

Qcells Achieves Key Tandem Solar Module Stability Milestone

Energy leader takes another leap towards tandem module commercialization, aiming to make solar power more affordable, accessible and sustainable

(Bitterfeld-Wolfen, Germany) – May 14, 2025 – Qcells, a premier provider of complete energy solutions and global solar energy market leader, today announced it has achieved successful stress test validation for its tandem modules, according to both IEC and UL certification standards. These tests also complied with tandem-specific requirements for power measurements, making them a key first in the industry. The standard-compliant execution of the stress tests and measurements has been independently confirmed by TÜV Rheinland. After announcing world-record efficiency for a commercially scalable perovskite/silicon tandem solar cell [in December 2024](#), Qcells has now achieved this major milestone in durability that reinforces the company's leadership in advancing tandem technology toward real-world, commercial deployment.

Tandem technology, which is the pairing of perovskite cells with standard silicon cells, has long shown promise in laboratory settings for improving overall efficiency. It has demonstrated the potential to further reduce the cost of solar energy, and the land footprint required for solar projects, thus helping accelerate the transition to cleaner, more efficient energy. However, long-term stability and standardized measurement posed challenges for commercialization. By successfully passing the most critical stress tests for solar cell reliability, especially considering tandem-specific restrictions on power measurement, Qcells has demonstrated that tandem technology can now meet the performance benchmarks that set the groundwork for commercial acceptance.

“To Qcells’ knowledge, this is the first report of tandem modules passing these stress tests, considering tandem-specific restrictions on power measurement, so this is truly a pivotal moment for tandem solar technology,” **said Danielle Merfeld, Global Chief Technology Officer at Qcells.** “Qcells’ breakthrough marks a critical step towards commercial readiness.”

“Qcells is pleased to announce this outstanding stability achievement based on our in-house developed perovskite technology as a top cell, and cost-efficient Q.ANTUM silicon technology as a bottom cell,” **said Fabian Fertig, Head of Tandem R&D at Qcells Germany.** “The tested cells and modules are typical devices from our R&D pilot line in Germany and have been fabricated by exclusively using processes that are feasible for mass production. This result is laying the groundwork for future commercialization of this exciting technology.”

Qcells’ tandem cell technology features a 2-terminal device architecture, which is composed of a perovskite technology top layer and silicon bottom layer featuring Qcells’ proprietary Q.ANTUM technology. The core of this latest achievement by Qcells involves successfully passing the most critical stress tests for solar cell reliability according to International Standards IEC 61215-2:2021 and UL 61215-2:2021. These include the UV preconditioning test for 15kWh/m² (MQT10; UV15), thermal cycling test for 200 cycles (MQT11; TC200),



humidity-freeze test for 10 cycles (MQT12; HF10), and damp heat test for 1000h (MQT13; DH1000). These stress tests have been successfully passed by fulfilling the tandem-specific requirements for power measurements as specified in International Standard IEC TS 60904-1-1 for multi-junction modules.

The tested modules were fabricated using Qcells' tandem R&D pilot line in Bitterfeld-Wolfen, Germany, by incorporating tandem solar cells on full-area M10 substrates and applying exclusive mass-production processes for cell and module fabrication.

The Bitterfeld-Wolfen R&D Center in Germany is supported by funding from the German Federal Ministry for Economic Affairs and Climate Action (BMWK), the state of Saxony-Anhalt and the European Union, including the light-house project PEPPERONI, along with the Dutch and Swiss governments. Qcells' Pangyo R&D center, appointed as a research institute for national projects, has received ongoing support from the Korean government to develop commercially viable tandem cell technology.

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About Qcells

Qcells is one of the world's leading clean energy companies, recognized for its established reputation as a manufacturer of high-performance, high-quality solar cells and modules, portfolio of intelligent storage systems, and growing international pipeline of large-scale renewable energy projects. Qcells also provides renewable electricity retail services and packages to end customers across the world. The company is headquartered in Seoul, South Korea (Global Executive HQ) with its diverse international manufacturing facilities in the U.S., Malaysia, and South Korea. Qcells offers Completely Clean Energy through the full spectrum of photovoltaic products, storage solutions, renewable electricity contracting and large-scale solar power plants. Through its growing global business network spanning Europe, North America, Asia, South America, Africa and the Middle East, Qcells provides excellent services and long-term partnerships to its customers in the utility, commercial, governmental and residential markets. For more information, visit: <https://qcells.com/us/>.

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This press release contains forward-looking statements. These forward-looking statements can be identified by terminology such as "will," "expects," "anticipates," "future," "intends," "plans," "believes," "estimates" and similar statements. Among other things, the quotations from management in this press release and Qcells' operations and business outlook, contain forward-looking statements. Such statements involve certain risks and uncertainties that could cause actual results to differ materially from those expressed in or suggested by the forward-looking statements. Except as required by law, Qcells does not undertake any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Media Contact:

Debra DeShong, VP, Corporate Communications
Qcells North America
Us-media@qcells.com