
Dekoratívni visokotlačni laminati (HPL) - Plošče na osnovi duromernih smol - 7. del: Kompaktni laminati in kompozitni paneli HPL za notranjo in zunanjo oblogo zidov in stropov

High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes

Dekorative Hochdruck-Schichtpressstoffplatten (HPL) - Platten auf Basis härtbarer Harze (Schichtpressstoffe) - Teil 7: Kompaktplatten und HPL-Mehrschicht-Verbundplatten für Wand- und Deckenbekleidungen für Innen- und Außenanwendung

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Stratifiés décoratifs haute pression (HPL) - Plaques à base de résines thermodurcissables (communément appelées stratifiés) - Partie 7 : Panneaux stratifiés compacts et composites HPL pour finitions des murs et plafonds intérieurs et/ou extérieurs

Ta slovenski standard je istoveten z: prEN 438-7

ICS:

83.140.20 Laminatne plošče Laminated sheets

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High-pressure decorative laminates (HPL) - Sheets based on thermosetting resins (Usually called Laminates) - Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 249.

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European forward

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For relationship with Regulation EU 305/2011 (CPR), see informative Annex ZA, which is an integral part of this document.

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Introduction

An overview of European standards addressing compact laminate panels and HPL composite panels and related products for building applications is given below.

Test methods	EN 438-2:2016+A1:2018 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 2: Determination of properties
	EN ISO 13894-1:2015 , High-pressure decorative laminates — Composite elements — Part 1: Test methods (ISO 13894-1)
	EN 16094:2012 , Laminate floor coverings — Test method for the determination of micro-scratch resistance
Product standards Classification, specifications	EN 438-3:2016 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 3: Classification and specifications for laminates less than 2 mm thick intended for bonding to supporting substrates
	EN 438-4:2016 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 4: Classification and specifications for Compact laminates of thickness 2 mm and greater
	EN 438-5:2016 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 5: Classification and specifications for flooring grade laminates less than 2 mm thick intended for bonding to supporting substrates
	EN 438-6:2016 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 6: Classification and specifications for Exterior-grade Compact laminates of thickness 2 mm and greater
	EN 438-8:2018 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 8: Classification and specifications for design laminates
	EN 438-9:2017 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 9: Classification and specifications for alternative core laminates
	EN ISO 13894-2:2015 , High-pressure decorative laminates — Composite elements — Part 2: Specifications for composite elements with wood-based substrates for interior use (ISO 13894-2)
	EN 13329:2016+A1:2017 , Laminate floor coverings — Elements with a surface layer based on aminoplastic thermosetting resins — Specifications, requirements and test methods
	EN ISO 10874:2012 , Resilient, textile and laminate floor coverings — Classification
Product standards	prEN 438-7, HPL —Laminates — Part 7: Compact laminate and HPL composite panels for internal and external wall and ceiling finishes (This document)
	EN 13986:2004+A1:2015 , Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking
	EN 14041:2018 , Resilient, textile and laminate floor coverings — Essential characteristics
	EN 13964:2014 , Suspended ceilings — Requirements and test methods

General standard	EN 438-1:2016 , High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 1: Introduction and general information
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1 Scope

This document specifies characteristics for compact laminate panels and HPL composite panels both for non-structural uses in interior or external wall and ceiling finish applications (including in suspended ceiling).

This document deals with compact laminate panels of thickness 2 mm and greater.

The compact laminate panels are produced by using a high pressure process and the HPL composite panels are produced bonding an HPL sheet to a substrate.

This document covers compact laminate panels with the following types of laminates:

- compact laminates, as defined in EN 438-4:2016;
- exterior-grade compact laminates, as defined in EN 438-6:2016;
- pearlescent compact laminates, metal compact laminates and wood veneer compact laminates, as defined in EN 438-8:2018;
- coloured core layer compact laminates and metal reinforced core layer compact laminates, as defined in EN 438-9:2017.

This document covers full size and cut-to-size compact laminate panels and HPL composite panels, e.g. tiles and sidings.

This document specifies only compact laminate panels and HPL composite panels mechanically fixed using e.g. screws or rivets.

Both the compact laminate panels and HPL composite panels may contain flame retardant to improve their reaction to fire performance.

This document also specifies provisions for the assessment and verification of constancy of performance (AVCP) of the characteristics and includes provisions for marking these panels.

This document does not cover:

- a) HPL sheets less than 2 mm thick as defined in EN 438-3:2016, EN 438-8:2018 or EN 438-9:2017, which are not glued on a substrate;
- b) overlaid or veneered wood-based panels, where the overlay/veneer is not an HPL;
- c) HPL composite panels intended for use as floor coverings;
- d) panels used for fire protection of walls or ceilings;
- e) performances of installed systems for walls and ceilings with compact or composite high pressure laminate panels.

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 438-2:2016+A1:2014, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Part 2: Determination of properties*

EN 717-1:2004, *Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the chamber method*

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EN 12664:2001, *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 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13238:2010, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates*

EN 13823:2010+A1:2014, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 13986:2004+A1:2015, *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking*

EN 16516:2017, *Construction products: Assessment of release of dangerous substances — Determination of emissions into indoor air*

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

EN ISO 1183-1:2019, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2019)*

EN ISO 7049:2011, *Cross-recessed pan head tapping screws (ISO/FDIS 7049:2011)*

EN ISO 10140-1:2016, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 1: Application rules for specific products (ISO 10140-1:2016)*

EN ISO 10140-2:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)*

EN ISO 10140-4:2010, *Acoustics — Laboratory measurement of sound insulation of building elements — Part 4: Measurement procedures and requirements (ISO 10140-4:2010)*

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

EN ISO 10456:2007, *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values — Technical Corrigendum 1 (ISO 10456:2007)*

EN ISO 10456:2007/AC:2009, *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values — Technical Corrigendum 1 (ISO 10456:2007/Cor 1:2009)*

EN ISO 12572:2016, *Hygrothermal performance of building materials and products — Determination of water vapour transmission properties — Cup method (ISO 12572:2016)*

EN ISO 13894-1:2015, *High-pressure decorative laminates — Composite elements — Part 1: Test methods (ISO 13894-1:2000)*

CEN/TR 14823:2003, *Durability of wood and wood-based products — Quantitative determination of pentachlorophenol in wood — Gas chromatographic method*

3 Terms and definitions, symbols and abbreviations

3.1 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

high-pressure decorative laminate(s) (HPL)

sheet(s) consisting of decorative surface layer(s) and core layers bonded together by a high pressure process

Note 1 to entry: Typical values for the high pressure process are: a temperature of ≥ 120 °C and a pressure of ≥ 5 MPa.

3.1.2

surface layer

upper decorative layer consisting in one or more sheets of fibrous material (usually paper) impregnated with aminoplastic thermosetting resins (usually melamine based resins) or other curable resins or other decorative design surfaces which are not necessarily treated with thermosetting resin

Note 1 to entry: 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) may be made suitable for adhesive bonding to a substrate.

Note 2 to entry: Examples of decorative design surface are metal foils, wood-veneers or textiles.

3.1.3

core layer

core layer consisting of fibrous materials (usually paper) impregnated with thermosetting resins (usually phenolic based resins) or other curable resins, eventually reinforced by metal layer(s) or metal mesh(es) and others which are not necessarily treated with thermosetting resin

3.1.4

compact laminate panel

panel consisting of decorative surface layer(s) and core layers bonded together by a high pressure process with a thickness of 2 mm or greater

3.1.5

HPL composite panel

panel produced by adhesively bonding an HPL to one or both sides of a substrate

3.1.6

substrate of the HPL composite panels

board to which the HPL is bonded

Note 1 to entry: The substrate can be a wood based product (e.g. particleboard, plywood or fibreboard), a mineral board (e.g. calcium silicate), an expanded honeycomb, a metal sheet or plastic material, organic or inorganic fibre boards.

3.1.7

pearlescent compact laminate panel

compact laminate panel, the surface layer of which consists of a pearlescent effect decorative paper, which is impregnated with aminoplastic thermosetting resins (usually melamine based resins)

prEN 438-7:2019 (E)**3.1.8****metal compact laminate panel**

compact laminate panel, the surface layer of which consists of a thin layer of metal

3.1.9**wood veneer compact laminate panel**

compact laminate panel, the surface layer of which consists of a wood veneer, which is covered by a protective melamine layer

3.1.10**coloured core layer compact laminate panel**

compact laminate panel, the core layer of which consists of coloured fibrous materials (usually paper) impregnated with aminoplastic thermosetting resins (usually melamine based resins) or fibrous materials (usually paper) impregnated with coloured aminoplastic thermosetting resins (usually melamine based resins)

3.1.11**metal reinforced core layer compact laminate panel**

compact laminate panel, the core layer of which consists of metal layer(s) or mesh(es) and cellulosic fibrous layers (usually paper) impregnated with phenolic thermosetting resins or aminoplastic thermosetting resins (usually melamine based resins)

3.1.12**exterior-grade compact laminate panel**

compact laminate panel for use under outdoor weather conditions such as direct sunlight rain and frost

3.1 Symbols and abbreviations

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3.2.1 Symbols

For the purposes of this document, the following symbol applies

t nominal thickness of the laminate

3.2.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

ACF	Pearlescent compact laminate with improved fire retardance
ACS	Standard grade pearlescent compact laminate
BCS	Standard grade Coloured core layer compact laminate
CGF	Compact laminates with improved fire retardance
CGS	Standard grade compact laminates
EDF	Exterior-grade compact laminate with improved fire retardance, intended for severe outdoor conditions
EDS	Standard exterior-grade compact laminate, intended for severe outdoor conditions
EGF	Exterior-grade compact laminate with improved fire retardance, intended for moderate outdoor conditions
EGS	Standard exterior-grade compact laminate, intended for moderate outdoor conditions
FR	Flame Retardant
MCF	Metal compact laminate with improved fire retardance
MCS	Standard grade metal compact laminate

RCF	Metal reinforced core layer compact laminate with improved fire retardance
RCS	Metal reinforced core layer standard grade compact laminate
WCF	Wood veneer compact laminate with improved fire retardance
WCS	Standard grade wood veneer compact laminate

4 Product characteristics

4.1 Reaction to fire

4.1.1 The reaction to fire shall be assessed and classified in accordance with 5.1.

4.1.2 Only the interior grade non-flame retardant Compact laminate panels and HPL composite panels may be classified without the need for testing (CWT), as specified in Table 1¹⁾.

Table 1 — Classes of reaction-to-fire performance

Product ^a	Product detail	Minimum density (kg/m ³)	Minimum overall thickness (mm)	Class ^b (excluding floorings)
Interior grade non-FR Compact HPL panels	Compact HPL meeting EN 438-4, Type CGS	1 350	6	D-s2,d0
Interior grade non-FR HPL composite panels with wood-based substrates	Composite panels comprising non-FR grade HPL meeting the requirements of EN 438-3, adhesively bonded to both sides of non-FR grade wood-based core of minimum thickness 12 mm complying with EN 13986, using PVAc or thermosetting adhesive at an application rate of 60 g/m ² to 120 g/m ²	Wood-based core minimum density 600 HPL minimum density 1 350	12 mm wood-based core with HPL ≥ 0,5 mm bonded to both sides	D-s2,d0
<p>^a Either directly fixed (i.e. with no air gap) to a material having a reaction to fire class of A2-s1,d0 or better and a density of at least 600 kg/m³; or mounted on a timber or metal batten support frame, with a non-ventilated (i.e. void open only at the top) air gap of at least 30 mm, the reverse face of the cavity so formed having a reaction to fire classification of A2-s2,d0 or better.</p> <p>^b Classes as provided for in Table 1 of the Annex to Decision 2000/147/EC.</p>				

NOTE Compact HPL panels are to be understood as compact laminate panels.

4.1.3 Compact laminate panels and HPL composite panels shall be tested according to 5.1.1 and the results evaluated and expressed as class A1 to F together with the information to identify the mounting and fixing conditions as provided in Annex A.

¹⁾ Commission Decision 2003/43/EC of 2003 January 17th (OJEU L 13 of 18.01.2003) as amended by Commission Decision 2003/593/EC of 2003 August 7th (OJEU L 201 of 8.08.2003) establishing the classes of reaction-to-fire of certain construction products.

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4.1.4 For reaction to fire, the classification of the thinnest either compact laminate panels or HPL composite panels of the family tested shall be valid for all thicker products of that family. However, testing of thicker product may be used to prove a better classification.

Panel parameters defining family of panels in relation to reaction to fire performance shall be as listed in Annex B, Table B.1.

4.2 Water vapour permeability

4.2.1 The water vapour permeability shall be expressed as the water vapour resistance factor μ .

4.2.2 The value of the water vapour resistance factor shall be taken from Table 2 in both conditions wet and dry.

Table 2 — Water vapour resistance factors

Product	Density	Water vapour resistance factor a	
		Wet cup μ	Dry cup μ
Compact laminate panel	$\geq 1\,350 \text{ kg/m}^3$	110	250
HPL composite panel	Particleboard substrate density 300 kg/m^3	10	50
	Particleboard substrate density 600 kg/m^3	15	50
	Particleboard substrate density 900 kg/m^3	20	50
HPL composite panel	Fibreboard substrate density 400 kg/m^3	5	10
	Fibreboard substrate density 600 kg/m^3	12	20
	Fibreboard substrate density 800 kg/m^3	20	30
a Linear interpolation for intermediate density values is possible.			

4.2.3 When a better performance is sought for declaration, the water vapour resistance factor of the compact laminate panels and HPL composite panels shall be defined and determined in accordance with 5.2 and the values obtained shall be expressed in both conditions wet and dry.

4.3 Resistance to fixings

4.3.1 Compact laminate panels

4.3.1.1 The resistance to fixings of compact laminate panels shall be expressed as the screw holding value from Table 3.

Table 3 — Screw holding value for compact laminate panels

Compact laminate panels thickness (t) mm	Screw holding value N
$2 \leq t < 4$	250
$4 \leq t < 6$	1 000
$6 \leq t < 8$	2 000
$8 \leq t < 10$	3 000
$t \geq 10$	4 000

4.3.1.2 When tested, the resistance to fixings of compact laminate panels shall be done by determining the resistance to the axial withdrawn force of wood screws from the panel in accordance with 5.3.1. The value shall be expressed as screw holding value in newton (N).

4.3.2 HPL composite panels

The resistance to fixings of HPL composite panels shall be done by determining the resistance to the axial withdrawn force of wood screws from the face (face screw-holding) in accordance with 5.3.2. The value shall be expressed as screw holding value in newton (N).

4.4 Bonding strength

The bonding strength of HPL composite panels shall be done by determining the surface bond strength in accordance with 5.4 and the obtained value shall be expressed in MPa.

4.5 Airborne sound insulation (standards.iteh.ai)

The performance of the airborne sound insulation for compact laminate panels and for HPL composite panels shall be determined as sound reduction index $R_w(C;C_{tr})$ in accordance with 5.5 and expressed as value in dB.

4.6 Flexural tensile strength

4.6.1 Compact laminate panels

The flexural tensile strength of compact laminate panels shall be done by determining both the flexural strength and the flexural modulus of elasticity in accordance with 5.6.1, and both results expressed in values as MPa.

4.6.2 HPL composite panels

The flexural tensile strength of HPL composite panels shall be done by determining the perpendicular tensile strength in accordance with 5.6.2 and the result expressed in value as MPa.

4.7 Thermal resistance

4.7.1 Compact laminate panels

4.7.1.1 The thermal resistance of compact laminate panels shall be expressed as value of thermal conductivity of 0,3 W/(m K) according to EN ISO 10456:2007, Table 3 (see Material group: plastic solid, phenolic resin).

4.7.1.2 When the thermal resistance of compact laminate panels is tested, it shall be done in accordance with 5.7 and the result expressed as value in (m² K/W).