

### SLOVENSKI STANDARD SIST EN 62660-2:2011

01-oktober-2011

### Sekundarni litij-ionski členi za pogon električnih cestnih vozil - 2. del: Preskušanje zanesljivosti in izrabljivosti

Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing

Lithium-Ionen-Sekundärzellen für den Antrieb von Elektrostraßenfahrzeugen - Teil 2: Zuverlässigkeits- und Missbrauchsprüfung ARD PREVIEW

Eléments d'accumulateurs lithium-ion pour la propulsion des véhicules routiers - Partie 2: Essais de fiabilité et de traitement abusif EN 62660-2:2011

https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-

Ta slovenski standard je istoveten z: EN 62660-2-2011

ICS:

29.220.30 Alkalni sekundarni členi in Alkaline secondary cells and

> batteries baterije

Električna cestna vozila 43.120 Electric road vehicles

SIST EN 62660-2:2011 en SIST EN 62660-2:2011

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62660-2:2011

https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-a2c86f865b4b/sist-en-62660-2-2011

**EUROPEAN STANDARD** 

EN 62660-2

NORME EUROPÉENNE EUROPÄISCHE NORM

July 2011

ICS 29.220.20; 43.120

English version

## Secondary lithium-ion cells for the propulsion of electric road vehicles - Part 2: Reliability and abuse testing

(IEC 62660-2:2010)

Eléments d'accumulateurs lithium-ion pour la propulsion des véhicules routiers - Partie 2: Essais de fiabilité et de traitement abusif (CEI 62660-2:2010)

Lithium-Ionen-Sekundärzellen für den Antrieb von Elektrostraßenfahrzeugen -Teil 2: Zuverlässigkeits- und Missbrauchsprüfung (IEC 62660-2:2010)

### iTeh STANDARD PREVIEW

This European Standard was approved by CENELEC on 2011-01-20. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration)-2:2011

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

### **CENELEC**

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

#### **Foreword**

The text of document 21/727/FDIS, future edition 1 of IEC 62660-2, prepared by IEC TC 21, Secondary cells and batteries, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62660-2 on 2011-01-20.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

 latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement

(dop) 2011-10-20

 latest date by which the national standards conflicting with the EN have to be withdrawn

(dow) 2014-01-20

Annex ZA has been added by CENELEC.

#### **Endorsement notice**

The text of the International Standard IEC 62660-2:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62660-1 NOTE Harmonized as EN 62660-12:2011

https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-a2c86f865b4<u>h/sist-en-62660</u>-2-2011

## Annex ZA (normative)

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

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 60050-482	-	International Electrotechnical Vocabulary - Part 482: Primary and secondary cells and batteries	-	-
IEC 60068-2-64	-	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	-
IEC 61434	· iTe	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	-
ISO 16750-3	- https://star	Road vehicles - Environmental conditions and testing for electrical and electronic equipment atalog/standards/sist/8ad078e9-1117-4c0 Part 3 Mechanical loads 62660-2-2011		-
ISO 16750-4	-	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 4: Climatic loads	1 -	-

SIST EN 62660-2:2011

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62660-2:2011

https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-a2c86f865b4b/sist-en-62660-2-2011



IEC 62660-2

Edition 1.0 2010-12

## INTERNATIONAL STANDARD

## NORME INTERNATIONALE



Secondary lithium-ion cells for the propulsion of electric road vehicles – Part 2: Reliability and abuse testing and sitem. ai)

Éléments d'accumulateurs lithi<u>um-ion pour la propulsion des véhicules routiers</u> électriques – <a href="https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-">https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-</a>

Partie 2: Essais de fiabilité et de traitement abusifil

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE CODE PRIX S

ICS 29.220.20, 43.120

ISBN 978-2-88912-302-5

### CONTENTS

FO	REWC	DRD	4
INT	RODU	JCTION	6
1	Scop	re	7
2	Norm	native references	7
3	Term	is and definitions	7
4		conditions	
7	4.1	General	
	4.1	Measuring instruments	
	4.2	4.2.1 Range of measuring devices	
		4.2.2 Voltage measurement	
		4.2.3 Current measurement	
		4.2.4 Temperature measurements	
		4.2.5 Other measurements	
	4.3	Tolerance	
	4.4	Test temperature	
5		rical measurement	
Ū	5.1	General charge conditions	
	5.2	Capacity iTeh STANDARD PREVIEW 1	
6	Relia	SOC adjustment	1
Ü	6.1		
	0.1	Mechanical test	1
		6.1.1 Vibration 1 6.1.2 Vibration 1 6.1.2 Mechanical shocks 6(865b4b/sist-en-62660-2-2011 117-4c03-9ac9- 1117-4c03-9ac9- 1117-	2
		6.1.3 Crush	
	6.2	Thermal test	
	0.2	6.2.1 High temperature endurance	
		6.2.2 Temperature cycling	
	6.3	Electrical test	
		6.3.1 External short circuit	
		6.3.2 Overcharge	
		6.3.3 Forced discharge	9
7	Desc	ription of test results	20
Anr	nex A	(informative) Selective test conditions	21
		phy	
טוט	iiogiai	p''y	_
⊏:~	1	Everynle of term persture management of cell	^
		Example of temperature measurement of cell	
		– PSD of acceleration vs. frequency	
Fig	ure 3 -	– Example of crush test1	4
Fig	ure 4 -	<ul> <li>BEV current profile for temperature cycling</li></ul>	6
Fig	ure 5 -	<ul> <li>SOC level over all test cycles – BEV application</li> </ul>	7
Fig	ure 6 -	HEV current profile for temperature cycling1	8
Tab	le 1 –	- Discharge conditions1	1
Tah	le 2 –	- Values for PSD and frequency	2

2	

Table 3 – Mechanical shock test – parameters	13
Table 4 – Temperatures and time duration for temperature cycling	15
Table 5 – Temperatures and time duration for temperature cycling	16
Table 6 – Test steps and BEV current profile	17
Table 7 – Test steps and HEV current profile	18
Table A.1 – Capacity test conditions	21

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62660-2:2011

https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-a2c86f865b4b/sist-en-62660-2-2011

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

#### Part 2: Reliability and abuse testing

#### **FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 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.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate. IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 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
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies:n-62660-2-2011
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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.

International Standard IEC 62660-2 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	
21/727/FDIS	21/731/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 the 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.

62660-2 © IEC:2010

- 5 -

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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

## iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62660-2:2011</u> https://standards.iteh.ai/catalog/standards/sist/8ad078e9-1117-4c03-9ac9-a2c86f865b4b/sist-en-62660-2-2011