



VeraSolSM

Consumer Information, Performance Reporting, and Component Labeling Requirements

(for IEC 62257-9-8)

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This document provides guidelines for performance reporting requirements for all products that meet the Quality Standards¹. The performance-reporting framework provides buyers throughout the supply chain with standardized information about key metrics to make purchasing decisions, while allowing manufacturers and suppliers the flexibility to provide this information in innovative and product-specific ways.

The performance reporting requirements are included as part of the Quality Standards so that any product supported by the program will need to adhere to the reporting policy.

Guidelines for this policy are listed below:

1. All manufacturers are required to accurately present performance metrics on product packaging and other relevant consumer-facing materials to enable retail buyers and distributors to compare products and make educated choices. In addition, PV modules and batteries must be labeled with certain information, which should match the information in consumer-facing materials. Requirements vary by product type—pico or SHS—and include information on where specifications must appear: on the packaging, in the user manual, or on the component. For components that are packaged in the kit, all information must appear on the packing or in the user manual for the kit. For components that are packaged separately from the kit (common for the components of product families), information must appear on the packaging or in the user manual for the component. Specific details appear in the table on the following pages.

¹ In this document, the term Quality Standards refers to IEC 62257-9-8. VeraSol began referencing *IEC TS 62257-9-8: Integrated systems – Requirements for stand-alone renewable energy products with power ratings less than or equal to 350 W* in place of the Lighting Global Quality Standards in 2020. Products may be certified by meeting the requirements described in this policy as of the date of publication, and will be required to comply with these requirements as of 1 January 2021. Refer to <https://verasol.org/updates/transition-to-iec-ts-62257-9-8> for detailed transition information. See the [Change Log for Quality Standards](#) for details on new requirements and the differences between the Standards.

Pico² Products (Must meet the requirements for All Products below, AND the following)	
Packaging Requirements	
Light output - brightest setting Solar run time - brightest setting	<p>The name of the metric and the units must be included, for example, "Light Output on High: 75 lm" or "Brightness on highest setting: 75 lumens." A number without the units or an appropriate description is not acceptable.</p> <p>For products that provide multiple brightness settings, these metrics must be reported for at least the brightest setting. Performance metrics for other settings may be reported, and reported metrics for all settings may be subject to verification through QTM, MCM or renewal testing. As with all truth-in-advertising aspects, the reported values for each metric must be no more than 15% greater than the values determined through QTM testing as described in IEC TS 62257-9-8.</p> <p>For products with included light points that have their own battery (often referred to as torches, portable lamps, or lanterns), the light output of all light points must be reported, either separately or as part of the overall light output of the product. The solar run time for the "brightest setting" must include all the light points included in the product.³ In practice, this will require reporting two (or more) separate run times: (i) the solar run time for the main product on the brightest setting and (ii) the separate solar run time for the portable light points on their brightest settings. In practice, this may require reporting two (or more) separate run times for the LED Bulbs and Integrated Light, but the run times should be limited by the energy received during a single solar charge. These two (or more) solar run times must be reported on the packaging and are checked using the energy service calculations from IEC 62257-9-8.</p> <p>Manufacturers have the option to also present comparative measures of brightness, though they must also report the value in lumens. In cases where manufacturers or distributors choose to provide comparative measures of brightness in addition to reporting the value in lumens, comparisons must be standardized to reflect the light output as reported in lumens. Allowable equivalents include:</p> <ul style="list-style-type: none"> • 1 candle or 1 kerosene wick lamp = 10 lumens • 1 hurricane lamp = 40 lumens • Incandescent bulb = 900 lumens (this is based on a 60 W bulb) • Compact Fluorescent bulb (CFL) = 900 lumens (13 W bulb)⁴

² Pico-products typically have a peak power rating of less than or equal to 10 W.

³ Only portable lights brighter than 15 lumens are required to have their brightness and solar run time reported. Components considered to be non-lighting appliances, such as torches with light output ≤15 lumens and radios, do not need to state their solar run time, but their qualitative impact on the runtime must be noted as described in the table.

⁴ These values are based on a range of literature sources, including:

- Mills, E. (2003). Technical and economic performance analysis of kerosene lamps and alternative approaches to illumination in developing countries. Lawrence Berkeley National Laboratory. <https://escholarship.org/uc/item/42j7337w>
- van der Plas, R. and A. de Graaff. (1988). A comparison of lamps for domestic lighting in developing countries. Industry and Energy Department Working Paper, Energy Services Paper No. 6.
- Nieuwenhout, F., P. van de Rijt, and E. Wiggelinkhuizen. (1998). Rural lighting services: A comparison of lamps for domestic lighting in developing countries. Energieonderzoek Centrum, Netherlands.
- US Department of Energy. (2013). Lighting Basics. <http://energy.gov/eere/energybasics/articles/lighting-basics>

Note: the hurricane lamp refers to an unpressurized lamp; pressurized mantle lamps can provide upward of 500 lm of light.

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	<p>For example, a 45-lumen product could advertise that it is “brighter than 4 candles” or “as bright as a hurricane lamp.” Other standardized comparisons may be included in consultation with the VeraSol team.</p>
<p>Impact of mobile phone/other auxiliary appliance(s) charging on performance qualitatively described</p>	<p>Pico-products that offer or advertise mobile phone charging or other auxiliary services (such as a radio) must add an informational element in the consumer-facing packaging (text or graphic) that describes the effect of mobile phone charging and any other included service on product performance. This does <u>not</u> need to be quantitative, but it is intended to ensure that the consumer is aware of the tradeoff between using the available stored energy for lighting or other services. A statement such as, “mobile phone charging can reduce the daily runtime of the lights,” or “charging mobile phones or using the radio will result in shorter run times for the lights,” would be acceptable. The VeraSol team will be available to review statements or graphics prior printing to advise the manufacturer on whether the graphic would meet the reporting requirement.</p>

Solar Home System Products	
(Must meet the requirements for All Products below, AND the following)	
Packaging Requirements	
PV Module Power	This must be reported in watts [W] on the kit packaging, or the PV module packaging if the module is packaged separately.
Battery replaceability statement	<p>Solar Home System Kits must provide a clear statement regarding battery replacement on the consumer-facing packaging⁵. Accepted phrases are:</p> <ul style="list-style-type: none"> Battery is field replaceable Battery may be serviced by manufacturer Battery is not replaceable
Additional Packaging OR User Manual	
Run Time Profile	
Solar Run Time (SRT) profile	Report the SRT for all included light points on high with any other included appliances (the profile may also include advertised appliances). As a <i>minimum</i> requirement, this SRT profile must be reported. Additional SRT profiles may be reported, but are not required.
Instructional Information	
Connecting the PV module to the unit for charging	
Do not shade the PV module	
Face the PV module toward the sun	
Instructions for making all required permanent connections	
Instructions for connecting all advertised appliances	
Battery state-of-charge instructions	
Any required pre-use steps (<i>i.e.</i> , fully charge the battery, insert supplied fuse)	
PAYG products: Detailed operating instructions, at a minimum how to make payments	
Component Replacement Methods	
Component replacement methods	<p>Consumer information must provide at least one of the following options:</p> <ol style="list-style-type: none"> 1) State that components can be replaced and provide any specifications necessary for a PV module, battery, light, or fuse to function with the system (in addition to the required specifications outlined in the performance reporting requirements), OR 2) Provide directions as to how the consumer can get components, including the battery, replaced at service centers, OR 3) Include a clear consumer-facing statement that the batteries and other components are not replaceable. <p>Detailed instructions or descriptions regarding replacing components may be included in the user manual, but a clear statement regarding the battery replacement must be included on the consumer-facing packaging or user agreement as described above.</p>

⁵ For products that are provided with a user agreement (e.g., rental units or licensed products), battery replacement information may appear in the user agreement.

All Products – Pico and SHS⁶	
Packaging Requirements	
Manufacturer name	All products (and separately packaged components) must present the manufacturer name and a uniquely identifiable product name and/or model number on the product packaging. Note: The manufacturer name, product name(s) and model number(s) on the packaging of the sampled product(s) will be the name(s) and model number(s) used on the test report, Standardized Specification Sheet and VeraSol certificate. ⁷ "Manufacturer" refers to the entity that provided the product for testing. This can be the maker of the product, or a supplier, distributor, or other.
Product name	
Model number (if applicable)	
Packaging OR Component	
Date of manufacture (May be included on the packaging or the component)	All products shall be labeled with the date of manufacture or a serial number assuring traceability of the date of manufacture (<i>i.e.</i> the date need not be discernible to consumers, only to those who are able to interpret the code). The date of manufacture shall be reported with a precision of at least the month and year. If components are packaged separately, each component shall carry these component-specific markings. The label may be on the product or the packaging.
Packaging OR User Manual—And Component, where specified (Key component specifications)	
PV Modules (not applicable for integrated panels)	
Maximum power [P_{mpo}]	Power must be reported in watts [W]. Power, current and voltage must also be labeled on the module itself, and the information should match in all locations. This information is required for all modules, when multiple modules are provided (common for product families).
Open-circuit voltage [V_{oc}]	
Short-circuit current [I_{sc}]	
Batteries	
Battery chemistry	The capacity and nominal voltage must also appear on the battery itself, and the information should match in all locations. This information is required for all batteries, when multiple batteries are provided (common for products which include a torch, radio, or other components, and for product families).
Battery capacity (mAh, Ah, or Wh)	
Battery nominal voltage	
Lighting appliances without batteries	
Luminous flux (or brightness), reported in lumens [lm]	This does not apply to accessory lights of 15 lm or less.
Power in watts [W]	This is the power consumption (power while in use).
Nominal operating voltage or voltage range [V]	
Lighting appliances with batteries	
Luminous flux (or brightness), reported in lumens [lm]	This does not apply to accessory lights of 15 lm or less.
Appliance full-battery run time (FBRT) for brightest setting	Run times for additional settings may be reported, but are not required.

⁶ For the purposes of VeraSol, solar home system kits have peak power ratings greater than 10 W up to 350 W.

⁷ Changes to the product name or model number on the test report can only be made following an additional sampling and visual screening at the test lab. Changes to the product name and model number on the Standardized Specification Sheet require submission of additional documentation to VeraSol. For changes to the company name, see our [Co-branding Policy](#).

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Power in watts [W]	This is the power consumption (power while in use).
Nominal charging voltage or voltage range	
Battery chemistry	
Battery capacity (mAh, Ah, or Wh)	The capacity and nominal voltage must also appear on the battery itself, and the information should match in all locations.
Battery nominal voltage	
Non-lighting appliances without batteries	
Power in watts [W]	This is the power consumption (power while in use).
Nominal operating voltage or voltage range [V]	
Non-lighting appliances with batteries	
Power in watts [W]	This is the power consumption (power while in use).
Battery chemistry	
Battery capacity (mAh, Ah, or Wh)	The capacity and nominal voltage must also appear on the battery itself, and the information should match in all locations.
Battery nominal voltage	
Lighting Integrated into Main Unit (separate PV)⁸	
Luminous flux (or brightness), reported in lumens [lm]	This does not apply to accessory lights of 15 lm or less.
Power in Watts	This is the power consumption (power while in use).
Nominal charging voltage or voltage range	
PAYG (if reported)	
Accurately specified	
All information presented clearly, legibly and with equal prominence	
For both PAYG and non-PAYG versions: energy services provided truthfully advertised for each	

⁸ For units with the PV module, battery and light integrated into a single unit, power and voltage are not required.

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- As noted above, PV modules (other than modules integrated into another component) and all batteries, including those used in main units and accessories such as torches and radios, must be labeled with certain specifications. These requirements apply to all products: pico and SHS systems.

Component Specifications - All Products	
Requirements for Separate PV Modules	
Manufacturer Name	This must appear as the name of the manufacturer in text, or the registered trade name or registered trademark used by the PV module manufacturer or kit manufacturer.
Model Number Designation number	A numeric/alphanumeric identifier must appear on the PV module.
Serial number	The serial number may be omitted from the PV module label if the module is included in a kit, and the serial number is labeled on another component in the kit.
Date and location of manufacture	The date and location can be specified directly, or may be represented by a serial number that can be traced to the date and location by those who are able to interpret the code. The date must be to the level of precision of at least the month and year of manufacture. The location must identify the actual address, or geocoordinates.
Maximum system voltage	
Open-circuit voltage [V_{oc}]	This should match the information on the packaging and in the user manual.
Short-circuit current [I_{sc}]	This should match the information on the packaging and in the user manual.
Maximum power [P_{mpp}]	This must be accurately reported in watts [W] and should match the information on the packaging and in the user manual.
Requirements for Batteries	
Battery capacity (mAh, Ah, or Wh)	The battery capacity can be reported in mAh, Ah, or Wh, and should match the information as reported on the packaging and in the user manual.
Battery nominal voltage	The battery capacity can be reported in mAh, Ah, or Wh, and should match the information as reported on the packaging and in the user manual.
Requirements for Ports	
Ports not intended to provide power must be labeled	Ports that are not intended to provide power, such as data ports or input ports, must be labeled as "not for charging devices", or similar. These ports must be labeled on the port, on the packaging, or in the user manual. (For PV input ports, clear indication that the port is intended for connecting the PV module is sufficient.) If this information is not provided in the consumer-facing materials, ports will be tested and must meet all ports requirements.

3. As noted in the Quality Standards, products must offer and present a consumer-facing warranty. The consumer-facing warranty terms may be on the box, or on a card or paper that can be accessed prior to purchase, or some combination thereof. As per the existing requirements outlined in the Quality Standards, the warranty must meet the following conditions, as specified in the table below.

Warranty Requirements for All Products	
Minimum coverage requirements	The warranty must cover, at a minimum, manufacturing defects that impede operation under normal use and protection from early component failure.
Access requirements	The consumer-facing warranty must explain how the consumer can access the warranty (return to point of purchase/distributor/service center, call or SMS a number, etc.), how the warranty will be executed (repair, replacement, etc.) and should advise the customer to inquire about the warranty terms prior to purchase.
Availability	The consumer-facing warranty must be available to the consumer in writing in a way that enables the end user to verify and understand the terms of the warranty prior to purchase. The written information should be in a regionally appropriate language. Consumer-facing warranties could be included on the product box or on a user agreement or warranty card that is easily accessed prior to purchase.
Requirements for Pico Products (≤ 10 W PV power)	
Minimum requirements	In addition to the above requirements, the <i>minimum</i> warranty period for pico-products is: <ul style="list-style-type: none"> ○ One year from the time of purchase by the end-user. The warranty must cover the entire product, including the battery.
Solar Home System Products (10-350 W PV power)	
Minimum requirements	In addition to the requirements for all products, specified above, the <i>minimum</i> warranty periods from the time of purchase by the end-user for solar home system kits ¹ are: <ul style="list-style-type: none"> ○ Two years for the main system, including the PV module, control box, cables and lights ○ Two years for the system battery. (Note that batteries included within appliances are only required to meet the one-year warranty). The battery warranty is assumed to include a capacity retention figure of at least 80% capacity at two years, benchmarked to the rated battery capacity. ○ 1 year for all lighting appliances that include their own batteries (including pico-power lights) and all non-lighting appliances, USB charging adapters and similar accessories.

Note that this is a *Minimum* Standard and it is up to the discretion of manufacturers and distribution partners to exceed the basic protection offered in these terms to differentiate their products from others that are available in the market.

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4. The manufacturer may choose how to present the required performance metrics, mobile-charging information, battery replacement information, and warranty terms, so long as the presentation adheres to the guidelines above and the design requirements below:
 - The following items are required:
 - All information must be presented in a clear, unambiguous manner. No elements should be misleading.
 - The information must have at least the same style and prominence as the other messages on the packaging.
 - The label /information must be sized such that:
 - The text is at least 10-point font
 - Any graphics are clearly visible
 - There must be sufficient contrast between the text / graphics and background to be clearly legible.
 - The information must be placed on the outside of the package in at least one prominent location (note that warranty terms may be included on a warranty card or user agreement rather than on-the-box). In cases where companies install the products for the customer and the product packaging is not designed to be consumer facing, the required elements may instead be included in a prominent location in a user agreement or other documentation the consumer reviews prior to purchase. All information must be available to customers prior to sale.
 - The following are strongly suggested:
 - The text and graphic elements should be simple and understandable.
 - The information should be presented graphically and/or using an appropriate language for the region(s) where the product will be sold.
5. These requirements are considered part of the Quality Standards, and product packaging will need to comply with the performance reporting requirements prior to meeting the Quality Standards and being eligible for VeraSol program support. Not meeting the performance reporting requirements will be treated as a "Conditional Pass Pending Correction" as described in the VeraSol [Conditional Pass Policy](#).

Conclusion

This performance reporting policy is intended to ensure that all those making purchasing decisions in the market have access to the necessary information to make well-informed decisions. Further, the policy is designed to allow manufacturers and other suppliers with the ability to provide this critical information in whatever way best suits their product design, product attributes, and marketing plans.

About VeraSol

An evolution of Lighting Global Quality Assurance, the VeraSol program supports high-performing, durable off-grid products that expand access to modern energy services. VeraSol builds upon the strong foundation for quality assurance laid by the World Bank Group and expands its services to encompass off-grid appliances, productive use equipment, and component-based solar home systems. Like Lighting Global Quality Assurance, the VeraSol program is managed by CLASP in collaboration with the Schatz Energy Research Center at Humboldt State University. Foundational support is provided by the World Bank Group's Lighting Global program, UKaid, IKEA Foundation, Good Energies Foundation, and others.

Please visit VeraSol.org for more information.