

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

Reference: FLT 3744621 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor:



Order: 2021-03-04 **Arrived:** 2021-03-04

Description of samples: Uncoated, white and black nonwoven panels made of flame retardant polyester fibres, named: [REDACTED], (for details see page 2)

Delivered: 2021-02-15

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 in a freely suspended arrangement or at a distance of > 40 mm to the same or other plain materials. (for details see page 5)

Validity 2026-02-28

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 proof of conformity
- non-regulated building products for the needed proof of applicability.

This test certificate comprises 5 pages and 2 enclosures.

Approved testing, inspection and certification body

This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents. Agreement of the test laboratory has to be given in any case if norms in which the tests are based or other technical standards have changed.



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TEST CERTIFICATE



1 Description of test material

1.1 Test material (according to the sponsor)

The delivered material are uncoated fibre boards made of fibres of flame retardant polyester (designated PET) with a nominal thickness of 24 mm. The fibre boards are intended to be used indoor as acoustics elements and were named with the trade name [REDACTED] by the sponsor.

1.2 Description of the delivered samples

For the tests the laboratory received 13 white and 13 black samples, each 1.0 m long and 0.19 m wide, of the platelike nonwoven fabric made of synthetic fibers.

Designation: [REDACTED] color: black;
[REDACTED] color: white.

Characteristic values see Table 1.

Other specifications are not known to the laboratory, a retain sample is deposited.

2 Preparation of samples

For the fire shaft test (Brandschacht) 2 specimens were assembled. Specimens from the black plates were used to prepare specimen A, and specimens from the white plates were used for specimen B.

For the small burner test (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.

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).

All tests were performed in a freely suspended arrangement.

Examination period: March 2021

4 Results

- Table 1 Material characteristics
- Table 2 Test results class B2 ("Brennkasten"), see enclosure 2
- Table 1 Test results class B1 ("Brandschacht")

4.1 Material characteristics

Table 1

Trade name	Colour	Specifications by manufacturer		Measured values		
		Thickness [mm]	Weight per unit area [g/m ²]	Thickness (m.v.) [mm]	s	Weight per unit area [g/m ²]
[REDACTED]	black	24	3000	24,3	0,586	3289
	white	24	3000	24,1	0,311	2997

m.v. mean value
s standard deviation



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 class B2.

(Results: see enclosure 2)

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results (part 1)						
Line no.		Specimen				Requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	5	5	-	-	
2	<u>Maximal flame height</u> above bottom edge cm	50	50	-	-	*)
3	Time ¹⁾ min	1	1	-	-	
4	<u>Burning / melting through</u> Time ¹⁾min	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	./.	./.			
7	<u>Falling of burning droplets</u> Begin ¹⁾ min	Yes	No	-	-	
8	Extend: Sporadic falling of burning droplets	Yes				
9	Continuous falling of burning droplets	No				
10	<u>Falling of burning parts</u> Begin ¹⁾ min	No	No	-	-	
11	Extend: Sporadic falling of burning parts			-	-	
12	Continuous falling of burning parts			-	-	
13	<u>Afterflame time at the bottom of the sieve (max.)</u> min:s	4:35	./.	-	-	
14	<u>Impairment of the burner flames by dropping or falling</u> <u>Material</u> Time ¹⁾ min:s	No	No	-	-	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen ¹⁾min	5	5	-	-	
16	Time of eventually end of test ¹⁾ min:s	./.	./.	-	-	

¹⁾ Indication of time: from the beginning of testing procedure

- No specified / not tested

./. Not occurred

*) No cause for complaint



Test results (part 2)						
Line no.		Specimen				Requirements
		A	B	C	D	
17	<u>Afterflame after end of test</u> Timemin:s	No	No	-	-	
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame lengthcm					
22	<u>Afterglow after end of test</u> Timemin:s	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	20,2	4,6	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.	-	-	
30	Diagram fig. no.	1	3	-	-	
31	<u>Residual length</u> Individual valuecm	59 55 52 53	55 51 54 51	- - - -	- - - -	> 0
32	Average valuecm	54	52	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
34	<u>Flue gas temperature</u> Maximum of average value...°C	111	114	-	-	≤ 200
35	Time ¹⁾min:s	9:54	9:36	-	-	
36	Diagram fig. no.	1	3	-	-	
37	<u>Remarks:</u> line 13: Duration of continued burning of specimen parts at the bottom of the sieve > 20 sec. is considered as burning dripping/falling 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: "AkuBond" (black) VN 744621-001
Test specimen B: "AkuBond" (white) VN 744621-002

- 1) Indication of time: from the beginning of testing procedure
- No specified / not tested
./ Not occurred
*) No cause for complaint
VN Test-no.



5 Assessment

In section 4.2 the test results of the test material described in sections 1 and 4.1 were compiled and compared with the requirements of DIN 4102-1.

The test results show that the requirements of class B1 building materials were met by the tested building materials when used in a freely suspended arrangement or at a distance of > 40 mm to the same or other plain building materials.

██████████ (black) showed falling of burning parts/droplets during the tests.

The requirements of building materials class B2 are also fulfilled.

The verification

- for outdoor usage (ageing by outdoor weathering)
has not been proved.

6 Special remarks

The above results are only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or substrates 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 2026-02-28, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 8th of March 2018



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



In charge for testing
Dipl.-Ing. Kai Kielinski

This translation was issued 8th of March 2021, in a case of doubt the German version is valid solely.

Test specimen A

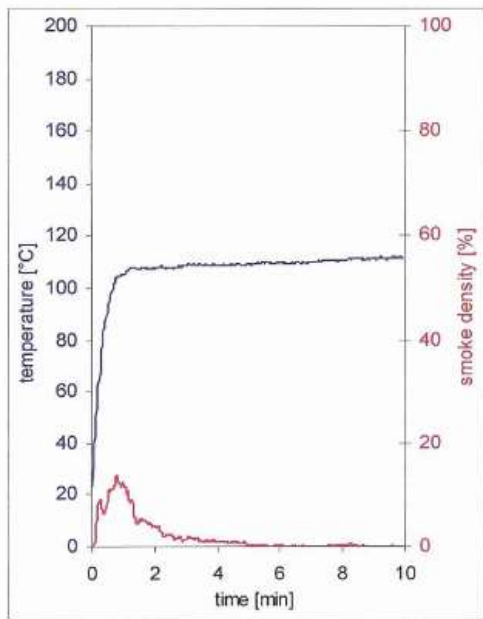


fig. 1
Graphs of the flue gas temperature and the smoke density

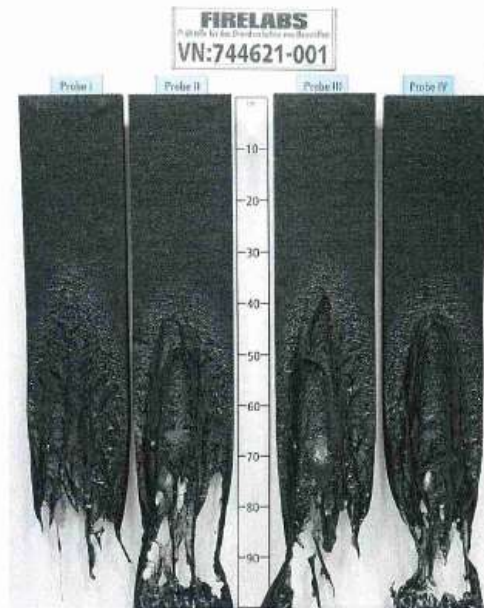


fig. 2
View of test specimen after the test

Test specimen B

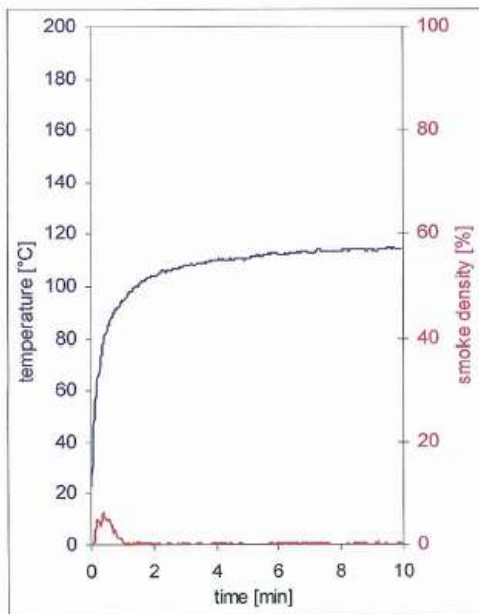


fig. 3
Graphs of the flue gas temperature and the smoke density

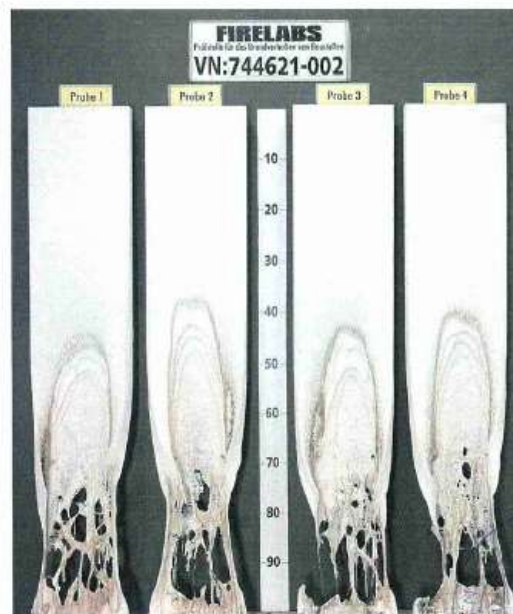


fig. 4
View of test specimen after the test



Test results small burner test

Table 2

	Dim.	[REDACTED]						[REDACTED]						Requirements
		(black)						(white)						
Sample-No.	-	1	2	3	4	5	6	1	2	3	4	5	6	
Ignition of the sample	s	1	3	3	3	3	2	3	4	2	4	5	4	-
Maximum flame height	cm	3	4	5	3	4	5	2	4	4	5	4	5	-
Time of the maximum	s	5	9	6	6	8	8	10	8	6	11	12	15	-
Flame tip reached the 150 mm test mark	s	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	≥ 20
Flame has extinguished before reaching the test mark	s	6	20	47	16	16	28	16	13	12	16	16	19	-
Ignition of filter paper	s	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	1)
Smoke density (visual)	-	very low						very low						-
Afterburning time	s	.J.	.J.	27	.J.	.J.	8	.J.	.J.	.J.	.J.	.J.	.J.	-
Flames have been extinguished	s	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	-

View of the samples after the tests:

After the end of the test (20 seconds after the start of the test), the samples were burned up to a maximum height of about 3 cm and a width of about 2 cm, sintered above and slightly sooted.

Samples 1: Edge flame exposure

Samples 2-6: Surface flame exposure

1) no ignition within 20 seconds

.J. not occurred

Dim. Dimension

Indication of time: from the beginning of testing procedure

Indication of measurements: from reference line of the flame

