

TEST REPORT

Order no: 20.12.2024

Signature: SL/Z-1182/EN45545-R1/1274a/2024

Police, 15.01.2025

Test methods:

1. ISO 5658-2:2006/Amd. 1:2011. Reaction to fire tests – Spread of flame – Part 2: Lateral spread on building and transport products in vertical configuration.
2. EN-ISO 5659-2:2017. Plastic – Smoke generation – Part 2: Determination of optical density by a single – chamber test.
3. ISO 5660-1:2015/Amd.1:2019. Reaction to fire tests – Heat release, smoke production and mass loss rate – Part 1: Heat release rate (cone calorimeter method).
4. EN 17084:2018. Railway applications – Fire protection of railway vehicles – Toxicity test of materials and components.
5. EN 45545-2:2020+A1:2023. Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behavior of materials and components.

Content of request: Tests according to EN 45545-2:2020+A1:2023 - requirement R1, R7 and R17.

Sponsor: Antalis
8, rue de Seine
92100 Boulogne - France

Material: Coala Walk & Wall

Composition: Fabric with a textured matte vinyl coating (white)

Manufacturer/supplier: Antalis
8, rue de Seine
92100 Boulogne - France

Assessment: The tested product fulfils the requirements R1, R7 and R17 according to EN 45545-2:2020+A1:2023 for hazard level HL1, HL2 and HL3.

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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.

Content of test report: eight pages with signature and numbers.

1. Spread of flame according to ISO 5658-2

Substrate: on 1mm steel plate.

Tested side: fabric side.

Table 1.1. Findings of critical heat flux at extinguishment CFE

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of the specimen	g	30,4	30,3	31,1	30,6	0,4
Specimen thickness	mm	0,3	0,3	0,3	0,3	0
Ignition time	s	20	23	16	20	4
Extinction time	s	144	144	175	154	18
Duration of the test	s	745	745	780	757	20
Flame-spread distance	mm	260	240	250	250	10
Critical heat flux at extinguishment CFE	$\text{kW}\cdot\text{m}^{-2}$	35,2	37,4	36,4	36,3	1,1
Flaming particles or droplets	YES/NO	NO	NO	NO	NO	

Table 1.2. Time of the movement of the flame front

Distance from exposed of the specimen	Calibration flux levels at the specimen	Time of arrival of the flame front		
		Specimen		
mm	$\text{kW}\cdot\text{m}^{-2}$	1	2	3
50	50,5	32	31	33
100	48,5	36	34	36
150	46,4	43	44	41
200	41,4	57	54	59
250	36,4	75	-	89
300	30,2	-	-	-
350	23,9	-	-	-
400	18,2	-	-	-
450	12,5	-	-	-

Remarks: none.

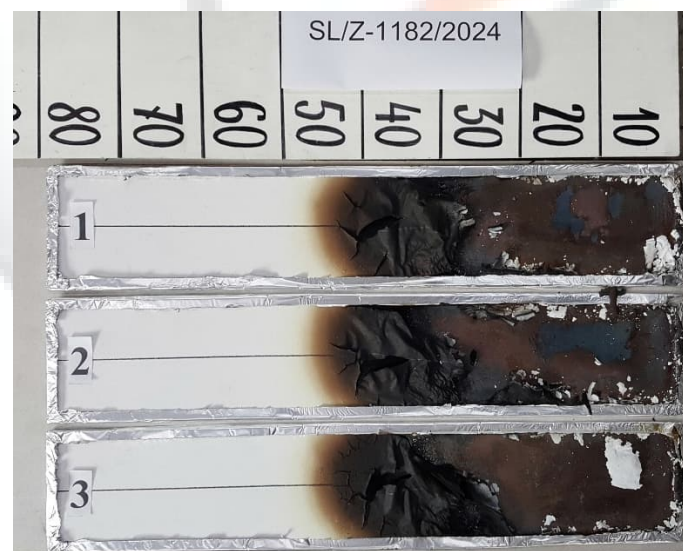


Figure 1. Appearance of the specimens after the test

2. Smoke generation according to EN-ISO 5659-2 + EN 45545-2

Test conditions - irradiance of $50 \text{ kW} \cdot \text{m}^{-2}$

Table 2. Final findings of smoke generation

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of specimen	g	1,4	1,4	1,4	1,4	0
Specimen thickness	mm	0,3	0,3	0,3	0,3	0
Ignition time - t_z	s	47	58	40	48	9
Extinction time	s	77	78	81	78,7	2,1
Duration of the test	s	600	600	600	600	0
Maximum of specific optical density - $D_{s,max}$	-	98	95	85	92	7
Time of arrival of the maximum of $D_{s,max}$	s	232	256	212	233	22
Specific optical density in the first 4 min of the test - $D_s(4)$	-	97	94	84	92	7
Cumulative specific optical densities in the first 4 min of the test - VOF_4	min	263	230	239	244	17

Remarks: none.

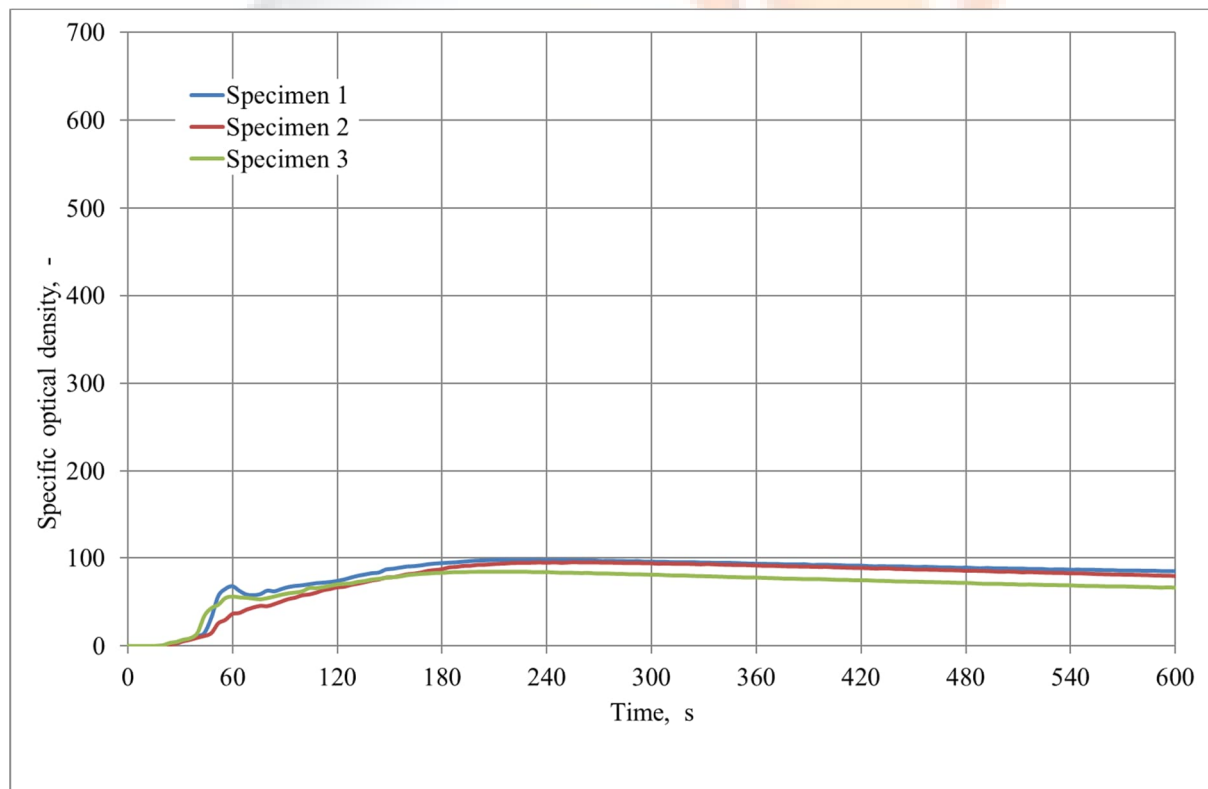


Figure 2. Specific optical density in the time

3. Results of toxic products emission of material decomposition and burning according to EN 17084, Method 1

Test conditions - irradiance of $50 \text{ kW} \cdot \text{m}^{-2}$

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	1023	876	1187	1029	155
CO	125	101	153	126	26
HCN	0	0	0	0	0
NO ₂	0	0	0	0	0
NO	0	0	0	0	0
HCL	0	0	0	0	0
SO ₂	14	21	12	15	5
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	1448	1362	1695	1501	173
CO	200	190	226	205	18
HCN	0	0	0	0	0
NO ₂	0	0	0	0	0
NO	0	0	0	0	0
HCL	0	0	0	0	0
SO ₂	20	23	11	18	6
HF	0	0	0	0	0
HBr	0	0	0	0	0

Table 3.3. Conventional index of toxicity

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Conventional index of toxicity CIT _G at 4 min	-	0,01	0,01	0,01	0,01	0,00
Conventional index of toxicity CIT _G at 8 min	-	0,02	0,02	0,02	0,02	0,00

Remarks: none.

4. Heat release rate of specimen according to ISO 5660-1

Test conditions - irradiance of $50 \text{ kW} \cdot \text{m}^{-2}$

Table 4. Heat release rate

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of the specimen	g	2,6	2,4	2,4	2,5	0,1
Specimen thickness	mm	0,3	0,3	0,3	0,3	0
Ignition time	s	26	34	30	30	4
Extinction time	s	90	101	90	94	6
Duration of the test	s	632	626	640	633	7
Maximum heat release rate	$\text{kW} \cdot \text{m}^{-2}$	98	95	95	96	1
Total heat release	$\text{MJ} \cdot \text{m}^{-2}$	4,3	3,6	3,8	3,9	0,4
Maximum average rate of heat emission MARHE	$\text{kW} \cdot \text{m}^{-2}$	39,2	32,4	35,9	35,8	3,4
Fire integrity acc. 5.2.2.2 EN 45545-2	YES/NO	YES	YES	YES	YES	-

Remarks: none.

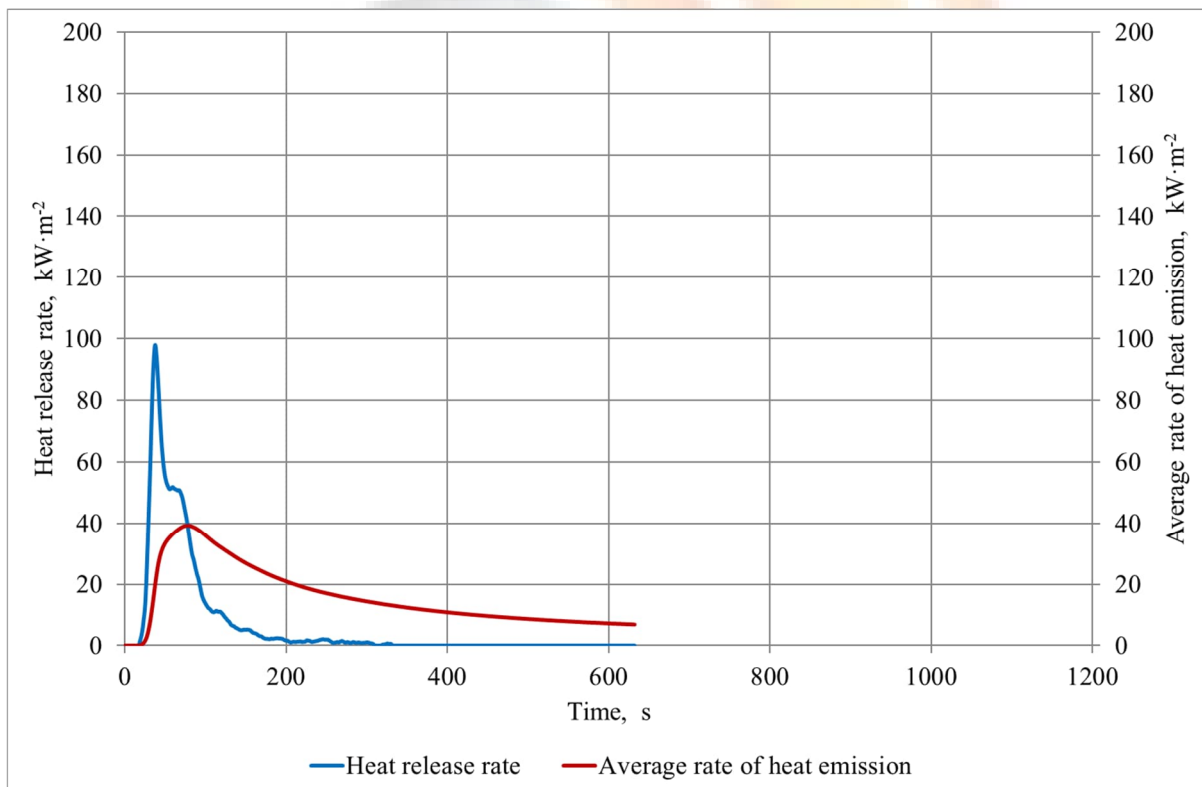


Figure 4.1. The relation of heat release rate and the time – specimen 1

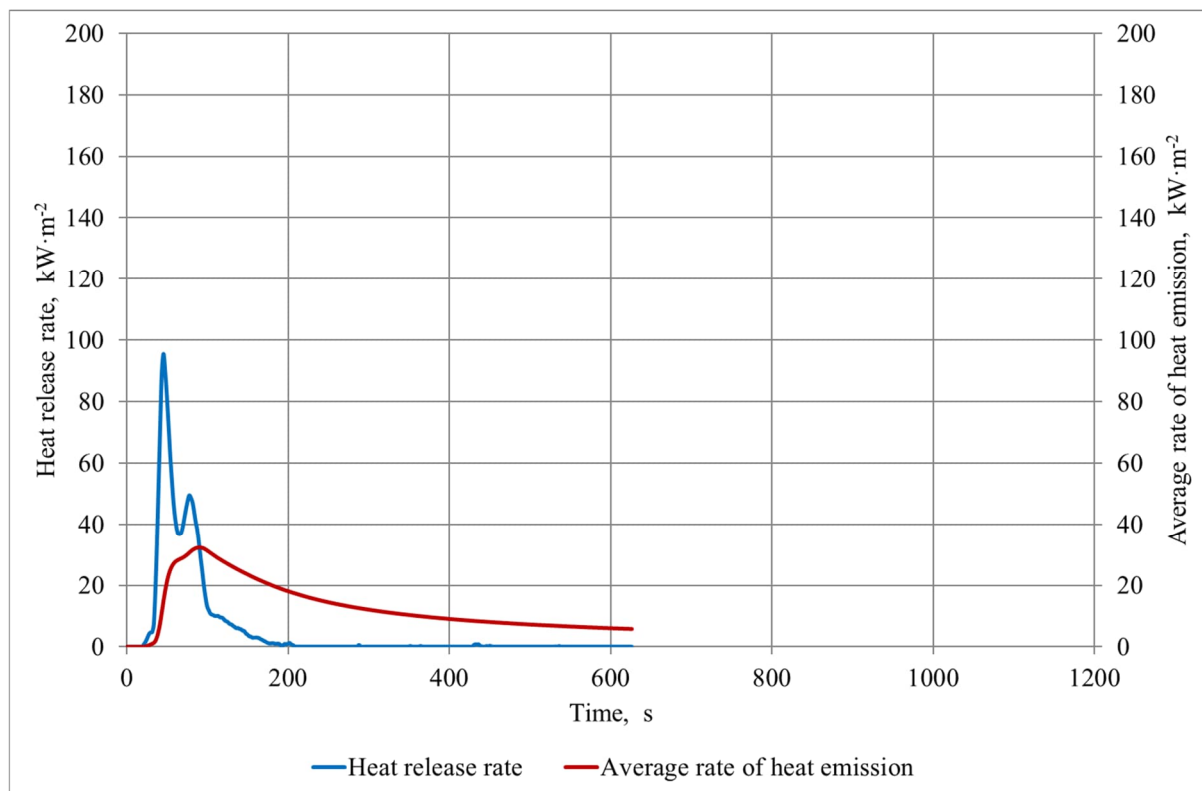


Figure 4.2. The relation of heat release rate and the time – specimen 2

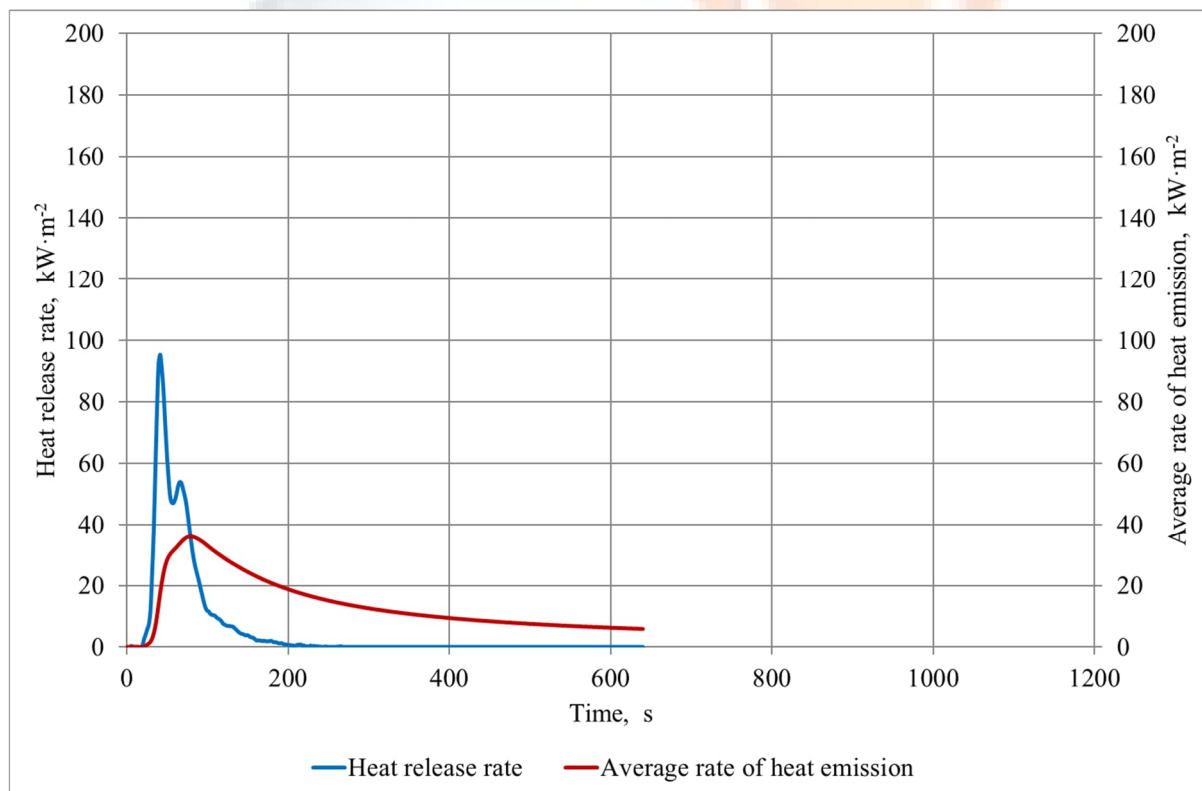


Figure 4.3. The relation of heat release rate and the time – specimen 3

5. Final findings

Requirement	Method/norm	Measured quantity	Unit	Measured value	Critical value			Crossing coefficient		
					HL1	HL2	HL3	HL1	HL2	HL3
R1	T02 ISO 5658-2	CFE	kW·m ⁻²	36,3	20	20	20	0,55	0,55	0,55
	T03.01 ISO 5660-1: 50 kW·m ⁻²	MARHE	kW·m ⁻²	35,8	-	90	60	-	0,40	0,60
	T10.01 EN ISO 5659-2: 50 kW·m ⁻²	D _s (4)	-	92	600	300	150	0,15	0,31	0,61
	T10.02 EN ISO 5659-2: 50 kW·m ⁻²	VOF ₄	min	244	1200	600	300	0,20	0,41	0,81
	T11.01 EN 17084 Method 1 50 kW·m ⁻²	CIT _G (4)	-	0,01	1,2	0,9	0,75	0,01	0,01	0,02
		CIT _G (8)	-	0,02	1,2	0,9	0,75	0,02	0,02	0,03

The tested product fulfils the requirement R1 according to EN 45545-2:2020+A1:2023 for hazard level HL1, HL2 and HL3.

Requirement	Method/norm	Measured quantity	Unit	Measured value	Critical value			Crossing coefficient		
					HL1	HL2	HL3	HL1	HL2	HL3
R7	T02 ISO 5658-2	CFE	kW·m ⁻²	36,3	20	20	20	0,55	0,55	0,55
	T03.01 ISO 5660-1: 50 kW·m ⁻²	MARHE	kW·m ⁻²	35,8	-	90	60	-	0,40	0,60
	T10.04 EN ISO 5659-2: 50 kW·m ⁻²	D _s max	-	92	-	600	300	-	0,15	0,31
	T11.01 EN 17084 Method 1 50 kW·m ⁻²	CIT _G (4)	-	0,01	-	1,8	1,5	-	0,01	0,01
		CIT _G (8)	-	0,02	-	1,8	1,5	-	0,01	0,01

The tested product fulfils the requirement R7 according to EN 45545-2:2020+A1:2023 for hazard level HL1, HL2 and HL3.

Requirement	Method/norm	Measured quantity	Unit	Measured value	Critical value			Crossing coefficient		
					HL1	HL2	HL3	HL1	HL2	HL3
R17	T02 ISO 5658-2	CFE	kW·m ⁻²	36,3	13	13	13	0,36	0,36	0,36
	T03.01 ISO 5660-1: 50 kW·m ⁻²	MARHE	kW·m ⁻²	35,8	-	90	60	-	0,40	0,60
	T10.04 EN ISO 5659-2: 50 kW·m ⁻²	D _s max	-	92,4	-	600	300	-	0,15	0,31
	T11.01 EN 17084 Method 1 50 kW·m ⁻²	CIT _G (4)	-	0,01	-	1,8	1,5	-	0,01	0,01
		CIT _G (8)	-	0,02	-	1,8	1,5	-	0,01	0,01

The tested product fulfils the requirement R17 according to EN 45545-2:2020+A1:2023 for hazard level HL1, HL2 and HL3.

6. Remaining required information

Date of receipt of samples: 30.12.2024

Sampling: sponsor took and delivered samples.

Description of the test material: white self-adhesive wallpaper with a rough decorative surface (thickness approx. 0,35 mm) on a paper backing (thickness 0,14-0,16 mm), with a total thickness of 0,49-0,51 mm and a weight per unit area of 240-260 g/m² (without backing paper). Sponsor delivered 1 roll of 1220 mm width. Laboratory prepared the samples for the tests.

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

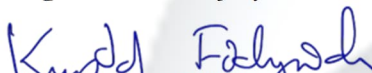
Declarations:

1. The test results relate 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.
2. The information provided on the first page of the report concerning the scope of research and identification of the tested object/objects were provided by the Sponsor.

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dr inż. Krzysztof Sychta

Date and place of test - 08.01.2025, Police

