

BS EN 654:2011



BSI Standards Publication

Resilient floor coverings — Semi-flexible polyvinyl chloride tiles — Specification

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The UK participation in its preparation was entrusted to Technical Committee PRI/60, Resilient floor coverings.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

**Resilient floor coverings - Semi-flexible polyvinyl chloride tiles -
Specification**

Revêtements de sol résilients - Dalles semi-flexibles à base
de polychlorure de vinyle - Spécifications

Elastische Bodenbeläge - Polyvinylchlorid-Flex-Platten -
Spezifikation

This European Standard was approved by CEN on 10 March 2011.

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Foreword

This document (EN 654:2011) has been prepared by Technical Committee CEN/TC 134 "Resilient, textile and laminate floor coverings", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2011, and conflicting national standards shall be withdrawn at the latest by October 2011.

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1 Scope

This European Standard specifies the characteristics of semi-flexible tiles based on polyvinyl chloride and modifications thereof.

To encourage the consumer to make an informed choice, this European Standard includes a classification system (see EN 685) based on intensity of use, which shows where these floor coverings should give satisfactory service. It also specifies requirements for marking.

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 425, *Resilient and laminate floor coverings — Castor chair test*

EN 427, *Resilient floor coverings — Determination of the side length, squareness and straightness of tiles*

EN 428, *Resilient floor coverings — Determination of overall thickness*

EN 429, *Resilient floor coverings — Determination of the thickness of layers*

EN 430, *Resilient floor coverings — Determination of mass per unit area*

EN 434, *Resilient floor coverings — Determination of dimensional stability and curling after exposure to heat*

EN 435, *Resilient floor coverings — Determination of flexibility*

EN 436, *Resilient floor coverings — Determination of density*

EN 660-2, *Resilient floor coverings — Determination of wear resistance — Part 2: Frick-Taber test*

EN 662, *Resilient floor coverings — Determination of curling exposure to moisture*

EN 663, *Resilient floor coverings — Determination of conventional pattern depth*

EN 685, *Resilient, textile and laminate floor coverings — Classification*

EN ISO 105-B02, *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)*

3 Terms and definitions

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

3.1
polyvinyl chloride floor covering
floor covering with surface layers which are produced using polyvinyl chloride (and modifications thereof) as binder

3.2
semi-flexible polyvinyl chloride floor covering
rigid tiles made from polyvinyl chloride (and modifications thereof) which can only be deflected under specified conditions

4 Requirements

4.1 General requirements

Floor coverings described in this European Standard shall conform to the appropriate general requirements specified in Table 1, when tested in accordance with the methods given therein.

4.2 Classification requirements — Level of use classification

Floor coverings described in this European Standard shall be classified as suitable for different levels of use in accordance with the performance requirements specified in Table 2 when tested with the methods given therein. Classification shall conform to the scheme specified in EN 685.

4.3 Homogeneous products and wear layers

A homogeneous product shall retain its wear group classification throughout the thickness of the product if tested.

A wear layer shall retain its wear group classification throughout its thickness if tested.

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Table 1 — General requirements

Characteristic		Requirement	Test method
Side length of tiles	mm	Deviation $\leq 0,13\%$ of nominal length up to 0,5 mm maximum	EN 427
squareness and straightness for side length:	mm	Deviation allowed at any point	
≤ 400 mm		$\leq 0,25$	
> 400 mm		$\leq 0,35$	
Overall thickness:	mm		EN 428
average		Nominal value + 0,13 - 0,10	
individual results		Average value $\pm 0,15$	
Total mass per unit area (average)	g/m ²	Nominal value + 13% - 10%	EN 430
Density (average)	kg/m ³	Nominal value $\pm 0,75$	EN 436
Products with nominal density ≥ 230 kg/m ³		Nominal value $\pm 0,100$	
Dimensional stability after exposure to heat:	%	$\leq 0,25$	EN 434
Curling on exposure to moisture	mm	$\leq 0,75$	EN 662
Flexibility		Shall show no signs of cracking when deflected to a minimum of 15 mm	EN 435 Method B
Colour fastness to artificial light		6 minimum	EN ISO 105-B02 Method 3 ¹
¹ Expose a full size of test specimen. Store a further test specimen in the dark, which will constitute the reference standard for assessment of colour change.			

Table 2 — Classification requirements for wear groups

Characteristic	Requirements for wear group				Test method
	T	P	M	F	
volume loss F_v mm ³	$F_v \leq 2,0^1$	$2,0 < F_v \leq 4,0$	$4,0 < F_v \leq 7,5$	$7,5 < F_v \leq 15,0$	EN 660-2
¹ If tested for verification					

Table 3 — Classification requirements for level of use











Class	Symbol	Level of use	Overall thickness		Effect of a castor chair*
			Nominal value ¹ , mm		
			Smooth tiles	Special products ²	
21 ³		domestic moderate	Without relief 1,6	Without relief 1,6	No requirement
22 ³		domestic general	With relief 2,0	With relief 2,0	
22+ ³		domestic general			
23 ³		domestic heavy	2,0	2,0	
31 ³		commercial moderate			
32		commercial general	2,5	2,0	When tested for verification, no disturbance to the surface other than slight change in appearance and no delamination shall occur
41		light industrial moderate			
33		commercial heavy	2,5	2,0	
42		light industrial general			
34		commercial very heavy	3,2	2,5	

Table 3 (continued)

Test method	EN 429	EN 425
<p>¹ The average value shall be the nominal value +13% but not more than 0,1 mm. No individual shall vary more than $\pm 0,15$ mm from the average value. -10%</p> <p>² Tiles shall be classed as special products when the thickness loss is $\leq 0,4$ mm or the volume loss is ≤ 10 mm³ when tested in accordance with EN 660-2.</p> <p>³ Tiles with a relief shall be at least 2 mm thick and shall have a conventional pattern depth of at least 0,5 mm when tested in accordance with EN 663 and are classified, 21, 22, 22+, 23 and 31</p> <p>* Floor coverings in classes 32 to 43 are <i>a priori</i> classified as suitable for castor chair use and need not be tested.</p>		

5 Marking

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

- a) number and date of this European Standard, i.e. EN 654:2011;
- b) manufacturer's or supplier's identification;
- c) product name;
- d) colour/pattern, and batch number;
- e) classes/symbols appropriate for the product;
- f) length, width and thickness;
- g) area in square metres contained in a package.

Annex A (informative)

Optional properties

Where the following properties are required for specific applications, the floor covering should be tested in accordance with the appropriate methods.

- electrical resistance (see EN 1081);
- electrostatic propensity (see EN 1815);
- effect of stains (see EN 423).

Annex B (informative)

Additional methods of test

The following test methods are also available for this type of product but do not form part of the specification:

- volatile loss (EN 664);
- exudation of plasticizers (EN 665);
- gelling (EN 666).

Bibliography

- [1] EN 423, *Resilient floor coverings — Determination of resistance to staining*
- [2] EN 664, *Resilient floor coverings — Determination of volatile loss*
- [3] EN 665, *Resilient floor coverings — Determination of exudation of plasticizers*
- [4] EN 666, *Resilient floor coverings — Determination of gelling*
- [5] EN 1081, *Resilient floor coverings — Determination of electrical resistance*
- [6] EN 1815, *Resilient and textile floor coverings — Assessment of static electrical propensity*
- [7] EN 433, *Resilient floor coverings — Determination of residual indentation after static loading*

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