



## Questions & Answers IEC TS 62257-9-8

The VeraSol program, formerly Lighting Global Quality Assurance, hosted a webinar on May 7 on the new quality standards for pico-solar products and solar home system kits and the important implications of the transition to these standards. These standards, contained in IEC Technical Specification 62257-9-8, will replace the Lighting Global Quality Standards.

The presented document contains answers to the questions that the stakeholders asked during the webinar and in email messages to the VeraSol team.

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## General

### **Where can I find information on the new requirements in IEC TS 62257-9-8?**

The VeraSol team has prepared the below documents which provide information on the new requirements to help stakeholders prepare for the transition:

- [Change Log for Quality Standards](#)
- [Summary of Requirements in IEC TS 62257-9-8:2020](#)
- [Technical Note - IEC Adopts Quality Standards for Standalone Solar Energy Kits: Implications for Governments and Other Institutions](#)
- [Stakeholder Feedback on Proposed Changes to the Draft Quality Standards under Review by the IEC: February 2020](#)
- [Recording of the May 7 webinar and presentation slides](#)

### **What's the difference between IEC TS 62257-9-5 and IEC TS 62257-9-8?**

IEC TS 62257-9-5 are the test methods and IEC TS 62257-9-8 are the standards used to evaluate products based on the results of testing. VeraSol already uses IEC TS 62257-9-5, and expects to begin using IEC TS 62257-9-8 this year. VeraSol plans to offer testing to the new requirements soon after the date of publication, but will not require testing to the new requirements until 1 October 2020 (though this transition date may be delayed further depending on market dynamics due to the COVID-19 crisis).

### **How can we send comments about the IEC standards?**

The comment period on the IEC standards has already ended and the standards have been adopted by the IEC. Please see [this document](#) outlining the feedback we received from stakeholders. However, please [reach out to us](#) if you'd like to provide any additional feedback.

### **The verification period is two years, is there any plan to extend it?**

No, we are not currently pursuing a longer certification period as two years has been the norm for some time. The reason the certification period remains two years is because we have often found that when a company submits a product for renewal testing, the product no longer meets the standards due to intentional changes to the product, manufacturing issues, or changes to the standards. This indicates that extending the certification length beyond two years would not work. However, to renew certification for a product after two years, full testing is not required. There is a shorter, less-expensive suite of tests that are carried out.

### **Is it possible to have a simplified version of Energy Service Calculation for non-technical staff?**

Our team is considering providing a spreadsheet that outlines the inputs for energy services calculations for companies to use as a tool to calculate themselves. We will be sure to share with companies if we develop this.

### **For wire sizing, do the new standards look at AWG sizing/losses?**

IEC 62257-9-8 includes two elements related to wire sizing. First, there is a requirement for “wiring and connector safety”. To meet this requirement, companies must provide a declaration stating that the “wires, cables, and connectors are appropriately sized for the expected current and voltage, and all connectors and wire joints are robust.” This includes that all external cords provided with the product must be capable of carrying the electric currents present during normal operation without exceeding  $50\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$  (i.e., if during testing, a technician observes that the wiring is overheating, the product could fail for this aspect). Secondly, the PV cable’s conductor diameter will be measured to ensure it is sized to safely carry the maximum short circuit current of the module. This requirement is only considering current-carrying capacity of the cable for safety, and does not assess voltage drop or voltage losses. Voltage losses are accounted for in the performance measurements of the systems (for instance, the PV power is measured at the end of the cable and this value is used when calculating the solar run time of the product).

### **Product Scope**

#### **What size of SHS kits are covered? Is there a limit to the array capacity?**

IEC TS 62257-9-8 covers the same scope as the current Lighting Global Quality Standards. Kits from 0 to 350 Wp will be covered.

#### **Some systems with productive use appliances require capacity above 350 Wp. Is there a plan to increase the allowance of systems beyond 350 Wp?**

Currently, we don’t plan to allow systems beyond 350 Wp, but please [contact us](#) if you’re interested in increase the Wp allowance to discuss further.

#### **How will VeraSol’s transition to larger SHS kits affect companies?**

The scope of the certification program isn’t changing, we are still certifying systems up to 350 Wp. The two main changes are the use of IEC quality standards instead of the Lighting Global Quality Standards and the issuing of certificates under VeraSol (note, we will continue offering evaluation to the Lighting Global Quality Standards until at least October 2020). It will be the same process, conducted by the same team with testing by the same labs.

#### **Can you certify certain productive use appliances like solar water pumps and solar refrigerators?**

Currently, solar water pumps and solar refrigerators are not within the certification scope of VeraSol nor the forthcoming IEC standards. Our team is currently exploring the potential to include solar refrigerators within the certification scope. If you are interested in testing the quality and performance of your solar refrigerator or solar water pump as a standalone product, please [contact us](#).

**Will the new standards also include detailed testing requirements for appliances like fans and refrigerators?**

The new standards do not cover refrigerators and do not provide any new requirements for fans beyond those already included in the Lighting Global Quality Standards.

**Do you plan to allow for certification of SHS kits with AC outputs?**

IEC TS 62257-9-5 does not currently include SHS kits with AC outputs. However, our team is exploring potentially including SHS kits with AC outputs into our program scope. We are currently reviewing the technical requirements to allow this, and then will engage stakeholders about the expanded scope.

**Will component-based SHS kits be included in the new standards?**

No, component-based SHS kits are not within the scope of IEC TS 62257-9-8. There is no difference in product scope between the Lighting Global Quality Standards and the new standards.

**Are there standards for IoT remote monitoring of solar systems?**

To date, our program has not focused on standards for IoT remote monitoring devices. If you are interested in this, please [contact us](#) so we can discuss further.

**Publication**

**How soon are the standards likely to be published by the IEC and when will VeraSol start using them?**

The IEC has stated a tentative publication date of May 28, 2020. VeraSol plans to offer testing to the new requirements soon after the date of publication, but will not require testing to the new requirements until October 1, 2020 (though this transition date may be delayed further depending on market dynamics due to the COVID-19 crisis).

**IEC TS 62257-9-8 is not yet available in IEC webstore, will you notify us when it is?**

Yes, we will notify all companies with quality-verified products and those on the VeraSol newsletter as soon as the standards have been published and are available for purchase.

**How can I access the test methods and quality standards, and are there any discounts available for NGOs or companies?**

The test methods (IEC TS 62257-9-5) are available for purchase from the IEC webstore [here](#) and the standards (IEC TS 62257-9-8) will also be available from the IEC webstore once they are published. There is a discount available. Please complete [this form](#) to see if you qualify for a discount.

## Battery Safety Requirements

### Why are new battery tests required?

These tests are primarily being included to address recognized safety hazards associated with lithium-based batteries. We are responding to reports of recent safety incidents in the sector and the fact that lithium batteries are beginning to be more commonly used in larger products. The recent safety incidents have caused a great deal of concern among market development programs and procurement agencies. The lithium safety requirements are intended to mitigate these concerns with the goal of both ensuring safe batteries and preventing the inclusion of more stringent battery specifications that might not consider the impacts to the industry.

### Do all battery chemistries have new standards?

No, the new tests are only required for lithium-based batteries.

### What are the new requirements for lithium batteries?

Lithium batteries must have overcharge protection for individual cells or sets of parallel-connected cells. Lithium batteries shall additionally meet the requirements of a standard for safety during use. Test reports from accredited laboratories shall cover both the individual cell and the fully assembled battery pack.

- Batteries used in portable applications (i.e. easily hand-carried devices), shall meet either IEC 62133-2, UL 62133, or the combination of UL 1642 and UL 2054
- Batteries used in stationary applications shall either:
  - Meet the requirements for portable batteries, or
  - Meet the United Nations Recommendations on the transport of dangerous goods: manual of tests and criteria (UN 38.3) and either IEC 62619 or UL 1973.
- Batteries used in a component with a mass > 18 kg shall meet the requirements of IEC 62619 or UL 1973. Batteries of included appliances must also meet this standard.

### Why are the battery tests required at both the pack and cell level?

Previously, we accepted safety documentation for either the pack or cell, but lithium battery experts concluded that requiring safety testing at the pack level is imperative. Similarly, the experts were reluctant to provide any justification for exceptions to pack-level testing for small battery packs and/or packs constructed with the same cells or sub-packs. All stated that testing should follow the accepted safety standards. Additionally, national representatives in Joint Working Group 1 of IEC Technical Committee 82 (i.e. the off-grid working group within IEC that manages the 62257 series) agreed that the safety requirements in the document were necessary and should be applied to all lithium chemistries.

We acknowledge the significant burden the additional testing requirements will place on some companies (especially for smaller companies and those assembling locally), and are interested in hearing any ideas of how to minimize the impacts of these requirements and/or improve them in future revisions of the standards.

**Why isn't a UN38.3 certification sufficient?**

The testing for UN38.3 is designed to evaluate safety during *transportation*, whereas the requirements in IEC TS 62257-9-8 are intended to evaluate safety during *use*, which is more relevant for protecting the end consumer.

**Do you accept IEC 62133:2012 for the new battery safety requirements?**

No, we do not accept 62133:2012. IEC 62133:2012 is quite old given all that has changed in relation to measures to address lithium battery safety. The requirements for IEC 62257-9-8 can be met with IEC 62133-2 (which is from 2017) for batteries in components with a mass  $\leq 18$  kg.

**Are "certificates" required for the new battery safety requirements, or will test reports be accepted?**

Either a certificate or test report would be sufficient, as long as it can easily be determined that the battery met the requirements, that the report or certificate is valid, and that the tests were conducted at an accredited laboratory.

**UL 1642 is for individual cells and UL 2054 is for battery packs. If the battery is a single cell, do we just need to provide the test report of UL 1642?**

UL 2054 applies to single cell batteries, so we would require both UL 2054 and UL 1642 for a single cell battery pack.

**The tests in IEC 62619 are similar to those in UN 38.3. Are both required at the cell level, or is IEC 62619 only required at the pack level?**

Both UN 38.3 and IEC 62619 are required at both the cell and pack level. There are a few tests in UN 38.3 that are not included in IEC 62619 which seem important to ensure battery safety.

**Is there a way to know in advance whether our battery will pass the tests in IEC 62619?**

Most of the tests in IEC 62619 are safety tests which cannot be predicted without detailed understanding of the design and manufacture of the battery. Tests include external short circuit, overcharge, forced discharge, impact, thermal abuse, drop, and internal short circuit tests.

**Do pico-solar products have similar battery standards for lithium batteries if they only use four small separate cylindrical cells?**

Yes, all lithium batteries, regardless of size will need to meet safety standards. The safety standards differ based on whether the components housing the batteries are considered portable or stationary.

**Are lithium iron phosphate (LiFePO<sub>4</sub>) batteries exempt from the new battery certification requirements since they don't have thermal runaway like lithium NMC?**

No, though lithium iron phosphate batteries are generally more thermally stable than other lithium chemistries, all of the battery experts we consulted with agreed that the safety requirements should be applied to all lithium chemistries. If in the future, lithium battery safety standards begin to specify alternate requirements for lithium iron phosphate batteries, we will endeavor to update the standards in IEC 62257-9-8 to mirror the accepted standards in the lithium battery industry.

### **Are there any requirements for recycling of lithium batteries?**

At this time, there are no requirements for battery recycling in IEC 62257-9-8. However, we agree that this is a key issue. Several partners are currently working on efforts to confront the issue of e-waste including Global LEAP, which is managing a solar e-waste challenge: <https://globalleapawards.org/e-waste>

### **Reporting Requirements: Ports**

#### **For the item "All ports on appliances shall be required to meet the requirements for charging ports unless they are explicitly advertised on the packaging, user manual, or at the port as "not for charging," does this apply to all ports, even those clearly labeled as input ports?**

Any ports that are not meant to be output ports (i.e., not meant to charge other devices) need to be noted as "not for charging," or similar (e.g., "not for charging devices", "cannot charge phones", "input only, cannot provide power", "input only", etc.). This information can be on the ports, or on the package or user manual. If on the package or user manual, a statement such as, "The USB ports can be used to charge phones and power other devices. All other ports on the appliances are not intended for charging." The goal is to make it clear to the user (and our team) which ports are meant to power other devices and which are not, as it impacts the performance expectations for those ports.

#### **Would the labeling on non-charging ports have to be on the product itself for every port, or can this be indicated in the user manual?**

This can be indicated on the product, in the user manual, or on the product packaging.

#### **Some systems have multiple types of charging to various appliances. How would these ports be classified?**

If a port is intended to be used to charge another device, it will be treated as an output port and be expected to meet the requirements for DC ports. These requirements differ based on the nominal voltage of the port. The requirements are essentially the same as those currently in the Lighting Global Quality Standards. Ports must be protected from output overload, PV overvoltage, and miswiring, and must meet basic truth-in-advertising and functionality requirements. A detailed summary of the requirements for output ports is provided under note "h" in this document: [Summary of Requirements in IEC TS 62257-9-8:2020](#)

### **Reporting Requirements: Solar Run Time**

#### **How will the run time profile be assessed?**

The methods we use for assessing run times are the Energy Service Calculations (ESC) presented in IEC TS 62257-9-5. These calculations are implemented in a spreadsheet that takes all of the inputs from other tests and calculates the run times and Wh/day estimates for given scenarios. We are hoping to provide this spreadsheet along with a Tech Note describing the ESC soon to assist manufacturers and others trying to better estimate run times according to IEC TS 62257-9-5.

**For the run time profile, should runtimes be reported for appliances running together or separately?**

The run time profile should be for all appliances that are included in the kit used together. If a company wants to also include advertised appliances they can, but are not required to. If advertised appliances are included in the runtime profile, it must be clearly indicated that they are advertised and not included in the kit.

**For the run time profile, how will you account for appliances that have an internal battery and are charged infrequently (e.g. a torch)?**

The runtime profile will be evaluated using the Energy Service Calculations (ESC) described in IEC 62257-9-5. In this method, appliances with internal batteries are treated in one of two ways:

- For torches and radios, the actual run time of the appliance is considered and estimated taking into account the charging efficiency, efficiency of the appliance's internal battery, and power consumption of the light or radio.
- For mobile phones and tablets, the number of full charges are reported (rather than a run time for the device).

Reporting Requirements: Components

**For appliances without batteries, power in watts and nominal voltage are required. If the nominal voltage is 12 V, should we also claim the power at 12 V?**

The voltage is the nominal operating voltage or voltage range, so 12 V would be appropriate or 11.5 V - 14 V, for example. In IEC TS 62257-9-5, the power will be measured when the main unit is being powered at the "typical battery discharge voltage" which is determined as the average voltage during the full battery run time. The measured power will need to be within 15% of the advertised power.

(Note for appliances with batteries, the power is measured when the appliance is powered at the standard operating voltage of the battery.)

Reporting Requirements: Date of Manufacture

**Is it acceptable to apply the date of manufacture by laser or print?**

The label can be on the product or on the packaging, applied in any way that is permanent.

**Does the date of manufacture have to be to the nearest day, week or month?**

Any of these would be acceptable. IEC TS 62257-9-8 specifies that the date must be at least as accurate as one month, but by week or day would be acceptable too.



## Product Testing

### **What are the most common failures so that we can prepare before submitting our product for testing under VeraSol?**

Many of the common failures are issues that can be corrected via changes to the packaging or advertising materials either before or after testing. These include issues due to truth-in-advertising (i.e., run time, time to charge, light output, and other component specification claims), performance reporting requirements, user manual requirements, warranty terms, and lack of documentation for PV cables and AC/DC chargers. Prior to testing, VeraSol will offer to review your packaging and user manual to identify any potential issues that can be identified and fixed in advance of testing. For issues that are identified after testing, we offer our [“Conditional Pass Policy”](#) which provides companies a way to make corrections without requiring full re-testing.

Other common issues include inadequate protection from water ingress (the required level of protection depends on the expected use of the product), lack of appropriate charge/discharge control for batteries, poor battery durability during storage, poor internal wiring, and lack of adequate voltage control/protection for output ports.

### **Is the functionality of the complete system also tested, not just the individual components?**

VeraSol is already using the test methods contained in IEC TS 62257-9-5. In the test methods, there are both component-level and system-level tests. The system-level tests do assess the functionality of the complete system and are used to determine the full-battery run time, solar run time, and available daily energy. The test methods also measure component performance, such as lumen maintenance of the LEDs, PV power, and long-term durability of the batteries.

### **How do you expect the added costs for PV module and battery safety tests to affect the market?**

We do not anticipate the PV tests to have a major impact on the market. The added cost of testing for small modules is minimal and the requirements for larger modules are easily met by sourcing modules that meet IEC 61730. We anticipate that the added costs of the battery safety tests will have a variable impact on different companies. In cases where a company is assembling their own battery packs or assembling batteries locally, these new requirements are likely to have a significant impact. For other companies that purchase battery packs from larger suppliers, the new requirements will likely have a smaller impact because the cost of testing will be more distributed.

### **Will motion sensor lights be required to test on full brightness over an extended period of time?**

Yes, motion sensor lights will need to also meet the lumen maintenance requirements and maintain at least 90% their original brightness for 2000 hours. Typically, for testing, the motion sensor feature of lights is disabled so that the light can remain on during the test.

**Can any lab certify products to IEC TS 62257-9-8 and issue certificates under VeraSol?**

Any lab can obtain the equipment and training to test products to IEC TS 62257-9-5 and IEC 62257-9-8 if they receive accreditation from the appropriate national body. In order to test products under VeraSol, labs will need to sign an MOU with our program, undergo additional training, and participate in round-robin testing.

**Do you expect the high cost of testing and absence of labs in certain countries to promote sub-standard products?**

As the majority of products are manufactured in China, India and similar manufacturing hubs, and many countries are beginning to employ a pre-verification of conformity (PVoC) process for imports, we do not anticipate the lack of labs in certain countries to promote sub-standard products. However, we are simultaneously working with the DfID ACE program and the World Bank to increase lab capacity throughout sub-Saharan Africa to improve the ability for countries and regions to conduct market check testing of both quality-verified and non-quality verified products in the market.

**Is there a test lab in Ethiopia accredited to test to IEC TS 62257-9-5?**

No, currently there is no test lab in Ethiopia accredited to test to IEC TS 62257-9-5. The Ethiopian Conformity Assessment Enterprise (ECAE) lab is equipped and has some training to carry out tests, but it is not currently ISO-accredited to test to the IEC test methods. Certification to the Standards

**How long is the transition period from Lighting Global Quality Assurance to VeraSol?**

We plan to migrate all the data from the Lighting Global website to the VeraSol website and begin issuing verification letters and specification sheets under the new VeraSol brand in July 2020.

**Will the cost of quality verification be the same through VeraSol as it was with Lighting Global Quality Assurance?**

There are two types of fees to get your product quality verified: testing costs and certification costs. Testing costs are solely determined by the test labs depending on the complexity of the product and number of test required. Since the new IEC standards have more requirements than the current Lighting Global Quality Standards, this will increase testing costs. The certification costs are charged by VeraSol. Our pricing for certification was modified in October 2019 and we plan to revise again October 2020.

**Will our current contacts at Lighting Global continue to be the contacts for VeraSol?**

Yes, you will still be communicating with the same team, just from a new email address. We are currently transitioning [testing@lightingglobal.org](mailto:testing@lightingglobal.org) to [testing@verasol.org](mailto:testing@verasol.org), and you will be auto directed when that switch is made.

**Will Lighting Global continue to exist or will it be replaced by VeraSol?**

Lighting Global, managed by the World Bank Group, continues to exist as a market development program. Lighting Global Quality Assurance has transitioned to VeraSol.

**Will the new verification documents state that the IEC standards replace and are more rigorous than the Lighting Global Quality Standards?**

No, the new VeraSol certification documents will only specify to which standards the product was evaluated.

**If we start the certification process now and the IEC standards are published while our product is under test, would we need to evaluate our products against the IEC standards or can we use the Lighting Global Quality Standards?**

For any products that begin testing before October 1, 2020, the company may choose whether to have them evaluated to the Lighting Global Quality Standards or IEC 62257-9-8. The standards used for evaluation will be agreed upon prior to testing.

**If my product is quality verified through Lighting Global, will it automatically receive a VeraSol certificate or will I need to resubmit it for testing and certification?**

All products that are currently quality-verified through Lighting Global Quality Assurance will automatically become verified through VeraSol. We plan to move all products and verification documents to the VeraSol website in mid-2020 and will keep companies informed of the change. No action is needed from the companies to do this.

**If you we just got our product quality verified through Lighting Global Quality Assurance, will it last for two years under VeraSol?**

Yes. All products that were quality verified through Lighting Global Quality Assurance will have the same expiration date under VeraSol.

**At what point in time should manufacturers plan on getting VeraSol verification documents that replace the current Lighting Global documents? Will this happen automatically or do we need to request them from VeraSol?**

After July 1, 2020, all products with valid Lighting Global Verification Letters will be automatically “grandfathered” into the VeraSol program.

## **Use of Standards by National Governments**

**Which countries do you expect to adopt and harmonize with the IEC standards in the future?**

Several countries, including Kenya, Tanzania, and Ethiopia, have already adopted national standards that are aligned with the Lighting Global Quality Standards. It is likely that these countries will update their national standards to harmonize with the IEC standards. We anticipate that many other countries, especially other countries in Sub-Saharan Africa, will also adopt national standards harmonized with the IEC standards.

**Who assures that products brought into the Kenyan market are quality verified?**

The Kenya Bureau of Standards (KEBS) is responsible for ensuring that products entering the Kenyan market meet national standards. KEBS has contracted several companies to inspect goods destined for Kenya on its behalf.