

Lighting Global Quality Assurance

PowerPoint slides available upon request. Contact qa@lightingglobal.org.



Agenda

- What is Lighting Global Quality Assurance?
- Who is Lighting Global Quality Assurance?
- Why does quality matter?
- Lighting Global Quality Standards
- Benefits of quality-verification
- Testing & verification overview
- Market surveillance
- How to get in touch with the Lighting Global team



What is Lighting Global Quality Assurance and What Does it do?

Lighting Global Quality Assurance catalyzes off-grid solar markets to power the world's poorest people.

Lighting Global Quality Assurance:

1. Develops and manages the test methods and quality standards that serve as a universal benchmark for product quality and performance
2. Offers manufacturers expert, unparalleled quality-verification services, product performance benchmarking, and guidance on how to improve their products
3. Provides technical assistance to national governments and other large institutions with a commitment to quality

What does success look like?

A competitive global market where quality products are the default option



Consumers are satisfied with their purchases, so markets are not spoiled



More households achieve higher levels of energy access faster

Core Elements of Lighting Global Quality Assurance

Lighting Global QA Framework

Test Methods and Quality Standards



Technical Specification
62257-9-5, Ed. 4.0



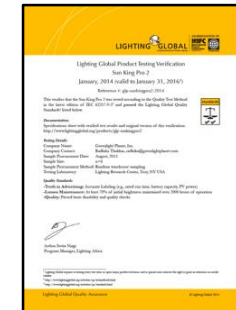
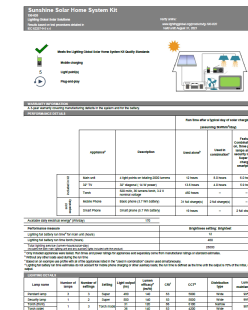
Quality Standards

Testing and Verification



ISO 17025 accreditation using
ILAC affiliated organizations

Communicating Quality to the Market



Stakeholder engagement
Consumer awareness campaigns
Product listing on Lighting Global website

Who is Behind Lighting Global?



- Created Lighting Global and continues to fund program
- Manages Lighting Global Business Development Services



- Headquartered in Washington, DC with offices in Kenya, India, and Europe
- Leading international voice and resource for appliance energy efficiency policy and market acceleration initiatives
- Manages Lighting Global Quality Assurance



- Located at Humboldt State University in California
- Providing technical and strategic support to Lighting Global Quality Assurance for more than 10 years
- Now under contract to CLASP

Why does Quality Matter?

- Off-grid solar markets lack strong consumer protection frameworks
- Poor quality products can lead to “market spoilage”
- Results from a [recent Lighting Global study](#) indicate that non-quality verified pico-solar products break more often, more quickly, and undermine consumer confidence and market health



Quality Matters – Understanding non-Quality Verified Products

Pico-solar products—lanterns or multi-light systems with a peak PV module power of up to 10 watts—make up the largest share of off-grid solar product sales.

The global pico-solar market is dominated by products that have not yet been quality verified by Lighting Global or have failed to meet Lighting Global Standards.

To better understand the performance of these products, **Lighting Global tested 17 top-selling, non-Quality Verified pico-solar products** from retail stores in five markets: Ethiopia, Kenya, Myanmar, Nigeria, and Tanzania.



Quality Matters - Understanding non-Quality Verified Products

100% of the tested products failed to meet the Lighting Global Standards.

Nearly all of the products lacked consumer-facing information, or had some combination of technical issues that would shorten product lifetime and contribute to consumer dissatisfaction, which may make them less likely to purchase other products.

Access the full study at: www.lightingglobal.org/resource/quality-matters/

94%

had one or more deficiency known to affect product durability

88%

inaccurately advertised product performance

88%

did not have a consumer-facing warranty

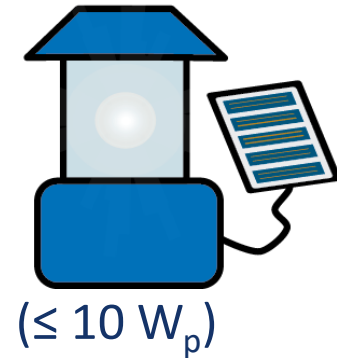
76%

would require significant changes to meet the Standards

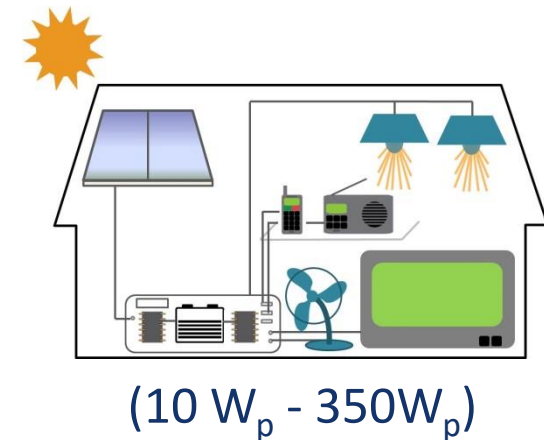
Lighting Global Quality Standards

- The Quality Standards are benchmarks that set a baseline level of **quality, durability, and truth-in-advertising** to protect consumers of off-grid lighting products
- Conformance is evaluated based on results from **laboratory testing** according to International Electrotechnical Commission (IEC) Technical Specification 62257-9-5
- Tests are conducted at **third-party, approved test centers** that are ISO 17025 accredited
- The Lighting Global Quality Standards are the **only internationally recognized standards** for these products and are expected to be adopted by the IEC by the end of 2019

Pico-PV Quality Standards



SHS Kit Quality Standards



Lighting Global Quality Standards Core Elements

TRUTH IN ADVERTISING

Advertising and marketing materials accurately reflect tested product performance.

LUMEN MAINTENANCE AND DURABILITY

Product maintains consistent light output after 2,000 hours of operation. Product is appropriately protected from water exposure and physical ingress, has durable switches and connectors and, if portable, survives being dropped.

SYSTEM QUALITY AND SAFETY

Product passes a visual wiring and assembly inspection, and is safe to use.

WARRANTY

A consumer-facing warranty is available; the required warranty duration varies by product type.

Benefits for Manufacturers

- **Gain entry to markets** where Lighting Global quality verification and test reports can be used to demonstrate compliance with national standards
- **Signal product quality** to professional buyers and investors
- Have confidence that **products are tested correctly** and test reports are accurate
- **Compare products to competitors'** products through benchmarking services
- **Get help bringing products into compliance** with the quality standards



Benefits for Distributors

- **Qualify products** for bulk procurements, results-based financing schemes, and working capital facilities
- Quickly and easily **identify products** that will meet customers' needs and expectations
- Reduce the financial and reputational risks associated with guaranteeing products to end consumers



Benefits for Investors

- **Reduce risk** by investing only in companies that trade in products designed to meet consumers' expectations for quality, performance, and durability



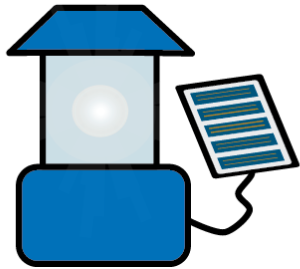
Benefits for Governments

- Use the framework as a basis for tax and duty policies, voluntary market stimulation programs, and product regulations to protect consumers.
- Aligning with international standards **reduces the time and resources needed** to develop and implement such policies
- Give consumers **expanded access to global product innovation**



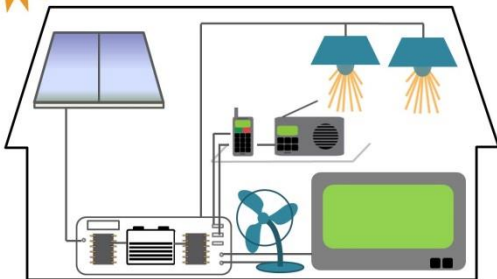
Lighting Global Quality-Verification Process

Pico-PV Products



($\leq 10 W_p$)

Solar Home System Kits



($10 W_p - 350W_p$)

QTM

Random sampling and full testing at a test lab in the Lighting Global Lab Network

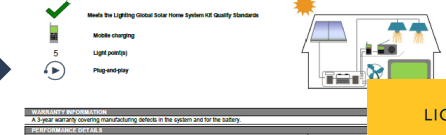
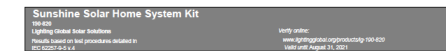
n=6

A product that meets the Standards receives a Standardized Specification Sheet, Verification Letter, and a listing on the Lighting Global website

quality

Test results are evaluated by the QA team against the standards and company receives results

✓ ✓



| Appliance* | Description | Used alone* |
|--------------|--|-----------------|
| Main unit | 4 light points on totaling 2000 lumens | 12 hours |
| | 32" TV (14 W power) | 13.6 hours |
| Tranch | 600 W, 16.5 V, 3.2 V nominal voltage | 400 hours |
| Mobile Phone | Basic phone (3.7 Wh battery) | 21 full charges |
| | Smart Phone (5.7 Wh battery) | 19 hours |

| Performance measure | Brightness |
|--|------------|
| Lighting full battery run time (hours) | |
| Lighting full battery run time (hours) | |

| Item | Number of lamps | Rating | Light output (lm) | Lumen efficacy* (lm/W) | CRI* | CCF* | |
|----------------|-----------------|--------|-------------------|------------------------|------|------|------|
| Pendant lamp | 3 | Super | 400 | 140 | 83 | 5000 | |
| Security lamp | 1 | Super | 800 | 140 | 83 | 5000 | |
| Table lamp | 2 | Super | 200 | 140 | 86 | 4100 | |
| Tranch (total) | 1 | 3 | Tranch mode | 34 | 140 | 83 | 4200 |

Lighting Global Product Testing Verification
Sunshine Solar Home System Kit

Verify here: www.lightingglobal.org/products/man-HP170-32

Expiration Date: August 31, 2021*

This verifies that the Home Power was tested according to the Quality Test Method stipulated in addition 4 of IEC 62572-5:1* and complied with the Lighting Global Solar Home System Kit Quality Standards.*

Testing Details:
Product Name: Sunshine Solar Home System Kit
Model Number: 190-320
Company Name: Lighting Global Solar Solutions
Country of Origin: China
Company Contact: info@lightingglobal-solar.com
Original QTM Sample Size: n=4
Revised Test Condition: n/a
Sample Procurement Method: Random warehouse sampling
Testing Laboratory: Shenzhen Academy of Metrology and Quality Inspection, Shenzhen, China

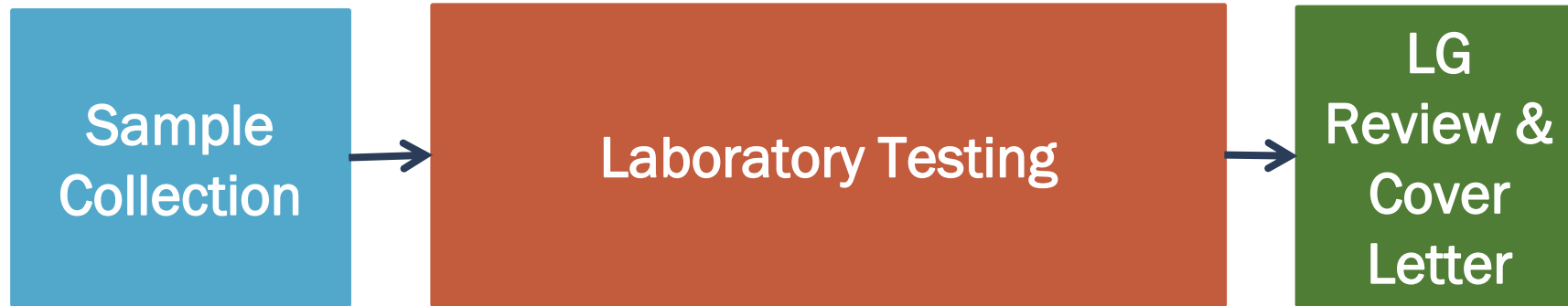
Documentation:
Specimens sheet with verified test results and original version of this verification: www.lightingglobal.org/products/lg-190-320

Paul Steiner
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*Lighting Global requires re-testing every two years or upon major product revisions, and in special cases reserves the right to grant an extension to re-test validity.
*www.lightingglobal.org/lighting-access-program
*www.lightingglobal.org/lighting-access-program/verification-methods/

Lighting Global Quality Assurance © Lighting Global 2019

Testing Timeline Overview



3-4 months



Verification Documents

Standardized Specification Sheet & Verification Letter

Sunshine Solar Home System Kit
 Lighting Global Solar Solutions
 Results based on test procedures detailed in IEC 62257-9-5:4

Verify online:
www.lightingglobal.org/products/190-820
 Valid until: August 31, 2021

Meets the Lighting Global Solar Home System Kit Quality Standards

- Mobile charging
- Light points) 5
- Plug-and-play

WARRANTY INFORMATION
 A 3-year warranty covering manufacturing defects in the system and for the battery.

PERFORMANCE DETAILS

| Appliances* | Description | Run time after a typical day of solar charging (assuming 5kWh/m ² /day) | | | |
|-----------------|--------------|--|----------------------|---|------------------|
| | | Used alone* | Used in combination* | Featured Combination (TV on, three pendant lamps and one security lamp on Super and charging smartphones) | |
| included in kit | Main unit | 4 light points on totaling 2000 lumens | 12 hours | 8.0 hours | 6.0 hours |
| | 32" TV | 32" diagonal (14 W power) | 13.6 hours | 4.0 hours | 5.9 hours |
| | Torch | 520 mA/h, 36 lumens torch, 3.2 V nominal voltage | 460 hours | - | - |
| not included | Mobile Phone | Basic phone (3.7 Wh battery) | 31 full charge(s) | 2 full charge(s) | - |
| | Smart Phone | Smart phone (5.7 Wh battery) | 19 hours | - | 2 full charge(s) |

Available daily electrical energy* (Wh/day): 170

Performance measure: Brightness setting: Brightest

Lighting full battery run time¹ for main unit (hours): 12

Lighting full battery run time torch (hours): 460

Total lighting service (lumen-hours/solar-day) (includes the main main lighting unit and any battery) (also includes use the product): 26200

* Only included appliances were tested. Run times and power ratings for appliances sold separately come from manufacturer ratings or standard estimates.

¹ Without any other loads used during the run time

² Based on an example use profile with all of the appliances listed in the "Used in combination" column used simultaneously

³ Lighting full battery run time estimates do not account for mobile phone charging or other auxiliary loads; the run time is defined as the time until the output is 70% of the initial, stabilized output.

LIGHTING DETAILS

| Lamp name | Number of lamps | Number of settings | Setting | Light output (lm) | Lumen efficacy* (lm/W) | CR1 ² | CCR ³ | Distribution type | Lumen maintenance ⁴ |
|---------------|-----------------|--------------------|------------|-------------------|------------------------|------------------|------------------|-------------------|--------------------------------|
| Pendant lamp | 3 | 3 | Super | 400 | 140 | 83 | 5000 | Wide | 95% |
| Security lamp | 1 | 2 | Super | 500 | 140 | 83 | 5000 | Wide | 95% |
| Torch (front) | 1 | 3 | Torch mode | 31 | 120 | 86 | 6100 | Narrow | 95% |
| Torch (side) | 1 | 3 | Torch mode | 36 | 140 | 83 | 4200 | Wide | 95% |

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Lighting Global Product Testing Verification
 Sunshine Solar Home System Kit

Expiration Date: August 31, 2021¹
 Verify here: www.lightingglobal.org/products/mar-HP170-32

This verifies that the Home Power 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: Sunshine Solar Home System Kit
 Model Number: 190-820
 Company Name: Lighting Global Solar Solutions
 Country of Origin: China
 Company Contact: info@lightingglobal.org
 Original QTM Sample Size: n=4
 Resetest Test Conducted: n/a
 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/lg-190-820

Russell Struan
 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/

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Public listing on Lighting Global website

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ABOUT US QUALITY ASSURANCE PROGRAM PRODUCTS WHERE WE WORK WORK WITH US RESOURCES NEWS

Home » Products

FILTER BY

- **Product Type**
 - Multiple Light Points (98)
 - Single Light Point (66)
- **System Size**
 - Pico Product ≤ 10W (129)
 - SHS Products >10W-350W (38)
- **Additional Features**
 - Mobile Phone Charging (140)
 - Pay-as-you-go (PAYG) (50)
- **Manufacturers**
 - A4&T Power Solutions (1)
 - Al Furaat Solar Tech Manufacturing PLC (1)
 - All Solar Lights (2)
 - Amped Innovation PBC (3)
 - Azuri Technologies LTD (2)
 - BBOX (2)
 - BioLite (1)
 - Bright Products (7)
 - Chaohu Venus Solar Technology Co. (4)
 - d.light design (14)
 - EcoZoom (1)

Products

The products listed on this website have met the **Lighting Global Quality Standards**. The list of products is updated frequently, due to the addition of new products, the expiration or renewal of products' **quality verification periods**, and the removal of products as a result of failed **market check testing**. Please check the status of your product before purchase. Please note that the inclusion of a product on this list does not guarantee that it does not violate the intellectual property rights of any person, organization or firm. For more information, read the **Lighting Global IP Policy**.

SORT BY
 Date (Newest)

+ [Click here to show Verification Letters](#)

ASSOCIATE

Home Power

ASSOCIATE

bPower

ASSOCIATE

bPower50

Market Surveillance Protects Consumers & Instills Trust in Program

Lighting Global conducts market surveillance through two pathways: market check test and market observations. If a product fails to meet the Standards and the manufacturer does not take action, it will lose verification status

Market Check Tests - randomly sample quality-verified products from retail shops and performs laboratory testing according to the Market Check Method (MCM) as described in [IEC/TS 62257-9-5](#)

Market Observations- use an app to evaluate consumer-facing information, such as packaging and warranty, of quality-verified products in retail shops



Market Check Testing Policy

Version 7
Last Updated: March 2019

What is Market Check Testing?
Market Check Testing verifies that the quality and performance of products sold in the market meet the levels measured during Lighting Global program entry testing (using the Quality Test Method (QTM) and reported on Standardized Specification Sheets).¹ The goal is to ensure the quality performance of products in the market is consistent and matches advertised levels.

How frequently does Lighting Global conduct Market Check Testing?
Check testing may be conducted at any time on products that are supported by Lighting Global. Selection of products for Market Check Testing and frequency of testing is at the discretion of Lighting Global.

How are samples selected for Market Check Testing?
When market check testing occurs, samples are randomly and anonymously procured from outlets in the market by an agent of Lighting Global. Product samples may also be randomly procured by Lighting Global or an approved third-party sampling agent from among products that are warehouses, distributorships, factories or other bulk storage locations. Lighting Global may periodically ask manufacturers or distributors to provide a list of no fewer than 10 outlets to sampling. Sampling locations may be chosen from a subset of those outlets or from others independently identified.

How does Market Check Testing work?
Market Check Testing involves a two-stage process. The first stage, referred to as **Primary Testing**, involves testing using the same approach used in the Initial Screening Method (ISM) stage of the process, one or more samples of the product may be evaluated in each of the test sample size used at this stage is based on the discretion of Lighting Global, but is typically a size of two. If the results meet or exceed the Lighting Global Quality Standards, no further testing is required.

However, if the results indicate possible deficiencies relative to the Quality Standards, additional testing may be used to confirm the problem. Companies will be provided with the results from the Market Check Testing and given two weeks to provide a plan to address the issues identified or agree to undergo additional testing.^{2,3,4} This subsequent testing, which is referred to as **Secondary C**

¹The Quality Test Method (QTM) and Initial Screening Method (ISM) are described in IEC/TS 62257-9-5 for products and described in the Lighting Global Quality Assurance Protocols for Solar Home System Kits for S...
²Upon request and at the discretion of Lighting Global, companies may be granted an additional two weeks to decision if they are actively engaging with the Lighting Global Quality Assurance team regarding the issue.
³See the [Conditional Pass Policy](#) regarding options to address easy-to-fix issues.
⁴As part of meeting the Quality Standards, product performance will be compared to all public-facing advertised Lighting Global Standardized Specification Sheets (SSS). If the product performance is lower than what is

The image shows a smartphone displaying the LGQA_PICO app interface. The app is titled "SAMSUNG" at the top. The main screen shows a form for "LGQA_PICO" with fields for "what is your name?", "select the observation date", "what is the full name of the retailer or point of sale?", "tag the location of the store", "what is the product name?", and "what is the model name or number?". There is also a map of the world for location tagging.

Next Steps

To find quality-verified products, visit: www.lightingglobal.org/products/

To get your products quality verified, contact: qa@lightingglobal.org

To learn more about Lighting Global Quality Assurance, visit: <https://www.lightingglobal.org> or contact the Lighting Global team for more information: qa@lightingglobal.org

