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

FIRE LABS
Prüfstelle für das Brandverhalten von Baustoffen
Dipl.-Ing. Uwe Kühnast
Steinstrasse 18
D - 14822 Borkheide
Fon: +49 33845 90901
Fax: +49 33845 90909
Mail: info@firelabs.de

TEST REPORT

Reference:	FLT 3253909 (Translation of the German test report - no guarantee for translation of technical terms)
Company:	Neschen AG Hans-Neschen-Straße 1 D - 31675 Bückeburg
Order:	2009-07-05 **Arrived:** 2009-07-05
Description of samples:	White, on both sides with plasticised PVC coated polyester fabric to be used as printable advertising space or for decoration purposes, named: **"solvoprint PVC frontlit premium"** (for details see page 2)
Delivered:	2009-07-08
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" (hardly 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 of test report:	2014-07-31
Sampling:	by the company itself

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 underlie building supervisory procedures:

- for regular building products for the pre scribed proofs of conformity
- for non-regular building products for the needed proofs of applicability.

This test report includes 5 pages and 2 enclosures.

Approved testing, inspection and certification body

1 Description of test material (According to the manufacturer)

According to the manufacturer: Polyester fabric, coated on both sides with white plasticised PVC, thickness approx. 0,45 mm to be used as printable advertising space or decoration
The material was named as "solvoprint PVC frontlit premium" by the manufacturer
For the tests the laboratory received a 4,7 m long, 1 m wide sample. The material was delivered plain.
Colour: white polyester fabric with white coating
Characteristic values: see table 1; Photos: see enclosure 1

2 Preparation of samples

Out of the material the following samples have been cut:

For the small burner test (Brennkasten) 5 samples for edge exposure (dimensions 190 mm x 90 mm) and 1 sample for surface exposure (dimensions 230 mm x 90 mm) were cut in weft and warp direction of the fabric.
For the fire shaft test (Brandschacht) 2 specimens, made of 4 samples with the dimensions 1000 mm x 190 mm were assembled. The samples for the test specimens A were cut in weft direction, the samples for the test specimens B were cut in warp direction of the fabric.

Following all samples kept in a climate chamber acc. DIN 50014-23/50-2 until they reached constant weight.

3 Arrangement of samples

The tests have been performed acc. DIN 4102-1, chapter 6.2.4.2 (building materials class B2) and DIN 4102-1 and -16 (building materials class B1).

Arrangement of all samples: freely suspended

Examination period: August 2009

4 Results

- Table 1 Material characteristics
- Table 2 Test results class B2
- Table 3 Test results class B1

4.1 Material characteristics

Table 1

specific values		Specifications by manufacturer	Measured values m.v.	s
Dicke	mm	0,45	0,46	0,005
mass / unit polyester fabric	g/m^2	./.	./.	
overall weight	g/m^2	500	551	

\- 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)

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; the material does not show burning particles / droplets. Exposing the flame to the face 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.	Measurement	Test results				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	40	50	-	-	
3	Time 1) ..... min	1	7			*)
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: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:s Extend:	No	No	-	-	
11	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	No	No	-	-	
15	Premature end of test Final occurrence of burning at the specimen 1).....min:s	No	No	-	-	
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.	Measurement	Test results				require-ments
		A	B	C	D	
17	Afterflame after end of test Time .....min:s	No	No	-	-	
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame length .....cm					
22	Afterglow after end of test Time .....min:s	No	No	-	-	
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	31,7	61,3	-	-	
29	≥ 400 % min (very strong smoke density)					
30	Diagram fig. no.	1	3			
31	Residual length Individual value .....cm	66 68 62 68	67 58 58 69	- - - -	- - - -	> 0
32	Average value .....cm	**66**	**63**	-	-	≥15
33	Photo of test specimen fig. no.	2	4			
34	Flue gas temperature Maximum of average value...°C	121	116	-	-	≤200
35	Time 1) .....min:s	9:58	9:52			
36	Diagram fig. no.	1	3			
37	Remarks: There were no additional tests proceeded, because of the residual length of more then 45 cm (line32).					

Test specimen A: samples in machine direction; VN 243509-001
Test specimen B: samples in cross machine direction; VN 243509-002

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 building materials class B1 according to DIN 4102-1 if the material is used suspended freely or with a distance of > 40mm 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 this tests.

This test report is not valid for

- the exposure to outdoor climate conditions.

6 Special remarks

This report is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or grounds 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.

In General Building Inspectorates procedures this test report can be based for

- regular building materials for the required proof of accordance
- for not regular building materials for the required proof of applicability

This test report is valid until the mentioned date on page 1, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 15th of August 2009

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

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

Test specimen A

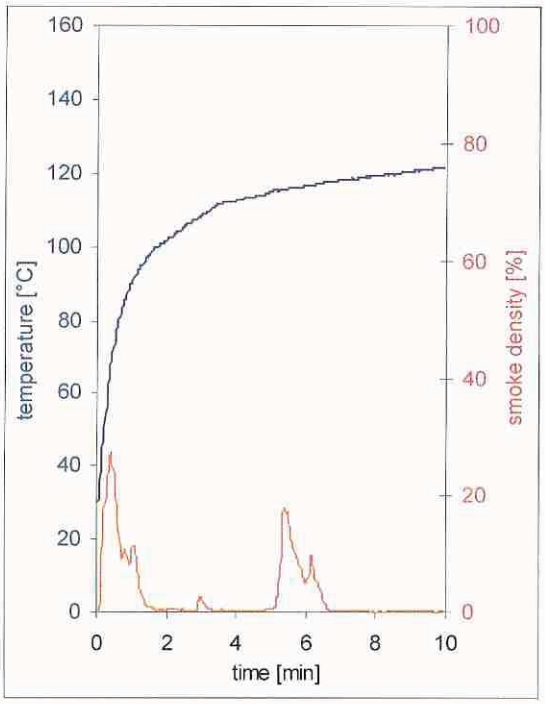

fig. 1
Graphs of the flue gas temperature and the smoke density

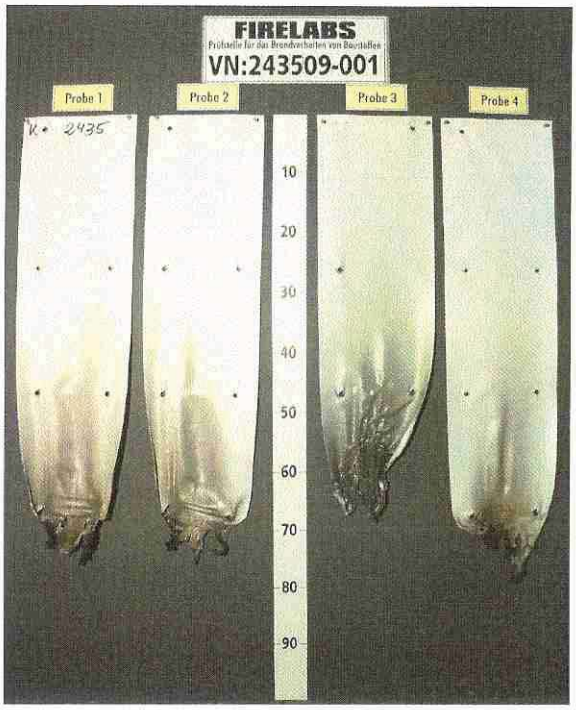

fig. 2
Photo of test specimen after the test

Test specimen B

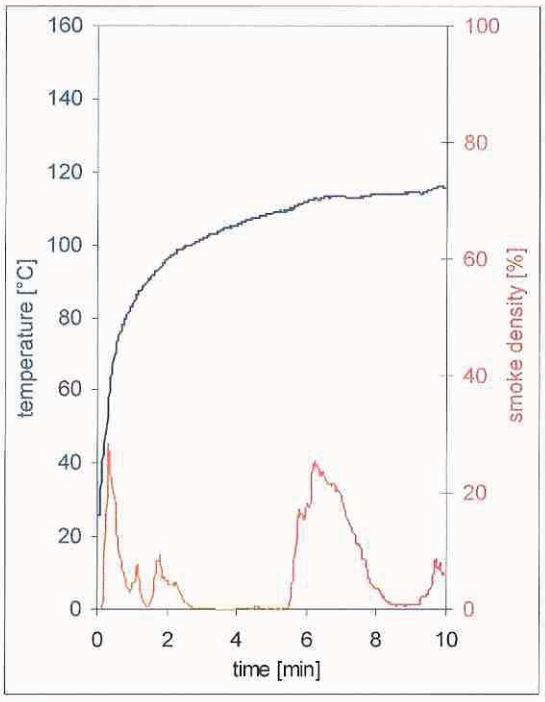

fig. 3
Graphs of the flue gas temperature and the smoke density

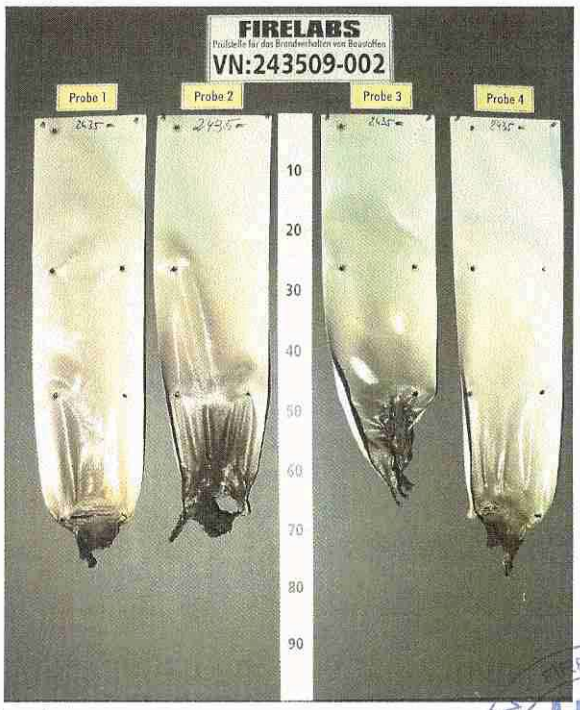

fig. 4
Photo of test specimen after the test

Table 2 : Test results class B2 (Brennkasten)

	MD						CMD						dim.	require-ments
Sample	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	1	1	1	1	1	6	1	1	1	1	1	7	s	-
Maximum flame height	12	13	11	13	12	6	10	13	13	10	10	10	cm	-
Time of the maximum	14	15	14	13	14	15	15	15	15	14	13	15		
Flame tip reached the 150 mm test mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Flame has extinguished before reaching the test mark	16	27	19	17	16	17	16	16	18	17	16	17	s	
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density	intense						intense						-	-
Afterburning time	./.	7	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
View of the samples after the test (20 seconds after exposure the flame): - warp and weft direction: burned length: app. 3 cm; burned width: app. 2 cm; above slightly sooted: app. 5 cm														

Samples 1-5: edge exposure
Samples 6: surface exposure

1) No ignition within 20 seconds
./. Not occurred
dim. Dimension
Indication of time: from the beginning of testing procedure
MD machine direction (warp) / CMD cross machine direction (weft)