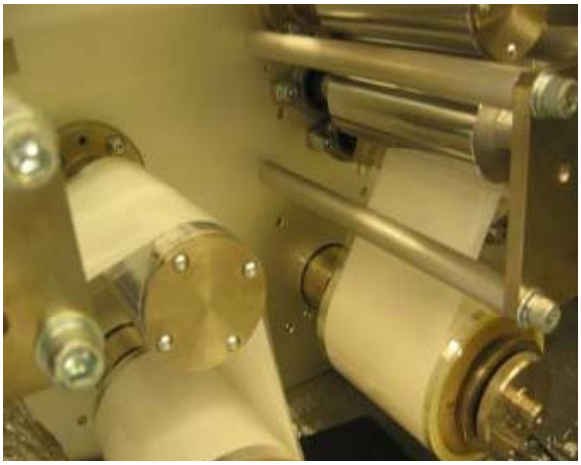
National Aeronautics and Space Administration

Success Comes Battery-Powered with NASA and New Jersey Company Partnership

In space, without the luxury of electrical outlets or a power company to store energy, the need for reliable mobile power sources becomes apparent. With so much riding on these mobile power sources, increasing their safety wherever possible is in NASA's best interest. That is just what NASA is doing through a partnership with Policell Technologies Inc., a New Jersey mobile power source solution provider that developed an innovative new technology.



Policell developed a unique, cost-effective membrane for batteries that helps prevent heat generation, ignition and explosions while also optimizing safety, energy capacity and lifespan.

A microporous membrane has been used in certain batteries to prevent heat generation, ignition or explosions due to the short-circuiting of external circuits. However, this extra safety precaution comes at a price – a battery's energy capacity and lifespan are sacrificed while costs are increased.

Because spacecraft and supporting equipment require power and the capability to store power from renewable energy sources, NASA requires batteries with improved safety, greater energy capacity and increased reliability for mission success. The forced trade-off created by the microporous membrane prompted NASA's search for a membrane technology designed to optimize safety, energy capacity, lifespan and cost.

Policell has developed a novel separator membrane that meets those needs. Its technology results in a rechargeable lithium-ion battery with a higher energy capacity, longer lifespan and selectable thermal shut-down temperature of five grades – 120 C, 110 C, 100 C, 90 C and 80 C. These five of selectable shut-down temperatures are significantly lower than batteries with a 135 C shut-down temperature, resulting in greater safety.

When using the novel separator membrane with its thermal shut-down feature, the cost of other safety devices can be eliminated. In addition, since batteries are heavy, launching one into space can be costly. Therefore, if a battery's lifespan can be increased, the cost of launching replacement batteries into space can be avoided. A cost savings also can result from the ability to achieve greater energy capacity for the same amount of weight, as fewer batteries are needed. Thus, the novel separator developed by Policell is more cost effective than previous technologies.

Policell and NASA entered into a partnership through the Small Business Innovation Research (SBIR) Program in 2004. The program provides NASA with innovations to enhance and complement research and technology in critical mission areas while giving businesses the chance to develop and commercialize innovations in a low-risk manner.

A battery's energy capacity, safety and reliability are key factors in NASA's success in many of its projects, which means there are countless opportunities for NASA to make use of Policell's technology. These include all types of spacecraft and various equipment used in human space operations.

tech transfer

About the NASA Innovative Partnerships Program

Innovative Partnerships Program: Adding value to NASA and benefits to the nation. The Innovative Partnerships Program provides specialized technology and capabilities for NASA's mission directorates, programs and projects through investments and partnerships with industry, academia, government agencies and national laboratories. Program supports technology transfer through dual-use partnerships and licensing, while creating socio-economic benefits for the American public.