

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

Reference	FLT 3644017	(Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)
Sponsor	SMD Textiles Ltd. Pittman Way Fulwood, Preston PR2 9ZD United Kingdom	
Order	2017-11-14	Arrived 2017-11-14
Description of samples	On one side coated fabric made of polyester, acrylic and linen, named "Delta". (for details see page 2)	
Delivered	2017-10-30	
Content of request	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1	
Assessment	The examined products 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	2023-01-31	
Sampling	The samples were 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 certificates comprises 5 pages and 4 enclosures.

Approved testing, inspection and certification body

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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 provided is fabric made of polyester with a one-sided flame-retardant acrylic coating. The fabric is intended to be used indoor as screen fabric or for decorative purposes and was named with the trade name "Delta".

1.2 Description of the delivered material

For the tests the laboratory received a section of a one-sided plastic-coated fabric of a length of approx 5 m and a width of 1.46 m. The material was marked with "Delta Cinnamon FR".

Colour: greyish-brown fabric, white coating on the reverse side.

Characteristic values: see section 4.1; Photos: see enclosures 1-3.

Other specifications are not known by the laboratory, a sample is stored.

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 6 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimens A, C and E were cut in warp orientation; the samples for the test specimen B, D and F 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 ("Brandschacht") have been performed according DIN 4102-1 and -16 (building materials class B1). The small burner ("Brennkasten") tests have been performed according to DIN 4102-1, chapter 6.2.5 (building materials class B2).

All tests have been carried out in single layer, freely suspended, both from the front and reverse side of the fabric.

Examination period: January/February 2018.

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	Manufacturer's data		Measured values		
	Thickness [mm]	Weight per area unit [g/m ²]	Thickness (m.v.) [mm]	s	Weight per area unit [g/m ²]
"Delta"	537	./.	534	1,23	0,047

m.v. mean value

s standard deviation

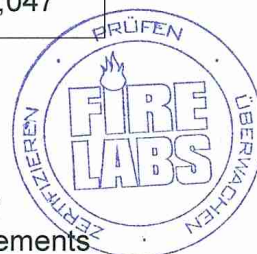
./. not received/not measured

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 4)



4.2.2 Test results class B1 (Brandschacht)

Table 3

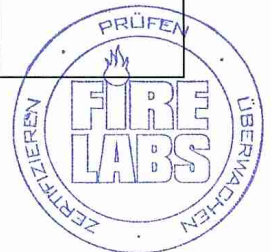
Test results "Brandschachtprüfung" (part 1)								
line no.		Test results						requirements
		A	B	C	D	E	F	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	1	1	1	1	1	1	
2	<u>Maximal flame height</u> above bottom edge cm	60	80	60	70	60	70	*)
3	Time ¹⁾ min	1	1	1	1	1	1	
4	<u>Burning / melting through</u> Time ¹⁾ min	1	1	1	1	1	1	
5	<u>Back side of the specimens:</u> <u>Flames / glowing</u> Time ¹⁾ min:s	./.	./.	./.	./.	./.	./.	
6	<u>Discolouring</u> Time ¹⁾ min:s	./.	./.	./.	./.	./.	./.	
7	<u>Falling of burning droplets</u> Begin ¹⁾ min	No	No	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	No	Yes 1	Yes 1	Yes 1	Yes 1	
11	Extend: Sporadic falling of burning parts	Yes		Yes	Yes	Yes	Yes	
12	Continuous falling of burning parts	No		No	No	No	No	
13	<u>Afterflame time at the bottom</u> <u>of the sieve (max.)</u> min:s	0:07	./.	0:17	0:12	0:11	0:06	
14	<u>Impairment of the burner</u> <u>flames by dropping or falling</u> <u>Material</u> Time ¹⁾ min:s	No	No	No	No	No	No	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen ¹⁾ min	3	4	4	4	3	3	
16	Time of eventually end of test ¹⁾ min:s	./.	./.	./.	./.	./.	./.	

¹⁾ Indication of time: from the beginning of testing

- Not tested

./. Not occurred

*) No cause for complaint



Test results "Brandschachtprüfung" (part 2)								
line no.		Measured values specimen						requirements
		A	B	C	D	E	F	
17	<u>Afterflame after end of test</u> Time min:s	No	No	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	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	83.6	94.4	90.6	84.7	77.6	93.3	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	./.	./.	
30	Diagram fig. no.	2	4	6	8	10	12	
31	<u>Residual length</u> Individual value cm	29 30 44 40	15 14 41 17	24 53 36 42	30 32 40 35	52 42 27 27	35 48 21 18	> 0
32	Average value cm	35	21	38	34	37	30	≥ 15
33	Photo of the test specimen fig. no.	1	3	5	7	9	11	
34	<u>Flue gas temperature</u> Maximum of average	118 0:58 2	141 0:54 4	116 0:58 6	119 0:54 8	111 9:46 10	118 0:56 12	≤ 200
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". (Diagrams and photos see enclosure 1-3)							

- 1) Indication of time: from the beginning of testing
- Not tested
- ./. Not occurred
- *) No cause for complaint

Specimen	Test-No.	Orientation of samples	Flame impingement onto
A	644017-001	warp	fabric
B	644017-002	weft	
C	644017-003	warp	coating (reverse side)
D	644017-004	weft	
E	644017-005	warp	fabric
F	644017-006	weft	



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

has not been proved with this test certificate.

6 Special remarks

This test certificate is only valid for the materials 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 certificates 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 has to be considered.

This test certificate is valid until 2023-01-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 17th of February 2018


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



This translation was issued on 3rd of March 2018, in a case of doubt the German version is valid solely.

Test specimen A

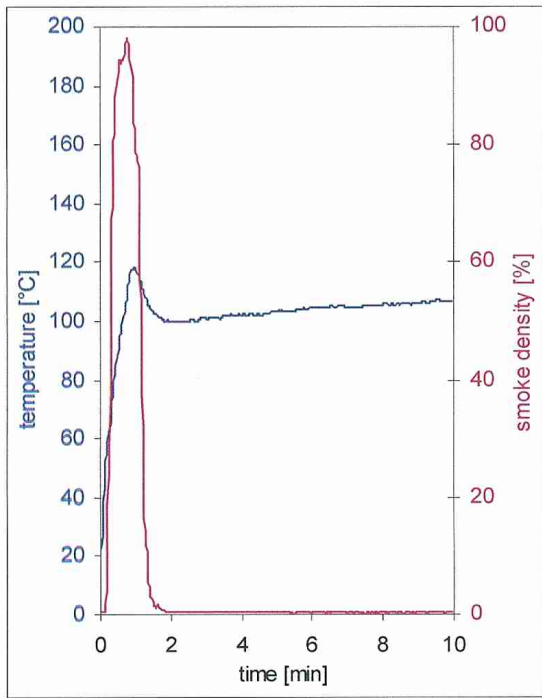


fig. 1
Graphs of the flue gas temperature and the smoke density

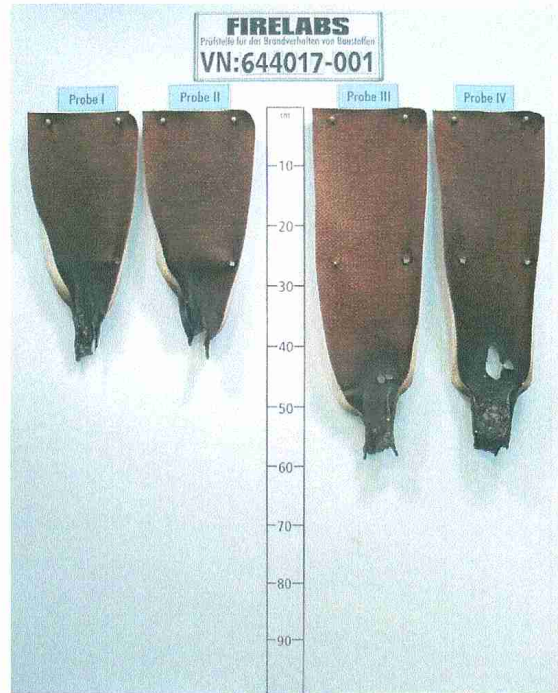


fig. 2
Photo of test specimen after the test

Test specimen B

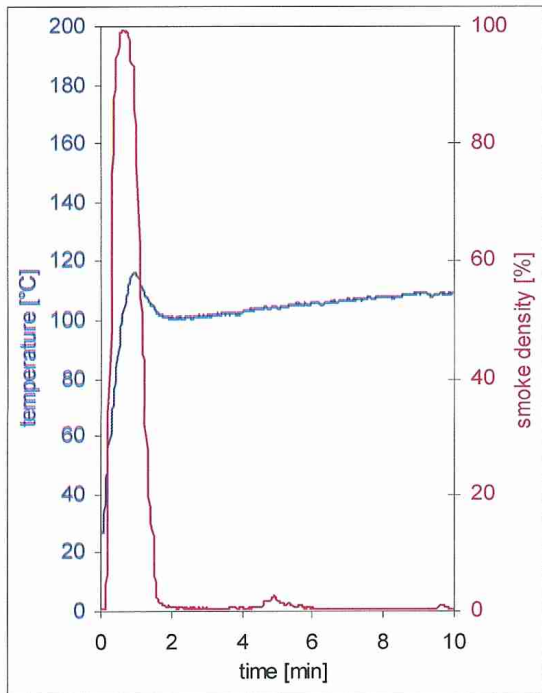


fig. 3
Graphs of the flue gas temperature and the smoke density

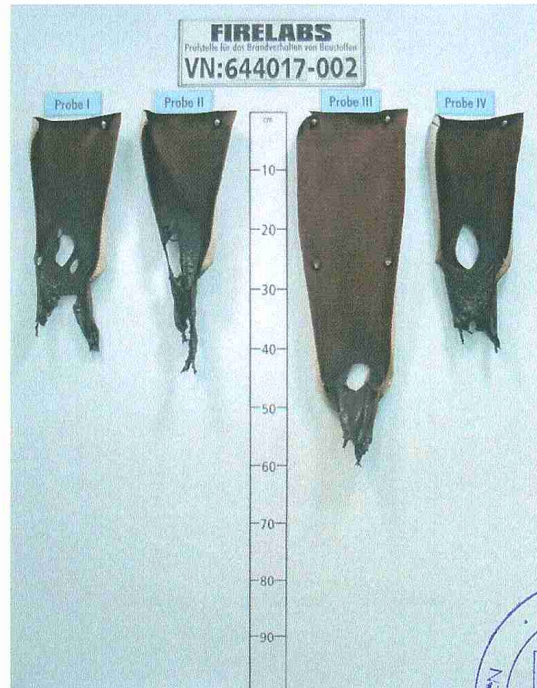


fig. 4
Photo of test specimen after the test



Test specimen C

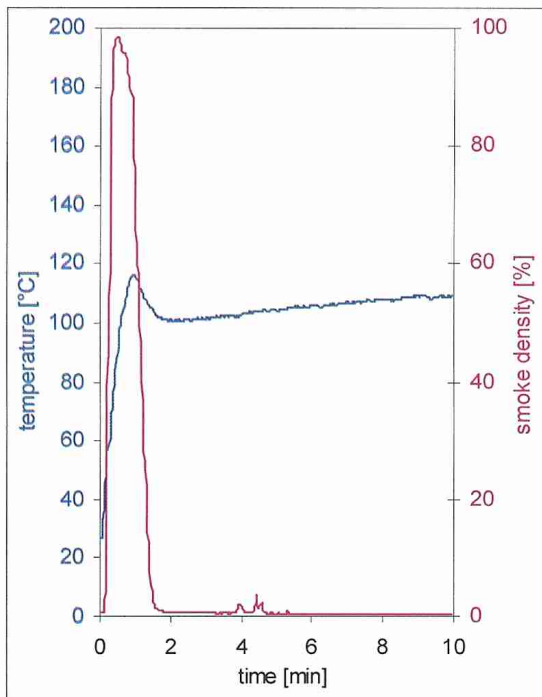


fig. 5
Graphs of the flue gas temperature and the smoke density

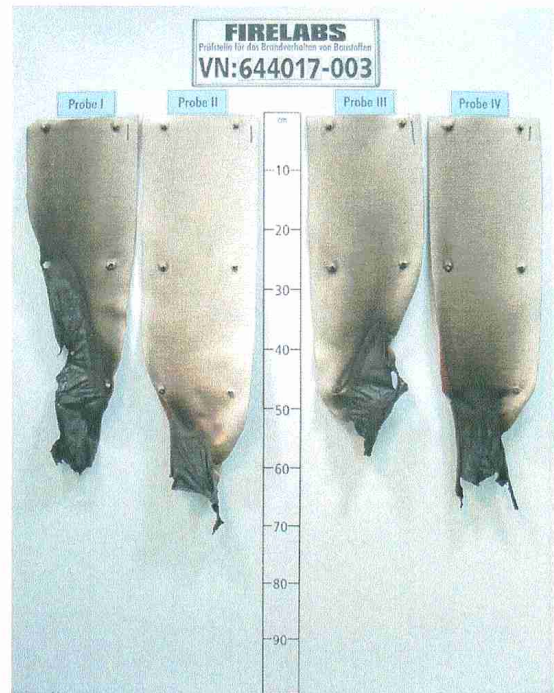


fig. 6
Photo of test specimen after the test

Test specimen D

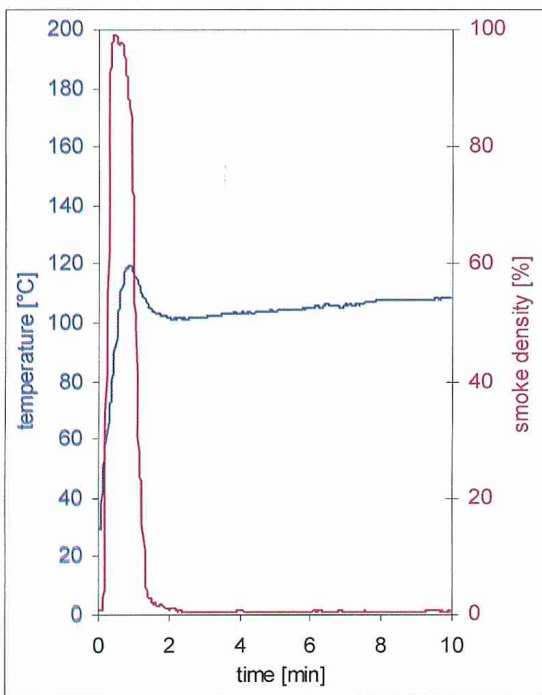


fig. 7
Graphs of the flue gas temperature and the smoke density

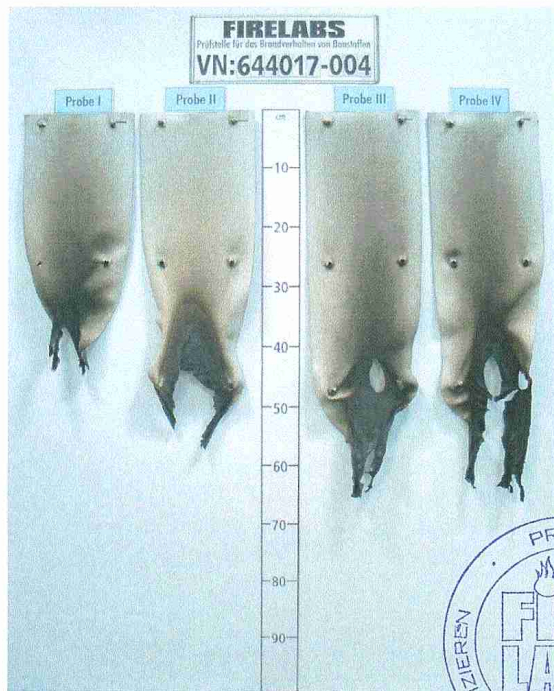


fig. 8
Photo of test specimen after the test



Test specimen E

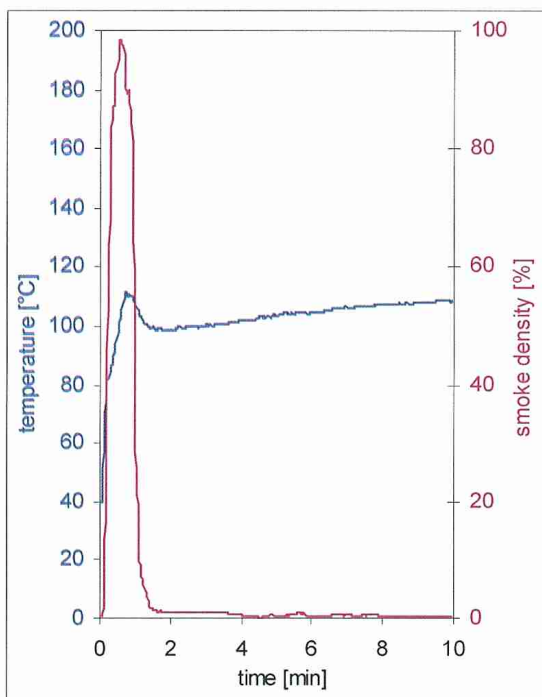


fig. 9
Graphs of the flue gas temperature and the smoke density

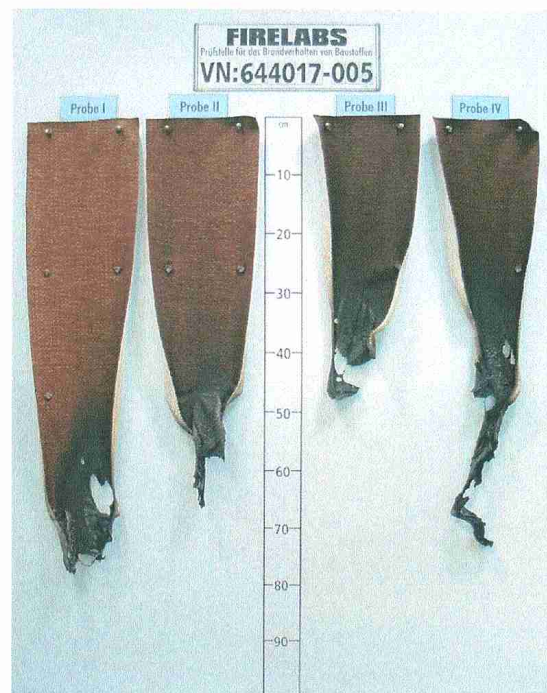


fig. 10
Photo of test specimen after the test

Test specimen F

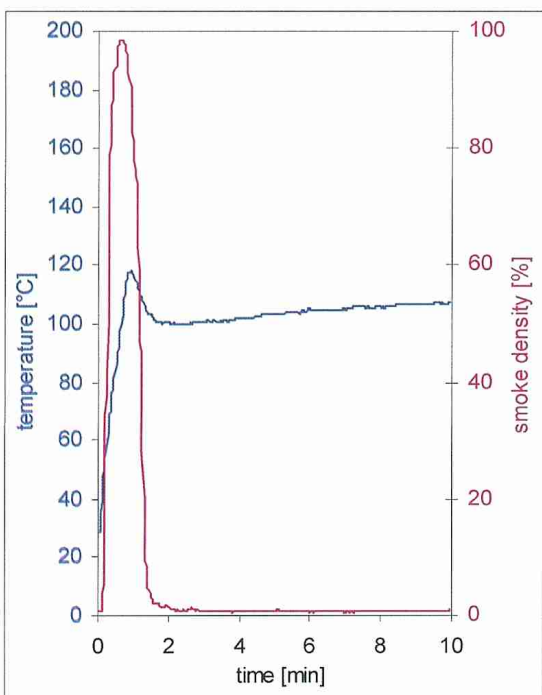


fig. 11
Graphs of the flue gas temperature and the smoke density

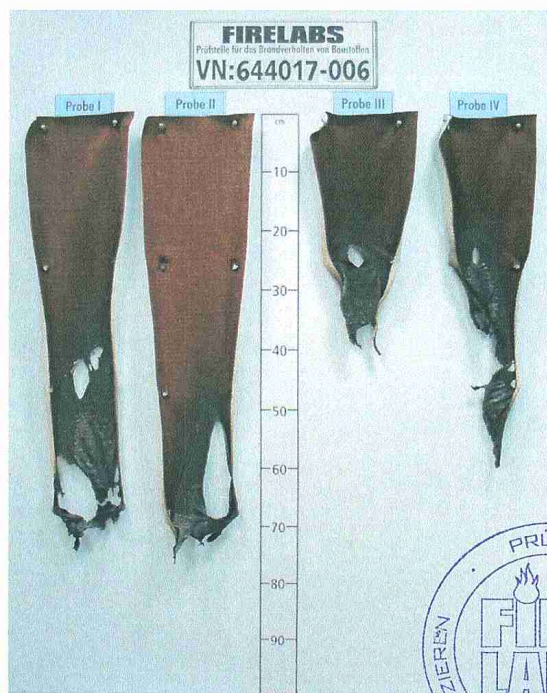


fig. 12
Photo of test specimen after the test

Test results class B2 (Brennkasten)

Table 2

Sample-No.	warp direction							weft direction							dim.	requirements
	1	2	3	4	5	6	7	1	2	3	4	5	6	7		
Ignition of the sample	1	1	1	1	1	5	6	1	1	1	1	1	6	6	s	-
Maximum flame height	8	8	7	8	8	7	6	9	9	10	9	9	8	5	cm	-
Time of the maximum	14	15	15	15	15	15	15	15	15	15	15	15	15	13	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Flame has extinguished	35	36	./.	./.	./.	26	16	38	52	./.	./.	./.	31	16	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	15	16	>5	>5	>5	6	./.	18	52	>5	>5	>5	11	./.	s	-
Flames were extinguished after	./.	./.	25	25	25	./.	./.	./.	./.	25	25	25	./.	./.	s	-

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

The samples were destroyed in the area of the flame application point in a maximum height of 6 cm and a width of approx. 2 cm and soot above until top edge of the samples.

Samples 1-5: edge flame exposure

Samples 6: surface flame exposure onto uncoated side

Samples 7: surface flame exposure onto coated 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

