

TEST CERTIFICATE No. 22000375

Ordering party	Order date:	22.07.1999
NICOCYL®-GmbH	Receipt of specimens:	21.07.1999
Schäferstrasse 53		03.08.1999
		07.10.1999
		15.11.1999
44147 Dortmund	Date of test:	28.07.1999
	to	17.11.1999

Order

Testing a heterogeneous floor covering on a PVC base

Description of the test object/Number of specimens/Specimen designation

10 m² of a single-layer heterogeneous floor covering on a PVC base containing approx. 5% alien parts consisting of PE, rubber, silicon and upper parts.

Designation: "NICOCYL® 10 mm"
Rated thickness: 10 mm
Supplied as: tiles (500 x 500) mm
Colour: black

Description of the sampling procedure

The test specimens were sent to MPA NRW by the ordering party.

Underlying regulations/Description of the tests

DIN EN 649:1997-01 "Resilient Floor Coverings; Homogeneous and heterogeneous polyvinylchloride Floor Coverings; Specifications
DIN EN 685:1996-07 "Resilient Floor Coverings; Classification"
DIN EN 1081:1998-04 "Resilient Floor Coverings: Determining the electrical resistance", Procedures A and B
DIN EN 423:1993-10 "Resilient Floor Coverings; Behaviour vis-à-vis Stains"
DIN 53505:1987-06 "Testing Rubber, Elastomers and Plastics; Hardness Test acc. to Shore A and Shore D"
DIN EN ISO 527-1:1996-04 "Plastics; Determining the Extension Properties; Part 1: General Fundamentals"

The results of the tests are related exclusively to the above specified specimens.

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This Test Certificate consists of 2 pages and 3 annexes.

DIN EN ISO 527-3: 1995-10 "Plastics; Determination of the Extension Properties; Part 3; Testing Conditions for Sheets and Tiles"

Tension Test ISO 527-3/1B/20

Test specimen: Type 1B acc. to ISO 527-3

Specimen removal: Cutting without pretensioning device

Testing device: Universal Testing Machine DIN 51 221 Part 1
- 2 kN - Class 1 with non-contact elongation measuring device

testing speed: 20 mm/min

DIN EN 1399:1998-02 "Resilient Floor Coverings; Determining the Resistance to Stubbing out and Burning Cigarettes".

DIN 52615:1987-11 "Thermal Protection Tests. Determining the Water Vapour Permeability of Building and Insulating Materials".

Number of test specimens : 5

Blind test : 1

Marginal conditions : 23-0/85

DIN 4102:1998-05 "Burning Behaviour of Building Materials and Building Parts Part 1: Building Materials - Terms, Demands and Tests", Section 6.2 - Building Material Class B2.

DIN 52210 Part 3:1987-02 "Building Acoustic Tests; Air-borne and Footfall Sound Insulation; Testing Building Parts on Test Standards and between Rooms in a Building".

DIN 52612:1979-09 "Determining the Thermal Conductivity with the Tile Device".

DIN 52614:1974-10 "Determining Heat Dissipation of Floors".

Ambient conditions: Standard Climate DIN 50 014-23/50-2.

Test results:

See Annexes 1 to 3

Assessment/Classification

The results of the conducted tests conform with the requirements of DIN EN 649.

According to the classification demands of DIN EN 649/DIN EN 685, the tested floor covering "NICOCYL 10 mm" must be classified as follows:

Wear group: P

Application range: Classes 34 and 43

Dortmund, 17.11.1999

By order

(Stamp)

Dipl.-Ing. Jessen
Head of Subject Area

Test results

Floor covering on PVC basis with the designation "NICOCYL® 10 mm"

Form of delivery: Tiles Colour: black

Properties	Unit	Extreme value	Mean value	Requirements DIN EN 649	
Side length	mm	Conforms		$\leq 0.13\%$ to max. 0.5 mm	
Rectangularity and straightness	mm	Conforms		≤ 0.35 mm* ≤ 0.50 mm**	
Total thickness	mm	9.89 10.08	9.95	Mean value $+0.13$ -0.10 of rated value Individual values ± 0.15 of mean value	
Total mass per unit area	g/m ²	13540 14229	13884	$+13\%$ -10% of mean value	
Density	g/cm ³	1.45 1.46	1.45	$+0.05$ of rated value	
Residual indentation	mm	0.10 0.11	0.10	≤ 0.1	
Dimensional change after exposure to heat	Direction 1	%	-0.05 0.03	-0.01	$\leq 0.25^*$ $\leq 0.4^{**}$
	Direction 2	%	-0.05 0.08	0.003	$\leq 0.25^*$ $\leq 0.4^{**}$
Cupping after exposure to heat	mm	No cupping detected		$\leq 2^*$ $\leq 8^{**}$	
Flexibility (mandrel diameter 20 mm)	mm	No cracking		No cracking	
Colour fastness to artificial light (light fastness type acc. to DIN 54 004)	Level	>6		at least 6	
Wear behaviour pr EN 660-1	mm	0.13 0.14	0.14	(see Classification)	
Effects of roll-chairs	-	Conforms		Only slight surface changes; no delamination	
Seam strength	N/50 mm	731 867	806	Mean value ≥ 240 Individual values $>180^{**}$	

*) Requirements only apply to floor coverings laid by dry joint method

**) These requirements only apply to welding envisaged floor coverings

Manufacturer's details (rated values):

- Side length of floor covering tiles: (500 x 500) mm
- Thickness: 10 mm
- Mass per unit area: 14,500 g/m²
- Density: 1.44 g/cm³

Test results

Floor covering on PVC basis with the designation "NICOCYL® 10 mm"

Form of delivery: Tiles Colour: black

<u>Properties</u>	<u>Unit</u>	<u>Extreme values</u>		<u>Mean value</u>
Volume resistance R ₁	Ohm	1.7 x 10 ¹⁰	2.5 x 10 ¹⁰	Median value 2.5 x 10 ⁹
Resistance to earth R ₂	Ohm	1.3 x 10 ⁹	1.6 x 10 ⁹	Median value 1.6 x 10 ⁹
Behaviour vis-à-vis stains* Exposure time: 30 minutes and 2 hours	-	After cleaning with a cotton cloth soaked methylated spirit no change of covering surface. Complies in all instances with Assessment Index 0 acc. to DIN EN 423		
Shore-D hardness		46	49	47
Tensile strength	N/mm ²	6.83	8.51	7.77
Elongation at tensile strength	%	28.0	52.7	40.5
Fire behaviour B2 orientated	-	Conforms with Building Class B2		
Footfall sound improvement measures**	ΔL' _w	9 dB		
Thermal At 10°C resistance At 20°C and 65% relative humidity	(m ² .K)W	0.1569	0.1486	
Heat W ₁ dissipation*** W ₁₀	kJ/m ² kJ/m ²	22	126	
Water vapour permeability WDD	g/(m ² .d)	0.103	0.136	0.126
Water-vapour diffusion resistance coefficient	μ	30900	41300	33900
Water-vapour diffusion equivalent air layer thickness	S _d m	300	396	327

*) Substances used: Acetic acid 5%; sodium lye 10%; acetone; heating oil; olive oil; butter (commercial grade); cup grease; shoe polish (light brown); milk; ethanol 96%; glycerine; methanol; mineral oil; blood; urine; wine.

**) The floor covering was laid by fixing.

***) As a result of the established heat dissipation rates, the floor covering "NICOCYL® 10 mm" can be assigned to the heat dissipation level - Especially Foot-warm.

Test results

Floor covering on a PVC base with the designation "NICOCYL® 10 mm"
Supplies as: Tiles Colour: black

Resistance to cigarette stubbing**Procedure A (stubbing a cigarette)**

Floor covering designation	Type of cigarette	Description of the cleaning product used to clean the floor covering surface	Result level* EN 1399
	REVAL	Cleaning with a cotton	4
NICOCYL 10 mm	Roth-Händle	cloth soaked in	4
	GAULOISES	methylated spirit	4

Procedure B (burning down a cigarette)

Floor covering designation	Type of cigarette	Description of the cleaning product used to clean the floor covering surface	Result level* EN 1399
	REVAL	Cleaning with a cotton	4
NICOCYL 10 mm	Roth-Händle	cloth soaked in	4
	GAULOISES	methylated spirit	4

***) Explanations:**

- 5 No visible change
- 4 Slight change of the gloss only visible at a certain viewing angle and/or light brown stain
- 3 Moderate change of gloss and/or brown stain
- 2 Strong brown stain, but surface is not damaged
- 1 Formation of bubbles and/or damaged surface