

Nickel-cadmium batteries — Technical specification

The European Standard EN 2570:1996 has the status of a
British Standard

ICS 29.220.30; 49.060

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Committees responsible for this British Standard

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- British Airways
- British Cable Makers' Confederation
- British Rubber Manufacturers' Association
- Civil Aviation Authority (Airworthiness Division)
- Federation of the Electronics Industry
- Ministry of Defence
- Society of British Aerospace Companies Ltd.

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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 2570	3
List of references	Inside back cover

National foreword

This British Standard has been prepared by Technical Committee ACE/6 and is the English language version of EN 2570:1996 *Aerospace series — Nickel-cadmium batteries — Technical specification* published by the European Committee for Standardization (CEN).

EN 2570 was produced as a result of international discussion in which the United Kingdom took an active part.

Cross-references

Publication referred to	Corresponding British Standard
ISO 7137:1992	BS 3G 229:1993 <i>Schedule for environmental conditions and test procedures for airborne equipment</i>
IEC 51-1:1984 (EN 60051:1989)	BS 89 <i>Direct acting indicating analogue electrical measuring instruments and their accessories</i> Part 1:1990 <i>Specification for definitions and general requirements common to all Parts</i> BS EN 60952 <i>Aircraft batteries</i>
IEC 952-1:1988 (EN 60952-1:1993)	BS EN 60952-1:1993 <i>General test requirements and performance levels</i>
IEC 952-2:1991 (EN 60952-2:1993)	BS EN 60952-2:1993 <i>Design and construction requirements</i>
EN 3042:1991	BS EN 3042:1992 <i>Quality assurance. EN aerospace products. Qualification procedure</i>

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 20, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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English version

Aerospace series — Nickel-cadmium batteries — Technical specification

Série aérospatiale — Batteries d'accumulateurs
au nickel-cadmium — Spécification technique

Luft- und Raumfahrt —
Nickel-Cadmium-Batterien — Technische
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 1997 and conflicting national standards shall be withdrawn at the latest by January 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Contents

	Page
Foreword	2
0 Introduction	3
1 Scope	3
2 Normative references	3
3 Definitions	3
4 Design	3
5 Tests	7
6 Quality assurance	18
7 Marking	19
8 Accompanying documents	19
9 Delivery	19
Figure 1 — Battery connector	5
Figure 2 — Adaptor position for horizontal coupling	6
Figure 3 — Adaptor position for vertical coupling	6
Figure 4 — Orientation of battery for the mechanical shock, vibration, acceleration and inversion tests	11
Figure 5	12
Figure 6	13
Table 1	5
Table 2	7
Table 3	7
Table 4	10
Table 5	14
Table 6	17
Table 7	18
Table 8	19
Table 9	19

0 Introduction

This standard has taken into consideration IEC standards 952-1 and 952-2 implemented at European level as EN 60952-1 and EN 60952-2.

1 Scope

This standard provides information on design and specifies complementary requirements for nickel-cadmium batteries for aerospace applications.

It is applicable whenever referenced.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment (Endorsement of EUROCAE/ED-14C and RTCA/DO-160C)*.

IEC 51-1, *Direct acting indicating analogue electrical measuring instruments and their accessories — Part 1: Definitions and general requirements common to all parts*.

IEC 952-1, *Aircraft batteries — Part 1: General test requirements and performance levels*.

IEC 952-2, *Aircraft batteries — Part 2: Design and construction requirements*.

EN 3042, *Aerospace series — Quality assurance — EN aerospace products — Qualification procedure*.

3 Definitions

For the purposes of this standard, the following definitions apply:

nickel-cadmium cell

rechargeable alkaline accumulator in which the positive active mass is nickel-based and the negative active mass is cadmium-based

rated capacity C_1

quantity of electricity (in Ah) which the cell is capable of delivering in 1 h, throughout its normal service life, after full charge, under conditions defined with regard to temperature and end discharge voltage

recharged capability

the recharged capability is the product (in Ah) of the discharge current values and the duration

charge or discharge currents

level of direct current (in A) at which charging¹⁾ or discharging¹⁾ is carried out

charged battery

battery which has been charged, unless otherwise indicated, in accordance with the procedure described in 5.1.6

end discharge voltage

voltage at which discharge shall be stopped. This is obtained by multiplying the voltage per cell by the number of cells

maintenance cycle

indispensable periodic maintenance and monitoring operation. This is described in the manufacturers' maintenance manuals

battery case

case, not including the lid, containing the battery cells and on which the connector is fixed

cell container

container enclosing the positive and negative plates, the electrolyte etc

4 Design

Batteries shall be :

- made up of electrical cells with vented containers in a battery case from which gas can escape;
- designed to:
 - a) provide an emergency back-up and indirect starting of the main engines (normal batteries);
 - b) provide instantaneous high power and direct starting (high-power or high current batteries);
 - c) satisfy new requirements (e.g. long service life).

¹⁾ Current (A) = $\frac{C_1 \text{Ah}}{t(\text{h})}$, e.g.: $\frac{C_1 \text{A}}{10} = 0,1 C_1 \text{A}$

4.1 Battery case

The battery case shall be:

- of metal or other material, resistant to corrosion and, unless otherwise specified, leakproof;
- designed to hold 19 or 20 cells and such that any movement of the cells is avoided and that they can be removed. Where only 19 cells are required, a suitable dummy shall replace the twentieth cell.

Seals and accessories shall be resistant to electrolyte (see 5.3.6) and to the temperatures (see 5.4.3 and 5.4.4).

The case may be fitted in its upper section with air circulation ducts. The arrangement and form of this device are described in the product standards.

4.2 Lid (of the battery case)

The materials of the lid and its accessories shall have the same characteristics as those of the case.

The lid may:

- be provided with a seal and fitting devices, but is not necessarily sealed;
- serve to secure the battery and/or have a separate attachment system.

These options are described in the product standard.

4.3 Battery cells

Cell containers and lids

They shall be:

- made of insulating material which is resistant to the operating conditions;
- joined together by a weld which is resistant to atmospheric pressure.

Vent plugs

Each cell shall be fitted with a vent plug in plastic material which is resistant to electrolyte and has a seal.

The plug shall contain a device to permit the escape of gas and to prevent the escape of liquid if the battery is inverted.

The vents shall open at an internal overpressure of between 14 kPa and 70 kPa.

The vent plug shall fulfil its function in all specified tests, at the pressures defined in 5.2.6.1.

4.4 Electrolyte

Shall be an aqueous solution of potassium hydroxide.

Purity of the solution shall conform to the battery manufacturer's specifications.

4.5 Connections between cells

These shall be in nickel-coated metal.

The type of metal and the section of connections shall be selected so as to be able to withstand the maximum current which the battery can supply.

The lock washers shall not damage the connections or the terminal nuts.

Where internal monitoring devices are required, these shall not affect the battery characteristics.

4.6 Identification of polarity

The cells shall bear positive polarity markings (+) and if necessary negative (−).

The battery case shall also bear polarity markings: the positive pole of the receptacle shall be on the right, viewed from the outside.

4.7 Battery connector

See Figure 1 and Table 1, Figure 2 and Figure 3 and Table 2.

The location of the battery connector is defined in the product standards, in conformity with Table 3. Dimensions and tolerances are in millimetres.