Materialprüfungsanstalt
Universität Stuttgart
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Materialprüfungsanstalt Universität Stuttgart

PRÜFZEUGNIS (Test Certificate)

900 6806 021/PZ-2-32/E *)

Auftraggeber: (Client)	Akzo Nobel Hilden GmbH Düsseldorfer Straße 96-100 40721 Hilden
Betreff: Subject	Reaction to fire testing according to DIN 4102-1, "Baustoffklasse B1"
Prüfmaterial: (Test Material)	Two-component varnish system „Quantum Q-T26x-xx[1]" on flame-retardant (DIN 4102-B1) particleboard – also veneered – as a flame-retardant building material ("Baustoffklasse DIN 4102-B1")
Datum: (Date)	15th of November 2021
Gültigkeitsdauer: (Period of Validity)	until 30th of September 2025
Hinweis: (Notes)	If the above-mentioned building material is not used as a building product according to MBO § 2, Para. 10, an „allgemeines bauaufsichtliches Prüfzeugnis (abP)" is not required. This test certificate does not apply if the tested building material is used as a building product within the meaning of the building regulations of the federal states (MBO § 17, Para. 1). This test certificate does not replace a possibly necessary certification according to German building regulations. This test certificate can serve as a basis in the building supervisory procedure: - in the case of regulated building products for the required certificates of conformity - in the case of non-regulated building products, for the required proof of usability. The explanations in DIN 4102-1, Annex D, in particular on third-party inspection, are to be particularly observed.

**) This test certificate is the English version of our test certificate 900 6806 021/PZ-2-32 dated 15. November 2021. In cases of doubt, the German version applies.*

UNIVERSITÄT STUTTGART
MATERIALPRÜFUNGSANSTALT (MPA)

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[1] The „x-xx" as part of the product name is replaced by numbers representing the different grades of gloss of the varnish system

1. Material description

Colourless two-component varnish on polyurethane basis "Quantum Q-T26x-xx" with the varnish systems 2K-PUR high-gloss clear varnish Q-T263-90, 2K-PUR deep matt clear varnish Q-T261-05 and 2K-PUR clear varnish Q-T260-80 (glossy), Q-T260-30 (silk gloss), Q-T260-15 (silk matt) and Q-T260-10 (matt)
applied on flame-retardant (DIN 4102-B1) particle boards - also with veneer.

The coatings can be used with or without primer.
2K-PUR Filling and Insulating Primer Q-IS160" and "2K-PUR Brightening Varnish Q-T262-05" are approved as primers.

The hardener "HPU6300" has to be used for varnish and filler base.

Application rate (wet):	used as multi-layer coating: varnish 2 x 120 g/m²
	used as top coating: grounding 1 x 120 g/m² (Q-IS160) and varnish 1 x 120 g/m² (Q-T262-05)
Mixing ratio (by weight):	high-gloss varnish : hardener = 2 : 1 deep-matt varnish : hardener = 10 : 1 varnish : hardener = 10 : 1 filler (Q-IS160) : hardener = 5 : 1 or 10 : 1 filler (Q-T262-05) : hardener = 20 : 1
Type of application:	Compressed air spraying
Field of application:	Interior fittings
Trade name:	„Quantum Q-T261-05" „Quantum Q-T260-x" (xx= 10, 15, 30, 80) „Quantum Q-T263-90" „Quantum Q-IS160" „Quantum-Q-T262-05" „HPU6300"
Receipt of samples:	a) 24th October 2017 (receipt-No. 17/324) b) and c) 27th November 2018 (receipt-No. 18/375) d) and e) 4th December 2019 (receipt-No. 19/376)
Quantity:	a) 4 flame-retardant particle boards (DIN 4102-B1), coated with „Q-T263-90" on „Q-T262-05" b) 4 flame-retardant particle boards (DIN 4102-B1), coated with „Q-T263-90" on „Q-IS160" c) 4 flame-retardant particle boards (DIN 4102-B1), coated with „Q-T260-30" on „Q-T262-05" d) 4 flame-retardant particle boards (DIN 4102-B1), coated with „Q-T261-05" on „Q-T262-05" e) 4 flame-retardant particle boards (DIN 4102-B1), coated with 2 x „Q-T261-05"

2. Sample preparation

Test specimen made of fire-retardant (DIN 4102-B1) particle boards, 1000 mm x 190 mm x 12 mm, were coated on one side with the paint system in the presence of an employee of the MPA Stuttgart at the company headquarters in Hilden. The carrier boards were provided by the MPA in each case.

For the B2 tests, 190 mm x 90 mm samples were cut from the coated particleboard test specimen.

3. Test procedure

The tests were carried out according to DIN 4102-1:1998 and DIN 4102-16:2015 in the fire shaft according to DIN 4102-15:1990 and the approval principles for the proof of the low flammability of building materials (version August 1994), published by the "Deutsches Institut für Bautechnik (DIBt)" in Berlin.

4. Test results

4.1 Test according to DIN 4102, clause 6.2, "Baustoffklasse B2"

Material	a)				
Specimen-No.:	1	2	3	4	5
Max. flame height within 20 s	3	3	3	3	3
Burning Droplets	none	none	none	none	none

Material	b)				
Specimen-No.:	1	2	3	4	5
Max. flame height within 20 s	5	4	4	4	4
Burning Droplets	none	none	none	none	none

Material	c)				
Specimen-No.:	1	2	3	4	5
Max. flame height within 20 s	4	5	5	4	4
Burning Droplets	none	none	none	none	none

Material	d)				
Specimen-No.:	1	2	3	4	5
Max. flame height within 20 s	3	3	3	3	3
Burning Droplets	none	none	none	none	none

Material	e)				
Specimen-No.:	1	2	3	4	5
Max. flame height within 20 s	3	3	3	3	3
Burning Droplets	none	none	none	none	none

4.2. Test according to DIN 4102, clause 6.1 – "Baustoffklasse B1"

The fire shaft test ("Brandschacht") A, B, C, D, E on the samples a), b), c), d), e) were carried out on free-hanging specimens without any substrates.

4.2.1. Results of fire shaft tests ("Brandschacht") (part 1)

Line No.			Test Results of Specimen Assembly A	B	C	D	E
1	No. of fastening method according to DIN 4102-15, table 1		7	7	7	7	7
2	Max. flame height above the lower edge of the sample	cm	80-90	90-100	80-90	80-90	80-90
3	Time of appearance [1]	min:s	1:45	2:15	1:45	5:30	1:35
4	Occurrence of holes in the material Time of appearance [1]	min:s	-	-	-	-	-
5	Observations of the reverse face of the specimen Flames / Glowing Time of appearance [1]	min:s	-	-	-	-	-
6	Discolouring Time of appearance [1]	min:s	-	-	-	-	-
7	Burning droplets Beginning [1]	min:s	-	-	-	-	-
	Continued burning on sieve tray	s					
8	Sporadically dripping sample material		-	-	-	-	-
9	Steady dripping sample material		-	-	-	-	-
10	Burning dripping sample parts Beginning [1]	min:s	-	-	-	-	-
	Amount:						
11	Sporadically dripping sample material		-	-	-	-	-
12	Steady dripping sample material		-	-	-	-	-
13	Duration of continued burning on the sieve bottom (max.)	min:s	-	-	-	-	-
14	Impairment of the burner flame due to dripping/falling material Time of appearance [1]	min:s	-	-	-	-	-
	Premature end of experiment						
15	End of fire reaction on the specimen [1]	min:s	-	-	-	-	-
16	Time of premature finishing the test, if done so [1]	min:s	-	-	-	-	-

[1] Elapsed time from the start of the test (t=0) shall be recorded

4.2.2 Results of fire shaft tests ("Brandschacht") (part 2)

Line No.			Test Results of Specimen Assembly A	B	C	D	E
	Afterburning after the end of the test						
17	Duration	min:s	-	-	-	-	-
18	Number of specimen						
19	On front face of the specimen						
20	On reverse face of the specimen						
21	Flame height	cm	-	-	-	-	-
	Afterglow after end of test						
22	Duration	min:s	-	-	-	-	-
23	Number of specimen						
	Location of glowing						
24	Lower half of the specimen						
25	Upper half of the specimen						
26	Front face of the specimen						
27	Reverse face of the specimen						
	Smoke density						
28	≤ 400 % · min		12	23	18	18	26
29	≥ 400 % · min						
	(very strong smoke development)		-	-	-	-	-
30	Graph in annex No.		1	2	3	4	5
	Residual length						
31	Single results of each specimen	cm	24 24 23 25	23 23 21 24	24 24 23 24	20 21 21 20	20 21 20 20
32	Average of each specimen assembly	cm	24 *)	23 *)	24 *)	21 **)	20 **)
33	Photo of the test assembly in annex No.		-	-	-	-	-
	Flue gas temperature						
34	Maximum of the average value	°C	132	149	146	144	146
35	Time of appearance [1]	min:s	4:00	4:30	4:01	6:20	6:17
36	Graph in annex No.		1	2	3	4	5
37	Notes:		Residual length of the non coated particle board: *) 24 cm **) 20 cm				

[1] Elapsed time from the start of the test (t=0) shall be recorded

5. Classification

All tested samples met the requirements for building materials according to DIN 4102, part 1, clause 6.1.2.2 and clause 6.2 for class B2.

Thus, the product as described in section 1 meets the requirements for building materials according to class B1 of DIN 4102-1:1998.

No sample parts fell off during the test according to DIN 4102-1:1998, clause 6.2.5 and according to DIN 4102-16:2015 neither burning nor glowing.

According to DIN 4102-16:2015, clause 9.3, the material is considered to be non-molten-dripping.

6. Notes

6.1 The containers of the two-component coating system must be labelled according to DIN 4102-1, clause 7 with the following marking:

DIN 4102 – B1, aufgebracht auf schwerentflammbaren (DIN 4102-B1) Holzspanplatten

6.2 The assessment in section 5 only applies to the two-component coating system described in section 1 and tested as in section 3, applied to flame-retardant (DIN 4101-B1) particleboard - also veneered.

Used in connection with other materials its fire performance is likely to be influenced this negatively, that the given classification in clause 5 is no longer valid.

Fire performance in connection with other materials is to be tested and classified separately.

6.3 For outdoor use, DIN 4102-16 : 2015, clause 6.2 requires proof that the requirements for building materials of building material class B1 "schwerentflammbar" (flame-retardant) are met even after 2 and 5 years of outdoor weathering. This proof has not (yet) been provided.

6.4 The validity of the assessment in section 5 of this test certificate ends on 30th of September 2025

The period of validity may be extended upon application.
Verification testing is necessary for this purpose.

6.5 This test certificate does not replace an „allgemeines bauaufsichtliches Prüfzeugnis (abP)" or an "allgemeine bauaufsichtliche Zulassung (abZ)" that may be required.

Abteilung Brandschutz / *Fire Safety Department*
Referat Brandverhalten von Baustoffen / *Section Reaction to Fire*

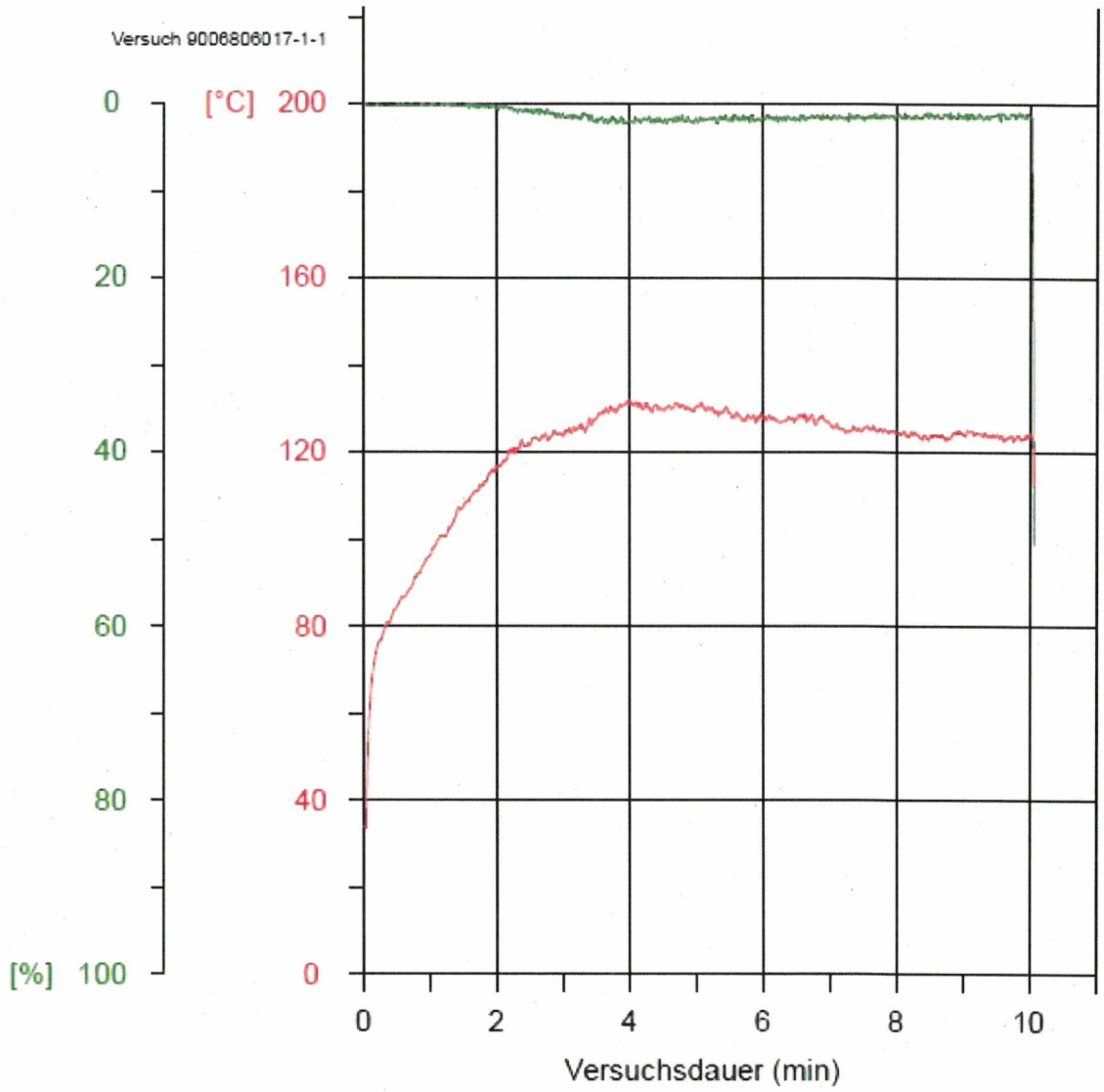
Der Prüfingenieur
The Engineer in Charge

Dipl.-Ing. Ernst Willand

UNIVERSITÄT STUTTGART
MATERIALPRÜFUNGSANSTALT (18)

Die Leiterin der Prüfstelle
Head of Notified Fire Testing Centre

Dipl.-Ing. Sabrina Heldele-Twietmeyer



max. Rauchgastemp.	132 °C
erreicht nach	4:00 min:sec
max. Rauchdichte	2 %
Integralwert	12 %*min

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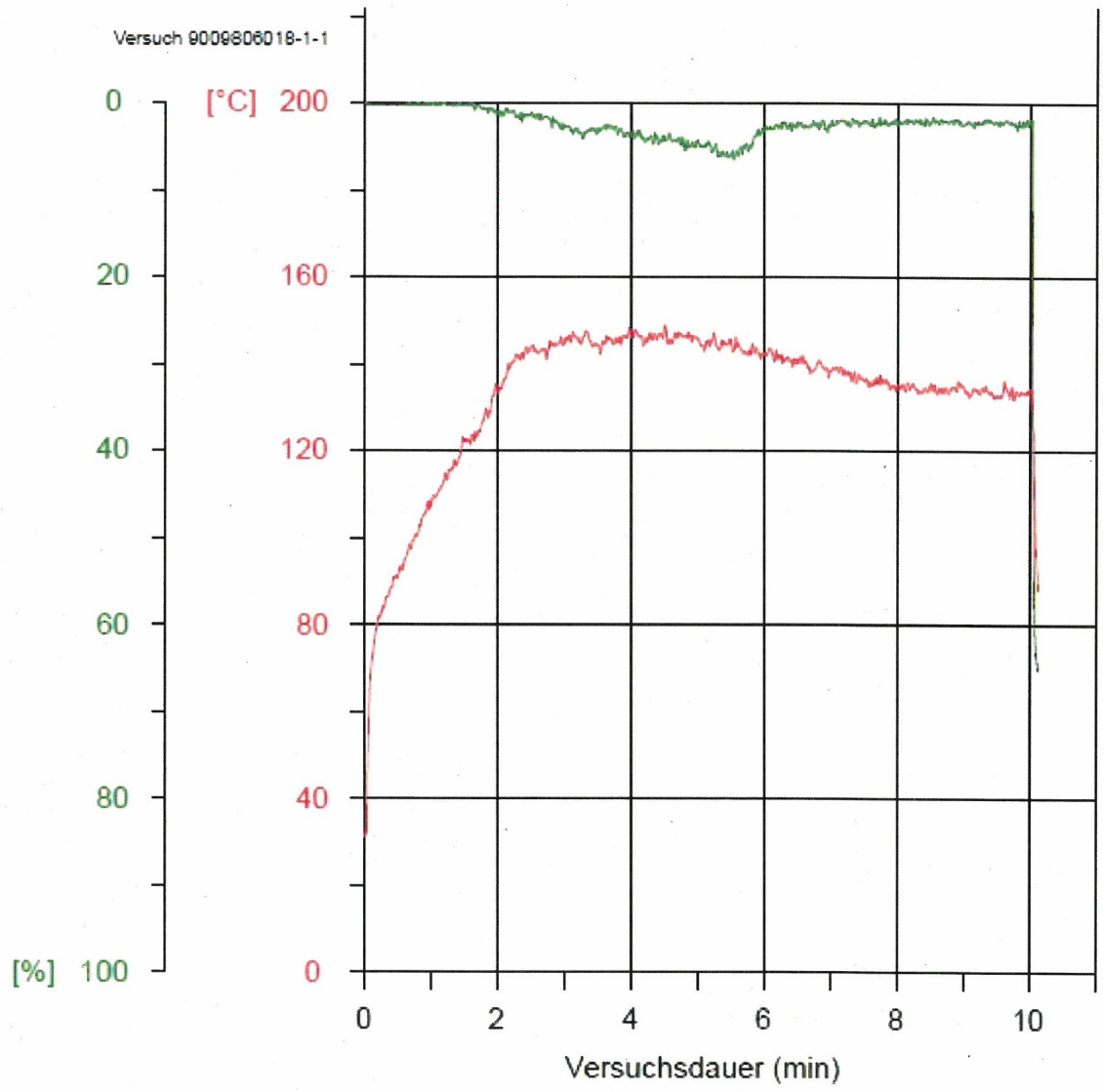
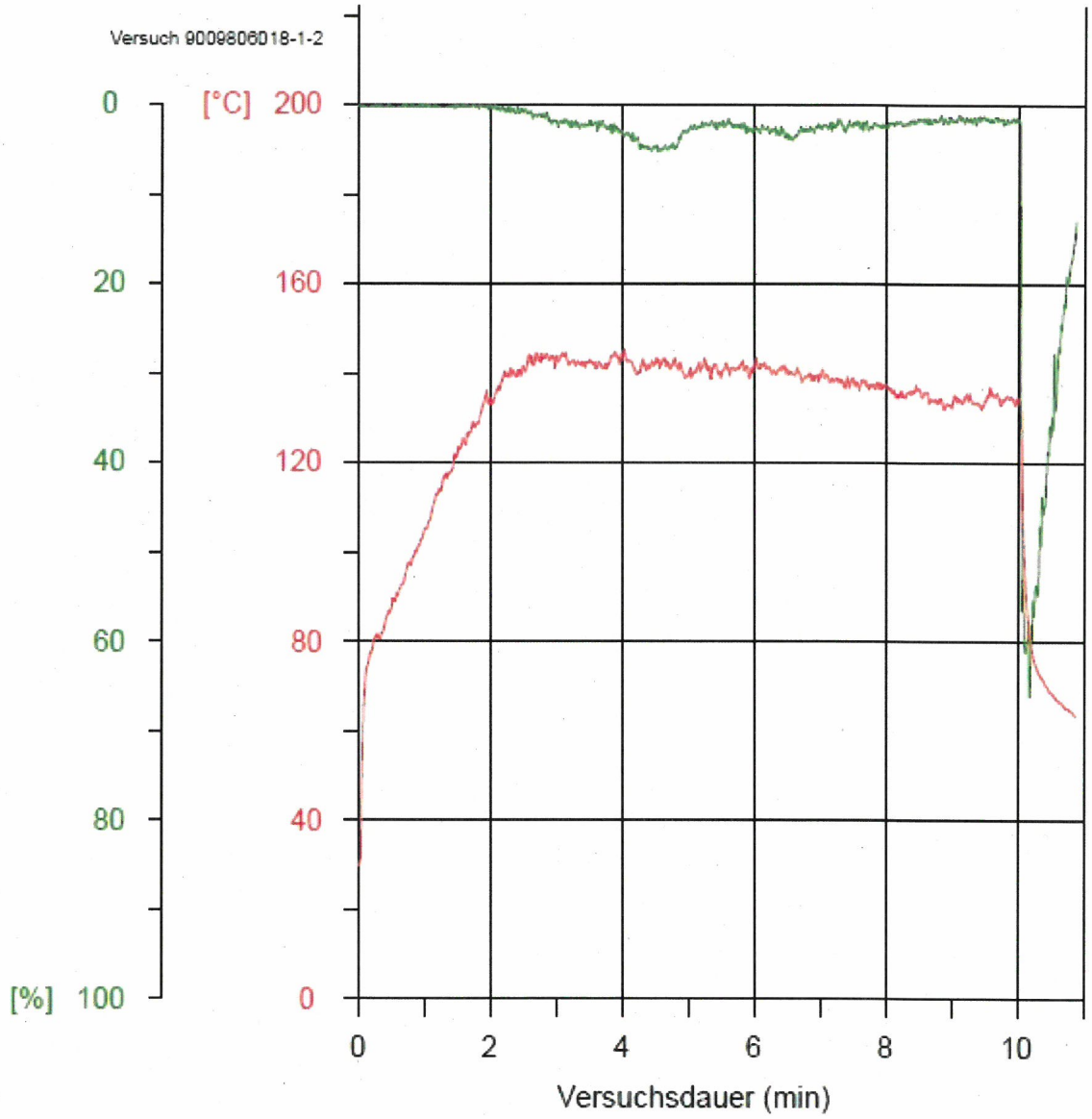
Figure 1: Results of fire shaft test A (“Brandschachtversuch”)
(smoke density, flue gas temperature)



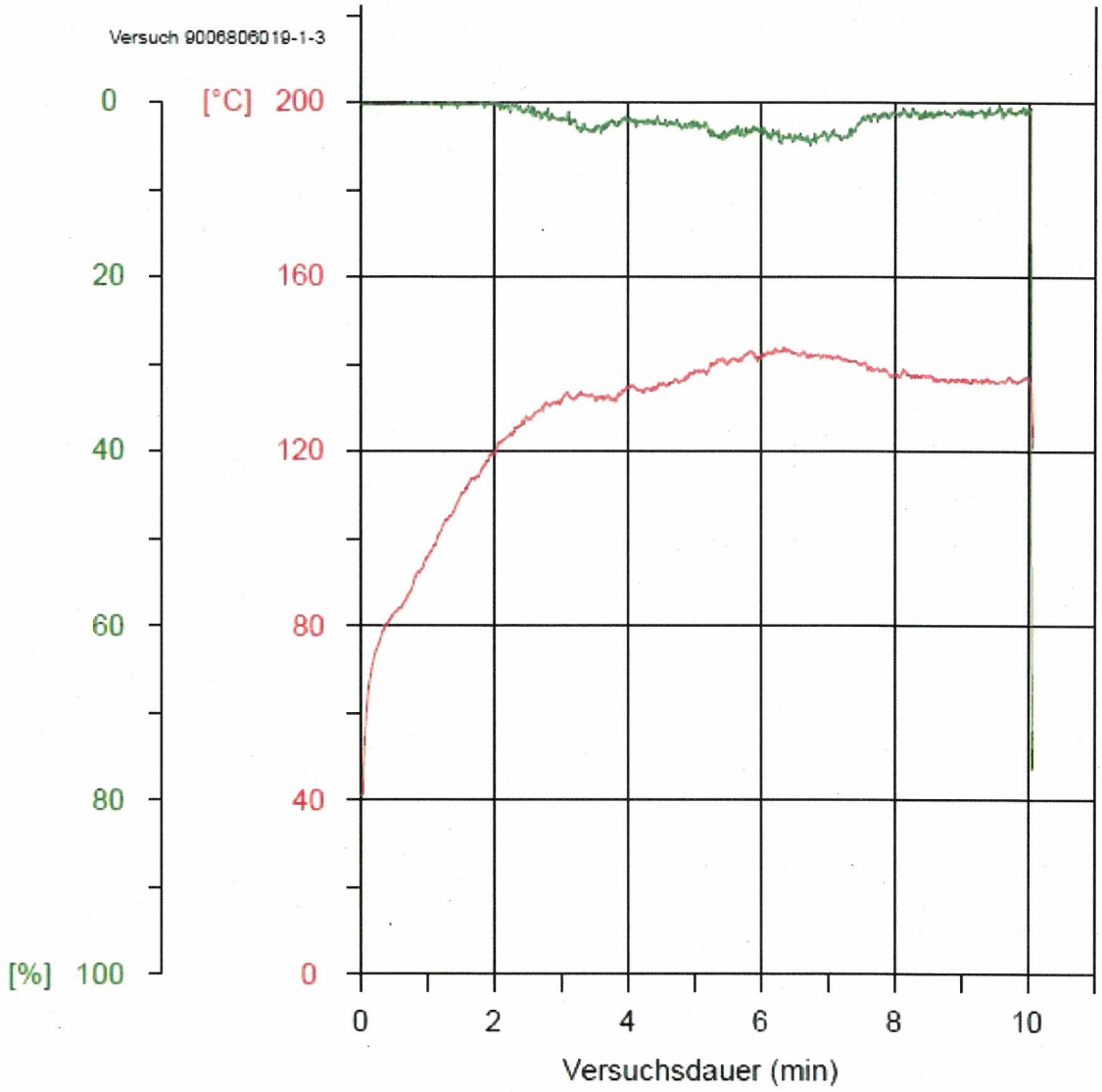
max. Rauchgastemp.	149 °C
erreicht nach	4:30 min:sec
max. Rauchdichte	6 %
Integralwert	23 %*min

Figure 2: Results of fire shaft test B (“Brandschachtversuch”)
(smoke density, flue gas temperature)



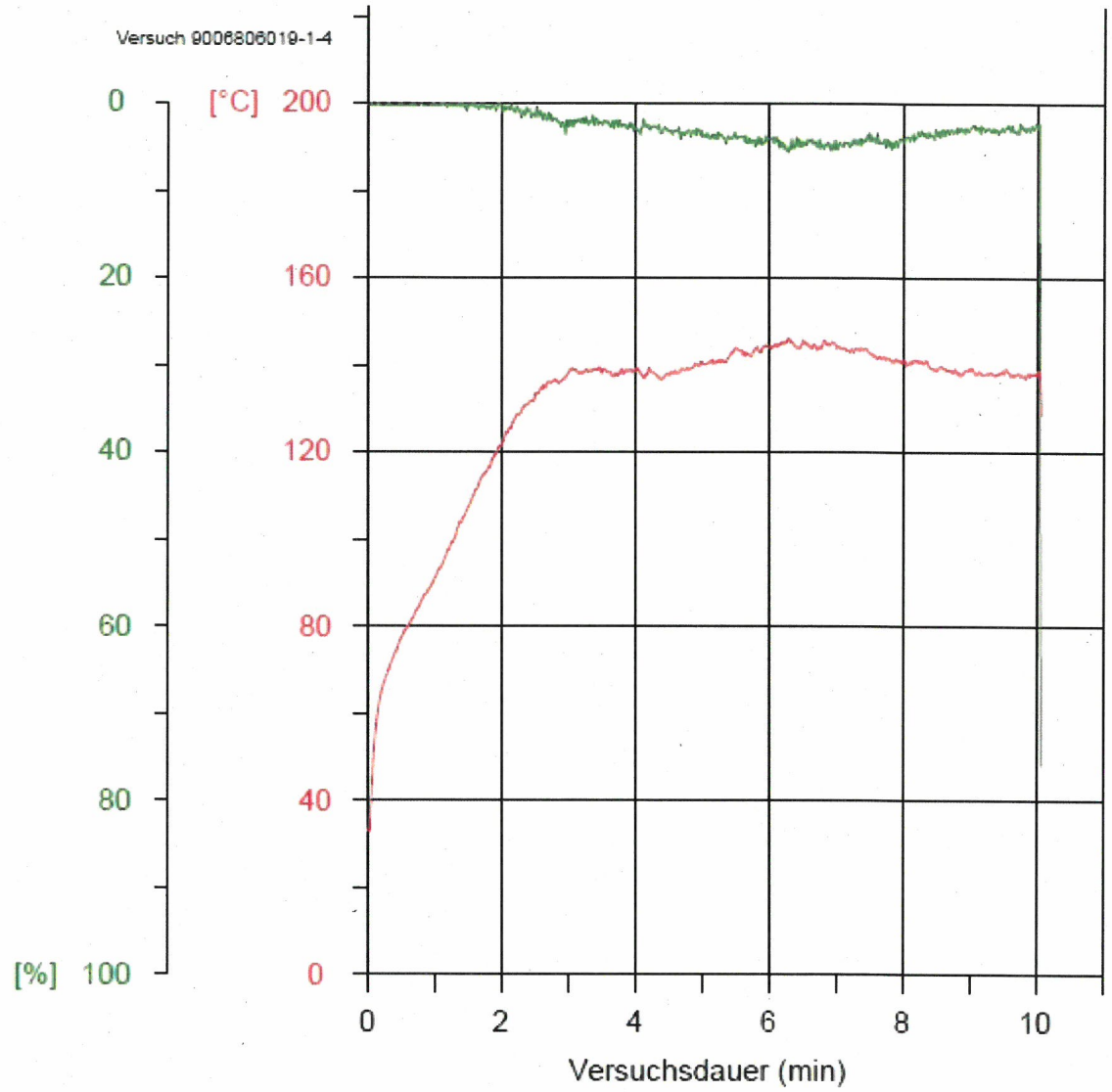
max. Rauchgastemp.	146 °C
erreicht nach	4:01 min:sec
max. Rauchdichte	5 %
Integralwert	18 %*min

Figure 3: Results of fire shaft test C (“Brandschachtversuch”)
(smoke density, flue gas temperature)



max. Rauchgastemp.	144 °C
erreicht nach	6:20 min:sec
max. Rauchdichte	5 %
Integralwert	18 %*min

Figure 4: Results of fire shaft test D (“Brandschachtversuch”)
(smoke density, flue gas temperature)



max. Rauchgastemp.	146 °C
erreicht nach	6:17 min:sec
max. Rauchdichte	5 %
Integralwert	26 %*min

Figure 5: Results of fire shaft test E (“Brandschachtversuch”)
(smoke density, flue gas temperature)