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Standards

Irish Standard  
I.S. EN 60068-2-27:2009

# Environmental testing -- Part 2-27: Tests - Test Ea and guidance: Shock (IEC 60068-2-27:2008 (EQV))

## I.S. EN 60068-2-27:2009

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I.S. EN 60068-2-27:2009

EUROPEAN STANDARD

**EN 60068-2-27**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2009

ICS 19.040

Supersedes EN 60068-2-27:1993 and EN 60068-2-29:1993

English version

**Environmental testing -  
Part 2-27: Tests -  
Test Ea and guidance: Shock  
(IEC 60068-2-27:2008)**

Essais d'environnement -  
Partie 2-27: Essais -  
Essai Ea et guide: Chocs  
(CEI 60068-2-27:2008)

Umgebungseinflüsse -  
Teil 2-27: Prüfverfahren -  
Prüfung Ea und Leitfaden: Schocken  
(IEC 60068-2-27:2008)

This European Standard was approved by CENELEC on 2009-04-22. 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.

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**CENELEC**

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

**Central Secretariat: avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 104/448/FDIS, future edition 4 of IEC 60068-2-27, prepared by IEC TC 104, Environmental conditions, classification and methods of test, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60068-2-27 on 2009-04-22.

This European Standard supersedes EN 60068-2-27:1993 and EN 60068-2-29:1993.

The major technical changes with regard to EN 60068-2-27:1993 concern:

- the merging of EN 60068-2-29:1993 into this Part 2-27;
- the introduction of soft packaged specimens as defined in the IEC ad hoc working group document agreed in Stockholm:2000.

This standard is to be used in conjunction with EN 60068-1.

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) 2010-02-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2012-05-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60068-2-27:2008 was approved by CENELEC as a European Standard without any modification.

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

IEC 60068-2-31	NOTE	Harmonized as EN 60068-2-31:2008 (not modified).
IEC 60068-2-81	NOTE	Harmonized as EN 60068-2-81:2003 (not modified).
ISO/IEC 17025	NOTE	Harmonized as EN ISO/IEC 17025:2005 (not modified).

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## Annex ZA (normative)

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

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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	- <sup>1)</sup>	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 <sup>2)</sup>
IEC 60068-2-47	2005	Environmental testing - Part 2-47: Tests - Mounting of specimens for vibration, impact and similar dynamic tests	EN 60068-2-47	2005
IEC 60068-2-55	- <sup>1)</sup>	Environmental testing - Part 2-55: Tests - Test Ee and guidance: Bounce	EN 60068-2-55	1993 <sup>2)</sup>
IEC 60721-3-1	- <sup>1)</sup>	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 1: Storage	EN 60721-3-1	1997 <sup>2)</sup>
IEC 60721-3-5	- <sup>1)</sup>	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 5: Ground vehicle installations	EN 60721-3-5	1997 <sup>2)</sup>
IEC Guide 104	- <sup>1)</sup>	The preparation of safety publications and the use of basic safety publications and group safety publications	—	—

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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IEC 60068-2-27

Edition 4.0 2008-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

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

**Essais d'environnement –  
Partie 2-27: Essais – Essai Ea et guide: Chocs**



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IEC 60068-2-27

Edition 4.0 2008-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

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

**Essais d'environnement –  
Partie 2-27: Essais – Essai Ea et guide: Chocs**

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## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions .....	8
4 Description of test apparatus .....	9
4.1 Required characteristics .....	9
4.2 Measuring system.....	11
4.3 Mounting .....	12
5 Severities .....	13
6 Preconditioning.....	14
7 Initial measurements and functional performance test .....	15
8 Testing .....	15
9 Recovery .....	15
10 Final measurements .....	15
11 Information to be given in the relevant specification.....	15
12 Information to be given in the test report .....	16
Annex A (normative) Selection and application of pulse shapes – Guidance.....	17
Annex B (informative) Shock response spectra and other characteristics of pulse shapes.....	27
Annex C (informative) Comparison between impact tests.....	36
Bibliography .....	37
Figure 1 – Pulse shape and limits of tolerance for half-sine pulse .....	10
Figure 2 – Pulse shape and limits of tolerance for final-peak saw-tooth pulse.....	10
Figure 3 – Pulse shape and limits of tolerance for trapezoidal pulse.....	11
Figure 4 – Frequency characteristics of the overall measuring system .....	12
Figure A.1 – Shock response spectrum of a symmetrical half-sine pulse .....	19
Figure A.2 – Shock response spectrum of a final-peak saw-tooth pulse .....	20
Figure A.3 – Shock response spectrum of a symmetrical trapezoidal pulse .....	21
Figure B.1 – Framework or box containing oscillatory systems of which $f_1$ , $f_2$ and $f_3$ are examples of resonance frequencies .....	27
Figure B.2a – Exciting pulse .....	29
Figure B.2b – Responses for $f_1$ , $f_2$ and $f_3$ .....	29
Figure B.2c – Spectra which result from an infinite number of frequencies, with $f_1$ , $f_2$ and $f_3$ shown as finite points on the continuous curves.....	29
Figure B.2 – Shock response spectrum concept .....	29
Figure B.3 – Framework containing damped multi-degree-of-freedom system .....	31
Figure B.4 – Shock response spectrum of a half-sine pulse with ripple.....	33

Figure B.5 – Spectrum of a final-peak saw-tooth  $300 \text{ m/s}^2$ , 18 ms pulse compared with the spectra of  $200 \text{ m/s}^2$  half-sine pulses with durations between 3 ms and 20 ms ..... 35

Table 1 – Severities for shock testing ..... 14

Table A.1 – Examples of pulse shapes and test severities typically employed for various applications..... 23

Table A.2 – Examples of severities typically employed for various applications ..... 24

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### ENVIRONMENTAL TESTING –

#### Part 2-27: Tests – Test Ea and guidance: Shock

### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60068-2-27 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test

This fourth edition cancels and replaces the third edition, published in 1987, and includes the merging of IEC 60068-2-29, second edition (1987). It constitutes a technical revision.

The major changes with regard to the previous edition concern:

- the merging of IEC 60068-2-29 into this edition of IEC 60068-2-27; Part 2-29 will be withdrawn as soon as this edition is published;
- the introduction of soft packaged specimens as defined in the IEC ad hoc working group document agreed in Stockholm:2000.

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

FDIS	Report on voting
104/448/FDIS	104/457/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.

It has the status of a basic safety publication in accordance with IEC Guide 104.

This standard is to be used in conjunction with IEC 60068-1.

A list of all the parts in the IEC 60068 series, under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

This part of IEC 60068 deals with components, equipments and other electrotechnical products, hereinafter referred to as “specimens”, which, during transportation, storage and handling, or in use, may be subjected either to conditions involving relatively infrequent non-repetitive or repetitive shocks. The shock test may also be used as a means of establishing the satisfactory design of a specimen in so far as its structural integrity is concerned and as a means of quality control. It consists of subjecting a specimen either to non-repetitive or repetitive shocks of standard pulse shapes with specified peak acceleration and duration.

Specification writers will find a list of details to be considered for inclusion in specifications in Clause 11. The necessary guidance is given in Annex A.

## ENVIRONMENTAL TESTING –

### Part 2-27: Tests – Test Ea and guidance: Shock

#### 1 Scope

This part of IEC 60068 provides a standard procedure for determining the ability of a specimen to withstand specified severities of non-repetitive or repetitive shocks.

The purpose of this test is to reveal mechanical weakness and/or degradation in specified performances, or accumulated damage or degradation caused by shocks. In conjunction with the relevant specification, this may be used in some cases to determine the structural integrity of specimens or as a means of quality control (see Clause A.2).

This test is primarily intended for unpackaged specimens and for items in their transport case when the latter may be considered to be part of the specimen. If an item is to be tested unpackaged, it is referred to as a test specimen. However, if the item is packaged, then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen. When used in conjunction with IEC 60068-2-47, this standard may be used for testing packaged products. This possibility was included in the 2005 version of IEC 60068-2-47 for the first time.

This standard is written in terms of prescribed pulse shapes. Guidance for the selection and application of these pulses is given in Annex A and the characteristics of the different pulse shapes are discussed in Annex B.

Wherever possible, the test severity and the shape of the shock pulse applied to the specimen should be such as to reproduce the effects of the actual transport or operational environment to which the specimen will be subjected, or to satisfy the design requirements if the object of the test is to assess structural integrity (see Clauses A.2 and A.4).

For the purposes of this test, the specimen is always mounted to the fixture or the table of the shock testing machine during testing.

NOTE The term “shock testing machine” is used throughout this standard, but other means of applying pulse shapes are not excluded.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications.

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

IEC 60068-2-47:2005, *Environmental testing – Part 2-47: Tests – Mounting of specimens for vibration, impact and similar dynamic tests*

IEC 60068-2-55, *Environmental testing – Part 2-55: Tests – Test Ee and guidance: Bounce*

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