SLOVENSKI STANDARD
SIST EN 438-9:2010+A1:2014

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Nadomešča:
SIST EN 438-9:2010

Dekorativni visokotlačni laminati (HPL) - Plošče na osnovi duromernih smol (laminati) - 9. del: Razvrstitev in specifikacije za izbrane glavne laminate (vključno z dopolnilom A1)

High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 9: Classification and specifications for alternative core laminates

Dekorative Hochdruck-Schichtpressstoffplatten (HPL) - Platten auf Basis härtbarer Harze (Schichtpressstoffe) -Teil 9: Klassifizierung und Spezifikationen für Schichtpressstoffe mit alternativem Kernaufbau

Stratifiés décoratifs haute pression (HPL) - Plaques à base de résines thermodurcissables (communément appelées stratifiés) - Partie 9 : Classification et spécifications relatives aux stratifiés avec autres types d'âmes

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83.140.20	Laminatne plošče	Laminated sheets

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Foreword

This document (EN 438-9:2010+A1:2013) has been prepared by Technical Committee CEN/TC 249 “Plastics”, 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of an identical text or by endorsement, at the latest by April 2014, and conflicting national standards shall be withdrawn at the latest by April 2014.

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

This document includes Amendment 1 approved by CEN on 2013-09-21.

This document supersedes EN 438-9:2010.

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

EN 438, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates)*, consists of the following parts:

— *Part 1: Introduction and general information*

— *Part 2: Determination of properties*

— *Part 3: Classification and specifications for laminates less than 2 mm thick intended for bonding to supporting substrates*

— *Part 4: Classification and specifications for Compact laminates of thickness 2 mm and greater*

— *Part 5: Classification and specifications for flooring grade laminates less than 2 mm thick intended for bonding to supporting substrates*

— *Part 6: Classification and specifications for Exterior-grade Compact laminates of thickness 2 mm and greater*

— *Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes*

— *Part 8: Classification and specifications for design laminates*

— *Part 9: Classification and specifications for alternative core laminates* [this standard].

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

1 Scope

This European Standard specifies performance requirements for high-pressure decorative laminates (HPL) intended for interior use, the core compositions of which are not covered by EN 438-3 [1] to EN 438-6 [4] and EN 438-8 [5]. The core composition types (coloured core and metal reinforced core) are defined in this part of EN 438.

EN 438-2 specifies the test methods relevant to this part of EN 438.

2 Normative references

The following referenced documents are indispensable for the application 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 438-2:2005, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called Laminates) — Part 2: Determination of properties*

EN 12721, *Furniture — Assessment of surface resistance to wet heat*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178:2001)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method (ISO 1183-1:2004)*

EN ISO 12572, *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties (ISO 12572:2001)*

ISO 11664-2:2007, *Colorimetry — Part 2: CIE standard illuminants*

3 Terms and definitions

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

3.1
high pressure process
process for producing laminate(s) by simultaneous application of heat (temperature ≥ 120 °C) and high specific pressure (≥ 5 MPa), to provide flowing and subsequent curing of the thermosetting resins

3.2
high-pressure decorative alternative core laminate(s)
alternative core laminate(s)
HPL
sheet(s) consisting of decorative surface layers and alternative core layers bonded together by a high pressure process

NOTE 1 For alternative core layers, see 3.3.

NOTE 2 The surface layer(s) on one or both face(s), having decorative colours or designs, impregnated with melamine based resins are supported by a core. The surface layers can appear on one or both side(s) of the laminate(s). In case of one-sided laminates the back of the sheet(s) is made suitable for adhesive bonding to a substrate.

3.3 Types of alternative core laminates according to the core compositions

3.3.1
coloured core laminate
high-pressure decorative alternative core laminate, the core of which consists of cellulosic fibrous layers (normally paper) impregnated with thermosetting resins typically aminoplastic thermosetting resins

NOTE 1 To achieve a coloured laminate, either the cellulosic fibres or the resins can be coloured. A translucent laminate can be achieved by using clear resins and bleached fibres.

NOTE 2 The surface and the core layers can have the same colour producing a uniformly coloured laminate or be different colours to achieve a succession of coloured layers.

3.3.2
metal reinforced core laminate
high-pressure decorative alternative core laminate, the core of which consists of metal layer(s) or mesh(es) and cellulosic fibrous layers (normally paper) impregnated with phenolic or aminoplastic thermosetting resins.

NOTE The purpose of including the metal layers is to improve the mechanical, fire or permeability performances of the laminate. Additionally the metal layers can give aesthetic improvements to edge.

4 Material types and classification system

Alternative core laminates are defined using a three-letter classification system as shown in Table 1.

Table 1 — Alternative core laminate classification system

First letter	Second letter	Third letter
B (Coloured core laminate)	C (Compact)	S (Standard grade)
A1 R A1 (Metal reinforced core laminate)	T (Thin laminate < 2 mm)	or F (Flame retardant grade)

Type S – Standard grade high-pressure decorative alternative core laminates.

Type F – High-pressure decorative alternative core laminates with improved fire retardance, similar to type S but also complying with special requirements of specified tests which may vary according to the application (e. g. construction, marine, transport) and the country of use (see 5.4.3).

NOTE These types of laminate are normally not postformable.

In addition to the abbreviation "HPL" and the number of this European Standard, materials are specified by the alphabetical classification system.

EXAMPLE "Coloured core Standard Grade Thin high-pressure decorative laminate" is designated as HPL/EN 438-9 BTS.

5 Requirements

5.1 Compliance

Alternative core laminates classified in Table 1 shall comply with all appropriate requirements specified in 5.2, 5.3 and 5.4. This applies to both full-size sheets and cut-to-size panels.

5.2 Inspection requirements

5.2.1 General

Inspection shall be carried out in accordance with EN 438-2:2005, Clause 4, at a distance of 1,5 m.

5.2.2 Colour and pattern

When inspected in daylight or D65 standard illuminant, as specified in ISO 11664-2:2007, and also under tungsten-filament lightning illuminant A as specified in ISO 11664-2:2007, a slight difference between the corresponding colour reference sample held by the supplier and the specimen under test is acceptable.

When colour and surface finish are critical, it is recommended that sheets are checked for colour and surface-finish compatibility without protective film before fabrication or installation.

5.2.3 Surface finish

When inspected at different viewing angles, there shall be no significant difference between the corresponding surface-finish reference sample held by the supplier and the specimen under test.

When colour and surface finish are critical, it is recommended that sheets are checked for colour and surface-finish compatibility without protective film before fabrication or installation.

5.2.4 Reverse side

The reverse side of single-sided sheets shall be suitable for adhesive bonding (e.g. sanded). In the case of sanded backs, slight chatter marks shall be permitted.

5.2.5 Visual inspection

5.2.5.1 General

The following inspection requirements are intended as a general guide, indicating the minimum acceptable quality for laminates. Cut-to-size panels and certain applications involving full-size sheets may call for special quality requirements which can be negotiated between supplier and purchaser; in such cases the following requirements may be used as a basis for agreement. It shall be noted that only a small percentage of sheets in a batch (the level to be agreed with the customer) shall contain defects of the minimum acceptable level.

It may be agreed between purchaser and supplier that the visual quality standard applies to one decorative face only.

5.2.5.2 Surface quality

The following surface defects are permissible:

— Dirt, spots and similar surface defects

  The admissible size of such defects is based on a maximum contamination area equivalent to 1,0 mm^2/m^2 of laminate and is proportional to the sheet size under inspection.

  The total admissible area of contamination may be concentrated in one spot or dispersed over an unlimited amount of smaller defects.

— Fibres, hairs and scratches

The admissible size of defects is based on a maximum contamination length equivalent to 10 mm/m^2 of laminate and is proportional to the sheet size under inspection.

The total admissible length of contamination may be concentrated in one defect or dispersed over an unlimited amount of smaller defects.

5.2.5.3 Edge quality

For thin laminates visual defects (e.g. moisture marks, lack of gloss, corner damage, etc.) can be present on all four edges of the laminate, providing the defect-free length and width are at least the nominal size minus 20 mm.

For compact laminates edge chipping up to 3 mm on each side is permissible.

5.3 Dimensional tolerance requirements

5.3.1 Dimensional tolerance requirements for coloured core laminates

Dimensional tolerance requirements for coloured core laminates are specified in Tables 2 and 3.

Table 2 — Dimensional tolerance requirements for thin coloured core laminates

Property	Test method (EN 438-2:2005, Clause no.)	Requirement
Thickness	5	$0,5 \leq t \leq 1,0$ mm: maximum variation ± 0,15 mm $1,0 < t < 2,0$ mm: maximum variation ± 0,18 mm (where t: nominal thickness of the thin coloured core laminate)
Flatness [a]	9	maximum deviation: 100 mm/m
Length and width [b]	6	$^{+10}_{0}$ mm
Straightness of edges [b]	7	maximum deviation: 1,5 mm/m
Squareness [b]	8	maximum deviation: 1,5 mm/m

[a] Provided that the thin coloured core laminates are stored in the manner and conditions recommended by the manufacturer, they shall comply with the flatness requirements specified in Table 2 when measured in accordance with EN 438-2:2005, Clause 9.

[b] Tolerances for cut-to-size panels shall be agreed between supplier and purchaser.