

# SmartShade™ Solar Parking Structures



**Sundial Energy, Inc. merges technology from Uni-Solar™ and MasterCraft Metals to produce SmartShade™ shade parking structures**

**Commercial Structures from 1 kW – 250 kW • Residential 1 kW – 6 kW**

**SmartShade™** solar parking structures deliver where it really counts: performance. The SmartShade™ roof generates electricity even at very low sun angles and continues to perform well under the hottest conditions or cloudy days. The result is more total energy throughput and up to 30% more power production, on an installed watt-per-watt comparison, than crystalline modules.\* All grid-tied SmartShade roofs include one or more AC receptacles that **can be used to charge plug-in hybrid cars or any electric vehicle, including bikes.**

**[www.sundialenergy.com](http://www.sundialenergy.com) Providing intelligent solutions for your renewable energy needs.**

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**Vandal Resistant**

**AC outlet for  
plug-in hybrid  
and electric vehicles**

## Why SmartPower Roof?

**Speed:** Sundial Energy's SmartPower Roof installs faster than all other solar panels. On-ladder time is minimized and no roof racks are needed with this system.

**Efficiency:** Due to their remarkable temperature and shadow tolerance, SmartPower Roofs produce more electricity than traditional crystalline panels, on a watt-per-watt basis, in actual power output.\*

**Aesthetics:** In the SmartPower Roof system the power producing surface is laminated directly to the metal panels to maintain roof profiles from all directions. The SmartPower roof's unobtrusive quick connect wiring system is hidden in roof details to eliminate the negative visual impact associated with rack-mounted crystalline modules.

**Flexibility:** The SmartPower Roof can be installed over a wide range of roof geometries, from 3.5° to 60°.

**Reliability:** The SmartPower Roof will last. With no penetrations through the roof panels, in typical installations, any potential for roof failure is minimized. Since power is produced under diverse temperature and lighting conditions, more electricity will be available when you need it. And, Uni-Solar includes a 20 year power output warranty and 5 year system warranty.

**Vandalism Resistance:** SmartPower Roof laminates are highly resistant to vandalism. They have no glass to shatter. Aggressive adhesion makes them extremely difficult to remove.

**Balance-of-System (BOS):** Because the SmartPower Roof laminates do not require an additional roof mounting system, as do crystalline solar panels, BOS costs for hardware and labor are reduced. Only the most efficient BOS components are used in order to reduce production losses inherent in many installed systems, resulting in more energy per watt installed.

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### Example:

40' x 40' Structure  
(20' x 10' individual space)

### Solar Output:

1kW per parking space  
8kW total peak rated power

## Specifications:

### Photovoltaic Laminates

- Roof slope: 3.5° to 60°
- Temperature limitations: 185°F (85°C)
- Available laminate lengths: 9'.4" (285 cm) 16'.5" (501 cm) 18' (549 cm)
- Standard laminate width: 15.5 inches (39.4 cm)
- Can be wired in series or parallel
- UL listed
- Efficiency: 100% rated output under standard test conditions (STC); 94.6% rated output - PVUSA test conditions (PTC) - one of the highest in the industry; actual energy output is up to 25% higher, kWh per installed watt, than silicon crystalline modules.
- Temperature Coefficient: -0.21%/°C > 25°C compared to -0.45%/°C to -0.55%/°C for crystalline modules

### MasterCraft Metals roofs

- Standing seam 24 gauge roof panels
- Low maintenance
- Low life-cycle cost
- Fire and wind resistant
- 20 year "Kynar" paint system
- Minimum roof panel width required: 16 inches (40.6 cm)

### Warranties

- 5 year system warranty
- Uni-Solar PV Laminates - 20 year limited warranty
- MasterCraft roof panels - 10 year limited warranty

### Balance-of-System

- NO roof mounts needed
- Inverters (DC to AC conversion)
- AC and DC disconnects
- Batteries (optional)
- Charge controller (only with battery system)
- Meter or meters



SmartPower Roof<sup>FM</sup> is a Uni-Solar trademark. SmartShade<sup>TM</sup> is a Sundial Energy trademark  
\*Paper 6B.7.3 presented at the 20th EPVSEC Conference, Barcelona (S), June 2005.  
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