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INTERNATIONAL STANDARD

COMMENTED VERSION

Primary batteries -
Part 1: General

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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This commented version (CMV) of the official standard IEC 60086-1:2026 edition 14.0 allows the user to identify the changes made to the previous IEC 60086-1:2021 edition 13.0. Furthermore, comments from IEC TC 35 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60086-1 has been prepared by IEC technical committee 35: Primary cells and batteries. It is an International Standard.

This fourteenth edition cancels and replaces the thirteenth edition published in 2021. This edition constitutes a technical revision.

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

a) In Clause 3, terms were reordered according to their functions: basic terms, electrochemical systems, battery shapes, electrical characteristics, specifications, failure modes;
b) New letter "T" was added in Table 1, *Standardized electrochemical systems of 4.1.4 classification*;
c) Maximum open circuit voltage of letter "F" was changed from 1,83 V to 1,90 V;
d) Drawing of pulse tests with multiple load was moved from IEC 60086-2 to 5.2.2.2, *Application tests with multiple loads*;
e) Annex F, *Guidance for proposing value of minimum average duration* was modified;
f) Annex D of IEC 60086-2:2021, *Common designation*, has been transferred to Annex H of this document;
g) Table H.1, *Common designation index*, was modified to provide reference to IEC 60086-2-1 and IEC 60086-2-2 for each battery;
h) Annex I identifies the batteries of general use and the applicable tests to compare their performance, in support of Regulation (EU) 2023/1542 (Batteries Regulation).

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

Draft	Report on voting
35/1590/FDIS	35/1600/RVD

Full information on the voting for its approval 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. The main document types developed by IEC are described in greater detail at www.iec.ch/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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

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~~ IEC 60086-2-1, IEC 60086-2-2 and IEC 60086-3. Environmental aspects are dealt with in IEC 60086-6.

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 document specifies standard test methods for testing primary cells and batteries.

This document also contains requirements in Annex A of this document 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 60086-2-1:2026, *Primary batteries - Part 2-1: Physical and electrical specifications of batteries with aqueous electrolyte* **1**

IEC 60086-2-2:2026, *Primary batteries - Part 2-2: Physical and electrical specifications of lithium batteries* **1**

IEC 60086-3:2021, *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*

Bibliography

IEC 60050-482, *International Electrotechnical Vocabulary (IEV) - Part 482: Primary and secondary cells and batteries*

IEC 60086-6, *Primary batteries - Part 6: Guidance on environmental aspects*

IEC 62281, *Safety of primary and secondary lithium cells and batteries during transport*

ISO/IEC Guide 36:1982, *Preparation of standard methods of measuring performance (SMMP) of consumer goods* (withdrawn 1998)

ISO 2859, *Sampling procedures for inspection by attributes*

ISO 22514-2:2017, *Statistical methods in process management - Capability and performance - Part 2: Process capability and performance of time-dependent process models*

ISO/IEC Directives Part 1~~:2019~~, *Procedures for the technical work - Procedures specific to IEC*