
Lesene talne obloge - Preskusne metode za ugotavljanje elastičnosti in odpornosti proti obrabi ter odpornosti proti udarcu in razenju/strganju

Wood flooring - Test methods to determine elasticity and resistance to wear and impact resistance and scratching/scraping

Holzfußböden - Prüfverfahren zur Bestimmung der Verformbarkeit und der Beständigkeit gegen Verschleiß und gegen Stoßbeanspruchung

Planchers en bois - Méthodes d'essai pour déterminer l'élasticité et la résistance à l'abrasion et la résistance au chocs

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**Wood flooring - Test methods to determine elasticity and
resistance to wear and impact resistance and
scratching/scraping**

Planchers en bois - Méthodes d'essai pour déterminer
l'élasticité et la résistance à l'abrasion et la résistance
au chocs

Holzfußböden - Prüfverfahren zur Bestimmung der
Verformbarkeit und der Beständigkeit gegen
Verschleiß und gegen Stoßbeanspruchung

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Contents	Page
European foreword.....	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Common methods	6
4.1 Conditioning.....	6
4.1.1 Equipment	6
4.1.2 Procedure.....	7
4.2 Measurement of the thickness of the lacquer.....	7
4.2.1 Equipment	7
4.2.2 Sampling.....	7
4.2.3 Procedure.....	7
4.2.4 Expression of the results	7
5 Falling sand wear resistance method	7
5.1 Principle	7
5.2 Sampling.....	8
5.3 Conditioning.....	8
5.4 Apparatus testing machine.....	8
5.4.1 General.....	8
5.4.2 Test piece holder.....	8
5.4.3 Holding and lifting device	8
5.4.4 Revolution-counter	9
5.5 Grit feeder and accessories	9
5.5.1 General.....	9
5.5.2 Vacuum cleaning device.....	9
5.5.3 Abrading material.....	12
5.5.4 Leather abrading wheels.....	12
5.5.5 Stopwatch.....	13
5.5.6 Grit collection container	13
5.5.7 Calibration plates.....	13
5.5.8 Transparent template to evaluate the wear of the abraded area.....	13
5.5.9 Weighing equipment.....	13
5.5.10 Contrast marking solutions.....	14
5.6 Procedure.....	14
5.6.1 General.....	14
5.6.2 Maintenance of the abrading wheels	14
5.6.3 Operation of the abrader.....	14
5.6.4 Calibration	14
5.6.5 Expression of the result for a test piece.....	16
5.7 Test report.....	17
6 Sand paper wear resistance method.....	17
6.1 Principal	17
6.2 Sampling.....	17
6.3 Conditioning.....	18

6.4	Apparatus	18
6.4.1	Testing machine	18
6.4.2	Additional material or equipment	21
6.5	Procedure	21
6.5.1	General	21
6.5.2	Preparation of test specimens and abrasive papers.....	22
6.5.3	Preparation of abrasive wheels.....	22
6.5.4	Determination of the abrasion rate of abrasive paper	22
6.5.5	Abrasion of test specimen	22
6.5.6	Expression of results	24
6.5.7	Test report	24
7	Elasticity of the lacquer	25
7.1	Principle.....	25
7.2	Equipment.....	25
7.2.1	Equipment to measure the thickness of the lacquer	25
7.2.2	Indentation plate (see Figure 2).....	25
7.2.3	Loading machine.....	27
7.2.4	Magnifying glass and lighting equipment.....	27
7.3	Test piece.....	27
7.3.1	Dimensions	27
7.3.2	Sampling	27
7.3.3	Conditioning	27
7.4	Procedure	27
7.4.1	Measurement of the thickness of the lacquer	27
7.4.2	Elasticity.....	27
7.5	Expression of the results for a test piece	28
7.5.1	Thickness of the lacquer	28
7.5.2	Elasticity.....	28
7.6	Expression of the result for a batch	28
7.6.1	Thickness of the lacquer	28
7.6.2	Elasticity.....	28
7.7	Test report	28
8	Determination of resistance to scratching and scraping	29
8.1	Principle.....	29
8.2	Terms and definitions.....	29
8.2.1	Film forming coating	29
8.2.2	Scratch	29
8.2.3	Groove.....	30
8.2.4	Relevant damage.....	30
8.2.5	Non relevant damage.....	30
8.3	Equipment.....	30
8.3.1	General	30
8.3.2	Cleaning cloth soft absorbent cloth material.....	30
8.3.3	Calibration of the scratch-plane tester	33
8.4	Preparation of apparatus	36
8.4.1	General	36
8.4.2	Scratch-plane tester.....	36
8.4.3	Indexable insert (Figure 18).....	36
8.5	Preparation of test pieces.....	36
8.6	Test procedure	37
8.7	Assessment.....	37
8.8	Test report	37

prEN 13696:2026 (E)

9	Impact resistance	38
9.1	Principle	38
9.2	Apparatus.....	38
9.2.1	Conditioning chamber	38
9.2.2	Polyethylene foam	38
9.2.3	Ball apparatus	38
9.3	Test specimens.....	41
9.4	Conditioning.....	42
9.5	Procedure.....	42
9.5.1	Principle	42
9.5.2	Testing.....	42
9.5.3	Factors influencing accuracy of the test.....	43
9.6	Expression of results.....	43
9.7	Test report.....	43
Annex A (informative)	Sand paper CS 17 wear resistance method.....	44
A.1	Principle	44
A.2	Test pieces	44
A.2.1	Dimensions.....	44
A.2.2	Sampling.....	44
A.2.3	Conditioning.....	44
A.3	Abrading system, Test equipment and materials.....	44
A.3.1	Abrading plate.....	44
A.3.2	Calibration plate.....	45
A.3.3	Abrasive wheels.....	45
A.3.4	Test machines.....	45
A.3.5	Regeneration disk.....	46
A.3.6	Contrast agent	46
A.4	Procedure.....	47
A.4.1	Preparation of abrasive wheels	47
A.4.2	Calibration of abrasive wheels.....	47
A.4.3	Abrasion of the specimen.....	47
A.5	Result for a test piece.....	47
A.5.1	Initial thickness of the coating	47
A.5.2	Wear through.....	48
A.5.3	Expression of the result for a test piece.....	48
A.5.4	Expression of the result for a batch.....	49
A.6	Test report.....	49
Bibliography.....		50

European foreword

This document (prEN 13696:2026) has been prepared by Technical Committee CEN/TC 175 “Round and sawn timber”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13696:2008.

The main changes compared to the previous edition are listed below:

- integration of new methods of abrasion;
- editorial update of the document.

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1 Scope

This document specifies a test method to determine the resistance to wear of lacquered wood floorings, a method to test the elasticity of the lacquer and a method to determine resistance to impact of lacquered wood floorings.

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 13756:2018, *Wood flooring and parquet — Terminology*

EN ISO 291:2018, *Plastics — Standard atmospheres for conditioning and testing (ISO 291:2008)*

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

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

ISO 48-6, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 6: Apparent hardness of rubber-covered rollers by IRHD method*

ISO 48-7, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 7: Apparent hardness of rubber-covered rollers by Shore-type durometer method*

3 Terms and definitions

For the purposes of this document, the following terms and definitions given in EN 13756 and the following apply.

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

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

3.1

lacquer

film making agent modifying surface layer properties

Note 1 to entry: It has a measurable thickness.

4 Common methods

4.1 Conditioning

4.1.1 Equipment

Enclosures with the following climatic conditions:

- climate temperature of $(23 \pm 2) ^\circ\text{C}$ and relative humidity of $(50 \pm 5) \%$.

4.1.2 Procedure

The manufacturer shall specify either of the conditioning climates above.

Unless otherwise specified, all equipment and materials required for the test shall be stabilised and kept in an enclosure in the climate specified.

4.2 Measurement of the thickness of the lacquer

4.2.1 Equipment

4.2.1.1 Optical instrument

An instrument with a resolution of at least $\pm 2 \mu\text{m}$.

NOTE For instance, a binocular microscope with a magnification of 100 to 200 and a built-in measuring scale in the field of view.

4.2.1.2 Contrast marking

A water-based felt tip pen.

4.2.2 Sampling

Choose the location from which the test pieces are taken, depending on the purpose of the measurement (either in an unworn area or in a worn area).

Test pieces with a size at least $10 \text{ mm} \times 10 \text{ mm}$ and by the full thickness shall be cut out of one of the wear test pieces or area to be tested in elasticity.

The number of test pieces is specified in 5.3.3.4.1 and 6.4.1.

4.2.3 Procedure

If needed, contrast mark the lacquered face with the felt-tip pen specified in 4.2.1.2.

Clear-cut with a razor blade the edge of the lacquered face to be inspected.

Mount the test piece with the clear-cut edge facing the microscope. For each test piece, make at least two measurements to the accuracy allowed by the resolution of the optical instrument.

Measurements of lacquer above open holes in the wood shall not be taken into account.

4.2.4 Expression of the results

When required, average the measurements made on each test piece.

If there is more than one test piece, calculate to one significant figure the mean value and the coefficient of variation (expressed as a percentage) of the results.

5 Falling sand wear resistance method

5.1 Principle

The resistance to wear is evaluated by abrading the face of representative lacquered test pieces or lacquered specimens with a specified abrasive sand applied by means of two loaded wheels.

The number of rotations, necessary to reach a defined wear, is used to evaluate the resistance to wear.

NOTE This test is mainly used for lacquers without antiabrasive materials like corundum.

5.2 Sampling

One floor covering element is needed. Take from this element three test pieces, measuring approximately $100\text{ mm} \times 100\text{ mm}$:

- two centred 10 mm in from the short edges; and
- one exactly in the centre of the element (see Figure 1).

Machined edges and machined surfaces shall be avoided in the pieces. If the thickness of the test pieces exceeds 8 mm the specimens shall be milled down from the backside to $(7,5 \pm 0,5)\text{ mm}$ to ensure a horizontal load of the abrader arms. Make sure that specimens are uniformly flat and parallel after milling.

If the dimension of the elements makes the described sampling impossible, the test pieces shall be sampled from the nearest available area. If the elements measure less than 100 mm, then a joint is necessary. The joint shall be positioned in the middle of the $100\text{ mm} \times 100\text{ mm}$ pieces.

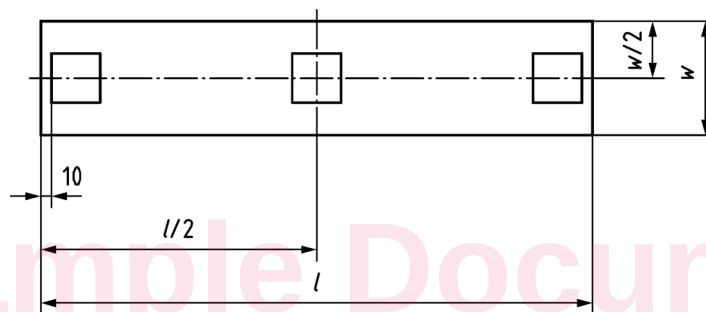


Figure 1 — Sampling from one floor covering element

Drill a $(7,2 \pm 0,1)\text{ mm}$ centre hole into the test pieces.

5.3 Conditioning

The test pieces shall be conditioned to constant mass in one of the climates defined in 4.1.

Prior to testing, the lacquer shall be fully cured according to the manufacturer's instructions.

5.4 Apparatus testing machine

5.4.1 General

The testing machine shall consist of the items specified in 5.4.2 to 5.4.4.

5.4.2 Test piece holder

In form of a disc with a diameter of approximately 105 mm (item 4 in Figure 3) which rotates in a horizontal plane with a permitted deviation of $\pm 2\text{ mm/m}$ at a frequency of 58/min to 62/min and to which the test specimen (item 3 in Figure 3) can be clamped with a clamping screw (item 11 in Figure 3).

5.4.3 Holding and lifting device

Holding and lifting device (item 7 in Figure 3) for the abrasive wheels, so constructed that each wheel exerts a force of $(10 \pm 0,2)\text{ N}$ on the test specimen.

A counterweight of (150 ± 3) g is required to counterbalance the mass of the leather abrading wheel (5.4.3). A second pair of leather abrading wheels may be used for this purpose.

The calibration and maintenance of the Taber abrader arms should be carried out according to ISO 24338:2022, Annex A.

5.4.4 Revolution-counter

A revolution counter is needed to record the number of revolutions of the specimen holder.

5.5 Grit feeder and accessories

5.5.1 General

A Grit feeder shall have a minimum storage capacity of about 200 g of grit. It shall be possible to open it at the top and at the bottom. The bottom opening shall be positioned (10 ± 1) mm above the face of the test piece and have a length of (16 ± 1) mm and width of $(3,18 \pm 0,38)$ mm. The length of the bottom opening shall be installed radially to the test specimen holder. To make sure of a regular flow, a device shall be provided in the grit feeder to ensure a regular flow. A further device ensuring an immediate stop of the feeding is also required (see Figure 2 and Figure 3).

5.5.2 Vacuum cleaning device

A suction nozzle positioned (3 ± 2) mm above the track to be worn, shall be installed in the axial vertical plane behind the left wheel after the abrasive grit passes under the wheel (relative to the rotation direction; see Figure 3). The vacuum power shall remove all dust and debris but shall not influence the flow of falling grit.

NOTE Equipment of this type, Taber Abrader and Taber Grit Feeder, are made by TABER Industries, 455 Bryant Street, North Tonawanda, New York 14120 USA. ¹⁾

¹⁾ This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of this product. Equivalent products may be used if they can be shown to lead to the same results.

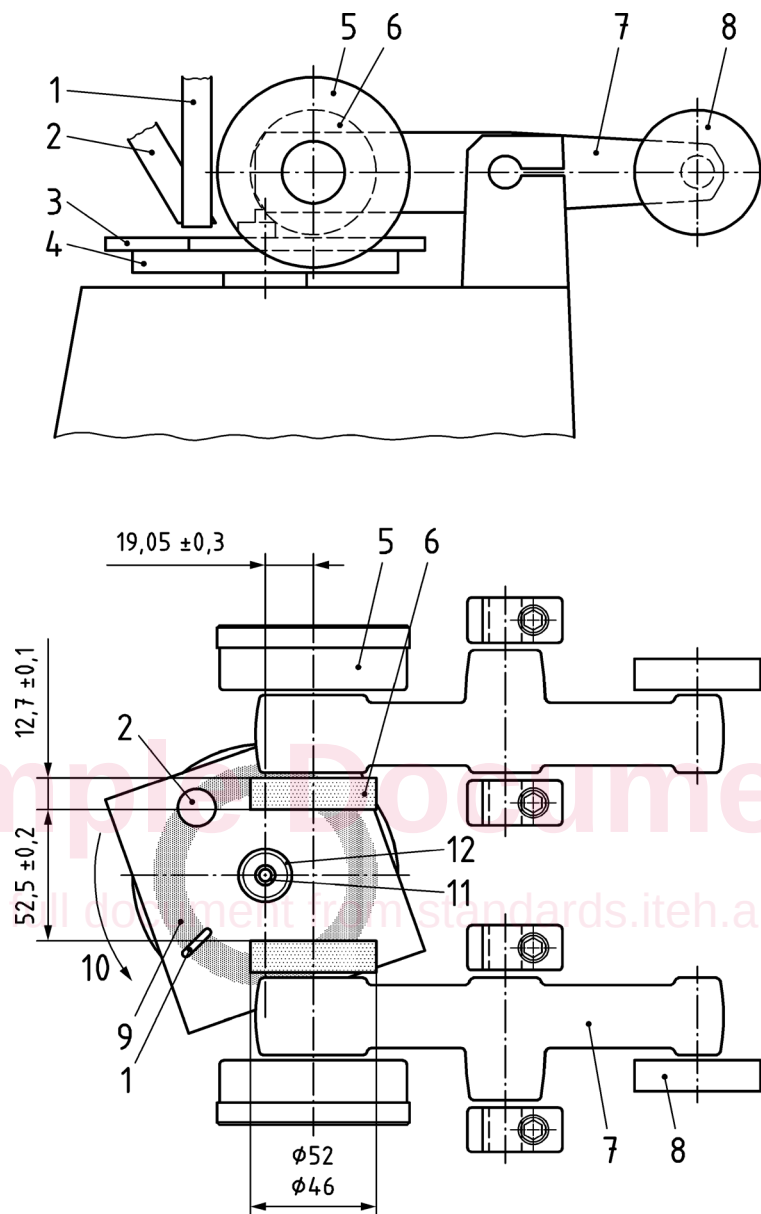


Figure 2 — Example of a Taber abrader with grit feeder

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Dimensions in millimetres

**Key**

- | | | | |
|---|-----------------|----|-----------------------|
| 1 | grit nozzle | 7 | abrader arm |
| 2 | suction nozzle | 8 | counterweight |
| 3 | test piece | 9 | wearing surface |
| 4 | specimen holder | 10 | direction of rotation |
| 5 | testing weight | 11 | clamping screw |
| 6 | abrading wheel | 12 | nut |

Figure 3 — Abrader with grit feeder

5.5.3 Abrading material

Electric arc furnaced Aluminium Oxide, bauxite based abrasive grain with a chemical composition according to Table 1. The abrasive mineral has a specific gravity of 3,96 g/cm³ and a hardness of 21 kN/mm² (Knoop). The medium grain shape of the mineral has a bulk density according to FEPA standard 44-1 in the range of 1,51 - 1,62 g/cm³. Particle size distribution ranges between 45 µm and 75 µm with a reduced fines portion according to Table 2 determined according to FEPA standard 42-1.

Table 1 — Chemical composition

Chemicals	Al ₂ O ₃	Fe ₂ O ₃	SiO ₂	TiO ₂	CaO	ZrO ₂	MgO
Chemical proportion %	> 95	< 0,30	< 0,90	2,4 to 3,0	< 0,30	< 0,30	< 0,30

Table 2 — Grain distribution

Sieve No.	170	200	270	270 - 325	325
Grading µm	90	75	53	45	
Grain distribution %	0	0 to 5	≥ 45	≥ 80	0 to 10

NOTE The abrading material “ALODUR ESK 240 (EN 14354)”, made by Treibacher Schleifmittel, Postfach 1, A-9523 Villach-Landskron Seebach 2, Austria, is an example of a suitable product available commercially. ²⁾

The abrading material shall be used only once. Do not sieve the abrading material before use. The abrading material shall be stored in a dry place.

5.5.4 Leather abrading wheels

Two cylindrical wheels free to turn on their axis with nominal diameter and width of respectively 44,4 mm and 12,7 mm. They are fitted with a leather strip having a width of (12,7 ± 0,1) mm and a minimum thickness of 1,5 mm. The overall diameter of the wheels, with leather strips shall not exceed 50,8 mm or be less than 47,4 mm.

The hardness of the leather strips shall be suitable for the purpose. It is measured according to the procedure in EN ISO 868 with a Shore-Durometer of Type A with the following deviations:

- the Shore-A hardness is measured at four points in the middle of the tire tread of abrading wheels (instead of the requirements in EN ISO 868:2003, 5.1, 5.2 and 8.1).
- the hardness of the leather is suitable if all the results are contained within the range A/1:85 – A/1:95.

The distance between the internal faces of the wheels shall be (52,5 ± 0,2) mm, their common axis being set, by (19,05 ± 0,3) mm nominally, off the axis of the specimen holder. The axis of rotation of the test piece shall be equidistant from the two wheels.

Prior to testing, new abrading wheels shall be preconditioned. Subject new wheels to an initial 2 000 cycle test following the procedure described in 6.5.4.

²⁾ This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of this product. Equivalent products may be used if they can be shown to lead to the same results.

NOTE The abrading wheels “S-39”, made by TABER Industries are an example of a suitable product available commercially. ³⁾

5.5.5 Stopwatch

A stopwatch accurate to $\pm 0,1$ s.

5.5.6 Grit collection container

A container of known mass to collect the grit when calibrating the grit feeder.

5.5.7 Calibration plates

Calibration plates made of cell-cast acrylics with Rockwell Hardness M 94 according to ASTM D785.

NOTE The calibration plates “S38”, made by TABER Industries, are an example of a suitable product available commercially. ⁴⁾

5.5.8 Transparent template to evaluate the wear of the abraded area

Transparent template for visual observation of wear through. Each quadrant is divided into four sectors of $22,5^\circ$ (see Figure 4).

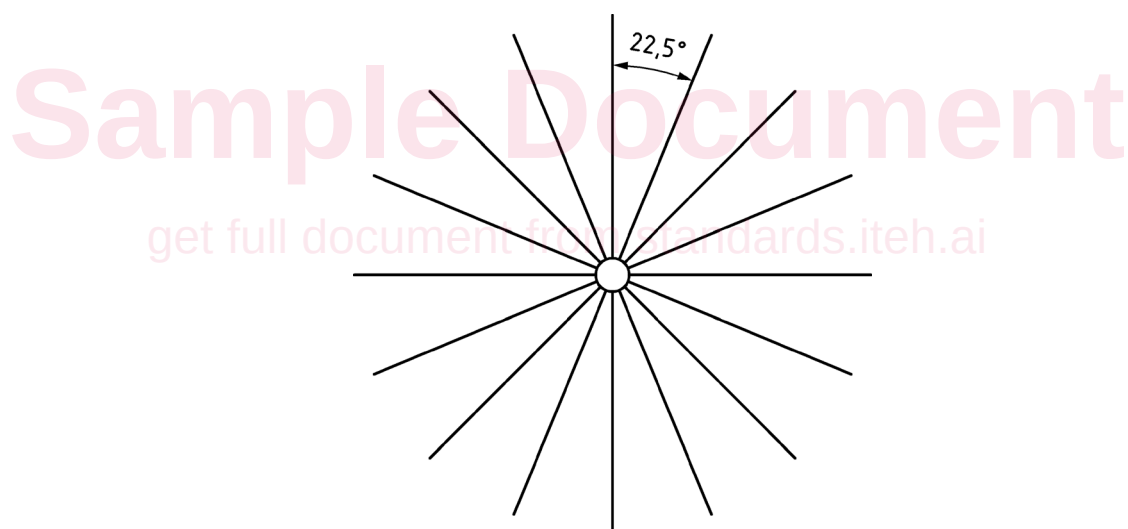


Figure 4 — Transparent template for visual observation of wear through

5.5.9 Weighing equipment

For determining the mass loss of the calibration plate by the sand or calibrating the grit flow of the abrading material, weighing equipment with an accuracy of ± 1 mg is needed.

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