

Datasheet • FEE-20-12C



IEC 61646 certified

Free Energy solar panels have been fully certified by TÜV Rheinland in April 2004, according to the IEC61646 standard for thin film solar panels.

Reliable cell technology

Free Energy produces stable and reliable amorphous silicon cells. After initial stabilization during the first two months of outdoor use, the amorphous silicon cell will be stable for decades.

The expected lifetime of the advanced amorphous silicon solar cells is at least 30 years.

High energy yield

The amorphous silicon solar cells, produced by Free Energy, function better than crystalline silicon solar cells in partial or indirect sunlight. Tests have shown that the annual energy output is approximately 15% higher per rated Watt-peak power.

Durability

The outdoor performance of amorphous silicon solar panels depends primarily on their protection against corrosion.

Free Energy applies an injected polymer frame, with a very high moisture barrier. This advanced framing technology has been developed internally and is unique to the Free Energy solar panels.

*This advanced technology makes our solar panels reliable with a **10 years warranty** on power output¹.*

¹) 80 % of maximum stabilized peak power (+/-10 %)



free energy

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Panel main characteristics

Cell technology	Single junction amorphous silicon
Panel technology	5th framing generation (compliance with IEC 61646 standard)
Encapsulation	Glass-to-glass with moulded polymer injection framing
Expected lifetime	20 years minimum
Operating conditions	- 40 °C to + 85 °C

Electrical characteristics - at Standard Test Conditions²

	Initial power	Stabilized Power
Maximum output power	19.0 Wp	16.0 Wp
Maximum current at 16 V	1.18 A	0.99 A
Short circuit current	1.45 A	1.22 A
Open circuit voltage	22.8 V	22.8 V

2) Data refers to Standard Test Conditions (STC), an approximation of operation in full sunlight (STC: 1000 W/m², 25 °C cell temperature, spectrum AM 1,5). Rated parameters may vary +/- 10 %.

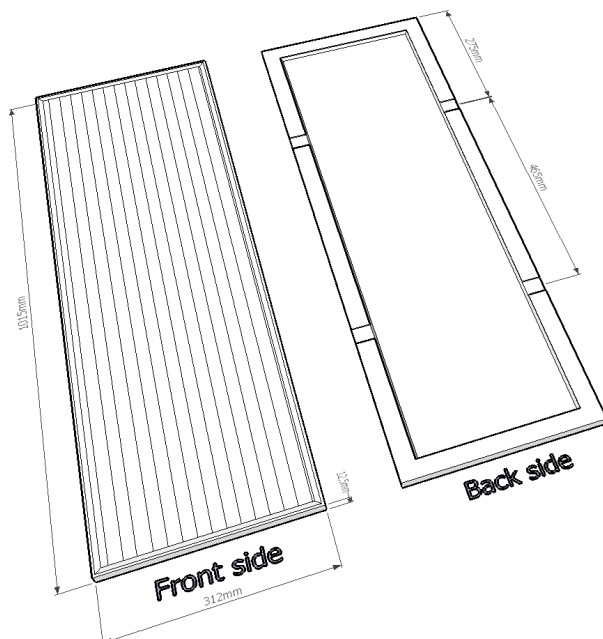
Electrical characteristics - at Average Operating Conditions³

	Stabilized power
Equivalent yield peak power	18.0 Wp

3) Data refers to real annual average irradiation at exposure with high diffused light ratio, normalized on average performance of crystalline silicon technology. Rated parameters may vary ± 10 %.

Temperature coefficients

Voltage	- 0.29 % / °C	Normal operating cell temperature	45°C (at 800 W / m ² , ambient temperature 21°C)
Current	+0.08 % / °C		



Dimensions

Dimensions (H x W)	1015 mm x 312 mm
Thickness	14.3 mm
Weight	4.6 kg

Installation

Cable	1m double insulated cable (2 x 0.75 mm ²)
Polarity	Brown = "+", Blue = "-"
Fixing and coupling	4 clips for easy mounting (M6 bolts and nuts)
Maximum nominal System voltage	50V DC

Non contractual photos and sketches