

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

The European Standard EN 62133:2003 has the status of a British Standard

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National foreword

This British Standard is the official English language version of EN 62133:2003. It is identical with IEC 62133:2002. It supersedes BS EN 61809:2001 which will be withdrawn on 2005-12-01. It also partially supersedes BS EN 61960-1:2001 and BS EN 61960-2:2002, both of which will be replaced by BS EN 61960 Ed. 1, which is currently under development and will not contain subjects now covered by this BS EN 62133.

The UK participation in its preparation was entrusted to Technical Committee PEL/21/1, Secondary cells and batteries containing alkaline and other non-acidic electrolytes, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English version

**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
(IEC 62133:2002)**

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
(CEI 62133:2002)

Akkumulatoren und Batterien mit
alkalischem oder anderen nicht
säurehaltigen Elektrolyten -
Sicherheitsanforderungen für tragbare
gasdichte Akkumulatoren und daraus
hergestellte Batterien für die Verwendung
in tragbaren Geräten
(IEC 62133:2002)

This European Standard was approved by CENELEC on 2002-12-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 21A/363/FDIS, future edition 1 of IEC 62133, prepared by SC 21A, Secondary cells and batteries containing alkaline or other non-acid electrolytes, of IEC TC 21, Secondary cells and batteries, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62133 on 2002-12-03.

This European Standard supersedes EN 61809:2000 and partially supersedes EN 61960-1:2001 and EN 61960-2:2001.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2003-11-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-12-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A and B are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62133:2002 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60664	NOTE	Harmonized as EN 60664 series (not modified).
IEC 61434	NOTE	Harmonized as EN 61434:1996 (not modified).

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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 General

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 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 60050-486, *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

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

¹ To be published.

1.3 Definitions

For the purpose of this international standard, the definitions contained in IEC 60050-486 and ISO/IEC Guide 51 as well as the following definitions apply.

1.3.1

safety

freedom from unacceptable risk

1.3.2

risk

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

1.3.3

harm

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

1.3.4

hazard

potential source of harm

1.3.5

intended use

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

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

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

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

1.3.9

leakage

visible escape of liquid electrolyte

1.3.10

venting

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

1.3.11

rupture

mechanical failure of a cell container or battery case induced by an internal or external cause, resulting in exposure or spillage but not ejection of materials

1.3.12**explosion**

failure that occurs when a cell container or battery case opens violently and major components are forcibly expelled

1.3.13**fire**

the emission of flames from a cell or battery

1.3.14**portable battery**

a battery for use in a device or appliance which is conveniently hand carried

1.3.15**portable cell**

a cell intended for assembly in a portable battery

1.3.16**rated capacity**

quantity of electricity C_5 Ah (ampere-hours) declared by the manufacturer which a single cell can deliver when discharged at the reference test current of $0,2 I_t$ A to a specified final voltage, after charging, storing and discharging under specified conditions

1.4 Parameter measurement tolerances

The overall accuracy of controlled or measured values, relative to the specified or actual parameters, shall be within these tolerances.

- a) ± 1 % for voltage;
- b) ± 1 % for current;
- c) ± 2 °C for temperature;
- d) $\pm 0,1$ % for time;
- e) ± 1 % for dimension;
- f) ± 1 % for capacity.

These tolerances comprise the combined accuracy of the measuring instruments, the measurement techniques used, and all other sources of error in the test procedure.

For assistance in selecting instrumentation see IEC 60051 for analogue instruments and IEC 60485 for digital instruments. The details of the instrumentation used shall be provided in any report of results.

2 General safety considerations

The safety of secondary cells and batteries requires the consideration of two sets of applied conditions:

- a) intended use;
- b) reasonably foreseeable misuse.

Cells and batteries shall be so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse. It is expected that cells or batteries subjected to misuse may fail to function following such experience. They shall not however present significant hazards. It may also be expected that cells and batteries subjected to intended use shall not only be safe but shall continue to be functional in all respects.