

Lighting Global Product Testing Verification Solar Home System

Expiration Date: December 31, 2021¹
Verify here: www.lightingglobal.org/products/qotto-TV4L

This verifies that the Solar Home System was tested according to the Quality Test Method stipulated in edition 4 of IEC 62257-9-5² and complied with the Lighting Global Solar Home System Kit Quality Standards.³



Testing Details:

Product Name: Solar Home System
Model Number: TV4L-Q22
Company Name: Qotto SAS
Country of Origin: China
Company Contact: Fabrice de Gaudemar, fabrice@qotto.net
Original QTM Sample Size: n=4
Renewal Test Conducted: no
Sample Procurement Method: Random warehouse sampling
Testing Laboratory: Shenzhen Academy of Metrology and Quality Inspection, Shenzhen, China

Documentation:

Specifications sheet with verified test results and original version of this verification:
www.lightingglobal.org/products/qotto-TV4L

Russell Sturm
Global Head, Energy Access
Lighting Global Project Manager
International Finance Corporation

¹ Lighting Global requires re-testing every two years or upon major product revisions, and in special cases reserves the right to grant an extension on results validity.

² www.lightingglobal.org/quality-assurance-program/

³ www.lightingglobal.org/quality-assurance-program/our-standards/

Type Approval Solar Home System

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| Category | Quality Standard | Verdict |
|---------------------------------|--|---------|
| Truth In Advertising | Manufacturer, Product Name and Model Number accurately specified | Pass |
| | Performance and Component Ratings accurately specified. Any description of the product that appears on the packaging, inside the package and in any media shall be truthful and accurate. No statements mislead buyers or end users about the utility of the product. Numeric ratings deviate no more than 15% from actual performance (note that it is acceptable for actual performance to exceed advertised performance). | Pass |
| | Port voltage and current specifications, if provided, are accurate. Included appliances function when connected to ports. Power output of ports is sufficient to power appliances that are advertised but not included. Ports that are intended for a function other than providing power, such as data ports, are not required to meet this standard. | Pass |
| Lumen Maintenance | Average relative light output $\geq 90\%$ of initial light output at 2,000 hours with only one sample allowed to fall below 85% OR All 4 samples maintain $\geq 95\%$ of initial light output at 1,000 hours | Pass |
| Circuit and Overload Protection | Products include a current limiting mechanism to prevent irreversible damage to the system. The mechanism is easily resettable or replaceable by the user, or automatically resets. If replaceable fuses are used for circuit protection, sizes are labeled on the product and listed in the user manual, and, if fuses are replaceable by the user, at least one spare fuse is included with the product. Included appliances are not required to meet this standard unless they have ports that are intended to provide power. | Pass |
| AC-DC Charger Safety | Any included AC-DC charger carries approval from a recognized consumer electronics safety regulator | n/a |
| Wiring and Connector Safety | Wires, cables and connectors are appropriately sized for the expected current and voltage. | Pass |
| Hazardous Substances Ban | No battery contains cadmium or mercury at levels greater than trace amounts | Pass |

Type Approval Continued

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| Category | Quality Standard | Verdict |
|---------------------------------------|--|---------|
| Battery Protection | Protected by an appropriate charge controller that prolongs battery life and protects the safety of the user. 4 samples must meet the requirements outlined in Lighting Global Quality Standards. Lithium batteries carry IEC 62281, IEC 62133-2, UL 1642 or UN 38.3 certification and have overcharge protection for individual cells or sets of parallel-connected cells. Batteries of included appliances must also meet this standard. | Pass |
| Battery Durability | The average capacity loss of 4 samples does not exceed 25% and only one sample may have a capacity loss greater than 35% following the battery durability storage test as defined in IEC/TS 62257-9-5 Annex BB | Pass |
| PV Overvoltage Protection | If the battery is disconnected or isolated, the system must not be damaged and the load terminals shall maintain a voltage that is safe for their intended uses. | Pass |
| Miswiring Protection | The user interface is designed to minimize the likelihood of making improper connections. If improper or reversed connections can easily be made, they cause no damage to the system or harm to the user. | Pass |
| Physical Ingress Protection | IP2X for all products, IP3X (or 2X + circuit protection) for PV modules, IP5X for fixed outdoor products | Pass |
| Water Ingress Protection | Degree of protection required is based on product type: Fixed separate (indoor): No protection required Portable separate: Occasional exposure to rain Portable integrated: Frequent exposure to rain Fixed integrated (outdoor): Permanent outdoor exposure PV modules: Outdoor rooftop installation | Pass |
| Drop Test | Fixed separate (indoor): No requirement All other products: All samples are functional after drop test; none result in dangerous failures. | Pass |
| Soldering and Electronics Workmanship | The system and any included appliances are rated “Good” or “Fair” for workmanship quality as defined in Annex F of IEC/TS 62257-9-5. At most, one sample may fail to function when initially evaluated. | Pass |
| Mechanical Durability | 4 samples and included appliances are functional after Switch, Connector, Gooseneck and Strain Relief tests; none result in dangerous failures | Pass |
| Cable Specifications | Any outdoor cables must be outdoor-rated and UV resistant. | Pass |

Type Approval Continued

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|---|--|---------|
| User Manual | User manual must present instructions for installation, use, and troubleshooting of the system. Installation instructions must include appropriate placement and installation of the PV module. Basic electrical safety and system maintenance must also be covered. Installation and operation instructions should be presented using language and graphics that can be understood by the typical consumer. | Pass |
| Component Specification and Replacement | <p>Consumer information must provide at least one of the following options:</p> <ol style="list-style-type: none"> 1) specifications for components that may require replacement (fuses, lights, PV, batteries) and instructions for replacement, OR 2) directions as to how the consumer can get components, including the battery, replaced at service centers, both during and post warranty, OR 3) a clear consumer-facing statement that the batteries and other components are not replaceable. <p>A clear statement regarding the battery replacement must be included on the consumer-facing packaging or user agreement.</p> | Pass |
| Minimum Warranty Terms | Accurately specified and consumer-facing; minimum coverage of at least two years for the system and one year for included appliances. | Pass |
| Performance Reporting | PV Power must be accurately reported on the product packaging. | Pass |

Additional details on the requirements listed above are provided in the Lighting Global Quality Standards, available here:
www.lightingglobal.org/quality-assurance-program/our-standards/

Products are tested according to the test methods described in edition 4 of IEC/TS 62257-9-5 and meet the Lighting Global Solar Home Sytem Kit Quality Standards.