S+ IEC 62133

Edition 2.0 2012-12

IEC STANDARDS+

colour inside

Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Exigences de sécurité pour les accumulateurs portables étanches, et pour les batteries qui en sont constituées, destinés à l'utilisation dans des applications portables



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Secondary cells and batteries containing alkaline or other non-acid electrolytes –
Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Exigences de sécurité pour les accumulateurs portables étanches, et pour les batteries qui en sont constituées, destinés à l'utilisation dans des applications portables



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES –

SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS

FOREWORD

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International Standard IEC 62133 has been prepared by subcommittee 21A: Secondary cells and batteries containing alkaline or other non-acid electrolytes, of IEC technical committee 21: Secondary cells and batteries.

This second edition cancels and replaces the first edition published in 2002. It constitutes a technical revision.

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

– update of assembly of cells into batteries (5.5);
– addition of design recommendations for lithium system only (5.6.2);
– separation of nickel systems and lithium systems (Clause 6);

– addition of specific requirements and tests for lithium systems (Clause 8);
– addition of charging of secondary lithium-ion cells for safe use (Annex A).

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

FDIS	Report on voting
21A/503/FDIS	21A/509/RVD

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.

The following difference exists in the countries indicated below:

Subclause 8.3.9: Design evaluation – Forced internal short circuit only applies to Korea, Japan, Switzerland and France.

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The contents of the corrigendum of June 2013 have been included in this copy.

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SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES –

SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS

1 Scope

This International Standard specifies requirements and tests for the safe operation of portable sealed secondary cells and batteries (other than button) containing alkaline or other non-acid electrolyte, under intended use and reasonably foreseeable misuse.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 – Part 482: Primary and secondary cells and batteries*

IEC 61951-1, S*econdary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 1: Nickel-cadmium*

IEC 61951-2, S*econdary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 2: Nickel-metal hydride*

IEC 61960, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-482 and ISO/IEC Guide 51, as well as the following apply.

3.1
safety
freedom from unacceptable risk

3.2
risk
a combination of the probability of occurrence of harm and the severity of that harm

3.3
harm
physical injury or damage to the health of people or damage to property or to the environment

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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ACCUMULATEURS ALCALINS ET AUTRES ACCUMULATEURS À ÉLECTROLYTE NON ACIDE –

EXIGENCES DE SÉCURITÉ POUR LES ACCUMULATEURS PORTABLES ÉTANCHES, ET POUR LES BATTERIES QUI EN SONT CONSTITUÉES, DESTINÉS À L'UTILISATION DANS DES APPLICATIONS PORTABLES

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Cette deuxième édition annule et remplace la première édition parue en 2002, dont elle constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

– mise à jour du montage des éléments en batteries (5.5);

– recommandations complémentaires de conception uniquement pour les systèmes au lithium (5.6.2);
– séparation des systèmes au nickel et des systèmes au lithium (Article 6);
– addition d'exigences et d'essais spécifiques pour les systèmes au lithium (Article 8);
– addition des éléments d'accumulateurs lithium-ion pour un usage sûr (Annexe A).

Le texte de cette norme est basé sur les documents suivants:

FDIS	Rapport de vote
21A/503/FDIS	21A/509/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/CEI, Partie 2.

Les différences suivantes existent dans les pays indiqués ci-dessous:

Paragraphe 8.3.9: Évaluation de la conception – Court-circuit interne forcé, s'applique uniquement à la Corée, à la France, au Japon et à la Suisse.

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ACCUMULATEURS ALCALINS ET AUTRES ACCUMULATEURS À ÉLECTROLYTE NON ACIDE –

EXIGENCES DE SÉCURITÉ POUR LES ACCUMULATEURS PORTABLES ÉTANCHES, ET POUR LES BATTERIES QUI EN SONT CONSTITUÉES, DESTINÉS À L'UTILISATION DANS DES APPLICATIONS PORTABLES

1 Domaine d'application

La présente Norme internationale spécifie les exigences et les essais pour le fonctionnement en sécurité des accumulateurs portables étanches, et accumulateurs (autre que boutons) contenant un électrolyte alcalin ou un autre électrolyte non acide dans des utilisations prévues et dans des utilisations abusives raisonnablement prévisibles.

2 Références normatives

Les documents suivants sont cités en référence de manière normative, en intégralité ou en partie, dans le présent document et sont indispensables pour son application. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

CEI 60050-482, *Vocabulaire Électrotechnique International – Partie 482: Piles et accumulateurs électriques*

CEI 61951-1, *Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Accumulateurs individuels portables étanches – Partie 1: Nickel-cadmium*

CEI 61951-2, *Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Accumulateurs individuels portables étanches – Partie 2: Nickel-métal hydrure*

CEI 61960, *Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Éléments et batteries d'accumulateurs au lithium pour applications portables*

Guide ISO/CEI 51, *Aspects liés à la sécurité – Principes directeurs pour les inclure dans les normes*

3 Termes et définitions

Pour les besoins du présent document, les termes et définitions donnés dans la CEI 60050-482 et dans le Guide ISO/CEI 51, ainsi que les suivants s'appliquent.

3.1
sécurité
absence de tout risque inacceptable

3.2
risque
combinaison de la probabilité d'occurrence de nuisance et de la sévérité de cette nuisance

IEC 62133

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REDLINE VERSION

colour inside

Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES –

SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS

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International Standard IEC 62133 has been prepared by subcommittee 21A: Secondary cells and batteries containing alkaline or other non-acid electrolytes, of IEC technical committee 21: Secondary cells and batteries.

This second edition cancels and replaces the first edition published in 2002. It constitutes a technical revision.

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

– update of assembly of cells into batteries (5.5);
– addition of design recommendations for lithium system only (5.6.2);
– separation of nickel systems and lithium systems (Clause 6);
– addition of specific requirements and tests for lithium systems (Clause 8);
– addition of charging of secondary lithium-ion cells for safe use (Annex A).

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

FDIS	Report on voting
21A/503/FDIS	21A/509/RVD

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.

The following difference exists in the countries indicated below:

Subclause 8.3.9: Design evaluation – Forced internal short circuit only applies to Korea, Japan, Switzerland and France.

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
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REDLINE

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES –

SAFETY REQUIREMENTS FOR PORTABLE SEALED SECONDARY CELLS, AND FOR BATTERIES MADE FROM THEM, FOR USE IN PORTABLE APPLICATIONS

~~1~~ ~~General~~

~~1.1~~1 Scope

This International Standard specifies requirements and tests for the safe operation of portable sealed secondary cells and batteries (other than button) containing alkaline or other non-acid electrolyte, under intended use and reasonably foreseeable misuse.

~~1.2~~2 Normative references

The following ~~referenced~~ documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 – Part 482: Primary and secondary cells and batteries*

~~IEC 60050-486, *International Electrotechnical Vocabulary – Chapter 486: Secondary cells and batteries*~~

~~IEC 60051 (all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories*~~

~~IEC 60285, *Alkaline secondary cells and batteries – Sealed nickel-cadmium cylindrical rechargeable single cells*~~

~~IEC 60485, *Digital electronic d.c. voltmeters and d.c. electronic analogue-to-digital converters*~~

~~IEC 61436, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Sealed nickel-metal hydride rechargeable single cells*~~

~~IEC 61438, *Possible safety and health hazards in the use of alkaline secondary cells and batteries – Guide to equipment manufacturers and users*~~

~~IEC 61440, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Sealed nickel-cadmium small prismatic rechargeable single cells*~~

IEC 61951-1, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 1: Nickel-cadmium*

IEC 61951-2, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells – Part 2: Nickel-metal hydride*

IEC 61960, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications*~~[1]~~

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~~[1] To be published.~~

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ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

~~1.3 Definitions~~

3 Terms and definitions

For the purposes of this ~~international standard~~ document, the terms and definitions ~~contained in IEC 60050-486~~ given in IEC 60050-482 and ISO/IEC Guide 51, as well as the following ~~definitions~~ apply.

3.1 ~~1.3.1~~
safety
freedom from unacceptable risk

3.2 ~~1.3.2~~
risk
a combination of the probability of occurrence of harm and the severity of that harm

3.3 ~~1.3.3~~
harm
physical injury or damage to the health of people or damage to property or to the environment

3.4 ~~1.3.4~~
hazard
potential source of harm

3.5 ~~1.3.5~~
intended use
use of a product, process or service in accordance with specifications, instructions and information provided by the supplier

3.6 ~~1.3.6~~
reasonably foreseeable misuse
use of a product, process or service in a way which is not intended by the supplier, but which may result from readily predictable human behaviour

3.7 ~~1.3.7~~
secondary cell
basic manufactured unit providing a source of electrical energy by direct conversion of chemical energy, that consists of electrodes, separators, electrolyte, container and terminals, and that is designed to be charged electrically

3.8 ~~1.3.8~~
secondary battery
assembly of secondary cell(s) ready for use as a source of electrical energy characterized by its voltage, size, terminal arrangement, capacity and rate capability

3.9 ~~1.3.9~~
leakage
visible escape of liquid electrolyte

3.10 ~~1.3.10~~
venting
release of excessive internal pressure from a cell/battery in a manner intended by design to preclude rupture or explosion

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