

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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

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

**Structures mécaniques pour équipements électroniques – Essais pour la CEI 60917 et la CEI 60297 –**

**Partie 2: Essais sismiques pour baies et bâtis**



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## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 Set up of test specimen and measurement items .....	7
4.1 Introductory remarks .....	7
4.2 General.....	7
4.3 Set up of the cabinets or racks to the vibration table .....	8
4.4 Measurement items.....	8
5 Test waveform and acceleration condition .....	9
5.1 Introductory remarks .....	9
5.2 General.....	9
5.3 Single-axis acceleration .....	9
5.4 Triaxial acceleration .....	10
6 Assessment following the test.....	13
Annex A (informative) Vibration generators and information.....	14
Figure 1 – Cabinets or racks configuration for test set up.....	7
Figure 2 – Block diagram of test set up configuration.....	8
Figure 3 – The RRS for test wave (damping ratio 2 % ).....	10
Figure 4 – Time-history of the test wave .....	10
Figure 5 – The RRS for test wave (damping ratio 3 % ).....	11
Figure 6 – Time-history of test wave for each axis .....	12
Table 1 – Load distribution within the cabinet .....	8

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MECHANICAL STRUCTURES FOR ELECTRONIC EQUIPMENT –  
TESTS FOR IEC 60917 AND IEC 60297 –****Part 2: Seismic tests for cabinets and racks**

## FOREWORD

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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 second edition of this standard replaces the first edition issued in 2000 and constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

Edition 1.0 specified the test condition with one size of the cabinet, and one load distribution. The specified acceleration condition for the test specimen was single-axis and one of the RRS (required response spectra) specified in the standard was selected. The test was aimed to obtain the reference for the structural strength of the enclosure against the specified seismic intensity. Earthquakes are actually random phenomena that are much more carefully simulated by tri-axial simultaneous operation. The demand of tri-axial excitation has emerged as a more accurate representation of an earthquake.

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

FDIS	Report on voting
48D/471/FDIS	48D/486/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 IEC 61587 series, under the general title: *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297*, 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.

## INTRODUCTION

Edition 1.0 of this standard specified the seismic test for the cabinets or racks according to IEC 60297 and IEC 60917. The specified test applied to the structure of the enclosure and did not apply to the whole system.

Edition 1.0 specified the test condition with one size of the cabinet, and one load distribution. The specified acceleration condition for the test specimen was single-axis and one of the RRS (required response spectra) specified in the standard was selected. The test was aimed to obtain the reference for the structural strength of the enclosure against the specified seismic intensity.

The electronic system consists of two or more subracks. Two or more plug-in units that perform signal processing are installed in each subrack. The size, i.e.: height, width and depth, and the weight of each subrack may vary for each electronic system. So, various types of cabinets or racks to equip the electronic system are currently demanded. Therefore, many types of cabinets or racks are required to install the equipment.

Earthquakes are actually random phenomena that are much more carefully simulated by tri-axial simultaneous operation. The demand of tri-axial excitation has emerged as a more accurate representation of an earthquake.

Edition 2.0 of this standard has been reviewed in consideration of these demanded conditions. However, it is impossible to perform the seismic test under all of the cabinet or rack conditions. The aim of this standard is then to evaluate the reference of the cabinet or rack structure with a common examination method. The seismic test is therefore assumed to be performed on one set of cabinet dimensional conditions (i.e. height, width and depth) and one set of load distribution conditions in the cabinet. The input acceleration for the test specimen is assumed to be selected and applied either single-axial or tri-axial. Single-axis acceleration was already specified in Edition 1.0 of this standard. Therefore, the RRS (required response spectra) for tri-axial acceleration have been added. According to this standard, the examination should be performed in the same manner, so as to obtain a reference for the evaluation of the structural strength of the tested cabinet or rack.

The user who requests an individual structural cabinet or rack condition, such as a different cabinet size or a different load distribution in the cabinet, and requests different seismic acceleration intensity, can perform the test by changing the corresponding condition specified in this standard. In this case, the test result is treated as an individual evaluation, not to be taken as a reference.

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

## Part 2: Seismic tests for cabinets and racks

### 1 Scope

This part of IEC 61587 specifies seismic tests for cabinets and racks accommodated with IEC 60917 and 60297 series. It applies, in whole or in part, only to the mechanical structures of cabinets and racks for electronic equipment according to the above cited series of standards, while it does not apply to the electronic equipment or systems deemed to be installed within these mechanical structures. This standard does not apply either to a cabinet or a rack having an anti-seismic isolation structure, either external or internal.

This standard aims to provide test conditions and criteria that constitute a reference to evaluate the ability of the mechanical structure of the cabinets or racks to acceptably withstand specified seismic intensities. For this purpose, this standard specifies test specimen conditions, such as dimensions (i.e. height, width and depth) of the cabinet and the rack, load distribution, structural test condition and the RRS (required response spectra) of single-axis or tri-axis acceleration as the seismic test wave condition. The single-axis or tri-axis acceleration is selectable.

### 2 Normative references

The following referenced documents are indispensable for the application 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 60068-2-6: *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-47: *Environmental testing – Part 2-47: Tests – Mounting of specimens for vibration, impact and similar dynamic tests*

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

IEC 60068-3-3: *Environmental testing – Part 3: Guidance – Seismic test methods for equipments*

IEC 60297 (all parts): *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series*

IEC 60917, (all parts): *Modular order for the development of mechanical structures for electronic equipment practices*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60068-2-6, IEC 60068-3-3, IEC 60068-2-47 and IEC 60068-2-57 apply.