

'Conductive Ink' Solar Panels Captures the Sun's Power for Soldiers

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- Scientists at the Air Force Research Laboratory Materials and Manufacturing Directorate (AFRL/RX), in a concerted effort with Plextronics, Inc., and the Pennsylvania NanoMaterials Commercialization Center, both located in Pittsburgh, Pa., have developed a ready-to-use, cost-reducing technology that can capture sunlight and store it as energy to power Global Positioning System components, portable communications, and other devices for U.S. soldiers.

According to 2nd Lt. Christopher A. Vaiana of the Directorate's Nonmetallic Materials Division, AFRL/RX provided guidance and funding to develop a special "conductive ink" that can be used to make printed organic photovoltaic solar cell panels on very thin, flexible surfaces using ink-jet printing. This new technology, called Plexcore®, developed and manufactured by Plextronics, allows solar cells to form-fit soldiers' uniforms. It can also be used to print solar panels onto thin films in military tents, Lieutenant Vaiana said.

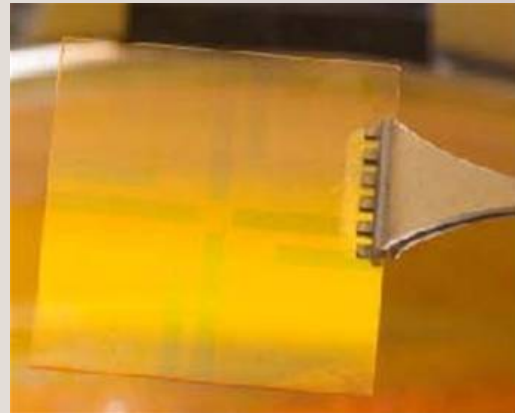
The agreement between AFRL/RX and the Commercialization Center includes the development of a technology roadmap identifying technologies AFRL/RX needs and is interested in funding. The Center is responsible for reporting these needs to industry and requesting proposals. Next, a team of personnel representing both organizations carefully examines the proposals and identifies those with the most promise to receive funding, Lieutenant Vaiana explained.

This agreement led to the program with Plextronics, whose primary focus is organic solar cell and organic light emitting diodes, and more specifically, the conductive inks and process technologies that enable such applications.

"Solar power and solid-state lighting offer substantial promise as approaches toward the development of practical alternative energy technology," Lieutenant Vaiana said. "Combined with the low-cost manufacturing methods of printed electronics, solar and solid-state lighting panels could become economical and environmentally compatible solutions to current day and future energy challenges.

"Military and commercial operations demand portable, highly efficient power sources. Using the power provided by natural sunlight via solar cells is an attractive option, yet has thus far been restricted by cost and size," Lieutenant Vaiana continued.

"Plextronics' new technology represents a significant step forward in printing inexpensive solar cells capable of powering a wide range of portable devices such as cell phones and radios. Key outcomes include lower costs and reduced logistical footprints for military operations across the battlefield environment," he added.



Plexcore® technology, depicted here, allows solar cells to form-fit soldiers' uniforms to power GPS components and communication devices, and could also be used to "print" solar panels onto thin films incorporated into military tents. Commercial applications include solar energy batteries for cell phones, radios, and other portable devices. (U.S. Air Force photo)

Source: <http://www.afmc.af.mil/news/story.asp?id=123157986>