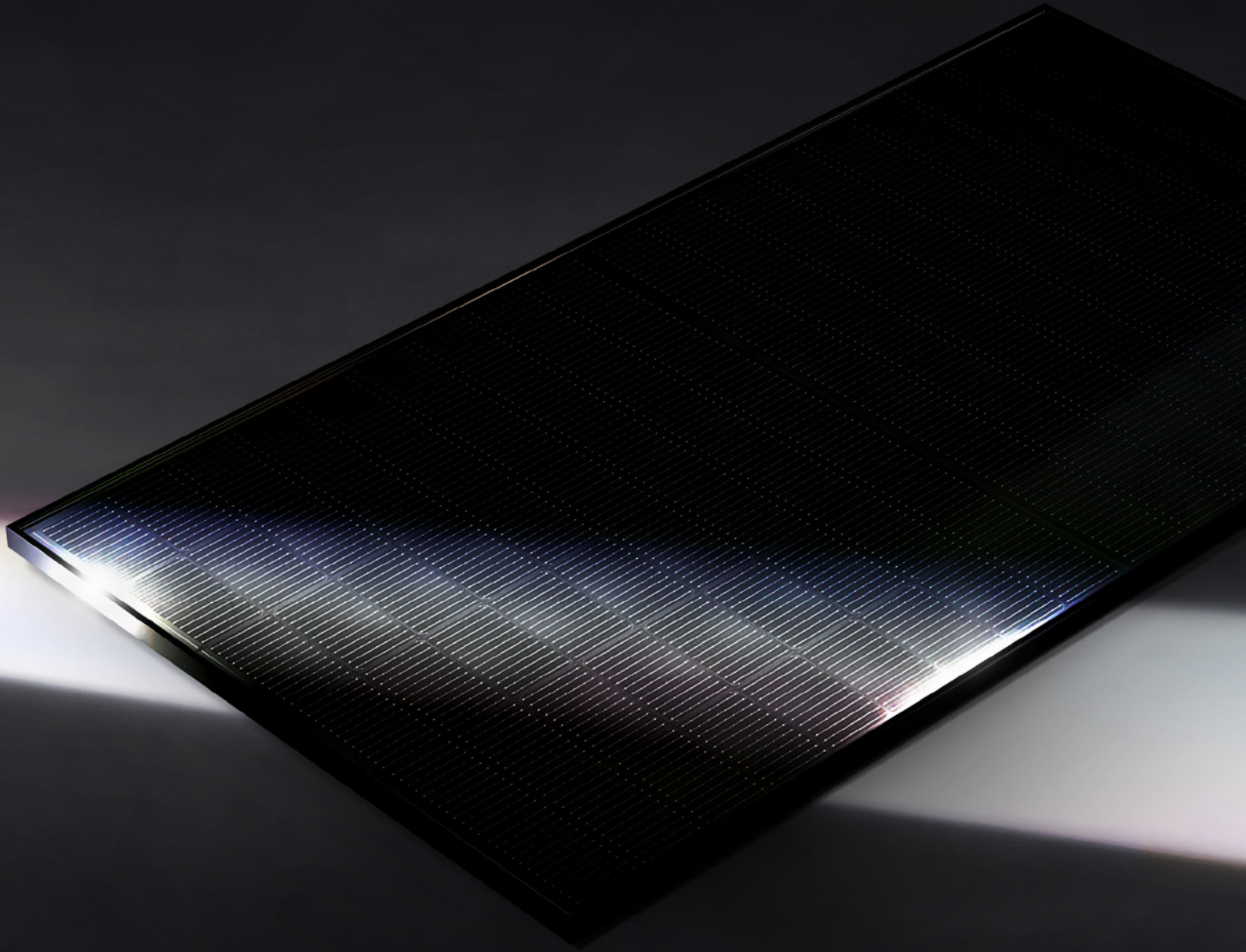




qcells



Q.TRON

Next Level Power.



Q.TRON

TOPCon N-type module, based on proprietary, Q.ANTUM NEO Technology



All Black

108 Half-cells

Q.TRON BLK M-G2+

405-440 Wp / 22.5%

USA's Leading Complete Energy Solutions Provider

Why choose Qcells when going solar?

Long-term reliability, high quality standards, financial bankability and market recognition are some important deciding factors to consider when selecting the right brand for your solar needs. Though there are many options in the market today, place your trust in the market leader.

No.1 Market Share

Top market share in both the U.S. residential and commercial segments.

*Wood Mackenzie US PV Leaderboard Residential & Commercial since 2018 and 2019 respectively.



Tier1 Bankability

Tier 1 solar manufacturer backed by Hanwha Group, a Fortune Global 500 company and 7th largest conglomerate in South Korea.



USA Manufacturing

The only company to establish a fully-integrated silicon based solar supply chain from raw material to finished panel in the US with the largest solar module factory of its kind in operation in the Western Hemisphere.



TOP Solar Brand

Qcells has been awarded the "Top Brand PV" seal by internationally recognized research institute EuPD for 11 years running.



Quality Assurance

Strict quality testing standards that ensure outstanding durability and world-class performance, proven by top global institutions PVEL and TÜV Rheinland.



BEST-in-Class Warranty

Extended 25-year product and performance warranties* that reflect our commitment to quality products built to last.

*30-year performance warranty option is available when financed with EnFin.
*Applicable to select products



- Exceptional power and efficiency
- Enhanced physical durability
- Improved temperature coefficient
- Installation friendly
- Advanced Yield Security (Anti-PID, Anti-LeTID, Hot-Spot Protect)
- EPEAT registered*

*Applies to Q.TRON BLK M-G2+

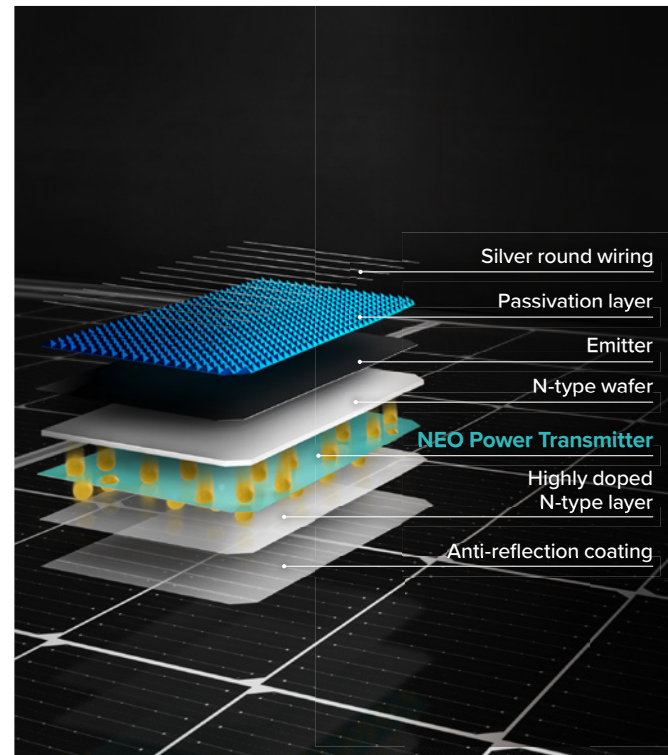
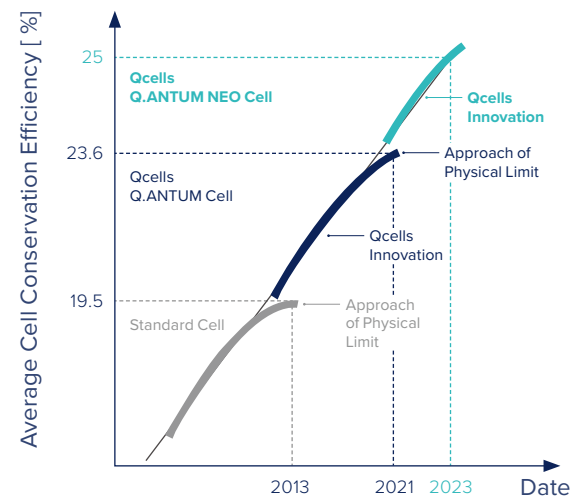


Innovation meets tradition with more than 20 years of experience.

Leveled Up Q.ANTUM Technology

Q.ANTUM is the most mature PERC (Passivated Emitter and Rear Cell) technology, and Qcells was the first solar company to commercialize the technology. With higher performance and efficiency, we are proud to introduce the new N-type TOPCon technology, Q.ANTUM NEO.

The source of the highly efficient Q.ANTUM NEO solar cells comes from the NEO Power Transmitter.



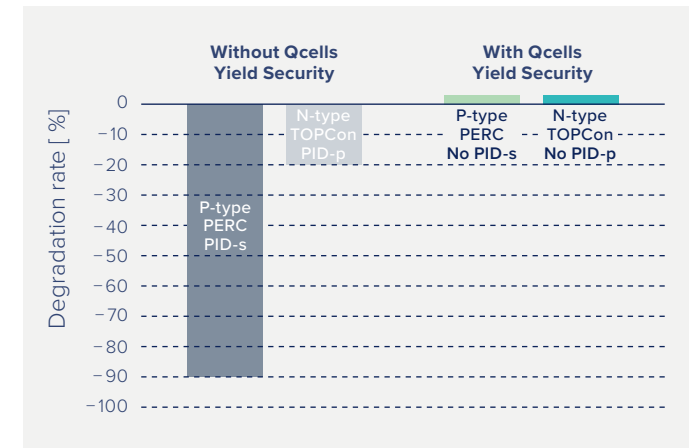
Advanced Yield Security

Qcells' Advanced Yield Security protects solar cells from critical degradation effects and potential hot-spots.



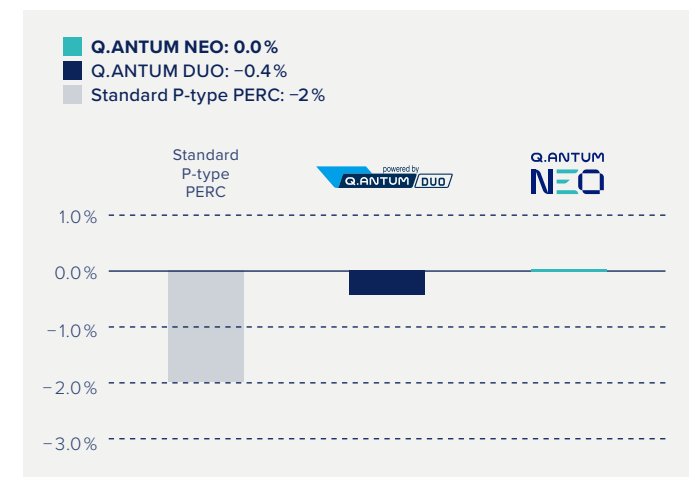
1 Advanced Anti-PID

Potential Induced Degradation (PID) can lead to significant power loss for both P-type and N-type cells. The Advanced Anti-PID Technology of Q.ANTUM NEO effectively protects the solar cells and secures high energy yield in the long-term.



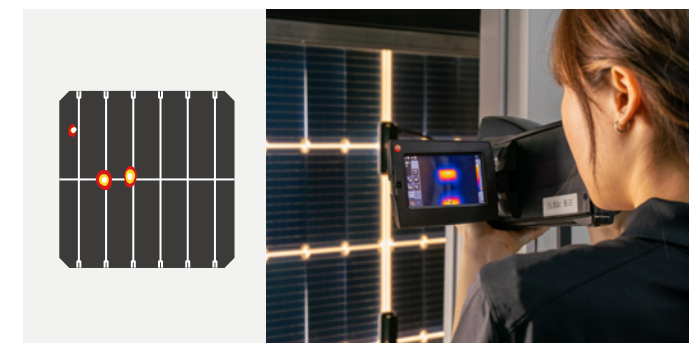
2 Advanced Anti-LeTID

Qcells is the first company to observe Light and Elevated Temperature Induced Degradation (LeTID) effects and devise a solution to suppress it since 2015. Our experience and scientific understanding of LeTID effects ensures high reliability of cell performance.



3 Hot-Spot Protect

Hot-spots can lead to delamination and micro cracks. Qcells ensures the quality of Q.ANTUM NEO cells against hot-spots, enabling 100% hot-spot free production.



Qcells' Measures to Ensure Outstanding Quality & Performance

The Four Quality Levels

Quality is one of the most important factors to consider when selecting a brand and product, especially considering the 25-year+ lifespan of a solar module.

All Qcells products, which are engineered in Germany, pass a strict quality program consisting of four levels.

Level 1 Initial Certification

The Basic Requirement for Commercial Solar Modules

To guarantee electrical safety and integrity of our modules, Qcells products are certified by official testing standard authorities including IEC and UL.

Level 2 Advanced Yield Security

The Most Trustful Cell Technology

Qcells Advanced Yield Security ensures long-term reliability of modules.



qcells
Advanced Yield Security

- Advanced Anti-PID
- Advanced Anti-LeTID
- Hot-Spot Protect

Level 3 Quality Controlled PV (QCPV)

The World's First to Pass Quality Controlled PV

Developed by TÜV Rheinland, QCPV is the strictest and most extensive testing program available in the industry. Along with that, it is the only certification in the industry to involve independent and random onsite testing as well as regular components and materials audits.

Level 4 Initial Quality Test

Uncompromising Testing Standards for Ultimate Quality

Qcells' Internal Quality Test Program (IQT) ensures that all products meet high quality standards. As a leader in product quality, Qcells applies up to 3 times stricter testing standards than the global standard.

Validity & Reliability

Q.TRON comes with TÜV Rheinland Quality Controlled PV

Qcells is the first solar module manufacturer in the industry to pass TÜV Rheinland's new Quality Controlled PV (QCPV), the most thorough testing program in the industry.



For more information



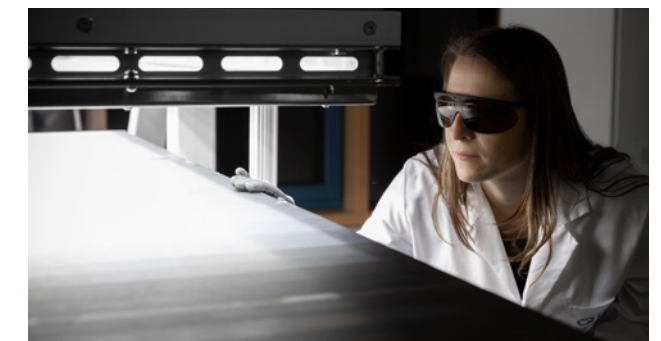
1 Onsite Production Monitoring

QCPV is the only testing program in the industry in which TÜV Rheinland experts continuously monitor and check the quality via random sampling at Qcells sites, in order to guarantee product stability. They also witness the certification tests of the Qcells module test centers in Germany, Korea, Malaysia and China.



2 Extended Stress Testing Standards

With our solar modules passing over 40 individual tests, Qcells consistently raises the bar for quality control. This series of individual tests puts our solar modules to the test: Before we go into series production and after any change – no matter how minor – we carry out module tests that set new industry standards.



3 Components and Materials Audits

To immediately detect quality fluctuations at the earliest stages in manufacturing, Qcells regularly checks components and materials using sophisticated test methods, paying particular attention to reliability and material properties as well as supplier change control.

Superior Quality with QCPV

Part 1. Initial Qualification Tests



1 Environmental Stress Test

Up to 3 times stricter than the IEC standard.



2 Mechanical Load Test Sequences

Combination of 1 Environmental Stress Test with mechanical and UV light stress test.



3 Test of Recent Failure Modes

Potential Induced Degradation (PID), Light and Elevated Temperature Induced Degradation (LeTID).

Part 2. Monitoring of Production

1

Random sampling of production



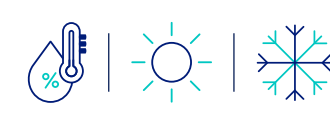
2

Surveillance and witnessing by independent TÜV Rheinland experts



3

Monthly testing of production in extended environmental stress tests



4

Daily testing of production in extended functional and security tests



Part 3. Material & Supplier Monitoring

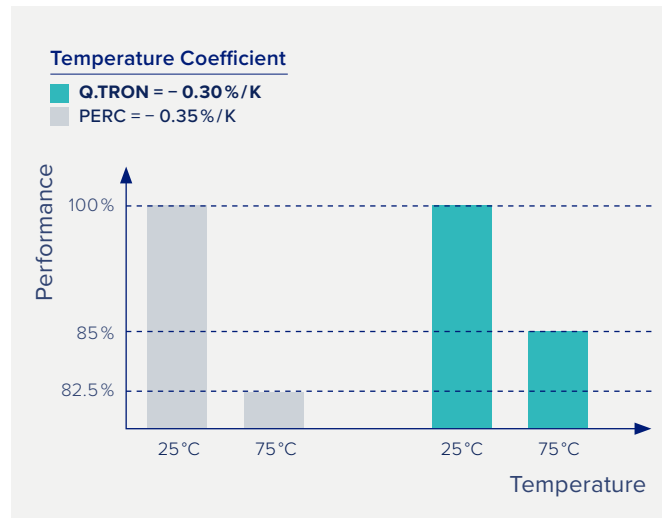
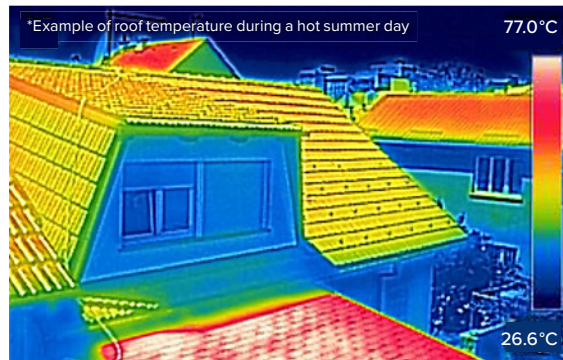
- Determination and monitoring of material fingerprint with sophisticated test methods
- Comprehensive supplier audit program and supplier change control

Physical Durability

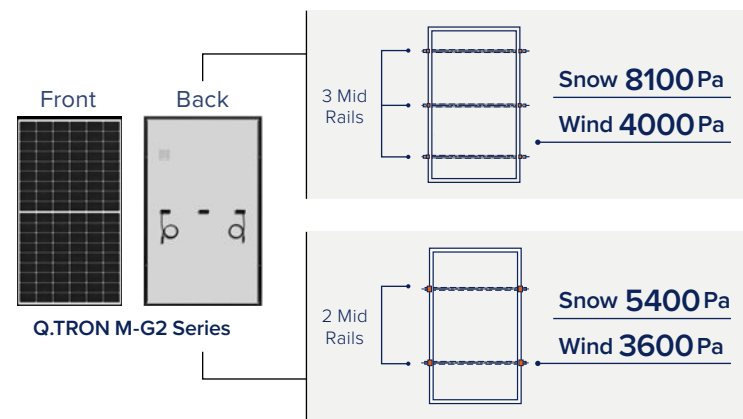
Superior performance even under high temperature.

Improved Temperature Coefficient

When the temperature of a solar module exceeds 25°C, its power production decreases. With an industry-leading temperature coefficient, Q.TRON maintains its high performance even under high temperature.



Industry Leading Mechanical Load Specification



Q.TRON N-type modules are designed to resist heavy snow and wind environments, even with a 30mm frame thickness. The thinner frame makes the module lighter, providing transportation and easy installation benefits.

Q.TRON solar modules with global standard mounting options, can withstand 5400/3600Pa, which covers most of the regions in the US with extreme environment conditions.

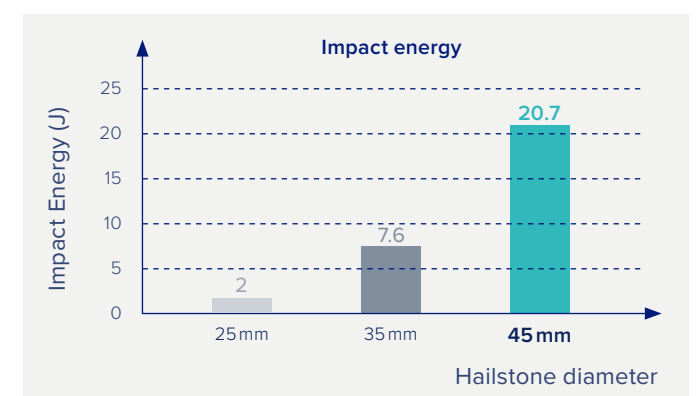
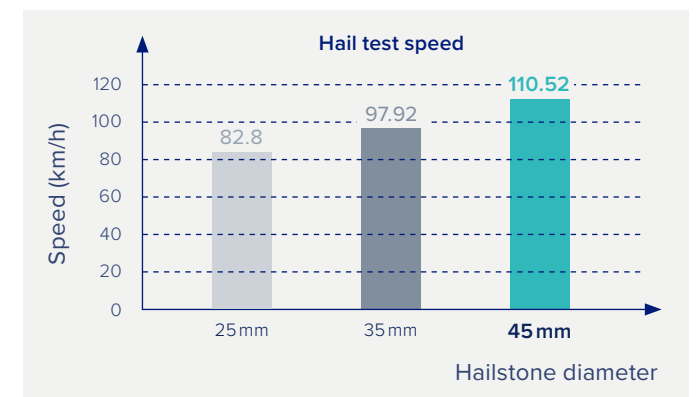
*Max. Test Load, Push/Pull



Protect Your Roof from Extreme Weather Conditions

Among extreme weather conditions like storms, blizzards and high winds, hail is the most concerning type for solar module owners looking to protect their investment. Generally, modules are tested to withstand hailstones up to 25mm in diameter.

Qcells' high quality Q.TRON solar modules are built to withstand **45mm hailstones**, far beyond the industry standard.



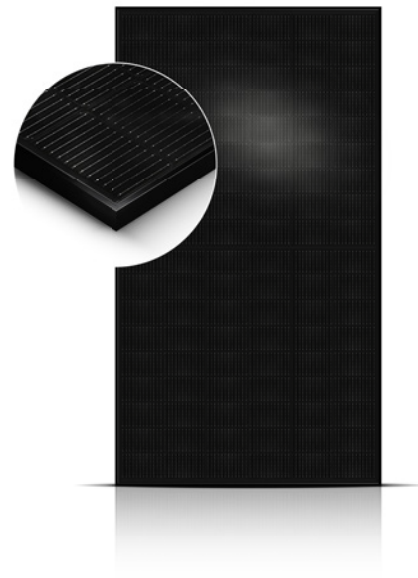
Q.TRON Series Specification

Highly efficient N-type solar modules with Q.ANTUM NEO Technology.

Introduction

Q.TRON is Qcells' highly efficient N-type solar module based on Q.ANTUM NEO Technology. Thanks to its high efficiency of up to 22.5%, Q.TRON is a suitable solution for residential and commercial building rooftops with limited space.

Specifications



Specification	Q.TRON BLK M-G2+ Series
Power Class	405 Wp - 440 Wp
Max Efficiency	22.5%
Format (including frame)	67.8 in × 44.6 in × 1.18 in
Weight	46.7 lbs
Frame	Black anodized aluminum
Cell	6 × 18 monocrystalline Q.ANTUM NEO solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in, Protection class IP67, with bypass diodes
Temperature Coefficient of PMPP	-0.30%/K

Warranty

25-year product and performance warranty*
*30-year performance warranty when financed with EnFin

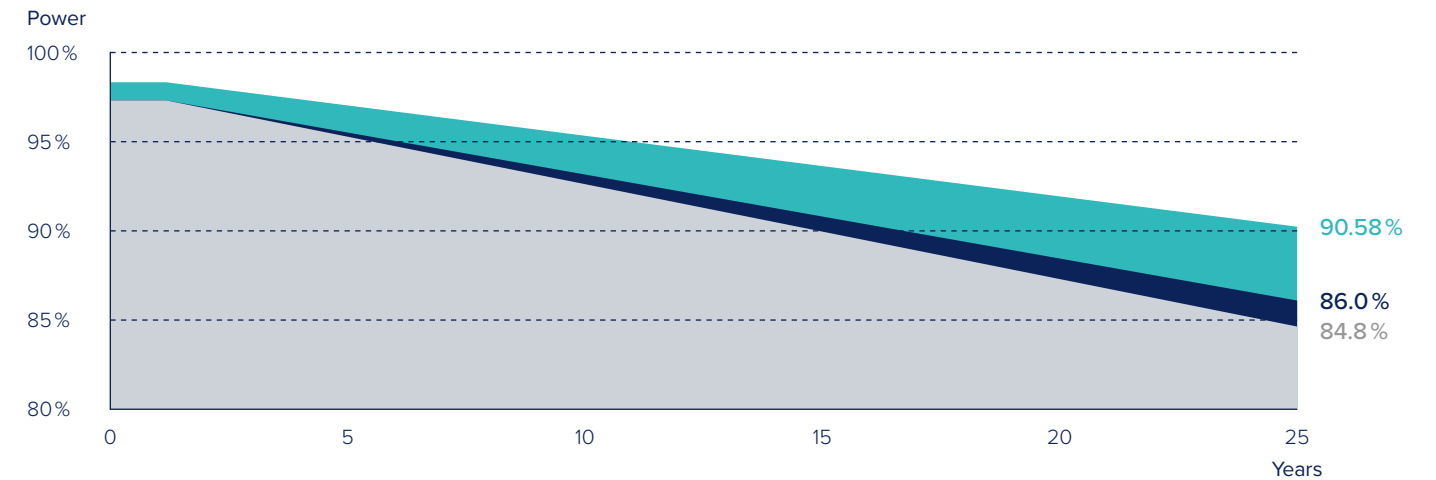


Higher Performance under Real Conditions

With its proven quality, Qcells confidently provides an inclusive 25-year product warranty and 25-year linear performance warranty, bringing users peace of mind.

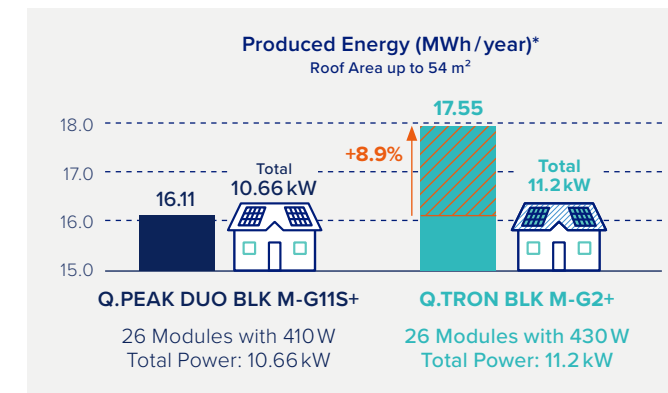


- **Q.TRON (98.5%, - 0.33% per year)**
- **Q.PEAK DUO (98%, - 0.50% per year)**
- **Industry Standard (P-Type) (98%, - 0.55% per year)**



More Power on the Roof

Energy production comparison reveals that Q.TRON N-type modules generate **8.9%** more energy per year compared to Q.PEAK DUO BLK M-G11S+ PERC modules.*



*Simulation: 26 modules per system installed in San Francisco, USA; mean value of warranted power (first year & 25 years) assumed (Q.PEAK: 92%; Q.TRON: 94.5%)

Sustainable Commitments for a Greener Future

We aim for a greener tomorrow with completely clean energy solutions.

Low Carbon Manufacturing Efforts

Qcells has made various efforts to reduce carbon emissions in its supply chain and manufacturing processes.



The first silicon-based solar module manufacturer to achieve EPEAT registration.*
*Applies to Q.TRON BLK M-G2+




Founding member of the Ultra Low-Carbon Solar Alliance

Carbon Reduction with Q.TRON*


Q.TRON modules provide benefits for you and the entire planet.

Q.TRON modules enable a new level of energy independence and contribute significantly to curbing climate change. With Q.TRON you can generate energy more efficiently than ever.




Energy Yield for 25 Years
345 MWh

=




Highest Energy Independence
over **25 Years**

*Assumption: 20 Q.TRON M-G2+ (440 Wp) per system installed in San Francisco, USA over 25 years. CO2 emission-factor based on "2019 Grid Electricity Emissions Factors v1.0 – June" Report



Reduction in CO₂ Emissions
164 tCO₂

=



CO₂ Absorption of
657 Trees

Campaigns to Create Social Value

Hanwha Solar Forest Campaign

Qcells has been continuously participating in the 'Hanwha Solar Forest' campaign, for which Hanwha Group creates eco-friendly forests with seedlings grown using solar power to respond to desertification and fine dust issues. Through the campaign, which celebrated its 10th anniversary this year, Hanwha Group created seven forests in Korea, China and Mongolia, and planted about 500,000 trees. This campaign was introduced as the world's first corporate campaign utilizing solar energy to prevent desertification at the 2011 United Nations Convention to Combat Desertification (UNCCD).



Clean Up Mekong Campaign

In 2019, Qcells donated solar modules to the 'Clean Up Mekong' campaign conducted by Hanwha Group. Clean Up Mekong is a campaign which provided two solar-powered waste-collecting boats to Vinh Long, Vietnam, to help remove floating waste from the river in an environmentally-friendly manner. This campaign, which creatively approached environmental issues with eco-friendly energy, won a Gold Award at the New York Festival, one of the world's three largest advertising festivals.



The Jukdo Project

The island of Jukdo, inhabited by 70 residents and once entirely dependent on diesel fuel for electricity, made the decision to add solar to its energy generation with the help of Qcells. Through this, the island transformed into a fully self-sufficient energy producing area with most of its electricity generated from solar.



Greener Davos Initiative

To address the issue of climate change and promote solar energy as an effective solution, Qcells installed 340kWp of solar on the Davos Congress Center in support of the Greener Davos Initiative.



Qcells is committed to local manufacturing in the U.S. and revitalizing the domestic solar value chain.

Qcells is the number one module supplier in the country for both the residential and commercial segments, a leader in the utility sector and a proud creator of U.S. manufacturing jobs. Based in Dalton, Georgia, our solar module factory is the largest of its kind in the United States.

In January 2023, Qcells announced the largest investment in U.S. solar history to build the nation's only complete and sustainable solar supply chain.

Qcells will be manufacturing 3.3 GW of solar ingots, wafers, cells and finished panels at our new Cartersville facility, which is expected to be completed and operational by 2025.

- 5.1 GW solar module production currently
- 8.4 GW total production capacity by 2024
- 2,500 new jobs, 4,000+ total GA jobs
- \$2.8 billion investment in GA
- Qcells' Q.TRON BLK M-G2+ solar module, assembled in Dalton, GA, is an EPEAT registered product, meeting the Global Electronics Council's (GEC) stringent sustainability criteria



Q.TRON BLK M-G2+

405-440 Wp

Efficiency up to 22.5%



Warranty
Product & Performance



Qcells
Advanced Solar Security

Q.ANTUM NEO



USA



ULTRA LOW-CARBON
SOLAR ALLIANCE
Founding Member



EPEAT
REGISTERED

Contact your Qcells Sales Representative for details regarding certain module products' eligibility to be Buy American Act (BAA) Compliant.

Qcells