

Nederlandse norm

# NEN-ISO 4586-3

(en)

High-pressure decorative laminates (HPL, HPDL) -  
Sheets based on thermosetting resins (Usually  
called Laminates) - Part 3: Classification and  
specifications for laminates less than 2 mm thick  
and intended for bonding to supporting  
substrates (ISO 4586-3:2015, IDT)

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- ISO 4586-3:2015, IDT

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**High-pressure decorative laminates  
(HPL, HPDL) — Sheets based on  
thermosetting resins (Usually called  
Laminates) —**

**Part 3:  
Classification and specifications for  
laminates less than 2 mm thick and  
intended for bonding to supporting  
substrates**

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

*Partie 3: Classification et spécifications des stratifiés d'épaisseur  
moins de 2 mm d'épaisseur et destiné pour le collage de support*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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. [www.iso.org/directives](http://www.iso.org/directives)

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

This first edition of ISO 4586-3:2015 cancels and replaces (ISO 4586-1:2004), which has been technically revised.

ISO 4586 consists of the following parts, under the general title *Plastics — High-Pressure Decorative Laminates (HPL, HPDL) — Sheets based on Thermosetting Resins (Usually called Laminates)*:

- *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: Classification and specifications for design laminates*
- *Part 8: Classification and specifications for alternative core laminates*

# High-pressure decorative laminates (HPL, HPDL) — Sheets based on thermosetting resins (Usually called Laminates) —

## Part 3: Classification and specifications for laminates less than 2 mm thick and intended for bonding to supporting substrates

### 1 Scope

This part of ISO 4586 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 ISO 4586 also specifies requirements for the properties of the various types of laminates covered by this classification system.

High-pressure decorative laminates are characterized 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.

ISO 4586-2 specifies the methods of test relevant to this part of ISO 4586. ISO 4586-4 through ISO 4586-8 are reserved for special types of HPL materials.

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 denoted as either "Method A" or "Method B". This is the case in the following tests: Edge Squareness - 17/19, Dry Heat - 17/18, Dimensional Stability at Elevated Temperatures - 19/20, Dimensional Stability at Ambient Temperature - 21/22, Staining - 30/31, Lightfastness - 32/33, Cigarette Burns - 36/37, Formability - 38/39, and Blistering - 40/41. 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, consult the documentation in specific clauses of ISO 4586 for performance requirements. Each specific method has performance requirements particular to that method for individual grades of high-pressure decorative laminate.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

### 3 Terms and definitions

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

**ISO 4586-3:2015(E)**

**3.1 High-Pressure Decorative Laminate(s)**  
**HPL**  
**HPDL**  
 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

**3.2 High-Pressure Process**  
 simultaneous application of heat (temperature  $\geq 120^{\circ}\text{C}$ ) and high specific pressure ( $\geq 5\text{ MPa}$ ), to provide flowing and subsequent curing of the thermosetting resins to obtain a homogeneous non-porous material with increased density ( $\geq 1,35\text{ g/cm}^3$ ), and with the required surface finish

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

**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 [6.4.3](#) and [Annex B](#)).

**5 Requirements****5.1 General**

Two different HPL classification systems are commonly used 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**

Initial point(revs) Wear value (revs)	<b>First index number - Wear resistance</b>		
	2	3	4
	≥ 50 ≥ 150	≥ 150 ≥ 350	≥ 350 ≥ 1000
Small diameter ball (N)	<b>Second index number - Impact resistance</b>		
	2	3	4
	≥ 15	≥ 20	≥ 25
Scratch resistance (Rating)	<b>Third index number - Scratch resistance</b>		
	2	3	4
	2	3	4
NOTE Index numbers 2, 3, and 4 are specified to maintain consistency with ISO 4586. Index number 1 represents a lower quality level that does not apply to HPL as defined by the scope of this part of ISO 4586.			

**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)

[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			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 Post-forming)	Countertops, institutional applications (prisons, military, barracks, etc.)
NOTE Combinations of wear, impact and scratch resistance index numbers other than those shown in <a href="#">Table 3</a> 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 <a href="#">Table 5</a> .						

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