

TEST REPORT

Order no: 25.07.2019

Signature: SL/Z-314/EN45545-R10/412a/2019

Police, 18.09.2019

Test methods:

1. EN ISO 5659-2:2017. Plastic – Smoke generation – Part 2: Determination of optical density by a single – chamber test.
2. EN ISO 9239-1:2010. Reaction to fire tests for floor coverings – Part 1. Determination of the burning behaviour using radiant heat source.
3. EN 45545-2:2013+A1:2015. Railway applications - Fire protection of railway vehicles - Part 2: Requirements for fire behaviour of materials and components.

Content of request: Test acc. to EN 45545-2, requirement R10

Sponsor: Tarkett Polska Sp. z o.o.
ul. Karolkowa 30
01-207 Warszawa
Poland

Material: Floor covering Tarkett Safetred Rail

Composition: Vinyl floor covering - Safetred Rail- made by Tarkett Ltd
Adhesive - Uzin KR 430 - made by UZIN utz AG
Birch plywood, thickness 18,5 mm – made by sklejk Mulit S.A..

Manufacturer/supplier: Tarkett Polska Sp. z o.o.
ul. Karolkowa 30
01-207 Warszawa
Poland

Assessment: The tested product fulfils the requirement of R10 according to EN 45545-2:2013+A1 for hazard level HL1 and HL2.

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Report applies only to the sample tested and is not necessarily indicative of the qualities of apparently identical or similar products.

Contain of test report: five pages with signature and numbers.

1. Reaction to fire tests for floor coverings according to EN ISO 9239-1

Table 1.1. critical heat flux at extinguishment CHF

Name of measured quantity	Unit	Test direction	
		length direction	cross direction
Critical heat flux at extinguishment CHF	$\text{kW} \cdot \text{m}^{-2}$	7,4	-

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of the specimen	g	4066,0	4051,5	4037,5	4051,7	14,3
Specimen thickness	mm	20,5	20,5	20,5	20,5	0
Ignition time	s	127	130	129	129	2
Extinction time	s	726	811	878	805	76
Duration of the test	s	1800	1800	1800	1800	0
Flame spread distance after 10 min	mm	310	280	300	297	15
Flame spread distance after 20 min	mm	310	280	300	297	15
Maximum flame spread distance	mm	310	280	300	297	15
Critical heat flux at extinguishment CHF	$\text{kW} \cdot \text{m}^{-2}$	7,1	7,8	7,3	7,4	0,4

Table 1.2. Time of the movement of the flame front

Distance from exposed of the specimen mm	Calibration flux levels at the specimen $\text{kW} \cdot \text{m}^{-2}$	Time of arrival of the flame front		
		Specimen		
		1	2	3
		s		
110	10,9	128	134	135
160	10,2	140	148	138
210	9,5	161	182	159
260	8,4	222	211	237
310	7,3	297	-	-
360	6,2			
410	5,1	-	-	-
460	4,2	-	-	-

Remarks: none.



Figure 1. Appearance of the specimens after the test

2. Smoke generation according to EN ISO 5659-2

Test conditions - irradiance of $25 \text{ kW} \cdot \text{m}^{-2}$ with pilot flame + EN 45545-2:2013+A1:2015

Table 2.1. Final findings of smoke generation

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of specimen	g	93,3	93,4	92,3	93,0	0,6
Specimen thickness	mm	20,5	20,5	20,3	20,4	0,1
Ignition time - t_z	s	42	46	43	44	2
Extinction time	s	-	-	-	-	-
Duration of the test	s	600	600	600	600	0
Maximum of specific optical density - $D_{s\text{max}}$	-	230	250	239	240	10
Time of arrival of the maximum of $D_{s\text{max}}$	s	600	600	600	600	0
Specific optical density in the first 4 min of the test - $D_s(4)$	-	189	250	210	216	31
Cumulative specific optical densities in the first 4 min of the test - VOF_4	min	426	410	482	439	38

Remarks: none.

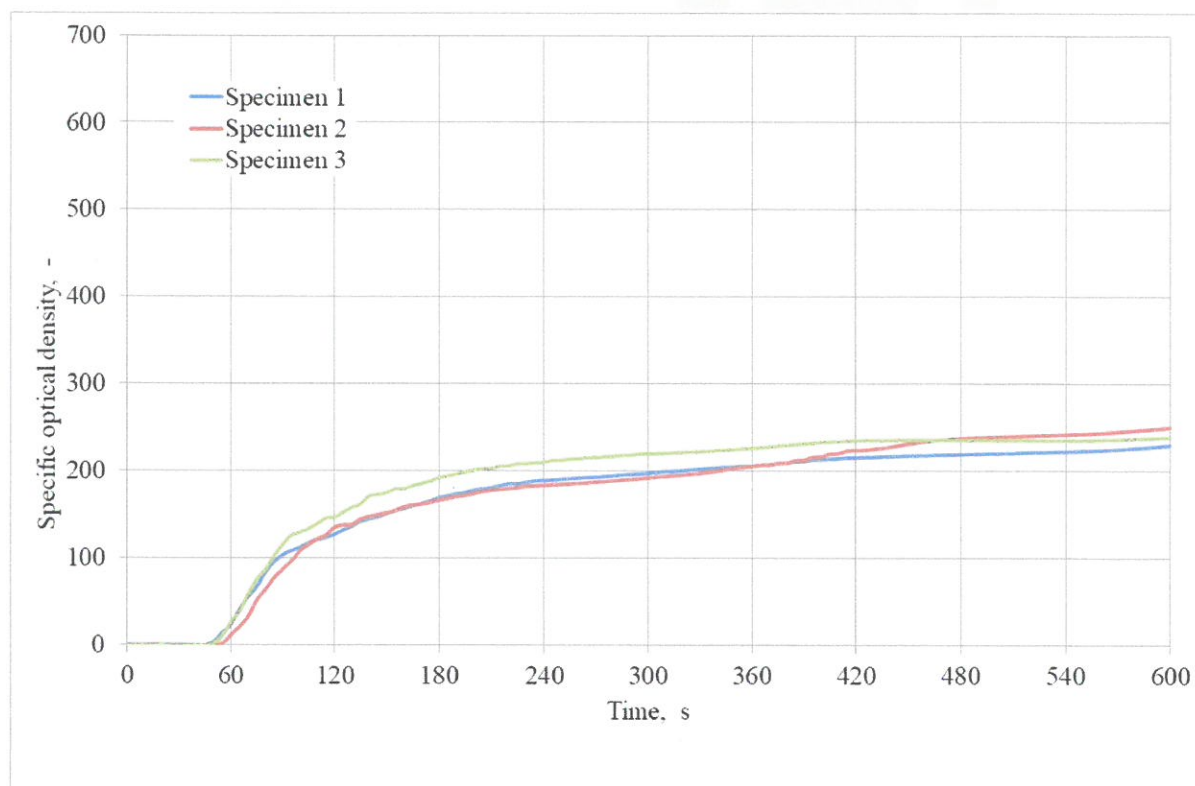


Figure 2. Specific optical density in the time

3. Results of toxic products emission of material decomposition and burning according to EN ISO 5659-2

Test conditions - irradiance of $25 \text{ kW} \cdot \text{m}^{-2}$ with pilot flame + EN 45545-2:2013+A1:2015

Table 3.1. Concentration of toxic products of material decomposition and burning after 4 min

Toxic component of burning products	Concentration of toxic products after 4 min				
	Specimen no.			Average	Standard deviation
	1	2	3		
	mg·m ⁻³				
CO ₂	15626	15908	10798	14111	2872
CO	279	250	199	242	41
HCN	0	0	0	0	0
NO ₂	0	0	0	0	0
NO	0	0	0	0	0
HCL	452	418	277	382	93
SO ₂	0	0	0	0	0
HF	0	0	0	0	0
HBr	0	0	0	0	0

Table 3.2. Concentration of toxic products of material decomposition and burning after 8 min

Toxic component of burning products	Concentration of toxic products after 8 min				
	Specimen no.			Average	Standard deviation
	1	2	3		
	mg·m ⁻³				
CO ₂	28445	29528	13916	23963	8718
CO	374	349	192	305	98
HCN	0	0	0	0	0
NO ₂	0	0	0	0	0
NO	0	0	0	0	0
HCL	372	364	170	302	115
SO ₂	0	0	0	0	0
HF	0	0	0	0	0
HBr	0	0	0	0	0

Table 3.3. Conventional index of toxicity according EN 45545-2

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Conventional index of toxicity CIT _G at 4 min	-	0,52	0,48	0,32	0,44	0,11
Conventional index of toxicity CIT _G at 8 min	-	0,45	0,44	0,21	0,37	0,14

Remarks: none.

4. Final findings

Requirement	Method/norm	Measured quantity	Unit	Measured value	Critical value			Crossing coefficient		
					HL1	HL2	HL3	HL1	HL2	HL3
R10	T04 EN ISO 9239-1	CHF	kW·m ⁻²	7,4	4,5	6	8	0,61	0,81	1,08
	T03.02 ISO 5660-1: 25 kW·m ⁻²	MARHE	kW·m ⁻²	-	-	-	-	-	-	-
	T10.03 EN ISO 5659-2: 25 kW·m ⁻²	D _s max	-	240	600	300	150	0,40	0,80	1,60
	T11.02 EN ISO 5659-2: 25 kW·m ⁻²	CIT _G (4)	-	0,44	1,2	0,9	0,75	0,37	0,49	0,59
		CIT _G (8)	-	0,37	1,2	0,9	0,75	0,31	0,41	0,49

The tested product fulfils the requirement of R10 according to EN 45545-2:2013+A1 for hazard level HL1 and HL2.

5. Remaining required information

Date of receipt of samples: 11.09.2019

System of the sampling: sponsor took and delivered samples.

Description of the test material: floor system consisting of vinyl floor covering of beige color (2 mm), glued to birch plywood (18,2-18,5 mm). Total thickness 20,3-20,6 mm and weight per unit area 16,5-16,8 kg/m². 4 samples dimensions of 1050x230 mm and 6 samples dimensions of 1050x230 mm were delivered by the sponsor.

Conditioning of specimens: constant mass at a temperature of 23±2 °C, and relative humidity of 50±5 %.

Declaring: The test results rate to the behaviour of the test specimens under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the products in use.

Operators:

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dr inż. Krzysztof Sychta

Date and place of test - 13.09 and 18.09.2019, Police