



**SLOVENSKI STANDARD**  
**oSIST prEN 1534:2019**  
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**Lesene talne obloge - Ugotavljanje odpornosti proti vtiskovanju (Brinell) - Preskusna metoda**

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

Holzfußböden - Bestimmung des Eindruckwiderstands (Brinell) - Prüfmethode

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

**Ta slovenski standard je istoveten z: prEN 1534**

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**ICS:**

|        |                    |                             |
|--------|--------------------|-----------------------------|
| 79.080 | Polizdelki iz lesa | Semi-manufactures of timber |
| 97.150 | Talne obloge       | Floor coverings             |

**oSIST prEN 1534:2019**

**en,fr,de**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 1534**

February 2019

ICS 79.080

Will supersede EN 1534:2010

English Version

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

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

Holzfußböden - Bestimmung des Eindruckwiderstands (Brinell) - Prüfmethode

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 175.

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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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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (prEN 1534:2019) 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 supersedes EN 1534:2010.

This document is one of a series of standards concerning wood flooring.

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SIST EN 1534:2020

<https://standards.iteh.ai/catalog/standards/sist/b2e7136e-aed3-451c-8ef6-7e45445bc8b0/sist-en-1534-2020>

## prEN 1534:2019 (E)

### 1 Scope

This document specifies a method, derived from the test, for determining the resistance to indentation of wood flooring.

### 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, *Wood flooring and parquet - Terminology*

EN 14762, *Wood flooring - Sampling procedures for evaluation of conformity*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13756, EN 14762 and the following apply.

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

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

#### 3.1

##### **indentation**

concave deformation of the surface of a test specimen from the action of an indenter

#### 3.2

##### **indentation under action**

momentary indentation when the indenter is applied

#### 3.3

##### **residual indentation**

indentation after the time of recovery

Note 1 to entry: The time of recovery is specified in 7.3.

#### 3.4

##### **test specimen**

elements or square test piece cut from an element

#### 3.5

##### **hardness HB**

Brinell hardness in newtons per square millimetre

### 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. After the loading the unloaded specimen is left to recover.

## 5 Apparatus

**5.1 Indenter, i.e.** a hardened steel spherical body with contact diameter of  $(10 \pm 0,01)$  mm.

**5.2 Measurement rig, i.e.** a device capable of measuring the diameter of the residual indentation on the face of the test specimen to an accuracy of  $\pm 0,1$  mm.

**5.3 Loading head, i.e.** a device with a load cell accurate to  $\pm 2$  % of the maximum 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

Indentation test shall be carried out on each element; the minimum number of tests to be carried out depends on the element length according to Table 1.

**Table 1 — Minimum number of test according to the element length**

| Element length (mm) | Minimum number of test on one element | Number of elements to be tested |
|---------------------|---------------------------------------|---------------------------------|
| $\leq 200$          | 1                                     | 20                              |
| 200 to 500          | 2                                     | 20                              |
| 500 to 1 000        | 3                                     | 20                              |
| 1 000 to 2 000      | 4                                     | 10                              |
| $> 2 000$           | 5                                     | 10                              |

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.

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.

Within the above defined limits, the indentation points shall be distributed at random, representing the whole element length.

Test specimens shall be selected at random.

### 6.3 Conditioning

The test shall be carried out on test specimens conditioned in a relative humidity of  $65 \pm 5$  % and a temperature of  $20 \pm 2$  °C.

### 6.4 Preparation prior to testing

The test specimen shall be free of any material that may interfere with the results.

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.

**prEN 1534:2019 (E)****7 Test method****7.1 Accuracy**

All the measurements shall be carried out to the limits of accuracy specified for the instruments as defined in Clause 5.

**7.2 Application of load**

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  $(15 \pm 3)$  s. Maintain the force at this value for  $(25 \pm 5)$  s. Withdraw the indenter completely.

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

**7.3 Measurement of residual indentation**

After withdrawal of the indenter, wait (let recover) 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  $\pm 0,2$  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 digits, according to the following formula:

$$HB = \frac{2F}{\pi \cdot D \cdot \left[ D - \sqrt{D^2 - d^2} \right]} \quad (1)$$

where

$HB$  is the Brinell hardness in newtons per square millimetre;

$\pi$  is the “pi” factor (3,14);

$F$  is the maximum load applied force, in newtons;

$D$  is the diameter of the ball, in millimetres,

$d$  is the diameter of the residual indentation, in millimetres (average of  $d_1$  and  $d_2$ ).

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

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



## 8.2 Calculation values of hardness

### 8.2.1 General

A normal distribution is assumed.

The mean value, the standard deviation and the characteristics value of the hardness Brinell shall be calculated. The mean value shall be expressed as the whole number.

### 8.2.2 Characteristic value

A characteristic value is defined as the fifth percentile of the assumed normal distribution.

A characteristic value is given by the following formula:

$$X_k = m - (t_{05} \times s) \quad (3)$$

where

$X_k$  is the characteristic value;

$t_{05}$  is the Student coefficient for a one sided 5 % probability.

Table 2 gives the Student coefficient for a range of values of  $n$ .

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Table 2 — Student coefficient for a range of values of  $n$ 

| Number of indentations<br>$n$ | Student coefficient<br>$t_{05}$ |
|-------------------------------|---------------------------------|
| 6                             | 2,02                            |
| 7                             | 1,94                            |
| 8                             | 1,90                            |
| 9                             | 1,86                            |
| 10                            | 1,83                            |
| 11                            | 1,81                            |
| 12                            | 1,80                            |
| 13                            | 1,78                            |
| 14                            | 1,77                            |
| 15                            | 1,76                            |
| 16                            | 1,75                            |
| 17                            | 1,75                            |
| 18                            | 1,74                            |
| 19                            | 1,73                            |
| 20                            | 1,73                            |
| 21                            | 1,72                            |
| 22                            | 1,72                            |
| 23                            | 1,72                            |
| 24                            | 1,71                            |
| 25                            | 1,71                            |
| 26                            | 1,71                            |
| 27                            | 1,71                            |
| 28                            | 1,70                            |
| 29                            | 1,70                            |
| 30                            | 1,70                            |
| 40                            | 1,68                            |
| 60                            | 1,67                            |
| 120                           | 1,66                            |
| $\infty$                      | 1,645                           |