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

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PÜZ-Stelle (LBO): BRA09

Reference: FLT 3617117 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)

Sponsor: Drytac Europe Ltd.
Filwood Road, Fishponds
UK – Bristol BS16 3RY

Order 2017-01-06, 2017-02-13 **Arrived** 2017-01-06, 2017-02-16

Description of samples: White, self-adhesive plastic film, named "**SpotOn White**" and transparent self-adhesive plastic film, named "**SpotOn Clear**"
(for details see page 2)

Delivered: "SpotOn White": 2016-10-17
"SpotOn Clear": 2017-02-16

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

Assessment: The examined materials
- "SpotOn White", bonded to solid mineral substrates or to gypsum plaster boards, with a density of ≥ 650 kg/m^3 and a thickness of ≥ 11 mm and
- "SpotOn Clear", bonded on one side to single-pane glass, at a distance of the material compound to the same or other plain materials of > 40 mm,

meet the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1.
(for details see page 5)

Validity: 2022-03-31

Sampling: The samples were sent to the laboratory by the sponsor.

TEST CERTIFICATE

Remark: If the above-mentioned building material is not used as product according to MBO § 2, there is no need for a general building supervisory test certificate.
This test certificate is not valid 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 Prufzeugnis (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall (exceptional approval).

This test certificate can underlie building supervisory procedures:

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

This test certificate includes 5 pages and 3 enclosures.

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1 Description of test material

1.1 Test material (according to the sponsor)

The materials delivered are self-adhesive films, consisting of a white or transparent plasticized PVC film with a one sided polyacrylate adhesive layer and a covering of the adhesive layer with a siliconized protective paper. The self-adhesive films are intended to be used inside buildings, bonded on the following substrates:

Trade name	Substrate
"SpotOn White"	Solid mineral substrates or to gypsum plaster boards
"SpotOn Clear"	Glass

1.2 Description of the delivered samples

For the tests, 2 test rolls of self-adhesive plastic films were sent to the laboratory by the sponsor. The self-adhesive surfaces of the films were each covered with a white protective paper. The materials were labelled with the material name and batch-no and were delivered in the following versions:

Labelling	Length [m]	Width [m]	Batch	Colour and surface of self-adhesive layer
"Spot On"	ca. 50	1,42	039658	White with dot shaped adhesive
"Spot-On Clear"		1,07	039289	Transparent with dot shaped adhesive

Characteristic values: see paragraph 4.1; photos: see enclosures
Other specifications are not known by the laboratory, a sample each is stored.

2 Preparation of samples

From material delivered 4 specimens were assembled. The samples (dimensions 1000 mm x 190 mm) of test specimen A and C were cut in longitudinal and for test specimen B and D in transversal direction of the film, for bonding one side onto gypsum plaster boards (according to DIN 4102-16, clause. 4.4 d, thickness 12,5 mm) or single-pane glass with a thickness of 3 mm. For the small burner tests ("Brennkastenprüfungen") samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) have been cut in longitudinal and transversal direction for bonding on one side onto gypsum plaster boards with a thickness of 12.5 mm or single-pane glass with a thickness of 3 mm (assignment of films to the test specimens: see page 4). 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 tests ("Brennkastenprüfungen") have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2). No additional substrate was arranged behind the material composite of single-pane glass and the self-adhesive film "SpotOn Clear".
Examination period: January 2017 and March 2017

4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2
- section 4.3.3 Test results class B1

4.1 Material characteristics

Table 1

Characteristics			Manufacturer`s data	Measured values (m.v.)	
				SpotOn White	SpotOn Clear
Film with adhesive layer	Thickness	[mm]	0,1	0,12	0,13
	Weight per area unit	[g/m^2]	140	137	143
Protective paper	Thickness	[mm]	./.	0,13	0,14
	Weight per area unit	[g/m^2]	135	142	140

./. not received or not measured
m.v. mean value

4.2 Results of the fire behaviour

4.2.1 Test results class B2 (Brennkasten)

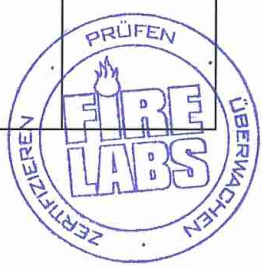
All building materials class B1 must also meet the requirements of materials class B2 (flammable). The materials, tested in "Brennkasten" acc. DIN 50 050 meets the requirements class B2; the materials did not show burning particles / droplets during these tests.
(Results: see tables 2.1 und 2.2, enclosure 3)

4.2.2 Test results class B1 (Brandschacht)

Table 3

Test results "Brandschachtprüfung" (part 1)						
line no.		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	50	50	50	50	
3	Time [1] ..... min	2	2	1	1	*)
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	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:s	No	No	No	No	
11	Extend: Sporadic falling of burning parts					
12	Continuous falling of burning parts					
13	Afterflame time at the bottom of thesieve (max.) ..... min:s	./.	./.	./.	./.	
14	Impairment of the burner flames by dropping or falling Material Time [1] ..... min:s	No	No	No	No	
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.		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	No	No	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	Back side of specimen					
	Smoke density					
28	≤ 400 % min	6,3	10,1	9,6	6,1	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
	Residual length					
31	Individual values ..... cm	51 53 46 51	50 51 51 53	51 50 47 43	51 51 62 49	> 0
32	Average value ..... cm	**50**	**51**	**47**	**53**	≥ 15
33	Photo of the test specimen fig. no.	2	4	6	8	
	Flue gas temperature					
34	Maximum of average value...°C	102	101	112	114	≤ 200
35	Time [1] ..... min:s	9:24	9:52	9:48	10:00	
36	Diagram fig. no.	1	3	5	7	
37	Remarks: line 32: There were no additional tests proceeded because of the residual length of > 45 cm. (DIN 4102-16: 2015-09, 5.2 b))					

Test specimen	Test-no.	Type name	Orientation of samples	Substrate
A	612617-001	"SpotOn White"	longitudinal	gypsum plaster boards
B	612617-002		transversal	
C	617117-001	"SpotOn Clear"	longitudinal	pane glass
D	617117-002		transversal	

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

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5 Assessment

According to the test results in section 4.2, the materials described in section 1 and 4.1 fulfil the requirements of building materials class B1 according to DIN 4102-1 by the tested building materials

"SpotOn White": bonded to solid mineral substrates or to gypsum plaster boards (non-perforated), with a density of ≥ 650 kg/m^3 and a thickness of ≥ 11 mm

"SpotOn Clear": bonded on one side to single-pane glass, at a distance of the material compound 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 by outdoor weathering)

is not proved with this test certificate.

This test certificate is not valid, if the material described in section 1 is used freely suspended.

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 not 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 2022-03-31, provided the test methods, classification rules and technology do not change during this period.

Borkheide, 31st of March 2017

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

This translation was issued on 31s of March 2017, in a case of doubt the German version is valid solely.

Test specimen A

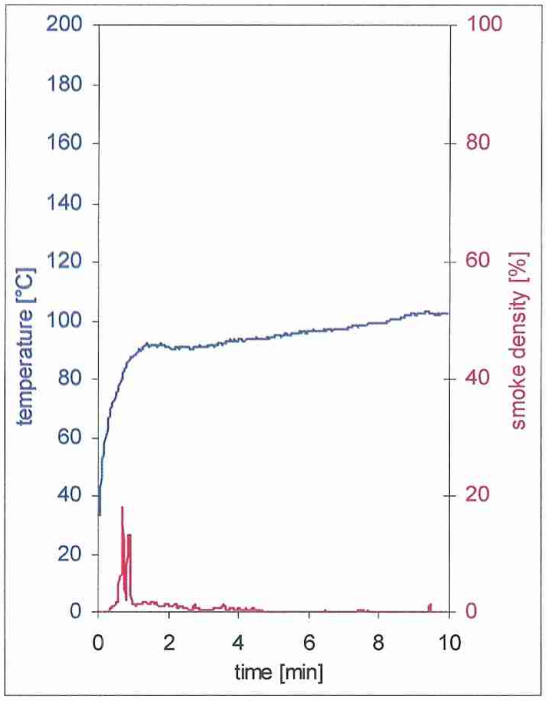

fig. 1
Graphs of the flue gas temperature and the smoke density

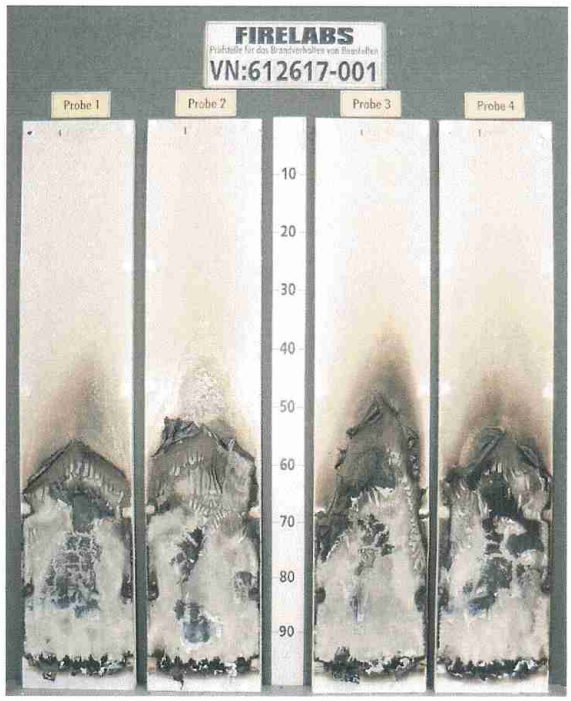

fig. 2
Photo of the test specimen after the test

Test specimen B

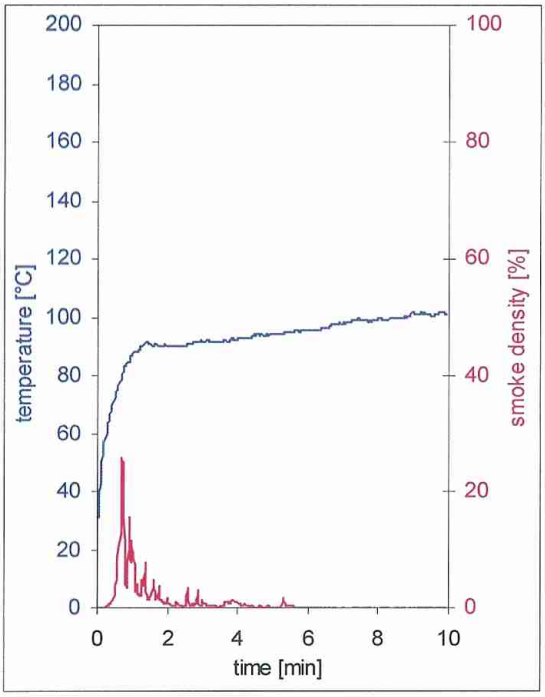

fig. 3
Graphs of the flue gas temperature and the smoke density

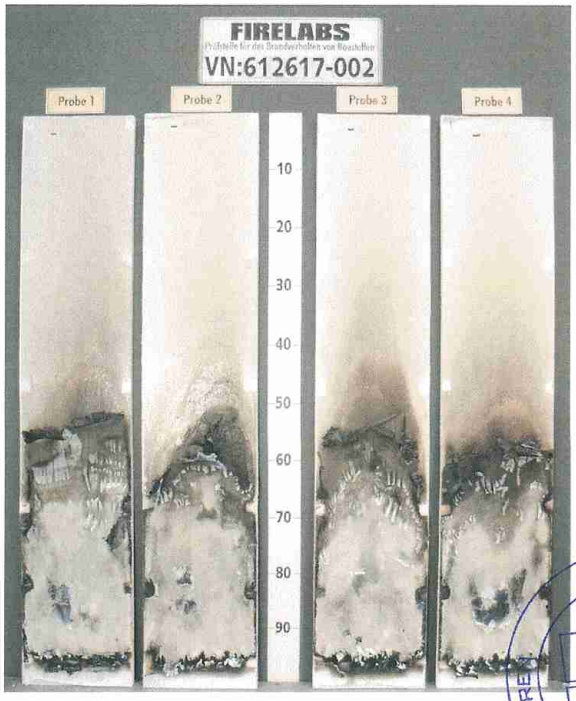

fig. 4
Photo of the test specimen after the test

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Test specimen C

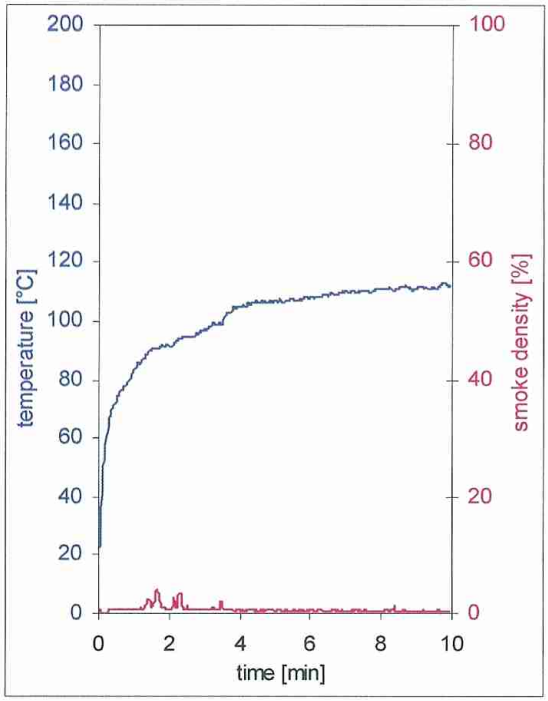

fig. 5
Graphs of the flue gas temperature and the smoke density

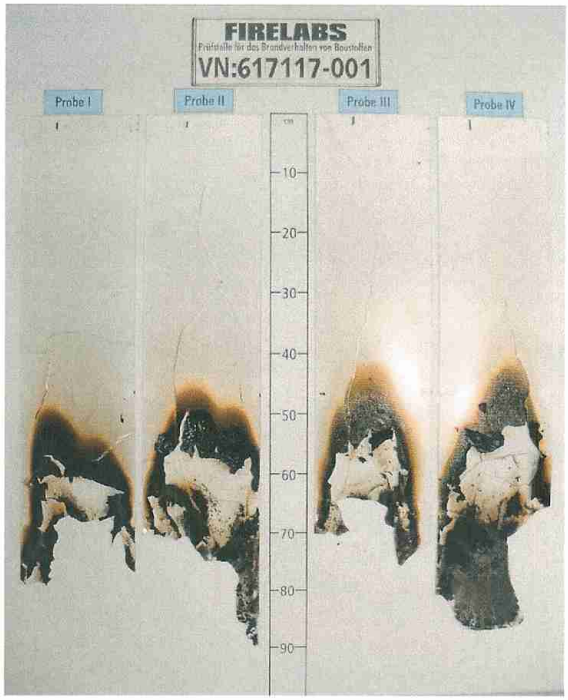

fig. 6
Photo of the test specimen after the test

Test specimen D

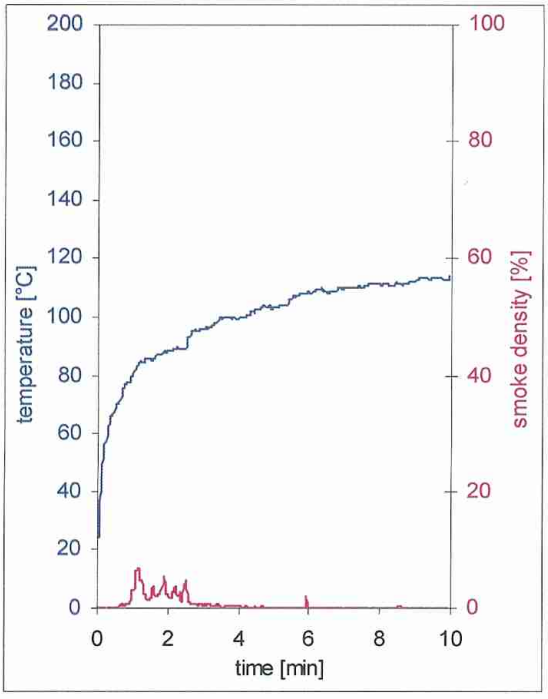

fig. 7
Graphs of the flue gas temperature and the smoke density

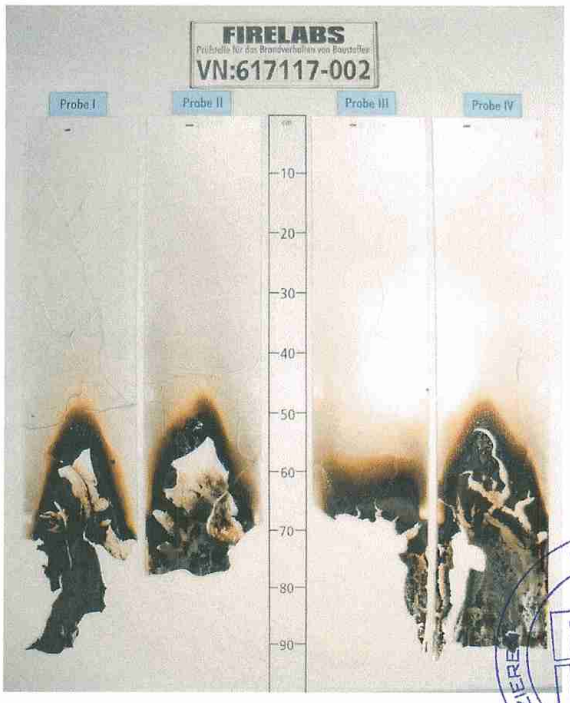

fig. 8
Photo of the test specimen after the test

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Test results small burner test

Table 2.1

"SpotOn White" on gypsum plaster boards acc. section 2	longitudinal direction						transversal direction						dim.	require-ments
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	1	2	1	1	1	./.	2	2	1	2	1	./.	s	-
Maximum flame height	1	1	1	1	1	0	1	1	1	1	1	0	cm	-
Time of the maximum	8	7	9	8	9	./.	7	7	8	9	9	./.		
Flame tip has reached the 150 mm mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Self-extinguishing of flames	16	16	16	16	16	./.	16	16	16	16	16	./.	s	
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	very low						very low						-	./.
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
View of the samples after the test (20 seconds after exposure the flame): The samples showed minor damage at the point of flame application.														

Table 2.2

"SpotOn Clear" on pane glass acc. section 2	longitudinal direction						transversal direction						dim.	require-ments
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	1	1	1	1	1	./.	1	1	1	1	1	./.	s	-
Maximum flame height	2	2	2	2	2	1	2	2	2	2	2	1	cm	-
Time of the maximum	9	7	6	5	4	15	6	4	5	4	4	15		
Flame tip has reached the 150 mm mark	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	≥ 20
Self-extinguishing of flames	16	16	16	16	16	16	16	16	16	16	16	16	s	
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	very low						very low						-	./.
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
View of the samples after the test (20 seconds after exposure the flame): Samples were destroyed in the longitudinal and transverse direction up to a max. height of about 1.5 cm and a width of about 1 cm, discoloured above about 1.5 cm.														

Samples 1-5: Edge flame exposure
Samples 6: Surface flame impingement

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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