Materialprüfungsanstalt
Universität Stuttgart
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MPA STUTTGART
Otto-Graf-Institut
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PRÜFZEUGNIS (Test Certificate)

901 6890 000-2 E
English Version*)

Auftraggeber: (Client)	BEN Kunststoffe Vertriebs-GmbH Hinterweilerstraße 20 72810 Gomaringen
Betreff (Subject) :	reaction-to-fire testing according to DIN 4102, class B1
Prüfmaterial: (Test material)	plastic boards made of solid PVC "MEDUR B1"
Datum (Date):	18th February 2011 Mül/lmn
Gültigkeitsdauer: (Period of validity)	until 28th February 2014
Hinweise: (Notes)	The tested building-material not being used as a construction product according to German building regulations MBO § 2, Abs. 9, Ziffer 1, no „allgemeines bauaufsichtliches Prüfzeugnis" is required. This test certificate is not valid, if the tested product is utilised as construction product according to German building regulations (MBO § 20, Abs. 3). This test certificate is in no case a substitute for any required certification according to German building regulations. In cases where approvals are required by German building regulations and authorities, this test certificate may be utilised for issuing these approvals: - Übereinstimmungsnachweise (certificate of conformity) - Verwendbarkeitsnachweise (allgemeines bauaufsichtliches Prüfzeugnis, allgemeine bauaufsichtliche Zulassung) The notes in annex D of DIN 4102-1 with reference to third-party-control are to be considered in particular.

***) This is the English version of our test certificate 901 6890 002 dated 2nd November 2009. In cases of doubt, the German version is valid.**

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On 21st October 2009 we had been requested to perform reaction-to-fire tests according to DIN 4102, class B1.

1. Material description

Plastic boards made of solid PVC with flame-retardant treatment. The boards are manufactured in various colours and in thicknesses of 1 to 15 mm.

Field of application: tent walls

Trade name: "MEDUR B1"

Sampling: a) by customer
b) 24th June 2009 by MPA University of Stuttgart (OGI) at production site Mělnik / CZ

Receipt of samples: a) 11th November 2008 (receipt-No.: 08/355)
b) 26th June 2009 (receipt-No.: 09/210)

Quantity: a) 10 plastic boards, each in dark grey colour, 1000 mm x 190 mm,
thickness of approx. 1 mm, density of approx. 1476 kg/m³
thickness of approx. 6 mm, density of approx. 1501 kg/m³
thickness of approx. 15 mm, density of approx. 1472 kg/m³

b) 10 plastic boards, each in white colour, 1000 mm x 190 mm,
thickness of approx. 1 mm, density of approx. 1483 kg/m³
thickness of approx. 6 mm, density of approx. 1481 kg/m³
thickness of approx. 15 mm, density of approx. 1473 kg/m³

2. Test Procedure

The tests had been performed according to standard DIN 4102, part 1 and part 16. (May 1998 edition) using the Brandschacht according to DIN 4102, part 15, (May 1990 edition) and the „Zulassungsgrundsätze für den Nachweis der Schwerentflammbarkeit von Baustoffen (Baustoffklasse DIN 4102-B1), issued by Deutsches Institut für Bautechnik, Berlin". Tests had been performed on plastic boards without substrate.

3. Test Results

3.1 Tests according to DIN 4102, clause 6.2 - Baustoffklasse B2 with edge flame-exposure

Plastic boards in dark grey colour										
Thickness of boards	mm	approx. 1			approx. 6			approx. 15		
Test No.		1	2	3	4	5	6	7	8	9
Max. flameheight within 20 s	cm	6	7	7	3	2	3	3	3	3
Separation of burning droplets		none			none			none		

Plastic boards in white colour										
Thickness of boards	mm	approx. 1			approx. 6			approx. 15		
Test No.		10	11	12	13	14	15	16	17	18
Max. flameheight within 20 s	cm	5	6	4	2	2	2	2	2	2
Separation of burning droplets		none			none			none		

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3.2. Tests according to DIN 4102-1, part 15 (Brandschacht-test)

Test A:	plastic boards of approx. 1 mm thickness, in dark grey colour
Tests B and C:	plastic boards of approx. 6 mm thickness, in dark grey colour
Tests D and E:	plastic boards of approx.15 mm thickness, in dark grey colour
Test F:	plastic boards of approx. 1 mm thickness, in white colour
Test G:	plastic boards of approx. 6 mm thickness, in white colour
Test H:	plastic boards of approx.15 mm thickness, in white colour

3.2.1. Results of Brandschacht tests (part 1) for specimen assembly A to E

Line No.			Test Results Specimen Assembly A	B	C	D	E
1	No. of fastening method according to DIN 4102, table 1		2	2	2	2	2
2	Max. flame height	cm	70-80	70-80	70	70-80	70-80
3	Time of appearance [1]	min:s	0:30	3:30	1:20	3:00	5:00
4	Occurrence of holes in the material Time of appearance [1]	min:s	0:30	-	-	-	-
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 Time of appearance [1]	min:s	-	-	-	-	-
8	Amount Single drops						
9	Continuously dripping						
10	Separation of burning debris Time of appearance [1]	min:s	-	-	-	-	-
11	Amount Single pieces				-		
12	Continuously falling pieces						
13	Burning material on the screening surface Duration (max.)	min:s	-	-	-	-	-
14	Reduction of burner flames by falling droplets or debris Time of occurrence [1]	min:s	-	-	-	-	-
15	End of test (premature) 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

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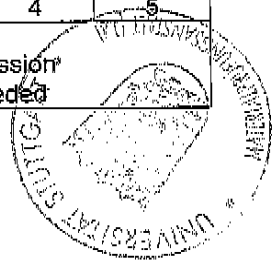
3.2.2. Results of Brandschacht tests (part 2) for specimen assembly A to E

	Line No.		Test Results Specimen Assembly A	B	C	D	E
	Afterflame						
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						
22	Duration	min:s	0:45	0:30	0:12	0:10	0:10
23	Number of specimen		3	4	4	1	2
	Location of glowing						
24	Lower half on the specimen		X	X	X	X	X
25	Upper half of the specimen						
26	Front face of the specimen		X	X	X	X	X
27	Reverse face of the specimen						
	Smoke density (area below the curve)						
28	≤ 400 % · min		356	-	-	-	-
29	≥ 400 % · min		-	716	742	757	752
	(very strong smoke development)						
30	Graph in annex No.		1	2	3	4	5
	Residual length						
31	Single results of each specimen	cm	47 48 48 38	21 22 21 22	21 21 20 20	25 27 24 26	21 21 20 20
32	Average of each specimen assembly	cm	45	21	20	25	20
33	Photo of the test assembly in annex No.		-	9	-	-	-
	Flue gas temperature						
34	Maximum of the average value	°C	129	125	125	128	123
35	Time of appearance [1]	min:s	4:51	8:50	7:06	9:50	9:10
36	Graph in annex No.		1	2	3	4	5
37	Notes:		Limit of smoke emission (400 %·min) exceeded				



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3.2.3. Results of Brandschacht tests (part 1) for specimen assembly F to H

Line No.			Test Results Specimen Assembly				
			F	G	H	-	-
1	No. of fastening method according to DIN 4102, table 1		2	2	2	-	-
2	Max. flame height	cm	60-70	80	70-80	-	-
3	Time of appearance [1]	min:s	0:30	2:00	2:00		
4	Occurrence of holes in the material Time of appearance [1]	min:s	1:00	-	-	-	-
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 Time of appearance [1]	min:s	-	-	-	-	-
	Amount						
8	Single drops						
9	Continuously dripping						
10	Separation of burning debris Time of appearance [1]	min:s	-	-	-	-	-
	Amount						
11	Single pieces						
12	Continuously falling pieces						
13	Burning material on the screening surface Duration (max.)	min:s	-	-	-	-	-
14	Reduction of burner flames by falling droplets or debris Time of occurrence [1]	min:s	-	-	-	-	-
15	End of test (premature) 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

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3.2.4. Results of Brandschacht tests (part 2) for specimen assembly F to H

	Line No.		Test Results Specimen Assembly F	G	H	-	-
	Afterflame						
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						
22	Duration	min:s	-	-	-	-	
23	Number of specimen						
	Location of glowing						
24	Lower half on the specimen						
25	Upper half of the specimen						
26	Front face of the specimen						
27	Reverse face of the specimen						
	Smoke density (area below the curve)						
28	≤ 400 % · min		230	-	-	-	-
29	≥ 400 % · min (very strong smoke development)		-	676	694	-	-
30	Graph in annex No.		6	6	8	-	-
	Residual length						
31	Single results of each specimen	cm	47 48 46 44	22 23 22 22	25 28 26 27	-	-
32	Average of each specimen assembly	cm	46	22	26	-	-
33	Photo of the test assembly in annex No.		-	-	-	-	-
	Flue gas temperature						
34	Maximum of the average value	°C	122	127	124	-	-
35	Time of appearance [1]	min:s	4:35	8:55	9:49	-	-
36	Graph in annex No.		6	7	8	-	-
37	Notes:		Limit of smoke emission (400 %·min) exceeded				

4. Classification

The tested specimen met the requirements for building materials according to DIN 4102, part 1, clause 6.1.3.1 and clause 6.2 for class B2.

Thus, the plastic boards "MEDUR B1" in white and dark grey colours made of solid PVC with flame-retardant treatment, as described in clause 1, met the requirements for building materials of class B1 according to DIN 4102, part 1 (May 1998 edition).

The plastic boards "MEDUR B1" of solid PVC with flame-retardant treatment according to DIN 4102-16, clause 9,3 are stated as not burning dripping. When performing the Brandschacht-tests, the limited value of smoke density was exceeded.

5. Notes

5.1. The plastic boards "MEDUR B1" made of solid PVC with flame-retardant treatment must be labelled according to DIN 4102-1, clause 7 as follows:

DIN 4102 - B1

5.2. Classification in clause 4 is valid solely for the plastic boards "MEDUR B1" made of solid PVC with flame-retardant treatment as described in clause 1 and tested as in clause 2 and solely with an air-gap of ≥ 40 mm to the building product itself and other flat substrates.

Used in connection with other materials, especially substrates, their fire performance is likely to be influenced this negatively, that the given classification in clause 4 is no longer valid. Fire performance in connection with other materials or substrates is to be tested and classified separately.

5.3. According to DIN 4102-16, clause 6.2 building materials intended to be used in outside conditions the requirements for Baustoffklasse B1 ("schwerentflammbar") must be proven to be met after a 2- and 5-years' weathering-period, too. This proof is not (yet) given.

5.4. Classification in clause 4 of this test certificate expires by 28th February 2014. Validity may be extended on request. Additional tests may be necessary.

5.5. This test certificate is in no case any substitute for
„Allgemeines bauaufsichtliches Prüfzeugnis" or
„Allgemeine bauaufsichtliche Zulassung.

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

Der Bearbeiter
(*The Engineer in Charge*)
Dipl.-Ing. (FH) Gerhard Müller

Der Leiter der Prüfstelle
(*Head of Notified Fire Testing Department*)
Dr. rer. nat. Stefan Lehner,
Akad. Direktor

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 1 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

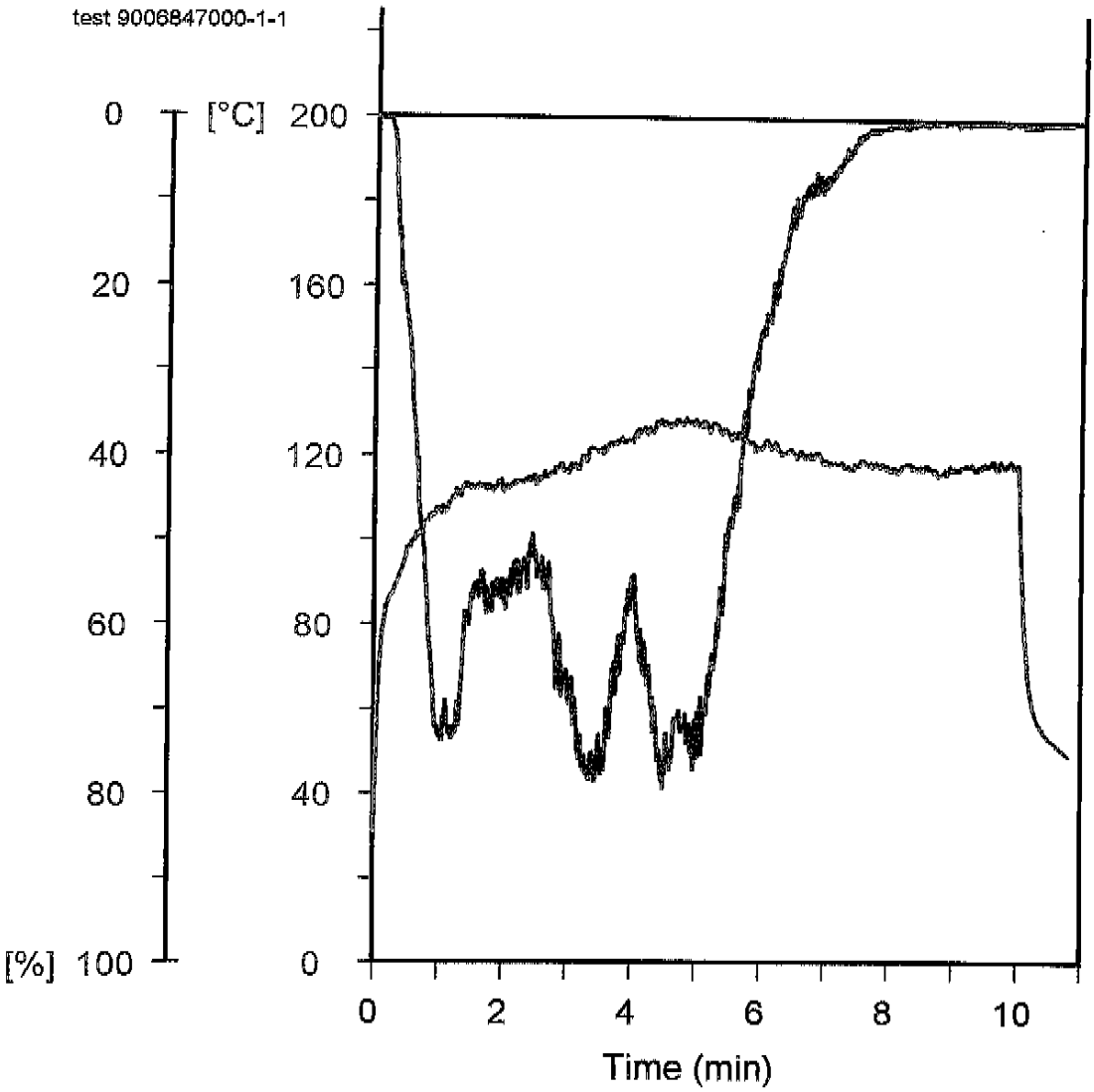

Figure 1 Results of Brandschacht test A

max. flue gas temp.	129 °C
Time of appearance	4:51 min:sec
max. smoke density	79 %
Integral value	356 %*min

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Beilage 2 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

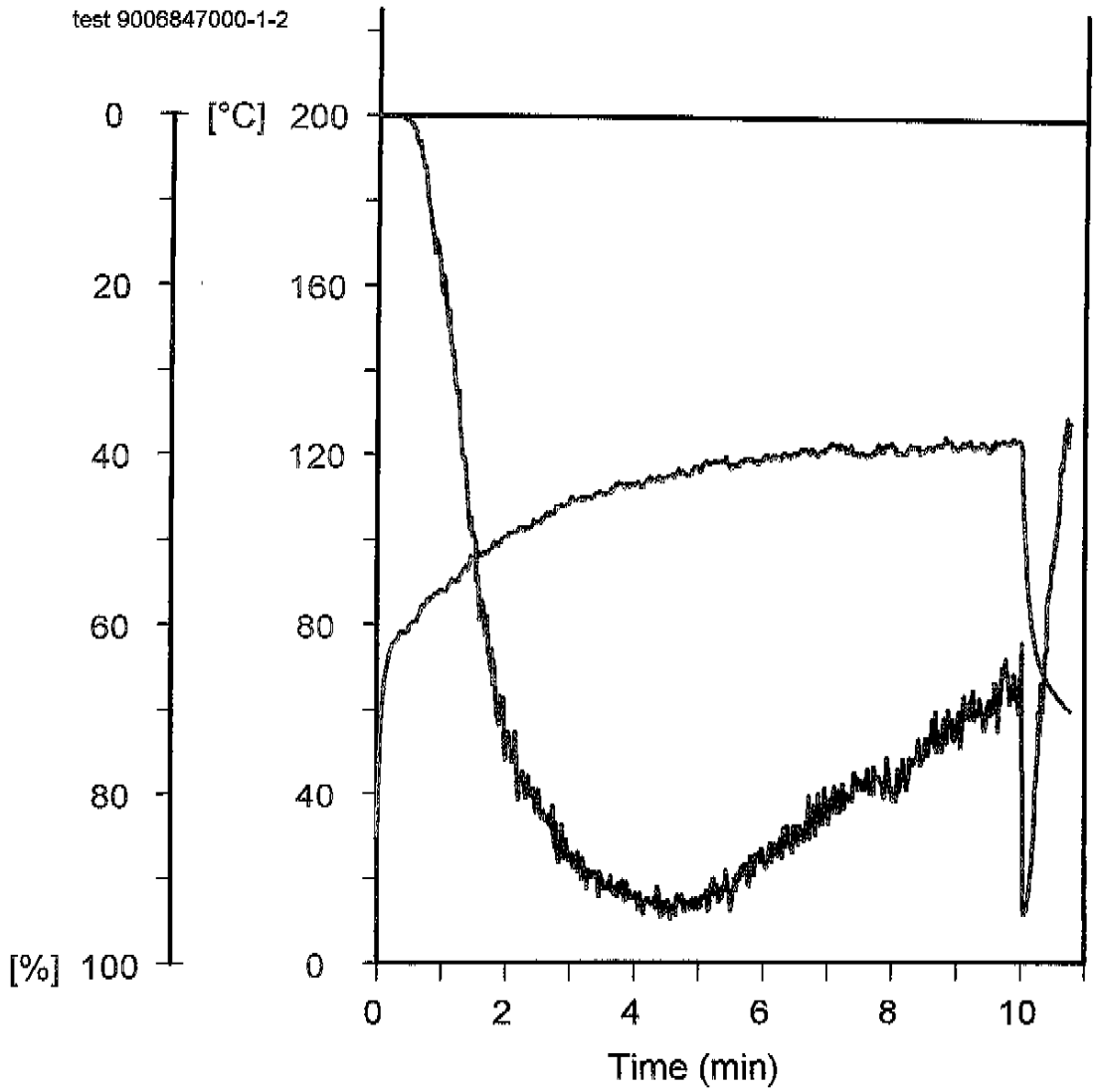

Figure 2 Results of Brandschacht test B

max. flue gas temp.	125 °C
Time of appearance	8:50 min:sec
max. smoke density	95 %
Integral value	716 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 3 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

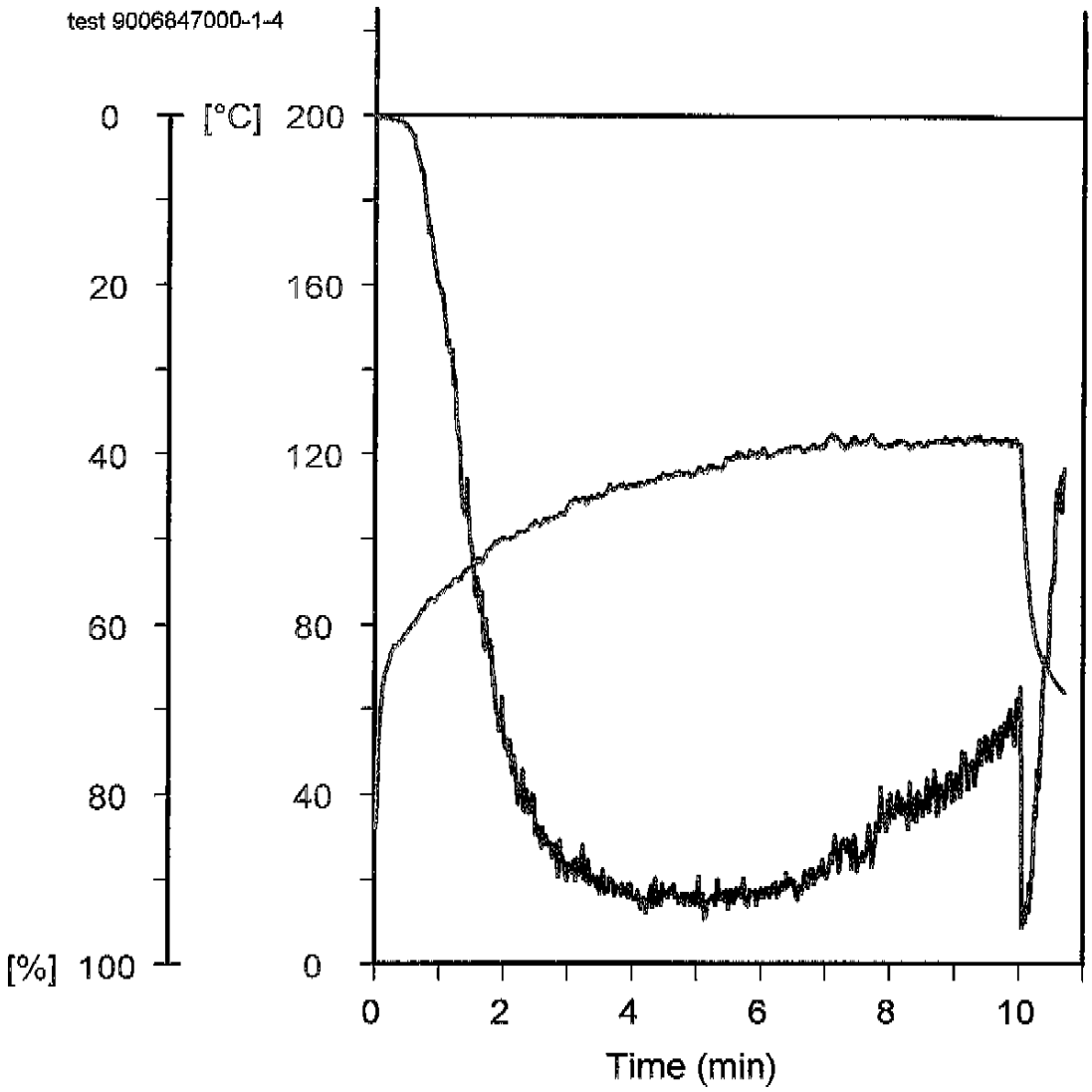

Figure 3 Results of Brandschacht test C

max. flue gas temp.	125 °C
Time of appearance	7:06 min:sec
max. smoke density	95 %
Integral value	742 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 4 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

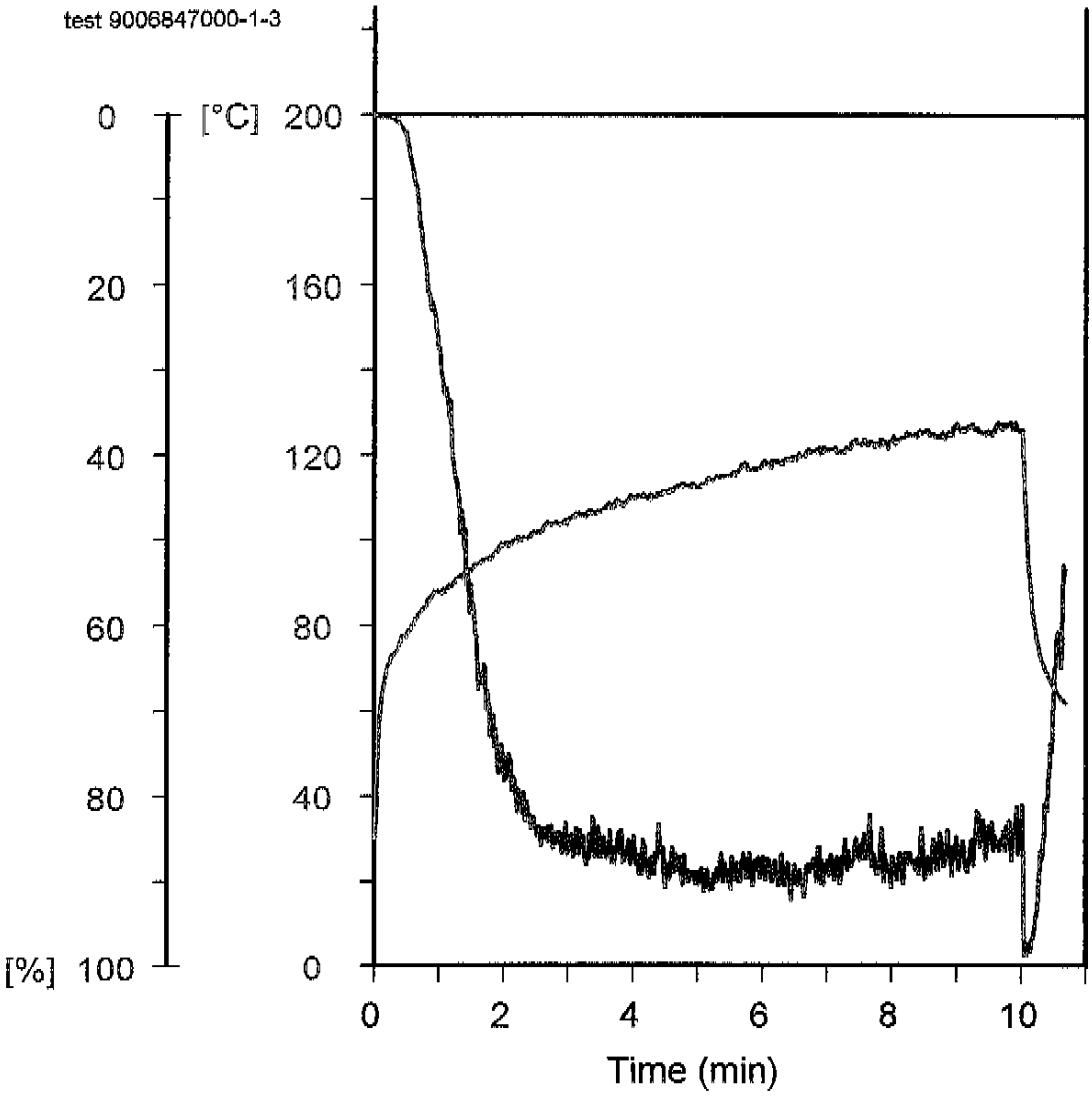

Figure 4 Results of Brandschacht test D

max. flue gas temp.	128 °C
Time of appearance	9:50 min:sec
max. smoke density	92 %
Integral value	757 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 5 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

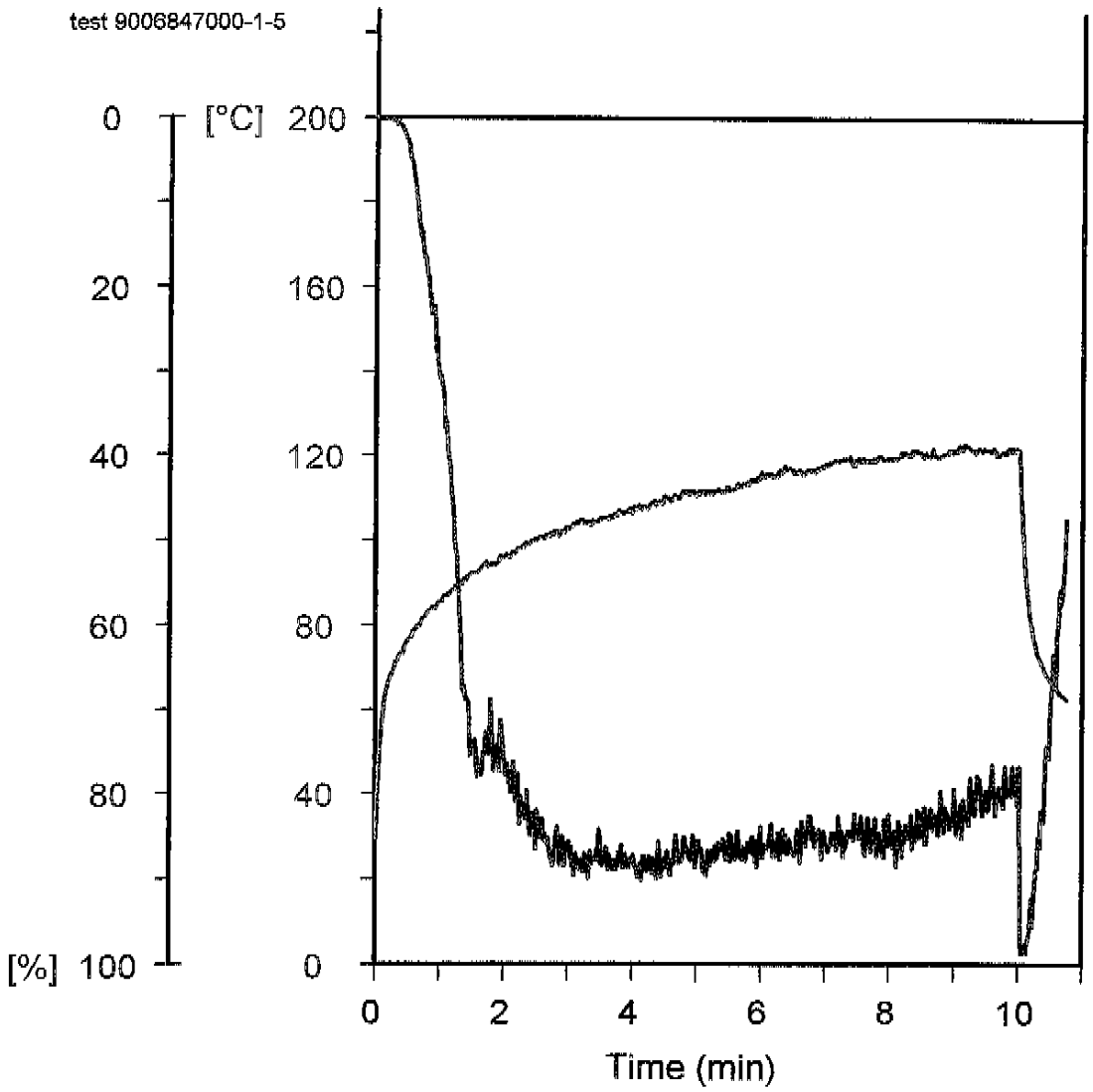

Figure 5 Results of Brandschacht test E

max. flue gas temp.	123 °C
Time of appearance	9:10 min:sec
max. smoke density	90 %
Integral value	752 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 6 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

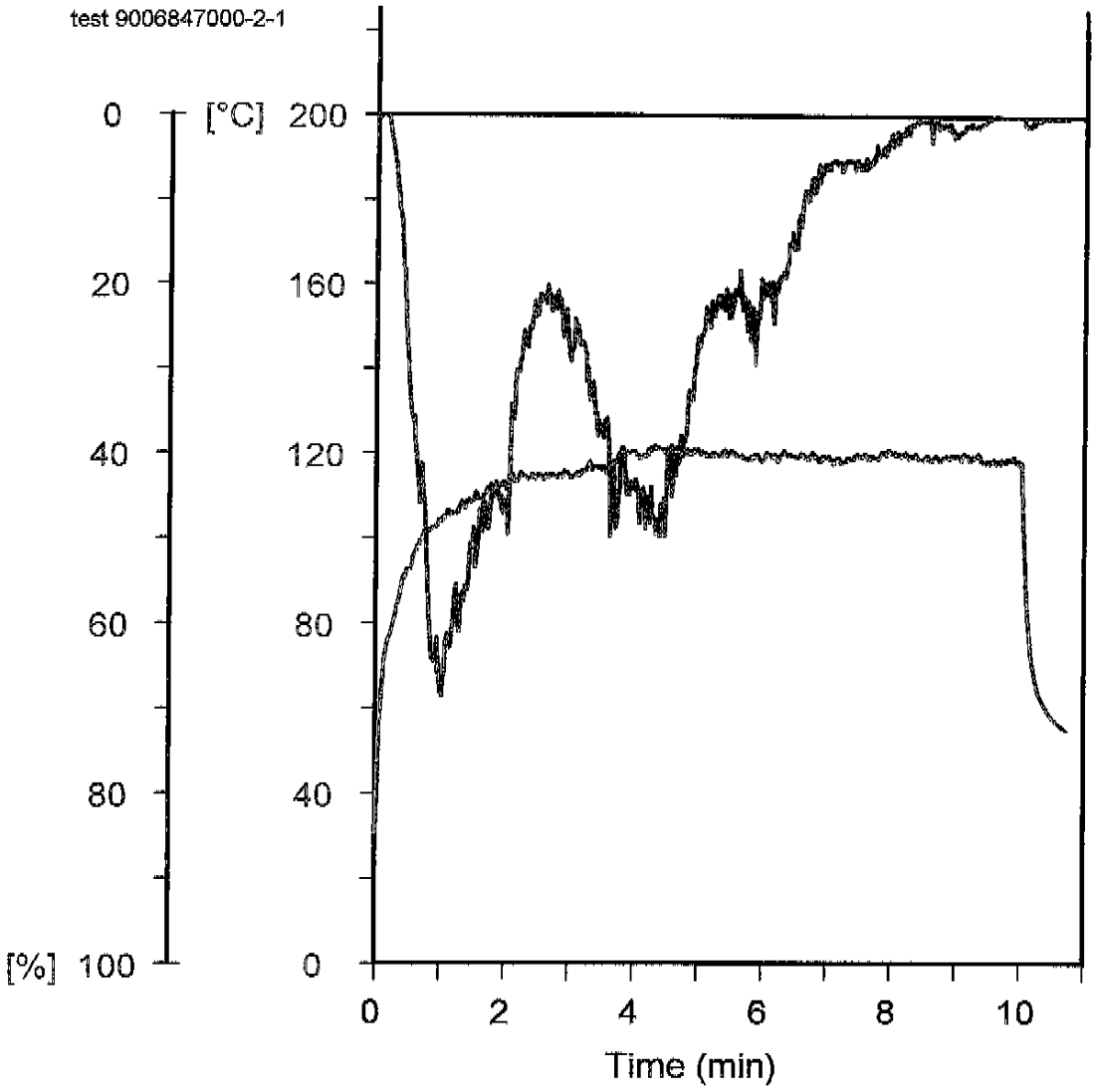

Figure 6 Results of Brandschacht test F

max. flue gas temp.	122 °C
Time of appearance	4:35 min:sec
max. smoke density	69 %
Integral value	230 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 7 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

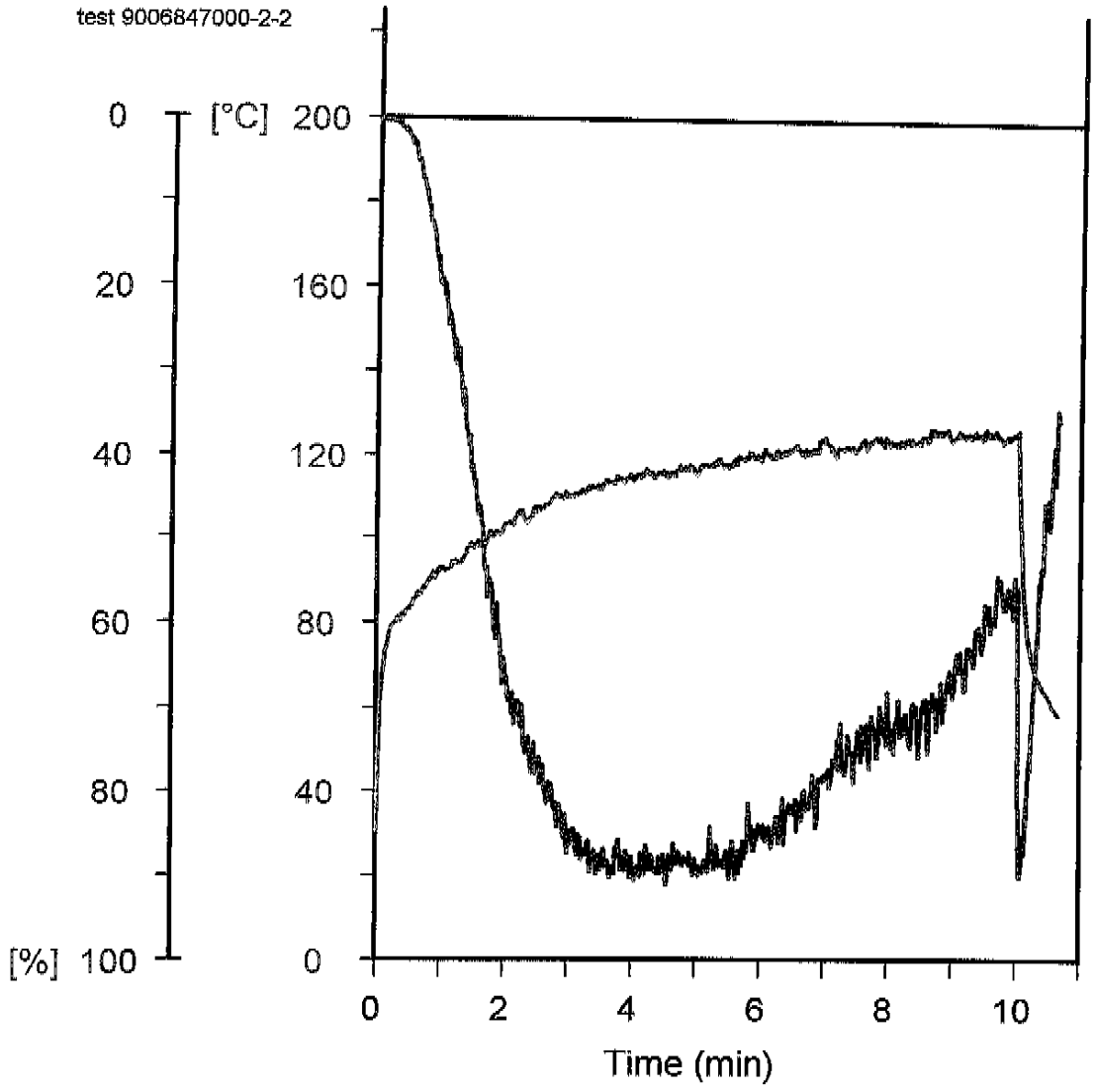

Figure 7 Results of Brandschacht test G

max. flue gas temp.	127 °C
Time of appearance	8:55 min:sec
max. smoke density	91 %
Integral value	676 %*min

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Auftrags-Nr.: 901 6890 000-2 E
Beilage 8 zum Prüfzeugnis (*to test certificate*)
vom (*dated*) 18th February 2011

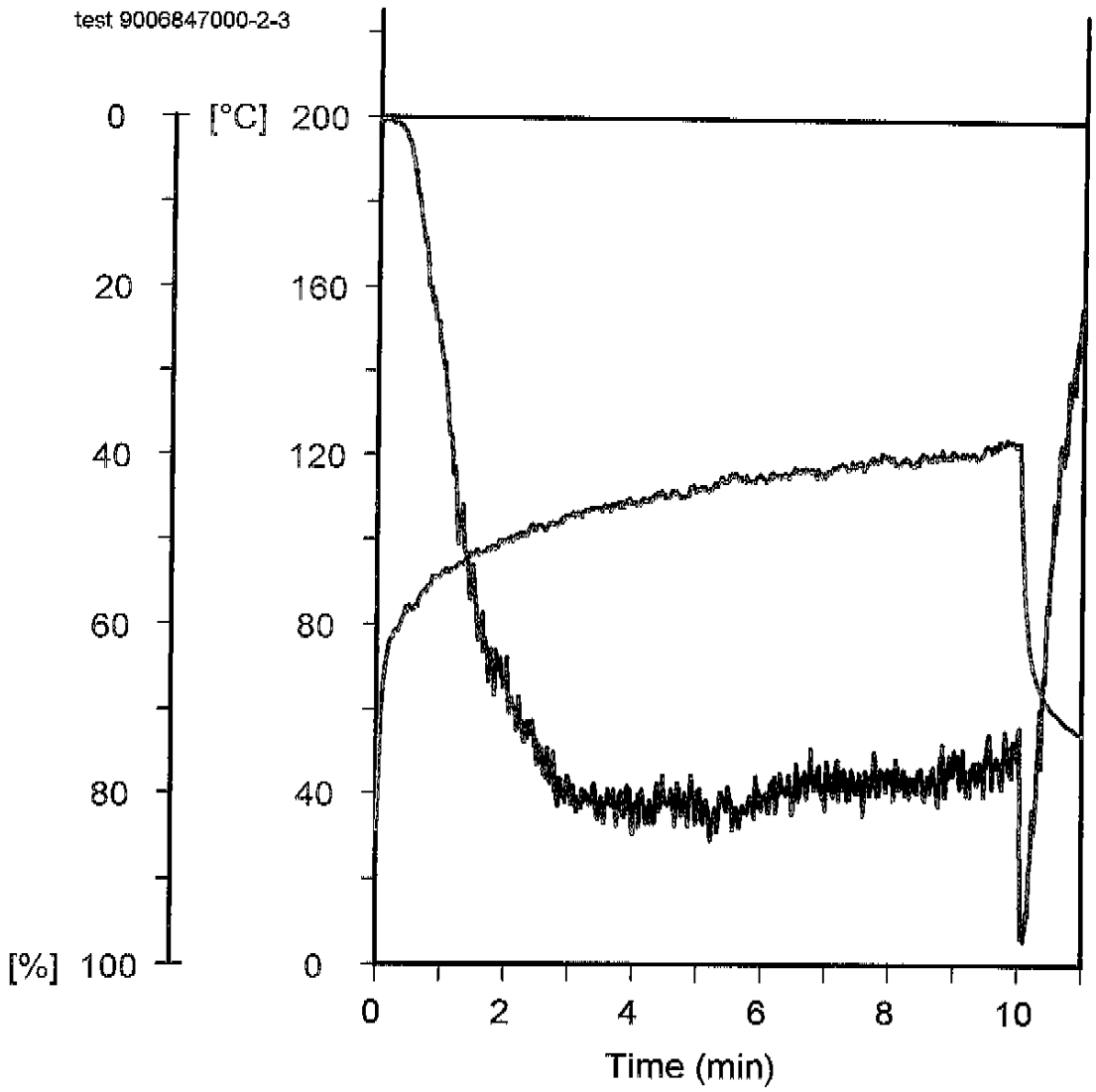

Figure 8 Results of Brandschacht test H

max. flue gas temp.	124 °C
Time of appearance	9:49 min:sec
max. smoke density	86 %
Integral value	694 %*min