

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-241364-2

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 Polyester and Trevira CS, in 3 different colours
name of the material	„10593“
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	30.10.2029
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, 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This test report must not be published and copied without preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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 40178:** "10593" colour: black
-fabric consisting of 39% Polyester and 61% Trevira CS-
side A: black / side B: a little bit brighter
characteristic values determined by the test laboratory:
area weight: about 168 g/m² thickness: about 0,44 mm
- PN 40179:** "10593" colour: white
-fabric consisting of 39% Polyester and 61% Trevira CS-
Visually there is no difference between side A and side B.
characteristic values determined by the test laboratory:
area weight: about 162 g/m² thickness: about 0,39 mm
- PN 40180:** "10593" colour: red
-fabric consisting of 39% Polyester and 61% Trevira CS-
side A: red / side B: grey-red
characteristic values determined by the test laboratory:
area weight: about 164 g/m² thickness: about 0,43 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

#8429	flaming side A in warp direction	PN 40180	red
#8430	flaming side B in warp direction	PN 40180	red
#8431	flaming side A in weft direction	PN 40180	red
#8433	flaming side A in warp direction	PN 40179	white
#8434	flaming side A in warp direction	PN 40178	black

4. Date of test CW 43 in 2024

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

line no.	Measurement	Result with the tested specimen					Dim.
	Test number	#8429	#8430	#8431	#8433	#8434	
	flamed direction	warp dir. A	warp dir. B	weft dir. A	warp dir. A	warp dir. A	
	flamed side						
	colour	red			white	black	
1	<u>Number of specimen arrangement</u> acc. to. DIN 4102/T15, schedule 1	1	1	1	1	1	
2	<u>Maximum flame height</u> 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	<u>Burn through / melting</u> Time ¹⁾	0:03	0:03	0:03	0:03	0:03	min:s
5	<u>Observations on the back side of the specimen</u> Flames / Glowing Time ¹⁾	---	---	---	---	---	min:s
6	Change of colour Time ¹⁾	./.	./.	./.	./.	./.	min:s
7	<u>Falling of burning droplets</u> Start ¹⁾	./.	./.	./.	./.	./.	min:s
8	<u>Extent</u>						
9	sporadic falling of burning droplets ²⁾	---	---	---	---	---	min:s
10	continuous falling of burning droplets ²⁾	---	---	---	---	---	min:s
11	<u>Falling of burning droplets</u> Start ¹⁾	./.	./.	./.	./.	./.	min:s
12	<u>Extent</u>						
13	sporadic falling of burning droplets ²⁾	---	---	---	---	---	min:s
14	continuous falling of burning droplets ²⁾	---	---	---	---	---	min:s
15	<u>After flame time at the bottom of the sieve (max.)</u>	./.	./.	./.	./.	./.	min:s
16	<u>Impairment of the burner by dropping or falling material:</u> Time ¹⁾	./.	./.	./.	./.	./.	min:s
17	Final occurrence of burning at the specimen ¹⁾	0:45	0:40	0:35	0:25	0:42	min:s
18	Time of eventually end of test ¹⁾	./.	./.	./.	./.	./.	min:s
19	<u>After flame after end of test</u> Time ¹⁾	./.	./.	./.	./.	./.	min:s
20	Number of specimen	./.	./.	./.	./.	./.	
21	Front side of specimen ²⁾	./.	./.	./.	./.	./.	
22	Back side of specimen ²⁾	./.	./.	./.	./.	./.	
23	flame length	./.	./.	./.	./.	./.	cm

line no.	Measurement	Result with the tested specimen					Dim.
	Test number	#8429	#8430	#8431	#8433	#8434	
	flamed direction	warp dir.	warp dir.	weft dir.	warp dir.	warp dir.	
	flamed side	A	B	A	A	A	
	<u>Afterglow after end of test</u>	./.	./.	./.	./.	./.	min:s
22	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>						
28	≤ 400 % * min	1	1	1	1	1	% * min
29	> 400 % * min ⁴⁾	./.	./.	./.	./.	./.	% * min
30	Diagram: encl. no.	1	2	3	4	5	
	<u>Residual lengths: individual value³⁾</u>						
31	Specimen 1	64	66	61	65	66	cm
	Specimen 2	63	69	67	70	74	cm
	Specimen 3	64	65	68	67	63	cm
	Specimen 4	67	74	65	71	75	cm
32	<u>Average value, individual test ³⁾</u>	65	69	65	68	70	
33	<u>Photo of specimen in enclosure no.</u>	1	2	3	4	5	
34	<u>Flue gas temperature</u>	115	107	109	111	110	°C
35	Maximum of average value Time ¹⁾	09:39	10:00	09:36	09:42	09:57	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 o	measurement	Result with the tested specimen					Dim.
	test-no.	#8429	#8430	#8431	#8433	#8434	
	flamed direction flamed side	warp dir. A	warp dir. B	weft dir. A	warp dir. A	warp dir. A	
	colour	red			white	black	
1	residual length	65	69	65	68	70	cm
2	max. smoke temperature	115	107	109	111	110	°C
3	density of smoke - integral	1	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, 06.11.2024

clerk in charge:

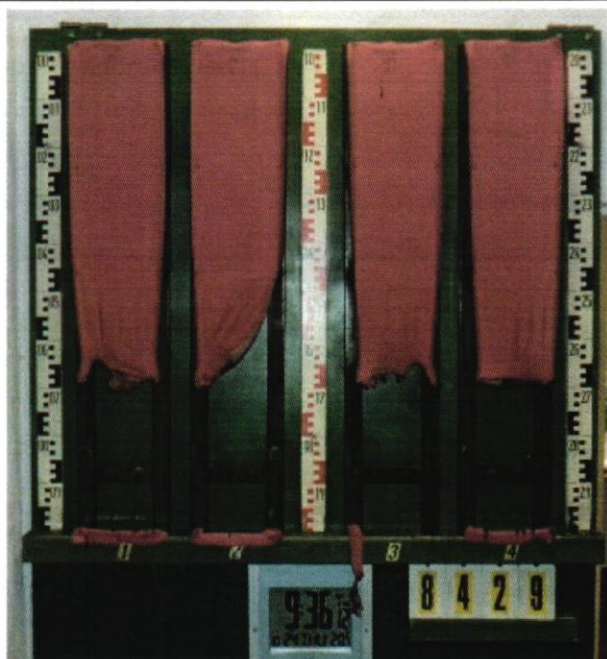

(Silke Biendara)



Head of the test laboratory:


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

„Brandschacht“-test #8429

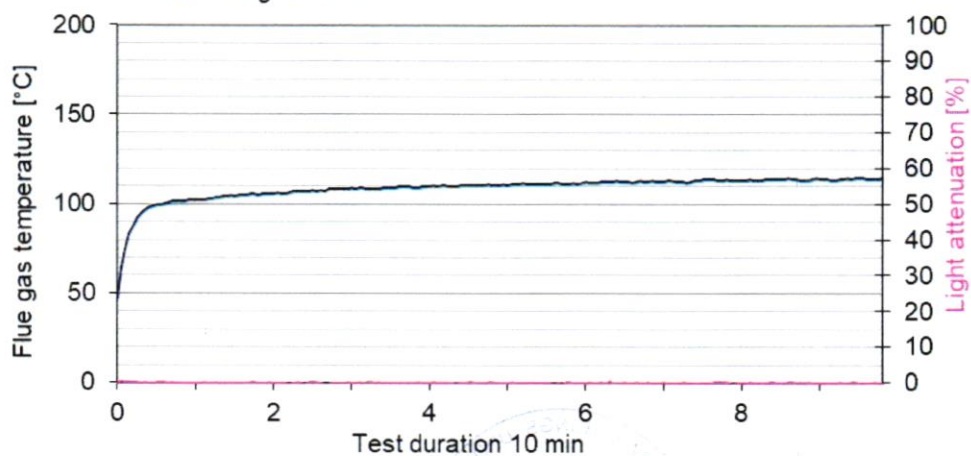


measurement

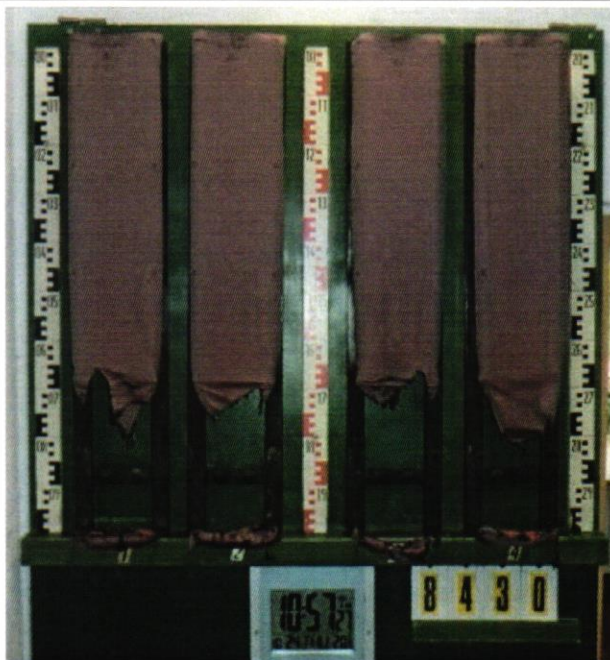
#8429, PN40180: A + K

Max. flue temperature: 115°C, Smoke density integral: 1%min

Residual length: 65 cm



„Brandschacht“-test #8430

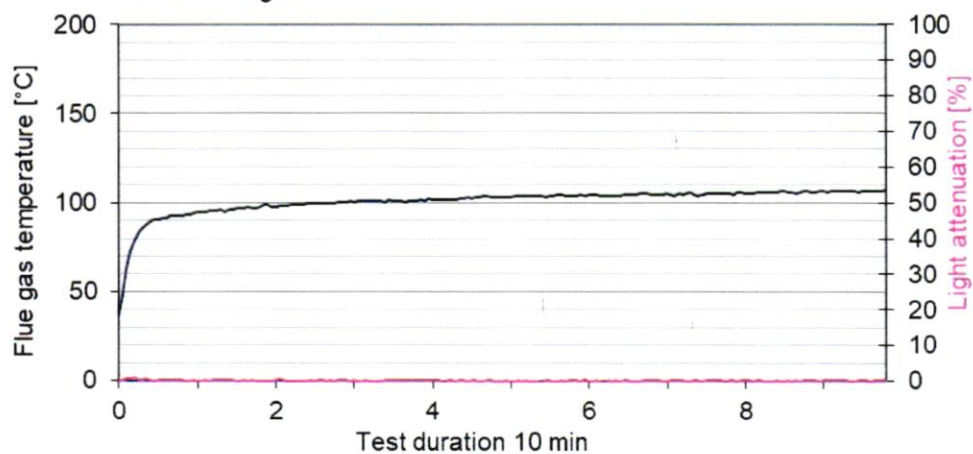


measurement

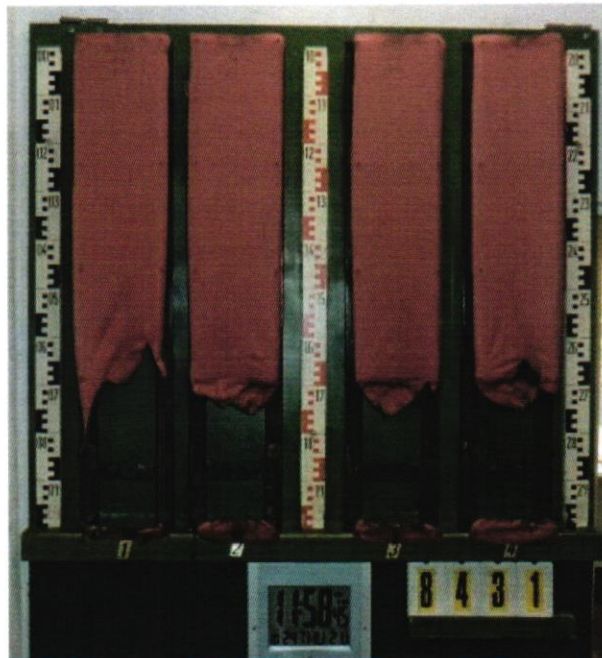
#8430, PN40180: B + K

Max. flue temperature: 107°C, Smoke density integral: 1%min

Residual length: 69 cm



„Brandschacht“-test #8431

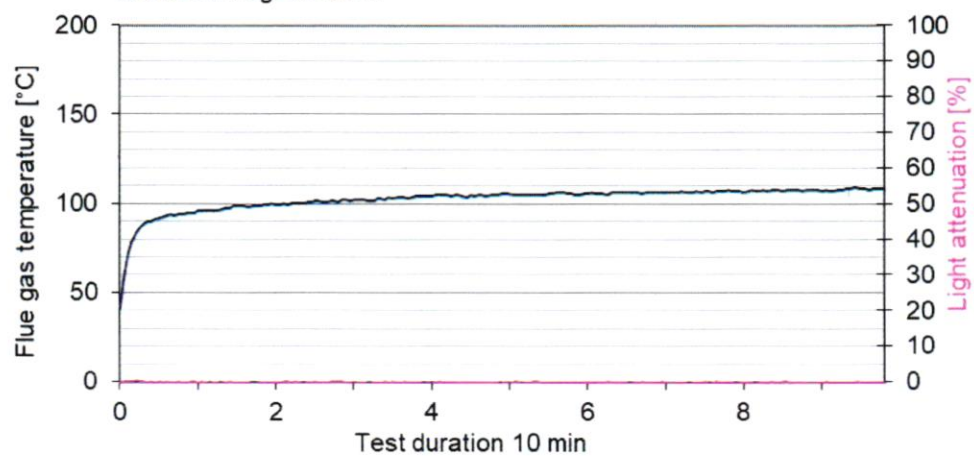


measurement

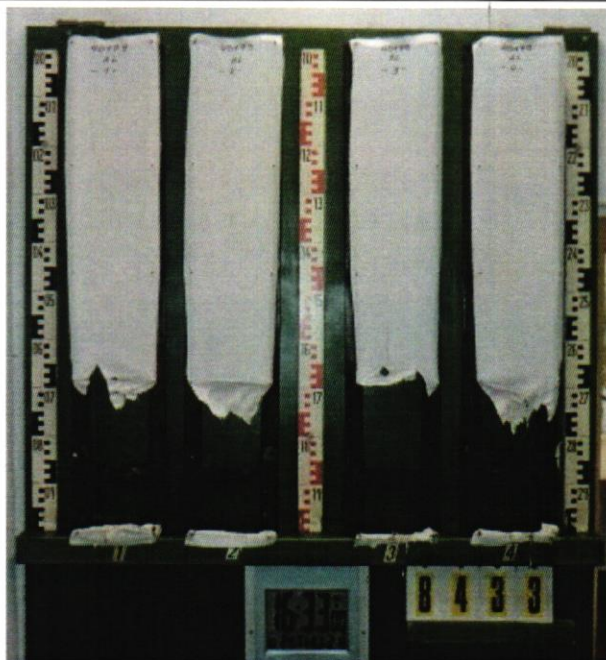
#8431, PN40180: A + S

Max. flue temperature: 109°C, Smoke density integral: 1%min

Residual length: 65 cm



„Brandschacht“-test #8433

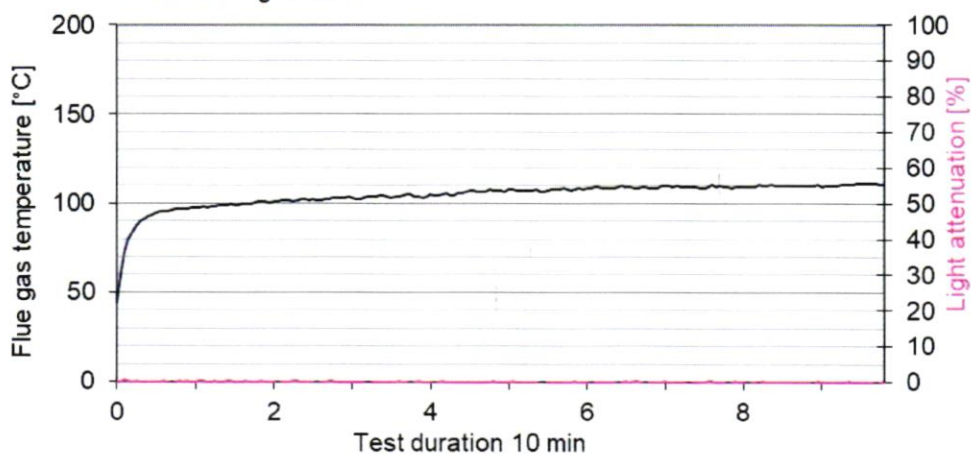


measurement

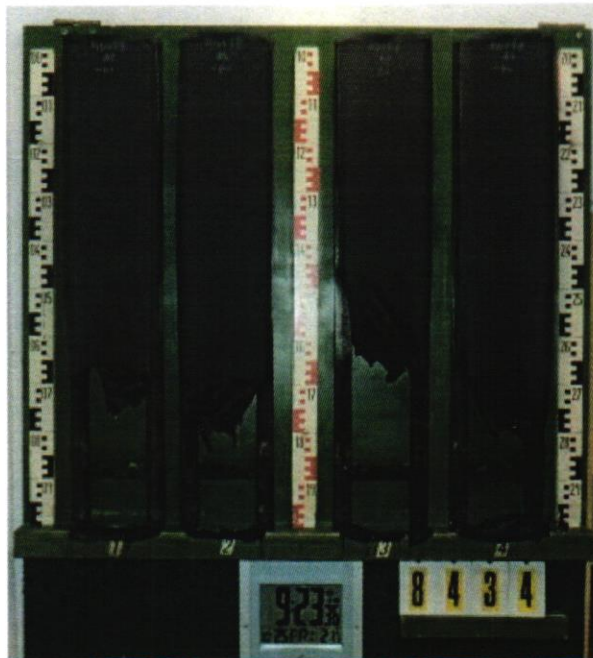
#8433, PN40179: A + K

Max. flue temperature: 111°C, Smoke density integral: 1%min

Residual length: 68 cm



„Brandschacht“-test #8434

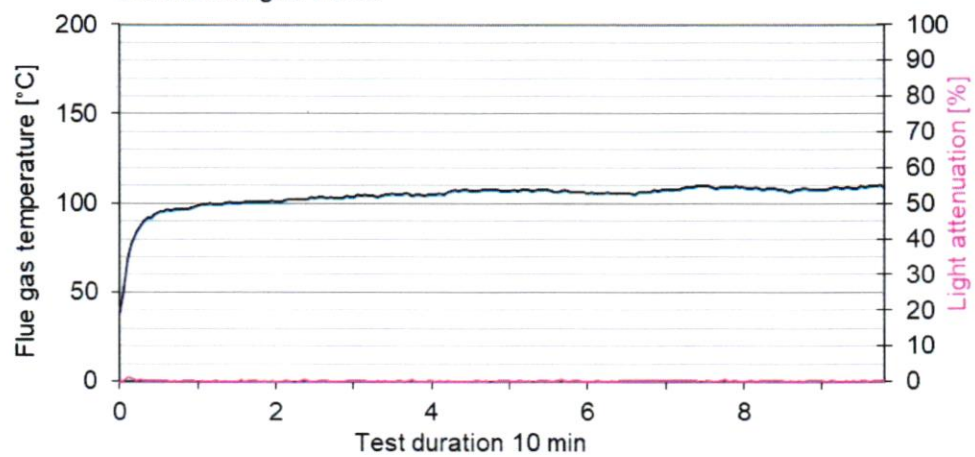


measurement

#8434, PN40180: A + K

Max. flue temperature: 110°C, Smoke density integral: 1%min

Residual length: 70 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 machine direction and transverse direction / side A and side B

4. Date of test CW 43 in 2024

5. Results

PN 40179: flaming side A in weft direction	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	--	2	--	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	-/-	--	./.	--	--	--	--	--	s
max. flame height	8	5	6	6	7	--	4	--	--	--	--	--	cm
time	8	10	7	7	6	--	6	--	--	--	--	--	s
self-cessation of the flames end of afterflame ¹⁾	10	14	10	10	8	--	8	--	--	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	
smoke development (visual)	little						little						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
Appearance after test: burned out till max. height 9 cm x width 3 cm													

PN 40179: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
arrangement of samples side / direction	A/K	B/K	B/S	--	--	--	A/K	B/K	B/S	--	--	--	
ignition ¹⁾	1	1	1	--	--	--	2	2	2	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
max. flame height	7	5	6	--	--	--	4	4	4	--	--	--	cm
time	6	6	6	--	--	--	8	6	6	--	--	--	s
self-cessation of the flames end of afterflame ¹⁾	8	6	6	--	--	--	10	8	8	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
smoke development (visual)	little						little						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
Appearance after test: burned out till max. height 9 cm x width 3 cm													

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

K: warp direction / S: weft direction

PN 40180: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
arrangement of samples side / direction	A/K	B/K	A/S	B/S	--	--	A/K	B/K	A/S	B/S	--	--	
ignition ¹⁾	1	1	1	1	--	--	2	2	2	2	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
max. flame height	6	5	6	5	--	--	3	3	3	4	--	--	cm
time	6	6	6	6	--	--	4	4	4	8	--	--	s
self-cessation of the flames end of afterflame ¹⁾	8	6	8	6	--	--	5	5	5	12	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
smoke development (visual)	little						little						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
Appearance after test: burned out till max. height 8 cm x width 3 cm													

PN 40178: additional tests	edge-test						surface-test						Dim
samples no.	1	2	3	4	5	6	1	2	3	4	5	6	
arrangement of samples side / direction	A/K	B/K	A/S	B/S	--	--	A/K	B/K	A/S	B/S	--	--	
ignition ¹⁾	1	1	1	1	--	--	2	2	2	2	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
max. flame height	7	5	7	5	--	--	3	3	3	4	--	--	cm
time	10	6	8	6	--	--	4	4	4	10	--	--	s
self-cessation of the flames end of afterflame ¹⁾	14	6	10	8	--	--	5	5	5	14	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
smoke development (visual)	moderate						little						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	--	--	-/-	-/-	-/-	-/-	--	--	s
Appearance after test: burned out till max. height 5 cm x width 3 cm													

¹⁾ time mentioned from the beginning of the test ²⁾ during 20 Sec -/- no appearance -- no information
K: warp direction / S: weft direction

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

7. Opinion concerning the dropping of burning material

The examined product shows no burning dripping material.