Classification report No.: 15127 / 55671 Date: 21.07.2023

BASF SE
Brandschutztechnik
E-CPB/EG - A521
D-67056 Ludwigshafen

Classification according to

EN 45545 Part 2 : 2020-10

Railway applications - Fire protection of railway vehicles - Part 2: Requirements for fire behaviour of materials and components

Client:

Semperit Technische Produkte GmbH

Triester Bundesstr. 26

2632 Wimpassing
Österreich

The results refer exclusively to the tested samples.

As an accredited Test Laboratory, the BASF SE Fire Safety Technology Test Centre is authorized to conduct fire tests in accordance with DIN EN ISO/IEC 17025 : 2018.
DAkkS-Register-No.: D-PL-14121-07-00

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-14121-07-00

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Report according to DIN EN ISO/IEC 17025 : 2018

Classification report according to EN 45545 Part 2 : 2020-10
Railway applications - Fire protection of railway vehicles - Part 2: Requirements for fire behaviour of materials and components

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Receipt of order: 17.04.2023

1. Material: (information supplied by client)

E2441 Rubber (EPDM) black

Colour:

End use application: Sealing profiles and flat gaskets

2. Summary of results and classification:

Standard: DIN EN 45545-2:2020-10		Set of requirements: R22/R23			
15127 / 55668 thickness: 4mm	**EN ISO 4589-2**	**LOI**	**≥28,0**	**[% O2]**	**HL2**
15127 / 55669 thickness: 2mm	**EN ISO 5659-2 25 kW/m² (pilot flame)**	**Ds (max)**	**285**		**HL2***
15127 / 55670 thickness: 20mm	**EN ISO 5659-2 25 kW/m² (pilot flame)**	**Ds (max)**	**221**		**HL2***
15127 / 55669 thickness: 2mm	**EN 17084 method 1 25 kW/m² (pilot flame)**	**CIT (G)**	**0,1**		**HL3**
15127 / 55670 thickness: 20mm	**EN 17084 method 1 25 kW/m² (pilot flame)**	**CIT (G)**	**0,1**		**HL3**
Final classification:		**HL2**			

Remarks:

Valid for thickness range from 2 mm to 20 mm. * Requirements R23: HL3.

Any conclusions we draw about the fire safety of the materials we test are based exclusively on the results of the test under the conditions described. The extent to which such conclusions can be applied to non-tested material under non-standard conditions is the sole responsibility of the customer and is done so at his own risk. - Decision rule acc. to DIN EN ISO/IEC 17025: Wherever statements of conformity are made, no measurement uncertainty is taken into account.

BASF-Fire Safety Technology

Dr. Houssin
Head of Laboratory

Ludwigshafen, 21.07.2023

Hammann
Technician

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3. Material:

Information supplied by client

E2441 Rubber (EPDM) black

Additional details from test laboratory

Colour:	black
End use application:	Sealing profiles and flat gaskets
Exposed surface:	Identical surfaces

4. Remarks:

Specimen tested as received (no sampling by test laboratory).

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5. Requirements acc. to DIN EN 45545-2:2020-10

Method	Standard / irradiance level	Param.	Unit	Max. or Min	HL1	HL2	HL3
Requirement set: **R1**							
T02	ISO 5658-2	CFE	kW/m²	Min	20 a)	20 a)	20 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	---	90	60
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	600	300	150
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	1200	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R2**							
T02	ISO 5658-2	CFE	kW/m²	Min	13 a)	13 a)	13 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	---	---	90
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	600	300	150
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	1200	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R3**							
T02	ISO 5658-2	CFE	kW/m²	Min	13 a)	13 a)	13 a)
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	---	480	240
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	---	960	480
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R4**							
T02	ISO 5658-2	CFE	kW/m²	Min	13	13	13
T05	EN 11925-2 30s flame application	Flame spread	mm	Max	150 (in 60 s)	150 (in 60 s)	150 (in 60 s)
T05	EN 11925-2 30s flame application	Flaming droplets			0	0	0
T11.01	EN 17084 Method 1,50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R5**							
T05	EN ISO 11925-2 30s flame application	Flame spread	mm	Max	150 (in 60 s)	150 (in 60 s)	150 (in 60 s)
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	50	50	50
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	300	250	200
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Unit	Max. or Min	HL1	HL2	HL3
Requirement set: **R6**							
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	90	90	60
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	600	300	150
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	1200	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R7**							
T02	ISO 5658-2	CFE	kW/m²	Min	20 a)	20 a)	20 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	---	90	60
T10.04	EN ISO 5659-2, 50 kW/m²	Ds max		Max	---	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R8**							
T04	EN ISO 9239-1	CHF	kW/m²	Min	4,5	6	8
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	---	50	50
T10.03	EN ISO 5659-2, 25 kW/m²	$D_s(max)$		Max	---	600	300
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R9**							
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	90	90	60
T10.03	EN ISO 5659-2, 25 kW/m²	$D_s(max)$		Max	---	600	300
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R10**							
T04	EN ISO 9239-1	CHF	kW/m²		4,5	6	8
T10.03	EN ISO 5659-2, 25 kW/m²	$D_s(max)$		Max	600	300	150
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R11**							
T02	ISO 5658-2	CFE	kW/m²	Min	30 a)	30 a)	30 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	90	90	60
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	600	300	150
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	1200	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Unit	Max. or Min	HL1	HL2	HL3
Requirement set: **R12**							
T02	ISO 5658-2	CFE	kW/m²	Min	40 a)	40 a)	40 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	60	60	60
T10.01	EN ISO 5659-2, 50 kW/m²	$D_s(4)$		Max	600	300	150
T10.02	EN ISO 5659-2, 50 kW/m²	VOF4		Max	1200	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R13**							
T14	EN 13501	Eurokl.		Min	A1	A1	A1
Requirement set: **R14 – R16 and R18: Not performed by BASF ➔ no requirements listed**							
Requirement set: **R17**							
T02	ISO 5658-2	CFE	kW/m²	Min	13 a)	13 a)	13 a)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	---	90	60
T10.04	EN ISO 5659-2, 50 kW/m²	D_s(max)		Max	---	600	300
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R19**							
T03.02	ISO 5660-1, 25kW/m²	MARHE	kW/m²	Max	75	50	50
Requirement set: **R20**							
T07	EN ISO 12952-2	Afterflame time	s	Max	10	10	10
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	50	50	50
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	200	200	200
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	0,75	0,75	0,75
Requirement set: **R21**							
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	75	50	50
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	300	300	200
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75
Requirement set: **R22**							
T01	EN ISO 4589-2	OI	$\%_{Oxygen}$	Min	28	28	32
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	600	300	150
T11.02 or T12	EN 17084 Method 1, 25 kW/m² or EN 17084 Method 2, 600°C	CIT_G or CIT_{NLP}		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Unit	Max. or Min	HL1	HL2	HL3
Requirement set: **R23**							
T01	EN ISO 4589-2	OI	$\%_{Oxygen}$	Min	28	28	32
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	---	600	300
T11.02 or T12	EN 17084 Method 1, 25 kW/m² or EN 17084 Method 2, 600°C	CIT_G or CIT_{NLP}		Max	---	1,8	1,5
Requirement set: **R24**							
T01	EN ISO 4589-2	OI	$\%_{Oxygen}$	Min	28	28	32
Requirement set: **R25**							
T16	EN 60695-2-11	Glow wire	°C	Min	850	850	850
Requirement set: **R26**							
T17	EN 60695-11-10	Vert. Small flame test		Min	V0	V0	V0
Requirement set: **R27**							
T02	ISO 5658-2	CFE	kW/m²	Min	13	13	13
T05	EN 11925-2 30s flame application	Flame spread	mm	Max	150 (in 60 s)	150 (in 60 s)	150 (in 60 s)
T05	EN 11925-2 30s flame application	Flaming droplets			0	0	0
T11.01	EN 17084 Method 1, 50 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R28**							
T04	EN ISO 9239-1	CHF	kW/m²	Min	3	4,5	6
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	600	300	150
T11.02	EN 17084 Method 1, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75

a) If flaming droplets/particles are reported according to 5.3.8 during the test ISO 5658-2, or for the special case of materials which do not ignite in ISO 5658-2 and are additionally reported as unclassifiable, the following requirements shall be added:

Test to the requirements of T05 (EN ISO 11925-2 with 30 s flame application).

The acceptance requirements are:
- Flame spread < 150 mm within 60 s;
- no burning droplets / particles.

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