SLOVENSKI STANDARD
SIST EN 1534:2003

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Wood and parquet flooring - Determination of resistance to indentation (Brinell) - Test method

Wood and parquet flooring - Determination of resistance to indentation (Brinell) - Test method

Parkett und andere Holzfußböden - Bestimmung des Eindruckwiderstands (Brinell) - Prüfmethode

Parquets et planchers en bois - Détermination de la résistance au poinçonnement (Brinell) - Méthode d'essai

Ta slovenski standard je istoveten z: EN 1534:2000

ICS:

79.080	Polizdelki iz lesa	Semi-manufactures of timber
97.150	Netekstilne talne obloge	Non-textile floor coverings

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EUROPEAN STANDARD

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English version

Wood and parquet flooring - Determination of resistance to indentation (Brinell) - Test method

Parquets et planchers en bois - Détermination de la
résistance au poinçonnement (Brinell) - Méthode d'essai

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Eindruckwiderstands (Brinell) - Prüfmethode

This European Standard was approved by CEN on 2 May 1999.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 175 "Round and sawn timber", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This standard is one of a series of standards concerning wood and parquet flooring and wood panelling and cladding.

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1. Scope

This European Standard specifies a method, derived from the BRINELL test, for determining the resistance to indentation of wood and parquet flooring.

2. Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 13756   Wood floor covering – Terminology

3. Definitions

For the purposes of this European Standard, the definitions given in prEN 13756 apply together with the following:

3.1
element
The smallest individual part (e.g. a finger, a strip) of wood flooring.

3.2 lot
Quantity of wood flooring with the same set of features, within a consignment or in a storage facility.

3.3
lay-up
Description of the assembly of an element.

3.4
indentation
Concave deformation of the surface of a test specimen under the action of an indenter.

3.5
indentation under action
Deformation of the surface of the test specimen while the action of the indenter is applied.

3.6
residual indentation
Deformation of the surface of the test specimen after the time of recovery.

> NOTE: The time of recovery is specified in 7.3.

4. Principle

The resistance to indentation is determined by applying a loaded indenter to the face of the test specimen. The diameter of the residual indentation is used to evaluate the resistance to indentation of the test specimen.

5. Apparatus

5.1 Indenter

A hardened steel ball with a diameter of (10 ± 0,01) mm.

5.2 Measurement rig

A device capable of measuring the diameter of the residual indentation on the face of the test specimen to an accuracy of ± 0,1 mm.

5.3 Loading head

A device with a load cell accurate to ± 2 % of the applied loads, moving perpendicular to a flat rigid table. The load and the rate of head movement of the loading head shall be adjustable within specified limits.

6. Test specimens

6.1 Dimensions

The test shall be carried out on test specimens that may be elements or may be square test pieces, cut from elements, that preferably have sides approximately 50 mm long.

6.2 Sampling

6.2.1 Within a test specimen

Indentations shall be carried out either in the central area of test pieces or distributed all over the area of the face of the element.

If, in an element, the length of a piece of timber exceeds 200 mm, up to two indentations can be carried out on that piece of timber.
If not, only one indentation can be carried out.

The distance from the centre of the indentation to any edge of a test piece or an element or to a knot shall not be less than 20 mm. However, if the width of the test specimen is less than 40 mm, the indentation shall be placed along its longitudinal axis.

If an element consists of a number of components, each component can be indented.

Within the above defined limits, the indentation points shall be distributed at random.

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6.2.2 Within a lot

The number of test specimens to be sampled is related to the number of indentations carried out on each test specimen. It shall be such that the total number of indentations is at least 50.

Test specimens shall be selected at random from the lot.

6.3 Conditioning

The test shall be carried out on test specimens conditioned in accordance with the manufacturer's instructions.

6.4 Possible preparation prior to testing

If the test specimens are fitted with a soft or brittle material on the back, this shall be removed to prevent any displacement during the test.

7. Test method

7.1 Accuracy

All the measurements shall be made to the limits of accuracy specified for the instruments as defined in clause 5.

7.2 Application of load

The test specimen shall be free of any material that may interfere with the results. Set the test specimen on the table of the loading head. Lower the indenter to the surface of the test specimen. Apply a force increasing at such rate, that the nominal value of 1 kN is reached after (15 ± 3) s. Maintain the force at this value for (25 ± 5) s. Withdraw the indenter completely.

Throughout the test, the machinery shall be vibration and shock free, to ensure that the sample is rigidily held.

7.3 Measurement of indentation

After withdrawal of the indenter, wait for at least 3 min. Measure with the measurement rig two diameters of the residual indentation at right angles to each other: one along the grain d_1, another across the grain d_2, with an accuracy of ± 0,2 mm.

Contrast on the edge of the indentation can be improved with appropriate lighting and/or application of graphite lead.

8. Expression of results

8.1 Hardness for each indentation

The hardness Brinell HB is calculated to two significant figures, according to the following formula:

$$HB = \frac{2F}{g\,\pi\,D\left[D-(D^2-d^2)^{\frac{1}{2}}\right]} \qquad (1)$$

where:

HB is the Brinell hardness in kilogram force per square millimetre;
g is the acceleration of gravity, in metres per second squared;
π is the "pi" factor ($\approx 3,14$);
F is the nominal force, in newtons;
D is the diameter of the ball, in millimetres;
d is the diameter of the residual indentation, in millimetres.

To express HB in newtons per square millimetre, delete g from the formula.

The diameter of the residual indentation d is calculated from the measurements taken in accordance with 7.3, using the formula:

$$d = \frac{d_1 + d_2}{2} \qquad (2)$$

8.2 Hardness for a lot

8.2.1 General

A normal distribution is assumed.

The mean value, the standard deviation and the characteristic value of the hardness Brinell shall be calculated.

8.2.2 Mean value

$$m = \frac{\sum_{1}^{n} P_i}{n} \qquad (3)$$

where:

m is the mean value of the performance of the sample;
P_i is the performance of "ith" point of indentation in the sample;
n is the number of indentations carried out in the sample.