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

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PÜZ-Stelle (LBO): BRA09

Reference	FLT 3570216 (Translation of the German test report - no guarantee for translation of technical terms)
Sponsor	Neschen AG Hans-Neschen-Straße 1 D - 31675 Bückeburg
Order	2015-12-21 **Arrived** 2015-12-21
Description of samples	Self-adhesive plastic film, named "**solvoprint glass deco**" (for details see page 2)
Delivered	2016-01-03
Content of request	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1
Assessment	The examined self-adhesive plastic film bonded to glass surfaces 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	2021-01-31
Sampling	The samples were sent to the laboratory by the sponsor

TEST REPORT

Remark: If the above-mentioned building material is not used as product according to MBO § 2, Abs. 9, Ziffer 1, there is no need for a general building supervisory test report.
This test report is not valid if the examined building material is used as product in the meaning of state building prescriptions (MBO § 17, Abs. 3).

This test report 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 report 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 report comprises 5 pages and 2 enclosures.

1 Description of test material in condition as delivered

1.1 Test material (according to the sponsor)

The delivered material is a self-adhesive plastic film made of soft PVC with a self-adhesive bonding (silver grey pigmented), covered with a protective paper. The transparent film is intended to be used inside of buildings, bonded onto glass and was named "solvoprint glass deco".

1.2 Description of the delivered material

For the tests the laboratory received the following self-adhesive plastic film with a white protective paper on the rear side:

Trade name	Length [m]	Width [mm]	Batch	Colour
"solvoprint glass deco"	10	1067	VS15/110	silver grey

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

2 Preparation of samples

For the fire shaft ("Brandschacht") tests, from material provided, 2 specimen were prepared. 4 samples each with dimensions 1000 mm x 190 mm for the test specimen A were cut in longitudinal direction, the samples for the test specimen B were cut in transversal direction of the material. The film was bonded onto single glass panes with a thickness of 3 mm.
For the small burner ("Brennkasten") tests samples have been prepared 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 of the material by using the same procedure.
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 ("Brennkasten") tests have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).

No backing was used additionally behind the material compound.

Examination period: February 2016.

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2 (Brennkasten), see enclosure 3
- section 4.2.2 Test results class B1 (Brandschacht)

4.1 Material characteristics

Table 1

Type name:	Manufacturer's data [1]		Measured values [2]		
	Thickness [µm]	Weight per area unit [g/m²]	Thickness (m.v.) [mm]	s	Weight per area unit [g/m²]
"solvoprint glass deco"	80	95	0,09	./.	125

m.v. mean value
s standard deviation
./. not received/not measured
1) film without adhesive and without paper liner
2) film including 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 of building materials class B2. (Results see enclosure 2)

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	-	-	
2	Maximal flame height above bottom edge ..... cm	50	50	-	-	
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:s	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	-	-	
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	- -	- -	
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	-	-	
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	Rear side of specimen					
	Smoke density					
28	≤ 400 % min	1,4	2,2	-	-	
29	≥ 400 % min (very strong smoke density)	./.	./.	-	-	
30	Diagram fig. no.	1	3	-	-	
	Residual length					
31	Individual value .....cm	52	49	-	-	
		52	57	-	-	> 0
		63	57	-	-	
		50	46	-	-	
32	Average value .....cm	**54**	**52**	-	-	≥ 15
33	Photo of test specimen fig. no.	2	4	-	-	
	Flue gas temperature					
34	Maximum of average value...°C	110	112	-	-	≤ 200
35	Time [1] .....min:s	10:00	9:48	-	-	
36	Diagram fig. no.	1	3	-	-	
37	Remarks: line 32: There were no additional tests proceeded, because of the residual length of more then 45 cm. (DIN 4102-16:1998-05, 5.2 b)) (diagrams and photos see appendix 1)					

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

Specimen	Test-No.	Type name	Orientation	Substrate
A	570216-001	"solvoprint glass deco"	longitudinal	pane glass
B	570216-002		transversal	

5 Assessment

According to the test results in section 4.2 the material, described in section 1, fulfils the requirements of building materials class B1 according to DIN 4102-1, if the bonded combination is used 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)

has not been proved.

6 Special remarks

This report is only valid for the materials as described under paragraph 1. In combination with other materials or with additional coatings or surfaces etc. the burning behaviour may differ.

This test report 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, par. 3).

This test report is no substitute for a General Building Inspectorate Certificate. This test report is granted without prejudice to the rights of third parties, or particular private proprietary rights.

This test report 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.

The explanations given in DIN 4102-1 app. D, especially concerning an external production control has to be considered.

This test report is valid until 2021-01-31, provided that the test methods, the classification rules and the technology do not change during this period.

According DIN 4102 -1, clause 7, the material has to be marked with the following identification:

DIN 4102 – B1

Borkheide, 10th of February 2016

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

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In charge for testing
(Dipl.-Ing. Manfred Sailer)

This translation was issued on 10th of February 2016, in a case of doubt the German version is valid solely.

Test specimen A

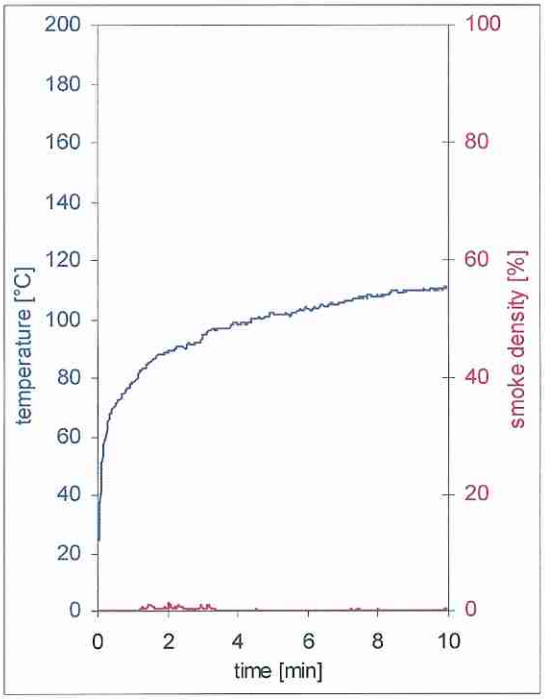

fig. 1
Graphs of the flue gas temperature and the smoke density

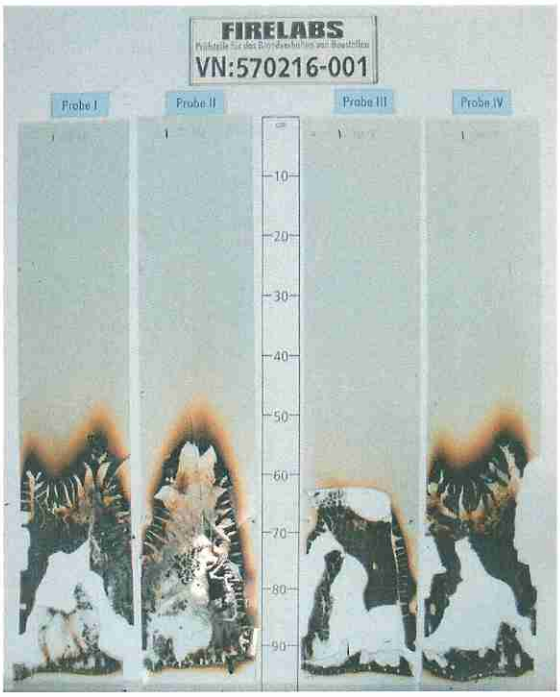

fig. 2
Photo of test specimen after the test

Test specimen B

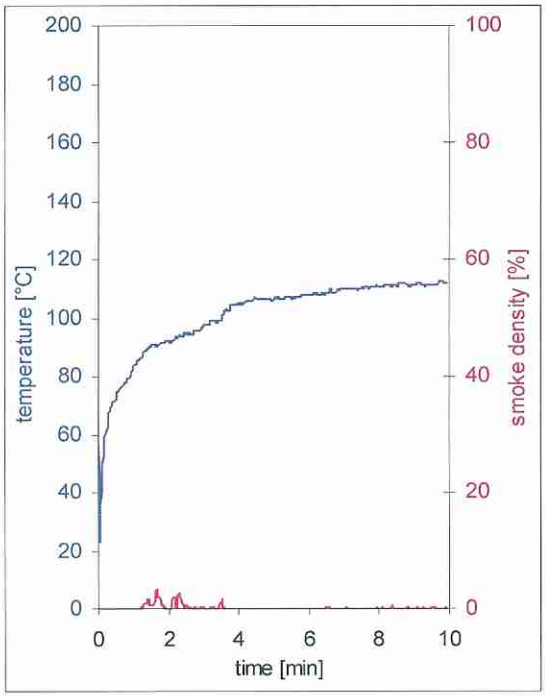

fig. 3
Graphs of the flue gas temperature and the smoke density

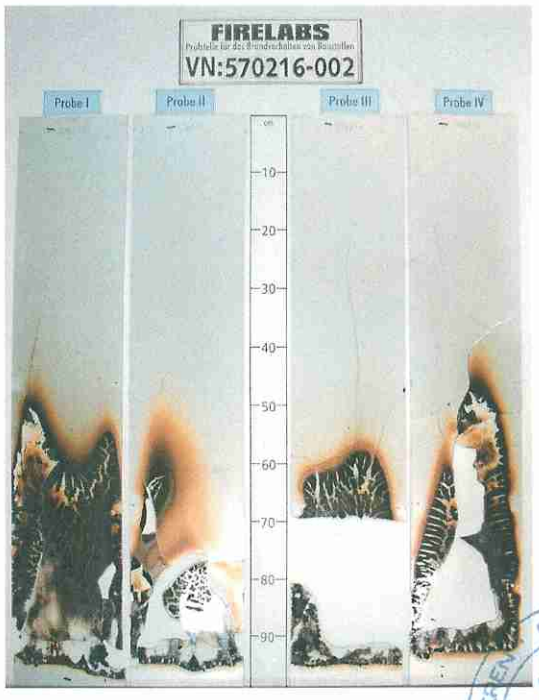

fig. 4
Photo of test specimen after the test

Test results class B2 (Brennkasten)

Table 2.1 : "solvoprint glass deco" bonded onto float glass

	Längsrichtung						Querrichtung						Dim.	Anforde-rungen
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	8	9	9	9	9	./.	9	8	9	8	8	./.	s	-
Maximum flame height	1	1	1	1	1	2	1	1	1	1	1	2	cm	-
Time of the maximum	15	15	15	15	15	15	15	15	15	15	15	15		
Flame tip has 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)	sehr gering						sehr gering						-	./.
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
View of the samples after the test: - Colour change at area of flame impingement														

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