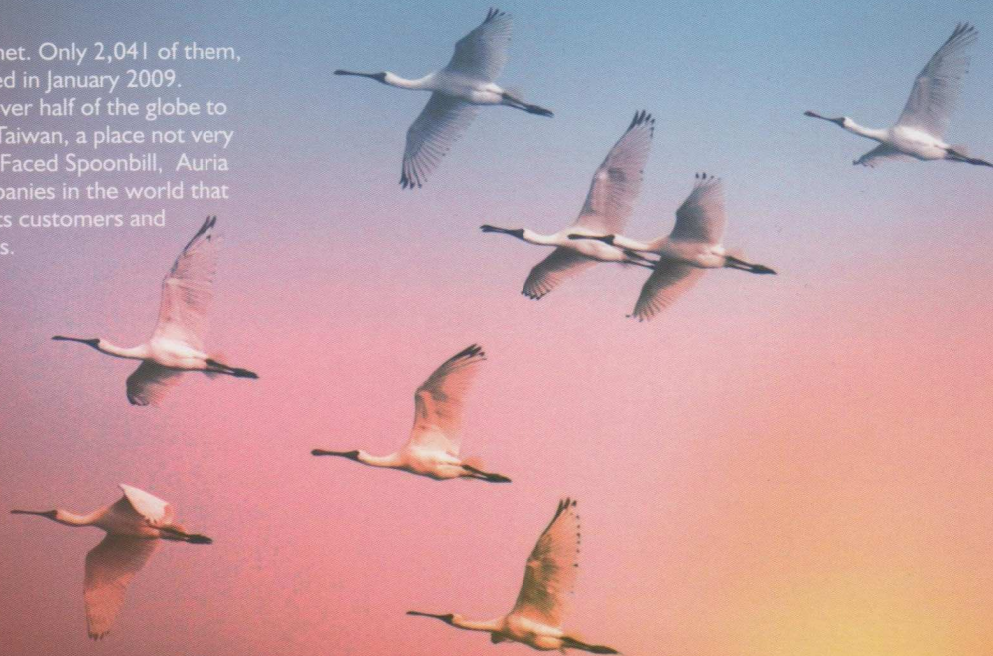


# 承諾

## The Black-Faced Spoonbill

is one of the rarest birds on the planet. Only 2,041 of them, at most, left in the world as recorded in January 2009.

Every year, over 1,000 of them fly over half of the globe to spend their winter in the southern Taiwan, a place not very far from Auria Solar. Like the Black-Faced Spoonbill, Auria Solar is one of the rarest solar companies in the world that determines to answer the need of its customers and promises to deliver its best products.



Photographer / Pan Pei-sun



Micromorph Solar Modules



# Company Profile

Founded in 2007, AURIA SOLAR is a company pioneering in research, development, and production of micromorph thin film solar modules. With its own innovations and state of the art technologies filing 270 patents for world class high efficiency modules in 2009, Auria Solar has been able to produce modules with stabilized 140 Wp output power and superior module conversion efficiency of 10% from its 60 MWp – the largest fully automation end-to-end single micromorph production line worldwide. Auria Solar aims to offer the world sustainable energy of micromorph photovoltaic modules with stabilized high efficiency of 11% and the capacity will be expanded to 245 MWp by 2011 and low cost of \$1/Wp by 2012.

## Auria Solar at a glance

- \* Location : Tainan Science Park, TAIWAN
- \* Factory Area : 23,000 m<sup>2</sup>
- \* Clean-room (Class I, 1,000~10,000) : 7,571 m<sup>2</sup>
- \* Tandem Micromorph Capacity : 60 MWp
- \* 245 MWp Capacity by the end of 2011
- \* 525 MWp Capacity in 2012

## Product Features:

- \* Total solution for mounting system which ensures easy, quick, and optimized installation.
- \* Robust structure with double-glass design and PVB lamination material.
- \* 25-year product output warranty.
- \* Certified by IEC 61646 & 61730 : ID 0000024521 (TÜV Rheinland).
- \* Certified by UL1703: ETL No. 3196826

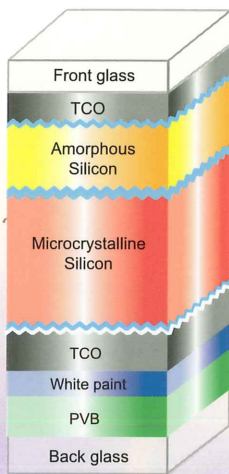


Production Equipment in Class 1000

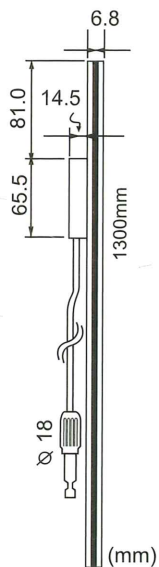
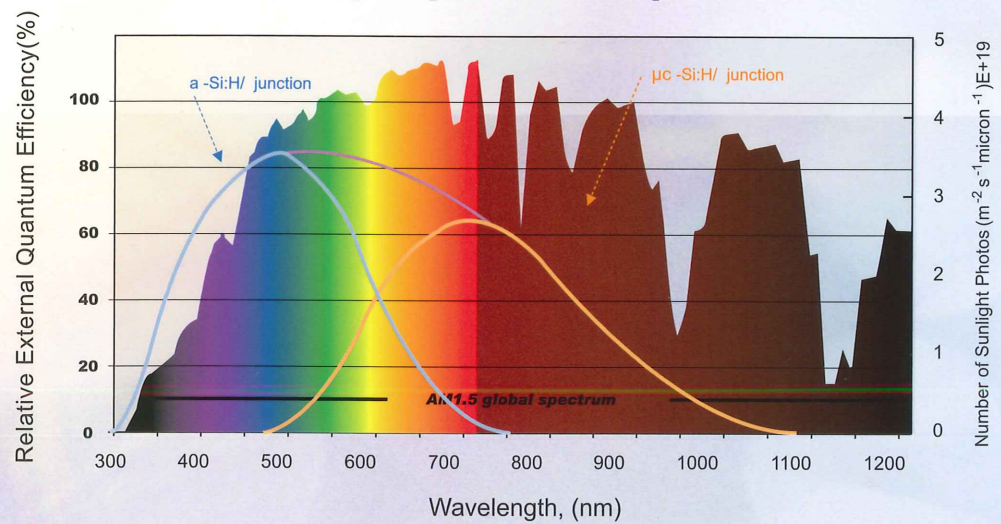


# Auria Micromorph Thin Film Photovoltaic Modules

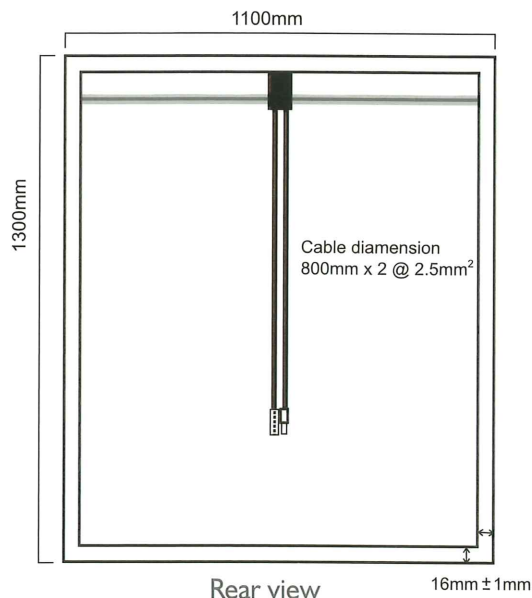
Auria micromorph solar modules have a tandem structure with an additional microcrystalline absorber underneath amorphous layer, which converts the energy of the red and near infrared spectrum, allowing an efficiency boost of approximately 50%.



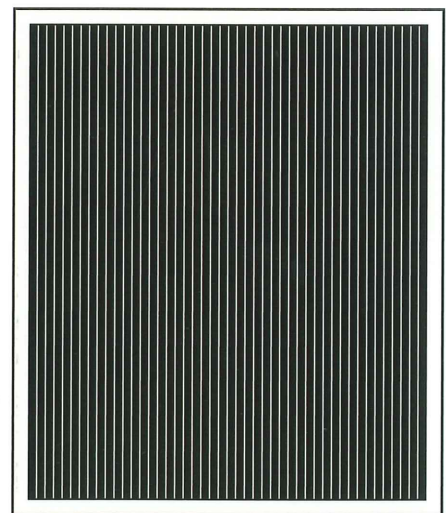
## Micromorph Spectrum Response



Side view



Rear view



Front view



# Why Auria Solar

## \* Moon Technology

### 1. Efficiency Enhancement

Stabilized output power ( $P_{mpp}$ ) enhancement up to 10%.

### 2. Better Energy Yield

Energy yield is 10~15% higher due to excellent low light performance through significantly improved shunt resistance ( $R_{sh}$ ) up to 20,000 ohm.

### 3. Superior Reliability

Leakage resistance surpass the criteria of TÜV damp-heat test.

### 4. Excellent Performance

Actual output power exceeds the simulation result made by PVsyst.

## \* Experienced and Innovative R&D Team

### 1. More than 270 patents have been filed to rapidly increase module efficiency.

### 2. Considerable R&D projects funded by Taiwanese Government enable Auria Solar with sufficient resources to execute its pioneer R&D work.

### 3. Strong R&D momentum is due to over 25% of employees holding Master and Ph.D degree.

### 4. Auria is the first Taiwanese company to receive "Green Patent" by the US Patent Office, which is strictly limited to worldwide 3,000 patents proven as "materially enhances the quality of the environment".

## \* Premium Quality Control

### 1. Enterprise Resource Planning (ERP) software from SAP implemented to record every raw material source and provide traceability to the module life time.

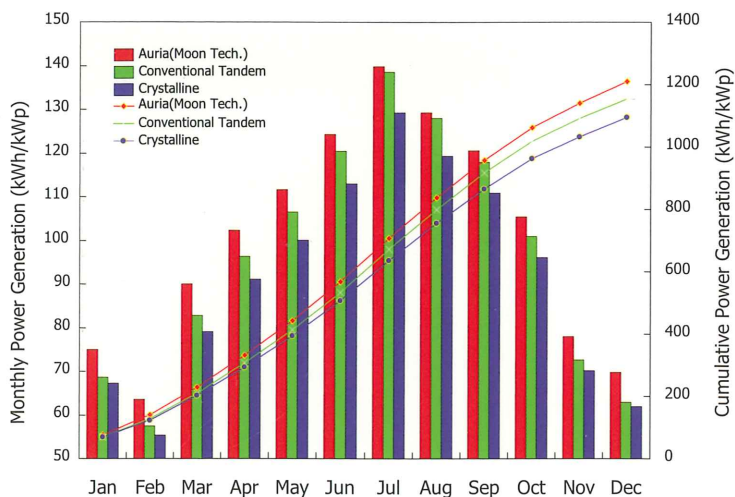
### 2. High quality clean room at class-1000 level to reduce the particle pollution and increase the product reliability.

### 3. 100% fully automated production line with advanced MES system, eliminating the mistake of manual operation.

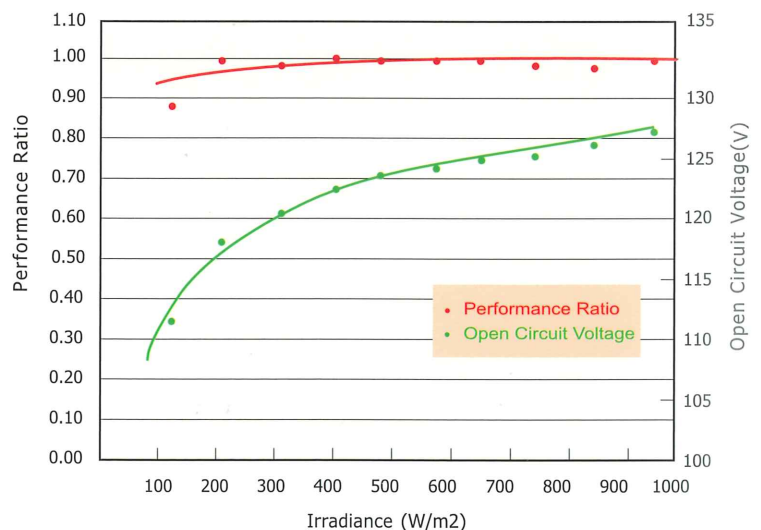
## \* Low Voltage Module

Low voltage micromorph modules (70 V, 30 V) provided for customer selection.

Energy Yield Comparison with Different Technologies



AURIA Excellent Low Light Performance



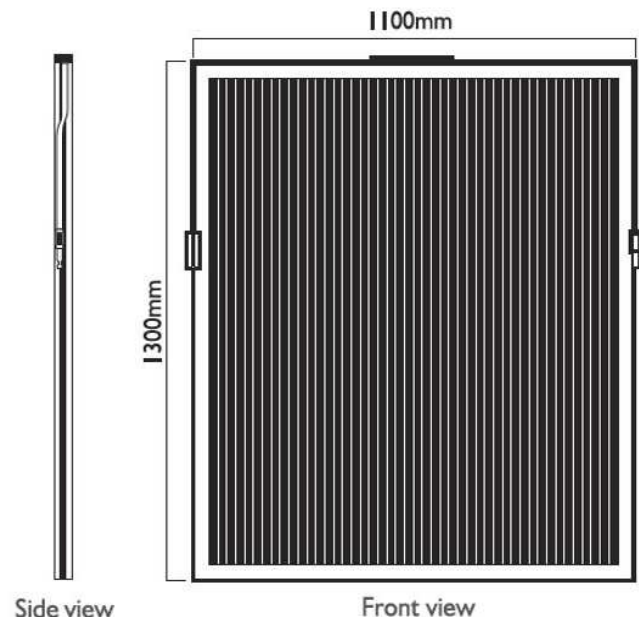
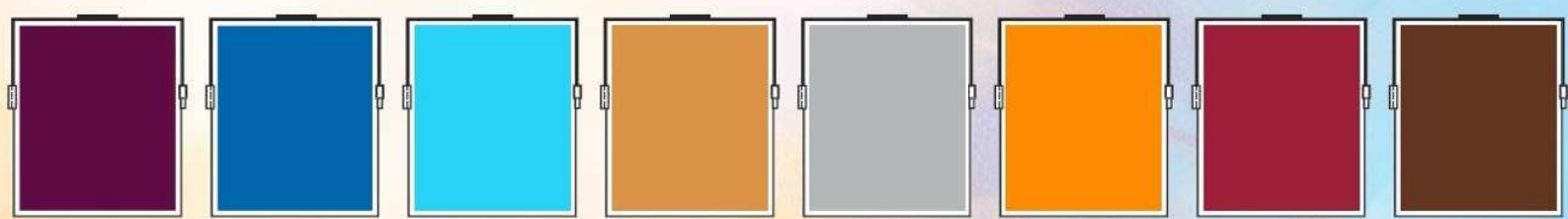
# Auria Micromorph BIPV Modules

Auria thin film PV modules are ideal for building integrated photovoltaic (BIPV) applications. They not only can generate electric energy from the sun, but also can be customized to be any color to match any specific architectural design. In addition, they have outstanding anti-UV properties and thus offer an alternative choice to conventional low-E glass used in eco-architects.

With our patented Auria Azur technology®, custom-made design and in-house manufacture capability, our BIPV modules can be tailored to be any color in the whole spectrum of visible light and can even be fine tuned to be versatile colors, such as light-blue, blue, and deep-blue.

Due to Auria's superior technology and uncompromised quality control on our manufacture processes, our thin-film PV modules have superb and unprecedented uniformity in color and appearance. They offer architects extra degrees of freedom in choosing the colors for their BIPV modules, particularly suitable for appearance-oriented building, e.g. land-marking skyscrapers or public architecture.

## Full Range Color Micromorph BIPV Modules





# Auria Micromorph BIPV Specification

## Electrical Characteristics(STC:1000W/m<sup>2</sup>; 25°C; AM1.5)

Color	Purple	Dark Blue	Light Blue	Golden	Silver	Orange	Red-wine	Coffee
Transmittance (400~800nm) *	11.6%	10.9%	9.5%	6.3%	9.5%	19.9%	16.2%	5.9%
Rated Power (Wp ± 3%) *	70-80W	70-80W	55-65W	40-50W	40-50W	75-85W	85-95W	100-115W
Max. Power Voltage Vmpp (V)	85-87	84-86	89-91	91-92	89-91	96-98	85-95	99-101.38
Max. Power Current Imp (A)	0.84-0.94	0.84-0.93	0.63-0.70	0.48-0.54	0.49-0.54	0.79-0.88	0.90-1.00	0.99-1.11
Open Circuit Voltage Voc (V)	115-117	114-115	116-117	116-117	117-118	126-127	124-125	128-130
Short Circuit Current Isc (A)	1.01-1.06	0.99-1.04	0.74-0.78	0.57-0.60	0.60-0.62	0.92-0.96	1.04-1.09	1.21-1.305

\* can be customized upon request

## Mechanical Characteristics

Standard Size (W×L)	1,100 mm x 1,300 mm
Thickness	Front: 3.2mm low iron glass PVB: 0.76mm Back: 3.2mm tempered glass
Weight	23kg
Maximum Size	2,200 mm x 2,600 mm
Junction Box (LxWxH)	Yukita pen type (9mmx9mmx130mm)
Connectors	MC3 compatible

## Electrical Data

Maximum System Voltage (V)	1000 (600UL**)
Bypass Diodes	Optional
Reverse Current Overload(A)	3

\*\* Required to maintain UL compliance.

## Qualifications and Certificates

Salt-Mist Test	Salt solution concentration:20%
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## Limited Warranty

Material and Workmanship Warranty	5 Years
90% of the minimal rated Power Output	10 Years
80% of the minimal rated Power Output	25 Years

## Temperature Coefficients

Nominal Operation Cell Temperature(NOCT)	45°C
Temperature Coefficient of Pmpp (%/K)	- 0.25
Temperature Coefficient of Voc (%/K)	- 0.30
Temperature Coefficient of Isc (%/K)	+0.07



# Auria Micromorph Thin Film Modules

## Electrical Characteristics (STC: 1000W/m<sup>2</sup> ; 25°C ; AM1.5) \*

Product Name	M115000	M120000	M125000	M130000	M135000	M140000
Rated Power (W <sub>p</sub> ± 3%)	115	120	125	130	135	140
Max. Power Voltage V <sub>mpp</sub> (V)	93.9	96.0	98.5	99.1	99.7	100.3
Max. Power Current I <sub>mpp</sub> (A)	1.22	1.25	1.27	1.31	1.35	1.40
Open Circuit Voltage V <sub>oc</sub> (V)	127.5	129.8	132.5	133.1	133.7	134.2
Short Circuit Current I <sub>sc</sub> (A)	1.49	1.51	1.52	1.56	1.59	1.63

\* All values ±5% unless specified otherwise.

## Low Irradiation Electrical Characteristics (200W/m<sup>2</sup> ; 25°C ; AM 1.5) \*

Product Name	M115000	M120000	M125000	M130000	M135000	M140000
Rated Power (W <sub>p</sub> ± 3%)	23	24	25	26	27	28
Max. Power Voltage V <sub>mpp</sub> (V)	87.0	89.0	91.3	91.9	92.4	93.0
Max. Power Current I <sub>mpp</sub> (A)	0.27	0.27	0.27	0.28	0.29	0.30
Open Circuit Voltage V <sub>oc</sub> (V)	115.4	117.5	119.9	120.4	121.0	121.5
Short Circuit Current I <sub>sc</sub> (A)	0.34	0.34	0.35	0.35	0.36	0.37

\* All values ±5% unless specified otherwise.

## Qualifications and Certificates

TÜV Rheinland	IEC61646 & IEC61730, ID0000024521
UL1703	ETL No. 3196826
CE/CEC	Certified
California CEC	Certified
Australia CEC	Certified
Salt-Mist Test	Salt solution concentration:20%

## Mechanical Characteristics

Dimensions(W×L)	1,100 mm x 1,300 mm
Thickness	6.8 mm (without Junction Box)
Weight	23kg
Frame	Optional upon request
Junction Box	Multi-Contact, with Bypass Diode
Connectors	MC4 compatible
Glass Type	Front: 3.2mm low iron glass Back : 3.2mm tempered glass

## Limited Warranty

Material and Workmanship Warranty	5 Years
90% of the Minimal Rated Power Output	10 Years
80% of the Minimal Rated Power Output	25 Years

## Electrical Data

Nominal Operation Cell Temperature(NOCT)	45°C
Temperature Coefficient of P <sub>mpp</sub> (%/K)	- 0.25
Temperature Coefficient of V <sub>oc</sub> (%/K)	- 0.30
Temperature Coefficient of I <sub>sc</sub> (%/K)	+0.07
Maximum System Voltage (V)	1000 (600UL**)
Reverse Current Overload (A)	3

\*\* Required to maintain UL compliance.





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