

Test Report No.: 14083 / 52045

Date: 29.10.2020

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

### Test according to

**NF X 70-100 Partie 1+2 : 2006-04**

**Fire tests - Analysis of gaseous effluents - Part 1 : methods for analysing gases stemming from thermal degradation Calculation of CIT-NLP according to DIN EN 45545:2016**

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 : 2005.

DAkKS-Register-No.: D-PL-14121-07-00



Deutsche  
Akkreditierungsstelle  
D-PL-14121-07-00

# BASF – Fire Safety Technology

Test according to NF X 70-100 Partie 1+2 : 2006-04  
Fire tests - Analysis of gaseous effluents - Part 1 : methods for analysing gases stemming from  
thermal degradation  
Calculation of CIT-NLP according to DIN EN 45545:2016

Test report No.: 14083 / 52045

Receipt of order: 02.04.2020

Receipt of samples: 31.07.2020

Date of test: 09.10.2020

## 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:**


Conventional Index of Toxicity	CIT <sub>NLP</sub>	0,29
Classification with respect to Smoke Gas Toxicity determination for "Non Listed Products" according to DIN EN 45545-2:2016-02, set of requirements	R22 / R23	HL3

### Remarks:

For a final classification, additional tests are required.

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 17025:2018: Wherever statements of conformity are made, no measurement uncertainty is taken into account

BASF Fire Safety Technology

  
Dr. Henn  
Head of Laboratory

Ludwigshafen, 29.10.2020

  
Kaiser  
Technician

# BASF – Fire Safety Technology

Test according to NF X 70-100 Partie 1+2 : 2006-04  
Fire tests - Analysis of gaseous effluents - Part 1 : methods for analysing gases stemming from  
thermal degradation  
Calculation of CIT-NLP according to DIN EN 45545:2016

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### 3. Material:

#### Information supplied by client

E2441 Rubber (EPDM) black

#### Additional description by laboratory

### 4. Samples:

#### Dimensions (determined by BASF test laboratory):

Length:	21,55 [mm]	Weight:	1,00 [g]
Width:	19,10 [mm]	Weight per unit area:	2,42 [kg/m <sup>2</sup> ]
Thickness:	2,15 [mm]	Density:	1130,00 [kg/m <sup>3</sup> ]
Outer diameter:	[mm]	Remarks:	
Inner diameter:	[mm]		

#### Pre-conditioning:

	Conditions	Duration days
Client: (information supplied by client)	Standard 23/50 ISO 554	
Laboratory:	Standard 23/50 ISO 554	40

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

#### Remarks:

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## 5. Test results:

**Test of smoke gas toxicity at a temperature of 600 °C**

$$CIT_{NLP} = \frac{450 \text{ g}}{150 \text{ m}^3 \times N} \times \sum_{i=1}^{i=8} \frac{c_i \text{ mg g}^{-1}}{C_i \text{ mg m}^{-3}}$$

With  $N^* = 3$ :  $CIT_{NLP} = \sum_{i=1}^{i=8} \frac{c_i}{C_i}$  (\*correction factor)

	Concentration, $c_i$				Reference value, $C_i$ [mg/m <sup>3</sup> ]	$c_i / C_i$
	[mg/g]					
Sample No.	1	2	3	Avg.		
Init. weight [g]	1,00	1,00	1,00	1,00		
CO <sub>2</sub>	1421	1439	1347	1402	72000	0,02
CO	279	273	277	276	1380	0,20
HF *)	nd	nd	nd	nd	25	nd
HCl *)	nd	nd	nd	nd	75	nd
HBr *)	nd	nd	nd	nd	99	nd
HCN *)	2,60	2,60	2,08	2,42	55	0,04
NO <sub>x</sub> *)	nd	nd	nd	nd	38	nd
SO <sub>2</sub> *)	7,00	6,23	8,04	7,09	262	0,03
*) Wet analysis carried out by BASF Central Analytics, DAKKS accreditation No. D-PL-14121-02-00. nd = not detected					<b>CIT<sub>NLP</sub>: 0,29</b>	

## BASF – Fire Safety Technology

Test according to NF X 70-100 Partie 1+2 : 2006-04  
Fire tests - Analysis of gaseous effluents - Part 1 : methods for analysing gases stemming from  
thermal degradation  
Calculation of CIT-NLP according to DIN EN 45545:2016

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### Observations:

### 6. Test equipment:

Test apparatus	PV 0006
Data acquisition	MC 0005
Analyzer	MA 0009
Balance	MW 0009

### 7. Requirements:

#### DIN EN 45545-2:2016-02 (equivalent to EN 45545-2:2013 + A1:2015)

Method	Standard	Parameter	HL1	HL2	HL3
Set of requirements: <b>R22</b>					
T12	NF X 70-100-1 & 2	CIT <sub>NLP</sub> (Max.)	1,2	0,9	0,75
Set of requirements: <b>R23</b>					
T12	NF X 70-100-1 & 2	CIT <sub>NLP</sub> (Max.)	---	1,8	1,5

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Date: 06.10.2020

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

**Test according to**

**ISO 5659 Part 2 : 2017-05**

**Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test**

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 : 2005.

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



# BASF – Fire Safety Technology

Test according to ISO 5659 Part 2 : 2017-05  
Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test

Test Report No.: 14083 / 52080

Receipt of order: 02.04.2020  
Receipt of samples: 18.09.2020  
Date of test: 05.10.2020

1. **Material:** (information supplied by client)

E2441 Rubber (EPDM) black, thickness: 2mm

Colour:

End use application: Sealing profiles and flat gaskets

2. **Summary of results and classification:**

Mean value of specific optical density at 4 min	D <sub>s</sub> (4)	29
Cumulative value of spec. optical dens. in the first 4 min.	VOF4	40
Mean value of maximum specific optical density	D <sub>s</sub> (max)	245
Classification according to DIN EN 45545-2:2016-02, set of requirements R22, with respect to test method ISO 5659-2, at 25 kW/m <sup>2</sup> , with pilot flame		HL2
Classification according to DIN EN 45545-2:2016-02, set of requirements R23, with respect to test method ISO 5659-2, at 25 kW/m <sup>2</sup> , with pilot flame		HL3

Remarks: For a final classification, additional tests are required.

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. Henn  
Head of Laboratory

Ludwigshafen, 05.10.2020

  
Engelhardt  
Technician

Test Report No.: 14083 / 52080

### 3. Material:

Information supplied by client

E2441 Rubber (EPDM) black, thickness: 2mm

Additional details from testing laboratory

### 4. Samples:

Sample size (determined by BASF test laboratory):

Length:	73,45 [mm]	Weight:	13,67 [g]
Width:	73,90 [mm]	Weight per unit area:	2,51 [kg/m <sup>2</sup> ]
Thickness:	2,30 [mm]	Density:	1094,97 [kg/m <sup>3</sup> ]
Outer diameter:	[mm]	Remarks:	
Inner diameter:	[mm]		

Pre-conditioning:

	Conditions	Duration days
Client: (information supplied by client)	Standard 23/50 ISO 554	
Test Laboratory:	Standard 23/50 ISO 554	17

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

Exposed surface : identical surfaces

### 5. Test equipment:

Test apparatus	PE 0020
Sliding gauge	MB 0038
Balance	MW 0009



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## 6. Test results:

Irradiance	[kW/m <sup>2</sup> ]	25		
Flame mode		with flame		
Test duration	[min]	10		
Sample		1	2	3
Wire grid used	yes/no	no	no	no
Thickness	[mm]	2,3	2,3	2,3
C <sub>f</sub>				
Clear beam correction factor	D <sub>c</sub>	6,13	19,57	21,24
Specific optical density at 4 min	D <sub>s4</sub>	27	36	24
Mean value of specific optical density at 4 min	D <sub>s4</sub>	29,1		
Specific optical density at 10 min	D <sub>s10</sub>	155	293	283
Mean value of specific optical density at 10 min	D <sub>s10</sub>	243,6		
Specific optical density (maximum)	D <sub>s(max)</sub>	156	295	283
Mean value of specific optical density (maximum)	D <sub>s(max)</sub>	244,6		
Obscuration value in 4 min	VOF4	37	54	29
Mean obscuration value in 4 min	VOF4	40		
Ignition	[s]	102	339	245
Extinguishment	[s]	>600	>600	>600

### Observations:

Material tested with wire grid

# BASF – Fire Safety Technology

Test according to ISO 5659 Part 2 : 2017-05  
 Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test

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## 7. Requirements:

**DIN EN 45545-2:2016-02 (equivalent to EN 45545-2:2013 + A1:2015)**

Set of requiremt.	Reference	kW/m <sup>2</sup>	Parameter	HL1	HL2	HL3
<b>R1, R2, R6, R11, R12</b>	T10.01	50 w/o fl.	D <sub>s</sub> (4)	600	300	150
	T10.02		VOF4	1200	600	300
	T11.01		CIT <sub>G</sub> *	1,2	0,9	0,75
<b>R3</b>	T10.01	50 w/o fl.	D <sub>s</sub> (4)	---	480	240
	T10.02		VOF4	---	960	480
	T11.01		CIT <sub>G</sub> *	1,2	0,9	0,75
<b>R5</b>	T10.03	25 w. fl.	D <sub>s</sub> (max)	300	250	200
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
<b>R7</b>	T10.04	50 w/o fl.	D <sub>s</sub> (max)	---	600	300
	T11.01		CIT <sub>G</sub> *	---	1,8	1,5
<b>R8, R9</b>	T10.03	25 w. fl.	D <sub>s</sub> (max)	---	600	300
	T11.02		CIT <sub>G</sub> *	---	1,8	1,5
<b>R10</b>	T10.03	25 w. fl.	D <sub>s</sub> (max)	600	300	150
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
<b>R17</b>	T10.04	50 w/o fl.	D <sub>s</sub> (max)	---	600	300
	T11.01		CIT <sub>G</sub> *	---	1,8	1,5
<b>R20</b>	T10.03	25 w. fl.	D <sub>s</sub> (max)	200	200	200
	T11.02		CIT <sub>G</sub> *	0,75	0,75	0,75
<b>R21</b>	T10.03	25 w. fl.	D <sub>s</sub> (max)	300	300	200
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
<b>R22</b>	T10.03	25 w. fl. 600°C	D <sub>s</sub> (max)	600	300	150
	T12 **		CIT <sub>(NLP)</sub>	1,2	0,9	0,75
<b>R23</b>	T10.03	25 w. fl. 600°C	D <sub>s</sub> (max)	---	600	300
	T12 **		CIT <sub>(NLP)</sub>	---	1,8	1,5

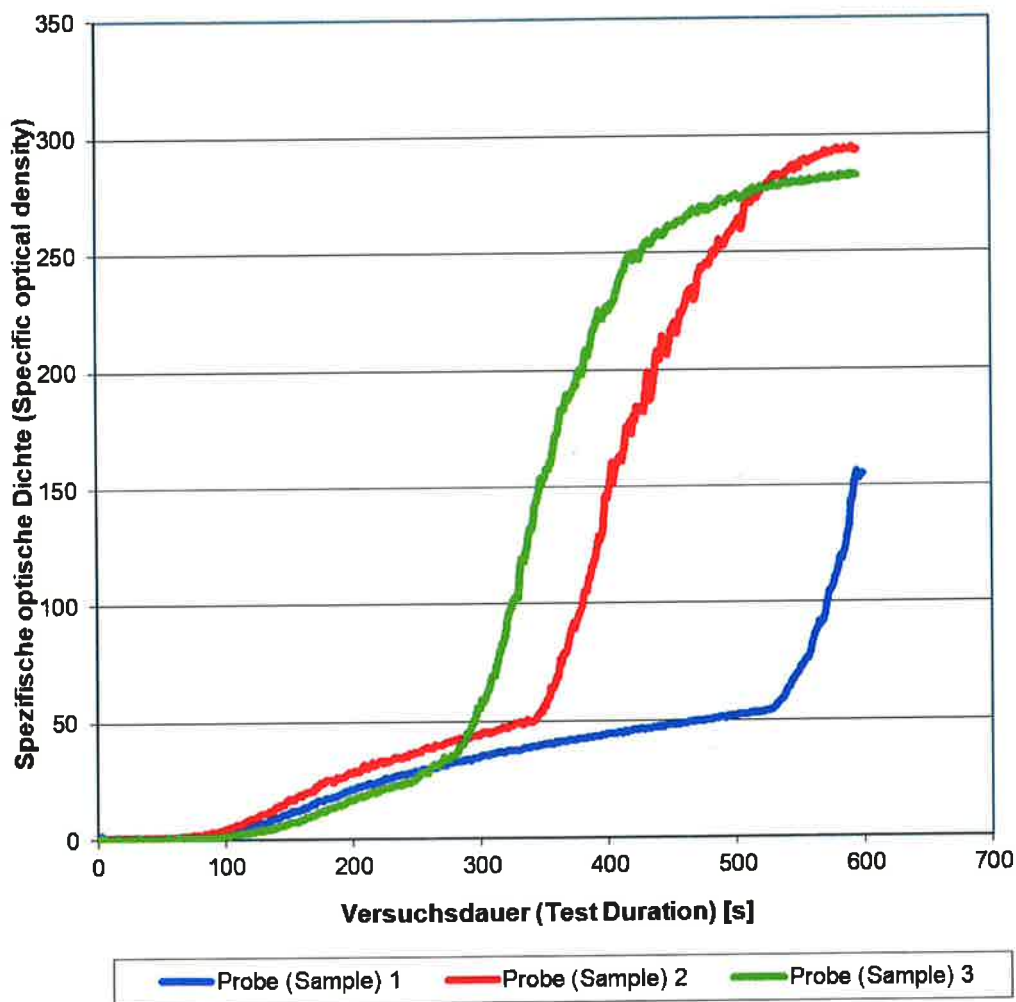
\* after 4 or 8 minutes, whichever is higher

\*\* NF X 70-100-1 &-2

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## 8. Charts:

### Spezifische optische Dichte (Specific optical density)



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Date: 08.09.2020

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

Test according to

**ISO 4589 Part 2 : 2017-04**

**Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test**

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 : 2005.

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



Deutsche  
Akkreditierungsstelle  
D-PL-14121-07-00

# BASF – Fire Safety Technology

## Test according to ISO 4589 Part 2 : 2017-04 Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test

Test report No.: 14083 / 52041

Receipt of order: 02.04.2020

Receipt of samples: 31.07.2020

Date of test: 08.09.2020

### 1. **Material:** (information supplied by client)

E2441 Rubber (EPDM) black, thickness: 2mm

Colour:

End use application: Sealing profiles and flat gaskets

### 2. **Summary of results and classification:**

Limiting Oxygen Index (LOI)	[% O <sub>2</sub> ]	33,0
Classification according to DIN EN 45545-2:2016-02, R22, R23 with respect to test acc. to EN ISO 4589-2	HL 3	

#### **Remarks:**


For a final classification, additional tests are required.

**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 17025:2018: Wherever statements of conformity are made, no measurement uncertainty is taken into account.**

BASF Fire Safety Technology

  
Dr. Henn  
Head of Laboratory

Ludwigshafen, 09.09.2020

  
Engelhardt  
Technician

# BASF – Fire Safety Technology

## Test according to ISO 4589 Part 2 : 2017-04 Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test

Test report No.: 14083 / 52041

### 3. Material:

#### Information supplied by client

E2441 Rubber (EPDM) black, thickness: 2mm

#### Additional details from test laboratory

### 4. Samples:

#### Sample size (determined by BASF test laboratory):

Length:	136,62 [mm]	Weight (upon receipt)	17,30 [g]
Width:	50,80 [mm]	Weight (after precond.):	17,30 [g]
Thickness:	2,24 [mm]	Weight loss:	0,00 [%]
Outer diameter:	[mm]	Weight per unit area:	2,49 [kg/m <sup>2</sup> ]
Inner diameter:	[mm]	Density:	1112,80 [kg/m <sup>3</sup> ]
Remarks: Specimens tested as received			

#### Pre-conditioning:

	Conditions	Duration days
Client: (information supplied by client)	Standard 23/50 ISO 554	
Test laboratory:	Standard 23/50 ISO 554	39

#### Sample preparation:

Exposed surface: identical surfaces

Test gas temperature: 24°C  
(start of test)

#### Remarks:

**Test according to ISO 4589 Part 2 : 2017-04  
Plastics - Determination of burning behaviour by oxygen index  
Part 2: Ambient-temperature test**

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## 5. Test results:

Sample type: V - For flexible film or sheet  
Procedure (Ignition method): B - Propagating ignition

### 5.1 Preliminary determination of Oxygen concentration (Increment d = 1 Vol. %)

Oxygen [Vol. %]	32,0	34,0	33,0								
Duration of burning [s]	0	180	0								
Burning distance [mm]	0	35	0								
Event (X or O)	O	X	O								

### 5.2 Determination of Oxygen concentration (Increment d = 0,2 Vol. %)

N <sub>T</sub> -Series											
N <sub>L</sub> -Series (8.7.1 – 8.7.2)							(8.7.3)				C <sub>r</sub>
Oxygen [Vol. %]	33,00	33,20					33,20	33,00	32,80	33,00	32,80
Duration of burning [s]	0	180					180	180	0	180	0
Burning distance [mm]	0	28					28	30	0	42	0
Event (X or O)	O						X	X	O	X	O
(Table 4): k-Factor with corrected sign:						0,83					
<b>Oxygen Index:</b>						[%]	<b>33,0</b>				
Standard deviation σ :						[%]	0,151				

The following requirement by ISO 4589-2 section 8.7.4 was fulfilled:

$$\frac{2\sigma}{3} < d < 1,5\sigma \quad 0,10 < 0,2 < 0,22$$

According to aforementioned requirements, determination of limiting Oxygen concentration did not have to be repeated.

#### Observations:

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**6. Test equipment:**

Test apparatus	PK 0023
Caliper gauge	MB 0038
Balance	MW 0009
Stop watch	MU 0062



**Test according to ISO 4589 Part 2 : 2017-04  
Plastics - Determination of burning behaviour by oxygen index  
Part 2: Ambient-temperature test**

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## 7. Requirements:

Standard ISO 4589 Part 2 does not define any requirements.

### Requirements by other standards:

Standard	Criteria	Requirements	
<b>DIN EN 45545-2: 2016-02</b>	Set of requirements R22, R23, R24	HL 1 and 2	LOI ≥ 28%
		HL 3	LOI ≥ 32%
<b>DIN 5510 – 2:2009-05, section 5.2.2.4</b>	Small electrical parts with a combustible material mass of 50 or 300 g (accessible / not accessible by passengers), which are arranged with a spacing of ≤ 20 cm behind, next to or above one another		LOI ≥ 28%
	Materials used in electrical equipment that is not accessible to passengers		LOI ≥ 30%
<b>NF F 16-101, section 6.1.3</b>	„ I “ classification  (in conjunction with test acc. to IEC 60695-2-10)	I 0	LOI ≥ 70%
		I 1	LOI ≥ 45%
		I 2	LOI ≥ 32%
		I 3	LOI ≥ 28%
		I 4	LOI ≥ 20%
<b>BS 6853</b>	Tables 7 + 8	Vehicle category Ia and Ib	LOI ≥ 34 %
		Vehicle category II	LOI ≥ 28 %
<b>TSI Freight waggon (2006)*</b>	Section 4.2.7.2.2.4. Material requirement		LOI ≥ 26 %

\*from edition 2013-04, no more requirements regarding LOI

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Date: 03.09.2020

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

Test according to

ISO 5659 Part 2 : 2017-05

**Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test**

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 : 2005.

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



Deutsche  
Akkreditierungsstelle  
D-PL-14121-07-00

# BASF – Fire Safety Technology

Test according to ISO 5659 Part 2 : 2017-05  
Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test

Test Report No.: 14083 / 52044

Receipt of order: 02.04.2020

Receipt of samples: 31.07.2020

Date of test: 01.09.2020

1. **Material:** (information supplied by client)

E2441 Rubber (EPDM) black, thickness: 10mm

Colour:

End use application: Sealing profiles and flat gaskets

2. **Summary of results and classification:**

Mean value of specific optical density at 4 min	D <sub>s</sub> (4)	19
Cumulative value of spec. optical dens. in the first 4 min.	VOF4	36
Mean value of maximum specific optical density	D <sub>s</sub> (max)	286
Classification according to DIN EN 45545-2:2016-02, set of requirements R22, with respect to test method ISO 5659-2, at 25 kW/m <sup>2</sup> , with pilot flame		HL2
Classification according to DIN EN 45545-2:2016-02, set of requirements R23, with respect to test method ISO 5659-2, at 25 kW/m <sup>2</sup> , with pilot flame		HL3


Remarks: For a final classification, additional tests are required.

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 17025:2018: Wherever statements of conformity are made, no measurement uncertainty is taken into account

BASF Fire Safety Technology

  
Dr. Henn  
Head of Laboratory

Ludwigshafen, 03.09.2020

  
Engelhardt  
Technician

# BASF – Fire Safety Technology

Test according to ISO 5659 Part 2 : 2017-05  
Plastics - Smoke generation - Part 2: Determination of optical density by a single-chamber test

Test Report No.: 14083 / 52044

### 3. Material:

#### Information supplied by client

E2441 Rubber (EPDM) black, thickness: 10mm

#### Additional details from testing laboratory

### 4. Samples:

#### Sample size (determined by BASF test laboratory):

Length:	74,80 [mm]	Weight:	63,77 [g]
Width:	74,80 [mm]	Weight per unit area:	11,39 [kg/m <sup>2</sup> ]
Thickness:	10,24 [mm]	Density:	1113,04 [kg/m <sup>3</sup> ]
Outer diameter:	[mm]	Remarks:	
Inner diameter:	[mm]		

#### Pre-conditioning:

	Conditions	Duration days
Client: (information supplied by client)	Standard 23/50 ISO 554	
Test Laboratory:	Standard 23/50 ISO 554	32

Sample preparation: specimen tested as received

Exposed surface : identical surfaces

### 5. Test equipment:

Test apparatus	PE 0020
Sliding gauge	MB 0038
Balance	MW 0009

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## 6. Test results:

Irradiance	[kW/m <sup>2</sup> ]	25		
Flame mode		with flame		
Test duration	[min]	10		
Sample		1	2	3
Wire grid used	yes/no	no	no	no
Thickness	[mm]	10,0	10,0	10,0
C <sub>r</sub>				
Clear beam correction factor	Dc	19,45	19,38	30,43
Specific optical density at 4 min	Ds4	19	20	18
Mean value of specific optical density at 4 min	Ds4	18,7		
Specific optical density at 10 min	Ds10	312	283	262
Mean value of specific optical density at 10 min	Ds10	285,7		
Specific optical density (maximum)	Ds <sub>(max)</sub>	312	284	262
Mean value of specific optical density (maximum)	Ds <sub>(max)</sub>	286,1		
Obscuration value in 4 min	VOF4	22	23	21
Mean obscuration value in 4 min	VOF4	22		
Ignition	[s]	367	342	322
Extinguishment	[s]	>600	>600	>600

### Observations:

Material tested with wire grid.

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## 7. Requirements:

### DIN EN 45545-2:2016-02 (equivalent to EN 45545-2:2013 + A1:2015)

Set of requiremt.	Reference	kW/m <sup>2</sup>	Parameter	HL1	HL2	HL3
R1, R2, R6, R11, R12	T10.01	50 w/o fl.	D <sub>s</sub> (4)	600	300	150
	T10.02		VOF4	1200	600	300
	T11.01		CIT <sub>G</sub> *	1,2	0,9	0,75
R3	T10.01	50 w/o fl.	D <sub>s</sub> (4)	---	480	240
	T10.02		VOF4	---	960	480
	T11.01		CIT <sub>G</sub> *	1,2	0,9	0,75
R5	T10.03	25 w. fl.	D <sub>s</sub> (max)	300	250	200
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
R7	T10.04	50 w/o fl.	D <sub>s</sub> (max)	---	600	300
	T11.01		CIT <sub>G</sub> *	---	1,8	1,5
R8, R9	T10.03	25 w. fl.	D <sub>s</sub> (max)	---	600	300
	T11.02		CIT <sub>G</sub> *	---	1,8	1,5
R10	T10.03	25 w. fl.	D <sub>s</sub> (max)	600	300	150
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
R17	T10.04	50 w/o fl.	D <sub>s</sub> (max)	---	600	300
	T11.01		CIT <sub>G</sub> *	---	1,8	1,5
R20	T10.03	25 w. fl.	D <sub>s</sub> (max)	200	200	200
	T11.02		CIT <sub>G</sub> *	0,75	0,75	0,75
R21	T10.03	25 w. fl.	D <sub>s</sub> (max)	300	300	200
	T11.02		CIT <sub>G</sub> *	1,2	0,9	0,75
R22	T10.03	25 w. fl. 600°C	D <sub>s</sub> (max)	600	300	150
	T12 **		CIT <sub>(NLP)</sub>	1,2	0,9	0,75
R23	T10.03	25 w. fl. 600°C	D <sub>s</sub> (max)	---	600	300
	T12 **		CIT <sub>(NLP)</sub>	---	1,8	1,5

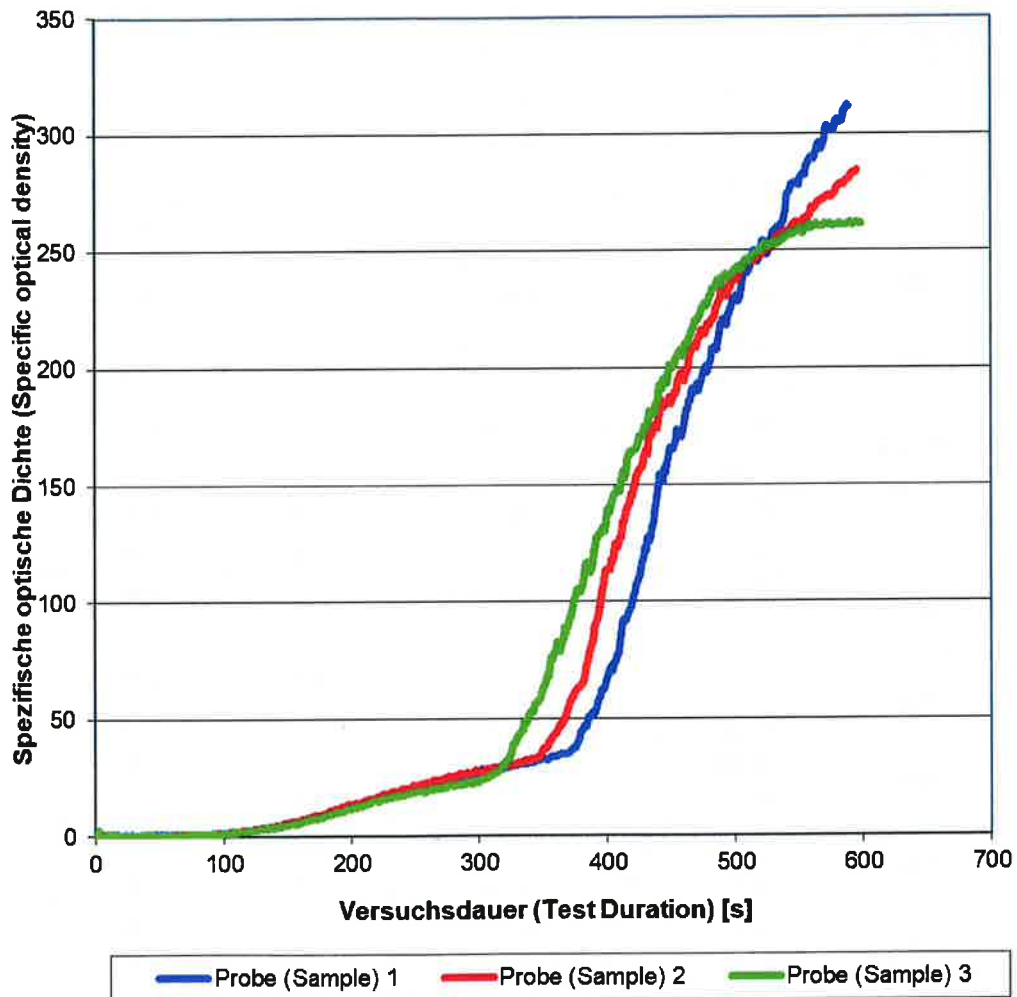
\* after 4 or 8 minutes, whichever is higher

\*\* NF X 70-100-1 &-2

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8. Charts:

Spezifische optische Dichte (Specific optical density)



Test Report No.: 14083 / 52042

Date: 07.09.2020

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

Test according to

**ISO 4589 Part 2 : 2017-04**

**Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test**

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 : 2005.

DAkKS-Register-No.: D-PL-14121-07-00



Deutsche  
Akkreditierungsstelle  
D-PL-14121-07-00



# BASF – Fire Safety Technology

## Test according to ISO 4589 Part 2 : 2017-04 Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test

Test report No.: 14083 / 52042

Receipt of order: 02.04.2020  
Receipt of samples: 31.07.2020  
Date of test: 07.09.2020

### 1. **Material:** (information supplied by client)

E2441 Rubber (EPDM) black, thickness: 10mm

Colour:

End use application:

### 2. **Summary of results and classification:**

Limiting Oxygen Index (LOI)	[% O <sub>2</sub> ]	>38,0
Classification according to DIN EN 45545-2:2016-02, R22, R23 with respect to test acc. to EN ISO 4589-2		HL 3

#### **Remarks:**

For a final classification, additional tests are required.

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 17025:2018: Wherever statements of conformity are made, no measurement uncertainty is taken into account.

BASF Fire Safety Technology

  
Dr. Henn  
Head of Laboratory

Ludwigshafen, 09.09.2020

  
Engelhardt  
Technician

# BASF – Fire Safety Technology

## Test according to ISO 4589 Part 2 : 2017-04 Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test

Test report No.: 14083 / 52042

### 3. Material:

#### Information supplied by client

E2441 Rubber (EPDM) black, thickness: 10mm

#### Additional details from test laboratory

### 4. Samples:

#### Sample size (determined by BASF test laboratory):

Length:	140,00 [mm]	Weight (upon receipt)	80,29 [g]
Width:	51,44 [mm]	Weight (after precond.):	80,29 [g]
Thickness:	10,04 [mm]	Weight loss:	0,00 [%]
Outer diameter:	[mm]	Weight per unit area:	11,14 [kg/m <sup>2</sup> ]
Inner diameter:	[mm]	Density:	1110,44 [kg/m <sup>3</sup> ]
Remarks: Specimens tested as received			

#### Pre-conditioning:

	Conditions	Duration days
Client: (information supplied by client)	Standard 23/50 ISO 554	
Test laboratory:	Standard 23/50 ISO 554	38

#### Sample preparation:

Exposed surface: identical surfaces

Test gas temperature: 23°C  
(start of test)

#### Remarks:

Test report No.: 14083 / 52042

**5. Test results:**

Sample type: V - For flexible film or sheet  
Procedure (Ignition method) B - Propagating ignition

**5.1 Preliminary determination of Oxygen concentration (Increment d = 1 Vol. %)**

Oxygen [Vol.%]	38,0	38,0	38,0									
Duration of burning [s]	0	0	0									
Burning distance [mm]	0	0	0									
Event (X or O)	O	O	O									

**Observations:**

The test was terminated, because the minimum threshold limit for "HL3" classification was significantly exceeded, see ISO 4589-2 : 2017-04 Procedure C (shortened procedure).

**6. Test equipment:**

Test apparatus PK 0023  
Caliper gauge MB 0038  
Balance MW 0009  
Analyzer MA 0002  
Stop watch MU 0062

# BASF – Fire Safety Technology

## Test according to ISO 4589 Part 2 : 2017-04 Plastics - Determination of burning behaviour by oxygen index Part 2: Ambient-temperature test

Test report No.: 14083 / 52042

### 7. Requirements:

Standard ISO 4589 Part 2 does not define any requirements.

Requirements by other standards:

Standard	Criteria	Requirements	
DIN EN 45545-2: 2016-02	Set of requirements R22, R23, R24	HL 1 and 2	LOI ≥ 28%
		HL 3	LOI ≥ 32%
DIN 5510 – 2:2009-05, section 5.2.2.4	Small electrical parts with a combustible material mass of 50 or 300 g (accessible / not accessible by passengers), which are arranged with a spacing of ≤ 20 cm behind, next to or above one another		LOI ≥ 28%
	Materials used in electrical equipment that is not accessible to passengers		LOI ≥ 30%
NF F 16-101, section 6.1.3	„ I “ classification  (in conjunction with test acc. to IEC 60695-2-10)	I 0	LOI ≥ 70%
		I 1	LOI ≥ 45%
		I 2	LOI ≥ 32%
		I 3	LOI ≥ 28%
		I 4	LOI ≥ 20%
BS 6853	Tables 7 + 8	Vehicle category Ia and Ib	LOI ≥ 34 %
		Vehicle category II	LOI ≥ 28 %
TSI Freight waggon (2006)*	Section 4.2.7.2.2.4. Material requirement		LOI ≥ 26 %

\*from edition 2013-04, no more requirements regarding LOI