



BSI Standards Publication

Loose-laid panels — Semi-rigid multilayer modular floor covering (MMF) panels with wear resistant top layer

National foreword

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The UK participation in its preparation was entrusted to Technical Committee PRI/60, Resilient and Laminate Floor Coverings.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 80941 5

ICS 97.150

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2014.

Amendments issued since publication

Date	Text affected
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EUROPEAN STANDARD

EN 16511

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

ICS 97.150

English Version

Loose-laid panels - Semi-rigid multilayer modular floor covering (MMF) panels with wear resistant top layer

Panneaux pour pose flottante - Panneaux de revêtement de sol semi-rigides, multicouches et modulaires (MMF) avec couche supérieure résistante à l'usure

Paneele für schwimmende Verlegung - Halbstarre, mehrlagige, modulare Fußbodenbeläge (MMF) mit abriebbeständiger Decklage

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Foreword

This document (EN 16511:2014) 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of an identical text or by endorsement, at the latest by November 2014 and conflicting national standards shall be withdrawn at the latest by November 2014.

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1 Scope

This European Standard specifies the characteristics of semi-rigid multilayer modular floor covering with a wear-resistant and decorative surface layer supplied in panels (either tile or plank form). The floor panels are considered suitable for domestic and commercial levels of use and designed for floating installation.

This European Standard does not apply to resilient floor panels for loose-laying according to EN 14085, to multilayer wood floorings according to EN 13489, nor to products specified in EN ISO 10581, EN ISO 10582, EN ISO 24011, EN 12104 and ISO 14486.

This European Standard applies to areas which are subject to frequent wetting, e.g. bathrooms, laundry rooms or saunas, only if recommended by the producer.

This European Standard also includes requirements for marking and packaging.

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 424, *Resilient floor coverings - Determination of the effect of simulated movement of a furniture leg*

EN 425, *Resilient and laminate floor coverings - Castor chair test*

EN 438-2, *High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (usually called Laminates) - Part 2: Determination of properties*

EN 13329:2006+A1:2008, *Laminate floor coverings - Elements with a surface layer based on aminoplastic thermosetting resins - Specifications, requirements and test methods*

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

prEN 15468:2013, *Laminate floor coverings - Elements with directly applied printing and resin surface layer - Specifications, requirements and test methods*

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

EN ISO 23999, *Resilient floor coverings - Determination of dimensional stability and curling after exposure to heat (ISO 23999)*

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

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 24337, *Laminate floor coverings - Determination of geometrical characteristics*

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

floor panel

semi-rigid decorative floor covering in plank or tile form, with a multiple layer structure and worked edges that allow joining products together to form a larger integral unit

Note 1 to entry The multi-layer structure consists of a wear-resistant top layer, a decorative surface layer, a substrate and usually a backer.

3.2

substrate

core layer providing thickness, stability and other properties needed

3.3

top layer

layer providing wear resistance and protection

3.4

surface layer

layer providing visual and esthetical properties, intended to be the visible side when the floor is installed

3.5

backer

layer opposite to the surface layer

3.6

modular

elements supplied in single sheets or tiles with worked edges that allow the product to be joint together to form a layer integral unit

3.7

semi-rigid

element consisting of materials or layers for the core which allow the floor panel to have worked edges with surface and/or top layers giving resiliency to a surface

3.8

underlayment

material used between the floor covering and the subfloor

4 Requirements

4.1 General requirements for the panels

All classes of the MMF panels shall meet the requirements specified in Table 1 when tested in accordance with ISO 24337.

Table 1 — General requirements

Geometrical characteristics	Requirements (testing in accordance with ISO 24337)
Thickness, t	$\Delta t_{avg} \leq 0,50$ mm, relative to nominal value $t_{max} - t_{min} \leq 0,50$ mm
Length, l	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
Width, w	$\Delta w_{avg} \leq 0,10$ mm, relative to nominal value $w_{max} - w_{min} \leq 0,20$ mm
Length and width of squared elements, $l = w$	$\Delta l_{avg} \leq 0,10$ mm relative to nominal value $\Delta w_{avg} \leq 0,10$ mm, relative to nominal value $l_{max} - l_{min} \leq 0,20$ mm $w_{max} - w_{min} \leq 0,20$ mm
Squareness, q	$q_{max} \leq 0,20$ mm
Straightness, s	$s_{max} \leq 0,30$ mm/m
Flatness, f	Maximum single values: $f_{w, concave} \leq 0,15$ %, $f_{w, convex} \leq 0,20$ % $f_{l, concave} \leq 0,50$ %, $f_{l, convex} \leq 1,00$ %
Openings, o	Openings measured from the surface between vertical contacting edges: $o_{avg} \leq 0,15$ mm $o_{max} \leq 0,20$ mm
Height difference, h	$h_{avg} \leq 0,10$ mm $h_{max} \leq 0,15$ mm

4.2 Classification requirements

The classification scheme and use intensity symbols are described in EN ISO 10874. The requirements are valid for all types of floor panels except for panels without coatings (see Table 2).

The producer shall indicate with which method (method A or B) wear resistance shall be tested.

Table 2 — Classification

Class (EN ISO 10874) →	21/22	23	31	32	33	34	Reference test method
Characteristic ↓							
Wear resistance IP, method A or	≥ 200 cycles	≥ 400 cycles	≥ 600 cycles	≥ 1 200 cycles	≥ 2 000 cycles	≥ 4 000 cycles	EN 13329, Annex E
Wear resistance IP, method B	≥ 500 cycles	≥ 1 000 cycles	≥ 1 500 cycles	≥ 3 000 cycles	≥ 5 000 cycles	≥ 7 000 cycles	prEN 15468:2013, Annex A
Impact resistance [mm] (big ball)	≥ 400 mm	≥ 600 mm	≥ 800 mm	≥ 1 200 mm	≥ 1 600 mm	≥ 1 800 mm	EN 13329:2006+A1:2008, Annex F
Micro-scratch resistance [class]				≤ MSR-A3, ≤ MSR-B3	≤ MSR-A2, ≤ MSR-B2	≤ MSR-A2, ≤ MSR-B2	EN 16094
Castor chair resistance			10 000 cycles ^{a, c}	25 000 cycles ^{a, c}	25 000 cycles ^{a, c}	25 000 cycles ^{a, c}	EN 425
Effect of furniture leg				No visible damage	No visible damage	No visible damage	EN 424 (tested with foot type 0)
Residual indentation	≤ 0,3 mm	≤ 0,3 mm	≤ 0,3 mm	≤ 0,2 mm	≤ 0,2 mm	≤ 0,15 mm	EN ISO 24343-1
Resistance to staining [grade, per group]	Water, coffee and cleaning solution (10 min): grade 4	Water, coffee and cleaning solution (10 min): grade 4	Groups 1 and 2: grade 4 Group 3: grade 3	Groups 1 and 2: grade 5 Group 3: grade 4	Groups 1 and 2: grade 5 Group 3: grade 4	Groups 1 and 2: grade 5 Group 3: grade 4	EN 438-2: Group 1 only 10 min
Swelling * [%]	≤ 20	≤ 20	≤ 20	≤ 18	≤ 18	≤ 12	ISO 24336
Locking strength ^{b, **} [kN/m] Locking strength ^{b, *}				Long side ≥ 1,0 Short side ≥ 1,5 Long side ≥ 1,0 Short side ≥ 2,0	Long side ≥ 1,0 Short side ≥ 1,5 Long side ≥ 1,0 Short side ≥ 2,0	Long side ≥ 2,0 Short side ≥ 3,5 Long side ≥ 1,0 Short side ≥ 3,5	ISO 24334
Dimensional variations due to variation of climate*						$\Delta W_{avg}, \Delta l_{avg}: \leq 0,15 \%$ $- 0,20 \% \leq C_{avg} \leq 0,25 \%$ ^d $J_{L, avg}, J_{S, avg} \leq 0,15 \text{ mm}$ $h_{L, avg}, h_{S, avg} \leq 0,15 \text{ mm}$	ISO 24339

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Class (EN ISO 10874) →	21/22	23	31	32	33	34	Reference test method
Characteristic↓							
Dimensional Stability due to variation of temperature Length variation Δl (length and crosswise) in %**	≤ 0,5 %	≤ 0,5 %	≤ 0,25 %	≤ 0,25 %	≤ 0,25 %	≤ 0,25 %	EN ISO 23999
<p>^a No disturbance to the surface only gloss changes, no delamination, cracks or disruptions.</p> <p>^b Only for loose-laid panels.</p> <p>^c Tested with soft wheels.</p> <p>^d Take the maximum of C_{avg} from wet climate (23 °C, 85 % relative humidity) and the minimum of C_{avg} from dry climate (23 °C, 30 % relative humidity) for the evaluation.</p> <p>* Only for panels with substrates or layers with hygroscopic properties, e.g. HDF or cork.</p> <p>** Only for products with significant reaction on temperature changing, e.g. thermoplastic vinyl core.</p>							

5 Marking and packaging

5.1 Marking

Floor panels manufactured and conforming to this European Standard shall be clearly marked by the manufacturer on a label on or in the package giving the following information:

- a) reference of this document, i.e. EN 16511:2014;
- b) manufacturer's or supplier's identification;
- c) product name;
- d) class / symbol of level of use according to EN ISO 10874;
- e) procedure of wear resistance test (A or B);
- f) year of manufacture (last two digits);
- g) colour / pattern and identification number;
- h) successive number of the package if necessary for the installation;
- i) nominal dimensions of the panel;
- j) number of panels contained in the package;
- k) covered floor area after installation per package;
- l) the warning that packages shall be stored shielded from direct sunlight and humidity.

5.2 Packaging

Floor panels shall be delivered in packages designed to protect the corners, edges and surfaces of the product, under normal conditions of transport and handling. Installation, cleaning and maintenance instructions shall be delivered together with the product.

Annex A (informative)

Optional properties

Where specific properties are required for certain applications, the floor panels should be tested in accordance with the following methods, as appropriate:

- long-side friction: ISO 25620;
- resistance to staining: EN 14565:2004, Annex B.

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