IEC 62902

Edition 2.0 2025-02
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Secondary cells and batteries – Marking symbols for identification of their chemistry

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.220.20; 29.220.30

ISBN 978-2-8327-0287-1

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CONTENTS

FOREWORD 4
INTRODUCTION 2
1 Scope 9
2 Normative references 9
3 Terms and definitions 10
4 Application of markings 10
4.1 General 12
4.2 Marking of electrochemical battery systems 12
4.3 Marking requirements for additional chemistry information of Li-ion batteries 13
4.4 Application of the markings on the battery 13
5 Markings 13
5.1 Markings without recycling symbol 13
5.1.1 General 13
5.1.2 Lead acid batteries 14
5.1.3 Nickel cadmium batteries 14
5.1.4 Nickel metal hydride batteries 14
5.1.5 Lithium ion batteries 14
5.1.6 Lithium metal batteries 14
5.2 Optional markings with recycling symbol 14
5.2.1 General 14
5.2.2 Lead acid batteries 15
5.2.3 Nickel cadmium batteries 15
5.2.4 Nickel metal hydride batteries 15
5.2.5 Lithium ion batteries 16
5.2.6 Lithium metal batteries 16
5.3 Background colours 16
5.4 Design of markings and symbols 16
5.4.1 General 17
5.4.2 Dimensions for symbols 17
5.4.3 Dimensions for markings without recycling symbol 17
5.4.4 Dimensions for markings with recycling symbol 18
5.4.5 Adaptive size 19
5.4.6 Design of the recycling symbol 19
5.4.7 Design of the letters (characters) 19
5.4.8 Exception for marking with a single colour 20
6 Durability of markings with respect to chemical agents 20
6.1 General 20
6.2 Test procedure 21
6.2.1 General 21
6.2.2 Test with water and recommended cleaning agents 21
6.2.3 Test with electrolyte 21
6.2.4 Test with neutralizing solutions 21
6.3 Criteria 21
Annex A (informative) Colours for background 22
A.1 General 22
A.2 Colour definition for background 22

Annex B (informative) Calculation method for the battery volume 23
Bibliography 24

Figure 1 – Example of marking for lead acid batteries 14
Figure 2 – Example of marking for nickel cadmium batteries 14
Figure 3 – Example of marking for nickel metal hydride batteries 14
Figure 4 – Example of marking for lithium ion batteries 14
Figure 5 – Example of marking for lithium metal batteries 14
Figure 6 – Example of marking with recycling symbol for lead acid batteries 15
Figure 7 – Example of marking with recycling symbol for nickel cadmium batteries 15
Figure 8 – Example of marking with recycling symbol for nickel metal hydride batteries 15
Figure 9 – Example of marking with recycling symbol for lithium ion batteries 16
Figure 10 – Example of marking with recycling symbol for lithium metal batteries 16
Figure 11 – Size of marking without recycling symbol 17
Figure 12 – Size of marking with recycling symbol 18
Figure 13 – Design of recycling symbol 19
Figure 14 – Design of letters 19
Figure 15 – Examples for markings with frames of a contrasting colour 20

Table 1 – Recycling and ecolabels regarding batteries 7
Table 2 – List of dimensions for symbols 17
Table 3 – Test matrix for durability test of markings 20
Table A.1 – Colour references 22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SECONDARY CELLS AND BATTERIES – MARKING SYMBOLS FOR IDENTIFICATION OF THEIR CHEMISTRY

FOREWORD

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2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
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4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62902:2019. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62902 has been prepared by IEC technical committee 21: Secondary cells and batteries. It is an International Standard.

This second edition cancels and replaces the first edition published in 2019. This edition constitutes a technical revision.

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

a) Addition of an Introduction;
b) Addition of exemptions and clarifications for the marking background colour requirement;
c) Addition of a calculation method for the battery volume;
d) Addition of a new note to the Scope;
e) Addition of a term and definition for the principal display panel;
f) Addition of further chemistry information for Li-ion batteries;
g) Addition of a new subclause on adaptive size;
h) Clarification of the test methods for durability and permanence of the marking.

The text of this International Standard is based on the following documents:

Draft	Report on voting
21/1195/CDV	21/1208/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This document introduces uniform marking symbols for the identification of the secondary battery chemistries prevailing on the market. A primary reason is that lead smelters around the world are reporting increasing numbers of lithium ion batteries finding their way into the lead-acid battery waste stream. Because the shape and design of these batteries sometimes is very similar, it can be difficult for sorting facilities and battery smelters to distinguish one technology from the other if there is no clear identification of the battery chemistry by marking symbols.

Processing lithium ion batteries within a lead smelter, e-waste facility, or municipal waste sorting facility, can result in fire or explosions, with numerous accidents or near-accidents already reported in European and US recycling facilities.

Besides lead-acid and lithium ion batteries, the labelling scheme should also apply to other battery chemistries with a significant market share, such as nickel metal hydride and nickel cadmium. Other batteries, such as sodium ion batteries, should be included in the marking scheme when their market share becomes significant.

A clear identification of the battery chemistry would be helpful throughout the entire battery lifetime, i.e. from the selection and purchase of a new battery (e.g. by economic operators as well as end users), to transportation, installation and use of the battery and then to waste battery collection, sorting, storage and treatment.

The following standards and recommendations were considered during the development of this document.

The Battery Association of Japan (BAJ) has issued "Guidelines for Recycle Mark on rechargeable cells and batteries for portable applications" which include an optional colour code system for identifying major (rechargeable) battery chemistries: Pb, Ni-Cd, Ni-MH, and Li-ion. These guidelines also distinguish different cathode materials as well as important impurities (mostly from the anode material)[1].

Call2Recycle has introduced in Canada and the United States of America a licensed labelling program for batteries. It is a non-profit organization that collects and recycles batteries on behalf of companies that pay a fee to license the label.

The recycling symbol required on batteries within the scope of this document is the general symbol for recovery/recyclable as standardised in ISO 7000-1135:2004-01, see item 1 in Table 1. It is worth noting the information that ISO provides for this symbol: Function/description: to indicate that the marked item or its material is part of a recovery or recycling process. Additional information: the symbol is applicable only to those products or materials for which at the end of life there is a well-established collection route and recycling process, and which does not significantly impair the effectiveness of other recycling schemes.

Battery marking can also be subject to regional legislation. One example being the crossed-out wheeled bin used in the European Union (EU) and in some other countries to make consumers aware of their obligation to make their batteries available for separate collection. Some other regulations, e.g. Regulation (EU) 2023/1542 on batteries and waste batteries, can require the use of additional symbols for substances of very high concern (SVHC), namely cadmium (Cd) and lead (Pb) exceeding certain concentration levels[2].

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1 For more information see the document referred to under "Source reference" for item 5 in Table 1.

2 Regulation EU 2023/1542 does not require the addition of the Hg symbol to the separate collection symbol. However, there is a requirement for max. 0,0005 % Hg for all batteries in Annex I *Restriction on substances* of the Batteries Regulation.

In a comment submitted by Battery Council International (BCI) on a request by the Environmental Protection Agency (USA) for information regarding the development of best practices for the collection of batteries to be recycled and voluntary battery labelling guidelines, it was suggested that battery labels should have a consistent and simple marking (e.g. a colour code) across all battery chemistries to encourage and aid appropriate handling which should, at a minimum, address three primary goals – in descending order of priority:

1) inform and educate consumers to keep batteries out of the trash and curbside recycling, and direct batteries to dedicated battery recycling networks where available;
2) provide consumers and recycling network employees with human-readable information to enable sorting of used batteries among major chemistry families (e.g. Pb, Li-ion, Ni-Cd, Ni-MH, and Li-metal);
3) if appropriate within a chemistry family, inform recyclers of the unique features, components or constituents or both, for recovery (e.g. cathode material).

Table 1 contains a list of recycling and ecolabels that can be expected on batteries.

Table 1 – Recycling and ecolabels regarding batteries

No.	Symbol	Official name	Alternative information	Purpose	Source reference
1		General symbol for recovery/recyclable	Möbius loop, three curved arrows	To indicate that the marked item or its material is part of a recovery or recycling process.	ISO 7000-1135:2004-01 www.iso.org/obp
2		4 in 1 symbol	The white interior shows 4 arrows pointing outwards		Environmental Protection Administration of Taiwan (Province of China)
3		Crossed-out wheeled bin		To indicate "separate collection" for all batteries and accumulators	Regulation (EU) 2023/1542
4		Call 2 Recycle battery seal		Private recycling program in the USA and Canada	Battery recycling Seal usage standards
5		Recycling symbol and chemistry for batteries[a]	Guidelines for recycle mark on batteries	Compliance with the Japanese Law for the Promotion of Effective Utilization of Resources	Tecchio, P. el al., Analysis of material efficiency aspects of personal computers product group, JRC Report EUR 28394 EN (2018), page 60
6		U.S. Mercury-Containing and Rechargeable Battery Recycling Act symbol (Battery Council International model)	See footnote[b]	See footnote[c]	42 U.S.C. § 14322(b)

[a] The symbol has two placeholders after "Li-ion" where codes for details of the chemistry are entered.

[b] Three chasing arrows or a comparable recycling symbol. For nickel-cadmium batteries, the symbol must also state "Ni-Cd" and the phrase "BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY." For lead acid batteries, the symbol must also state "Pb" or the words "LEAD", "RETURN", and "RECYCLE" and if the regulated battery is sealed, the phrase "BATTERY MUST BE RECYCLED."

[c] Model symbol developed by Battery Council International for Small Sealed Lead Acid (SSLA) batteries in compliance with the U.S. Mercury-Containing and Rechargeable Battery Recycling Act. Variations allowed.

During the preparation of the second edition, the Scope of this document was subject to intensive discussions. One of the subjects that were discussed, was the inclusion of a battery's energy content. Some experts thought that a limit like the 100 Wh limit used in dangerous goods transportation regulations to distinguish between "fully regulated" and "exempted" when offering batteries for transport under UN numbers 3480 and 3481 could be suitable to distinguish between the different levels of labelling requirements. However, these thoughts were not pursued as they applied only to lithium ion batteries and could hardly be translated into a technology agnostic language. No generally acceptable calculation method was found that would enable the transfer of the energy limit from lithium ion batteries to other chemistries.

A limit of 100 Wh for lithium ion spare batteries in the Federal Aviation Administration (FAA) (of the United States) and International Air Transport Association (IATA) regulations for carry-on baggage on board of passenger aircraft was not considered to be suitable for consideration for similar reasons. The same applied even more to a mass limit of 500 g applicable during the collection of lithium batteries according to UNECE, Special Provision 636 of the Agreement for the carriage of Dangerous goods by Road (ADR).

Other suggestions were made to limit the Scope to batteries with one or more dimension(s) exceeding 5 cm or, in a different proposal, 100 mm. However, it could not be shown how these limits would correlate with each other and with the volume limit of 900 cm^3 and why they would be more suitable than the volume limit.

It was also discussed to add the following recommendation: "In addition, the markings may be used also on secondary battery packaging and in accompanying documents when secondary batteries are placed on the market".

SECONDARY CELLS AND BATTERIES – MARKING SYMBOLS FOR IDENTIFICATION OF THEIR CHEMISTRY

1 Scope

This document specifies methods for the clear identification of secondary cells, batteries, battery modules and monoblocs according to their chemistry (electrochemical storage technology).

~~The markings described in this document are applicable for secondary cells,batteries,battery modules andmonoblocs with a volume of more than 900 cm^3.~~

~~The marking of the chemistry is useful for the installation, operation and decommissioning phases of battery life.~~

The markings described in this document are applicable to

– secondary cells,
– batteries,
– battery modules, and
– monoblocs,

when they are placed on the market for end use and when their battery volume exceeds 900 cm^3.

The chemistry marking is useful for the installation, operation and decommissioning phases in the battery's life cycle.

Many recycling processes are chemistry specific, thus undesired events can occur when a battery which is not of the appropriate chemistry enters a given recycling process. Therefore, the battery is marked so as to identify its chemistry to ensure safe handling during sorting and recycling processes.

This document defines the conditions of use of the markings indicating the chemistry of these secondary batteries.

The details of markings and their application are defined in this document.

~~NOTE Nothing in this document precludes the marking of batteries with recycling and chemistry symbols required by state, federal, national or regional laws or regulations or with a seal under license by a national recycling program.~~

NOTE The 900 cm^3 limit has been chosen because it is a reasonable compromise between larger format batteries and small batteries. On small batteries, the space for additional labels is limited which can result in a readability conflict.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60896-21:2004, *Stationary lead-acid batteries – Part 21: Valve regulated types – Methods of test*

IEC 60896-22:2004, *Stationary lead-acid batteries – Part 22: Valve regulated types – Requirements*

IEC 61960-3:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications – Part 3: Prismatic and cylindrical lithium secondary cells and batteries made from them*

ISO 7000, *Graphical symbols for use on equipment* (available at http://www.graphical-symbols.info/equipment)

IEC 62902

Edition 2.0 2025-02

INTERNATIONAL STANDARD

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Secondary cells and batteries – Marking symbols for identification of their chemistry

Batteries d'accumulateurs – Symboles de marquage pour l'identification de leur caractéristique chimique



IEC 62902:2025-02(en-fr)

CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 9
2 Normative references 9
3 Terms and definitions 10
4 Application of markings 12
4.1 General 12
4.2 Marking of electrochemical battery systems 12
4.3 Marking requirements for additional chemistry information of Li-ion batteries 13
4.4 Application of the markings on the battery 13
5 Markings 13
5.1 Markings without recycling symbol 13
5.1.1 General 13
5.1.2 Lead acid batteries 13
5.1.3 Nickel cadmium batteries 13
5.1.4 Nickel metal hydride batteries 14
5.1.5 Lithium ion batteries 14
5.1.6 Lithium metal batteries 14
5.2 Optional markings with recycling symbol 14
5.2.1 General 14
5.2.2 Lead acid batteries 14
5.2.3 Nickel cadmium batteries 15
5.2.4 Nickel metal hydride batteries 15
5.2.5 Lithium ion batteries 15
5.2.6 Lithium metal batteries 16
5.3 Background colours 16
5.4 Design of markings and symbols 16
5.4.1 General 16
5.4.2 Dimensions for symbols 16
5.4.3 Dimensions for markings without recycling symbol 17
5.4.4 Dimensions for markings with recycling symbol 18
5.4.5 Adaptive size 18
5.4.6 Design of the recycling symbol 19
5.4.7 Design of the letters (characters) 19
5.4.8 Exception for marking with a single colour 20
6 Durability of markings with respect to chemical agents 20
6.1 General 20
6.2 Test procedure 21
6.2.1 General 21
6.2.2 Test with water and recommended cleaning agents 21
6.2.3 Test with electrolyte 21
6.2.4 Test with neutralizing solutions 21
6.3 Criteria 21
Annex A (informative) Colours for background 22
A.1 General 22
A.2 Colour definition for background 22

Annex B (informative) Calculation method for the battery volume 23
Bibliography 24

Figure 1 – Example of marking for lead acid batteries 13
Figure 2 – Example of marking for nickel cadmium batteries 13
Figure 3 – Example of marking for nickel metal hydride batteries 14
Figure 4 – Example of marking for lithium ion batteries 14
Figure 5 – Example of marking for lithium metal batteries 14
Figure 6 – Example of marking with recycling symbol for lead acid batteries 14
Figure 7 – Example of marking with recycling symbol for nickel cadmium batteries 15
Figure 8 – Example of marking with recycling symbol for nickel metal hydride batteries 15
Figure 9 – Example of marking with recycling symbol for lithium ion batteries 15
Figure 10 – Example of marking with recycling symbol for lithium metal batteries 16
Figure 11 – Size of marking without recycling symbol 17
Figure 12 – Size of marking with recycling symbol 18
Figure 13 – Design of recycling symbol 19
Figure 14 – Design of letters 19
Figure 15 – Examples for markings with frames of a contrasting colour 20

Table 1 – Recycling and ecolabels regarding batteries 7
Table 2 – List of dimensions for symbols 17
Table 3 – Test matrix for durability test of markings 20
Table A.1 – Colour references 22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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Processing lithium ion batteries within a lead smelter, e-waste facility, or municipal waste sorting facility, can result in fire or explosions, with numerous accidents or near-accidents already reported in European and US recycling facilities.

Besides lead-acid and lithium ion batteries, the labelling scheme should also apply to other battery chemistries with a significant market share, such as nickel metal hydride and nickel cadmium. Other batteries, such as sodium ion batteries, should be included in the marking scheme when their market share becomes significant.

A clear identification of the battery chemistry would be helpful throughout the entire battery lifetime, i.e. from the selection and purchase of a new battery (e.g. by economic operators as well as end users), to transportation, installation and use of the battery and then to waste battery collection, sorting, storage and treatment.

The following standards and recommendations were considered during the development of this document.

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Call2Recycle has introduced in Canada and the United States of America a licensed labelling program for batteries. It is a non-profit organization that collects and recycles batteries on behalf of companies that pay a fee to license the label.

The recycling symbol required on batteries within the scope of this document is the general symbol for recovery/recyclable as standardised in ISO 7000-1135:2004-01, see item 1 in Table 1. It is worth noting the information that ISO provides for this symbol: Function/description: to indicate that the marked item or its material is part of a recovery or recycling process. Additional information: the symbol is applicable only to those products or materials for which at the end of life there is a well-established collection route and recycling process, and which does not significantly impair the effectiveness of other recycling schemes.

Battery marking can also be subject to regional legislation. One example being the crossed-out wheeled bin used in the European Union (EU) and in some other countries to make consumers aware of their obligation to make their batteries available for separate collection. Some other regulations, e.g. Regulation (EU) 2023/1542 on batteries and waste batteries, can require the use of additional symbols for substances of very high concern (SVHC), namely cadmium (Cd) and lead (Pb) exceeding certain concentration levels[2].

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[1] For more information see the document referred to under "Source reference" for item 5 in Table 1.

[2] Regulation EU 2023/1542 does not require the addition of the Hg symbol to the separate collection symbol. However, there is a requirement for max. 0,0005 % Hg for all batteries in Annex I *Restriction on substances* of the Batteries Regulation.

In a comment submitted by Battery Council International (BCI) on a request by the Environmental Protection Agency (USA) for information regarding the development of best practices for the collection of batteries to be recycled and voluntary battery labelling guidelines, it was suggested that battery labels should have a consistent and simple marking (e.g. a colour code) across all battery chemistries to encourage and aid appropriate handling which should, at a minimum, address three primary goals – in descending order of priority:

1) inform and educate consumers to keep batteries out of the trash and curbside recycling, and direct batteries to dedicated battery recycling networks where available;
2) provide consumers and recycling network employees with human-readable information to enable sorting of used batteries among major chemistry families (e.g. Pb, Li-ion, Ni-Cd, Ni-MH, and Li-metal);
3) if appropriate within a chemistry family, inform recyclers of the unique features, components or constituents or both, for recovery (e.g. cathode material).

Table 1 contains a list of recycling and ecolabels that can be expected on batteries.

Table 1 – Recycling and ecolabels regarding batteries

No.	Symbol	Official name	Alternative information	Purpose	Source reference
1		General symbol for recovery/recyclable	Möbius loop, three curved arrows	To indicate that the marked item or its material is part of a recovery or recycling process.	ISO 7000-1135:2004-01 www.iso.org/obp
2		4 in 1 symbol	The white interior shows 4 arrows pointing outwards		Environmental Protection Administration of Taiwan (Province of China)
3		Crossed-out wheeled bin		To indicate "separate collection" for all batteries and accumulators	Regulation (EU) 2023/1542
4		Call 2 Recycle battery seal		Private recycling program in the USA and Canada	Battery recycling Seal usage standards
5		Recycling symbol and chemistry for batteries[a]	Guidelines for recycle mark on batteries	Compliance with the Japanese Law for the Promotion of Effective Utilization of Resources	Tecchio, P. el al., Analysis of material efficiency aspects of personal computers product group, JRC Report EUR 28394 EN (2018), page 60
6		U.S. Mercury-Containing and Rechargeable Battery Recycling Act symbol (Battery Council International model)	See footnote[b]	See footnote[c]	42 U.S.C. § 14322(b)

[a] The symbol has two placeholders after "Li-ion" where codes for details of the chemistry are entered.

[b] Three chasing arrows or a comparable recycling symbol. For nickel-cadmium batteries, the symbol must also state "Ni-Cd" and the phrase "BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY." For lead acid batteries, the symbol must also state "Pb" or the words "LEAD", "RETURN", and "RECYCLE" and if the regulated battery is sealed, the phrase "BATTERY MUST BE RECYCLED."

[c] Model symbol developed by Battery Council International for Small Sealed Lead Acid (SSLA) batteries in compliance with the U.S. Mercury-Containing and Rechargeable Battery Recycling Act. Variations allowed.

During the preparation of the second edition, the Scope of this document was subject to intensive discussions. One of the subjects that were discussed, was the inclusion of a battery's energy content. Some experts thought that a limit like the 100 Wh limit used in dangerous goods transportation regulations to distinguish between "fully regulated" and "exempted" when offering batteries for transport under UN numbers 3480 and 3481 could be suitable to distinguish between the different levels of labelling requirements. However, these thoughts were not pursued as they applied only to lithium ion batteries and could hardly be translated into a technology agnostic language. No generally acceptable calculation method was found that would enable the transfer of the energy limit from lithium ion batteries to other chemistries.

A limit of 100 Wh for lithium ion spare batteries in the Federal Aviation Administration (FAA) (of the United States) and International Air Transport Association (IATA) regulations for carry-on baggage on board of passenger aircraft was not considered to be suitable for consideration for similar reasons. The same applied even more to a mass limit of 500 g applicable during the collection of lithium batteries according to UNECE, Special Provision 636 of the Agreement for the carriage of Dangerous goods by Road (ADR).

Other suggestions were made to limit the Scope to batteries with one or more dimension(s) exceeding 5 cm or, in a different proposal, 100 mm. However, it could not be shown how these limits would correlate with each other and with the volume limit of 900 cm^3 and why they would be more suitable than the volume limit.

It was also discussed to add the following recommendation: "In addition, the markings may be used also on secondary battery packaging and in accompanying documents when secondary batteries are placed on the market".

SECONDARY CELLS AND BATTERIES – MARKING SYMBOLS FOR IDENTIFICATION OF THEIR CHEMISTRY

1 Scope

This document specifies methods for the clear identification of secondary cells, batteries, battery modules and monoblocs according to their chemistry (electrochemical storage technology).

The markings described in this document are applicable to

– secondary cells,
– batteries,
– battery modules, and
– monoblocs,

when they are placed on the market for end use and when their battery volume exceeds 900 cm^3.

The chemistry marking is useful for the installation, operation and decommissioning phases in the battery's life cycle.

Many recycling processes are chemistry specific, thus undesired events can occur when a battery which is not of the appropriate chemistry enters a given recycling process. Therefore, the battery is marked so as to identify its chemistry to ensure safe handling during sorting and recycling processes.

This document defines the conditions of use of the markings indicating the chemistry of these secondary batteries.

The details of markings and their application are defined in this document.

NOTE The 900 cm^3 limit has been chosen because it is a reasonable compromise between larger format batteries and small batteries. On small batteries, the space for additional labels is limited which can result in a readability conflict.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60896-21:2004, *Stationary lead-acid batteries – Part 21: Valve regulated types – Methods of test*

IEC 60896-22:2004, *Stationary lead-acid batteries – Part 22: Valve regulated types – Requirements*

IEC 61960-3:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for portable applications – Part 3: Prismatic and cylindrical lithium secondary cells and batteries made from them*

ISO 7000*, Graphical symbols for use on equipment* (available at http://www.graphical-symbols.info/equipment)

SOMMAIRE

AVANT-PROPOS 28
INTRODUCTION 30
1 Domaine d’application 34
2 Références normatives 34
3 Termes et définitions 35
4 Application des marquages 37
4.1 Généralités 37
4.2 Marquage des systèmes de batteries électrochimiques 37
4.3 Exigences de marquage pour les informations chimiques supplémentaires des batteries Li-ion 38
4.4 Application des marquages sur la batterie 38
5 Marquages 38
5.1 Marquages sans symbole de recyclage 38
5.1.1 Généralités 38
5.1.2 Batteries au plomb 39
5.1.3 Batteries nickel-cadmium 39
5.1.4 Batteries au nickel-métal-hydrure 39
5.1.5 Batteries ion-lithium 39
5.1.6 Batteries métal lithium 39
5.2 Marquages facultatifs avec symbole de recyclage 39
5.2.1 Généralités 39
5.2.2 Batteries au plomb 40
5.2.3 Batteries nickel-cadmium 40
5.2.4 Batteries au nickel-métal-hydrure 40
5.2.5 Batteries ion-lithium 41
5.2.6 Batteries métal lithium 41
5.3 Couleurs de fond 41
5.4 Conception des marquages et symboles 41
5.4.1 Généralités 41
5.4.2 Dimensions des symboles 42
5.4.3 Dimensions des marquages sans symbole de recyclage 42
5.4.4 Dimensions des marquages avec symbole de recyclage 43
5.4.5 Taille adaptative 43
5.4.6 Conception du symbole de recyclage 44
5.4.7 Conception des lettres (caractères) 44
5.4.8 Exception pour le marquage d’une seule couleur 45
6 Durabilité des marquages par rapport aux agents chimiques 45
6.1 Généralités 45
6.2 Procédure d’essai 46
6.2.1 Généralités 46
6.2.2 Essai avec eau et agents de nettoyage recommandés 46
6.2.3 Essai avec électrolyte 46
6.2.4 Essai avec solutions de neutralisation 46
6.3 Critères 46
Annexe A (informative) Couleurs de fond 47
A.1 Généralités 47

A.2 Définition de la couleur de fond 47
Annexe B (informative) Méthode de calcul du volume de batterie 48
Bibliographie 49

Figure 1 – Exemple de marquage des batteries au plomb 39
Figure 2 – Exemple de marquage des batteries nickel-cadmium 39
Figure 3 – Exemple de marquage des batteries au nickel-métal-hydrure 39
Figure 4 – Exemple de marquage des batteries ion-lithium 39
Figure 5 – Exemple de marquage des batteries métal lithium 39
Figure 6 – Exemple de marquage des batteries au plomb avec symbole de recyclage 40
Figure 7 – Exemple de marquage des batteries nickel-cadmium avec symbole de recyclage 40
Figure 8 – Exemple de marquage des batteries au nickel-métal-hydrure avec symbole de recyclage 40
Figure 9 – Exemple de marquage des batteries ion-lithium avec symbole de recyclage 41
Figure 10 – Exemple de marquage des batteries métal lithium avec symbole de recyclage 41
Figure 11 – Taille du marquage sans symbole de recyclage 42

Figure 12 – Taille du marquage avec symbole de recyclage 43
Figure 13 – Conception du symbole de recyclage 44
Figure 14 – Conception des lettres 44
Figure 15 – Exemples de marquages avec des bordures de couleur contrastée 45

Tableau 1 – Marques de recyclage et labels écologiques pour batteries 32
Tableau 2 – Liste des dimensions des symboles 42
Tableau 3 – Matrice d'essai pour les essais de durabilité des marquages 45
Tableau A.1 – Références de couleur 47

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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BATTERIES D'ACCUMULATEURS – SYMBOLES DE MARQUAGE POUR L'IDENTIFICATION DE LEUR CARACTÉRISTIQUE CHIMIQUE

AVANT-PROPOS

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L'IEC 62902 a été établie par le comité d'études 21 de l'IEC: Accumulateurs. Il s'agit d'une Norme internationale.

Cette deuxième édition annule et remplace la première édition parue en 2019. Cette édition constitue une révision technique.

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

a) ajout d'une Introduction;
b) ajout d'exemptions et de clarifications concernant l'exigence sur les couleurs de fond pour le marquage;
c) ajout d'une méthode de calcul pour le volume de batterie;
d) ajout d'une nouvelle note au Domaine d'application;
e) ajout d'un terme et d'une définition pour l'espace d'affichage principal;
f) ajout d'informations supplémentaires sur la caractéristique chimique des batteries Li-ion;
g) ajout d'un nouveau paragraphe sur la taille adaptative;
h) clarification des méthodes d'essai pour la durabilité et la permanence du marquage.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
21/1195/CDV	21/1208/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications/.

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INTRODUCTION

Le présent document introduit des symboles de marquage uniformes pour identifier les batteries d'accumulateurs les plus courantes sur le marché. La raison principale est que, dans le monde entier, les fonderies de plomb constatent que de plus en plus de batteries ion-lithium se retrouvent dans le flux de déchets des batteries au plomb. La forme et la conception de ces batteries étant parfois très similaires, il peut être difficile pour les centres de tri et fonderies de batteries de faire la distinction entre ces deux technologies en l'absence d'identification claire de la caractéristique chimique des batteries par des symboles de marquage.

Le traitement des batteries ion-lithium dans une fonderie de plomb, des installations de gestion d'e-déchets ou un centre de tri de déchets municipaux peut entraîner des incendies ou des explosions; de nombreux accidents ou quasi-accidents ont déjà été signalés dans les centres de recyclage en Europe et aux États-Unis.

Outre les batteries au plomb et les batteries ion-lithium, il convient que le programme d'étiquetage s'applique également à d'autres caractéristiques chimiques de batteries représentant une part de marché considérable, comme le nickel-métal hydrure et le nickel-cadmium. Il convient ainsi d'intégrer d'autres batteries au programme de marquage, par exemple les batteries ion sodium, dès lors que leur part de marché devient significative.

Une identification claire de la caractéristique chimique des batteries serait également utile tout au long de la durée de vie des batteries, c'est-à-dire de la sélection et l'achat d'une nouvelle batterie (par les acteurs économiques aussi bien que par les utilisateurs finaux, par exemple), au transport, à l'installation et à l'utilisation des batteries, puis à la collecte, au tri, au stockage et au traitement des déchets de batteries.

Les normes et recommandations ci-dessous ont été prises en compte lors de l'établissement du présent document.

L'Association japonaise des batteries (BAJ, *Battery Association of Japan*) a publié des "lignes directrices relatives aux marques de recyclage sur les accumulateurs et batteries rechargeables pour applications portables", qui prévoient un système de code couleur facultatif permettant d'identifier les principales caractéristiques chimiques des batteries (rechargeables): Pb, Ni-Cd, Ni-MH et Li-ion. Ces lignes directrices distinguent également différents matériaux de cathode, ainsi que d'importantes impuretés (provenant pour la plupart du matériau de l'anode)[1].

Call2Recycle a introduit au Canada et aux États-Unis d'Amérique un programme d'étiquetage sous licence pour batteries. Il s'agit d'une association à but non lucratif qui collecte et recycle les batteries au nom d'entreprises qui paient un droit pour mettre leur étiquette sous licence.

Le symbole de recyclage exigé sur les batteries entrant dans le Domaine d'application du présent document est le symbole général de valorisation/recyclage normalisé dans l'ISO 7000-1135:2004-01, voir l'élément 1 dans le Tableau 1. Il est à noter que, pour ce symbole, l'ISO indique les informations suivantes: Fonction/description: indiquer que l'article présentant le marquage ou son matériau fait partie d'un procédé de valorisation ou de recyclage. Informations supplémentaires: ce symbole s'applique uniquement aux produits ou matériaux pour lesquels un procédé de parcours de collecte et de recyclage bien précis est prévu en fin de vie, procédé qui n'impacte pas significativement l'efficacité d'autres programmes de recyclage.

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[1] Pour plus d'informations, se reporter au document mentionné dans "Référence de le source" pour l'élément 5 du Tableau 1.

Le marquage des batteries peut également être soumis à la législation régionale. Par exemple, une poubelle sur roues barrée d'une croix est utilisée au sein de l'Union européenne (UE) et dans d'autres pays pour indiquer aux consommateurs leur obligation de mettre à disposition leur batteries pour une collecte séparée. Certains autres règlements, par exemple le Règlement (UE) 2023/1542 relatif aux batteries et aux déchets de batteries, peuvent exiger l'utilisation de symboles supplémentaires pour les substances extrêmement préoccupantes (SVHC, *Substances of Very High Concern*), à savoir le cadmium (Cd) et le plomb (Pb) qui dépassent certains niveaux de concentration[2].

Dans un commentaire soumis par le Conseil international des batteries (BCI, *Battery Council International*) sur demande de l'Agence américaine pour la protection de l'environnement concernant des informations liées à l'élaboration des meilleures pratiques pour la collecte des batteries à recycler et des lignes directrices relatives à l'étiquetage volontaire des batteries, il a été suggéré ce qui suit: il convient que les étiquettes de batteries possèdent un marquage simple et cohérent (par exemple, un code couleur) commun à toutes les caractéristiques chimiques des batteries pour favoriser et aider au traitement adéquat dont il convient, au minimum, qu'il atteigne les trois objectifs principaux suivants (par ordre décroissant de priorité):

1) informer et éduquer les consommateurs à ne pas jeter les batteries avec les ordures ménagères ou dans les poubelles de tri sélectif, mais plutôt à se tourner vers les réseaux de recyclage propres aux batteries lorsque ceux-ci sont disponibles;
2) mettre à disposition des consommateurs et des employés des réseaux de recyclage des informations lisibles par un humain pour leur permettre de trier les batteries usagées par grandes familles de produits chimiques (par exemple, Pb, Li-ion, Ni-Cd, Ni-MH, et Li-métal);
3) si cela est pertinent pour une famille chimique, informer les recycleurs de ses caractéristiques, composants ou constituants particuliers ou les deux, à des fins de valorisation (par exemple, le matériau d'une cathode).

Le Tableau 1 présente une liste des symboles de recyclage et de labels écologiques qui sont susceptibles d'être apposés sur des batteries.

[2] Le Règlement UE 2023/1542 n'exige pas l'ajout du symbole Hg au symbole de collecte séparée. Toutefois, l'Annexe I *Restriction applicable aux substances* du règlement relatif aux batteries prévoit une exigence de max. 0,000 5 % Hg pour toutes les batteries.

Tableau 1 – Marques de recyclage et labels écologiques pour batteries

N°	Symbole	Désignation officielle	Informations alternatives	Objectif	Référence de la source
1		Symbole général de valorisation/recyclage	Ruban de Möbius, trois flèches incurvées	Indiquer que l'article présentant le marquage ou son matériau fait partie d'un procédé de valorisation ou de recyclage.	ISO 7000-1135:2004-01 www.iso.org/obp
2		Symbole 4 en 1	L'intérieur blanc représente 4 flèches dirigées vers l'extérieur		Administration taïwanaise de la protection environnementale (Province chinoise)
3		Poubelle à roues barrée d'une croix		Indiquant le "tri séparé" de l'ensemble des batteries et accumulateurs	Règlement (UE) 2023/1542
4		Sceau de batterie Call2Recycle		Programme de recyclage privé des USA et du Canada	Recyclage des batteries Norme d'utilisation de sceau
5		Symbole de recyclage et caractéristique chimique pour batteries[a]	Lignes directrices relatives à la marque de recyclage sur les batteries	Conformité à la loi japonaise sur la promotion de l'utilisation effective des ressources	Tecchio, P. el al., Analysis of material efficiency aspects of personal computers product group, rapport JRC EUR 28394 EN (2018), page 60
6		Symbole de la loi américaine sur la teneur en mercure et le recyclage des batteries rechargeables (modèle du Battery Council International)	Voir la note de bas de page[b]	Voir la note de bas de page[c]	42 U.S.C. § 14322(b)

[a] Le symbole comporte deux espaces réservés après "Li-ion", où les codes concernant les détails des caractéristiques chimiques sont entrés.

[b] Trois flèches formant un triangle ou un symbole de recyclage comparable. Pour les batteries nickel-cadmium, le symbole doit également indiquer "Ni-Cd" et la mention "BATTERY MUST BE RECYCLED OR DISPOSED OF PROPERLY" (les batteries doivent être recyclées ou éliminées selon une méthode appropriée). Pour les batteries au plomb, le symbole doit également indiquer "Pb", ou les mots "LEAD" (plomb), "RETURN" (à retourner) et "RECYCLE" (à recycler) et si la batterie réglementée est scellée, la mention "BATTERY MUST BE RECYCLED" (la batterie doit être recyclée).

[c] Modèle de symbole conçu par le Battery Council International pour les batteries au plomb de petite taille (SSLA, *Small Sealed Lead Acid*) conformément à la loi américaine sur la teneur en mercure et le recyclage des batteries rechargeables. Variations autorisées.

Lors de l'établissement de la deuxième édition, le Domaine d'application du présent document a fait l'objet d'intenses discussions. L'un des sujets ayant été traités a été l'intégration de la valeur énergétique d'une batterie. Certains experts ont pensé qu'une limite telle que celle de 100 Wh utilisée dans les réglementations sur le transport de marchandises dangereuses, visant à distinguer les batteries faisant l'objet d'une "réglementation exhaustive" des batteries "exemptées" lorsqu'elles sont proposées à l'expédition en vertu des numéros UN 3480 et 3481, pourrait permettre de faire la distinction entre les différents niveaux d'exigences d'étiquetage. Toutefois, ces considérations n'ont pas été approfondies, car elles s'appliquent uniquement aux batteries ion-lithium et il aurait été difficile de les transposer dans un langage applicable à toutes les technologies. En effet, aucune méthode de calcul généralement acceptable qui permettrait de transférer la limite énergétique des batteries ion-lithium à d'autres caractéristiques chimiques n'a été trouvée.

La limite de 100 Wh pour les batteries ion-lithium de rechange visée dans les réglementations de l'Administration fédérale de l'aviation (FAA, *Federal Aviation Administration*) (des États-Unis) et l'Association du transport aérien international (IATA, *International Air Transport Association*) pour les bagages cabine des passagers d'aéronefs n'a pas été retenue, n'ayant pas été jugée pertinente pour des raisons similaires. Il en a été de même pour une limite de masse de 500 g applicable à la collecte des batteries lithium conformément à l'UNECE (Commission économique des Nations Unies pour l'Europe, *United Nations Economic Commission for Europe*) en vertu de la Disposition spéciale 636 de l'accord relatif au transport international des marchandises dangereuses par route (ADR, *Agreement for the carriage of Dangerous goods by Road*).

D'autres suggestions ont été évoquées pour limiter le Domaine d'application aux batteries dont une ou plusieurs dimensions dépassent 5 cm ou, selon une proposition différente, 100 mm. Cependant, la corrélation entre ces limites et la limite de volume de 900 cm^3 et la raison pour laquelle ces limites seraient plus adaptées que la limite de volume n'ont pas pu être démontrées.

Il a également été envisagé d'ajouter la recommandation suivante: "De plus, les marquages peuvent être également utilisés sur les emballages de batteries d'accumulateurs et leurs documents d'accompagnement lorsque les batteries d'accumulateurs sont mises sur le marché".

BATTERIES D'ACCUMULATEURS – SYMBOLES DE MARQUAGE POUR L'IDENTIFICATION DE LEUR CARACTÉRISTIQUE CHIMIQUE

1 Domaine d'application

Le présent document spécifie les méthodes permettant d'identifier clairement les batteries d'accumulateurs, batteries, modules de batteries et monoblocs selon leur caractéristique chimique (technologie de stockage électrochimique).

Les marquages décrits dans le présent document s'appliquent aux:

– accumulateurs;

– batteries;

– modules de batteries;

– monoblocs,

lorsqu'ils sont mis sur le marché en vue d'une utilisation finale et lorsqu'ils ont un volume de batterie supérieur à 900 cm^3.

Le marquage de la caractéristique chimique sert aux différentes phases de vie de la batterie, à savoir l'installation, le fonctionnement et la mise hors service lors du cycle de vie de la batterie.

Dans la mesure où de nombreux procédés de recyclage dépendent de la caractéristique chimique, des événements non désirés peuvent se produire lorsqu'une batterie dont la caractéristique chimique n'est pas appropriée est soumise à un procédé de recyclage donné. Par conséquent, la batterie est marquée afin d'identifier sa composition chimique, pour assurer une manutention sûre pendant les procédés de tri et de recyclage.

Le présent document définit les conditions d'utilisation des marquages indiquant la caractéristique chimique de ces batteries d'accumulateurs.

Les détails des marquages et leur application sont définis dans le présent document.

NOTE La limite de 900 cm^3 a été choisie, car elle constitue un compromis raisonnable entre les batteries plus grandes et les petites batteries. Sur les petites batteries, l'espace pour des étiquettes supplémentaires est limité, ce qui peut entraîner un conflit de lisibilité.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. 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 60896-21:2004, *Batteries stationnaires au plomb – Partie 21: Types étanches à soupapes – Méthodes d'essai*

IEC 60896-22:2004, *Batteries stationnaires au plomb – Partie 22: Types étanches à soupapes – Exigences*

IEC 61960-3:2017, *Accumulateurs alcalins et autres accumulateurs à électrolyte non acide – Accumulateurs au lithium pour applications portables – Partie 3: Éléments et batteries d'accumulateurs au lithium, parallélépipédiques et cylindriques*

ISO 7000, *Symboles graphiques utilisables sur le matériel* (disponible à l'adresse http://www.graphical-symbols.info/equipment)