

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



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

Reference: FLT 3769322 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Client: IBENA Textilwerke GmbH
Peterskamp 20
D - 46414 Rhede

Order: 2022-01-10 **Arrived:** 2022-01-11

Description of samples: Uncoated fabric made of polyester, named "IFR Serge" black.
(for details see page 2)

Delivered: 2022-01-11

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: 2027-02-28

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

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 regarded as the sole proof if the tested building material is used as building product within 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 2 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This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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.

TEST CERTIFICATE



1 Description of test material

1.1 Test material (according to the client)

The material provided is an uncoated fabric made of inherently flame-retardant polyester fibres (referred to as "polyester FR"). The fabric is intended to be used indoor as curtain fabric or for decorative purposes and was named with the trade name "IFR Serge", black and article-no. 9074 by the client.

1.2 Description of the delivered samples

For the tests 1 section of an uncoated fabric made of synthetic fibres and roughed surface on both sides with a length of approx. 2,2 m and a width of 3,06 m was received by the laboratory. The uncoated fabric was labelled "IFR Serge", article-No. 9074 and colour name 75 black. Colour: black.

Characteristic values see section 4.1; photos: see enclosure 1.

Other specifications 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 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A were cut in warp orientation; the samples for the test specimen B were cut in weft orientation of the fabric.

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

3 Arrangement of samples

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

All tests were carried out in single layer, freely suspended.

Period of testing: February 2022

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 manufacturer	Measured values	
			m.v.	s
Thickness	[mm]	./.	1,97	0,048
Mass per unit area	[g/m ²]	500 ± 5 %	514	

m.v. mean value (n=10)

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 showed falling of burning parts/droplets during these tests (results: see enclosure 2).



4.2.2 Test results class B1 (Brandschacht)

Table 3

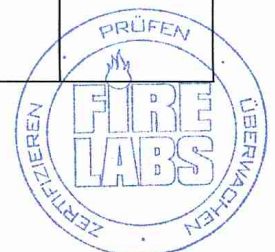
Test results (part 1)						
line no.		Specimen				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	1	1	-	-	
2	<u>Maximal flame height</u> above bottom edge cm	30	30	-	-	*)
3	Time ¹⁾ min	1	1	-	-	
4	<u>Burning / melting through</u> Time ¹⁾min	1	1	-	-	
5	<u>Back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

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

- Not tested

./. Not occurred

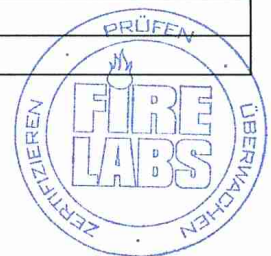
*) No cause for complaint



Test results (part 2)						
line no.		Specimen				requirements
		A	B	C	D	
17	<u>Afterflame after end of test</u> Timemin:s	No	No	-	-	
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame lengthcm					
22	<u>Afterglow after end of test</u> Timemin:s	No	No	-	-	
23	Number of specimen					
	<u>Place of appearance:</u>					
24	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	1,9	1,2	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.	-	-	
30	Diagram fig. no.	1	3	-	-	
31	<u>Residual length</u> Individual valuecm	63 60 62 63	65 58 63 64	- - - -	- - - -	> 0
32	Average valuecm	62	62	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
34	<u>Flue gas temperature</u> Maximum of average value...°C	115	117	-	-	≤ 200
35	Time ¹⁾min:s	9:58	9:14	-	-	
36	Diagram fig. no.	1	3	-	-	
37	<u>Remarks</u> Line 32: Due to the residual length of > 45 cm, no further tests were carried out (DIN 4102-16:2015-09, 5.2 b)). (Graphs and photos: see enclosures 1)					

Specimen	Test-no.	Direction of fabric
A	769322-001	Warp
B	769322-002	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.

The material showed falling of burning parts/droplets during the tests.

The verification

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

is not proven with this test certificate.

6 Special remarks

This 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 regarded as the sole proof if the tested building material is used as building product within the meaning of state building prescriptions (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 2027-02-28, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 1st of March 2022

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

This translation was issued the 1st of March 2022, in a case of doubt the German version is valid solely.

Test specimen A

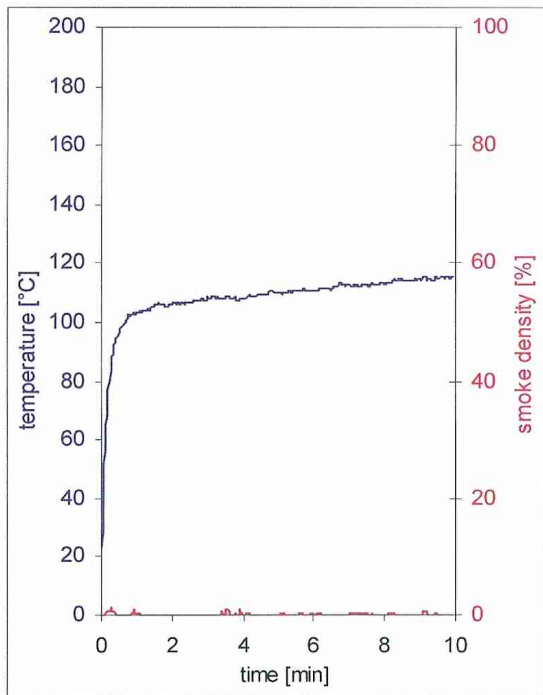


fig. 1
Graphs of the flue gas temperature and smoke density

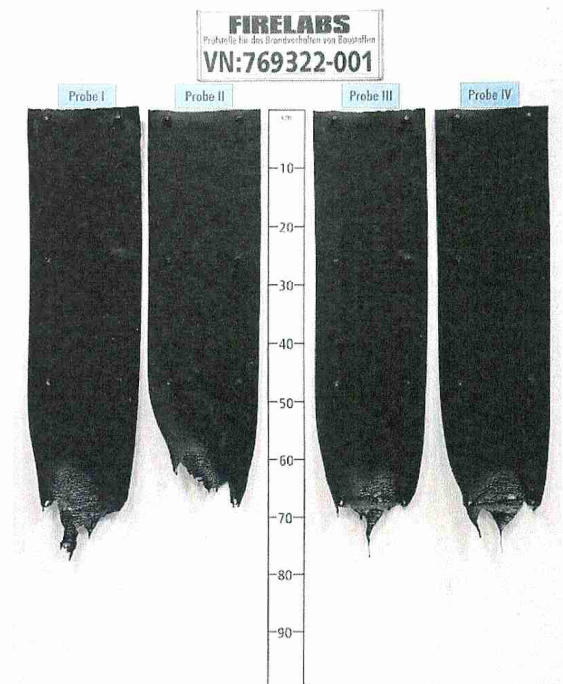


fig. 2
View of test specimen after the test

Test specimen B

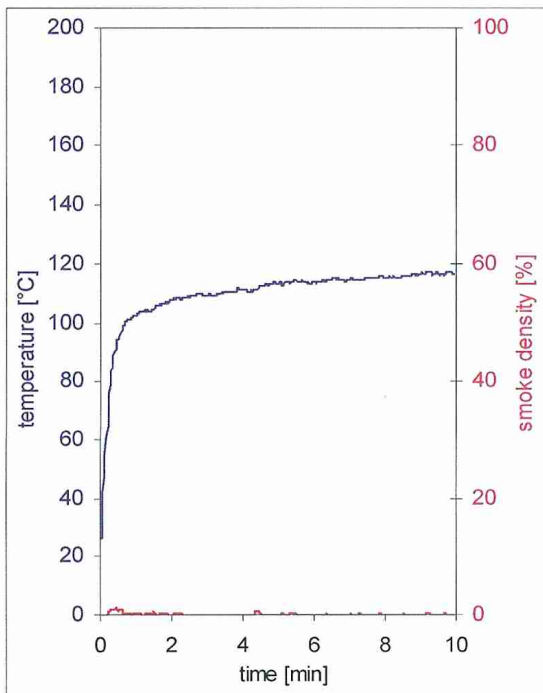


fig. 3
Graphs of the flue gas temperature and smoke density

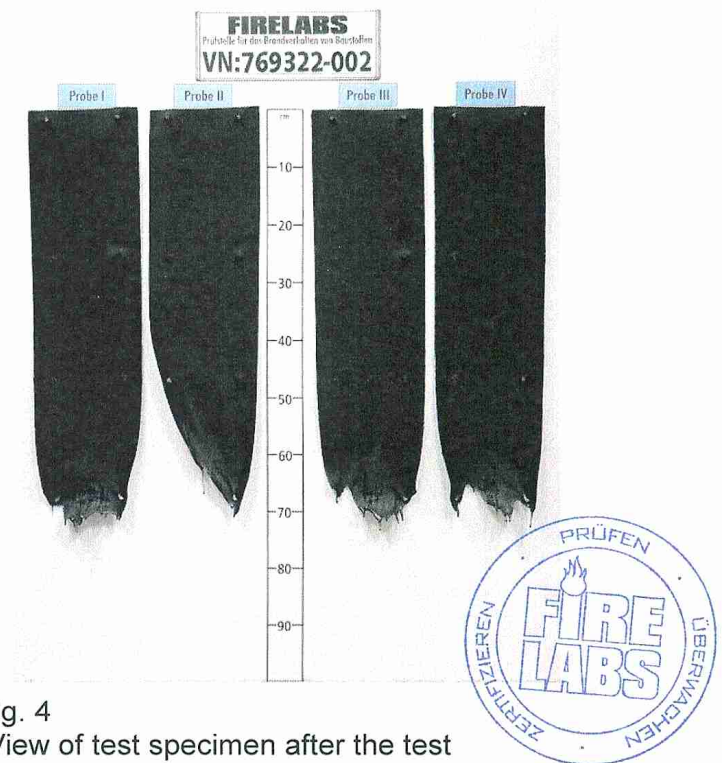


fig. 4
View of test specimen after the test

Test results small burner test (Brennkasten)

Table 2

Sample-No.	warp								weft								dim.	requirements
	1	2	3	4	5	6	-	1	2	3	4	5	6	-	-	-		
Ignition of the sample	1	1	1	1	1	5	-	1	1	1	1	1	5	-	s	-		
Maximum flame height	7	8	10	8	8	1	-	4	5	5	5	4	1	-	cm	-		
Time of the maximum	9	10	16	17	15	5	-	7	8	9	9	8	5	-	s	-		
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20		
Extinction of the flames	17	19	21	21	13	6	-	8	9	9	10	9	6	-	s	-		
Ignition of filter paper	9	8	21	17	19	./.	-	./.	./.	./.	./.	./.	./.	-	s	1)		
Smoke density (visual)	very low								very low								-	-
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-		
Flames were extinguished after	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-		
View of the samples after the test (20 seconds after exposure the flame): - in warp and weft direction destroyed length up to a max. height of about 7 cm and a width of max. 8 cm, sintered and slightly soot above.																		

Samples 1-5: edge flame exposure
 Samples 6: surface flame exposure

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

