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Recommendations for renewable energy and hybrid systems for rural electrification – Part 12-1: Laboratory evaluation of lamps and lighting appliances for off-grid electricity systems

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

FOREWORD 7
INTRODUCTION 9
1 Scope 10
2 Normative references 10
3 Terms and definitions 11
4 Characteristics of lamps and lighting appliances 15
4.1 Product categories 15
4.2 System measurements and observations 15
4.2.1 General 15
4.2.2 Design, manufacture, and marketing 15
4.2.3 Durability and workmanship 17
4.2.4 Electrical characteristics 19
4.2.5 Photometric performance measures 20
4.2.6 Photometric durability measures 21
4.2.7 Self-declaration aspects 21
5 Product specification 22
5.1 General 22
5.2 Applications 22
5.3 Quality assurance principles 23
5.3.1 General 23
5.3.2 Rationale for dividing quality, warranty, and performance 23
5.4 Product specification framework description 24
5.4.1 General 24
5.4.2 Product specification template 24
5.4.3 Tolerances 27
5.4.4 Quality standards criteria 28
5.4.5 Warranty requirements criteria 33
5.4.6 Performance criteria 33
6 Quality test method (QTM) 35
6.1 General 35
6.2 Applications 36
6.3 Sampling requirements 36
6.4 Laboratory requirements 36
6.5 Testing requirements 36
6.6 Recommended test programme 38
6.6.1 General 38
6.6.2 Reporting 40
7 Market check method (MCM) 41
7.1 General 41
7.2 Applications 41
7.3 Sampling requirements 42
7.4 Laboratory requirements 42
7.5 Testing requirements 42
7.6 Recommended tests programme 44
7.7 Report requirements 44

Annex A (informative) Example quality standards and performance criteria for off-grid lighting market support programme qualification and bulk procurement (“sample tender”) qualification 45
A.1 Overview 45
A.2 Test requirements 45
A.3 Quality standards 45
A.4 Warranty requirements 47
A.5 Performance criteria 47
Annex B (informative) Reserved 49
Annex C (normative) Manufacturer self-reported information 50
C.1 Background 50
C.2 Outcomes 50
C.3 Solicited information 50
Annex D (normative) Product sampling 51
D.1 Background 51
D.2 Test outcomes 51
D.3 Related tests 51
D.4 Procedure 51
Annex E (normative) Power supply requirements for testing 52
E.1 Background 52
E.2 Related tests 52
E.3 Equipment requirements 52
E.3.1 DC systems 52
E.3.2 AC systems 52
E.4 Reporting 53
Annex F (normative) Visual screening 54
F.1 Background 54
F.2 Test outcomes 54
F.3 Related tests 54
F.4 Procedure 54
F.4.1 Properties, features, and information 54
F.4.2 Specifications 56
F.4.3 Functionality and internal inspection 57
F.5 Reporting 58
Annex G (normative) Sample preparation 61
G.1 Background 61
G.2 Test outcomes 61
G.3 Related tests 61
G.4 Procedure 61
G.4.1 General 61
G.4.2 Equipment requirements 61
G.4.3 Test prerequisites 62
G.4.4 Procedure 62
G.5 Calculations 63
G.6 Reporting 63
Annex H (normative) Voltage and frequency settings, voltage measurement points, and product stabilization procedures 64
H.1 Background 64

H.2 Related tests 64
H.3 Equipment requirements 64
H.4 Procedure 64
H.4.1 Test setup 64
H.4.2 Standard operating voltages 65
H.4.3 Frequency selection 66
H.4.4 Stabilization period 66
H.5 Reporting 67
Annex I (normative) Light output 68
I.1 Background 68
I.2 Test outcomes 68
I.3 Related tests 68
I.4 Procedure 68
I.5 Calculations 69
I.6 Reporting 69
Annex J (normative) Light distribution 70
J.1 Background 70
J.2 Test outcomes 70
J.3 Related tests 70
J.4 Procedure 70
J.5 Calculations 70
J.6 Reporting 71
Annex K (normative) Input voltage range 72
K.1 Background 72
K.2 Test outcomes 72
K.3 Related tests 72
K.4 Procedure 73
K.4.1 General 73
K.4.2 Equipment requirements 73
K.4.3 Test prerequisites 73
K.4.4 Apparatus 73
K.4.5 Procedure 73
K.5 Calculations 75
K.6 Reporting 75
Annex L (normative) Lumen maintenance 77
L.1 Background 77
L.2 Test outcomes 77
L.3 Related tests 77
L.4 Procedure 77
L.5 Calculations 77
Annex M (normative) Cycling 78
M.1 Background 78
M.2 Test outcomes 78
M.3 Related tests 78
M.4 Procedure 78
M.4.1 General 78
M.4.2 Equipment requirements 78
M.4.3 Test prerequisites 79

M.4.4 Apparatus 79
M.4.5 Procedure 79
M.5 Calculations 79
M.6 Reporting 80
Annex N (normative) Mechanical durability 81
N.1 Background 81
N.2 Test outcomes 81
N.3 Related tests 82
N.4 Procedures 82
N.4.1 General 82
N.4.2 Shipping vibration test 82
N.5 Reporting 83
Annex O (normative) Physical ingress and water protection 84
O.1 Background 84
O.2 Test outcomes 84
O.3 Related tests 85
O.4 Procedure 85
O.5 Reporting 85
Annex P (normative) Power consumption and power quality 86
P.1 Background 86
P.2 Test outcomes 86
P.3 Related tests 86
P.4 Procedure 86
P.4.1 DC power 86
P.4.2 AC power 87
P.5 Reporting 89
Bibliography 90

Figure 1 – Recommended sequence of testing for QTM 38
Figure H.1 – Test configuration 65
Figure M.1 – Plot of cycle life for 6 samples 80
Figure P.1 – Test configuration for the AC power consumption and power quality test if an external power meter is used 88

Table 1 – Applications of product specifications 23
Table 2 – Truth-in-advertising tolerance 25
Table 3 – Safety and durability standards 25
Table 4 – Power quality standards for AC products 26
Table 5 – End-user support standards 27
Table 6 – End-user support requirements 27
Table 7 – Lighting service criteria for performance assessment 27
Table 8 – Truth-in-advertising criteria for quality standards 29
Table 9 – Notes on common truth-in-advertising aspects 29
Table 10 – Safety and durability criteria for quality standards 30
Table 11 – Recommended level of water protection by product category 32
Table 12 – Power quality criteria for quality standards 32

Table 13 – End-user support criteria for quality standards 33
Table 14 – Criteria for warranty standards 33
Table 15 – Lighting service criteria for performance assessment 34
Table 16 – Lighting service benchmarks 35
Table 17 – Applications of QTM results 36
Table 18 – QTM testing requirements 37
Table 19 – Applications of MCM results 41
Table 20 – MCM testing requirements 42
Table A.1 – Truth-in-advertising tolerance 46
Table A.2 – Safety and durability standards 46
Table A.3 – Power quality standards for AC products 47
Table A.4 – End-user support requirements 47
Table A.5 – Lighting service criteria for performance assessment 48
Table C.1 – Manufacturer self-reported information outcomes 50
Table D.1 – Product sampling outcomes 51
Table F.1 – Visual screening test outcomes 54
Table H.1 – Standard operating voltage for several nominal system voltages 65
Table H.2 – Voltage and current reporting requirements 67
Table I.1 – Light output test outcomes 68
Table J.1 – Light distribution test outcomes 70
Table K.1 – Input voltage range test outcomes 72
Table K.2 – Recommended operating voltage range and maximum allowable voltage by nominal operating voltage 74
Table K.3 – Example table of operating voltage, current, voltage at DUT, and relative light output 76
Table L.1 – Lumen maintenance test outcomes 77
Table M.1 – Cycling test outcomes 78
Table N.1 – Mechanical durability test outcomes 81
Table O.1 – Water exposure and physical ingress protection test outcomes 84
Table P.1 – AC power quality test outcomes 86

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RECOMMENDATIONS FOR RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 12-1: Laboratory evaluation of lamps and lighting appliances for off-grid electricity systems

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 62257-12-1, which is a Technical Specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition.

Title modified.

- Annex A and Annex B were combined into a single Annex A to eliminate duplicate tables and simplify the document. Annex A in this third edition now covers recommendations and requirements for both market support programmes and bulk procurement programs. Annex A provides specific examples for quality standards, warranty requirements, and performance criteria for off-grid lighting products.

This Technical Specification is to be used in conjunction with other parts of the IEC 62257 series.

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
82/1617/DTS	82/1642A/RVDTS

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.

A list of all parts of the IEC 62257 series, under the general title *Recommendations for renewable energy and hybrid systems for rural electrification*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

INTRODUCTION

The IEC 62257 series provides support and strategies for organizations and institutions involved in rural electrification projects. It documents technical approaches for designing, building, testing, and maintaining off-grid renewable energy and hybrid systems with AC nominal voltage below 1 000 V, and DC nominal voltage below 1 500 V.

These documents are recommendations:

- to support buyers who want to connect with good quality options in the market,
- to choose the right system for the right place,
- to design the system,
- to operate and maintain the system.

These documents are focused only on technical aspects of rural off-grid electrification concentrating on but not specific to developing countries. They are not all inclusive to rural electrification. The documents do not describe a range of factors that can determine project or product success: environmental, social, economic, service capabilities, and others. 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 affordable costs. The main objectives are to support the capabilities of households and communities that use small renewable energy and hybrid off-grid systems and inform organizations and institutions in the off-grid power market.

The purpose of this document is to specify laboratory test methods for evaluating the quality assurance of lamps and lighting appliances for off-grid electricity systems, including product specifications and tests. 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 lighting appliances in off-grid applications.

This part of IEC 62257 presents a quality assurance framework that includes product specifications (a framework for interpreting test results) and test methods.

The intended users of this document are:

- Market support programmes that support the off-grid lighting market with financing, consumer education, awareness, and other services;
- Manufacturers and distributors that need to verify the quality and performance of products;
- Bulk procurement programmes that facilitate or place large orders of products; and,
- Trade regulators such as government policymakers and officials who craft and implement trade and tax policy.

The tests and inspections are designed to be widely applicable across different markets, countries, and regions.

RECOMMENDATIONS FOR RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 12-1: Laboratory evaluation of lamps and lighting appliances for off-grid electricity systems

1 Scope

This part of IEC 62257 establishes the framework for creating a product specification for lamps and lighting appliances to serve as the basis for evaluating quality for a particular context. Product specifications include minimum requirements for quality standards, warranty requirements, and/or performance criteria. Products are compared to specifications based on test results and other information about the product. The product specification framework is flexible and can accommodate the goals of diverse organizations and institutions.

This document applies to lamps and lighting appliances for off-grid electricity systems that have the following characteristics:

- The power supply is AC or DC:
  - AC nominal voltages up to 250 V;
  - DC nominal voltages up to 48 V.
- The light source is CFL, linear fluorescent, or LED.
- Operation of the lamp or lighting appliance does not require any components to be supplied by the testing laboratory other than lampholders, wire, connectors, and a power supply.
- The lamp or lighting appliance does not include a battery or energy source (for example, a photovoltaic module or electromechanical generator).

Luminaires are included in the definition of “lighting appliances” if packaged together with a lamp intended to be used with the luminaire. Luminaires without lamps are not included in the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60598-2-1, *Luminaires – Part 2-1: Particular requirements – Fixed general purpose luminaires*

IEC TS 61836, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC TS 62257-9-5: 2018, *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*