SLOVENSKI STANDARD
SIST EN 60068-2-29:2001

01-september-2001

Basic environmental testing procedures - Part 2: Tests - Test Eb and guidance: Bump

Environmental testing -- Part 2: Tests - Test Eb and guidance: Bump

Grundlegende Umweltprüfverfahren -- Teil 2: Prüfungen - Prüfung Eb und Leitfaden: Dauerschocken

Essais fondamentaux climatiques et de robustesse mécanique -- Partie 2: Essais - Essai Eb et guide: Secousses

Ta slovenski standard je istoveten z: EN 60068-2-29:1993

ICS:

19.040	Preskušanje v zvezi z okoljem	Environmental testing

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EUROPEAN STANDARD EN 60068-2-29

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ENGLISH VERSION

Basic environmental testing procedures
Part 2: Tests
Test Eb and guidance: Bump
(IEC 68-2-29:1987 + corrigendum)

Essais fondamentaux climatiques et de robustesse mécanique
Deuxième partie: Essais
Essai Eb et guide: Secousses
(CEI 68-2-29:1987)

Grundlegende Umweltprüfverfahren
Teil 2: Prüfungen
Prüfung Eb und Leitfaden: Dauerschocken
(IEC 68-2-29:1987)

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 323.2.29 S2:1989 (IEC 68-2-29:1987 + corrigendum) 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 60068-2-29 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 68-2-29:1987 and its corrigendum 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
68-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
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 60668-2-47	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	EN 60721-3-1*	1993
721-3-5	1985	Ground vehicle installations	EN 60721-3-5*	1993

* IEC 68-1:1982 is superseded by IEC 68-1:1988 which is harmonized as HD 323.1 S2:1988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

NORME INTERNATIONALE
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Essais fondamentaux climatiques et de robustesse mécanique

Deuxième partie: Essais — Essai Eb et guide: Secousses

Basic environmental testing procedures

Part 2: Tests — Test Eb and guidance: Bump

Publication
68-2-29: 1987

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test Eb and guidance: Bump

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 text 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 second edition of IEC Publication 68-2-29 replaces the first edition issued in 1968, Amendment No. 1 (1982) and Amendment No. 2 (1983).

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

Six Months' Rule	Report on Voting
50A(CO)163 50A(CO)171	50A(CO)170 50A(CO)174

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

The following IEC publications are quoted in this standard:

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

68-2: Part 2: Tests.

68-2-27 (1986): Test Ea and Guidance: Shock.

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.)

721-3-1: Classification of Environmental Conditions. 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 Eb and guidance: Bump

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 repetitive shocks. The bump 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, on a bump tester, a specimen to repetitive shocks of a standard pulse shape with specified peak acceleration and duration.

Note. — The term "bump tester" is used throughout this standard but other means of applying "bumps" are not excluded.

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. Object

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

2. General description

This standard is written in terms of a prescribed number of repetitive half-sine pulses with given peak acceleration and duration.

The purpose of the test is to reveal the accumulated damage or degradation caused by repetitive shocks, and to use the 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 A3.)

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 bumps are not intended to reproduce those encountered in practice. Wherever possible, the test severity 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 Clause A3).

For the purpose of this test the specimen is always fastened to the fixture or the table of the bump tester during conditioning.

In order to facilitate the use of this standard, references are given in the main part where the reader is invited to refer to Appendix A and the clause numbers in the main part are also referred to in Appendix A.

This standard is to be used in conjunction with IEC Publication 68-1: Basic Environmental Testing Procedures, Part 1: General and Guidance.

3. Definitions

The terms used are generally defined in ISO 2041 or IEC Publication 68-1.

The following additional terms and definitions are also applicable for the purposes of this standard.

3.1 *Fixing point*

Part of the specimen in contact with the fixture or the table of the bump tester and which is normally used to fasten the specimen in service.

3.2 *Check point*

Fixing point nearest to the centre of the table surface of the bump tester, unless there is a fixing point having a more rigid connection to the table, in which case this latter point shall be used.

Note. — This definition applies as there is only one nominated check point. Other standards in IEC Publication 68-2 contain definitions of "check point" applicable where provision is made for the control of the test by nomination of more than one check point.

3.3 *Bump severity*

Combination of the peak accceleration, the duration of the nominal pulse and the number of bumps.

3.4 *Velocity change*

Absolute value of the sudden change of speed resulting from the application of the specified acceleration.

Note. — The change is normally considered sudden if it takes place in a time that is short compared with the fundamental period of concern.

3.5 g_n

Standard acceleration due to the earth's gravity, which itself varies with altitude and geographical latitude.

Note. — For the purposes of this standard, the value of g_n is rounded up to the nearest unity, that is 10 m/s².

4. Description of test apparatus

4.1 *Required characteristics*

When the bump tester and/or fixture are loaded with the specimen, the bumps applied at the check point shall have the following specified characteristics.

4.1.1 *Basic pulse shape*

The true value of each half-sine pulse shall be within the limits of tolerance shown by the solid line in Figure 1, page 28.

Note. — Where it is not practicable to achieve a pulse shape falling within the specified tolerance, the relevant specification should state the alternative procedure to be applied (see Clause A4).