SLOVENSKI STANDARD

SIST EN 438-7:2005

01-maj-2005

Dekorativni visokotlaļ ni laminati (HPL) - Ploģļ e 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

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

Ta slovenski standard je istoveten z: **EN 438-7:2005**

ICS:

83.140.20

SIST EN 438-7:2005 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 438-7

January 2005

ICS 83.140.20

Supersedes EN 438-1:1991, EN 438-2:1991

English version

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

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 extérieurs

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

This European Standard was approved by CEN on 12 August 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword

This document (EN 438-7:2005) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by IBN.

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 July 2005, and conflicting national standards shall be withdrawn at the latest by July 2005.

This document supersedes EN 438-1:1991 and EN 438-2:1991.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is a revision of EN 438:1991 and consists of seven 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.*

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

1 Scope

This document specifies the health, safety and energy saving requirements for:

- Compact laminate panels/sidings for interior wall and ceiling finishes (including suspended ceilings);
- HPL composite panels/sidings for interior wall and ceiling finishes (including suspended ceilings);
- Compact laminate panels/sidings for exterior wall and ceiling finishes (including suspended ceilings);
- HPL composite panels/sidings for exterior wall and ceiling finishes (including suspended ceilings).

It also specifies methods for the evaluation of conformity of the product to the requirements, and includes requirements for marking. It covers only the HPL panels for non-structural applications, and does not cover fixing systems.

The products are intended for use as wall and ceiling finishes for internal and external applications according to the manufacturer's specifications.

The scope of this document does not cover:

a) overlaid or veneered wood-based panels where the overlay/veneer is not HPL;

b) HPL-surfaced wood-based panels intended for use as structural components. These products are covered by EN 13986 (wood-based panels for use in construction).

This document covers only characteristics related to health, safety and energy-saving. All other characteristics are covered in separate European Standards for HPL products (see Annex B).

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 438-1:2005, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) — Part 1: Introduction and general information.*

EN 438-2:2005, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) — Part 2: Determination of properties.*

EN 438-3, *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 438-4:2005, *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 438-6:2005, *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 717-1, *Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the chamber method.*

EN 717-2, *Wood-based panels — Determination of formaldehyde release — Part 2: Formaldehyde release by the gas analysis method.*

EN 12524, *Building materials and products — Hygrothermal properties — Tabulated design values.*

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

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services).*

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

EN 13986, *Wood-based panels for use in construction — Characteristics, evaluation of conformity and marking.*

EN ISO 140-3, *Acoustics — Measurement of sound insulation in buildings and of building elements — Part 3: Laboratory measurements of airborne sound insulation of building elements (ISO 140-3:1995).*

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

EN ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354:2003).*

EN ISO 717-1, *Acoustics — Rating of sound insulation in buildings and of building elements — Part 1: Airborne sound insulation (ISO 717-1:1996).*

EN ISO 1183-1:2004, *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 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption (ISO 11654:1997).*

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

ISO 13894-1:2000, *High-pressure decorative laminates — Composite elements — Part 1: Test methods.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 438-1:2005 and the following apply

3.1
Compact laminate panel
panels of high-pressure laminate supplied in thicknesses of 2 mm and greater.

Panels may be supplied in the form of large sheets (i.e. the full manufactured size), or smaller cut-to-size panels or sidings

3.2
HPL composite panel
composite panel produced by adhesively bonding high-pressure decorative laminate sheet material to one or both sides of a substrate.

Panels may be supplied in the form of large sheets (i.e. the full manufactured size), or smaller cut-to-size panels or sidings

3.3
substrate of the composite panel
board to which the high-pressure decorative laminate is bonded.

The substrate can be a wood based product (e.g. particleboard or fibreboard), a mineral board (e.g. calcium silicate), an expanded honeycomb, a metal sheet or plastic material, or organic or inorganic foams

4 Performance characteristics

4.1 Conditioning of specimens

Unless otherwise stated, all specimens shall be conditioned for at least 72 h at (23 ± 2) °C and relative humidity (50 ± 5) % prior to testing.

4.2 Reaction to fire

4.2.1 General

Reaction to fire applies only for panels/sidings intended for end uses on walls/ceilings subject to reaction to fire regulations.

For reaction to fire testing of Compact and composite panels, the classification of the thinnest product tested is valid for all thicker panels of the same type. However, testing of thicker panels may be used to prove a better classification.

4.2.2 Specimen preparation

Preparation of the test specimens shall be in accordance with the specified test method.

For the SBI test according to EN 13823, the specimens shall be mounted as defined in Annex B.

4.2.3 Requirement

Interior grade non-flame retardant HPL panels are considered to be Classified Without Further Testing (CWFT) in the classes shown in Table 1.

For products other than those covered by the CWFT Decision, or where the manufacturer seeks a higher class, the product shall be tested and classified according to EN 13501-1 and the resulting class and sub-class shall be declared.

Table 1 — Reaction to fire classes for high-pressure decorative laminate panels Classified Without Further Testing (CWFT)

High-pressure decorative laminate panels [a]	Product detail	Minimum density (kg/m^3)	Minimum overall thickness (mm)	Class [b] (excluding floorings)
Interior grade non-FR Compact HPL panels [c]	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 [c]	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

[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/m^3; 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.

[b] Classes as provided for in Commission Decision 2000/147/EC Annex Table 1.

[c] Complying with this standard.

4.3 Fire resistance

4.3.1 General

Fire resistance applies only for panels intended for end-uses subject to resistance to fire regulations, and where the panel is intended to contribute to fire resistance.

4.3.2 Specimen preparation

The product tested shall be mounted in a manner representative of the end-use conditions.

4.3.3 Requirement

The product shall be tested and classified according to EN 13501-2, and the resulting class or classes with the corresponding end use(s) shall be declared.

4.4 Water vapour permeability

4.4.1 General

Water vapour permeability applies only for panels intended for end uses on walls subject to water vapour permeability regulations, and where the panel is intended to contribute to water vapour resistance.

4.4.2 Requirement

The water vapour permeability shall either be determined as water vapour resistance factor according to EN ISO 12572, or taken from Table 2.

Table 2 — Water vapour permeability values

Panel	Density	Water vapour resistance factor [a]	
		Wet cup μ	Dry cup μ
Compact HPL	1 350 kg/m^3	110	250
HPL particleboard composite panel	Substrate density 300 kg/m^3	10	50
	Substrate density 600 kg/m^3	15	50
	Substrate density 900 kg/m^3	20	50
HPL fibreboard composite panel	Substrate density 400 kg/m^3	5	10
	Substrate density 600 kg/m^3	12	20
	Substrate density 800 kg/m^3	20	30

[a] Linear interpolation for intermediate density values is permitted.

4.5 Resistance to fixings

Resistance to fixings shall be determined as resistance to axial withdrawal of wood screws from the panel face (face screw-holding) according to ISO 13894-1:2000, test method 15, or in the case of Compact panels taken from Table 3. When testing Compact panels a pilot hole, with a diameter 0,5 mm less than the nominal screw size, shall be pre-drilled before inserting the screw.

Table 3 — Resistance to fixings – values for Compact panels

Compact panel thickness (mm)	Screw holding value (Newtons)
2	250
4	1 000
6	2 000
8	3 000
≥ 10	4 000

4.6 Direct airborne sound insulation

4.6.1 General

Direct airborne sound insulation applies for panels intended for uses in walls/ceilings subject to acoustic insulation regulations, and where the panel is intended to contribute to sound insulation.

Compact panels/sidings and composite panels/sidings are used most of the time as a component of a building element. The acoustic performance is relevant for the building element of which the panel is a part.

4.6.2 Requirement

If the building element including Compact or composite panels is to be tested for airborne sound insulation, then it shall be tested in accordance with EN ISO 140-3 and rated in accordance with EN ISO 717-1.

4.7 Bonding strength

4.7.1 General

Bonding strength applies only for wood-based HPL composite panels/sidings.

4.7.2 Requirement

The bonding strength of wood-based HPL composite panels/sidings shall be determined as surface bond strength according to ISO 13894-1:2000, test method 9, and the result shall be declared.

4.8 Flexural tensile strength

4.8.1 General

Flexural tensile strength is applicable only to panels intended for use in suspended ceilings.

4.8.2 Requirement

The flexural tensile strength of HPL composite panels for suspended ceilings shall be determined as surface bond strength according to ISO 13894-1:2000, test method 9. The result(s) shall be declared.

For Compact panels it shall be determined as flexural strength and flexural modulus of elasticity, measured in the transverse direction according to EN ISO 178, at a machine crosshead speed of 2 mm/min. The results shall comply with the corresponding requirements of EN 438-4:2005, Table 2 for interior use, and EN 438-6:2005, Table 2 for exterior use, and shall be declared as pass results.

4.9 Thermal resistance/conductivity

4.9.1 General

Thermal resistance/conductivity applies only for panels intended for end uses on walls/ceilings subject to thermal insulation regulations, and where the panel is intended to contribute to the thermal insulation.

4.9.2 Requirement

The thermal conductivity shall be determined in accordance with EN 12664 and the result shall be declared, or it shall be calculated from data taken from EN 12524, where the conductivity of the HPL part of the product shall be taken to be 0,3 W/(m K).

4.10 Release of dangerous substances

4.10.1 Content of pentachlorophenol

4.10.1.1 General

Content of pentachlorophenol applies only for wood-based HPL composite panels/sidings.

4.10.1.2 Requirement

HPL does not contain PCP. Wood-based substrates normally contain less than 5 ppm of pentachlorophenol. If the substrate contains more than 5×10^{-6} (ppm) then it shall be declared by the manufacturer of the composite panel.

4.11 Additional characteristics for internal use

4.11.1 Release of formaldehyde

Formaldehyde emission levels from HPL Compact laminate panels comply with Class E1 requirements without the need for testing.

In the case of HPL wood-based composite panels, if the substrate complies with Class E1 requirements, then the complete panel shall be accepted as meeting Class E1 without the need for testing.

For initial type testing of HPL wood-based composite panels the release of formaldehyde shall be determined according to EN 717-1 and the result shall be declared in terms of formaldehyde class as defined in Table 4. For factory production control purposes formaldehyde emission may be determined in accordance with EN 717-2, applying the appropriate values from Table 4.

Table 4 — Release of formaldehyde limit values

	EN 717-1 requirement	EN 717-2 requirement
Class E1	≤ 0,13 mg/m^3 air	≤ 3,5 mg/m^2 h
Class E2	> 0,13 mg/m^3 air	> 3,5 to ≤ 8,0 mg/m^2 h
NOTE For established products, initial type testing may also be done on the basis of existing data from tests carried out in accordance with EN 120 or EN 717-2, either from factory production control or from external inspection.		

4.11.2 Sound absorption

4.11.2.1 General

Sound absorption applies only for panels intended to be used for acoustical absorbent purposes, and where the panel is intended to contribute to sound absorption.

Compact panels/sidings and composite panels/sidings are used most of the time as a component of building element. The acoustic performance is relevant for the building element of which the panel is a part.

4.11.2.2 Requirement

If the building element including Compact or composite panels is to be tested for sound absorption, then it shall be tested in accordance with EN ISO 354 and rated in accordance with EN ISO 11654.

4.12 Additional characteristics for external use

The thermal shock resistance shall be determined as resistance to climatic shock according to EN 438-2:2005, Test method 19. Compact laminate panels shall comply with the requirement specified for a ‘Pass’ result specified in EN 438-6.