
**Stationary lead-acid batteries - General requirements and methods of test - Part 1:
Vented types**

Stationary lead-acid batteries - General requirements and methods of test -- Part 1:
Vented types

Ortsfeste Blei-Akkumulatoren - Allgemeine Anforderungen und Prüfungen -- Teil 1:
Geschlossene Batterien

Batteries stationnaires au plomb - Prescriptions générales et méthodes d'essai -- Partie
1: Batteries au plomb du type ouvert

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Ta slovenski standard je istoveten z: EN 60896-1:1991

ICS:

29.220.20 Sä | ä • \ ä ^ \ ~ } å æ } ä | ^ } ä ð Acid secondary cells and
à æ ^ | ä ð batteries

SIST EN 60896-1:1997

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EUROPEAN STANDARD

EN 60896-1

NORME EUROPEENNE

EUROPÄISCHE NORM

August 1991

UDC 621.355.2

Descriptors: Lead-acid batteries, specifications, characteristics, tests

ENGLISH VERSION

STATIONARY LEAD-ACID BATTERIES - GENERAL REQUIREMENTS
AND METHODS OF TEST - PART 1: VENTED TYPES
(IEC 896-1:1987 + A1:1988)

Batteries stationnaires au
plomb - Prescriptions générales
et méthodes d'essai
Première partie: Batteries au
plomb du type ouvert
(CEI 896-1:1987 + A1:1988)

Ortsfeste Blei-Akkumulatoren
Allgemeine Anforderungen und
Prüfungen
Teil 1: Geschlossene Batterien
(IEC 896-1:1987 + A1:1988)

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This European Standard was approved by CENELEC on 1991-03-15.
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,
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 CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 896-1:1987 and its amendment 1:1988 could be accepted without textual changes, has shown that no CENELEC common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60896-1 on 15 March 1991.

The following dates were fixed:

- latest date of publication of
an identical national standard (dop) 1992-03-15
- latest date of withdrawal of
conflicting national standards (dow) 1992-03-15

For products which have complied with the relevant national standard before 1992-03-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1997-03-15.

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Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

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ENDORSEMENT NOTICE

The text of the International Standard IEC 896-1:1987 and its amendment 1:1988 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

<u>IEC</u> <u>Publication</u>	<u>Date</u>	<u>Title</u>	<u>EN/HD</u>	<u>Date</u>
50 (151)	1978	International electrotechnical Vocabulary (IEV) - Chapter 151: Electrical and magnetic devices	-	-
51	-	Direct acting indicating analogue electrical measuring instruments and their accessories	EN 60051	(series)
359	1971	Expression of the functional performance of electronic measuring equipment	-	-
485	1974	Digital electronic D.C. voltmeters and D.C. electronic analogue-to-digital converters	-	-

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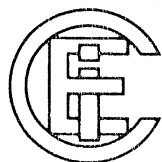
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NORME INTERNATIONALE INTERNATIONAL STANDARD

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CEI
IEC
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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

Première édition
First edition
1987

Batteries stationnaires au plomb

Prescriptions générales et méthodes d'essai
Première partie: Batteries au plomb du type ouvert

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Stationary lead-acid batteries

General requirements and methods of test
Part 1: Vented types

Publication
896-1: 1987

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

STATIONARY LEAD-ACID BATTERIES

General requirements and methods of test

Part 1: Vented types

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by IEC Technical Committee No. 21: Secondary Cells and Batteries.

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

Six Months' Rule	Report on Voting	Two Months' Procedure	Reports on Voting
21(CO)275	21(CO)283	21(CO)285	21(CO)287 and 21(CO)287A

Further information can be found in the relevant Reports on Voting indicated in the table above.

The following IEC publications are quoted in this standard:

Publications Nos. 50(151) (1978): International Electrotechnical Vocabulary (IEV), Chapter 151: Electrical and Magnetic Devices.

51: Direct-Acting Indicating Analogue Electrical Measuring Instruments and their Accessories.

359 (1971): Expression of the Functional Performance of Electronic Measuring Equipment.

485 (1974): Digital Electronic D.C. Voltmeters and D.C. Electronic Analogue-to-digital Converters.

STATIONARY LEAD-ACID BATTERIES

General requirements and methods of test

Part 1: Vented types

SECTION ONE — GENERAL

1. Scope

This standard is applicable to lead-acid cells and batteries which are designed for service in a fixed location (i.e. not habitually to be moved from place to place) and which are permanently connected to the load and to the d.c. power supply. Batteries operating in such applications are called "stationary batteries". A list of typical applications is given in Table AI of Appendix A.

Any type or construction of lead-acid cell or battery may be used for stationary battery applications. Typical types and constructions are given in Table AII of Appendix A. This Part 1 of the standard is applicable to vented types only. A Part 2 will be prepared for valve-regulated types.

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2. Object

The object of this standard is to specify general requirements and the main characteristics together with corresponding test methods associated with all types and construction modes of lead-acid stationary batteries, excluding valve-regulated types.

Statements and claims of basic performance data by the manufacturers shall correspond to those tests. The tests may also be used as type-qualification tests.

SECTION TWO — GENERAL REQUIREMENTS AND DEFINITIONS

3. Mechanical strength

Stationary cells or batteries shall be designed to withstand mechanical stresses during normal transportation and handling. Resistance to earthquakes, if required, shall be particularly specified.

4. Electrolyte levels

- 4.1 Each cell shall be equipped with a device to indicate the minimum and maximum electrolyte levels.

For instance:

- 4.2 For containers made of translucent material, the minimum and maximum levels shall be indicated on the container wall.

4.3 For containers made of an opaque material, a gauge shall be provided indicating the position of the electrolyte level in relation to the minimum and maximum levels.

5. Definition — Electrolyte reserve

5.1 The volume of electrolyte between minimum and maximum level is called the electrolyte reserve.

5.2 The electrolyte reserve, together with the battery design and the charging method used, governs the frequency of inspections for electrolyte level readjustments.

5.3 For batteries in float operation (see Sub-clause 7.1) the minimum electrolyte reserve is specified in Item *d*) of Sub-clause 7.2.

SECTION THREE — FUNCTIONAL CHARACTERISTICS AND SPECIFIC REQUIREMENTS

6. Capacity

(Test, see Clause 13).

6.1 The essential characteristic of a stationary cell or battery is its capacity for the storage of electric energy. This capacity, expressed in ampere-hours (Ah) varies with the conditions of use (discharge-current and -voltage and temperature).

6.2 The rated capacity C_{rt} is a reference value, indicated by the manufacturer, which is valid for a new cell or battery at the reference temperature of 20 °C and a discharge time t hours to the final voltage (end-of-discharge voltage) U_f .

Recommended t -values are:

$t = 240$ h, 20 h, 10 h, 8 h, 5 h, 3 h, 2 h, 1 h, 0.5 h.

Of those various C_{rt} values one value may be selected and declared as nominal capacity C_{nom} (see IEC Publication 50 (151): reference IEC 151-04-01).

6.3 The most commonly used values of t are between 10 h and 3 h. For these the final voltage (end of discharge-voltage) shall be $U_f = 1.80$ V per cell, (unless otherwise recommended or requested by the manufacturer or user). For other discharge rates, the recommended value of U_f shall be set by National Standards or shall be stated by the manufacturer together with the value of C_{rt} or together with the particular performance data (see Sub-clause 6.6).

6.4 The discharge current at the reference temperature 20 °C corresponding to the rated capacity C_{rt} is:

$$I_{rt} = \frac{C_{rt}}{t} \text{ (A)}$$

to the final discharge voltage U_f in accordance with Sub-clause 6.3.

6.5 The actual capacity C_a shall be determined by discharging a fully charged cell or battery in accordance with Clause 13. The resultant value shall be used for comparison with the rated capacity C_{rt} (or C_{nom} , see Sub-clause 6.2) stated by the manufacturer, or for control of the state of a battery after long periods of service.