



**MULTICRYSTALLINE SOLAR MODULES**

**Q.PRO**

**Raising the bar for highly reliable energy output**

**Q.CELLS**



**02 COMPANY** **04 PRODUCTION AND QUALITY INSPECTION** **08 PRODUCT OVERVIEW**  
**AND SPECIFICATIONS** **10 PRODUCT BENEFITS** **18 SERVICE** **20 CONTACT**

# A LEADER IN THE SOLAR INDUSTRY

## PASSION FORMS THE BASIS FOR OUR JOINT SUCCESS

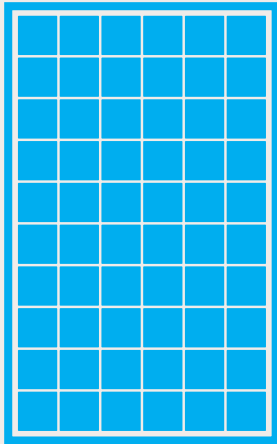
**Solar energy is in limitless supply, conserves natural resources, and protects the climate.**

**We have made it our mission to promote the development of solar power.**

Shortly after the company was founded in 1999, Q-Cells developed into one of the world's largest solar cell manufacturers. Since then it has shown a real pioneering spirit, innovation strength, and quality awareness in its work to establish photovoltaics as a sustainable and environmentally sound form of technology. Initially, Q-Cells was solely focused on its core competence: The production of solar cells. Today, Q-Cells offers a wide range of innovative photovoltaic solutions: From solar cells and modules to solar power plants.



## Q-CELLS PRODUCT PORTFOLIO

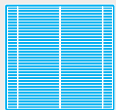


### OUTSTANDING QUALITY FOR RELIABLE ENERGY YIELDS

#### SOLAR MODULES

With its crystalline and thin-film modules, Q-Cells supplies certified solutions for a wide range of requirements. Homeowners and commercial customers are equally impressed by the modules' quality, attractive design, and reliable energy output.

PRODUCT GROUP	APPLICATION			
	SOLAR ARRAYS ON RESIDENTIAL ROOFTOPS	SOLAR ARRAYS ON COMMERCIAL AND INDUSTRIAL ROOFTOPS	IN-ROOF AND FACADE SOLAR ARRAYS	LARGE-SCALE SOLAR ARRAYS, SOLAR POWER PLANTS
<b>Q.PRO</b> Multicrystalline solar modules	Excellent performance, reliable yields, the industry standard			
<b>Q.SMART</b> CIGS solar modules	Prime aesthetics, inclination angle-independent installation and good yields at each roof orientation			
<b>Q.BASE</b> Multicrystalline solar modules				High performance for large-scale solar arrays



#### SOLAR CELLS

Q-Cells leads the field when it comes to developing, producing, and marketing solar cells from mono- and multicrystalline silicon. The solar cells manufactured by Q-Cells are subjected to rigorous testing to achieve maximum efficiencies.



#### SOLAR SYSTEMS

Q-Cells is one of the largest system integrators active in the global photovoltaic industry. We plan, build, and maintain large-scale solar power plants and roof-mounted systems worldwide, providing our customers with turnkey solutions from a one-stop supplier.

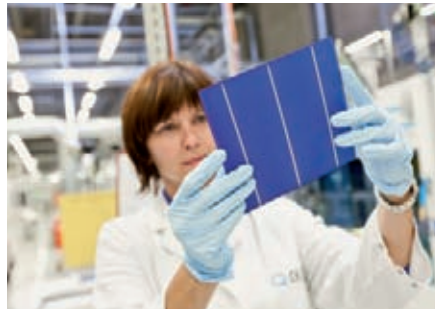


# TESTED TO GUARANTEE AN EFFICIENT SOLAR MODULE

## WORKING TO GERMAN STANDARDS, WE ACHIEVE AN IMPRESSIVE LEVEL OF QUALITY

Q-Cells has many years of experience and expertise as a manufacturer of solar cells, which is also leveraged for the production of solar modules and systems. Our private research center is home to over 200 ambitious employees working on the continuous improvement of our products' performance and quality. In manufacturing our products, we make the highest demands both of ourselves and of our suppliers. From the moment parts are received to the shipping of the finished product, our modules are subjected to extremely stringent quality checks. Our production follows the strict requirements enforced by our technology specialists and quality engineers. The result: Solar modules that deliver long-lasting high yields.

### INCOMING INSPECTION



All the materials we use are inspected and assessed against specific parameters before they are allowed to enter the production process. Every cell, for example, is checked for mechanical damage and the quality of its appearance. The glass panels are cleaned and checked for trapped air bubbles and scratches, in order to ensure the greatest possible luminous efficacy.

### PRODUCTION PROCESS



#### 1. STRINGING

The fully automated soldering machine (stringer) uses copper bands to establish a string of 10 solar cells.

**The level of thermal stress experienced here can lead to invisible damage. However, an electroluminescence test ensures the quality of the product by detecting micro-cracks via a before-and-after comparison.**



## 2. LAY-UP

A solar module consists of several layers. An EVA film is laid on the glass panel, with the strings then being bedded onto this film and soldered with cross ribbons. Another EVA film is applied to the created cell matrix, and a final rear film is added.

**Mechanical tests guarantee the quality of the soldering ribbon.**



## 3. LAMINATING

In the laminator, the individual components are joint to create an extremely stable module. This is done by liquefying the EVA film and hardening it under pressure. Thus, the solar cells are protected against environmental influences.

**An optical inspection ensures that the module is free of air pockets and discoloration.**



## 4. FRAMING

A flex-resistant frame made of anodized aluminum is attached in order to protect the delicate glass edges. The frame also allows for easy mounting.

**Stringent checks ensure that the frame is precisely aligned.**



#### 5. MOUNTING THE JUNCTION BOX

The junction box allows a safe interconnection between several modules. It is attached using silicone, which is applied from an automated dispenser.

**The even silicone seam is characteristic for the German standard of quality.**

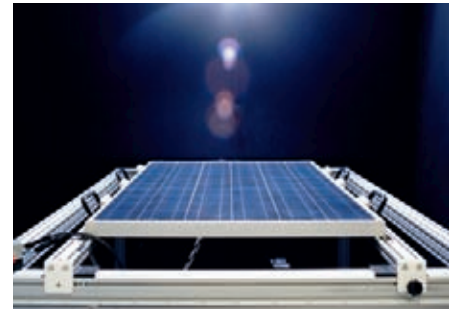


#### 6. MEASURING PERFORMANCE

The power output of every module is measured by the “flasher” under standard test and weak light conditions. The modules then are sorted into power classes of 5-watt increments. Only modules that deliver at least the nominal power are supplied to customers.

**Hipot and insulation tests are carried out to check the electrical reliability of every module.**

## PRE-DELIVERY INSPECTION

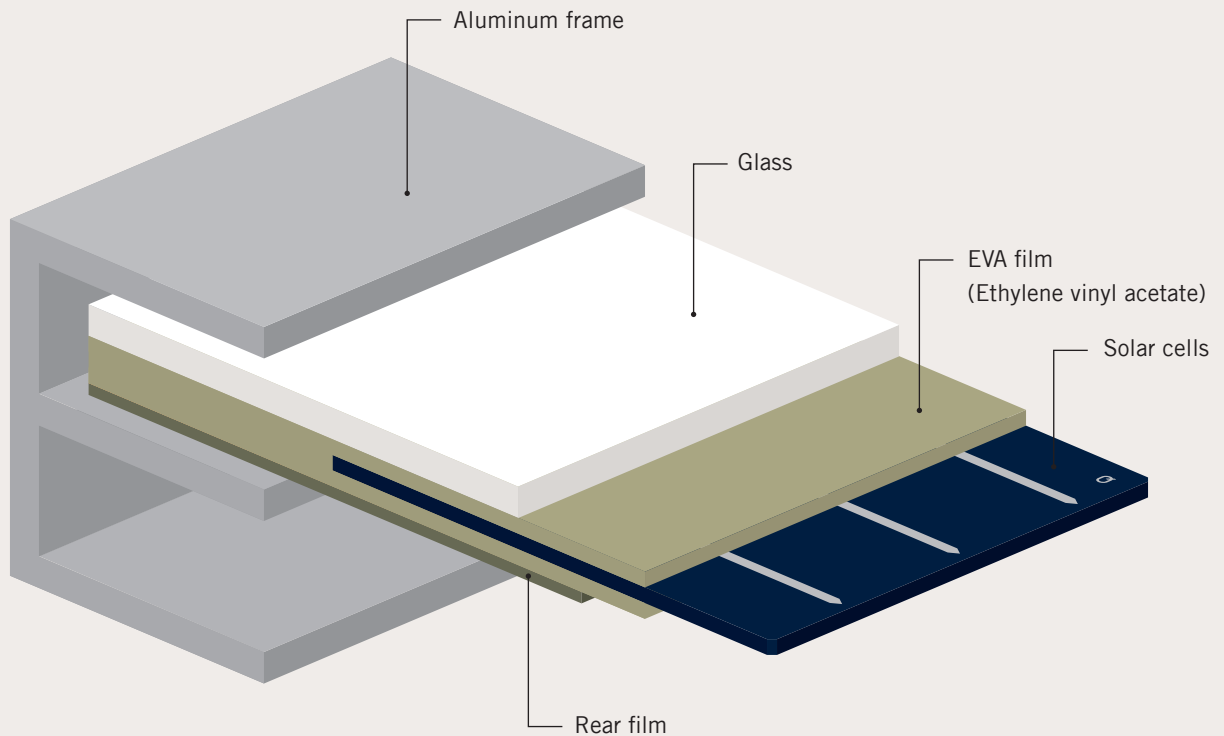


No module leaves our production facilities without meeting strict electrical and optical criteria during the final inspection. Apart from performing routine tests during the production process, we regularly remove modules from series production and check them in our own module testing center. In order to achieve certification to IEC standards 61215 and 61730, the test routines are performed by the VDE.



## LAYERED STRUCTURE OF A MULTICRYSTALLINE SOLAR MODULE

A product ID number is permanently embedded in this structure, which can be used to trace the integrated components and the process cycle at any time: A standard quality tracking feature that comes with all Q-Cells solar modules.



# Q.PRO SOLAR MODULES

RAISING THE BAR FOR  
HIGHLY RELIABLE ENERGY OUTPUT

Q-Cells manufactures multicrystalline solar modules based on highly efficient solar cells which are produced in-house. Q.PRO solar modules offer huge advantages when used in applications with limited space on private homes or commercial buildings: Excellent efficiencies, outstanding low-light behavior, and longevity create a perfect foundation for achieving high, reliable energy yields.

## Q.PRO 225–240 MULTICRYSTALLINE SOLAR MODULE



### PRODUCT BENEFITS

- German engineering for highly reliable yields in the power classes 225–240 Wp
- Further optimization of output due to positive sorting +5/–0 Wp
- Sturdy, weather-resistant construction
- Approved for increased snow and wind loads of up to 5400 Pa
- Simple, cost-effective installation
- 10-year product warranty, 25-year performance warranty\*

### IDEAL FOR



Rooftop arrays on residential buildings



Small rooftop arrays on commercial and industrial buildings

\* 90 % of the initial efficiency up to 10 years, 80 % up to 25 years  
(according to the respective effective regional warranty terms)

PRODUCT LINE	Q.PRO 225 – 240
<b>Nominal power</b>	225–240 Wp
<b>Positive sorting</b>	+5/-0 Wp
<b>Format</b>	1670 mm × 1000 mm × 50 mm
<b>Surface area</b>	1.67 m <sup>2</sup>
<b>Height</b>	50 mm
<b>Weight</b>	20 kg
<b>Front cover</b>	Heat-treated, hardened solar glass
<b>Back cover</b>	Composite film
<b>Frame</b>	Anodized aluminum
<b>Cell type</b>	Multicrystalline solar cell with three busbars (156 mm × 156 mm)
<b>Junction box</b>	Protection class IP 67 with bypass diodes
<b>Cable length</b>	1100 mm (positive cable), 1100 mm (negative cable)
<b>Connector</b>	Yamaichi Y-SOL4 (MC4 compatible)
<b>System voltage</b>	1000 V
<b>Reverse current resistance</b>	25 A
<b>Inverter</b>	Compatible with inverters with and without transformer
<b>Snow / wind load</b>	Up to 5400 Pa
<b>Certification</b>	CE-Compliant; IEC 61215 (ed.2); IEC 61730 (ed.1)



For detailed information on the different power classes of Q.PRO solar modules, please refer to the data sheet.

# GERMAN ENGINEERING FOR HIGHLY RELIABLE YIELDS

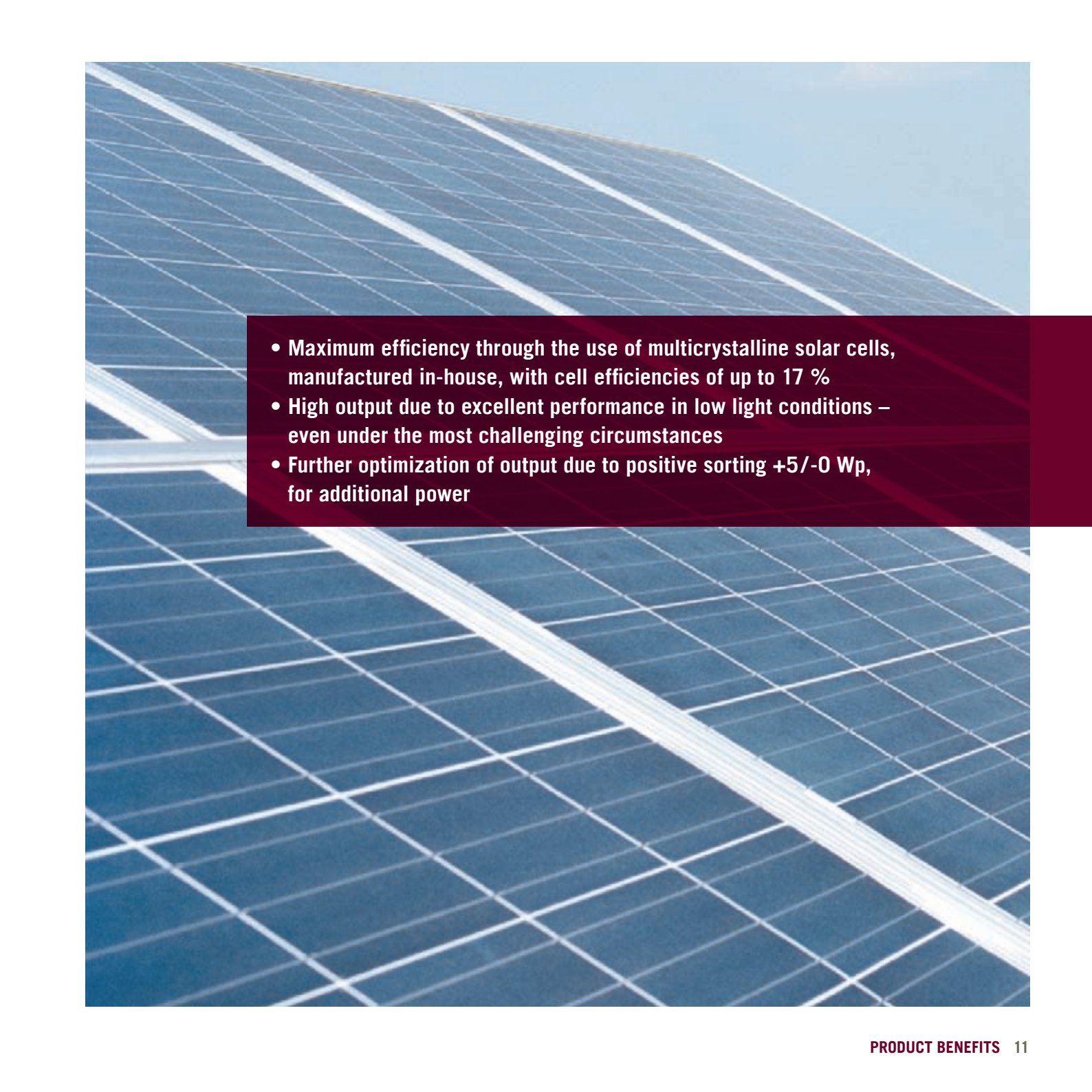
## Q.PRO SOLAR MODULES ACHIEVE MAXIMUM EFFICIENCIES THANKS TO Q-CELLS SOLAR CELLS

**The solar cell has a significant impact on the output and durability of a solar module. This is why Q-Cells has put its core expertise in its Q.PRO modules, using only quality solar cells that have been produced in-house.**

Q-Cells solar cells undergo an automated manufacturing process, starting with the incoming inspection of the silicon wafers and through to the final inspection and testing; they are also subjected to extremely stringent quality checks. We employ a test that is unique within the photovoltaic industry and ensures that our cells are 100 % free of hotspots, thus protecting the module from damage due to overheating and experiencing a total failure. Our solar cells, which achieve efficiencies of up to 17 %, deliver outstanding yields and long-term stability, making them a strong foundation for our Q.PRO module.

For maximum module efficiency and energy output, a blue anti-reflection layer is applied to the surface of the cell absorbing incident light. This also optimizes performance in low-light conditions for optimal energy output.

The output is increased further by carefully sorting the modules according to their power classes. The positive sorting of Q.PRO modules means that deviations can only occur at higher than expected levels. Only modules that deliver at least their nominal power – or up to 5 Wp more – are supplied to customers.

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- **Maximum efficiency through the use of multicrystalline solar cells, manufactured in-house, with cell efficiencies of up to 17 %**
  - **High output due to excellent performance in low light conditions – even under the most challenging circumstances**
  - **Further optimization of output due to positive sorting +5/-0 Wp, for additional power**



# STURDY, WEATHER-RESISTANT CONSTRUCTION

## HIGH-QUALITY COMPONENTS GUARANTEE STABILITY IN EVERY SITUATION

**The output of a solar module is largely determined by the quality of its components. These components must be able to guarantee efficient, fault-free operation over the long term, which is why we only use the best materials to produce our Q.PRO modules.**

### THE CELLS

Only solar cells that have been produced in-house with efficiencies of up to 17 % are used. Q-Cells solar cells are 100 % free of hotspots and, as such, offer unique protection against module failure and against the associated loss of yield.

### THE GLASS

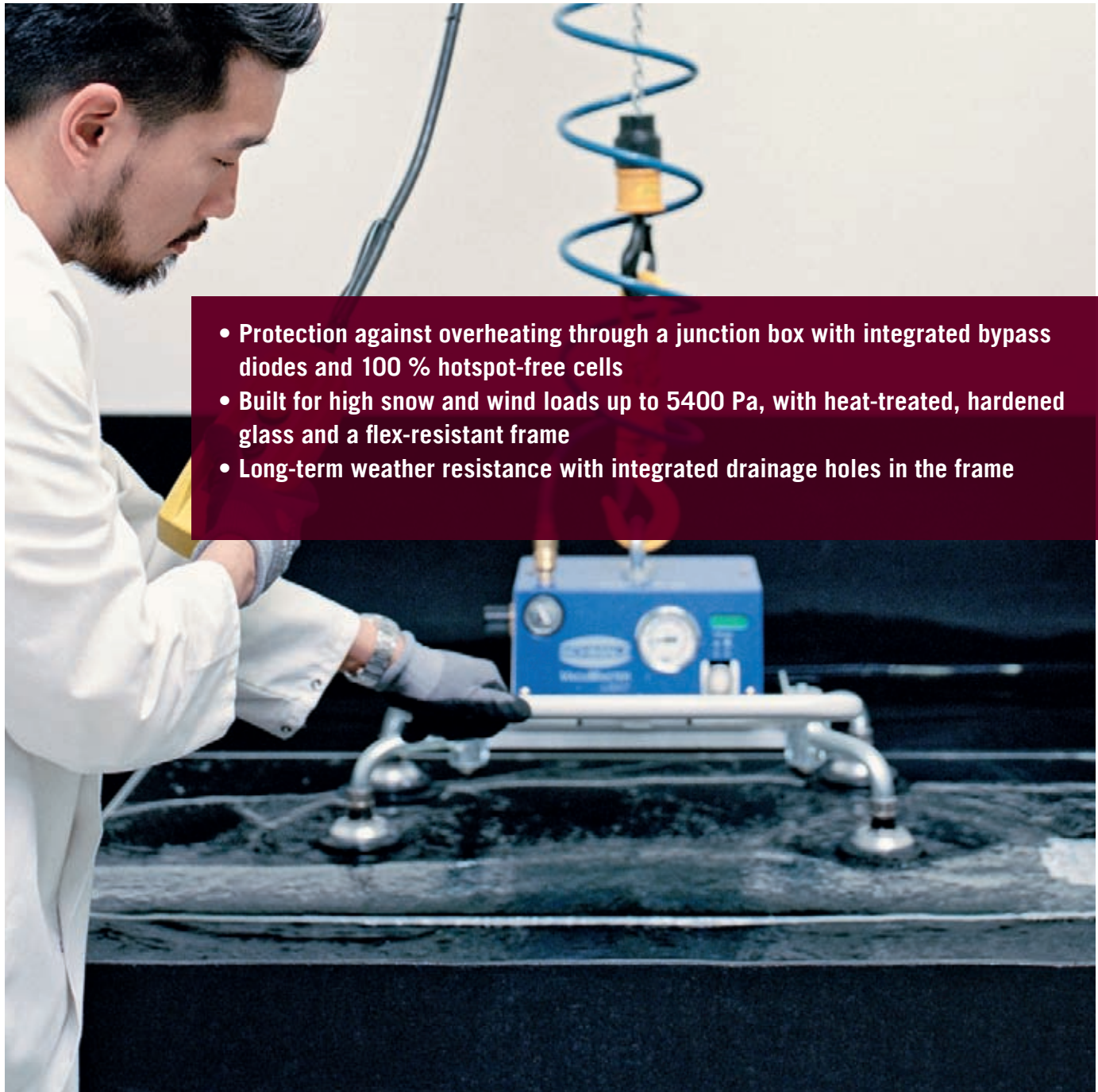
The heat-treated, hardened glass provides a high degree of mechanical stability and offers protection against extreme weather conditions. This glass is characterized by a low iron content, resulting in minimal reflectivity, and high transparency.

### THE FRAME

The design of the frame is flex-resistant and has a hollow-chamber to ensure safety even at high snow and wind loads of up to 5400 Pa. Aluminum alloying and drainage holes in the frame protect the glass from corrosion and frost damage in sub-zero temperatures.

### THE JUNCTION BOX

The Japanese manufacturer Yamaichi's junction box is produced in Germany and meets the highest safety standards. Integrated bypass diodes minimize the risk of the module overheating. The use of surface-mount diodes reduces heat generation and increases current resistance.



- Protection against overheating through a junction box with integrated bypass diodes and 100 % hotspot-free cells
- Built for high snow and wind loads up to 5400 Pa, with heat-treated, hardened glass and a flex-resistant frame
- Long-term weather resistance with integrated drainage holes in the frame

# SIMPLE, COST-EFFECTIVE INSTALLATION


## Q.PRO SOLAR MODULES ARE VERSATILE AND QUICK TO MOUNT



Q.PRO solar modules deliver reliable yields on homeowners' roofs.

Q.PRO solar modules are particularly well suited for residential and commercial roof-mounted solutions, where versatility is essential. They are compatible with all of the latest standard, commercially available inverters and mounting systems allowing for the ease and flexibility that's often required when designing a solar power system. The extremely high reverse current resistance carrying a capacity of up to 25 A enables three module strings to be connected in parallel reducing the required wiring effort. The ideal size of the Q.PRO solar modules (1670 mm x 1000 mm) permits good utilization of the surface area in relation to output and, in conjunction with the favorable weight ratio (12.6 kg/m<sup>2</sup>), helps to make mounting fast and cost-effective.



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- A photograph showing a worker in a blue cap and red safety vest installing solar panels on a red-tiled roof. The panels are mounted on a metal frame. The sky is blue with some clouds.
- **Compatible with all of the latest standard, commercially available inverters and mounting systems**
  - **Minimal wiring effort required, as the module itself has high reverse current resistance (25 A)**
  - **Good power per roof area ratio**
  - **Easy installation due to optimized weight**

# STEADY, GUARANTEED PERFORMANCE WE TAKE RESPONSIBILITY FOR OUR MODULES THROUGHOUT THEIR LIFE CYCLE

**The ‘Q’ in the company name stands for quality and German engineering expertise. The reliability and high quality of Q.PRO solar modules are backed up by relevant certificates and long-term warranties**

We carry out comprehensive product life-time tests in the module testing center in “Solar Valley”, in Bitterfeld-Wolfen, Germany, to assure ourselves of the quality of our modules. This is why we provide an extended 10-year product warranty and guarantee a high-yield performance of our modules for at least 25 years\*.

Q.PRO solar modules are certified by the VDE (Association for Electrical, Electronic & Information Technologies) in accordance with IEC standards 61215 and 61730.

Even when they reach the end of their life cycle, we take responsibility for our modules. The membership in the PV Cycle Association ensures that our modules can be returned free of charge within Europe once a system has been dismantled\*\*. For more information visit: [www.pvcycle.com](http://www.pvcycle.com).



\* 90% of the initial efficiency up to 10 years, 80% up to 25 years (according to the respective effective regional warranty terms)

\*\* In PV Cycle member countries only





- 10-year product warranty
- 25-year performance warranty \*
- Free module recycling through membership in the PV Cycle Association \*\*

# OUR SERVICE: WORKING WITH PARTNERS IN A SOLUTION-ORIENTED MANNER TOGETHER, WE SUCCEED

**Q-Cells takes responsibility for the reliability of the solar modules before, during, and after you have taken delivery. Technical specialists are ready to help during the planning stage, on-site, and after the modules are installed.**

With the constant changes in the PV industry, an ongoing knowledge transfer with our business partners is a high priority. Our experts are available for comprehensive training. Our telephone support is always available and staffed with technical experts. Our business partners value the personal contact and quality of advice we provide. Our service engineers are especially skilled in advising on performance simulation. Together, we will find solutions to benefit us all.



Our technical customer service responds quickly to questions on deployment options.

- 
- A photograph showing three business professionals walking through a modern glass entrance. On the left, a man in a dark jacket and glasses is walking. In the center, a man in a light pink shirt and blue jeans is walking. On the right, a woman in a dark blazer and black pants is walking and smiling. They are walking on a light-colored tiled floor with a blue carpet runner. A dark red semi-transparent box is overlaid on the right side of the image, containing a list of services.
- **Proficient telephone support**
  - **Application-oriented planning advice**
  - **Reliable simulation of energy yields using PV-Sol and PV-Syst**
  - **Professional on-site service**
  - **Practical product training**

# DO YOU HAVE ANY QUESTIONS ABOUT OUR Q.PRO SOLAR MODULES? WE ARE THERE FOR YOU, WHEREVER IN THE WORLD YOU ARE

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