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EUROPEAN STANDARD

EN 13329:2016+A2

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English Version

Laminate floor coverings - Elements with a surface layer based on aminoplastic thermosetting resins - Specifications, requirements and test methods

Revêtements de sol stratifiés - Éléments dont la surface
est à base de résines aminoplastes thermodurcissables
- Spécifications, exigences et méthodes d'essai

Laminatböden - Elemente mit einer Deckschicht auf
Basis aminoplastischer, wärmehärtbarer Harze -
Spezifikationen, Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 27 November 2015 and includes Amendment 1 approved by CEN on 1 July 2017 and includes Amendment 2 approved by CEN on 18 July 2021.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 13329:2016+A2:2021) has been prepared by Technical Committee CEN/TC 134 “Resilient, textile and laminate floor coverings”, the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by March 2022, and conflicting national standards shall be withdrawn at the latest by March 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 2017-07-01 and Amendment 2 approved by CEN on 2021-07-18.

This document supersedes **A2** EN 13329:2016+A1:2017 **A2**.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1** and **A2** **A2**.

A2 In comparison with the previous version EN 13329:2016+A1:2017 of the original edition EN 13329:2016, the new consolidated version EN 13329:2016+A2:2021 contains the following technical modifications:

- Normative references: replace EN 424, *Resilient floor coverings - Determination of the effect of simulated movement of a furniture leg* with EN ISO 16581, *Resilient and laminate floor coverings — Determination of the effect of simulated movement of a furniture leg*;
- Normative references: add EN 17368, *Laminate floor coverings - Determination of impact resistance with small ball*”;
- Scope: replacement of the last paragraph;
- term 3.3 substrate: replacement of the definition;
- Table 2: change the requirements and test method for impact resistance: small ball and addition of footnote to table ^d as clarification for testing, replacement of Table 2;
- Annex H: small ball test method has been deleted, replacement of Annex H. **A2**

A1 *deleted text* **A1**

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies characteristics, requirements and test methods for laminate floor coverings with a surface layer based on aminoplastic thermosetting resins as defined in 3.1 and 3.2. It also specifies requirements for marking and packaging.

It includes a classification system, based on EN ISO 10874, giving practical requirements for areas of use and levels of use, to indicate where laminate floor coverings will give satisfactory service and to encourage the consumer to make an informed choice.

A₂ Laminate floor coverings are generally designed for floating installations and are considered for domestic and commercial levels of use, including domestic kitchens. This document does not specify requirements relating to the use in areas which are subjected to frequent wetting, such as bathrooms, laundry rooms or saunas. In general laminate floor coverings can only be used in those areas when authorized by the manufacturer and under conditions described in the manufacturer's installation guidelines. **A₂**

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 311, *Wood-based panels — Surface soundness — Test method*

EN 318, *Wood based panels — Determination of dimensional changes associated with changes in relative humidity*

EN 322, *Wood-based panels — Determination of moisture content*

A₂ EN ISO 16581, *Resilient and laminate floor coverings — Determination of the effect of simulated movement of a furniture leg (ISO 16581)* **A₂**

EN 425:2002, *Resilient and laminate floor coverings — Castor chair test*

EN 438 (all parts), *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates)*

EN 16094, *Laminate floor coverings — Test method for the determination of micro-scratch resistance*

A₂ EN 17368, *Laminate floor coverings — Determination of impact resistance with small ball* **A₂**

CEN/TS 16354, *Laminate floor coverings — Underlays — Specification, requirements and test methods*

EN 20105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour (ISO 105-A02)*

EN ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02)*

EN ISO 4892-2:2006/A1:2009, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2006/Amd1:2009)*

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

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EN ISO 10874, *Resilient, textile and laminate floor coverings — Classification (ISO 10874)*

EN ISO 24343-1, *Resilient and laminate floor coverings — Determination of indentation and residual indentation — Part 1: Residual indentation (ISO 24343-1)*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 7267-2, *Rubber-covered rollers — Determination of apparent hardness — Part 2: Shore-type durometer method*

ISO 24334, *Laminate floor coverings — Determination of locking strength for mechanically assembled panels*

ISO 24336, *Laminate floor coverings — Determination of thickness swelling after partial immersion in water*

ISO 24339, *Laminate and textile floor coverings — Determination of dimensional variations after exposure to humid and dry climate conditions*

3 Terms and definitions

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

3.1 laminate floor covering

rigid floor covering, typically in a plank or tile format, with a multiple layer structure: e.g. backer, substrate, décor and worked edges that allow the product to be joined together to form a larger integral unit

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Note 1 to entry: Laminate flooring does not include products having a resilient, stone, textile, wood, leather or metal top surfacing material(s).

3.2 surface layer based on aminoplastic thermosetting resins

upper decorative layer, which may vary in surface texture and gloss level, consisting of one or more thin sheets of a fibrous material (usually paper), impregnated with aminoplastic, thermosetting resins (usually melamine)

Note 1 to entry: By the simultaneous action of heat and pressure, these sheets are either pressed as such (HPL, CPL, Compact), and in the case of HPL and CPL bonded on a substrate (usually wood-based panels), or in the case of DPL directly pressed on a substrate (usually wood-based panels). The product is usually finished with a backer (e.g. HPL, CPL, impregnated papers), primarily used as a balancing material.

3.3 substrate

A₂ core material of the laminate floor covering containing wood for at least 65 % in mass **A₂**

Note 1 to entry: It is generally a particleboard, as defined in EN 309, or a dry process fibreboard (MDF) as defined in EN 316 or a so called High Density Fibreboard (HDF) which is a MDF-board with a density ≥ 800 kg/m³.

3.4 backer

layer opposite to the surface layer used to balance and stabilize the product

Note 1 to entry: The backer is generally made of impregnated papers.

3.5

underlay

layer placed between the laminate floor covering and the subfloor to impart specific properties

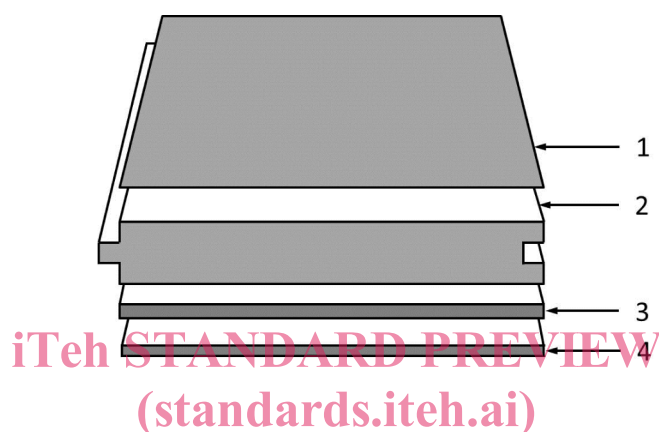
Note 1 to entry: Some laminate floor covering products have the underlay pre-attached directly to the backer.

3.6

laminate floor covering element

piece of the floor covering with profiled edges to facilitate assembly at installation

Note 1 to entry: See Figure 1.



Key

- 1 surface layer
- 2 substrate
- 3 backer
- 4 underlay (optional)

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Figure 1— Laminate floor-covering element

4 Requirements

4.1 General requirements

All laminate floor coverings shall conform to the general requirements given in Table 1, when tested by the methods specified therein.

Table 1 — General requirements

Characteristic	Requirement	Test method
Thickness of the element, (<i>t</i>) without underlay	$\Delta t_{\text{average}} \leq 0,50$ mm, relative to nominal value $t_{\text{max.}} - t_{\text{min.}} \leq 0,50$ mm	Annex A
With pre-attached underlay	$\Delta t_{\text{average}} \leq 0,50$ mm, relative to nominal value $t_{\text{max.}} - t_{\text{min.}} \leq 0,80$ mm	Annex A
Length of the surface layer, (<i>l</i>)	For the nominal values given, no measured value shall exceed: $l \leq 1\,500$ mm: $\Delta l \leq 0,5$ mm $l > 1\,500$ mm: $\Delta l \leq 0,3$ mm/m	Annex A
Width of the surface layer, (<i>w</i>)	$\Delta w_{\text{average}} \leq 0,10$ mm, relative to nominal value $w_{\text{max.}} - w_{\text{min.}} \leq 0,20$ mm	Annex A
Length and width of squared elements, (<i>l = w</i>)	$\Delta l_{\text{average}} \leq 0,10$ mm relative to nominal value $\Delta w_{\text{average}} \leq 0,10$ mm, relative to nominal value $l_{\text{max.}} - l_{\text{min.}} \leq 0,20$ mm $w_{\text{max.}} - w_{\text{min.}} \leq 0,20$ mm	Annex A
Squareness of the element, (<i>q</i>)	$q_{\text{max.}} \leq 0,20$ mm	Annex A
Straightness of the surface layer, (<i>s</i>)	$s_{\text{max.}} \leq 0,30$ mm/m	Annex A
Flatness of the element, (<i>f</i>)	Maximum single values: $f_{w, \text{concave}} \leq 0,15$ % $f_{w, \text{convex}} \leq 0,20$ % $f_{l, \text{concave}} \leq 0,50$ % $f_{l, \text{convex}} \leq 1,00$ %	Annex A
Openings between elements, (<i>o</i>)	$o_{\text{average}} \leq 0,15$ mm $o_{\text{max.}} \leq 0,20$ mm	Annex B
Height difference between elements, (<i>h</i>)	$h_{\text{average}} \leq 0,10$ mm $h_{\text{max.}} \leq 0,15$ mm	Annex B
Dimensional variations after changes in relative humidity, (δl , δw)	$\delta l_{\text{average}} \leq 0,9$ mm $\delta w_{\text{average}} \leq 0,9$ mm	Annex C
Light fastness	Colour contrast between unexposed and exposed sample part ≥ 4 of grey scale according to EN 20105—A02	EN ISO 4892-2:2006/A1:2009 procedure B – cycle 5 (50 % rel. hum.) ^{a b}
Static indentation	residual indentation $\leq 0,05$ mm	EN ISO 24343-1

^a Test until blue wool scale No. 6 according to EN ISO 105-B02 (= colour contrast 4 on the grey scale according to EN 20105-A02 between exposed and unexposed part of blue wool scale).

^b Allow sample (24 ± 1 h) recovery time without light exposure at 23 °C and 50 % rel. humidity before taking final assessment.

4.2 Classification requirements

All laminate floor coverings shall be classified as suitable for different levels of use according to the requirements specified in Table 2, when tested by the methods given therein. Classification shall conform to the scheme specified in EN ISO 10874.

The large ball impact test and the castor chair test of class 34 products shall be carried out with the pre-attached underlays or with an underlay specified by the manufacturer.. For the large ball impact test of

products of the classes 21 – 23 and 31 – 33 a standard EPS foam of $(1,8 \pm 0,2)$ mm thickness, with a CS value of (60 ± 10) kPa¹ and with PC-value of $(0,9 \pm 0,1)$ mm shall be used. The three parameters of the foam shall be determined according to CEN/TS 16354.

Table 2 — Classification requirements and level of use

Class:	Level of use							Test method
	Domestic			Commercial				
	Moderate	General	Heavy	Moderate	General	Heavy	Very Heavy	
	21	22	23	31	32	33	34	
Abrasion resistance	AC1	AC2	AC3		AC4	AC5	AC6	Annex E
Impact resistance				≥ 35 mm	≥ 70 mm	≥ 120 mm		EN 17368 ^d
Small ball	≥ 10 mm							
Large ball	≥ 500 mm			750 mm	$\geq 1\,000$ mm	$\geq 1\,600$ mm		Annex H
Resistance to staining	4, (groups 1 and 2) 3, (group 3)		5, (groups 1 and 2) 4, (group 3)		5, (groups 1, 2 and 3)			EN 438 series
Effect of a furniture leg	-			No damage shall be visible, when tested with foot type 0				EN ISO 16581
Effect of a castor chair ^a	-			25 000 cycles, No damage ^a with type W wheels			25 000 cycles No damage ^a with type H wheels	EN 425:2002 ^b
Thickness swelling	≤ 20 %		≤ 18 %			≤ 15 %	≤ 8 %	ISO 24336
Locking strength	-			$f_{10,2} \geq 1$ kN/m (length) $f_{s0,2} \geq 2$ kN/m (width)		$f_{10,2} \geq 3,5$ kN/m (length) $f_{s0,2} \geq 3,5$ kN/m (width)		ISO 24334
Surface soundness	$\geq 1,0$ N/mm ²			$\geq 1,25$ N/mm ²		$\geq 1,50$ N/mm ²		Annex D

¹ The product "Selitflex 1,6 mm" made by Selit Dämmtechnik GmbH is an example of a suitable product commercially available. This information is given for the convenience of users of this European Standard 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.

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Class:	Level of use							Test method
	Domestic			Commercial				
	Moderate	General	Heavy	Moderate	General	Heavy	Very Heavy	
	21	22	23	31	32	33	34	
Dimensional stability	-						Δ_w avg: Δ_l avg: $\leq 0,15$ % $- 0,20$ % $\leq C_{avg}$ $c \leq 0,25$ % J_L avg: J_S avg: \leq 0,15 mm h_L avg: h_S avg: $\leq 0,15$ mm	ISO 24339
<p>a No visible damage on the surface of the assembled test area caused by detachment of layers, opening of joints, or crazing. Ignore any flattening or change in appearance, e.g. change in gloss.</p> <p>b Using soft castor wheels W PU (95 ± 5) Shore A except for class 34 wheels H PA (95 ± 5) Shore A.</p> <p>c Take the maximum of C_{avg} from wet climate (23 °C, 85 % rel. hum) and the minimum of C_{avg} from dry climate (23 °C, 30 % rel. hum.) for the evaluation.</p> <p>d The small ball diameter test shall be carried out without underlay. The pre-attached underlay shall be removed.</p>								

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(A2)

4.3 Additional technical characteristics

When any of the characteristics given in Table 3 are requested for specific applications, the laminate floor coverings shall be tested by the methods given therein. The properties stated in Table 3 are considered important for some specific products or applications.

Table 3 — Additional technical characteristics

Characteristic	Comment	Test method
Humidity at dispatch from the manufacturer	The elements shall have a moisture content of 4 % to 10 %. Any single batch shall be homogeneous with $H_{max} - H_{min} \leq 3$ %	EN 322
Appearance, surface defects	Minor surface defects as defined in the EN 438 series are permitted.	EN 438-2
Micro-scratch resistance	Can be declared as micro-scratch resistance classes according to procedure A and/or B	EN 16094

5 Marking and packaging

5.1 Marking

NOTE For CE-Marking see EN 14041.

Laminate floor coverings which comply with the requirements of this standard shall have the following information clearly marked by the manufacturer, either on their packaging, or on a label or information sheet included in the packaging:

- a) a reference to this European Standard;
- b) manufacturer's and/or supplier's identification;
- c) product name;
- d) colour/pattern and batch number;
- e) level of use symbols appropriate to EN ISO 10874 and in accordance with Table 4;
- f) nominal dimensions of one floor covering element in millimetres; if relevant: nominal thickness of pre-attached underlay, nominal thickness of products with pre-attached underlay e.g. 10 (8 + 2) mm;
- g) number of elements contained in a package;
- h) area contained in a package in square metres.

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