VeraSol

Conformity Assessment for Off-Grid Solar Products

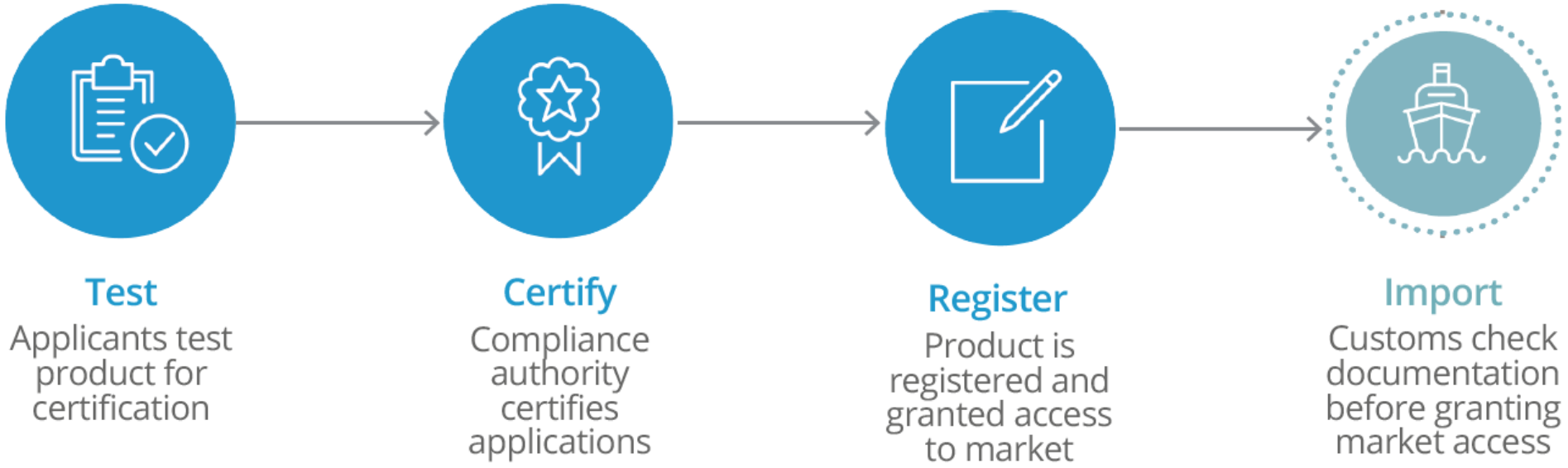
August 2022

Presentation Outline

- Introduction to Conformity Assessment
- Difference between IEC TS 62257-9-5 and IEC TS 62257-9-8
- IEC TS 62257-9-8: Quality Standards for OGS products
- PVoC process for OGS products
- Introduction to VeraSol QA framework
- How VeraSol supports the PVoC process
- Guide to assessing test reports for conformity with IEC TS 62257-9-8

Introduction to Conformity Assessment

- **Conformity Assessment** is the most essential and effective tool available to governments that seek to protect consumers from sub-standard products. It involves checking and recording products as compliant before allowing them on the market through these activities:



Conformity Assessment for OGS products

Benefits of Conformity Assessment

A **rigorous and independent** conformity assessment benefits the entire market by:

Expediting the free flow of goods in international commerce.

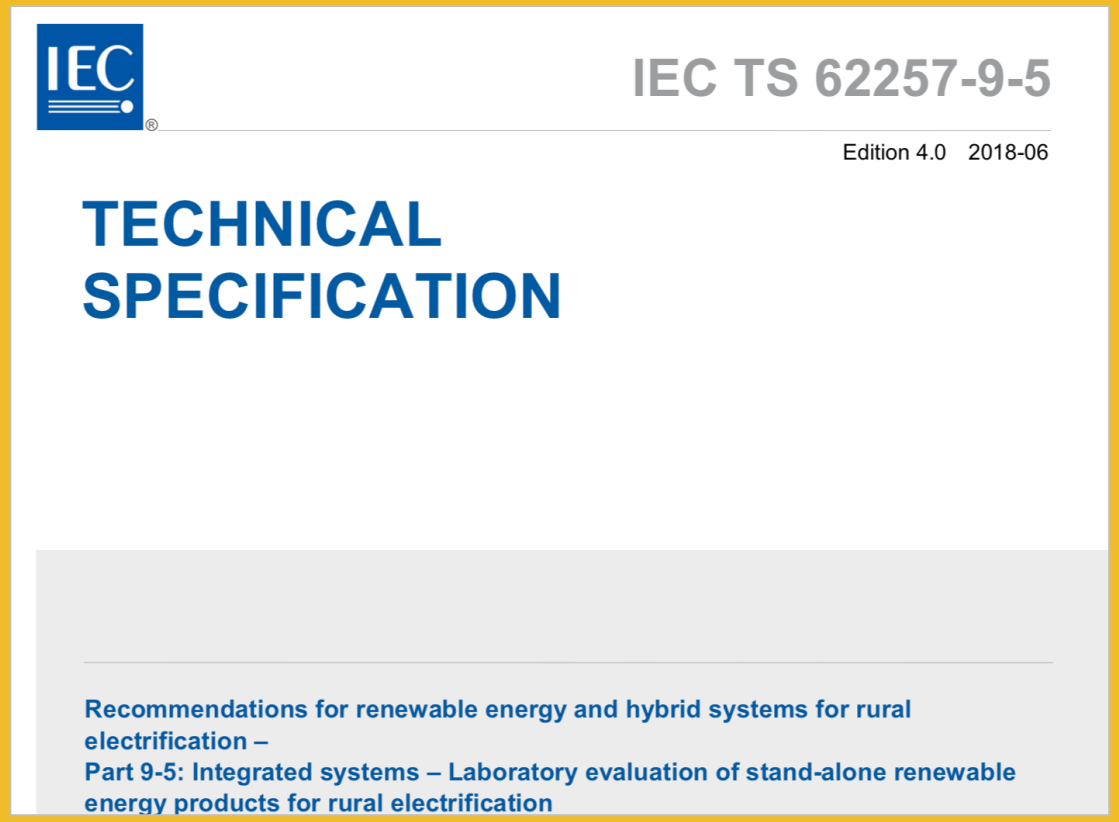
Ensuring confidence of consumers, public authorities, and manufacturers on conformity of products.

Providing regulatory confidence and demonstrating that products placed on the market comply with all legislative requirements.

Providing cost savings for market surveillance and enforcement.

Conformity Assessment supports compliance at market entry

What is the difference between these two IEC documents?



IEC TS 62257-9-5

Edition 4.0 2018-06

TECHNICAL SPECIFICATION

Recommendations for renewable energy and hybrid systems for rural electrification –
Part 9-5: Integrated systems – Laboratory evaluation of stand-alone renewable energy products for rural electrification

IEC TS 62257-9-8

Edition 1.0 2020-06

TECHNICAL SPECIFICATION

Renewable energy and hybrid systems for rural electrification –
Part 9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W

TEST METHODS

Instructions for how to **perform** the tests. Mainly used by test labs

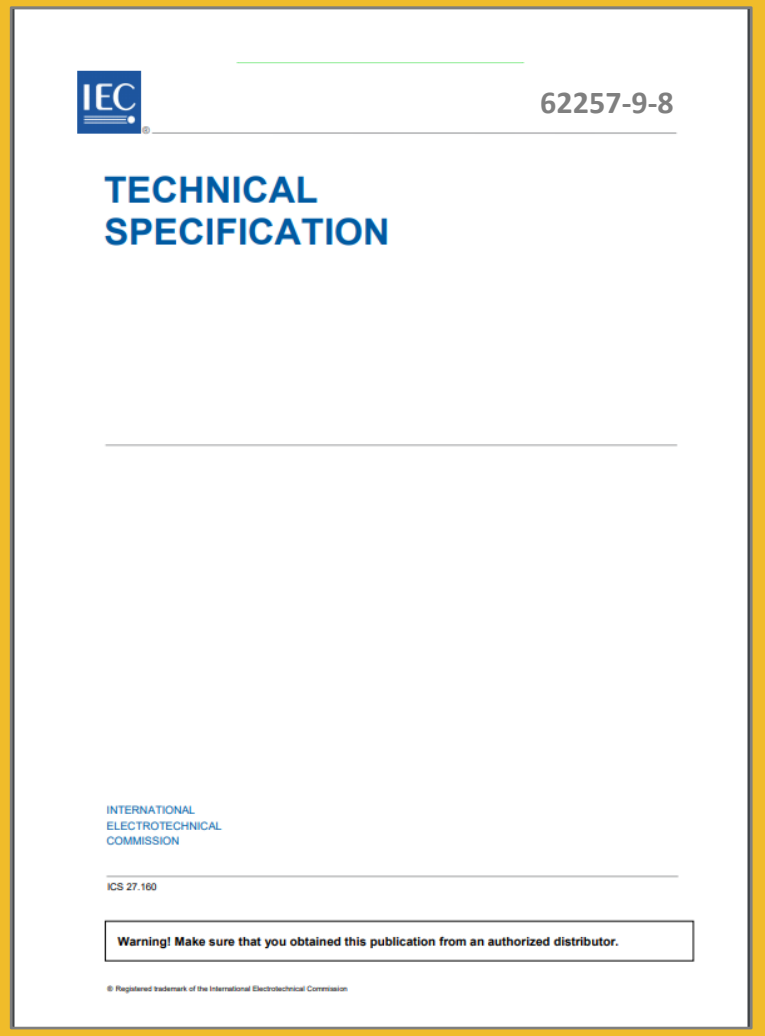
QUALITY STANDARDS

Instructions for how to **evaluate** the test results

Test Methods & Standards: Working Together

- A functional QA framework requires **both** test methods and quality standards
- Products are tested at ISO 17025 accredited laboratories according to the IEC test methods (-9-5)
- Test results are evaluated to determine compliance with the IEC standards (-9-8)
- International harmonization of standards facilitates growth and consistency across markets

IEC TS 62257 – 9 – 8 Quality Standards for OGS products



Scope and Quality Requirements

IEC TS 62257-9-8: Products covered

Pico-solar products
Size A

Power up to and including 10W

Solar home system kits
Size B

Power from 10W up to 350W

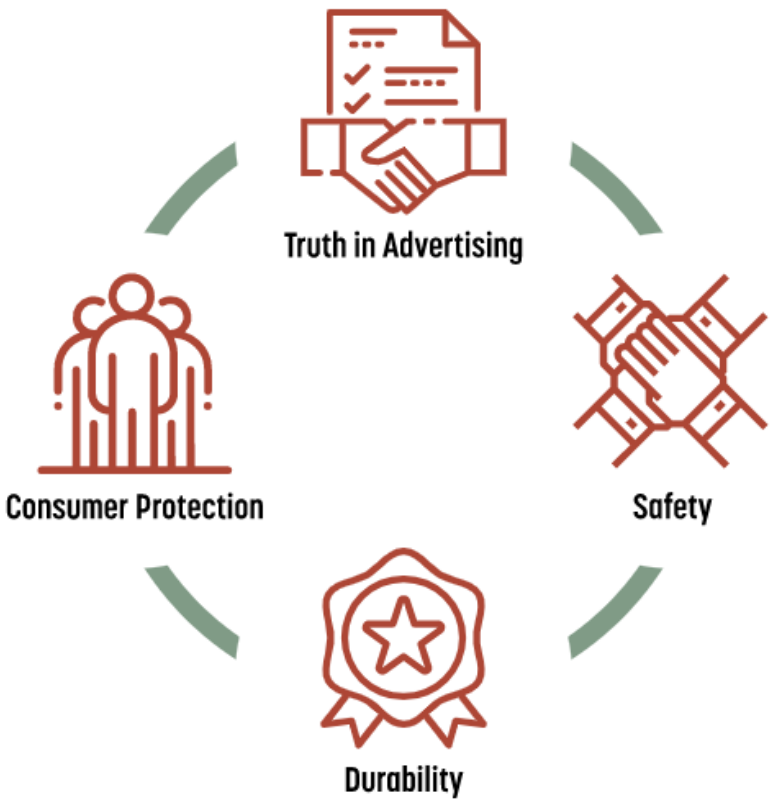
In 2020, the International Electrotechnical Commission (IEC) published **IEC TS 62257-9-8**, the quality standard for pico-solar products and Solar Home System (SHS) kits. This IEC standard is based on the **Lighting Global Quality Standards.** We strongly recommend that governments and other institutions **continue to accept** products that meet the Lighting Global Quality Standards at least until early 2023.

IEC TS 62257-9-8: Quality Standards - Scope

PRODUCTS	The products are **powered by photovoltaic (PV) modules** or electromechanical power generating devices (such as dynamos) or are designed to use grid electricity to charge a battery or other energy-storage device for off-grid use.
POWER RATING	The peak power rating of the PV module or other power generating device is less than or equal to **350 W.**
COMPONENTS	All **components** required to provide basic energy services are **sold/installed as a kit.** The system evaluated includes all the loads (lighting, television, radio, fan, etc.) and load adapter cables that are sold or included as part of the kit or integrated into kit components.
VOLTAGE REQUIREMENTS	The PV module maximum power point voltage and the working voltage of any other components in the kit **do not exceed 35 V.**
CURRENT REQUIREMENTS	Standard covers **only DC outputs and loads**. Products that include inverters, AC outputs/outlets, or AC appliances are not within the scope of this document.
INSTALLATION	**No design expertise** is required to choose appropriate system components.
ELECTRICAL CONNECTIONS	All **electrical connections**, except for permanent connections made at the time of installation, can be **made using plug-and-socket connectors without the use of any tools**. All connections made in the field are straightforward to make and **do not require technical expertise**.

Video: Introduction to IEC Quality Standards for pico solar and SHS kits

IEC TS 62257-9-8: Quality Requirements



Truth in Advertising: Product packaging should include sufficient and accurate information on performance.

Safety: Requirements include items such as circuit and overload protection.

Consumer protection: Requires products to contain a detailed user manual and adequate warranty coverage.

Durability: Covers aspects such as workmanship quality, water and physical ingress protection, and lumen maintenance.

Summary-of-requirements-in-IEC-TS-62257-9-8

Pre-shipment Verification of Conformity (PVoC)

How does VeraSol support PVoC for OGS products?

Process of PVoC for OGS products

REQUIRED DOCUMENTS	DOCUMENT REVIEW	INSPECTION	CERTIFICATION	SHIPMENT	EVALUATION	IMPORT DUTY	RELEASE
• **Official test report:** From ISO 17025 accredited lab • **Certificates** • **Conformity marks** • **Safety marks** e.g CE, UL • **Factory certifications** e.g ISO 9001 • **Import declaration form**	Authorized CA company reviews documents to establish compliance with national standards	CA company conducts physical inspection of consignment	CA company issues Certificate of Conformity (CoC) once it has confirmed that the submitted documentation complies with national requirements and that the contents of the shipment are acceptable.	Consignment is cleared for export and shipped to destination port	National customs authority evaluates documentation, inspects goods and assesses duty at destination port	Importer pays applicable customs duties and taxes	Consignment is released to importer

Pre-shipment Conformity Assessment-for-pico-PV-products

VeraSol Quality Assurance Framework

VeraSol maintains the world's most widely recognized quality assurance framework for OGS products.

Test Methods

Test Methods

We define how product quality is measured to provide a common basis for performance claims

Lab Capacity Building

Test Lab Capacity Building

We improve global testing capacity through lab training and knowledge dissemination

Product Data Sharing

Product Testing & Data Sharing

We generate comparable data to showcase quality products and enable faster decision making

Quality Standards

Quality Standards

We help determine and set the baseline level of product quality for consumer protection

Solar Energy Kit Certification

Certification

We certify products that meet international standards through independent evaluation

Technical Assistance

Technical Assistance

We assist governments in the development and adoption of standards and policies

Stakeholder Engagement

Stakeholder Engagement

We communicate to the market about the importance and need for quality assurance

Appliance Testing

Appliance Testing

We standardize off-grid appliance testing enabling consistent product comparisons

How does Certification support the PVoC process?

VeraSol℠

VeraSol* Product Certificate

*Previously Lighting Global Quality Assurance

Pocket Sunshine

Expiration Date: May 31, 2023[1]
Verify here: https://data.verasol.org/products/sek/to-srl

This document verifies that the Solar Reading Lamp from ShenZhen Solar Run Energy Co., Ltd. was tested according to the following test methods and conformed with the following standards. Total also distributes the Solar Reading Lamp under its own product name, the Pocket Sunshine. These are the same product with a different brand name.

Test methods:	IEC TS 62257-9-5:2018[2]
Quality standards:	Lighting Global Pico PV Quality Standards[3]

Testing Details

Product Name:	Pocket Sunshine
Model Number:	TLS001
Company Name:	Total
Country of Origin:	China
Company Contact:	florent.giorgi@total.com
Co-brand of:	Solar Reading Lamp, ShenZhen Solar Energy Co., Ltd.
Original QTM Sample Size:	n=6
Renewal Test Conducted:	yes
Sample Procurement Method:	Random warehouse sampling
Testing Laboratory:	Shenzhen Academy of Metrology and Quality Inspection, Shenzhen, Guangdong, China

Documentation

Specifications sheet with verified test results and original version of this verification: https://data.verasol.org/products/sek/to-srl

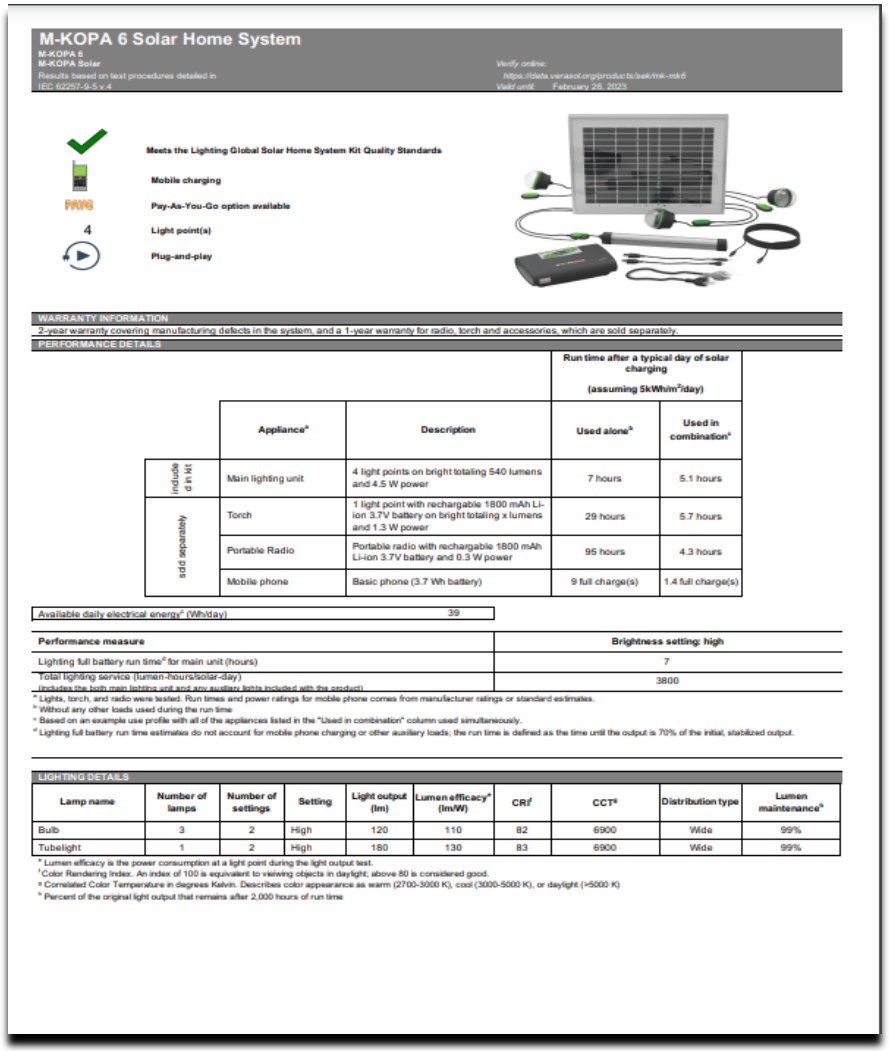
Ari Reeves
Senior Manager, CLASP

[1] VeraSol 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] https://verasol.org/solutions/test-methods
[3] https://verasol.org/solutions/quality-standards

VeraSol Product Certificate © VeraSol 2022

- VeraSol Certificates facilitate Conformity Assessment since they are easily verifiable.
- If a product has been certified through VeraSol, it may be verified from the **Product Database.**

VeraSol Specification Sheet



M-KOPA 6 Solar Home System

M-KOPA 6
M-KOPA Solar
Results based on test procedures detailed in IEC 62257-9-5 v1

Verify online: https://data.verasol.org/product/sek/mk-mk6
Valid until: February 28, 2023

Meets the Lighting Global Solar Home System Kit Quality Standards

Mobile charging

PAYG — Pay-As-You-Go option available

4 — Light point(s)

Plug-and-play

WARRANTY INFORMATION

2-year warranty covering manufacturing defects in the system, and a 1-year warranty for radio, torch and accessories, which are sold separately.

PERFORMANCE DETAILS

	Appliance[a]	Description	Run time after a typical day of solar charging (assuming 5kWh/m²/day) Used alone[b]	Used in combination[c]
included in kit	Main lighting unit	4 light points on bright totaling 540 lumens and 4.5 W power	7 hours	5.1 hours
sold separately	Torch	1 light point with rechargable 1800 mAh Li-ion 3.7V battery on bright totaling x lumens and 1.3 W power	29 hours	5.7 hours
	Portable Radio	Portable radio with rechargable 1800 mAh Li-ion 3.7V battery and 0.3 W power	95 hours	4.3 hours
	Mobile phone	Basic phone (3.7 Wh battery)	9 full charge(s)	1.4 full charge(s)

Available daily electrical energy[c] (Wh/day)	39

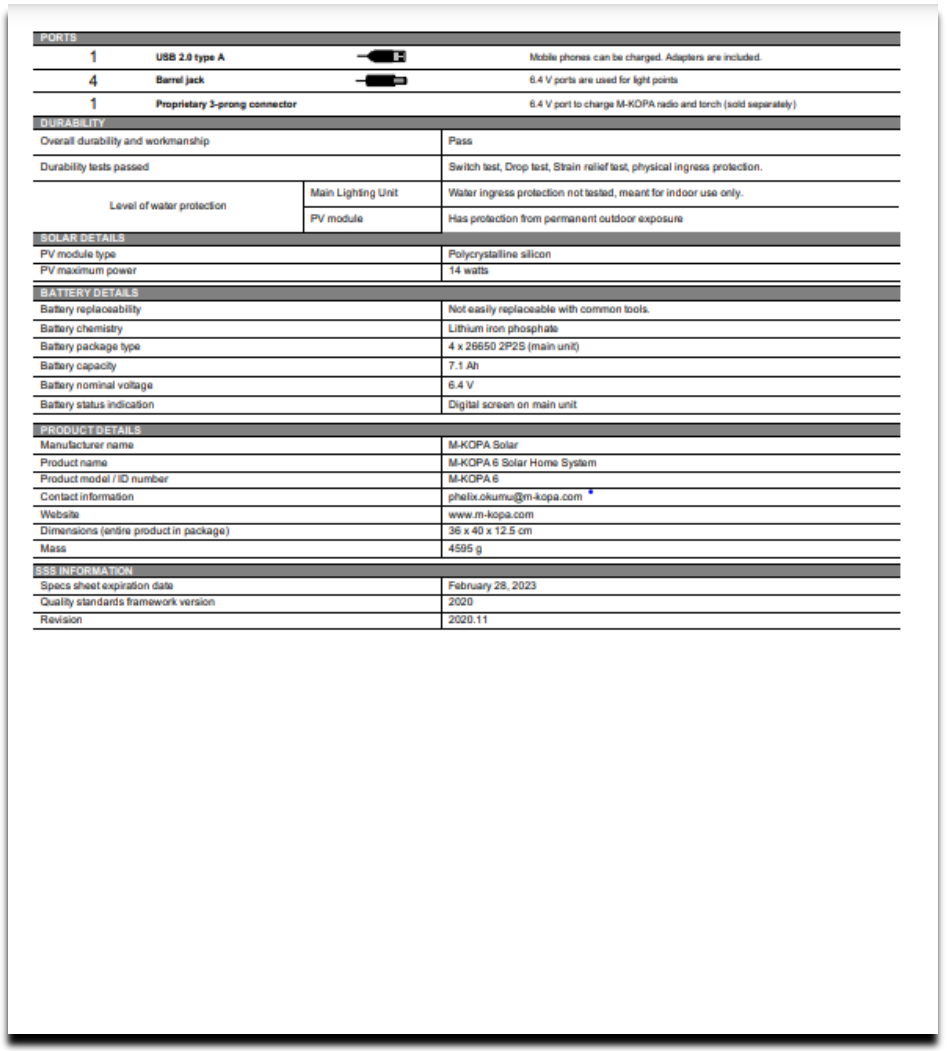
Performance measure	Brightness setting: high
Lighting full battery run time[d] for main unit (hours)	7
Total lighting service (lumen-hours/solar-day) (Includes the both main lighting unit and any auxiliary lights included with the product)	3800

[a] Lights, torch, and radio were tested. Run times and power ratings for mobile phone comes from manufacturer ratings or standard estimates.
[b] Without any other loads used during the run time
[c] Based on an example use profile with all of the appliances listed in the "Used in combination" column used simultaneously.
[d] 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[e] (lm/W)	CRI[f]	CCT[g]	Distribution type	Lumen maintenance[h]
Bulb	3	2	High	120	110	82	6900	Wide	99%
Tubelight	1	2	High	180	130	83	6900	Wide	99%

[e] Lumen efficacy is the power consumption at a light point during the light output test.
[f] Color Rendering Index. An index of 100 is equivalent to viewing objects in daylight; above 80 is considered good.
[g] Correlated Color Temperature in degrees Kelvin. Describes color appearance as warm (2700-3000 K), cool (3000-5000 K), or daylight (>5000 K)
[h] Percent of the original light output that remains after 2,000 hours of run time



PORTS

1	USB 2.0 type A	Mobile phones can be charged. Adapters are included.
4	Barrel jack	6.4 V ports are used for light points
1	Proprietary 3-prong connector	6.4 V port to charge M-KOPA radio and torch (sold separately)

DURABILITY

Overall durability and workmanship		Pass
Durability tests passed		Switch test, Drop test, Strain relief test, physical ingress protection.
Level of water protection	Main Lighting Unit	Water ingress protection not tested, meant for indoor use only.
	PV module	Has protection from permanent outdoor exposure

SOLAR DETAILS

PV module type	Polycrystalline silicon
PV maximum power	14 watts

BATTERY DETAILS

Battery replaceability	Not easily replaceable with common tools.
Battery chemistry	Lithium iron phosphate
Battery package type	4 x 26650 2P2S (main unit)
Battery capacity	7.1 Ah
Battery nominal voltage	6.4 V
Battery status indication	Digital screen on main unit

PRODUCT DETAILS

Manufacturer name	M-KOPA Solar
Product name	M-KOPA 6 Solar Home System
Product model / ID number	M-KOPA 6
Contact information	phelix.okumu@m-kopa.com
Website	www.m-kopa.com
Dimensions (entire product in package)	36 x 40 x 12.5 cm
Mass	4595 g

SSS INFORMATION

Specs sheet expiration date	February 28, 2023
Quality standards framework version	2020
Revision	2020.11

- The Product Database also includes a detailed Specification Sheet, as illustrated above for each listed product.

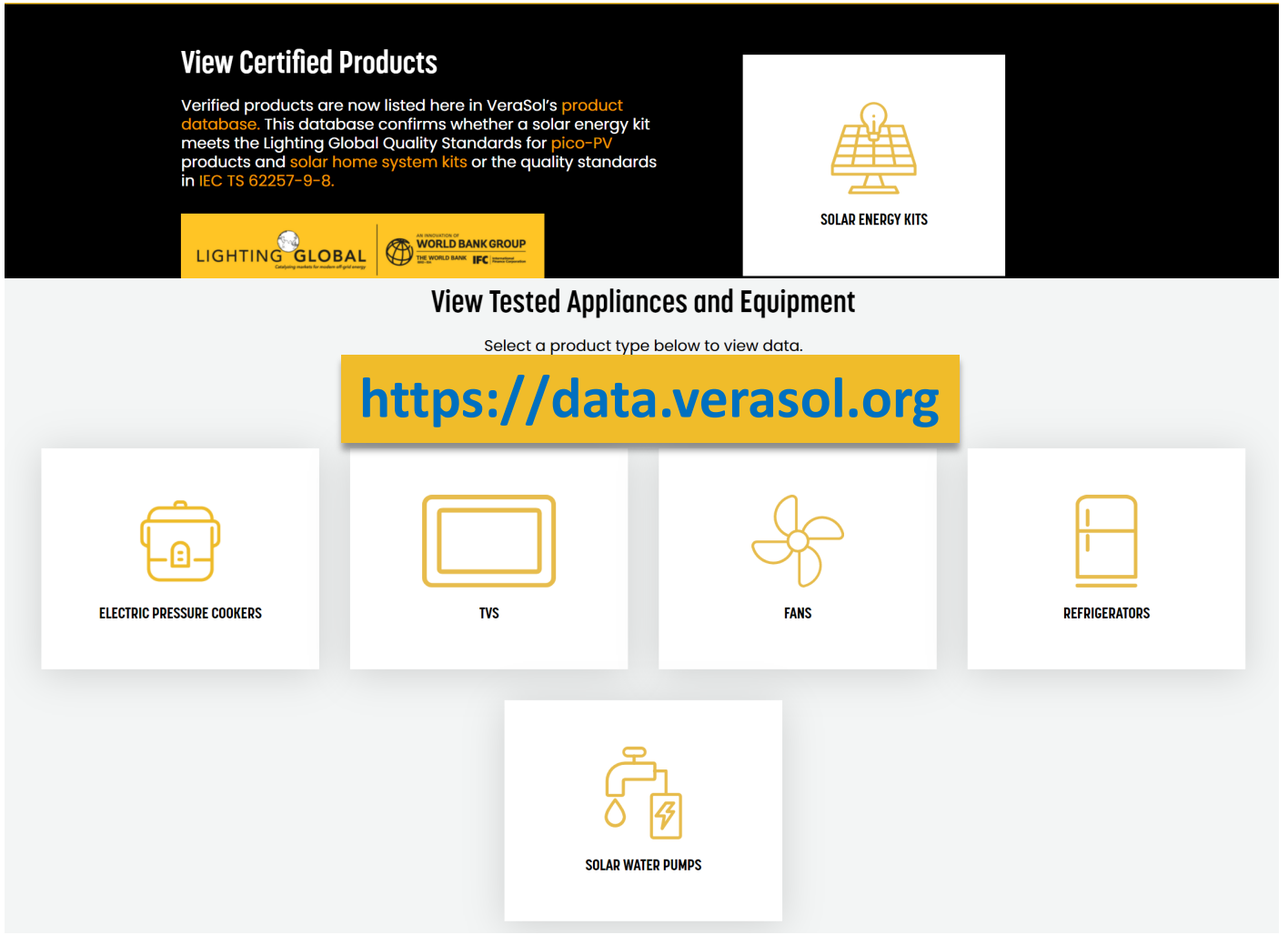
VeraSol Product Database

200+
Solar energy kits currently VeraSol **certified**

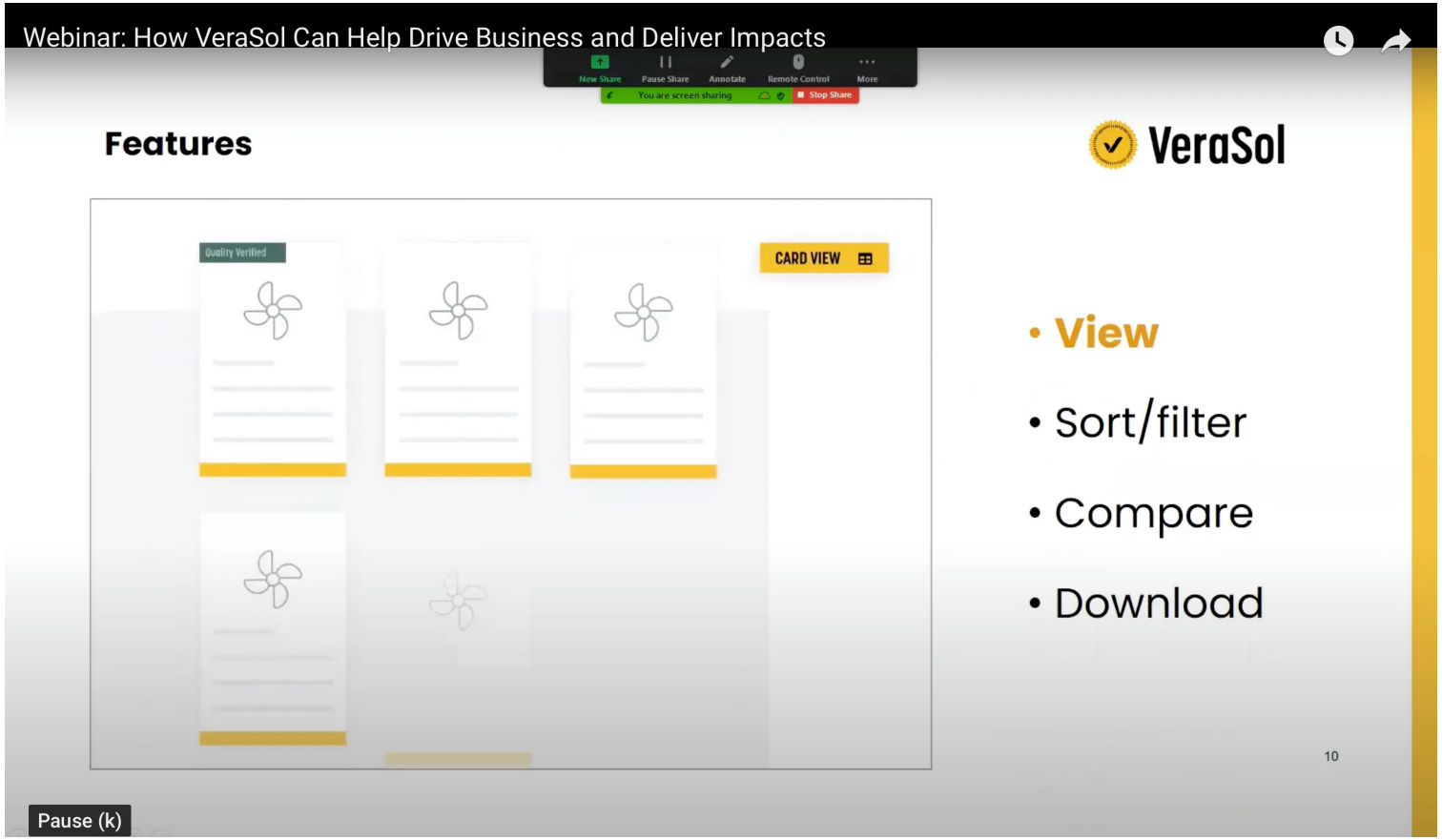
370+
Off-grid-appropriate appliances tested to date

1800
Product database uses in an average month

2x
Demand for quality verification since 2017



How to navigate the VeraSol database



[Video: How to navigate the VeraSol database]

How to review an IEC TS 62257 – 9 – 5 Test Report

How to Review a Test Report for Conformity Assessment

An IEC TS 62257-9-5 test report must be reviewed in **seven steps** to determine whether a product conforms with the quality standards in IEC TS 62257-9-8:

1. Is the product in the test report the same product in question?
2. Were the correct test methods used?
3. Has the test report expired?
4. What sample size was used for the tests?
5. How were the samples procured?
6. Was the report issued by a laboratory that is accredited to carry out the tests?
7. Were all the necessary tests covered in the report?

Toolkit: Assessing Conformity with IEC-TS-62257-9-8

Element to Assess

VeraSol

Same Product

The product name, model number, and manufacturer in the test report must match the product in question.

Indicated on the General Information page of the test report

General information

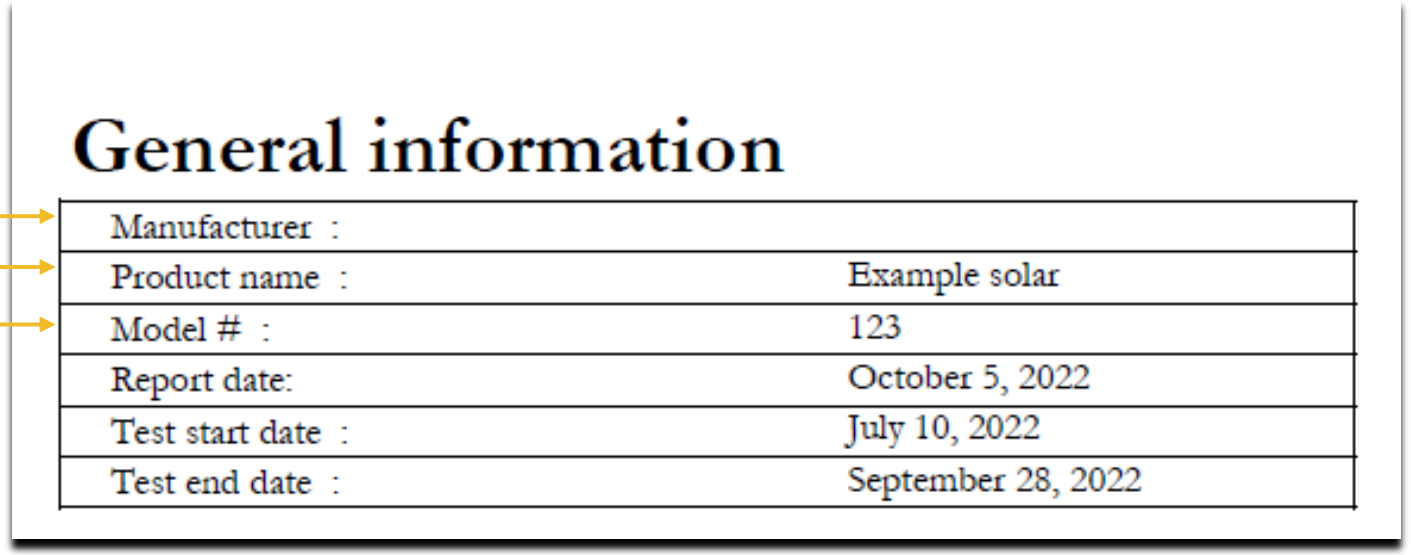
Manufacturer :	
Product name :	Example solar
Model # :	123
Report date:	October 5, 2022
Test start date :	July 10, 2022
Test end date :	September 28, 2022

Element to Assess – Product Families

Same Product

The product name, model number, and manufacturer in the test report must match the product in question.

Indicated on the General Information page of the test report



General information

Manufacturer :	
Product name :	Example solar
Model # :	123
Report date:	October 5, 2022
Test start date :	July 10, 2022
Test end date :	September 28, 2022

For product families, Model # listed here might not be the same as the products submitted to PVoC for assessment.

How does VeraSol certify product families?

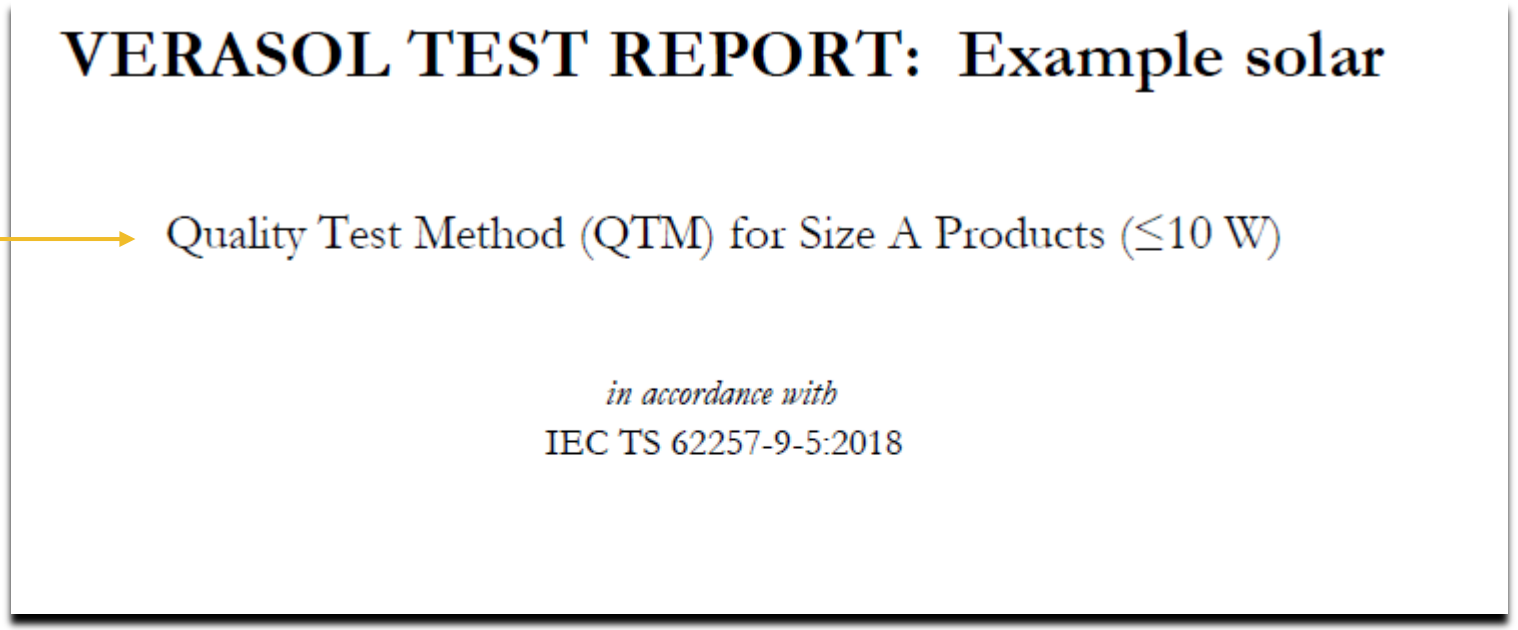
A product family, as described in IEC TS 62257-9-8, is a range of product configurations that are comprised of different combinations of interchangeable components. VeraSol certifies product families by **testing at least one fully configured "kit" in addition to testing a select number of individual components**. This approach allows manufacturers to certify product families without thoroughly testing each unique configuration, reducing testing time and cost.

Element to Assess

Test methods used

The test methods used must be one of the following: QTM, AVM, or Renewal.

Indicated on the test report cover page


VERASOL TEST REPORT: Example solar

Quality Test Method (QTM) for Size A Products (≤10 W)

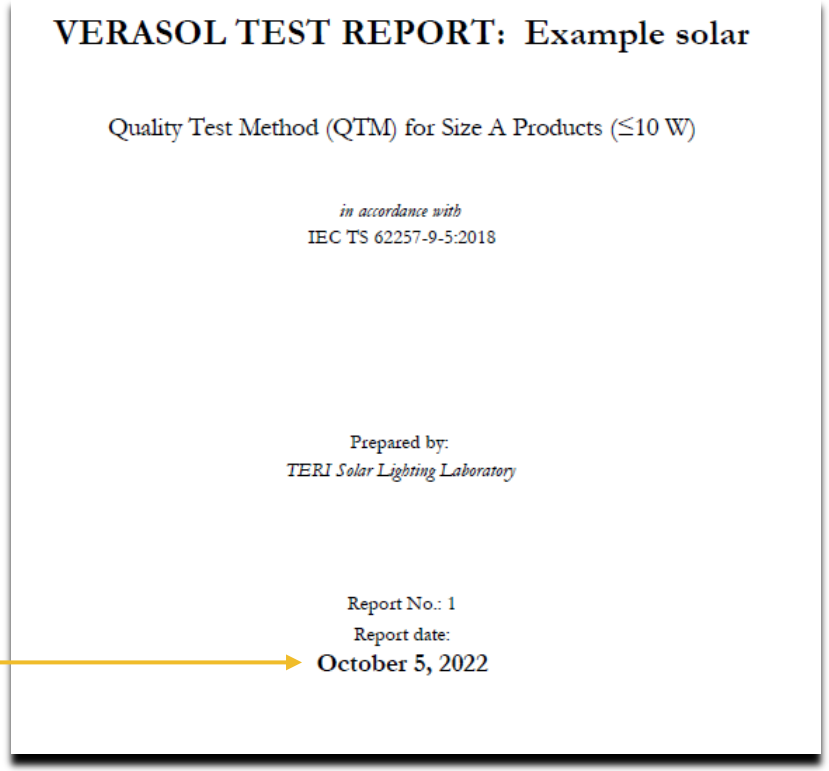
in accordance with

IEC TS 62257-9-5:2018

Element to Assess

Expiration date

The test report's date of issuance must be no more than two years old; if the date written is a few months older than two years, reach out to VeraSol as there may be an exception.


VERASOL TEST REPORT: Example solar

Quality Test Method (QTM) for Size A Products (≤10 W)

in accordance with
IEC TS 62257-9-5:2018

Prepared by:
TERI Solar Lighting Laboratory

Report No.: 1
Report date:
October 5, 2022

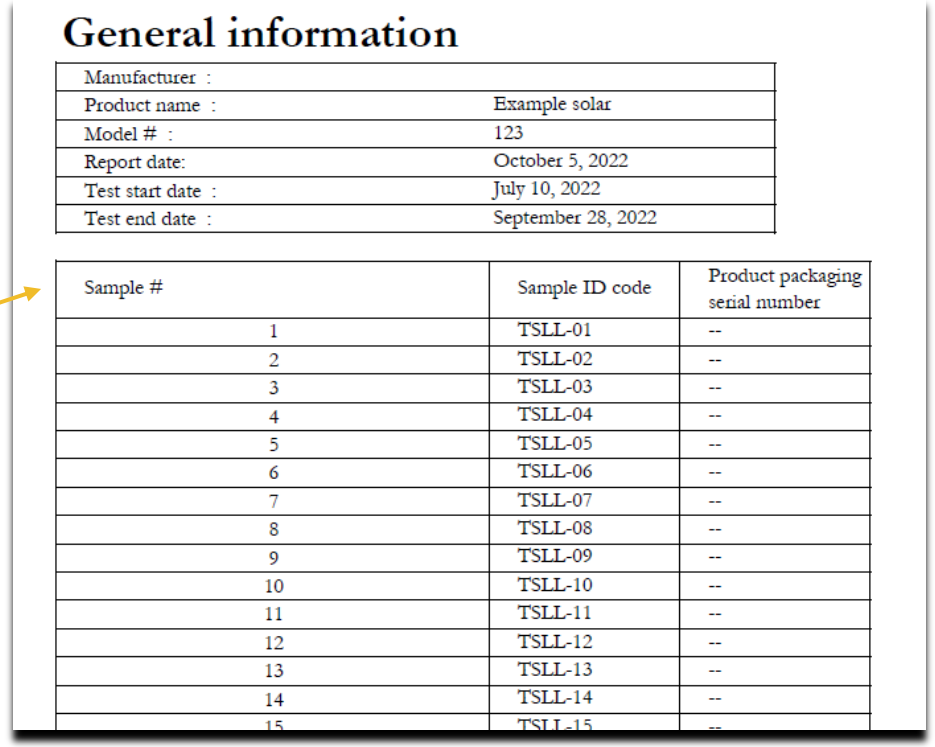
Indicated on the test report cover page

Element to Assess

Sample Size

For QTM testing, the sample size must be 6 for pico or 4 for SHS; for AVM testing, the sample size must be either 2 for the initial report or the same as a QTM for the follow-up testing report; and for Renewal testing, the sample size must be 2.

The number of samples will be indicated here on the General Information page. It is also shown on the VeraSol certificate.



General information

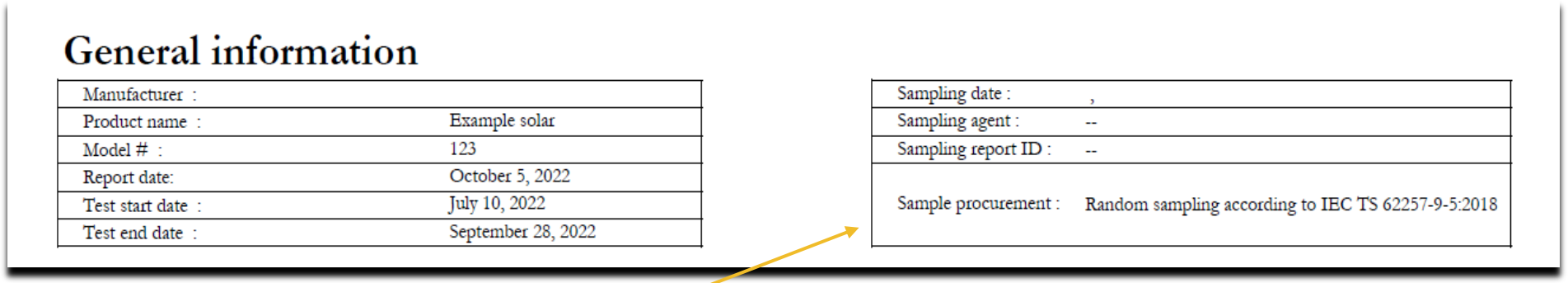
Manufacturer :	
Product name :	Example solar
Model # :	123
Report date:	October 5, 2022
Test start date :	July 10, 2022
Test end date :	September 28, 2022

Sample #	Sample ID code	Product packaging serial number
1	TSLL-01	--
2	TSLL-02	--
3	TSLL-03	--
4	TSLL-04	--
5	TSLL-05	--
6	TSLL-06	--
7	TSLL-07	--
8	TSLL-08	--
9	TSLL-09	--
10	TSLL-10	--
11	TSLL-11	--
12	TSLL-12	--
13	TSLL-13	--
14	TSLL-14	--
15	TSLL-15	--

Element to Assess

Sample Procurement Method

For QTM, the follow-up testing for an AVM, and Renewal testing, the samples being tested must have been randomly sampled by a third party. For initial AVM testing, the samples are not required to be randomly sampled.



General information

Manufacturer :	
Product name :	Example solar
Model # :	123
Report date:	October 5, 2022
Test start date :	July 10, 2022
Test end date :	September 28, 2022

Sampling date :	,
Sampling agent :	--
Sampling report ID :	--
Sample procurement :	Random sampling according to IEC TS 62257-9-5:2018

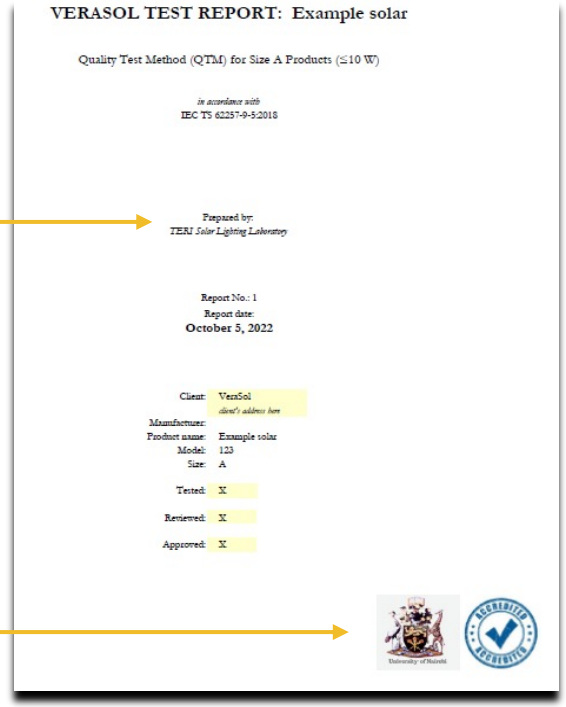
Sample procurement method indicated here on the General Information page

Element to Assess

Laboratory Accreditation

The laboratory that tested the samples must be ISO 17025 accredited to IEC TS 62257-9-5.

Name of lab indicated on the test report cover page



VERASOL TEST REPORT: Example solar

Quality Test Method (QTM) for Size A Products (≤10 W)

in accordance with
IEC TS 62257-9-5:2018

Prepared by:
TERI Solar Lighting Laboratory

Report No.: 1
Report date:
October 5, 2022

Client:	VeraSol
	client's address here
Manufacturer:	
Product name:	Example solar
Model:	123
Size:	A
Tested:	X
Reviewed:	X
Approved:	X

Lab logo and accreditation symbol

In most cases, the accreditation of a laboratory may be verified using search tools on the accrediting body's website. An updated list of VeraSol laboratories is available here.

Element to Assess

VeraSol

Necessary Tests Performed

Reference the Annexes within IEC TS 62257-9-5 to ensure the test reported corresponds to the correct test required.


IEC

IEC TS 62257-9-5

Edition 4.0 2018-06

TECHNICAL SPECIFICATION

Recommendations for renewable energy and hybrid systems for rural electrification –
Part 9-5: Integrated systems – Laboratory evaluation of stand-alone renewable energy products for rural electrification

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 27.160

ISBN 978-2-8322-5690-0

Warning! Make sure that you obtained this publication from an authorized distributor.

Refer to Page 6: Outline of required tests

Summary: Leveraging VeraSol for PVoC

VeraSol

VeraSol℠

VeraSol® Product Certificate
*Previously Lighting Global Quality Assurance

Pocket Sunshine

Expiration Date: May 31, 2023[1]
Verify here: https://data.verasol.org/products/sek/to-srl

This document verifies that the Solar Reading Lamp from ShenZhen Solar Run Energy Co., Ltd. was tested according to the following test methods and conformed with the following standards. Total also distributes the Solar Reading Lamp under its own product name, the Pocket Sunshine. These are the same product with a different brand name.

Test methods:	IEC TS 62257-9-5:2018[2]
Quality standards:	Lighting Global Pico PV Quality Standards[3]

Testing Details

Product Name:	Pocket Sunshine
Model Number:	TLS001
Company Name:	Total
Country of Origin:	China
Company Contact:	florent.giorgi@total.com
Co-brand of:	Solar Reading Lamp, ShenZhen Solar Energy Co., Ltd.
Original QTM Sample Size:	n=6
Renewal Test Conducted:	yes
Sample Procurement Method:	Random warehouse sampling
Testing Laboratory:	Shenzhen Academy of Metrology and Quality Inspection, Shenzhen, Guangdong, China

Documentation
Specifications sheet with verified test results and original version of this verification: https://data.verasol.org/products/sek/to-srl

Ari Reeves
Senior Manager, CLASP

[1] VeraSol 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] https://verasol.org/solutions/test-methods
[3] https://verasol.org/solutions/quality-standards

VeraSol Product Certificate © VeraSol 2022

Step 1: Certification - indicator that a product has met quality standards

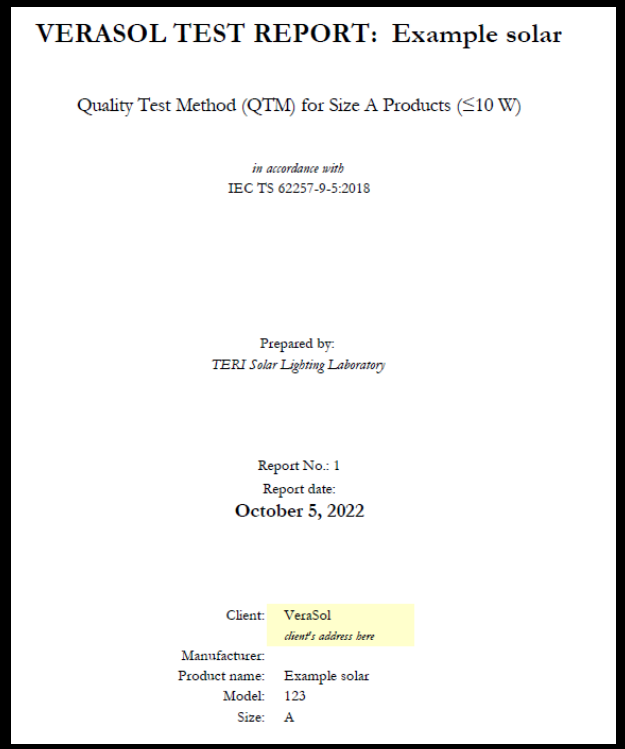
View Certified Products

Verified products are now listed here in VeraSol's product database. This database confirms whether a solar energy kit meets the Lighting Global Quality Standards for pico-PV products and solar home system kits or the quality standards in IEC TS 62257-9-8.

LIGHTING GLOBAL | WORLD BANK GROUP IFC

SOLAR ENERGY KITS

Step 2: Verification – Ensure the validity of the certificate through our easy-to- use **Product Database**



VERASOL TEST REPORT: Example solar

Quality Test Method (QTM) for Size A Products (≤10 W)

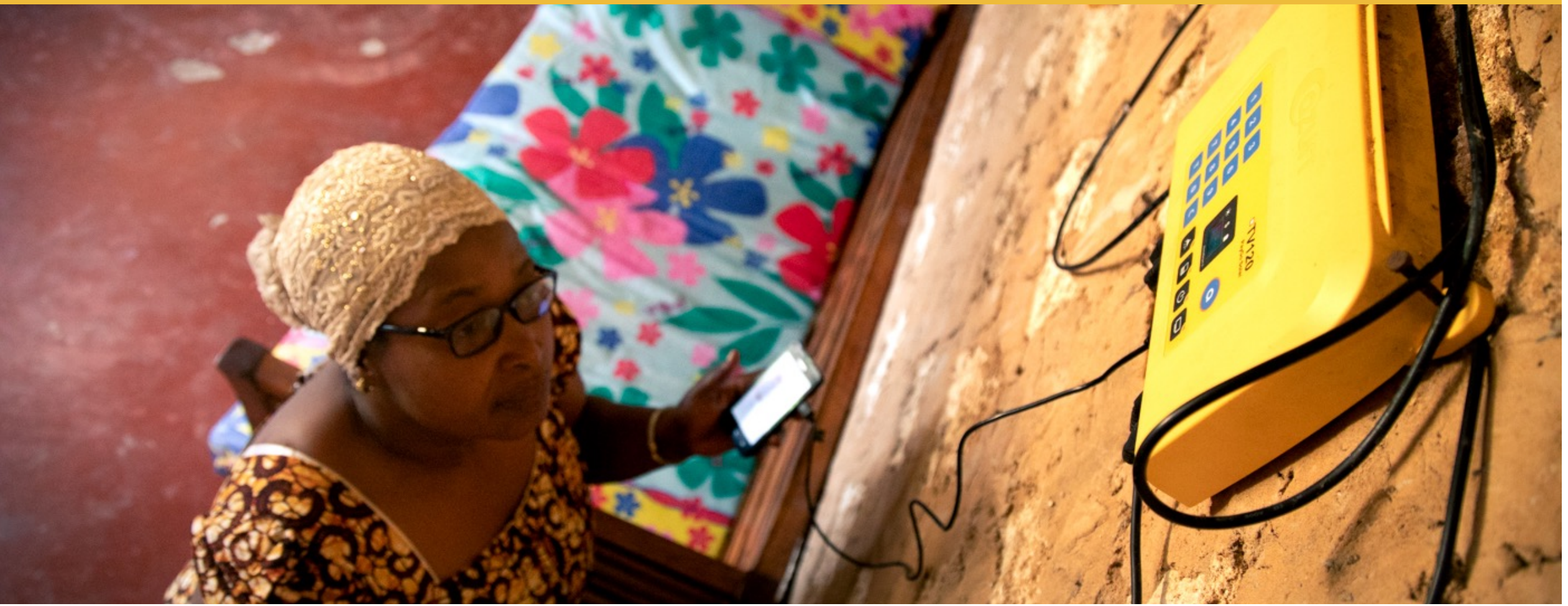
in accordance with
IEC TS 62257-9-5:2018

Prepared by:
TERI Solar Lighting Laboratory

Report No.: 1
Report date:
October 5, 2022

Client:	VeraSol
	client's address here
Manufacturer:	
Product name:	Example solar
Model:	123
Size:	A

Step 3: Test Report – Review report from accredited lab to check conformity with IEC TS 62257-9-8



Thank You! Any questions?

Contact Us: info@verasol.org

Twitter LinkedIn

VeraSol