

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Aircraft batteries – **STANDARD PREVIEW**
Part 3: Product specification and declaration of design and performance (DDP)
(standards.iteh.ai)

Batteries d'aéronefs –
Partie 3: Spécification de produit et déclaration de conception et de performance
(DDP)

IEC 60952-3:2013
<https://standards.iteh.ai/catalog/standards/sist/6219c166-450c-489a-a54c-da7956fb55b5/iec-60952-3-2013>





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AIRCRAFT BATTERIES –

**Part 3: Product specification and declaration
of design and performance (DDP)**

FOREWORD

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International Standard IEC 60952-3 has been prepared by IEC technical committee 21: Secondary cells and batteries.

This third edition cancels and replaces the second edition published in 2004. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: requirements for defining the declaration of performance and specification details between supplier and purchaser.

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

FDIS	Report on voting
21/805/FDIS	21/816/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.

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

A list of all the parts in the IEC 60952 series, published under the general title *Aircraft batteries* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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- withdrawn,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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AIRCRAFT BATTERIES –

Part 3: Product specification and declaration of design and performance (DDP)

1 Scope

This part of IEC 60952 defines requirements for the product specification as well as procedures for a Declaration of Design and Performance (DDP) for nickel-cadmium and lead-acid aircraft batteries containing vented or valve-regulated cells or monoblocs. The batteries are used for both general purposes and specific aerospace applications.

The specific topics addressed in this part serve to establish acceptable quality standards required to qualify a battery as airworthy as defined in Clause 3 of IEC 60952-1:2013.

The design construction and test requirements should conform to the requirements specified in IEC 60952-1 and IEC 60952-2.

It is recognised that additional data may be required by other organisations (national standards bodies, AECMA, SAE etc.). The present standard can be used as a framework to devise tests for generation of the required data.

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2 Normative references

<https://standards.iteh.ai/catalog/standards/sist/d210-166-a30-485a-a54-1e79-645756/iec-60952-3-2013>

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60952-1:2013, *Aircraft batteries – Part 1: General test requirements and performance levels*

IEC 60952-2:2013, *Aircraft batteries – Part 2: Design and construction requirements*

ISO/TR 224, *Aircraft – Declaration of design and performance for aircraft equipment – Standard form*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60952-1:2013 apply.

4 Product specification

4.1 General requirements

A product specification is required for each battery design. Once accepted, by both the manufacturer and customer, the requirements of the product specification shall comply with the overall requirements of IEC 60952 series.

The scope and content of the product specification will be defined by the customer but should include:

- reference to test requirements detailed in the range of IEC 60952 series. Additional requirements shall be selected from national or international standards;
- the required format and connectors shall comply with IEC 60952-2, wherever possible.

The manufacturer shall:

- verify performance to these additional requirements in an extension to the declaration of design and performance (DDP).

4.2 Example product specification

An example template for a product specification is shown in Annex A, which shall be used to define specific requirements.

5 Declaration of design and performance (DDP)

5.1 General

IEC 60952-3:2013

<https://standards.iteh.ai/catalog/standards/sist/d219e166-a30c-485a-a54e-4a7956185905/iec-60952-3-2013>

These requirements were derived from ISO/TR 224 and amended to meet the requirements for battery systems.

5.2 Performance

The limits of declared performance and those implied by the declarations in the DDP are not intended to be absolute, but are intended to indicate the performance which has been shown by tests, or calculation, analysis or similarity.

5.3 Limitations

Limitations are the minimum life or useful service between equipment overhaul (based on test results and/or operational experience), as well as any standard tests necessary to satisfy safety requirements.

The designer shall state any known limitations of which the user should be aware which are not specifically covered by the DDP.

5.4 Departures from specification

The equipment designer shall list any departures from the requirements of this or any other standards to be specified, as well as from the design specifications which the battery shall meet.

5.5 Verification

For verification purposes, the manufacturer shall complete the DDP template detailing the tests completed, the performance and the test report, analysis or similarity reference.

The test shall be carried out in accordance with the test procedures defined in IEC 60952-1. If alternative test procedures have been used, these shall be declared.

5.6 Authentication

The DDP shall be authenticated by completion of Annex B and would normally be completed by the manufacturer's technical manager.

5.7 Construction

The DDP shall be supported by a unique reference to the build standard of the battery.

5.8 Definition

The DDP shall identify the applicable format, connector, special fittings as well as specific requirements for use, such as dedicated charger or aircraft busbar limits.

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Annex A
(normative)

**Template for a typical purchaser's
product specification/requirement**

Purchaser's name:.....

Aircraft type/project:.....

Application:.....

A.1 General description

Characteristics	Purchaser's requirement
a) Chemistry	
b) Number of cells	
c) 1) IEC 60952-2 format	
2) Other formats	
d) Main interface connector	
e) Nominal voltage	
f) Capacity	
1) Minimum rated capacity	
2) End of life capacity	
g) Maximum mass	
h) Other interface connectors	
i) Mounting attitude	
j) Venting method	
k) Preferred charging method	
l) Test plans	

A.2 Performance requirements

Test Procedures	Relevant IEC 60952-1 clause	Mandatory X	Remarks
1 Electrical			
Rated capacity C_1	5.1.1	X	
Initial capacity requirement for vented and valve regulated nickel-cadmium	5.1.2	X	
1 I_1 Capacity at 1 I_1 and - 18 °C	5.1.3	X	
1 I_1 Capacity at 1 I_1 and - 30 °C	5.1.4	X	
1 I_1 Capacity at 1 I_1 and 50 °C	5.1.5	X	
Constant voltage/current at 23 °C	5.2.2.2	X	
Constant voltage/current at -18 °C	5.2.2.3	X	
Constant voltage/current at -30 °C	5.2.2.4	X	
Constant voltage current (14 V) at 23 °C	5.2.3.2	X	
Constant voltage current (14 V) at -18 °C	5.2.3.3	X	
Constant voltage current (14 V) at -30 °C	5.2.3.4	X	
Rapid discharge capacity at 23 °C	5.3.1	X	
Rapid discharge capacity at -30 °C	5.3.2	X	
Charge retention	5.4	X	
Storage	5.5	X	
Charge stability	5.6	X2	
Short circuit	5.7	X	
Charge acceptance at ambient temperature	5.8.2	X	
Charge acceptance at -18 °C	5.8.3.2	X	
Charge acceptance at -40 °C	5.8.3.3	X	
Insulation resistance	5.9.2	X	
Dielectric strength	5.9.3	X	
Duty cycle performance	5.10	X	
Water consumption test	5.11	X	
Overcharge endurance	5.12	X	
Cyclic endurance	5.13	X	
Deep discharge	5.14	X	
Induced destructive overcharge	5.15	X	
Electrical emissions	5.16	X	

Test Procedures	Relevant IEC 60952-1 clause	Mandatory X	Remarks
2 Environmental requirements			
Vibration test	6.1	X	
– Option 1: Sinusoidal vibration test or	6.1	2	
– Option 2: Random vibration test	6.1	2	
Acceleration or shock test		X	
– Option 1: Acceleration test or	6.2	2	
– Option 2: Operational shock or	6.3.1	2	
– Option 3: Crash safety	6.3.2	2	
Explosion containment	6.4	X	
Gas emission	6.5	X	
Altitude pressure	6.6	X	
Temperature variation (shock)	6.7	X	
Fungus resistance	6.8	X	
Humidity	6.9	X	
Fluid contamination	6.10	X	
Salt spray	6.11	X	
Physical integrity at high temperature (85 °C)	6.12	X	
Flammability	6.13	X	
Electrolyte resistance	6.14	X	
Temperature sensors	6.15	X	
Component qualification tests	6.16	X	
Battery airtightness test	6.17	X	
Strength of connector receptacle	6.18	X	
Handle strength test	6.19	X	
(X) indicates that the test shall be completed.			
(2) indicates a mandatory test where at least one option shall be crossed.			

A.3 Quality assurance requirement

The purchaser is to insert here the relevant national or other pertinent quality assurance (QA) requirements.

A.4 Special requirements

This clause is used to identify specific additional requirements such as the following:

- additional vibration requirements;
- special labelling requirements;
- specific contractual requirements.

A.5 List of any attached documents