



Fire Test Report

Germany

Foamalux FES 3mm White

Test Result/Classification: **B1**

Test Method/Standard: **DIN 4102**

## PRÜFZEUGNIS (Test Certificate)

900 6112 000-11/E \*)

English Version

**Auftraggeber:** Brett Martin Ltd  
(Client) 24 Roughfort, Road  
Mallusk, Co. Antrim  
BT36 4RB  
Northern Ireland

**Betreff:** Reaction-to-fire testing according to DIN 4102, class B1  
(Subject)

**Prüfmaterial:** Closed-cell low density foamed PVC sheets "Foamalux FES"  
(Test Material)

**Datum:** 03. May 2011  
(Date)

**Gültigkeitsdauer:** until 31. May 2016  
(Period of Validity)

**Hinweise:** The tested building-material not being used as a construction product  
(Notes) 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 according to Bauregelliste:  
- Übereinstimmungsnachweise (certificate of conformity)  
- Verwendbarkeitsnachweise (allgemeines bauaufsichtliches Prüf-  
zeugnis, 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 test certificate is the English version of our test certificate 900 6112 000-11/D  
dated 03. May 2011. In cases of doubt, the German version is valid.**

Dieses Prüfzeugnis umfasst 5 Textseiten und 6 Beilagen. Textseiten und Beilagen sind mit unserem Dienstsiegel versehen. Die Vervielfältigung und Veröffentlichung des Prüfzeugnisses, sowohl in vollem als auch in gekürztem Wortlaut sowie die Verwendung zur Werbung ist nur mit unserer schriftlichen Genehmigung zulässig. Das Prüfzeugnis wird unbeschadet der Rechte Dritter, insbesondere privater Schutzrechte, erteilt. Gerichtsstand und Erfüllungsort ist Stuttgart.

Nach DIN EN ISO/IEC 17025 durch die DAP Deutsches Akkreditierungssystem Prüfwesen GmbH akkreditiertes Prüflaboratorium. Die Akkreditierung gilt für die in den Urkunden aufgeführten Prüfverfahren (DAR-Reg.-Nr.: DAP-PL-2907.99). Zusätzliche Akkreditierungen nach DIN EN ISO/IEC 17025 durch DKD / PTB, KBA, ZLS und Zertifizierung nach DIN EN ISO 9001:2000 durch TÜV. Vom DIBt anerkannte PÜZ-Stelle, bei EU notifizierte Stelle 0672 und 1080.

On 25. February 2011 we had been requested to perform reaction-to-fire tests according to DIN 4102, class B1.

1. Material Description and Material Data

Homogeneous closed-cell low density foamed PVC sheets out of rigid PVC foam with fire retardant and inorganic fillers.

The thickness of the PVC-sheets is approx. 3 mm

Its density range is 480 kg/m<sup>3</sup> to 520 kg/m<sup>3</sup>.

Field of application: Shop outfitting, exhibition stands and displays construction, signage and point of purchase

Trade name: "Foamalux FES"

Sampling: by sponsor / client

Receipt of samples: 23. December 2010 (Eingangs-Nr. / receipt-No. 10/496)  
25. January 2011 (Eingangs-Nr. / receipt-No. 11/22)

Quantity: 14 white sheets each 1000 mm x 190 mm  
approx. 3 mm thick

2. Material data

Thickness:	mm	ca. 2,9
Mass per unit area:	g/m <sup>2</sup>	ca. 1443
Density:	kg/m <sup>3</sup>	ca. 494



3. 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.

The fire test had been conducted on free-hanging samples without substrate.

4. Testing Results

4.1. Tests in accordance with DIN 4102-1, clause 6.2 – Baustoffklasse B2 – edge flame application

Flame application at:		edge				
Test No. / specimen:		1	2	3	4	5
Ignition		immediately				
Max. flameheight						
within 20 s	cm	5	6	6	6	7
reached after	s	15	15	15	15	14
Measuring mark reached after	s	-	-	-	-	-
Flames ceased after	s	15	16	15	15	15
End of afterglowing	s	-	-	-	-	-
Smoke development		very strongly				
Separation of burning droplets	s	-	-	-	-	-
Filter paper ignited after	s	no				

4.2. Tests according to DIN 4102-1, clause 6.1 – Baustoffklasse B1

Brandschacht-tests A to C: sheet thickness 3 mm

4.2.1. Results of Brandschacht tests (part 1)

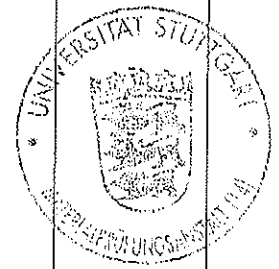
Line No.	Test results Specimen Assembly	Test results		
		A	B	C
1	No. of fastening method according to DIN 4102, table 1	2	2	2
2	Max. flame height			
3	Time of appearance <sup>1)</sup>	80-90	80-90	80-90
	cm			
	min : s	0:40	0:45	0:45
4	Occurrence of holes in the material			
	Time of appearance <sup>1)</sup>	1:00	0:55	0:57
	min : s			
5	Observations of the reverse face of the specimen			
	Flames / Glowing			
	Time of appearance <sup>1)</sup>	min : s	-	-
6	Discolouring			
	Time of appearance <sup>1)</sup>	min : s	-	-
7	Burning droplets			
	Time of appearance <sup>1)</sup>	min:s	-	-
	Amount			
8	Single drops			
9	Continuously dripping			
10	Separation of burning debris			
	Time of appearance <sup>1)</sup>	min : s	2:12	2:10
	Amount			-
11	Single pieces		x	x
12	Continuously falling pieces			
13	Burning material on the screening surface			
	Duration (max.)	min : s	2:27	3:41
14	Reduction of burner flames by falling droplets or debris			
	Time of occurrence <sup>1)</sup>	min : s	-	-
15	End of test (premature)			
	End of fire reaction on the specimen <sup>1)</sup>	min : s	-	-
16	Time of premature finishing the test, if done so <sup>1)</sup>	min : s	-	-

<sup>1)</sup> Elapsed time from the start of the test (t=0) shall be recorded



4.2.2. Results of Brandschacht tests (part 2)

	Line No.	Test results Specimen Assembly		
		A	B	C
17	<u>Afterflame</u> 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			
22	<u>Afterglow</u> Duration min : s	-	-	-
23	Number of specimens			
24	Location of glowing Lower half on the specimen			
25	Upper half of the specimen			
26	Front face of the specimen			
27	Reverse face of the specimen			
28	<u>Smoke density (area below the curve)</u> ≤ 400 % · min	-	-	-
29	≥ 400 % · min (very strong smoke development)	348	296	281
30	Graph in annex No.	1	2	3
31	<u>Residual length</u> Single results of each specimen cm	20 / 21 21 / 26	20 / 22 23 / 21	22 / 25 20 / 20
32	Average of each specimen assembly cm	22	22	22
33	Photo of the test assembly in annex No.	4	5	6
34	<u>Flue gas temperature</u> Maximum of the average value °C	124	125	129
35	Time of appearance <sup>1)</sup> min : s	2:48	2:23	3:14
36	Graph in annex No.	1	2	3
37	Notes:	none		



5. Classification

The tested samples 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 closed-cell low density foamed PVC sheets "Foamalux FES" as described in section 1 and 2 meet the requirements for building materials according to class B1 of DIN 4102, part 1 (May 1998 edition).

The PVC sheets "Foamalux FES" are applied according to DIN 4102, part 16 clause 9.3 as burning droplets/debris.

6. Notes

- 6.1. The closed-cell low density foamed PVC sheets "Foamalux FES" must be labelled according to DIN 4102, part 1, clause 7 as follows:

DIN 4102 - B1

- 6.2. Classification in clause 5 is valid solely to the closed-cell low density foamed PVC sheets "Foamalux FES" as described in clause 1 and tested as in clause 2, and solely with a distance of 40 mm to any other building material.

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 According to DIN 4102-16, clause 6.2 for building materials that are intended to be used in outside conditions, it must be proven that the requirements for Baustoffklasse B1 ("schwerentflammbar") are met after a 2- and 5-years' weathering-period, too. This proof is not (yet) given.
- 6.4. Classification in clause 4 of this test certificate expires by 31. May 2016. Validity may be extended on request. Additional tests may be necessary.
- 6.5. 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*

The Engineer in Charge

Dipl.-Ing. (BA) Harald Schillo



Head of Notified Fire Testing Department

Dr. rer. nat. Stefan Lehner,  
Akad. Direktor

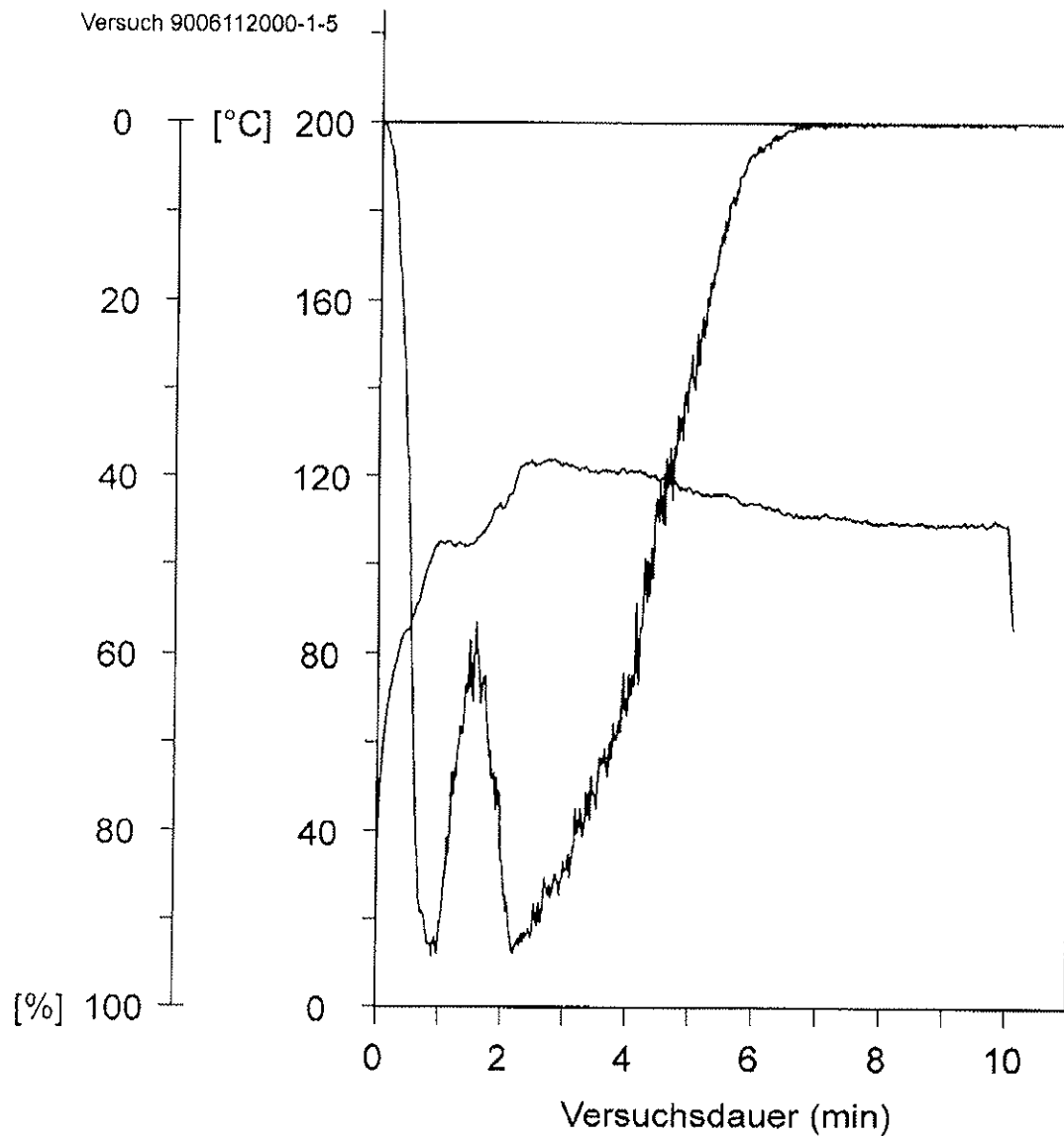


Abb.1 Verlauf des Brandschachtversuchs A

max. Rauchgastemp. 124 °C

erreicht nach 2:48 min:sec

max. Rauchdichte 94 %

Integralwert 345 %\*min

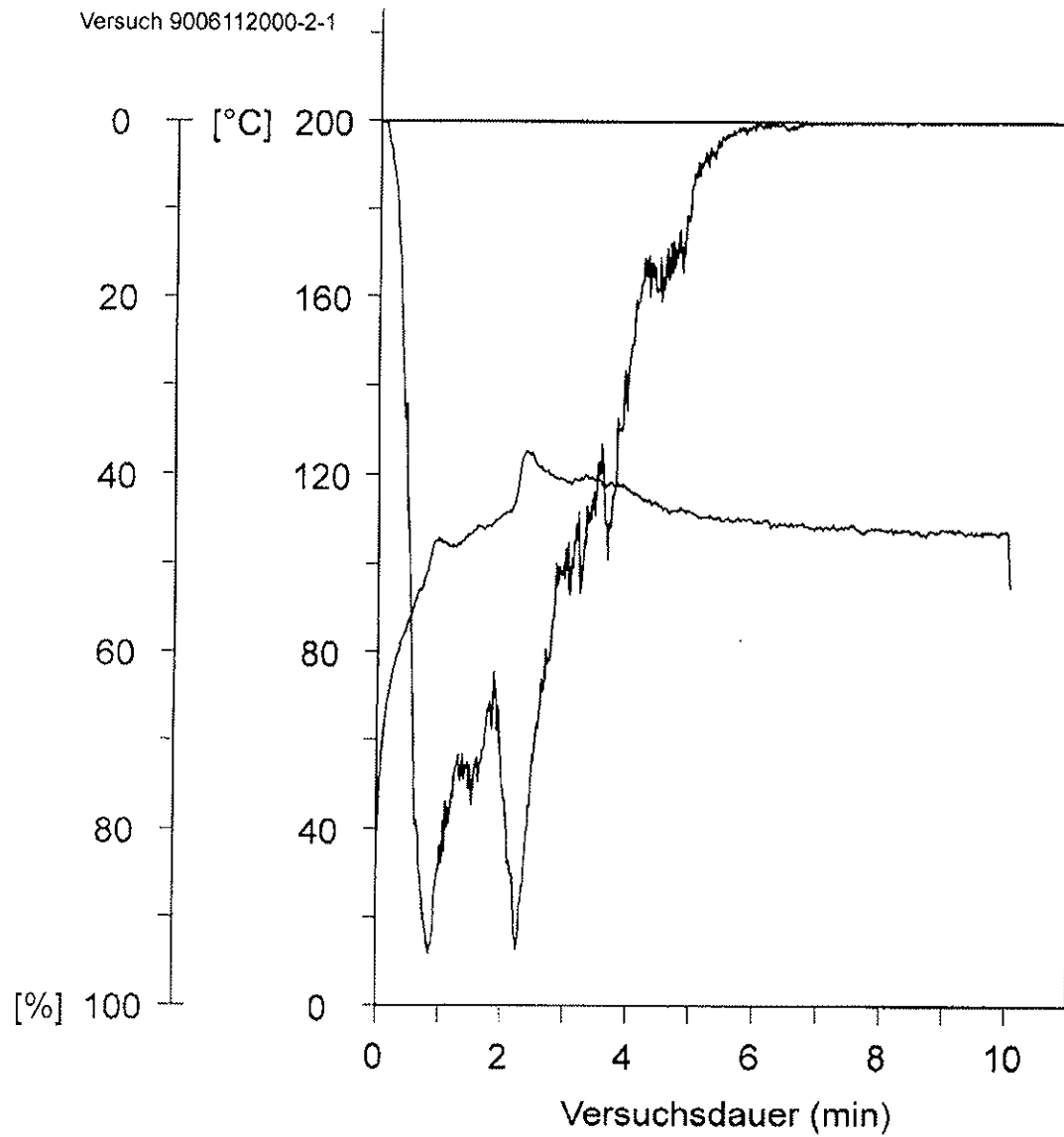


Abb.2 Verlauf des Brandschachtversuchs B

max. Rauchgastemp. 125 °C

erreicht nach 2:23 min:sec

max. Rauchdichte 94 %

Integralwert 256 %\*min



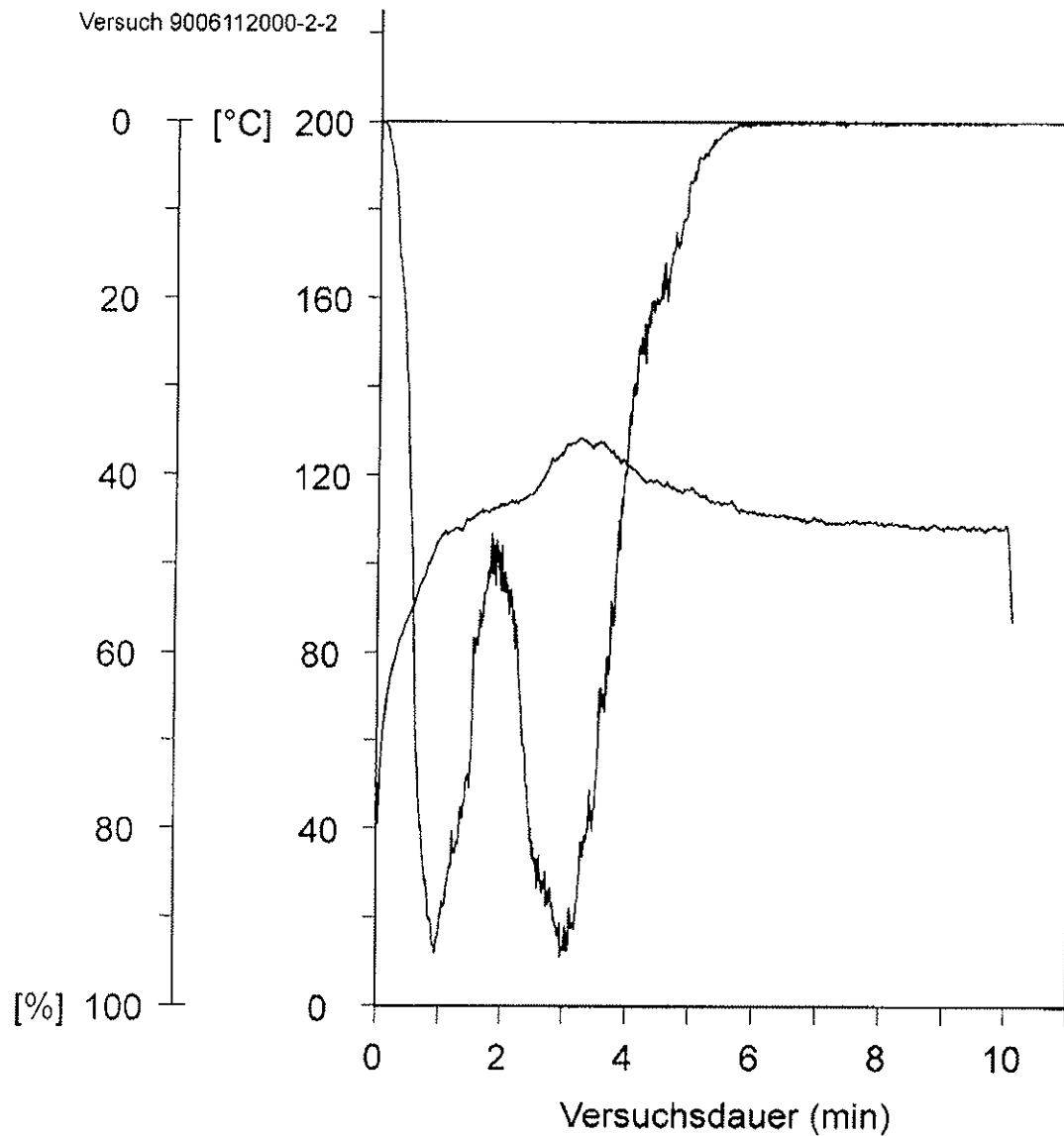


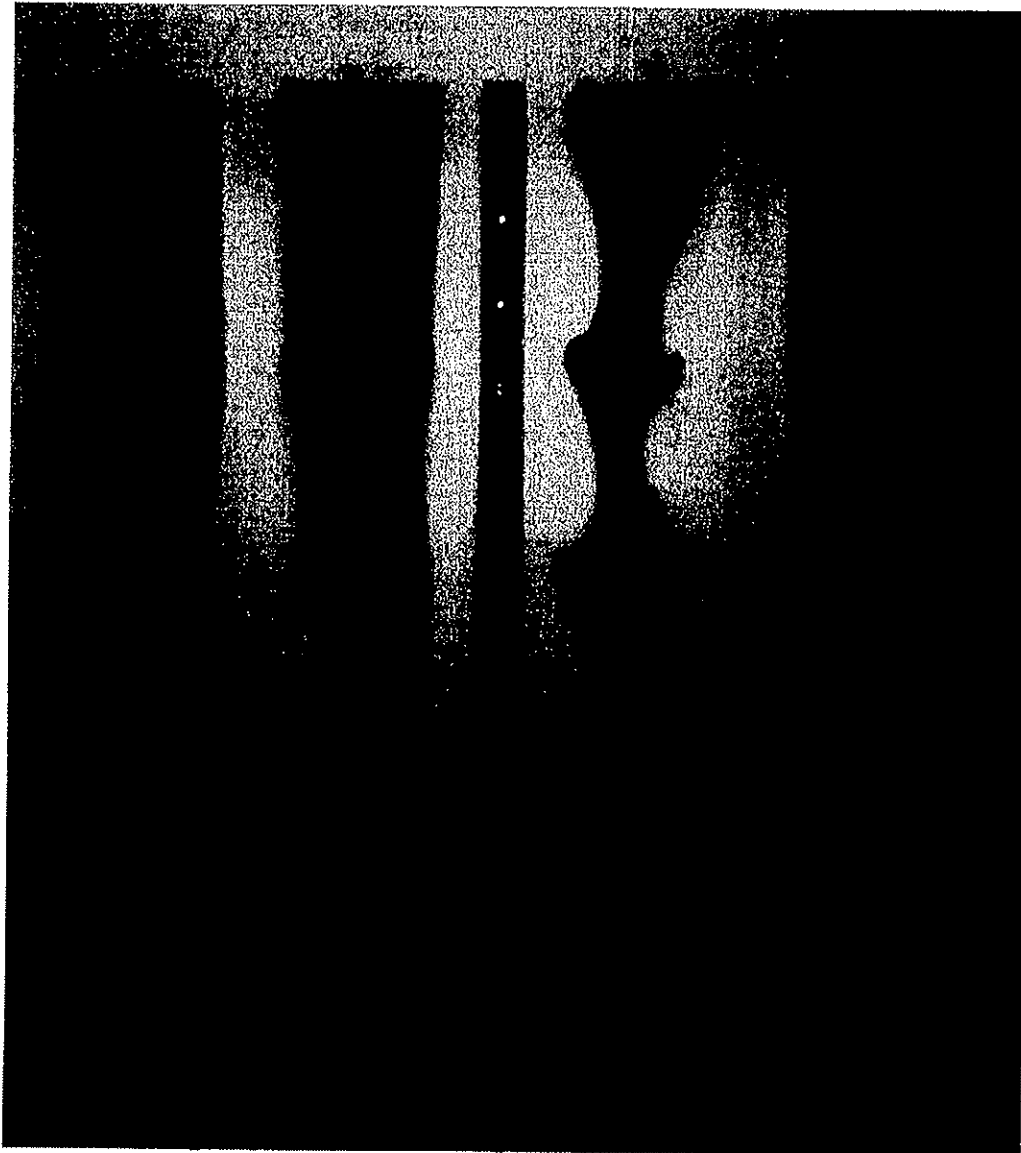
Abb.3 Verlauf des Brandschachtversuchs C

max. Rauchgastemp. 129 °C

erreicht nach 3:14 min:sec

max. Rauchdichte 94 %

Integralwert 281 %\*min



I

II

III

IV

Abb. 4: specimen after fire testing A



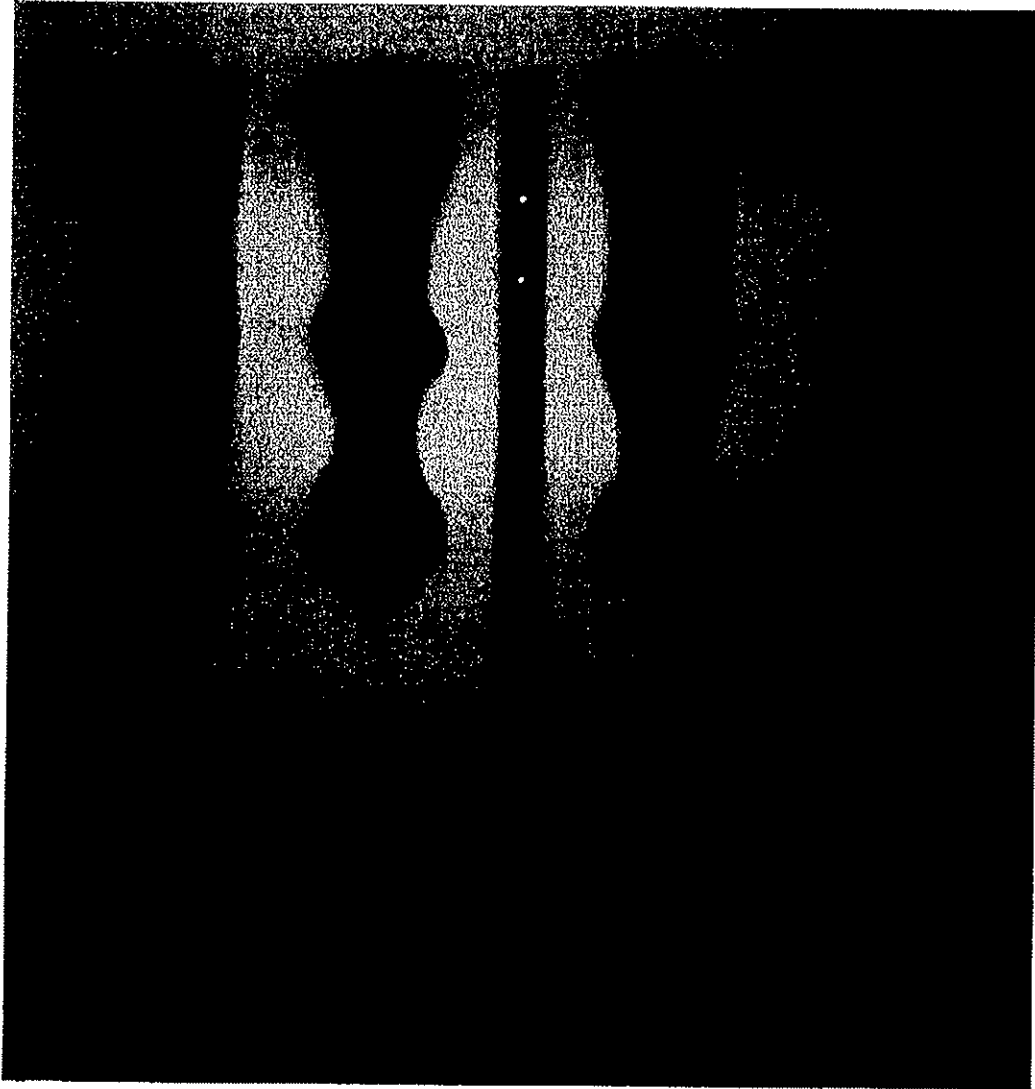
I

II

III

IV

Abb. 5: specimen after fire testing B



I

II

III

IV

Abb. 6: specimen after fire testing C