
8 Y_cfUhj b]j]gc_chU b]`Ua]bUj`fkD@!'D`cý Y`bUcgbcj]`Xi fca Yfb] `ga c`!`* "
XY. `F Uj fgh]hYj `]b`gdYWZ_UW`Y`nU&`a a `]b`j Y `XYVY`Ua]bUj`nU`ni bUb`c
i dcfUc

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

STANDARD PREVIEW
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Dekorative Hochdruck-Schichtpressstoffplatten (HPL) - Platten auf Basis härtbarer Harze (Schichtpressstoffe) - Teil 6: Klassifizierung und Spezifikationen für Kompakt-Schichtpressstoffe für die Anwendung im Freien mit einer Dicke von 2 mm und größer

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Stratifiés décoratifs haute pression (HPL) - Plaques a base de résines thermodurcissables (communément appelées stratifiés) - Partie 6 : Classification et spécifications des stratifiés compacts pour usage en extérieur d'épaisseur égale ou supérieure a 2 mm

Ta slovenski standard je istoveten z: EN 438-6:2005

ICS:

83.140.20 Šæ ã æ ^Á || z ^ Laminated sheets

SIST EN 438-6:2005**en**

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English version

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This European Standard was approved by CEN on 16 August 2004.

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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 Central Secretariat has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 438-6:2005) 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of an identical text or by endorsement, at the latest by July 2005, and conflicting national standards shall be withdrawn at the latest by July 2005.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 Standard 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.

EN 438-6:2005 (E)**1 Scope**

This Part of EN 438 applies to Exterior-grade Compact laminates of thickness 2mm and greater. It specifies requirements for standard and flame-retardant laminates intended for use under outdoor weather conditions such as direct sunlight rain and frost. Two levels of performance are specified; one for moderate exterior conditions, and the other for severe exterior conditions. Laminates complying with this Part of EN 438 are referred to as Exterior-grade Compact laminates, and are characterized by their high tensile strength, high impact resistance, thermal shock resistance, and resistance to weather and corrosion. They are available in a variety of decorative colours, with high resistance to colour change and aging in outdoor applications. When they are self-supporting Exterior-grade Compact laminates are ready for installation, and only require cutting to size, drilling, etc. to suit the application. EN 438-2 specifies the methods of test 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, *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) — Part 2: Determination of properties*

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

EN ISO 527-2:1996, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994)*

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

3 Term and definition

For the purposes of this document, the following term and definition applies:

3.1**high-pressure decorative exterior-grade compact laminate(s) (HPL)**

sheet(s) consisting of layers of cellulosic fibrous material (e.g. paper) impregnated with thermosetting resins and bonded together by the high pressure process described below. The surface layer(s) on one or both sides, having decorative colours or designs, are impregnated with suitable thermosetting resins (aminoplastic based resins or others). A suitable outer layer or coating may be added to enhance weather and light protecting properties. The core layers are impregnated with phenolic based resins, and may be combined with other fibres and/or fillers during the manufacturing process

The high pressure process is defined as the simultaneous application of heat (temperature ≥ 120 °C) and high specific pressure (≥ 5 MPa), to provide flowing and subsequent curing of the thermosetting resins to obtain a homogeneous non-porous material with increased density ($\geq 1,35$ g/cm³), and with the required surface finish.

4 Material types and classification system

Exterior-grade Compact laminates are defined using the three letter classification system shown in Table 1.

Table 1 — Classification system

FIRST LETTER	SECOND LETTER	THIRD LETTER
E (EXTERIOR GRADE)	G (MODERATE USE) or D (SEVERE USE)	S (STANDARD GRADE) or F (FLAME-RETARDANT GRADE)

For example an Exterior-grade flame-retardant HPL for severe outdoor conditions is specified as HPL/prEN 438-6/EDF.

Laminate grades EGS and EGF are intended for moderate outdoor conditions, for example applications involving medium term exposure to average levels of sunlight and weathering.

Laminate grades EDS and EDF are intended for severe outdoor conditions, for example applications involving long term exposure to strong sunlight and weather.

5 Requirements

5.1 Compliance

Exterior-grade Compact laminate types EGS, EGF, EDS and EDF shall meet all appropriate requirements specified in Clauses 5.2, 5.3 and 5.4. This applies to both full-size sheets and cut-to-size panels.

5.2 Inspection requirements

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5.2.1 General

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

5.2.2 Colour and pattern

When inspected in daylight or D65 standard illuminant and again under tungsten illuminant F, there shall be no significant difference between the corresponding colour reference sample held by the supplier and the specimen under test.

NOTE Where colour and surface finish are critical, it is recommended that sheets be checked for colour and surface finish compatibility 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.

NOTE Where colour and surface finish are critical, it is recommended that sheets be checked for colour and surface finish compatibility before fabrication or installation.

EN 438-6:2005 (E)**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 each decorative face of a laminate supplied as a full-size sheet.

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 should be noted that only a small percentage of sheets in a batch (the level to be agreed with the customer) should 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.

5.2.4.2 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 $2,0 \text{ mm}^2/\text{m}^2$ 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 $20 \text{ mm}/\text{m}^2$ 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

Edge chipping up to 3 mm on each side is permissible.

5.3 Dimensional tolerance requirements

Dimensional tolerance requirements are specified in Table 2.

Table 2 — Dimensional tolerances

Property	Test method (EN 438-2, Clause no.)	Requirement	
			maximum variation
Thickness	5	$2,0 \leq t < 3,0$ mm: $3,0 \leq t < 5,0$ mm: $5,0 \leq t < 8,0$ mm: $8,0 \leq t < 12,0$ mm: $12,0 \leq t < 16,0$ mm: $16,0 \leq t < 20,0$ mm: $20,0 \leq t < 25,0$ mm: $25,0 \leq t$	± 0.20 mm ± 0.30 mm ± 0.40 mm ± 0.50 mm ± 0.60 mm ± 0.70 mm ± 0.80 mm to be agreed between supplier and customer.
Flatness ^{a)}	9	$2,0 \leq t < 6,0$ mm: $6,0 \leq t < 10,0$ mm: $10,0 \leq t$	maximum deviation 8,0 mm/m 5,0 mm/m 3,0 mm/m
Length and width ^{b)}	6	+ 10 mm/ – 0 mm	
Straightness of edges ^{b)}	7	1,5 mm/m maximum deviation	
Squareness ^{b)}	8	1,5 mm/m maximum deviation	
^{a)} Provided that the 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. The flatness values specified in Table 2 apply to laminates with two decorative faces. Limits for laminates with one Face sanded shall be agreed between supplier and customer. ^{b)} Tolerances for cut-to-size panels shall be agreed between supplier and purchaser. Note: (where t = nominal thickness)			

5.4 Test requirements

5.4.1 Physical property requirements

Physical property requirements are specified in Table 3.