

for the proof of fire behaviour according to DIN 4102-1

Reference: FLT 3693419 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor:  **NONSTOP**
PRINTING

Order: 2019-05-07 **Arrived:** 2019-05-10

Test material: On one side coated polyester fabric, named "Mercury NQ".
(for details see page 2)

Delivered: 2019-05-10

Content of request: Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1

Assessment: The examined product meets the requirements of class B1 for not easily flammable ("schwerentflammbare") building materials according to DIN 4102-1. If used in one layer, suspended freely or with distance of > 40 mm to same or other plain materials.
(for details see page 5)

Validity: 2024-05-31

Sampling: The sample was sent to the laboratory by the sponsor.

Remark: If the above-mentioned building material is not used as product according to MBO § 2, there is no need for a general building supervisory test certificate.
This test certificate is not valid if the examined building material is used as product in the meaning of state building prescriptions (MBO § 17).

This test certificate does not replace an eventually necessary proof of applicability concerning building supervisory or building laws in the meaning of state building prescriptions.
This has to be verified by:

- "allgemeine bauaufsichtliche Zulassung" (general building inspectorate approval) or by
- "allgemeines bauaufsichtliches Prüfzeugnis" (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall" (exceptional approval).

This test certificate can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

This test certificate comprises 5 pages and 3 appendices.

Approved testing, inspection and certification body

This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents. Agreement of the test laboratory has to be given in any case if norms in which the tests are based or other technical standards have changed.


FIRE
LABS

Prüfstelle für das
Brandverhalten
von Baustoffen
Dipl.-Ing. Uwe Kühnast

Steinstrasse 18
D - 14822 Borkheide
Fon: +49 33845 90901
Fax: +49 33845 90909
Mail: info@firelabs.de

PÜZ-Stelle (LBO): BRA09

TEST CERTIFICATE



1 Description of test material

1.1 Test material (according to the sponsor)

The material delivered is a fabric made of polyester with a one-sided coating made of flame-retardant treated polyurethane. The coated fabric is intended to be used indoor as printable banner material or for decorative purposes and was named with the trade name "Mercury NQ", article-no. F924FR06.

1.2 Description of the delivered samples

For the tests the laboratory received a sample of a one-sided plastic coated fabric made of synthetic fibres. The sample was approx. 5 m long and 1.50 m wide and was labelled with Mercury NQ 180 FR, item F924FR06/SR-100 and batch 181491/R5/SRA.

Colour: white fabric, white coating

Characteristic values: see paragraph 4.1; Photos: see enclosures 1, 2

Further details are not known to the laboratory, a retain sample has been deposited.

2 Preparation of samples

For the small burner ("Brennkasten") tests samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) have been cut in warp and in weft orientation of the fabric.

For the fire shaft ("Brandschacht") tests 4 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A and C were cut in warp orientation; the samples for the test specimen B and D were cut in weft orientation of the fabric.

Afterwards all samples were kept in a climate chamber acc. DIN 50014-23/50-2 until they reached constant weight.

3 Arrangement of samples

The tests in the fire shaft test ("Brandschacht") have been performed acc. DIN 4102-1 and -16 (building materials class B1). The small burner tests ("Brennkasten") have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).

All tests were carried out single-layered, suspended freely, from the front and the rear side of the coated fabric.

Period of testing: Juni 2019

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2 ("Brennkasten")
- section 4.2.2 Test results class B1 ("Brandschacht")

4.1 Material characteristics

Table 1

Specific values		Specifications by the sponsor	Measured values	
			m.v.	s
Total thickness	[mm]	0.24	0.23	0.002
Mass per unit area	[g/m ²]	180	171	

m.v. mean value

s standard deviation

./ not received/not measured

4.2 Results of the fire behaviour

4.2.1 Test results class B2 (Brennkasten)

All building materials class B1 must also meet the requirements of materials class B2 (flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements of building materials class B2; the material did not show burning particles/droplets during these tests.

(Results: see enclosure 3)



4.2.2 Test results class B1 (Brandschacht)

Table 3

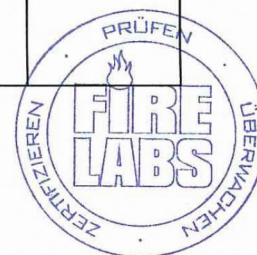
Test results (part 1)						
line no.		Specimen				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	1	1	1	1	
2	<u>Maximal flame height</u> above bottom edge cm	30	30	30	30	*)
3	Time ¹⁾ min	1	1	1	1	
4	<u>Burning / melting through</u> Time ¹⁾min	1	1	1	1	
5	<u>Back side of the specimens:</u> Flames / glowing Time ¹⁾ min	./.	./.	./.	./.	
6	Discolouring Time ¹⁾ min					
7	<u>Falling of burning droplets</u> Begin ¹⁾ min	No	No	No	No	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	<u>Falling of burning parts</u> Begin ¹⁾ min	Yes 1	Yes 1	Yes 1	Yes 1	
11	Extend: Sporadic falling of burning parts	Yes	Yes	Yes	Yes	
12	Continuous falling of burning parts	No	No	No	No	
13	Afterflame time at the bottom of the sieve (max.) min:s	0:04	0:12	0:06	0:07	
14	<u>Impairment of the burner flames by dropping or falling</u> <u>Material</u> Time ¹⁾ min:s	./.	./.	./.	./.	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen ¹⁾ min	2	2	2	2	
16	Time of eventually end of test ¹⁾ min:s	./.	./.	./.	./.	

¹⁾ Indication of time: from the beginning of testing procedure

- Not tested

./. Not occurred

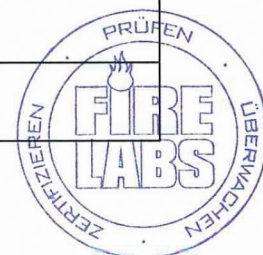
*) No cause for complaint



Test results (part 2)						
line no.		Specimen				requirements
		A	B	C	D	
17	<u>Afterflame after end of test</u> Time min:s	No	No	No	No	
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame length cm					
22	<u>Afterglow after end of test</u> Time min:s	No	No	No	No	
23	Number of specimen					
24	<u>Place of appearance:</u> Lower half of specimen					
25	Upper half of specimen					
26	Front side of specimen					
27	Back side of specimen					
28	<u>Smoke density</u> ≤ 400 % min	3,7	4,6	2,0	2,7	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
31	<u>Residual length</u> Individual value cm	68 64 68 61	69 68 69 67	68 70 69 70	70 72 68 62	> 0
32	Average value cm	65	68	69	68	≥ 15
33	Photo of test specimen fig. no.	2	4	6	8	
34	<u>Flue gas temperature</u> Maximum of average value ...°C	108	113	114	110	≤ 200
35	Time ¹⁾ min:s	9:26	9:16	9:44	9:58	
36	Diagram fig. no.	1	3	5	7	
37	<p><u>Remarks:</u> line 13: Afterflame time at the bottom of the sieve < 20 sec. is not rated as "falling of burning parts or droplets"</p> <p>line 32: Due to the residual length of the samples of > 45 cm, no additional tests were carried out (DIN 4102-16, 5.2 b))</p> <p>(Diagrams and photos see enclosures 1, 2)</p>					

Specimen	Test-no.:	Direction	Side of flame impingement
A	693419-001	warp	coated side
B	693419-002	weft	
C	693419-003	warp	uncoated side
D	693419-004	weft	

1) indication of time: from the beginning of testing procedure
 - not tested
 ./ not occurred
 *) no cause for complaint



5 Assessment

According to the test results in section 4.2 the material, described in section 1 and 4.1, fulfils the requirements of building materials class B1 according to DIN 4102-1 if the material is used suspended freely or with a distance of > 40 mm to the same or other plain materials.

The requirements of building materials class B2 are also fulfilled, no falling of burning parts or droplets occurred during these tests.

The verification

- for outdoor usage (ageing by outdoor weathering)
- after washing or cleaning with chemicals

is not been proved with this test certificate.

6 Special remarks

This test certificate is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or surfaces etc. the burning behaviour may differ.

This test certificate is not valid, as soon as the product is used as a building product in the sense of the "Landesbauordnungen" (state building codes, MBO § 17). This test certificate is no substitute for a General Building Inspectorate Certificate. This test certificate is granted without prejudice to the rights of third parties, or particular private proprietary rights.

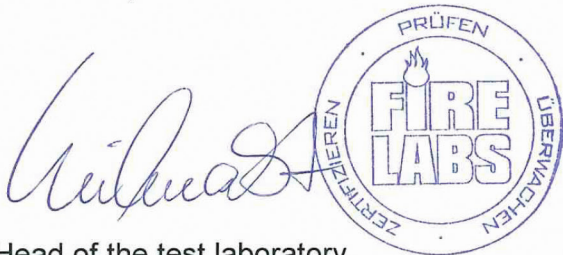
This test certificate can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

The explanations given in DIN 4102-1 app. D, especially concerning an external production control have to be considered.

This test certificate is valid until 2024-05-31, provided the test methods, classification rules and technology do not change during this period.

Borkheide, 7th of June 2019



Head of the test laboratory
(Dipl.-Ing. Uwe Kühnast)

This translation was issued the 7th of June 2019, in a case of doubt the German version is valid solely.

Test specimen A

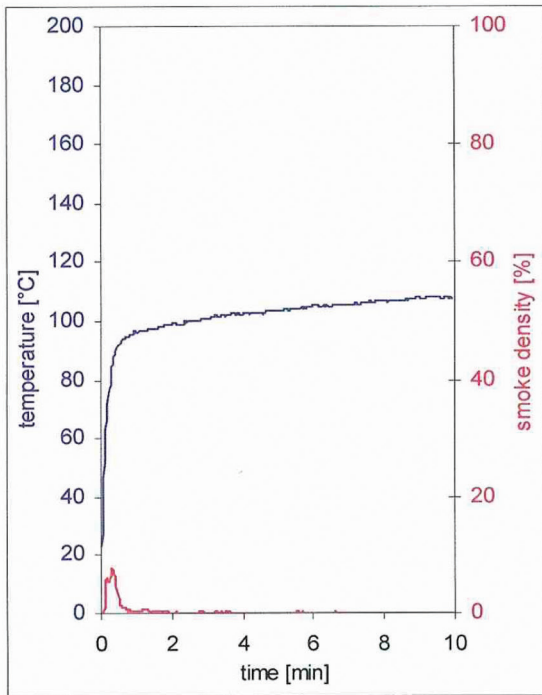


fig. 1
Graphs of the flue gas temperature and smoke density

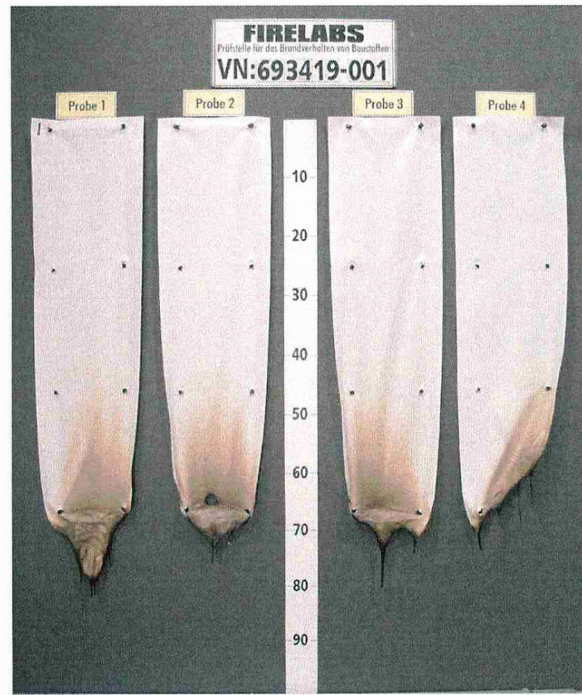


fig. 2
View of test specimen after the test

Test specimen B

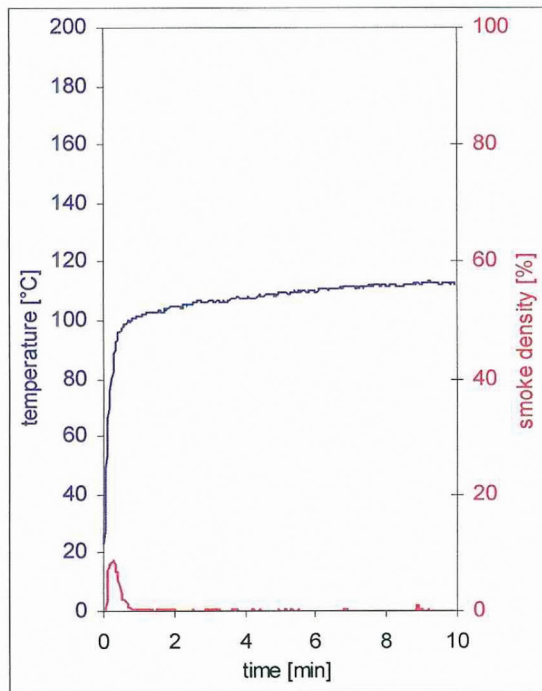


fig. 3
Graphs of the flue gas temperature and smoke density

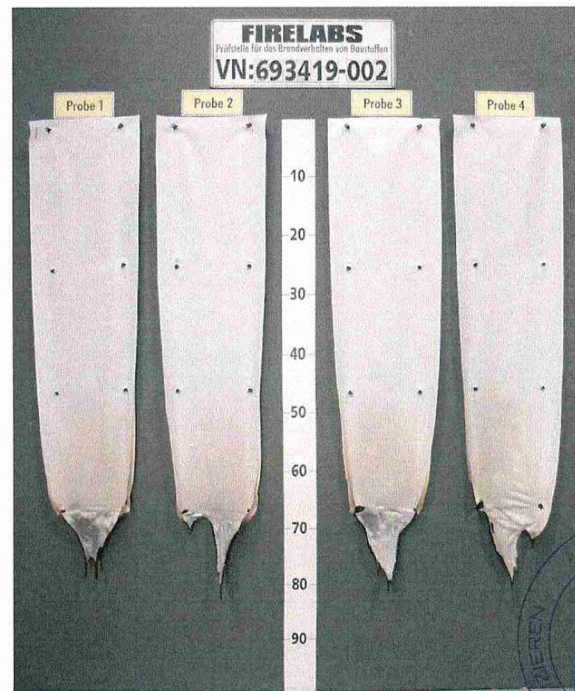


fig. 4
View of test specimen after the test



Test specimen C

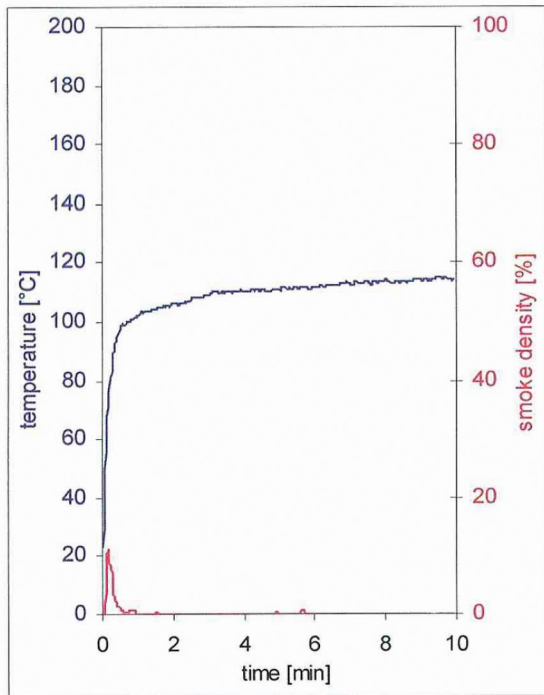


fig. 5
Graphs of the flue gas temperature and smoke density

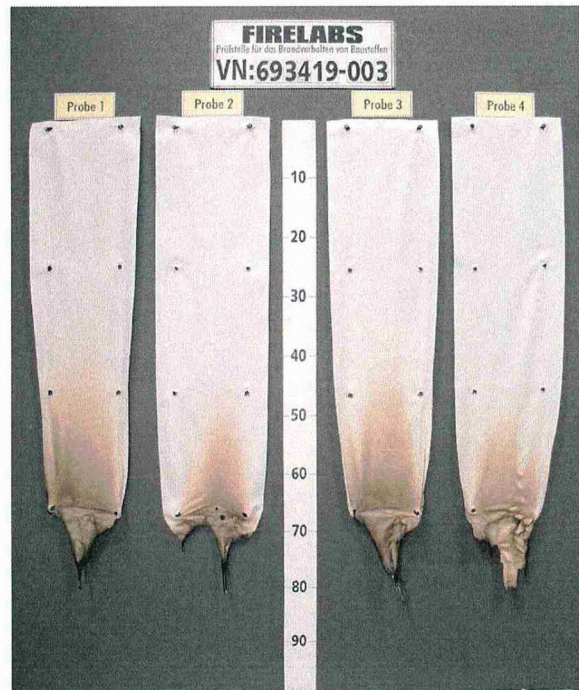


fig. 6
View of test specimen after the test

Test specimen D

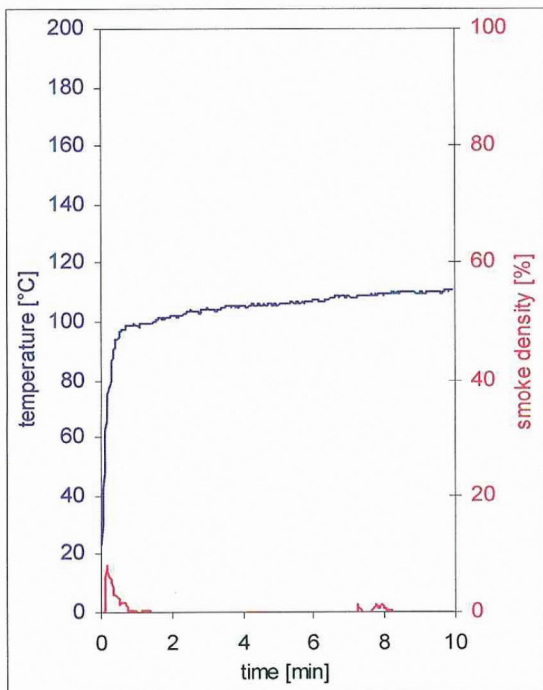


fig. 7
Graphs of the flue gas temperature and smoke density

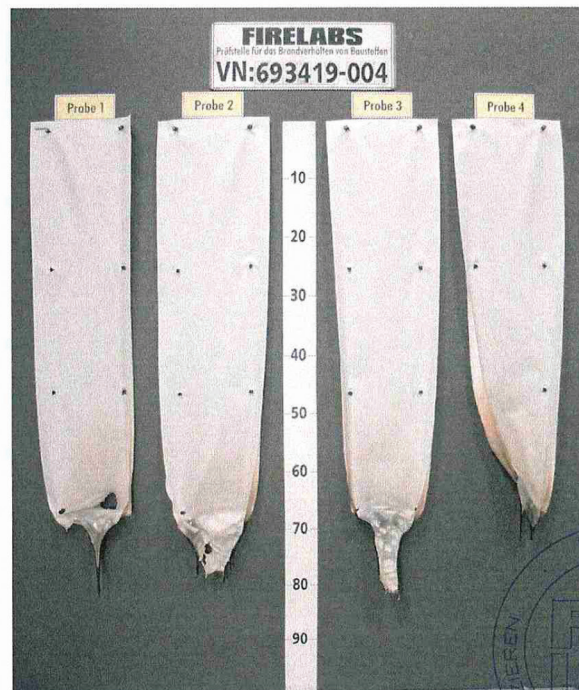


fig. 8
View of test specimen after the test (sample 4: rear side)

Test results small burner test ("Brennkasten")

Table 2

Sample-No.	warp direction							weft direction							dim.	requirements
	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Ignition of the sample	1	1	1	1	1	2	3	1	3	3	2	3	3	3	s	-
Maximum flame height	3	4	3	4	3	4	3	3	3	3	4	3	3	4	cm	-
Time of the maximum	3	4	3	4	2	6	6	3	6	7	6	6	6	7	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Flames extinguished	4	8	3	19	3	30	17	4	64	./.	35	./.	./.	21	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	./.	./.	./.	./.	./.	10	./.	./.	44	>5	15	>5	>5	1	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	./.	./.	./.	./.	25	./.	25	25	./.	s	-

View of the samples after the test (20 seconds after exposure the flame):

Samples have been destroyed at area of flame impingement up to a max. height of 5 cm and a width of approx. 2 cm, above slightly sooty up to the top edge of the sample

Samples 1-5: Edge flame exposure
 Samples 6, 9: Surface flame coated side
 Samples 7, 10-14: Surface flame uncoated side

1) No ignition within 20 seconds

./. Not occurred

dim. Dimension

Indication of time: from the beginning of testing procedure

Indication of measurements: from reference line of the flame

