenberg Safety Separators Resolve

Common Causes for Lithium-ion Battery Failure

Freudenberg Performance Materials will be presenting innovative, high-performance separators with ceramic impregnation for lithium-ion batteries at the Battery Show in Novi, Michigan on September 13-15, 2016.

Freudenberg’s safety separator successfully resolves common causes for lithium-ion battery failures in batteries with membrane based separators. The roots causes for failure include localized heat up, large scale heat up, uncontrolled discharge, and penetration of the separator by foreign particles. The high-functioning capabilities of the ceramic-impregnated, lithium-ion battery separators by Freudenberg Performance Materials help resolve these issues, making lithium-ion batteries used in electric vehicles more dependable.

Due to their excellent safety performance and high reliability, these separators can also be adapted for use in stationary energy storage systems, such as solar energy. “Compared to conventional products, the Freudenberg safety separator offers decisive advantages. It significantly increases safety, is much more temperature-resistant, and gives lithium-ion batteries a longer service life”, explained Dr. Frank Heislitz, Chief Technology Officer Freudenberg Performance Materials.

**Increased safety and reduced production costs**

The safety separator consists of an ultra-thin polyester nonwoven impregnated with ceramic particles. It remains stable at temperatures of up to several hundred degrees Celsius and does not shrink. In comparison to conventional products, it is considerably less sensitive to mechanical penetration , particularly at high temperatures. Another plus is that using the safety separator helps to reduce the production cost of lithium-ion batteries. Higher temperatures can be used allowing accelerated preparation of the battery cells through a faster drying process and increased electrolyte impregnation speed.

**Safety and reliability for stationary energy storage systems**

From energy density to energy throughput and temperature range, the demands placed on batteries for applications in stationary energy storage systems are very different from those in electric vehicles. Each battery component must be individually selected for the specific application. However, all applications share one thing in common: the need to offer a high degree of safety and reliability while avoiding harming people and the environment. These are precisely the properties offered by the Freudenberg separator.

**Suitable for high-energy cathode systems**

The separator has already been successfully tested in customer-developed high-energy cathode systems. Although these electrode materials promise a higher level of cell energy density and are particularly suitable for use in both cars and buses, they have not yet proved sufficiently reliable and safe. Using the Freudenberg separator has significantly reduced these problems.

**Separators for nickel batteries**

At The Battery Show, Freudenberg will also be presenting the company’s separators for nickel batteries. Their advantages include a high uniformity in structure and thickness as well as tight pore radius distribution. The reliable separation of positive and negative electrodes and the labyrinth structure that acts as an effective barrier to dendrite growth, are further strengths of Freudenberg’s separators for nickel batteries.

**Experts on the stand**

Visitors to the Battery Show 2016 will find the Freudenberg Performance Materials at booth #1717.

**Appointments to speak with Freudenberg experts at The Battery Show can be made in advance by contacting:**

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**New Freudenberg separators website**

Further information about the features and benefits of Freudenberg separators can be found on the new website at https://separators.freudenberg-pm.com

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About Freudenberg Performance Materials

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The company is part of the Freudenberg Group. In 2015, the Freudenberg Group employed over 40,000 people in some 60 countries worldwide and generated sales of more than 7,5 billion Euros (including pro-rata consolidation of 50:50 joint ventures). For more information, please visit www.freudenberg.com