Classification report No.: 12951 / 46811 Date: 24.08.2017

BASF SE
Brandschutztechnik
G-PMF/OP - A521
D-67056 Ludwigshafen

Classification according to

DIN EN 45545 Part 2 : 2016-02

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

Client:

Semperit Techn. Produkte GesmbH

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 : 2005.
DAkkS-Register-No.: D-PL-14121-07-00

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

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

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Receipt of order: 11.07.2017

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 45545-2:2016-02		Set of requirements: R22/R23			
12951 / 46311 thickness: 2mm	EN ISO 5659-2 25 kW/m² (pilot flame)	Ds (max)	166		HL2*
12951 / 46548 thickness: 10mm	EN ISO 5659-2 25 kW/m² (pilot flame)	Ds (max)	249		HL2*
12951 / 46310 thickness: 2mm	EN ISO 4589-2	LOI	30,1	[% O2]	HL2
12951 / 46545 thickness: 6mm	EN ISO 4589-2	LOI	>32	[% O2]	HL3
12951 / 46547 thickness: 10mm	EN ISO 4589-2	LOI	>35	[% O2]	HL3
12951 / 46312	NF X 70-100-1/-2	CIT (NLP)	0,31		HL2
Final classification:		**HL2**			

Remarks:

Valid for thickness range from 2 to 10 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.

BASF-Fire Safety Technology

Dr. Henn
Head of Laboratory

Ludwigshafen, 24.08.2017

Engelhardt
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:

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5. Requirements acc. to DIN EN 45545-2:2016-02

Method	Standard / irradiance level	Param.	Einheit	Anford.	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 ISO 5659-2, 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	--- a)	--- a)	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 ISO 5659-2, 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)
T03.01	ISO 5660-1, 50 kW/m²	MARHE	kW/m²	Max	--- a)	--- a)	--- 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 ISO 5659-2, 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
T11.02	EN ISO 5659-2, 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 ISO 5659-2, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Einheit	Anford.	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 ISO 5659-2, 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	--- a)	90	60
T10.04	EN ISO 5659-2, 50 kW/m²	Ds max		Max	---	600	300
T11.01	EN ISO 5659-2, 50 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R8**							
T04	EN ISO 9239-1	CFE	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 ISO 5659-2, 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 ISO 5659-2, 25 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R10**							
T04	EN ISO 9239-1	CFE	kW/m²		4,5	6	8
T03.02	ISO 5660-1, 25 kW/m²	MARHE	kW/m²	Max	---	---	---
T10.03	EN ISO 5659-2, 25 kW/m²	$D_s(max)$		Max	600	300	150
T11.02	EN ISO 5659-2, 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 ISO 5659-2, 50 kW/m²	CIT_G		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Einheit	Anford.	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 ISO 5659-2, 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: 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	--- a)	90	60
T10.04	EN ISO 5659-2, 50 kW/m²	D_s(max)		Max	---	600	300
T11.01	EN ISO 5659-2, 50 kW/m²	CIT_G		Max	---	1,8	1,5
Requirement set: **R18** b)							
T06	ISO 9705	MARHE	kW	Max	75	50	20
T06	ISO 9705	RHR Peak	kW	Max	350	350	350
Requirement set: **R19**							
T03.02	ISO 5660-1, 25kW/m²	MARHE	kW/m²	Max	75	50	50
Requirement set: **R20**							
T07	EN ISO 12952-3/-4	Afterflame time	Sek	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 ISO 5659-2, 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 ISO 5659-2, 25 kW/m²	CIT_G		Max	1,2	0,9	0,75

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Method	Standard / irradiance level	Param.	Einheit	Anford.	HL1	HL2	HL3
Requirement set: **R22**							
T01	EN ISO 4589-2	LOI	%Oxygen	Min	28	28	32
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	600	300	150
T12	NF X 70-100-1/-2 (600°C)	CIT_{NLP}		Max	1,2	0,9	0,75
Requirement set: **R23**							
T01	EN ISO 4589-2	LOI	%Oxygen	Min	28	28	32
T10.03	EN ISO 5659-2, 25 kW/m²	D_s(max)		Max	---	600	300
T12	NF X 70-100-1/-2 (600°C)	CIT_{NLP}		Max	---	1,8	1,5
Requirement set: **R24**							
T01	EN ISO 4589-2	LOI	%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

a) If flaming droplets/particles are reported according to 5.3.7 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 EN ISO 11925-2 with 30 s flame application.

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

b) - during the test, the flame spread shall not reach the edges of the seat surface or the backrest;

- during the test, the flame hiéight above the highest point of the seat surface shall not exceed 1000 mm;

- if the peak heat release values are too high for test equipment safety, then the product is not compliant.