



**SLOVENSKI STANDARD**  
**SIST EN 14602:2005**

**01-april-2005**

---

**Obutev - Preskusne metode za ocenjevanje ekoloških meril**

Footwear - Test methods for the assessment of ecological criteria

Schuhe - Prüfverfahren zur Beurteilung ökologischer Kriterien

Chaussure - Méthodes d'essai pour l'évaluation de critères écologiques

**Ta slovenski standard je istoveten z: EN 14602:2004**

SIST EN 14602:2005  
<https://standards.iteh.ai/catalog/standards/sist/e5905726-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005>

---

**ICS:**

61.060

Obuvala

Footwear

**SIST EN 14602:2005**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 14602:2005](https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005)

<https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005>

EUROPEAN STANDARD

EN 14602

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2004

ICS 61.060

English version

## Footwear - Test methods for the assessment of ecological criteria

Chaussure - Méthodes d'essai pour l'évaluation de critères écologiques

Schuhe - Prüfverfahren zur Beurteilung ökologischer Kriterien

This European Standard was approved by CEN on 10 September 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies 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.

[SIST EN 14602:2005](https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005)

<https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

|  | Page |
|--|------|
| Foreword.....  | 3    |
| 1 Scope .....  | 4    |
| 2 Normative references .....   | 4    |
| 3 Terms and definitions.....   | 5    |
| 4 Preparation of samples .....   | 6    |
| 4.1 General.....   | 6    |
| 4.3 Preparation for tests on whole footwear.....                       | 7    |
| 4.3.1 Grinding .....   | 7    |
| 4.3.2 Constitution of the ground sample .....                          | 8    |
| 5 Test methods.....  | 8    |
| 5.1 Determination of Cr (VI).....                                      | 8    |
| 5.2 Determination of total heavy metals content.....                   | 9    |
| 5.2.1 General.....   | 9    |
| 5.2.2 Test pieces digestion .....                                      | 9    |
| 5.2.3 Determination of heavy metals content.....                       | 10   |
| 5.2.4 Calculation and expression of results.....                       | 11   |
| 5.2.5 Test report .....  | 11   |
| 5.3 Determination of partially hydrolysable formaldehyde content ..... | 11   |
| 5.4 Determination of pentachlorophenol (PCP) concentration .....       | 11   |
| 5.5 Determination of azo-dyes.....                                     | 12   |
| 5.6 Determination of nitrosamines.....                                 | 13   |
| 5.7 Determination of Chloroalcanes .....                               | 13   |
| 5.8 Determination of the VOC emissions .....                           | 13   |
| 5.8.1 Procedure .....  | 13   |
| 5.8.2 Test report .....  | 14   |
| 5.9 Determination of phthalates in PVC.....                            | 14   |
| 5.10 Determination of cadmium in polymeric materials .....             | 14   |
| 5.11 Determination of organotin compound in footwear material .....    | 14   |
| 5.12 Determination of the electrical energy consumption.....           | 15   |
| 5.12.1 Apparatus and procedure .....                                   | 15   |
| 5.12.2 Calculation and expression of results.....                      | 15   |
| 5.12.3 Test report .....   | 15   |
| 5.13 Parameters contributing to durability.....                        | 15   |
| Bibliography .....   | 16   |

## Foreword

This document (EN 14602:2004) has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR.

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 May 2005, and conflicting national standards shall be withdrawn at the latest by May 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 14602:2005](https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005)

<https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005>

## EN 14602:2004 (E)

## 1 Scope

This document establishes the test methods to assess the ecological criteria of the footwear manufacturing process.

NOTE This document has been designed to define the test methods necessary to issue the footwear Ecolabel (JOCE 19<sup>th</sup> March 2002). However this standard covers more than this field.

This document applies to any kind of footwear except those containing electrical or electronic components.

The chemical analysis of the metallic components is outside of the scope of this document.

## 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.

EN 12770, *Footwear — Test methods for outsoles — Abrasion resistance.*

EN 12771, *Footwear — Test methods for outsoles — Tear strength.*

EN 12868, *Child use and care articles - Methods for determining the release of N-Nitrosamines and N-Nitrosatable substances from elastomer or rubber teats and soothers*

EN 13512, *Footwear — Test methods for uppers and lining — Flex resistance.*

EN 13516, *Footwear — Test methods for uppers, lining and insoles — Colour fastness to rubbing.*

EN 13518, *Footwear — Test methods for uppers — Water resistance.*

EN 13571, *Footwear — Test methods for uppers, lining and insoles — Tear strength.*

EN 14362-1, *Textiles — Methods for the determination of certain aromatic amines derived from azo colorants — Part 1: Detection of the use of certain azo colorants accessible without extraction.*

EN 14362-2, *Textiles — Methods for the determination of certain aromatic amines derived from azo colorants — Part 2: Detection of the use of certain azo colorants accessible by extracting the fibres.*

CEN/TS 14494, *Leather — Chemical tests — Determination of the content of pentachlorophenol in leather.*

CEN/TS 14495, *Leather — Chemical tests — Determination of chromium VI content*

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

EN ISO 5404, *Leather — Physical and mechanical tests — Determination of the water resistance of heavy leathers (ISO 5404:2002).*

EN ISO 11885, *Water quality — Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996).*

EN ISO 14184-1, *Textiles — Determination of formaldehyde — Part 1: Free and hydrolysed formaldehyde (water extraction method) (ISO 14184-1:1998).*

EN ISO 14184-2, *Textiles — Determination of formaldehyde — Part 2: Released formaldehyde (vapour absorption method) (ISO 14184-2:1998).*

EN ISO 17707, *Footwear — Test methods for outsoles — Flex resistance (ISO 17707:2004)*.

EN ISO 17708, *Footwear — Test methods for whole shoe — Sole adhesion (ISO 17708:2003)*.

CEN ISO/TS 17226, *Leather — Chemical tests — Determination of formaldehyde contents (ISO/TS 17226:2003)*.

CEN ISO/TS 17234, *Leather — Chemical tests — Determination of certain azo colourants in dyed leathers (ISO/TS 17234:2003)*.

ISO 7176-4, *Wheelchairs — Part 4: Energy consumption of electric wheelchairs and scooters for determination of theoretical distance range*.

ISO 8288, *Water quality — Determination of cobalt, nickel, copper, zinc, cadmium and lead — Flame atomic absorption spectrometric methods*.

ISO 18856 *Water quality -- Determination of selected phthalates using gas chromatography/mass spectrometry*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1

##### **volatile organic compound (VOC)**

organic compound having at 293,15 K a vapour pressure of 0,01 kPa or more, or having a corresponding volatility under the particular conditions of use

#### 3.2

##### **volatile organic compounds emissions (VOC emissions)**

amount of volatile organic compounds emitted to the atmosphere to produce a pair of shoes

<https://standards.iteh.ai/catalog/standards/sist/e5903728-b8ab-42f9-89ce-29185da29a7e/sist-en-14602-2005>

#### 3.3

##### **test period, T<sub>p</sub>**

consecutive test period during which:

- the production of the shoe or a group of shoes being analysed is well known
- the consumption of chemicals preparations is well known

#### 3.4

##### **pentachlorophenol (PCP)**

pentachlorophenol (CAS 87-86-5), the sodium salt of pentachlorophenol (CAS 131-52-2) and other pentachlorophenol salts and derivatives

#### 3.5

##### **process electric consumption (PEC)**

electricity used only by the process equipment used to manufacture the footwear

## EN 14602:2004 (E)

## 4 Preparation of samples

### 4.1 General

This standard describes different test methods either on footwear material or on the complete footwear or on the manufacturing of footwear. The different tests to perform are described in table 1.

The complete item of footwear is the sample. Several samples will be needed according to Table 1. No analysis is requested for empty box (packaging).

**Table 1: Tests to perform**

| Tests to perform        | Test clause | Materials   |                                  |        |                   |                                  | Complete footwear | Footwear manufacturing |
|-------------------------|-------------|---|----------------------------------|--------|-------------------|----------------------------------|-------------------|------------------------|
|                         |             | Leather and leather based materials <sup>1)</sup> | Textile and fibre based material | Rubber | PVC <sup>2)</sup> | Polymeric material <sup>3)</sup> |                   |                        |
| Chromium VI             | 5.1         | X   |                                  |        |                   |                                  |                   |                        |
| Cadmium                 | 5.10        |   |                                  |        |                   | X                                |                   |                        |
| Heavy metals (Cd-As-Pb) | 5.2         |   |                                  |        |                   |                                  | X                 |                        |
| Formaldehyde            | 5.3         | X   | X                                |        |                   |                                  |                   |                        |
| PCP and TCP             | 5.4         | X   | X                                |        |                   |                                  |                   |                        |
| Azo dyes                | 5.5         | X   | X                                |        |                   |                                  |                   |                        |
| Nitrosamines            | 5.6         |   |                                  | X      |                   |                                  |                   |                        |
| Chloroalcanes           | 5.7         |   |                                  |        |                   |                                  |                   | X                      |
| VOC                     | 5.8         |   |                                  |        |                   |                                  |                   | X                      |
| Phthalates              | 5.9         |   |                                  |        | X                 |                                  |                   |                        |
| Organotins compounds    | 5.11        | X   | X                                |        | X                 | X                                |                   |                        |
| Energy consumption      | 5.12        |   |                                  |        |                   |                                  |                   | X                      |
| Durability parameters   | 5.13        | See the corresponding standards                   |                                  |        |                   |                                  |                   |                        |

<sup>1)</sup> If the leather is tanned without Cr, then Cr (VI) analysis is not required  
<sup>2)</sup> Coated fabric PVC has to fulfil requirement of PVC and textile  
<sup>3)</sup> Coated fabric PU has to fulfil requirement of polymeric material and textile

### 4.2 Preparation for tests on materials

The samples are taken from either the footwear or raw materials.



### 4.3 Preparation for tests on whole footwear

Weigh the footwear,  $M_1$ , and then remove all the metallic pieces from the footwear.

Weigh the metallic parts,  $M_m$ , and determine the mass of the non metallic parts of the footwear,  $M_0$ , by the formula:

$$M_0 = M_1 - M_m \quad (1)$$

Dismantle the footwear; separate the hard material, which is that with hardness shore D according to EN ISO 868 greater than 50° (e.g. PVC, rubber, leather sole), from the soft material (e.g. textile, leather). Weigh the hard material,  $M_h$  and the soft material,  $M_s$ :

$$M_0 \approx M_h + M_s$$

Determine the percentage of hard ( $H\%$ ) and soft ( $S\%$ ) material by the formulas:

$$H\% = \frac{M_h}{M_h + M_s} \quad (2)$$

$$S\% = \frac{M_s}{M_h + M_s} \quad (3)$$

Hard and soft material will be ground separately.

#### 4.3.1 Grinding

##### 4.3.1.1 Soft material grinding

Separate leather and textile pieces for the specific analyses mentioned in clause 5. In cases where the footwear is made up of several types of leather or textile, then all leather will be jointly tested, and all textile will also be jointly tested.

Cut the soft material into pieces of side length between 30 mm and 50 mm, using the appropriate means (e.g. an electric saw).

Grind the pieces using the appropriate means (e.g. a leather grinder as described in EN ISO 4044) until the material passes through a sieve of 4 mm diameter mesh. The sample must be ground in small batches to allow rapid grinding and to avoid increasing the temperature of the sample excessively.

##### 4.3.1.2 Hard material grinding

###### 4.3.1.2.1 Common hard soling material (e.g. leather, PVC)

Cut the hard material into pieces of side length between 20 mm and 40 mm, using the appropriate means (e.g. an electric saw).

Grind the pieces using the appropriate means (e.g. a leather grinder as described in EN ISO 4044). If necessary, after each grinding operation, the mill should be left to cool down. The sample must be ground in small batches to allow rapid grinding and to avoid increasing the temperature of the sample excessively:

- carry out an initial short (5 min  $\pm$  1 min) grinding without use of any size restricting device, i.e. mesh. Several successive grindings can be carried out to complete the grinding of the whole sample;
- carry out a second grinding also for a short (5 min  $\pm$  1 min) time to reduce the material to a size which will pass through a sieve of 4 mm diameter mesh. Several successive grindings can be carried out to complete the grinding of the whole sample.