



KANEKA HYBRID PV

Thin-film silicon hybrid solar panel

U-EA type

U-EA100/105/110/115/120



Decades of research and development have created HYBRID — the Next Generation innovation from Kaneka.

Kaneka's HYBRID solar panel has a tandem structure that absorbs both the blue and red ends of the light spectrum allowing it to convert even more of the sun's light into energy. This latest HYBRID innovation can deliver high power generation, kWh/kWp, and is environmentally friendly.



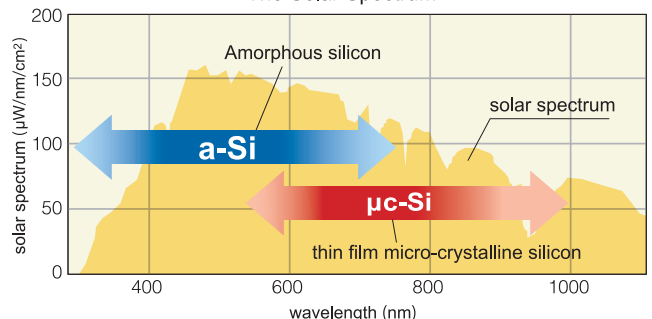
25-year warranty

The Hybrid PV module comes with a 25 year warranty on power output.

Kaneka's HYBRID technology combines the features of both amorphous silicon and micro-crystalline silicon to create higher energy production.

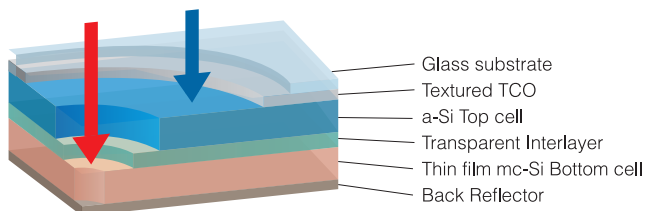
The words "solar panel" are often associated with crystalline solar panels, but Kaneka's HYBRID solar module offers some unique features over traditional crystalline. Its dual-layer structure of microcrystalline and amorphous silicon can capture both short and long wavelengths of the light spectrum, allowing the HYBRID to convert even more sunlight into electricity. This enhances the efficiency of power generation, and produces up to 30% higher power output than conventional thin-film amorphous silicon panels. The HYBRID delivers greater performance capabilities and offers a lower open circuit voltage for enhanced design flexibility. Kaneka's HYBRID panel is the future of solar power.

The Solar Spectrum

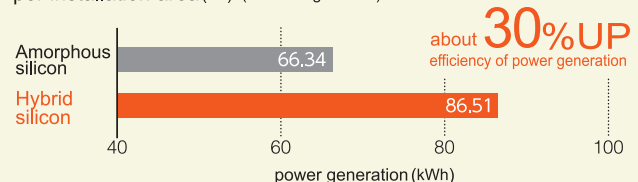


*The yellow area shows the typical solar spectrum. The amorphous silicon and micro-crystalline silicon arrows represent the spectrum band that solar panels use to turn light into electricity

HYBRID absorbs both ultraviolet (short rays) and infrared (long) rays.



Comparison: forecast of annual electricity generation per installation area (m²) (alternating current)

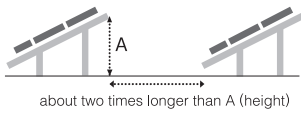


*Osaka-city. A case of low angle (5 degrees) installation, due south. Based on Kaneka's power generation forecast

HYBRID panels are ideal for low angle installations.

Because of HYBRID's cell structure, low angle (5 degree) roof installations are possible without a significant loss of power generation by shadow. Panels can be installed close together, allowing for more roof coverage and higher power output.

The case of high angle set up



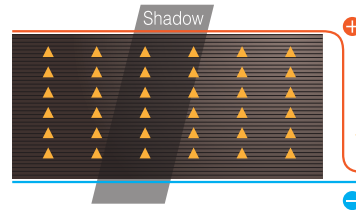
The case of hybrid solar panel



The HYBRID cell structure is shadow tolerant.

The HYBRID panel measures 1,210x1,008 mm. Unlike traditional crystalline panels, the HYBRID cells allow it to perform even if part of the panel is shaded*.

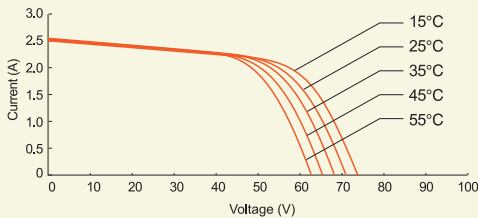
*The cell configuration allows it to prevent power output deterioration under shadow dropped conditions like picture below.



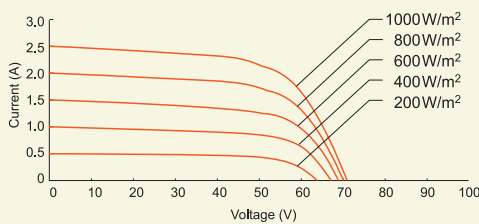
For example, if 20% of one cell becomes shady, remaining 80% of the cell can generate power normally.

Electrical characteristics U-EA110 type

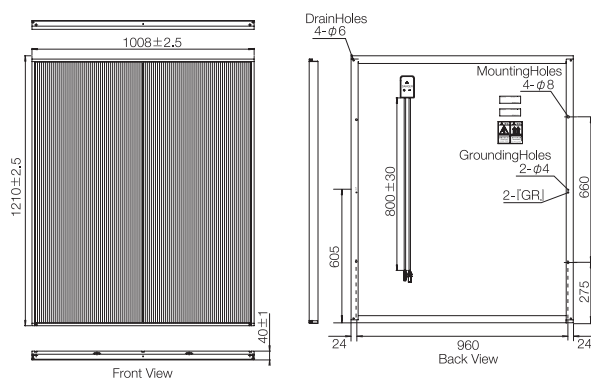
Current-Voltage characteristics at various cell temperature



Current-Voltage characteristics at various irradiance levels



U-EA100/U-EA105/U-EA110/U-EA115/U-EA120



Products		U-EA100	U-EA105	U-EA110	U-EA115	U-EA120
Electrical Data (Standard Test Condition)*1	Maximum Power (Pmax) [W]	100	105	110	115	120
	Tolerance	-5%/+10%	-5%/+10%	-5%/+10%	-5%/+10%	-5%/+10%
	Minimum value of Pmax [W]	95.0	99.75	104.5	109.25	114.0
	Open circuit voltage (Voc) [V]	71	71	71	71	71
	Short circuit current (Isc) [A]	2.25	2.40	2.50	2.50	2.60
	Voltage at Pmax (Vmpp) [V]	53.5	53.5	54.0	55.0	55.0
	Current at Pmax (Impp) [A]	1.87	1.96	2.04	2.09	2.18
	Module Efficiency (η) [%]	8.2	8.6	9.0	9.4	9.8
	Efficiency reduction at 200W/m²	<5%	<5%	<5%	<5%	<5%
	Data at normal operating cell temperature (NOCT)*2	Temperature (TNOCT)	45	45	45	45
Maximum Power (Pmax) [W]		74.4	78.1	81.8	85.6	89.3
Open circuit voltage (Voc) [V]		65.5	65.5	65.5	65.5	65.5
Short circuit current (Isc) [A]		1.82	1.94	2.02	2.02	2.10
Voltage at Pmax (Vmpp) [V]		48.8	48.8	49.2	50.2	50.2
Temperature coefficients	Power [%/K]	-0.35				
	Open circuit voltage [%/K]	-0.39				
	Short circuit current [%/K]	0.056				
Mechanical characteristic Data	Cell Type	Thin film (amorphous Si / thin film micro crystalline Si)				
	No. of cells	106 (53 in series / 2 in parallel)				
	Dimension [mm]	W1,210 × L1,008 × T40				
	Weight [kg]	18.3				
	Junction box (Dimension) [mm]	W64 × L96 × T16.5				
	Output cable	2.5mm² Onamba PV cable with Multi-Contact PV-KBT and KST 3 II connectors				
	Front panel	low iron glass with 5.0mm thickness				
Limits and Others	Frame material	anodised aluminum				
	Maximum system voltage [V]	600				
	Limiting reverse current [A]	3.5				
	Operating module temperature [°C]	-20...+80°C (module temperature)				
	Maximum load [Pa]	2,400				
	Application classification (IEC 61730-Ed.1)	A				
	Fire classification (IEC 61730-Ed.1)	Class C				
	Safety classification (IEC 61730-Ed.1)	II				

*1 Irradiance 1000 W/m², spectrum Air Mass 1.5 and cell temperature 25°C

*2 Irradiance 800 W/m², wind speed 1m/s and air temperature 20°C

IEC 61646/EN61730 Safety Class II **CE**

Certification : IEC 61646-Ed. 2, IEC 61730-Ed. 1 Manufactured in ISO 9001 certified factories.

kaneka

<http://www.pv.kaneka.co.jp>

KANEKA BELGIUM N.V. GERMAN BRANCH
Otto-von-Guericke-Ring 13 D-65205 Wiesbaden Germany
Phone : +49-6122-5077-44 Fax : +49-6122-5077-23

KANEKA TEXAS CORPORATION
6161, Underwood Road, Pasadena, Texas 77507, U.S.A.
Phone : +1-281-474-1850 Fax : +1-281-909-2223

KANEKA CORPORATION
3-2-4, Nakanoshima, Kita-ku, Osaka 530-8288, Japan
Phone : 81-6-6226-5315 Fax : 81-6-6226-5144

