# Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 - Part 2: Seismic tests for cabinets and racks

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

| | |
|---|---|
| Käesolev Eesti standard EVS-EN 61587-2:2002 sisaldab Euroopa standardi EN 61587-2:2001 ingliskeelset teksti. | This Estonian standard EVS-EN 61587-2:2002 consists of the English text of the European standard EN 61587-2:2001. |
| Standard on kinnitatud Eesti Standardikeskuse 15.10.2002 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas. | This standard is ratified with the order of Estonian Centre for Standardisation dated 15.10.2002 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation. |
| Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 26.02.2001. | Date of Availability of the European standard text 26.02.2001. |
| Standard on kättesaadav Eesti standardiorganisatsioonist. | The standard is available from Estonian standardisation organisation. |



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EUROPEAN STANDARD **EN 61587-2**

NORME EUROPÉENNE

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English version

# Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 Part 2: Seismic tests for cabinets and racks

(IEC 61587-2:2000)

Structures mécaniques pour équipement électronique -
Essais pour la CEI 60917 et la CEI 60297
Partie 2: Essais sismiques pour baies et bâtis
(CEI 61587-2:2000)

Mechanische Bauweisen für elektronische Einrichtungen -
Prüfungen für IEC 60917 und IEC 60297
Teil 2: Seismische Prüfungen für Schränke und Gestelle
(IEC 61587-2:2000)



This European Standard was approved by CENELEC on 2001-01-01. 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, Czech Republic, 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**



Ref. No. EN 61587-2:2001 E

## Foreword

The text of document 48D/236/FDIS, future edition 1of IEC 61587-2 prepared by SC 48D, Mechanical structures for electronic equipment, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61587-2 on 2001-01-01.

The following dates were fixed:

| | | |
|---|---|---|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2001-10-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2004-01-01 |

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative .
Annex ZA has been added by CENELEC.

## Endorsement notice

The text of the International Standard IEC 61587-2:2000 was approved by CENELEC as a European Standard without any modification.

## Annex ZA
(normative)

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

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 (including amendments).

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

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60068-2-6<br>+ corr. March | 1995<br>1996 | Environmental testing<br>Part 2: Tests - Test Fc: Vibration (sinusoidal) | EN 60068-2-6 | 1995 |
| IEC 60068-2-47 | 1999 | Part 2-47: Test methods - Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests | EN 60068-2-47<br>+ corr. June | 1999<br>2000 |
| IEC 60068-2-57 | 1999 | Part 2-57: Tests - Test Ff: Vibration - Time-history method | EN 60068-2-57 | 2000 |
| IEC 60068-3-3 | 1991 | Part 3: Guidance - Seismic test methods for equipments | HD 323.3.3 S1 | 1991 |
| IEC 60297-1 | [1)] | Dimensions of mechanical structures of the 482,6 mm (19 in) series<br>Part 1: Panels and racks | HD 493.1 S1 | 1988[2)] |
| IEC 60297-2 | [1)] | Part 2: Cabinets and pitches of rack structures | HD 493.2 S1 | 1988[2)] |
| IEC 60297-3 | [1)] | Part 3: Subracks and associated plug-in units | HD 493.3 S2 | 1993[2)] |
| IEC 60297-4 | [1)] | Part 4: Subracks and associated plug-in units - Additional dimensions | EN 60297-4 | 1995[2)] |
| IEC 60917-2 | [1)] | Modular order for the development of mechanical structures for electronic equipment practices<br>Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice | EN 60917-2 | 1994[2)] |

[1)] undated reference.

[2)] valid edition at date of issue.

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60917-2-1 | 1) | 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 | 1995 2) |
| IEC 60917-2-2 | 1) | 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 | 1996 2) |
| IEC 61587-1 | 1) | Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297<br>Part 1: Climatic, mechanical tests and safety aspects for cabinets, racks, subracks and chassis | EN 61587-1 | 1999 2) |

# INTERNATIONAL STANDARD

# IEC 61587-2

First edition
2000-12

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

**Part 2: Seismic tests for cabinets and racks**

*Structures mécaniques pour équipement électronique – Essais pour la CEI 60917 et la CEI 60297 –*

*Partie 2: Essais sismiques pour baies et bâtis*



Reference number
IEC 61587-2:2000(E)

## Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

## Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

## Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site (www.iec.ch)**

- **Catalogue of IEC publications**

  The on-line catalogue on the IEC web site (www.iec.ch/catlg-e.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## Part 2: Seismic tests for cabinets and racks



## FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61587-2 has been prepared by subcommittee 48D: Mechanical structures for electronic equipment, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

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

| FDIS | Report on voting |
|---|---|
| 48D/236/FDIS | 48D/245/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 3.

IEC 61587 consists of the following parts under the general title *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297*:

Part 1: Climatic, mechanical tests and safety aspects for cabinets, racks, subracks and chassis

Part 2: Seismic tests for cabinets and racks

Part 3: Electromagnetic shielding performance tests for cabinets, racks and subracks

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

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

## Part 2: Seismic tests for cabinets and racks



## 1 Scope and object

This part of IEC 61587 specifies seismic requirements for cabinets or racks as defined in the IEC 60917 and IEC 60297 series. It applies, in whole or in part, only to the mechanical structures of cabinets or racks for electronic equipment, according to the IEC 60297 and the IEC 60917 series, and does not apply to electronic equipment or systems within the mechanical structures.

The object of this standard is to help ensure physical integrity and environmental performance in mechanical cabinets or racks, taking into account the need for different levels of performance in different applications and geographical regions. It is intended to give the user a high level of confidence in the selection of an equipment practice to meet specific needs. A specific test specimen has been selected (see figure 1).

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61587. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61587 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60068-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-47:1999, *Environmental testing – Part 2-47: Test method – Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests*

IEC 60068-2-57:1999, *Environmental testing – Part 2-57: Tests – Test Ff: Vibration – Time-history method*

IEC 60068-3-3:1991, *Environmental testing – Part 3: Guidance – Seismic test methods for equipment*

IEC 60297-1, *Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 1: Panels and racks*

IEC 60297-2, *Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 2: Cabinets and pitches of rack structures*

IEC 60297-3, *Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3: Subracks and associated plug-in units*

IEC 60297-4, *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 4: Subracks and associated plug-in units – Additional dimensions*

IEC 60917-2, *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*

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*

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*

IEC 61587-1, *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 – Part 1: Climatic, mechanical tests and safety aspects for cabinets, racks, subracks, and chassis*

## 3 Seismic and vibration test requirements

The loading and mounting conditions, along with the cabinet or rack size and as-tested configuration, shall be in compliance with this standard. The cabinet or rack configuration and the set-up and loading condition (shown in figure 1) are based on 5.2 of IEC 61587-1.