

UNITED SOLAR OVONIC Corporate Overview

Who we are

UNITED SOLAR OVONIC LLC, a subsidiary of Energy Conversion Devices, Inc. (ECD), is a world leader in the technology and manufacturing of thin film solar panels under the name brand UNI-SOLAR®. We have a 167,000 square foot manufacturing plant of 28 MW annual capacity that offers solar panels to the market for a wide range of applications. Our lightweight, flexible, and rugged products are receiving worldwide recognition, and during the last year, we have witnessed 100 % sales growth.

A second, 170,000 square foot Auburn Hills facility is complete. With a capacity of 30 MW per annum, Auburn Hills II became operational December of 2006. The next phase of the expansion plan will include the construction of a third manufacturing facility in Greenville, Michigan with an annual capacity of 60 MW. It is anticipated to be operational during 2007. A fourth manufacturing facility, with an annual capacity of 60 MW, is expected to be operational in Greenville in 2008.

Market Segments

Commercial / Industrial Systems

Lightweight, easily installed, solar electric solutions that can be integrated with a variety of roofing materials.

Residential Systems

Complete residential solar electric integrated systems and solutions.

Off-Grid and Remote Applications

Electricity for remote areas of developing countries.



Commercial Product Line

UNITED SOLAR OVONIC offers a complete line of solar products that are lightweight, glass-free, flexible, durable, shadow tolerant, have excellent high temperature performance and are easily installed. Our products offer the following solutions:



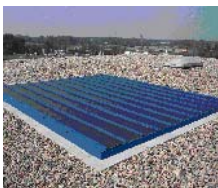
Standing Seam Metal Roof Solution

Designed for customers with traditional metal roofs, UNI-SOLAR®'s SSMR solutions leverage the ease of installing our popular photovoltaic laminates (PVL).



UNI-SOLAR® Membrane Roof Solution

Designed for applying the UNI-SOLAR®'s photovoltaic laminates onto styrene-butadiene-styrene (SBS) modified bitumen and other low-slope membrane roofs, this solution is flexible and durable, capable of withstanding all environmental stresses.



Premier Solar Flat Solution

A self-ballasted collection of framed modules that can be easily removed for roof replacement or repair and is appropriate for any type of existing low-slope roofing material.

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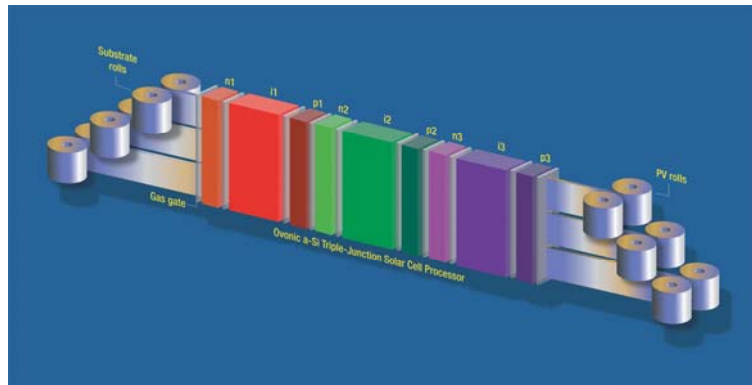
www.uni-solar.com

UNI-SOLAR® PV products provide 20 % more real energy* than crystalline panels of the same power and our modules come with up to a 20-year warranty on power output. With power ratings of 3 watts to 136 watts, our solar modules can be customized to fit virtually any need.

(*Source: Solfest '98, Module Shoot Out, June 20-21, 1998)

Our Innovative Technology

Each UNI-SOLAR® PV-module utilizes the unique Triple-Junction thin-film silicon solar cells from United Solar Ovonix LLC. UNI-SOLAR® modules yield unprecedented performance. Each solar cell is composed of three semiconductor junctions stacked on top of each other, forming three different sub-cells. The bottom sub-cell absorbs the red light; the middle cell the yellow/green light and the top cell absorbs the blue light. This light spectrum splitting capability is the key to higher efficiency, especially at lower insolation levels and under diffuse light.



UNI-SOLAR® solar cells are made in a roll-to-roll vacuum deposition process on a continuous roll of stainless steel sheet. The result is a unique, flexible and lightweight cell. The solar cells are arranged in a series string and encapsulated in UV stabilized and weather-resistant polymers to form PV Laminates. The polymer encapsulation includes at the front side EVA and the fluoro-polymer ETFE (e.g. TEFZEL® from DuPont).

Flexible UNI-SOLAR® PV-modules can be bonded to conventional metal roofing panels, single-ply membranes, and modified bitumen roofing materials. The resulting modules are exceptionally durable. By-pass diodes are connected across each cell, allowing the modules to produce power even when partially shaded or soiled. Each power module has a means of easily making the required electrical connections to create compatible system voltages. These interfaces include weather-tight, Quick Connect plugs, pre-connected to UV protected wires appropriate for all applications from simple single module requirements to high voltage grid-connected applications.

Higher Outdoor Performance

UNI-SOLAR® products perform better than all their crystalline-silicon and other thin film counterparts under non-ideal orientations and under real outdoors conditions (higher kWh energy output per Wp installed). This enhanced performance, up to 20 % higher, can be attributed to the higher sensitivity for low light conditions and for diffuse light, better performance at high temperatures and improved shadow tolerance of UNI-SOLAR® products.

All solar modules are sold with their peak power performance (Wp) tested under laboratory conditions (STC conditions), i.e. under a very high and direct irradiation (1000 W/m²) of only one type of solar spectrum (AM 1.5) and under a module temperature of 25°C.

In real outdoor conditions this peak power is seldom achieved, since module temperature usually is more in the range of 40-60 °C when in the sun (this is especially true for modules that are building-integrated), since the occurrence of 1000 W/m² irradiation is only about 1 % of total sun-hours and since the spectral content of the solar spectrum changes continuously with varying climatic conditions. Diffuse light is dominating when the sky is clouded or during mornings and evenings. In most areas of North America as well as Northern and Central Europe, the majority of solar irradiation comes from diffuse light (more than 50 % of all solar irradiation) and even in the sunnier sections, the diffuse part is, on average, still 33 %. Outdoor testing has shown that UNI-SOLAR® PV products perform 40 % better at low light conditions (40-100 W/m²) than all present crystalline technologies. In North American climates, where low light conditions and diffuse light prevail, this results in 8-20 % higher yearly energy output per Wp of purchased power for UNI-SOLAR® products compared to all crystalline (and other thin film) technologies. In warm climates, e.g. southern US, performance and yearly energy harvest is also up to 20 % higher, in this case due to the better temperature behavior of UNI-SOLAR® products.

Quality Warranty – Proven Reliability

UNI-SOLAR® modules comply with following qualification tests (CEI/IEC61646-CEC701 Certificate):

- Thermal Cycling
- Humidity-Freeze Test
- Damp Heat Test
- UV-Test
- Wet Insulation Test
- Mechanical Load Test
- Hail Impact Test
- Robustness of Terminations Test

A subsidiary of Energy Conversion Devices