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**Environmental testing - Part 2-77: Tests - Test 77: Body strength and impact shock**

Environmental testing -- Part 2-77: Tests - Test 77: Body strength and impact shock

Umweltprüfungen -- Teil 2-77: Prüfungen - Prüfung 77: Körperfestigkeit und Schlagprüfung

Essais d'environnement -- Partie 2-77: Essais - Essai 77: Résistance du corps et résistance au choc par impact (standards.iteh.ai)

Ta slovenski standard je istoveten z: **EN 60068-2-77:1999**  
SIST EN 60068-2-77:2001  
<https://standards.iteh.ai/catalog/standards/sist/ac2d9125-7985-45bc-8438-ae539ee3f6c3/sist-en-60068-2-77-2001>

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**ICS:**

19.040	Preskušanje v zvezi z okoljem	Environmental testing
31.190	Sestavljeni elektronski elementi	Electronic component assemblies

**SIST EN 60068-2-77:2001****en**

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[SIST EN 60068-2-77:2001](#)

<https://standards.iteh.ai/catalog/standards/sist/ae2d9123-7985-43bc-8438-ae539ee3f6c3/sist-en-60068-2-77-2001>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60068-2-77**

April 1999

ICS 19.040; 31.190

English version

**Environmental testing**  
**Part 2-77: Tests - Test 77: Body strength and impact shock**  
**(IEC 60068-2-77:1999)**

Essais d'environnement  
Partie 2-77: Essais  
Essai 77: Résistance du corps  
et résistance au choc par impact  
(CEI 60068-2-77:1999)

Umweltprüfungen  
Teil 2-77: Prüfungen  
Prüfung 77: Körperfestigkeit und  
Schlagprüfung  
(IEC 60068-2-77:1999)

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This European Standard was approved by CENELEC on 1999-04-01. 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, Czech Republic, 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

The text of document 91/155/FDIS, future edition 1 of IEC 60068-2-77, prepared by IEC TC 50, Environmental testing and published by IEC TC 91, Surface mounting technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60068-2-77 on 1999-04-01.

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) 2000-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-01-01

Annexes designated "normative" are part of the body of the standard.  
Annexes designated "informative" are given for information only.  
In this standard, annex ZA is normative and annex A is informative.  
Annex ZA has been added by CENELEC.

### Endorsement notice

The text of the International Standard IEC 60068-2-77:1999 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex A, Bibliography, the following note has to be added for the standard indicated:

IEC 60068-2-21 NOTE: Harmonized as EN 60068-2-21:1999 (not modified).



**Annex ZA (normative)****Normative references to international publications  
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60194	-	Terms and definitions for printed circuits	-	-

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# INTERNATIONAL STANDARD

# IEC 60068-2-77

First edition  
1999-01

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**Environmental testing –**  
**Part 2-77:**  
**Tests – Test 77 – Body strength and impact shock**

**ITC STANDARD PREVIEW**  
*Essais d'environnement –*  
*Partie 2-77:*  
*Essais – Essai 77 – Résistance du corps*  
*et résistance au choc par impact*

<https://standards.iteh.ai/catalog/standards/sist/ae2d9123-7985-43bc-8438-ae539ee3f6c3/sist-en-60068-2-77-2001>

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ENVIRONMENTAL TESTING –

## Part 2-77: Tests – Test 77: Body strength and impact shock

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60068-2-77 has been prepared by IEC technical committee 50: Environmental testing, and is published by IEC technical committee 91: Surface mounting technology.

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

FDIS	Report on voting
91/155/FDIS	91/162/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.

Annex A is for information only.



## 4.2 Impact shock

This test evaluates the physical resistance of SMDs against impact shock. This test simulates the dynamic forces applied by picking and placing tools on a high speed mounting machine. The influence of a dynamic force on a device can differ from the influence of a static force. This test shall be referred to in the relevant detail specification.

## 5 Test

### 5.1 Equipment

#### a) Body strength equipment

The equipment shall be able to apply the specified force to the specimen and maintain the test load for the specified duration. The length (L) of the tip of the pushing tool shall be wider than the width (W) of the specimen under test. Unless otherwise specified in the relevant specification, the shape of the tip of the pushing tool shall be chamfered with a radius of 0,5 mm. The thickness of the pushing tool is not specified (see figure 1). If this specification cannot be applied due to the shape or construction of the specimen under test or for any other reason, the shape of the pushing tool shall be specified in the relevant specification.

#### b) Impact shock equipment

The equipment shall be able to apply the specified potential energy to the specimen. The principle of the equipment is given in figure 4. The potential energy is given by the following formula:

$$E_p(\text{J}) = m(g) g h (\text{cm}) 10^{-7}$$

where

$E_p$  is the potential energy;

$m$  is the load (weight of collet, shaft and additional weight);

$g$  is the gravity;

$h$  is the height.

The equipment shall be capable of generating a specified impact energy to a specimen by dropping a load (collet and weight) (see figure 5). No apparent friction shall be experienced when the collet and weight are dropped. The material of the base of the equipment shall be made of metal in excess of 1 cm thick, having a sufficiently larger area than the specimen to be tested and weighing more than 2 kg. There shall be no material under the base which might reduce the impact energy, such as an elastomer sheet. The equipment shall be placed on a concrete floor or equivalent rigid structure. The construction and dimensions of the specimen holding jig shall be given in the relevant specification.

### 5.2 Preconditioning

Specimens which need preconditioning shall be pretreated in accordance with the relevant specification.

### 5.3 Initial measurements

Visual inspection of the specimen shall be made with the assistance of a magnification of at least 10x under adequate lighting (e.g. 2 000 lx). If specified in the relevant specification, electrical and/or mechanical characteristics shall be measured.