



NSAI
Standards

Irish Standard
I.S. EN 61587-1:2017

Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 series - Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation

I.S. EN 61587-1:2017

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National Foreword

I.S. EN 61587-1:2017 is the adopted Irish version of the European Document EN 61587-1:2017, Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 series - Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation

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EUROPEAN STANDARD

EN 61587-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2017

ICS 31.240

Supersedes EN 61587-1:2012

English Version

**Mechanical structures for electronic equipment - Tests for IEC
60917 and IEC 60297 series - Part 1: Environmental
requirements, test set-up and safety aspects for cabinets, racks,
subracks and chassis under indoor condition use and
transportation
(IEC 61587-1:2016)**

Structures mécaniques pour équipement électronique -
Essais pour les séries IEC 60917 et IEC 60297 - Partie 1:
Exigences environnementales, montage d'essai et aspects
liés à la sécurité des baies, bâtis, bacs à cartes et châssis
dans des conditions d'utilisation intérieure ou de transport
(IEC 61587-1:2016)

Mechanische Bauweisen für elektronische Einrichtungen -
Prüfungen für die Reihen IEC 60917 und IEC 60297 - Teil
1: Umgebungsanforderungen, Prüfaufbau und
Sicherheitsaspekte für Schränke, Gestelle,
Baugruppenträger und Einschübe bei Bedingungen in
Innenräumen und beim Transport
(IEC 61587-1:2016)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 61587-1:2017**European foreword**

The text of document 48D/623/FDIS, future edition 4 of IEC 61587-1, prepared by SC 48D "Mechanical structures for electrical and electronic equipment" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61587-1:2017.

The following dates are fixed:

- latest date by which the document has to be (dop) 2017-10-21
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2020-04-21
standards conflicting with the
document have to be withdrawn

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

| | | |
|--------------------|------|----------------------------------|
| IEC 60068 (series) | NOTE | Harmonized as EN 60068 (series). |
| IEC 60068-2-75 | NOTE | Harmonized as EN 600068-2-75. |
| IEC 62262 | NOTE | Harmonized as EN 62262. |

Annex ZA

(normative)

**Normative references to international publications
with their corresponding European publications**

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|--|----------------|-------------|
| IEC 60068-1 | - | Environmental testing -- Part 1: General and guidance | EN 60068-1 | - |
| IEC 60068-2-1 | - | Environmental testing -- Part 2-1: Tests - Test A: Cold | EN 60068-2-1 | - |
| IEC 60068-2-2 | - | Environmental testing -- Part 2-2: Tests - Test B: Dry heat | EN 60068-2-2 | - |
| IEC 60068-2-6 | - | Environmental testing -- Part 2-6: Tests - Test Fc: Vibration (sinusoidal) | EN 60068-2-6 | - |
| IEC 60068-2-11 | - | Basic environmental testing procedures - Part 2-11: Tests - Test Ka: Salt mist | EN 60068-2-11 | - |
| IEC 60068-2-27 | - | Environmental testing -- Part 2-27: Tests - Test Ea and guidance: Shock | EN 60068-2-27 | - |
| IEC 60068-2-30 | - | Environmental testing -- Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) | EN 60068-2-30 | - |
| IEC 60068-2-42 | - | Environmental testing -- Part 2-42: Tests - Test Kc: Sulphur dioxide test for contacts and connections | EN 60068-2-42 | - |
| IEC 60068-2-43 | - | Environmental testing -- Part 2-43: Tests - Test Kd: Hydrogen sulphide test for contacts and connections | EN 60068-2-43 | - |
| IEC 60068-2-49 | - | Environmental testing -- Part 2: Tests - Guidance to Test Kc: Sulphur dioxide test for contacts and connections | - | - |
| IEC 60068-2-52 | - | Environmental testing -- Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution) | EN 60068-2-52 | - |
| IEC 60068-2-64 | - | Environmental testing -- Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance | EN 60068-2-64 | - |
| IEC 60297 | series | Dimensions of mechanical structures of the 482,6 mm (19 in) series | | series |
| IEC 60297-3-100 | - | Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series -- Part 3-100: Basic dimensions of front panels, subracks, chassis, racks and cabinets | EN 60297-3-100 | - |
| IEC 60297-3-101 | - | Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series -- Part 3-101: Subracks and associated plug-in units | EN 60297-3-101 | - |

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|------------------------|--------|--|----------------|--------|
| IEC 60297-3-107 | - | Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series -- Part 3-107: Dimensions of subracks and plug-in units, small form factor | EN 60297-3-107 | - |
| IEC 60297-3-108 | - | Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series -- Part 108: Dimensions of R-type subracks and plug-in units | EN 60297-3-108 | - |
| IEC 60512-1-1 | - | Connectors for electronic equipment - Tests and measurements -- Part 1-1: General examination - Test 1a: Visual examination | EN 60512-1-1 | - |
| IEC 60529 | - | Degrees of protection provided by enclosures (IP Code) | - | - |
| IEC 60654-4 | - | Operating conditions for industrial-process measurement and control equipment -- Part 4: Corrosive and erosive influences | EN 60654-4 | - |
| IEC 60695-11-10 | - | Fire hazard testing -- Part 11-10: Test flames - 50 W horizontal and vertical flame test methods | EN 60695-11-10 | - |
| IEC 60721-3-3 | - | Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 3: Stationary use at weatherprotected locations | EN 60721-3-3 | - |
| IEC 60917 | series | Modular order for the development of mechanical structures for electronic equipment practices | EN 60917 | series |
| IEC 60917-2-1 | - | Modular order for the development of mechanical structures for electronic equipment practices -- Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice -- Section 1: Detail specification - Dimensions for cabinets and racks | EN 60917-2-1 | - |
| IEC 60917-2-2 | - | Modular order for the development of mechanical structures for electronic equipment practices -- Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice -- Section 2: Detail specification - Dimensions for subracks, chassis, backplanes, front panels and plug-in units | EN 60917-2-2 | - |
| IEC 60917-2-3 | - | Modular order for the development of mechanical structures for electronic equipment practices -- Part 2-3: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Extended detail specification - Dimensions for subracks, chassis, backplanes, front panels and plug-in units | EN 60917-2-3 | - |
| IEC 60950-1 (mod) 2005 | - | Information technology equipment - Safety - Part 1: General requirements | EN 60950-1 | 2006 |
| - | - | | + A11 | 2009 |
| + A1 (mod) | 2009 | | + A1 | 2010 |
| - | - | | + A12 | 2011 |
| - | - | | + AC | 2011 |
| + A2 (mod) | 2013 | | + A2 | 2013 |

| | | | | |
|-------------|---|--|------------|---|
| IEC 61010-1 | - | Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 1: General requirements | EN 61010-1 | - |
| IEC 61373 | - | Railway applications - Rolling stock equipment - Shock and vibration tests | EN 61373 | - |
| IEC 61587-2 | - | Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 -- Part 2: Seismic tests for cabinets and racks | EN 61587-2 | - |
| IEC 61587-3 | - | Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 - Part 3: Electromagnetic shielding performance tests for cabinets and subracks | EN 61587-3 | - |
| IEC 61587-5 | - | Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 - Part 5: Seismic tests for chassis, subracks, and plug-in units | EN 61587-5 | - |

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IEC 61587-1

Edition 4.0 2016-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 series –

Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation

Structures mécaniques pour équipement électronique – Essais pour les séries IEC 60917 et IEC 60297 –

Partie 1: Exigences environnementales, montage d'essai et aspects liés à la sécurité des baies, bâtis, bacs à cartes et châssis dans des conditions d'utilisation intérieure ou de transport



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Edition 4.0 2016-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 series –
Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation**

**Structures mécaniques pour équipement électronique – Essais pour les séries IEC 60917 et IEC 60297 –
Partie 1: Exigences environnementales, montage d'essai et aspects liés à la sécurité des baies, bâtis, bacs à cartes et châssis dans des conditions d'utilisation intérieure ou de transport**

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ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT – TESTS FOR IEC 60917 AND IEC 60297 SERIES –

Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation

FOREWORD

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International Standard IEC 61587-1 has been prepared by IEC subcommittee 48D: Mechanical structures for electronic equipment, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

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

- a) total overhaul of Clause 7 “Mechanical tests”;
- b) compatibility with IEC 61587-5.

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

| FDIS | Report on voting |
|--------------|------------------|
| 48D/623/FDIS | 48D/628/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 parts of the IEC 61587 series, under the general title *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 series*, 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 website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
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- amended.

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INTRODUCTION

The purpose of this standard is to provide a common methodology to perform and report conformance tests of IEC 60917 or IEC 60297 compliant cabinets, racks, subracks, chassis with integrated subracks and associated plug-in units under indoor condition use and transportation. Based upon the most recent specification/standard developments in the industry (such as PICMG, ANSI/VITA, ATIS, etc.) and to address new requirements, this edition 4 of IEC 61587-1 includes the following significant technical changes with respect to the previous edition:

- a) Document title change to read: IEC 61587-1: Mechanical structures for electronic equipment – Tests for the IEC 60917 and IEC 60297 series – Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation.
- b) Total overhaul of Clause 7 “Mechanical tests” so as to make it compatible with legacy equipment (i.e., equipment commercially available prior to the publication of the standard). In particular:
 - 1) Subclause 7.2 “Tests for subracks or chassis with an integrated subrack and associated plug-in units” has been considerably expanded and provides for a more realistic intended use test environment (simulation of service condition).
 - 2) Subclause 7.2.1 “Static mechanical load tests of a subrack or a chassis with an integrated subrack” cabinet or rack static load test categories such as cabinets or racks with lifting eye test only and cabinets or racks without the use of lifting eyes have been added.
 - 3) Subclause 7.2.3 “Vibration and shock test of a mass loaded plug-in unit” has been updated to be in line with IEC 62262, which defines the way cabinets should be mounted when impact tests are carried out, the atmospheric conditions that should prevail, the number of impacts, and their distribution, and the physical size, dimensions, etc. of the various styles of hammers designed to produce the test energy level required.
- c) Compatibility with IEC 61587-5.

MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT – TESTS FOR IEC 60917 AND IEC 60297 SERIES –

Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation

1 Scope

This part of IEC 61587 specifies environmental requirements, test set-up, as well as safety aspects for empty enclosures, i.e., cabinets, racks, subracks, chassis with an integrated subrack, and associated plug-in units under indoor condition use and transportation.

The purpose of this standard is to establish defined levels of physical performance in order to meet certain requirements of storage, transport and final location conditions. It applies in whole or part only to the mechanical structures of cabinets, racks, subracks, chassis with an integrated subrack, and associated plug-in units, but it does not apply to electronic equipment.

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 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11, *Environmental testing – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests– Test Ea and guidance: Shock*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-42, *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-43, *Environmental testing – Part 2-43: Tests – Test Kd: Hydrogen sulphide test for contacts and connections*

IEC 60068-2-49, *Environmental testing – Part 2-49: Tests – Guidance to test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium, chloride solution)*

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