

TEST REPORT

Order no: 29.03.2021

Signature: SL/Z-201/EN45545-R19/222a/2021

Police, 31.03.2021

Tests methods:

1. ISO 5660-1:2015. Reaction to fire tests – Heat release, smoke production and mass loss rate – Part 1: Heat release rate (cone calorimeter method).
2. EN 45545-2:2020. 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 - requirement R19.

Sponsor: MK Seats Sp. z o.o.
Dolnik nr 33
77-430 Dolnik, Poland

Material: Upholstery set I of driver's seats MKS Rail I series

Composition/specification: - fabric – 69737 (85% wool / 15% polyamide) – Lantal Textiles AG
- fire barrier - IBIFLAME F110- 130
- polyurethane foam - Isringhausen

Manufacturer/supplier: MK Seats Sp. z o.o.
Dolnik nr 33
77-430 Dolnik, Poland

Assessment: The tested product fulfils the requirement of R19 according to EN 45545-2:2020 for hazard level HL1, HL2 and HL3.

The reprint and the copying: only with the agreement of MK Seats Sp. z o.o.

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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: four pages with signature and numbers.

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

Test conditions - irradiance of $25 \text{ kW}\cdot\text{m}^{-2}$

Note: Thickness of the samples was reduced to 50 mm.

Table 1. Heat release rate

Name of measured quantity	Unit	Specimen			Average	Standard deviation
		1	2	3		
Mass of the specimen	g	36,8	40,7	35,2	37,6	2,8
Specimen thickness	mm	50,0	50,0	50,0	50,0	0,0
Ignition time	s	34	36	36	35	1
Extinction time	s	494	256	418	389	122
Duration of the test	s	1200	1200	1200	1200	0
Maximum heat release rate	$\text{kW}\cdot\text{m}^{-2}$	105,8	122,7	94,8	107,8	14,0
Total heat release	$\text{MJ}\cdot\text{m}^{-2}$	17,5	15,1	26,2	19,6	5,8
Maximum average rate of heat emission MARHE	$\text{kW}\cdot\text{m}^{-2}$	43,3	46,3	42,4	44,0	2,1
Fire integrity acc. 5.2.2.2 EN 45545-2	YES/NO	YES	YES	YES	YES	-

Remarks: none.

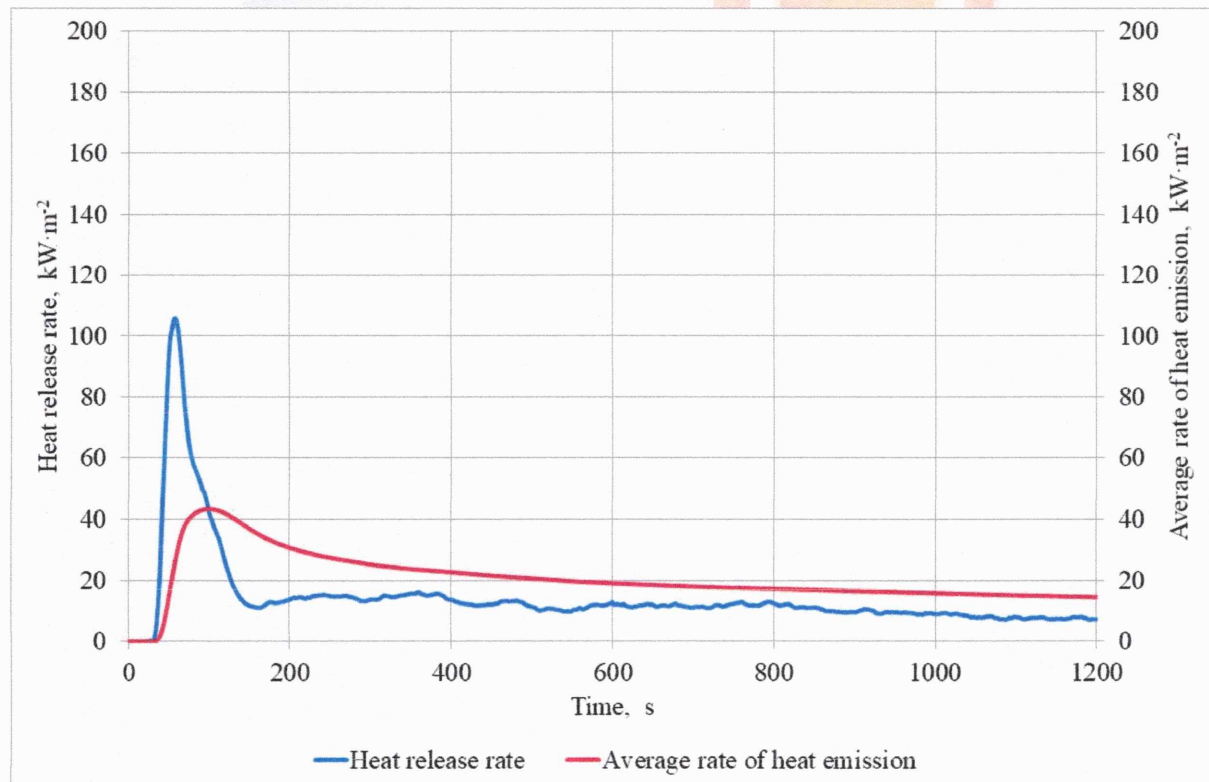


Figure 1. The relation of heat release rate and the time – specimen 1

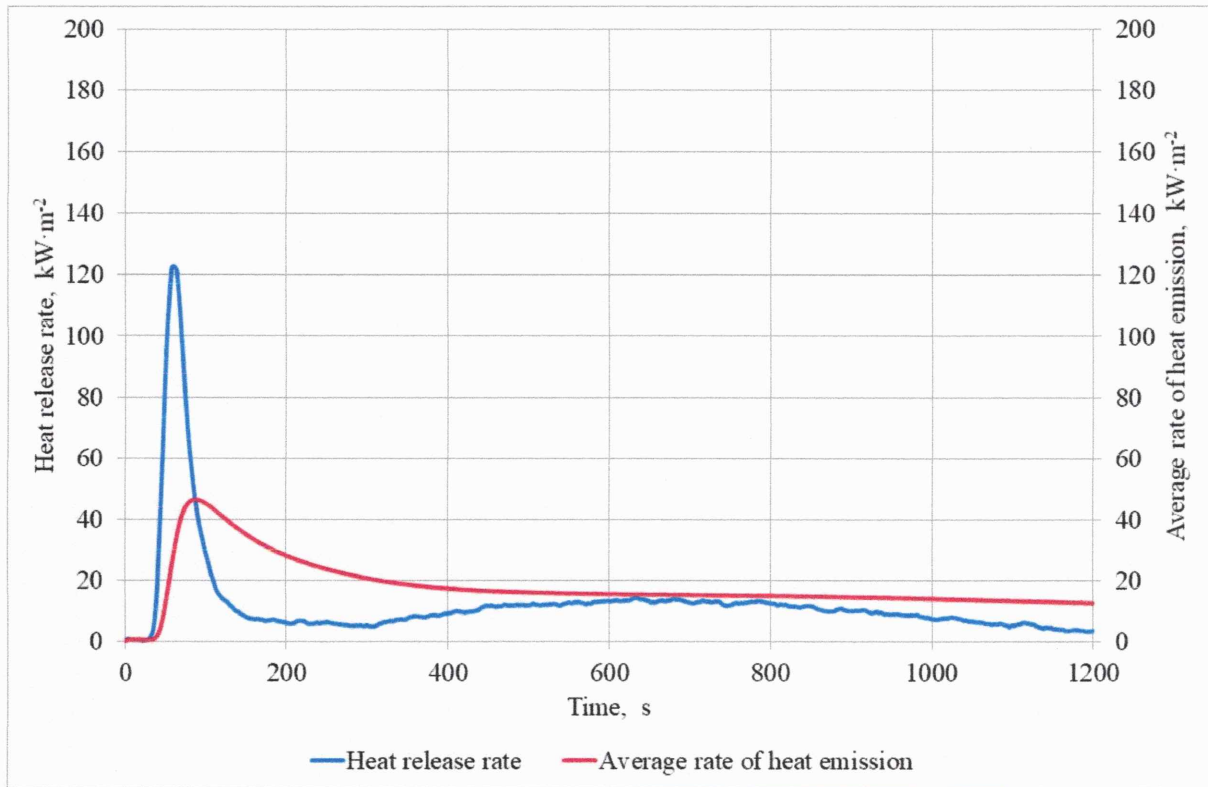


Figure 2. The relation of heat release rate and the time – specimen 2

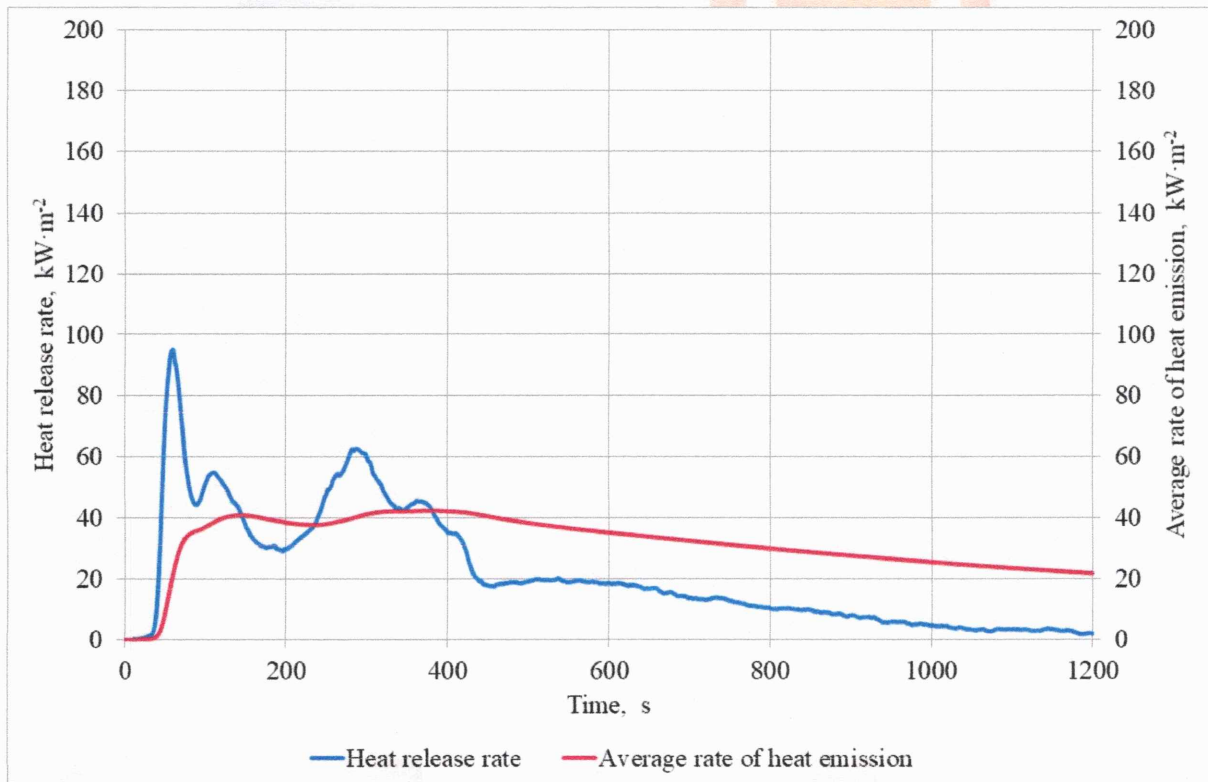


Figure 3. The relation of heat release rate and the time – specimen 3

2. Final findings

Requirement	Method/norm	Measured quantity	Unit	Measured value	Critical value			Crossing coefficient		
					HL1	HL2	HL3	HL1	HL2	HL3
R19	T03.02 EN ISO 5660-1: 25 kW·m ²	MARHE	kW·m ²	44,0	75	50	50	0,59	0,88	0,88

The tested product fulfils the requirement of R19 according to EN 45545-2:2020 for hazard level HL1, HL2 and HL3.

3. Remaining required information

Date of receipt of samples: 29.03.2021

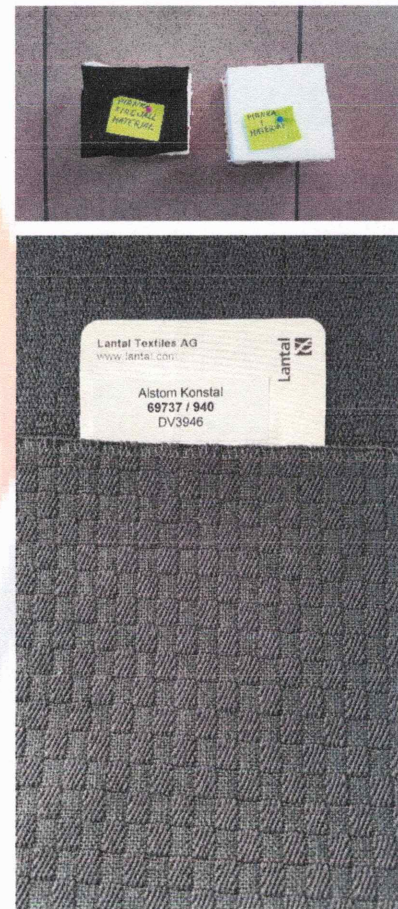
Sampling: sponsor took and delivered samples.

Description of the test material: Upholstery set, consisted of: gray upholstery fabric 1,4 mm thick with weight per unit area 635 g/m² + black fire barrier fabric 2,0 mm thick with weight per unit area 130 g/m² + white polyurethane foam 50-75 mm thick and density of approx. 74 kg/m³. 2 samples of upholstery fabric dimensions of 295-300x420-425 mm, 6 samples of fire barrier fabric dimensions of 90-100x100 mm and 6 samples of polyurethane foam dimensions of 88-105x100-115x 50-75 mm were delivered by the sponsor. Laboratory prepared 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 was provided by the Sponsor.


Operators:

[Signature]
mgr inż. Andrzej Sychta

SYCHTA LABORATORIUM Sp. J.
72-010 Police, ul. Ofiar Stutthofu 90
tel./fax +48 91 4210 214, tel. 502078855
e-mail: biuro@sychta.eu www:sychta.eu
KRS 0000387681 REGON 321023120
NIP 8513152392

Signature:

[Signature]
KIEROWNIK TECHNICZNY
dr inż. Krzysztof Sychta

Date and place of test - 31.03.2021, Police