

INTERNATIONAL STANDARD

IEC 61951-2

Second edition
2003-04

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

**Part 2:
Nickel-metal hydride**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2: Nickel-metal hydride

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61951-2 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 2001 of which it constitutes a technical revision.

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

FDIS	Report on voting
21A/374/FDIS	21A/380/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.

IEC 61951 series, published under the general title *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Portable sealed rechargeable single cells*, consists of the following parts:

- Part 1: Nickel-cadmium
- Part 2: Nickel-metal hydride.

The committee has decided that the contents of this publication will remain unchanged until 2008-06. At this date, the publication will be

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- withdrawn;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

Withdrawn

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

Part 2: Nickel-metal hydride

1 Scope

This part of IEC 61951 specifies marking, designation, dimensions, tests and requirements for portable sealed nickel-metal hydride, small prismatic, cylindrical and button rechargeable single cells, suitable for use in any orientation.

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 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*

IEC 61959, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Mechanical tests for sealed portable secondary cells and batteries¹*

3 Definitions

For the purposes of this document, the definitions contained in IEC 60050-486 and the following apply:

3.3.1

small prismatic cell

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

¹ To be published.

3.3.2**cylindrical cell**

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

3.3.3**button cell**

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

3.3.4**nickel-metal hydride cell**

cell containing a nickel hydroxide compound for the positive electrode and a hydrogen absorbing alloy for the negative electrode

3.3.5**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

NOTE The nickel-metal hydride cell, however, may release gas towards the end of its life due to the accumulation of hydrogen in the cell.

3.3.6**nominal voltage**

nominal voltage of a sealed nickel-metal hydride rechargeable single cell: 1,2 V

3.3.7**portable cell**

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

3.3.8**rated capacity**

quantity of electricity C_5 Ah (ampere-hours) declared by the manufacturer which a single cell can deliver during a 5 h period when charging, storing and discharging under the conditions specified in 7.2.1

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 the 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.

5 Cell designation and marking

5.1 Cell designation

5.1.1 Small prismatic cells

Sealed nickel-metal hydride small prismatic rechargeable single cells shall be designated by the letters "HF" 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 HF 18/07/49 designation identifies a small prismatic cell, with a maximum width of 18 mm, a maximum thickness of 7 mm and a maximum height of 49 mm.

5.1.2 Cylindrical cells

Sealed nickel-metal hydride cylindrical rechargeable single cells shall be designated by the letters "HR" followed by a letter L, M, H or X which signifies:

- low rate of discharge (L);
- medium rate of discharge (M);
- high rate of discharge (H);
- very high rate of discharge (X).

NOTE These cells are typically but not exclusively used for the following discharge rates:

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

When a cell is intended for permanent charge at elevated temperatures, typically higher than 40 °C, a letter "T" is placed after the letter L, M, H or X.

When a cell is intended for rapid charge, typically at 1,0 I_t A, a letter "R" is placed after the letter L, M, H or X.

The group of three (or four) letters shall then be followed by two groups of figures separated by a solidus.

- 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 Table 2 shall also be marked on the cell.

EXAMPLE 1 HRL 33/62 designation identifies a cylindrical cell of low discharge rate capability, with a maximum diameter of 33 mm and a maximum height of 61,5 mm.

EXAMPLE 2 HRLT 33/62 designation identifies a cylindrical cell of low discharge rate capability, intended for permanent charge at elevated temperatures with a maximum diameter of 33 mm and a maximum height of 61,5 mm.

EXAMPLE 3 HRXR 23/43 designation identifies a cylindrical cell of very high discharge rate capability, which is also intended for rapid charge, with a maximum diameter of 23 mm and a maximum height of 43 mm.

5.1.3 Button cells

Sealed nickel-metal hydride button rechargeable single cells shall be designated by the letters "HB" 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 HB 116/054 designation identifies a button cell, with a maximum diameter of 11,6 mm and a maximum height of 5,4 mm.

5.2 Cell termination

This standard does not specify cell termination.

5.3 Marking

5.3.1 Small prismatic cells and cylindrical cells

Each jacketed cell supplied without connections shall carry durable markings giving the following minimum information:

- sealed rechargeable nickel-metal hydride or Ni-MH;
- designation as specified in 5.1 (in addition, it is permissible for a manufacturer to use his own type designation);
- rated capacity;
- nominal voltage;
- recommended charge rate and time or permanent charge current for "T" cells;
- polarity;
- date of manufacture (which may be in code);
- name or identification of manufacturer or supplier.

NOTE In general, sealed nickel-metal hydride rechargeable single cells with connection tabs need no labels if they form an integral part of a battery, in which case, the battery itself is marked with the above information.