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The Black-Faced Spoonbill

is one of the rarest birds on the planet. Only 2041 of them, at most, left in the world as recorded in January 2009. Every year, they will 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 determine to answer the need of its customers and promise to deliver its best products.



otographer / Pan Pai-tsun



Micromorph Solar Modules

Company Profile

Auria Solar, founded in Oct. 2007, 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, Auria Solar has been able to produce modules with stabilized 120W output power and 9% conversion efficiency from its superior production line, and more than 20 patents have been filed for these world-class high-efficiency modules. The objectives of Auria Solar are to manufacture photovoltaic modules of 10% stabilized efficiency by 2010 and to reach the grid-parity, \$1/W, by 2011. Auria Solar aims to offer the world with sustainable energy by high-efficiency, high quality, and low-cost micromorph photovoltaic modules.

Corporate Mission

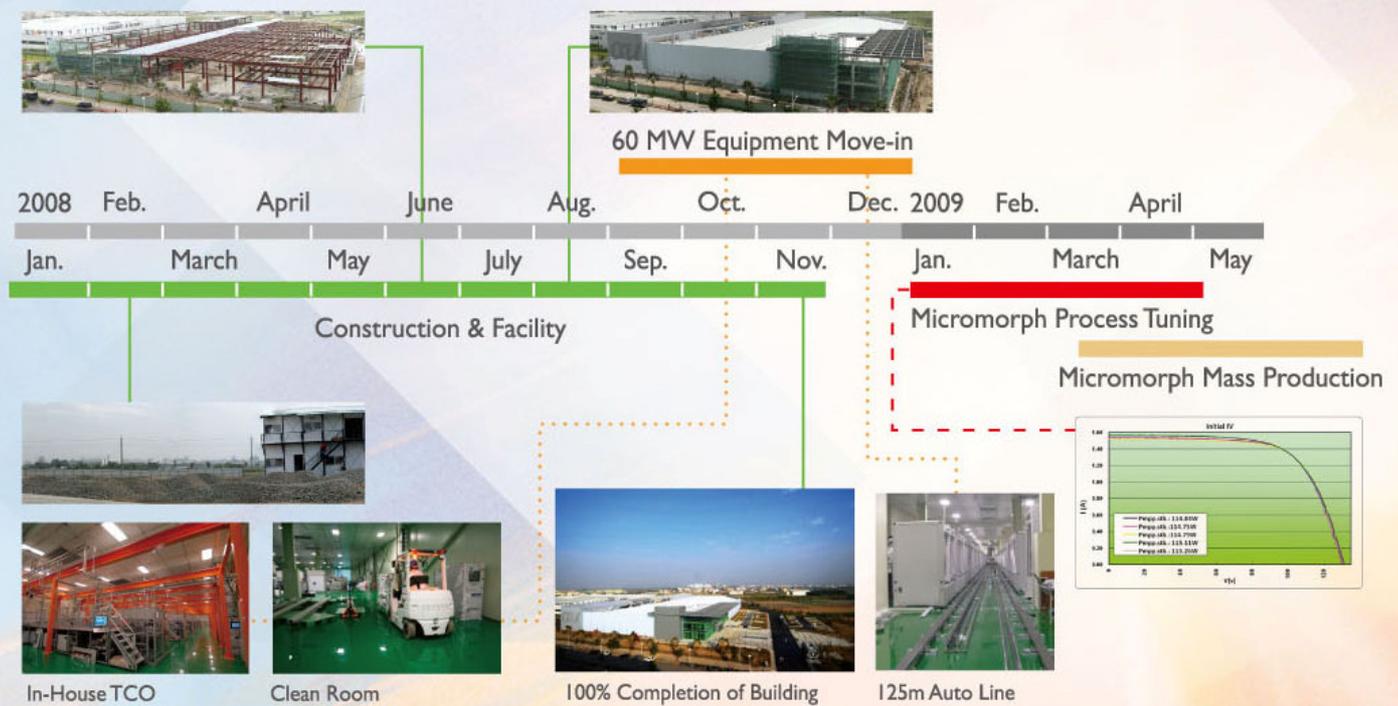
- * Auria Solar will power the world with clean and sustainable energy by high-efficiency micromorph photovoltaic modules.
- * Auria Solar aims to be the leader of the next generation micromorph thin-film solar modules 10% stabilized efficiency by 2010.
- * Auria Solar aims to reach the grid-parity, \$1/W, by 2011.



Auria Solar at a glance

Auria Solar is located in Tainan Science Park, Taiwan.
 Auria factory area: 23,000m²
 Auria clean-fab (Class I, 1,000~10,000) : 7,571m²
 The construction period: Feb. ~ Nov. / 2008
 The facility move-in period: Sep. ~ Dec. / 2008
 Worldwide largest single line Micromorph Capacity : 60MW

Solid Schedule Control in Auria (Construction & Move-in)

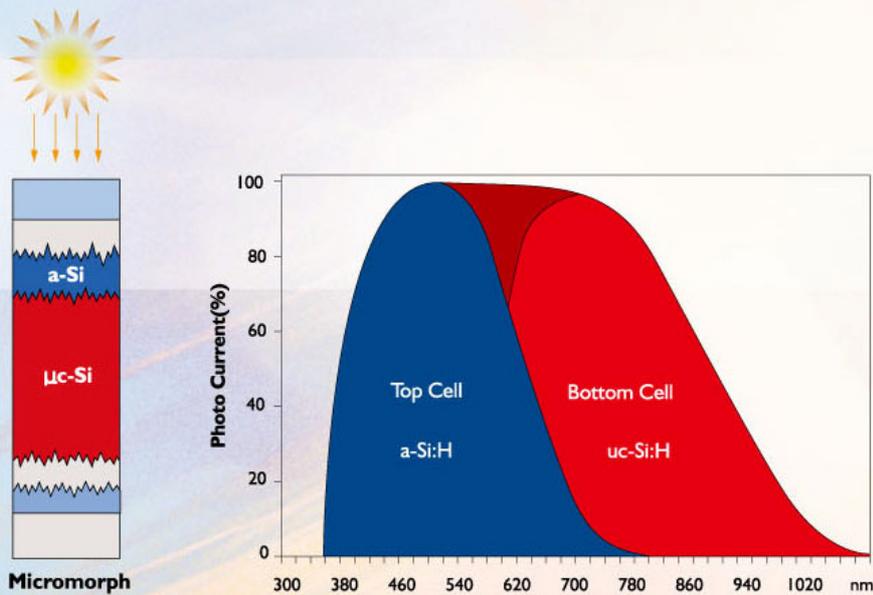


Technology

Auria micromorph thin film solar modules consist of two silicon layers, amorphous and microcrystalline thin films, allowing a broader use of the whole sun light spectrum.

1. Auria technology improves the module efficiency up to 50 percent and dramatically increases the shunt resistance, offering an advantage of competitive energy yield for our customers.
2. Auria micromorph modules, using non-toxic, abundant, and air-stable silicon, will lead the PV market in the near future.

The Comparison of Lattice Structure between Microcrystal and Amorphous Silicon



Auria Superior Production Line



Excellent VHF PECVD



Excellent VHF PECVD



Ultra-precise Laser-scribing



Robust mechanical design with double glasses and PVB

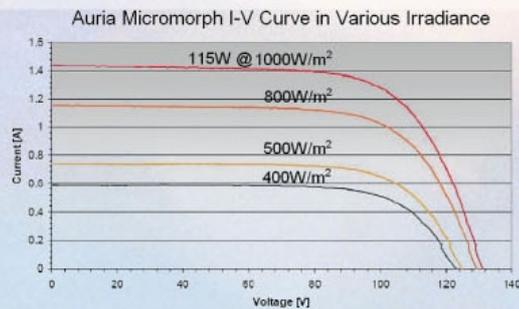
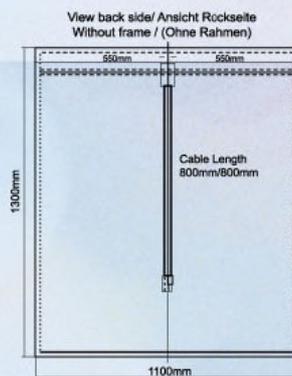


Auria Micromorph Thin-Film Photovoltaic Modules

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

Product Features:

1. Much higher energy yield
 - Better temperature coefficient leads to 7% more energy gain, compared to conventional wafer-based modules
2. Higher energy yield in low light environment due to high Rsh (Shunt Resistance)
3. The finest reliability
 - 50% longer product life-span from outstanding performance of damp-heat test
4. Total solution for mounting system ensures easy, quick, and optimized installation
5. Robust structure with double glasses design and PVB lamination material
6. 20-year long product warranty
7. Certified by IEC 61646 & 61730 : ID 0000024521 (TÜV Rheinland)



Certification by TÜV Rheinland



Why Auria Solar

- **Leading Technology in Micromorph**

1. In-House TCO allows for cost reduction and efficiency improvement.
2. Excellent VHF PECVD delivers superior thin films and guarantees high efficiency.
3. Ultra-precise laser-scribing minimizes the dead-zone and increases efficiency.

- **Experienced and innovative R&D team**

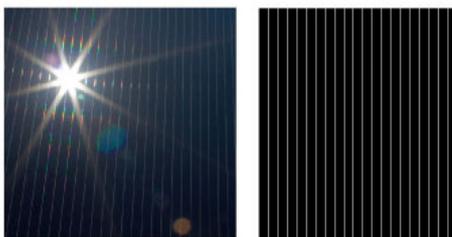
1. More than 20 patents have been filed to significantly increase modules' efficiency.
2. Several R&D projects funded by Taiwanese Government have been granting Auria Solar with sufficient resources to execute its first-rate R&D work.

- **Premium Quality Control**

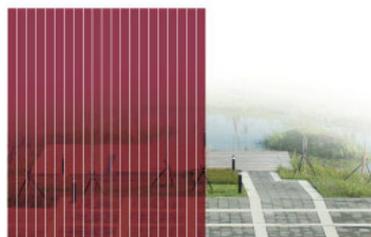
1. Auria runs Enterprise Resource Planning (ERP) software from SAP to record every raw material source and provide the module life time traceability.
2. Highly quality clean room at class-1000 level to reduce the particle pollution and hence increase the product reliability.
3. 100% fully automated production line with advance MES system, eliminating the mistake of manual operation.

- **The uniqueness of Auria's product**

1. Modules of adjustable transparency according to customers' specifications.
2. Modules with extraordinary high shunt resistance, implying an excellent low-light performance (much higher energy yield)
3. Modules with low temperature coefficient and thus high-yield of actual annual energy output.



Micromorph Solar Modules



Micromorph See-through Modules

Auria Micromorph Thin Film Modules

Auria M-series Product Specification

Electrical Characteristics (STC: 1000W/m²; 25°C; AM1.5)

Product Name	M105000	M110000	M115000	M120000	M125000	M130000	M135000	M140000
Rated Power (Wp ± 5%)	102.5	107.5	112.5	117.5	122.5	127.5	132.5	137.5
Max. Power Voltage Vmpp (V)	91.9	92.6	93.3	94.0	94.6	95.2	95.8	96.3
Max. Power Current Imp (A)	1.12	1.16	1.21	1.25	1.29	1.34	1.38	1.43
Open Circuit Voltage Voc (V)	125.3	126.3	127.3	128.3	129.3	130.2	131.2	132.2
Short Circuit Current Isc (A)	1.38	1.41	1.45	1.49	1.53	1.57	1.60	1.64
Open Circuit Voltage Initial(V)	127.5	128.5	129.5	130.5	131.5	132.5	133.5	134.5
Short Circuit Current Initial(A)	1.46	1.50	1.54	1.58	1.62	1.66	1.70	1.74

Maximum System Voltage (V)

1000

Bypass Diodes

1

Reverse Current Loading (A)

3

Qualifications and Certificates (TÜV Rheinland)

IEC 61646	ID:0000024521
IEC 61730	ID:0000024521
CE	Available

Limited Warranty

Material and Workmanship Warranty	5 Years
90% of the Minimal Rated Power Output	10 Years
80% of the Minimal Rated Power Output	20 Years

Mechanical Characteristics

Dimensions (w x l)	1,100 mm x 1,300 mm
Thickness	6.8 mm (without Junction Box)
Weight	25kg
Frame Material	Optional
Junction Box	Multi-Contact, PV-JB / K-2 / N2, 5SOL / 065025
Connectors	MC4 compatible

Temperature Coefficients

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

Low Irradiation Electrical Characteristics (200W/m²; 25°C; AM 1.5)

Product Name	M105000	M110000	M115000	M120000	M125000	M130000	M135000	M140000
Output Power (Wp)	21.6	23.0	24.3	25.8	26.4	27.0	28.6	29.1
Max. Power Voltage Vmpp (V)	90.0	92.0	93.5	95.5	98.0	100.0	102.0	104.0
Max. Power Current Imp (A)	0.24	0.25	0.26	0.27	0.27	0.27	0.28	0.28
Open Circuit Voltage Voc (V)	117.5	118.5	119.5	120.0	120.5	122.5	123.5	124.0
Short Circuit Current Isc (A)	0.29	0.29	0.30	0.30	0.31	0.31	0.32	0.32



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