

STN	Primárne batérie. Časť 4: Bezpečnosť lítiových batérií.	STN EN 60086-4 36 4110
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Primary batteries - Part 4: Safety of lithium batteries

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 05/15

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EUROPEAN STANDARD

EN 60086-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 60086-4:2007

English Version

**Primary batteries - Part 4: Safety of lithium batteries
(IEC 60086-4:2014)**Piles électriques - Partie 4: Sécurité des piles au lithium
(IEC 60086-4:2014)Primärbatterien - Teil 4: Sicherheit von Lithium-Batterien
(IEC 60086-4:2014)

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

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Foreword

The text of document 35/1324/FDIS, future edition 4 of IEC 60086-4, prepared by IEC TC 35 "Primary cells and batteries" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60086-4:2015.

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) 2015-07-09
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-10-08

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The text of the International Standard IEC 60086-4:2014 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 60027-1:1992	NOTE Harmonized as EN 60027-1:1992.
IEC 60068-2-6:1995	NOTE Harmonized as EN 60068-2-6:1995.
IEC 60068-2-27:1987	NOTE Harmonized as EN 60068-2-27:1987.
IEC 60068-2-31:2008	NOTE Harmonized as EN 60068-2-31:2008.
IEC 60086-5:2011	NOTE Harmonized as EN 60086-5:2011.
IEC 60617 (Series)	NOTE Harmonized as EN 60617 (Series).
IEC 62133	NOTE Harmonized as EN 62133.
IEC 61960	NOTE Harmonized as EN 61960.
IEC 62281	NOTE Harmonized as EN 62281.

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60086-1	2011	Primary batteries -- Part 1: General	EN 60086-1	2011
IEC 60086-2	-	Primary batteries -- Part 2: Physical and electrical specifications	EN 60086-2	-



IEC 60086-4

Edition 4.0 2014-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Primary batteries –
Part 4: Safety of lithium batteries**

**Piles électriques –
Partie 4: Sécurité des piles au lithium**





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IEC 60086-4

Edition 4.0 2014-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Primary batteries –
Part 4: Safety of lithium batteries**

**Piles électriques –
Partie 4: Sécurité des piles au lithium**

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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 Requirements for safety.....	11
4.1 Design	11
4.2 Quality plan	11
5 Sampling	11
5.1 General.....	11
5.2 Test samples	11
6 Testing and requirements	12
6.1 General.....	12
6.1.1 Test application matrix.....	12
6.1.2 Safety notice	13
6.1.3 Ambient temperature	13
6.1.4 Parameter measurement tolerances	13
6.1.5 PredischARGE	14
6.1.6 Additional cells	14
6.2 Evaluation of test criteria	14
6.2.1 Short-circuit.....	14
6.2.2 Excessive temperature rise.....	14
6.2.3 Leakage	14
6.2.4 Venting.....	14
6.2.5 Fire.....	14
6.2.6 Rupture	15
6.2.7 Explosion.....	15
6.3 Tests and requirements – Overview	15
6.4 Tests for intended use	16
6.4.1 Test A: Altitude.....	16
6.4.2 Test B: Thermal cycling	16
6.4.3 Test C: Vibration.....	17
6.4.4 Test D: Shock.....	18
6.5 Tests for reasonably foreseeable misuse	19
6.5.1 Test E: External short-circuit	19
6.5.2 Test F: Impact	19
6.5.3 Test G: Crush	20
6.5.4 Test H: Forced discharge.....	21
6.5.5 Test I: Abnormal charging.....	21
6.5.6 Test J: Free fall	21
6.5.7 Test K: Thermal abuse	22
6.5.8 Test L: Incorrect installation.....	22
6.5.9 Test M: Overdischarge	23
6.6 Information to be given in the relevant specification	24
6.7 Evaluation and report.....	24
7 Information for safety.....	24

7.1	Safety precautions during design of equipment	24
7.1.1	General	24
7.1.2	Charge protection	25
7.1.3	Parallel connection	25
7.2	Safety precautions during handling of batteries	25
7.3	Packaging	27
7.4	Handling of battery cartons	27
7.5	Transport	28
7.5.1	General	28
7.5.2	Air transport	28
7.5.3	Sea transport	28
7.5.4	Land transport	28
7.6	Display and storage	28
7.7	Disposal	28
8	Instructions for use	29
9	Marking	29
9.1	General	29
9.2	Small batteries	30
9.3	Safety pictograms	30
Annex A (informative)	Guidelines for the achievement of safety of lithium batteries	31
Annex B (informative)	Guidelines for designers of equipment using lithium batteries	32
Annex C (informative)	Additional information on display and storage	35
Annex D (informative)	Safety pictograms	36
D.1	General	36
D.2	Pictograms	36
D.3	Instruction for use	37
Bibliography	38
Figure 1	– Mesh screen	15
Figure 2	– Thermal cycling procedure	17
Figure 3	– Example of a test set-up for the impact test	19
Figure 4	– Examples of a test set-up for the crush test	20
Figure 5	– Axes for free fall	22
Figure 6	– Circuit diagram for incorrect installation	22
Figure 7	– Circuit diagram for overdischarge	23
Figure 8	– Examples of safety wiring for charge protection	25
Figure 9	– Ingestion gauge	26
Figure 10	– Example for warning against swallowing, particularly lithium coin cell batteries	26
Figure A.1	– Battery design guidelines	31
Table 1	– Number of test samples	12
Table 2	– Test application matrix	13
Table 3	– Mass loss limits	14
Table 4	– Tests and requirements	16
Table 5	– Vibration profile (sinusoidal)	18

Table 6 – Shock parameters	18
Table 7 – Resistive load for overdischarge.....	23
Table 8 – Parameters to be specified	24
Table B.1 – Equipment design guidelines (<i>1 of 3</i>)	32
Table D.1 – Safety pictograms (<i>1 of 2</i>).....	36

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PRIMARY BATTERIES –**Part 4: Safety of lithium batteries**

FOREWORD

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International Standard IEC 60086-4 has been prepared by technical committee 35: Primary cells and batteries.

This fourth edition cancels and replaces the third edition published in 2007. This edition constitutes a technical revision.

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

- a) Harmonisation with the second edition of IEC 62281 [12]¹;
- b) Alternative protective circuits in 7.1.1;

¹ Numbers in square brackets refer to the Bibliography.

- c) More information regarding risks of swallowing lithium batteries in (former) 7.2.m) and promotion of this item to 7.2a);
- d) A new Annex D with pictograms for some of the safety precautions in 7.2.

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

FDIS	Report on voting
35/1324/FDIS	35/1332/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.

NOTE The following print types are used:

- requirements: in roman type;
- instructions/warnings for consumers: *in italic type*.

A list of all parts in the IEC 60086 series, under the general title *Primary batteries*, 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 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.

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INTRODUCTION

The concept of safety is closely related to safeguarding the integrity of people and property. This standard specifies tests and requirements for lithium batteries and has been prepared in accordance with ISO/IEC guidelines, taking into account all relevant national and international standards which apply.

Lithium batteries are different from conventional primary batteries using aqueous electrolyte in that they contain flammable materials.

Consequently, it is important to carefully consider safety during design, production, distribution, use, and disposal of lithium batteries. Based on such special characteristics, lithium batteries for consumer applications were initially small in size and had low power output. There were also lithium batteries with high power output which were used for special industrial and military applications and were characterized as being “technician replaceable”. The first edition of this standard was drafted to accommodate this situation.

However, from around the end of the 1980s, lithium batteries with high power output started to be widely used in the consumer replacement market, mainly as a power source in camera applications. Since the demand for such lithium batteries with high power output significantly increased, various manufacturers started to produce these types of lithium batteries. As a consequence of this situation, the safety aspects for lithium batteries with high power output were included in the second edition of this standard.

Primary lithium batteries both for consumer and industrial applications are well-established safe and reliable products in the market, which is at least partly due to the existence of safety standards such as this standard and, for transport, IEC 62281. The fourth edition of this standard therefore reflects only minor changes which became necessary in order to keep it harmonized with IEC 62281 and to continuously improve the user information about safety related matters.

Guidelines addressing safety issues during the design of lithium batteries are provided in Annex A. Annex B provides guidelines addressing safety issues during the design of equipment where lithium batteries are installed. Both Annex A and B reflect experience with lithium batteries used in camera applications and are based on [20].

Safety is freedom from unacceptable risk. There can be no absolute safety: some risk will remain. Therefore a product, process or service can only be relatively safe. Safety is achieved by reducing risk to a tolerable level determined by the search for an optimal balance between the ideal of absolute safety and the demands to be met by a product, process or service, and factors such as benefit to the user, suitability for purpose, cost effectiveness, and conventions of the society concerned.

As safety will pose different problems, it is impossible to provide a set of precise provisions and recommendations that will apply in every case. However, this standard, when followed on a judicious “use when applicable” basis, will provide reasonably consistent standards for safety.

PRIMARY BATTERIES –

Part 4: Safety of lithium batteries

1 Scope

This Part of IEC 60086 specifies tests and requirements for primary lithium batteries to ensure their safe operation under intended use and reasonably foreseeable misuse.

NOTE Primary lithium batteries that are standardized in IEC 60086-2 are expected to meet all applicable requirements herein. It is understood that consideration of this part of IEC 60086 might also be given to measuring and/or ensuring the safety of non-standardized primary lithium batteries. In either case, no claim or warranty is made that compliance or non-compliance with this standard will fulfil or not fulfil any of the user's particular purposes or needs.

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 60086-1:2011, *Primary batteries – Part 1: General*

IEC 60086-2, *Primary batteries – Part 2: Physical and electrical specifications*

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