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

FIRE LABS
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TEST CERTIFICATE

Reference	FLT 3673818 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)
Sponsor	Neschen Coating GmbH Hans-Neschen-Straße 1 D - 31675 Bückeburg
Order	2018-11-14 **Arrived** 2018-11-19
Description of samples	Nonwoven materials on one side colour-coated and self-adhesive on the reverse side, named "**NESCHEN wallpaper L-UV smooth adh**" and "**NESCHEN wallpaper L-UV sand adh**". (for details see page 2)
Delivered	2018-11-19
Content of request	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1
Assessment	The examined materials, bonded to solid mineral substrates or to gypsum plaster boards, meet the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1. (for details see page 5)
Validity of report	2023-12-31
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, a general building supervisory test certificate is not required.
This test certificate shall not be used as the sole proof 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 3 enclosures.

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1 Description of test material in condition as delivered

1.1 Test material (according to the sponsor):
The delivered samples are two nonwoven materials, mainly consisting of cellulose and plastic fibres with a one-sided, printable coating and a self-adhesive backing. The nonwoven materials are intended to be used inside of buildings, glued to solid mineral substrates or gypsum plasterboards and have been named by the sponsor "NESCHEN wallpaper L-UV smooth adh" and "NESCHEN wallpaper L-UV sand adh".

1.2 Description of the delivered material
For the tests, 2 sample rolls of self-adhesive nonwoven materials were sent to the laboratory. The fleece materials were colour-coated on the visible side, the self-adhesive surface was covered with a white protective paper. The following variants were received:

Trade name, labelled:	Length [m]	Width [m]	Visible side colour, surface	Total weight [g/m²]
NESCHEN wallpaper L-UV smooth adh	ca. 10	1,60	white, smooth	293
NESCHEN wallpaper L-UV sand adh		1,60	white, textured	315

Characteristic values: see table 1; Photos: see enclosures;
Other specifications are not known by the laboratory, samples are stored.

2 Preparation of samples

For the fire shaft ("Brandschacht") tests, from materials provided, 2 specimen each were prepared. 4 samples each with dimensions 1000 mm x 190 mm for the test specimen A and C were cut in longitudinal direction, the samples for the test specimen B and D were cut in transverse direction of the materials and bonded onto gypsum plaster boards (GKB, thickness 12.5 mm, class DIN 4102-A2). For the small burner ("Brennkasten") tests samples for edge flame exposure (dimensions 190 mm x 90 mm) and surface flame exposure (dimensions 230 mm x 90 mm) in longitudinal and transversal direction were prepared using the same method.
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 ("Brennkasten") tests have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).

Examination period: January 2019.

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

Tradename / Layer	Manufacturer´s data		Measured values (m.v.)		
	Thickness [mm]	Weight per unit area [g/m²]	Thickness [mm] (m.v.)	Thickness [mm] s	Weight per unit area [g/m²]
NESCHEN wallpaper L-UV smooth adh *)	./.	./.	0,24	0,005	203
Fleece, without coatings	./.	ca. 150	./.	./.	./.
Paper liner	./.	./.	0,08	< 0,003	90
NESCHEN wallpaper L-UV sand adh *)	./.	./.	0,28	0,01	225
Fleece, without coatings	./.	ca. 170	./.	./.	./.
Paper liner	./.	./.	0,08	< 0,003	90

m.v. mean value
s standard deviation
./. not received/not measured
*) with adhesive layer, without paper liner

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 (low flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements class B2. (Results see enclosure 3)

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results (part 1)						
line no.		Measured Values Specimen				require-ments
		A	B	C	D	
1	Number of specimen arrangement acc. DIN 4102 –15 Table 1	7	7	7	7	
2	Maximal flame height above bottom edge ..... cm	60	60	60	60	
3	Time [1] ..... min	2	2	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:s	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	No 10	No 10	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.		Measured Values 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	Yes	Yes	Yes	Yes	
22	Time .....min:s	0:20	0:16	0:18	0:18	
23	Number of specimen	4	4	4	4	
	Place of appearance:					
24	Lower half of specimen	Yes	Yes	Yes	Yes	
25	Upper half of specimen	No	No	No	No	
26	Front side of specimen	Yes	Yes	Yes	Yes	
27	Rear side of specimen	No	No	No	No	
	Smoke density					
28	≤ 400 % min	2,3	1,6	2,3	2,3	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
	Residual length					
31	Individual value .....cm	51 55 52 53	48 52 53 53	49 51 51 49	48 52 49 51	> 0
32	Average value .....cm	**52**	**51**	**50**	**50**	≥ 15
33	Photo of test specimen fig. no.	2	4	6	8	
	Flue gas temperature					
34	Maximum of average value...°C	115	112	106	105	≤ 200
35	Time [1] .....min:s	1:32	1:34	1:34	1:30	
36	Diagram fig. no.	1	3	5	7	
37	Remarks: line 32: There were no additional tests proceeded, due to the residual length of ≥ 45 cm (DIN 4102-16: 2015-09, 5.2 b)). (diagrams and photos see enclosure 1 - 2)					

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

Specimen	Test-No.	Trade name	Orientation of samples	Substrate
A	673818-001	NESCHEN wallpaper L-UV sand adh	longitudinal	gypsum plaster board
B	673818-002		transversal	
C	673818-003	NESCHEN wallpaper L-UV smooth adh	longitudinal	
D	673818-004		transversal	

5 Assessment

According to the test results in section 4.2 the 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 used on solid mineral substrates with a gross density ≥ 650 kg/m^3 and a thickness ≥ 11 mm or gypsum plaster boards (non-perforated).

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)

is not proved with this test certificate.

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 non-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 2023-12-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 15^h of January 2019

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

This translation was issued on 15^h of January 2019. In a case of doubt the German version is valid solely.

Test specimen A

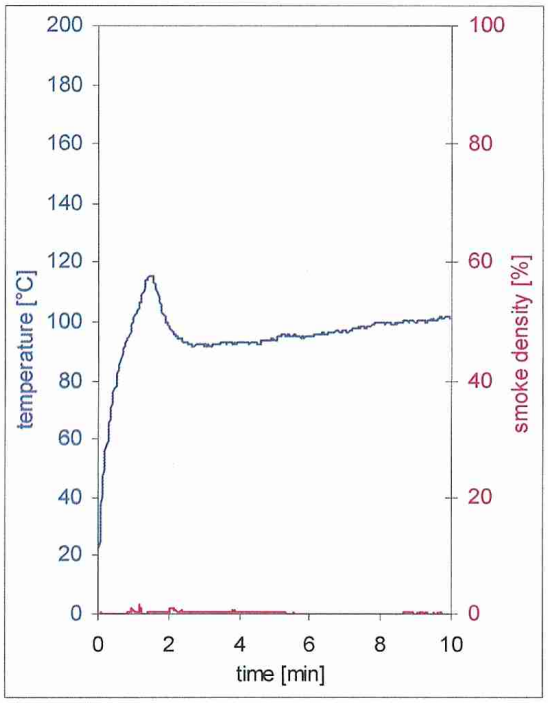

fig. 1
Graphs of the flue gas temperature and the smoke density

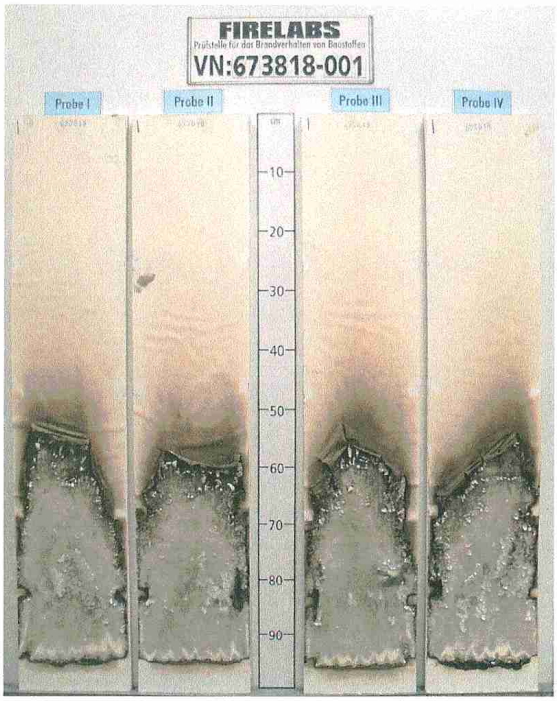

fig. 2
Photo of test specimen after the test

Test specimen B

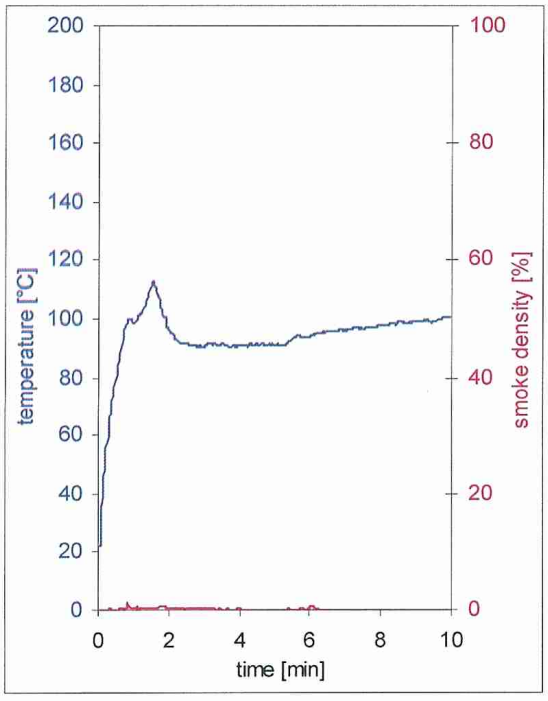

fig. 3
Graphs of the flue gas temperature and the smoke density

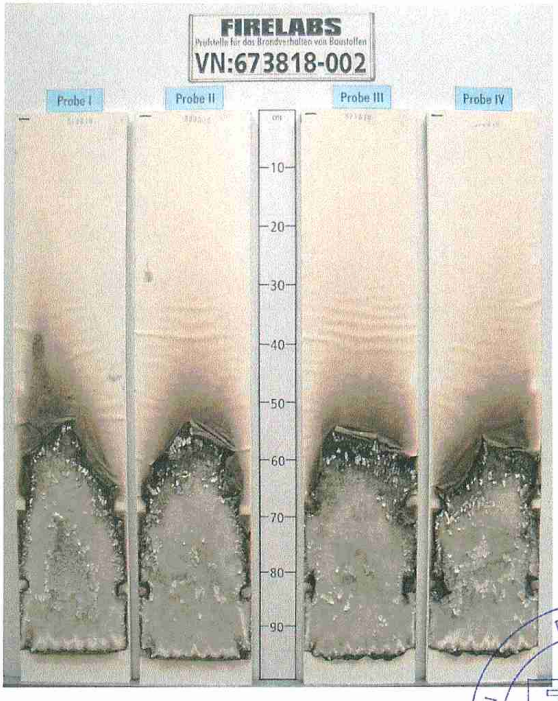

fig. 4
Photo of test specimen after the test

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Test specimen C

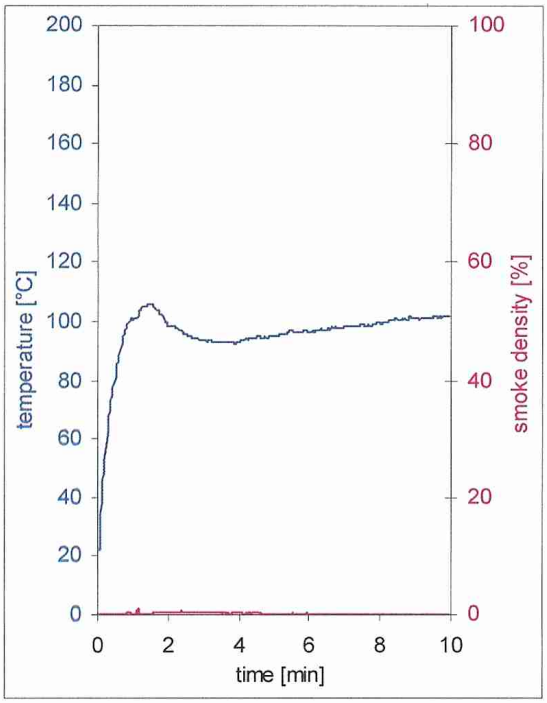

fig. 5
Graphs of the flue gas temperature and the smoke density

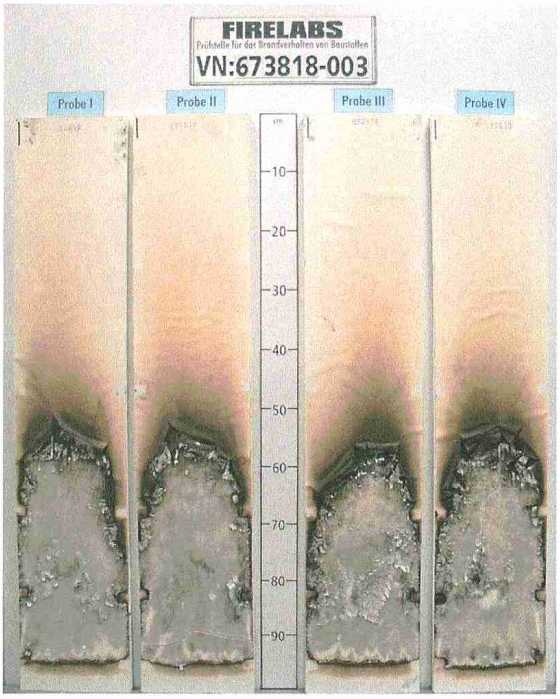

fig. 6
Photo of test specimen after the test

Test specimen D

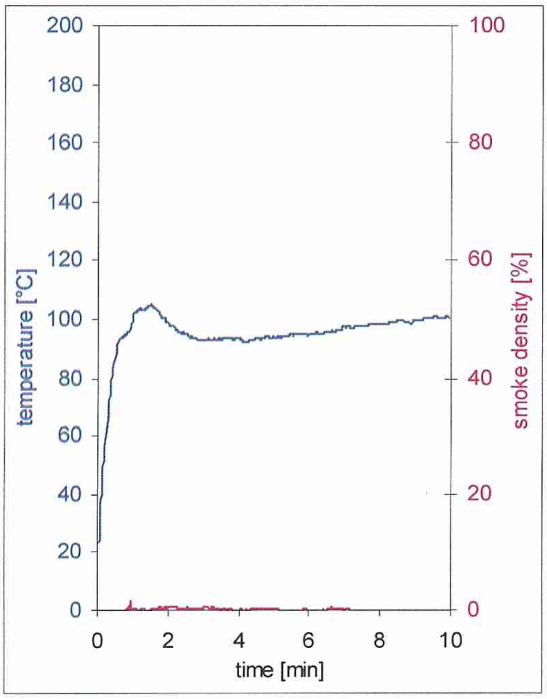

fig. 7
Graphs of the flue gas temperature and the smoke density

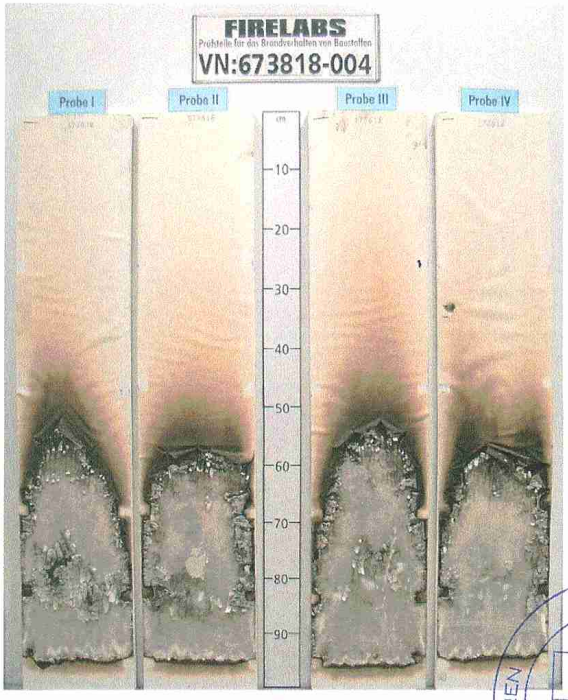

fig. 8
Photo of test specimen after the test

Test results class B2 (Brennkasten)

Table 2.1: "NESCHEN wallpaper L-UV smooth adh" bonded to gypsum plasterboards

	longitudinal direction							transversal direction							dim.	require-ments
Sample-No.	1	2	3	4	5	6	-	1	2	3	4	5	6	-	n	-
Ignition of the sample	3	3	3	3	3	13	-	3	2	3	3	3	10	-	s	-
Maximum flame height	2	3	2	2	3	1	-	2	2	3	2	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	17	16	16	16	16	-	34	16	46	17	19	16	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	[1]
Smoke density (visual)	very low							very low							-	-
Afterburning time	./.	./.	./.	./.	./.	./.	-	14	./.	26	./.	./.	./.	-	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	-
View of the samples after the test (20 seconds after exposure the flame): - the fleece surface was destroyed up to a max. height of 2 cm and a width of approx. 2 cm, above discoloured about 2.5 cm.																

Table 2.2 : "NESCHEN wallpaper L-UV sand adh" bonded to gypsum plasterboards

	longitudinal direction							transversal direction							dim.	require-ments
Sample-No.	1	2	3	4	5	6	-	1	2	3	4	5	6	-	n	-
Ignition of the sample	2	2	2	2	2	12	-	2	2	2	2	2	./.	-	s	-
Maximum flame height	2	3	3	2	2	3	-	2	3	2	2	2	2	-	cm	-
Time of the maximum	15	15	18	15	17	20	-	15	20	15	15	15	15	-	s	-
Flame tip reached the 150 mm mark	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	≥ 20
Flame has extinguished	17	17	19	16	19	22	-	16	36	16	19	16	./.	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	[1]
Smoke density (visual)	very low							very low							-	-
Afterburning time	./.	./.	./.	./.	./.	./.	-	./.	./.	./.	./.	./.	./.	-	s	-
Flames were extinguished after	./.	./.	./.	./.	./.	2	-	./.	16	./.	./.	./.	./.	-	s	-
View of the samples after the test (20 seconds after exposure the flame): - the fleece surface was destroyed up to a max. height of 2 cm and a width of approx. 1.5 cm, above discoloured about 3.5 cm.																

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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