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High-pressure decorative laminates (HPL, HPDL) — 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

*Stratifiés décoratifs haute pression (HPL, HPDL) — Plaques à base de résines thermodurcissables
(communément appelées stratifiés) —*

*Partie 5: Classification et spécifications des stratifiés pour revêtement de sol d'épaisseur inférieure à 2 mm
destinés à être collés sur des supports*

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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ISO/DIS 4586-5

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This second edition cancels and replaces the first edition (ISO 4586-5:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

- correction of errors due to typographical, formatting, and omission issues.

A list of all parts in the ISO 4586 series can be found on the ISO website.

Introduction

High-pressure decorative flooring laminates are characterized by their high resistance to abrasion, aesthetic qualities, and durability. They have good hygienic and anti-static properties and are easy to clean and maintain.

In an effort to harmonize ISO 4586 with other high-pressure decorative laminate standards, multiple methods may be published that demonstrate similar properties. In these instances, the same test method title is given and is annotated as either “Method A” or “Method B”. This is the case in the following tests: Edge squareness — 8/9, Dry heat — 17/18, Dimensional stability at elevated temperatures — 19/20, Dimensional stability at ambient temperature — 21/22, Staining — 30/31, Lightfastness — 32/33, Formability — 36/37, and Blistering — 38/39. In these instances, either method may be utilized in testing. Compliance to both methods is not required. While these tests are similar they are by no means identical and results of one method do not necessarily correspond to the results of the accompanying test. In these situations, it is intended that the documentation in specific parts of ISO 4586 for performance requirements be consulted. Each specific method has performance requirements particular to that method for individual grades of high-pressure decorative laminate.

This document has been harmonized with EN 438-5 whenever possible.

In addition, [Annex A](#) provides information on electrostatic properties and is included as a convenient reference to answer common questions.

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High-pressure decorative laminates (HPL, HPDL) — 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

1 Scope

This document applies to five classes of flooring grade laminates less than 2 mm thick intended for bonding to supporting substrates, to produce high-pressure decorative laminates (HPL, HPDL) flooring elements. For laminate floor covering applications they meet the surface property requirements specified in EN 13329^[2].

The requirements in this document apply only to the high-pressure laminate, and additional properties are intended to be specified in order to define the functional performance of the finished flooring product.

ISO 4586-2 specifies the methods of test relevant to this document.

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2 Normative references

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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.

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

ISO 4586-2:2018, *High-pressure decorative laminates (HPL, HPDL) — Sheets based on thermosetting resins (usually called laminates) — Part 2: Determination of properties*

ISO 10874, *Resilient, textile and laminate floor coverings — Classification*

3 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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1
high-pressure decorative compact laminate
HPL
HPDL

sheet consisting of layers of cellulosic fibrous material (normally paper) impregnated with thermosetting resins and bonded together by the *high pressure process* (3.2)

Note 1 to entry: This is a general definition of high-pressure decorative laminate(s). More specific product definitions can be found in ISO 4586-3 to ISO 4586-8.

Note 2 to entry: The surface layer(s) on one or both sides, having decorative colours or designs, are typically impregnated with melamine based resins. The core layers are typically impregnated with phenolic based resins.

3.2
high-pressure process

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

3.3
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 such as metal foils, wood-veneers, and textiles, etc. which are not necessarily treated with thermosetting resin

3.4
core layer

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

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4 Classification, designation and coding

The classification system makes reference to ISO 10874 (level of use) in combination with the abrasion class (AC) given by a numerical rating of 1 to 6 defining the level of abrasion resistance, 6 being the highest and 1 the lowest performance.

[Table 1](#) shows how the five abrasion classes of flooring grade laminate relate to level of use and some examples of typical applications.

Flooring grade laminates are specified according to abrasion class (e.g. HPL/ISO 4586-5/AC1).

Table 1 — Classification system and typical applications

ISO 10874 classification	Level of use	Description	Examples of applications	Abrasion class
21	Moderate domestic	Residential areas with low or intermittent use	Bedrooms	AC1
22	General domestic	Residential areas with medium use	Living rooms, entrance halls	AC2
23	Heavy domestic	Residential areas with intense use	Living rooms, entrance halls	AC3
31	Moderate commercial	Commercial areas with low or intermittent use	Hotel rooms, small offices, hotel boutiques	
32	General commercial	Commercial areas with medium use	Classrooms, small offices, hotel boutiques	AC4
33	Heavy commercial	Commercial areas with heavy use	Corridors, department stores, schools, multipurpose halls, open plan offices	AC5
34	Very heavy commercial	Commercial areas with very heavy use	Airports, multi-purpose halls, counter halls, department stores	AC6

5 Requirements

5.1 Compliance

Laminates classified in [Table 1](#) shall meet 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 ISO 4586-2:2018, Clause 4 at a distance of 0,75 m to 1,5 m.

5.2.2 Colour and pattern

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

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.

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

5.2.4 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.