



BSI Standards Publication

## **Recommendations for renewable energy and hybrid systems for rural electrification**

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Part 8-1: Selection of batteries and battery management systems for stand-alone electrification systems — Specific case of automotive flooded lead-acid batteries available in developing countries

## National foreword

This Published Document is the UK implementation of IEC TS 62257-8-1:2018. It supersedes DD IEC/TS 62257-8-1:2007, which is withdrawn.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.

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# TECHNICAL SPECIFICATION



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**Recommendations for renewable energy and hybrid systems for rural electrification –  
Part 8-1: Selection of batteries and battery management systems for stand-alone electrification systems – Specific case of automotive flooded lead-acid batteries available in developing countries**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	7
4 Batteries and battery management system selection.....	9
4.1 Battery technical characteristics.....	9
4.1.1 Battery cases.....	9
4.1.2 Battery terminals .....	9
4.1.3 Electrolyte .....	9
4.2 Comparative tests .....	10
4.2.1 General .....	10
4.2.2 Evaluation of the charge and discharge current for testing ( $I_{\text{test}}$ ) .....	10
4.2.3 Test 1: battery endurance test .....	11
4.2.4 Test 2: endurance test for battery and BMS .....	15
4.2.5 Test 3: Battery storability test .....	17
5 Documentation .....	18
6 Installation rules .....	19
6.1 Packing and shipping.....	19
6.2 Environment .....	19
6.3 Battery accommodation, housing .....	20
6.3.1 General .....	20
6.3.2 Provision against electrolyte hazard .....	20
6.3.3 Prevention of short circuits and protection from other effects of electric current.....	21
6.3.4 Battery enclosures.....	21
6.4 Final inspection.....	22
6.5 Safety .....	22
6.5.1 Safety provisions .....	22
6.5.2 Safety Information .....	22
6.6 Administrative formalities .....	23
6.7 Recycling .....	23
Figure 1 – Test 1 phases .....	12
Figure 2 – Phase A battery endurance test .....	13
Figure 3 – Phase B battery endurance test .....	14
Figure 4 – Test 2 phases .....	16
Figure 5 – Phase C battery – BMS endurance test.....	16
Figure 6 – Test 3 phases .....	17
Figure 7 – Phase D storability test .....	18
Figure 8 – Marking for spillage prevention .....	19

Table 1 – Testing procedure .....	10
Table 2 – Evaluation of charge and discharge current ( $I_{\text{test}}$ ) .....	11
Table 3 – Voltage regulation variation with temperature (examples).....	11

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RECOMMENDATIONS FOR RENEWABLE ENERGY AND  
HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –****Part 8-1: Selection of batteries and battery management systems  
for stand-alone electrification systems – Specific case of  
automotive flooded lead-acid batteries  
available in developing countries**

## 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 62257-8-1, 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 published in 2007. This edition constitutes a technical revision.

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

- a) increase of the applicable voltage levels and removal of the 100 kW power limit;
- b) removal of the word "small" from the description of these systems.

This technical specification is to be used in conjunction with the 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
82/1330/DTS	82/1384/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 document 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.

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

- 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 of documents intends to provide to different players involved in rural electrification projects (such as project implementers, project contractors, project supervisors, installers) with documents for the setting up of renewable energy and hybrid systems with AC voltage below 1 000 V and DC voltage below 1 500 V.

These documents are recommendations:

- 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 rural electrification concentrating on, but not specific to, developing countries. They are not 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 mechanisms developments at this time (CO<sub>2</sub> emissions, 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 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.

For rural electrification projects using PV systems, it is recommended to use solar batteries defined in IEC 61427.

Nevertheless in many situations, it is a fact that most of the rural electrification projects are implemented using locally made automotive flooded lead-acid batteries. But these products are not designed for photovoltaic systems applications. There is presently no test to discriminate, in a panel of models of such batteries, which one could provide the best service as close as possible to the requirement of the general specification as a storage application for small PV individual electrification systems (see IEC TS 62257-2) in an economically viable way.

The purpose of IEC TS 62257-8-1 is to propose tests for automotive lead-acid batteries and battery management systems used in small PV individual electrification systems.

## **RECOMMENDATIONS FOR RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –**

### **Part 8-1: Selection of batteries and battery management systems for stand-alone electrification systems – Specific case of automotive flooded lead-acid batteries available in developing countries**

#### **1 Scope**

This part of IEC 62257 proposes simple, cheap, comparative tests in order to discriminate easily, in a panel of automotive flooded lead-acid batteries, the most acceptable model for PV individual electrification systems.

It could be particularly useful for project implementers to test in laboratories of developing countries, the capability of locally made car or truck batteries to be used for their project.

Furthermore, battery-testing specifications usually need test equipment that is too costly and too sophisticated to be applied in developing countries' laboratories.

The tests provided in this document allow assessment of the batteries' performances according to the general specification of the project (see IEC TS 62257-2) and batteries associated with their battery management system (BMS) in a short time and with common technical means. They can be performed locally, as close as possible to the operating conditions of the real site.

The document provides also regulations and installation conditions to be complied with in order to ensure the life and proper operation of the installations as well as the safety of people living in proximity to the installation.

This document is not a type approval standard. It is a technical specification to be used as guidelines and does not replace any existing IEC standard on batteries.

#### **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 60050-482:2004, *International Electrotechnical Vocabulary – Part 482: Primary and secondary cells and batteries*

IEC 60050-482:2004/AMD1:2016

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

#### **3 Terms and definitions**

For the purposes of this document, the terms and definitions for secondary cells and batteries given in IEC 60050-482 and the following apply.