

## Test report

**Document number:** (2300/679/16-a) – Rhr of 18/08/2016

**Client:** SISTEM METAL  
Yapi Reklam Malzemeleri Insaat San ve Tic. A.S  
Istiklal Mh. Atatürk Cad. 19 Mayıs Is Mrk. No.: 1  
34522 KIRAÇ - Esenyurt / ISTANBUL

**Order date:** 03/01/2016

**Content of the order:** Performance of tests to classify fire behaviour according to  
DIN EN 13501-1:2010-01;  
SBI test procedure

**Test subject:** Aluminium composite panel;  
product designation: "ALBOND"

**Test basis:** DIN EN 13823:2015-02

**Sample production:** by product manufacturer

**Sample received:** 07/03/2016

**Please note:** The test results refer to the fire behaviour of samples of a  
construction product under the specific test conditions; they  
are not the sole criterion for assessing the potential fire risk  
of the product in practical application.

This test report consists of 4 pages, including the cover sheet, and 7 annexes.



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## 1 Introduction

This test report describes the fire behaviour test and results according to DIN EN 13823:2015-02 for the construction products listed below.

## 2 Product description and product data

Product name: "ALBOND"

The construction product is an aluminium composite panel for cladding curtain walls.

Material data determined by the testing laboratory:

Layer	Type	Thickness	Weight per unit area [kg/m <sup>2</sup> ]	Application quantity [g/m <sup>2</sup> ]
Top coat (F)	PVDF	20 µm	--	90*
Primer	PVDF	5 µm	--	60*
Metal layer	Aluminium	0.5 mm	1.26	--
Adhesive layer	Polyethylene	80 µm	--	77
Core material	inorganic	3.0 mm	5.39	--
Adhesive layer	Polyethylene	80 µm	--	77
Metal layer	Aluminium	0.5 mm	1.26	--
Primer	PVDF	5 µm	--	60*
Top coat (R)	PVDF	4 µm	--	50*

\* Information provided by the manufacturer

## 3 Sample preparation and construction

The test specimens with the dimensions stipulated in DIN EN 13823:2015-02 were supplied to MPA Braunschweig ready for testing.

## 4 Conditioning

Conditioning was performed in accordance with DIN EN 13238:2010-06.

## 5 Test procedure

The substrate used and the distance between the test specimen and rear wall are specified in the table below. Consult the annexes for photos showing how the test specimens were mounted and a description of the test procedures.

Specimens	Substrate/rear wall	Distance from rear wall [mm]
ALBOND	free-standing/calcium silicate panel 10 mm	80

Tests were performed in accordance with DIN EN 13823:2015-02.

Specimens	Test date	Number of attempts
ALBOND	16/06/2016	3

## 6 Test results according to DIN EN 13823:2015-02

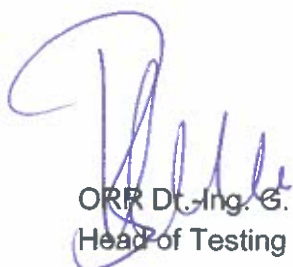
Specimens	1	2	3	Mean value
FIGRA <sub>0,2 MJ</sub> [W/s]	17	17	19	18
FIGRA <sub>0,4 MJ</sub> [W/s]	13	14	18	15
THR <sub>600s</sub> [MJ]	1.7	1.6	2.2	1.8
LFS < edge	Yes	Yes	Yes	Yes
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]	0	0	0	0
TSP <sub>600s</sub> [m <sup>2</sup> ]	12	20	22	18
Burning droplets/ falling particles	No	No	No	No

See annexes for measurement curves.


## 7 Please note

- 7.1 The test results in section 6 are valid only for the construction product as per the sample configuration specified in section 2. Deviations from the sample configuration or in the composition of the test specimen may have a negative impact on the fire behaviour to such an extent that the test result is no longer valid. In such cases, the fire behaviour must be verified separately.
- 7.2 This test report does not replace any technical certificates that may be necessary under German construction law (state building codes).

This document is the translated version of test report no. 2300/679/16-a) – Rhr – dated 18/08/2016.  
The legally binding text is the aforementioned German test report.

  
ORR Dr.-Ing. G. Blume  
Head of Testing Laboratory



  
Pp  
Techn.-Ang. D. Röhr  
Engineer/Official in Charge

## List of annexes

- 1 Descriptions of the test procedures
- 2 Illustrations of the measurement curves:  $HRR_{av}$  and THR
- 3 Illustrations of the measurement curves:  $SPR_{av}$  and TSP
- 4 Illustrations of the measurement curves: FIGRA and SMOGRA
- 5 – 7 Test specimen before the test (photos)

### Description of the testing procedure in accordance with DIN EN 13823:2015-02

The description of the procedure includes the following statements:

- visual observations
- data measured

<b>Aluminium composite panel "ALBOND"</b>			
Test specimen / Trial	1	2	3
Test date	16/06/2016	16/06/2016	16/06/2016
Conditions before start of test			
Ambient pressure [Pa]	99520	99630	99610
Relative humidity [%H <sub>2</sub> O]	51	50	47
Volumetric flow in exhaust pipe [m <sup>3</sup> /s]	0.59	0.60	0.59
Light transmission in exhaust pipe [%]	99.8	100.0	99.9
O <sub>2</sub> content in exhaust pipe [%]	20.95	20.95	20.95
CO <sub>2</sub> content in exhaust pipe [%]	0.045	0.048	0.048
Temperature in exhaust pipe [°C]	21.5	21.5	22.4
Observations			
Falling, burning pieces of test specimen FDP <sub>(f≤10s)</sub>	No	No	No
Falling, burning pieces of test specimen FDP <sub>(f&gt;10s)</sub>	No	No	No
Lateral flame spread LFS <sub>edge</sub>	No	No	No
Flame spread across the entire surface	No	No	No
Smoke outside the extraction hood	No	No	No
Falling pieces of test specimen	No	No	No
Failure of the rear closure panels	No	No	No
Collapse or deformation of the test specimen	No	No	No
Reasons to end the test early	None	None	None
Full test time elapsed	Yes	Yes	Yes
Time that test was ended early [s]	-	-	-
Other observations	None	None	None
Conditions after end of test			
O <sub>2</sub> content in exhaust pipe [vol%]	20.94	20.94	20.94
CO <sub>2</sub> content in exhaust pipe [vol%]	0.055	0.058	0.058
Light transmission in exhaust pipe [%]	100.0	100.0	100.0

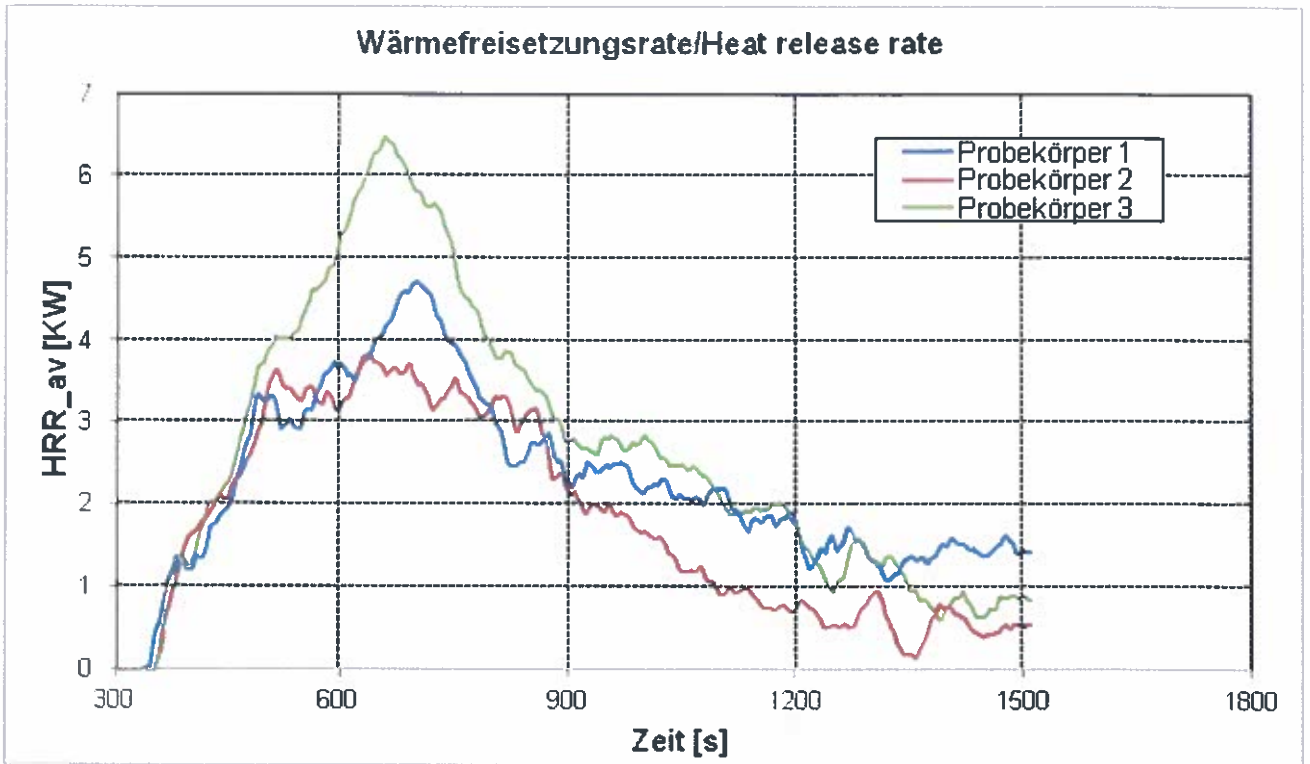


Figure 1: Thermal release rates of the test specimens

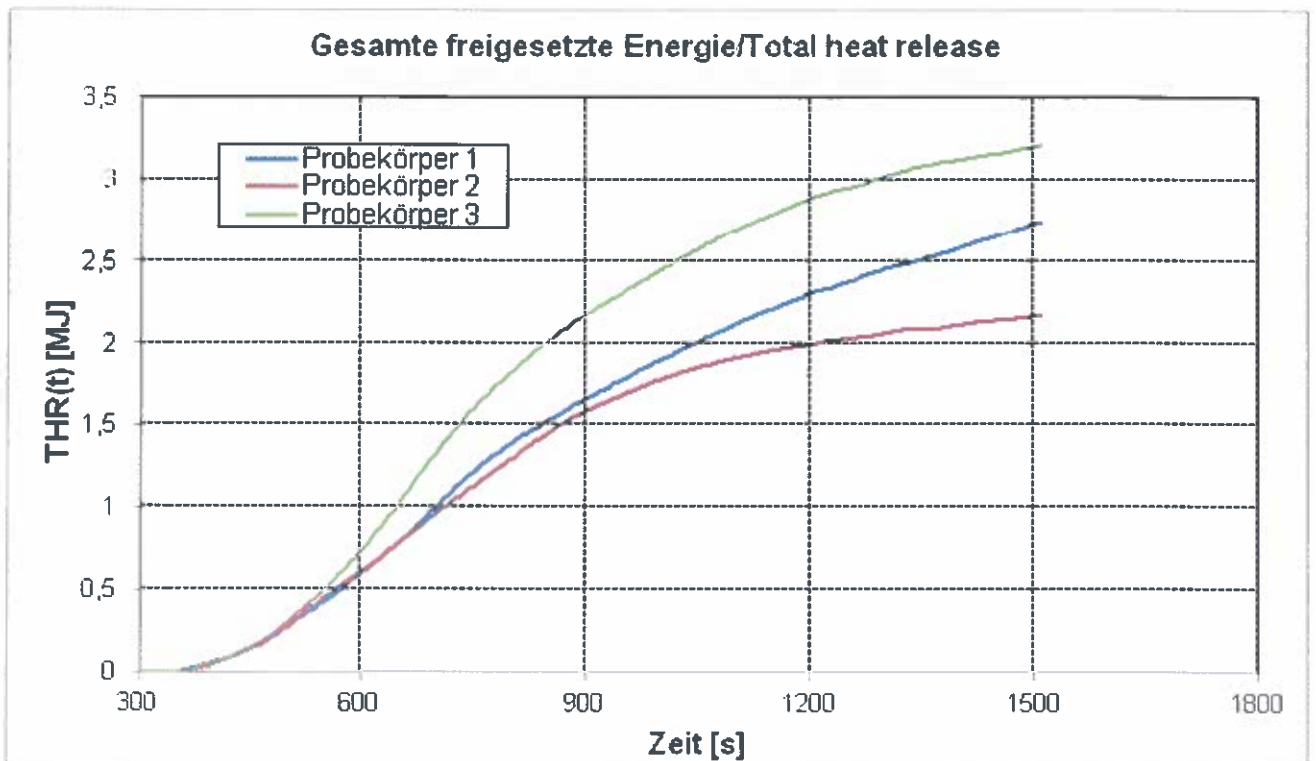


Figure 2: Total energy released by the test specimens

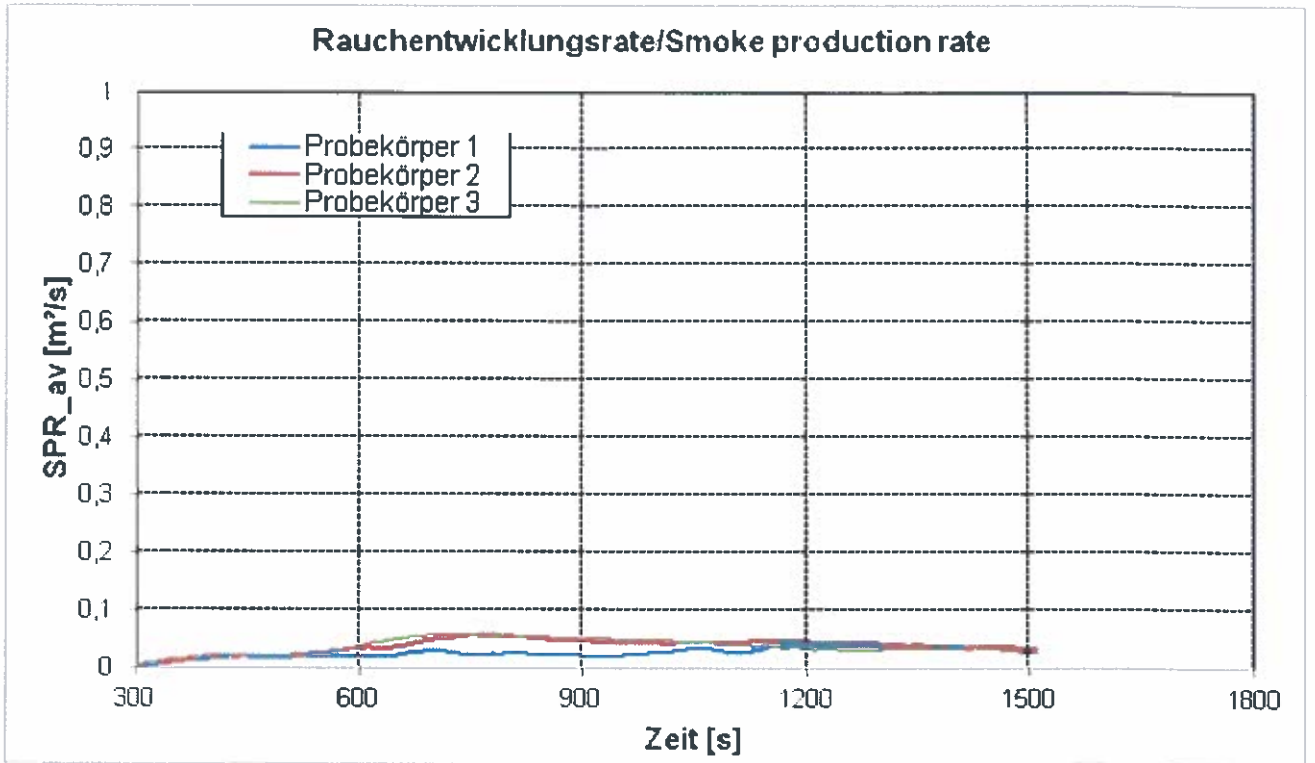


Figure 3: Smoke development rate of the test specimens

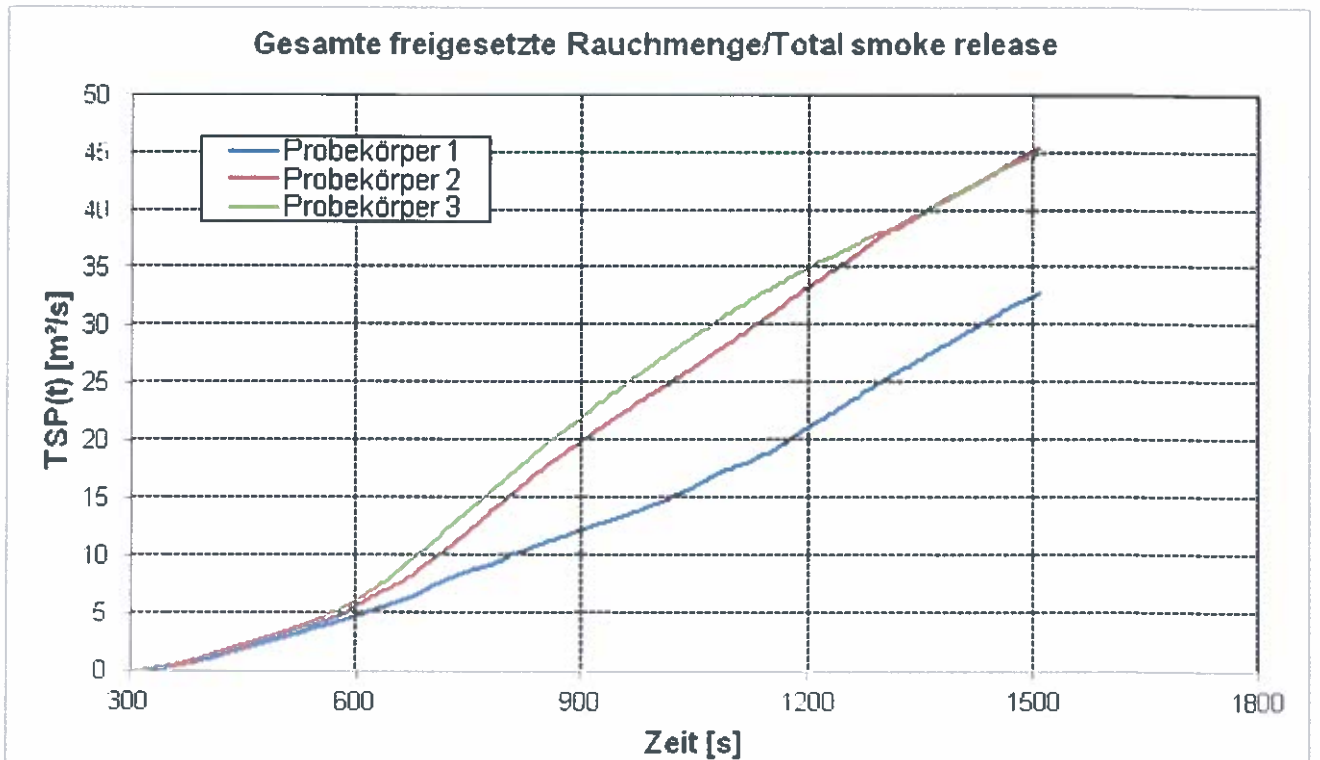


Figure 4: Total smoke quantities released by the test specimens

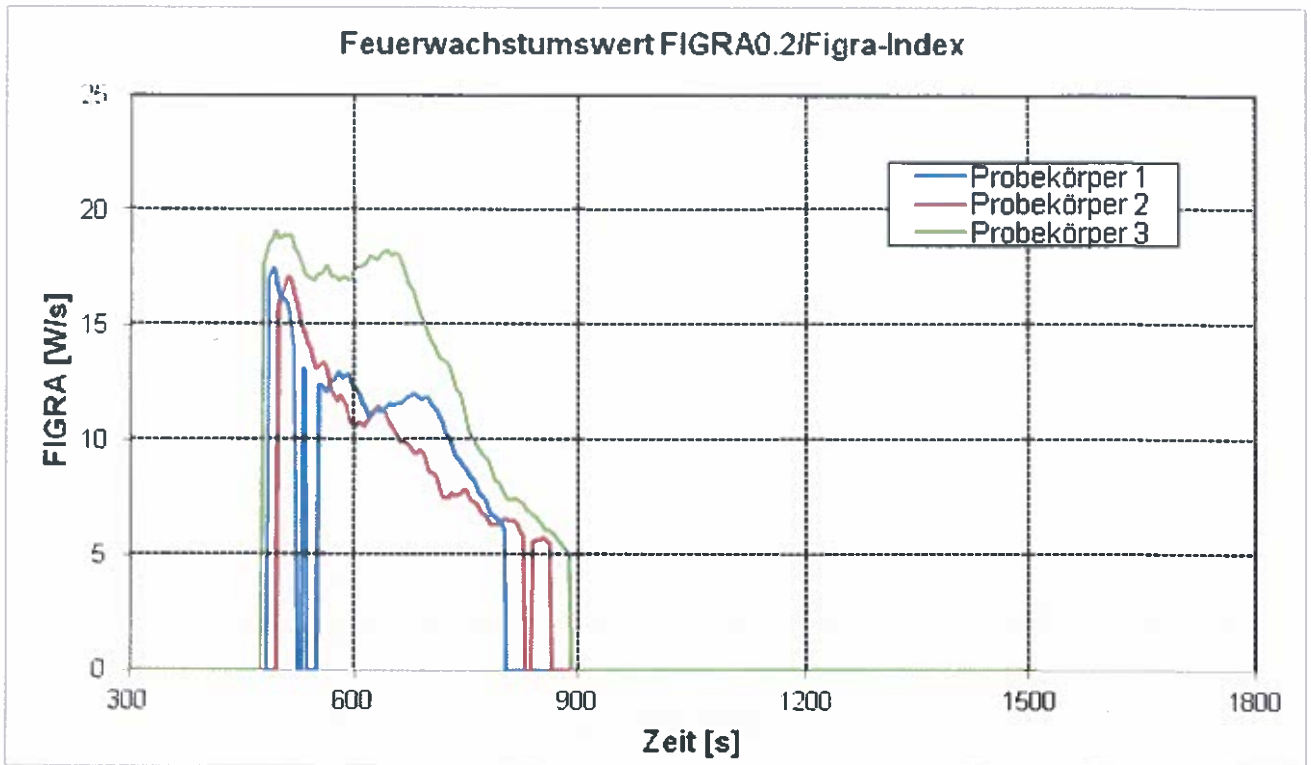


Figure 5: Fire growth rate (FIGRA) of the test specimens

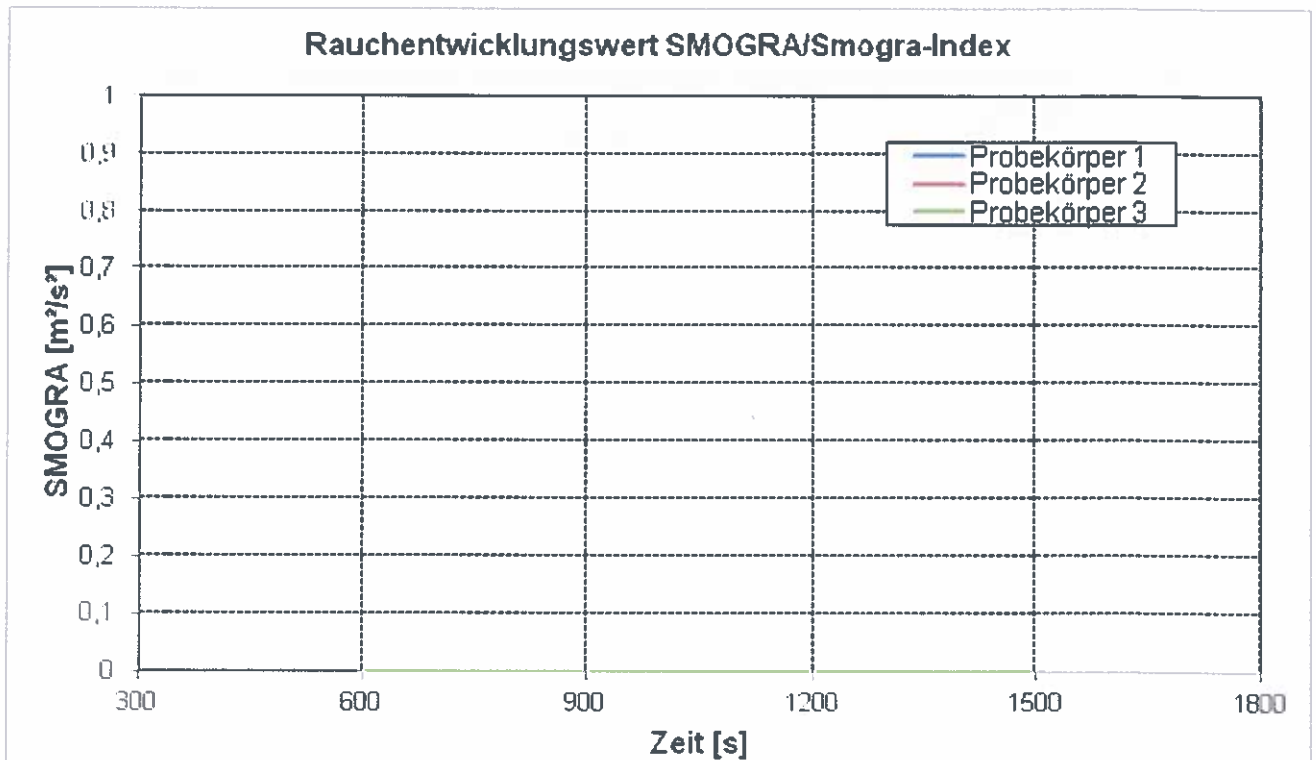


Figure 6: Smoke growth rate (SMOGRA) of the test specimens





Figure 7: Full view of the broad wing of test specimen 1



Figure 8: Close-up of the vertical outer edge of the broad wing of test specimen 1



Figure 9: Full view of the broad wing of test specimen 2



Figure 10: Close-up of the vertical outer edge of the broad wing of test specimen 2



Figure 11: Full view of the broad wing of test specimen 3



Figure 12: Close-up of the vertical outer edge of the broad wing of test specimen 3