



POWER the Possibilities

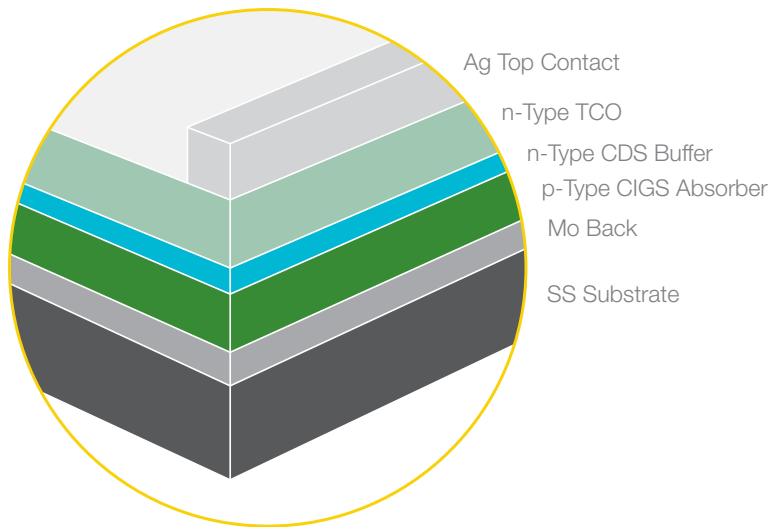


Global Solar is an **Innovator** in Flexible Thin Film Solar Solutions

Founded in 1996, Global Solar® has evolved into a leading manufacturer of thin-film (CIGS) solar solutions. Global Solar's® answer to lightweight and portable solar power has been integrated into commercial, residential, utility-scale and government applications across the globe. Among Global Solar's® most innovative contributions are solutions for the emerging building integrated photovoltaic (BIPV) market. State-of-the-art facilities in Tucson, Arizona, USA and in Berlin, Germany manufacture Global Solar's® products for worldwide distribution.

Global Solar® is redefining solar power: integrating solar solutions into building materials. Our industry leading, high efficiency thin-film solar material allows us to partner with building industry leaders to create innovative, efficient, and effective products. Together, we are redefining how we build and power the world around us.

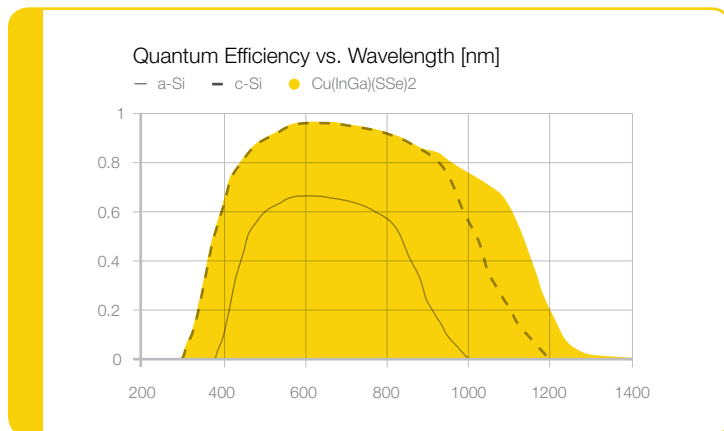
CIGS TECHNOLOGY



CIGS Dissected

Co-evaporated CIGS on .001"-thick, 1km-long stainless steel foil is the basis of our proprietary roll-to-roll manufacturing process. This record setting method for flexible thin film photovoltaic cells results in lower material usage, lower manufacturing costs, and higher efficiency.

Efficiency

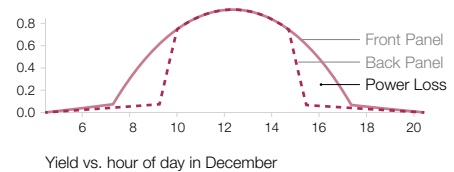


Best Absorption of Sunlight

CIGS is known for best sunlight absorption of all photovoltaic technologies. This property allows it to perform well in diffuse blue, evening red, and all light conditions in between.

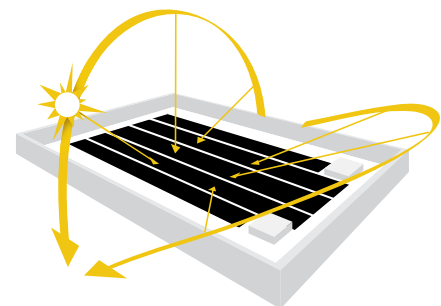
The Problem with Tilt

Solar panels are typically mounted at a fixed tilt angle, representing a trade-off between summer and winter production. Adjacent rows of tilted panels must be spaced to avoid shading; this spacing, however, reduces the amount of power on the roof. Inadequate spacing can result in significant power losses (see below).

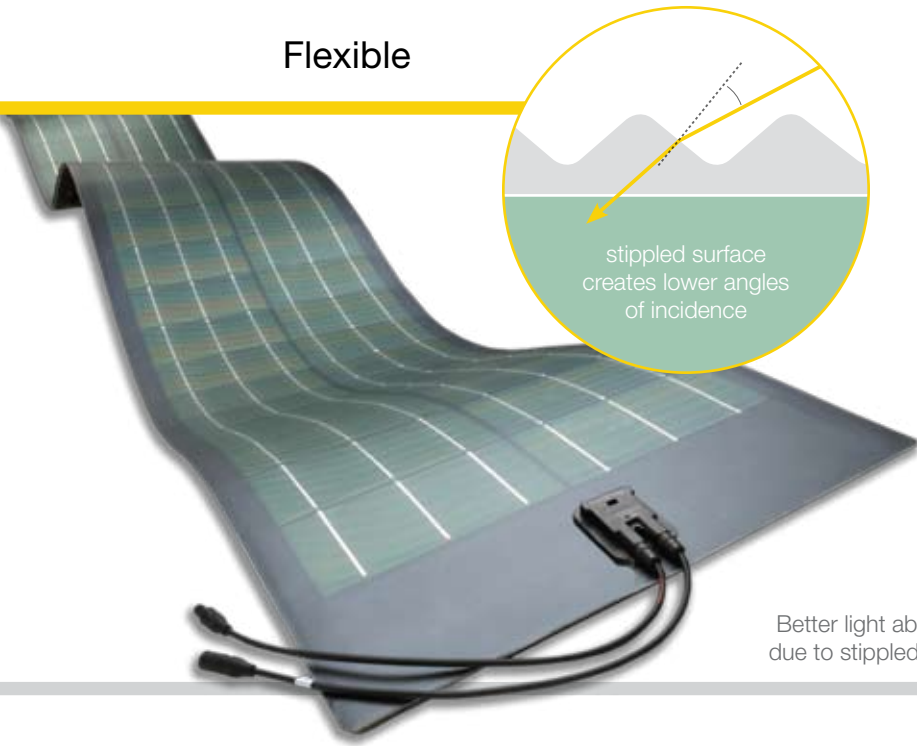


Flat Panel Advantage

Global Solar's PowerFLEX modules enable simpler, more versatile, and higher power density solutions for limited area roof-top installations. The result is higher net energy production per rooftop.



Flexible



stippled surface
creates lower angles
of incidence

Better light absorption
due to stippled surface



Designed Specifically for roofs

Integrates with roof surface

- » No mounting hardware
- » No roof penetrations
- » No additional wind load

Flexible module

- » Fits many roof types
- » Durable, non-breakable

Light weight

- » 3.5 kg/m² (0.7 lb/ft²) with adhesive
- » No structural reinforcement required

More energy per roof

High efficiency CIGS

- » 10.5% to 12.6% aperture efficiency
- » 50% more efficient than flexible a-Si

High performance

- » Performs in all light conditions
- » Shade tolerant

Covers entire roof area

- » Lays flat. No tilt required
- » No module spacing required
- » Conforms to roof shape

Lower Installed System Costs

Large format module

- » 250-300 Watts
- » 5.7m x 0.5m dimensions
- » 30 to 40% BOS & Installation cost savings

Performance Examples

1000m² Fixed Area; 10,764 sq feet; 81.5kW

| Location | Annual Production kWh | Annual Production kWh per sq. ft. | Yield kWh / kW |
|---------------|--------------------------|--------------------------------------|-------------------|
| Munich | 67,761 | 6.30 | 831 |
| Newark, NJ | 84,991 | 7.90 | 1043 |
| Rome | 91,993 | 8.55 | 1129 |
| San Francisco | 111,748 | 10.38 | 1371 |
| Sydney | 103,564 | 9.62 | 1271 |
| Tokyo | 82,925 | 7.70 | 1017 |
| Tucson | 128,307 | 11.92 | 1574 |
| Valencia | 101,324 | 9.41 | 1243 |

Installation Costs per Watt

Direct Costs

BOS | Installation Labor | Mounting Racks

When direct project costs are divided by the 300-Watt module rating, the PowerFLEX system presents a possible **30 to 40%** cost advantage vs industry standard modules.

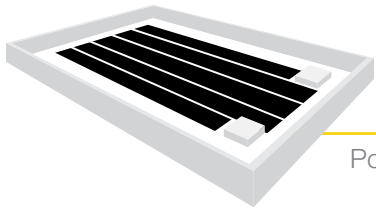
Indirect Costs

Permits | Engineering & Design | Overhead

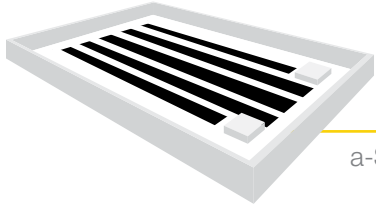
When indirect project costs are divided by the total array power, PowerFLEX's higher power density can result in a comparative advantage of **40 to 50%** savings vs other technologies.

MOST POWERFUL ROOF

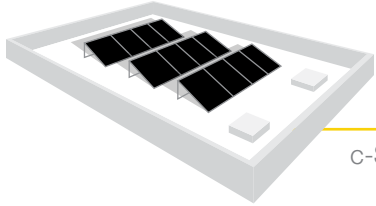
How PowerFLEX Compares | Munich 1000 m²



PowerFLEX



a-Si



c-Si

| Characteristics | Module | Annual Production |
|---|---|--|
| Flexible Lightweight <i>No rack or structural reinforcement required</i> Flat <i>Low Wind Uplift</i> | 300 Watts 3.5 kg / m² | 81.5 kW (DC) 67,400 kWh (AC) |
| Flexible Lightweight <i>No rack or structural reinforcement required</i> Flat <i>Low Wind Uplift</i> | 144 Watts 3.5 kg / m ² | 44.4 kW (DC) 42,300 kWh (AC) |
| Rigid Glass Heavy <i>Rack and structural reinforcement required</i> Fixed Tilt <i>High Wind Uplift</i> | 235 Watts 20 - 50 kg / m ² | 33.6 kW (DC) 34,600 kWh (AC) |
| PowerFLEX Benefits Lightweight module requires no structural reinforcement and no roof penetrations. Flat modules allow greater roof coverage and maximum power density. | Highest output and lowest weight per area. | Highest net production per rooftop. Most Powerful Roof. |

More surface area covered plus higher performance equals more power to you.

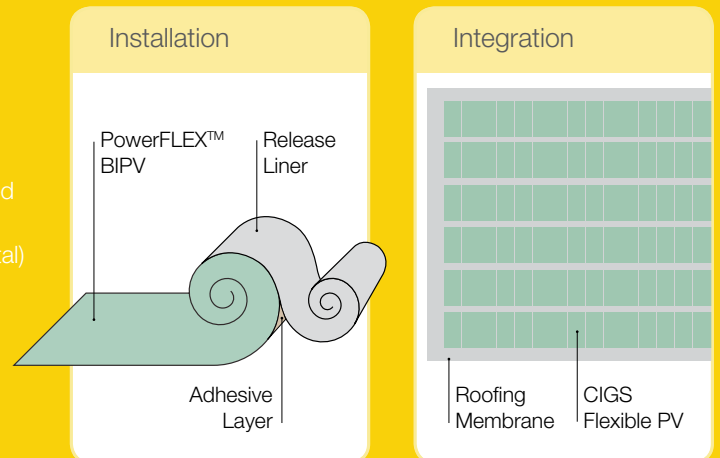
PowerFLEX™

Application: In the field or in the factory

Global Solar's PowerFLEX module enables a wide range of system innovation.

Installation: Modules can be installed in the field using accepted roofing practices. The flexible module can be applied to new, clean roofing surfaces (TPO, EPDM, modified bitumen, and metal) using approved adhesives such as butyl mastic.

Integration: OEM's can take advantage of the flexible, high efficiency characteristics of PowerFLEX to develop innovative, integrated, and value-added BIPV products for their own manufacturing lines and market channels.





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