

Test laboratory for the fire behavior of building materials, Dipl.-Ing. (FH) Andreas Hoch
Testing, supervising and certifying body, authorized by the building supervision authority

TEST REPORT

PZ-Hoch-171385

for the proof of Fire behaviour according to DIN 4102, part 1

Translation of the German test report – no guarantee for translation of technical terms

company	GF Genereal Formulations GmbH Hansestraße 105 D-51149 Köln			
description of samples	polymer PVC self-adhesive foils in a nominal thickness of 85µ colour: white			
name of the material	„Concept E201“ „Concept E201OAPAE“ „Concept E202“ „Concept E235“	oder oder oder	„Concept E201OAP“ „Concept E201HTAP“ „Concept E212“	oder oder oder
sampling	by the company itself			
content of request	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102, part 1			
validity of test report	30.11.2022			
result	The examined product with an area weight of 306 g/m² up to 327 g/m² meets affixed on metallic surfaces with a density of $\geq 5.890 \text{ kg/m}^3$, a melting point of $\geq 1000 \text{ °C}$ and a thickness of $\geq 0,6 \text{ mm}$ the requirements of class B1 for "schwerentflammbare" (hardly flammable) building materials according to DIN 4102, part 1 (May 1998).			

This test report includes 5 pages and 8 enclosures.

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This test report must not be published and copied without preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.

1. Description of test material in condition as delivered

PN 26433: „Concept E201OAP“ colour: white
- polymer PVC self-adhesive foil - nominal thickness 85µ

characteristic values determined by the test laboratory:

whole thickness including protection film: about 0,30 mm
whole area weight including protection film: about 307 g/m²
thickness of self-adhesive foil: about 0,11 mm
area weight of self-adhesive foil: about 147 g/m²

PN 26434: „Concept E235“ colour: white
- polymer PVC self-adhesive foil - nominal thickness 85µ

characteristic values determined by the test laboratory:

whole thickness including protection film: about 0,34 mm
whole area weight including protection film: about 327 g/m²
thickness of self-adhesive foil: about 0,15 mm
area weight of self-adhesive foil: about 177 g/m²

PN 26435: „Concept E201HTAP“ colour: white
- polymer PVC self-adhesive foil - nominal thickness 85µ

characteristic values determined by the test laboratory:

whole thickness including protection film: about 0,30 mm
whole area weight including protection film: about 306 g/m²
thickness of self-adhesive foil: about 0,12 mm
area weight of self-adhesive foil: about 149 g/m²

The testing laboratory is not provided with further details concerning composition of the tested building materials. Samples are deposited.

2. Preparation of samples

Samples with the dimensions 1000 mm height and 190 mm width were cut out from the material for fire testing. The self-adhesive foil was affixed on steel panel with a thickness of 0,88 mm. The samples were kept in climate chamber 23/50 until they reached constant weight.

3. Arrangement of samples

#9737:	flaming in longitudinal direction
#9738:	flaming in longitudinal direction
#9739:	flaming in longitudinal direction
#9750:	flaming in longitudinal direction
#9751:	flaming in longitudinal direction
#9745:	flaming in cross direction

„Concept E201OAP“
„Concept E235“
„Concept E201HTAP“
„Concept E201HTAP“
„Concept E201HTAP“
„Concept E201HTAP“

4. Date of test CW 49 and CW 50 in 2017

5. Results

The test has been examined according to DIN 4102 (Mai 1998)

line no.	Measurement	Result with the tested specimen						Dim.
		#9737	#9738	#9739	#9750	#9751	#9745	
	Test number	E2010AP	E235	E201HTAP				
	foil							
	flaming direction	longitud.	longitud.	longitud.	longitud.	longitud.	cross	
1	Number of specimen arrangement acc. to. DIN 4102/T15, schedule 1	7	7	7	7	7	7	
2	Maximum flame height above bottom edge of the specimen	60	70	70	60	70	70	cm
3	Time ¹⁾	0:42	1:05	0:41	0:47	1:06	1:13	min:s
4	Burn through / melting Time ¹⁾	0:31	0:31	0:27	0:33	0:38	0:41	min:s
5	Observations on the back side of the specimen							
	Flames / Glowing	./.	./.	./.	./.	./.	./.	min:s
6	Time ¹⁾	./.	./.	./.	./.	./.	./.	min:s
	Change of colour	./.	./.	./.	./.	./.	./.	min:s
7	Falling of burning droplets Start ¹⁾	./.	./.	X	./.	./.	./.	min:s
	Extent	./.	./.	0:40	./.	./.	./.	min:s
8	sporadic falling of burning droplets ²⁾	./.	./.	X	./.	./.	./.	min:s
9	continuous falling of burning droplets ²⁾	./.	./.	./.	./.	./.	./.	min:s
10	Falling of burning droplets Start ¹⁾	./.	./.	./.	./.	./.	./.	min:s
	Extent	./.	./.	./.	./.	./.	./.	min:s
11	sporadic falling of burning droplets ²⁾	./.	./.	./.	./.	./.	./.	min:s
12	continuous falling of burning droplets ²⁾	./.	./.	./.	./.	./.	./.	min:s
13	After flame time at the bottom of the sieve (max.)	./.	./.	0:13	./.	./.	./.	min:s
14	Impairment of the burner by dropping or falling material: Time ¹⁾	./.	./.	./.	./.	./.	./.	min:s
15	Premature end of test	./.	./.	./.	./.	./.	./.	min:s
16	Final occurrence of burning at the specimen ¹⁾	./.	./.	./.	./.	./.	./.	min:s
17	Time of eventually end of test ¹⁾	./.	./.	./.	./.	./.	./.	min:s
18	After flame after end of test Time ¹⁾	./.	./.	./.	./.	./.	./.	min:s
19	Number of specimen	./.	./.	./.	./.	./.	./.	min:s
20	Front side of specimen ²⁾	./.	./.	./.	./.	./.	./.	min:s
21	Back side of specimen ²⁾	./.	./.	./.	./.	./.	./.	min:s
	flame length	./.	./.	./.	./.	./.	./.	cm

line no.	Measurement	Result with the tested specimen						Dim.
		#9737	#9738	#9739	#9750	#9751	#9745	
	Test number	E2010AP	E235	E201HTAP				
	<u>foil</u>	longitud.	longitud.	longitud.	longitud.	longitud.	cross	
	flaming direction	.	.	.	.	.	.	
22	Afterglow after end of test	.	.	.	.	.	.	min:s
	Time ¹⁾	.	.	.	.	.	.	
23	Number of specimen	.	.	.	.	.	.	
	Place of appearance	.	.	.	.	.	.	
24	Lower half of the specimen ²⁾	.	.	.	.	.	.	
25	Upper half of the specimen ²⁾	.	.	.	.	.	.	
26	Front side of specimen ²⁾	.	.	.	.	.	.	
27	Back side of specimen ²⁾	.	.	.	.	.	.	
	Density of smoke							
28	≤ 400 % * min	1	6	17	8	7	6	% * min
29	> 400 % * min ⁴⁾	.	.	.	.	.	.	% * min
30	Diagram: encl. no.	1	2	3	4	5	6	
31	Residual lengths: individual value ³⁾							
	Specimen 1	46	42	39	42	44	43	cm
	Specimen 2	40	39	36	36	38	36	cm
	Specimen 3	43	40	36	38	38	37	cm
	Specimen 4	46	42	39	42	41	41	cm
32	Average value, individual test ³⁾	44	41	38	40	40	39	
33	Photo of specimen in enclosure no.	1	2	3	4	5	6	
34	Flue gas temperature	107	111	109	109	110	111	°C
35	Maximum of average value							
	Time ¹⁾	09:30	01:38	09:42	09:48	09:30	09:27	min:s
36	Diagram: encl. no.	1	2	3	4	5	6	
37	Remarks: - none -							

¹⁾ indication of times: from the begin of testing procedure ²⁾ checked off if applicable

³⁾ indication of carrier/foam layer separated in case of fire-proofing agents

⁴⁾ very strong development of smoke

6. Explanations concerning the testing procedure

-none-

7. Summary of results and additional establishments to Fire Behaviour

line no.	measurement	Result with the tested specimen						Dim.
	test-no.	#9737 longitud.	#9738 longitud.	#9739 longitud.	#9750 longitud.	#9751 longitud.	#9745 cross	
	foil	E2010AP	E235	E201HTAP				
1	residual length	44	41	38	40	40	39	cm
2	max. smoke temperature	107	111	109	109	110	111	°C
3	density of smoke - integral	1	6	17	8	7	6	%min
4	remarks: -none-							

According to DIN 4102, part 1, "schwerentflammbare" (hardly flammable) building materials must meet the requirements of class B2.

Pursuant to additional tests in the ignitability apparatus this can be determined (appendix 7 & 8).

8. Special remarks

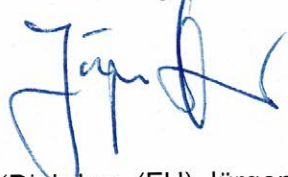
- This report is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or grounds etc. the burning behaviour may differ.
- This test report is not valid for the exposure to outdoor climate conditions.
- This test report is not valid, as soon as the fabric 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, in particular private proprietary rights.
- For legal interests only the German original version is relevant.
- 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

9. Validity

This test report is valid until the mentioned date on page 1. The test report becomes invalid in case the standards on which the tests are based are changed.

Fladungen, 13.12.2017

clerk in charge:



(Dipl.-Ing. (FH) Jürgen Hammer)



Head of the test laboratory:



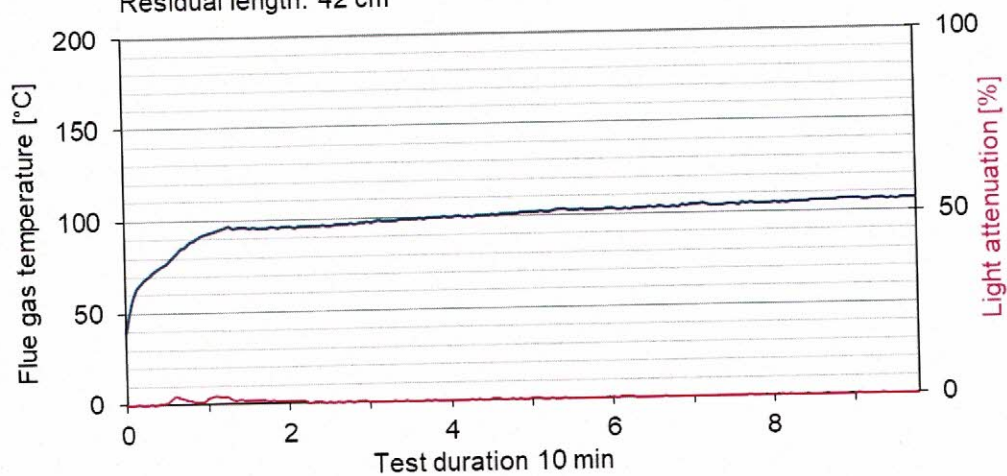
(Dipl.-Ing. (FH) Andreas Hoch)

„Brandschacht“-test #9737

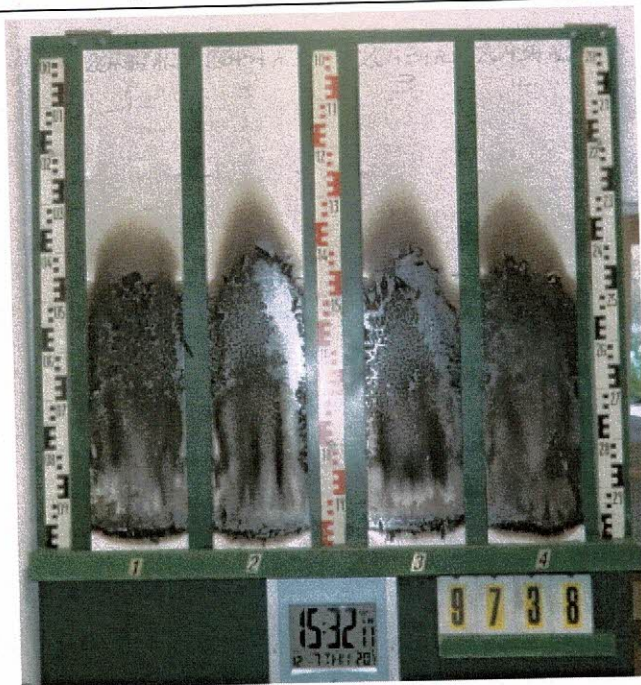


measurement

#9737, PN26433: GENERAL FORMULATIONS, "E201OAP", längs
 Max. flue temperature: 107°C, Smoke density integral: 1%/min
 Residual length: 42 cm

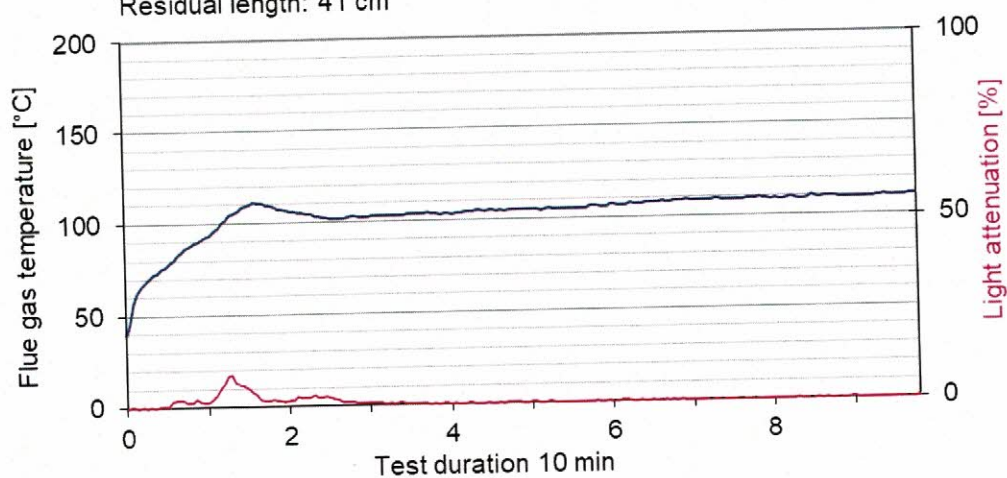


„Brandschacht“-test #9738



measurement

#9738, PN26434: GENERAL FORMULATIONS, "E235", längs
Max. flue temperature: 111°C, Smoke density integral: 6%min
Residual length: 41 cm

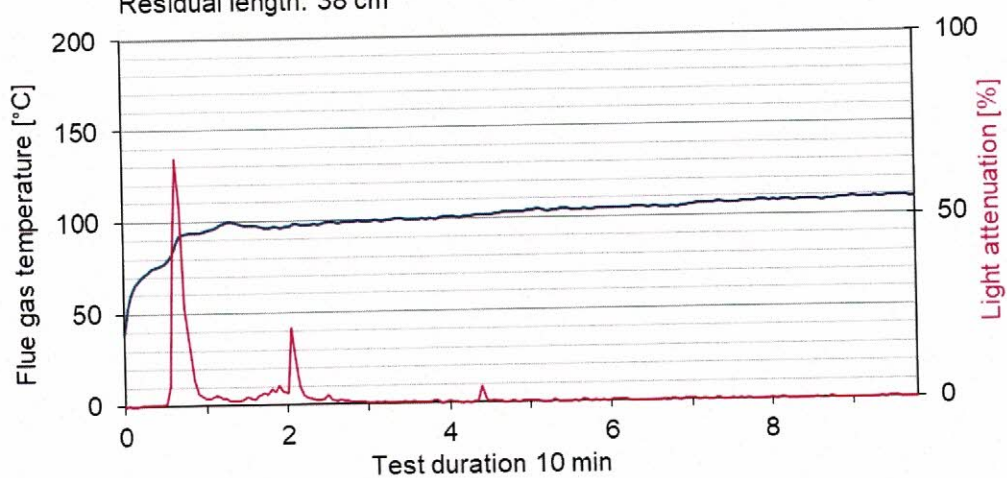


„Brandschacht“-test #9739

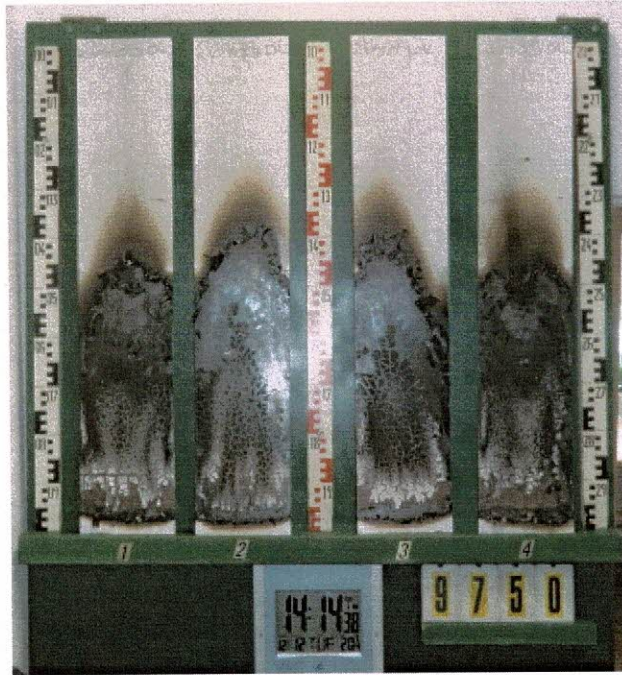


measurement

#9739, PN26435: GENERAL FORMULATIONS, "E201HTAP", längs
Max. flue temperature: 109°C, Smoke density integral: 17%min
Residual length: 38 cm



„Brandschacht“-test #9750

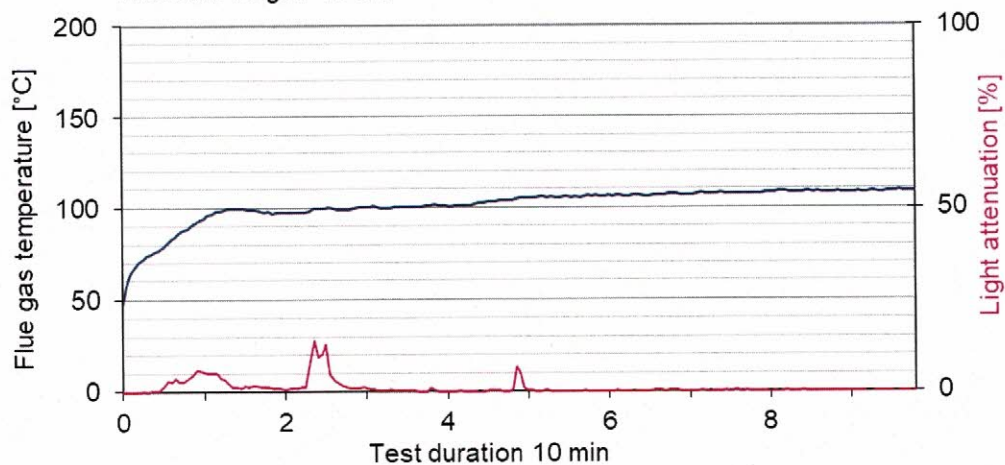


measurement

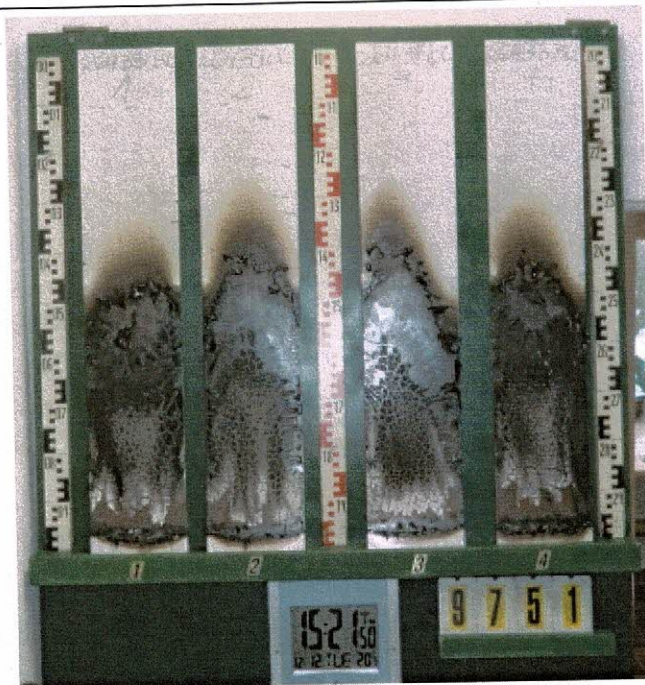
#9750, PN26435: GENERAL FORMULATIONS, "E201HTAP", längs

Max. flue temperature: 109°C, Smoke density integral: 8%/min

Residual length: 40 cm

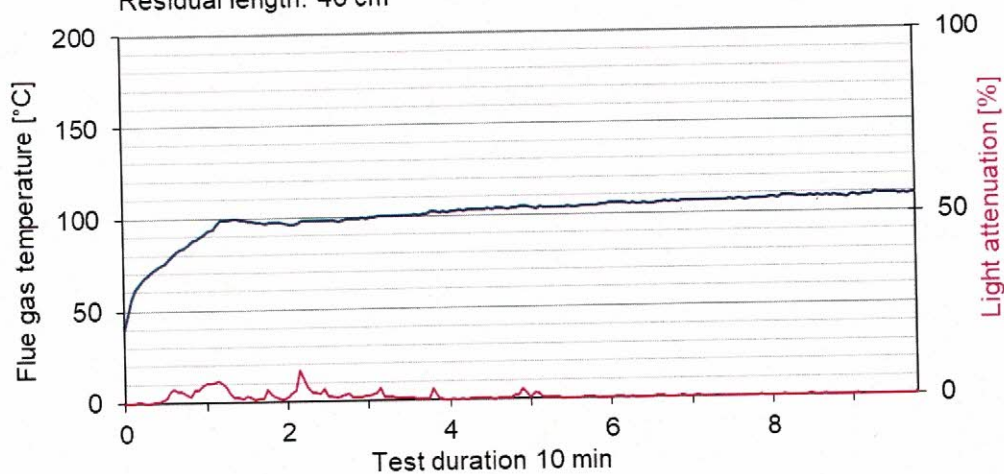


„Brandschacht“-test #9751

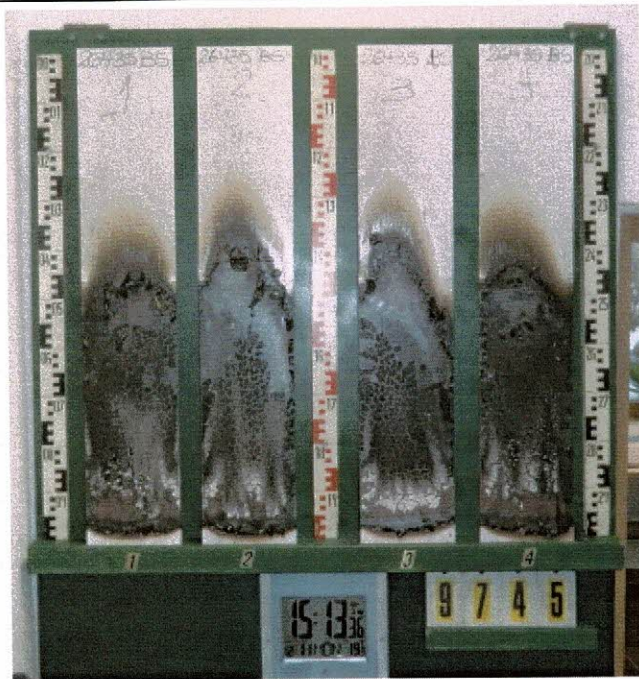


measurement

#9751, PN26435: GENERAL FORMULATIONS, "E201HTAP", längs
Max. flue temperature: 110°C, Smoke density integral: 7%min
Residual length: 40 cm

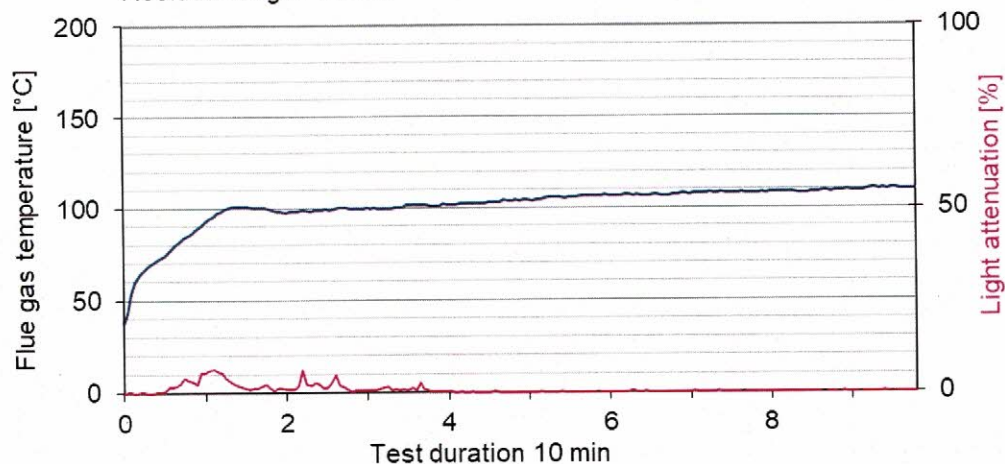


„Brandschacht“-test #9745



measurement

#9745, PN26435: GENERAL FORMULATIONS, "E201HTAP", quer
Max. flue temperature: 111°C, Smoke density integral: 6%/min
Residual length: 39 cm



**Test for normal flammability
classifying B2 according to DIN 4102**

1. Description of test material in condition as delivered look at page 2

2. Preparation of samples

Out of the material there have been cut samples for the ignitability apparatus.
The samples were kept in a climate 23/50 until they reached constant weight.

3. Arrangement of samples -glued on steel panels-

Flaming in longitudinal and in cross direction

4. Date of test CW 47 in 2017

5. Results

PN 26433: flaming lengthwise	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	1	1	1	--	./.	--	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	./.	./.	./.	./.	./.	--	./.	--	--	--	--	--	S
max. flame height	3	2	1	2	2	--	1	--	--	--	--	--	cm
time	5	3	2	2	2	--	./.	--	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	15	15	15	15	15	--	./.	--	--	--	--	--	s
end of glowing ¹⁾	./.	15	15	./.	./.	--	./.	--	--	--	--	--	s
flames were extinguished after ¹⁾	./.	./.	./.	./.	./.	--	./.	--	--	--	--	--	s
smoke development (visual)	little						very little						
dropping of burning material during 20 s ¹⁾	./.	./.	./.	./.	./.	--	./.	--	--	--	--	--	s
Appearance after test: burned out till max. height 3 cm x width 2,5 cm													

PN 26433: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	--	--	--	--	--	./.	--	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	./.	--	--	--	--	--	./.	--	--	--	--	--	s
max. flame height	1	--	--	--	--	--	1	--	--	--	--	--	cm
time	2	--	--	--	--	--	./.	--	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	15	--	--	--	--	--	./.	--	--	--	--	--	s
end of glowing ¹⁾	./.	--	--	--	--	--	./.	--	--	--	--	--	s
flames were extinguished after ¹⁾	./.	--	--	--	--	--	./.	--	--	--	--	--	s
smoke development (visual)	little						very little						
dropping of burning material during 20 s ¹⁾	./.	./.	./.	--	--	--	./.	./.	./.	--	--	--	s
Appearance after test: burned out till max. height 3 cm x width 2,5 cm													

¹⁾ time mentioned from the beginning of the test ²⁾ during 20 Sec -/- no appearance -- no information

PN 26434: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	--	--	--	--	./.	./.	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
max. flame height	1	1	--	--	--	--	1	1	--	--	--	--	cm
time	3	4	--	--	--	--	./.	./.	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	15	15	--	--	--	--	./.	./.	--	--	--	--	s
end of glowing ¹⁾	15	15	--	--	--	--	./.	./.	--	--	--	--	s
flames were extinguished after ¹⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
smoke development (visual)	little						very little						
dropping of burning material during 20 s ¹⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
Appearance after test: burned out till max. height 3 cm x width 2 cm													

PN 26435: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	--	--	--	--	./.	./.	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
max. flame height	1	1	--	--	--	--	1	1	--	--	--	--	cm
time	15	15	--	--	--	--	./.	./.	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	15	15	--	--	--	--	./.	./.	--	--	--	--	s
end of glowing ¹⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
flames were extinguished after ¹⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
smoke development (visual)	little						very little						
dropping of burning material during 20 s ¹⁾	./.	./.	--	--	--	--	./.	./.	--	--	--	--	s
Appearance after test: burned out till max. height 1,5 cm x width 1 cm													

¹⁾ time mentioned from the beginning of the test ²⁾ during 20 Sec -/- no appearance -- no information

6. Remarks and explanations to the testing procedure - none –

7. Opinion concerning the dropping of burning material

The test for normal flammability shows no burning dripping material.