



**SLOVENSKI STANDARD**  
**SIST EN 60086-4:2001**  
**01-september-2001**

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**Primary batteries - Part 4: Safety standard for lithium batteries (IEC 60086-4:2000)**

Primary batteries -- Part 4: Safety of lithium batteries

Primärbatterien -- Teil 4: Sicherheit für Lithium-Batterien

Piles électriques -- Partie 4: Sécurité des piles au lithium

**Ta slovenski standard je istoveten z: EN 60086-4:2000**

[SIST EN 60086-4:2001](https://standards.iteh.ai/catalog/standards/sist/76c890be-ddd0-407c-9642-100aecd40493/sist-en-60086-4-2001)

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**ICS:**

29.220.10 Úřadové a jiné články a články Primární články a baterie

**SIST EN 60086-4:2001**

**en**

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EUROPEAN STANDARD

**EN 60086-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2000

ICS 29.220.10

Supersedes EN 60086-4:1996

English version

**Primary batteries**  
**Part 4: Safety standard for lithium batteries**  
(IEC 60086-4:2000)

Piles électriques  
Partie 4: Norme de sécurité pour les piles  
au lithium  
(CEI 60086-4:2000)

Primärbatterien  
Teil 4: Sicherheitsnorm für Lithium-  
Batterien  
(IEC 60086-4:2000)

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This European Standard was approved by CENELEC on 2000-04-01. 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.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 35/1114/FDIS, future edition 2 of IEC 60086-4, prepared by IEC TC 35, Primary cells and batteries, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60086-4 on 2000-04-01.

This European Standard supersedes EN 60086-4:1996.

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) 2001-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-04-01

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annex ZA is normative and annexes A, B and C are informative.  
Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60086-4:2000 was approved by CENELEC as a European Standard without any modification. (standards.iteh.ai)

In the official version, for the Bibliography, the following notes have to be added for the standards indicated:

- SIST EN 60086-4:2001
- IEC 60068-2-6:1995 NOTE: Harmonized as EN 60068-2-6:1995 (not modified).  
100aecd40493/sist-en-60086-4-2001
- IEC 60068-2-27:1987 NOTE: Harmonized as EN 60068-2-27:1993 (not modified).
- IEC 60068-2-32:1975 NOTE: Harmonized as EN 60068-2-32:1993 (not modified).
- IEC 60617 (all parts) NOTE: Harmonized in the series EN 60617.
-

**Annex ZA (normative)****Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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>	<u>EN/HD</u>	<u>Year</u>
IEC 60086-1	1996	Primary batteries Part 1: General	EN 60086-1	1997

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# INTERNATIONAL STANDARD

# IEC 60086-4

Second edition  
2000-03

## Primary batteries –

### Part 4: Safety of lithium batteries

**iTeh STANDARD PREVIEW**

*Piles électriques –*  
(standards.iteh.ai)

Partie 4: [SIST EN 60086-4:2001](https://standards.iteh.ai/catalog/standards/sist/en/76c890be-ddd0-407c-9642-100acc40493/sist-en-60086-4-2001)  
*Sécurité des piles au lithium*

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## PRIMARY BATTERIES –

## Part 4: Safety of lithium batteries

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition, published in 1996, and constitutes a technical revision.

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

FDIS	Report on voting
35/1114/FDIS	35/1125/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 3.

Annexes A, B and C are for information only.

IEC 60086 consists of the following parts, under the general title Primary batteries:

- Part 1: General
- Part 2: Specification sheets
- Part 3: Watch batteries
- Part 4: Safety of lithium batteries
- Part 5: Safety of batteries with aqueous electrolyte

The committee has decided that the contents of this publication will remain unchanged until 2002.

At this date the publication will be

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

A bilingual version of this publication may be issued at a later date.

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## INTRODUCTION

The concept of safety is closely related to safeguarding the integrity of people and property. This standard specifies requirements and tests 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 take safety precautions very carefully 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 applications and were characterized as being "technician replaceable".

The first edition of IEC 60086-4 (1996) was drafted to accommodate the above situation.

However, from around the end of the 1980s, lithium batteries with high power output have started to be widely used in the consumer replacement market, mainly as a power source in camera applications.

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Since the demand for such lithium batteries with high power output has significantly increased in recent years, various manufacturers have started to produce these types of lithium batteries. As a consequence of this situation, the safety aspects for lithium batteries with high power output have been included in this second edition of IEC 60086-4.

[https://standards.iteh.ai/catalog/standards/sist/76c890be-ddd0-407c-9642-](https://standards.iteh.ai/catalog/standards/sist/76c890be-ddd0-407c-9642-1d6ccc404933/iec-60086-4-2001)

Safety is a balance between freedom from hazard and other requirements to be met by the product. There can be no absolute safety. Even at the highest level of safety, the product can only be relatively safe. In this respect, decision-making is based on risk evaluation and safety judgement.

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 International Standard specifies tests and requirements for primary lithium batteries to ensure their safe operation under intended use and reasonably foreseeable misuse.

#### 2 Normative reference

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60086-1:1996, *Primary batteries – Part 1: General*

#### 3 Definitions

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For the purpose of this part of IEC 60086, the definitions given in IEC 60086-1 (some of which are repeated below for convenience) and the following definitions apply.

[SIST EN 60086-4:2001](https://standards.iteh.ai/catalog/standards/sist/76c890be-ddd0-407c-9642-100aacc40493/sist-en-60086-4-2001)

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##### 3.1

##### **battery (primary)**

one or more primary cells, including case, terminals and marking

##### 3.2

##### **button battery**

small round battery, where the overall height is less than the diameter; batteries complying with IEC 60086-1, figures 2, 3 and 4

##### 3.3

##### **cell (primary)**

a source of electrical energy obtained by the direct conversion of chemical energy, that is not designed to be charged by any other electrical source

##### 3.4

##### **consumer batteries**

batteries readily available in the commercial retail market and that are considered user replaceable, i.e. replaceable without the need of special tools

##### 3.5

##### **cylindrical battery**

primary battery with cylindrical geometry where the overall height is equal to or greater than the diameter; batteries complying with IEC 60086-1, figures 1A and 1B

##### 3.6

##### **depth of discharge (DOD)**

percentage of rated capacity discharged from a battery