

Laboratory of Flammability Testing

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TEST CERTIFICATE ON THE REACTION TO FIRE TESTS FOR FLOORINGS

No 86 / BP / 17

Test method:

- PN-EN ISO 9239-1:2010 Reaction to fire tests for floorings.
Part 1: Determination of the burning behaviour using a radiant heat source.
- PN-EN ISO 11925-2:2010 Reaction to fire tests. Ignitability of building products subjected to direct impingement of flame.
Part 2: Single-flame source test.

Orderer:

Tarkett Vinisin LLC
Promyshlennaya 10, Kalush, Ukraine

Subject of testing:

Heterogeneous vinyl floor covering referenced **Omnisports V35, 3.5 mm** consisting of:

- an overlay made of polyvinyl chloride covered with a finishing layer made of polyvinyl chloride at the rate of 24 g/m²
- a first intermediate foam layer made of polyvinyl chloride and fillers
- a second intermediate saturant layer made of polyvinyl chloride and fillers reinforced with glass fibres and calander film,
- a foam made of polyvinyl chloride and fillers

Overall nominal weight: 3.2 kg/m²
Overall nominal thickness: 3.50 mm
Testing sample with the correct size, in appropriate state for testing, supplied by the Orderer with its characteristic and without the Sampling Protocol.

Results of testing: Samples placed on non-flammable substrate (cement-fibre plate).

1. Flame spread testing and measurement of smoke emission according to PN-EN ISO 9239-1:2010

Critical heat flux CHF	7,1 ± 0,5 [kW/m ²]
Maximum light beam weakness	93 ± 1 [%]
Total smoke emission	193 ± 8 [%·min]

The reported expanded uncertainty is based on a standard uncertainty, multiplied by a coverage factor k=2, providing a confidence level of approximately 95%.

2. Ignitability testing under the direct impingement of flame according to PN-EN ISO 11925-2:2010

During 20 s test (flame acting - 15 s):

- samples tested on surface exposure melted and charred in the flame acting area,
- samples tested on edge exposure melted and charred in the flame acting area,
- the top of flame hasn't reached 150 mm above its contact point for each tested samples.

The above results refer to testing conditions specified by the standard; they shouldn't be taken into consideration to real fire conditions.

Tests performed by:

Agnieszka Hulewicz, MSc. Eng.

Andrzej Kubański, technician

Test Certificate authorized by:

Laboratorium Badań Palności Wyrobów
KIEROWNIK

Sample received on: 08.03.2017
Test performed on: 05-07.04.2017

mgr Inż. Małgorzata Szejna

10.04.2017

NOTES:

- The Testing results refer only to the tested sample.
- Test Certificate consists of 7 pages.
- Test Certificate must not be reproduced in another way, than as a whole without a prior written consent of the Testing Laboratory.
- The Orderer using this Test Certificate is responsible for the conformity between the product and sample submitted for testing.

The Testing Laboratory accredited by the Polish Centre for Accreditation (PCA), No AB 029.

DETAILED TESTING RESULTS**1. Flame spread testing and measurement of smoke emission according to PN-EN ISO 9239-1:2010**

Climate conditions: temperature $(23 \pm 2) ^\circ\text{C}$; humidity $(50 \pm 5) \%$; time: 2 weeks
 Testing conditions: temperature $22 ^\circ\text{C}$; humidity 33 %

Samples placed on non-flammable substrate - cement-fibre plate: thickness $(8 \pm 2) \text{mm}$, density $(1800 \pm 200) \text{kg/m}^3$

a) Results of basic testing

Flame spread testing

Pilot burner flame acting time : 10 min

Tested value	Unit	Number of specimen			
		1	2	3	4
		Direction			
		lengthwise	crosswise		
Extinguish time of specimen	[s]	350	369	354	329
Flame spread distance after 10min	[mm]	260	310	310	310
Flame spread distance after 20min	[mm]	260	310	310	310
Flame spread distance after 30min	[mm]	-	-	-	-
Maximum flame spread distance	[mm]	260	310	310	310
Melting (charring) range	[mm]	480	485	440	460
Heat Flux after 10min – HF-10	[kW/m ²]	8,2	7,1	7,1	7,1
Heat Flux after 20min – HF-20	[kW/m ²]	8,2	7,1	7,1	7,1
Critical Heat Flux – CHF	[kW/m ²]	8,2	7,1	7,1	7,1
Critical Heat Flux - average value – CHF _{av}	[kW/m ²]	-	7,1		

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Time of flame front crossing reaching zones and the corresponding intensity of the heat flux

Zone No	Number of specimen			
	1	2	3	4
	Direction			
	lengthwise	crosswise		
1	124 s ($>11 \text{ kW/m}^2$)	122 s ($>11 \text{ kW/m}^2$)	124 s ($>11 \text{ kW/m}^2$)	124 s ($>11 \text{ kW/m}^2$)
2	127 s ($10,9 \text{ kW/m}^2$)	124 s ($10,9 \text{ kW/m}^2$)	126 s ($10,9 \text{ kW/m}^2$)	126 s ($10,9 \text{ kW/m}^2$)
3	136 s ($10,1 \text{ kW/m}^2$)	132 s ($10,1 \text{ kW/m}^2$)	136 s ($10,1 \text{ kW/m}^2$)	139 s ($10,1 \text{ kW/m}^2$)
4	156 s ($9,3 \text{ kW/m}^2$)	145 s ($9,3 \text{ kW/m}^2$)	155 s ($9,3 \text{ kW/m}^2$)	156 s ($9,3 \text{ kW/m}^2$)
5	196 s ($8,2 \text{ kW/m}^2$)	166 s ($8,2 \text{ kW/m}^2$)	179 s ($8,2 \text{ kW/m}^2$)	179 s ($8,2 \text{ kW/m}^2$)
6		211 s ($7,1 \text{ kW/m}^2$)	235 s ($7,1 \text{ kW/m}^2$)	227 s ($7,1 \text{ kW/m}^2$)

b) Results of additional testing

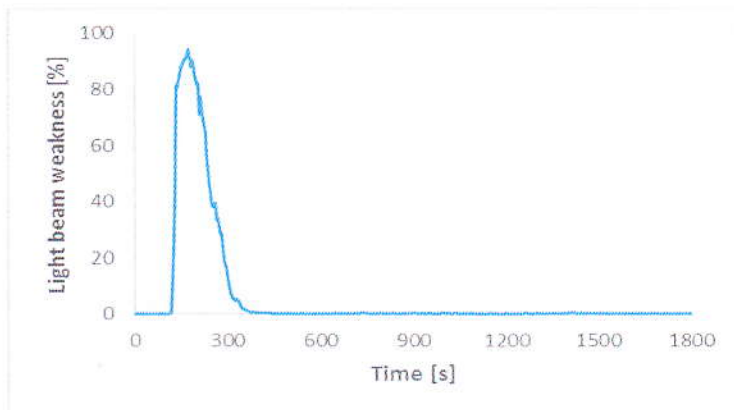
Measurement of smoke emission

Tested parameters	Unit	Number of specimen			
		1	2	3	4
		Direction			
		lengthwise	crosswise		
Maximum light beam weakness	[%]	89,1	94,5	92,6	92,9
Maximum light beam weakness - average value	[%]	-	93,3		
Total smoke emission	[%·min]	173,7	194,2	184,2	200,5
Total smoke emission - average value	[%·min]	-	192,7		

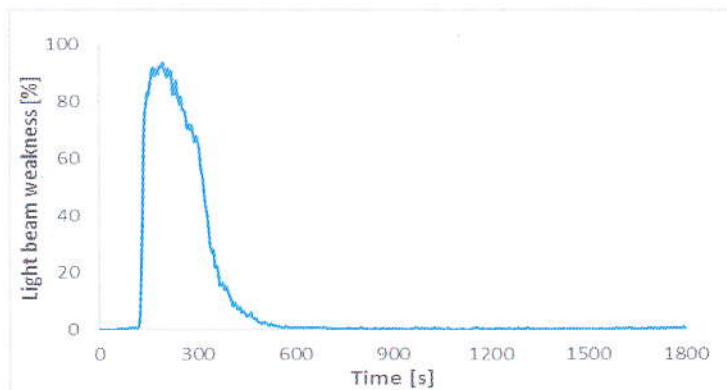
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Graph: relationship between light beam weakness and time

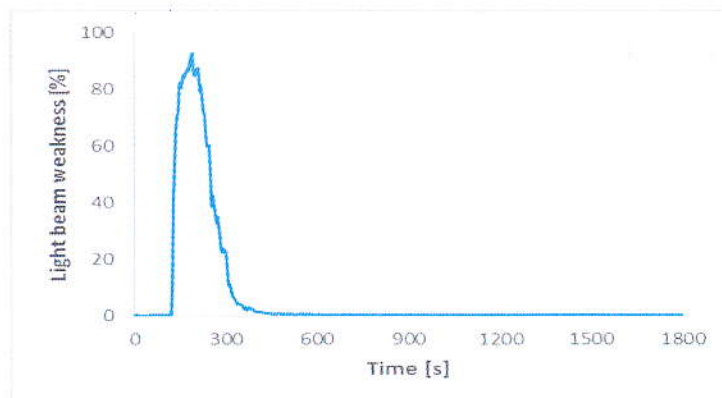
Sample No 2



Sample No 3



Sample No 4



2. Ignitability testing under the direct impingement of flame according to PN-EN ISO 11925-2:2010

Climate conditions: temperature $(23 \pm 2) ^\circ\text{C}$; humidity $(50 \pm 5) \%$; time: 2 weeks
 Testing conditions: temperature $22 ^\circ\text{C}$; humidity 33%

Samples placed on non-flammable substrate - cement-fibre plate: thickness $(8 \pm 2)\text{mm}$, density $(1800 \pm 200) \text{ kg/m}^3$

Flame acting time: 15 s
 Test time: 20 s

a) Lengthwise direction

Surface exposure

Sample no	Did sample ignition appear?	Did the top of flame reach 150 mm above its contact point within 20 s of testing?	The time of reaching 150 mm above its contact point within 20 s by flame top [s]	Did filter paper ignition appear?
1	NO	NO	-	NO
2	NO	NO	-	NO
3	NO	NO	-	NO

Remarks:

Under the flame acting surface of samples charred and melted in the flame acting area.

Edge exposure

Sample no	Did sample ignition appear?	Did the top of flame reach 150 mm above its contact point within 20 s of testing?	The time of reaching 150 mm above its contact point within 20 s by flame top [s]	Did filter paper ignition appear?
1	NO	NO	-	NO
2	NO	NO	-	NO
3	NO	NO	-	NO

Remarks:

Under the flame acting surface of samples charred and melted in the flame acting area.

b) Crosswise direction

Surface exposure

Sample no	Did sample ignition appear?	Did the top of flame reach 150 mm above its contact point within 20 s of testing?	The time of reaching 150 mm above its contact point within 20 s by flame top [s]	Did filter paper ignition appear?
1	NO	NO	-	NO
2	NO	NO	-	NO
3	NO	NO	-	NO

Remarks:

Under the flame acting surface of samples charred and melted in the flame acting area.

Edge exposure

Sample no	Did sample ignition appear?	Did the top of flame reach 150 mm above its contact point within 20 s of testing?	The time of reaching 150 mm above its contact point within 20 s by flame top [s]	Did filter paper ignition appear?
1	NO	NO	-	NO
2	NO	NO	-	NO
3	NO	NO	-	NO

Remarks:

Under the flame acting surface of samples charred and melted in the flame acting area.

TESTS RESULTS COMMENT


Based on results of the tests performed according to:

1. PN-EN ISO 9239-1:2010

- critical heat flux CHF = $(7,1 \pm 0,5) \text{ kW/m}^2$
- total smoke emission = $(193 \pm 8) \% \cdot \text{min}$

2. PN-EN ISO 11925-2:2010

- the top of flame hasn't reached 150 mm above its contact point for each tested samples within 20 s,
samples of tested heterogeneous vinyl floor covering named **Omnisports V35**, meet requirements of
PN-EN 13501-1+A1:2010 *Fire classification of construction products and building elements – Part 1:*
Classification using data from reaction to fire tests *) for **C_f s1** class.

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*) Table 2. *Classes of reaction to fire performance for floorings* – requirements for C_f s1 class:

1. PN-EN ISO 9239-1:2010

- critical heat flux $\geq 4,5 \text{ kW/m}^2$
- s1 = total smoke emission $\leq 750 \% \cdot \text{min}$

2. PN-EN ISO 11925-2:2010

- F_s $\leq 150 \text{ mm}$ within 20 s

Łódź, 10.04.2017r.

END OF THE TEST CERTIFICATE