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

FIRE LABS
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PÜZ-Stelle (LBO): BRA09

Reference: FLT 3780822 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Client: Mermet SAS
58, chemin du Mont Maurin
F - 38630 Veyrins

Order: 2022-05-09 **Arrived:** 2022-05-10

Description of samples: Fabric made of glass fibre yarns, coated with plasticized PVC and a metallisation on both sides, named "**SATINÉ 5500 LOW E**".
(For details see page 2)

Delivered: 2022-05-10

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: 2027-05-31

Sampling: The samples were sent to the laboratory by the client

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 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 proof of conformity
- non-regulated building products for the needed proof 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 delivered material is a fabric made of glass fibre yarns individually coated with plasticised PVC, thermally fixed and metalized surfaces on both sides. The fabric is intended to be used indoor as sun protection or for decorative purposes and was named with the trade name "SATINÉ 5500 LOW E".

1.2 Description of the delivered samples

For the tests the laboratory received a fabric made of plastic coated yarns and a silver coloured coating on both sides of approx. 2 m in length and 2.41 m in width. The sample was marked with the trade name and the production direction.
Colour: silver shiny on both sides.
Colour name: LOW E.
Characteristic values: see passage 4.1; photos: see enclosures 1, 2.
Further details are not known to the laboratory; a retain sample has been deposited.

2 Preparation of samples

For the small burner ("Brennkasten") 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 base fabric.

For the fire shaft ("Brandschacht") tests 4 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) for the test specimens A and B were cut in warp orientation; the samples for the test specimens C and D 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 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: The tests have been carried out in single layer, freely suspended, both from the coated and the uncoated surface.

Examination period: May 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

Characteristics		Manufacturer's data	Measured values m.v.	s
Total thickness	[mm]	0,65 ± 5%	0.65	0.006
Weight per unit area	[g/m^2]	520 ± 5%	508	

m.v. mean value (n=10)
s standard deviation
./. not received/not measured

4.2 Results of the fire behaviour

4.2.1 Test results class B2 (Brennkasten)

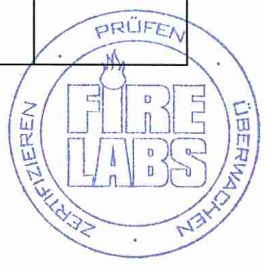
All building materials class B1 must also meet the requirements of materials class B2 (flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements class B2; the material did not show burning particles/droplets during these tests (Results: see enclosure 3).

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results (part 1)						
line no.		Specimen				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	70	80	80	80	
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	No	No	No	No	
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	./.	./.	./.	./.	

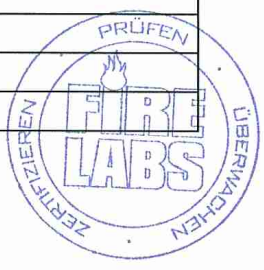
[1] Indication of time: from the beginning of testing procedure
- Not tested
. /. Not occurred
*) No cause for complaint



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	54,1	46,2	50,9	52,3	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
	Residual length					
31	Individual value .....cm	38 36 39 38	49 48 41 39	38 36 34 36	37 38 42 41	> 0
32	Average value .....cm	**37**	**44**	**36**	**39**	≥ 15
33	Photo of test specimen fig. no.	2	4	6	8	
	Flue gas temperature					
34	Maximum of average value...°C	120	122	121	120	≤ 200
35	Time [1] .....min:s	0:28	0:30	0:30	0:30	
36	Diagram fig. no.	1	3	5	7	
37	Remarks: - (Diagrams and photos see enclosureses 1, 2)					

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

Specimen	Test-no.:	Direction of support fabric
A	780822-001	Warp
B	780822-002	Weft
C	780822-003	Warp
D	780822-004	Warp



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 in one layer, 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

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 regarded as the sole proof if the tested building material is used as a 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.

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 2027-03-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 1st of June 2022

PRÜFEN ZERTIFIZIEREN FIRE LABS ÜBERWACHEN

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

This translation was issued the 1st of June 2022, in a case of doubt the German version is valid solely.

Test specimen A

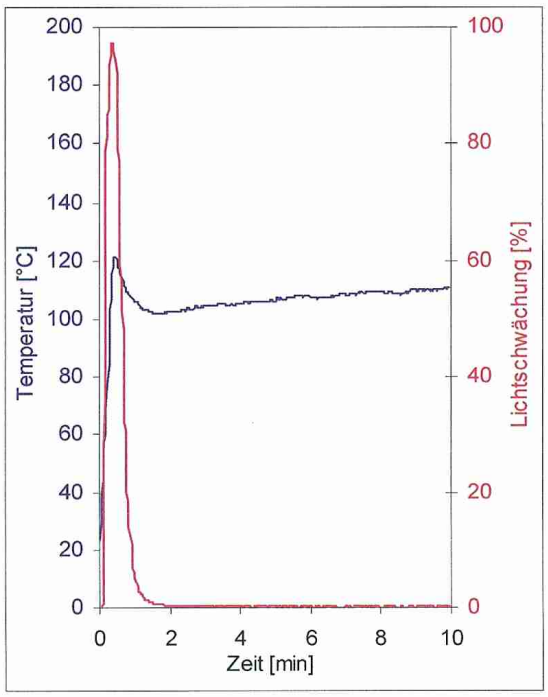


fig. 1
Graphs of the flue gas temperature and the smoke density

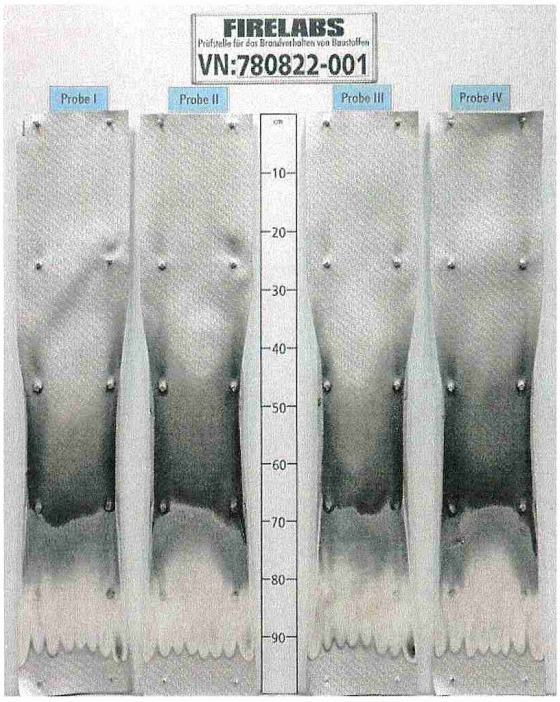


fig. 2
View of test specimen after the test

Test specimen B

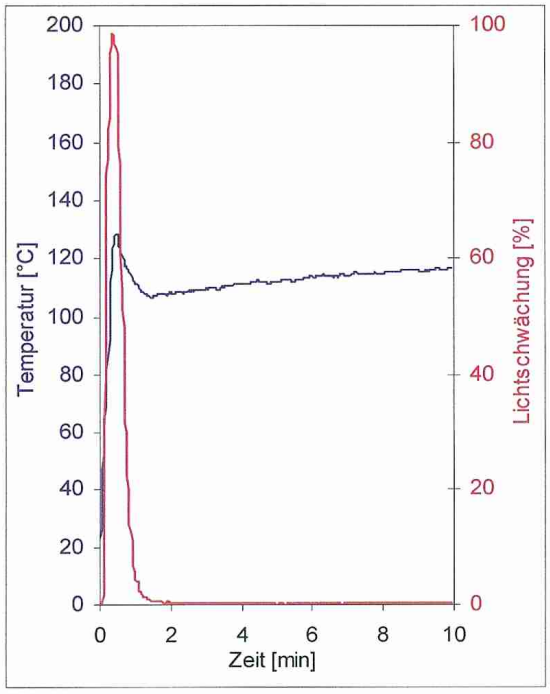


fig. 3
Graphs of the flue gas temperature and the smoke density

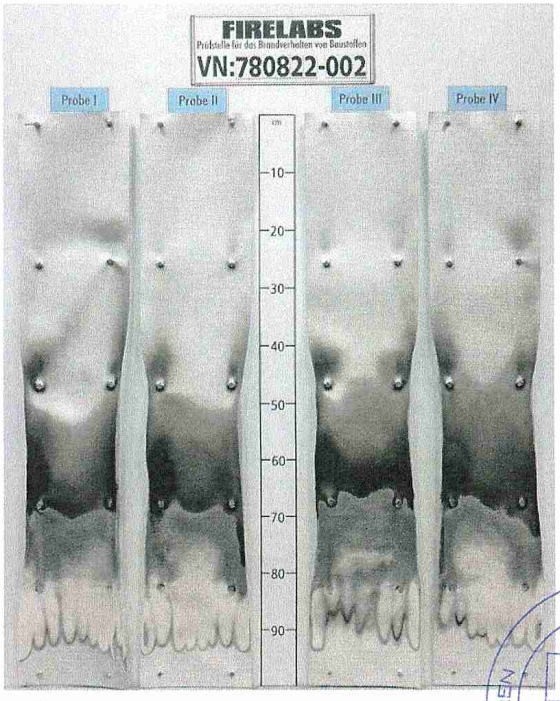


fig. 4
View of test specimen after the test

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Test specimen C

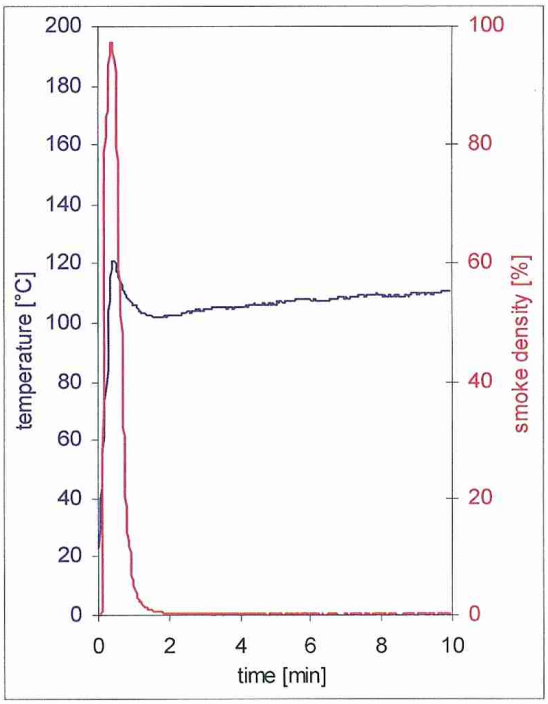

fig. 5
Graphs of the flue gas temperature and the smoke density

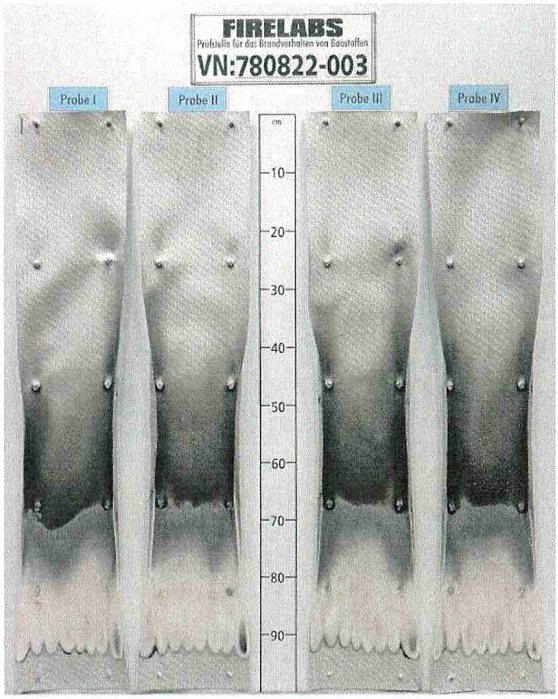

fig. 6
View of test specimen after the test

Test specimen D

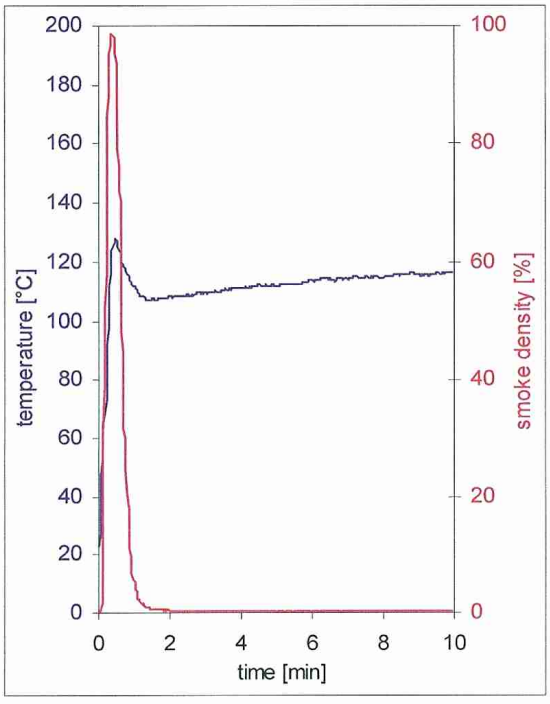

fig. 7
Graphs of the flue gas temperature and the smoke density

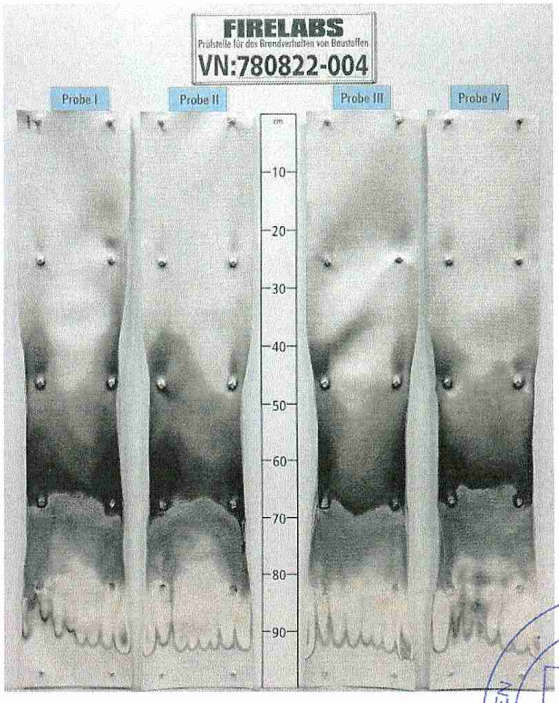

fig. 8
View of test specimen after the test

Test results small burner ("Brennkasten") tests

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	3	3	3	3	-	1	3	3	3	3	3	-	s	-
Maximum flame height	8	9	9	8	9	10	-	7	10	10	10	11	10	-	cm	-
Time of the maximum	9	10	9	7	10	10	-	7	11	9	10	10	11	-	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Extinction of flames	16	16	16	16	16	16	-	16	16	16	16	16	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): In the area of the impingement point the samples were destroyed up to a max. height of approx. 8 cm and approx. 1.5 cm in width, soot above until top edge of the sample.																

Samples 1: Edge flame exposure
Samples 2-6: 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