

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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**Primary batteries –  
Part 1: General**

**Piles électriques –  
Partie 1: Généralités**





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IEC 60086-1

Edition 13.0 2021-04

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# NORME INTERNATIONALE

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**Primary batteries –  
Part 1: General**

**Piles électriques –  
Partie 1: Généralités**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

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ICS 29.220.10

ISBN 978-2-8322-9672-1

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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms and definitions .....	8
4 Requirements .....	11
4.1 General.....	11
4.1.1 Design .....	11
4.1.2 Battery dimensions .....	11
4.1.3 Terminals .....	11
4.1.4 Classification (electrochemical system) .....	13
4.1.5 Designation .....	14
4.1.6 Marking .....	14
4.1.7 Interchangeability: battery voltage .....	15
4.2 Performance .....	16
4.2.1 Discharge performance.....	16
4.2.2 Dimensional stability.....	16
4.2.3 Leakage .....	16
4.2.4 Open-circuit voltage limits .....	16
4.2.5 Service output .....	16
4.2.6 Safety.....	16
4.2.7 Validity of testing.....	17
5 Performance – Testing .....	17
5.1 Capacity testing versus application and service output testing .....	17
5.2 Discharge testing.....	17
5.2.1 General .....	17
5.2.2 Application tests .....	18
5.2.3 Service output tests .....	18
5.3 Conformance check to a specified minimum average duration .....	19
5.4 Guidance for considering proposed value of minimum average duration .....	19
5.5 OCV testing .....	19
5.6 Insulation resistance.....	19
5.7 Battery dimensions .....	19
5.8 Leakage and deformation.....	19
6 Performance – Test conditions .....	20
6.1 Storage and discharge conditions .....	20
6.2 Commencement of discharge tests after storage.....	20
6.3 Discharge test conditions .....	20
6.3.1 General .....	20
6.3.2 Compliance .....	20
6.4 Load resistance .....	21
6.5 Time periods.....	21
6.6 Test condition tolerances .....	21
6.7 Activation of ‘P’-system batteries .....	21
6.8 Measuring equipment.....	22
6.8.1 Voltage measurement.....	22

6.8.2	Mechanical measurement .....	22
7	Sampling and quality assurance .....	22
8	Battery packaging .....	22
Annex A (normative) Criteria for the standardization of batteries .....		23
Annex B (informative) Recommendations for equipment design .....		24
B.1	Technical liaison .....	24
B.2	Battery compartment .....	24
B.2.1	General .....	24
B.2.2	Limiting access by children .....	25
B.3	Voltage cut-off .....	25
Annex C (normative) Designation system (nomenclature) .....		26
C.1	General .....	26
C.2	Designation system in use up to October 1990 .....	26
C.2.1	General .....	26
C.2.2	Cells .....	26
C.2.3	Electrochemical system .....	28
C.2.4	Batteries .....	28
C.2.5	Modifiers .....	29
C.2.6	Examples .....	29
C.3	Designation system in use since October 1990 .....	29
C.3.1	General .....	29
C.3.2	Round batteries .....	29
C.3.3	Non-round batteries .....	33
C.3.4	Ambiguity .....	36
Annex D (informative) Standard discharge voltage $U_S$ – Definition and method of determination .....		38
D.1	Definition .....	38
D.2	Determination .....	38
D.2.1	General considerations: the $C/R$ -plot .....	38
D.2.2	Determination of the standard discharge resistor $R_S$ .....	39
D.2.3	Determination of the standard discharge capacity $C_S$ and standard discharge time $t_S$ .....	40
D.3	Experimental conditions to be observed and test results .....	41
Annex E (informative) Preparation of standard methods of measuring performance (SMMP) of consumer goods .....		42
E.1	General .....	42
E.2	Performance characteristics .....	42
E.3	Criteria for the development of test methods .....	42
Annex F (informative) Guidance for proposing value of minimum average duration .....		43
F.1	General .....	43
F.2	Sampling .....	43
F.3	Calculation method .....	43
Annex G (normative) Code of practice for packaging, shipment, storage, use and disposal of primary batteries .....		44
G.1	General .....	44
G.2	Packaging .....	44
G.3	Transport and handling .....	44
G.4	Storage and stock rotation .....	44

G.5	Displays at sales points .....	45
G.6	Selection, use and disposal .....	45
G.6.1	Purchase .....	45
G.6.2	Installation.....	45
G.6.3	Use.....	45
G.6.4	Replacement .....	46
G.6.5	Disposal .....	46
Annex H (informative)	Compliance checklist .....	47
Bibliography	.....	48

Figure C.1 – Designation system for round batteries: $d_1 < 100$ mm; height $h_1 < 100$ mm .....	30
---	----

Figure C.2 – Diameter code for non-recommended diameters .....	31
--	----

Figure C.3 – Height code for denoting the hundredths of a millimetre of height .....	32
--	----

Figure C.4 – Designation system for round batteries: $d_1 \geq 100$ mm; height $h_1 \geq 100$ mm .....	33
--	----

Figure C.5 – Designation system for non-round batteries, dimensions $< 100$ mm .....	34
--	----

Figure C.6 – Designation system for non-round batteries, dimensions $\geq 100$ mm .....	35
---	----

Figure C.7 – Height code for discrimination per tenth of a millimetre .....	35
---	----

Figure D.1 – Normalized $C/R$ -plot (schematic).....	39
--	----

Figure D.2 – Standard discharge voltage (schematic) .....	40
---	----

Table 1 – Standardized electrochemical systems .....	13
--	----

Table 2 – Marking requirements.....	15
-------------------------------------	----

Table 3 – Conditions for storage before and during discharge testing .....	20
--	----

Table 4 – Resistive loads for tests .....	21
---	----

Table 5 – Time periods for tests.....	21
---------------------------------------	----

Table 6 – Test condition tolerances .....	21
---	----

Table A.1 – Items necessary to standardize.....	23
---	----

Table C.1 – Physical designation and dimensions of round cells and batteries.....	27
---	----

Table C.2 – Physical designation and nominal overall dimensions of flat cells .....	28
---	----

Table C.3 – Physical designation and dimensions of square cells and batteries .....	28
---	----

Table C.4 – Diameter code for recommended diameter.....	31
---	----

Table C.5 – Physical designation and dimensions of round cells and batteries based on Clause C.2 .....	36
---	----

Table C.6 – Physical designation and dimensions of non-round batteries based on Clause C.2 .....	37
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Table D.1 – Standard discharge voltage by system.....	41
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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## PRIMARY BATTERIES –

### Part 1: General

#### 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 60086-1 has been prepared by IEC technical committee 35: Primary cells and batteries.

This thirteenth edition cancels and replaces the twelfth edition published in 2015. This edition constitutes a technical revision.

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

- a) a compliance checklist was added as an Annex H;
- b) definitions were harmonized with the other 60086 series documents;
- c) the nominal voltage of the zinc air system is now listed as either 1,4 V or 1,45 V;
- d) Annex F for calculation of MAD values was simplified;
- e) a validity period for testing was added;
- f) the accelerated aging test at 45 °C was changed from 13 to 4 weeks;

The text of this International Standard is based on the following documents:

FDIS	Report on voting
35/1465/FDIS	35/1469/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

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 document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

## INTRODUCTION

The technical content of this part of IEC 60086 provides fundamental requirements and information on primary cells and batteries. All batteries within the IEC 60086 series are considered dry cell batteries. In this sense, IEC 60086-1 is the main component of the IEC 60086 series and forms the basis for the subsequent parts. For example, this part includes elementary information on definitions, nomenclature, dimensions and marking. While specific requirements are included, the content of this part tends to explain methodology (how) and justification (why).

Over the years, this part has been changed to improve its content and remains under continual scrutiny to ensure that the publication is kept up to date with the advances in both battery and battery-powered device technologies.

Safety requirements and recommendations are available in IEC 60086-4, IEC 60086-5 and IEC 62281. Specifications are available in IEC 60086-2 and IEC 60086-3. Environmental aspects are dealt with in IEC 60086-6.

# PRIMARY BATTERIES –

## Part 1: General

### 1 Scope

This part of IEC 60086 is intended to standardize primary batteries with respect to dimensions, nomenclature, terminal configurations, markings, test methods, typical performance, safety and environmental aspects.

This document on one side specifies requirements for primary cells and batteries. On the other side, this document also specifies procedures of how requirements for these batteries are to be standardised.

As a classification tool for primary batteries, this document specifies system letters, electrodes, electrolytes, and nominal as well as maximum open circuit voltage of electrochemical systems.

The object of this part of IEC 60086 is to benefit primary battery users, device designers and battery manufacturers by ensuring that batteries from different manufacturers are interchangeable according to standard form, fit and function. Furthermore, to ensure compliance with the above, this part specifies standard test methods for testing primary cells and batteries.

This document also contains requirements in Annex A justifying the inclusion or the ongoing retention of batteries in the IEC 60086 series.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60086-2:2015, *Primary batteries – Part 2: Physical and electrical specifications*

IEC 60086-3, *Primary batteries – Part 3: Watch batteries*

IEC 60086-4, *Primary batteries – Part 4: Safety of lithium batteries*

IEC 60086-5, *Primary batteries – Part 5: Safety of batteries with aqueous electrolyte*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>