

# 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 3621217 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

**Sponsor:** KREA Technische Textilien GmbH  
Hochstrasse 84  
D - 47228 Duisburg

**Order:** 2017-04-18 **Arrived:** 2017-04-20

**Description of samples:** On both sides plastic coated fabric made of polyester, named "KREA BlackBack Soft".  
(for details see page 2)

**Delivered:** 2017-04-20

**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 it is used in one layer, suspended freely or with distance of >40 mm to same or other plain materials.  
(for details see page 5)

**Validity:** 2022-04-30

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This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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

CERTIFICATE  
TEST



## 1 Description of test material

### 1.1 Test material (according to the sponsor)

The delivered material is a fabric made of polyester with a one-sided white and a rear black acrylic coating containing flame retardant treatments. The coated fabric is intended to be used as banner material or for decorative purposes and was named with the trade name "KREA BlackBack Soft" and article-no. 1056-16.

### 1.2 Description of the delivered samples

For the tests the laboratory received a fabric, plastic-coated on both sides, with a length of approx. 4,5 m and a width of 1,5 m. The coated fabric was labelled with "BlackBack Soft" and article-no. 1056-16.

Colour: One-sided white, black on the rear side

Batch: T 7559021

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

Characteristic values: see paragraph 4.1; Photos: see enclosure 1-2

## 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 direction.

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 direction; the samples for the test specimen B and D were cut in weft direction.

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

## 3 Arrangement of samples

The tests in the fire shaft ("Brandschacht") have been performed acc. DIN 4102-1 and -16 (building materials class B1). The small burner ("Brennkasten") tests have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2) without edge protection.

The tests were carried out in single layer, freely suspended, both from the front and from the rear side.

Period of testing: May 2017

## 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

Name / type	Specifications by manufacturer		Measured values		
	Weight per unit area [g/m <sup>2</sup> ]	Thickness [mm]	Weight per unit area [g/m <sup>2</sup> ]	Thickness (m.v.) [mm]	s
KREA BlackBack Soft	0,22 ± 5 %	240 ± 5 %	0,26	0,005	233

./.. not received/not measured

m.v. mean value

s standard deviation





## 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

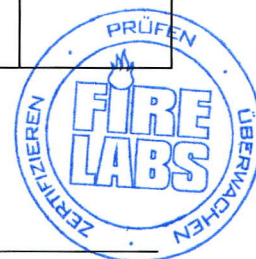
Test results (part 1)						
line no.		Specimen				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	1	1	1	1	
2	<u>Maximal flame height</u> above bottom edge ..... cm	40	40	40	40	*)
3	Time <sup>1)</sup> ..... min	1	1	1	1	
4	<u>Burning / melting through</u> Time <sup>1)</sup> .....min	1	1	1	1	
5	<u>Back side of the specimens:</u> <u>Flames / glowing</u> Time <sup>1)</sup> ..... min	./.	./.	./.	./.	
6	<u>Discolouring</u> Time <sup>1)</sup> ..... min					
7	<u>Falling of burning droplets</u> Begin <sup>1)</sup> ..... min	No	No	No	No	
8	Extend:					
9	Sporadic falling of burning droplets					
10	Continuous falling of burning droplets					
11	<u>Falling of burning parts</u> Begin <sup>1)</sup> ..... min	Yes 1	Yes 1	Yes 1	Yes 1	
12	Extend:					
13	Sporadic falling of burning parts	Yes	Yes	Yes	Yes	
14	Continuous falling of burning parts	No	No	No	No	
15	Afterflame time at the bottom of the sieve (max.). ..... min:s	0:06	0:11	0:07	0:09	
16	<u>Impairment of the burner</u> <u>flames by dropping or falling</u> <u>Material</u> Time <sup>1)</sup> ..... min:s	./.	./.	./.	./.	
17	<u>Premature end of test</u> Final occurrence of burning at the specimen <sup>1)</sup> .....min	3	2	3	3	
18	Time of eventually end of test <sup>1)</sup> ..... min:s	./.	./.	./.	./.	

<sup>1)</sup> 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>	No	No	No	No	
18	Time .....min:s					
19	Number of specimen					
20	Front side of specimen					
21	Back side of specimen					
21	Flame length .....cm					
22	<u>Afterglow after end of test</u>	No	No	No	No	
23	Time .....min:s					
23	Number of specimen					
24	Place of appearance:					
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>					
28	≤ 400 % min	13,6	14,9	18,9	14,7	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
31	<u>Residual length</u>					> 0
	Individual value .....cm	62	65	63	66	
		60	56	56	57	
		55	60	60	60	
		64	56	63	60	
32	Average value .....cm	<b>60</b>	<b>59</b>	<b>60</b>	<b>60</b>	≥ 15
33	Photo of test specimen fig. no.	2	4	6	8	
34	<u>Flue gas temperature</u>					≤ 200
34	Maximum of average value...°C	109	116	117	117	
35	Time <sup>1)</sup> .....min:s	9:42	9:56	9:22	9:22	
36	Diagram fig. no.	1	3	5	7	
37	<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” line 32: Due to the the residual length of > 45 cm no additional tests were proceeded (DIN 4102-16: 2015-09, 5.2 b)).					

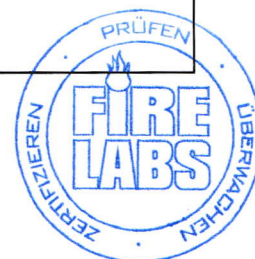
Specimen	Test-no.	Direction of samples	Surface of flame impingement
A	621217-001	warp	black
B	621217-002	weft	
C	621217-003	warp	white
D	621217-004	weft	

<sup>1)</sup> 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 behavior by outdoor weathering)
- after washing or cleaning with chemicals.

is not 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.

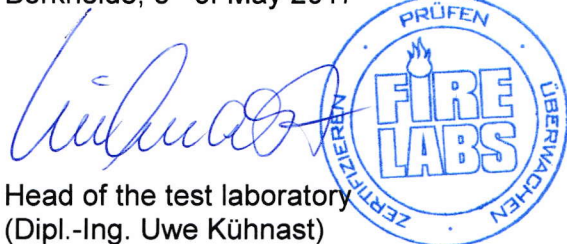
This test certificate can serve as a basis for building supervisory procedures for:

- 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 2022-04-30, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 5<sup>th</sup> of May 2017



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

*This translation was issued the 5<sup>th</sup> of May 2017, in a case of doubt the German version is valid solely.*

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## Test specimen A

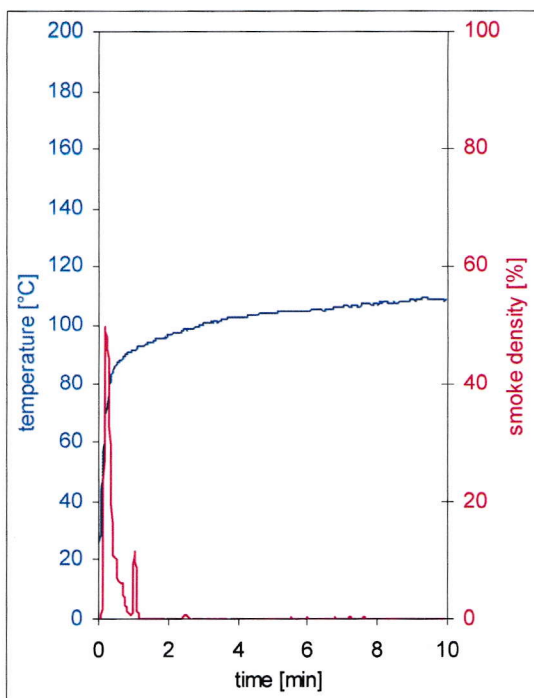


fig. 1  
Graphs of the flue gas temperature and smoke density

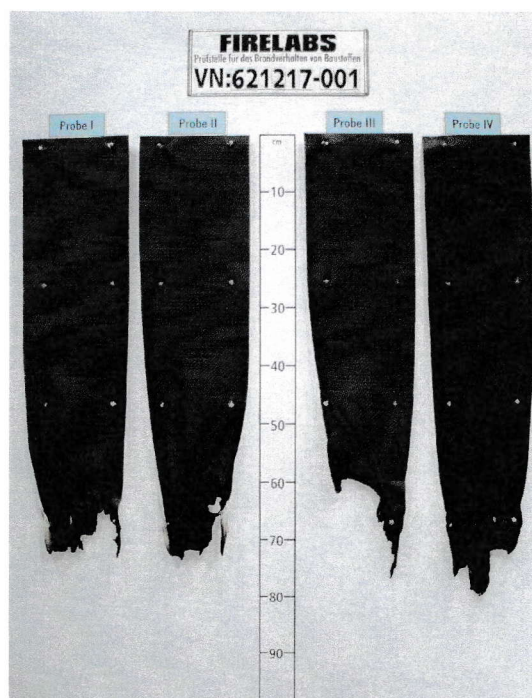


fig. 2  
View of test specimen after the test

## Test specimen B

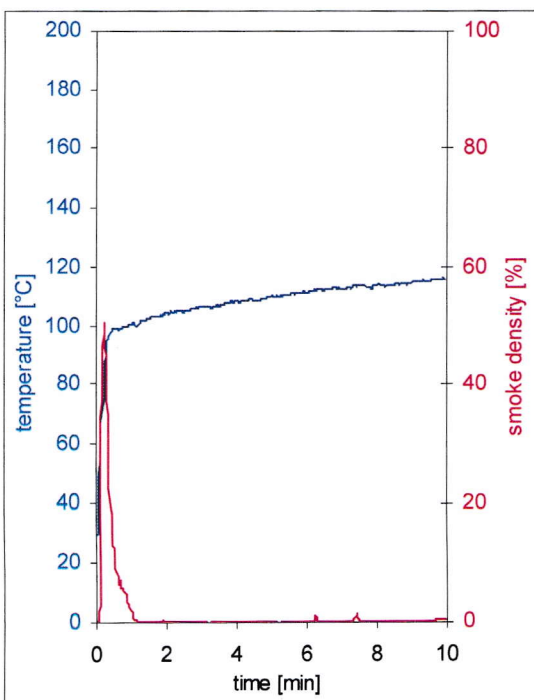


fig. 3  
Graphs of the flue gas temperature and smoke density

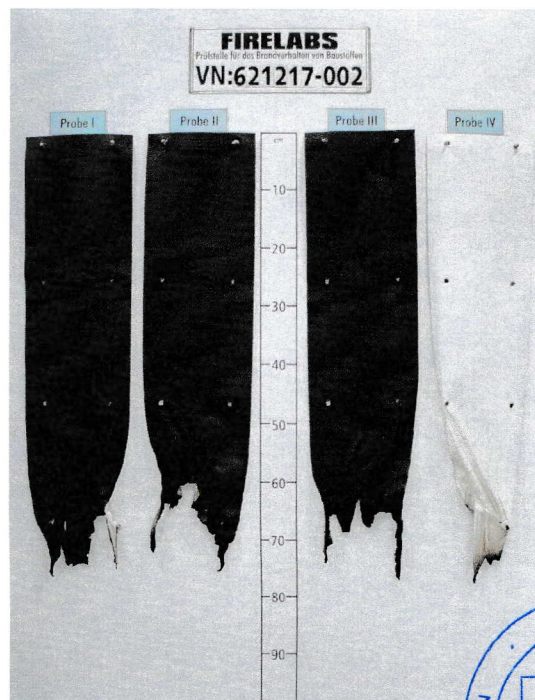


fig. 4  
View of test specimen after the test  
(sample 4: rear side)



## Test specimen C

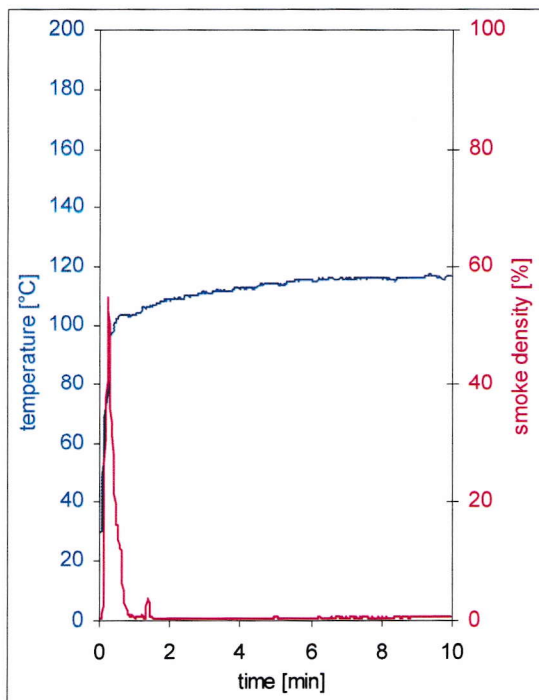


fig. 5  
Graphs of the flue gas temperature and  
smoke density

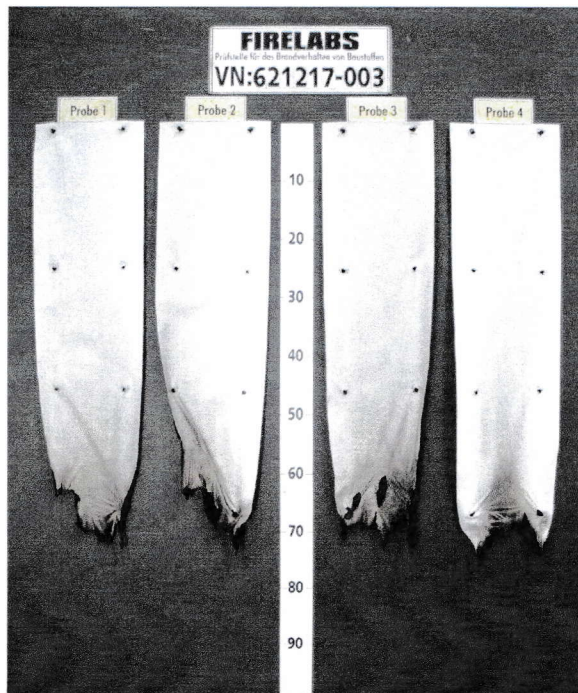


fig. 6  
View of test specimen after the test

## Test specimen D

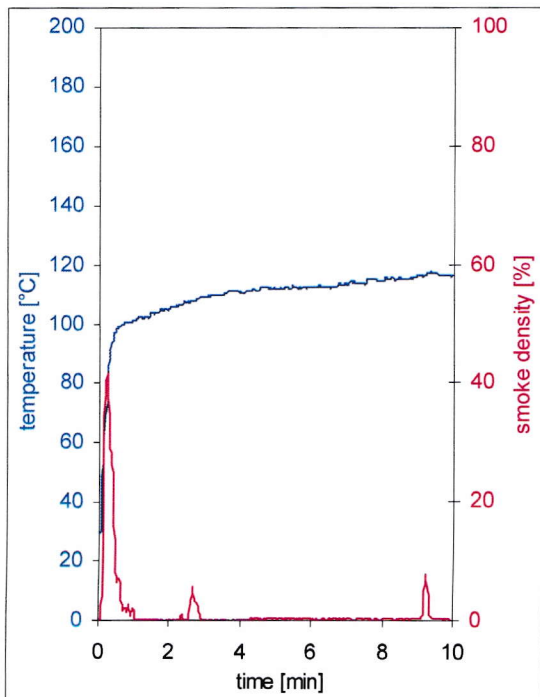


fig. 7  
Graphs of the flue gas temperature and  
smoke density

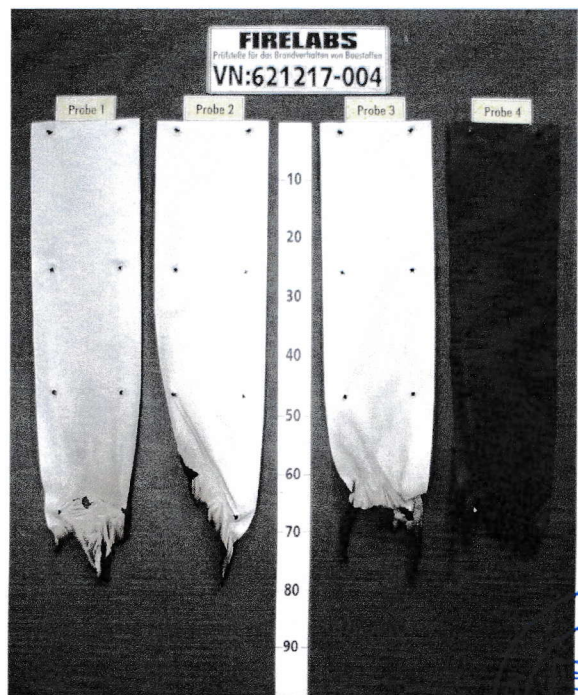


fig. 8  
View of test specimen after the test  
(sample 4: rear side)





Test results small burner test ("Brennkasten")

Table 2

	warp direction							weft direction							dim.	requirements
Sample-No.	1	2	3	4	5	6	7	1	2	3	4	5	6	7	-	-
Ignition of the sample	1	1	1	1	1	4	4	1	1	1	1	1	3	3	s	-
Maximum flame height	11	14	13	7	6	8	14	9	9	6	10	9	10	8	cm	-
Time of the maximum	9	11	11	7	9	20	15	8	7	6	8	8	12	9	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	26	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Self-extinguishing of flames	16	16	16	16	16	28	16	16	16	16	16	16	16	16	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	./.	./.	./.	./.	./.	8	./.	./.	./.	./.	./.	./.	./.	./.	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-

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

Samples were destroyed at flame impingement area in a max. length of app. 4 cm and destroyed width of 2 cm, soot above about 6 cm.

Samples 1-5: edge flame impingement

Samples 6: surface flame impingement black surface

Samples 7: surface flame impingement white surface

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

