Safety requirements for secondary batteries and battery installations –
Part 2: Stationary batteries

Exigences de sécurité pour les batteries d’accumulateurs et les installations
de batteries –
Partie 2: Batteries stationnaires
INTERNATIONAL STANDARD

NORME INTERNATIONALE

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FOREWORD

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International Standard IEC 62485-2 has been prepared by IEC technical committee 21: Secondary cells and batteries.

The text of this standard is based on the following documents:

<table>
<thead>
<tr>
<th>FDIS</th>
<th>Report on voting</th>
</tr>
</thead>
<tbody>
<tr>
<td>21/711/FDIS</td>
<td>21/718/RVD</td>
</tr>
</tbody>
</table>

Full information on the voting for the approval of this standard 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 62485 series can be found, under the general title Safety requirements for secondary batteries and battery installations, on the IEC website.
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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**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 described safety requirements comprise the protective measures to protect from hazards generated by the electricity, the electrolyte, and the explosive gases when using secondary batteries. In addition measures are described to maintain the functional safety of batteries and battery installations.

For the electrical safety (protection against electric shock) under Clause 4, this standard refers to IEC 60364-4-41. The pilot function of this standard is fully observed by indication of cross-reference numbers of the relevant clauses, but interpretation is given where adoption to direct current (DC) circuits is required.

This safety standard comes into force with the date of publication and applies to all new batteries and battery installations. Previous installations are intended to conform to the existing national standards at the time of installation. In case of redesign of old installations this standard applies.

Valve-regulated lead-acid batteries used in stationary battery installations are intended to fulfil safety requirements in accordance to IEC 60896-21 and IEC 60896-22.
1 Scope

This part of the IEC 62485 applies to stationary secondary batteries and battery installations with a maximum voltage of DC 1 500 V (nominal) and describes the principal measures for protections against hazards generated from:

– electricity,
– gas emission,
– electrolyte.

This International Standard provides requirements on safety aspects associated with the erection, use, inspection, maintenance and disposal.

It covers lead-acid and NiCd / NiMH batteries.

Examples for the main applications are:

– telecommunications,
– power station operation,
– central emergency lighting and alarm systems,
– uninterruptible power supplies,
– stationary engine starting,
– photovoltaic systems.

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 60364-4-41, Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock

IEC 60364-4-43, Low-voltage electrical installations – Part 4-43: Protection for safety – Protection against overcurrent

IEC 60364-5-53, Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control

IEC 60529:1989, Degrees of protection provided by enclosures (IP Code)

IEC 60622:2002, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Sealed nickel cadmium prismatic rechargeable single cells

IEC 60623:2001, Secondary cells and batteries containing alkaline or other non-acid electrolytes – Vented nickel-cadmium prismatic rechargeable single cells
3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 (secondary) cell
(rechargeable) cell
single cell
assembly of electrodes and electrolyte which constitutes the basic unit of a secondary battery

NOTE This assembly is contained in an individual case and closed by a cover.

3.2 vented (secondary) cell
secondary cell having a cover provided with an opening through which gaseous products may escape

3.3 valve regulated (secondary) cell
secondary cell which is closed under normal conditions but has an arrangement which allows the escape of gas if the internal pressure exceeds a predetermined value. The cell cannot normally receive addition to the electrolyte
3.4 gastight sealed (secondary) cell
secondary cell which remains closed and does not release either gas or liquid when operated within the limits of charge and temperature specified by the manufacturer. The cell may be equipped with a safety device to prevent dangerously high internal pressure. The cell does not require addition to the electrolyte and is designed to operate during its life in its original sealed state.

3.5 secondary battery
two or more secondary cells connected together and used as a source of electrical energy.

3.6 lead dioxide-lead (acid) battery
secondary battery with an aqueous electrolyte based on dilute sulphuric acid, a positive electrode of lead dioxide and a negative electrode of lead.

3.7 nickel oxide-cadmium battery
secondary battery with an alkaline electrolyte, a positive electrode containing nickel oxide and a negative electrode of cadmium.

3.8 stationary battery
secondary battery which is designed for service in a fixed location and is not habitually moved from place to place during the operating life. It is permanently connected to the d.c power supply (fixed installation).

3.9 monobloc battery
battery with multiple separate but electrically connected cell compartments each of which is designed to house an assembly of electrodes, electrolyte, terminals and interconnections and possible separator.

NOTE The cells in a monobloc battery can be connected in series or parallel.

3.10 electrolyte
liquid or solid substance containing mobile ions which render it ionically conductive.

NOTE The electrolyte may be liquid, solid or a gel.

3.11 gassing
gas emission
evolution of gas resulting from the electrolysis of water in the electrolyte of a cell.

3.12 charge
charging (of a battery)
operation during which a secondary cell or battery is supplied with electrical energy from an external circuit which results in chemical changes within a cell and thus storage of energy as chemical energy occurs.

3.13 battery on float charge
secondary battery whose terminals are permanently connected to a source of constant voltage sufficient to maintain the battery approximately fully charged, and which is intended to supply power to an electrical circuit, if the normal supply is temporarily interrupted.