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SIST EN 60086-2:2002/A2:2004

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Primary batteries - Part 2: Physical and electrical specifications

Primärbatterien - Teil 2: Physikalische und elektrische Spezifikationen

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Piles électriques - Partie 2: Spécifications physiques et électriques

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Ta slovenski standard je istoveten z: EN 60086-2:2007

ICS:

29.220.10 Ú!ā æ} ā|^} āā Áæ^!ā Primary cells and batteries

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English version

**Primary batteries –
Part 2: Physical and electrical specifications
(IEC 60086-2:2006)**

Piles électriques –
Partie 2: Spécifications physiques
et électriques
(CEI 60086-2:2006)

Primärbatterien –
Teil 2: Physikalische und elektrische
Spezifikationen
(IEC 60086-2:2006)

STANDARD PREVIEW
This European Standard was approved by CENELEC on 2007-02-01. 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, Bulgaria, 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

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

Foreword

The text of document 35/1245/FDIS, future edition 11 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 2007-02-01.

This European Standard supersedes EN 60086-2:2001 + A1:2001 + A2:2004.

The major technical changes are the addition of a "digital still camera test" for the LR6 battery, the reduction, for selected no letter batteries, from three grades (S, C and P) to two grades (S and P) with appropriate adjustments to MAD values, the deletion of the 3,6 ohm pulse test for the R03 battery, and the addition of new constant current hearing aid tests (standard and high drain) for the PR41, PR44, PR48 and PR70 batteries.

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) 2007-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-02-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60086-2:2006 was approved by CENELEC as a European Standard without any modification.

[SIST EN 60086-2:2007](https://standards.iteh.ai/catalog/standards/sist/285B3cf-51ee-415c-99a7-14457850cd/sist/EN-60086-2-2007)

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

IEC 60086-4	NOTE	Harmonized as EN 60086-4:2000 (not modified).
IEC 60086-5	NOTE	Harmonized as EN 60086-5:2005 (not modified).
IEC 62281	NOTE	Harmonized as EN 62281:2004 (not modified).

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 60050-482	2004	International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries	-	-
IEC 60086-1	- ¹⁾	Primary batteries – Part 1: General	EN 60086-1	2007 ²⁾
ISO 1101	- ¹⁾	Geometrical Product Specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out	EN ISO 1101	2005 ²⁾

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¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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INTERNATIONALE

IEC
CEI

60086-2

Eleventh edition
Onzième édition
2006-12

Primary batteries –

Part 2:
Physical and electrical specifications

STANDARD PREVIEW
iTech
Piles électriques –
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Partie 2:
Spécifications physiques et électriques

<https://standards.iteh.ai/catalog/standards/sist/285f33cf-51ee-415c-99a7-f44f57830cd/sist-en-60086-2-2007>



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Pour prix, voir catalogue en vigueur

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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 eleventh edition cancels and replaces the tenth edition (2000) and its amendments 1 (2001) and 2 (2004), and constitutes a technical revision.

The major technical changes are the addition of a "digital still camera test" for the LR6 battery, the reduction, for selected no letter batteries, from three grades (S, C and P) to two grades (S and P) with appropriate adjustments to MAD values, the deletion of the 3,6 ohm pulse test for the R03 battery, and the addition of new constant current hearing aid tests (standard and high drain) for the PR41, PR44, PR48 and PR70 batteries.

This bilingual version (2007-04) replaces the English version.

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

FDIS	Report on voting
35/1245/FDIS	35/1248/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.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the 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 maintenance result 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 60050-482:2004, *International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries*

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

[SIST EN 60086-2:2007](https://standards.iteh.ai/catalog/standards/sist/285f33cf-51ee-415c-99a7-14457830cd/sist-en-60086-2-2007)

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

3 Terms and definitions

For the purposes of this document, the definitions given in IEC 60050-482 and IEC 60086-1 (some of which are repeated below for convenience) and the following definitions apply.

3.1

application test

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

3.2

end-point voltage

EV

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

[IEV 482-03-30:2004, modified]

3.3

minimum average duration

MAD

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 and designed to show conformity with the standard applicable to the battery types.

3.4
nominal voltage of a primary battery

V_n
suitable approximate value of voltage used to identify the voltage of a primary battery

[IEV 482-03-31:2004, modified]

3.5
on-load voltage

closed-circuit voltage

CCV

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

[IEV 482-03-28:2004, modified]

3.6
open-circuit voltage

off-load voltage

OCV

voltage across the terminals of a battery when no current is flowing

[IEV 482-03-32:2004, modified]

3.7
primary battery

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

3.8
primary cell

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

[IEV 482-01-02:2004, modified]

3.9
service output (of a primary battery)

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

3.10
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.

3.11
storage life

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

[IEV 482-03-47:2004, modified]

3.12
terminals (of a primary battery)

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

4 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 battery

5 Battery dimensions, symbols

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

A	maximum overall height of the battery;
B	minimum distance between the flats of the positive and negative contacts;
C	minimum outer diameter of the negative flat contact surface;
D	maximum inner diameter of the negative flat contact surface;
E	maximum recess of the negative flat contact surface;
F	maximum diameter of the positive contact within the specified projection height;
G	minimum projection of the flat positive contact;
K	minimum projection of the flat negative contact;
L	maximum diameter of the negative contact within the specified projection height;
M	minimum diameter of the flat negative contact;
N	minimum diameter of the flat positive contact;
\emptyset	maximum and minimum diameters of the battery;
$\emptyset P$	concentricity of the positive contact.

Recesses are permitted in the negative flat contact surface defined by dimensions C and D 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:

$$C > F$$

$$N > D$$

$$G > E$$

6 Constitution of the battery specification tables

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

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

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

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