



# TECHNICAL SPECIFICATION



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**Recommendations for small 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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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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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**

### FOREWORD

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- 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 document is based on IEC/PAS 62111 (1999); it cancels and replaces the relevant parts of IEC/PAS 62111.

This part of IEC 62257 is to be used in conjunction with the IEC 62257 series.

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
82/457/DTS	82/476/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 maintenance result 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- withdrawn,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 publication 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, etc.) documents for the setting up of renewable energy and hybrid systems with a.c. voltage below 500 V, d.c. voltage below 750 V and power below 100 kVA.

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 must 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 mechanisms developments at this time (CO<sub>2</sub> 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.

For rural electrification project 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 application. 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 62257-2) in an economically viable way.

The purpose of Part 8-1 of IEC 62257 is to propose tests for automotive lead acid batteries and batteries management systems used in small PV Individual Electrification Systems

This document and the others in the IEC 62257 series are only guidance and so cannot be international standards. Additionally, their subject is still under technical development and so they shall be published as Technical Specifications.

NOTE The IEC 62257 series of Technical Specifications is based on IEC/PAS 62111 (1999-07) and is developed in accordance with the PAS procedure.

## **RECOMMENDATIONS FOR SMALL 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 Technical Specification 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 too costly and too much sophisticated test equipment to be applied in developing countries laboratories.

The tests provided in this document allow to assess batteries performances according to the general specification of the project (see IEC 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 real site operating conditions.

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 referenced documents are indispensable for the application 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, *International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries*

IEC 61427, *Secondary cells and batteries for photovoltaic energy systems (PVES) – General requirements and methods of test*

IEC 62257 (all parts), *Recommendations for small renewable energy and hybrid systems for rural electrification*