

### **Lockheed Martin To Evaluate Uni-Solar Cells For Airship Program**

Auburn Hills - Mar 19, 2004 United Solar Ovonic has been awarded a contract by Lockheed Martin to develop and deliver solar cells on polymer substrates. These solar cells will be used by Lockheed Martin in Phase 2 of the High Altitude Airship (HAA) program, awarded by the Missile Defense Agency in September 2003.



Uni-Solar Ovonic is working with aerospace companies to develop space file image of HAA and stratospheric photovoltaic (PV) products under contracts from the U.S.

Air Force Research Laboratory. These products offer an ultra-light, flexible and low-cost alternative to conventional space PV modules made of crystalline silicon or gallium arsenide. The flexible products can be bonded to a curved skin or can be stowed for deployment in satellites.

"Our thin-film triple-junction products have received wide recognition for terrestrial applications and have proven to be promising for space use as well," said Stanford R. Ovshinsky, president and chief technology officer of ECD and chairman and CEO of Uni-Solar Ovonic.

"In 1998, Uni-Solar's space solar modules were successfully installed on the MIR Space Station. After 19 months and 200 million miles in space, the modules looked great and performed just as they did on the first day of the MIR mission."

"The high-altitude airship prototype will demonstrate the technical feasibility and utility of a regenerative, solar-power airship," said Mike Baumgartner, Lockheed Martin's HAA program director. "The persistent time on station resulting from solar power generation gives the airship great utility over a number of applications in addition to our current work for the Missile Defense Agency."

"The high altitude airship program opens up another valuable use for solar power," said Subhendu Guha, president and chief operating officer of Uni-Solar Ovonic. "Successful demonstration by Lockheed Martin of an airship prototype in 2006 could lead to extending the airship's application into a wide variety of uses."

Lockheed Martin was awarded a contract for Phase 2, design and risk reduction activities, in September 2003. Phase 2 includes developing an airship that can sustain operations for one month at 60,000 feet while providing 10 kilowatts of power to a 4,000-pound payload. The prototype airship will become part of the Ballistic Missile Defense System Test Bed following the successful demonstration in 2006.

The current design is a non-rigid, super-pressure airship. It is expected to be 100 feet in diameter by 200 feet long. Its total volume will be 0.7 million cubic feet. The airship will be controlled by four electrically powered, vectored propulsion pods and powered by a solar regenerative battery- based power system with thin-film photovoltaics on the hull surface.

Uni-Solar Ovonic, building on technology invented and pioneered by ECD Ovonic, is the world leader in thin-film amorphous photovoltaics. The Uni- Solar Ovonic 20-megawatt production equipment is the world's largest and most advanced machine for the manufacture of thin-film amorphous silicon alloy solar cells and related products used for a variety of applications ranging from solar lanterns of 2-3 watts to large solar farms of 200 kilowatts.

Because of characteristics unique to Uni-Solar Ovonic's solar cell technology, such as lightweight, ruggedness and flexibility, they are ideal as building- integrated photovoltaic roofing systems for residential and industrial customers.

ECD Ovonic and Uni-Solar Ovonic hold the basic patents covering the continuous roll-to-roll manufacturing of thin-film amorphous silicon alloy multi-junction solar cells and related products.

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