SLOVENSKI STANDARD
SIST EN 16511:2023

01-julij-2023

Modularne mehansko spojene talne obloge (MMF) - Specifikacije, zahteve in preskusne metode za večslojne modularne plošče za plavajočo namestitev

Modular mechanical locked floor coverings (MMF) - Specification, requirements and test method for multilayer modular panels for floating installation

Modulare mechanisch verriegelnde Bodenbeläge (MMF) - Spezifikation, Anforderungen und Prüfverfahren für mehrschichtige modulare Paneele für die schwimmende Verlegung

Revêtements de sol modulaires à verrouillage mécanique (MMF) - Spécifications, exigences et méthodes d'essai pour panneaux multicouches modulaires pour pose flottante

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This European Standard was approved by CEN on 10 April 2023.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16511:2023) 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of an identical text or by endorsement, at the latest by November 2023, and conflicting national standards shall be withdrawn at the latest by November 2023.

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 supersedes EN 16511:2014+A1:2019.

The main changes compared to the previous edition are listed below:

a) title changed;

b) terms and definitions added in Clause 3;

c) EN 17539 included as test method for general requirements in 5.1;

d) light fastness and dimensional stability added as general requirements in 5.1;

e) classification requirements divided in floorings with wear layers (Table 2) and floorings with non-film-forming oil or wax finishes (Table 3);

f) additional technical characteristics for moisture resistance added as Table 4;

g) Annex B presenting a test method for the classification of the flexibility added.

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, Türkiye and the United Kingdom.

1 Scope

This document specifies the characteristics of multilayer mechanical locked 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 document does not apply to resilient floor panels for loose-laying according to EN ISO 20326, to multilayer wood floorings according to EN 13489, to wood veneer floor coverings according to EN 14354, to laminate floor covering according to EN 13329, EN 14978 and EN 15468 nor to products specified in EN ISO 10581, EN ISO 10582, EN ISO 24011, EN 12104 and ISO 14486.

This document is applicable to areas which are subject to frequent wetting, e.g. bathrooms, laundry rooms or saunas, only if specified by the producer.

This document also includes requirements for marking and packaging.

In Annex A (informative), optional properties are given. In Annex B (informative), a test method for the classification of the flexibility is given.

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 317, *Particleboards and fibreboards - Determination of swelling in thickness after immersion in water*

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*

EN 17539, *Modular mechanical locked floor coverings (MMF) - Determination of geometrical characteristics*

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

EN ISO 105-B02:2014, *Textiles - Tests for colour fastness - Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:2014)*

EN ISO 178:2019, *Plastics - Determination of flexural properties (ISO 178:2019)*

EN ISO 4918, *Resilient, textile and laminate floor coverings - Castor chair test (ISO 4918)*

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

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

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 4760:2022, *Laminate Flooring — Topical Moisture Resistance — Assembled joint*

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 24338, *Laminate floor coverings — Determination of abrasion resistance*

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.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

3.1
modular mechanical locked floor panel
MMF
decorative floor covering element in plank or tile form, with a multiple layer structure and worked edges with a mechanical interlocking system that allows joining elements to form a larger integral floating floor

Note 1 to entry: The multi-layer structure consists of a top layer, a substrate (core) and usually a backing layer.

3.2
substrate
core layer providing thickness, stability and other properties needed

3.2.1
polymer substrate
core layer based on polymer(s)

3.2.2
wood based substrate
core layer with a content of wood > 65 % by weight

3.2.3
other substrate
core layer which is not covered by 3.2.1 and 3.2.2

3.3
surface layer
all layers above the core including decorative and wear layer

3.4
wear layer
layer(s) providing wear resistance

Note 1 to entry: Wear layers can consist of solid polymer layers or coatings with or without factory finish.

3.5
decorative layer
layer providing visual and esthetical properties, intended to be the visible side when the floor is installed

Note 1 to entry: Decorative layers can consist of resilient layers including cork, layers with aminoplastic thermosetting resins and wood veneer layers with a thickness < 2,5 mm.

3.6
backing layer
layer(s) attached to the bottom side of the *substrate* (3.2)

Note 1 to entry: These layers can include a pre-attached underlay.

3.7
underlay
separate material used between the floor covering and the subfloor

3.8
pre-attached underlay
underlay permanently attached to the panel at the factory

3.9
moisture sensitive panel
panel which undergoes a change in dimensional stability with a change in relative humidity and in direct contact with water

3.10
temperature sensitive panel
panel which undergoes a change in dimensional stability with a change in temperature

3.11
water resistant floor
floor which can withstand topical water spillages on to its surface

3.12
resistance of mechanical joints to water leakage
resistance of joints between panels to penetration of liquid water standing on the surface for 24 h

3.13
water proof panel
panel consisting of materials which don't swell or increase their mass in contact with liquid water

4 Symbols

Δ	difference between two values
min	lowest value
max	highest value
average	mean value

5 Requirements

5.1 General requirements for the panels

All classes of the MMF panels shall meet the requirements specified in Table 1.

Table 1 — General requirements

Geometrical characteristics	Requirements	Test method
Thickness, t	$\Delta t_{average} \leq 0{,}50$ mm, relative to nominal value $t_{max} - t_{min} \leq 0{,}50$ mm (for panels without preattached underlay) $t_{max} - t_{min} \leq 0{,}80$ mm (for panels with preattached underlay)	EN 17539
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	EN 17539
Width, w	$\Delta w_{average} \leq 0{,}10$ mm, relative to nominal value $w_{max} - w_{min} \leq 0{,}20$ mm	EN 17539
Length and width of squared elements, $l = w$	$\Delta l_{average} \leq 0{,}10$ mm relative to nominal value $\Delta w_{average} \leq 0{,}10$ mm, relative to nominal value $l_{max} - l_{min} \leq 0{,}20$ mm $w_{max} - w_{min} \leq 0{,}20$ mm	EN 17539
Squareness, q	$q_{max} \leq 0{,}20$ mm	EN 17539
Straightness, s	$s_{max} \leq 0{,}30$ mm/m	EN 17539
Flatness, f	Maximum single values: $f_{w,\,concave} \leq 0{,}15$ %, $f_{w,\,convex} \leq 0{,}20$ % $f_{l,\,concave} \leq 0{,}50$ %, $f_{l,\,convex} \leq 1{,}00$ %	EN 17539

Geometrical characteristics	Requirements	Test method
Openings, *o*	Openings measured from the surface between vertical contacting edges: $o_{average}$ ≤ 0,15 mm o_{max} ≤ 0,20 mm	EN 17539
Height difference, *h*	$h_{average}$ ≤ 0,10 mm h_{max} ≤ 0,15 mm	EN 17539
Light fastness	Colour contrast between unexposed and exposed sample part ≥ 3 of grey scale according to EN 20105-A02 or blue wool scale ≥ 6	EN ISO 105-B02:2014 procedure 3 [a, b, c, d]
Dimensional stability under influence of temperature in x and y direction Curling in z direction (both parameters only for temperature sensitive panels)	I ≤ 0,15 %I ≤ 2 mm	EN ISO 23999

[a] Test until blue wool scale No. 6 according to EN ISO 105-B02 and compare that with the reference sample which was stored in the dark.

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

[c] For linoleum surface layer: before assessing the colour contrast between exposed and unexposed (reference) expose the reference sample, together with the blue wool cloth, to the xenon arc lamp, until a contrast is produced on Blue Wool Reference 2 equal to the contrast illustrated by Grey Scale 3. This step is necessary to remove the inherent "stove yellowing" of linoleum before the stable colouration is achieved.

[d] The general requirement is not valid for decorative layer made of cork or wood.

5.2 Classification requirements

The classification scheme and use intensity symbols shall be according to EN ISO 10874.

Requirements for floorings with wear layers shall be according to Table 2. The producer shall indicate with which method (method A or B) wear resistance shall be tested.

For requirements for floorings with oiled or waxed surface finishings (thickness < 20 µm) shall be according to Table 3.

For additional technical characteristics see Table 4. When any of the characteristics given in Table 4 are requested for specific applications, the floor coverings shall be tested by the methods given therein. The properties stated in Table 4 are considered important for some specific products or applications.