



SLOVENSKI STANDARD

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Primarne baterije - 2. del: Fizikalne in električne specifikacije (IEC 60086-2:2011)

Primary batteries - Part 2: Physical and electrical specifications (IEC 60086-2:2011)

Primärbatterien - Teil 2: Physikalische und elektrische Spezifikationen (IEC 60086-2:2011)

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Piles primaires - Partie 2: Spécifications physiques et électriques (CEI 60086-2:2011)

Ta slovenski standard je istoveten z: EN 60086-2:2011

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EUROPEAN STANDARD
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English version

**Primary batteries -
Part 2: Physical and electrical specifications
(IEC 60086-2:2011)**

Piles primaires -
Partie 2: Spécifications physiques et
électriques
(CEI 60086-2:2011)

Primärbatterien -
Teil 2: Physikalische und elektrische
Spezifikationen
(IEC 60086-2:2011)

This European Standard was approved by CENELEC on 2011-03-24. 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, 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

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Foreword

The text of document 35/1271/CDV, future edition 12 of IEC 60086-2, prepared by IEC TC 35, Primary cells and batteries, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60086-2 on 2011-03-24.

This European Standard supersedes EN 60086-2:2007.

Significant changes from EN 60086-2:2007 are the deletion of eight battery types from this standard, the addition of an air hole placement diagram and deletion of the resistive hearing aid tests for the P-system (zinc air) hearing aid batteries, standardization of a new form of alkaline (L-system) 9 volt battery (6LP3146), addition of a common designation reference as Annex D and general adjustment of application tests and their minimum average duration values to reflect changes in battery usage.

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) 2011-12-24
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-03-24

Annex ZA has been added by CENELEC.

[SIST EN 60086-2:2011](https://standards.iteh.ai/standards/sist-en-60086-2-2011)

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Endorsement notice
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The text of the International Standard IEC 60086-2:2011 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 60086-3	NOTE	Harmonized as EN 60086-3.
IEC 60086-4	NOTE	Harmonized as EN 60086-4.
IEC 60086-5	NOTE	Harmonized as EN 60086-5.
IEC 62281	NOTE	Harmonized as EN 62281.

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>	<u>EN/HD</u>	<u>Year</u>
IEC 60086-1	2011	Primary batteries - Part 1: General	EN 60086-1	2011
ISO 1101	2004	Geometrical Product Specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out	EN ISO 1101	-

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NORME INTERNATIONALE

Primary batteries – **STANDARD PREVIEW**
Part 2: Physical and electrical specifications
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Piles électriques –
Partie 2: Spécifications physiques et électriques
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRIMARY BATTERIES –

Part 2: Physical and electrical specifications

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.
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International Standard IEC 60086-2 has been prepared by IEC technical committee 35: Primary cells and batteries.

This twelfth edition cancels and replaces the eleventh edition (2006) and constitutes a technical revision.

Significant changes from the previous edition are the deletion of eight battery types from this standard, the addition of an air hole placement diagram and deletion of the resistive hearing aid tests for the P-system (zinc air) hearing aid batteries, standardization of a new form of alkaline (L-system) 9 volt battery (6LP3146), addition of a common designation reference as Annex D and general adjustment of application tests and their minimum average duration values to reflect changes in battery usage.

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

CDV	Report on voting
35/1271/CDV	35/1275/RVC

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 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 technical content of this part of IEC 60086 provides physical dimensions, discharge test conditions and discharge performance requirements. IEC 60086-2 complements the general information and requirements of IEC 60086-1.

This part was prepared to benefit primary battery users, device designers and battery manufacturers by furnishing the specifics of form, fit and function for individual standardized primary cells and batteries. Over the years, this part has been changed to improve its contents and may again be revised in due course in the light of comments made by national committees and experts on the basis of practical experience and changing technology.

This current revision is the result of a reformatting initiative, as well as some content changes, aimed at making this part more user-friendly, less ambiguous, and, from a cross reference basis, fully harmonized with other parts of IEC 60086.

NOTE Safety information is available in IEC 60086-4, IEC 60086-5 and IEC 62281.

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PRIMARY BATTERIES –

Part 2: Physical and electrical specifications

1 Scope

This part of IEC 60086 is applicable to primary batteries based on standardized electro-chemical systems.

It specifies

- the physical dimensions,
- the discharge test conditions and discharge performance requirements.

2 Normative references

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.

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

ISO 1101, *Geometrical product specifications (GPS) – Geometrical tolerancing – Tolerances of form, orientation, location and run-out*

[SIST EN 60086-2:2011](https://standards.iteh.ai/catalog/standards/sist/6aac75a8-c674-437c-b94b-1c462c4c2020/sist-en-60086-2-2011)

3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms, definitions, symbols and abbreviations given in IEC 60086-1 and the following apply.

3.1 Terms and definitions

3.1.1

application test

simulation of the actual use of a battery in a specific application

3.1.2

closed-circuit voltage

CCV (abbreviation)

voltage across the terminals of a battery when it is on discharge

[IEC 60050- 482:2004, 482-03-28, modified]

3.1.3

end-point voltage

EV (abbreviation)

specified voltage of a battery at which the battery discharge is terminated

[IEC 60050-482:2004, 482-03-30, modified]

3.1.4**minimum average duration****MAD** (abbreviation)

minimum average time on discharge which shall be met by a sample of batteries

NOTE The discharge test is carried out according to the specified methods or standards and designed to show conformity with the standard applicable to the battery types.

3.1.5**nominal voltage** (of a primary battery) V_n (symbol)

suitable approximate value of the voltage used to designate or identify a cell, a battery or an electrochemical system

[IEC 60050-482:2004, 482-03-31, modified]

3.1.6**open-circuit voltage****OCV** (abbreviation)

voltage across the terminals of a battery when it is off discharge

[IEC 60050-482:2004, 482-03-32, modified]

3.1.7**primary** (cell or battery)

cell or battery that is not designed to be electrically recharged

3.1.8**round** (cell or battery)

cell or battery with circular cross section

3.1.9**service output** (of a primary battery)

service life, or capacity, or energy output of a battery under specified conditions of discharge

3.1.10**service output test**

test designed to measure the service output of a battery

NOTE A service output test may be prescribed, for example, when

- a) an application test is too complex to replicate;
- b) the duration of an application test would make it impractical for routine testing purposes.

3.1.11**storage life**

duration under specified conditions at the end of which a battery retains its ability to perform a specified service output

[IEC 60050-482:2004, 482-03-47, modified]

3.1.12**terminals** (of a primary battery)

conductive parts provided for the connection of a battery to external conductors

3.2 Symbols and abbreviations

EV end-point voltage

MAD	minimum average duration
OCV	open-circuit voltage (off-load voltage)
R	load resistance
V_n	nominal voltage of a primary battery

4 Battery dimensions, symbols

The symbols used to denote the various dimensions are as follows:

h_1	maximum overall height of the battery;
h_2	minimum distance between the flats of the positive and negative contacts;
h_3	minimum projection of the flat positive contact;
h_4	maximum recess of the negative flat contact surface;
h_5	minimum projection of the flat negative contact;
d_1	maximum and minimum diameters of the battery;
d_2	minimum diameter of the flat positive contact;
d_3	maximum diameter of the positive contact within the specified projection height;
d_4	minimum diameter of the flat negative contact;
d_5	maximum diameter of the negative contact within the specified projection height;
d_6	minimum outer diameter of the negative flat contact surface;
d_7	maximum inner diameter of the negative flat contact surface;
$\varnothing P$	concentricity of the positive contact.

Recesses are permitted in the negative flat contact surface defined by dimensions d_6 and d_7 for batteries having the shape shown in Figure 1a provided that batteries placed end to end in series make electrical contact with each other and that the contact separation is an integral multiple of the contact separation for one battery. The following conditions must be satisfied:

$$d_6 > d_3$$

$$d_2 > d_7$$

$$h_3 > h_4$$

5 Constitution of the battery specification tables

5.1 Batteries are categorized into several groups according to their shapes.

5.2 In each category, batteries having the same shape but belonging to a different electrochemical system are grouped together and shown in succession.

5.3 Batteries are always listed in ascending order of nominal voltage and, within each nominal voltage, in ascending order of volume.

5.4 One common shape drawing of these batteries which fall in the same group is exhibited.

5.5 Designation, nominal voltage, dimensions, discharge conditions, minimum average duration and application for these batteries which fall into the same group are summarized in one table.

5.6 When a drawing represents only one type of battery, the dimensions of the relevant battery may be directly shown on the drawing.