

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-120267-2

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	Georg+Otto Friedrich Waldstraße 73 D-64868 Groß-Zimmern
description of samples	knitted polyester fabric (colour: white) -fabric 1: area weight about 95 g/m ² -fabric 2: area weight about 170 g/m ²
name of the material	„PES-Fahnenstoff mit INKTeX+ [®] FL Ausrüstung“
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	28.02.2017 ¹⁾
result	The examined product meets <ul style="list-style-type: none">• with an area weight of ~ 95 g/m² until ~ 170 g/m²• suspended freely or with distance of >40 mm to same or other plain materials, 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 6 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This test report must not be published and copied without preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents.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⁾ prolongation on request.

¹⁾ Verlängerung auf Antrag

1. Description of test material in condition as delivered

PN 14701: "PES-Fahnenstoff mit INKTeX+®FL Ausrüstung"

knitted polyester fabric (colour: white)

side A: smoother

characteristic values determined by the test laboratory:

area weight: about 169 g/m² thickness: about 0,36 mm

PN 14702: "PES-Fahnenstoff mit INKTeX+®FL Ausrüstung"

knitted polyester fabric (colour: white)

side B: smoother

characteristic values determined by the test laboratory:

area weight: about 97 g/m² thickness: about 0,30 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

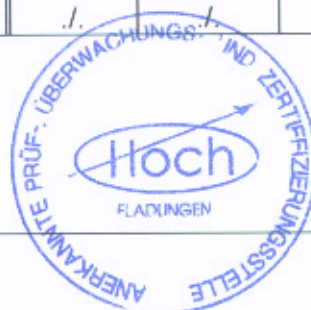
#2583:	flaming side B in weft direction	PN14701
#2584:	flaming side A in warp direction	PN14701
#2589:	flaming side A in weft direction	PN14702
#2590:	flaming side B in warp direction	PN14702

4. Date of test CW 09 in 2012



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

line no.	Measurement	Result with the tested specimen				Dim.
		#2583	#2584	#2589	#2590	
	Test number	#2583	#2584	#2589	#2590	
	flaming direction / side	weft / B	warp / A	weft / A	warp / B	
	Sample-no.	PN14701		PN14702		
1	Number of specimen arrangement acc. to. DIN 4102/T15, schedule 1	1	1	1	1	
2	Maximum flame height above bottom edge of the specimen	30	30	30	30	cm
3	Time ¹⁾	0:02	0:02	0:02	0:02	min:s
4	Burn through / melting Time ¹⁾	0:03	0:03	0:02	0:03	min:s
	Observations on the back side of the specimen					
5	Flames / Glowing Time ¹⁾	./.	./.	./.	./.	min:s
6	Change of color 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	Afterflame 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					
18	Final occurrence of burning at the specimen ¹⁾	./.	./.	./.	./.	min:s
19	Time of eventually end of test ¹⁾	./.	./.	./.	./.	min:s
20	Afterflame 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



Ino No.	Measurement	Result with the tested specimen				Dim.
	Test number	#2583	#2584	#2589	#2590	
	flaming direction / side	weft / B	warp / A	weft / A	warp / B	
22	<u>Afterglow after end of test</u> Time ¹⁾	./.	./.	./.	---	min:s
23	Number of specimen	./.	./.	./.	---	
24	<u>Place of appearance</u> 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⁾	./.	./.	./.	---	
28	<u>Density of smoke</u> ≤ 400 % * min	2	1	1	1	
29	> 400 % * min ⁴⁾	./.	./.	./.	./.	% * min
30	Diagram: encl. no.	1	2	3	4	
31	<u>Residual lengths: individual value ³⁾</u> Specimen 1	74	73	63	71	cm
	Specimen 2	73	67	66	69	cm
	Specimen 3	65	70	64	67	cm
	Specimen 4	79	70	60	75	cm
32	<u>Average value, individual test ³⁾</u>	73	70	63	71	
33	Photo of specimen in enclosure no.	1	2	3	4	
34	<u>Flue gas temperature</u>	126	126	124	123	°C
35	Maximum of average value Time ¹⁾	10:00	10:00	10:00	10:00	min:s
36	Diagram: encl. no.	1	2	3	4	
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 more than 45 cm.

7. Summary of results and additional establishments to Fire Behaviour

lineno.	Measurement test-no.	Result with the tested specimen				dimens ion
		#2583 weft / B	#2584 warp / A	#2589 weft / A	#2590 warp / B	
	<u>Sample-no.</u>	PN14701		PN14702		
1	residual length	73	70	63	71	cm
2	max. smoke temperature	126	126	124	123	°C
3	density of smoke - integral	2	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 5,6).

8. Special remarks

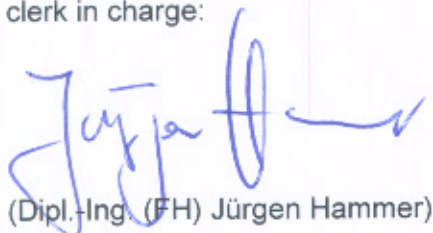
- This report is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or grounds etc. the burning behaviour may differ.
- This test report is not valid for the exposure to outdoor climate conditions, washing or cleaning with chemicals.
- 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, im 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, 16.03.2012

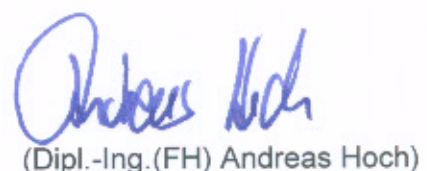
clerk in charge:



(Dipl.-Ing. (FH) Jürgen Hammer)

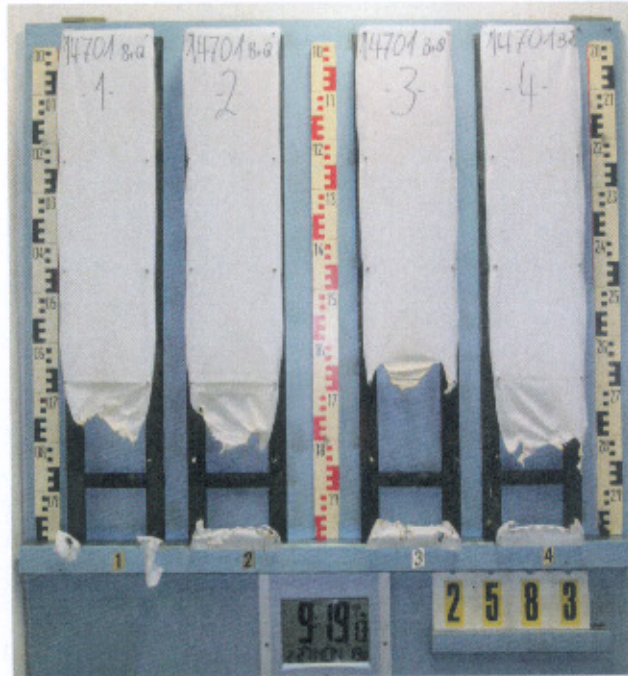


Head of the test laboratory:



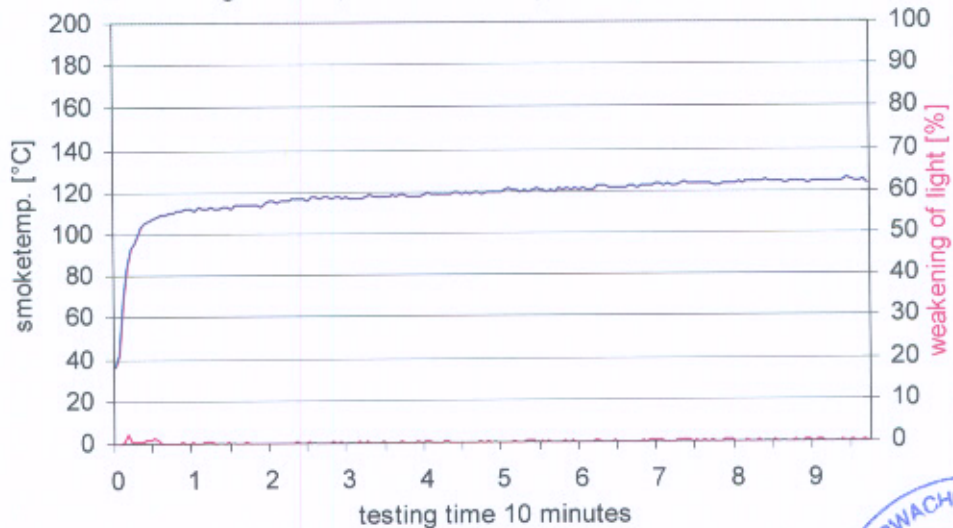
(Dipl.-Ing. (FH) Andreas Hoch)

„Brandschacht“-test #2583

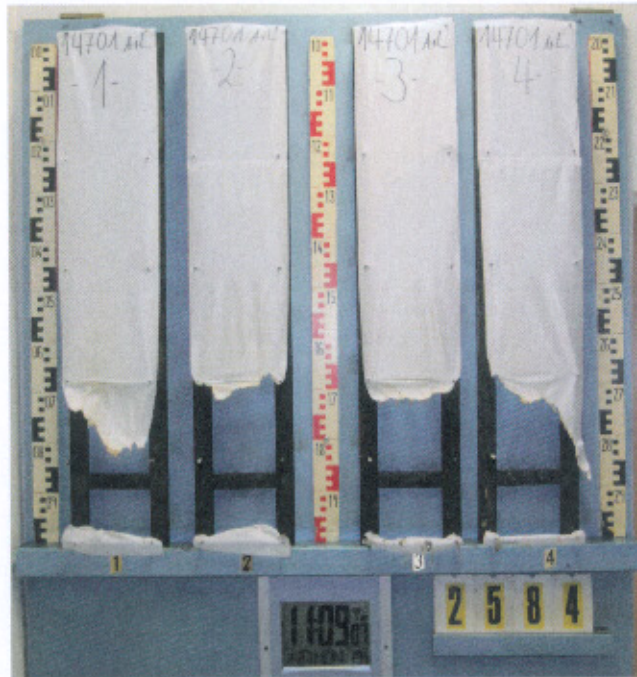


measurement

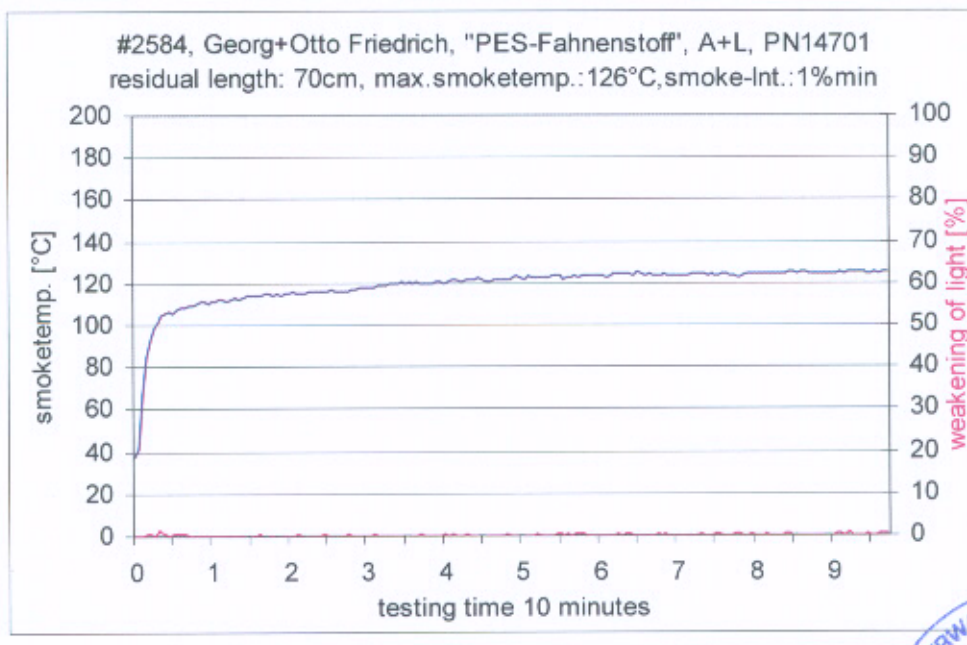
#2583, Georg+Otto Friedrich, "PES-Fahnenstoff", B+Q, PN14701
residual length: 73cm, max.smoketemp:126°C, smoke-Int.:2%/min



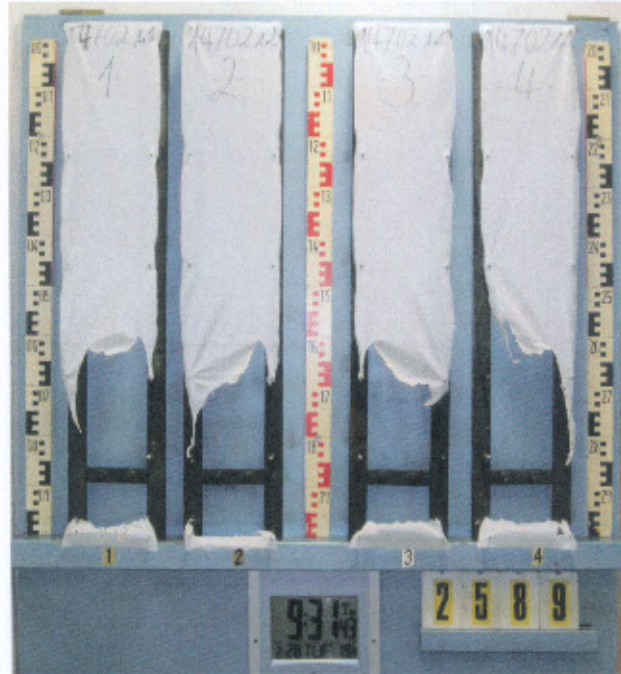
„Brandschacht“-test #2584



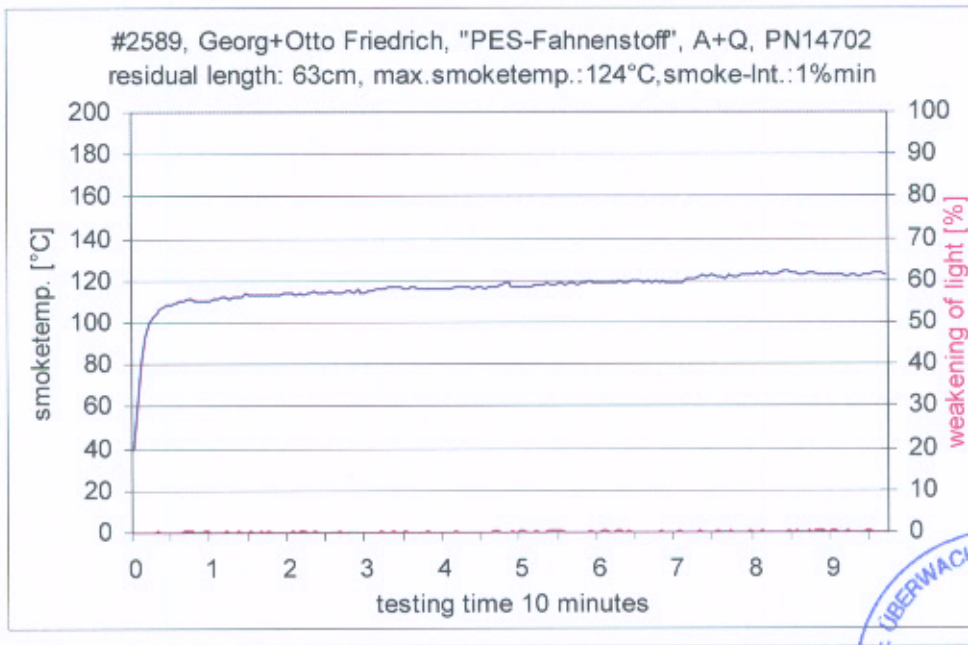
measurement



„Brandschacht“-test #2589



measurement

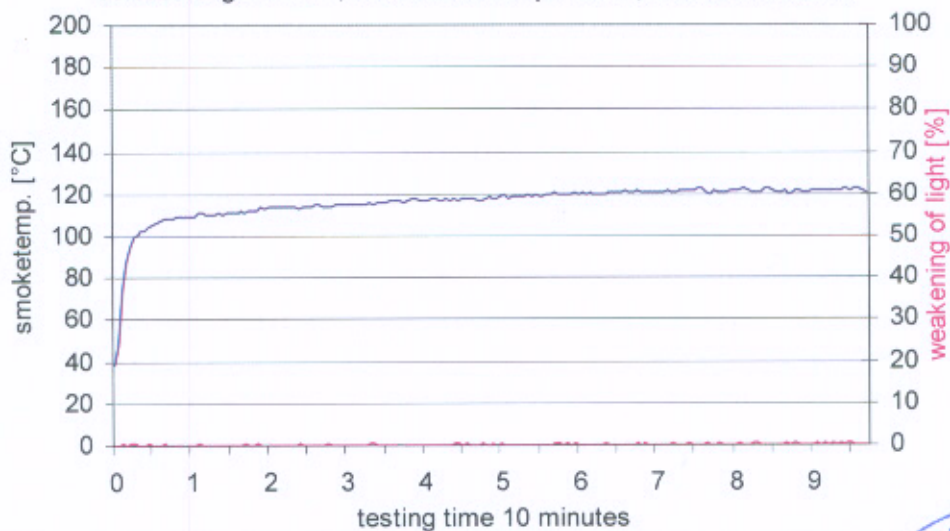


„Brandschacht“-test #2590



measurement

#2590, Georg+Otto Friedrich, "PES-Fahnenstoff", B+L, PN14702
residual length: 71cm, max.smoketemp.:123°C,smoke-Int.:1%min



**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 / Flaming side A and side B
4. Date of test CW 08 in 2012
5. Results

PN 14701: flaming side B in warp direction	surface-test						edge-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	1	3	1	1	--	1	--	--	--	--	--	s
ignition ¹⁾	1	1	3	1	1	--	1	--	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
max. flame height	6	7	5	6	13	--	5	--	--	--	--	--	cm
time	4	4	6	4	17	--	3	--	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	7	8	7	6	28	--	4	--	--	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
smoke development (visual)	heavy						heavy						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	--	--	--	--	--	s
Appearance after test: burned out till max. height 13 cm x width 7 cm													

PN 14701: additional tests	edge-test						surface-test						Dim
	1	2	3	4	5	6	1	2	3	4	5	6	
samples no.	1	1	1	--	--	--	1	2	1	--	--	--	s
ignition ¹⁾	1	1	1	--	--	--	1	2	1	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	./.	./.	./.	--	--	--	./.	./.	./.	--	--	--	s
max. flame height	6	3	4	--	--	--	2	3	5	--	--	--	cm
time	5	2	2	--	--	--	2	9	3	--	--	--	
self cessation of the flames end of afterflame ¹⁾	12	3	3	--	--	--	3	10	5	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	15	--	--	--	s
flames were extinguished after ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
smoke development (visual)	heavy						heavy						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	--	--	--	-/-	-/-	-/-	--	--	--	s
Appearance after test: burned out till max. height 13 cm x width 7 cm													

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

PN 14702: flaming in warp direction	surface-test						edge-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	--	1	1	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	-/-	--	--	--	--	s
max. flame height	6	4	4	4	4	--	3	3	--	--	--	--	cm
time	6	3	3	2	2	--	2	2	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	9	5	5	4	4	--	4	3	--	--	--	--	s
end of glowing ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	-/-	--	--	--	--	s
smoke development (visual)	moderate						moderate						
dropping of burning material during 20 s ¹⁾	-/-	-/-	-/-	-/-	-/-	--	-/-	-/-	--	--	--	--	s
Appearance after test: burned out till max. height 10 cm x width 3,5 cm													

PN 14702: flaming in weft 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	--	--	--	--	-/-	-/-	--	--	--	--	s
reaching the mark of measurement ¹⁾²⁾	-/-	-/-	--	--	--	--	-/-	-/-	--	--	--	--	s
max. flame height	1	2	--	--	--	--	1	1	--	--	--	--	cm
time	-/-	1	--	--	--	--	-/-	-/-	--	--	--	--	
self cessation of the flames end of afterflame ¹⁾	-/-	2	--	--	--	--	-/-	-/-	--	--	--	--	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 6,5 cm x width 2 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 dripping burning material.

