



# SLOVENSKI STANDARD

## oSIST prEN 15185:2022

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### Pohištvo - Ocenjevanje odpornosti površine proti obrabi

Furniture - Assessment of the surface resistance to abrasion

Möbel - Bewertung der Abriebfestigkeit von Oberflächen

Ameublement - Évaluation de la résistance de la surface à l'abrasion

Ta slovenski standard je istoveten z: prEN 15185

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#### ICS:

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Pohištvo

Furniture

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**prEN 15185**

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English Version

**Furniture - Assessment of the surface resistance to  
abrasion**

Ameublement - Évaluation de la résistance de la  
surface à l'abrasion

Möbel - Bewertung der Abriebfestigkeit von  
Oberflächen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 207.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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## European foreword

This document (prEN 15185:2022) has been prepared by Technical Committee CEN/TC 207 “Furniture”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15185:2011.

Compared with EN 15185:2011, the following modifications have been made:

- a) deviations of 5.4 “Test apparatus” modified and additional bullet regarding table rotary speed added;
- b) revision of 7.2 “Calibration of abrasive paper” and formula added for calculating a correction factor;
- c) revision of title 7.4.2 to “Foil, uncoated and coated laminate and melamine faced boards”;
- d) revision of title 7.4.4 to “Transparent lacquers on wood or lignocellulosic-substrates” and modified IP;
- e) completion of the statement on A.3.4 “Alignment - Dual head abrader”;
- f) Annex C deleted
- g) the significant changes in the revised edition are now given in the European foreword;
- h) Bibliography updated;
- i) document editorially revised in its entirety.

<https://standards.iteh.ai/catalog/standards/sist/e03737a9-586e-4b95-a837-b0a270794ae9/osist-pren-15185-2022>

## 1 Scope

This document specifies a method for the assessment of the abrasion resistance of surfaces with foils, laminates, melamine faced boards, pigmented and transparent lacquers.

It does not apply to leather and textile surfaces.

It does not apply to the surfaces covered by EN 14434.

The test is intended to be carried out on an unused part of the finished furniture, but can be carried out on test panels of the same material, finished in an identical manner to the finished product, and of a size sufficient to meet the requirements of the test.

The test is intended to be carried out on unused surfaces.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 ISO 6506-1, *Metallic materials - Brinell hardness test - Part 1: Test method (ISO 6506-1)*

ISO 9352, *Plastics — Determination of resistance to wear by abrasive wheels*

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

### 3.1

#### **test surface**

part of the test panel

### 3.2

#### **test panel**

panel including the test surface

Note 1 to entry: It may be cut from a finished item of furniture or it may be a separate panel produced in the same manner as the finished item of furniture.

### 3.3

#### **test area**

part of the test surface under the wheels covered by the abrasion paper strips (5.3)

### 3.4

#### **colour rendering index**

$R_a$

unitless number that specifies how well the colour of an object appears under illumination by a light source compared to a reference light source

## 4 Principle

The test simulates the ability of the furniture surface under test, to resist abrasive wear-through. Abrasion is achieved by rotating a specimen in contact with a pair of loaded cylindrical wheels covered with abrasive paper. The wheels are positioned so that their cylindrical faces are equidistant from the specimen's axis of rotation but not tangential to it. As they are turned by the rotating specimen they abrade an annular track on the specimen's surface. The number of revolutions of the specimen required to cause one defined degree of abrasion, is used as measurement of resistance to surface wear.

## 5 Apparatus and materials

### 5.1 Cleaning cloth

White soft absorbent cloth.

### 5.2 Calibration plates

Taber S-34 <sup>1</sup> or equivalent, having a thickness of  $(0,8 \pm 0,1)$  mm and a Brinell hardness of  $(48 \pm 2)$  when tested in accordance with EN ISO 6506-1, except that the ball diameter shall be 5 mm and the load 360 N.

### 5.3 Abrasion paper strips

Taber S-42 <sup>2</sup> or equivalent, of width  $(12,7 \pm 0,1)$  mm and length about 160 mm, according to the following specifications:

- a) paper of grammage from 70 g/m<sup>2</sup> to 100 g/m<sup>2</sup>;
- b) open coated 180 grit powdered aluminium oxide (Al<sub>2</sub>O<sub>3</sub>) having a particle size such that it will pass through a sieve of aperture 100 µm and remain on a sieve having an aperture of 63 µm;
- c) adhesive backing.

### 5.4 Test apparatus

As specified in ISO 9352 with following deviations <sup>3</sup>:

- a) the hardness of wheels' rubber layer shall be between 60 Shore A and 70 Shore A, when measured in the middle of the contact surface; make 4 measurements and calculate the average value;

The laboratories should measure the hardness at least once every 12 months. Checking of rubber wheels geometry shall be performed. If any deformation is observed the rubber wheel should be rejected.

- b) weight of loading: every wheel shall apply a force  $(5,4 \pm 0,2)$  N on the sample;
- c) vacuum system: the suction nozzle should be as close to the surface as possible without rubbing it. The vacuum system shall remove practically all the dust;

<sup>1</sup> Taber S-34 is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of this product.

<sup>2</sup> Taber S-42 is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of this product.

<sup>3</sup> A suitable machine is available from Taber Acquisition Corp., Taber industries, 455 Bryant St P.O. Box 164, North Tonawanda, NY 14120, USA. This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of the machine.

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- d) the distance between the middle axis of the sample holder and the wheels should be calibrated according to Annex A;
- e) the table rotary speed shall be  $(60 \pm 2)$  r/min.

**5.5 Balance**

The accuracy of the balance shall be 1 mg.

**5.6 Conditioning chamber**

A chamber with a standard atmosphere of  $(23 \pm 2)$  °C, relative humidity  $(50 \pm 5)$  %.

**5.7 Diffuse light source**

Light source providing evenly diffused light giving an illumination on the test surface of  $(1\,200 \pm 400)$  lx. This may either be diffused daylight or be diffused artificial daylight.

The daylight should be unaffected by surrounding trees, buildings, etc. When artificial light is used it is recommended that it should have a correlated colour temperature of  $(6\,500 \pm 50)$  K and a colour rendering index ( $R_a$ ) greater than 92, by using a colour matching booth in accordance with EN ISO 3668.

**6 Preparation and conditioning****6.1 Conditioning**

Conditioning of test surface shall begin at least one week before testing and shall be carried out in air at a temperature of  $(23 \pm 2)$  °C and relative humidity of  $(50 \pm 5)$  %.

NOTE The final curing of some coatings, such as waterborne coatings, can require a longer conditioning time.

The conditioning time shall be stated in the test report.

Condition the abrasion paper strips at least for one week in the conditioning atmosphere of  $(23 \pm 2)$  °C and  $(50 \pm 5)$  % RH, before testing; see 5.6.

**6.2 Test surface**

Three test surfaces shall be prepared.

The test surface shall be taken at least 5 mm from the edge of the test panel.

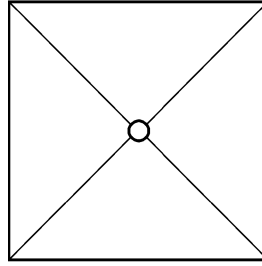
Each test surface shall be a piece of test panel, shaped to fit the type of clamping device used. It shall usually be a square of 100 mm × 100 mm, and including an appropriated hole drilled in the centre to place the test surface in the axis of the apparatus.

The test surface shall be carefully wiped with a cleaning cloth (5.1) before the test.

The test surface shall be substantially flat, and free from defect such as scratch, colour fading and surface folding.

**6.3 Preparation of test surfaces and abrasive paper**

Using a suitable marker pen, mark the surface of each test surface with two lines at right angles, diagonals, so that the surface area is divided into four quadrants, according to Figure 1.



**Figure 1 — Test surface area divided into four quadrants**

## 7 Test procedure

### 7.1 Preparation of abrasive wheels

Bond a strip of conditioned unused abrasive paper to each of the rubber covered wheels. Ensure that the cylindrical surface is completely covered, but without any overlapping of the abrasive paper.

### 7.2 Calibration of abrasive paper

Carry out this calibration three times for each box.

Prepare two abrasive wheels, in the correct hardness range (5.4), with conditioned unused strips of abrasive paper.

Clamp a zinc plate in the specimen holder, start the vacuum device, set the revolution-counter to zero, lower the wheels, ensuring that the arms are horizontal and the load on the zinc plate is  $(5,4 \pm 0,2)$  N, and abrade the zinc plate for 500 revolutions. Wipe the zinc plate clean and weigh to the nearest 1 mg. Replace the abrasive paper on the wheels with preconditioned unused strips from the same batch, clamp the same zinc plate in the specimen holder, lower the abrasive wheels and operate the suction device. Abrade the zinc plate for an additional 500 revolutions, then wipe it clean and reweigh it to the nearest 1 mg.

Any box containing abrasive paper which causes a loss in mass of the zinc plate which is outside  $(110 \pm 20)$  mg, for any pair of calibrate strips, shall not be used for testing.

Calculate a correction factor by use of Formula (1):

$$CF = \frac{(avg)}{(110)} \quad (1)$$

where

$CF$  is the correction factor;

$avg$  is the mean value if three calibrations, in mg;

110 is the limit for the mass loss value of the zinc plate, in mg.

Report this factor in the test report.

### 7.3 Abrasion of test area

Perform the test immediately after removal of the test surface and calibrated abrasive paper from the conditioning atmosphere.

Prepare two wheels, in the correct hardness range, with preconditioned unused abrasive paper from the same box previously approved by calibration. Fit the wheels to the machine and set the revolution counter to zero.

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Clamp the test surface in the holder, ensuring that it is placed horizontally. Lower the abrasive wheels on to the specimen, ensuring that the arms are horizontal and the load on the samples is  $(5,4 \pm 0,2)$  N. Start the vacuum device for removing practically all the dust, and begin abrading the test area.

**NOTE** If the arms are not horizontal, then there are two possibilities: to modify appropriately the apparatus or to reduce appropriately the thickness of the test surface before the conditioning; see Clause 6.

Before each assessment, in order to correctly assess the Initial Wear Point (IP); see 7.4, ensure the surface is free of dust. If needed, wipe with the cleaning cloth.

At the beginning of the test, the visual assessment shall be carried out, depending on the expected IP (see 7.4), as follows:

- under 200 revolutions, every 10 cycles;
- over 200 revolutions, every 25 cycles;
- over 500 revolutions, every 50 cycles;
- when close to IP, the assessment shall be carried out every 10 cycles.

Replace the abrasive paper after every 200 revolutions.

Continue the test in this way until the IP is reached. Record the number of revolutions.

## **7.4 Determination of initial wear point (IP)**

### **7.4.1 General**

The determination of IP shall be established by one observer experienced in this type of assessment. In case of a dispute, three observers shall carry out the visual assessment.

The determination of IP shall be carried out under the light described above; see 5.7.

To assess the IP, use the following.

### **7.4.2 Foil, uncoated and coated laminate and melamine faced boards**

The first clearly recognizable wear-through of the print, pattern or plain colour appears and the sublayer becomes exposed in four quadrants.

Compare the examined test surface with the examples for IP points; see Table B.1.

The sub-layer for printed patterns is the background on which the pattern is printed; for plain colours it is the first sub-layer of different colour.

### **7.4.3 Pigmented lacquers**

The first clearly recognizable wear-through of the substrate, or layer with other colour, appears in all the four quadrants.

### **7.4.4 Transparent lacquers on wood or lignocellulosic-substrates**

The first clearly recognizable wear-through of the lacquers becomes exposed in four quadrants; see examples in Table B.2.