SLOVENSKI STANDARD
SIST EN 438-8:2009

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Dekorativni visokotlaļ ni laminati (HPL) - Ploġļ e na osnovi duromernih smol (laminati) - 8. del: Razvrstitev in specifikacije laminatov s posebnimi vzorci

High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 8: Classification and specifications for design laminates

Dekorative Hochdruck-Schichtpressstoffplatten (HPL) - Platten auf Basis härtbarer Harze (Schichtpressstoffe) - Teil 8: Klassifizierung und Spezifikationen für Design-Schichtpressstoffe

Stratifiés décoratifs haute pression (HPL) - Plaques à base de résines thermodurcissables (communément appelées stratifiés) - Partie 8 : Classification et spécifications relatives aux stratifiés à effets de surface spéciaux

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83.140.20 Laminatne ploġļ e Laminated sheets

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 438-8:2009) 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of an identical text or by endorsement, at the latest by September 2009, and conflicting national standards shall be withdrawn at the latest by September 2009.

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.

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

— *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 (this standard)*

— *Part 9: Classification and specifications for alternative core laminates*[1]

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 In preparation.

1 Scope

This part of EN 438 specifies performance requirements for high-pressure decorative laminates (HPL) intended for interior use with a design effect surface having a phenolic based core and a decorative surface, not covered by EN 438-3 to EN 438-6. Three surface material types (metal, wood veneer and pearlescent decor) 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 (ISO 4211-2:1993 modified)*

EN 12722, *Furniture — Assessment of surface resistance to dry heat (ISO 4211-3:1993 modified)*

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

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)*

ISO 11664-2, *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 design laminate(s) (HPL)
sheet(s) consisting of decorative surface layers supported by layers of cellulosic fibrous material (normally paper) impregnated with thermosetting resins and bonded together by a high pressure process

NOTE 1 For surface layers, see 3.3.

NOTE 2 The core layers are impregnated with phenolic based resins. The surface layers can appear on one or both side(s) of the laminate(s). They are not necessarily treated with thermosetting resin. In case of one-sided design laminates the back of the sheet(s) is made suitable for adhesive bonding to a substrate.

3.3 Types of high-pressure decorative design laminates according to the surface layer materials

3.3.1
pearlescent laminate
high-pressure decorative design laminate, the surface material of which consists of a pearlescent effect decorative paper, which is impregnated with melamine resin

NOTE 1 To achieve the optimum aesthetic effect from the pearlescent pigment a protective melamine layer is not used.

NOTE 2 As a result some surface properties are reduced (e.g. scratch, wear) therefore it is recommended that these products are used for vertical applications.

3.3.2
metal laminate
high-pressure decorative design laminate, the surface material of which consists of a thin layer of metal

NOTE 1 E.g. aluminium, steel or copper.

NOTE 2 It is often protected by a thin layer of lacquer or in the case of aluminium the surface can be anodized. The surface performance and appearance of these metal laminates is equivalent to that of thin metal sheet.

NOTE 3 As some surface properties are lower than that of melamine (e.g. scratch and wear), it is recommended that these products are used for vertical applications.

3.3.3
wood veneer laminate
high-pressure decorative design laminate, the surface material of which consists of a wood veneer, which is covered by a protective melamine layer. The surface appearance of these wood veneer laminates is similar to wood. Wood veneer laminates are not normally available in postforming grade

4 Material types and classification system

High-pressure decorative design laminates are defined using a three letter classification system as shown in Table 1.

Table 1 — High-pressure decorative design laminate classification system

First letter	Second letter	Third letter
A (Pearlescent laminate)	C (Compact)	S (Standard grade)
M (Metal laminate)	T (Thin laminate < 2 mm)	or P (Postformable grade)
W (Wood veneer laminate)		or F (Flame retardant grade)

Type S – Standard grade high-pressure decorative design laminates.

Type P – Postformable high-pressure decorative design laminates, similar to type S but can also be formed at elevated temperature.

Type F – High-pressure decorative design laminates with improved fire retardance similar to type S or P 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 5.4.5).

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

EXAMPLE "Pearlescent Standard Grade Thin high-pressure decorative design laminate" is designated as HPL/EN 438-8 ATS.

5 Requirements

5.1 Compliance

High-pressure decorative design 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, pattern and surface finish

5.2.2.1 Pearlescent

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

As 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.

Some of these products are directional in surface finish or colour and they shall be installed in the correct orientation.

5.2.2.2 Metal

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

As 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.

Some of these products are directional in surface finish or colour and they shall be installed in the correct orientation. Small indentations in the surface are unavoidable.

5.2.2.3 Wood veneer

Due to the fact that wood is a natural product, each veneer may be considered as unique. Slight colour and structure differences are considered as normal. Singularities such as knots and resin inclusions are not considered as defects, but as a part of the decor. There are differences in light fastness performances depending on the wood species and the source of the wood.

5.2.3 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.

5.2.4 Visual inspection

5.2.4.1 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. 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.

5.2.4.2 Surface quality

The following surface defects are permissible:

Dirt, spots, dents 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.

5.2.4.3 Edge quality

Visual defects (e.g. moisture marks, lack of gloss, corner damage) 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.

5.3 Dimensional tolerance requirements

5.3.1 Dimensional tolerance requirements for pearlescent laminates

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