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BSI Standards Publication

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

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National foreword

This Published Document is the UK implementation of IEC/TS 62257-9-5:2013. It supersedes DD IEC/TS 62257-9-5:2007 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/82, Photovoltaic Energy Systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62257-9-5, which is a technical specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition issued in 2007. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- Overall, shifted from narrow focus on the needs of bulk procurement programmes to a wider framework for structuring quality assurance using appropriate methods for a range of stakeholders including governments, manufacturers, buyers, and others.
- Revised structure of document with modular methods (located in annexes) that are applied using four distinct test regimes.
- Added normative references and definitions to support new document structure.
- Added a framework for categorizing products based on the arrangement of components.
- Expanded the range of aspects that are considered and formalized a framework for product specification that can be customized based on stakeholder needs, with example, informative product specifications in the annexes.
- Added a “Quality test method” that prescribes a set of rigorous laboratory tests using randomly-selected samples. The description includes a comprehensive list of tests and guidance for test labs on staging.
- Added a “Market check method” that is a targeted set of tests to confirm results.
- Added an “Initial screening method” that provides rapid laboratory feedback on product quality and performance.
- Updated and strengthened the previously defined test programme using the “Field screening method” that can be achieved at low cost without laboratory facilities.
- Added a description for “Standardized specifications sheets” that can be used to disseminate test results to the market.
- Created or modified several key test procedures:
  - Full battery run time
  - Durability
  - Water protection assessment
  - Solar run time
  - Light output, distribution, and maintenance
  - Visual screening
  - Random product sampling

This technical specification shall be used in conjunction with:

– IEC 62257-1:Recommendations for small renewable energy and hybrid systems for rural electrification – Part 1: General introduction to rural electrification

– IEC 62257-2:Recommendations for small renewable energy and hybrid systems for rural electrification – Part 2: From requirements to a range of electrification systems

– IEC 62257-3: Recommendations for small renewable energy and hybrid systems for rural electrification – Part 3: Project development and management

– IEC 62257-4: Recommendations for small renewable energy and hybrid systems for rural electrification – Part 4: System selection and design

– IEC 62257-5: Recommendations for small renewable energy and hybrid systems for rural electrification – Part 5: Protection against electrical hazards

– IEC 62257-6: Recommendations for small renewable energy and hybrid systems for rural electrification – Part 6: Acceptance, operation, maintenance and replacement

It is also to be used with future parts of this series as and when they are published.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
82/731/DTS	82/759/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The IEC 62257 series intends to provide to different players involved in rural electrification projects (such as project implementers, project contractors, project supervisors, installers, etc.) guidelines for the setting up of renewable energy and hybrid systems with AC nominal voltage below 500 V, DC nominal voltage below 750 V and nominal power below 100 kVA.

These documents are recommendations

- to choose the right system for the right place,
- to design the system, and
- to operate and maintain the system.

These documents are focused only on rural electrification concentrating on but not specific to developing countries. They shall not be considered as all inclusive to rural electrification. The documents try to promote the use of renewable energies in rural electrification; they do not deal with clean mechanism developments at this time (CO_2 emission, carbon credit, etc.). Further developments in this field could be introduced in future steps.

This consistent set of documents is best considered as a whole with different parts corresponding to items for safety, sustainability of systems, and at the lowest life cycle cost as possible. One of the main objectives is to provide the minimum sufficient requirements, relevant to the field of application that is: small renewable energy and hybrid off-grid systems.

The purpose of this part of IEC 62257 series is to specify quality assurance strategies for stand-alone lighting kits, including product specifications, tests, and a standardized specifications sheet format. In addition to supporting the selection of products by project developers and implementers, quality assurance can help market support organizations, manufacturers, and governments achieve the goals they have for off-grid lighting projects.

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

1 Scope

This part of IEC 62257 applies to stand-alone rechargeable electric lighting appliances or kits that can be installed by a typical user without employing a technician.

This technical specification presents a quality assurance framework that includes product specifications (a framework for interpreting test results), test methods, and standardized specifications sheets (templates for communicating test results).

The intended users of this technical specification are listed below. In some clauses and subclauses of this technical specification, a description of the application of the subclause contents is offered to help provide context for each type of user.

- **Market support programmes** are programmes that support the off-grid lighting market with financing, consumer education, awareness, and other services. Market support programmes often use quality assurance to qualify for access to services like
  - greenhouse gas reduction certifications or other incentives,
  - access to financing (trade or consumer finance),
  - use of a buyer seal and certification (government or non-governmental institutional backing, consumer or “business to business” seals),
  - participation in a public product information database (e.g., standardized specifications sheets),
  - access to a business network or trade group,
  - business support and development services,
  - access to market intelligence, and
  - participation in consumer awareness campaigns.
- **Manufacturers and distributors** need to verify the quality and performance of products from different batches and potential business partners. Manufacturers and distributors often use quality assurance plans or requirements to
  - support quality control processes at a manufacturing plant or upon receipt of goods from a contract manufacturer, and
  - choose products to distribute.
- **Bulk procurement programmes** facilitate or place large orders for devices from a distributor or manufacturer. Bulk procurement programmes may use quality assurance to
  - provide devices to a particular, relatively small group of end-users whose needs are understood (e.g., project developers and implementers for an electrification project may include quality assurance requirements in the GS of an electrification project (see IEC/TS 62257-3)), and
  - organize a subsidy, buy-down, or giveaway programme that will serve a broad set of users.
- **Trade regulators** are typically government policymakers and officials who craft and implement trade and tax policy. Regulators may use quality assurance requirements to
  - qualify for exemption from tax or duties, and