

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

Reference: FLT 3360511 (Translation of the German test report - no guarantee for translation of technical terms)

Order 2011-08-11 **Arrived** 2011-08-15

Description of samples: White, self-adhesive plastic film to be used on steel surfaces, named "solvoprint easy 80 GSP nolite".
(for details see page 2)

Delivered: 2011-08-15

Content of request: Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1

Assessment: The examined material compound meets the requirements of class B1 for "schwerentflammbare" (hardly flammable) building materials according to DIN 4102-1 if suspended freely or with distance if >40 mm to the same or other plain materials.
(for details see page 5)

Validity of report: 2016-09-30

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 prescribed 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

This report must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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 REPORT



1 Test material

1.1 Description (according to the client)

The materials provided is a self-adhesive film made from white flexible PVC film with a thickness of 80 µm and a semi-permanent black pigmented acrylic adhesive on the back. The self-adhesive film is intended to be used indoor applied on steel surfaces and was labelled "solvoprint easy 80 GSP nolite".

1.2 Description of the delivered samples

For the tests the laboratory received a sample of a self-adhesive surface of approx. 5 m length and approx. 1,37 m width with a black adhesive. The self-adhesive film was covered with a protective paper (liner).

Colour: white, glossy on the visible side, characteristic values: table 1; photos: see enclosures. Other specifications are not known by the laboratory, samples are stored.

2 Preparation of samples

For the fire shaft test ("Brandschacht") 2 specimen were prepared. The samples (dimensions 1000 mm x 190 mm) of test specimen A were cut in cross direction, the samples for the test specimen B were cut in machine direction of the material and applied on sheet steel (thickness 1,0 mm).

For the small burner test ("Brennkasten") 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 machine- and cross direction of the material and applied on sheet steel (thickness 1,0 mm).

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

3 Test procedure

The tests in the fire shaft test ("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 6.2.4.2 (building materials class B2). There was no additional substrate arranged behind the material compound.

Examination period: September 2011

4 Results

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

4.1 Material characteristics

Table 1

Characteristic value		Specifications by manufacturer	Measured values (m.v.)
thickness self-adhesive film	[mm]	./.	0,11
thickness liner		./.	0,17
weight per unit area self-adhesive film	[g/m ²]	./.	127
weight per unit area liner		./.	139

m.v. mean value

s standard deviation

./. not received/not measured

4.2 Results of the fire behaviour

4.2.1 Test results class B2 (Brennkasten)

According DIN 4102-1 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.

(Results: see enclosure 2)



4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results "Brandschachtprüfung" (part 1)						
line no.	Measurement	Test results				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	7	7	-	-	
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	./.	./.	-	-	
5	<u>Back side of the specimens:</u> <u>Flames / glowing</u> Time ¹⁾min:s	./.	./.	-	-	
6	<u>Discolouring</u> Time ¹⁾min:s	./.	./.	-	-	
7	<u>Falling of burning droplets</u> Begin ¹⁾min:s	No	No	-	-	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	<u>Falling of burning parts</u> Begin ¹⁾min:s	No	No	-	-	
11	Extend: Sporadic falling of burning parts					
12	Continuous falling of burning parts					
13	<u>Afterflame time at the bottom of thesieve (max.)</u>min:s	./.	./.	-	-	
14	<u>Impairment of the burner flames by dropping or falling Material</u> Time ¹⁾min:s	No	No	-	-	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen ¹⁾min	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				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	5,9	14,2			
29	≥ 400 % min (very strong smoke density)					
30	Diagram fig. no.	1	3			
31	<u>Residual length</u> Individual valuecm	48 48 46 46	55 55 52 53	- - - -	- - - -	> 0
32	Average valuecm	47	53	-	-	≥ 15
33	Photo of the test specimen fig. no.	2	4			
34	<u>Flue gas temperature</u> Maximum of average value...°C	119	111	-	-	≤ 200
35	Time ¹⁾min:s	9:58	9:56			
36	Diagram fig. no.	1	3			
37	<u>Remarks:</u> line 32: There were no additional tests proceeded, because of the residual length of ≥ 45 cm.					

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



Test specimen A (VN 360511-001): samples in cross direction
 Test specimen B (VN 360511-002): samples in machine direction

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 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.

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 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.

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

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 2016-09-30, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 12th of October 2011



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



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

Test specimen A

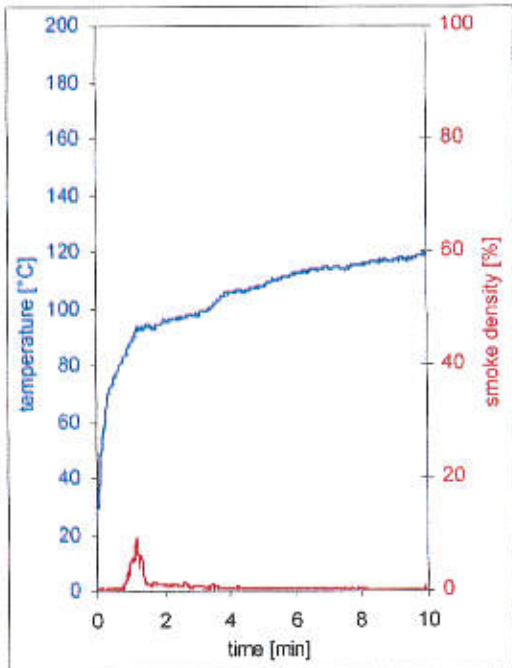


fig. 1
Graphs of the flue gas temperature and the smoke density

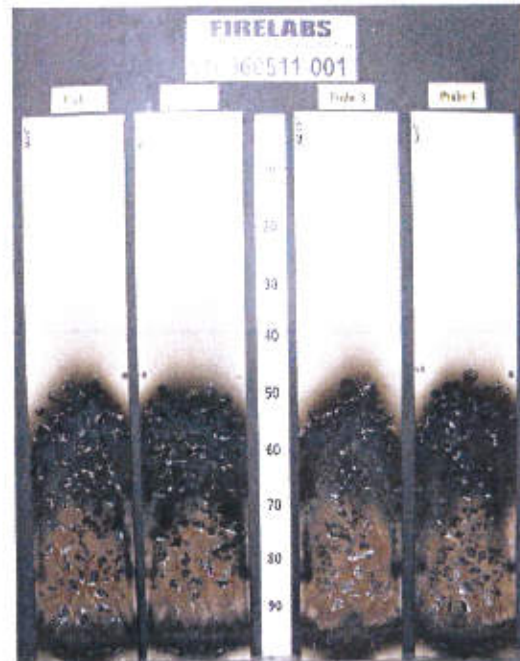


fig. 2
Photo of the test specimen after the test

Test specimen B

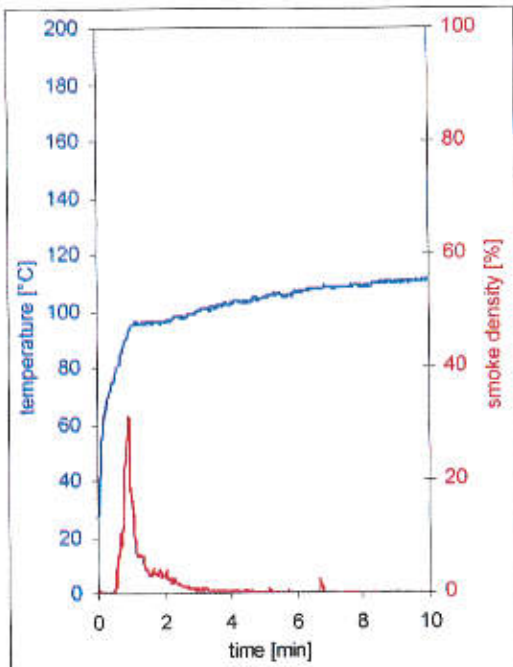


fig. 3
Graphs of the flue gas temperature and the smoke density

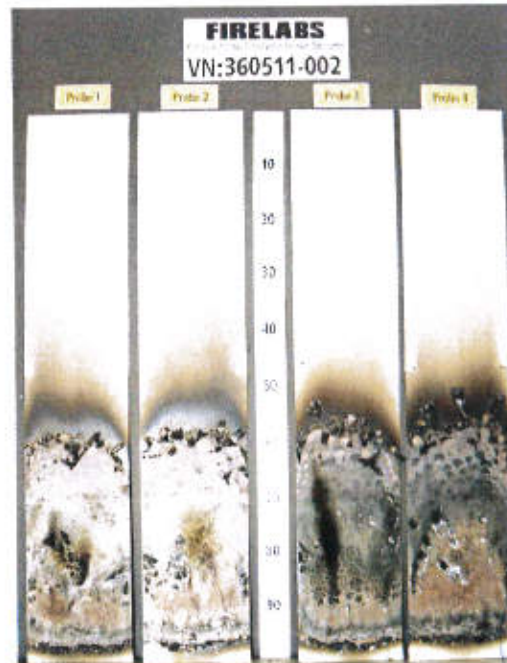


fig. 4
Photo of the test specimen after the test



Table 2: Test results small burner test (Brennkasten), freely suspended

	machine direction						cross direction						dim.	requirements
	1	2	3	4	5	6	1	2	3	4	5	6		
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	1	1	.J.	.J.	1	.J.	1	2	.J.	1	.J.	.J.	s	-
Maximum flame height	1	1	1	1	1	1	1	1	1	1	1	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 test mark	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	s	≥ 20
Flame has extinguished before reaching the test mark	16	16	16	16	16	16	16	16	16	16	16	16	s	
Ignition of filter paper	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	s	1)
Smoke density	very low						very low							
Afterburning after end of test	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	.J.	s	-

View of the samples after the test (20 seconds after exposure the flame):

- damaged area at the point of flame impingement: approx. 3 mm height x 3 mm width

Samples 1-5: edge exposure

Samples 6: surface 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

