





EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 15185**

October 2009

ICS 97.140

Will supersede CEN/TS 15185:2005

English Version

## Furniture - Assessment of the surface resistance to 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.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN Management Centre has the same status as the official versions.

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

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.

**Warning** : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

<https://standards.cen.eu/catalog/standards/sist/c67ff043-9e85-4628-bd23-7a32f226c3f5/sist-en-15185-2012>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

## Contents

Page

Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions .....	4
4 Principle.....	5
5 Apparatus and materials.....	5
5.1 Cleaning cloth .....	5
5.2 Calibration plates.....	5
5.3 Abrasion paper strips.....	5
5.4 Test apparatus .....	5
5.5 Balance .....	6
5.6 Conditioning chamber.....	6
5.7 Diffuse light source .....	6
6 Preparation and conditioning.....	6
6.1 Conditioning.....	6
6.2 Test surface.....	6
6.3 Preparation of test surfaces and abrasive paper .....	6
7 Test procedure .....	7
7.1 Preparation of abrasive wheels.....	7
7.2 Calibration of abrasive paper .....	7
7.3 Abrasion of test area .....	7
7.4 Determination of Initial Wear Point (IP) .....	8
7.4.1 General.....	8
7.4.2 Foil, laminate and melamine faced boards .....	8
7.4.3 Pigmented lacquers.....	8
7.4.4 Varnishes.....	8
8 Assessment of results .....	9
9 Test report .....	9
Annex A (normative) Calibration and maintenance of abrasion equipment.....	10
A.1 General.....	10
A.2 Apparatus .....	10
A.2.1 Calibration block.....	10
A.2.2 Feeler gauges.....	10
A.2.3 Shim washers.....	10
A.3 Procedure .....	10
A.3.1 Bearing wear .....	10
A.3.2 Shaft wear .....	11
A.3.3 Alignment .....	11
A.3.4 Alignment – Dual head abrader.....	11
Annex B (normative) Examples of abrasion traces .....	13
Annex C (informative) Significant technical changes in revised edition of this standard .....	15

## Foreword

This document (prEN 15185:2009) 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 CEN/TS 15185:2005.

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

SIST EN 15185:2012

<https://standards.iteh.ai/catalog/standards/sist/c67ff043-9e85-4628-bd23-7a32f226c3f5/sist-en-15185-2012>

## 1 Scope

This European standard specifies a method for the assessment of the abrasion resistance of surfaces referred to under clause 7.4.

It does not apply to leather and textile surfaces.

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

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

## 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.

FprEN 14434:xxxx, *Writing board for educational institutions - Ergonomic, technical and safety requirements and their test methods*

EN ISO 3668:2001, *Paints and varnishes – Visual comparison of the colour of paints*

EN ISO 6506-1:1999, *Metallic materials - Brinell hardness test - Part 1: Test method*

ISO 9352:1995, *Plastics – Determination of resistance to wear by abrasive wheels*

## 3 Terms and definitions

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

### 3.1

#### **test surface**

part of the test panel

### 3.2

#### **test panel**

panel including the test surface

NOTE 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)

## 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 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 6506-1:1999, except that the ball diameter shall be 5 mm and the load 360 N.

### 5.3 Abrasion paper strips

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

- a) paper of grammage from  $70 \text{ g/m}^2$  to  $100 \text{ g/m}^2$ ;
- b) open coated 180 grit powdered aluminium oxide ( $\text{Al}_2\text{O}_3$ ) having a particle size such that it will pass through a sieve of aperture  $100 \mu\text{m}$  and remain on a sieve having an aperture of  $63 \mu\text{m}$ ;
- c) adhesive backing.

### 5.4 Test apparatus <sup>1)</sup>

As specified in ISO 9352:1995 with following deviations:

- a) the wheels hardness shall be between 60 and 70 Shore A;

NOTE The laboratories should measure the hardness periodically (at least once every 6 months).

- b) weight of loading: every wheel shall apply a force  $(5,4 \pm 0,2)$  N on the sample;
- c) vacuum system: the distance between the vacuum suction nozzle (inlet vacuum system) and the test area shall be  $(1,5 \pm 0,5)$  mm. The vacuum system shall remove practically all the dust;
- d) the distance between the middle axis of the sample holder and the wheels shall be calibrated according to Annex A.

---

1) A suitable machine is available from Taber Acquisition Corp., Taber industries, 455 Bryant St P.O. Box 164, North Tonawanda, NY 14120, USA. (This test machine is an example of a suitable machine available commercially. This information is given for the convenience of users of this European standard and does not constitute an endorsement by CEN of the machine).

**prEN 15185:2009 (E)****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  $(1200 \pm 400)$  lx. This may either be diffused daylight or be diffused artificial daylight.

NOTE 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  $(6500 \pm 50)$  K and a  $R_a$  greater than 92, by using a colour matching booth in accordance with EN ISO 3668:2001.

**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  $(50 \pm 5)$  %.

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  $(50 \pm 5)$  % R.H., before testing, see clause 5.6.

**6.2 Test surface**

Three test surfaces shall be prepared.

The test surface shall be taken at least 20 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  $(100 \times 100)$  mm, and including an appropriated hole drilled in the center 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.

**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.



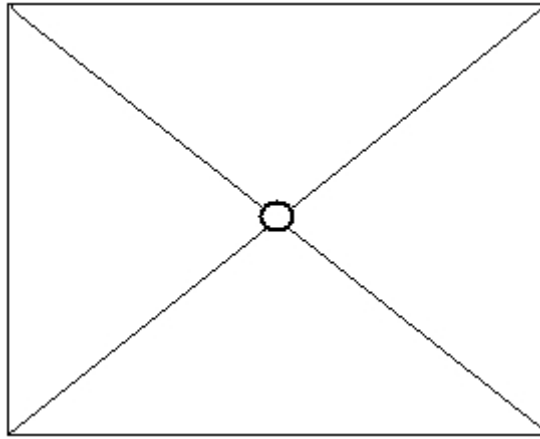


Figure 1 — Surface area divided into four quadrants

## 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  $(120 \pm 20)$  mg, for any pair of calibrate strips, shall not be used for testing.

The result (mean value of the 3 calibrations / 120) shall be named "correction factor" and shall be included 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.

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.

**prEN 15185:2009 (E)**

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 clause 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 clause 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 clause 5.7.

To assess the IP, use the following:

**7.4.2 Foil, laminate and melamine faced boards**

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

Compare the examined test surface with the examples for IP points and deviations in Annex B.

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 recognisable wear-through of the substrate, or layer with other colour, appears in all the four quadrants.

**7.4.4 Varnishes**

The first clearly recognisable wear-through of the varnish becomes exposed in four quadrants.

The following procedure shall be used:

- draw a circle on the abrasion trace by using a black felt tip pen (not waterproof ink);
- if the ink penetrates into the wood grain along the grain direction in any part of abrasion trace, the IP point is nearly reached;