



Aston Group 2023

September, 2023



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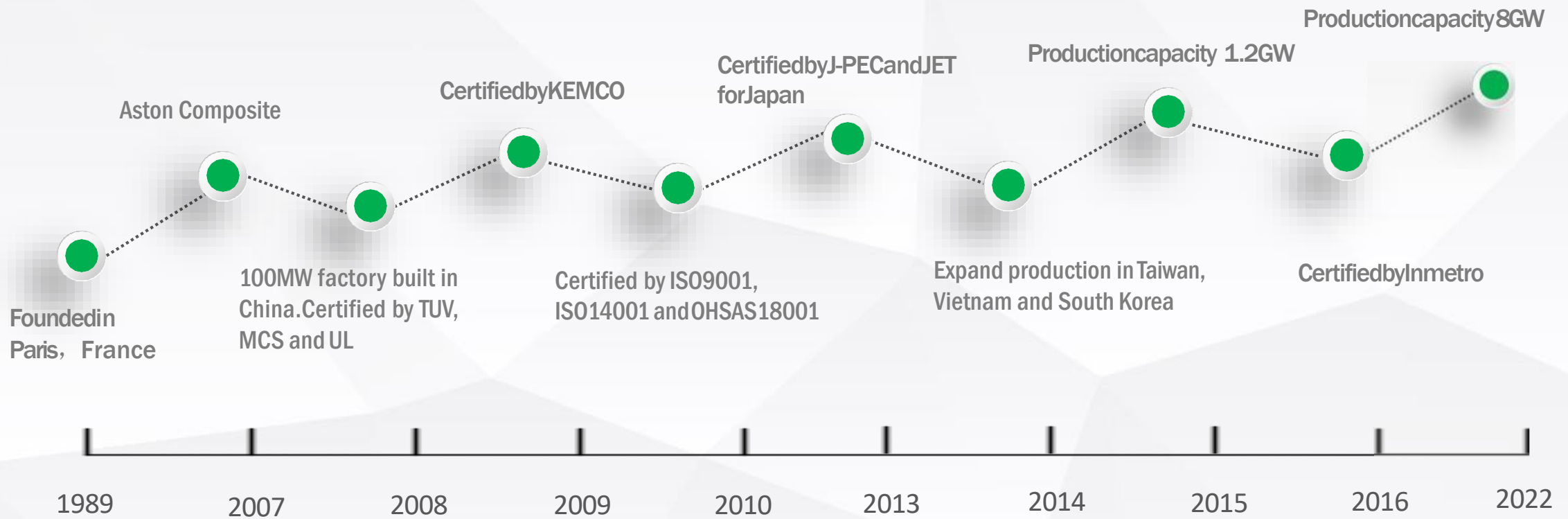
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- ✓ Vision and Mission
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- ✓ To develop and enhance solar technology, provide the most reliable and affordable solar energy in global markets.
- ✓ To gain complete control over a vertical-value-chain, from manufacturing materials and modules to providing solar technical services for solar systems and power plants.
- ✓ To be a worldwide leader in PV technology.
- ✓ To be an ESG company taking more social responsibilities.



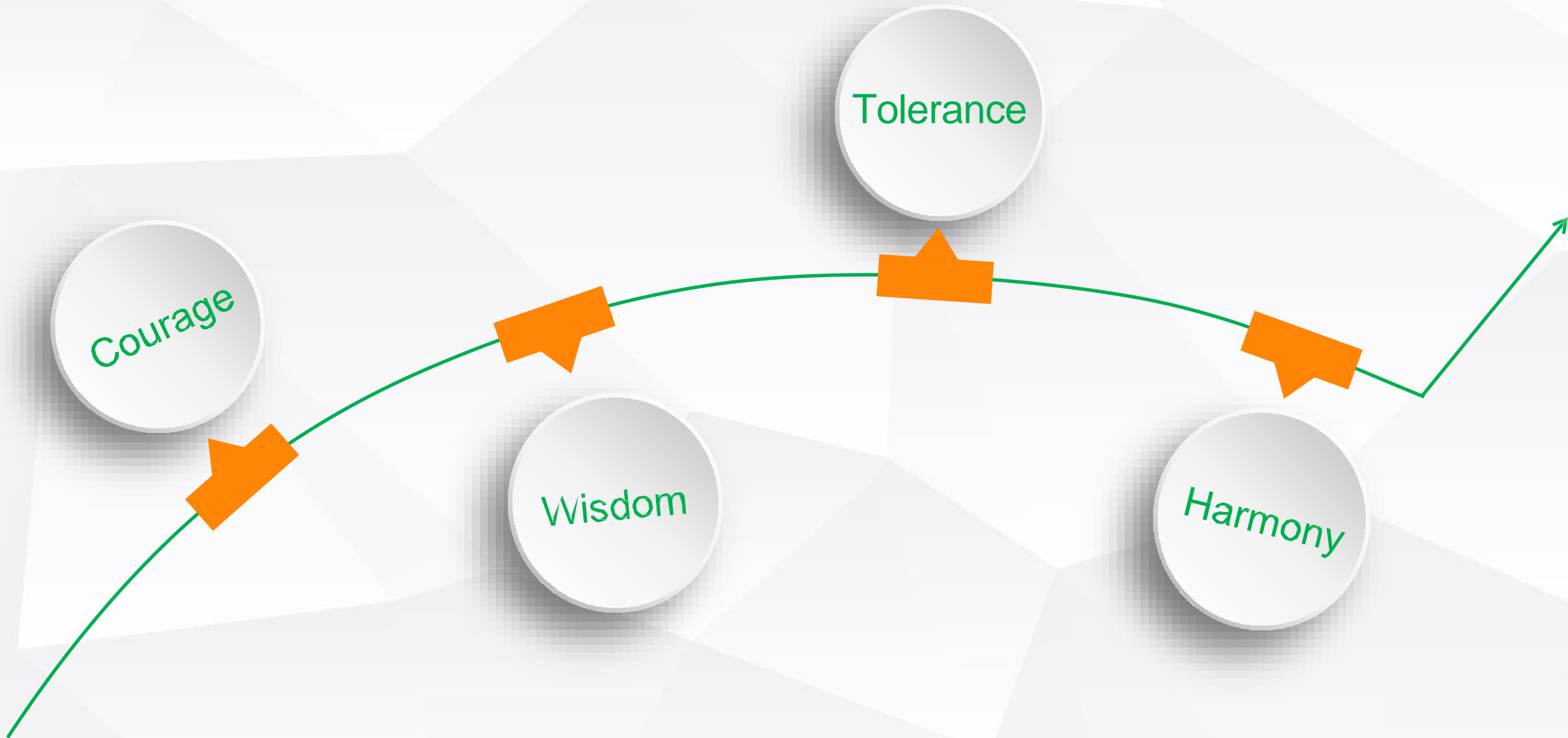
History





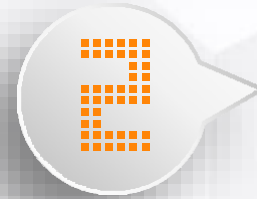
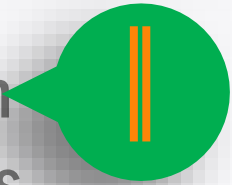
Continuously invest in PV technology development, control and lower down material and manufacturing cost, and provide the best and most affordable solar energy for global customers.





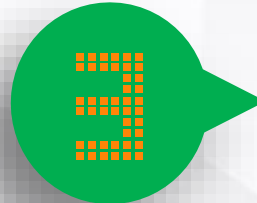
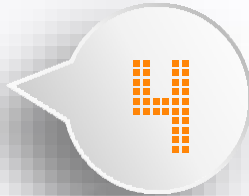
Competitive Advantages

Worldwide Leading Solar Technology (PERC, Topcon and HJT)-over 150 patents



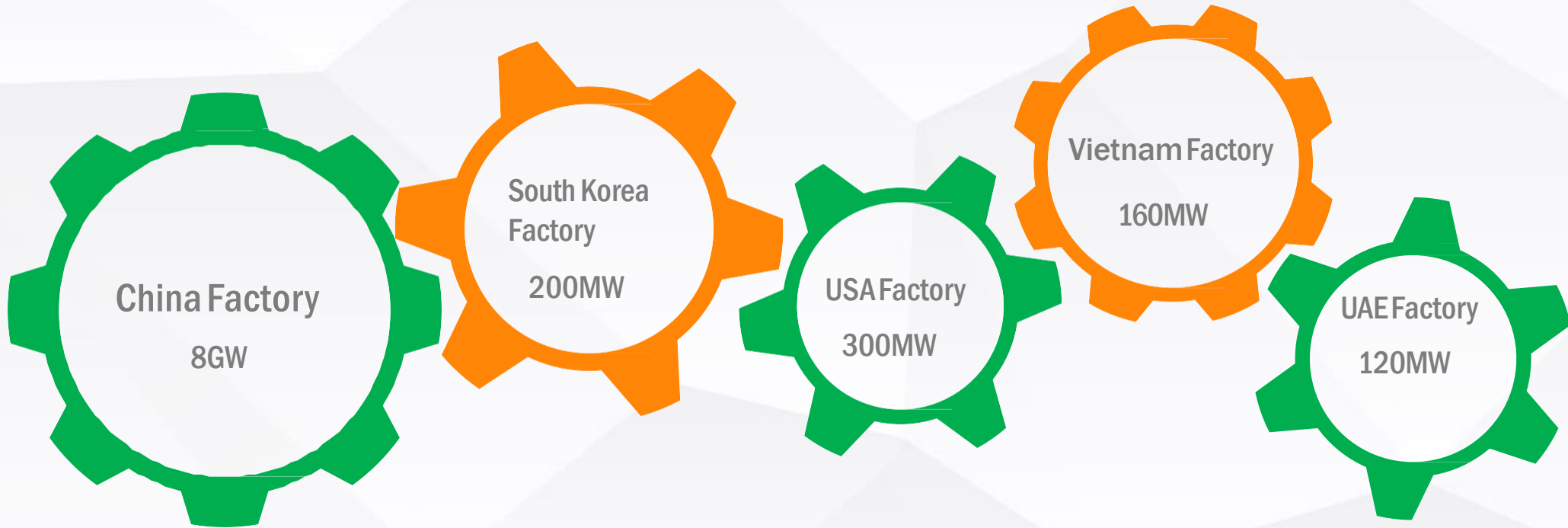
Highest-efficiency solar modules and most competitive prices

Global Manufacturing Bases, no Anti-Dumping Tariff for USA markets

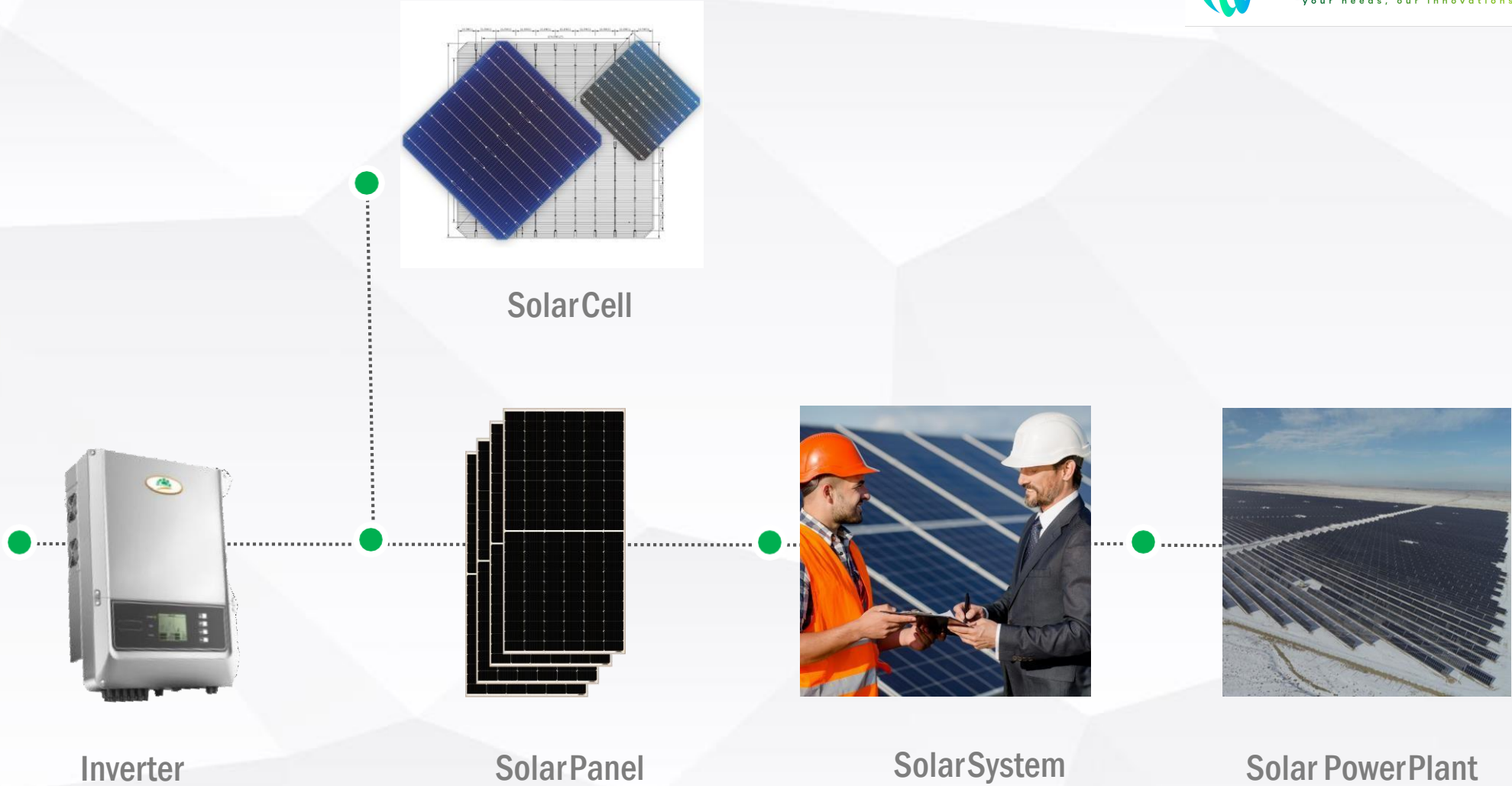


Global Door-to-Door Logistics Services 7/24





Worldwide Production Capacity Reaches 9Gw in 2022



■ Production lines



Laying

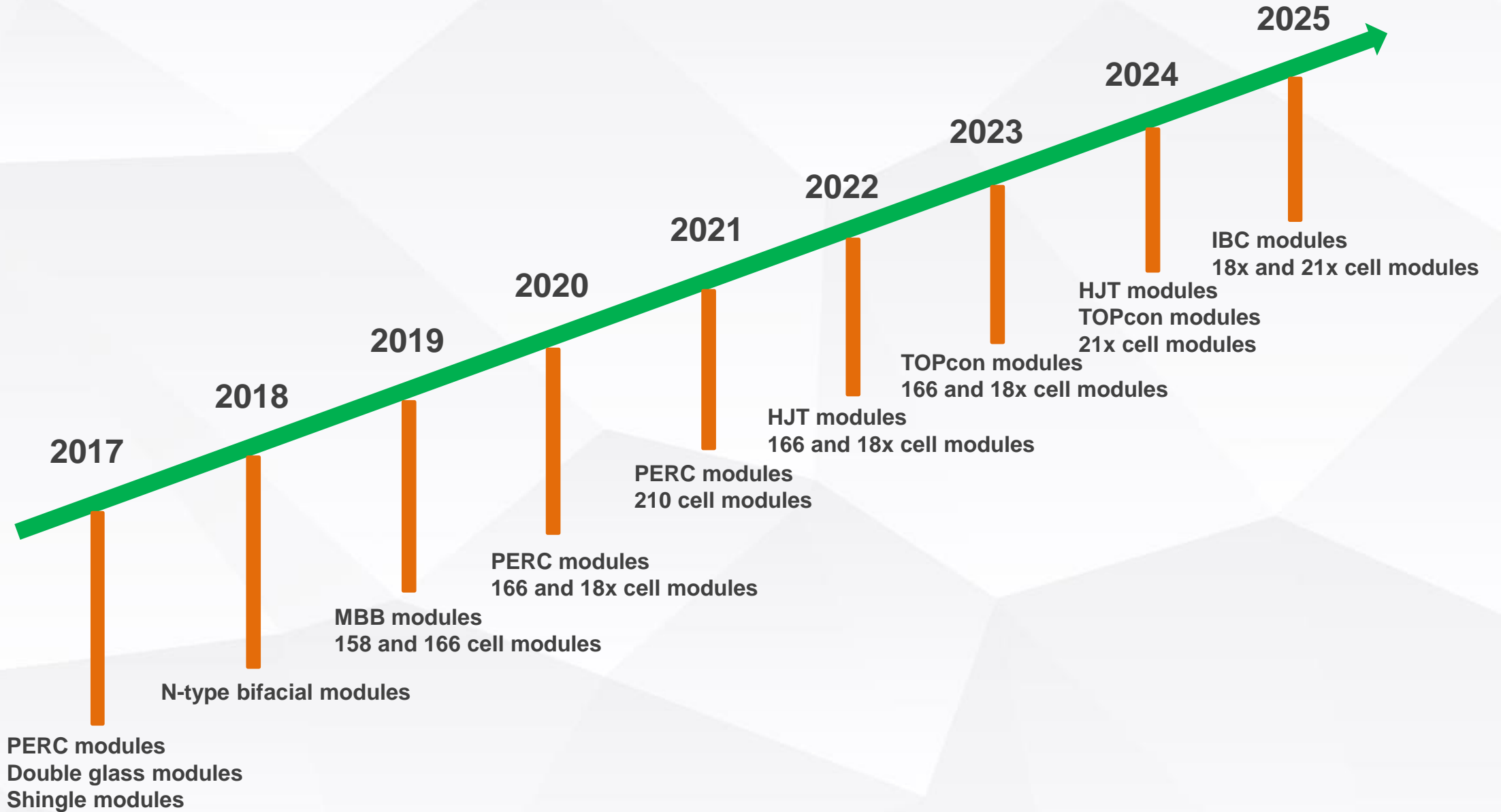
Automatic Soldering

Laminating

EL testing



Technology R&D Roadmap

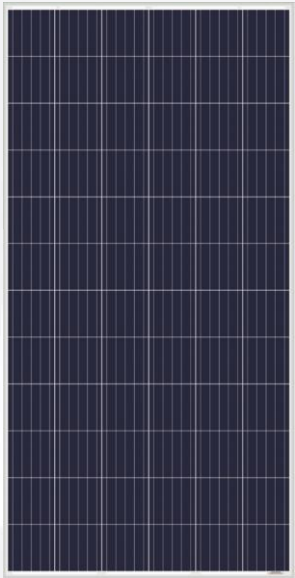


■ Main Products (I)

Poly AS-6P

Output up to 350 Watt

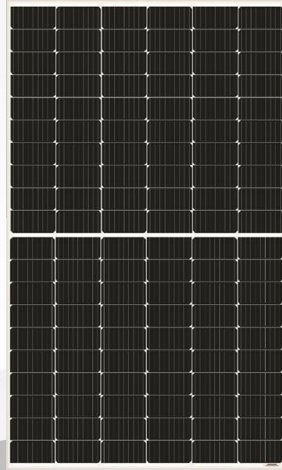
72pcs of 6 inch cells



AS-6M120-HC

Output up to 385 Watt

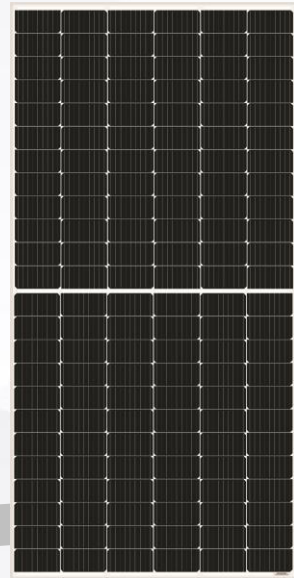
120pcs of 166mm cells



AS-6M144-HC

Output up to 465 Watt

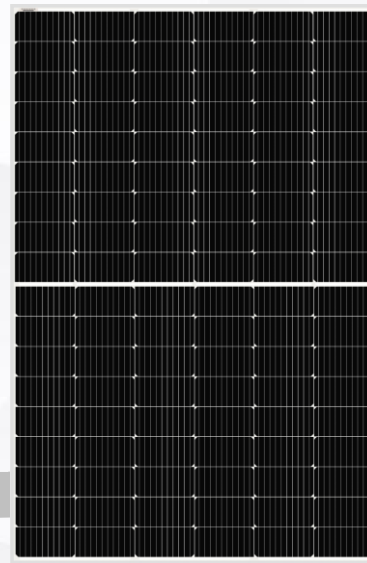
144pcs of 166 mm cells



AS-7M108-HC

Output up to 415Watt

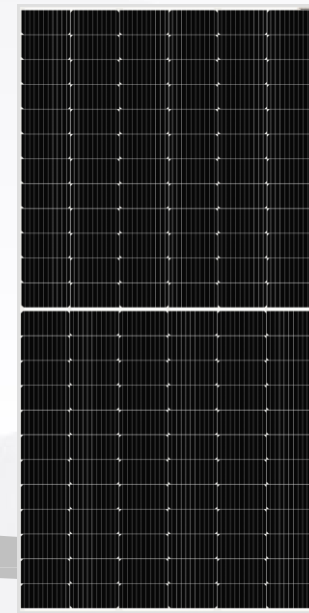
108pcs of 182mm cells



AS-7M144-HC

Output up to 555 Watt

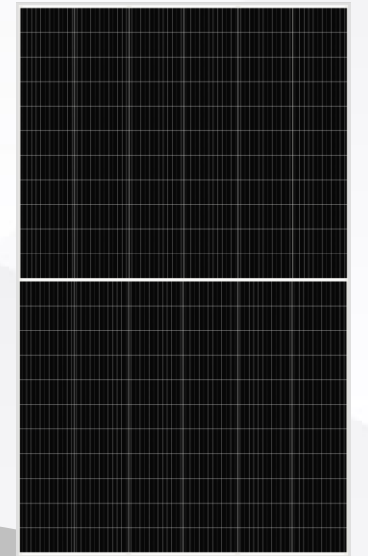
144pcs of 182mm cells



AS-8M132-HC

Output up to 665 Watt

132pcs of 210mm cells



■ Main Products (II)-New Topcon and HJT technology



HJT Module

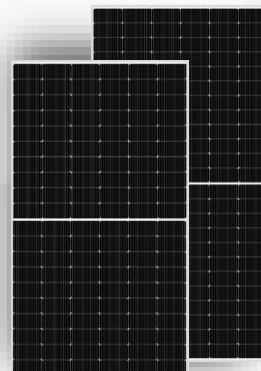
The most advanced **HJT cell technology**

Super high efficiency

High bifaciality

More Power Gain up to **30%**

High reliability due to MBB and half-cell design.



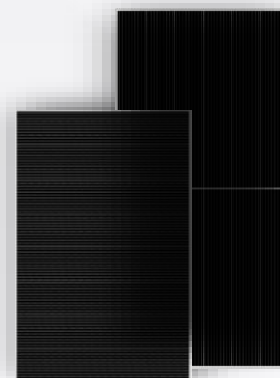
TOPCon Modules

Advanced **N-type TOPCon cell technology**

Ultrahigh power and efficiency

Extremely low LID and LETID

Lower LCOE, reduced BOS.

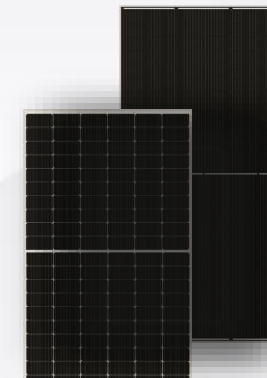


Tiger Plus Module

Unique **1/4-cut cell technology**
Flexible back circuit

Super flexible interconnection technology realizes zero gap connection of cells without micro-cracks.

Flexible back circuit encapsulation technology



TigerOne Modules

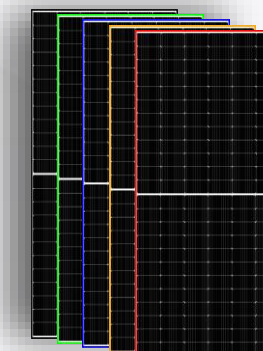
Half-cell design and MBB cell technology.

Super strong Al-Zn-Mg(AZM) alloy coated steel frame

Higher mechanical strength

Lower product cost and logistic cost

More loading quantity



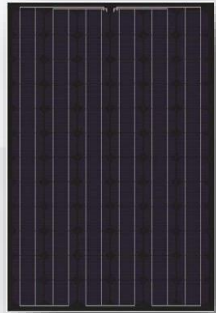
Colorful Frame Modules

Higher mechanical strength by **GPRU composite frames**

Lightweight and easy, fast installation

Aesthetic appearance with color composite frames

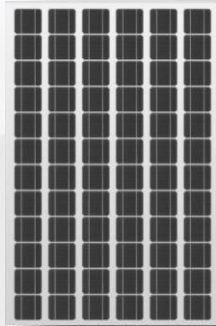
■ Main Products (III)



SuperThin

All black appealing design with black backsheet and frame.

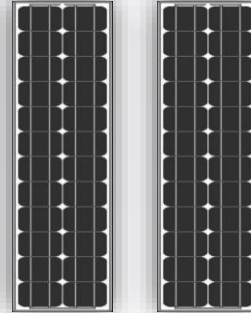
Easy handling due to super thin frame and light weight



Double Glass

Aesthetically appealing design with Double Glass backsheet especially for skylight, roofing and facades applications.

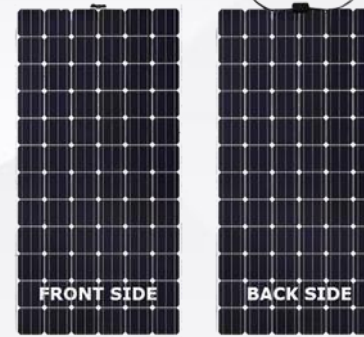
High module conversion efficiency up to 20.36% through advanced manufacturing technology.



Agility™

High module conversion efficiency up to 16.11% through advanced manufacturing technology.

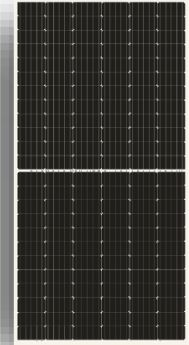
Robust aluminum frame ensures the modules to withstand wind loads up to 3600Pa.



Bifacial

High module conversion through the use of advanced bifacial cell technology.

The back side of the module can generate electricity from the ambient light reflected by surrounding surfaces, which can yield up to 30% gain in power generation per square meter.



Half-cell

High module conversion efficiency up to 20.36% by using Half-cell design.

Reduced Power Loss, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.



ESS-3.6kW/5kW/10kW

1) Independent

- Built-in EMS function with multi-mode operation
- Real uninterruptible power supply, switching time <20ms
- Stronger back up power

2) Simple

- All-in-one design
- Modular installation & Quick plug connector (battery module)
- Multiple battery expansion & Multiple system expansion

3) Safe

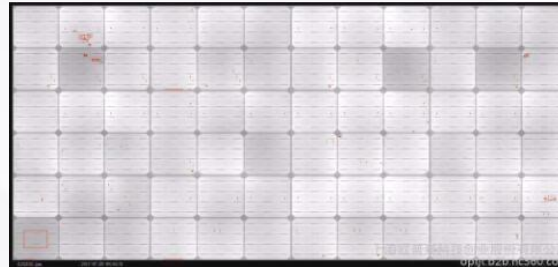
- Safest LiFePO4 battery with long lifespan
- Physical and electrical dual isolation
- Modular fire protection integration
- AFCI function integration

4) Smart

- Multi-point real-time monitoring, adaptive SOC management
- PACK-level battery management, active balance of charging and discharging
- Intelligent energy management

Strict Quality Control System

EL Recording



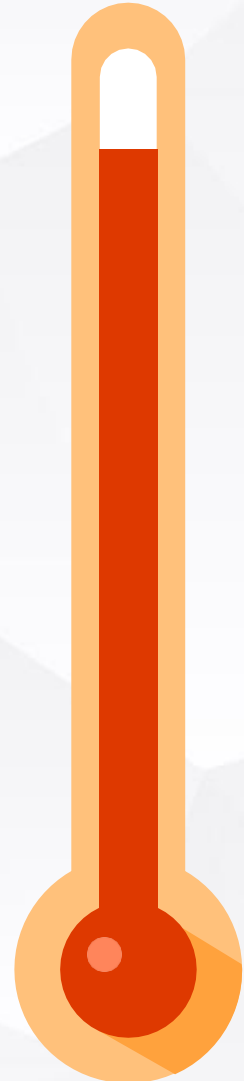
EL TEST



EL TEST



Each piece of solar module has been strictly tested and only **100%** Qualified products could be delivered to our clients worldwide.



30-Year Warranty and Commercial Insurance



30-Year-Warranty



R&D Exclusive Patents



CHUBB Insurance

- ✓ Guaranteed power output: 0 ~ +3%
- ✓ Over 20 years repair & replacement product warranty
- ✓ Over 12 years 91.2% power output warranty
- ✓ Over 30 years 80.6% power output warranty
- ✓ Over 150 patents for Amerisolar modules to ensure perfect products
- ✓ Product ranges from 70w to 665w
- ✓ High efficiency solar cell up to 23.9%
- ✓ High-transmission-rate glass with Anti-reflecting coating
- ✓ Robust aluminum frames which ensure modules to withstand
- ✓ snow loads up to 5400Pa
- ✓ Water proof junction box plus MC4 connectors
- ✓ USA Insurance Company 500 Fortune



Leading Manufacturing and Quality - Proven Certificated by Third Party Authorities:

- ✓ PID Free
- ✓ Salt Mist Approved
- ✓ Fire Test Approved



The Performance Ratio of Amerisolar mono 190W solar panel (made in 2007) is 99.9%, which is the highest compared to other first-class manufacturers in the world.

Test Laboratory

A couple of years ago, PHOTON Europe GmbH decided to build its own test lab, resulting in the creation of PHOTON laboratory, located at the company's headquarters in Aachen, Germany. The lab was established as a means to perform independent evaluations of inverters and modules.

Solar modules in PHOTON Lab's test field

The table starting on this page shows data for modules in PHOTON Laboratory's test field during 2011 and January 2012. The table shows full-year results for 2011, when available, as well as monthly statistics for January.

Note that the results from just 1 month tell us nothing about how the modules function over the course of a year. For instance, modules that perform well under direct solar irradiation, and that therefore deliver high yields in the summer months, can see considerable reductions in performance during fall and winter (when the share of diffuse irradiation is higher). The opposite scenario is also possible. Naturally, the summer months play a disproportionately large role in annual yield calculations.

One should also take the installation date of each module into account when comparing figures in these tables. To ensure that test conditions are as realistic as possible, we do not clean the modules on the test field.

PHOTON Lab's outdoor module tests: Results of 2011 and January 2012 yield measurements

Manufacturer	Model	Cell type	Origin	Production dates**	Installed in	STC power (W)	2011 rank	Performance Ratio 2011	Performance Ratio January 2012	Yield January 2012 (kWh/kW)
Aide Solar Energy Technology	AD190M-A6	Monocr.	CN	9/2011	1/2012	190.0	1	99.9%	99.9%	29.7
Aide Solar	AS-19.225	Multi	DE, ES	2/2011	2/2011	230.5	15	87.6%	97.3%	30.7
Alex Solar Energy & Technology	ALM-190D-24	Monocr.	CN	2/2011	1/2012	187.8	1	93.8%	93.8%	29.5
Amerisolar, Worldwide Energy & Manufacturing	AS-1M-190W	Monocr.	---	---	1/2012	190.0	---	99.9%	99.9%	29.5
Amerisolar, Worldwide Energy & Manufacturing	AS-190-230W	Multi	---	---	1/2012	230.0	---	96.4%	96.4%	30.1
Apollo Solar Energy	230GEM	Multi	---	---	1/2012	230.0	---	101.8%	101.8%	30.1
Astroenergy	CHM5612M-195	Monocr.	---	---	1/2012	187.4	---	94.1%	94.1%	29.2
Astroenergy	CHM5613P-230	Multi	---	---	1/2012	234.2	---	91.4%	91.4%	28.8
Axtec	AC-230P136-605	Multi	DE	Through 2011	2/2011	232.9	---	96.4%	96.4%	30.4
Axtec	AC-230M156-605	Monocr.	CN, EU	---	1/2012	240.9	---	97.3%	97.3%	29.8
Bisul	BMI-215-2221	Multi	SI	2/2011	2/2011	225.1	8	86.2%	93.1%	29.3
Bisul	BMI-215-2232	Multi	SI	2/2011	2/2011	234.2	---	97.0%	97.0%	30.6
Bosch Solar Energy	Bosch c-Si M 60 230	Monocr.	DE	2009-2010	2/2011	233.2	---	96.4%	96.4%	30.1
BP Solar International	BP-230 T	Multi	CN	Through 2011	2/2011	232.5	---	96.5%	96.5%	30.5
BP Solar International	BP-230 F	Multi	---	Through 2011	4/2011	247.4	---	97.7%	97.7%	30.7

丘博保險(中國)有限公司江苏省分公司
CHUBB INSURANCE (CHINA) COMPANY LTD., JIANGSU BRANCH
 CHUBB
 中國江蘇省南京市建寧路1號 1001, 1002, 1003 郵編: 210019 電話: (86 25) 8670141 傳真: (86 25) 85218888
 The 100110021003, Jintan Road, 100 100 London Road, Jiangsu District, Nanjing, Jiangsu Province, 210019, P.R. China Tel: (86 25) 8670141 Fax: (86 25) 85218888
 南京英華路 1 號 1001, 1002, 1003 郵編: 210019 電話: (86 25) 8670141 傳真: (86 25) 85218888

ACORD-20 **CERTIFICATE OF LIABILITY INSURANCE** No. **93519144C2** DATE: **May 15, 2013**

PRODUCER:
WADE WANG
 Unit 901-905 and 907-908, Kerry Parkside Office Building, No. 1155, Fang dan Road, Pudong New District, Shanghai

INSURED:
 Worldwide Energy and Manufacturing (Nantong) Co., Ltd.
 Worldwide Energy and Manufacturing USA Co., Ltd.
 No. 88, Qifeng Road, Rugao City, 226500, Jiangsu Province, China
 RM 1708 C1, Wan Fung Tower, 173 Desvoeux RD Central, Hong Kong

INSURER A: Chubb Insurance (China) Company Limited, Jiangsu Branch
INSURER B:
INSURER C:
INSURER D:

COVERAGES:
 THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENTS WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. ADEQUATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

DESCRIPTION	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY X CLAIMS MADE OCCURRENCE GENERAL AGRGREGATE LIMIT APPLIC PER POLICY	93519144	04/20/2013	04/20/2014	EACH OCCURRENCE PER OCCURRENCE (Any one day) PER YEAR (Any one period) PER POLICY (Any one period) U.S.D. 1,000,000.00
	GENERAL AGRGREGATE LIMIT APPLIC PER POLICY				U.S.D. 1,000,000.00
	PROJECT LOCATION				
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS RENTED AUTOS HIRED AUTOS NON OWNED AUTOS				COMBINED SINGLE LIMIT BODILY INJURY (Any one person) PROPERTY DAMAGE (Ag. or other) U.S.D. 1,000,000.00
	GARAGE LIABILITY ANY AUTO				PROPERTY DAMAGE (Ag. or other) AUTO THEFT EACH OCCIDENT OTHER THAN AUTO THEFT U.S.D. 1,000,000.00
	EXCESS LIABILITY CLAIMS MADE OCCURRENCE END ORACLE EXTENSION				EACH OCCURRENCE AGRGREGATE
	WORKERS COMPENSATION AND EMPLOYER'S LIABILITY				EACH OCCURRENCE AGRGREGATE
	FREIGHT OR SUBSISTENCE LIABILITY CLAIMS MADE OCCURRENCE				EACH OCCURRENCE AGRGREGATE

DESCRIPTION OF OPERATIONS, LOCATIONS, SPECIAL ITEMS
 Policy subject to Vendor's Endorsement.
 Insured Products: See the attached in World by World

CERTIFICATE HOLDER/ADDITIONAL INSURED:
WORLDWIDE ENERGY AND MANUFACTURING USA CO., LTD at the following address:
 RM 1708 C1, MAN FUNG TOWER, 173 DES VOEUX RD
 CENTRAL HONGKONG

CANCELLATION:
 SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL WRITTEN NOTICE OF CANCELLATION 60 DAYS IN ADVANCE OF CANCELLATION DATE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT WITHIN THE TIME PRESCRIBED IN SUCH POLICIES, BUT FAILURE TO MAIL SUCH NOTICE IN SUCH TIME SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES AUTHORIZED REPRESENTATIVE

Authorized Signature:

Page 1 of 1 Website: <http://www.chubb.com.cn>



Certificate Of Liability Insurance No.93519144c2

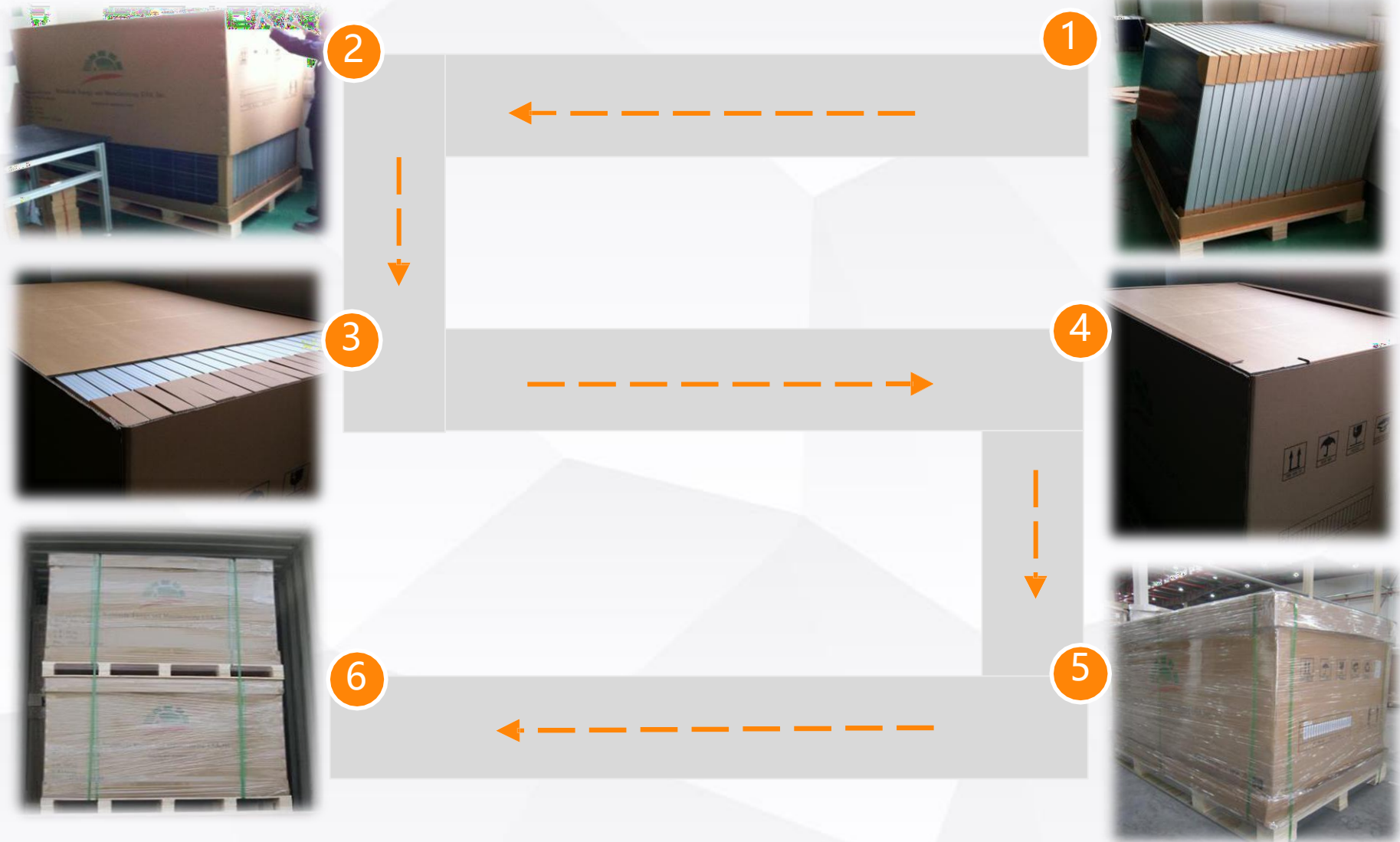


CHUBB - USA Insurance Company 500 Fortune




Insured by
 Worldwide energy and manufacturing USA Co., Limited

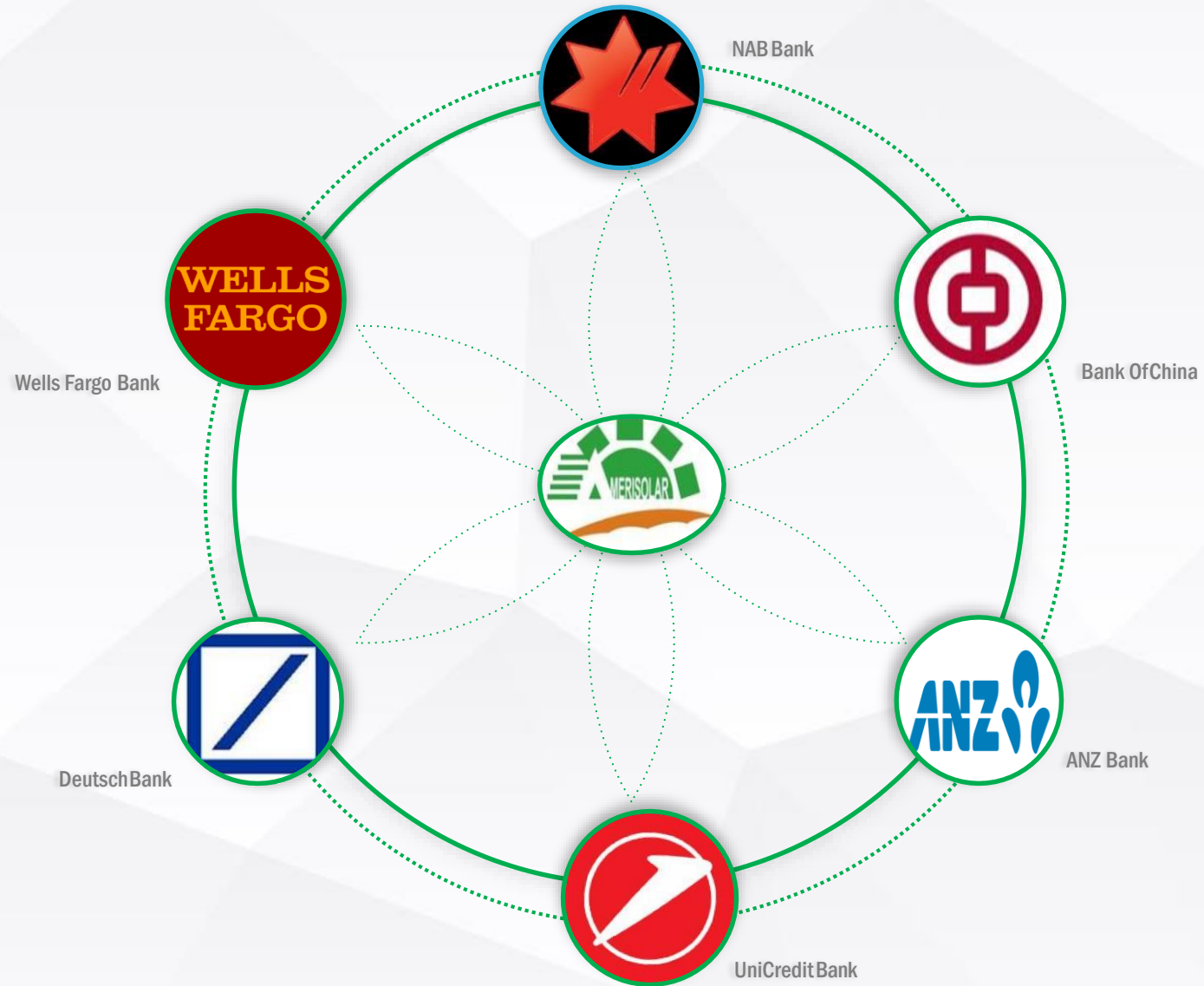
Solar Module Packing & Shipment



Bankability

 We has received a high- level evaluation for its product quality and factory facilities from PROTOS Research Institute, and been bankable in these global main banks.

PROTOS S.P.A. is a professional technical surveyor organization who is in Uni-credit's white-list.



Aston Group is awarded as TOP PV Brand in Spain and Brazil in 2021 by EuPD Research



EuPD Research Sustainable Management GmbH
congratulates



on the Award of

Top Brand PV Spain 2021

Category **Modules**

The company Amerisolar ranks among the top PV brands in Spain according to the results of a survey carried out by EUPD Research among installers on brand awareness, customers' choice and distribution.



Markus A. W. Hoehner
CEO



Global Project References



40MW 2017 in Canada



20.5 MW 2019 in India



25 MW 2015-2016 in Tinglev , Denmark



14.5MW 2011 in Italy



Total over 65MW 2019-2020 in Brazil



Total over 100MW 2017-2021 in Hungary

■ Global Project References



2MW Denizli, Turkey



35MW 2020, Vietnam



36MW 2022 in Germany



5.659MW 2016 in Belarus



3.4MW & 4MW 2018 in Ukraine



81MW 2022, Brazil

Global Project References (in 2022)

Brazil 120MW



- UK 22.5MW
- Romania 4MW/3MW/1MW
- Hungary 47MW
- Germany 36MW
- Chile 13.7MW
- Netherland 5MW
- Slovenia 1.3MW
- Haiti 1.12MW
- Brazil 65MW
- Ukraine 38MW
- Japan 8MW
- Egypt 5.6MW
- Jordan 10.3MW
- Taiwan 0.7MW
- Sri Lanka 0.4MW
- Finland 0.528MW
- Dominican 0.4MW
- Vietnam 35MW
- Poland 41MW
- SouthAfrica 18MW

Worldwide Presentation



Las Vegas



Tokyo



Abu Dhabi



Daegu



New Delhi

Sao Paulo

Munich

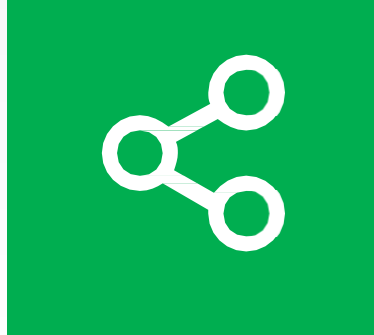
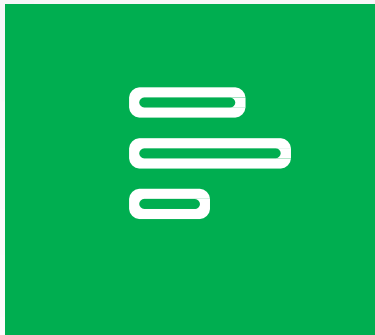


Mexico city



Thank

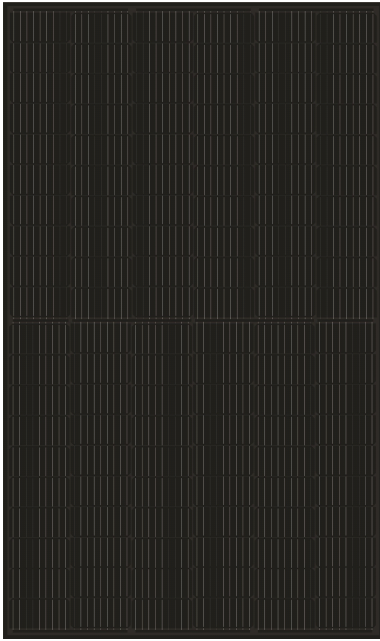
You



[Contact us Today:](#)



sales@astongroups.com



AS-6M120-HC BLACK

365W~385W

MONOCRYSTALLINE MODU

ADVANCED PERFORMANCE & PROVEN ADVANTAGES

- High module conversion efficiency up to 21.10% by using innovative Half-cell design and Multi-busbar(MBB) cell technology.
- Low temperature coefficient and excellent performance under high temperature and low light conditions.
- Robust aluminum frame ensures the modules to withstand wind loads up to 2400Pa and snow loads up to 5400Pa.
- High reliability against extreme environmental conditions (passing salt mist, ammonia and hail tests).
- Potential induced degradation (PID) resistance.
- Aesthetically appealing design with black backsheet and frame.

CERTIFICATIONS

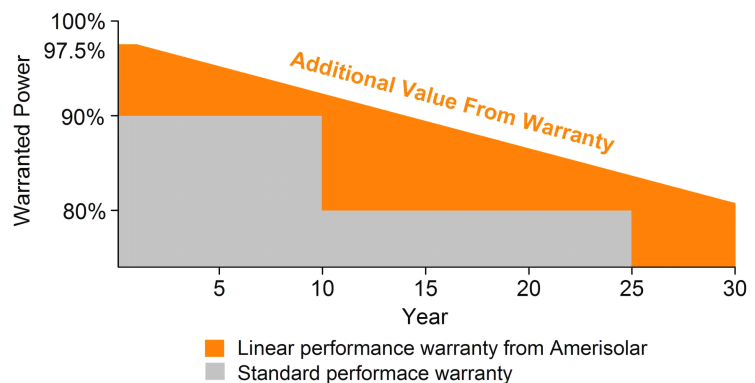


- IEC 61215, IEC 61730, UL 1703, IEC 62716, IEC 61701, IEC TS 62804, CE, CQC
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system

SPECIAL WARRANTY

- 20 years product warranty
- 30 years linear power output warranty

Passionately
committed to
delivering innovative
energy solution



ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	365W	370W	375W	380W	385W
Open Circuit Voltage (V_{OC})	41.4V	41.6V	41.8V	42.0V	42.2V
Short Circuit Current (I_{SC})	11.23A	11.30A	11.37A	11.44A	11.51A
Voltage at Maximum Power (V_{mp})	34.4V	34.6V	34.8V	35.0V	35.2V
Current at Maximum Power (I_{mp})	10.62A	10.70A	10.78A	10.86A	10.94A
Module Efficiency (%)	20.01	20.28	20.55	20.83	21.10
Operating Temperature	-40°C to +85°C				
Maximum System Voltage	1000V DC/1500V DC				
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)				
Maximum Series Fuse Rating	20A				

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of Pmax: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	271W	275W	279W	283W	287W
Open Circuit Voltage (V_{OC})	38.0V	38.2V	38.4V	38.6V	38.8V
Short Circuit Current (I_{SC})	9.09A	9.15A	9.21A	9.27A	9.33A
Voltage at Maximum Power (V_{mp})	31.4V	31.6V	31.8V	32.0V	32.2V
Current at Maximum Power (I_{mp})	8.64A	8.71A	8.78A	8.85A	8.92A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1 m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 166*83mm
Number of cells	120 (6x20)
Module dimensions	1756x1039x35mm (69.13x40.91x1.38inches)
Weight	20kg (44.1lbs)
Front cover	3.2mm (0.13inches) tempered glass with AR coating
Frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Cable	4mm ² (0.006inches ²), Length: Portrait: 300mm (11.81inches); Landscape: 1200mm (47.24inches)
Connector	MC4 or MC4 compatible

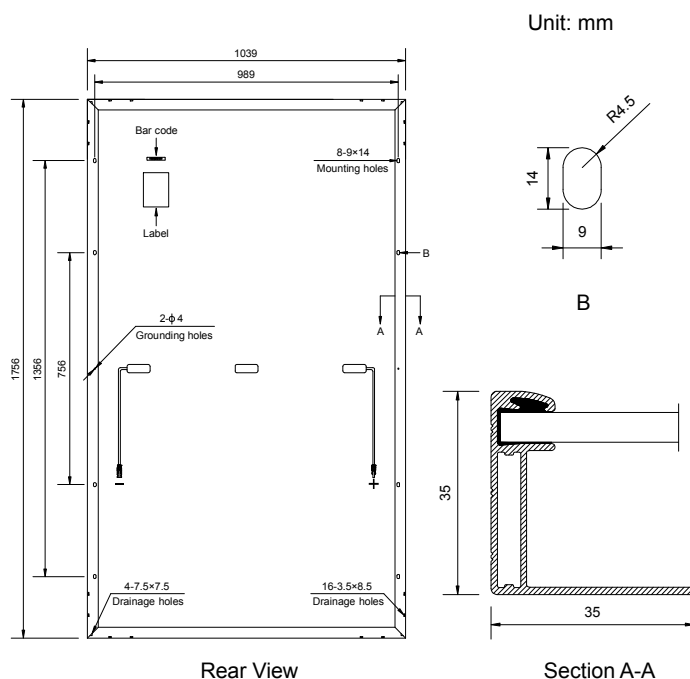
TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.36%/°C
Temperature Coefficients of V_{OC}	-0.28%/°C
Temperature Coefficients of I_{SC}	0.05%/°C

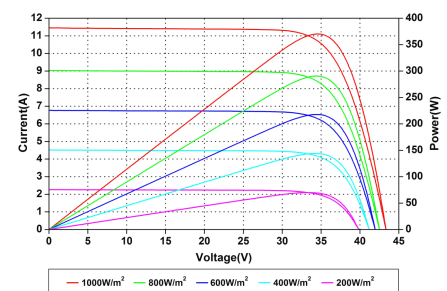
PACKAGING

Standard packaging	31pcs/pallet
Module quantity per 20' container	186pcs
Module quantity per 40' container	858pcs

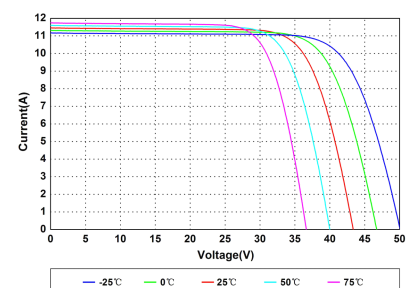
ENGINEERING DRAWINGS



IV CURVES

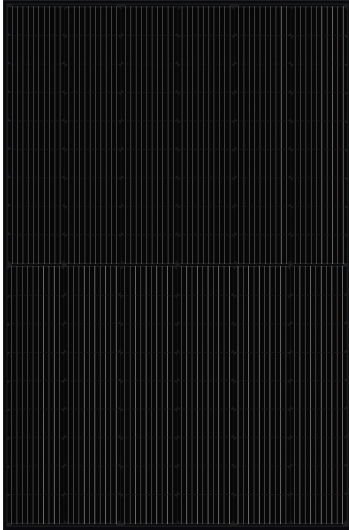


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-7M108-HC BLACK

400W~420W

MONOCRYSTALLINE MODULE

ADVANCED PERFORMANCE & PROVEN ADVANTAGES

- High module conversion efficiency up to 21.53% by using innovative Half-cell design and Multi-busbar(MBB) cell technology.
- Low temperature coefficient and excellent performance under high temperature and low light conditions.
- Robust aluminum frame ensures the modules to withstand wind loads up to 2400Pa and snow loads up to 5400Pa.
- High reliability against extreme environmental conditions (passing salt mist, ammonia and hail tests).
- Potential induced degradation (PID) resistance.
- Aesthetically appealing design with black backsheet and frame.

CERTIFICATIONS

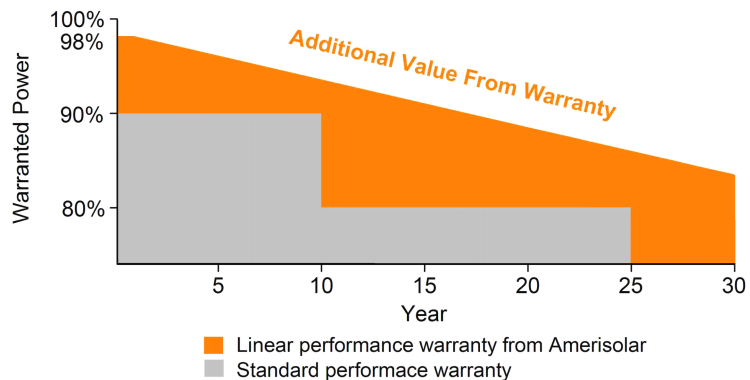


- IEC 61215, IEC 61730, CE
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system

SPECIAL WARRANTY

- 20 years product warranty
- 30 years linear power output warranty

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ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	400W	405W	410W	415W	420W
Open Circuit Voltage (V_{OC})	37.2V	37.4V	37.6V	37.8V	40.0V
Short Circuit Current (I_{SC})	13.70A	13.76A	13.82A	13.88A	13.94A
Voltage at Maximum Power (V_{mp})	31.0V	31.2V	31.4V	31.6V	31.8V
Current at Maximum Power (I_{mp})	12.91A	12.99A	13.06A	13.14A	13.22A
Module Efficiency (%)	20.49	20.74	21.00	21.25	21.53
Operating Temperature	-40°C to +85°C				
Maximum System Voltage	1000V DC/1500V DC				
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)				
Maximum Series Fuse Rating	25A				

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of Pmax: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	300W	304W	308W	312W	316W
Open Circuit Voltage (V_{OC})	34.2V	34.4V	34.6V	34.8V	35.0V
Short Circuit Current (I_{SC})	11.10A	11.15A	11.20A	11.25A	11.30A
Voltage at Maximum Power (V_{mp})	28.2V	28.4V	28.6V	28.8V	29.0V
Current at Maximum Power (I_{mp})	10.64A	10.71A	10.77A	10.84A	10.91A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1 m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 182*91mm
Number of cells	108 (6x18)
Module dimensions	1722x1134x35mm (67.80x44.65x1.38inches)
Weight	21.5kg (47.4lbs)
Front cover	3.2mm (0.13inches) tempered glass with AR coating
Frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Cable	4mm ² (0.006inches ²), Portrait: 300mm (11.81inches); Landscape: 1200mm (47.24inches)
Connector	MC4 or MC4 compatible

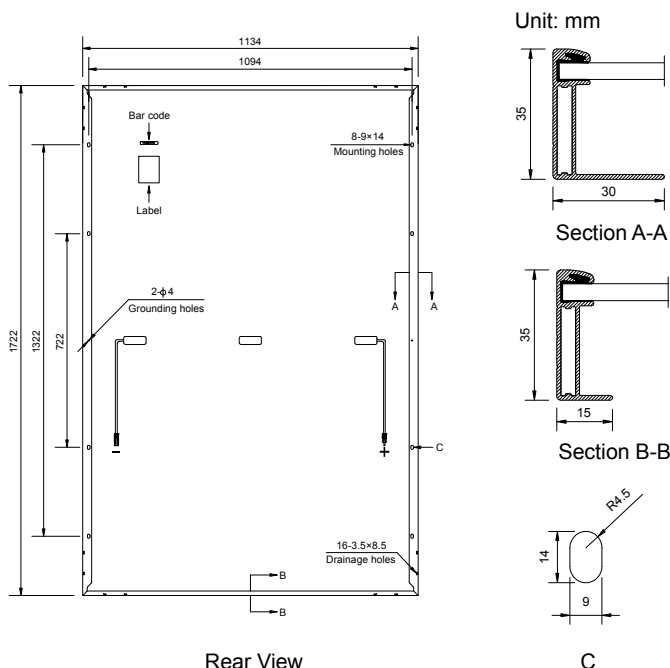
TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.36%/°C
Temperature Coefficients of V_{OC}	-0.28%/°C
Temperature Coefficients of I_{SC}	0.05%/°C

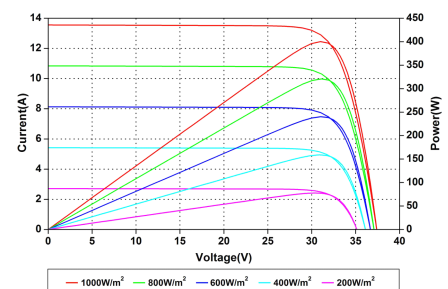
PACKAGING

Standard packaging	31pcs/pallet
Module quantity per 20' container	186pcs
Module quantity per 40' container	806pcs (HQ)

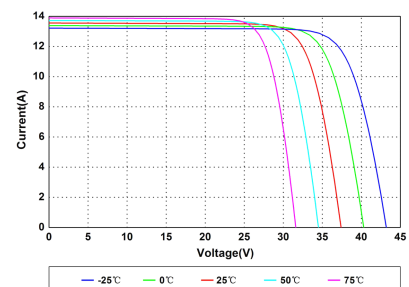
ENGINEERING DRAWINGS



IV CURVES

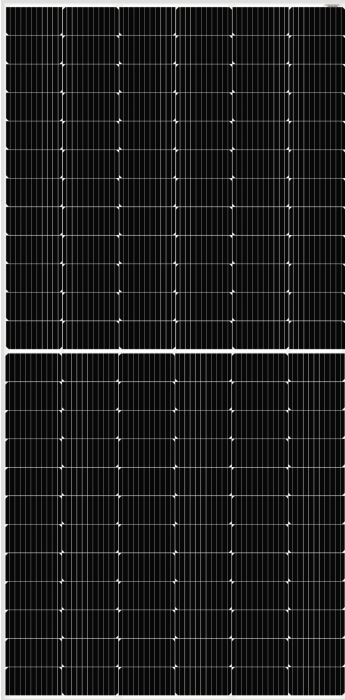


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-7M144-HC

530W~555W

MONOCRYSTALLINE MODULE

ADVANCED PERFORMANCE & PROVEN ADVANTAGES

- High module conversion efficiency up to 21.48% by using innovative Half-cell design and Multi-busbar(MBB) cell technology.
- Low temperature coefficient and excellent performance under high temperature and low light conditions.
- Robust aluminum frame ensures the modules to withstand wind loads up to 2400Pa and snow loads up to 5400Pa.
- High reliability against extreme environmental conditions (passing salt mist, ammonia and hail tests).
- Potential induced degradation (PID) resistance.

CERTIFICATIONS

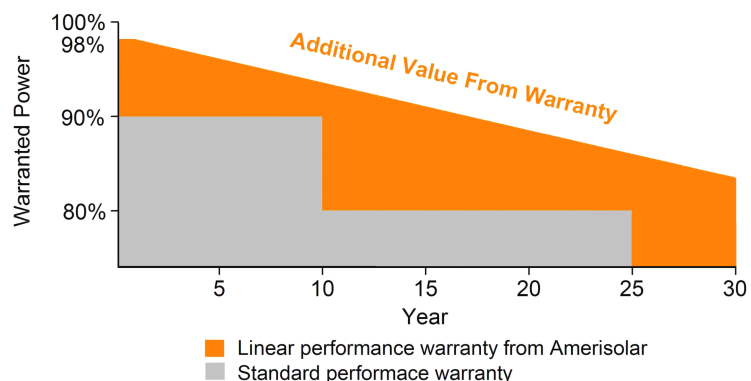
- IEC 61215, IEC 61730, IEC 61701, IEC TS 62804, CE, MCS
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system



SPECIAL WARRANTY

- 20 years product warranty
- 30 years linear power output warranty

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ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	530W	535W	540W	545W	550W	555W
Open Circuit Voltage (V_{OC})	49.2V	49.4V	49.6V	49.8V	50.0V	50.2V
Short Circuit Current (I_{SC})	13.78A	13.82A	13.86A	13.90A	13.94A	13.98A
Voltage at Maximum Power (V_{mp})	41.0V	41.2V	41.4V	41.6V	41.8V	42.0V
Current at Maximum Power (I_{mp})	12.93A	12.99A	13.05A	13.11A	13.16A	13.22A
Module Efficiency (%)	20.51	20.70	20.89	21.09	21.28	21.48
Operating Temperature	-40°C to +85°C					
Maximum System Voltage	1000V DC/1500V DC					
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)					
Maximum Series Fuse Rating	25A					

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of P_{max}: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	395W	399W	403W	407W	411W	415W
Open Circuit Voltage (V_{OC})	45.3V	45.5V	45.7V	45.9V	46.1V	46.3V
Short Circuit Current (I_{SC})	11.16A	11.19A	11.22A	11.25A	11.28A	11.31A
Voltage at Maximum Power (V_{mp})	37.3V	37.5V	37.7V	37.9V	38.1V	38.3V
Current at Maximum Power (I_{mp})	10.59A	10.64A	10.69A	10.74A	10.79A	10.84A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1 m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 182*91mm
Number of cells	144 (6x24)
Module dimensions	2279x1134x30mm (89.72x44.65x1.18inches)
Weight	28kg (61.7lbs)
Front cover	3.2mm (0.13inches) tempered glass with AR coating
Frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Cable	4mm ² (0.006inches ²), Portrait: 300mm (11.81inches); Landscape: 1300mm (51.18inches)
Connector	MC4 compatible

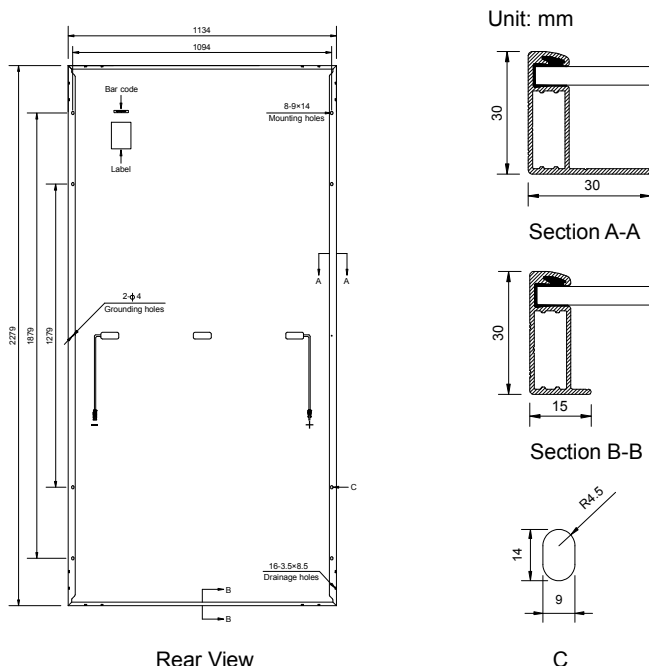
TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.35%/°C
Temperature Coefficients of V_{OC}	-0.28%/°C
Temperature Coefficients of I_{SC}	0.046%/°C

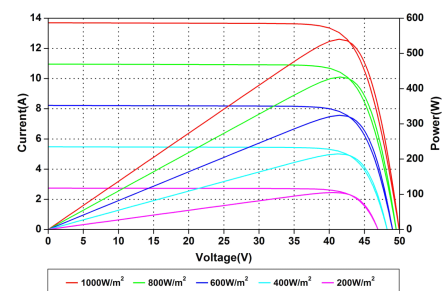
PACKAGING

Standard packaging	36pcs/pallet
Module quantity per 20' container	180pcs
Module quantity per 40' container	720pcs (HQ)

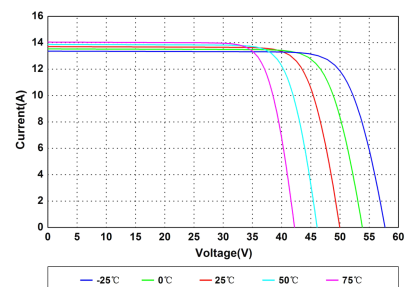
ENGINEERING DRAWINGS



IV CURVES

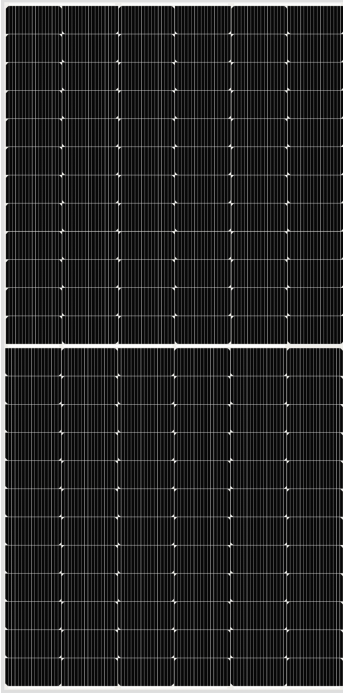


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-7M144N-HC

555W~580W

MONOCRYSTALLINE MODULE

ADVANCED PERFORMANCE & PROVEN ADVANTAGES

- High module conversion efficiency up to 22.45% by using innovative N-type TOPCon cell technology.
- Extremely low LID (light induced degradation) and low annual power degradation ensure higher energy yield during the module's lifetime.
- Low temperature coefficient and excellent performance under high temperature and low light conditions.
- Robust aluminum frame ensures the modules to withstand wind loads up to 2400Pa and snow loads up to 5400Pa.
- High reliability against extreme environmental conditions (passing salt mist, ammonia and hail tests).
- Potential induced degradation (PID) resistance.

CERTIFICATIONS

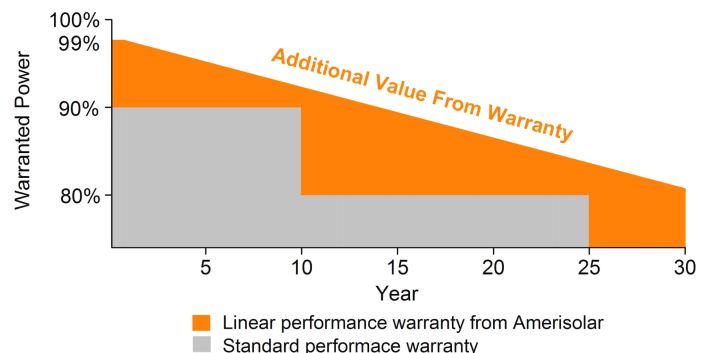
- IEC 61215, IEC 61730, CE
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system



SPECIAL WARRANTY

- 20 years product warranty
- 30 years linear power output warranty

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ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	560W	565W	570W	575W	580W
Open Circuit Voltage (V_{OC})	50.4V	50.6V	50.8V	51.0V	51.2V
Short Circuit Current (I_{SC})	14.04A	14.09A	14.14A	14.19A	14.24A
Voltage at Maximum Power (V_{mp})	42.2V	42.4V	42.6V	42.8V	43.0V
Current at Maximum Power (I_{mp})	13.28A	13.33A	13.39A	13.44A	13.49A
Module Efficiency (%)	21.68	21.87	22.07	22.26	22.45
Operating Temperature	-40°C to +85°C				
Maximum System Voltage	1000V DC/1500V DC				
Fire Resistance Rating	Class C				
Maximum Series Fuse Rating	25A				

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of Pmax: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	421W	425W	429W	433W	437W
Open Circuit Voltage (V_{OC})	47.9V	48.1V	48.3V	48.5V	48.7V
Short Circuit Current (I_{SC})	11.37A	11.41A	11.45A	11.49A	11.53A
Voltage at Maximum Power (V_{mp})	39.7V	39.9V	40.1V	40.3V	40.5V
Current at Maximum Power (I_{mp})	10.61A	10.66A	10.70A	10.75A	10.79A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1 m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline N-type 182*91mm
Number of cells	144 (6x24)
Module dimensions	2278x1134x30mm (89.69x44.65x1.18inches)
Weight	28kg (61.7lbs)
Front cover	3.2mm (0.13inches) tempered glass with AR coating
Frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Cable	4mm ² (0.006inches ²), Portrait: 300mm (11.81inches); Landscape: 1300mm (51.18inches)
Connector	MC4 or MC4 compatible

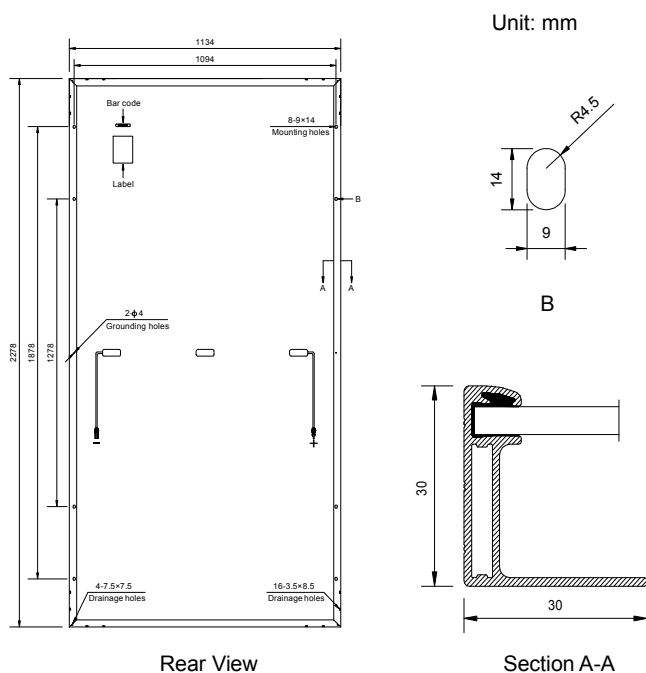
TEMPERATURE CHARACTERISTICS

Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.30%/°C
Temperature Coefficients of V_{OC}	-0.25%/°C
Temperature Coefficients of I_{SC}	0.045%/°C

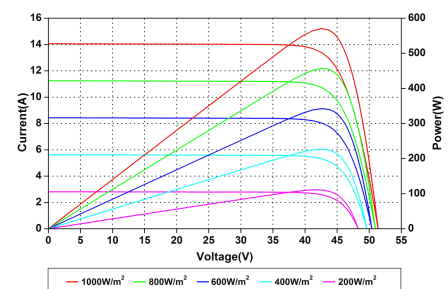
PACKAGING

Standard packaging	36pcs/pallet
Module quantity per 20' container	180pcs
Module quantity per 40' container	720pcs (HQ)

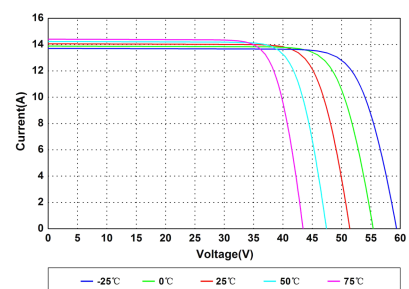
ENGINEERING DRAWINGS



IV CURVES

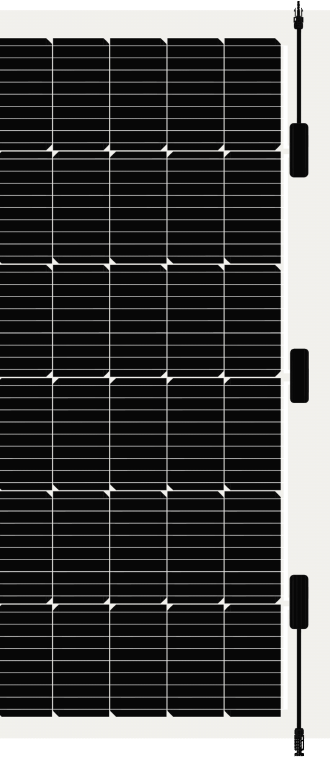


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-FL6M30-HC

95W~100W

MONOCRYSTALLINE MODULE

Product Characteristics

- Optimized composite materials, 70% lighter at the same power
- Used advanced organic polymer encapsulation materials, bending radius reach 0.30m, fit all kinds of curved surface perfectly
- Through quickly bonding installation, requires no penetration, eliminates the use of mounting hardware

CERTIFICATIONS

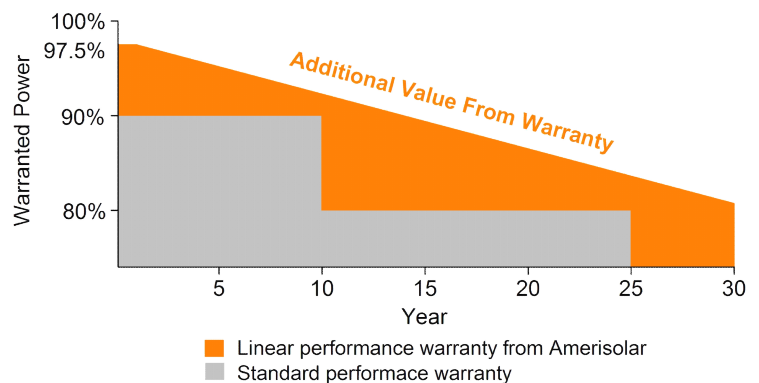
- IEC 61215, IEC 61730
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system



SPECIAL WARRANTY

- 10 years product warranty
- 25 years linear power output warranty

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ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	95W	100W
Open Circuit Voltage (V_{oc})	22.0V	22.4V
Short Circuit Current (I_{sc})	5.90A	6.03A
Voltage at Maximum Power (V_{mp})	17.6V	18.0V
Current at Maximum Power (I_{mp})	5.40A	5.56A
Module Efficiency (%)	16.44	17.31
Operating Temperature	-40°C to +85°C	
Maximum System Voltage	1000V DC/1500V DC	
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)	
Maximum Series Fuse Rating	20A	

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of Pmax: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	72W	75W
Open Circuit Voltage (V_{oc})	20.9V	21.3V
Short Circuit Current (I_{sc})	4.78A	4.88A
Voltage at Maximum Power (V_{mp})	16.56V	16.94V
Current at Maximum Power (I_{mp})	4.32A	4.45A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 166*83mm
Number of cells	30 (5x6)
Module dimensions	535x1080x2mm
Weight	2.5kg
Front cover	Lightweight high transparent polymer materials
Junction box	IP68, 3 diodes
Cable	4mm ² , Portrait: 300mm; Customized Length
Connector	MC4 compatible

TEMPERATURE CHARACTERISTICS

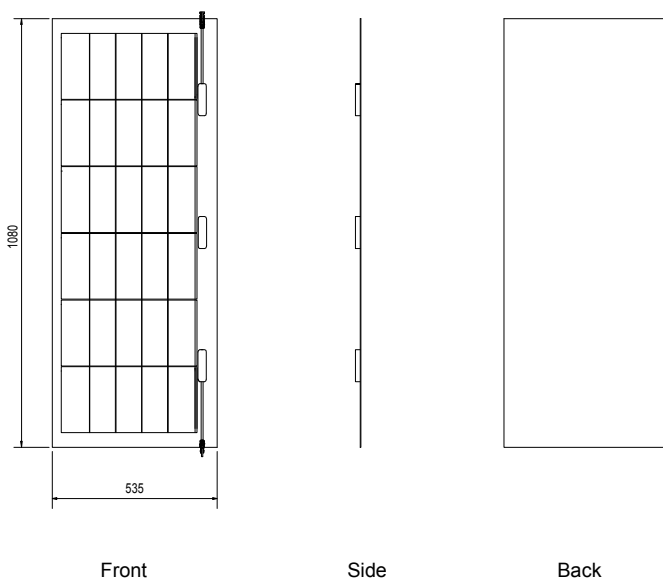
Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.36%/°C
Temperature Coefficients of V_{oc}	-0.28%/°C
Temperature Coefficients of I_{sc}	0.05%/°C

PACKAGING

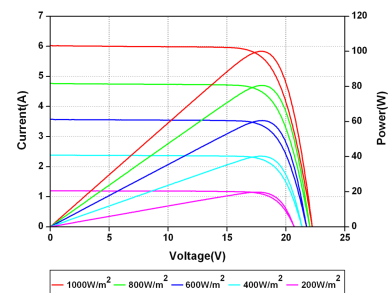
Standard packaging	46pcs/pallet
Module quantity per 20' container	1380pcs
Module quantity per 40' container	2762pcs (HQ)

ENGINEERING DRAWINGS

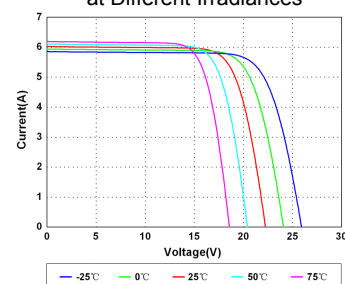
Unit: mm



IV CURVES

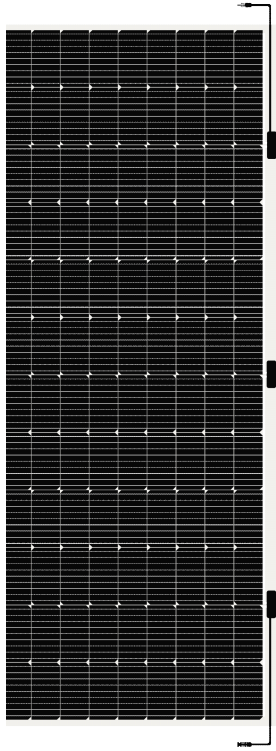


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-FL6M144-HC

420W~430W

MONOCRYSTALLINE MODULE

Product Characteristics

- Optimized composite materials, 70% lighter at the same power
- Used advanced organic polymer encapsulation materials, bending radius reach 0.30m, fit all kinds of curved surface perfectly
- Through quickly bonding installation, requires no penetration, eliminates the use of mounting hardware

CERTIFICATIONS

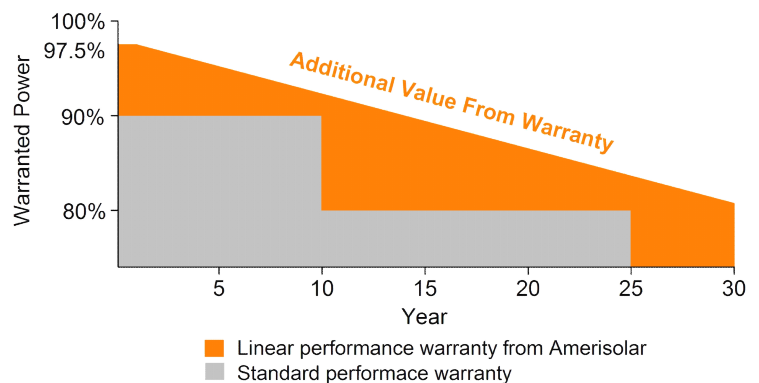
- IEC 61215, IEC 61730
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system



SPECIAL WARRANTY

- 10 years product warranty
- 25 years linear power output warranty

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ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	420W	425W	430W
Open Circuit Voltage (V_{oc})	49.0V	49.2V	49.4V
Short Circuit Current (I_{sc})	10.92A	10.98A	11.04A
Voltage at Maximum Power (V_{mp})	41.0V	41.2V	41.4V
Current at Maximum Power (I_{mp})	10.35A	10.42A	10.49A
Module Efficiency (%)	19.70	19.93	20.17
Operating Temperature	-40°C to +85°C		
Maximum System Voltage	1000V DC/1500V DC		
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)		
Maximum Series Fuse Rating	20A		

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of Pmax: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	311W	315W	319W
Open Circuit Voltage (V_{oc})	45.0V	45.2V	45.4V
Short Circuit Current (I_{sc})	8.84A	8.89A	8.94A
Voltage at Maximum Power (V_{mp})	36.8V	37.0V	37.2V
Current at Maximum Power (I_{mp})	8.46A	8.52A	8.58A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 166*83mm
Number of cells	144 (12x12)
Module dimensions	2050x1080x2mm
Weight	7.2kg
Front cover	Lightweight high transparent polymer materials
Junction box	IP68, 3 diodes
Cable	4mm ² , Portrait: 300mm; Customized Length
Connector	MC4 compatible

TEMPERATURE CHARACTERISTICS

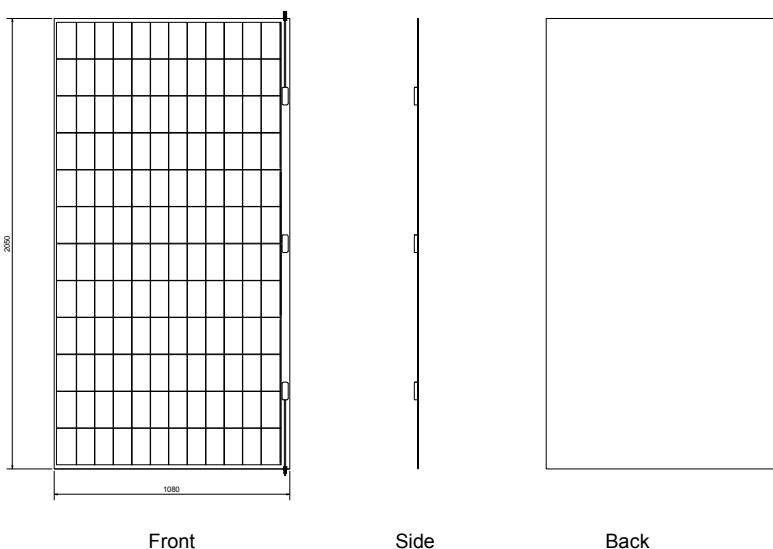
Nominal Operating Cell Temperature (NOCT)	43°C±2°C
Temperature Coefficients of P_{max}	-0.36%/°C
Temperature Coefficients of V_{oc}	-0.28%/°C
Temperature Coefficients of I_{sc}	0.05%/°C

PACKAGING

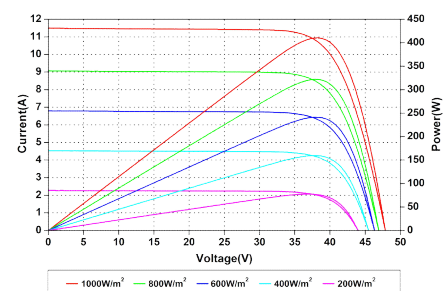
Standard packaging	66pcs/pallet
Module quantity per 20' container	530pcs
Module quantity per 40' container	1400pcs (HQ)

ENGINEERING DRAWINGS

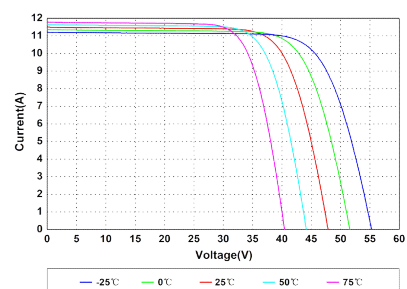
Unit: mm



IV CURVES

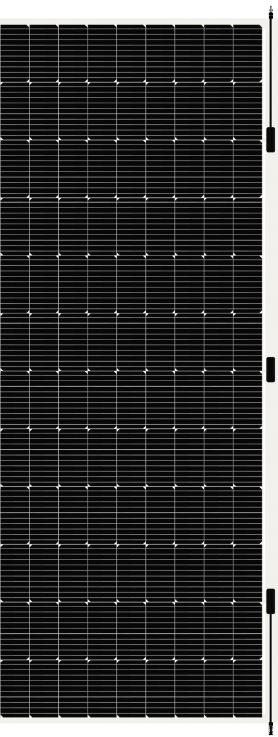


Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.



AS-FL7M144-HC

520W~530W

MONOCRYSTALLINE MODULE

Product Characteristics

- Optimized composite materials, 70% lighter at the same power
- Used advanced organic polymer encapsulation materials, bending radius reach 0.30m, fit all kinds of curved surface perfectly
- Through quickly bonding installation, requires no penetration, eliminates the use of mounting hardware

CERTIFICATIONS

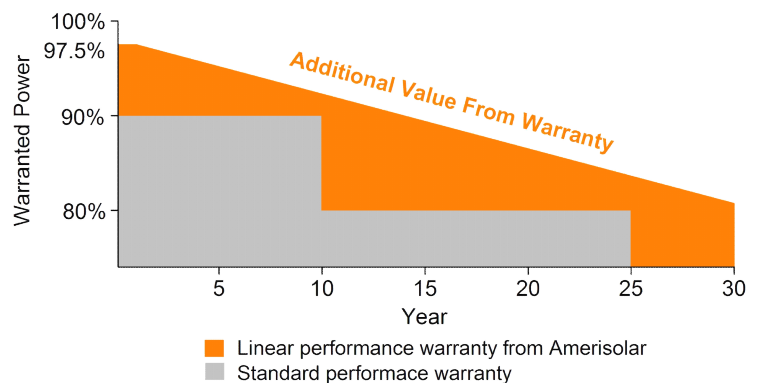
- IEC 61215, IEC 61730
- ISO 9001:2015: Quality management system
- ISO 14001:2015: Environmental management system
- ISO 45001:2018: Occupational health and safety management system



SPECIAL WARRANTY

- 10 years product warranty
- 25 years linear power output warranty

Passionately
committed to
delivering innovative
energy solution



ELECTRICAL CHARACTERISTICS AT STC

Maximum Power (P_{max})	520W	525W	530W
Open Circuit Voltage (V_{oc})	48.8V	49.0V	49.2V
Short Circuit Current (I_{sc})	13.70A	13.74A	13.78A
Voltage at Maximum Power (V_{mp})	40.6V	40.8V	41.0V
Current at Maximum Power (I_{mp})	12.83A	12.88A	12.93A
Module Efficiency (%)	19.34	19.52	19.71
Operating Temperature	-40°C to +85°C		
Maximum System Voltage	1000V DC/1500V DC		
Fire Resistance Rating	Type 1(in accordance with UL1703)/Class C(IEC61730)		
Maximum Series Fuse Rating	25A		

STC: Irradiance 1000W/m², Cell temperature 25°C, AM1.5; Tolerance of P_{max}: ±3%; Measurement Tolerance: ±3%

ELECTRICAL CHARACTERISTICS AT NOCT

Maximum Power (P_{max})	387W	391W	395W
Open Circuit Voltage (V_{oc})	44.9V	45.1V	45.3V
Short Circuit Current (I_{sc})	11.10A	11.13A	11.16A
Voltage at Maximum Power (V_{mp})	36.9V	37.1V	37.3V
Current at Maximum Power (I_{mp})	10.49A	10.54A	10.59A

NOCT: Irradiance 800W/m², Ambient temperature 20°C, Wind Speed 1m/s

MECHANICAL CHARACTERISTICS

Cell type	Monocrystalline PERC 182*91mm
Number of cells	144(12x12)
Module dimensions	2246x1197x2mm
Weight	8.0kg
Front cover	Lightweight high transparent polymer materials
Junction box	IP68, 3 diodes
Cable	4mm ² , Portrait: 300mm; Customized Length
Connector	MC4 compatible

TEMPERATURE CHARACTERISTICS

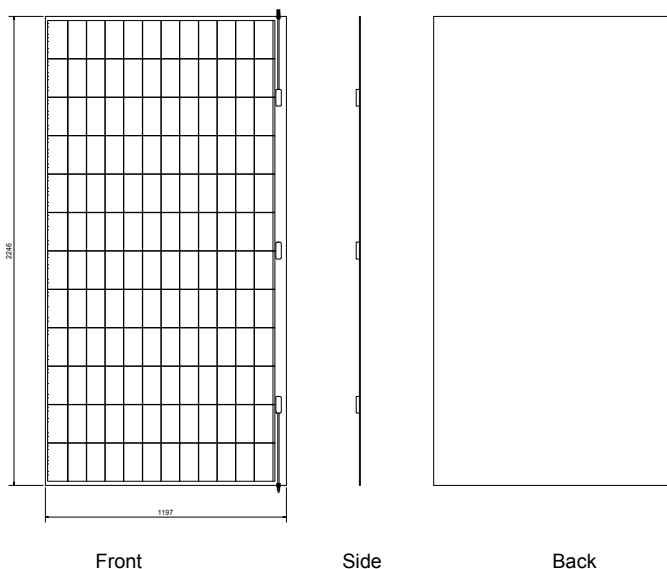
Nominal Operating Cell Temperature (NOCT)	42°C±2°C
Temperature Coefficients of P_{max}	-0.35%/°C
Temperature Coefficients of V_{oc}	-0.28%/°C
Temperature Coefficients of I_{sc}	0.048%/°C

PACKAGING

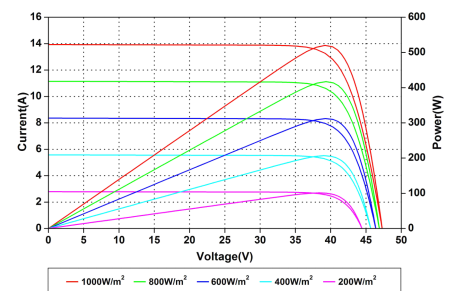
Standard packaging	66pcs/pallet
Module quantity per 20' container	264pcs
Module quantity per 40' container	1122pcs (HQ)

ENGINEERING DRAWINGS

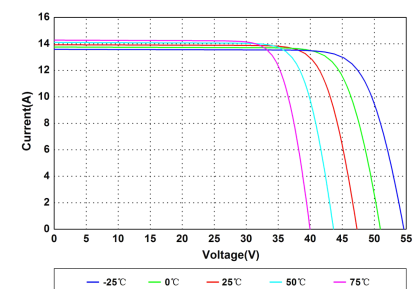
Unit: mm



IV CURVES



Current-Voltage and Power-Voltage Curves at Different Irradiances



Current-Voltage Curves at Different Temperatures

Specifications in this datasheet are subject to change without prior notice.

AS-Wolfram-10K Energy Storage System

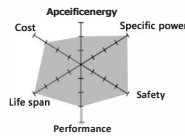
Special Features

- Modular Design
- Easy Installation
- Low and Easy Maintenance
- Long Lifespan
- Intelligent Remote Contrai
- Real-time Monitoring
- Light Load Threshold
- Fast Response
- Outdoor/Indoor
- UPS Ability



24/7 Internet Monitoring

Whole systems are designed to be monitored by internet or iOS/Android APP.



Optimal Chemical Formula

Li-phosphate is used for purpose of excellent function of safety and long lifespan.

CE:



ASTONGROUPS

"your needs, our innovations"

System Specification	
Model	Wolfram-10K
System components	
Inverter model	Wolfram-10K-INV
Number of Inverter	1
Battery system model	Wolfram-5000-BAT
Number of battery module	1~8
General	
Cell technology	LiFePO ₄
System capacity	5~40kWh
Rated system power	10kW
Dimension (W*H*D)	800*1995*240mm (four battery modules, with foundation)
Cooling type	Natural cooling
Operating temperature	-20~50° C
Operating humidity	0~100%RH
Display	LED & APP
Installation method	Floor or Wall-mounted (optional)
Communication interface	Portal-WiFi (standard) /4G (optional), Meter-RS485
Inverter Specification	
DC Input (PV)	
Recommended Max. PV input power	18kWp
Max. PV input voltage	1000Vdc
No. of MPPTs	2
No. of PV strings per MPPT	2/1
Max. PV input current	27A/16A
Max. shot current	34A/20A
MPPT voltage range	150~900Vdc
Starting voltage	180Vdc
DC Input (Battery)	
Battery voltage range	650~900Vdc
AC Input and Output (On-grid)	
Rated AC output power	10kW
Rated AC output voltage	380/400Vac, 3W/N/PE
Grid voltage range	323-418Vac/340-440Vac
Max. output current	16A
Max. input current	26A
Rated grid frequency	50/60Hz
Grid frequency range	45~55/55~65Hz
Power factor	>0.99 (rated power)
Adjustable power factor	0.8 (leading)~0.8 (lagging)
THDi	<3% (rated power)
AC Output (Back-up)	
Rated AC output voltage	380/400Vac, 3W/N/PE
Rated output frequency	50/60Hz
Rated output power	10kW
Switch time	<10ms (without parallel), <300ms (parallel)
Support the unbalance load	Yes
Efficiency	
Max. efficiency	98.3%
European efficiency	97.5%
General	
Weight	30kg
Dimension (W*H*D)	800*400*200mm
Enclosure type	IP65
Certification	EN/IEC 62109-1/2, EN/IEC 61000-6-1/2/3/4, EN 50549-1, CEI 0-21, VDE-AR-N 4105

AS-Wolfram-10K Energy Storage System



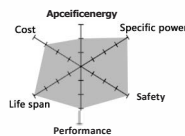
Special Features

- Modular Design
- Easy Installation
- Low and Easy Maintenance
- Long Lifespan
- Intelligent Remote Contrai
- Real-time Monitoring
- Light Load Threshold
- Fast Response
- Outdoor/Indoor
- UPS Ability



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Optimal Chemical Formula

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CE:



Manufacturing



System Specification	
Model	Wolfram-10K
System components	
Inverter model	Wolfram-10K-INV
Number of Inverter	1
Battery system model	Wolfram-5000-BAT
Number of battery module	1~8
General	
Cell technology	LiFePO ₄
System capacity	5~40kWh
Rated system power	10kW
Dimension (W*H*D)	800*1995*240mm (four battery modules, with foundation)
Cooling type	Natural cooling
Operating temperature	-20~50° C
Operating humidity	0~100%RH
Display	LED & APP
Installation method	Floor or Wall-mounted (optional)
Communication interface	Portal-WiFi (standard) /4G (optional), Meter-RS485
Inverter Specification	
DC Input (PV)	
Recommended Max. PV input power	18kWp
Max. PV input voltage	1000Vdc
No. of MPPTs	2
No. of PV strings per MPPT	2/1
Max. PV input current	27A/16A
Max. shot current	34A/20A
MPPT voltage range	150~900Vdc
Starting voltage	180Vdc
DC Input (Battery)	
Battery voltage range	650~900Vdc
AC Input and Output (On-grid)	
Rated AC output power	10kW
Rated AC output voltage	380/400Vac, 3W/N/PE
Grid voltage range	323-418Vac/340-440Vac
Max. output current	16A
Max. input current	26A
Rated grid frequency	50/60Hz
Grid frequency range	45~55/55~65Hz
Power factor	>0.99 (rated power)
Adjustable power factor	0.8 (leading)~0.8 (lagging)
THDi	<3% (rated power)
AC Output (Back-up)	
Rated AC output voltage	380/400Vac, 3W/N/PE
Rated output frequency	50/60Hz
Rated output power	10kW
Switch time	<10ms (without parallel), <300ms (parallel)
Support the unbalance load	Yes
Efficiency	
Max. efficiency	98.3%
European efficiency	97.5%
General	
Weight	30kg
Dimension (W*H*D)	800*400*200mm
Enclosure type	IP65
Certification	EN/IEC 62109-1/2, EN/IEC 61000-6-1/2/3/4, EN 50549-1, CEI 0-21, VDE-AR-N 4105



AS-Wolfram-3600/5000

Energy Storage System

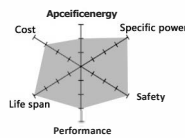
Special Features

- Modular Design
- Easy Installation
- Low and Easy Maintenance
- Long Lifespan
- Intelligent Remote Contrai
- Real-time Monitoring
- Light Load Threshold
- Fast Response
- Outdoor/Indoor
- UPS Ability



24/7 Internet Monitoring

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Optimal Chemical Formula

Li-phosphate is used for purpose of excellent function of safety and long lifespan.



CE:



System Specification		
Model	Wolfram-3600	Wolfram-5000
System components		
Inverter model	Wolfram-3600-INV	Wolfram-5000-INV
Number of Inverter	1	1
Battery system model	Wolfram-5000-BAT	
Number of battery module	1~8	
General		
Cell technology	LiFePO ₄	
System capacity	5~40kWh	
Rated system power	3.6kW	5kW
Dimension (W*H*D)	800*1090*240mm (four battery modules, with foundation)	
Cooling type	Natural cooling	
Operating temperature	-20~50° C	
Operating humidity	0~100%RH	
Display	LED & APP	
Installation method	Floor or Wall-mounted (optional)	
Communication interface	Portal-WiFi (standard) /4G (optional), Meter-RS485	
Inverter Specification		
DC Input (PV)		
Recommended Max. PV input power	9kWp	
Max. PV input voltage	580Vdc	
No. of MPPTs	2	
No. of PV strings per MPPT	1/1	
Max. PV input current	15A/15A	
Max. shot current	18.75A/18.75A	
MPPT voltage range	100~550Vdc	
Starting voltage	100Vdc	
DC Input (Battery)		
Battery voltage range	360~500Vdc	
AC Input and Output (On-grid)		
Rated AC output power	3.6kW	5kW
Rated AC output voltage	220/230/240Vac	
Grid voltage range	180-270Vac	
Max. output current	15.6A	21.7A
Max. input current	31.2A	43.4A
Rated grid frequency	50/60Hz	
Grid frequency range	45~55/55~65Hz	
Power factor	>0.99 (rated power)	
Adjustable power factor	0.8 (leading)~0.8 (lagging)	
THDi	<3% (rated power)	
AC Output (Back-up)		
Rated AC output voltage	220/230/240Vac	
Rated output frequency	50/60Hz	
Rated output power	3.6kW	5kW
Peak output power	4.68kW, 60s; 5.4kW, 30s	6.5kW, 60s; 7.5kW, 30s
Switch time	<10ms	
Efficiency		
Max. efficiency	97.7%	
European efficiency	97.1%	
General		
Weight	18kg	
Dimension (W*H*D)	800*280*232mm	
Enclosure type	IP65	
Certification	EN/IEC 62109-1/2, EN/IEC 61000-6-2/3, EN 50549-1, CEI 0-21, VDE-AR-N 4105	

AS-Wolfram-3600/5000 Energy Storage System

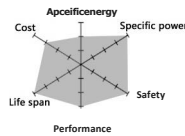
Special Features

- Modular Design
- Easy Installation
- Low and Easy Maintenance
- Long Lifespan
- Intelligent Remote Contrai
- Real-time Monitoring
- Light Load Threshold
- Fast Response
- Outdoor/Indoor
- UPS Ability



24/7 Internet Monitoring

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Optimal Chemical Formula

Li-phosphate is used for purpose of excellent function of safety and long lifespan.

CE:



III

System Specification		
Model	Wolfram-3600	Wolfram-5000
System components		
Inverter model	Wolfram-3600-INV	Wolfram-5000-INV
Number of Inverter	1	1
Battery system model	Wolfram-5000-BAT	
Number of battery module	1~8	
General		
Cell technology	LiFePO ₄	
System capacity	5~40kWh	
Rated system power	3.6kW	5kW
Dimension (W*H*D)	800*1090*240mm (four battery modules, with foundation)	
Cooling type	Natural cooling	
Operating temperature	-20~50° C	
Operating humidity	0~100%RH	
Display	LED & APP	
Installation method	Floor or Wall-mounted (optional)	
Communication interface	Portal-WiFi (standard) /4G (optional), Meter-RS485	
Inverter Specification		
DC Input (PV)		
Recommended Max. PV input power	9kWp	
Max. PV input voltage	580Vdc	
No. of MPPTs	2	
No. of PV strings per MPPT	1/1	
Max. PV input current	15A/15A	
Max. shot current	18.75A/18.75A	
MPPT voltage range	100~550Vdc	
Starting voltage	100Vdc	
DC Input (Battery)		
Battery voltage range	360~500Vdc	
AC Input and Output (On-grid)		
Rated AC output power	3.6kW	5kW
Rated AC output voltage	220/230/240Vac	
Grid voltage range	180-270Vac	
Max. output current	15.6A	21.7A
Max. input current	31.2A	43.4A
Rated grid frequency	50/60Hz	
Grid frequency range	45~55/55~65Hz	
Power factor	>0.99 (rated power)	
Adjustable power factor	0.8 (leading)~0.8 (lagging)	
THDi	<3% (rated power)	
AC Output (Back-up)		
Rated AC output voltage	220/230/240Vac	
Rated output frequency	50/60Hz	
Rated output power	3.6kW	5kW
Peak output power	4.68kW, 60s; 5.4kW, 30s	6.5kW, 60s; 7.5kW, 30s
Switch time	<10ms	
Efficiency		
Max. efficiency	97.7%	
European efficiency	97.1%	
General		
Weight	18kg	
Dimension (W*H*D)	800*280*232mm	
Enclosure type	IP65	
Certification	EN/IEC 62109-1/2, EN/IEC 61000-6-2/3, EN 50549-1, CEI 0-21, VDE-AR-N 4105	

Limited Warranty for Flexible and Light (FL) PV Module(s) 2023

1. Twelve (12) Year Limited Product Warranty

Worldwide Energy and Manufacturing USA Co., Ltd. (hereafter is referred to as “Amerisolar USA”) warrants its Flexible and Light Photovoltaic Module(s) (FL PV Modules), including factory-assembled DC connectors and cables, if any, to be free from defects and/or failure specified for a period not exceeding twelve (12) years from the date of sale as shown in the Proof of purchase to the direct Buyer.

The Product Warranty for FL PV Modules(s) covers (Applicable under normal application, installation, use and service conditions):

1) Failure due to defective materials:

a) Failure due to defective or malfunction of the junction factory-assembled cables and male/female connector.

2) Non-conformity to specifications due to faulty production and/or inspection processes.

If FL PV Module(s) fails to generate power and conform to this warranty, Amerisolar USA will repair or deliver new modules to replace the FL PV Module(s), or compensate the direct buyer at the market prices of claiming, at Amerisolar’s sole option. The remedies set forth in this clause shall be the sole and exclusive remedies provided under the “Limited Product Warranty”.

This “Limited Product Warranty” does not warrant a specific power output, which shall be exclusively covered under Clause 2 hereinafter (“Guaranteed Peak Power Limited Warranty”).

2. Guaranteed Peak Power Limited Warranty

Amerisolar warrants the power output for FL PV Modules for a period of thirty (30) years from the date shown in the Commercial Invoice and Sales Contract to the direct Buyer as set forth below.

For Monocrystalline Modules, 97.5% in the first year, thereafter, for years two (2) through thirty (30), 0.55% maximum decrease from Module’s nominal power output per year, ending with the 83.3% in the 30th year after the Warranty Start Date.

If the FL PV Module(s) exhibits a power output less than the warranties set forth above, Buyer need to provide that such loss in power is determined by Amerisolar to be due to defects in material or workmanship during manufacturing and not due to faulty transportation or installation or project maintenance, Amerisolar will at its sole option either provide additional Module(s) to the Customer to make up for such power loss compared to the specified in Product Labels, or repair the defective Module(s), or refund compensation at the market prices of claiming.

The remedies set forth in this Clause 2 shall be the sole and exclusive remedies provided under the “Guaranteed Peak Power Limited Warranty”.

3. Exclusions and Limitations

All warranty claims must, in any event, be filed within the applicable warranty period. The “Limited Product Warranty” and the “Guaranteed Peak Power Limited Warranties” do not apply when:

- 1) The product is improperly transported, installed or delivered by installers;
- 2) Defective components in the construction on which the module is mounted;
- 3) The product is subjected to inappropriate handling, including handling during in-land transportation or in customer’s storage or warehouses;
- 4) The product is installed in a mobile or marine environment, subjected to improper voltage or power surges, or subjected to abnormal environmental conditions (such as acid rain, salt damage or other pollution);
- 5) Inappropriate maintenance, including maintenance by an unauthorized service technician or non-conformance with Amerisolar’s User Manual or Installation Manual, is performed on the modules;
- 6) The product is subject to external accidents such as fire, explosion, and civil disorder;
- 7) The Product's type, labels, nameplate, module serial number or QC stamps are changed, erased or made illegible;
- 8) Other unforeseen circumstances or causes outside Amerisolar’s control including, but not limited to, surges, lightning, earthquakes, typhoons, hurricanes, tornadoes, volcanic action, floods, tsunami snow damage, etc.

The “Limited Product Warranty” and “Guaranteed Peak Power Limited Warranty” cover only the transportation cost for reshipment of any new FL PV Modules(s) to the place of installation, and do not cover any charges of transportation for the return of defective FL PV Module(s) to Amerisolar, customs clearance or any other costs related to installation, removal, or reinstallation of the FL PV Module(s) which shall be done by Buyer. Warranty claims will be honored only if the product can be identified as being manufactured or supplied by Amerisolar USA, as indicated by Sales Contract, Commercial Invoices and serial numbers under glass.

4. Limitation of Warranty Scope

Amerisolar USA shall not be liable for any incidental, indirect, consequential or special damages, howsoever caused.

Loss of use, loss of profits, loss of production, loss of revenues are therefore specifically but without limitation excluded. Amerisolar’s aggregate liability, if any, in damages or otherwise, shall not exceed the rest amount paid by the Buyer and deducted by the remaining value of the claimed FL PV Module(s).

5. Obtaining Warranty Performance

This “Limited Warranty for Flexible PV Module(s)” are applicable only to Buyer who has purchased the FL PV Module(s) directly from Amerisolar.

- 1) An immediate notification shall be filed directly to Amerisolar USA by e-mail. Together with the notification, the Buyer shall provide a Claim Sheet with signature and company stamp, including description of the claim, photos of the corresponding modules and serial number(s), QC stamps and Proof of Purchase such as Sales Contract and Commercial Invoice with signatures and company stamps.
- 2) The claimed FL PV Modules need to be selected at random by Amerisolar and shall be delivered back to Amerisolar factory for a second testing.
- 3) The return of any FL PV Module(s) will not be accepted unless prior written authorization has been given by Amerisolar.
- 4) Any replaced Modules shall become the property of Amerisolar. Amerisolar have the right to deliver another type of FL PV Module(s) (different in size, color, shape and/or power) in case production has been discontinued at the time of the claim, due to technical innovation and improvement. The repair or replacement of the FL PV Module(s) or the delivery with additional FL PV Module(s) does not cause the beginning of new warranty terms, nor shall the original terms of the "Limited Product Warranty" and the "Guaranteed Peak Power Limited Warranty" be extended.
- 5) This warranty is transferable when product remains installed in the original location.
- 6) The official Claim Sheet shall be sent to following address:
Worldwide Energy and Manufacturing USA Co., Ltd.
E-mail: sales@amerisolar-usa.com

6. Disputes and Validity

In case of any discrepancy in a warranty-claim, a test-institute TÜV Shanghai need to be involved for final judgment. The claimed FL PV Modules selected by Amerisolar at random shall be sent to TÜV Shanghai for a final testing. All fees and expenses shall be borne by the losing party, unless otherwise awarded.

This limited warranty for Flexible and Light (FL) PV Module(s) is provided by Worldwide Energy and Manufacturing USA Co., Ltd., and shall be valid from January 1, 2023, and shall apply to all FL PV Module(s) sold to the Buyer after this date. This Warranty shall be valid until an updated revision is issued.

















PLATINUM

Batterie Wolfram-BAT-5.12

PUTINUM

AS10KTLJAS12KTUAS15KTU
AS17KTUAS20KTUAS25KTL



Key Features

AS10KTL~AS25KTL Onduleurs ...

PIATINUIII

AS1000TUAS1500TUAS2000TU
AS2500TLJAS3000TL



Key Features

AS 1000TL,AS 1500TL,AS2000T ...

PLATINUM

AS3000MTUAS3600MTU
AS4200MTUASSO00MTL



Key Features

High Efficiency

Smart

AS3000MTL,AS3600MTL,AS42 ...