



SLOVENSKI STANDARD

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Laminatne talne obloge - Podlage - Specifikacije, zahteve in preskusne metode

Laminate floor coverings - Underlays - Specification, requirements and test methods

Laminatböden - Unterlagsmaterialien - Spezifikationen, Anforderungen und Prüfverfahren

Revêtements de sol stratifiés - Sous-couches - Spécifications, exigences et méthodes d'essai

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Netekstilne talne obloge

Non-textile floor coverings

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TECHNICAL SPECIFICATION
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**Laminate floor coverings - Underlays - Specification,
requirements and test methods**

Revêtements de sol stratifiés - Sous-couches -
Spécifications, exigences et méthodes d'essai

Laminatböden - Verlegeunterlagen - Spezifikationen,
Anforderungen und Prüfverfahren

This Technical Specification (CEN/TS) was approved by CEN on 3 September 2013 for provisional application.

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Foreword

This document (CEN/TS 16354:2013) has been prepared by Technical Committee CEN/TC 134 “Resilient, textile and laminate floor coverings”, the secretariat of which is held by NBN.

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CEN/TS 16354:2013 (E)**1 Scope**

This Technical Specification specifies test methods for the determination of the technical characteristics of underlays under laminate floor coverings. It includes minimum performance requirements for the underlay-flooring system to give satisfactory service and to encourage the consumer to make an informed choice. It also specifies requirements for marking and packaging.

Underlays pre-attached to the laminate flooring coverings are not covered by this Technical Specification.

Underlays for laminate floor coverings intended for use in electrostatically sensitive areas like computer rooms, etc., are not covered by this Technical Specification.

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 717-1, *Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method*

EN 717-2, *Wood-based panels - Determination of formaldehyde release - Part 2: Formaldehyde release by the gas analysis method*

EN 822, *Thermal insulating products for building applications - Determination of length and width*

EN 823, *Thermal insulating products for building applications - Determination of thickness*

EN 824, *Thermal insulating products for building applications - Determination of squareness*

EN 825, *Thermal insulating products for building applications - Determination of flatness*

EN 826, *Thermal insulating products for building applications - Determination of compression behaviour*

EN 1264-3, *Water based surface embedded heating and cooling systems - Part 3: Dimensioning*

EN 1606, *Thermal insulating products for building applications - Determination of compressive creep*

EN 1815, *Resilient and textile floor coverings - Assessment of static electrical propensity*

EN 12086, *Thermal insulating products for building applications - Determination of water vapour transmission properties*

EN 12311-2, *Flexible sheets for waterproofing - Determination of tensile properties - Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12664, *Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Dry and moist products of medium and low thermal resistance*

EN 12667, *Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance*

EN 13238, *Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates*

EN 13329, *Laminate floor coverings - Elements with a surface layer based on aminoplastic thermosetting resins - Specifications, requirements and test methods*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 13793:2003, *Thermal insulating products for building applications - Determination of behaviour under cyclic loading*

EN 14909, *Flexible sheets for waterproofing - Plastic and rubber damp proof courses - Definitions and characteristics*

EN ISO 717-1, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (ISO 717-1:2013)*

EN ISO 717-2, *Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (ISO 717-2:2013)*

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

EN ISO 1923, *Cellular plastics and rubbers - Determination of linear dimensions (ISO 1923)*

EN ISO 10140-2, *Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2)*

EN ISO 10140-3, *Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation (ISO 10140-3)*

EN ISO 10140-5:2010, *Acoustics - Laboratory measurement of sound insulation of building elements - Part 5: Requirements for test facilities and equipment (ISO 10140-5)*

EN ISO 11925-2:2010, *Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2)*

EN ISO 16000-9, *Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method (ISO 16000-9)*

3 Terms and definitions

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

3.1

laminated floor covering

floor covering with a surface layer consisting of one or more thin sheets of a decorative material (usually paper), impregnated with aminoplastic thermosetting resins (usually melamine) or impregnated and surfaced with an acrylate and/or methacrylate resin

3.2

underlay

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

Note 1 to entry: Underlays for laminated flooring can be principally divided into four main classes:

a) synthetic underlays:

- 1) cellular (foam) (e.g. PE, PP, PO, EPS, polyurethane, etc., -based);

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- 2) fibrous (e.g. non-woven polyester, polypropylene, etc., -based);
- b) renewable underlays (e.g. wood fibre boards, card board, coco fibre, etc.);
- c) other underlays (not falling into above groups).

Combinations of above underlays and underlay materials as well as combinations of above underlays with foils or films (e.g. vapour control layers) are also possible.

3.3**vapour control layer**

underlay and/or an additional layer that offers a resistance against the passage of water vapour

3.4**floor covering system**

combination of at least one underlay with a laminate floor covering

Note 1 to entry: For definition of laminate floor covering see 3.1.

3.5**reference floor covering**

monolithic seamless panel with no pre-attached underlay, having a nominal thickness of $(7,0 \pm 0,2)$ mm and a size of $(2,0 \pm 0,1)$ m x $(2,4 \pm 0,1)$ m in accordance with EN 13329, class 23/31 and produced by the DPL method with melamine backing, and with an HDF core board with a density of (850 ± 50) kg/m³

Note 1 to entry: The reference floor covering referred to in this Technical Specification is identical with the one specified in the reflected walking sound test according to Bibliographical entries [1] and [2]. This reference floor covering can be retrieved from EPLF (<http://www.eplf.com>).

3.6**substrate**

structural layer on which the floor covering system is installed

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4 Requirements**4.1 Characteristics**

The following table gives an overview of the important key characteristics and requirements for the underlay, depending on the exact application and products used. They have been determined for defined scenarios (e.g. dynamic load by walking persons, moving castor chair, structural floor unevenness) and by practical trials and measurements (e.g. 100 Pa is the approx. pressure of an unloaded laminate onto the underlay). Where needed, existing methods have been adapted.

When reference is made to this Technical Specification the characteristics declared shall be determined according to the test methods specified in Table 1.

Table 1 — Characteristics

No.	Characteristic	Requirements/Tolerances	Test method	Subclause
1	Thickness, (d)	Measured thickness in mm. Tolerance of declared thickness (d _d): $\pm 15\%$ or $\pm 0,5$ mm ^a	EN 823 + A.3.1	
2	Length,(l)	Measured length. Tolerance of declared length (l _d): boards: $- 1\% + 5\%$	EN 822 + A.3.3	

		rolls: - 0 % + 5 %		
3	Width, (w)	Measured width. Tolerance of declared width (w_d): - 1 % + 2,5 % and of width variation $W_{max} - W_{min} \leq 10 \text{ mm}$	EN 822 + A.3.2	
4	Squareness, (q)	$q_{max} < 5 \text{ mm/m}$	EN 824 + A.3.4	
5	Flatness, (S)	$S_{max} < 2 \text{ mm/m}$	EN 825 + A.3.5	
6	Punctual conformability (PC)	in mm^b	EN ISO 868 + A.3.6	4.2.3
7	Compressive strength (CS)	in kPa^b	EN 826 + A.3.7	4.2.4
8	Compressive Creep resistance (CC)	in kPa^b	EN 1606 + A.3.8	4.2.5
9	Dynamic load (DL) resistance	in number of cycles at the defined load applied ^b	EN 13793 + A.3.9	4.2.6
10	Thermal resistance (R)	in m^2/KW	EN 12667 or EN 12664 at 24 °C mean temperature	4.2.7
11	Water vapour diffusion resistance (SD)	in m	EN 12086, method A, at 23 °C and 0 %–50 % rel. humidity	4.2.8
12	Impact sound (IS)	Weighted reduction of impact sound pressure level ΔL_w in dB	EN ISO 10140-3 and EN ISO 717-2	4.2.12.2
13	Reflected walking sound (RWS)	RWS (in sone)	See Bibliography [1] and [2]	4.2.12.3
14	Air borne sound (AS)	Weighted apparent sound reduction index R_w' in dB	EN ISO 10140-2 and EN ISO 717-1	4.2.12.4
14.1	Reaction-to-fire (RTF)	Material (underlay only)	EN ISO 11925-2 Classification according to EN 13501-1:2007+A1:2009 - Table 2	4.2.11.1 1)
14.2		Product (underlay plus laminate in end-use conditions)	EN 13501-1:2007+A1:2009 - Table 2	4.2.11.1 2)
15	Resistance to impact by large diameter ball (RLB)	Product (underlay plus laminate in end-use conditions)	EN 13329	4.2.11.2
16	Electrostatic behaviour (EB)	Product (underlay plus laminate in end-use conditions)	EN 1815, method A	4.2.11.3
17	Alkaline resistance (AR)		EN 14909	4.2.9
18	Emission of formaldehyde		EN 717-1 or EN ISO 16000-9	4.2.11.4
19	Emission of VOCs		EN ISO 16000-9	4.2.11.5
20	Area weight (AW)		A.3.10	4.2.10

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^a Whichever gives the smallest numerical tolerances.

^b See Annex B (informative).

4.2 Testing**4.2.1 General**

The tests specified in this clause are based on existing standards used for other building applications and adapted to the specific application conditions of laminate flooring underlays where needed.

4.2.2 Thickness (d)

Thickness is the main property of an underlay to ensure functionality such as acoustic performance or conformability.

The thickness d shall be determined according to EN 823 plus the details given in A.3.1 under a measurement load of 100 Pa (= typical load of a laminate).

4.2.3 Punctual conformability (PC)

Punctual conformability is the ability of the underlay to smoothen small local defects of the subfloor (e.g. small protruding particles) and/or small particles laying on the subfloor when installed under a laminate floor covering.

The punctual conformability of the underlay shall be determined by measuring the Shore-A-hardness (SH) according to EN ISO 868 plus the details defined in A.3.6. The punctual conformability shall be declared as PC-value (mm).

The higher the PC-value the better the underlay will smoothen the punctual unevenness or defects of a subfloor.

4.2.4 Compressive strength (CS)

To ensure the integrity of the joints of a laminate floor covering element, the compressive strength at 0,5 mm deformation shall be determined according to EN 826 plus the details defined in A.3.7 and with a pre-load of 100 Pa. The compressive strength shall be declared as CS-value (in kPa).

4.2.5 Compressive Creep (CC) resistance

To ensure sufficient resistance of the underlay against static load applied by e.g. furniture feet, the resistance to compressive load shall be determined according to EN 1606 plus the details defined in A.3.8 and with a pre-load of 100 Pa.

Compressive creep resistance shall be determined as the maximum applicable load in kPa resulting in a thickness loss $X_t = X_0 + X_{ct}$ of $\leq 0,5$ mm after extrapolation to 10 years. The compressive creep resistance shall be declared as CC-value in kPa.

When CC is determined at temperatures other than the standard conditions as defined under A.2, the conditions shall be reported (e.g. CC (35 °C)).

4.2.6 Dynamic load (DL) resistance

To ensure sufficient resistance of the underlay against long-term dynamic loads applied by e.g. people walking or sitting on a castor chair the resistance to dynamic load shall be determined according to EN 13793 plus the details defined in A.3.9.

The dynamic load resistance shall be declared as DL-value (number of cycles). The value is determined as the maximum number of load cycles which can be applied to the underlay that results in a maximum loss in thickness of $\leq 0,5$ mm.

4.2.7 Thermal resistance (R)

If the laminate floor coverings is going to be installed over underfloor heating according to EN 1264-3 the thermal resistance R of the floor covering system shall not exceed $0,15 \text{ m}^2\text{K/W}$ when tested according to EN 12667 or EN 12664 at $24 \text{ }^\circ\text{C}$ mean temperature.

The heat resistance R of the materials laid onto the heated floor such as underlay and floor covering, etc., shall be summed up. Because of the weight of the floor covering itself and the weight of furniture, air gaps may not be expected and can be neglected in this respect.

NOTE For more information, see [3].

4.2.8 Water vapour resistance (SD)

In situations where slight rising dampness or occasional condensation can be expected because of differences in temperature, wet conditions in underneath rooms or in case of an underfloor heating, a vapour control layer shall be installed to protect the floor covering system from swelling or other negative effects. The minimum SD value of the vapour control layer in these situations should be $\text{SD} \geq 75 \text{ m}$ measured using EN 12086, method A, with the test conditions $23 \text{ }^\circ\text{C}$, $0/50 \%$ relative humidity.

The vapour control properties may be provided by the underlay itself (e.g. multilayer) or by a separate layer. For underlays known to be sensitive to humidity suitable precautions shall be taken to prevent water vapour from the structural floor to penetrate into the underlay (e.g. by installing a water vapour control layer between structural floor and underlay).

4.2.9 Alkaline resistance (AR)

To ensure the long-term performance of a floor covering system laid on concrete floors, a sufficient alkaline resistance of underlays and vapour control layers is important in case they are in direct contact to the alkaline substrate.

The alkaline resistance is determined in accordance with EN 14909. The upper concrete block is replaced by a 7 mm DPL board (130 mm x 110 mm) as described under 3.5.

The alkaline resistance is assessed by measuring the tensile elongation according to EN 12311-2 before and after alkaline exposure.

4.2.10 Area weight (AW)

The area weight may be important for logistical/transport reasons and shall be determined for the underlay as such (including e.g. foils, films) and as described in A.3.10.

4.2.11 Specific requirements for health/safety aspects

4.2.11.1 Reaction to fire (RTF)

The reaction to fire of an underlay can be determined and classified according to EN 13501-1 for two cases:

1) Material (underlay only):

The test shall be carried out according to the test procedure described in EN ISO 11925-2:2010, Clause 7.

Where an underlay is fixed to a substrate, the test specimen shall represent the end-use conditions.