

TEST CERTIFICATE

No. 230011248

issued 08.12.2017

as proof of the Schwerentflammbarkeit according to DIN 4102-1 (May 1998)

English version

Sponsor: ORAFOL Europe GmbH
Orafolstrasse 2
16515 Oranienburg

Date of application: 01.11.2017
Date of sampling: Samples were sent in by the sponsor
Samples delivered on 24.10.2011 and 09.11.2017
Date of testing: 28.11.2011, 29.11.2011, 07.12.2011, 23.11.2017 and 24.11.2017

Order

Testing according to DIN 4102-1 (May 1998) class B1

Description / Name of tested product

PVC-self-adhesive films „ORACAL 640“ used for marks, letterings and decorations

Applied test procedure

DIN 4102 part 1 (May 1998)

Remark: This test certificate is a translation of the original test certificate 230011248 issued 08.12.2017 in German language and is only allowed to be used together with the original test certificate.

This test certificate is valid until 07.12.2022.
The test results only relate to the above named product.
Any change in form or content to a test certificate and the reproduction of a shortened version can only be made by the approval of MPA NRW.
This test certificate consists of 10 pages and 1 enclosure.



Name of tested product: „ORACAL 640“

Description:

Soft-PVC-films with a matt resp. a glossy surface, one-side coated with a pressure-sensitive adhesive on basis of polyacrylate

Thickness of the PVC-film without the adhesive-coating: 0.08 mm

(Information given by the sponsor)

Colour of the tested films:

a) colourless, transparent, matt, b) colourless, transparent, glossy, c) white, matt, d) white, glossy

Table 1: Specific values of the tested material

		Minimum value	Arithmetic value	Maximum value
Thickness	mm	0.09	0.1	0.12
Mass per unit area	g/m ²	--	126	--
Density	kg/m ³	--	--	--

Special notes: None

Results of the Brandschacht test (part 1)					
row- no.	Colour of the tested films: transparent	measurements test specimen			
		matt A1	glossy B1		
1	<u>No. of test specimen arrangement according to DIN 4102, part 15 , table 1</u>	7	7		
2	<u>Max. flame height above bottom edge</u>	70	70		
	cm Time ¹⁾ min : s	1:00	1:00		
4	<u>Melt through / burn through</u> Time ¹⁾ min : s	-- ²⁾	-- ²⁾		
5	<u>Observations on the backside of the specimens</u> Flames/smouldering	-- ²⁾	-- ²⁾		
	Time ¹⁾ min : s				
6	Discolouration Time ¹⁾ min : s	10:00	10:00		
7	<u>Burning droplets</u> Start ¹⁾ min : s	-- ²⁾	-- ²⁾		
	<u>Extent</u>				
8	sporadic burning droplets	-- ²⁾	-- ²⁾		
9	continually falling particles	-- ²⁾	-- ²⁾		
10	<u>Falling particles which burns</u> Start ¹⁾ min : s	-- ²⁾	-- ²⁾		
	sporadic falling parts	-- ²⁾	-- ²⁾		
12	continually falling particles	-- ²⁾	-- ²⁾		
13	Duration of the burning on the screen bottom (max.) min : s	-- ²⁾	-- ²⁾		
14	<u>Interference of the burner flame by dripping /falling particles</u>				
	Time ¹⁾ min : s	-- ²⁾	-- ²⁾		
15	<u>Early termination of the test</u> End of burning at the specimen ¹⁾ min : s	-- ²⁾	-- ²⁾		
	Time of early cancellation of the test ¹⁾ min : s	-- ²⁾	-- ²⁾		
16		-- ²⁾	-- ²⁾		

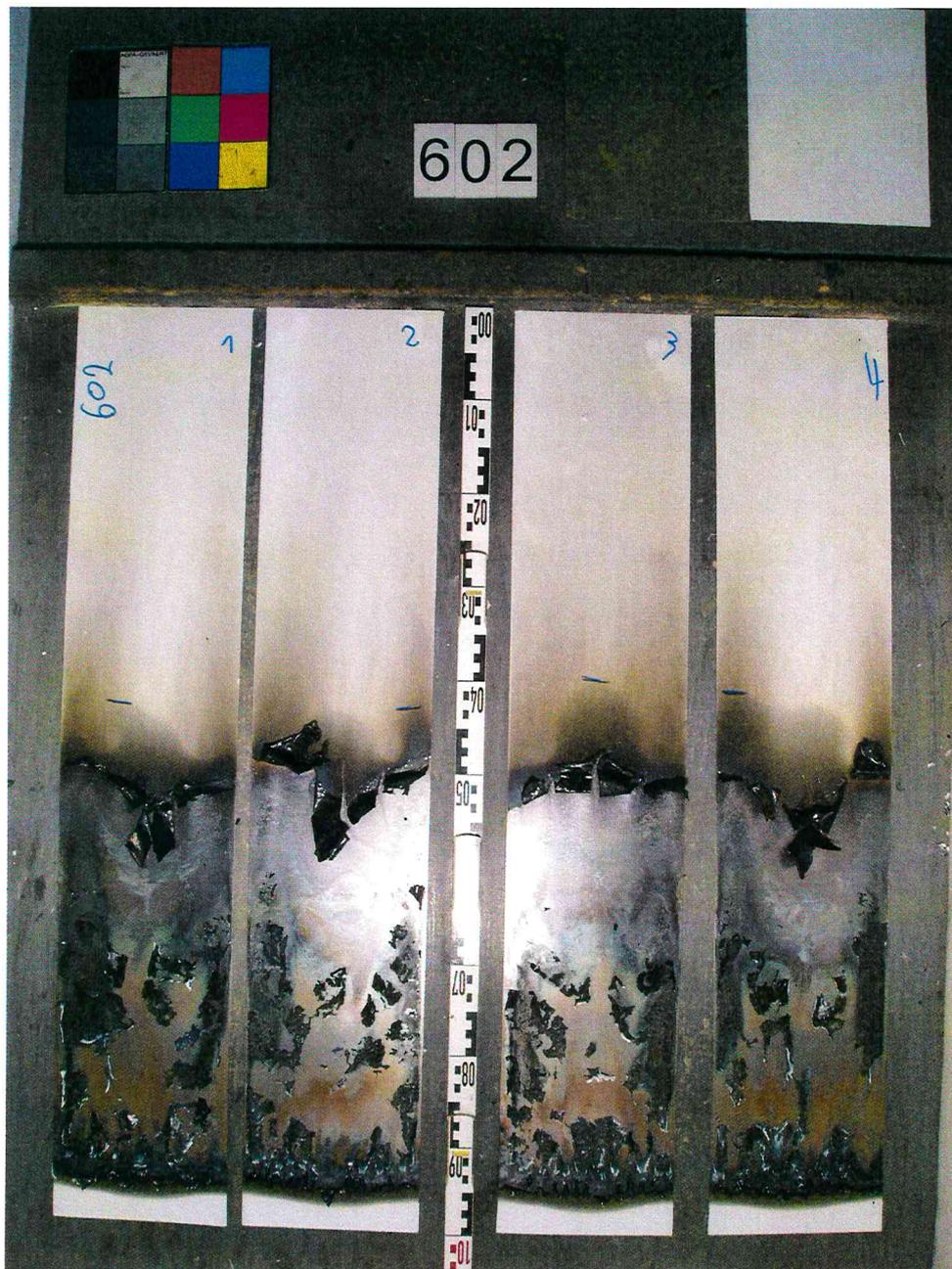
¹⁾ Time counting from the start of the test

row- no.		Results of the Brandschichttest (part 2)			
		measurements test specimen			
		A1	B1		
	<u>Continuous burning after termination of the test</u>				
17	Duration min : s	-- ²⁾	-- ²⁾		
18	Number of specimens	-- ²⁾	-- ²⁾		
19	Front side of the specimen	-- ²⁾	-- ²⁾		
20	Back side of the specimen	-- ²⁾	-- ²⁾		
21	Flame length cm	-- ²⁾	-- ²⁾		
	<u>Smouldering after termination of the test</u>				
22	Duration min : s	0:20	-- ²⁾		
23	Number of specimens	4	-- ²⁾		
	<u>Location</u>				
24	Lower half of the specimens	x	-- ²⁾		
25	Upper half of the specimens	-- ²⁾	-- ²⁾		
26	Front side of the specimen	x	-- ²⁾		
27	Backside of the specimen	-- ²⁾	-- ²⁾		
	<u>Smoke development</u>				
28	≤ 400 % x min	58	65		
29	> 400 % x min	-- ²⁾	-- ²⁾		
30	Diagram in appendix	--	--		
	<u>Residual lengths</u>	39	43	47	41
31	Single values cm	41	45	42	43
32	Average values cm	42	43		
33	Photo of the specimen on page	--	--		
	<u>Smoke temperature</u>				
34	Maximum value of the averaged values °C	113	116		
35	Time ¹⁾ min : s	10:00	9:44		
36	Diagram in appendix Nr.	--	--		
37	<u>Remarks:</u> For the tests the self-adhesive films were glued on 0.88 mm thick steel sheets. The test results were taken of the test report no. 230008247 of 09.12.2011. 2) Did not occur				

Results of the Brandschacht test (part 1)					
row-no.	Colour of the tested films: white	measurements test specimen			
		matt A2	glossy B2	glossy C2	
1	<u>No. of test specimen arrangement according to DIN 4102, part 15 , table 1</u>	7	7	--	
2	<u>Max. flame height above bottom edge</u>	70	70	70	
	cm Time ¹⁾ min : s	1:00	1:00	1:00	
4	<u>Melt through / burn through</u> Time ¹⁾ min : s	-- ²⁾	-- ²⁾	-- ²⁾	
5	<u>Observations on the backside of the specimens</u> Flames/smouldering	-- ²⁾	-- ²⁾	-- ²⁾	
	Time ¹⁾ min : s				
6	Discolouration Time ¹⁾ min : s	10:00	10:00	10:00	
7	<u>Burning droplets</u> Start ¹⁾ min : s	-- ²⁾	-- ²⁾	-- ²⁾	
	<u>Extent</u>				
8	sporadic burning droplets	-- ²⁾	-- ²⁾	-- ²⁾	
9	continually falling particles	-- ²⁾	-- ²⁾	-- ²⁾	
10	<u>Falling particles which burns</u> Start ¹⁾ min : s	-- ²⁾	-- ²⁾	0:45	
	sporadic falling parts	-- ²⁾	-- ²⁾	x	
12	continually falling particles	-- ²⁾	-- ²⁾	-- ²⁾	
13	Duration of the burning on the screen bottom (max.) min : s	-- ²⁾	-- ²⁾	-- ²⁾	
14	<u>Interference of the burner flame by dripping /falling particles</u>				
	Time ¹⁾ min : s	-- ²⁾	-- ²⁾	-- ²⁾	
15	<u>Early termination of the test</u> End of burning at the specimen ¹⁾ min : s	-- ²⁾	-- ²⁾	-- ²⁾	
	Time of early cancellation of the test ¹⁾ min : s	-- ²⁾	-- ²⁾	-- ²⁾	
16		-- ²⁾	-- ²⁾	-- ²⁾	

¹⁾ Time counting from the start of the test

row-no.		Results of the Brandschichttest (part 2)					
		measurements test specimen					
		A2	B2	C2			
<u>Continuous burning after termination of the test</u>							
17	Duration min : s	-- ²⁾	-- ²⁾	-- ²⁾			
18	Number of specimens	-- ²⁾	-- ²⁾	-- ²⁾			
19	Front side of the specimen	-- ²⁾	-- ²⁾	-- ²⁾			
20	Back side of the specimen	-- ²⁾	-- ²⁾	-- ²⁾			
21	Flame length cm	-- ²⁾	-- ²⁾	-- ²⁾			
<u>Smouldering after termination of the test</u>							
22	Duration min : s	-- ²⁾	-- ²⁾	-- ²⁾			
23	Number of specimens	-- ²⁾	-- ²⁾	-- ²⁾			
<u>Location</u>							
24	Lower half of the specimens	-- ²⁾	-- ²⁾	-- ²⁾			
25	Upper half of the specimens	-- ²⁾	-- ²⁾	-- ²⁾			
26	Front side of the specimen	-- ²⁾	-- ²⁾	-- ²⁾			
27	Backside of the specimen	-- ²⁾	-- ²⁾	-- ²⁾			
<u>Smoke development</u>							
28	≤ 400 % x min	48	44	47			
29	> 400 % x min	-- ²⁾	-- ²⁾	-- ²⁾			
30	Diagram in appendix	--	--	1			
<u>Residual lengths</u>		46	45	43	43	45	48
31	Single values cm	46	47	40	41	45	47
32	Average values cm	46	42	46			
33	Photo of the specimen on page	--	7	--			
<u>Smoke temperature</u>							
34	Maximum value of the averaged values °C	111	115	115			
35	Time ¹⁾ min : s	6:50	9:53	9:27			
36	Diagram in appendix Nr.	--	--	1			
37	<u>Remarks:</u> For the tests A2 and B2 the self-adhesive films were glued on 0.88 mm thick steel sheets. The test results of the tests A2 and B2 were taken of the test report no. 230008247 of 09.12.2011. For the test C2 the films were glued on 1 mm thick steel sheets. With this test the films were flamed across the production direction. 2) Did not occur						



Picture 1: Appearance of specimen B2 after the test

Results of the B2-testing according to DIN 4102-01

(Tests with flaming the edge)

Protection of edges: --

Point of flame attack: lower edge of the front side, flaming of the matt, transparent film type, glued on steel sheet

Specimen No.	1	2	3	4	5
(Times stated from start of test)					
Ignition (s)	1	-- ¹⁾	-- ¹⁾	1	-- ¹⁾
Flame passing the limit mark (s)	-- ¹⁾	--	--	-- ¹⁾	--
Self extinguishment (s)	2	--	--	2	--
Max. height of the flame (cm)	1	0	0	1	0
Continuous burning after 20 s	-- ¹⁾	--	--	-- ¹⁾	--
Continuous smouldering after 20 s	-- ¹⁾	--	--	-- ¹⁾	--
Extinguishment of flames / glowing after passing the limit mark	--	--	--	--	--
Smoke development (visual observation)	very low				
Falling of burning particles / droplets time (s)	-- ¹⁾	--	--	-- ¹⁾	--

Remarks: 1) Did not occur

The test results were taken of the test report no. 230008247 of 09.12.2011.

Point of flame attack: lower edge of the front side, flaming of the glossy, transparent film type, glued on steel sheet

Specimen No.	1	2	3	4	5
(Times stated from start of test)					
Ignition (s)	1	1	1	1	1
Flame passing the limit mark (s)	-- ¹⁾				
Self extinguishment (s)	2	2	2	2	2
Max. height of the flame (cm)	1	1	1	1	1
Continuous burning after 20 s	-- ¹⁾				
Continuous smouldering after 20 s	-- ¹⁾				
Extinguishment of flames / glowing after passing the limit mark	-- ¹⁾				
Smoke development (visual observation)	very low				
Falling of burning particles / droplets time (s)	-- ¹⁾				

Remarks: 1) Did not occur

The test results were taken of the test report no. 230008247 of 09.12.2011.

Results of the B2-testing according to DIN 4102-01

(Tests with flaming the edge)

Protection of edges: --

Point of flame attack: lower edge of the front side, flaming of the matt, white film type, glued on steel sheet

Specimen No.	1	2	3	4	5
(Times stated from start of test)					
Ignition (s)	1	1	-- ¹⁾	-- ¹⁾	1
Flame passing the limit mark (s)	-- ¹⁾	-- ¹⁾	--	--	-- ¹⁾
Self extinguishment (s)	2	2	--	--	2
Max. height of the flame (cm)	1	1	0	0	1
Continuous burning after 20 s	-- ¹⁾	-- ¹⁾	--	--	-- ¹⁾
Continuous smouldering after 20 s	-- ¹⁾	-- ¹⁾	--	--	-- ¹⁾
Extinguishment of flames / glowing after passing the limit mark	--	--	--	--	--
Smoke development (visual observation)	very low				
Falling of burning particles / droplets time (s)	-- ¹⁾	-- ¹⁾	--	--	-- ¹⁾

Remarks: 1) Did not occur

The test results were taken of the test report no. 230008247 of 09.12.2011.

Point of flame attack: lower edge of the front side, flaming of the glossy, white film type across the production direction, glued on steel sheet

Specimen No.	1	2	3	4	5
(Times stated from start of test)					
Ignition (s)	1	1	1	1	1
Flame passing the limit mark (s)	-- ¹⁾				
Self extinguishment (s)	15	15	15	15	15
Max. height of the flame (cm)	1	1	1	1	1
Continuous burning after 20 s	-- ¹⁾				
Continuous smouldering after 20 s	-- ¹⁾				
Extinguishment of flames / glowing after passing the limit mark	-- ¹⁾				
Smoke development (visual observation)	low				
Falling of burning particles / droplets time (s)	-- ¹⁾				

Remarks: 1) Did not occur

Due to the low flame heights by flaming the edge, negative results by flaming the surface are not expected. By this reason tests with flaming the surface were not necessary according to DIN 4102-1 section 6.2.5.3.

Assessment

- The product described on page 2 fulfilled the requirements of building products according to Baustoffklasse B2. According to the results, the product as tested in the described arrangement also fulfils the requirements of building products according to Baustoffklasse B1. In consequence the product can be classified as

Baustoffklasse B1 (schwerentflammbare Baustoffe)

according to DIN 4102 part 1 (Mai 1998). This assessment is only valid, if the films are glued on steel substrate. The surface of the self-adhesive films may not be covered with paints, coatings or similar products. The resistance of the fire behaviour against climatic influences in the outside was not proofed. Therefore the product may be used as schwerentflammbar only inside of buildings or in otherwise weather protected areas.

- The material does not produce burning droplets / particles.

Special remark

- The validity of this test certificate ends on 07.12.2022. The period of validity can be extended on application.
- Since the material is used for marks, letterings and decorations it is no building product according to §2 chapter 9 no. 1 MBO. An allgemeines bauaufsichtliches Prüfzeugnis of the test institute respectively an allgemeine bauaufsichtliche Zulassung of Deutsches Institut für Bautechnik, Berlin is not necessary.
- This test certificate is not the requested approval, if the tested material is used as building product according to the German building regulations.

Marking

The above mentioned material has to be marked as following:

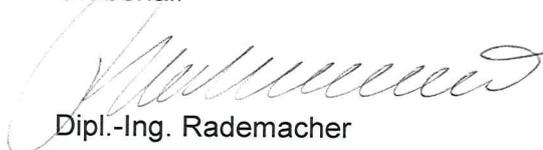
- "Only schwerentflammbar (class DIN 4102-B1) glued on steel substrate"

The marking shall be done on the material, on an enclosed paper or on the packaging or, if this would be too difficult, on the delivery-note or on an enclosure to the delivery-note.

This test certificate is solely valid in combination with the original test certificate issued in German language and dated of 08.12.2017. In case of doubt, the certificate issued in German language is valid solely.

Erwitte, 08.12.2017

On behalf



Dipl.-Ing. Rademacher

Head of testing body



Dipl.-Ing. Schreiner

Engineer in charge

Date of issue of this English version: 08.12.2017

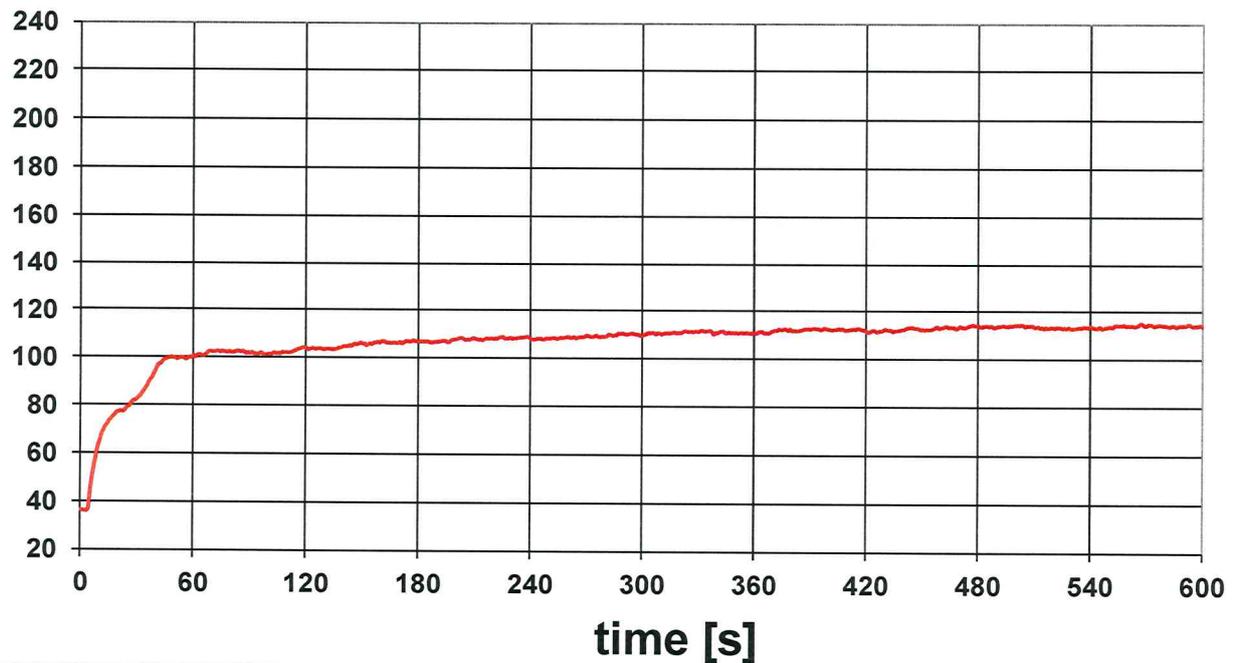
Max. flue gas-temperature = 115 °C
at [min : s] 09 : 27

Smoke-development [% x min]: 47

Enclosure 1 of test report
no. 230011248 of 08.12.2017

T [°C]

Average flue gas-temperature



RD [%]

Smoke-development

