

Basic environmental testing procedures - Part 2: Tests - Test Ea and guidance: Shock

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 60068-2-27:2002 sisaldab Euroopa standardi EN 60068-2-27:1993 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.12.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 60068-2-27:2002 consists of the English text of the European standard EN 60068-2-27:1993.</p> <p>This document is endorsed on 18.12.2002 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>The object of the test is to determine the suitability of components and equipment for application where they are subjected to non-repetitive mechanical shocks and/or to assess their structural integrity.</p>	<p>Scope:</p> <p>The object of the test is to determine the suitability of components and equipment for application where they are subjected to non-repetitive mechanical shocks and/or to assess their structural integrity.</p>
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ICS 19.040

Võtmesõnad: components, components specification writing, electricity, equipment, equipment specification writing, mechanical test, procedures, shock test

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Supersedes HD 323.2.27 S2:1988

Descriptors: Electricity, components, equipment, mechanical test, shock test, procedures, components specification writing, equipment specifications writing

ENGLISH VERSION

Basic environmental testing procedures

Part 2: Tests

Test Ea and guidance: Shock

(IEC 68-2-27:1987)

Essais fondamentaux climatiques
et de robustesse mécanique
Deuxième partie: Essais
Essai Ea et guide: Chocs
(CEI 68-2-27:1987)

Grundlegende Umweltprüfverfahren
Teil 2: Prüfungen
Prüfung Ea und Leitfaden:
Schocken
(IEC 68-2-27:1987)

This European Standard was approved by CENELEC on 1993-03-09.

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, 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

FOREWORD

At the request of CENELEC Reporting Secretariat SR 50A, HD 323.2.27 S2:1988 (IEC 68-2-27:1987) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60068-2-27 on 9 March 1993.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-03-01
- latest date of withdrawal of conflicting national standards (dow) -

Annexes designated "normative" are part of the body of the standard. In this standard, annex ZA is normative.

ENDORSEMENT NOTICE

The text of the International Standard IEC 68-2-27:1987 was approved by CENELEC as a European Standard without any modification.

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

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

IEC Publication	Date	Title	EN/HD	Date
68-1	1982*	Basic environmental testing procedures Part 1: General and guidance	HD 323.1 S1	1988
68-2-29	1968*	Part 2: Tests - Test Eb: Bump	HD 323.2.29 S1	1989
68-2-31	1969	Test Ec: Drop and topple, primarily for equipment-type specimens	EN 60068-2-31*	1993
68-2-32	1975	Test Ed: Free fall	EN 60068-2-32*	1993
68-2-47	1982	Mounting of components, equipment and other articles for dynamic tests including shock (Ea), bump (Eb), vibration (Fc and Fd) and steady-state acceleration (Ga) and guidance	EN 60068-2-47	1993
68-2-55	1987	Test Ee and guidance: Bounce	EN 60068-2-55	1993
721-3-1	1987*	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Storage	HD 478.3.1 S1	1990
721-3-5	1985*	Ground vehicle installations	-	-

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- * IEC 68-1:1982 is superseded by IEC 68-1:1988 which is harmonized as HD 323.1 S2:1988
 - * IEC 68-2-29:1968 is superseded by IEC 68-2-29:1987 which is harmonized as EN 60068-2-29:1993
 - * EN 60068-2-31 includes A1:1982
 - * EN 60068-2-32 includes A1:1982 + A2:1990
 - * IEC 721-3-1:1987 is superseded by IEC 721-3-1:1991 which is harmonized as EN 60721-3-1:1993
 - * IEC 721-3-5:1991 is harmonized as EN 60721-3-5:1993

INTERNATIONAL STANDARD

IEC
60068-2-27

Third edition
1987

Basic environmental testing procedures –

Part 2: Tests – Test Ea and guidance: Shock

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



Reference number
IEC 60068-2-27:1987(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.

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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/searchpub) 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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test Ea and guidance: Shock

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the test of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by Sub-Committee 50A: Shock and Vibration Tests, of IEC Technical Committee No. 50: Environmental Testing.

This third edition replaces the second edition of IEC Publication 68-2-27 (1972). It includes Amendment No. 1 (1982) and Amendment No. 2 (1983).

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

Six Months' Rule	Reports on Voting
50A(CO)161 50A(CO)162	50A(CO)168 50A(CO)169

Further information can be found in the relevant Reports on Voting indicated in the table above.

The following IEC publications are quoted in this standard:

Publication Nos. 68-1 (1982): Basic Environmental Testing Procedures, Part I: General and Guidance.

68-2: Part 2: Tests.

68-2-29 (1986): Test Eb and Guidance: Bump.

68-2-31 (1969): Test Ec: Drop and Topple, Primarily for Equipment-type Specimens.

68-2-32 (1975): Test Ed: Free Fall.

68-2-47 (1982): Mounting of Components, Equipment and Other Articles for Dynamic Tests Including Shock (Ea), Bump (Eb), Vibration (Fc and Fd) and Steady-state Acceleration (Ga) and Guidance.

68-2-XX: Test Ee and Guidance: Bounce. (In preparation.)

721-3: Classification of Environmental Conditions, Part 3: Classification of Groups of Environmental Parameters and Their Severities.

721-3-1: Part 3: Classification of Groups of Environmental Parameters and Their Severities — Storage. (Under consideration.)

721-3-5 (1985): Part 3: Classification of Groups of Environmental Parameters and Their Severities — Ground Vehicle Installations.

Other publication quoted:

ISO Standard 2041 (1975): Vibration and Shock — Vocabulary.

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test Ea and guidance: Shock

INTRODUCTION

This test is applicable to components, equipments and other electrotechnical products, hereinafter referred to as “specimens”, which, during transportation or in use, may be subjected to conditions involving relatively infrequent non-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 basically of subjecting a specimen to non-repetitive shocks of standard pulse shapes with specified peak acceleration and duration.

Specification writers will find in Clause 11 a list of details to be considered for inclusion in specifications and in Appendix A the necessary guidance.

1. Scope

To provide a standard procedure for determining the ability of a specimen to withstand specified severities of shock.

2. General description

This standard is written in terms of prescribed pulse shapes. Guidance for the selection and application of these pulses is given in Appendix A and the characteristics of the different pulse shapes are discussed in Appendix B. Three types of pulse, namely the half-sine pulse, the final-peak saw-tooth pulse and the trapezoidal pulse are included in this standard. The choice of pulse shape depends on a number of factors, and the difficulties inherent in making such a choice preclude a preferred order being given in this standard (see Clause A3).

The purpose of the test is to reveal mechanical weakness and/or degradation in specified performance and to use this information, in conjunction with the relevant specification, to decide whether a specimen is acceptable or not. It may also be used, in some cases, to determine the structural integrity of specimens or as a means of quality control (see Clause A2).

This test is primarily intended for unpackaged specimens and for items in their transport case when the latter may be considered as part of the specimen itself.

The shocks are not intended to reproduce those encountered in practice. 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 A2 and A4).

For the purpose of this test the specimen is always fastened to the fixture or the table of the shock-testing machine during conditioning.