

Secondary cells and batteries containing alkaline or other non-acid electrolytes — Portable sealed rechargeable single cells —

Part 1: Nickel-cadmium

The European Standard EN 61951-1:2001 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 61951-1:2001. It is identical with IEC 61951-1:2001.

The UK participation in its preparation was entrusted to Technical Committee PEL/21/1, Alkaline secondary cells and batteries, 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;
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**Secondary cells and batteries containing alkaline
or other non-acid electrolytes -
Portable sealed rechargeable single cells
Part 1: Nickel-cadmium
(IEC 61951-1:2001)**

Accumulateurs alcalins et autres
accumulateurs à électrolyte non acide -
Accumulateurs individuels portables
étanches
Partie 1: Nickel-cadmium
(CEI 61951-1:2001)

Sekundärzellen und Batterien mit
alkalischem oder anderen
nichtsäurehaltigen Elektrolyten -
Tragbare wiederaufladbare
gasdichte Einzelzellen
Teil 1: Nickel-Cadmium
(IEC 61951-1:2001)

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CENELEC

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

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Foreword

The text of document 21A/292/FDIS, future edition 1 of IEC 61951-1, 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 61951-1 on 2001-03-01.

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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.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61951-1:2001 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

1. This International Standard is an amalgamation of all currently valid standards for portable sealed nickel-cadmium secondary single cells: IEC 60285, 1999, IEC 60509, 1988 and IEC 61440, 1997. It complies with the objective of reducing the number of valid standards, and does not introduce technical modifications in the original standards. If, in the future, this standard is amended, the relevant original standards will be cancelled.

2. Traditionally, the manufacturers and users of alkaline secondary cells and batteries have expressed the current used to charge and discharge these cells and batteries as a multiple of the capacity. For example, a current of 20 A used to charge (or discharge) a cell with a rated capacity (C Ah) of 100 Ah would be expressed as C/5 A or 0,2 C A. This method of current designation has been used in earlier standards relating to alkaline secondary cells and batteries.

Comments have been made, that this method of current designation is dimensionally incorrect in that a multiple of the capacity (ampere-hours) will be in ampere-hours and not, as required for current, in amperes. As a result of these comments, the method described in IEC 61434 has been used in this standard. In brief, the method states that the reference test current (I_t) is expressed as:

$$I_t \text{ A} = C_n \text{ Ah} / 1 \text{ h}$$

where

C_n is the rated capacity declared by the manufacturer in ampere-hours (Ah), and

n is the time base in hours (h) for which the rated capacity is declared.

SECONDARY CELLS AND BATTERIES CONTAINING ALKALINE OR OTHER NON-ACID ELECTROLYTES – PORTABLE SEALED RECHARGEABLE SINGLE CELLS –

Part 1: Nickel-cadmium

1 General

1.1 Scope

This International Standard specifies marking, designation, dimensions, tests and requirements for portable sealed nickel-cadmium small prismatic, cylindrical and button rechargeable single cells, suitable for use in any orientation.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

IEC 60086 (all parts), *Primary batteries*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

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

1.3 Definitions

For the purposes of this International Standard, the following definitions apply:

1.3.1

small prismatic cell

cell in the form of a rectangular parallelepiped whose width and thickness dimensions are not more than 25 mm

1.3.2

cylindrical cell

cell of circular cross-section in which the overall height is equal to or greater than the overall diameter

1.3.3

button cell

cell of a circular cross-section in which the overall height is less than the overall diameter

1.3.4

sealed cell

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 is 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

1.3.5

nominal cell voltage

the nominal voltage of a single sealed nickel-cadmium rechargeable single cell is 1,2 V

1.3.6

portable battery

a cell designed for use in an easily hand-carried battery

1.3.7

rated capacity

quantity of electricity C_5Ah (ampere hours) declared by the manufacturer which a single cell can deliver at the reference test current of 0,2 I_t A to a final voltage of 1,0 V at +20 °C after charging, storing and discharging under the conditions specified in clause 4

1.4 Parameter measurement tolerances

The overall accuracy of controlled or measured values, relative to the specified or actual values, shall be within the following tolerances:

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

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 series for analogue instruments and IEC 60485 for digital instruments. The details of the instrumentation used shall be provided in each report of results.

2 Designation and marking

2.1 Cell designation

2.1.1 Small prismatic cells

Sealed nickel-cadmium small prismatic rechargeable single cells shall be designated by the letters "KF" followed by three groups of figures each one separated by a solidus.

- a) The two figures to the left of the first solidus shall indicate the maximum width specified for the cell, expressed in millimetres, rounded up to the next whole number.
- b) The two figures in the middle shall indicate the maximum thickness specified for the cell, expressed in millimetres, rounded up to the next whole number.
- c) The two figures to the right of the second solidus shall indicate the maximum height specified for the cell, expressed in millimetres, rounded up to the next whole number.

EXAMPLE: KF 18/07/49

2.1.2 Cylindrical cells

Sealed nickel-cadmium cylindrical rechargeable single cells shall be designated by the letters "KR" followed by a letter L, M, H or X which signifies whether the cell is designated for a low (L)*, medium (M)*, high (H)* or very high (X)* rates of discharge, followed by two groups of figures separated by a solidus.

NOTE These types of cells are recommended but not exclusively used for the following discharge rates:

- L typically up to 0,5 I_t A;
- M typically above 0,5 I_t A and up to 3,5 I_t A;
- H typically above 3,5 I_t A and up to 7 I_t A;
- X typically above 7 I_t A and up to 15 I_t A.

When a cell is intended for permanent charge at elevated temperature a letter "T" is inserted between the letter L, M, H or X and the two groups of figures.

- a) The two figures to the left of the solidus shall indicate the maximum diameter specified for the cell, expressed in millimetres, rounded up to the next whole number.
- b) The two figures to the right of the solidus shall indicate the maximum height specified for the cell, expressed in millimetres, rounded up to the next whole number.

When a manufacturer designs a cell with dimensions and tolerances which make it interchangeable with a primary battery, the designation of the primary battery may also be indicated on the cell.

EXAMPLE, when applicable:

KRL 33/62 or KRLT 33/62

KR 20

2.1.3 Button cells

Sealed nickel-cadmium button rechargeable single cells shall be designated by the letters "KB" followed by a letter L, M, or H which signifies whether the cell is designated for a low (L), medium (M) or high (H) rate of discharge, followed by two groups of figures separated by a solidus.

- a) The three figures to the left of the solidus shall indicate the maximum diameter specified for the cell, expressed in tenths of millimetres, rounded up to the next whole number.
- b) The three figures to the right of the solidus shall indicate the maximum height specified for the cell, expressed in tenths of millimetres, rounded up to the next whole number.

EXAMPLE: KBL 116/055