

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



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PÜZ-Stelle (LBO): BRA09  
Notified Body no.: 1507

<b>Reference:</b>	FLT 3374511	(Translation of the German test report - no guarantee for translation of technical terms)
<b>Company:</b>	Neschen AG Hans-Neschen-Straße 1 D - 31675 Bückeberg	
<b>Order</b>	2011-09-27	<b>Arrived</b> 2011-09-29
<b>Description of samples:</b>	White and transparent, self-adhesive plastic films to be used on solid mineral substrates or gypsum plasterboards, on glass- or steel surfaces, named "solvoprint easy dot 100 PE matt" "solvoprint easy dot 100 PE glossy" "solvoprint easy dot clear 100 PE" (for details see page 2)	
<b>Delivered:</b>	2011-09-29	
<b>Content of request:</b>	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1	
<b>Assessment:</b>	The examined materials meet the requirements of class B1 for "schwerentflammbare" (hardly flammable) building materials according to DIN 4102-1, if used on solid mineral substrates or gypsum plasterboards, also on glass- or steel surfaces. (for details see page 5)	
<b>Validity of report:</b>	2016-10-31	
<b>Sampling:</b>	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:

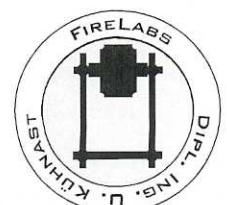
- for regular building products for the prescribed proofs of conformity
- for non-regular building products for the needed proofs of applicability.

This test report includes 5 pages and 6 enclosures.

## Approved testing, inspection and certification body

This test 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.

TEST REPORT



## 1 Test material

### 1.1 Description (according to the client)

The materials provided are white and transparent films made of monomer plasticised PVC with different gloss levels, a thickness of 0,1 mm and coated with a "dot-shaped" water-based permanent acrylic adhesive on the back. The adhesive coated side is masked by a paper liner.

### 1.2 Description of the delivered samples

For the tests the laboratory received samples of self-adhesive films of approx. 3,5 m length and approx. 1,37 m width in different versions:

1. white self-adhesive plastic film with a matt visible surface and a beige coloured paper liner on the back, labelled "solvoprint easy dot 100 PE matt"
2. white self-adhesive plastic film with a glossy visible surface and a white paper liner on the back, labelled "solvoprint easy dot 100 PE glossy"
3. transparent self-adhesive plastic film with a matt visible surface and a white paper liner on the back, labelled "solvoprint easy dot clear 100 PE"

Characteristic values: see section 4.1; photos: see enclosures 1-4.

Other specifications are not known by the laboratory, samples are stored.

## 2 Preparation of samples

For the fire shaft test ("Brandschacht") 8 specimens were prepared. The samples (dimensions 1000 mm x 190 mm) were cut longitudinally and transversely from the plastic films and were applied on different surfaces:

In order to verify the usage of the self-adhesive films on:

- solid mineral substrates or gypsum plasterboards: gypsum plasterboards (GKB, class DIN 4102-A2) with a thickness of 12,5 mm
- glass surfaces: single glass panes with a thickness of 3 mm
- steel surfaces: untreated steel plates with a thickness of 1,0 mm

were used as substrates.

For the small burner test ("Brennkasten") samples for edge exposure (dimensions 190 mm x 90 mm) and samples for surface exposure (dimensions 230 mm x 90 mm) were cut longitudinally and transversely from the material and applied on similar substrates specified above.

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: November 2011.

## 4 Results

- Table 1                      Material characteristics
- Table 2                      Test results class B1
- Tables 3, 4, 5              Test results class B2 (enclosures 5, 6)

### 4.1 Material characteristics

Table 1

"solvoprint easy dot..."	colour	surface	manufacturer's data		measured values		
			thickness (m.v.) [mm]	MA [g/m <sup>2</sup> ]	thickness (m.v.)* [mm]	thickness (s) [mm]	MA [g/m <sup>2</sup> ]
100 PE matt	white	matt	0,10	./.	0,13	0,005	148
100 PE glossy		glossy	0,10	./.	0,12	0,005	150
clear 100 PE	transparent	matt	0,10	./.	0,12	0,005	140

m.v. mean value

s standard deviation

./. not received or not measured

MA mass per unit area

\*) including adhesive layer, without paper liner



## 4.2 Results of the fire behaviour

### 4.2.1 Test results class B2 (Brennkasten)

According to 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 enclosures 5 and 6)

### 4.2.2 Test results class B1 (Brandschacht)

Table 2

Test results (part 1)										
line no.		Test results of specimen								requirements
		A	B	C	D	E	F	G	H	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	7	7	7	7	7	7	7	7	
2	<u>Maximal flame height</u> above bottom edge ..... cm	50	50	50	50	60	60	50	50	*)
3	Time <sup>1)</sup> ..... min	2	2	2	2	1	1	1	1	
4	<u>Burning / melting through</u> Time <sup>1)</sup> .....min	1	1	1	1	1	1	1	1	
5	<u>Back side of the specimens:</u> <u>Flames / glowing</u> Time <sup>1)</sup> .....min:s	./.	./.	./.	./.	./.	./.	./.	./.	
6	<u>Discolouring</u> Time <sup>1)</sup> .....min:s	./.	./.	./.	./.	./.	./.	./.	./.	
7	<u>Falling of burning droplets</u> Begin <sup>1)</sup> .....min:s	No	No	No	No	No	No	No	No	
8	Extend: Sporadic falling droplets									
9	Continuous falling droplets									
10	<u>Falling of burning parts</u> Begin <sup>1)</sup> .....min:s	No	No	No	No	No	No	No	No	
11	Extend: Sporadic falling parts									
12	Continuous falling parts									
13	<u>Afterflame time at the bottom of the sieve (max.)</u> .....min:s	./.	./.	./.	./.	./.	./.	./.	./.	
14	<u>Impairment of the burner flames by dropping or falling Material</u> Time <sup>1)</sup> .....min:s	No	No	No	No	No	No	No	No	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen <sup>1)</sup> .....min	No	No	No	No	No	No	No	No	
16	Time of eventually end of test <sup>1)</sup> .....min:s	./.	./.	./.	./.	./.	./.	./.	./.	

<sup>1)</sup> Indication of time: from the beginning of testing procedure

- Not tested

./. Not occurred

\*) No cause for complaint



Test results (part 2)										
line no.		Test results of specimen								requirements
		A	B	C	D	E	F	G	H	
17	<u>Afterflame after end of test</u>	No	No	No	No	No	No	No	No	
18	Time .....min:s									
19	Number of specimen									
20	Front side of specimen									
21	Back side of specimen									
21	Flame length .....cm									
22	<u>Afterglow after end of test</u>	No	No	No	No	No	No	No	No	
23	Time .....min:s									
23	Number of specimen									
24	<u>Place of appearance:</u>									
24	Lower half of specimen									
25	Upper half of specimen									
26	Front side of specimen									
27	Back side of specimen									
28	<u>Smoke density</u>									
28	≤ 400 % min	5,8	38,0	4,07	11,4	13,9	10,9	17,5	15,9	
29	≥ 400 % min (very strong smoke density)									
30	Diagram fig. no.	1	3	5	7	9	11	13	15	
31	<u>Residual length</u>									
31	Individual value .....cm	48	55	56	45	45	46	45	45	> 0
		47	55	62	43	44	43	47	45	
		53	55	47	45	45	47	42	46	
		45	51	48	47	44	47	45	45	
32	Average value .....cm	<b>48</b>	<b>54</b>	<b>53</b>	<b>45</b>	<b>44</b>	<b>45</b>	<b>44</b>	<b>45</b>	≥ 15
33	Photo of the test specimen fig. no.	2	4	6	8	10	12	14	16	
34	<u>Flue gas temperature</u>									
35	Maximum of average value...°C	118	102	113	113	110	102	106	104	≤ 200
36	Time <sup>1)</sup> .....min:s	9:58	9:58	9:54	9:58	9:38	9:42	9:34	9:34	
36	Diagram fig. no.	1	3	5	7	9	11	13	15	
37	<u>Remarks:</u> there were no additional tests proceeded for test specimens A-D, because of the residual length of ≥ 45 cm (line 31)									

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

test specimen	test-No.	solvoprint easy dot	substrate	orientation	tested side
A	374511-101	clear 100 PE	glass pane	longitudinal	visible side
B	374511-102	clear 100 PE		transverse	rear side
C	374511-103	100 PE glossy	steel plate	longitudinal	visible side
D	374511-201	100 PE glossy		longitudinal	
E	374511-301	100 PE matt		transverse	
F	374511-302	100 PE matt		longitudinal	
G	374511-401	100 PE glossy	gypsum plasterboard	transverse	visible side
H	374511-402	100 PE glossy		longitudinal	



## 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 materials are 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 2016-10-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 14<sup>th</sup> of November 2011



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



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

Test specimen A

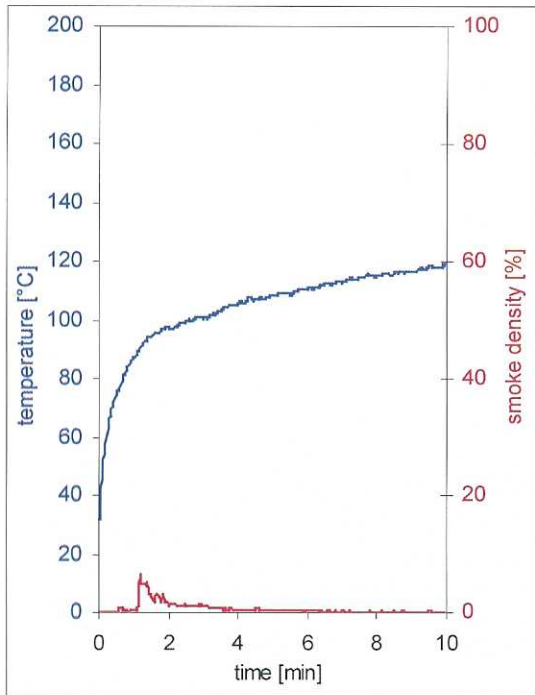


fig. 1  
Graphs of the flue gas temperature and the smoke density

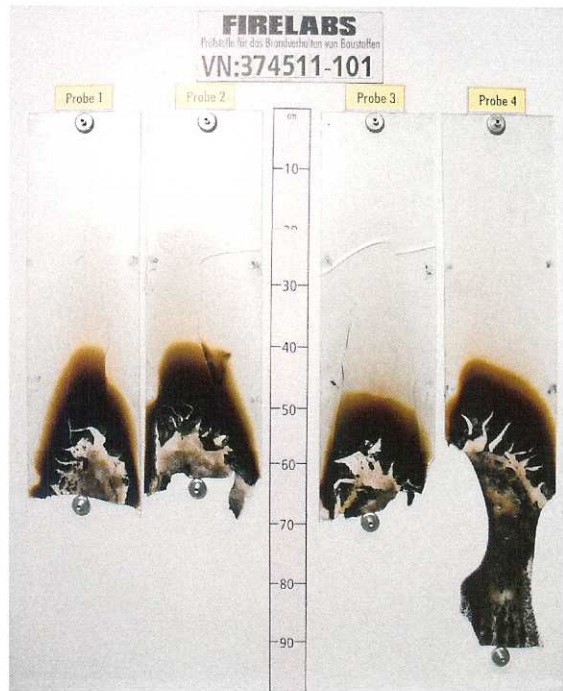


fig. 2  
Photo of the test specimen after the test

Test specimen B

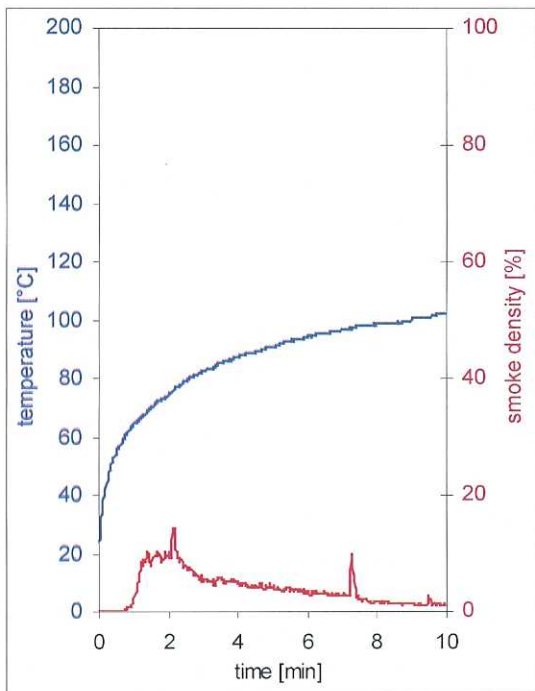


fig. 3  
Graphs of the flue gas temperature and the smoke density

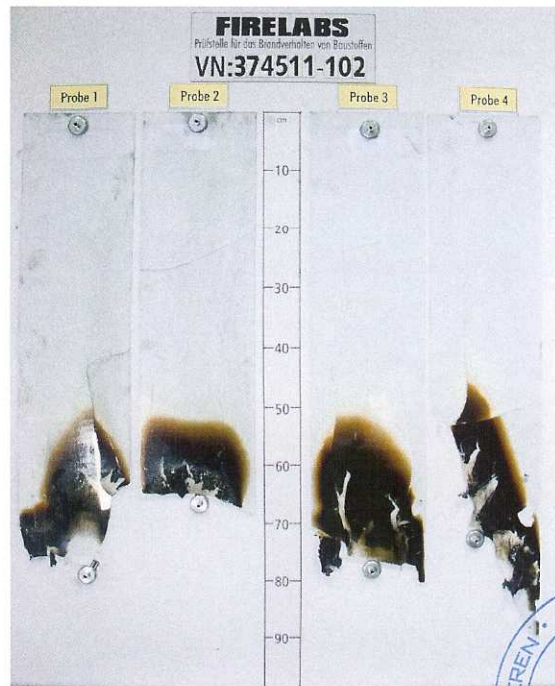


fig. 4  
Photo of the test specimen after the test



Test specimen C

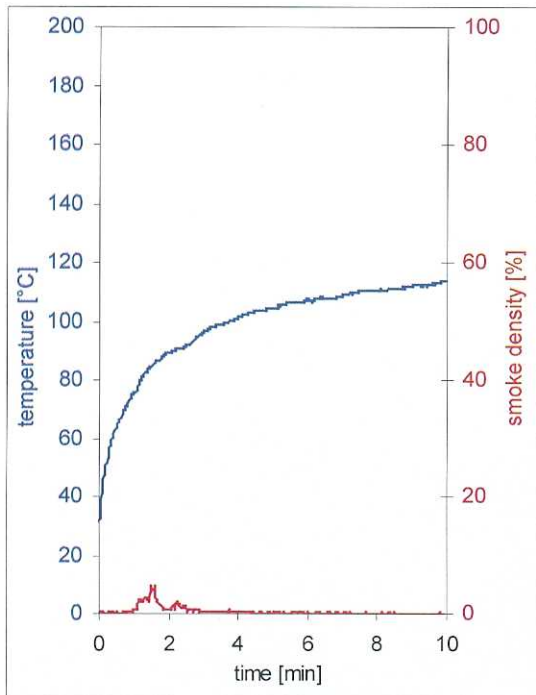


fig. 5  
Graphs of the flue gas temperature and the smoke density

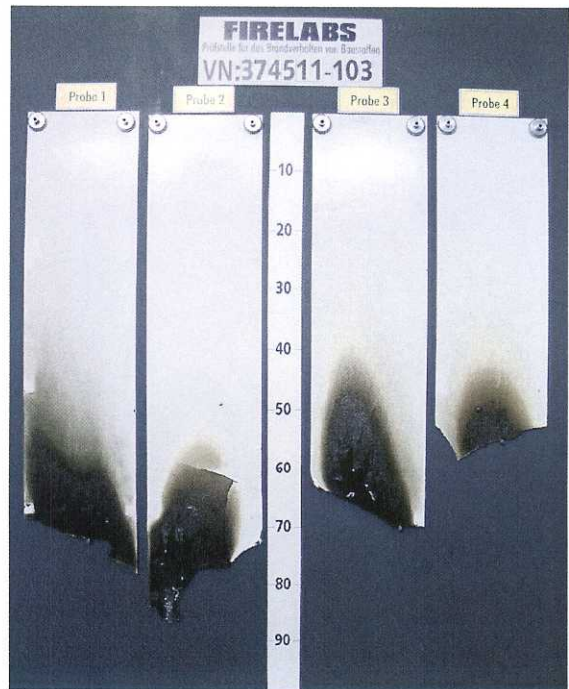


fig. 6  
Photo of the test specimen after the test

Test specimen D

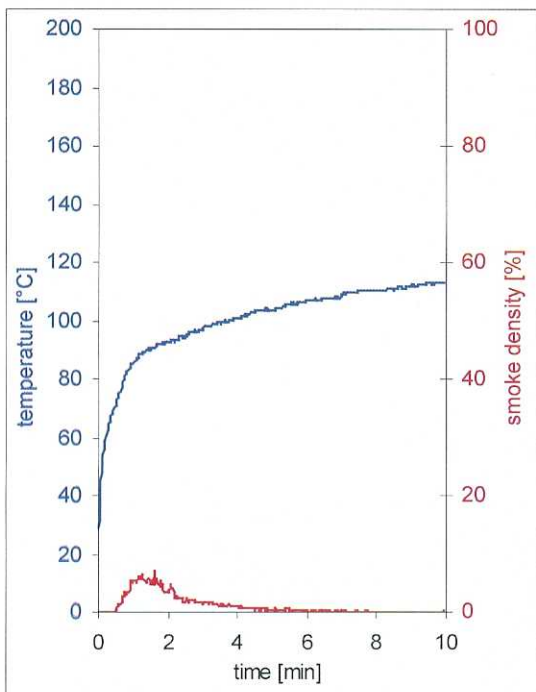


fig. 7  
Graphs of the flue gas temperature and the smoke density

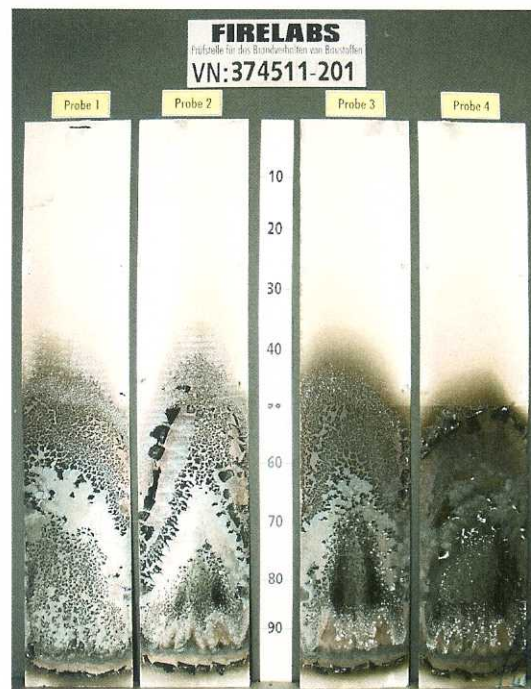


fig. 8  
Photo of the test specimen after the test



Test specimen E

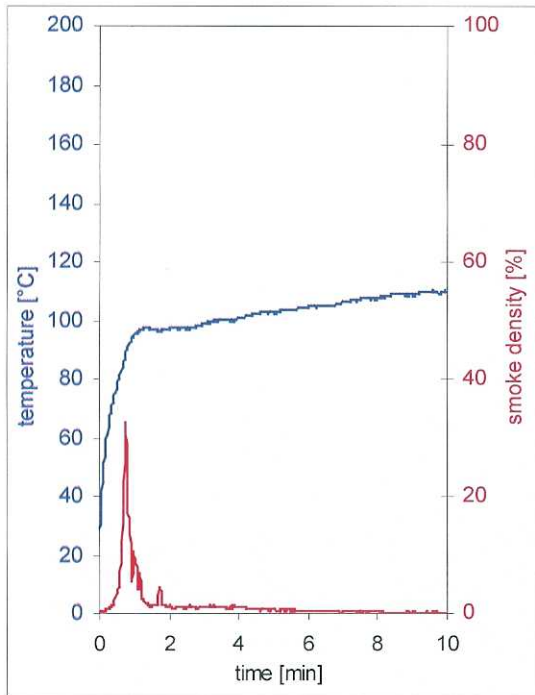


fig. 9  
Graphs of the flue gas temperature and the smoke density

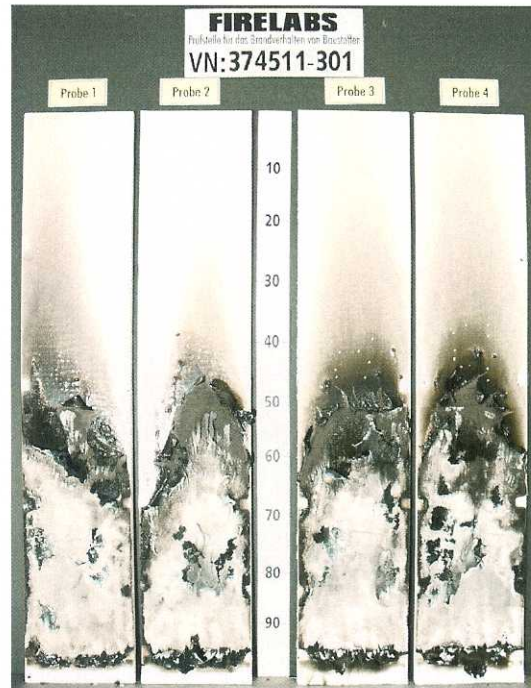


fig. 10  
Photo of the test specimen after the test

Test specimen F

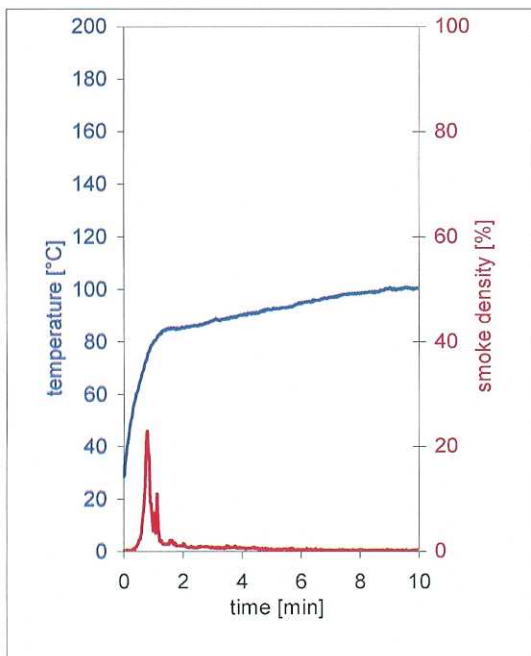


fig. 11  
Graphs of the flue gas temperature and the smoke density

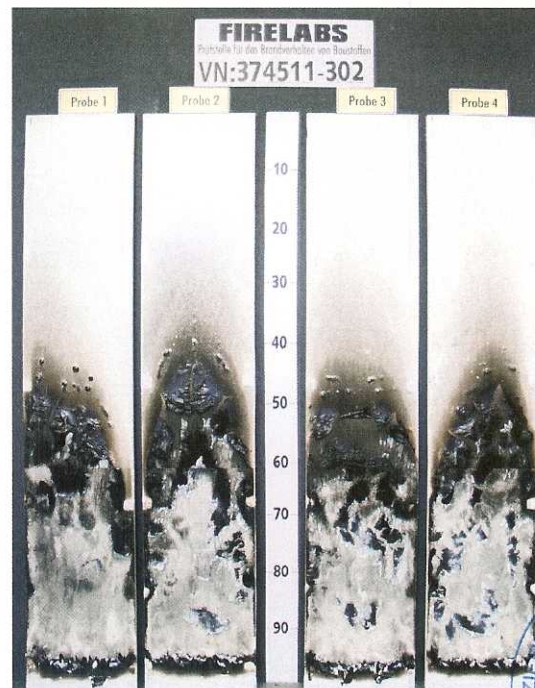


fig. 12  
Photo of the test specimen after the test





Test specimen G

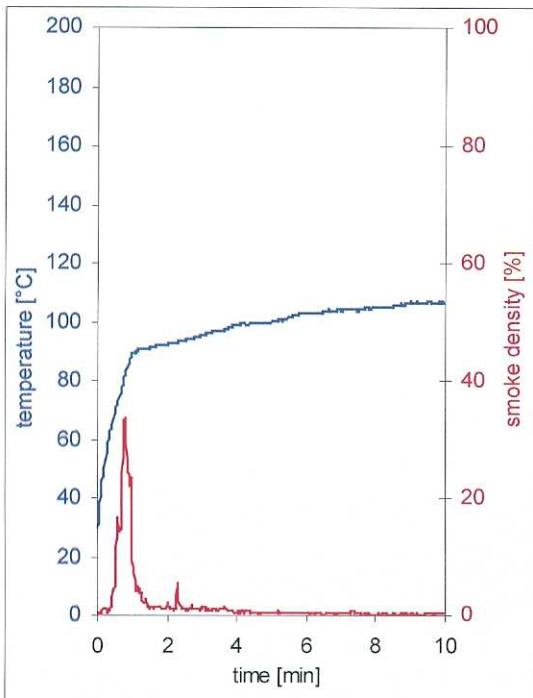


fig. 13  
Graphs of the flue gas temperature and the smoke density

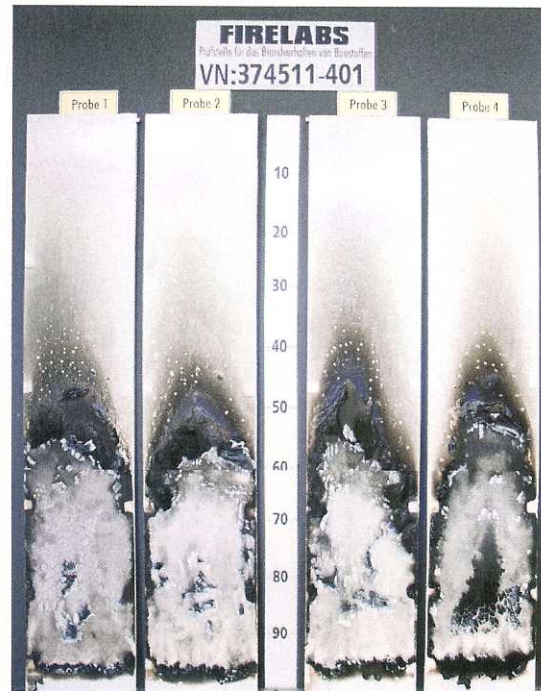


fig. 14  
Photo of the test specimen after the test

Test specimen H

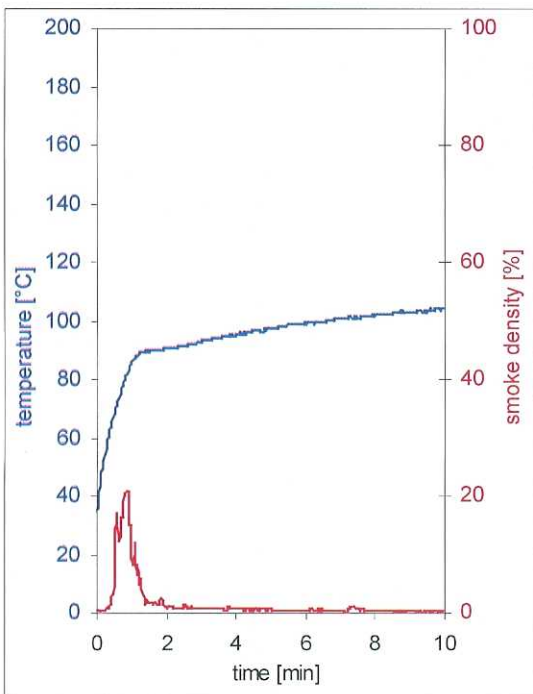


fig. 15  
Graphs of the flue gas temperature and the smoke density

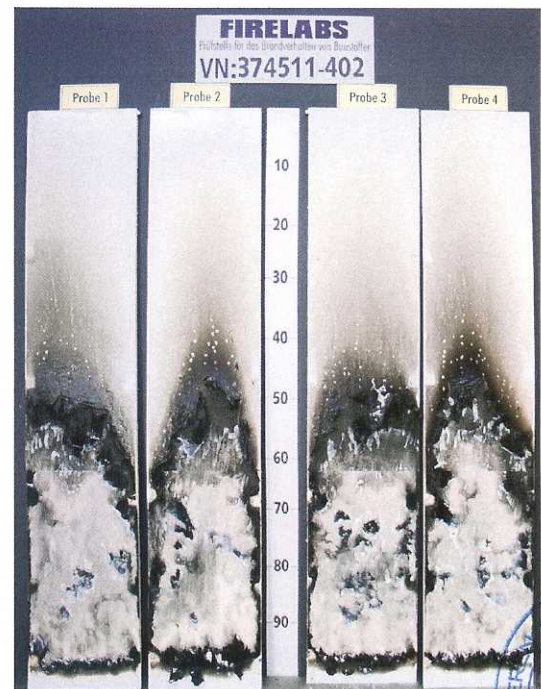


fig. 16  
Photo of the test specimen after the test



## Test results small burner test (Brennkasten)

Table 3 - "solvoprint easy dot 100 PE matt"

Substrate	gypsum plasterboard						-						dim.	requirements
Sample-No.	1	2	3	4	5	6	-	-	-	-	-	-	-	-
Ignition of the sample	9	10	10	9	8	./.	-	-	-	-	-	-	s	-
Maximum flame height	1	1	1	1	1	1	-	-	-	-	-	-	cm	-
Time of the maximum	15	15	15	15	15	15	-	-	-	-	-	-	s	
Flame tip reached the 150 mm test mark	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	≥ 20
Flame has extinguished before reaching the test mark	16	16	16	16	16	16	-	-	-	-	-	-	s	
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	1)
Smoke density	very low						-						-	-
Afterburning after end of test	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	-

View of the samples after the test (20 seconds after exposure the flame):  
- burned length: approx. 2 cm

Table 4 - "solvoprint easy dot 100 PE glossy"

Substrate	glass pane						steel plate						dim.	requirements
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	6	8	9	7	8	./.	8	9	10	9	8	./.	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	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	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	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density	very low						very low						-	
Afterburning after end of test	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-

View of the samples after the test (20 seconds after exposure the flame):  
- burned length: approx. 2 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

Indication of measurements: from reference line of the flame



Table 5 - "solvoprint easy dot 100 PE glossy"

Substrate	gypsum plasterboard						-						dim.	requirements
Sample-No.	1	2	3	4	5	6	-	-	-	-	-	-	-	-
Ignition of the sample	9	9	8	10	10	./.	-	-	-	-	-	-	s	-
Maximum flame height	1	1	1	1	1	1	-	-	-	-	-	-	cm	-
Time of the maximum	15	15	15	15	15	15	-	-	-	-	-	-	s	-
Flame tip reached the 150 mm test mark	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	≥ 20
Flame has extinguished before reaching the test mark	16	16	16	16	16	16	-	-	-	-	-	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	1)
Smoke density	very low						-						-	-
Afterburning after end of test	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	-
View of the samples after the test (20 seconds after exposure the flame): - burned length: approx. 2 cm														

Table 6 - "solvoprint easy dot clear 100 PE"

Substrate	glass pane						-						dim.	requirements
Sample-No.	1	2	3	4	5	6	-	-	-	-	-	-	-	-
Ignition of the sample	8	9	9	9	10	./.	-	-	-	-	-	-	s	-
Maximum flame height	1	1	1	1	1	1	-	-	-	-	-	-	cm	-
Time of the maximum	15	15	15	15	15	15	-	-	-	-	-	-	s	-
Flame tip reached the 150 mm test mark	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	≥ 20
Flame has extinguished before reaching the test mark	16	16	16	16	16	16	-	-	-	-	-	-	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	1)
Smoke density	very low						-						-	-
Afterburning after end of test	./.	./.	./.	./.	./.	./.	-	-	-	-	-	-	s	-
View of the samples after the test (20 seconds after exposure the flame): - burned length: approx. 2 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

Indication of measurements: from reference line of the flame

