
**Resilient floor coverings —
Heterogeneous poly(vinyl chloride)
flooring on foam — Specification**

*Revêtements de sol résilients — Revêtements de sol hétérogènes sur
mousse à base de poly(chlorure de vinyle) — Spécification*





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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 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

This second edition cancels and replaces the first edition (ISO 11638:2012), which has been technically revised.

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

- References to ISO 16906 and ISO 24342 have been added to [Clause 2](#);
- in [Table 2](#), a column for units has been added and requirements linked to permitted deviation for tile/plank length and diameter of mandrel for flexibility have been amended;
- in [Table 3](#), new requirements for seam strength have been added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Resilient floor coverings — Heterogeneous poly(vinyl chloride) flooring on foam — Specification

1 Scope

This document specifies the characteristics of heterogeneous poly(vinyl chloride) flooring on foam, based on poly(vinyl chloride), and supplied in roll form or tile and plank. Such products can contain a transparent, non PVC factory finish.

To encourage the consumer to make an informed choice, this document includes a classification system, based on intensity of use, which shows where these floor coverings can be expected to give satisfactory service.

It also specifies requirements for marking.

2 Normative references

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 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 4918, *Resilient, textile and laminate floor coverings — Castor chair test*

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

ISO 16581, *Resilient and laminate floor coverings — Determination of the effect of simulated movement of a furniture leg*

ISO 16906, *Resilient floor coverings — Determination of seam strength*

ISO 23997, *Resilient floor coverings — Determination of mass per unit area*

ISO 23999, *Resilient floor coverings — Determination of dimensional stability and curling after exposure to heat*

ISO 24340, *Resilient floor coverings — Determination of thickness of layers*

ISO 24341, *Resilient and textile floor coverings — Determination of length, width and straightness of sheet*

ISO 24343-1, *Resilient and laminate floor coverings — Determination of indentation and residual indentation — Part 1: Residual indentation*

ISO 24342, *Resilient and textile floor-coverings — Determination of side length, edge straightness and squareness of tiles*

ISO 24344:2008, *Resilient floor coverings — Determination of flexibility and deflection*

ISO 24345, *Resilient floor coverings — Determination of peel resistance*

ISO 24346, *Resilient floor coverings — Determination of overall thickness*

ASTM F1515, *Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change*

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:

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

3.1

heterogeneous flooring on foam

floor covering consisting of a wear layer and other solid layers on a foam backing

3.2

poly(vinyl chloride) flooring on foam

floor covering with surface layers which are produced using poly(vinyl chloride) as the binder

3.3

wear layer

layer of the floor covering directly exposed to wear

3.4

factory finish

transparent coating applied during the manufacture, usually not thicker than 0,03 mm

3.5

binder content

portion of the flooring composition consisting of poly(vinyl chloride) (PVC) resin, plasticizers and stabilizers

Note 1 to entry: It is expressed as a percentage mass fraction of the total composition.

3.6

seam strength

maximum tensile force recorded, for a defined width, when a floor covering is tested under a constant rate of separation

3.7

plank

tile with a width less than 250 mm and a width to length ratio of more than 1/3

4 Requirements

4.1 Identification requirements

Products described in this document are identified by wear-layer binder content and shall be in accordance with [Table 1](#). The binder content is determined by statement of formula (Manufacturer certificate of compliance).

Table 1 — Identification requirements

Type	Wear-layer binder content %
I	≥ 80
II	≥ 30

4.2 General requirements

Floor coverings shall conform to the appropriate general requirements specified in [Table 2](#) when tested in accordance with the methods given therein.

Optional properties are listed in [Annex A](#).

Table 2 — General requirements

Characteristic	Unit	Requirement	Test method
Roll form: Length: Width:	m mm	Not less than nominal values	ISO 24341
Tiles/planks: side length	mm	Deviation $\leq 0,15$ % of nominal length up to 0,5 mm maximum	ISO 24342
Squareness and straightness for side length: side length: ≤ 400 mm > 400 mm > 400 mm (intended for welding)	mm	Deviation allowed at any point $\leq 0,25$ mm $\leq 0,35$ mm $\leq 0,50$ mm	
Overall thickness: Average Individual results	mm	Declare Nominal value $+0,18$ mm/ $-0,15$ mm Average value $\pm 0,20$ mm	
Thickness of wear layer:	mm	Declare Nominal value $+13$ %/ -10 %	ISO 24340
Thickness of foam layer:	mm	Thickness shall be determined	ISO 24340
Total mass per unit area (average):	g/m ²	Nominal value $+13$ %/ -10 %	ISO 23997
Dimensional stability after exposure to heat: (not applicable to tension flex products) Sheets intended for welding Tiles (intended for dry-joint laying)	%	$\leq 0,4$ % ^a $\leq 0,25$ %	ISO 23999
Curling after exposure to heat: Sheets intended for welding Tiles (intended for dry-joint laying)	mm	≤ 10 mm ≤ 2 mm	ISO 23999
Flexibility of sheets Type 1: 20 mm diameter mandrel Type 2: 50 mm diameter mandrel	—	No cracking	ISO 24344:2008, Method A
Peel resistance strength: Average Individual results	N/mm	≥ 50 N/50 mm ≥ 40 N/50 mm	ISO 24345

^a The limit $\leq 0,4$ % ensures a satisfactory service for usual cases of use. Nevertheless, a less stringent requirement, ≤ 1 % can be accepted for specific applications. Consequently, only for sheet flooring intended for welding a maximum of 1 % is permitted in case of the manufacturer takes the responsibility to deviate from the requirement $\leq 0,4$ % and mentions clearly in its technical data sheet that there is a deviation with the sentence " ≤ 1 % instead of $\leq 0,4$ % as firstly required by ISO 11638 for use in the following application: ..."

^b Test until blue wool scale No. 6 according to ISO 105-B02. Compare this sample with a reference sample which was stored in the dark.

Table 2 (continued)

Characteristic	Unit	Requirement	Test method
Colour fastness to artificial light	—	≥ 6 or $\Delta E \leq 8$ after 300 h	ISO 105-B02, Method 3 ^b or ASTM F1515
<p>^a The limit $< 0,4$ % ensures a satisfactory service for usual cases of use. Nevertheless, a less stringent requirement, ≤ 1 % can be accepted for specific applications. Consequently, only for sheet flooring intended for welding a maximum of 1 % is permitted in case of the manufacturer takes the responsibility to deviate from the requirement $\leq 0,4$ % and mentions clearly in its technical data sheet that there is a deviation with the sentence “≤ 1 % instead of $\leq 0,4$ % as firstly required by ISO 11638 for use in the following application: ...”</p> <p>^b Test until blue wool scale No. 6 according to ISO 105-B02. Compare this sample with a reference sample which was stored in the dark.</p>			

4.3 Thickness of wear-layer requirements

Thicknesses of wear layers shall be in accordance with [Table 3](#).

5 Classification requirements

The classification scheme for resilient floor coverings is given in ISO 10874. The requirements for heterogenous poly(vinyl chloride) flooring on foam according to this scheme are specified in [Table 3](#).

Table 3 — Classification minimal requirement for level of use

Class	Symbol	Level of use	Thickness of wear-layer nominal value mm		Effect of castor chair	Simulated movement of a furniture leg		Residual indentation after static loading mm
			Type I	Type II		Surface	Joint	
Test method			ISO 24340		ISO 4918	ISO 16581		ISO 24340
Domestic								
21		Moderate/ Light	0,15	0,30	No requirement	No requirement	No requirement	≤ 0,35
22		General/ Medium	0,20	0,40	No requirement	No damage shall be visible with foot 3	No requirement	≤ 0,35
23		Heavy	0,25	0,50	No requirement		No requirement	≤ 0,35

Table 3 (continued)

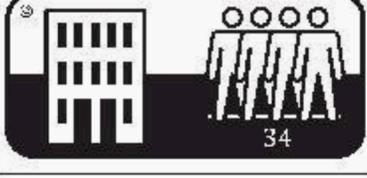
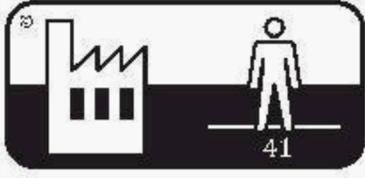
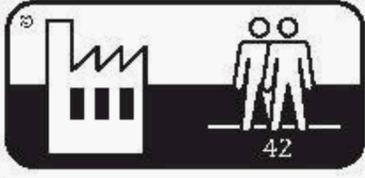
Class	Symbol	Level of use	Thickness of wear-layer nominal value mm		Effect of castor chair	Simulated movement of a furniture leg		Residual indentation after standard loading mm
			Type I	Type II		Surface	Joint	
Commercial								
31		Moderate	0,25	0,50	No requirement	No damage shall be visible with foot 3	No requirement	$\leq 0,35$
32		General	0,35	0,70	No delamination and no disturbance to the surface other than slight change in appearance caused by 25 000 cycles	No damage shall be visible with foot 2	When welded in accordance with manufacturer's instructions: no damage shall be visible with foot 0	$\leq 0,20$
33		Heavy	0,50	1,00				$\leq 0,20$
34		Very heavy	0,65	1,50				$\leq 0,20$

Table 3 (continued)

Class	Symbol	Level of use	Thickness of wear-layer nominal value mm		Effect of castor chair	Simulated movement of a furniture leg		Residual indentation after static loading mm
			Type I	Type II		Surface	Joint	
Light industrial								
41		Moderate	0,35	0,70	No delamination and no disturbance to the surface other than slight change in appearance caused by 25 000 cycles	No damage shall be visible with foot 2	When welded in accordance with manufacturer's instructions: no damage shall be visible with foot 0	≤ 0,20
42		General	0,50	1,00				

6 Marking

Floor coverings covered by this document and/or their packaging shall bear the following marking:

- a) number and date of this document including the year of publication, i.e. ISO 11638:2020;
- b) manufacturer or supplier identification;
- c) product name;
- d) colour/pattern, batch number and, if applicable, roll number;
- e) classes/symbols appropriate for the product;
- f) for rolls: the length, width and thickness.

Annex A

(informative)

Optional properties

Where the following properties are required for specific applications, the floor covering should be tested in accordance with the corresponding appropriate method or methods, as given in the standards listed below (see Bibliography).

- Electrical resistance: ASTM F150, EN 1081, ANSI/ES D S7.1, ANSI/ES D STM97.1, JIS A 1454.
- Electrical propensity: EN 1815, ANSI/ES D STM97.2.
- Effects of stains: ASTM F925, EN 423, ISO 26987, JIS A5705.
- Reaction to fire, determination of the burning behaviour using a radiant heat source: ISO 9239-1, ASTM E648, JIS A 1321.
- Reaction to fire, ignitability when subject to direct impingement of flame: ISO 11925-2.
- Reaction to fire, specific optical density of smoke generated: ASTM E662.
- Resistance to heat: ASTM F1514.

Bibliography

- [1] ISO 9239-1, *Reaction to fire tests for floorings — Part 1: Determination of the burning behaviour using a radiant heat source*
- [2] ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test*
- [3] ISO 23996, *Resilient floor coverings — Determination of density*
- [4] ISO 26987, *Resilient floor coverings — Determination of staining and resistance to chemicals*
- [5] EN 423, *Resilient floor coverings — Determination of resistance to staining*
- [6] EN 651, *Resilient floor coverings — Poly(vinyl chloride) floor coverings with foam layer — Specification*
- [7] EN 685, *Resilient, textile and laminate floor coverings — Classification*
- [8] EN 1081, *Resilient floor coverings — Determination of the electrical resistance*
- [9] EN 1815, *Resilient and textile floor coverings — Assessment of static electrical propensity*
- [10] ANSI/ES D S7.1, *Resistive characterization of materials — Floor materials*
- [11] ANSI/ES D STM97.1, *Floor materials and footwear-resistance measurement in combination with a person*
- [12] ANSI/ES D STM97.2, *Floor materials and footwear — Voltage measurement in combination with a person*
- [13] JIS A 1321, *Testing method for incombustibility of internal finish material and procedure of buildings*
- [14] JIS A 1454, *Test methods — Resilient floor coverings*
- [15] JIS A 5705, *Poly(vinyl chloride) floor coverings*
- [16] ASTM E662, *Standard test method for specific optical density of smoke generated by solid materials*
- [17] ASTM F150, *Standard test method for electrical resistance of conductive and static dissipative resilient flooring*
- [18] ASTM E648, *Standard test method for critical radiant flux of floor-covering systems using a radiant heat energy source*
- [19] ASTM F925, *Standard test method for resistance to chemicals of resilient flooring*
- [20] ASTM F1303, *Standard specification for sheet vinyl floor covering with backing*
- [21] ASTM F1514, *Standard test method for measuring heat stab*

