



**SLOVENSKI STANDARD**  
**SIST EN 14149:2003**  
**01-oktober-2003**

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9a VUÛjU!`7 Ycj JHÛbUdc`b^YbUhfUbgdcfbUYa VUÛjUË`DfYg\_i g'g'dfYj fU Ub^Ya

Packaging - Complete, filled transport packages and unit loads - Impact test by rotational drop

Verpackung - Versandfertige Packstücke und Ladeeinheiten - Vertikale Stoßprüfung durch Kippen

**iTeh STANDARD PREVIEW**

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Emballages - Emballages d'expédition et charges unitaires complets et pleins - Essai de choc par chute par basculement

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**ICS:**

55.180.40	Celovita, napolnjena transportna embalaža	Complete, filled transport packages
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EUROPEAN STANDARD

EN 14149

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2003

ICS 55.180.40

English version

## Packaging - Complete, filled transport packages and unit loads - Impact test by rotational drop

Emballages - Emballages d'expédition et charges unitaires  
complets et pleins - Essai de choc par chute par  
basculement

Verpackung - Versandfertige Packstücke und  
Ladeeinheiten - Vertikale Stoßprüfung durch Kippen

This European Standard was approved by CEN on 10 July 2003.

CEN 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 Management Centre or to any CEN 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 CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This document (EN 14149:2003) has been prepared by Technical Committee CEN /TC 261, "Packaging", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2004, and conflicting national standards shall be withdrawn at the latest by February 2004.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 14149:2003 (E)****1 Scope**

This European Standard specifies methods for carrying out a rotational impact test on complete, filled transport packages or unit loads, by dropping. It can be performed either as a single test to investigate the effects of rotational impact or as part of a sequence of tests designed to measure the ability of a package or unit load to withstand a distribution system that includes a rotational impact hazard.

**2 Normative reference(s)**

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 revision 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).

EN 22206, *Packaging - Complete, filled transport packages - Identification of parts when testing (ISO 2206:1987)*

EN ISO 2233, *Packaging - Complete, filled transport packages and unit loads - Conditioning for testing (ISO 2233:2000)*

**3 Terms and definitions**

For the purposes of this European Standard, the following terms and definitions apply

**3.1  
test item**

complete, filled transport package or unit load

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**4 Principle**

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One edge or corner of the test item is raised to a predetermined height above a rigid impact surface, the opposite edge or corner resting either on the impact surface, or on one or two blocks of specified height. The test item is then released to fall freely and impact the rigid impact surface.

**5 Apparatus****5.1 Lifting arrangement**

Equipment to raise an edge or corner of the test item to the test height within  $\pm 2\%$  and support it in a stable position for the test.

**5.2 Means of holding the test item**

A means of holding the test item prior to release in its predetermined attitude.

**5.3 Release mechanism**

Release mechanism, to release the test item in such a way that its free fall is not obstructed by any part of the apparatus before striking the impact surface.

**5.4 Supporting blocks**

Rigid block(s) of suitable height(s) for supporting edges or corners as required.

## 5.5 Impact surface

Impact surface, horizontal and flat, massive enough to be immovable and rigid enough to be non-deformable under the test conditions.

The impact surface provided shall be:

- a) integral with a mass at least 50 times that of the heaviest test item to be tested ;
- b) flat, such that no two points on its surface differ in level by more than 2 mm ;
- c) rigid, such that it will not be deformed by more than 0,1 mm when an area of 100 mm<sup>2</sup> is loaded statically with 10 kg anywhere on the surface;
- d) sufficiently large to ensure that the test item falls entirely upon the surface.

## 6 Test item preparation

**6.1** The test item shall normally be filled with its intended contents. However, simulated or substituted contents may be used, provided that the dimensions and physical properties of such contents are as close as possible to those of the intended contents.

**6.2** Ensure that the test item is closed as if ready for distribution. If simulated or substituted contents are used, ensure that the normal method of closure is still employed.

## 7 Conditioning

The test item shall be conditioned in accordance with one of the conditions specified in EN ISO 2233.

## 8 Procedure

**NOTE** It is the responsibility of the user of this standard to establish appropriate safety and health practice in accordance with relevant legislation.

### 8.1 General

**8.1.1** Whenever possible the test shall be carried out in the same atmospheric conditions as used for conditioning, particularly where this is critical to the materials or application of the package. In other circumstances, the test shall be carried out in atmospheric conditions which are as near as practicable to those used for conditioning.

**8.1.2** Select the method(s) of test by identifying each edge face or corner to be impacted.

### 8.2 Method A - Face impact test - Drop flat on face by tilting about one edge

With one edge of the face under test resting on the impact surface, raise the opposite edge of the face under test to the predetermined height ( $h_c$ ) and release the test item to fall freely (see Figure 1)

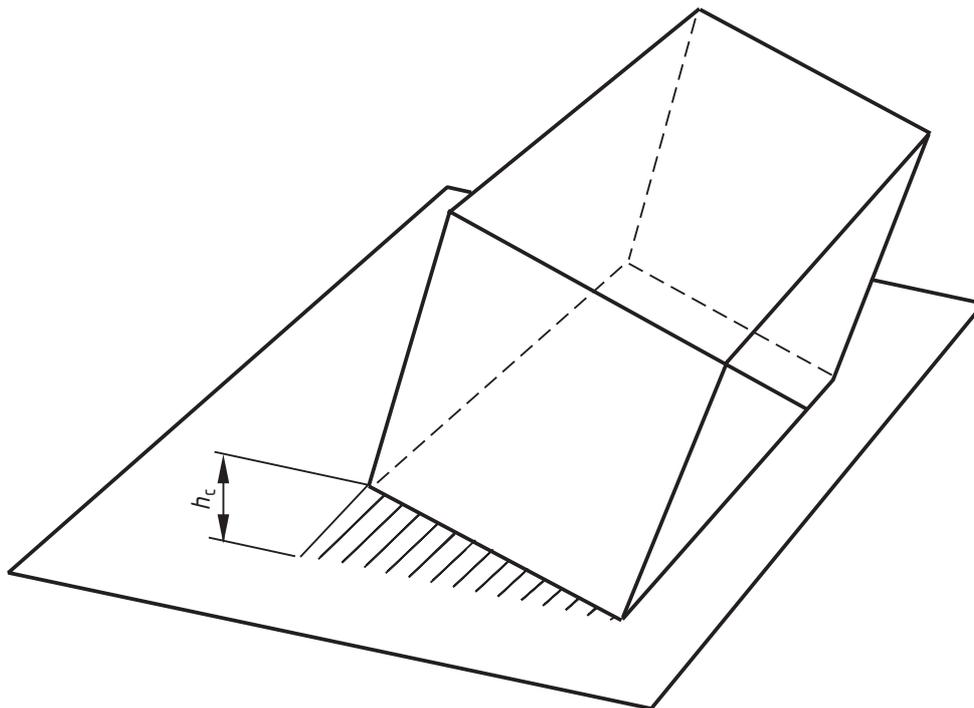
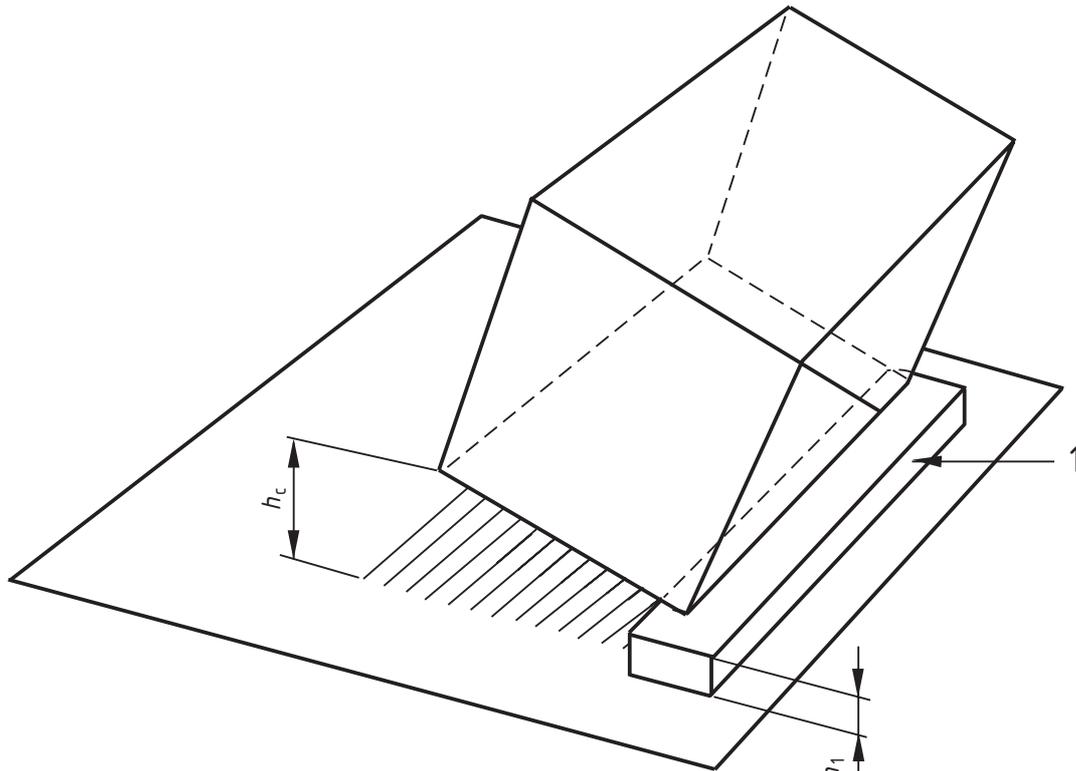


Figure 1 — Method A - Face impact test  
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### 8.3 Method B - Edge impact test - Drop on edge by tilting about parallel edge

With one edge of the test item supported on a block of specified height ( $h_1$ ), as near as practicable to the edge of the block, and within 10 cm from the edge, raise the opposite edge to the predetermined height ( $h_c$ ) and release the test item to fall freely. (see Figure 2).



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Key  
1 Block

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Figure 2 — Method B - Edge impact tests

#### 8.4 Method C 1 - Corner impact test - Drop on corner by tilting on two blocks

**8.4.1** Place one corner on a block of specified height ( $h_1$ ). Place an adjacent corner on a second block of specified height ( $h_2$ ), different from ( $h_1$ ), both corners being located as near as practicable to the edges of these supporting blocks and within 10 cm.

**8.4.2** Raise the corner diagonally opposite to that supported on the higher of the two blocks, to the predetermined height ( $h_c$ ) and release the test item to fall freely (see Figure 3). Alternatively, where this method is not practicable, the method described in 8.5 may be used.

NOTE The results from the two methods might not be identical.