

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 3702419 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor: 

Order: 2019-08-14 **Arrived:** 2019-08-19

Description of samples: Uncoated knit fabric made of polyester with flame retardant treatment, named "Basic Display 210".
(for details see page 2)

Delivered: 2019-08-19

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: 2024-09-30

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 2 enclosures.

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This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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 sponsor)

The delivered material is an uncoated knit fabric made of polyester with a flame retardant treatment. The knit fabric is intended to be used indoor as printable banner material or for decorative purposes and was named with the trade name "Basic Display 210", article F926FR02.

1.2 Description of the delivered material

For the tests the laboratory received a sample of an uncoated knitted fabric made of synthetic fibres of a length of approx. 10 m and a width of 1.01 m.

The material was marked with the trade name "Basic Display 210", article F926FR02, article and batch 815619/SR20.

Characteristic values: see chapter 4.1; photos: see enclosure.

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

2 Preparation of specimens

For the small burner test (Brennkasten) samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) were cut in longitudinal and transverse direction.

For the fire shaft test (Brandschacht) 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A were cut in longitudinal the samples for the test specimen B were cut in transverse direction.

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

3 Test procedure

The tests in the fire shaft ("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) without edge protection.

Arrangement of all samples: single layer, freely suspended

Examination period: September 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

Trade name	Specifications given by the client		Measured values		
	Thickness [mm]	Weight per unit area [g/m ²]	Thickness (m.v.)		Weight per unit area [g/m ²]
			[mm]	s	
Basic Display 210	0,47 ± 10 %	210 ± 10 %	0.51	0.006	220

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)

According DIN 4102-1 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 class B2.

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

(Results: see enclosure 2)



1 Description of test material

1.1 Test material (according to the sponsor)

The delivered material is an uncoated knit fabric made of polyester with a flame retardant treatment. The knit fabric is intended to be used indoor as printable banner material or for decorative purposes and was named with the trade name "Basic Display 210", article F926FR02.

1.2 Description of the delivered material

For the tests the laboratory received a sample of an uncoated knitted fabric made of synthetic fibres of a length of approx. 10 m and a width of 1.01 m.

The material was marked with the trade name "Basic Display 210", article F926FR02, article and batch 815619/SR20.

Characteristic values: see chapter 4.1; photos: see enclosure.

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

2 Preparation of specimens

For the small burner test (Brennkasten) samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) were cut in longitudinal and transverse direction.

For the fire shaft test (Brandschacht) 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A were cut in longitudinal the samples for the test specimen B were cut in transverse direction.

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

3 Test procedure

The tests in the fire shaft ("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) without edge protection.

Arrangement of all samples: single layer, freely suspended

Examination period: September 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

Trade name	Specifications given by the client		Measured values		
	Thickness [mm]	Weight per unit area [g/m ²]	Thickness (m.v.)		Weight per unit area [g/m ²]
			[mm]	s	
Basic Display 210	0,47 ± 10 %	210 ± 10 %	0.51	0.006	220

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)

According DIN 4102-1 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 class B2.

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

(Results: see enclosure 2)



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	-	-	
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	-	-	
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					
	<u>Smoke density</u>					
28	≤ 400 % min	1,0	0.6	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.	-	-	
30	Diagram fig. no.	1	3	-	-	
31	<u>Residual length</u> Individual value cm	72 68 66 71	68 70 71 71	- - - -	- - - -	> 0
32	Average value cm	69	70	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
34	<u>Flue gas temperature</u> Maximum of average value...°C	109	112	-	-	≤ 200
35	Time ¹⁾min:s	9:52	9:56	-	-	
36	Diagram fig. no.	1	3	-	-	
37	<u>Remarks:</u> line 32: Due to the residual length of > 45 cm no additional tests were proceed (DIN 4102-16: 2015-09, 5.2 b)). (diagrams and photos see enclosure 1)					

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

Specimen	Test-no.:	Trade name	Orientation of samples
A	702419-001	Basic Display 210	longitudinal
B	702419-002		transversal



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 been proved 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 valid, as soon as the product is used as a building product in the sense of the "Landesbauordnungen" (state building requirements, 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.

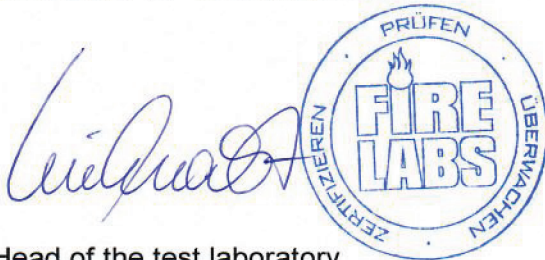
In General Building Inspectorates procedures this test certificate can be based for

- regulated building materials for the required proof of accordance
- for non-regulated building materials for the required proof of applicability

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

This test certificate is valid until 2024-09-30 provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 10th of October 2019



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

This translation was issued the 18th of June 2019, in a case of doubt the German version is valid solely

Test specimen A

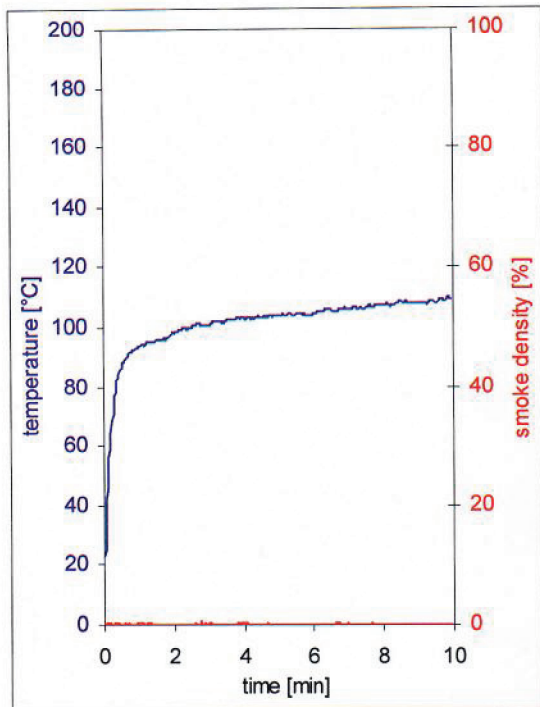


fig. 1
Graphs of the flue gas temperature and the smoke density

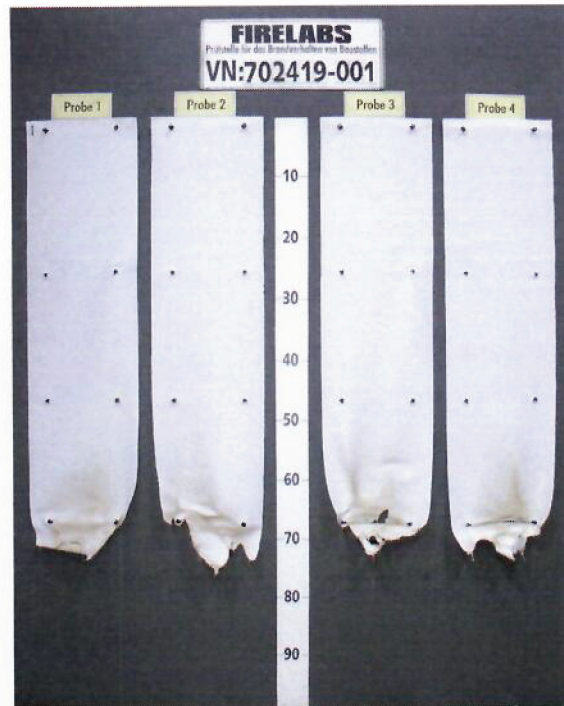


fig. 2
Photo of the test specimen after the test

Test specimen B

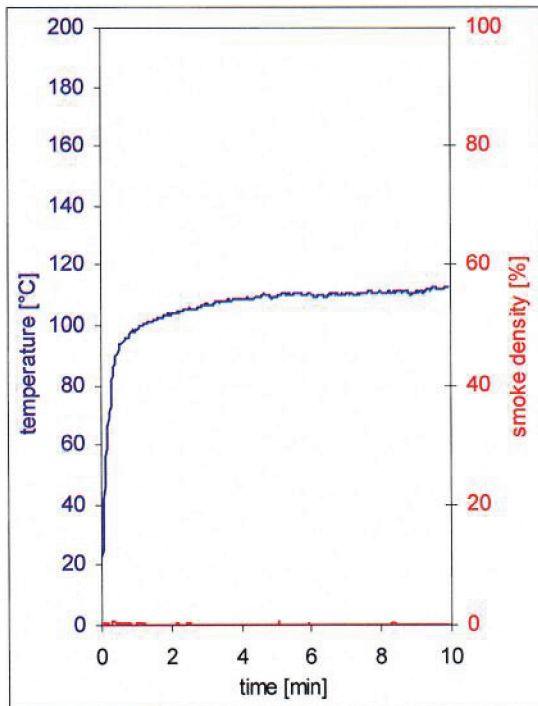


fig. 3
Graphs of the flue gas temperature and the smoke density

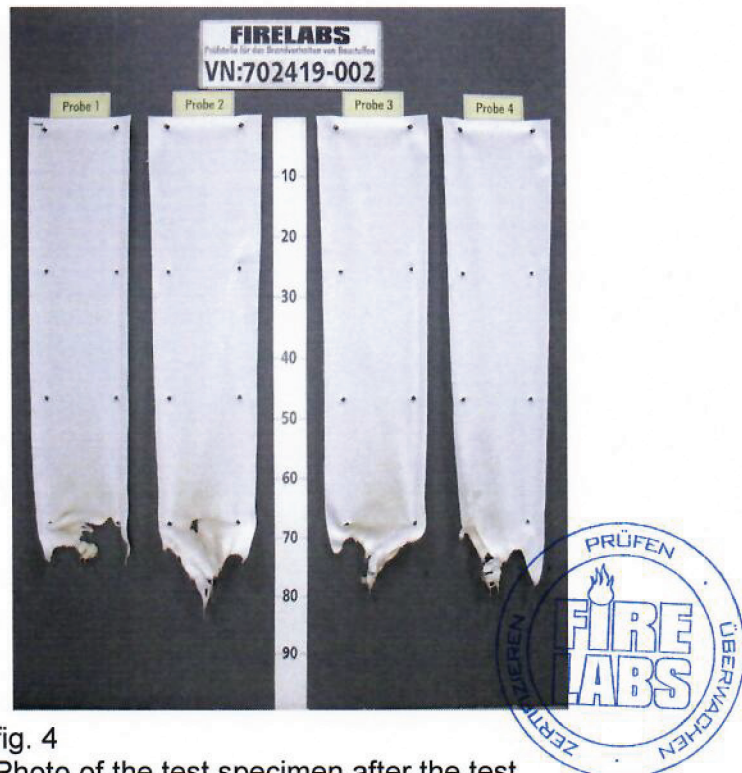


fig. 4
Photo of the test specimen after the test

Test results small burner test (Brennkasten)

Table 2

	longitudinal direction							transverse direction							dim.	requirements
	1	2	3	4	5	6	-	1	2	3	4	5	6	-		
Sample-No.	1	2	3	4	5	6	-	1	2	3	4	5	6	-	-	-
Ignition of the sample	1	1	1	1	1	./.	-	1	1	1	1	1	3	-	s	-
Maximum flame height	12	9	10	10	11	./.	-	3	4	4	3	3	1	-	cm	-
Time of the maximum	13	14	15	13	15	./.	-	6	5	6	5	5	4	-	s	-
Flame tip reached the 150 mm test mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Flames extinguished	20	23	23	26	24	./.	-	14	19	16	17	17	5	-	s	-
Ignition of filter paper	15	./.	14	./.	18	./.	-	./.	./.	./.	./.	./.	./.	-	s	1)
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	./.	3	3	6	4	./.	-	./.	./.	./.	./.	./.	./.	-	./.	-
Flames have been extinguished	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	./.	-

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

In longitudinal and transverse direction up to a maximum height of 8 cm and a width of approx. 7 cm destroyed, soot above until top edge of the sample.

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

