INTERNATIONAL STANDARD

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Resilient floor coverings — Specification for plain and decorative linoleum

Revêtements de sol résilients — Spécifications pour le linoléum uni et décoratif

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 24011 was prepared by Technical Committee ISO/TC 219, *Floor coverings*.

Resilient floor coverings — Specification for plain and decorative linoleum

1 Scope

This International Standard specifies the characteristics of plain and decorative linoleum, supplied as either tiles or rolls.

To encourage the consumer to make an informed choice, this International Standard includes a classification system based on the intensity of use, which shows where resilient floor coverings provide satisfactory service.

The term 'linoleum' is frequently incorrectly applied to a range of floor coverings, often to those based on poly(vinyl chloride) or rubber. Such materials are not included in this International Standard.

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.

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

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

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

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

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

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

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

ISO 26985, *Resilient floor coverings — Identification of linoleum and determination of cement content and ash residue*

EN ISO 105-B02:1999, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02:1994, including amendment 1:1998)*

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.

3.1
linoleum cement
binder in linoleum, consisting of a mixture of linseed oil and/or other vegetable drying oils, rosin and drying oil catalysts, which is converted to a semi-elastic mass by an oxidative curing process

3.2
linoleum
product produced by calendering one or more layers of a homogeneous mixture of linoleum cement, cork and/or wood flour, pigments and inorganic fillers containing a fibrous reinforcement and/or a fibrous backing

NOTE The product is then converted into its final form by an oxidative curing process. The only chemical cross-linking bondings in linoleum are those which are formed during the oxidation process.

3.3
surface layer
layer or layers with the same binder above a support material or backing

3.4
rosin
non-volatile part of the resinous material from pine trees

3.5
stove yellowing
yellowish cast formed on the surface of the linoleum during the oxidation process, which will disappear when exposed to either natural or artificial light to give a stable colour in service

NOTE Stove yellowing may reappear or not disappear in areas not exposed to light.

4 Identification requirements

Linoleum shall be identified by its ability to be disintegrated in 0,5 mol/l potassium hydroxide/methanol solution and by the determination of the cement content and ash residue.

The minimum amount of linoleum cement shall be 30 % when tested in accordance with ISO 26985.

The maximum amount of inorganic filler (ash residue) shall be 50 % when tested in accordance with ISO 26985.

5 Requirements

See Table 1.

Table 1 — General requirements

Characteristic		Requirement	Test method
Roll form:			ISO 24341
length	m	Not less than the nominal values	
width	m		
Tiles:			ISO 24342
side length	mm	Deviation ⩽ 0,15 % of nominal length, up to 0,5 mm maximum	
squareness and straightness for side length	mm	Deviation allowed at any point	
⩽ 400 mm		⩽ 0,25	
> 400 mm		⩽ 0,35	
Overall thickness:	mm		ISO 24346
average		Nominal value ± 0,15	
individual values		Nominal value ± 0,20	
Surface layer thickness:	mm		ISO 24340
average		Nominal value ± 0,07	
individual values		Nominal value ± 0,10	
Effect of a castor chair		No disturbance to the surface, other than a slight change in appearance, and no delamination shall occur	ISO 4918
Mass per unit area:	g/m^2		ISO 23997
average		Nominal value ± 10 %	
Residual indentation			ISO 24343-1
Nominal thickness:			
⩽ 3,2 mm		⩽ 0,15	
⩾ 4,0 mm		⩽ 0,20	
Flexibility of sheets			ISO 24344:2008
Thickness: (nominal)	Mandrel diameter		Method A
2,0 mm	30 mm	Shall show no sign of cracking when bent around the appropriate mandrel	
2,5 mm	40 mm		
3,2 mm	50 mm		
4,0 mm	60 mm		
Colour fastness to artificial light		6 minimum	EN ISO 105-B02:1999, Method 3[a]
		or	
		Maximum average $-\Delta E \leqslant 8$[b]	ASTM F1515[c]

[a] Before comparing the test piece, expose the reference sample, together with the blue wool cloth, to the xenon arc lamp, until a contrast is produced on Blue Wool Reference 2 equal to the contrast illustrated by Grey Scale 3. This step is necessary to remove the inherent “stove yellowing” of linoleum before the stable colouration is achieved.

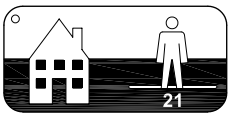
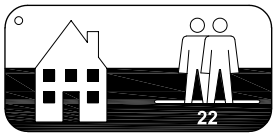
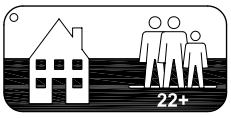
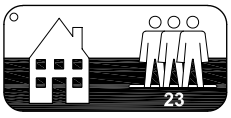
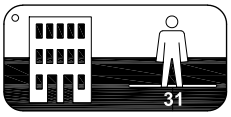
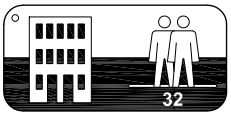
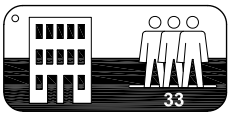
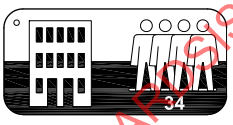
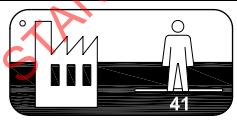
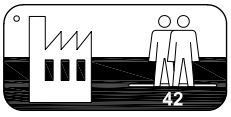
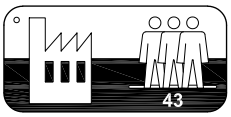
[b] ΔE is the unit of colour change specified in ASTM F1515.

[c] Remove "stove yellowing" by exposing the sample to a xenon-arc light source for a minimum of 24 h before measuring the initial colour.

6 Classification

The classification scheme for resilient floor coverings is specified in ISO 10874. The requirements for plain and decorative linoleum in accordance with this scheme are related to the nominal overall thickness and the surface layer thickness of the linoleum, as shown in Table 2.

Table 2 — Classification requirements

Class	Symbol	Intensity of use	Minimum surface layer thickness mm	Nominal overall thickness mm
Domestic				
21		Moderate/Light	0,8	2,0
22		General/Medium	0,8	2,0
22+		General	0,8	2,0
23		Heavy	0,8	2,0
Commercial				
31		Moderate	0,8	2,0
32		General	0,8	2,0
33		Heavy	1,3	2,5
34		Very heavy	1,3	2,5[a]
Light industrial				
41		Moderate	0,8	2,0[a]
42		General	1,3	2,5[a]
43		Heavy	1,3	2,5[a]

[a] Other thicknesses, e.g. 3,2 mm and 4,0 mm, may be specified to satisfy particular customer requirements.

7 Marking, labelling and packaging

Plain and decorative linoleum floor coverings and/or their packaging shall bear the following marking:

a) number and date of this International Standard, i.e. ISO 24011:2009;

b) manufacturer's or supplier's identification;

c) product name;

d) colour/pattern, and batch and roll number if applicable;

e) classes/symbols appropriate for the product;

f) for rolls: the length, width and thickness;

g) for tiles: the dimensions of a tile and the area, in square metres, contained in a package.