



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
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Work Group 3.1 - Fire Behaviour of Building Products

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Test Certificate No. PZ 3.1/20-193-1

17 July 2020

No. Copy 1

This is a translation of the German test certificate PZ 3.1/20-193-1.

Client: Oniro B.V.
Fahrenheitbaan 4-B
3439 MD Nieuwegein
Netherlands

Order: Test to verify the building material class DIN 4102-B1 according to
DIN 4102-1:1998-05

Subject matter: Object upholstery fabrics:
"NIROXX Classic & Stripes", "NIROXX Lamé" and "NIROXX Ultra"

Date of order: 10. June 2020

Samples received on: 3. July 2020 (DZ3.1/20-171)

Sampling: By client

Identification: 97001 (43028), 43042, 43022, 68009, 68018, 68019, 54009, 54011, 54018

Date of testing: 08./ 10. and 17.07.2020 (test in the Brandschacht) and
07.07.2020 (ignitability test)

Person in charge: Sören Laschke, M.Sc.

This document consists of 15 pages and 2 appendices.

In case of doubt the German version shall apply.

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

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1 Material description

The object cover materials to be tested were various single-side coated fabric. According to the client, these are used under the names "NIROXX Classic & Stripes", "NIROXX Lamé" and "NIROXX Ultra" as object upholstery materials. The upper layer is made of 100% polyester which is backside bonded with a liquid resistant coating.

Samples in black, red, grey and cream were selected for the tests. According to the client, the material is used inside buildings. The product itself had to be tested without consideration of adjacent building materials.

Further information on the material was not available to the testing laboratory.

2 Material parameters

Parameters according to the client: none;

Table 1: Characteristic values determined by MFPA Leipzig:

| Product group | Colour/ Identification | Mass per unit area [kg/m ²] | Thickness [mm] |
|----------------------------|---------------------------|--|-------------------|
| "NIROXX Classic & Stripes" | grey 43042 | approx. 0.32 | approx. 0.50 |
| | red 43022 | approx. 0.33 | approx. 0.55 |
| | black 97001 (43028) | approx. 0.29 | approx. 0.45 |
| "NIROXX Ultra" | cream 54011 | approx. 0.42 | approx. 0.55 |
| | red 54018 | approx. 0.38 | approx. 0.55 |
| | black 54009 | approx. 0.38 | approx. 0.6 |
| "NIROXX Lamé" | cream 68019 | approx. 0.41 | approx. 0.7 |
| | red 68018 | approx. 0.43 | approx. 0.65 |
| | black 68009 | approx. 0.43 | approx. 0.75 |

3 Conditioning

The samples were conditioned 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 Table 2 to Table 5.

Table 2: Test in the Brandschacht according to DIN 4102-1, section 6. 1.3, with Object upholstery fabrics: "NIROXX Classic & Stripes".

Sample A: samples from longitudinal direction, front exposed to fire, colour: red,
Sample B: samples from longitudinal direction, front exposed to fire, colour: grey,
Sample C: samples from longitudinal direction, front exposed to fire, colour: black;

| Line no. | | | Measured values for sample | | | |
|----------|---|-------|----------------------------|------|------|---|
| | | | A | B | C | - |
| 1 | No. of sample arrangement acc. to DIN 4102-15 table 1 | | 1 | 1 | 1 | - |
| 2 | Maximum flame height above lower edge of sample | cm | 50 | 50 | 60 | - |
| 3 | Time*) | min:s | 0:02 | 0:02 | 0:05 | - |
| 4 | Melting/burning through Time*) | min:s | 0:05 | 0:05 | 0:06 | - |
| 5 | Observations at the back of the sample Flaming/smouldering Time*) | min:s | ./. | ./. | ./. | - |
| 6 | Discolourations Time*) | min:s | ./. | ./. | ./. | - |
| 7 | Flaming droplets Start*) | min:s | ./. | 0:14 | ./. | - |
| 8 | Extent: individual droplets from the sample material | | - | Yes | - | - |
| 9 | continuous droplets from the sample material | | - | - | - | - |
| 10 | Flaming sample particles Start*) | min:s | 0:23 | 0:22 | 0:14 | - |
| 11 | Extent: falling of individual flaming sample particles | | Yes | Yes | Yes | - |
| 12 | continuous falling of flaming sample particles | | - | - | - | - |
| 13 | Duration of continued burning on the sieve bottom (max.) | min:s | 0:03 | 0:08 | 0:16 | - |
| 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 2 continued.

| Line no. | | | Measured values for sample | | | |
|-------------------------------------|--|-------|----------------------------|------------------|------------------|------------|
| | | | A | B | C | - |
| <u>Afterflame after end of test</u> | | | | | | |
| 17 | Duration | min:s | ./. | ./. | ./. | - |
| 18 | Number of samples | | - | - | - | - |
| 19 | Front of sample | | - | - | - | - |
| 20 | Back of sample | | - | - | - | - |
| 21 | Flame length | cm | - | - | - | - |
| <u>Afterglow after end of test</u> | | | | | | |
| 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 | | - | - | - | - |
| <u>Smoke density</u> | | | | | | |
| 28 | max. 400% min | %min | 4.07 | 4.80 | 20.53 | - |
| 29 | > 400% min (very strong smoke development) | %min | ./. | ./. | ./. | - |
| 30 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| <u>Residual lengths</u> | | | | | | |
| 31 | Individual values | cm | 67; 67 68; 67 | 64; 67 65; 66 | 60; 60 50; 56 | - - - - |
| 32 | Mean value | cm | 67 | 66 | 57 | - |
| 33 | Photo of the sample in Enclosure no. | | 1 | 1 | 1 | - |
| <u>Flue gas temperature</u> | | | | | | |
| 34 | Maximum of the mean value | °C | 118 | 120 | 116 | - |
| 35 | Time*) | min:s | 9:10 | 9:40 | 0:24 | - |
| 36 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| 37 | <u>Remarks:</u> - None. | | | | | |

*) Time expired since the test started,

./. No occurrence of the event,

- Not applicable.

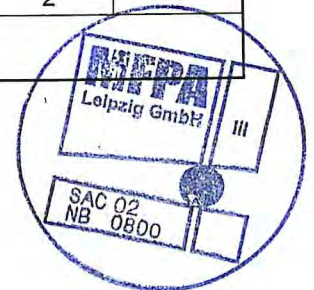


Table 3: Test in the Brandschacht according to DIN 4102-1, section 6. 1.3, with Object upholstery fabrics: "NIROXX Classic & Stripes".

Sample J: samples from transversal direction, front exposed to fire, colour: black,

Sample K: samples from transversal direction, back exposed to fire, colour: black;

| Line no. | | | Measured values for sample | | | |
|----------|---|-------|----------------------------|------|---|---|
| | | | J | K | - | - |
| 1 | No. of sample arrangement acc. to DIN 4102-15 table 1 | | 1 | 1 | - | - |
| 2 | Maximum flame height above lower edge of sample | cm | 60 | 50 | - | - |
| 3 | Time*) | min:s | 0:05 | 0:02 | - | - |
| 4 | Melting/burning through Time*) | min:s | 0:04 | 0:06 | - | - |
| 5 | Observations at the back of the sample Flaming/smouldering Time*) | min:s | ./. | ./. | - | - |
| 6 | Discolourations Time*) | min:s | ./. | ./. | - | - |
| 7 | Flaming droplets Start*) | min:s | ./. | 0:08 | - | - |
| 8 | Extent: individual droplets from the sample material | | - | Yes | - | - |
| 9 | continuous droplets from the sample material | | - | - | - | - |
| 10 | Flaming sample particles Start*) | min:s | 0:12 | 0:11 | - | - |
| 11 | Extent: falling of individual flaming sample particles | | Yes | Yes | - | - |
| 12 | continuous falling of flaming sample particles | | - | - | - | - |
| 13 | Duration of continued burning on the sieve bottom (max.) | min:s | 0:16 | 0:18 | - | - |
| 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 3 continued.

| Line no. | | | Measured values for sample | | | |
|-------------------------------------|--|-------|----------------------------|------------------|-----|-----|
| | | | J | K | - | - |
| <u>Afterflame after end of test</u> | | | | | | |
| 17 | Duration | min:s | ./. | ./. | - | - |
| 18 | Number of samples | | - | - | - | - |
| 19 | Front of sample | | - | - | - | - |
| 20 | Back of sample | | - | - | - | - |
| 21 | Flame length | cm | - | - | - | - |
| <u>Afterglow after end of test</u> | | | | | | |
| 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 | | - | - | - | - |
| <u>Smoke density</u> | | | | | | |
| 28 | max. 400% min | %min | 14.87 | 8.13 | - | - |
| 29 | > 400% min (very strong smoke development) | %min | ./. | ./. | - | - |
| 30 | Diagram in Enclosure no. | | 2 | 2 | - | - |
| <u>Residual lengths</u> | | | | | | |
| 31 | Individual values | cm | 52; 56 57; 56 | 70; 71 62; 69 | - - | - - |
| 32 | Mean value | cm | 55 | 68 | - | - |
| 33 | Photo of the sample in Enclosure no. | | 1 | 1 | - | - |
| <u>Flue gas temperature</u> | | | | | | |
| 34 | Maximum of the mean value | °C | 117 | 117 | - | - |
| 35 | Time*) | min:s | 9:58 | 9:14 | - | - |
| 36 | Diagram in Enclosure no. | | 2 | 2 | - | - |
| 37 | <u>Remarks:</u> - Due to the residual length > 45 cm, further tests could be dispensed with in accordance with DIN 4102 16 Section 5.2b). | | | | | |

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



Table 4: Test in the Brandschacht according to DIN 4102-1, section 6. 1.3, with Object upholstery fabrics: "NIROXX Lamé".

Sample D: samples from longitudinal direction, front exposed to fire, colour: red,
Sample E: samples from longitudinal direction, front exposed to fire, colour: cream,
Sample F: samples from longitudinal direction, front exposed to fire, colour: black;

| Line no. | | | Measured values for sample | | | |
|----------|---|-------|----------------------------|------|------|---|
| | | | D | E | F | - |
| 1 | No. of sample arrangement acc. to DIN 4102-15 table 1 | | 1 | 1 | 1 | - |
| 2 | Maximum flame height above lower edge of sample | cm | 60 | 50 | 60 | - |
| 3 | Time*) | min:s | 0:05 | 0:05 | 0:05 | - |
| 4 | Melting/burning through Time*) | min:s | 0:07 | 0:05 | 0:06 | - |
| 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 | 0:16 | 0:15 | 0:14 | - |
| 11 | Extent: falling of individual flaming sample particles | | Yes | Yes | Yes | - |
| 12 | continuous falling of flaming sample particles | | - | - | - | - |
| 13 | Duration of continued burning on the sieve bottom (max.) | min:s | 0:05 | 0:05 | 0:06 | - |
| 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.

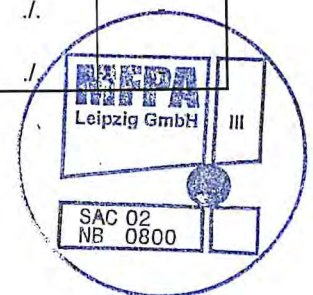


Table 4 continued.

| Line no. | | | Measured values for sample | | | |
|-------------------------------------|--|-------|----------------------------|------------------|------------------|------------|
| | | | D | E | F | - |
| <u>Afterflame after end of test</u> | | | | | | |
| 17 | Duration | min:s | ./. | ./. | ./. | - |
| 18 | Number of samples | | - | - | - | - |
| 19 | Front of sample | | - | - | - | - |
| 20 | Back of sample | | - | - | - | - |
| 21 | Flame length | cm | - | - | - | - |
| <u>Afterglow after end of test</u> | | | | | | |
| 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 | | - | - | - | - |
| <u>Smoke density</u> | | | | | | |
| 28 | max. 400% min | %min | 4.53 | 8.63 | 11.67 | - |
| 29 | > 400% min (very strong smoke development) | %min | ./. | ./. | ./. | - |
| 30 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| <u>Residual lengths</u> | | | | | | |
| 31 | Individual values | cm | 66; 65 65; 67 | 66; 66 63; 65 | 64; 63 65; 64 | - - - - |
| 32 | Mean value | cm | 66 | 65 | 64 | - |
| 33 | Photo of the sample in Enclosure no. | | 1 | - | - | - |
| <u>Flue gas temperature</u> | | | | | | |
| 34 | Maximum of the mean value | °C | 118 | 120 | 119 | - |
| 35 | Time*) | min:s | 9:54 | 9:36 | 8:54 | - |
| 36 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| 37 | <u>Remarks:</u> - None. | | | | | |

*) Time expired since the test started,

./.. No occurrence of the event,

- Not applicable.



Table 5: Test in the Brandschacht according to DIN 4102-1, section 6. 1.3, with Object upholstery fabrics: "NIROXX Ultra".

Sample G: samples from longitudinal direction, front exposed to fire, colour: red,
Sample H: samples from longitudinal direction, front exposed to fire, colour: cream,
Sample I samples from longitudinal direction, front exposed to fire, colour: black,;

| Line no. | | Measured values for sample | | | | |
|----------|---|----------------------------|------|------|------|---|
| | | G | H | I | - | |
| 1 | No. of sample arrangement acc. to DIN 4102-15 table 1 | 1 | 1 | 1 | - | |
| 2 | Maximum flame height above lower edge of sample | cm | 60 | 60 | 60 | - |
| 3 | Time*) | min:s | 0:10 | 0:05 | 0:10 | - |
| 4 | Melting/burning through Time*) | min:s | 0:04 | 0:07 | 0:06 | - |
| 5 | Observations at the back of the sample Flaming/smouldering Time*) | min:s | ./. | ./. | ./. | - |
| 6 | Discolourations Time*) | min:s | ./. | ./. | ./. | - |
| 7 | Flaming droplets Start*) | min:s | 0:27 | 0:12 | ./. | - |
| 8 | Extent: individual droplets from the sample material | | Yes | Yes | - | - |
| 9 | continuous droplets from the sample material | | - | - | - | - |
| 10 | Flaming sample particles Start*) | min:s | ./. | 0:14 | 0:13 | - |
| 11 | Extent: falling of individual flaming sample particles | | - | Yes | Yes | - |
| 12 | continuous falling of flaming sample particles | | - | - | - | - |
| 13 | Duration of continued burning on the sieve bottom (max.) | min:s | 0:02 | 0:03 | 0:14 | - |
| 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 5 continued.

| Line no. | | | Measured values for sample | | | |
|-------------------------------------|--|-------|----------------------------|------------------|------------------|------------|
| | | | G | H | I | - |
| <u>Afterflame after end of test</u> | | | | | | |
| 17 | Duration | min:s | ./. | ./. | ./. | - |
| 18 | Number of samples | | - | - | - | - |
| 19 | Front of sample | | - | - | - | - |
| 20 | Back of sample | | - | - | - | - |
| 21 | Flame length | cm | - | - | - | - |
| <u>Afterglow after end of test</u> | | | | | | |
| 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 | | - | - | - | - |
| <u>Smoke density</u> | | | | | | |
| 28 | max. 400% min | %min | 2.57 | 6.47 | 3.23 | - |
| 29 | > 400% min (very strong smoke development) | %min | ./. | ./. | ./. | - |
| 30 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| <u>Residual lengths</u> | | | | | | |
| 31 | Individual values | cm | 63; 62 64; 65 | 65; 64 66; 66 | 66; 66 67; 64 | - - - - |
| 32 | Mean value | cm | 64 | 6565 | 6666 | - |
| 33 | Photo of the sample in Enclosure no. | | 1 | - | - | - |
| <u>Flue gas temperature</u> | | | | | | |
| 34 | Maximum of the mean value | °C | 114 | 114 | 122 | - |
| 35 | Time*) | min:s | 6:44 | 8:02 | 8:22 | - |
| 36 | Diagram in Enclosure no. | | 2 | 2 | 2 | - |
| 37 | <u>Remarks:</u> - 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 und DIN 4102-16:2015-09.



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

5.1 Sample production

The sample material delivered by the client was cut to the required dimensions of 190 mm x 90 mm x sample thickness respectively 230 mm x 90 mm x sample thickness by employees of the fire testing laboratory.

The samples were produced 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 6 to Table 11.

Table 6: Ignitability test in accordance with DIN 4102-1, section 6.2.5.2 (edge flame impingement) with Object upholstery fabrics: "NIROXX Classic & Stripes"

Samples 1 and 2: edge flame impingement, Flaming of the front, colour: red,
 Samples 3 and 4: edge flame impingement, Flaming of the front, colour: grey,
 Samples 5 and 6: edge flame impingement, Flaming of the front, colour: black,
 Samples 1, 3 and 5: Samples from longitudinal direction,
 Samples 2, 4 and 6: Samples from transversal direction;

| Specifications in accordance with DIN 4102-1 | | Test results | | | | | |
|--|-----|--------------|----------|-----|--------|-----|-------------|
| | | Sample no. | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Ignition | s | 1 | 1 | 1 | 1 | 1 | 1 |
| Highest flame height | mm | 50 | 60 | 40 | 60 | 40 | 50 |
| Time of occurrence | s | 10 | 12 | 4 | 12 | 3 | 3 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 17 | 17 | 16 | 17 | 17 | 8 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 55 mm and at the bottom edge up to a maximum width of 15 mm. A burning dropping / dripping did not occur. | | | | | | | |
| Development of smoke (visual): | low | | moderate | | strong | | very strong |

./.

No occurrence of the event.



Table 7: 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 Object upholstery fabrics: "NIROXX Classic & Stripes"

Samples 1 and 2: edge flame impingement, Flaming of the back, colour: red,
 Samples 3 and 4: edge flame impingement, Flaming of the back, colour: grey,
 Samples 5 and 6: edge flame impingement, Flaming of the back, colour: black,
 Samples 7 and 8: surface flame impingement, Flaming of the front, colour: grey,
 Samples 1, 3, 5 and 7: Samples from longitudinal direction,
 Samples 2, 4, 6 and 8: Samples from transversal direction;

| 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 | 60 | 50 | 100 | 60 | 90 | 60 | 60 | 50 |
| Time of occurrence | s | 14 | 13 | 7 | 8 | 10 | 15 | 6 | 5 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 16 | 16 | 17 | 16 | 17 | 17 | 12 | 12 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 60 mm and at the bottom edge up to a maximum width of 15 mm. A burning dropping / dripping did not occur. | | | | | | | | | |
| Development of smoke (visual): | | low | moderate | strong | very strong | | | | |

./. No occurrence of the event.

Table 8: 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 Object upholstery fabrics: "NIROXX Lamé"

Samples 1 and 2: edge flame impingement, Flaming of the front, colour: red,
 Samples 3 and 4: edge flame impingement, Flaming of the front, colour: cream,
 Samples 5 and 6: edge flame impingement, Flaming of the front, colour: black,
 Samples 7 and 8: surface flame impingement, Flaming of the front, colour: red,
 Samples 1, 3, 5 and 7: Samples from longitudinal direction,
 Samples 2, 4, 6 and 8: Samples from transversal direction;

| 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 | 4 | 4 |
| Highest flame height | mm | 90 | 50 | 60 | 70 | 60 | 50 | 70 | 110 |
| Time of occurrence | s | 8 | 6 | 13 | 7 | 5 | 6 | 9 | 11 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 17 | 14 | 16 | 10 | 17 | 15 | 16 | 17 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 60 mm and at the bottom edge up to a maximum width of 20 mm. A burning dropping / dripping did not occur. | | | | | | | | | |
| Development of smoke (visual): | | low | moderate | strong | very strong | | | | |

./. No occurrence of the event.



Table 9: Ignitability test in accordance with DIN 4102-1, section 6.2.5.2 (edge flame impingement) with Object upholstery fabrics: "NIROXX Lamé"

Samples 1 and 2: edge flame impingement, Flaming of the back, colour: cream,
 Samples 3 and 4: edge flame impingement, Flaming of the back, colour: red,
 Samples 5 and 6: edge flame impingement, Flaming of the back, colour: black,
 Samples 1, 3 and 5: Samples from longitudinal direction,
 Samples 2, 4 and 6: Samples from transversal direction;

| Specifications in accordance with DIN 4102-1 | | Test results | | | | | |
|---|----|--------------|----------|--------|-------------|-----|-----|
| | | Sample no. | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Ignition | s | 1 | 1 | 1 | 1 | 1 | 1 |
| Highest flame height | mm | 50 | 50 | 50 | 80 | 50 | 50 |
| Time of occurrence | s | 4 | 7 | 5 | 12 | 5 | 5 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 17 | 17 | 16 | 17 | 16 | 16 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 110 mm and at the bottom edge up to a maximum width of 30 mm. A burning dropping / dripping did not occur. | | | | | | | |
| Development of smoke (visual): | | low | moderate | strong | very strong | | |

./. No occurrence of the event.

Table 10: Ignitability test in accordance with DIN 4102-1, section 6.2.5.2 (edge flame impingement) with Object upholstery fabrics: "NIROXX Ultra"

Samples 1 and 2: edge flame impingement, Flaming of the front, colour: red,
 Samples 3 and 4: edge flame impingement, Flaming of the front, colour: beige,
 Samples 5 and 6: edge flame impingement, Flaming of the front, colour: black,
 Samples 1, 3 and 5: Samples from longitudinal direction,
 Samples 2, 4 and 6: Samples from transversal direction;

| Specifications in accordance with DIN 4102-1 | | Test results | | | | | |
|--|----|--------------|----------|--------|-------------|-----|-----|
| | | Sample no. | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Ignition | s | 1 | 1 | 1 | 1 | 1 | 1 |
| Highest flame height | mm | 60 | 50 | 50 | 50 | 70 | 100 |
| Time of occurrence | s | 11 | 12 | 7 | 8 | 9 | 9 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 17 | 17 | 16 | 18 | 17 | 17 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 50 mm and at the bottom edge up to a maximum width of 20 mm. A burning dropping / dripping did not occur. | | | | | | | |
| Development of smoke (visual): | | low | moderate | strong | very strong | | |

./. No occurrence of the event.



Table 11: 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 Object upholstery fabrics: "NIROXX Ultra"

Samples 1 and 2: edge flame impingement, Flaming of the back, colour: red,
 Samples 3 and 4: edge flame impingement, Flaming of the back, colour: beige,
 Samples 5 and 6: edge flame impingement, Flaming of the back, colour: black,
 Samples 7 and 8: surface flame impingement, Flaming of the front, colour: black,
 Samples 1, 3, 5 and 7: Samples from longitudinal direction,
 Samples 2, 4, 6 and 8: Samples from transversal direction;

| 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 | 40 | 50 | 40 | 100 | 70 | 120 | 100 |
| Time of occurrence | s | 16 | 16 | 4 | 8 | 8 | 7 | 10 | 8 |
| Flame tip at measuring mark | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| Flame dies before reaching the measuring mark | s | 16 | 16 | 16 | 16 | 12 | 16 | 16 | 9 |
| Continues to burn after end of test | s | ./. | ./. | ./. | ./. | ./. | ./. | ./. | ./. |
| 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 occurred after 10 seconds. This is not burning dropping (dripping) according to DIN 4102 1 section 6.2.6.1. | | | | | | | | | |
| 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.

6 Assessment

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

The multi-layer object upholstery fabrics with the designations "NIROXX Classic & Stripes", "NIROXX Lamé" and "NIROXX Ultra" with sample thicknesses of approx. 0.45 - 0.70 mm and surface weights of approx. 0.29 – 0.43 kg/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 flaming dripping (dropping).

The tested building product can thus be classified in building material class B1 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 class B1 building material, the material must not be exposed to outdoor weathering for more than 2 years.
- This assessment applies to materials in any colour.



- The building product must be flame-retardant according to the data deposited with MFPA Leipzig.

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

The multi-layer object upholstery fabrics with the designations "NIROXX Classic & Stripes", "NIROXX Lamé" and "NIROXX Ultra" with sample thicknesses of approx. 0.45 - 0.70 mm and surface weights of approx. 0.29 – 0.43 kg/m² fulfilled the requirements for building materials of building material class B2 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 did not produce flaming particles (droplets).

7 Notes

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

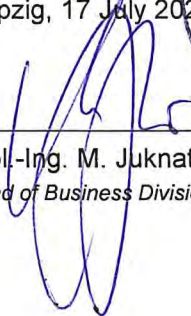
The test report does not replace a general appraisal verification certificate of usability that may be required according to German construction supervision procedures. It only serves as a basis for the issue of a general appraisal verification certificate.

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


The validity of this test Certificate will expire on 16. July 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.

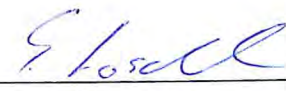
Leipzig, 17 July 2020



Dipl.-Ing. M. Juknat
Head of Business Division



N. Neumann, M.Sc.
Head of Laboratory



S. Laschke, M.Sc.
Testing Engineer

Enclosure 1: Photo of the damage to the Brandschacht samples

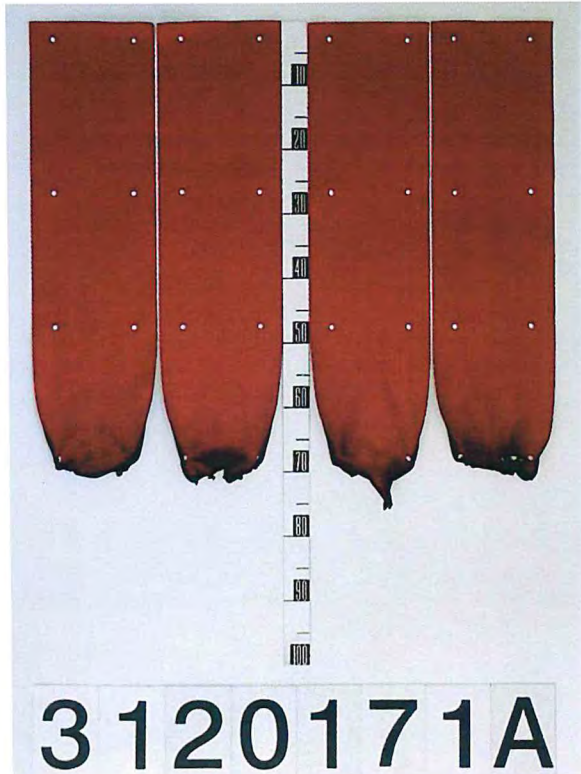


Photo 1: Damage to the Brandschacht samples:
Sample A "NIROXX Classic & Stripes"

Sample thickness: approx. 0.55 mm,
Mass per area: approx. 0.33 kg/m²,
Samples from longitudinal direction,
Front exposed to fire,
Freely hanging sample arrangement.

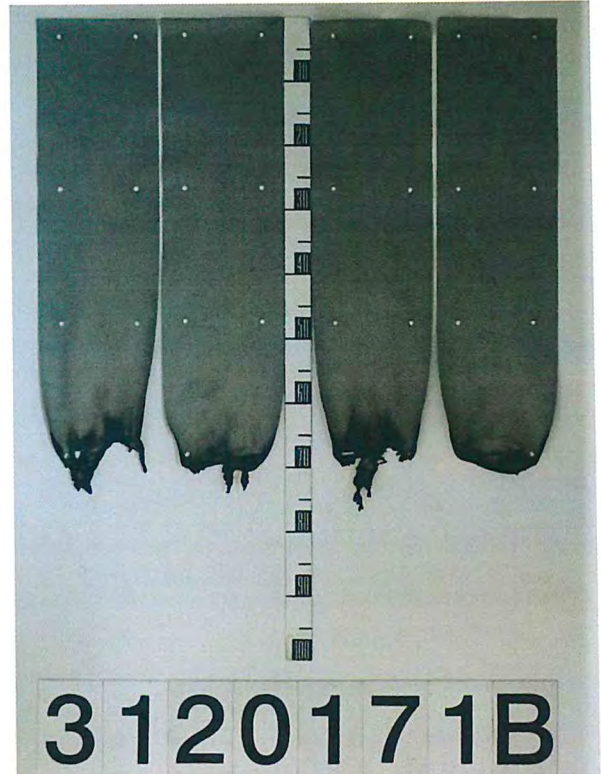
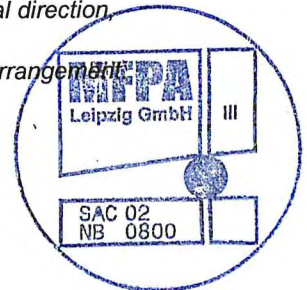


Photo 2: Damage to the Brandschacht samples:
Sample B "NIROXX Classic & Stripes"

Sample thickness: approx. 0.50 mm,
Mass per area: approx. 0.33 kg/m²,
Samples from longitudinal direction,
Front exposed to fire,
Freely hanging sample arrangement.



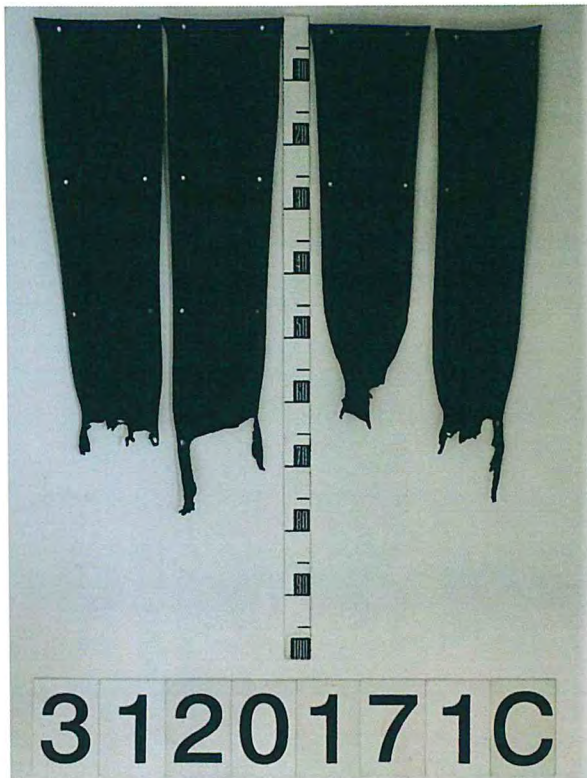


Photo 3: Damage to the Brandschacht samples:
Sample C "NIROXX Classic & Stripes"

Sample thickness: approx. 0.45 mm,
Mass per area: approx. 0.29 kg/m²,
Samples from longitudinal direction,
Front exposed to fire,
Freely hanging sample arrangement.

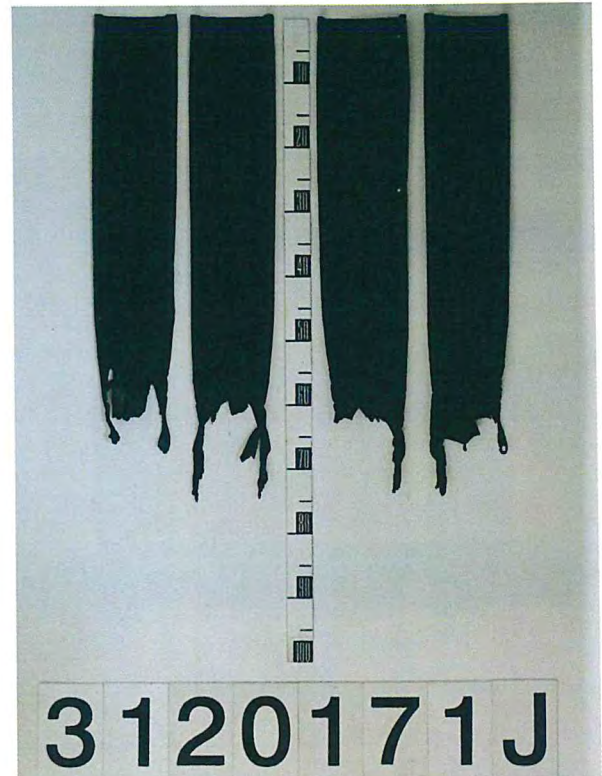
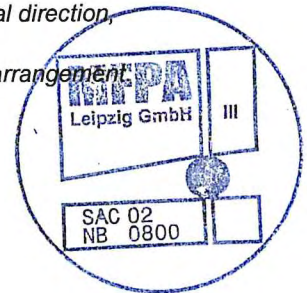


Photo 4: Damage to the Brandschacht samples:
Sample J "NIROXX Classic & Stripes"

Sample thickness: approx. 0.45 mm,
Mass per area: approx. 0.29 kg/m²,
Samples from transversal direction,
Front exposed to fire,
Freely hanging sample arrangement.



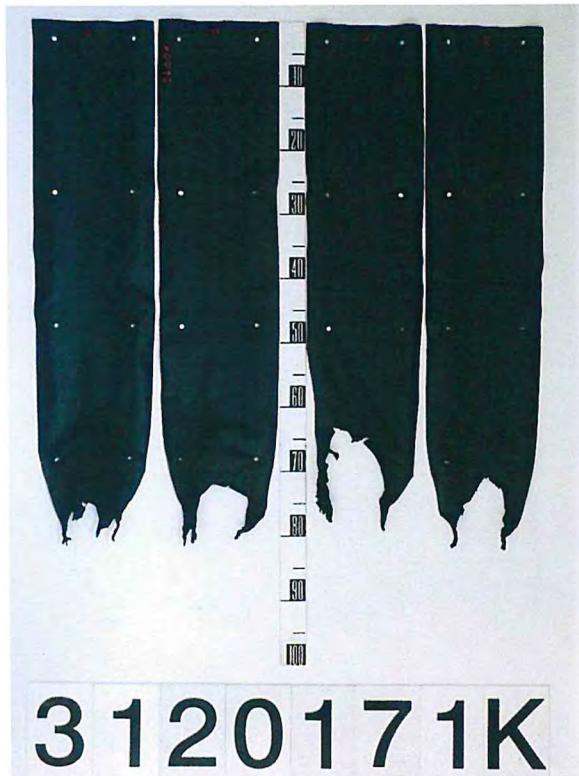


Photo 5: Damage to the Brandschacht samples:
Sample K "NIROXX Classic & Stripes"

Sample thickness: approx. 0.45 mm,
Mass per area: approx. 0.29 kg/m²,
Samples from transversal direction,
Back exposed to fire,
Freely hanging sample arrangement.

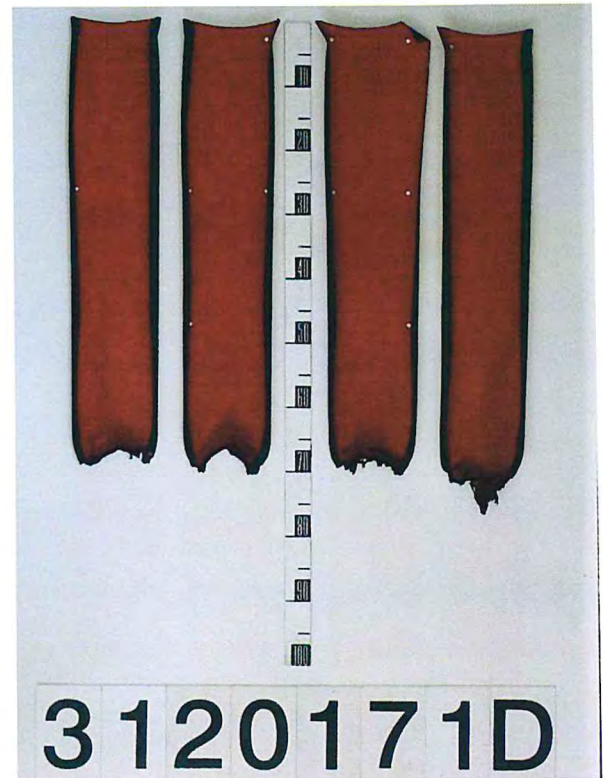
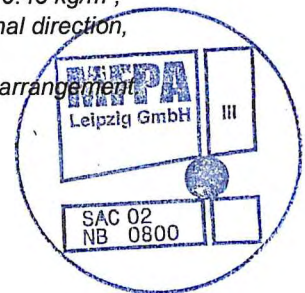
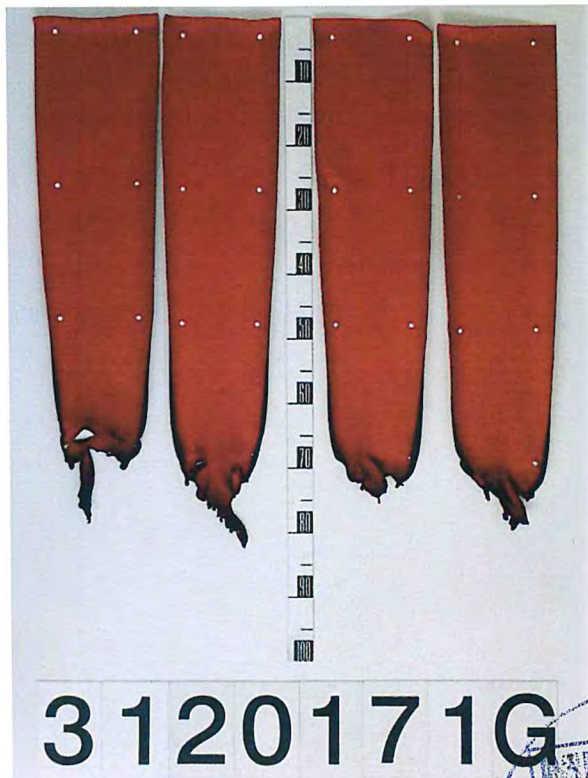


Photo 6: Damage to the Brandschacht samples:
Sample D "NIROXX Lamé"

Sample thickness: approx. 0.65 mm,
Mass per area: approx. 0.43 kg/m²,
Samples from longitudinal direction,
Front exposed to fire,
Freely hanging sample arrangement.





3 1 2 0 1 7 1 G

Photo 7: Damage to the Brandschacht samples:
Sample D "NIROXX Ultra"

Sample thickness: approx. 0.55 mm,
Mass per area: approx. 0.38 kg/m²,
Samples from longitudinal direction,
Front exposed to fire,
Freely hanging sample arrangement.



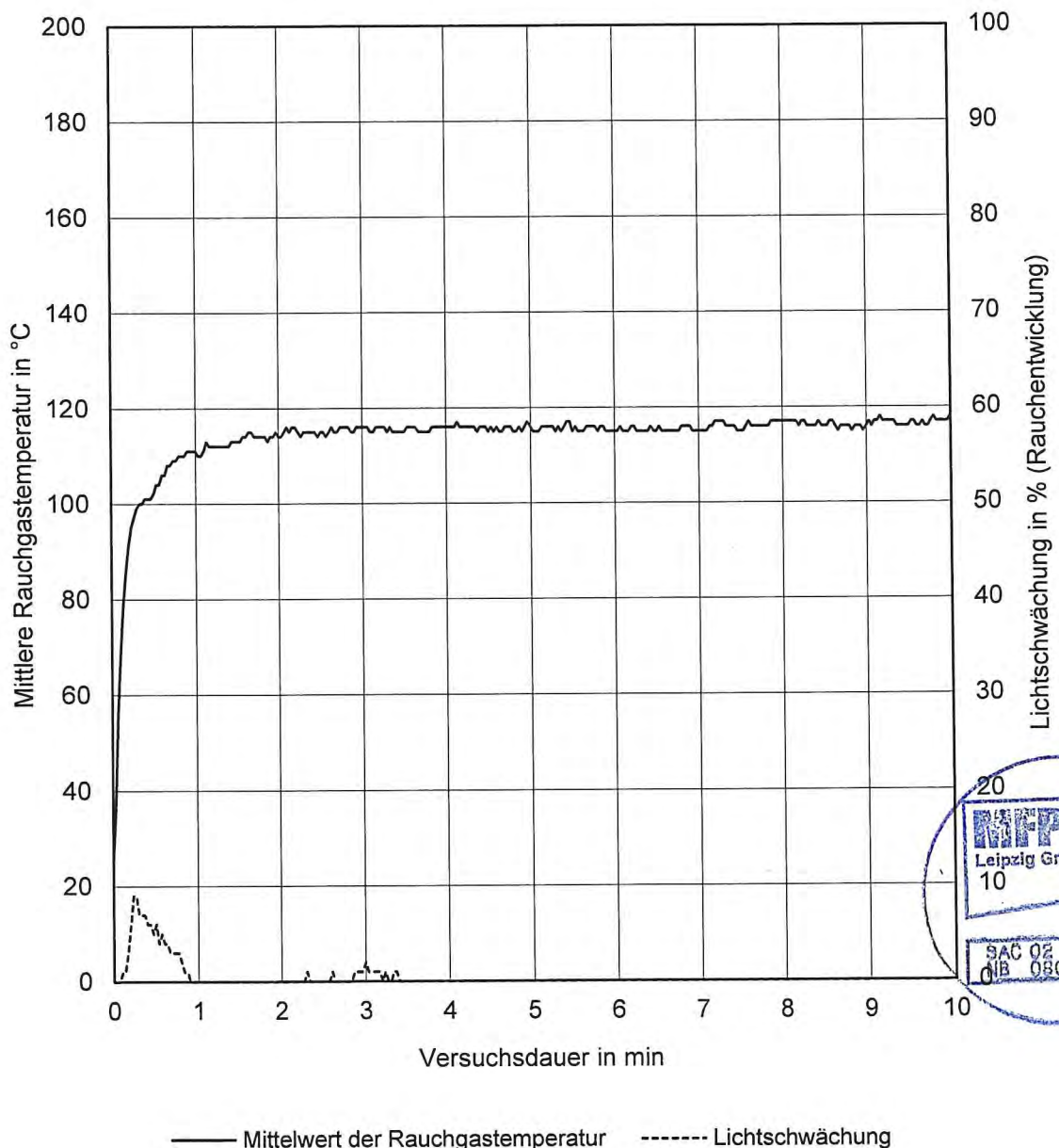
Enclosure 2: Diagrams and characteristic values of the tests in the Brandschacht in accordance with DIN 4102-1

Rauchgastemperaturen und Rauchentwicklung Brandschachtversuch am 08.07.2020

Probekörper A: Objektbezugsstoff: „NIROXX Classic & Stripes“, Farbe: rot
Dicke: ca. 0,55 mm; Flächenmasse: ca. 0,33 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 118 °C nach 9:10 min:s
Flächenintegral der Rauchdichte: 4 %min

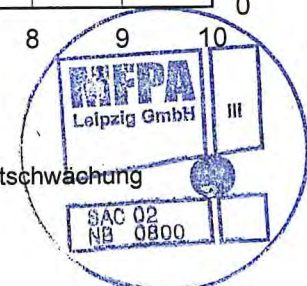
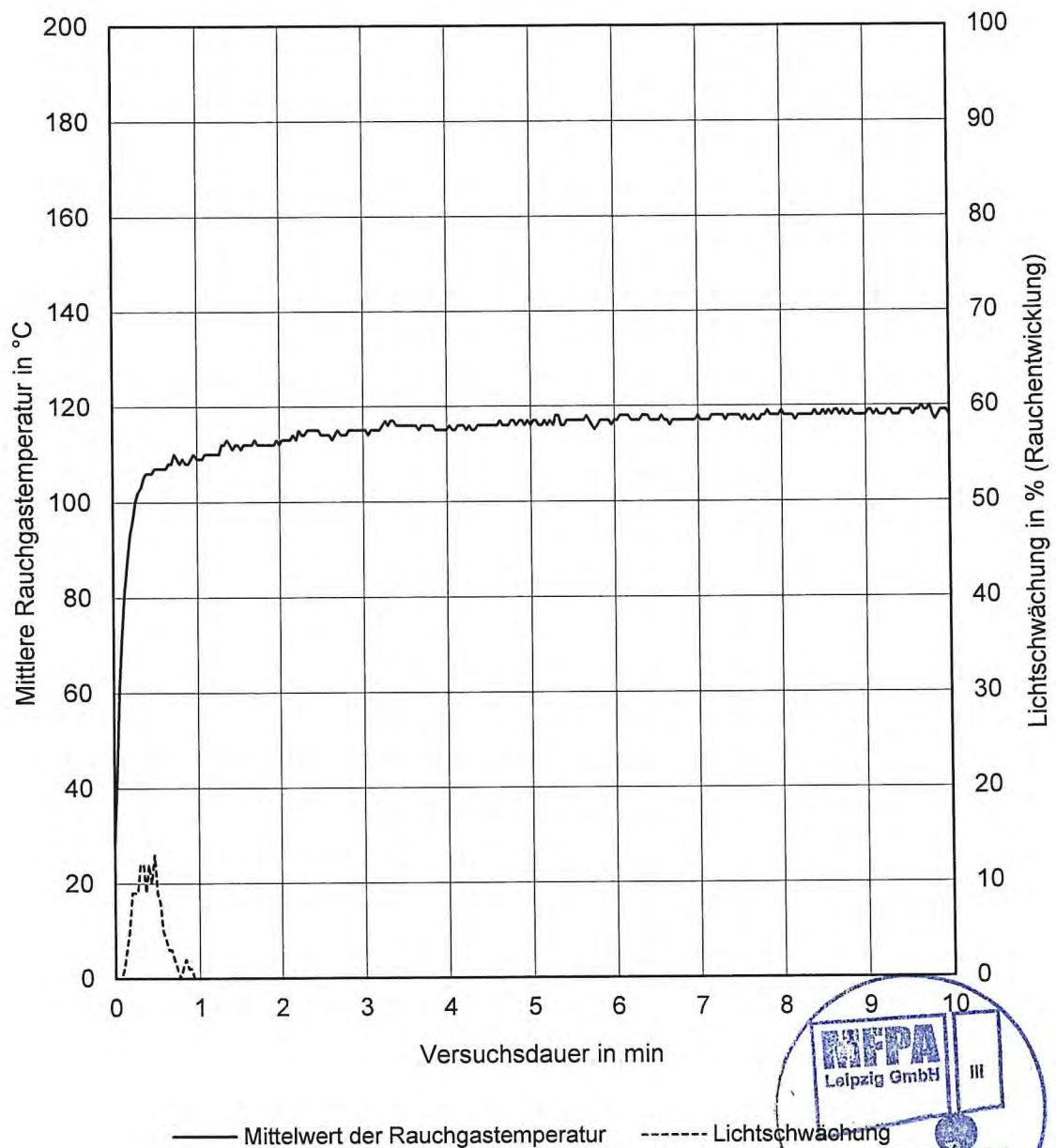


Rauchgastemperaturen und Rauchentwicklung Brandschachtversuch am 08.07.2020

Probekörper B: Objektbezugsstoff: „NIROXX Classic & Stripes“, Farbe: grau
Dicke: ca. 0,50 mm; Flächenmasse: ca. 0,33 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 120 °C nach 9:40 min:s
Flächenintegral der Rauchdichte: 5 %min

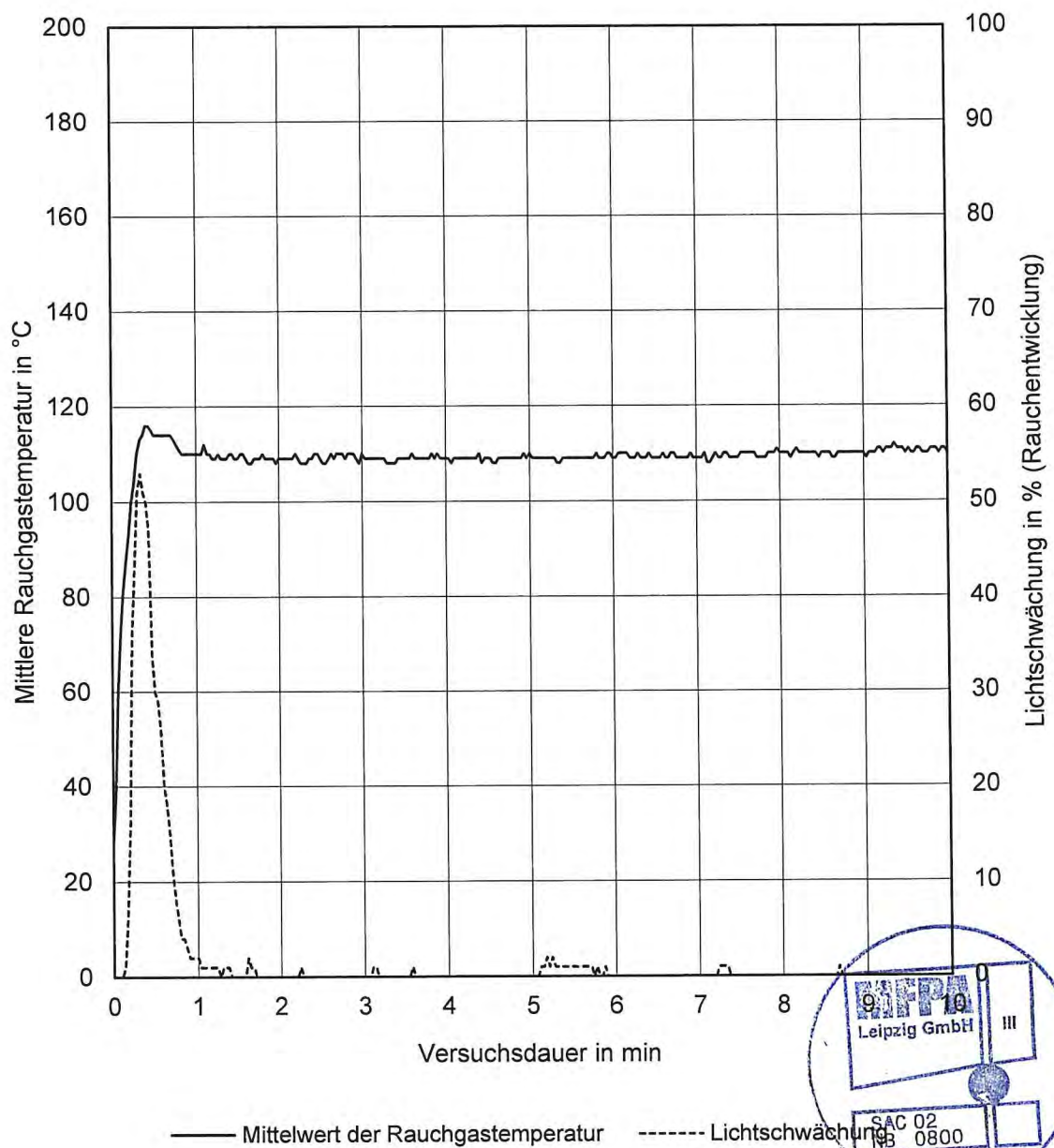


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 08.07.2020

Probekörper C: Objektbezugsstoff: „NIROXX Classic & Stripes“, Farbe: schwarz
Dicke: ca. 0,45 mm; Flächenmasse: ca. 0,30 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 116 °C nach 0:24 min:s
Flächenintegral der Rauchdichte: 21 %min

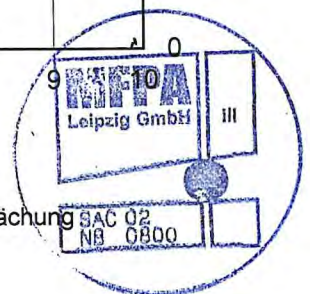
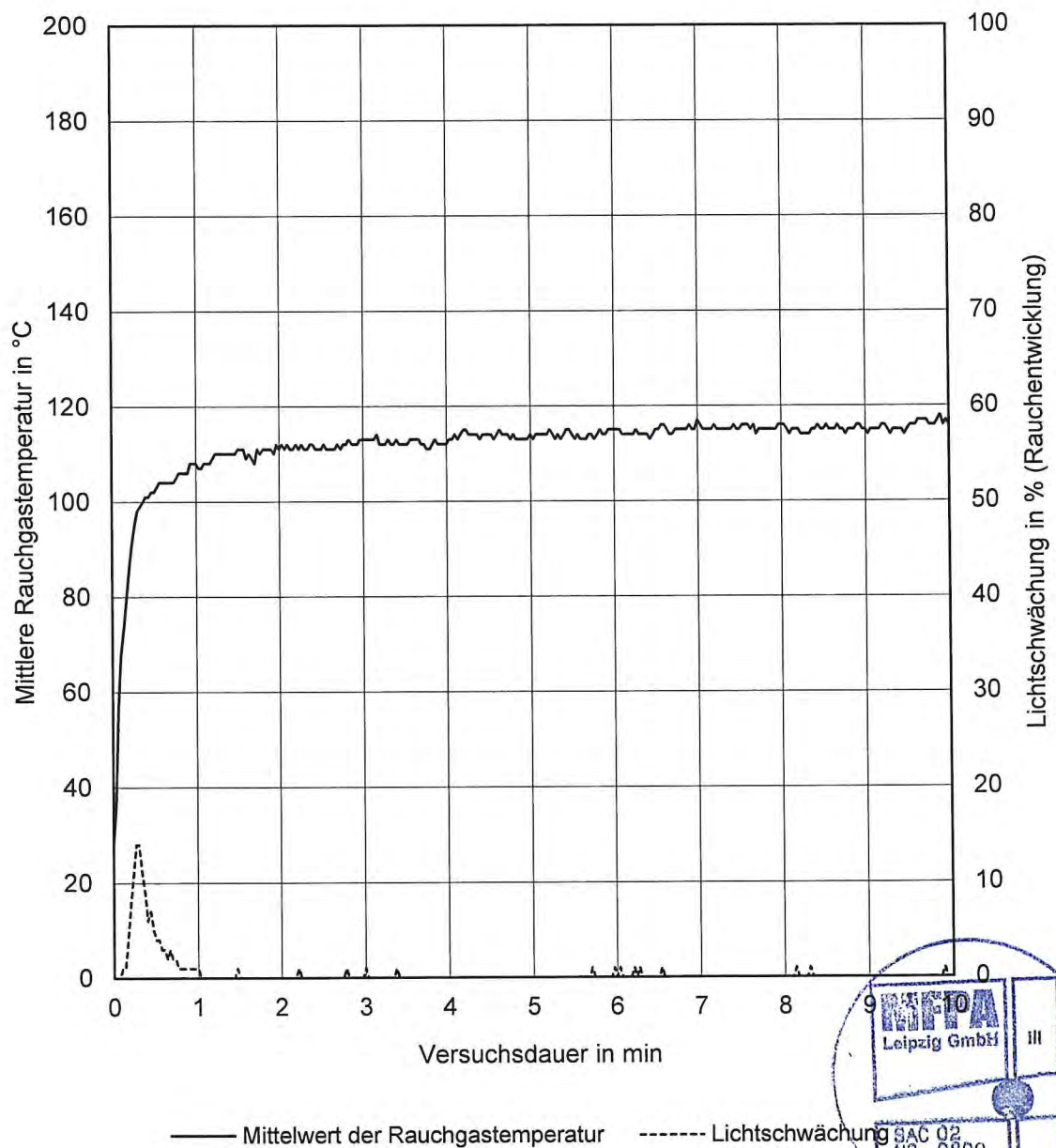


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 10.07.2020

Probekörper D: Objektbezugsstoff: „NIROXX Lamé“, Farbe: rot
Dicke: ca. 0,65 mm; Flächenmasse: ca. 0,43 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 118 °C nach 9:54 min:s
Flächenintegral der Rauchdichte: 5 %min

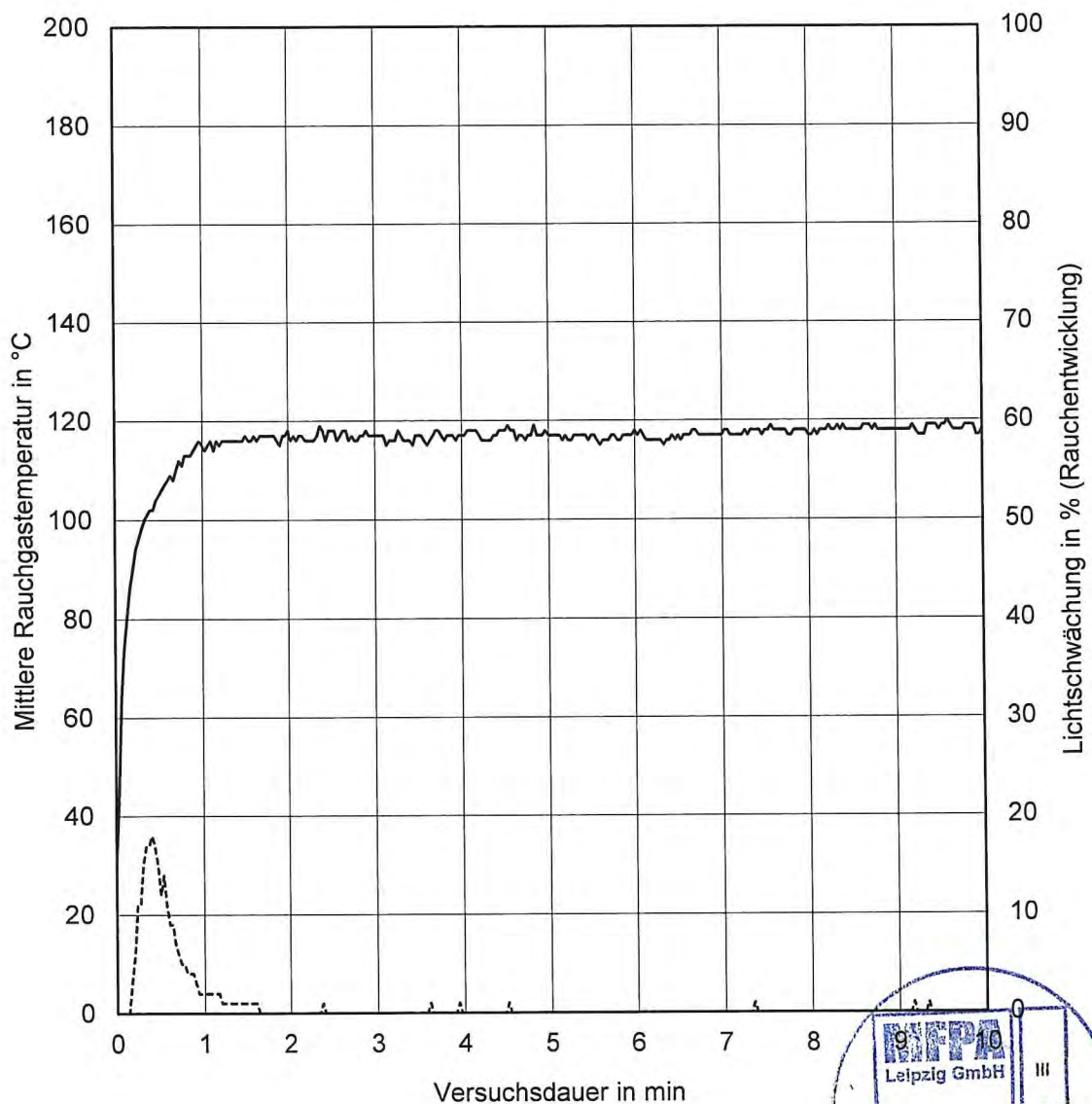


Rauchgastemperaturen und Rauchentwicklung Brandschachtversuch am 10.07.2020

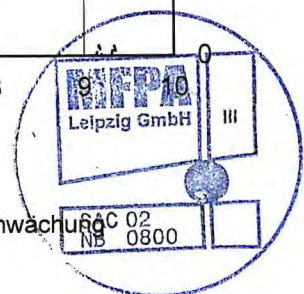
Probekörper E: Objektbezugsstoff: „NIROXX Lamé“, Farbe: beige
Dicke: ca. 0,70 mm; Flächenmasse: ca. 0,41 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 120 °C nach 9:36 min:s
Flächenintegral der Rauchdichte: 9 %min



— Mittelwert der Rauchgastemperatur - - - - - Lichtschwächung

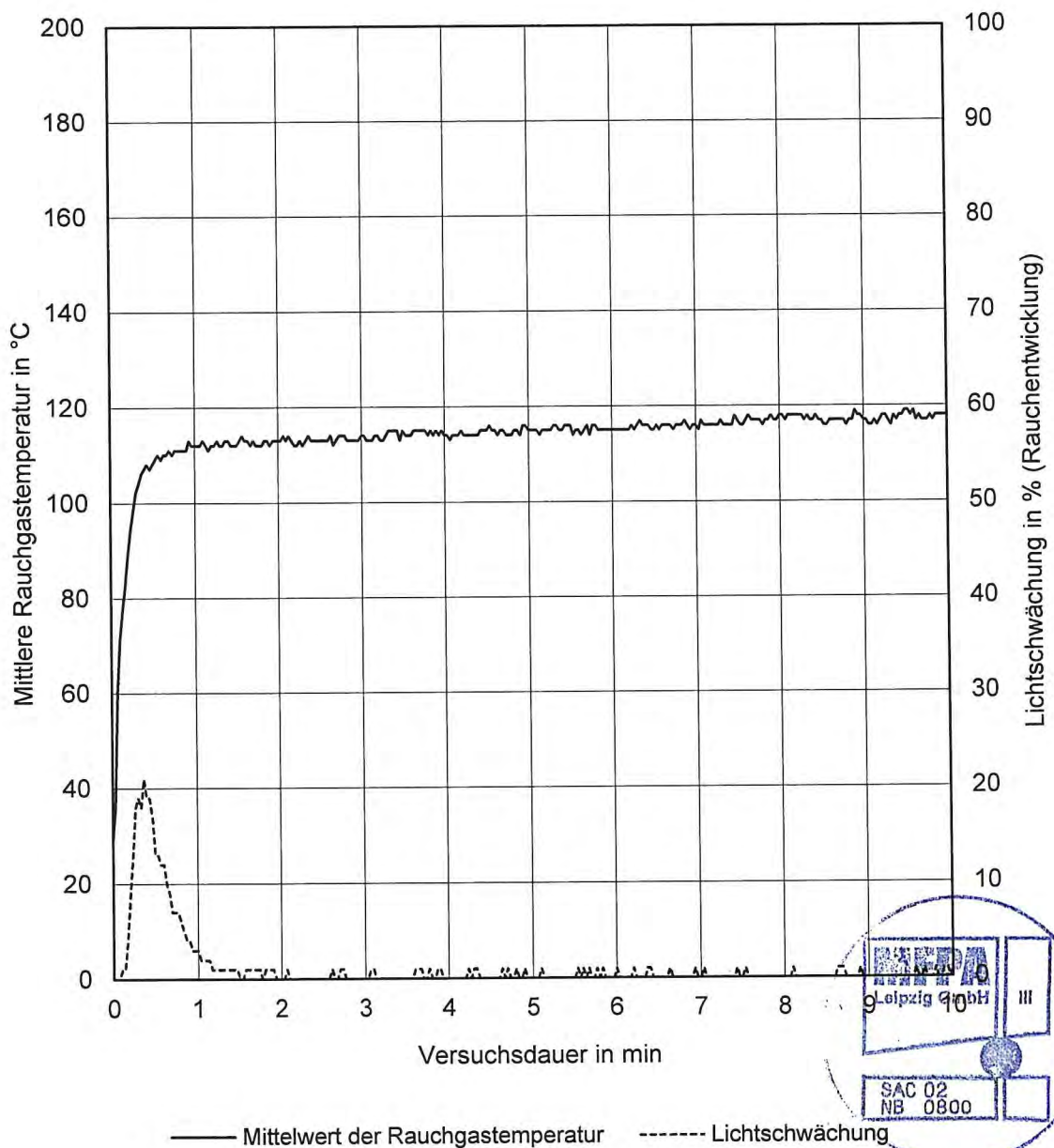


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 10.07.2020

Probekörper F: Objektbezugsstoff: „NIROXX Lamé“, Farbe: schwarz
Dicke: ca. 0,75 mm; Flächenmasse: ca. 0,43 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 119 °C nach 8:54 min:s
Flächenintegral der Rauchdichte: 12 %min

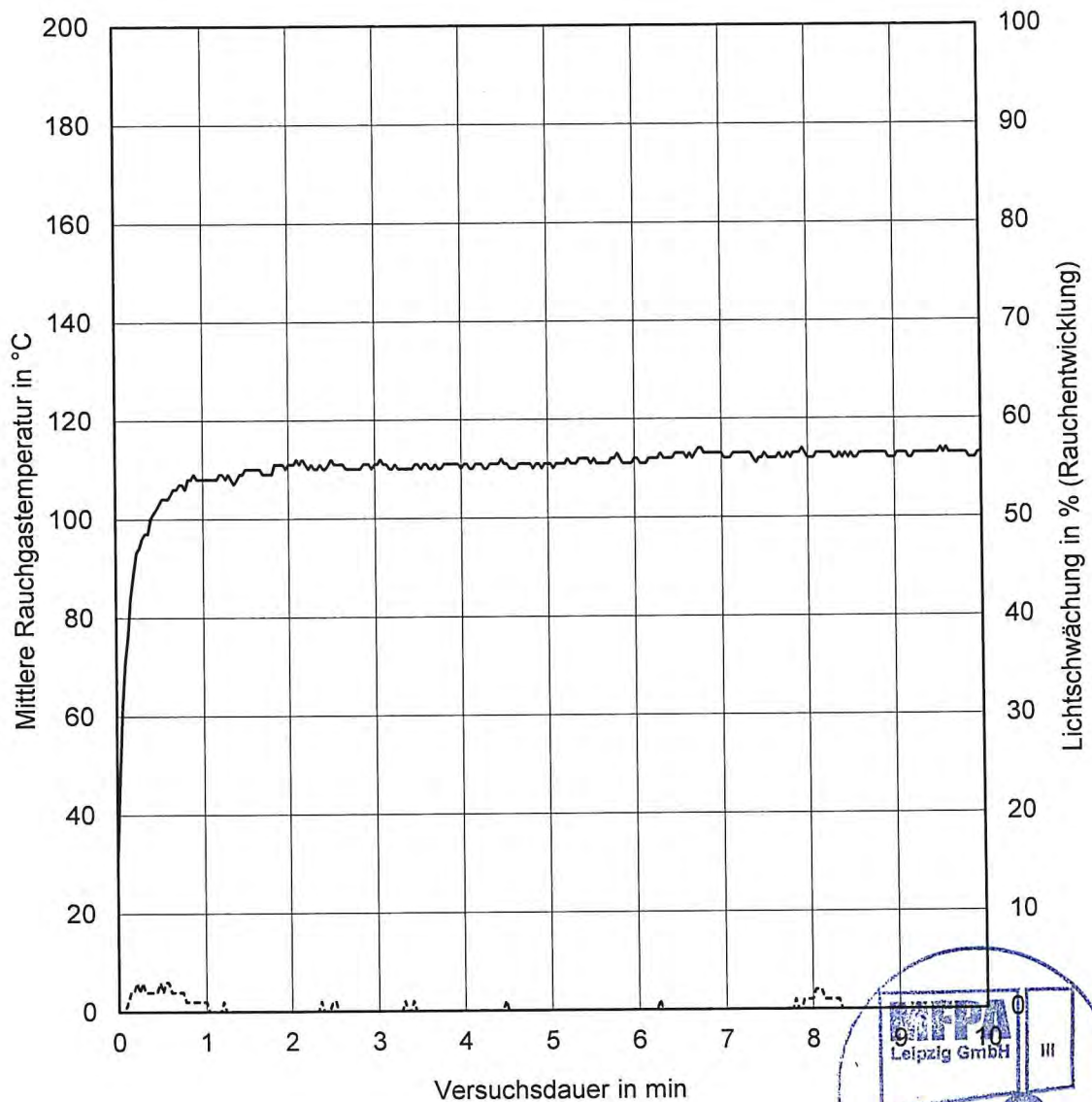


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 10.07.2020

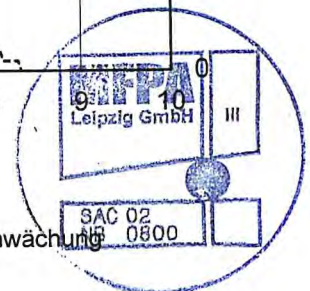
Probekörper G: Objektbezugsstoff: „NIROXX Ultra“, Farbe: rot
Dicke: ca. 0,55 mm; Flächenmasse: ca. 0,38 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 114 °C nach 6:44 min:s
Flächenintegral der Rauchdichte: 3 %min



— Mittelwert der Rauchgastemperatur - - - - - Lichtschwächung

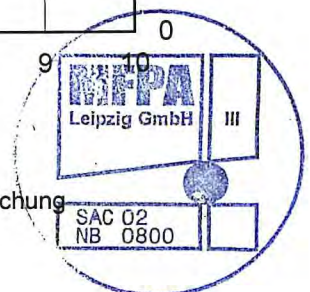
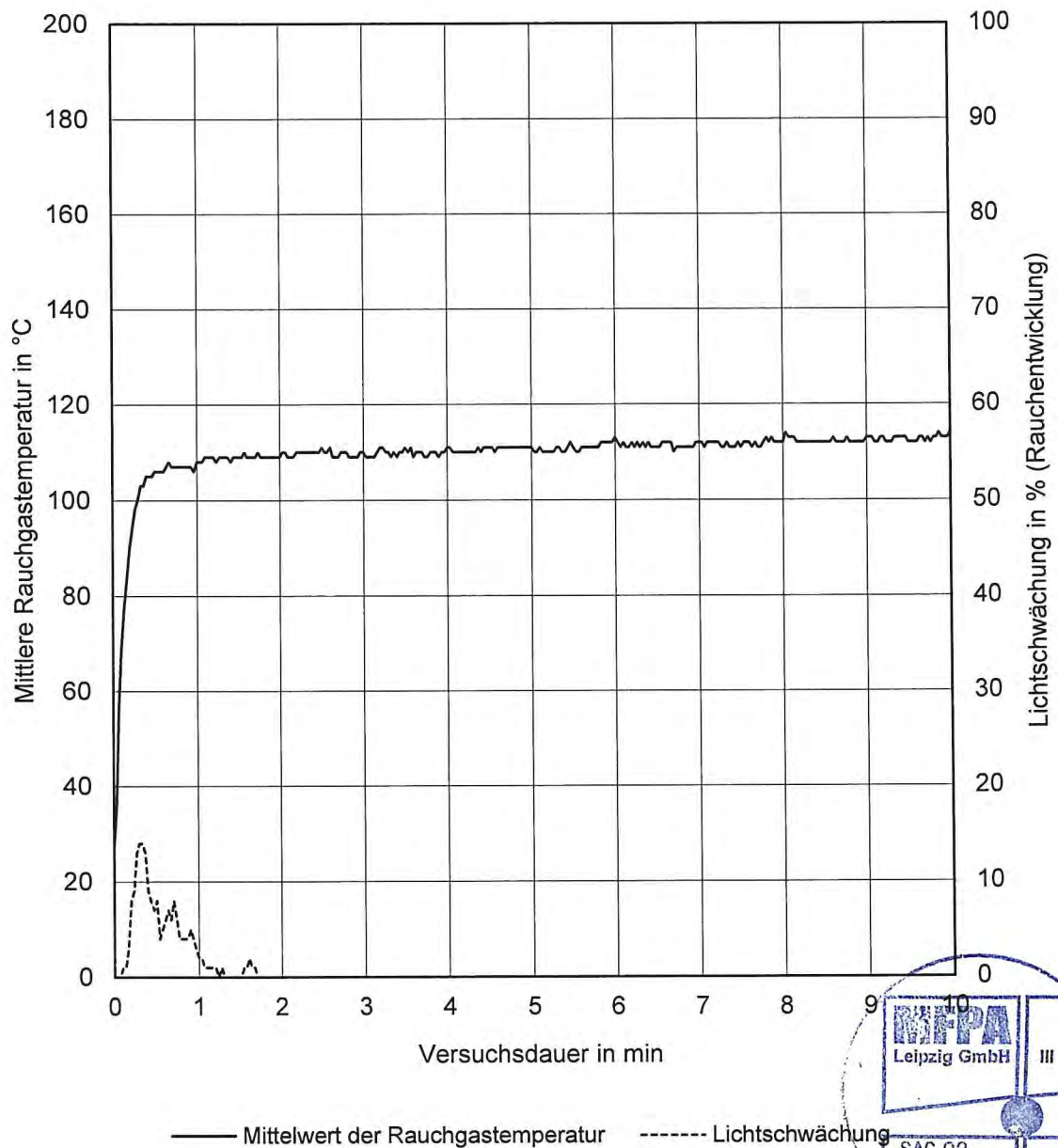


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 17.07.2020

Probekörper H: Objektbezugsstoff: „NIROXX Ultra“, Farbe: beige
Dicke: ca. 0,55 mm; Flächenmasse: ca. 0,42 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 114 °C nach 8:02 min:s
Flächenintegral der Rauchdichte: 6 %min

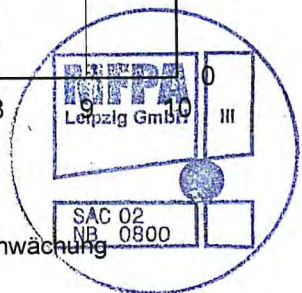
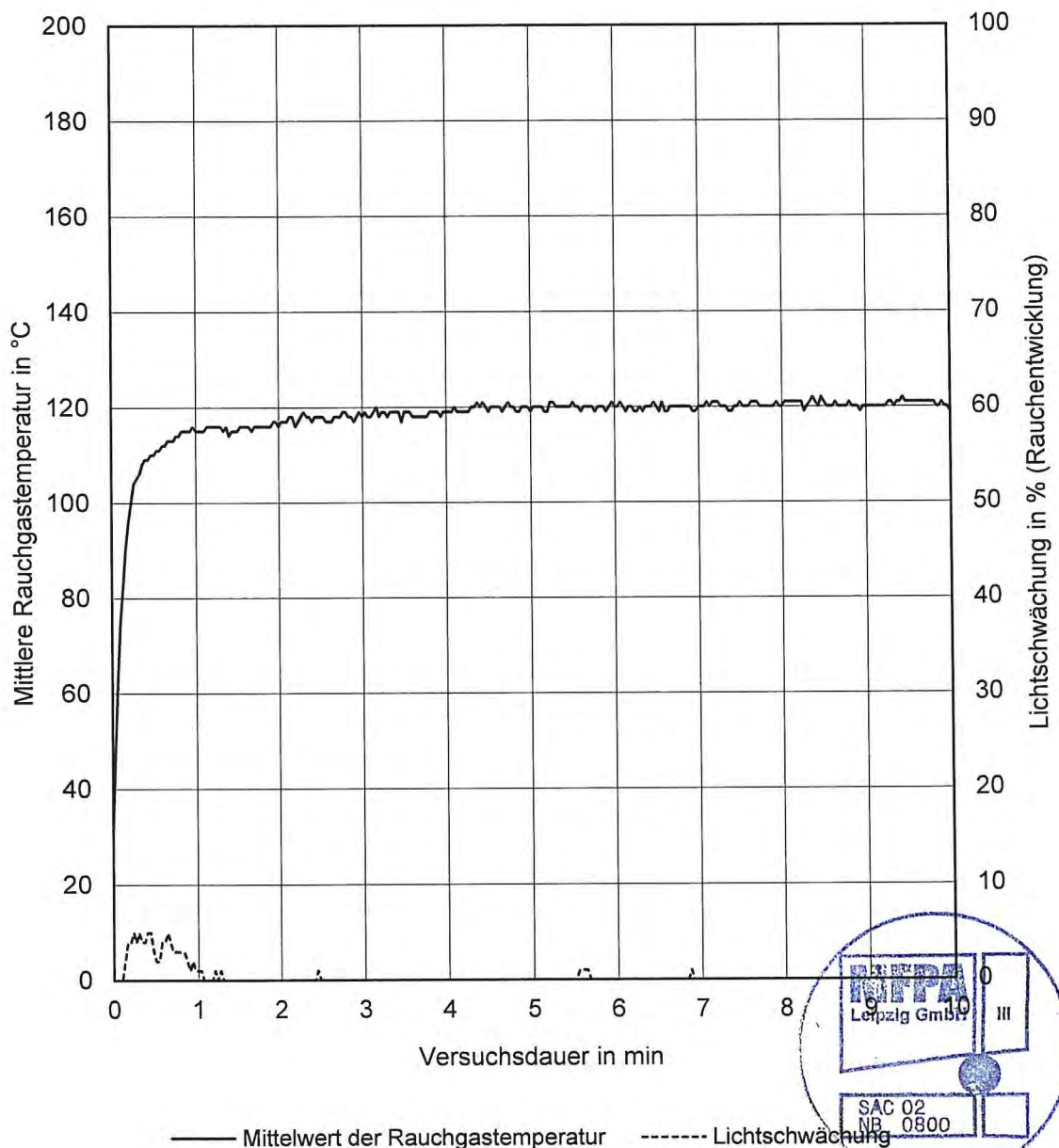


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 17.07.2020

Probekörper I: Objektbezugsstoff: „NIROXX Ultra“, Farbe: schwarz
Dicke: ca. 0,60 mm; Flächenmasse: ca. 0,38 kg/m²
Probenanordnung: Freihängend, Längsrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 122 °C nach 8:22 min:s
Flächenintegral der Rauchdichte: 3 %min

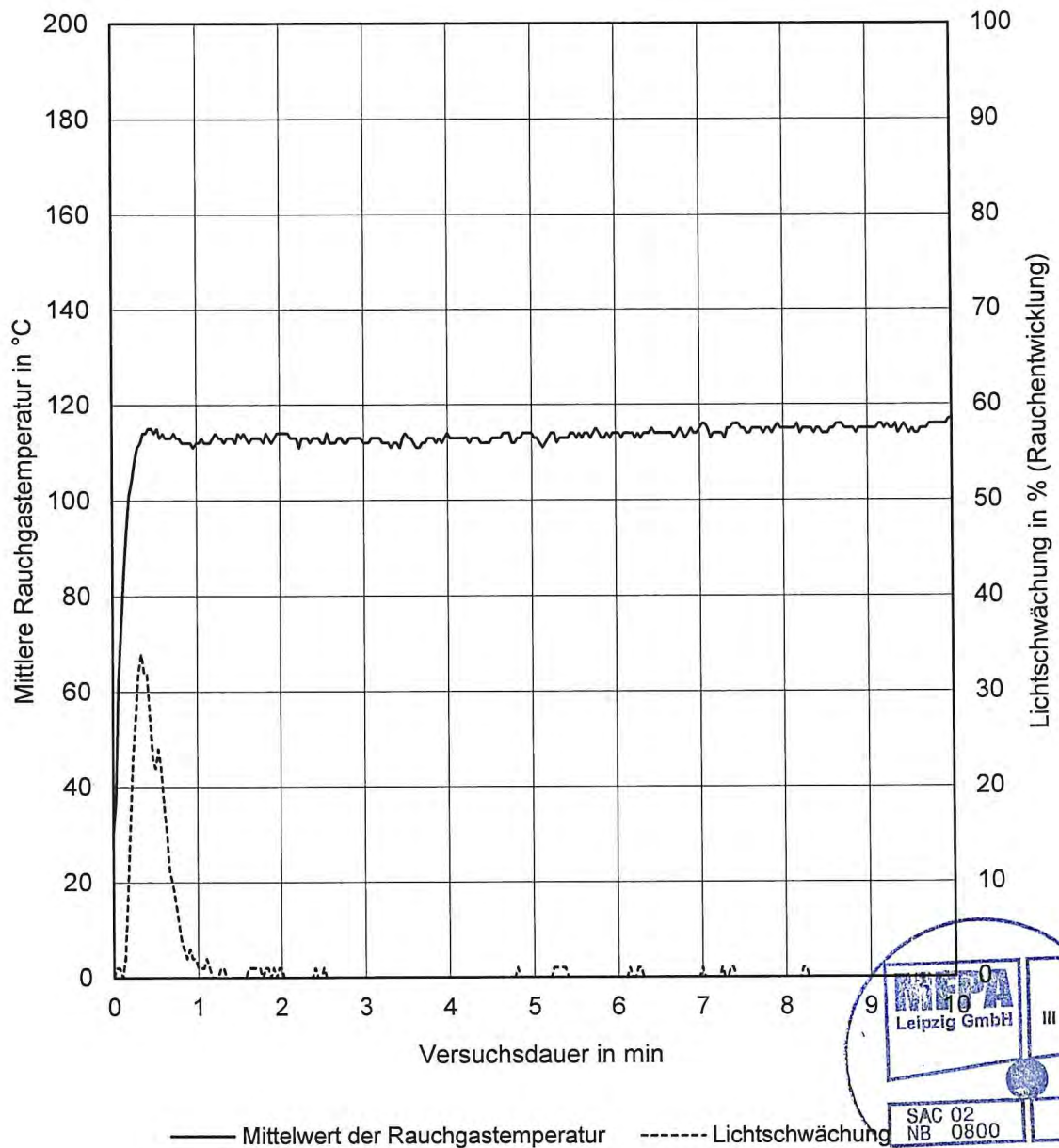


Rauchgastemperaturen und Raumentwicklung Brandschachtversuch am 17.07.2020

Probekörper J: Objektbezugsstoff: „NIROXX Classic & Stripes“, Farbe: schwarz
Dicke: ca. 0,45 mm; Flächenmasse: ca. 0,30 kg/m²
Probenanordnung: Freihängend, Querrichtung, Beflammung der Vorderseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 117 °C nach 9:58 min:s
Flächenintegral der Rauchdichte: 15 %min

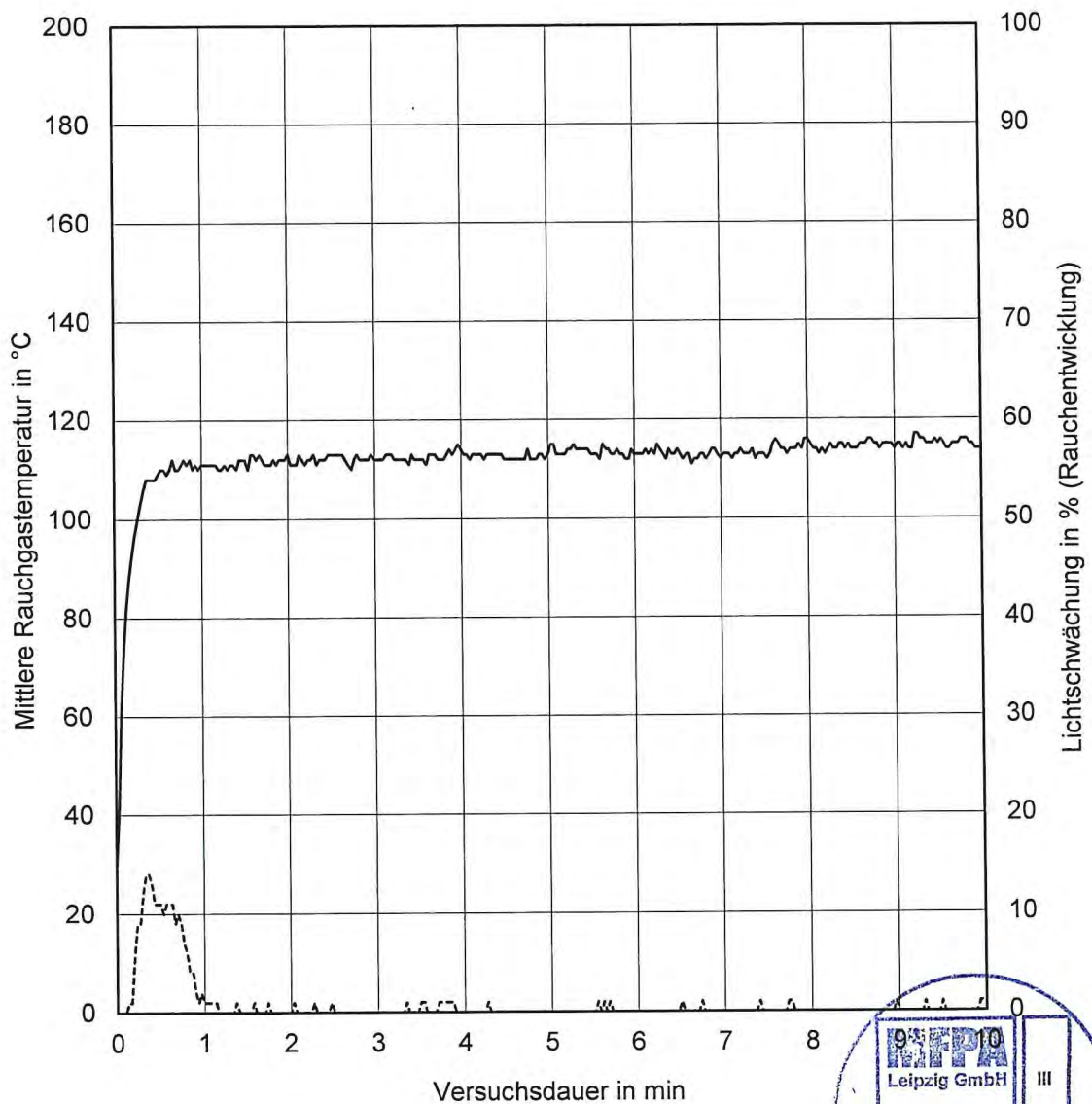


Rauchgastemperaturen und Rauchentwicklung
Brandschachtversuch am 17.07.2020

Probekörper K: Objektbezugsstoff: „NIROXX Classic & Stripes“, Farbe: schwarz
Dicke: ca. 0,45 mm; Flächenmasse: ca. 0,30 kg/m²
Probenanordnung: Freihängend, Querrichtung, Beflammung der Rückseite

Versuch abgebrochen nach: ./.

Maximum der mittleren Rauchgastemperatur: 117 °C nach 9:14 min:s
Flächenintegral der Rauchdichte: 8 %min



— Mittelwert der Rauchgastemperatur - - - - - Lichtschwächung

