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 3589216 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor: Antalis GmbH
Europaallee 19
D - 50226 Frechen

Order: 2016-07-13 **Arrived:** 2016-07-14

Description of samples: Polyester mesh fabric with a coating of plasticised PVC for use as advertising space or decoration material, named "**COALA Mesh Backing Daily S**".
(for details see page 2)

Delivered: 2016-07-14

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 "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1. If used in one layer, suspended freely or with distance of >40 mm to the same or other plain materials.
(for details see page 5)

Validity 2021-07-31

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 appendices.

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1 Description of test material

1.1 Test material (according to the sponsor)

The provided material is a mesh fabric made of polyester coated on both sides with plasticized PVC containing flame retardant treatments. The coated mesh was covered with a plastic film (liner) on one side. The material is intended to be used as printable advertising space or for decorative purposes and was named with the trade name "COALA Mesh Backing Daily S" by the sponsor.

1.2 Description of the delivered samples

For the tests the laboratory received a mesh fabric made of plastic fibres (Schussraschel) plastic coated on both sides of a length of approx. 50 m and a width of 1.37 m. One of the surfaces was covered with a white, semitransparent protective plastic film. The sample was labelled with "COALA Mesh Backing Daily S", article CSOMBD-13750, batch 150212-1 and was named with the trade name "COALA Mesh Backing Daily S".
Colour: white on both sides, plain
Characteristic values: see paragraph 4.1; Photos: see enclosure 1
Further details are not known to the laboratory; a sample has been deposited.

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) were cut in warp and in weft orientation of the fabric.
For the fire shaft (Brandschacht) tests 2 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimen A have been cut in warp orientation, the samples for the test specimen B have been 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 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: August 2016

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2
- section 4.2.2 Test results class B1

4.1 Material characteristics

Table 1

Specific values			Specifications by manufacturer	Measured values m.v.	s
Thickness (without liner)		[mm]	./.	0,36	0,005
Mass per unit area	Total (without liner)	[g/m²]	290 ± 20	274	
	Liner		100	94,4	

./. 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)

Building materials of 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 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 2)

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	-	-	
2	Maximal flame height above bottom edge ..... cm	30	40	-	-	
3	Time [1] ..... min	1	1	-	-	*)
4	Burning / melting through Time [1] .....min	1	1	-	-	
5	Back side of the specimens: Flames / glowing Time [1] ..... min:s	./.	./.	-	-	
6	Discolouring Time [1] ..... min	./.	./.			
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	No	Yes 1	- -	- -	
11	Extend: Sporadic falling of burning parts		Yes	-	-	
12	Continuous falling of burning parts		No	-	-	
13	Afterflame time at the bottom of the sieve (max.) ..... min:s	./.	0:11	-	-	
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	4	3	-	-	
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	17.6	21.3	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.			
30	Diagram fig. no.	1	3	-	-	
	Residual length					
31	Individual value .....cm	77	74	-	-	
		75	69	-	-	> 0
		65	64	-	-	
		68	65	-	-	
32	Average value .....cm	**71**	**68**	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
	Flue gas temperature					
34	Maximum of average value...°C	115	115	-	-	≤ 200
35	Time [1] .....min:s	9:18	10:00	-	-	
36	Diagram fig. no.	1	3	-	-	
37	Remarks: line 13: Afterflame time at the bottom of the sieve < 20 sec. is not rated as "falling of burning parts or droplets" line 32: There were no additional tests proceeded because of the residual length of > 45 cm (DIN 4102-16, 5.2 b))					

Test specimen A (VN 589216-001): samples in warp orientation
Test specimen B (VN 589216-002): samples in weft orientation

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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 material described in section 1 fulfils the requirements of a building material 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)

was not subject of the tests.

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, (3)).
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

- regular building materials for the required proof of accordance
- for not regular 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 2021-07-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 9th of August 2016

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

This translation was issued 15th of November 2017, in a case of doubt the German version is valid solely.

Test specimen A: samples in warp orientation

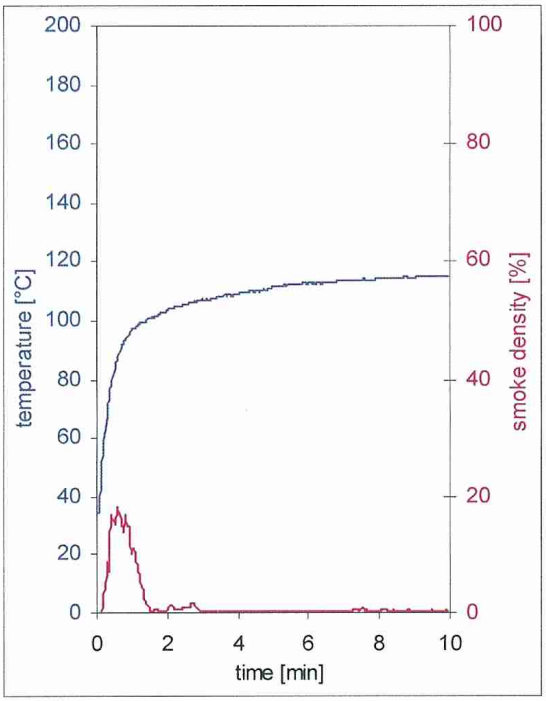

fig. 1
Graphs of the flue gas temperature and the smoke density

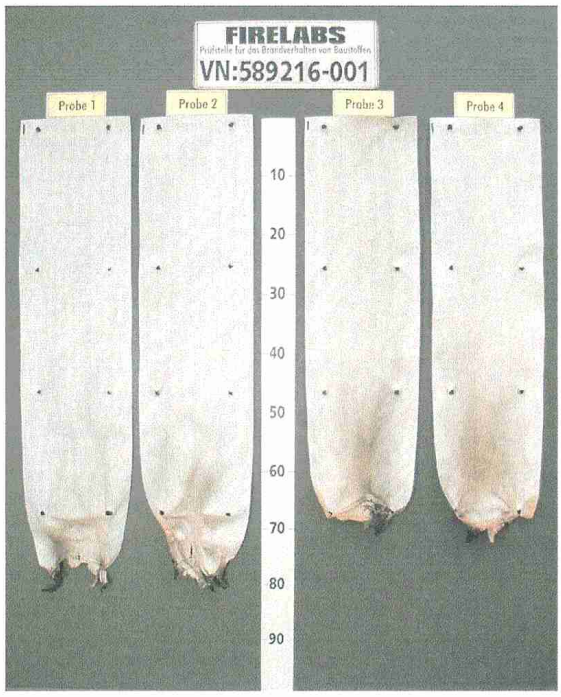

fig. 2
View of test specimen after the test

Test specimen B: samples in weft orientation

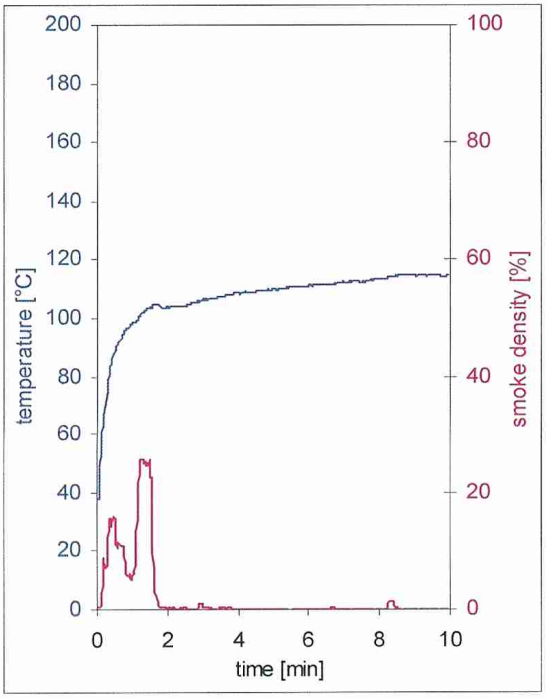

fig. 3
Graphs of the flue gas temperature and the smoke density

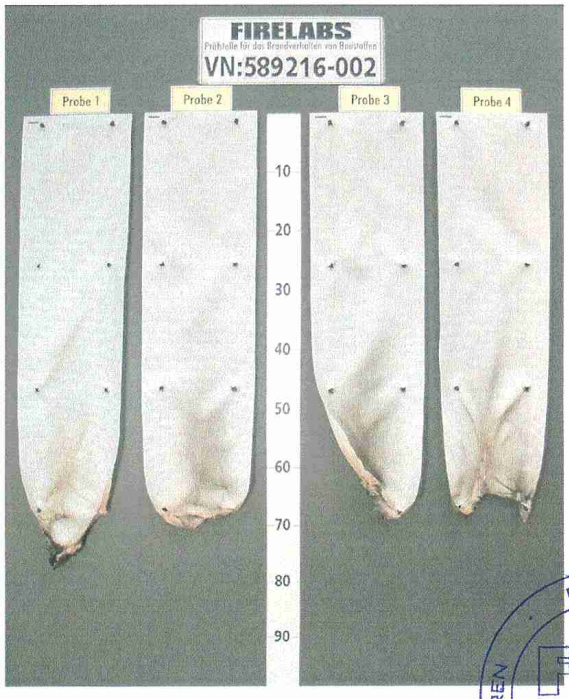

fig. 4
View of test specimen after the test

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Test results small burner test

Table 2

	warp direction							weft direction							dim.	require-ments
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	2	-	1	1	1	1	1	2	-	s	-
Maximum flame height	8	12	10	9	7	6	-	6	9	8	9	10	10	-	cm	-
Time of the maximum	8	9	7	10	7	13	-	7	7	7	8	8	11	-	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Self-extinguishing of flames	8	10	7	11	8	19	-	8	8	8	9	9	16	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	[1]
Smoke density (visual)	moderate							moderate							-	-
Afterburning time	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	-
View of the samples after the test (20 seconds after exposure the flame): - warp direction: destroyed or burned length max. 11 cm, destroyed width approx. 2 cm, soot above until top edge of samples - weft direction: destroyed or burned length max. 9 cm, destroyed width approx. 2 cm, soot above until top edge of samples																

Samples 1-5: Edge flame exposure
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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