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

FIRE LABS
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PÜZ-Stelle (LBO): BRA09

TEST CERTIFICATE

Reference: FLT 3787722 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Client: IBENA Textilwerke GmbH
Peterskamp 20
D - 46414 Rhede

Order: 2022-02-09 **Arrived:** 2022-02-09

Description of samples: Flame retardant treated fabrics made of cotton, named "**Budget Dekomolton**".
(for details see page 2)

Delivered: 2022-09-01, 2022-10-24

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: 2027-10-31

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 3 appendices.

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1 Description of test material

1.1 Test material (according to the client)

The materials submitted are uncoated cotton fabrics with a flame retardant treatment, in black and white. The fabrics are intended to be used inside buildings for stage and exhibition constructions or for decorative purposes and were named with the trade name "Budget Dekomolton", article no. 9786.

1.2 Description of the delivered samples

For the tests, 2 sections of uncoated fabrics, with roughened surfaces on both sides and different colours, were provided to the laboratory by the client. The samples were marked with the article number and the product width 300 cm and were provided in the following variants:

Colour	Colour name, colour no.	Article no.	Sample size [m]	
			Length	Width
Black	Black, 75	9786	1.1	3.04
White	White, 60		3.0	2.93

Further details are not known to the laboratory; samples are stored.
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 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 respective 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 ("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 a single layer, freely suspended.

Period of testing: September, November 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

Colour name, colour no.	Manufacturer's data		Measured values		
	Mass per unit area [g/m²]	Total thickness [mm]	Mass per unit area [g/m²]	Total thickness (m.v.) [mm]	s
Black, 75	160 ± 10	./.	160	0.64	0.034
White, 60			184	0.63	0.032

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. Exposing the flame to the front or reverse side did not influence the fire behaviour. (Results: see enclosure 3)

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results (part 1)						
line no.		Specimen				require-ments
		A	B	C	D	
1	Number of specimen arrangement acc. DIN 4102 –15 Table 1	1	1	1	1	
2	Maximal flame height above bottom edge ..... cm	50	50	50	50	
3	Time [1] ..... min	1	1	1	1	*)
4	Burning / melting through Time [1] .....min	1	1	1	1	
5	Back side of the specimens: Flames / glowing Time [1] ..... min	./.	./.	./.	./.	
6	Discolouring Time [1] ..... min					
7	Falling of burning droplets Begin 1)..... min	No	No	No	No	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	Falling of burning parts Begin [1]..... min	Nein	Nein	Nein	Nein	
11	Extend: Sporadic falling of burning parts					
12	Continuous falling of burning parts					
13	Afterflame time at the bottom of the sieve (max.). ..... min:s	./.	./.	./.	./.	
14	Impairment of the burner flames by dropping or falling Material Time [1] ..... min:s	./.	./.	./.	./.	
15	Premature end of test Final occurrence of burning at the specimen [1].....min	10	10	10	10	
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				require-ments
		A	B	C	D	
	Afterflame after end of test	No	No	No	No	
17	Time .....min:s					
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame length .....cm					
	Afterglow after end of test	No	No	No	No	
22	Time .....min:s					
23	Number of specimen					
	Place of appearance:					
24	Lower half of specimen					
25	Upper half of specimen					
26	Front side of specimen					
27	Back side of specimen					
	Smoke density					
28	≤ 400 % min	4.9	6.7	3.9	5.6	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
	Residual length					
31	Individual value .....cm	46 48 48 41	43 45 46 47	40 46 47 47	45 51 43 50	> 0
32	Average value .....cm	**45**	**45**	**45**	**47**	≥ 15
33	Photo of test specimen fig. no.	2	4	6	8	
	Flue gas temperature					
34	Maximum of average value...°C	120	117	113	113	≤ 200
35	Time [1] .....min:s	9:42	9:44	10:00	10:00	
36	Diagram fig. no.	1	3	5	7	
37	Remarks: 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))					

Specimen	Test-no.	Trade name	Colour name, colour no.	Direction of samples
A	787722-001	Budget Dekomolton	Black, 75	Warp
B	787722-002			Weft
C	787722-003		White, 60	Warp
D	787722-004			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 behavior by outdoor weathering)
- after washing or dry cleaning

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 2027-01-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 11th of November 2022

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

This translation was issued the 10th of December 2022, in a case of doubt the German version is valid solely.

Test specimen A

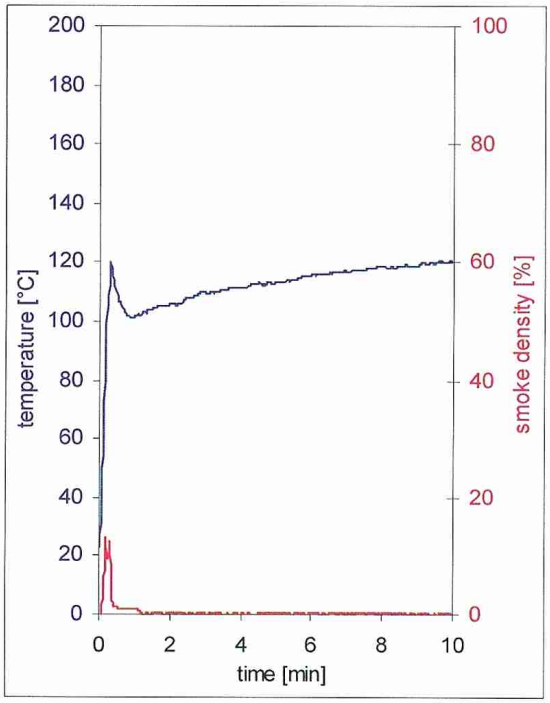

fig. 1
Graphs of the flue gas temperature and smoke density

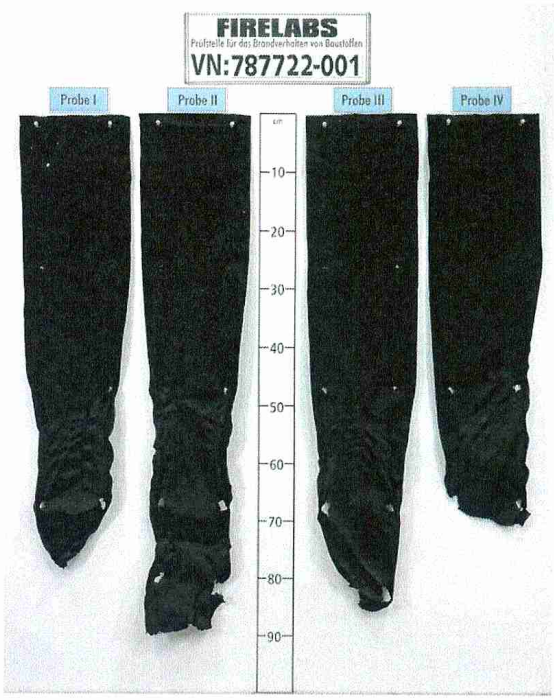

fig. 2
View of test specimen after the test

Test specimen B

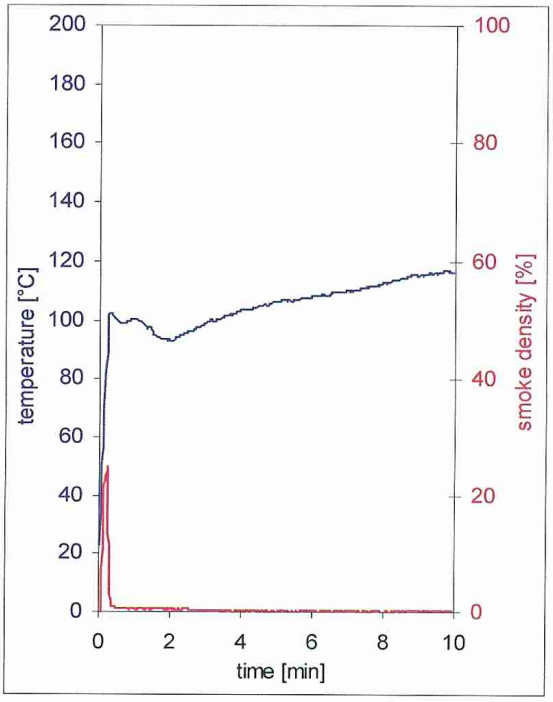

fig. 3
Graphs of the flue gas temperature and smoke density

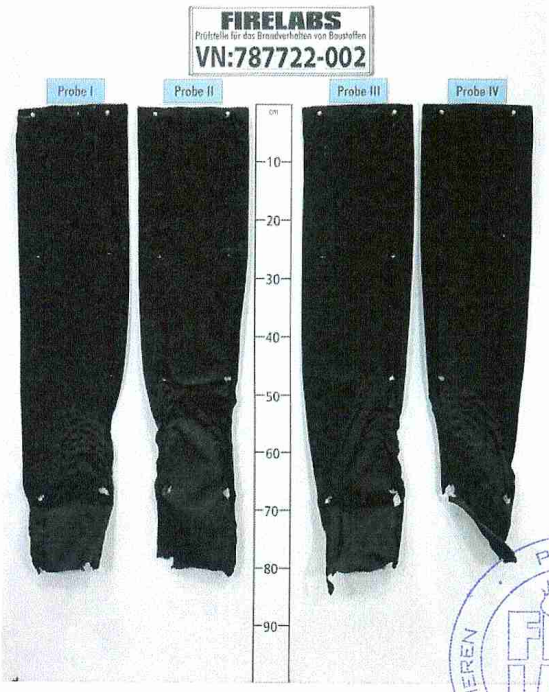

fig. 4
View of test specimen after the test

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Test specimen C

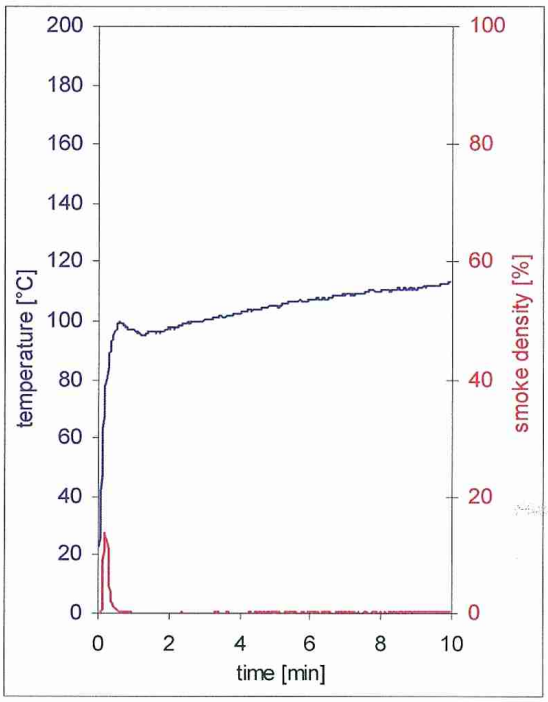

fig. 5
Graphs of the flue gas temperature and smoke density

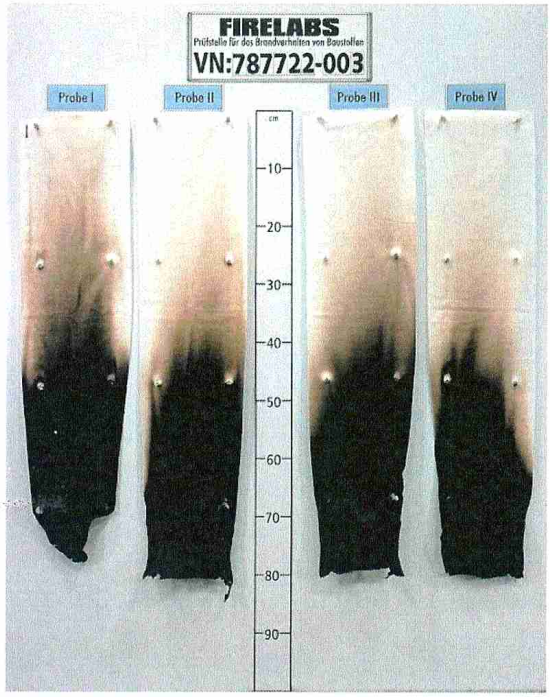

fig. 6
View of test specimen after the test

Test specimen D

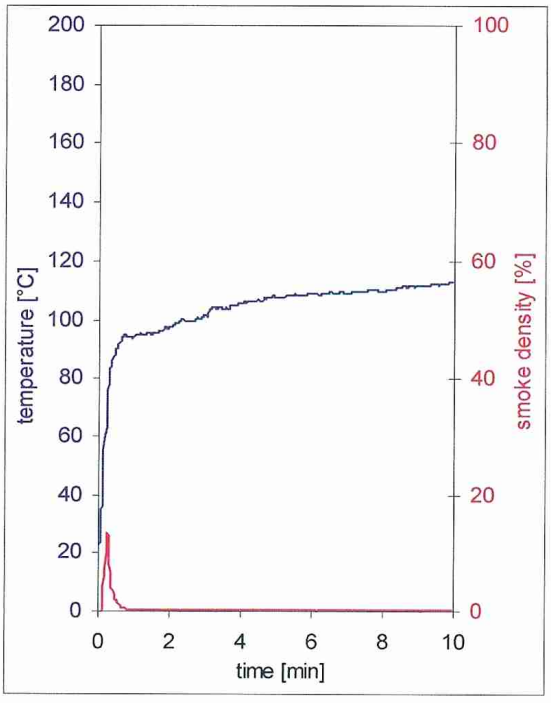

fig. 7
Graphs of the flue gas temperature and smoke density

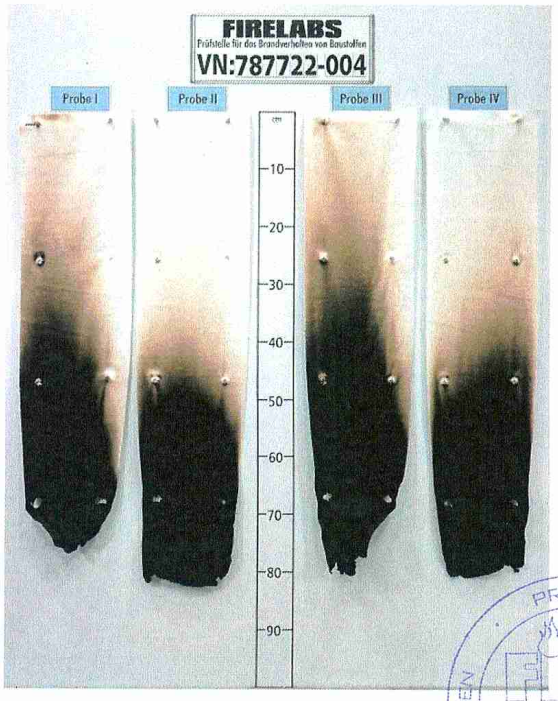

fig. 8
View of test specimen after the test

Test results small burner test ("Brennkasten")

Table 2

	warp direction							weft direction							dim.	require-ments
Sample-No.	1	2	3	4	5	6	-	1	2	3	4	5	6	-	-	-
Ignition of the sample	1	3	4	4	3	4	-	1	4	3	4	4	3	-	s	-
Maximum flame height	2	4	3	4	4	3	-	2	3	3	3	2	3	-	cm	-
Time of the maximum	4	7	8	8	7	7	-	4	8	9	8	8	9	-	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Self-extinguishing of flames	16	16	16	16	16	16	-	16	16	16	16	16	16	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	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): Samples were destroyed at flame impingement area in a max. length of app. 3 cm and destroyed width of 1,5 cm, discoloured above about 2-4 cm .																

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

[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

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