

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-190328-3

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	Zimmer + Rohde GmbH Zimmersmühlenweg 14-18 D-61440 Oberursel
description of samples	fabric consisting of 100% Polyester FR in 3 different colours
name of the material	„10919”
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	28.02.2024
result	The examined product meets in any colour the requirements of class B1 for “schwerentflammbare” (hardly flammable) building materials according to DIN 4102, part 1 (May 1998) , suspended freely or with distance of >40 mm to same or other plain materials.

This test report includes 5 pages and 7 enclosures.

Remark: If the above mentioned building material is not used as product according to MBO § 2, Abs. 9, Ziffer1, 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This test report must not be published and copied without preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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 28848:** „10919” colour: **beige**
-fabric consisting of 100% Polyester FR-
side A: smooth front / side B: back
characteristic values determined by the test laboratory:
area weight: about 419 g/m² thickness: about 0,78 mm
- PN 28849** as PN 28848, however in colour **green**
characteristic values determined by the test laboratory:
area weight: about 429 g/m² thickness: about 0,97 mm
- PN 28850** as PN 28848, however in colour **brown**
characteristic values determined by the test laboratory:
area weight: about 408 g/m² thickness: about 0,73 mm

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

2. Preparation of samples

The samples were kept in climate chamber 23/50 until they reached constant weight.

3. Arrangement of samples mounting: freely suspended

#2234	flaming side A in warp direction	brown
#2235	flaming side B in warp direction	brown
#2236	flaming side B in weft direction	brown
#2248	flaming side B in warp direction	green
#2249	flaming side B in warp direction	beige

4. Date of test CW 13 and CW 14 in 2019

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

line no.	Measurement	Result with the tested specimen					Dim.
	Test number	#2234	#2235	#2236	#2248	#2249	
	flamed direction	warp A	warp B	weft B	warp B	warp B	
	flamed side						
	colour of fabric	brown			green	beige	
1	Number of specimen arrangement acc. to. DIN 4102/T15, schedule 1	1	1	1	1	1	
2	Maximum flame height above bottom edge of the specimen	30	30	30	30	30	cm
3	Time ¹⁾	0:02	0:02	0:02	0:02	0:02	min:s
4	Burn through / melting Time ¹⁾	0:06	0:06	0:05	0:06	0:06	min:s
5	Observations on the back side of the specimen Flames / Glowing Time ¹⁾	./.	./.	./.	./.	./.	min:s
6	Change of colour Time ¹⁾	./.	./.	./.	./.	./.	min:s
7	Falling of burning droplets Start ¹⁾	./.	./.	./.	./.	./.	min:s
8	Extent	./.	./.	./.	./.	./.	
9	sporadic falling of burning droplets ²⁾	./.	./.	./.	./.	./.	min:s
10	continuous falling of burning droplets ²⁾	./.	./.	./.	./.	./.	min:s
11	Falling of burning droplets Start ¹⁾	./.	./.	./.	./.	./.	min:s
12	Extent	./.	./.	./.	./.	./.	
13	sporadic falling of burning droplets ²⁾	./.	./.	./.	./.	./.	min:s
14	continuous falling of burning droplets ²⁾	./.	./.	./.	./.	./.	min:s
15	After flame time at the bottom of the sieve (max.)	./.	./.	./.	./.	./.	min:s
16	Impairment of the burner by dropping or falling material: Time ¹⁾	./.	./.	./.	./.	./.	min:s
17	Premature end of test	./.	./.	./.	./.	./.	min:s
18	Final occurrence of burning at the specimen ¹⁾	./.	./.	./.	./.	./.	min:s
19	Time of eventually end of test ¹⁾	./.	./.	./.	./.	./.	min:s
20	After flame after end of test Time ¹⁾	./.	./.	./.	./.	./.	min:s
21	Number of specimen	./.	./.	./.	./.	./.	
22	Front side of specimen ²⁾	./.	./.	./.	./.	./.	
23	Back side of specimen ²⁾	./.	./.	./.	./.	./.	
24	flame length	./.	./.	./.	./.	./.	cm

line no.	Measurement	Result with the tested specimen					Dim.
	Test number	#2234	#2235	#2236	#2248	#2249	
	flamed direction	warp	warp	weft	warp	warp	
	flamed side	A	B	B	B	B	
22	<u>Afterglow after end of test</u>	./.	./.	./.	./.	./.	min:s
	Time ¹⁾	./.	./.	./.	./.	./.	
23	Number of specimen	./.	./.	./.	./.	./.	
	<u>Place of appearance</u>	./.	./.	./.	./.	./.	
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⁾	./.	./.	./.	./.	./.	
	<u>Density of smoke</u>						% * min
28	≤ 400 % * min	2	1	1	1	1	
29	> 400 % * min ⁴⁾	./.	./.	./.	./.	./.	
30	Diagram: encl. no.	1	2	3	4	5	
31	<u>Residual lengths: individual value</u> ³⁾						
	Specimen 1	71	69	68	70	63	cm
	Specimen 2	68	62	68	63	62	cm
	Specimen 3	68	67	67	68	65	cm
	Specimen 4	67	64	60	67	65	cm
32	<u>Average value, individual test</u> ³⁾	69	66	66	67	64	
33	<u>Photo of specimen in enclosure no.</u>	1	2	3	4	5	
34	<u>Flue gas temperature</u>	121	119	126	120	120	°C
35	Maximum of average value Time ¹⁾	09:27	10:00	09:54	09:45	09:42	min:s
36	Diagram: encl. no.	1	2	3	4	5	
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

There were no additional tests proceeded because of the residual length of \geq than 45 cm.

7. Summary of results and additional establishments to Fire Behaviour

line no.	measurement	Result with the tested specimen					dimension
	test-no.	#2234	#2235	#2236	#2248	#2249	
	flamed direction flamed side	warp A	warp B	weft B	warp B	warp B	
	colour of fabric	brown			green	beige	
1	residual length	69	66	66	67	64	cm
2	max. smoke temperature	121	119	126	120	120	°C
3	density of smoke - integral	2	1	1	1	1	%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 6 &7).

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, washing or cleaning with chemicals.
- 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, 10.01.2022

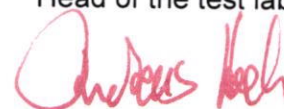
clerk in charge:



(Silke Biendara)

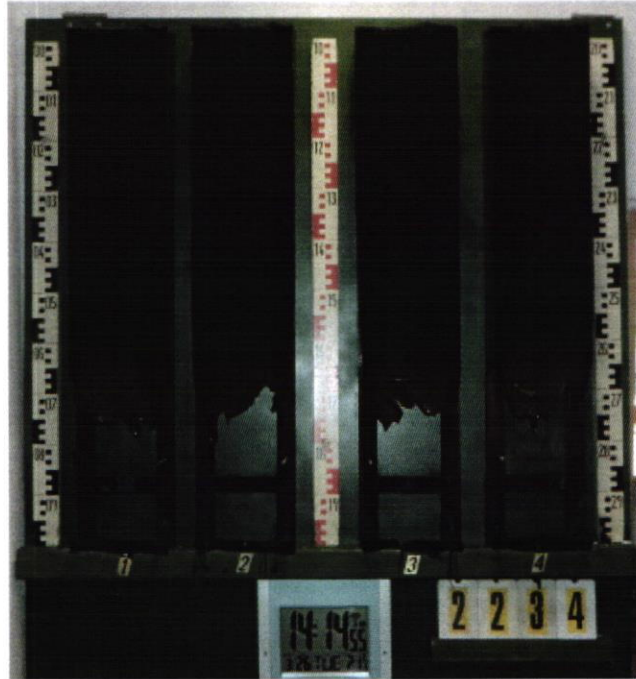


Head of the test laboratory:



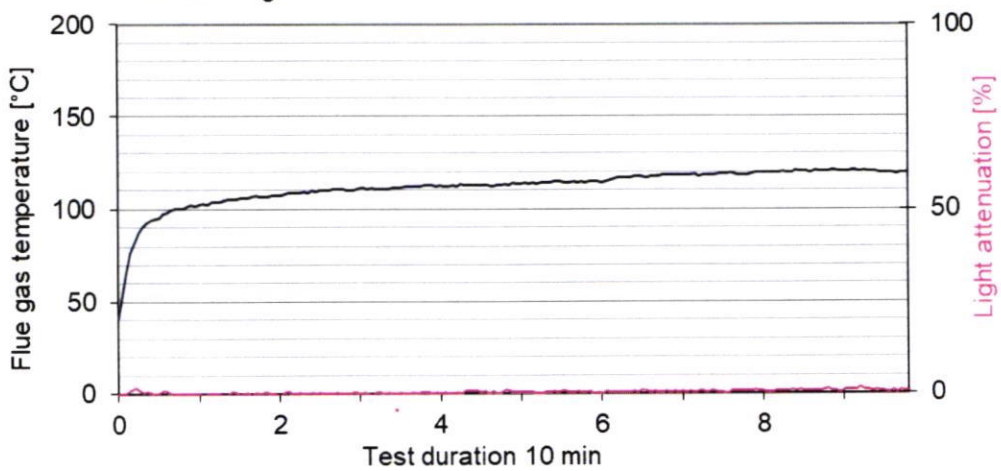
(Dipl.-Ing.(FH) Andreas Hoch)

„Brandschacht“-test #2234

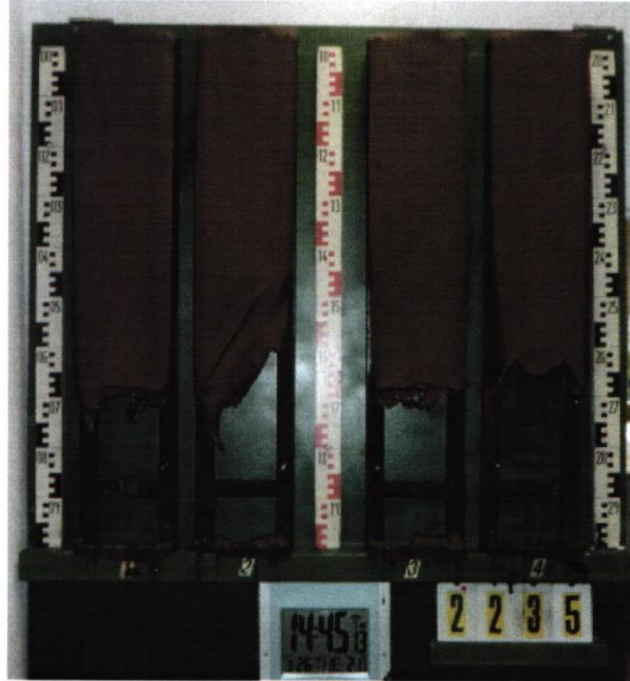


measurement

#2234, PN28850: Zimmer+Rohde, "10919", A+K
Max. flue temperature: 121°C, Smoke density integral: 2%/min
Residual length: 69 cm



„Brandschacht“-test #2235

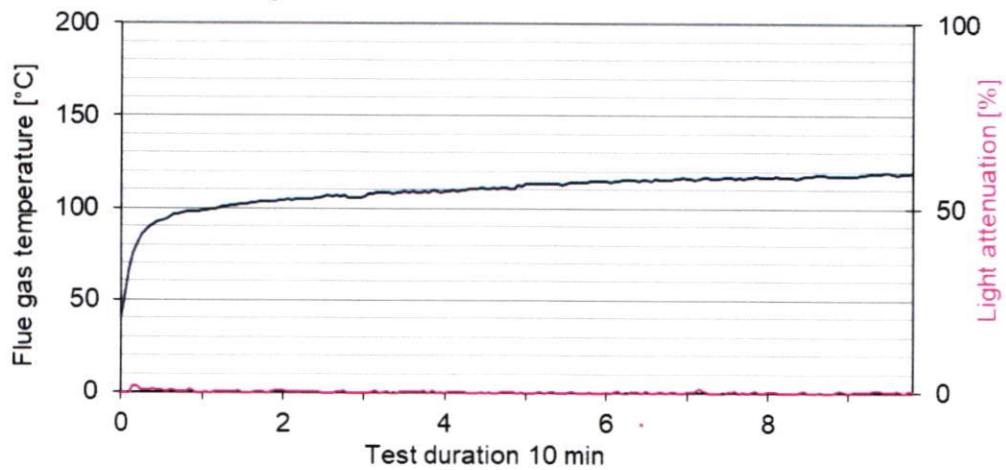


measurement

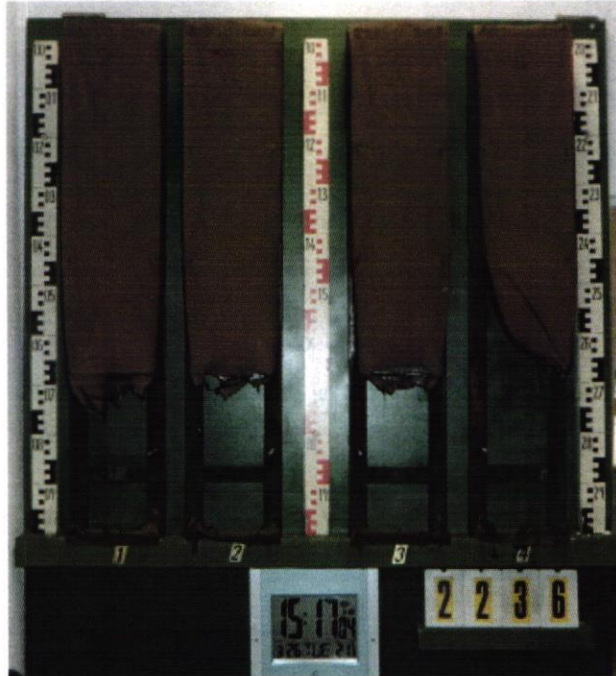
#2235, PN28850: Zimmer+Rohde, "10919", B+K

Max. flue temperature: 119°C, Smoke density integral: 1%min

Residual length: 66 cm

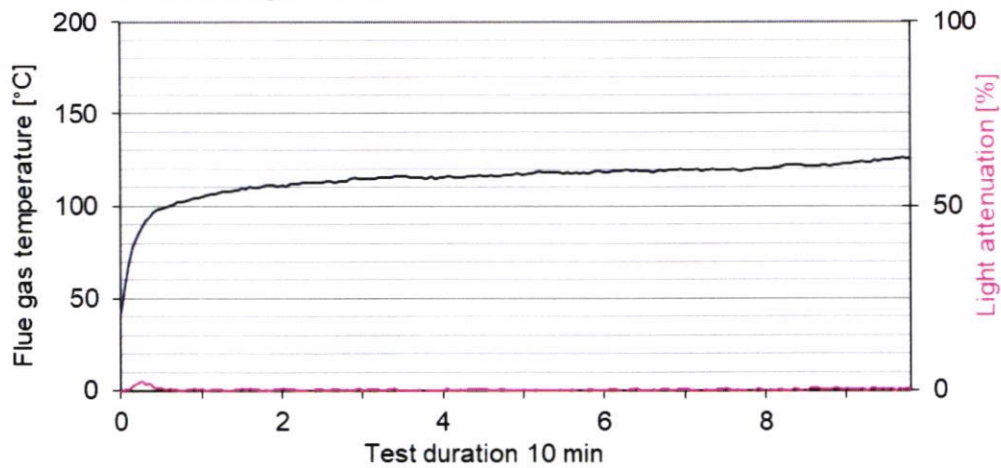


„Brandschacht“-test #2236

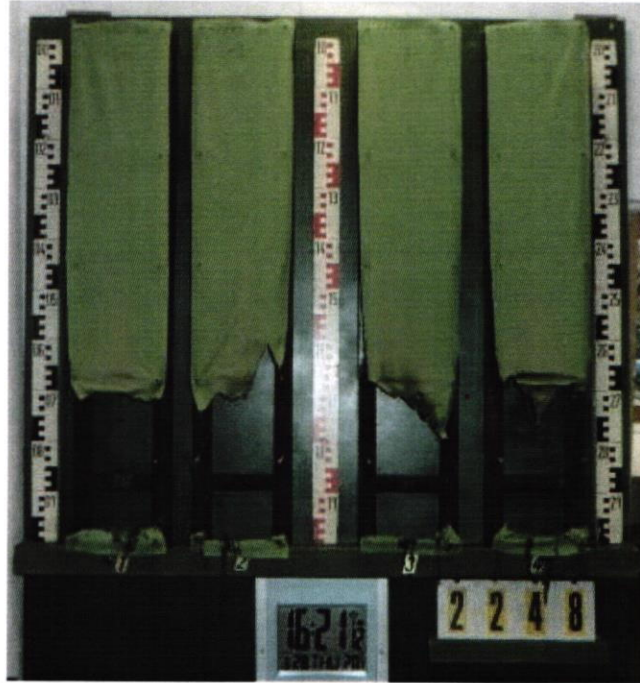


measurement

#2236, PN28850: Zimmer+Rohde, "10919", B+S
Max. flue temperature: 126°C, Smoke density integral: 1%/min
Residual length: 66 cm



„Brandschacht“-test #2248

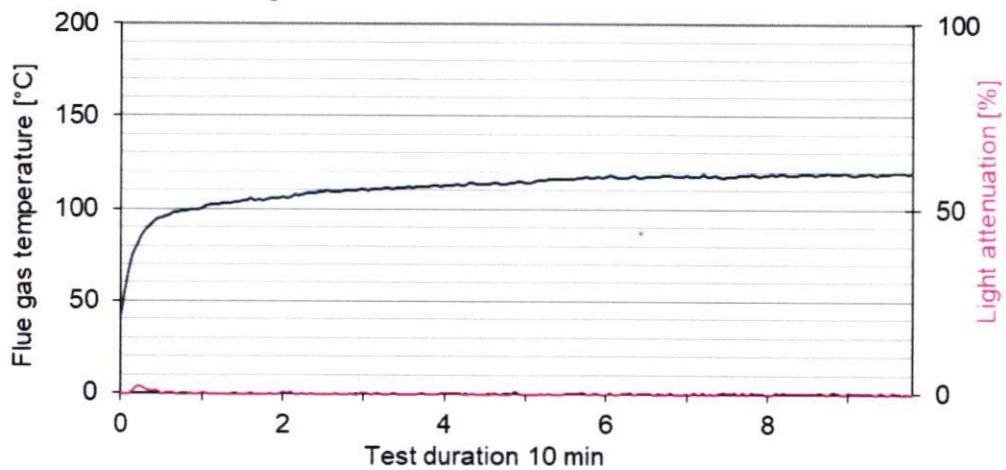


measurement

#2248, PN28849: Zimmer+Rohde, "10919", B+K

Max. flue temperature: 120°C, Smoke density integral: 1%min

Residual length: 67 cm



„Brandschacht“-test #2249

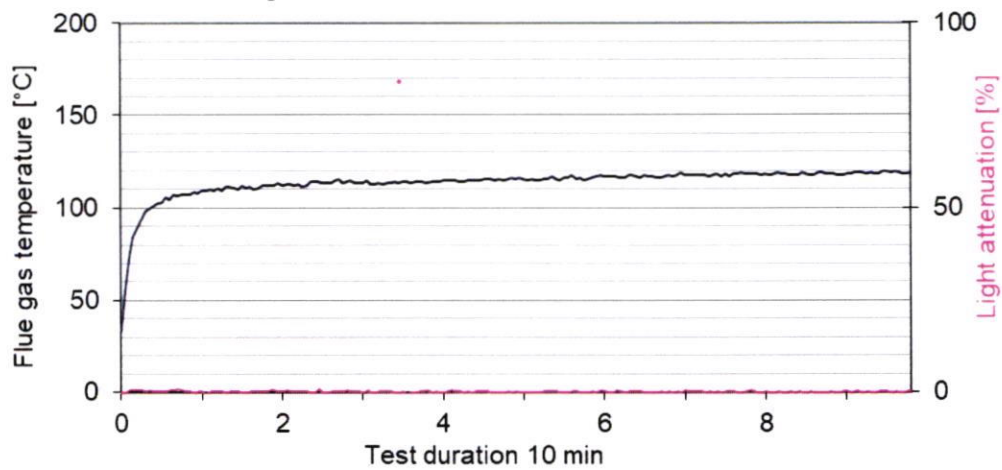


measurement

#2249, PN28848: Rohde, "10919", B+K

Max. flue gas temperature: 120°C, Smoke density integral: 1%/min

Residual length: 64 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 -freely suspended-
Flaming in warp and weft direction / side A and side B
4. Date of test CW 12 in 2019
5. Results

PN 28850: flaming side B in warp direction	edge-test						surface-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	1	1	1	--	3	--	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
max. flame height	14	8	10	9	11	--	3	--	--	--	--	--	cm
time	15	12	13	13	15	--	15	--	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	34	13	19	16	25	--	15	--	--	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	
smoke development (visual)	little-moderate						little-moderate						./.
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
Appearance after test: burned out till max. height 14 cm x width 6 cm													

PN 28850: additional tests	edge-test						surface-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	1	--	--	--	3	3	3	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
max. flame height	5	5	5	--	--	--	3	4	3	--	--	--	cm
time	7	7	7	--	--	--	15	14	15	--	--	--	
self cessation of the flames end of afterflame ¹⁾	8	8	8	--	--	--	15	14	15	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
smoke development (visual)	little-moderate						little-moderate						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
Appearance after test: burned out till max. height 7cm x width 2cm													

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

PN 28849: additional tests	edge-test						surface-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	1	1	--	--	3	3	3	3	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
max. flame height	8	8	6	6	--	--	7	4	4	4	--	--	cm
time	14	20	10	9	--	--	15	15	15	15	--	--	
self cessation of the flames end of afterflame ¹⁾	14	29	10	9	--	--	15	15	15	15	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
smoke development (visual)	moderate						moderate						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
Appearance after test: burned out till max. height 9cm x width 5cm													

PN 28848: additional tests	edge-test						surface-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
ignition ¹⁾	1	1	1	1	--	--	3	3	3	3	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
max. flame height	6	12	10	7	--	--	5	4	4	4	--	--	cm
time	20	20	15	10	--	--	15	15	15	15	--	--	
self cessation of the flames end of afterflame ¹⁾	43	27	20	13	--	--	15	15	15	15	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
smoke development (visual)	moderate						moderate						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
Appearance after test: burned out till max. height 11cm x width 8cm													

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.