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colour inside

Primary batteries –
Part 5: Safety of batteries with aqueous electrolyte

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PRIMARY BATTERIES –

Part 5: Safety of batteries with aqueous electrolyte

FOREWORD

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This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 60086-5 has been prepared by IEC Technical Committee 35: Primary cells and batteries.

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

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

a) The definition of explosion was changed to suitable sentence in order to harmonize in IEC 60086 series;
b) To prevent removal of hydrogen gas, we revised it to the suitable sentence,
c) To prevent misuse, the battery compartments with parallel connections were revised to the suitable sentence.
d) To clarify the method to determine the insulation resistance.

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

FDIS	Report on voting
35/1360/FDIS	35/1361/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.

A list of all parts in the IEC 60086 series, published under the general title *Primary batteries*, can be found 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 website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

The concept of safety is closely related to safeguarding the integrity of people and property. This part of IEC 60086 specifies tests and requirements for primary batteries with aqueous electrolyte and has been prepared in accordance with ISO/IEC guidelines, taking into account all relevant national and international standards which apply. Also included in this standard is guidance for appliance designers with respect to battery compartments and information regarding packaging, handling, warehousing and transportation.

Safety is a balance between freedom from risks of harm and other demands to be met by the product. There can be no absolute safety. Even at the highest level of safety, the product can only be relatively safe. In this respect, decision-making is based on risk evaluation and safety judgement.

As safety will pose different problems, it is impossible to provide a set of precise provisions and recommendations that will apply in every case. However, this standard, when followed on a judicious "use when applicable" basis, will provide reasonably consistent standards for safety.

PRIMARY BATTERIES –

Part 5: Safety of batteries with aqueous electrolyte

1 Scope

This part of IEC 60086 specifies tests and requirements for primary batteries with aqueous electrolyte to ensure their safe operation 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 60086-1~~:2011~~, *Primary batteries – Part 1: General*

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IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60086-5

Edition 4.0 2016-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Primary batteries –
Part 5: Safety of batteries with aqueous electrolyte

Piles électriques –
Partie 5: Sécurité des piles à électrolyte aqueux

IEC 60086-5:2016-07(en-fr)

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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PILES ÉLECTRIQUES –

Partie 5: Sécurité des piles à électrolyte aqueux

AVANT-PROPOS

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La Norme internationale IEC 60086-5 a été établie par le comité d'études 35 de l'IEC: Piles.

Cette quatrième édition annule et remplace la troisième édition parue en 2011. Cette édition constitue une révision technique.

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

a) La définition du terme explosion a été modifiée pour l'harmoniser avec les autres définitions de la série IEC 60086;
b) Empêcher l'élimination de l'hydrogène, la phrase a été révisée,
c) Empêcher les mauvais usages, la phrase sur les compartiments avec des piles connectées en parallèle a été révisée.
d) La méthode de détermination de la résistance d'isolement a été clarifiée.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
35/1360/FDIS	35/1361/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/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 60086, publiées sous le titre général *Piles électriques,* peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

INTRODUCTION

La notion de sécurité est étroitement liée à la protection de l'intégrité des personnes et des biens. La présente partie de l'IEC 60086 spécifie les exigences et essais pour les piles à électrolyte aqueux et elle a été établie conformément aux lignes directrices ISO/IEC en prenant en compte les normes nationales et internationales correspondantes. Cette norme donne également des lignes directrices pour les concepteurs d'appareils concernant les compartiments de piles et des informations relatives à l'emballage, à la manipulation, à l'entreposage et au transport.

La sécurité consiste en un équilibre entre l'absence de risques de dommages et d'autres exigences auxquelles le produit doit satisfaire. La sécurité absolue ne peut pas exister. Même au niveau le plus élevé de sécurité, le produit peut n'offrir qu'une sécurité relative. A cet égard, la prise de décision repose sur l'évaluation des risques et les jugements sur la sécurité.

Compte tenu des différents problèmes posés par la sécurité, il est impossible de fournir un ensemble de dispositions et de recommandations précises qui s'appliqueront à chaque cas. Cependant, la présente norme, si elle est suivie de manière judicieuse, c'est à dire en "l'utilisant lorsqu'elle est applicable", fournira des dispositions suffisamment cohérentes en matière de sécurité.

PILES ÉLECTRIQUES –

Partie 5: Sécurité des piles à électrolyte aqueux

1 Domaine d'application

La présente partie de l'IEC 60086 spécifie des essais et des exigences pour les piles à électrolyte aqueux pour assurer leur fonctionnement sûr dans des conditions d'utilisation prévue et de mauvais usage raisonnablement prévisible.

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).

IEC 60086-1, *Piles électriques – Partie 1: Généralités*

IEC 60086-2, *Piles électriques – Partie 2: Spécifications physiques et électriques*

IEC 60068-2-6, *Essais d'environnement – Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)*

IEC 60068-2-27, *Essais d'environnement – Partie 2-27: Essais – Essai Ea et guide: Chocs*

IEC 60068-2-31, *Essais d'environnement – Partie 2-31: Essais – Essai Ec: Choc lié à des manutentions brutales, essai destiné en premier lieu aux matériels*

Bibliographie

[1] IEC 60086-3, *Piles électriques – Partie 3: Piles pour montres*

[2] IEC 60086-4, *Piles électriques – Partie 4: Sécurité des piles au lithium*

[3] Guide ISO/IEC 50: 2015, *Aspects liés à la sécurité – Principes directeurs pour la sécurité des enfants dans les normes et autres spécifications*

[4] Guide ISO/CEI 51:2014, *Aspects liés à la sécurité – Principes directeurs pour les inclure dans les normes*

[5] IEC 60050-482:2004, *Vocabulaire Electrotechnique International – Partie 482: Piles et accumulateurs électriques*

[6] ISO 8124-1, *Sécurité des jouets – Partie 1: Aspects de sécurité relatifs aux propriétés mécaniques et physiques*

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