SVENSK STANDARD SS-EN IEC 62660-3

Utgåva 2

2022-05-18

REDLINE VERSION

Laddningsbara batterier – Litium-jonceller för elfordon – Del 3: Säkerhetsfordringar

Secondary lithium-ion cells for the propulsion of electrical road vehicles – Part 3: Safety requirements

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IEC 62660-3

Edition 2.0 2022-03
REDLINE VERSION

INTERNATIONAL STANDARD

colour inside

Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 3: Safety requirements

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SECONDARY LITHIUM-ION CELLS FOR THE PROPULSION OF ELECTRIC ROAD VEHICLES –

Part 3: Safety requirements

FOREWORD

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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.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62660-3:2016. 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 62660-3 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 2016. This edition constitutes a technical revision.

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

a) The new method for the internal short-circuit test has been added in 6.4.4.2.2 and Annex C, as an alternative option to the test in 6.4.4.2.1.

b) The vibration test has been deleted.

c) The test conditions of overcharge (6.4.2.2) have been partially revised.

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

Draft	Report on voting
21/1133/FDIS	21/1137/RVD

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/standardsdev/publications.

A list of all parts in the IEC 62660 series, published under the general title *Secondary lithium-ion cells for the propulsion of electric road vehicles*, can be found on the IEC website.

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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INTRODUCTION

The electric road vehicles (EV) including hybrid and plug-in hybrid electric vehicles are beginning to diffuse in the global market with backing from global concerns on CO_2 reduction and energy, recent advances in technology and cost reduction. This has led to a rapidly increasing demand for high-power and high-energy density traction batteries represented by lithium-ion batteries.

For securing a basic level of quality of lithium-ion batteries for automotive applications, relevant international standards, i.e. IEC 62660-1, IEC 62660-2, ISO 12405-1 and ISO 12405-2, have been published. These standards specify the performance, reliability and abuse testing of lithium-ion battery cells, packs and systems for EV applications. Further, in the light of increasing concerns on the safety of lithium-ion batteries and demand for a referenceable international standard, safety requirements for lithium-ion battery packs and systems are defined in ISO 12405-3. Regulations, such as UN ECE R100, are also being revised that include acceptance criteria for rechargeable energy storage systems of EVs.

It is essential to specify the safety criteria at cell level in this standard, in order to secure the basic safety level of cells which differ in performance and design, and are applied to a variety of types of packs and systems. For automobile applications, it is important to note the design diversity of automobile battery packs and systems, and specific requirements for cells and batteries 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 lithium-ion cells to be used in a variety of battery systems. Specific requirements for the safety of cells differ depending on the system designs of battery packs or vehicles, and should be evaluated by the users. Final pass-fail criteria of cells are to be based on the agreement between the cell manufacturers and the customers.

SECONDARY LITHIUM-ION CELLS FOR THE PROPULSION OF ELECTRIC ROAD VEHICLES –

Part 3: Safety requirements

1 Scope

This part of IEC 62660 specifies test procedures and acceptance criteria for safety performance of secondary lithium-ion cells and cell blocks used for propulsion of electric vehicles (EV) including battery electric vehicles (BEV) and hybrid electric vehicles (HEV).

~~NOTE 1 Cell blocks can be used as an alternative to cells according to the agreement between the manufacturer and the customer.~~

~~NOTE 2 Concerning the cell for plug-in hybrid electric vehicle (PHEV), the manufacturer can select either the test condition of the BEV application or the HEV application.~~

This document determines the basic safety performance of cells used in a battery pack and system under intended use and reasonably foreseeable misuse or incident, during the normal operation of the EV. The safety requirements of the cell in this document are based on the premise that the cells are properly used in a battery pack and system within the limits for voltage, current and temperature as specified by the cell manufacturer (cell operating region).

The evaluation of the safety of cells during transport and storage is not covered by this document.

NOTE 1 The safety performance requirements for lithium-ion battery packs and systems are defined in ~~ISO 12405-3~~ ISO 6469-1. The specifications and safety requirements for lithium-ion battery packs and systems of electrically propelled mopeds and motorcycles are defined in ISO 18243. IEC 62619 covers the safety requirements for the lithium-ion cells and batteries for industrial applications, including, for example, forklift trucks, golf carts, and automated guided vehicles.

~~NOTE 4 Information on the cell operating region is provided in Annex A.~~

NOTE 2 Lithium cells, modules, battery packs, and battery systems are regulated by International Air Transport Association (IATA) and International Maritime Organization (IMO) for air and sea transport, and, regionally, by other authorities, mainly for land transport. Refer to IEC 62281 for additional information.

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 60050-482, International Electrotechnical Vocabulary – Part 482: Primary and secondary cells and batteries*~~

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

IEC 62619:—[1], *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications*

[1] Second edition under preparation. Stage at the time of publication: IEC FDIS 62619:~~2015~~2021.

IEC 62660-2:~~2010~~2018, *Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 2: Reliability and abuse testing*

ISO/TR 8713, *Electrically propelled road vehicles – Vocabulary*

SVENSK STANDARD SS-EN IEC 62660-3

Fastställd	Utgåva	Sida	Ansvarig kommitté
2022-05-18	2	1 (1+29)	SEK TK 21

Laddningsbara batterier – Litium-jonceller för elfordon – Del 3: Säkerhetsfordringar

Secondary lithium-ion cells for the propulsion of electrical road vehicles – Part 3: Safety requirements

Som svensk standard gäller europastandarden EN IEC 62660-3:2022. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62660-3:2022.

Nationellt förord

Europastandarden EN IEC 62660-3:2022

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62660-3, Second edition, 2022 - Secondary lithium-ion cells for the propulsion of electrical road vehicles - Part 3: Safety requirements**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 62660-3, utgåva 1, 2016, gäller ej fr o m 2025-04-05.

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Denna standard är fastställd av SEK Svensk Elstandard,
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EN IEC 62660-3

April 2022

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Supersedes EN 62660-3:2016 and all of its amendments and corrigenda (if any)

English Version

Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 3: Safety requirements (IEC 62660-3:2022)

Eléments d'accumulateurs lithium-ion pour la propulsion des véhicules routiers électriques - Partie 3: Exigences de sécurité
(IEC 62660-3:2022)

Lithium-Ionen-Sekundärzellen für den Antrieb von Elektrostraßenfahrzeugen - Teil 3: Sicherheitsanforderungen
(IEC 62660-3:2022)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62660-3:2022 E

SEK Svensk Elstandard SS-EN IEC 62660-3, utg 2:2022

European foreword

The text of document 21/1133/FDIS, future edition 2 of IEC 62660-3, prepared by IEC/TC 21 "Secondary cells and batteries" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62660-3:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-01-05
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-04-05

This document supersedes EN 62660-3:2016 and all of its amendments and corrigenda (if any).

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Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62660-3:2022 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 61434	NOTE	Harmonized as EN 61434
IEC 62133-2	NOTE	Harmonized as EN 62133-2
IEC 62660-1	NOTE	Harmonized as EN IEC 62660-1
ISO 18243	NOTE	Harmonized as EN ISO 18243

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62619	—[1]	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications	EN IEC 62619	—[2]
IEC 62660-2	2018	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing	EN IEC 62660-2	2019
ISO/TR 8713	-	Electrically propelled road vehicles - Vocabulary	-	-

[1] Second edition under preparation. Stage at the time of publication: IEC FDIS 62619:2021.

[2] Under preparation. Stage at the time of publication: FprEN IEC 62619:2021.

IEC 62660-3

Edition 2.0 2022-03

INTERNATIONAL STANDARD

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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CONTENTS

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[1] Second edition under preparation. Stage at the time of publication: IEC FDIS 62619:2021.