



SLOVENSKI STANDARD SIST EN 438-3:2005

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8 Y_cfUj j b] j]gc_chU b]`Ua]bUj`fk D@!`D`cy Y`bUcgbcj]`Xi fca Yfb] `ga c`!` " XY. `F Uj fgh]h] `]b`gdYwz_ UY`nUa Ub^_ch&a a `XYVY`Ua]bUjzbUa Yb`YbY`nU j YnUj c`bUbcg]`bY`a UYf]UY

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

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Dekorative Hochdruck-Schichtpressstoffplatten (HPL) - Platten auf Basis härtbarer Harze (Schichtpressstoffe) - Teil 3: Klassifizierung und Spezifikationen für Schichtpressstoffe mit einer Dicke kleiner als 2 mm, vorgesehen zum Verkleben auf ein Trägermaterial

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Stratifiés décoratifs haute pression (HPL) - Plaques a base de résines thermodurcissables (communément appelées stratifiés) - Partie 3 : Classification et spécifications des stratifiés d'épaisseur inférieure a 2 mm destinés a etre collés sur des supports

Ta slovenski standard je istoveten z: EN 438-3:2005

ICS:

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

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 438-3

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English version

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

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de résines thermodurcissables (communément appelées
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Dekorative Hochdruck-Schichtpressstoffplatten (HPL) -
Platten auf Basis härtpbarer Harze (Schichtpressstoffe) -
Teil 3: Klassifizierung und Spezifikationen für Platten mit
einer Dicke kleiner als 2 mm, vorgesehen zum Verkleben
auf ein Trägermaterial

This European Standard was approved by CEN on 16 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.

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Foreword

This document (EN 438-3:2005) 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*

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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 438-3:2005 (E)**1 Scope**

This Part of EN 438 applies to laminates less than 2 mm thick normally intended for bonding to supporting substrates to produce HPL composite panels and establishes a classification system for high-pressure decorative laminates according to their performance and main recommended fields of application, including materials with special characteristics, for example formability or defined reaction to fire. This Part of EN 438 also specifies requirements for the properties of the various types of laminates covered by this classification system.

High-pressure decorative laminates are characterised by their qualities, durability and functional performance. HPL sheets are available in a wide variety of colours, patterns and surface finishes; they are resistant to wear, scratching, impact, moisture, heat and staining; and possess good hygienic and anti-static properties, being easy to clean and maintain.

EN 438-2 specifies the methods of test relevant to this Part of EN 438. Parts 4, 5, etc. of EN 438 are reserved for special types of HPL materials.

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 12721:1997, Furniture - Assessment of surface resistance to wet heat (ISO 4211-2:1993 modified)

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 1183-1:2004)

3 Term and Definition

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

3.1**High-pressure decorative laminate(s) (HPL)**

Sheet(s) consisting of layers of cellulosic fibrous material (normally paper) impregnated with thermosetting resins and bonded together by the high pressure process described below. The surface layer(s) on one side, having decorative colours or designs, are impregnated with melamine based resins. The core layers are impregnated with phenolic based resins. The back of the sheet(s) is made suitable for adhesive bonding to a substrate.

The high pressure process is defined as the simultaneous application of heat (temperature $\geq 120^{\circ}$ 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

4.1 Type S - Standard grade decorative laminates.

4.2 Type P - Postformable decorative laminates; similar to type S but can also be formed at elevated temperature.

4.3 Type F - Decorative laminates with improved fire retardance; similar to types S or P but also meeting special requirements of specified fire tests which may vary according to the application (e.g. construction, marine, transport) and the country of use (see Clause 6.4.3 and Annex B).

5 Classification systems

5.1 General

Two different HPL classification systems are commonly used in Europe, and both have been included in this document as alternatives.

5.2 Numerical classification system

In this system the classification of a letter denoting material type (see Clause 4) followed by three index numbers showing the levels of performance for wear resistance, impact resistance and scratch resistance respectively. Table 1 shows the performance levels corresponding to the index numbers.

Table 1 — Numerical classification

	FIRST INDEX NUMBER - WEAR RESISTANCE ^{a)}		
	2	3	4
INITIAL POINT(revs)	≥50	≥ 150	≥ 350
WEAR VALUE (revs)	≥150	≥ 350	≥ 1000
	SECOND INDEX NUMBER - IMPACT RESISTANCE ^{a)}		
	2	3	4
SMALL DIAMETER BALL (N)	≥ 15	≥ 20	≥ 25
	THIRD INDEX NUMBER - SCRATCH RESISTANCE ^{a)}		
	2	3	4
SCRATCH RESISTANCE (Rating)	2	3	4

^{a)} Index numbers 2, 3, and 4 are specified to maintain consistency with EN 438:1991. Index number 1 represents a lower quality level that does not apply to HPL covered by the scope of this part of the standard.

5.3 Alphabetical classification system

This system uses three letters to classify laminates as shown in Table 2.

Table 2 — Alphabetical classification

FIRST LETTER	SECOND LETTER	THIRD LETTER
H (HORIZONTAL GRADE) or V (VERTICAL GRADE)	G (GENERAL PURPOSE) or D (HEAVY DUTY)	S (STANDARD GRADE) or P (POSTFORMABLE GRADE) or F (FLAME-RETARDANT GRADE)

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Table 3 compares the alternative classification systems and shows how different HPL products relate to some typical applications. The list of typical applications shown for each category is for guidance only and is not intended to be comprehensive.

Table 3 — Classification system and typical applications

PERFORMANCE CATEGORY	MATERIAL TYPE	NUMERICAL CLASSIFICATION INDEX NUMBERS			EQUIVALENT ALPHABETICAL CLASSIFICATION	EXAMPLES OF TYPICAL APPLICATIONS
		WEAR RESISTANCE	IMPACT RESISTANCE	SCRATCH RESISTANCE		
VERY HIGH RESISTANCE TO SURFACE WEAR VERY HIGH RESISTANCE TO IMPACT VERY HIGH RESISTANCE TO SCRATCHING	S, F or P	4	4	4	HDS (HORIZONTAL HEAVY-DUTY STANDARD), HDF (HORIZONTAL HEAVY-DUTY FLAME-RETARDANT), OR HDP (HORIZONTAL HEAVY-DUTY POSTFORMING)	COUNTER TOPS, INSTITUTIONAL APPLICATIONS (PRISONS, MILITARY BARRACKS, ETC.)
HIGH RESISTANCE TO SURFACE WEAR HIGH RESISTANCE TO IMPACT HIGH RESISTANCE TO SCRATCHING	S, F or P	3	3	3	HGS (HORIZONTAL GENERAL-PURPOSE STANDARD), HGF (HORIZONTAL GENERAL-PURPOSE FLAME-RETARDANT), OR HGP (HORIZONTAL GENERAL-PURPOSE POSTFORMING)	KITCHEN AND OFFICE WORKING SURFACES, RESTAURANT AND HOTEL TABLES, DOORS AND WALL COVERINGS IN PUBLIC AREAS, INTERIOR WALLS OF PUBLIC TRANSPORT VEHICLES
MEDIUM RESISTANCE TO SURFACE WEAR MEDIUM RESISTANCE TO IMPACT MEDIUM RESISTANCE TO SCRATCHING	S, F or P	2	2	2	VGS (VERTICAL GENERAL-PURPOSE STANDARD), VGF (VERTICAL GENERAL-PURPOSE FLAME-RETARDANT), OR VGP (VERTICAL GENERAL-PURPOSE POSTFORMING)	FRONT PANELS FOR KITCHEN, OFFICE AND BATHROOM FURNITURE, WALL COVERINGS, CEILING PANELS, SHELVES, AND FURNITURE ELEMENTS

NOTE 1 Combinations of wear, impact and scratch resistance index numbers other than those shown in Table 3 are possible and can be specified using the numerical classification system. In such cases properties other than wear resistance, impact resistance and scratch resistance shall meet the requirements specified for type VG in Table 5.

NOTE 2 Some HPL products intended for vertical applications, having special optical effects (e.g. pearlescent laminates) are also available. With the exception of wear resistance, these products may meet the requirements of type VG, but are outside the scope of this part of the standard.

5.4 Nomenclature

In addition to the abbreviation "HPL" and the number of this document, materials can be specified either by the numerical classification system, or by the alphabetical classification system. For example, horizontal general-purpose postformable laminate can be specified as HPL/EN 438-3/P333 or HPL/EN 438-3/HGP.

6 Requirements

6.1 Compliance

Laminates classified in Table 3 shall meet all appropriate requirements specified in Clauses 6.2, 6.3 and 6.4. This applies to both full-size sheets and cut-to-size panels.

6.2 Inspection requirements

6.2.1 General

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

6.2.2 Colour and pattern

When inspected in daylight or D_{65} 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.

6.2.3 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.

6.2.4 Reverse side

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

6.2.5 Visual inspection

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.