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Standards

Irish Standard  
I.S. EN 62660-3:2016

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

**I.S. EN 62660-3:2016**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN 62660-3:2016 is the adopted Irish version of the European Document EN 62660-3:2016, Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 3: Safety requirements

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EUROPEAN STANDARD

**EN 62660-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2016

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English Version

**Secondary lithium-ion cells for the propulsion of electric road  
vehicles - Part 3: Safety requirements  
(IEC 62660-3:2016)**

Éléments d'accumulateurs lithium-ion pour la propulsion  
des véhicules routiers électriques - Partie 3: Exigences de  
sécurité  
(IEC 62660-3:2016)

Lithium-Ionen-Sekundärzellen für den Antrieb von  
Elektrostraßenfahrzeugen -  
Teil 3: Sicherheitsanforderungen  
(IEC 62660-3:2016)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**EN 62660-3:2016****European foreword**

The text of document 21/890/FDIS, future edition 1 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 62660-3:2016.

The following dates are fixed:

- latest date by which the document has to be (dop) 2017-07-03  
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publication of an identical national  
standard or by endorsement
- latest date by which the national (dow) 2019-10-03  
standards conflicting with the  
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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62133	NOTE	Harmonized as EN 62133.
IEC 62660-1	NOTE	Harmonized as EN 62660-1.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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](http://www.cenelec.eu)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-482	-	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 the designation of current in alkaline secondary cell and battery standards	EN 61434	-
IEC 62619	-	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications	-	-
IEC 62660-2	2010	Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing	EN 62660-2	2011

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**IEC 62660-3**

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# **INTERNATIONAL STANDARD**

## **NORME INTERNATIONALE**



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

**Éléments d'accumulateurs lithium-ion pour la propulsion des véhicules routiers  
électriques –  
Partie 3: Exigences de sécurité**



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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



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

**Éléments d'accumulateurs lithium-ion pour la propulsion des véhicules routiers  
électriques –  
Partie 3: Exigences de sécurité**

INTERNATIONAL  
ELECTROTECHNICAL  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SECONDARY LITHIUM-ION CELLS FOR THE PROPULSION  
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International Standard IEC 62660-3 has been prepared by IEC technical committee 21: Secondary cells and batteries.

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

FDIS	Report on voting
21/890/FDIS	21/897/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.

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 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 and plug-in hybrid electric vehicles are beginning to diffuse in the global market with backing from global concerns on CO<sub>2</sub> 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 the acceptance criteria for safety performance of secondary lithium-ion cells and cell blocks used for the 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 International Standard intends to determine 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 standard 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 standard.

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

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

#### 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, *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:—<sup>1</sup>, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications*

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

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC/CDV 62619:2015

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