

Lighting Global Product Testing Policy (version 1.0): Implications of Publication of IEC TS 62257-9-5, Edition 2.0 on Product Testing

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On April 3, 2013 the International Electrotechnical Commission (IEC) published technical specification 62257-9-5 Ed. 2.0: *Recommendations for small renewable energy and hybrid systems for rural electrification - Part 9-5: Integrated system - Selection of stand-alone lighting kits for rural electrification*. IEC 62257-9-5 is now the official test methods document for Lighting Global, replacing the *Lighting Global Quality Assurance Protocols v.3.1* document. Now that the Lighting Global test methods are published as an international technical specification, test laboratories that are not currently part of the Lighting Global network can provide product-testing services to off-grid lighting manufacturers according to the Lighting Global test methods. However, results from a particular test laboratory will not be accepted as valid unless the laboratory has been pre-approved by the Lighting Global program.

This document explains how manufacturers can obtain valid test results for use by Lighting Global from any qualified independent test lab, as well as how a test laboratory can become approved to produce test results that will be accepted by the Lighting Global Quality Assurance program. As with all Lighting Global policies, these policies are subject to revision.

For Manufacturers: Selecting a Testing Process

Product testing involves three phases. There is now an option for two approaches to the middle phase, laboratory testing.

Product Testing Phases

- 1) **Random Sampling (Quality Test Method - QTM¹ testing only):** Samples of the product are selected from warehouses and other locations according to the guidelines described in the latest edition of IEC 62257-9-5 (at this document's time of publication, Ed. 2.0 is the latest edition). *This process will continue to be coordinated through Lighting Global with our network of sampling agents.*

¹ Lighting Global utilizes three different test methods to evaluate products. These include the Quality Test Method (QTM), the Initial Screening Method (ISM), and the Market Check Test Method (MCM). All three test methods are included in IEC Technical Specification 62257-9-5. The Quality Test Method is used to determine whether products meet the program's minimum quality standards. The Initial Screening Method is used to generate rapid feedback for manufacturers and – in some cases – to determine if products are eligible to receive a subsidy for QTM testing. The Market Check Test Method is used to determine whether the manufacturer of a product that has met the minimum quality standards according to QTM testing continues to maintain the same level of quality and performance for the units that it delivers to market over time.

- 2) **Laboratory Testing:** The samples are tested according to procedures in the latest edition of IEC 62257-9-5. Off-grid lighting manufacturers now have two options for choosing a test laboratory: a) participating in testing coordinated by Lighting Global, and b) procuring product-testing services from a qualified, independent test laboratory (i.e., not coordinated by Lighting Global). Details on the options are listed below.
- 3) **Feedback and Support from Lighting Global:** Based on the test results, Lighting Global offers feedback and support to clients ranging from aid in interpreting test reports to issuing Standardized Specifications Sheets. *This support will continue to be offered to clients regardless of which test laboratory option they choose.*

Options for Test Laboratory Selection

Option 1: Participate in testing that is coordinated by the Lighting Global Quality Assurance (QA) team. With this option, the off-grid lighting manufacturer contracts with Lighting Global directly to pay for the testing services and the testing will be carried out at one of the approved test laboratories listed on the Lighting Global Product Testing webpage.² The test laboratories listed on the webpage have a history of conducting testing for the Lighting Global program and have been approved by the program to conduct tests using the procedures in the latest edition of IEC 62257-9-5. Products tested using this option are batched together to reduce the cost of testing, which occasionally introduces short delays for particular products if others in the batch create a bottleneck.

Option 2: Procure product-testing services independently (i.e., not in a Lighting Global test batch). With this option, the off-grid lighting manufacturer contracts directly with the test laboratory, including negotiating on price. It is important to ensure that the test laboratory has been approved to conduct testing by Lighting Global *prior to the testing commencing*. To become approved, the test laboratory must meet the requirements in Table 1 or the test laboratory must be listed on the Lighting Global Product Testing webpage.² In addition, Table 1 lists specific random sampling guidelines for QTM testing that must be met in order for the test results to be considered valid. Finally, both the manufacturer and the test laboratory will need to sign a document confirming that no conflicts of interest (financial or otherwise) or the appearance thereof exist between the manufacturer and the test laboratory.

² <http://www.lightingglobal.org/activities/qa/testing/>

Table 1. Criteria for independent test labs to produce valid test results for use by Lighting Global.

	Quality Test Method (QTM)	Initial Screening Method (ISM)
Laboratory accreditation requirements	Laboratory has completed the Independent Test Laboratory application process, and the Lighting Global Quality Assurance team has confirmed that the lab meets the requirements to conduct tests that will be accepted by the Lighting Global Quality Assurance Program as specified below.	Laboratory meets QTM requirement OR Laboratory is currently participating in the Lighting Global round robin testing framework and producing accurate results
Sampling requirements	Random sampling must be conducted by an agent of Lighting Global. The sampling procedure is described in the latest edition of IEC 62257-9-5. Please contact Lighting Global quality assurance at producttesting@lightingafrica.org to coordinate sampling events.	No requirement
Confirmation of absence of conflicts of interest	The manufacturer and the test laboratory will need to sign a document confirming that no conflicts of interest (financial or otherwise) or the appearance thereof exist between the manufacturer and the test laboratory.	

With these criteria in mind, it is important for an off-grid lighting manufacturer to ensure a particular test laboratory is approved by Lighting Global *before* the test laboratory is hired. The manufacturer can send an inquiry to the Lighting Global QA team to verify if a particular test laboratory meets the requirements to provide testing services, and if it has not yet been approved, the test laboratory will need to follow the application processes discussed in the following section. Furthermore, in the case of QTM testing, once the manufacturer has selected a test laboratory that meets the requirements, the manufacturer must contact the Lighting Global QA team to coordinate the random sampling. Lighting Global will pay for the random sampling, but the manufacturer is responsible for shipping the product samples to the test laboratory (this responsibility includes all costs associated with the shipping process, including any import duties, taxes, and other fees). Random sampling is not a requirement for ISM testing. At the completion of testing, if the manufacturer wishes to submit a product's test results to qualify for feedback and/or support from Lighting Global and its affiliate programs, the manufacturer should instruct *the test laboratory* to submit the test results to Lighting Global (test reports provided directly by the manufacturer will not be considered valid).

For Test Laboratories: How to Qualify to Produce Results for Lighting Global

With the QTM and ISM test procedures published in IEC 62257-9-5, Ed. 2.0 (and later editions, as they become available), independent test laboratories (i.e., test laboratories outside of the Lighting Global network) now have the ability to produce valid test results for use by Lighting Global. However, whether or not a particular test laboratory qualifies to produce valid test results for Lighting Global according to the procedures in the latest edition of IEC 62257-9-5 is dependent on the criteria listed in Table 1.

Independent test laboratories that intend to perform QTM testing (possibly in addition to ISM testing) for off-grid lighting manufacturers must contact the Lighting Global QA team (producttesting@lightingafrica.org) to obtain the Independent Test Laboratory application. This application will require the interested test laboratory to submit the following, at a minimum, for consideration:

- **Curricula vitae for all laboratory personnel** that will be involved in testing, as well as a description of the particular tests each person will be involved in;
- A **list of all equipment** that will be used in testing, and the associated specifications sheets for each unique piece of equipment; *and*
- Documentation proving the lab holds the **appropriate accreditation(s)** to conduct QTM tests (see Table 2).

Table 2. Qualification pathways for independent test laboratories

Primary Qualification Pathway	Alternate Qualification Pathway
ISO 17025 accreditation to conduct tests according to the latest edition of IEC 62257-9-5	<ul style="list-style-type: none"> • ISO 17025 accreditation to conduct tests according to LM-79, or equivalent;* • ISO 17025 accreditation to conduct tests according to IEC 61215 and IEC 61646, or equivalent;* <i>and</i> • Proof of staff experience and equipment capacity to successfully conduct battery tests and evaluations of electronic circuits as per the methods in IEC 62257-9-5.

***Note:** Test laboratories may submit documentation for what they consider to be an equivalent accreditation, but the final determination of whether a particular accreditation is satisfactory rests with the Lighting Global Quality Assurance team.

Once the application is submitted, the Lighting Global QA team will review the application materials and determine if the test laboratory (i.e., applicant) is eligible to conduct QTM tests according to the latest edition of IEC 62257-9-5 for use by the Lighting Global program. If the test laboratory is approved, Lighting Global will expect the test laboratory to:

- Submit the product test result(s) to the Lighting Global QA team in the format specified by Lighting Global after testing is completed (in cases where manufacturers want their product's test results to be considered by the Lighting Global Quality Assurance program);
- Answer any questions related to the test report for the product and provide supporting raw test data to the Lighting Global QA team, as necessary;
- Participate in the Lighting Global round robin testing framework (the laboratory will not need to conduct more than four (4) individual round robin tests in a calendar year); *and*
- Submit the Independent Test Laboratory application (along with all supporting materials) every two years.

If it is determined that the laboratory does not meet the necessary requirements, the lab will receive a letter that includes an explanation of the decision and a summary of the deficiencies that need to be addressed if the lab wishes to achieve approved status. Labs would be free to reapply once they have addressed any issues raised in the response letter.

Independent test laboratories that intend to conduct ISM testing only for off-grid lighting manufacturers must either meet the QTM qualifications (see the previous section) or be a part of the Lighting Global round robin testing framework. Test laboratories that do not hold a current ISO 17025 accreditation but are hoping to participate in the Lighting Global round robin testing framework should send inquiries to the Lighting Global QA team.