MFPA Leipzig GmbH

Testing, Inspection and Certification Authority for
Construction Products and Construction Types

Leipzig Institute for Materials Research and Testing
Business Division III - Structural Fire Protection
Dipl.-Ing. Michael Juknat

Work Group 3.1 - Fire Behaviour of Building Products

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Test Certificate No. PZ 3.1/19-394-1-r1

Replacement for PZ 3.1/19-394-1 dated 05/02/2020

20 March 2020
No. Copy 1

This is a translation of the German test certificate PZ 3.1/19-394-1.

Order:	Test of low flammability (building material class B1) in accordance with DIN 4102-1:1998-05
Subject matter:	PE tarpaulin FR. "COVER Standard", Colour: white
Date of order:	6 January 2020
Samples received on:	10 January 2020 (DZ3.1/20-005)
Sampling:	By client
Identification:	None
Date of testing:	29. January and 4. February 2020 (test in the Brandschacht) and 27. January 2020 (ignitability test)
Person in charge:	Sören Laschke, M.Sc.

This document consists of 6 pages and 2 appendices.

In case of doubt the German version shall apply.

In German construction supervision procedures, this lest report serves as a basis for the prescribed certificate of usability and does not replace the general appraisal verification certificate.

Notified testing laboratories, inspection bodies and certification bodies recognized according to the Construction Products Regulation (NB 800) and the State Building Code (SAC02).

Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH (MFPA Leipzig GmbH)

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1 Material description

According to the information provided by the client, the construction product to be tested was a PE tarpaulin for use as a cover sheet with the designation "COVER Standard". According to the client, the product is made of polyethylene and is coated on both sides with LDPE. The colour of the material was white. According to the client's specifications, the product is used indoors and outdoors as a covering and protective material or tarpaulin and, when used in the building industry, is not backed with other building materials.

According to the information provided by the client, the material will not be exposed to outdoor weathering for longer than one to a maximum of two years.

According to the client, this building product is not subjected to any harmonised European product standard.

Additional information on the building product was not provided to the testing laboratory.

2 Material parameters

Parameters according to the client:

- Thickness of the product 0.3 mm
- Mass per unit area of the product: 140 g/m²
- Colour of the product: white

The following parameters were determined by MFPA Leipzig:

- Thickness of the product approx. 0.2 mm
- Mass per unit area of the product: approx. 142 g/m²

3 Conditioning

The specimens for the fire shaft tests were stored prior to the test in accordance with DIN 4102-16, Section 6.1.

The samples for the ignitability test were conditioned in accordance with DIN 4102-1, section 6.2.3.2.

4 Test in the Brandschacht in accordance with DIN 4102-1, section 6.1.3

4.1 Sample production

The sample material delivered by the client was cut to the required dimensions of 1000 mm x 190 mm x sample thickness by employees of the fire testing laboratory.

The samples were produced without a substrate.

4.2 Test execution

The tests were performed in the fire testing laboratory of MFPA Leipzig GmbH, MFPA-Allee 1, 04509 Laue near Delitzsch in accordance with DIN 4102-1:1998-05, DIN 4102-15:1990-05 and DIN 4102-16:2015-09.

The building product described above was tested in a freely suspended sample arrangement.

4.3 Test results

The test results are summarized in the following table 2.

Table 1: Test in the Brandschacht according to DIN 4102-1, section 6.1.3 with PE tarpaulin "COVER Standard".

Sample C: samples from longitudinal direction,
Sample D: samples from transversal direction,
Sample G: samples from longitudinal direction,
Sample H samples from longitudinal direction;

Line no.			Measured values for sample			
			C	D	G	H
1	No. of sample arrangement acc. to DIN 4102-15 table 1		1	1	1	1
2	Maximum flame height above lower edge of sample	cm	50	50	40	50
3	Time*)	min:s	0:05	0:02	0:02	0:10
4	Melting/burning through Time*)	min:s	0:02	0:02	0:02	0:02
5	Observations at the back of the sample Flaming/smouldering Time*)	min:s	./.	./.	./.	./.
6	Discolourations Time*)	min:s	./.	./.	./.	./.
7	Flaming droplets Start*)	min:s	./.	./.	./.	./.
8	Extent: individual droplets from the sample material		./.	./.	./.	./.
9	continuous droplets from the sample material		./.	./.	./.	./.
10	Flaming sample particles Start*)	min:s	./.	./.	./.	./.
11	Extent: falling of individual flaming sample particles		./.	./.	./.	./.
12	continuous falling of flaming sample particles		./.	./.	./.	./.
13	Duration of continued burning on the sieve bottom (max.)	min:s	./.	./.	./.	./.
14	Impairment of the burner flame due to flaming droplets/particles Time*)	min:s	./.	./.	./.	./.
15	Premature end of test End of burning of the samples*)	min:s	./.	./.	./.	./.
16	Time of test discontinuation, if applicable*)	min:s	./.	./.	./.	./.

*) *Time expired since the test started,*
./. *No occurrence of the event,*
\- *Not applicable.*

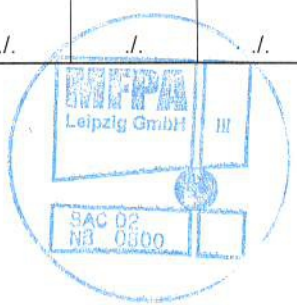


Table 1 continued.

Line no.			Measured values for sample			
			C	D	G	H
	Afterflame after end of test					
17	Duration	min:s	./.	./.	./.	./.
18	Number of samples		./.	./.	./.	./.
19	Front of sample		./.	./.	./.	./.
20	Back of sample		./.	./.	./.	./.
21	Flame length	cm	./.	./.	./.	./.
	Afterglow after end of test					
22	Duration	min:s	./.	./.	./.	./.
23	Number of samples		./.	./.	./.	./.
	Place of occurrence:					
24	Bottom half of sample		./.	./.	./.	./.
25	Top half of sample		./.	./.	./.	./.
26	Front of sample		./.	./.	./.	./.
27	Back of sample		./.	./.	./.	./.
	Smoke density					
28	max. 400% min	%min	0.47	2.87	2.87	0.77
29	> 400% min (very strong smoke development)	%min	./.	./.	./.	./.
30	Diagram in Enclosure no.		2	2	2	2
	Residual lengths					
			36; 37	38; 42	34; 41	34; 32
31	Individual values	cm	60; 38	50; 48	34; 23	33; 40
32	Mean value	cm	43	45	33	35
33	Photo of the sample in Enclosure no.		1	1	-	-
	Flue gas temperature					
34	Maximum of the mean value	°C	106	105	107	104
35	Time*)	min:s	9:38	9:46	9:30	9:28
36	Diagram in Enclosure no.		2	2	2	2
37	Remarks: - None;					

*) *Time expired since the test started,*
./. *No occurrence of the event,*
- *Not applicable.*

4.4 Deviations

There were no deviations from the test procedure according to DIN 4102-1:1998-05, DIN 4102-15:1990-05 and DIN 4102-16:2015-09.

5 Ignitability test in accordance with DIN 4102-1, section 6.2.5

5.1 Sample production

The specimen material supplied by the client was cut to the required dimensions of 190 mm x 90 mm x specimen thickness respectivly 230 mm x 90 mm x specimen thickness by employees of the fire testing laboratory.

The specimens were prepared without a substrate.

5.2 Test execution

The tests were performed in the fire testing laboratory of MFPA Leipzig GmbH, MFPA-Allee 1, 04509 Laue near Delitzsch in accordance with DIN 4102-1:1998-05.

Flame impingement was carried out in accordance with DIN 4102-1, section 6.2.5.2 (edge flame impingement) and section 6.2.5.3 (surface flame impingement).

The samples were tested in a free-hanging position.

5.3 Test results

The results of the ignitability tests are summarized in Table 2.

Table 2: Ignitability test in accordance with DIN 4102-1, section 6.2.5.2 (edge flame impingement) and section 6.2.5.3 (surface flame impingement) with PE tarpaulin "COVER Standard".

Samples 1 to 6: Edge flame impingement,
Samples 7 and 8: Surface flame impingement,
Samples 1, 3, 5 and 7: Samples of material longitudinal to the direction of production,
Samples 2, 4, 6 and 8: Samples of material transverse to the direction of production,

Specifications in accordance with DIN 4102-1		Test results Sample no. 1	2	3	4	5	6	7	8
Ignition	s	1	1	1	1	1	1	2	2
Highest flame height	mm	40	30	30	20	20	40	40	30
Time of occurrence	s	5	3	3	2	1	2	5	7
Flame tip at measuring mark	s	./.	./.	./.	./.	./.	./.	./.	./.
Flame dies before reaching the measuring mark	s	7	4	3	2	2	3	6	11
Continues to burn after end of test	s	2	./.	./.	./.	./.	./.	./.	./.
Ignition of the filter paper	s	./.	./.	./.	./.	./.	./.	./.	./.
Appearance of samples after fire tests:: The samples were damaged on the side exposed to the flames up to a maximum length of 70 mm and at the bottom edge up to a maximum width of 20 mm. A burning dropping / dripping did not occure.									
Development of smoke (visual):	low	moderate	strong	very strong					

./. no occurrence of the event.

5.4 Deviations

There were no deviations from the test procedure according to DIN 4102-1:1998-05.

MFPA Leipzig GmbH III
SAC 02
NB 0800

6 Assessment

6.1 Requirements for building material class B1 according to DIN 4102-1, section 6.1.2.2

The PE tarpaulin with the designation "COVER Standard" with a sample thickness of approx. 0.2 mm and a mass per unit area of approx. 142 g/m² passed the tests in the Brandschacht in a freely suspended sample arrangement in accordance with DIN 4102-1, Section 6.1.2.2.

In the test according to DIN 4102-16, section 9.3, the material is regarded as not burning dropping (dripping).

The tested building product can thus be classified in building material class B1 (flame retardant) according to DIN 4102 under the following conditions:

- The building product must be arranged at a distance of > 40 mm from the same or other flat materials.
- When used as a flame-retardant building product, the material must not be exposed to the weather outdoor for more than 2 years.
- The building product must be flame-retardant according to the data deposited at the MFPA Leipzig.

6.2 Requirements for building material class B2 according to DIN 4102-1, section 6.2.2

The PE tarpaulin with the designation "COVER Standard" with a sample thickness of approx. 0.2 mm and a mass per unit area of approx. 142 g/m² g/m² fulfilled the requirements for building materials of building material class B2 (normally flammable) according to DIN 4102 1, section 6.2.2 in a freely suspended sample arrangement.

In the test in accordance with DIN 4102-1, section 6.2.6, the material the material is not regarded as burning dropping (dripping).

7 Notes

In German construction supervision procedures, this test report serves as a basis for the prescribed certificate of usability

The test report does not replace a general appraisal verification certificate of usability that may be required according to German construction supervision procedures. It only serves as a basis for the issue of a general appraisal verification certificate.

This test certificate is not a certificate of usability approved by the building authorities.

The validity of this test certificate ends on 3. February 2025.

The results of the tests exclusively relate to the items tested. This document does not replace a certificate of conformity or suitability according to national and European building codes.

Leipzig, 20 March 2020

Dipl.-Ing. M. Juknat	N. Neumann, M.Sc.	S. Laschke, M.Sc.
Head of Business Division	*Head of Testing Laboratory*	*Testing Engineer*

Enclosure 1: Photo of the damage to the Brandschacht samples.

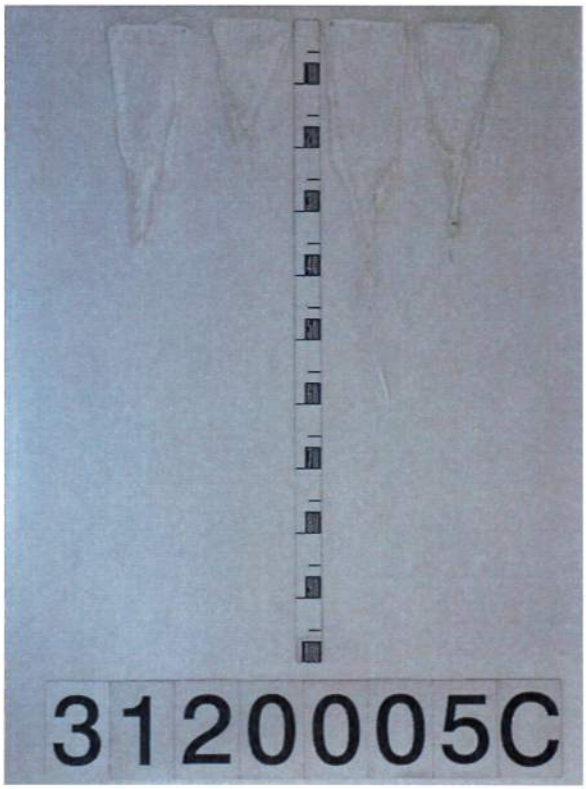


Photo 1: Damage to the Brandschacht samples:
Sample C "COVER Standard".

Sample thickness: approx. 0.2 mm,
Mass per unit area: approx. 142 g/m²,
Samples from longitudinal direction,
freely suspended sample arrangement.

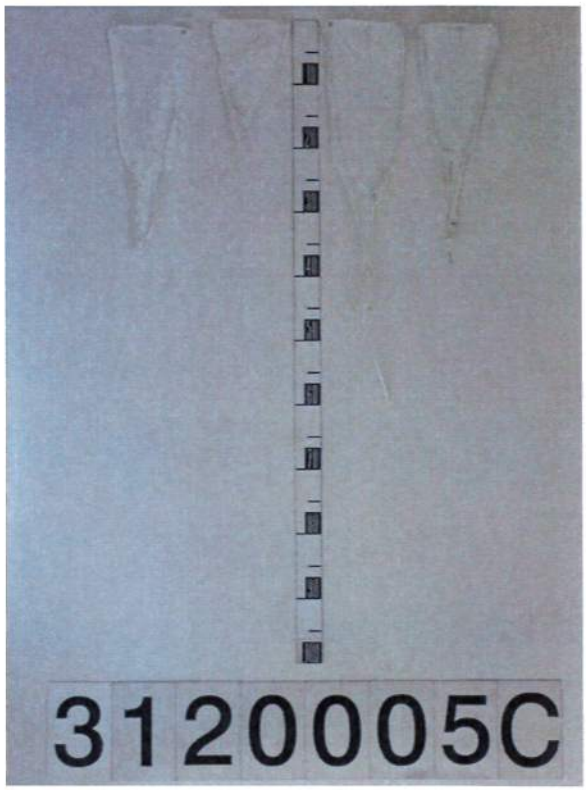


Photo 2: Damage to the Brandschacht samples:
Sample D "COVER Standard"

Sample thickness: approx. 0.2 mm,
Mass per unit area: approx. 142 g/m²,
Samples from transversal direction,
freely suspended sample arrangement.

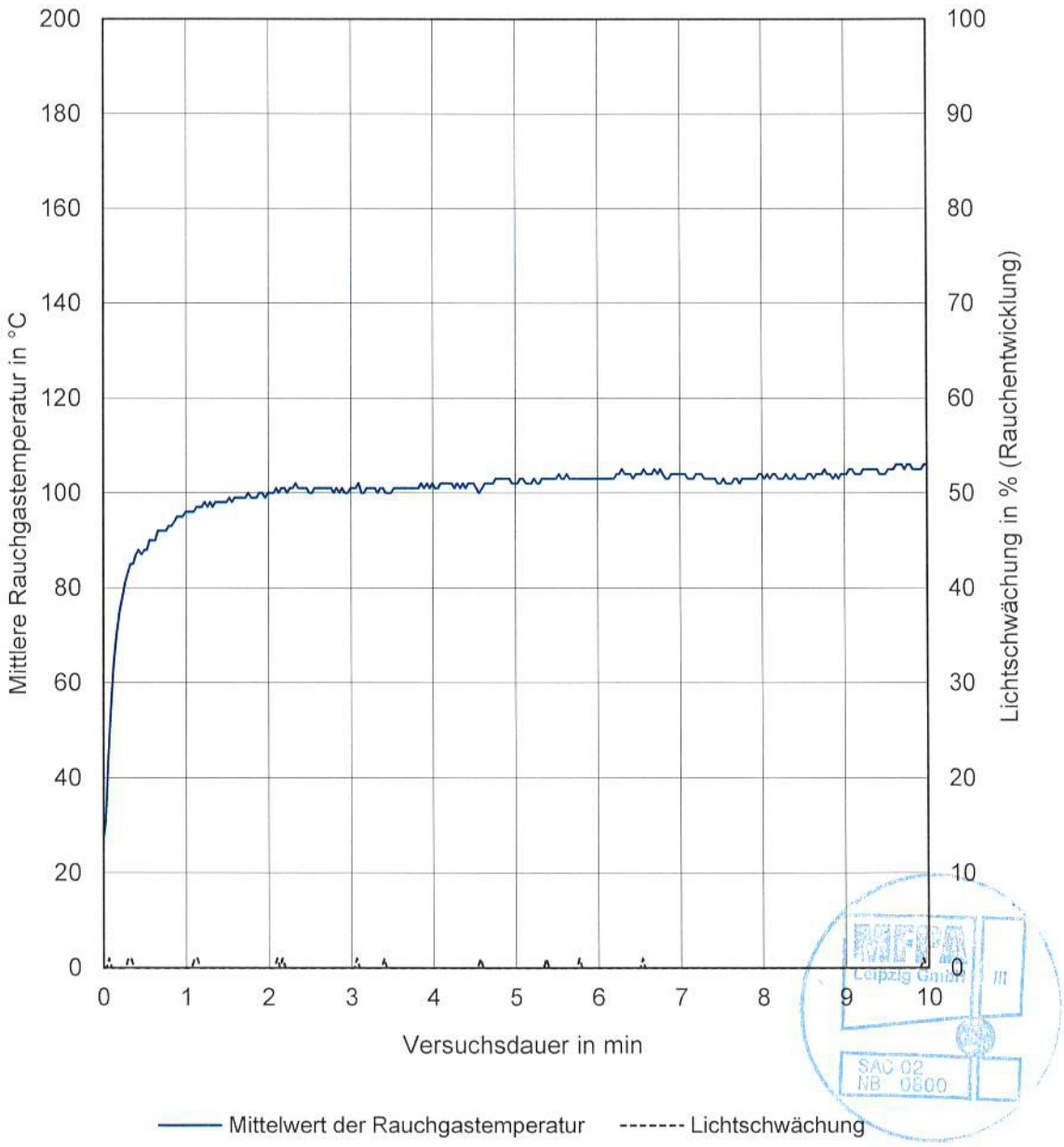
Enclosure 2: Diagrams and characteristic values of the tests in the Brandschacht in accordance with DIN 4102-1

Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 29.01.2020

Probekörper C: PE Bändchengewebe: „COVER Standard"
Dicke: etwa 0,2 mm; Flächenmasse: etwa 142 g/m²
Probenanordnung: freihängend, Proben aus Längsrichtung

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 106°C nach 9:38 min:s
Flächenintegral der Rauchdichte: < 1 %min

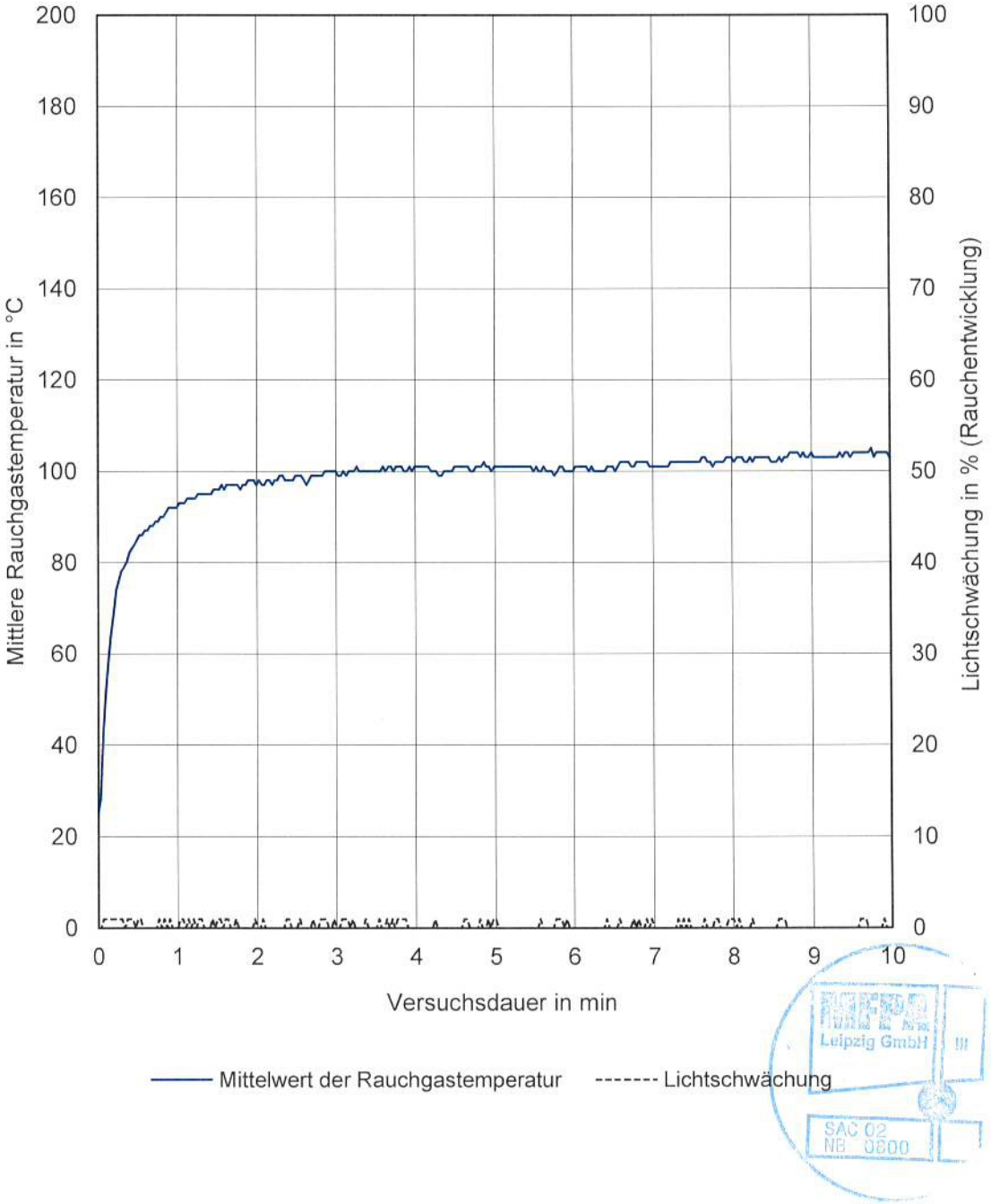


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 29.01.2020

Probekörper D: PE Bändchengewebe: „COVER Standard"
Dicke: etwa 0,2 mm; Flächenmasse: etwa 142 g/m²
Probenanordnung: freihängend, Proben aus Querrichtung

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 105°C nach 9:46 min:s
Flächenintegral der Rauchdichte: 3 %min



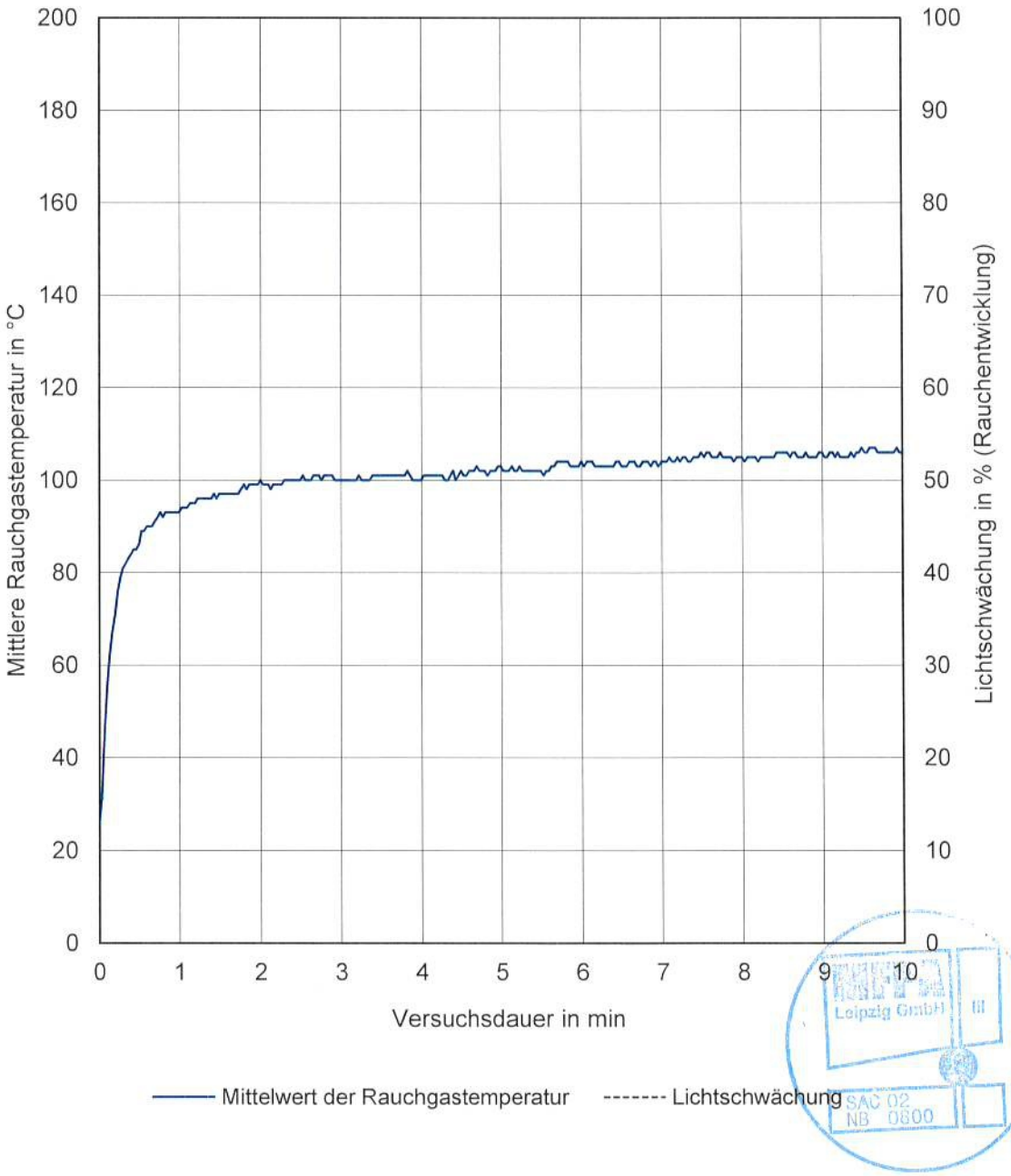
MFPA Leipzig GmbH
SAC 02
NB 0800

Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 04.02.2020

Probekörper G: PE Bändchengewebe: „COVER Standard"
Dicke: etwa 0,2 mm; Flächenmasse: etwa 142 g/m²
Probenanordnung: freihängend, Proben aus Längsrichtung

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 107°C nach 9:30 min:s
Flächenintegral der Rauchdichte: < 1 %min



Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 04.02.2020

Probekörper H: PE Bändchengewebe: „COVER Standard"
Dicke: etwa 0,2 mm; Flächenmasse: etwa 142 g/m²
Probenanordnung: freihängend, Proben aus Längsrichtung

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 104°C nach 9:28 min:s
Flächenintegral der Rauchdichte: 1 %min