

# HANWHA Q CELLS PRODUCT CATALOGUE 2016

PREMIUM SOLAR MODULES





## HANWHA Q CELLS

### GERMAN QUALITY BACKED BY KOREAN FINANCIAL STRENGTH

**For Hanwha Q CELLS, photovoltaic technology is not just a product. It is the key to reliable, powerful, and sustainable energy supply – today and for future generations.**

#### **THINK GLOBAL, ACT LOCAL.**

Hanwha Q CELLS offers a wide-ranging product portfolio - from solar modules and cells to complete systems for private, industrial and commercial rooftop installations, and up to turn-key solar power plants. We develop and test our products at our headquarters for technology and innovation in Germany until they are ready for serial production. They are then manufactured at our international production locations and marketed through our international distribution network.

#### **AN ALLIANCE OF TECHNOLOGY AND FINANCE**

Since October 2012, Hanwha Q CELLS has been part of the Hanwha Group. Founded in 1952, the Hanwha Group is one of the eight largest companies in South Korea. The group is comprised of 58 South Korean and 190 international subsidiaries belonging to the three main business areas of Production and Construction, Finance, Services and Leisure. Through this strong, long-term alliance, we are ideally positioned both financially and technologically for the future.



# HANWHA Q CELLS CERTIFIED QUALITY

For our products, high quality means a long service life and excellent technical characteristics. That's why quality assurance plays a critical role for us.

## GLOBAL NETWORK, GERMAN QUALITY

As Europe's largest manufacturer of solar modules, solar cells and PV systems, Hanwha Q CELLS boasts leading technology, financial stability, and a global network – for safe energy provision and a clean future.

- German Engineering from Bitterfeld-Wolfen, Germany.
- guaranteed quality with an outstandingly low rate of module degradation through a 12-year product warranty and a 25-year linear performance warranty.
- is the first manufacturer of solar modules to participate successfully in the Quality Tested programme of the VDE German independent certification institute. For the first time, periodic testing is now required.
- operates the largest technology and module test centre in the industry, as well as its own VDE-certified testing laboratory.
- tests its products under extreme climate conditions, such as tropical humidity, desert heat, and arctic cold.



# HANWHA Q CELLS THE FOUR LEVELS OF QUALITY

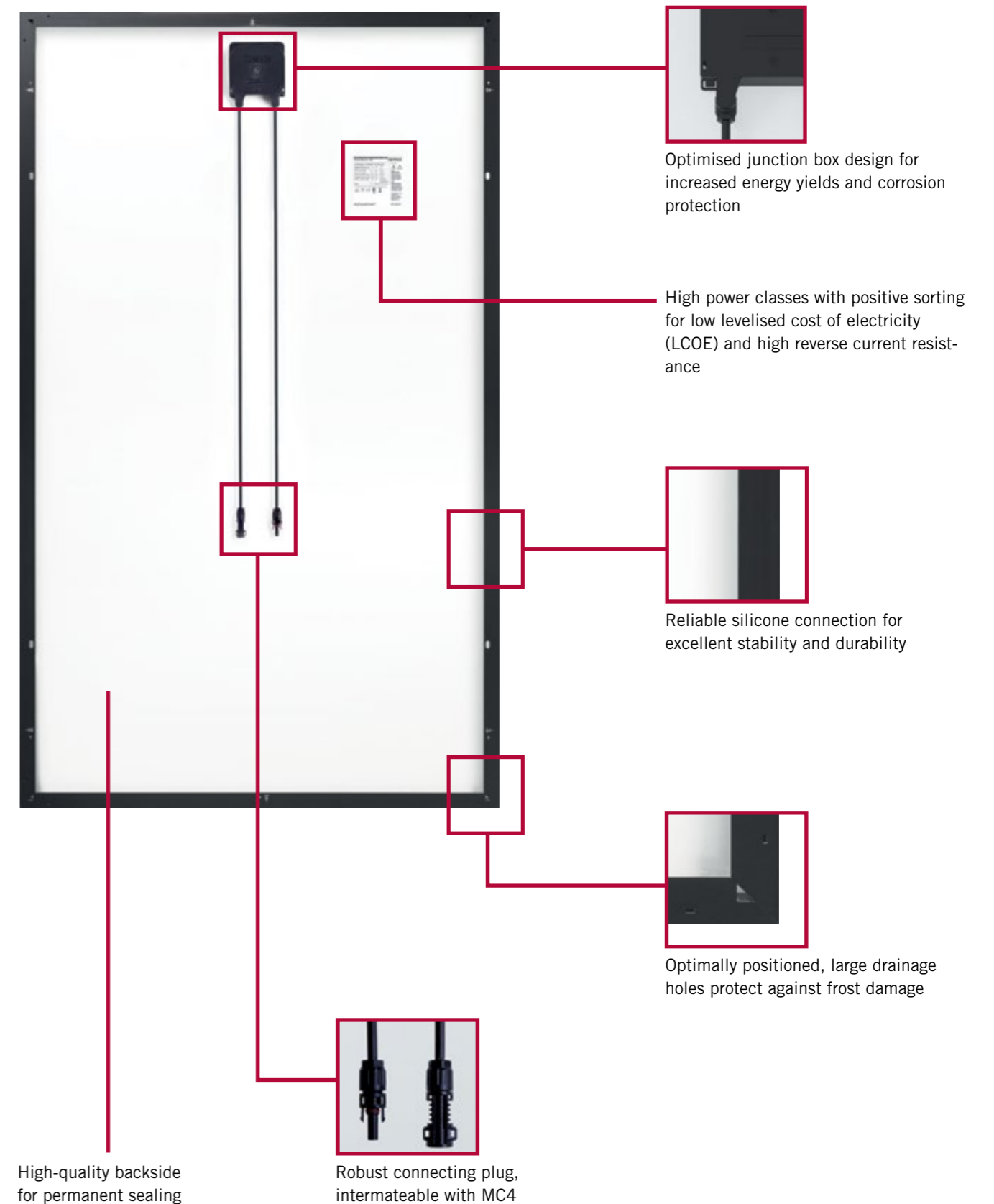
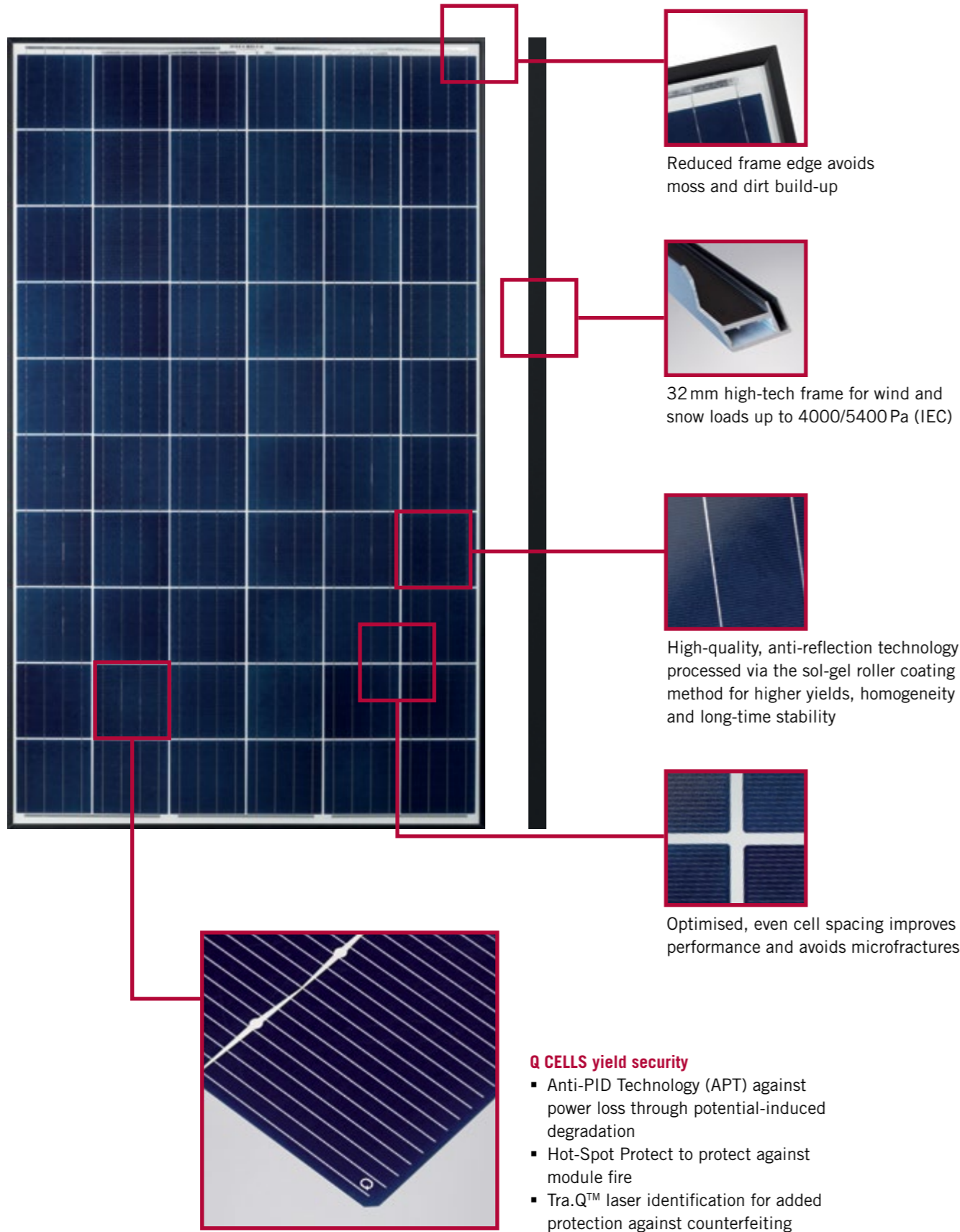
Before a product is worthy of the name "Q CELLS", it has to undergo and pass four independent quality programs:

- ✓ **LEVEL 1 – YIELD SECURITY**  
Since 2011, Q CELLS Yield Security has been the guarantee for the reliability of our products. It combines guaranteed PID resistance, security against hot spots, and protection against the counterfeiting of our company's products.
- ✓ **LEVEL 2 – ONE-TIME CERTIFICATION TESTS**  
The second level is comprised of international initial certification tests, for example, in accordance with IEC, CSA/UL, MCS, JET and Kemco. These guarantee that the electrical safety of the modules and the safety of its construction comply with international standards.
- ✓ **LEVEL 3 – VDE QUALITY TESTED**  
The VDE Quality Tested Programme exceeds the initial certification testing. In addition, quarterly re-testing guarantees consistent quality and product testing at all times.
- ✓ **LEVEL 4 – Q CELLS QUALITY PROGRAM**  
Q CELLS internal quality program ensures that all products meet our company's high standards on a daily basis.



REQUIRED TESTS	IEC CERTIFICATION	VDE QUALITY TESTED	Q CELLS QUALITY PROGRAMME
<b>Test frequency</b>	once, only for initial certification	continuous sampling, quarterly monitoring	continuous sampling and monitoring
<b>Temperature change test (TC)</b>	200 cycles	400 cycles	additional tests
<b>Humidity test (DH)</b>	1000h	1500h	additional tests
<b>Humidity-frost test (HF)</b>	10 cycles	10 cycles	30 cycles
<b>Load trial</b>	✓	dynamic load test (after UV test, before TC and HF)	additional tests
<b>Hot-spot test</b>	✓	✓	100% of cell production
<b>EL test</b>	only certification module	100% of module production	100% high-resolution, EL inspection
<b>PID test</b>	–	–	Monitoring of weekly production

# WE PAY ATTENTION TO DETAIL THE NEW G4 SOLAR MODULE



## Q.PRO BFR-G4.1 INNOVATION AND EXCELLENT PERFORMANCE

The new **Q.PRO BFR-G4.1** is the result of the continued evolution of our Q.PRO family. Thanks to improved power yield, excellent reliability, and high level operational safety, the new **Q.PRO BFR-G4.1** generates electricity at a low cost (LCOE) and is suitable for a wide range of applications.



### TECHNICAL DATA

<b>TYPE</b>	60-cell module
<b>CAPACITY</b>	Up to 270Wp
<b>EFFICIENCY</b>	Up to 16.5%
<b>SORTING</b>	+5/-0W

### HOW YOU BENEFIT

- 98% nominal performance in low light (200W/m<sup>2</sup>)
- High safety due to ammonia-resistant junction box and robust connectors
- Excellent stability: tested for wind loads up to 4000 Pa and snow loads up to 5400 Pa
- Up to 10% reduction in logistics and storage costs as compared to the G3 generation
- Optimised design with 32 mm frame height
- Easy to install, weighs just 18.8 kg

### THE IDEAL SOLUTION FOR:

-  Private rooftop installations
-  Commercial and industrial rooftop installations

# Q.PLUS BFR-G4.1 INNOVATION AND EXCELLENT PERFORMANCE



The new high-performance module **Q.PLUS BFR-G4.1** is the ideal solution for all applications thanks to its innovative **Q.ANTUM** cell technology. The world-record cell design was developed to achieve the best performance under real conditions - even with low radiation intensity and on clear, hot summer days.



#### TECHNICAL DATA

<b>TYPE</b>	60-cell module
<b>CAPACITY</b>	Up to 280Wp
<b>EFFICIENCY</b>	Up to 17.1%
<b>SORTING</b>	+5/-0W

#### HOW YOU BENEFIT

- High power class with Q.ANTUM cell technology
- High safety due to breathable, ammonia-resistant junction box and robust connectors
- Excellent stability: tested for wind loads up to 4000 Pa and snow loads up to 5400 Pa
- Up to 10% reduction in logistics and storage costs as compared to the G3 generation
- Optimised design with 32 mm frame height
- Easy to install, weighs just 18.8 kg

#### THE IDEAL SOLUTION FOR:

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# Q.ANTUM CELL TECHNOLOGY

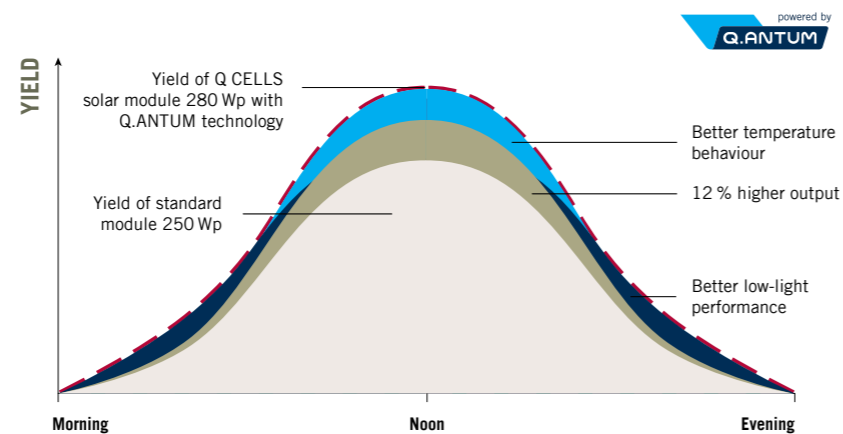
## HIGHER YIELD THANKS TO LOWER LCOE

Q.ANTUM combines the best characteristics of all available cell technologies to obtain high performance under real conditions, all with a low levelised cost of energy (LCOE).



### Q.ANTUM ADVANTAGE – MORE YIELD. MORE PROFIT. MORE FOR YOU.

Bottom line, only one thing counts: the total amount of electricity your PV plant produces throughout the day and throughout the year – and how much it costs. Q.ANTUM takes sophisticated and cost-effective crystalline silicon technology and optimises it to offer you the very best price performance ratio. The combination of high efficiency, high performance classes and maximum yields at optimum conditions guarantees that you'll profit from your business with the sun.



#### HIGHER PERFORMANCE CLASSES

Thanks to Q.ANTUM technology, Q CELLS solar modules offer more power per surface, resulting in higher yields at lower BOS costs.



#### TEMPERATURE COEFFICIENT

Even on hot days, Q CELLS solar modules produce reliable yields and lose less efficiency than standard solar modules.

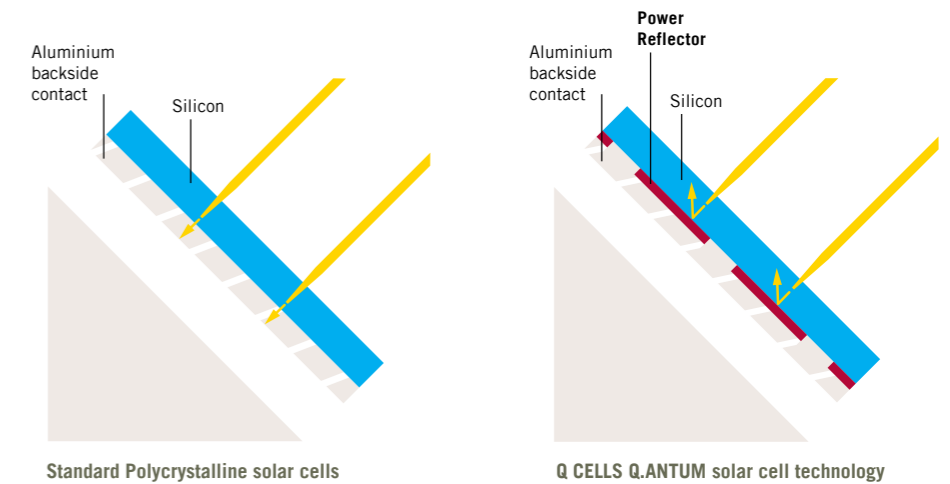


#### LOW-LIGHT BEHAVIOUR

High yields with low radiation intensity, for example, during sunrise and sunset and on cloudy days, but also in autumn and winter when the sun is flat over the horizon.

### Q.ANTUM PHYSICS – MORE LIGHT. MORE PERFORMANCE. MORE ELECTRICITY.

Don't maximize, optimize: The rear surfaces of Q.ANTUM solar cells are treated with a special nano coating that functions much like a typical household mirror. Rays of sunlight that would otherwise go to waste are reflected back through the cell to generate more electricity. This enhances the electrical properties, considerably increasing the efficiency.



### Q.ANTUM HISTORY – RESEARCH. DEVELOPMENT. PRODUCTION.

High performance meets mass production: In 2011, Q.ANTUM technology set a new world record for crystalline solar cells by achieving 19.5% efficiency. Q CELLS began producing modules based on Q.ANTUM in 2012, putting some of the highest-output modules available in its product line-up. The 2013 and 2014 PHOTON module test ranked the Q.PRO-G2 235 module at the top of all the polycrystalline modules tested. The current Q.PRO-G3 with Q.ANTUM technology surpasses even this winning module in every performance and yield category.

# Q CELLS SOLAR MODULES PRODUCE TOP YIELDS ON THE GRID NOT JUST ON PAPER

The 2014 PHOTON yield test proved the Q.PRO solar module of the second Q CELLS generation to be the polycrystalline module with the highest all-year yield.

## BEST POLYCRYSTALLINE SOLAR MODULE ON THE MARKET

The Q.PRO-G2 235Wp solar module tested by the renowned specialist journal PHOTON achieved the highest performance ratio (93.6%) and the best specific yield of all the polycrystalline solar modules tested. Innovation and quality under real conditions, set the Q CELLS solar module clearly apart from its competition.



### EXCELLENT PERFORMANCE UNDER LOW LIGHT

Minimal loss of efficiency at 200 W/m<sup>2</sup> with respect to efficiency at 1,000 W/m<sup>2</sup>.



### A RELIABLE INVESTMENT

12 year product warranty and 25 year linear performance warranty (maximum performance loss of 0.6% a year).



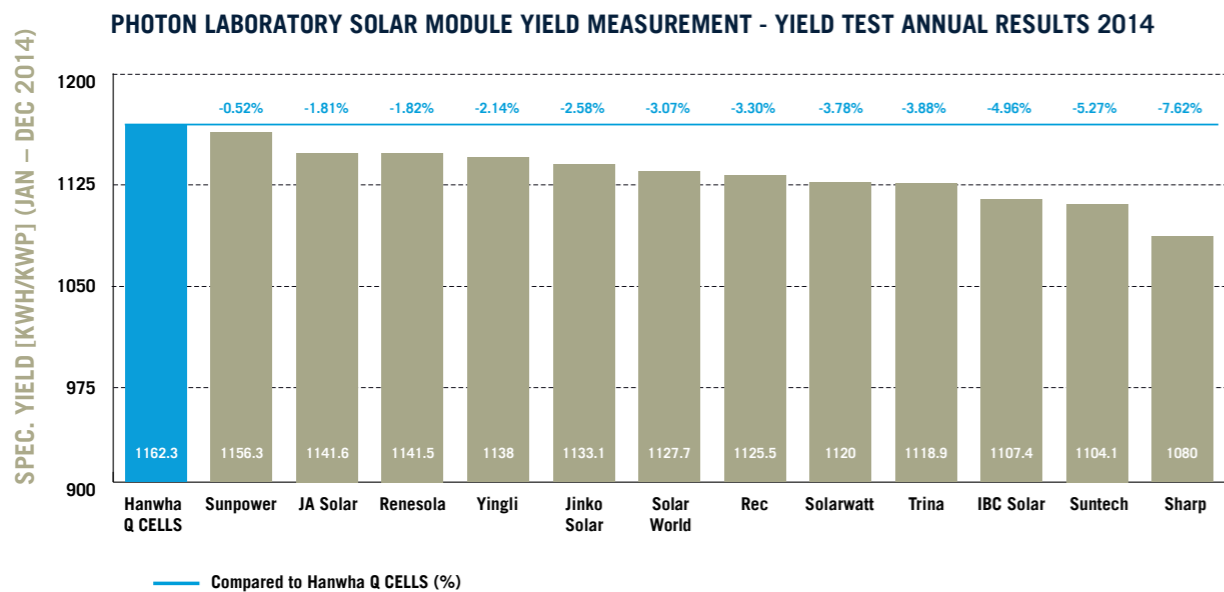
### ANTI-PID TECHNOLOGY AND HOT-SPOT PROTECT

No loss of performance thanks to Anti-PID (protection from potential-induced degradation) and Hot-Spot Protect (protection from hot-spots in the solar cells and from module fires).



### OPTIMAL TEMPERATURE BEHAVIOUR

Thanks to a temperature coefficient ( $P_{mpp}$ ) of -0.40%/K, Q CELLS modules produce reliable yields, even at high temperatures. Check out the results of the DKASC Alice Springs in Australia, and see for yourself. (<http://www.dkasolarcentre.com.au/>)



# HANWHA Q CELLS SERVICES YOU CAN RELAY ON US RIGHT FROM THE START

To us, service is much more than just a phone call. We don't just help our customers with technical consulting - we also offer a full range of comprehensive services.



## OUR TECHNICAL CUSTOMER SERVICE

As a Q CELLS customer, you will not just benefit from our high quality products. We are there for you if you have any questions or problems. Our competent, telephone support line is available to help in a flash – we don't put you through to a call centre, but to experienced technicians. In case of technical problems, we can also help you on site.



### PERSONAL SUPPORT

Your direct contact at Hanwha Q CELLS is available and ready to assist you with any issues. In addition, the qualified staff members of our special sales and technical hotlines can answer any questions about your order or shipment, as well as on technical details.



### MARKETING SUPPORT

We will gladly help you market our Q CELLS products, for example, by providing individualised marketing materials or supporting you at your customer events. Together, we can find the right solution to suit your needs - just call or write to us.



### FAST, CUSTOMISED DELIVERY

We'll deliver your solar modules ex works to your warehouse or directly to your current site. As a professional partner, you can additionally benefit from the possibility of smaller delivery units.



### TRAINING PROGRAMME FOR PROFESSIONALS

Participate in our special installer training and learn all about the advantages of our high quality Q CELLS products.



# REFERENCES



## TICINO, SWITZERLAND 450 kWp, 2013

Constructed out of 1,800 of our Q.PRO-G3 solar panels, the largest commercial solar installation in the Swiss canton of Ticino produces clean solar power throughout the year. The system was installed in just six weeks with the next generation of the Photon test-winner module and covers the power demand for 110 households.



## BAROSSA VALLEY SA, AUSTRALIA 90 kWp, 2013

For Barossa Vintners the sun is not used only to ripen grapes for their popular wines. It also powers a 90 kWp solar system with Q CELLS modules, reducing CO<sup>2</sup> emissions for the vineyard by 22% and, not least of all, saving it some 19,000€ in electricity and maintenance costs per year.



## CANHA, PORTUGAL 13.3 MWp, 2013

With 50,876 type Q.PRO-G3 solar modules, the solar park in Canha, Portugal has access to a power output of 13.3 MWp. Our Q.MEGA system was installed with 1.4 MWp DC blocks. The project, which Hanwha Q CELLS operates and maintains under the terms of an O&M contract, took only 6 weeks to construct.



## STOWBRIDGE, GREAT BRITAIN 24.3 MWp, 2014

The Stowbridge Solar Farm, in the Southwest of England, was built at the beginning of 2014 in just 12 weeks on based on our Q.MEGA system. The installation was constructed with type Q.PRO-G3 solar modules, with power ratings from 255 to 265 Wp, the successor to the best polycrystalline solar module in the Photon magazine output test 2013.



## DAVOS, SWITZERLAND 1.34 MWp, 2013

This rooftop system helps the World Economic Forum to reduce the environmental impact during the annual meeting in Davos. For Alois Zwinggi, Managing Director of the World Economic Forum "it is a further step towards a carbon-neutral future; generating enough energy to reduce CO<sup>2</sup> emissions by more than ten tonnes per year."



## JESSEN, GERMANY 1 MWp, 2011

This flat roof system from Q CELLS was installed on the roofs of two halls in just ten days. The power produced will be used to satisfy future on-site demand. As Raphael Huber, CEO of the engineering and operating company Sunovis GmbH, recognises, "energy use at the place of origin is becoming increasingly important."



## POTSDAM, GERMANY 8.46 kWp, 2010

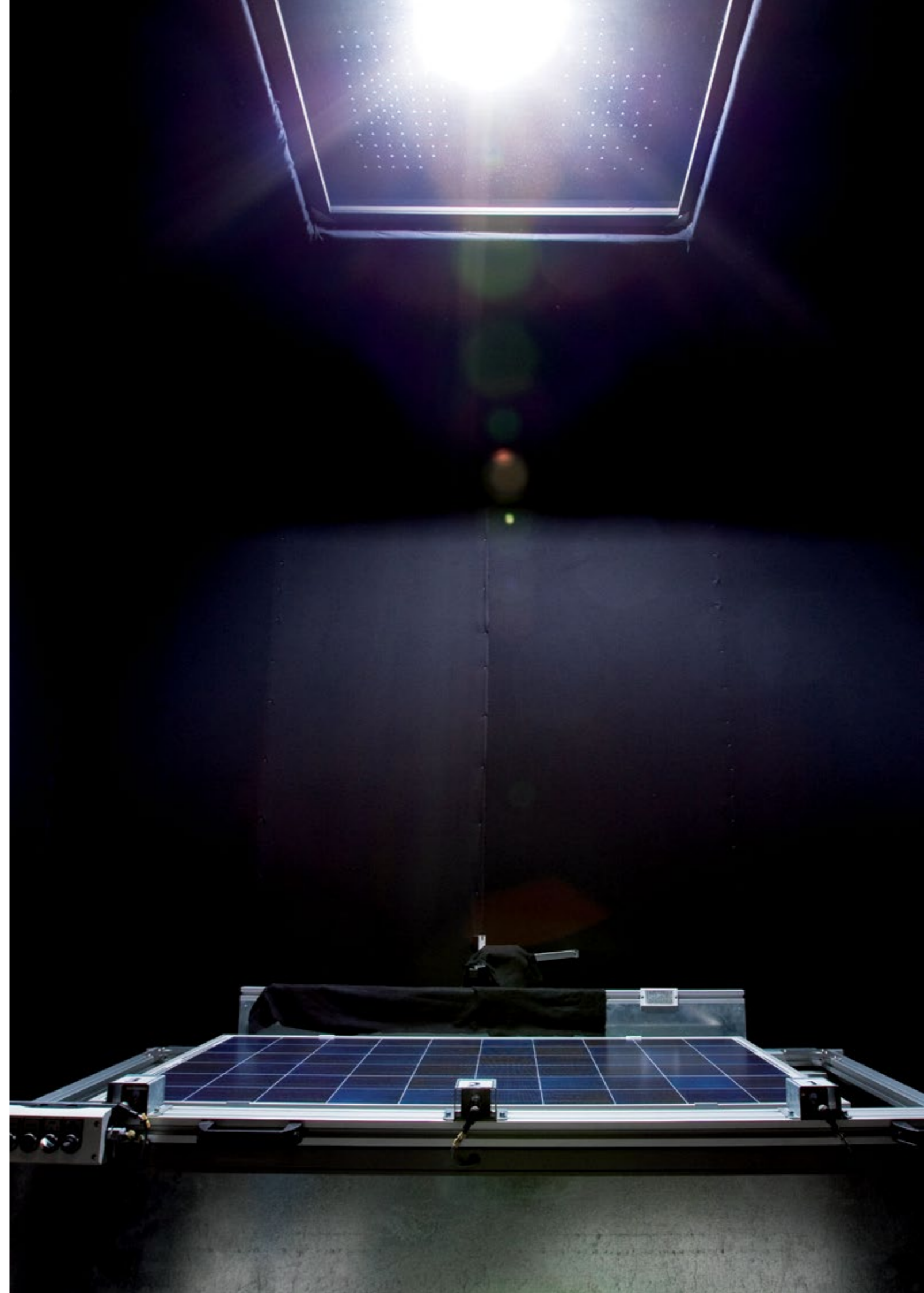
With 36 Q.PRO modules, this solar system supplies the family home with clean solar power and is capable of covering the full annual power demand. A first step towards energy transition and wider democracy in power supply.



## PERTH, AUSTRALIA 2.1 kWp, 2011

This solar system, built on the roof of a family house in the middle of Perth, Australia, has reduced energy costs for the inhabitants to almost zero. The main reason for deciding to purchase Q CELLS solar panels, were the excellent results from the Desert Knowledge Centre in Alice Springs, an independent test field in the Australian desert. (See <http://www.dkasolarcentre.com.au/>)

YOUR NOTES



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