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## **Miljötålighetsprovning – Del 2-47: Provningsmetoder – Monteringsanvisningar vid dynamisk provning**

*Environmental testing –*

*Part 2-47: Test methods –*

*Mounting of specimens for vibration, impact and similar dynamic tests*

Som svensk standard gäller europastandarden EN 60068-2-47:2005. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60068-2-47:2005.

### **Nationellt förord**

Europastandarden EN 60068-2-47:2005<sup>\*)</sup>

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60068-2-47, Third edition, 2005 - Environmental testing - Part 2-47: Test methods - Mounting of specimens for vibration, impact and similar dynamic tests**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60068-2-47, utgåva 1, 2001, gäller ej fr o m 2008-05-01.

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<sup>\*)</sup> EN 60068-2-47:2005 ikraftsattes 2005-08-22 som SS-EN 60068-2-47 genom offentliggörande, d v s utan utgivning av något svenskt dokument.

### *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

### *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

### *Stora delar av arbetet sker internationellt*

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

### *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

### **SEK Svensk Elstandard**

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English version

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

Essais d'environnement  
Partie 2-47: Essais –  
Fixation de spécimens pour essais  
de vibrations, d'impacts et autres essais  
dynamiques  
(CEI 60068-2-47:2005)

Umgebungseinflüsse  
Teil 2-47: Prüfverfahren –  
Befestigung von Prüflingen zur Schwing-,  
Stoß- und ähnlichen dynamischen  
Prüfungen  
(IEC 60068-2-47:2005)

This European Standard was approved by CENELEC on 2005-05-01. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, 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

The text of document 104/359/FDIS, future edition 3 of IEC 60068-2-47, 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 60068-2-47 on 2005-05-01.

This European Standard supersedes EN 60068-2-47:1999 + corrigendum June 2000.

The major technical changes with regard to EN 60068-2-47:1999 are related to specific guidance on the testing of packaged products.

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) 2006-02-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2008-05-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 60068-2-47:2005 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 60068-2-6  | NOTE | Harmonized as EN 60068-2-6:1995 (not modified).  |
| IEC 60068-2-7  | NOTE | Harmonized as EN 60068-2-7:1993 (not modified).  |
| IEC 60068-2-21 | NOTE | Harmonized as EN 60068-2-21:1999 (not modified). |
| IEC 60068-2-27 | NOTE | Harmonized as EN 60068-2-27:1993 (not modified). |
| IEC 60068-2-29 | NOTE | Harmonized as EN 60068-2-29:1993 (not modified). |
| IEC 60068-2-31 | NOTE | Harmonized as EN 60068-2-31:1993 (not modified). |
| IEC 60068-2-32 | NOTE | Harmonized as EN 60068-2-32:1993 (not modified). |
| IEC 60068-2-57 | NOTE | Harmonized as EN 60068-2-57:2000 (not modified). |
| IEC 60068-2-59 | NOTE | Harmonized as EN 60068-2-59:1993 (not modified). |
| IEC 60068-2-64 | NOTE | Harmonized as EN 60068-2-64:1994 (not modified). |
| IEC 60068-2-65 | NOTE | Harmonized as EN 60068-2-65:1994 (not modified). |
| IEC 60068-2-75 | NOTE | Harmonized as EN 60068-2-75:1997 (not modified). |
| IEC 60068-2-81 | NOTE | Harmonized as EN 60068-2-81:2003 (not modified). |

**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 Where 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        | 1988        | Environmental testing<br>Part 1: General and guidance | EN 60068-1 <sup>1)</sup> | 1994        |
| IEC 60068-2-55     | 1987        | Part 2: Tests - Test Ee and guidance:<br>Bounce       | EN 60068-2-55            | 1993        |
| ISO 2041           | 1990        | Vibration and shock - Vocabulary                      | -                        | -           |

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<sup>1)</sup> EN 60068-1 includes corrigendum October 1988 + A1:1992 to IEC 60068-1.

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## INTRODUCTION

This part of IEC 60068 defines the requirements and gives information regarding the mounting of components, equipment and other articles and packaged products, referred to as "specimens", when they are subjected to vibration, impact and similar dynamic tests.

In all cases, component-type specimens are mounted as stated in the relevant specification. Where these details are not specified, a number of standardized methods of mounting are given in this standard.

Equipment-type specimens should be mounted by their normal means of attachment unless otherwise stated in the relevant specification.

An attempt is made, in the first instance, to categorize specimens into either component or equipment types and then to proceed to test accordingly. If this is not possible, for example for packaged items, this standard may still be relevant, but relates to the packaging and not to the contents. It should be noted that this standard does not apply to the testing of empty packaging.

General guidance is provided in Annex A, as appropriate for both the specification writer and the test engineer. Specific guidance on the testing of packaged products is given in Annex B. Annex C provides guidance on the methodology for modifying a half sine pulse test, used as input to a packaged specimen, when the packaging is not available.

In some instances, requirements and guidance on mounting are included, partly or wholly, in the individual standards of the IEC 60068 series, for example, Test Fh. Where such a standard is called up by the relevant specification, it will need to be studied as well as this standard.

## ENVIRONMENTAL TESTING –

### **Part 2-47: Tests – Mounting of specimens for vibration, impact and similar dynamic tests**

#### **1 Scope**

This part of IEC 60068 provides methods for mounting products, whether packaged or unpackaged, as well as mounting requirements for equipment and other articles, for the series of dynamic tests in IEC 60068-2, that is impact (Test E), vibration (Test F) and acceleration, steady-state (Test G). When they are fastened to the test apparatus and subjected to these tests, whether packaged or unpackaged, they are referred to as specimens.

#### **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 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-55:1987, *Environmental testing – Part 2-55: Tests – Test Ee and guidance: Bounce*

ISO 2041:1990, *Vibration and shock – Vocabulary*