



SLOVENSKI STANDARD
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Pohištvo - Ocenjevanje odpornosti površine proti razenju

Furniture - Assessment of the surface resistance to scratching

Möbel - Bewertung der Kratzfestigkeit von Oberflächen

Ameublement - Evaluation de la résistance de la surface à la rayure

Ta slovenski standard je istoveten z: prEN 15186

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ICS:

97.140 Pohištvo Furniture

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Furniture - Assessment of the surface resistance to scratching

Ameublement - Evaluation de la résistance de la surface à la rayure

Möbel - Bewertung der Kratzfestigkeit von Oberflächen

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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.

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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 15186:2022) 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 15186:2012.

Compared with EN 15186:2012, the following modifications have been made:

- a) subclauses of Clause 4, Linear method (method A), revised;
- b) subclauses of Clause 5, Circular method (method B), revised;
- c) Annex B deleted; the significant changes in the revised edition are now given in the European foreword;
- d) Bibliography updated.

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[oSIST prEN 15186:2022](https://standards.iteh.ai/catalog/standards/sist/fb2d09a6-3fdb-4168-b7fe-2c0bbbdb484c/osist-pren-15186-2022)

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prEN 15186:2022 (E)**1 Scope**

This document specifies a method for the assessment of the surface resistance to penetrating scratches. It relates to the rigid surfaces of all finished products, regardless of their material.

It does not apply to finishes on leather and fabrics.

Method A is suitable for all types of surface coatings and coverings except for melamine faced boards (according to EN 14322) and HPL (according to EN 438-1). It simulates measurable penetrating and/or deforming scratches.

Method B is suitable for all types of surfaces. It simulates first visible traces (e.g. scratches, marks) that can also be a change in the gloss.

The test is intended to be carried out on a part of finished furniture. It can, however, 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.

It is essential that the test 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 1518-1, *Paints and varnishes - Determination of scratch resistance - Part 1: Constant-loading method (ISO 1518-1)*

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: The panel 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 equipment, where the measurement is carried out

3.4 scratching tip

3.4.1

method A

needle with a point of defined geometry

Note 1 to entry: See 4.2.3.

3.4.2

method B

needle with a point of defined geometry

Note 1 to entry: See 5.2.1.6.

3.5

scratching trace

3.5.1

method A

visible and measurable scratch on the tested surface which is produced under the specified load of the scratching tip; the shapes of the traces edges can be different depending on the substrate and coating type as shown in Table 2

3.5.2

method B

first visible traces on the tested surface (e.g. scratches, marks) which may also be a change in the gloss

3.6

scratching resistance

3.6.1

method A

minimum load, in N, applied to the scratching tip, which produces a measurable trace of the width (W) of $\geq 0,30$ mm

3.6.2

method B

minimum load, in N, applied to the scratching tip, which produces a continuous visible trace in at least six of eight slots of the template

3.7

preliminary assessments of the scratching resistance (method A)

minimum load causing the specified width of scratch on test surface

3.8

intermediate assessment of scratching resistance (method A)

mean value of preliminary assessments of test surface

3.9

final result of scratching resistance (method A)

mean value of intermediate assessments of three test surfaces

Note 1 to entry: See Figure A.2 in the informative Annex A.

4 Linear method (method A)

4.1 Principle

Surface scratching resistance is defined as the minimum load in N (Newton) applied to the tip with specified geometry, which produces a specified scratch width (see 4.4.2).

The width of the scratching trace is the result of the assessment of the series of scratches produced by the tip.

4.2 Apparatus and materials

4.2.1 Test apparatus

4.2.1.1 Equipment for linear, without hand movement of the scratching tip or the test surface, according to the principle of EN ISO 1518-1.

4.2.2 Equipment parameters

Technical parameters of the apparatus shall be as specified in Table 1.

Table 1 — Technical parameters

Parameter	Description/values
Tip/test surface movement	Linear
Load range (N)	1,0 to 20,0
Increment of load (N)	1,0 ± 0,1
Speed of the tip's/test surface movement (mm/s)	20 ± 10
Travel length of the tip or test surface (mm)	Minimum 20

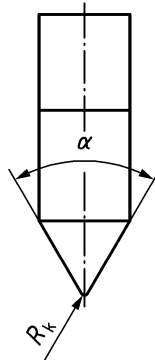
4.2.3 Scratching tip

Scratching tip made of diamond, with a radius (R) of $(0,30 \pm 0,01)$ mm.

The coupling between the spherical part of the tool and the truncated cone section shall allow the width of the trace produced by the tool on the test area to be higher than 0,30 mm, without disturbing this truncated cone section.

An example of this tool is shown in Figure 1.

The tip shall be mounted in the holder with the flat part on the leading side of the shank facing the working direction.

**Key**

α tip's angle $\alpha = (60,0 \pm 1,0)^\circ$

R_k radius of tip's rounded part $R_k = (0,30 \pm 0,01)$ mm

Figure 1 — Scratching tip of the cone type

4.2.4 Optical measurement equipment

Any suitable equipment (e.g. a microscope) for measuring the trace's width with $\pm 0,05$ mm accuracy.

4.2.5 Suitable illumination

Suitable illumination for measurement of the trace's width with $\pm 0,05$ mm accuracy.

4.2.6 Conditioning chamber

A chamber with a standard atmosphere of $(23 \pm 2)^\circ\text{C}$ and relative humidity of $(50 \pm 5)\%$.

4.2.7 Cleaning cloth

White, soft, absorbent cloth.

4.3 Preparation and conditioning

4.3.1 Conditioning

Conditioning of the test surface shall begin at least one week before testing, and shall be carried out in air with a temperature of $(23 \pm 2)^\circ\text{C}$ and relative humidity of $(50 \pm 5)\%$.

The conditioning time shall be stated in the test report.

NOTE Some finishing systems do not fully cure after one week of conditioning.

4.3.2 Test surface

Three test surfaces shall be prepared.

The test surface shall be taken at least 20 mm from the edge.

Each test surface shall be a piece of the test panel, shaped to fit the type of clamping device used.

The test surface shall be carefully wiped with a cleaning cloth (see 4.2.7) before the test without scratching the surface.

The test surface shall be substantially flat. If the original thickness of the test panel is reduced, the bottom side shall be parallel to the test surface.

prEN 15186:2022 (E)**4.3.3 Checking of the tip's geometry**

The tip's geometry shall be inspected (see Figure 2). If any flatness, holes or other kind of damages are found, the scratching tip shall be rejected and replaced by a new one.



Figure 2 — Correct shape of the scratching tip

4.4 Test Procedure**4.4.1 General**

Place the test apparatus (see 4.2.1) in a horizontal position to the test surface, with the tip perpendicular to the test surface.

Carry out the test in a conditioned atmosphere of $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \% \text{ R.H.}$

4.4.2 Scratching of test area

The scratches shall be carried out across the grain direction, if applicable.

The distance between two adjacent scratching traces shall be at least 5 mm, and at least 20 mm between the scratching trace and the edge of the test surface.

Start the test with the first test surface with a load of 1,0 N and continue with increments of 1,0 N, until 20,0 N, or until the scratch width is $\geq 0,30 \text{ mm}$, whichever is reached first.

NOTE The determination of the width of the scratches on the second and third test surface can normally begin 3,0 N below the load found for the first test surface.

For each test surface, repeat the series of scratching test and record the results of width measurements rounded to 0,05 mm (see the protocol example in Table A.1). The measurement shall be taken in the middle part of scratching trace.

For the customer's request, determine the minimum tip's load (using optical equipment see 4.2.4) producing clearly visible cracking of the tested coating (crack within the scratching trace or crack propagating in the coating outside the scratching trace). Water solution of methylene blue or another colouring agent can be used.

4.4.3 Determination of scratching resistance

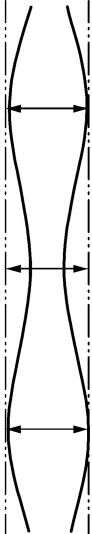

The determination of scratching resistance shall be established by one observer experienced in this type of assessment, by measuring, after 24 h, all the scratching trace widths using the optical measurement equipment (see 4.2.4).

In case of a dispute, three experienced observers shall carry out the determination.

NOTE For easier assessment of the scratching trace width, the surfaces of the estimated test areas before the measurement can be marked with a soft pencil (or another suitable colouring agent) across the scratching traces.

The points of width measurement of the different types of scratching traces (depending on the substrate and coating) are shown in Table 2.

Table 2 — Examples of scratching traces edges

Scratching traces edges	Width measurement
	<p>For scratching trace with a similar appearance as shown, the maximum value of the width shall be chosen.</p>
	<p>For scratching trace with a similar appearance as shown, the average width shall be chosen.</p>