

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Secondary batteries (except lithium) for the propulsion of electric road vehicles –  
Part 4: Safety requirements of nickel-metal hydride cells and modules**

**Accumulateurs (excepté lithium) pour la propulsion des véhicules routiers  
électriques –  
Partie 4: Exigences de sécurité pour les éléments et modules d'accumulateurs  
nickel métal-hydrure**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SECONDARY BATTERIES (EXCEPT LITHIUM) FOR THE PROPULSION OF ELECTRIC ROAD VEHICLES –

### Part 4: Safety requirements of nickel-metal hydride cells and modules

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International Standard IEC 61982-4 has been prepared by IEC technical committee 21: Secondary cells and batteries.

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

CDV	Report on voting
21/852/CDV	21/866/RVC

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 61982 series, published under the general title *Secondary batteries (except lithium) for the propulsion of electric road vehicles*, 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 electric road vehicles (EV) including hybrid electric vehicles (HEV) begin to diffuse in the global market with backing from global concerns on CO<sub>2</sub> reduction and clean energy, as well as from relevant technology advancement and cost reduction. Nickel-metal hydride (Ni-MH) batteries have advantages in cost and balanced performance, and have been used extensively for EV application, especially for the propulsion of HEV.

This standard provides the safety test procedures and acceptance criteria of Ni-MH batteries (cells and modules) for EV application in order to evaluate their basic safety performance. For automobile application, it is important to note the designing diversity of battery packs and systems, and specific requirements for cells corresponding to each of such designs. Based on these facts, the purpose of this standard is to provide a basic level of safety test methodology and criteria with general versatility, which serves a function in common primary testing of cells or modules to be used in a variety of battery systems.

For specific requirements for the safety of cell differ depending on the system designs of battery pack or vehicle, final pass-fail criteria of cell are to be based on the agreement between the cell manufacturers and the customers.

## SECONDARY BATTERIES (EXCEPT LITHIUM) FOR THE PROPULSION OF ELECTRIC ROAD VEHICLES –

### Part 4: Safety requirements of nickel-metal hydride cells and modules

#### 1 Scope

This Part of IEC 61982 specifies test procedures and acceptance criteria for safety performance of nickel-metal hydride (Ni-MH) secondary cells and modules used for the propulsion of electric vehicles (EV) including battery electric vehicles (BEV) and hybrid electric vehicles (HEV).

This standard intends to secure the basic safety performance of the cell as used in a battery system under intended use and reasonably foreseeable misuse, during the normal operation of EV. The safety requirements of the cell in this standard are based on the premise that the cells and modules are properly used in a battery pack and system within the limit of voltage, current and temperature as specified by the cell manufacturer.

The evaluation of the safety of batteries during transport and storage is not covered by this standard.

NOTE 1 In this standard, Ni-MH cells mean the sealed nickel-metal hydride cells: these are sealed cells that use nickel hydroxide at the positive electrode, a hydrogen absorbing alloy at the negative electrode, and alkaline aqueous solution such as potassium hydroxide as the electrolyte. Sealed-type cells are those that can maintain their sealed condition and do not release gas or liquid when electrically charged and discharged within the temperature range specified by the cell manufacturer. These cells are equipped with a gas release mechanism to prevent explosion.

NOTE 2 In this standard, all the description on the cell are applicable to the module under the test.

#### 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 60050-482:2000, *International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries*

IEC 61434, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Guide to designation of current in alkaline secondary cell and battery standards*

#### 3 Terms and definitions

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

##### 3.1

##### **battery electric vehicle**

##### **BEV**

electric vehicle with only a traction battery as power source for vehicle propulsion