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

FIRE LABS
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PÜZ-Stelle (LBO): BRA09

Reference	FLT 3761921 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)
Client	Com2C GmbH & Co. KG Industrieweg 1 D - 32457 Porta Westfalica
Test order	2018-06-14 **Arrived** 2018-06-28
Description of samples	On one side coated fabric made of cotton and polyester to be used as wall-covering, named "**Canvas 400 PC LUVESS M W FR**". (for details see page 2)
Delivered	2018-06-28
Content of request	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1
Assessment	The examined material, bonded to solid mineral substrates or to gypsum plaster boards, meets the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1. (for details see page 5)
Validity	2023-06-30
Sampling	The sample was sent to the laboratory by the manufacturer.

TEST CERTIFICATE

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 Prufzeugnis (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall (exceptional approval).

This test certificate can underlie building supervisory procedures:

- for regulated building products for the pre scribed proofs of conformity
- for non-regulated building products for the needed proofs of applicability.

This test certificate includes 5 pages and 2 enclosures.

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1 Description of test material

1.1 Description (according to the manufacturer)

The material delivered is a fabric made of 65 % cotton and 35 % flame-retardant treated polyester yarn. The fabric was coated with a printable polymer coating on one side. The material is intend to be used inside of buildings as wall-covering, bonded onto solid mineral substrates or gypsum plaster boards using a methylcellulose based adhesive. The material was named with the trade name "Canvas 400 PC LUVESS M W FR" by the client.

1.2 Description of the delivered samples

For the tests a section of a one-sided coated fabric of approx. 10 m length and 1.06 m width was sent to the laboratory by the manufacturer. The material was not marked. The coated fabric was named with the trade name "Canvas 400 PC LUVESS M W FR" by the client.
Colour: light beige fabric, white coating
Characteristic values: see paragraph 4.1; photos: see enclosures
Further details are not known to the laboratory, information about the manufacturer and a retain sample have been deposited.

2 Preparation of samples

For the test in the fire shaft ("Brandschacht") 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A were cut in longitudinal direction and the samples for the test specimen B were cut in transverse direction of the coated fabric. The samples have been bonded to gypsum plaster boards (GKB, thickness 12,5 mm, class DIN 4102-A2). For this standard wallpaper glue (based on methylcellulose) with an application quantity of approx. 250 g/m^2 was used to apply the uncoated surface of the test material on to the boards.

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 longitudinal and transversal orientation of the coated fabric and were glued to the boards in the same process.
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 tests ("Brennkastenprüfungen") have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).
Examination period: July 2018.

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2
- section 4.3.3 Test results class B1

4.1 Material characteristics

Table 1

Type	Manufacturer`s data		Measured values		
	Mass per unit area [g/m^2]	Thickness [mm]	Mass per unit area [g/m^2]	Thickness (m.v.) [mm]	[s]
Canvas 400 PC LUVESS M W FR	380	0,44	394	0,52	0,005

./. not received/not measured
m.v. mean value

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 class B2; the material did not show burning particles / droplets during these tests.
(Results: see enclosure 2)

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results "Brandschachtprüfung" (part 1)						
line no.		Specimen				require-ments
		A	B	C	D	
1	Number of specimen arrangement acc. DIN 4102 –15 Table 1	7	7	-	-	
2	Maximal flame height above bottom edge ..... cm	70	70	-	-	
3	Time [1] ..... min	2	2	-	-	*)
4	Burning / melting through Time [1] ..... min	./.	./.	-	-	
5	Back side of the specimens: Flames / glowing Time [1] ..... min:s	./.	./.	-	-	
6	Discolouring Time [1] ..... min:s	./.	./.	-	-	
7	Falling of burning droplets Begin [1] ..... min	No	No	-	-	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	Falling of burning parts Begin [1] ..... min:s	No	No	-	-	
11	Extend: Sporadic falling of burning parts					
12	Continuous falling of burning parts					
13	Afterflame time at the bottom of thesieve (max.) ..... min:s	./.	./.	-	-	
14	Impairment of the burner flames by dropping or falling Material Time [1] ..... min:s	No	No			
15	Premature end of test Final occurrence of burning at the specimen [1] .....min	No 10	No 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	-	-	
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	-	-	
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	9.65	11.1	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.			
30	Diagram fig. no.	1	3	-	-	
	Residual length					
31	Individual values ..... cm	48 47 44 46	46 45 47 49	- - - -	- - - -	> 0
32	Average value ..... cm	**46**	**46**	-	-	≥ 15
33	Photo of the test specimen fig. no.	2	4	-	-	
	Flue gas temperature					
34	Maximum of average value...°C	122	123	-	-	≤ 200
35	Time [1] ..... min:s	1:32	1:50	-	-	
36	Diagram fig. no.	1	3	-	-	
37	Remarks: line 32: There were no additional tests proceeded because of the residual length of > 45 cm. (DIN 4102-16:2015-09, 5.2 b))					

Test specimen A (VN 660318-001): Samples in longitudinal direction
Test specimen B (VN 660318-002): Samples in transversal direction

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

5 Assessment

According to the test results in section 4.2 the tested material, described in section 1 and 4.1, fulfils the requirements of a building material class B1 according to DIN 4102-1, if the material is bonded to solid mineral substrates or gypsum plaster boards (non-perforated), with a density of ≥ 650 kg/m^3 and a thickness of ≥ 11 mm.

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)
- with printed surface

is not proved with this test certificate.

This test certificate is not valid, if the material described in section 1 is used freely suspended.

6 Special remarks

This test 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 not 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 2023-06-30, provided the test methods, classification rules and technology do not change during this period.

Borkheide, 3rd December 2021

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

This translation was issued 3rd December 2021. In a case of doubt the German version is solely valid.

Test specimen A

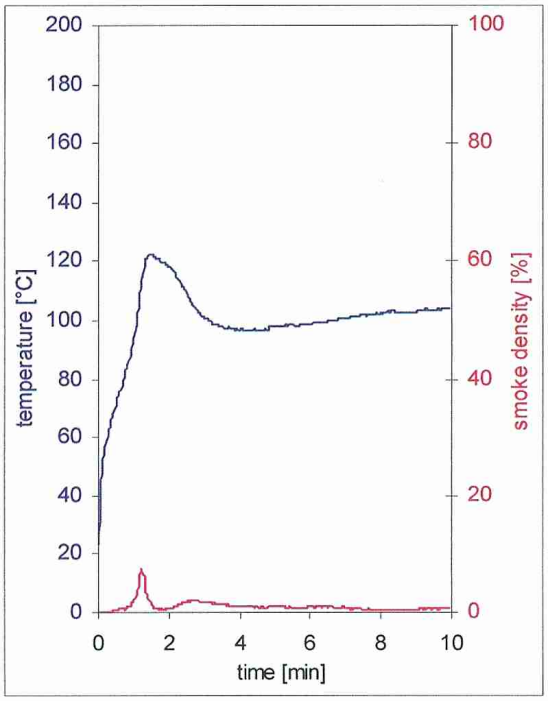

fig. 1
Graphs of the flue gas temperature and the smoke density

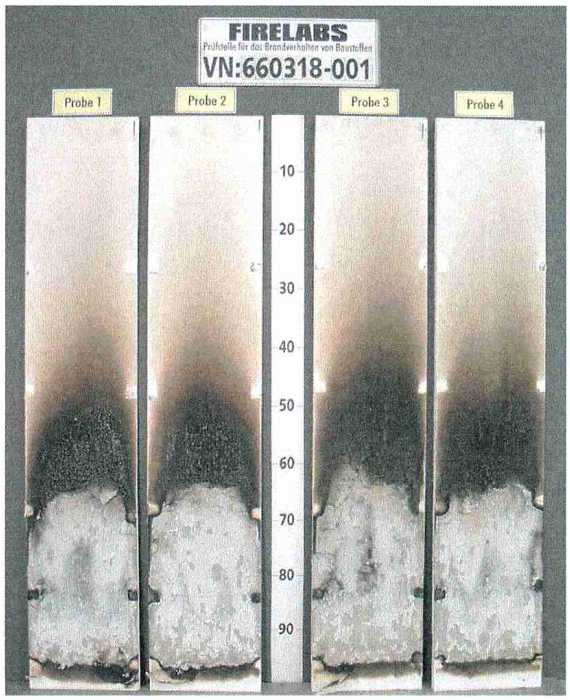

fig. 2
Photo of the test specimen after the test

Test specimen B

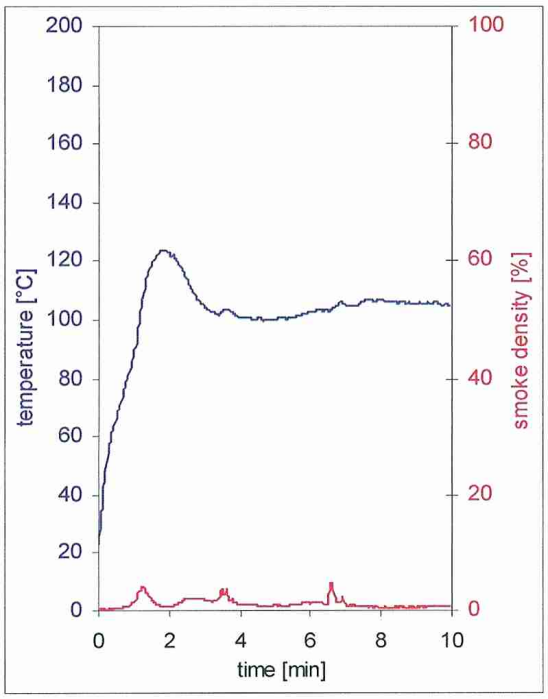

fig. 3
Graphs of the flue gas temperature and the smoke density

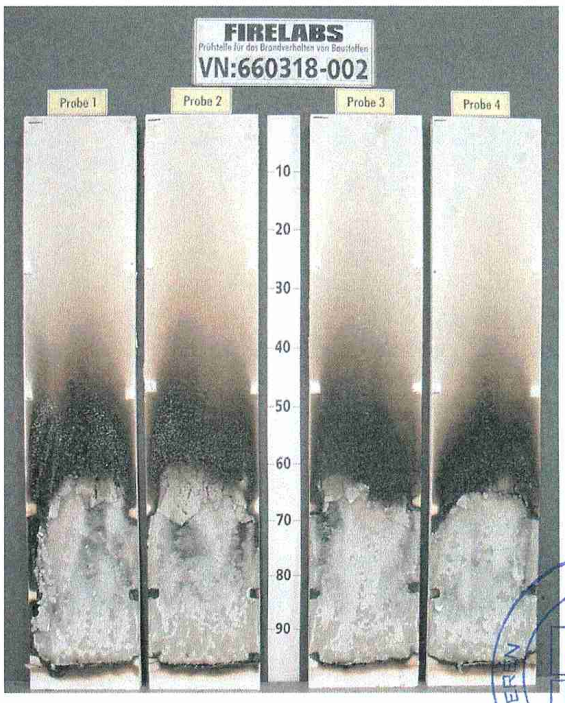

fig. 4
Photo of the test specimen after the test

Test results small burner test

Table 2

	longitudinal direction							transversal direction							dim.	require-ments
Sample-No.	1	2	3	4	5	6	-	1	2	3	4	5	6	-	-	-
Ignition of the sample	8	7	8	6	7	12	-	7	8	7	7	7	11	-	s	-
Maximum flame height	2	2	2	1	1	1	-	3	2	3	3	2	1	-	cm	-
Time of the maximum	15	15	15	15	15	15	-	15	15	15	15	15	15	-	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Flame has extinguished	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): Damaged and discoloured area at the point of flame impingement: approx. 4 cm height and 1.5 cm width.																

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

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