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**TNO report**

**EN 13823:2002 "Single Burning Item" and EN  
11925-2:2002 "Ignitability" test report of  
examination on the reaction to fire performance of  
wood particle board treated with Envirograf  
Product 42**

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Sponsor	Environmental Seals Ltd Envirograf House Barfrestone, DOVER Kent, CT15 7JG United Kingdom
Project name	Reaction to Fire
Project number	006.55494/01.01

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# 1 Introduction

**Products:** Both 12 mm wood particle board, treated with one coat of Product 42 at 8 m<sup>2</sup> per litre, and 18 mm wood particle board, treated with two coats of Product 42 at 8 m<sup>2</sup> per litre.

**Purpose of test:**

Examination of product name on reaction to fire performance and smoke production in accordance with EN 13823: 2002 – Single Burning Item (SBI).

**Contractor, manufacturer and production site:**

Environmental Seals Ltd  
 Envirograf House  
 Barfrestone, DOVER  
 Kent, CT15 7JG  
 United Kingdom

**Dates of examination:** 30 and 31 May, 2006

**Period of report issue and report number:**

2006; **2006-CVB-R0????**.

**Product description:** Wood particle board, thickness 12 mm, coated with one coat of Product 42 at 8 m<sup>2</sup> per litre, and thickness 18 mm, coated with two coats of Product 42 at 8 m<sup>2</sup> per litre.

**Mounting configuration:**

The products were mounted on a softwood frame against a wooden particle board substrate with an air gap of 40 mm. A horizontal joint was positioned at 500 mm from the bottom of the specimen, a vertical joint was positioned at 200 mm from the corner.

**Samples:**

*Sampling procedure:* by contractor

*Age:* At time of examination: unknown

*Date of receipt:* 18 April, 2006

Between receipt and testing the samples were conditioned at 23 °C and 50 % r.h.

**Examination:**

A total of three SBI test were carried out on each product.

**Table 1: SBI classification parameter results.**

Product ref. and test no.	Heat production / flame spread				Smoke production		Flaming debris	
	FIGRA <sub>0.2MJ</sub> [W/s]	FIGRA <sub>0.4MJ</sub> [W/s]	THR <sub>600s</sub> [MJ]	LFS <sub>edge</sub> {Y/N}	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]	TSP <sub>600s</sub> [m <sup>2</sup> ]	FDP <sub>f≤10s</sub> {Y/N}	FDP <sub>f&gt;10s</sub> {Y/N}
12 mm particle board	15	15	2.3	N	0	42	N	N
	13	11	2.0	N	0	34	N	N
	20	20	2.7	N	0	35	N	N

Values used for Classification	<b>16</b>	<b>15</b>	<b>2.3</b>	<b>N</b>	<b>0</b>	<b>37</b>	<b>N</b>	<b>N</b>
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Observations during the tests: none

**Table 2: SBI classification parameter results.**

Product ref. and test no.	Heat production / flame spread				Smoke production		Flaming debris	
	FIGRA <sub>0,2MJ</sub> [W/s]	FIGRA <sub>0,4MJ</sub> [W/s]	THR <sub>600s</sub> [MJ]	LFS <sub>edge</sub> {Y/N}	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]	TSP <sub>600s</sub> [m <sup>2</sup> ]	FDP <sub>f ≤10s</sub> {Y/N}	FDP <sub>f &gt;10s</sub> {Y/N}
18 mm particle board	5	5	0.6	N	0	40	N	N
	7	7	0.8	N	0	44	N	N
	8	8	1.0	N	0	48	N	N
Values used for Classification	<b>7</b>	<b>7</b>	<b>0.8</b>	<b>N</b>	<b>0</b>	<b>44</b>	<b>N</b>	<b>N</b>

Observations during the tests: none

Remark: the smoke production was calculated using the data from a separate run as reference level, as agreed upon in the SH02 of Notified Bodies, on April 10 2006, in Paris.

**Ignitability following EN 11925-2:2002**

The results are given in Table 2.

**Table 2: Ignitability classification parameter results, ignition time 30 s**

sample	Ignition of sample	Maximum flame height	$t_{150}$	After-burning time	Ignition of filter paper
	[Y/N]	[mm]	[s]	[s]	Y/N
<b>Edge ignition</b>					
1	Y		$\infty$ not reached	0	N
2	Y			0	N
3	Y			0	N
4	Y			0	N
5	Y			0	N
6	Y			0	N
Value used for classification					N
<b>surface ignition</b>					
1	Y		$\infty$ not reached	0	N
2	Y			0	N
3	Y			0	N
4	Y			0	N
5	Y			0	N
6	Y			0	N
Value used for classification					N

Observations of physical behaviour of the test specimen: the material did not shrink and melt away from the flame without ignition. Applying the testing protocol as specified in Annex A of the standard was therefore deemed not necessary.

**Conclusions/Remarks:**

1. A formal classification is to be assessed in accordance with the EN 13501-1, “Classification using fire reaction tests”.
2. The field of application of the test results is limited to the end use applications in accordance with the mounting and fixing used in the test.
3. Graphs of rate of heat release  $HRR_{av}(t)$ , total heat release  $THR(t)$ ,  $1000 \cdot HRR_{av}(t)/(t-300)$ , rate of smoke production  $SPR_{av}(t)$ , total smoke production  $TSP(t)$  and  $10000 \cdot SPR_{av}(t)/(t-300)$ , are presented hereafter.
4. The test results relate to the behaviour of the test specimens of a material under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.
5. Regarding the precision of the test method, the following information is given in the Annex B of the EN 13823:

**Table B.2 — Average relative standard deviations**

	FIGRA <sub>0,2MJ</sub>	FIGRA <sub>0,4MJ</sub>	THR <sub>600s</sub>	SMOGRA	TSP <sub>600s</sub>
Average ( sr/m)	14 %	15 %	11 %	15 %	18 %

Following Annex B of EN 11925-2 the absolute repeatability/reproducibility for this test method is within 3 s to 5 s.

W. Langstraat

F. Paap Ph.D.

## EN 13823 (SBI test)

TNO  
 data processing

Productname: **Envirograf product 42**

Testdate: 30 May 2006

Specimen no: 1 of 3

Preliminary SBI classification: A1-B / s1 / d0

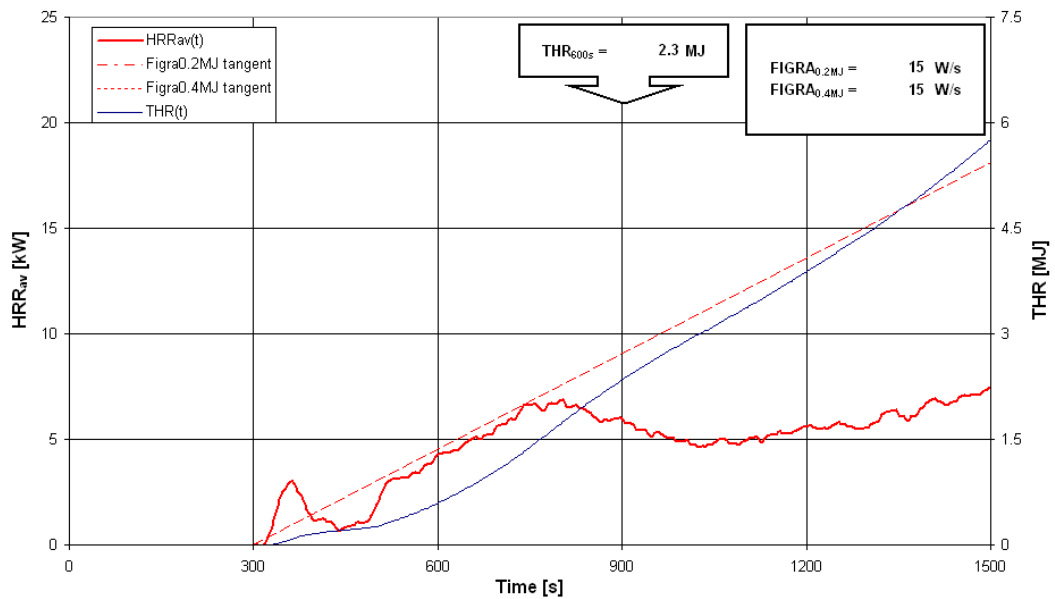
(Final classification assessment is based on repetitive SBI tests and other tests)

### Classification parameter results:

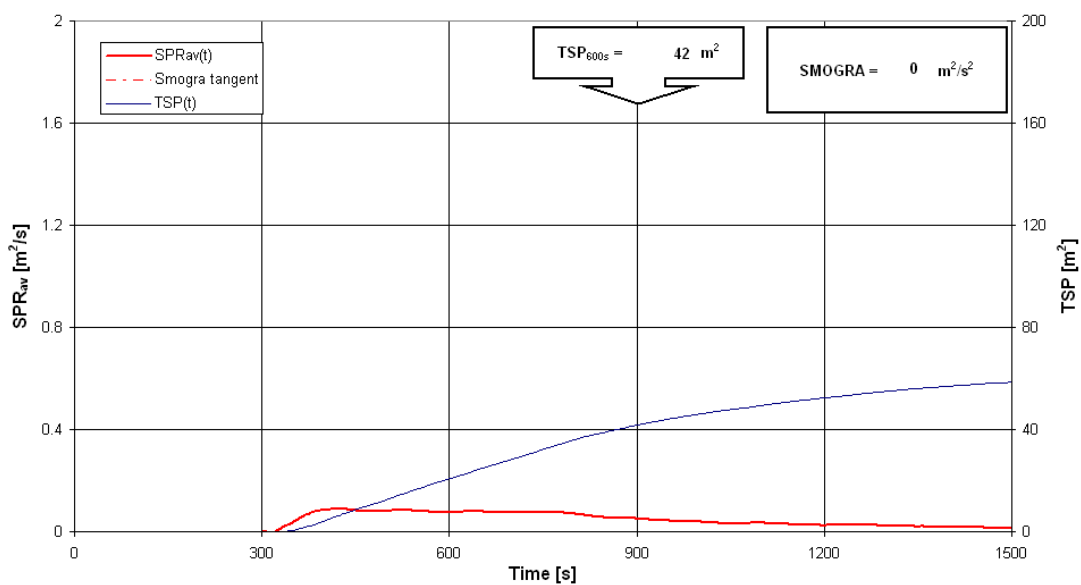
FIGRA <sub>0.2MJ</sub> [W/s]:	15	LFS till edge {Y/N}:	N
FIGRA <sub>0.4MJ</sub> [W/s]:	15	FDP (f<10s) {Y/N}:	N
THR <sub>600s</sub> [MJ]:	2.3	FDP (f>10s) {Y/N}:	N
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]:	0		
TSP <sub>600s</sub> [m <sup>2</sup> ]:	42		

Checks OK {Y/N}: Y

### HRR<sub>av</sub>(t) and THR(t)



### SPR<sub>av</sub>(t) and TSP(t)



**EN 13823 (SBI test)**

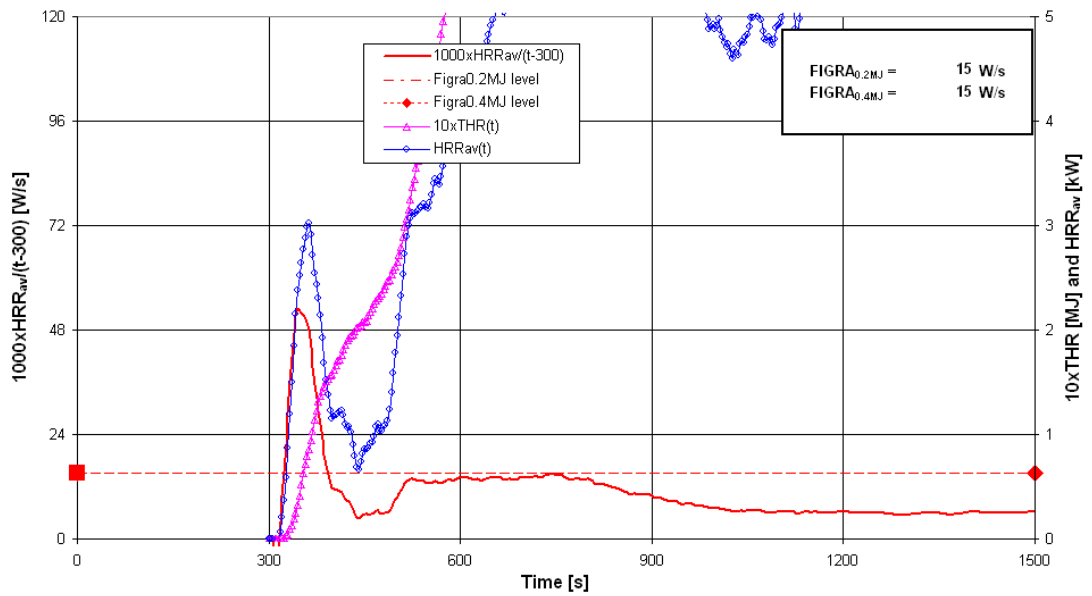
TNO  
 data processing

Productname: **Envirograf product 42**

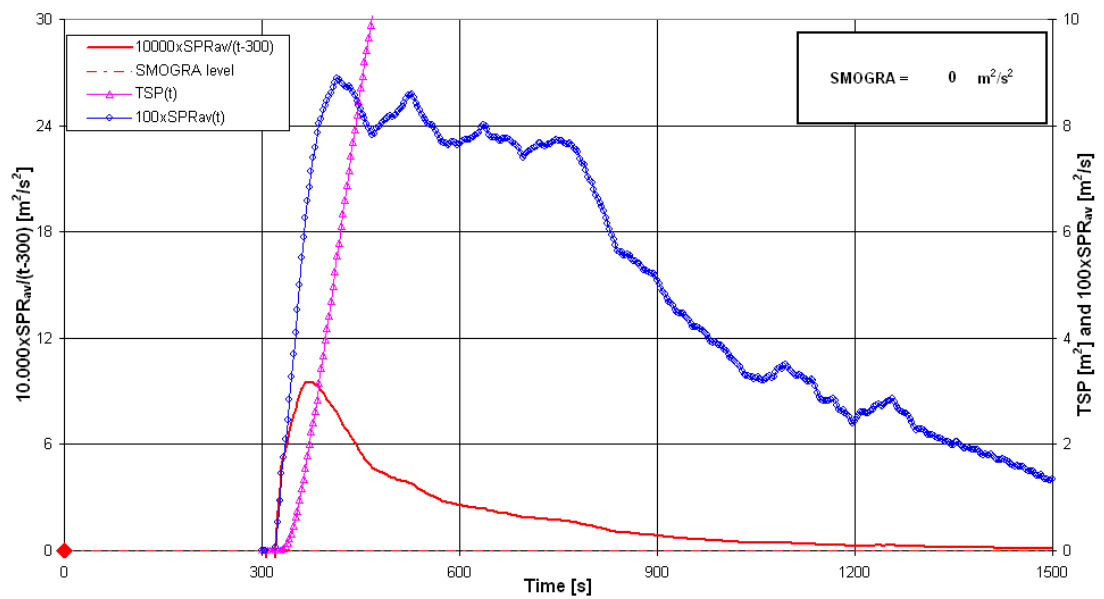
Testdate: 30 May 2006

Specimen no: 1 of 3

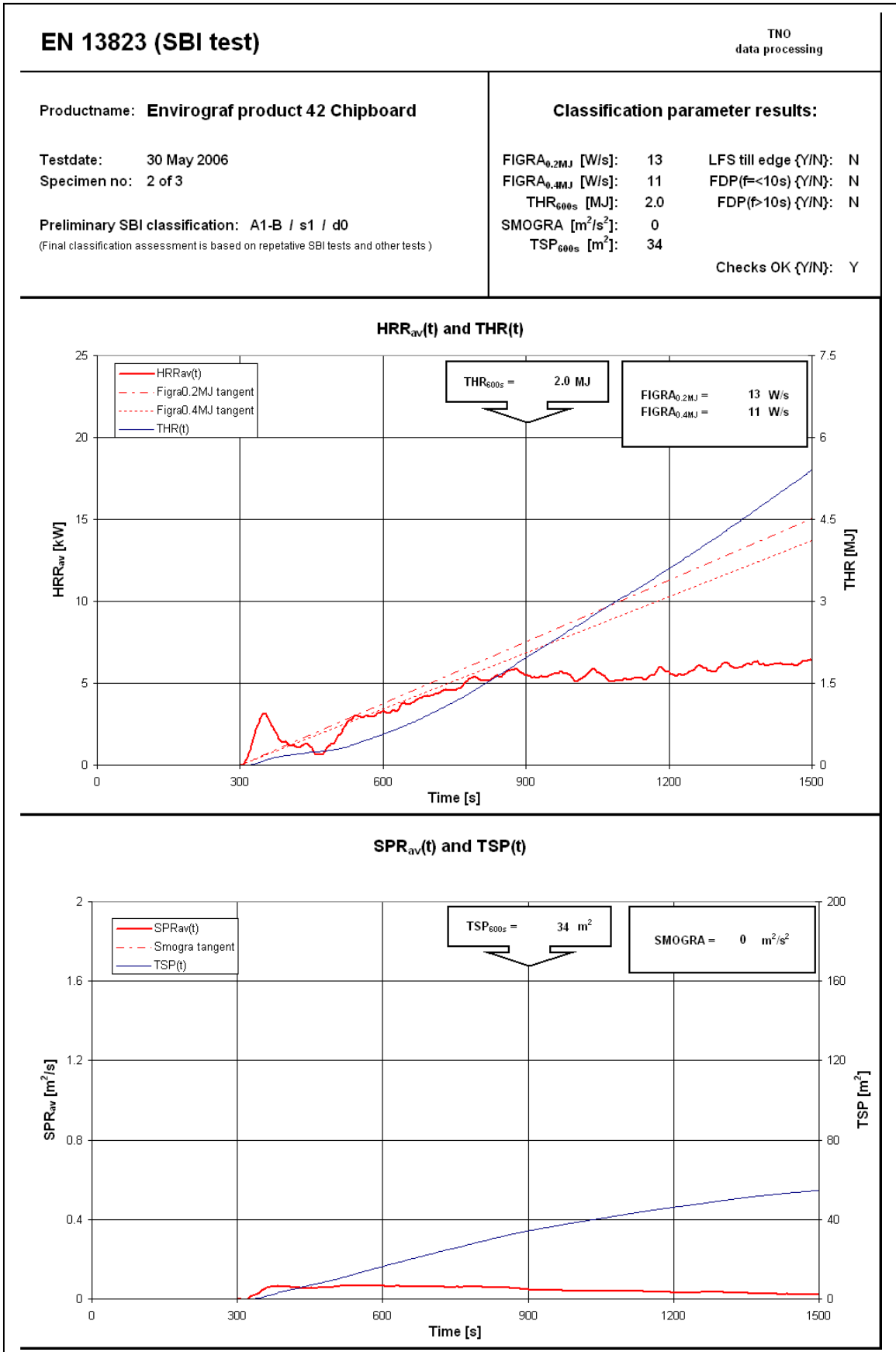
**FIGRA with thresholds**



**SMOGRA with thresholds**







**EN 13823 (SBI test)**

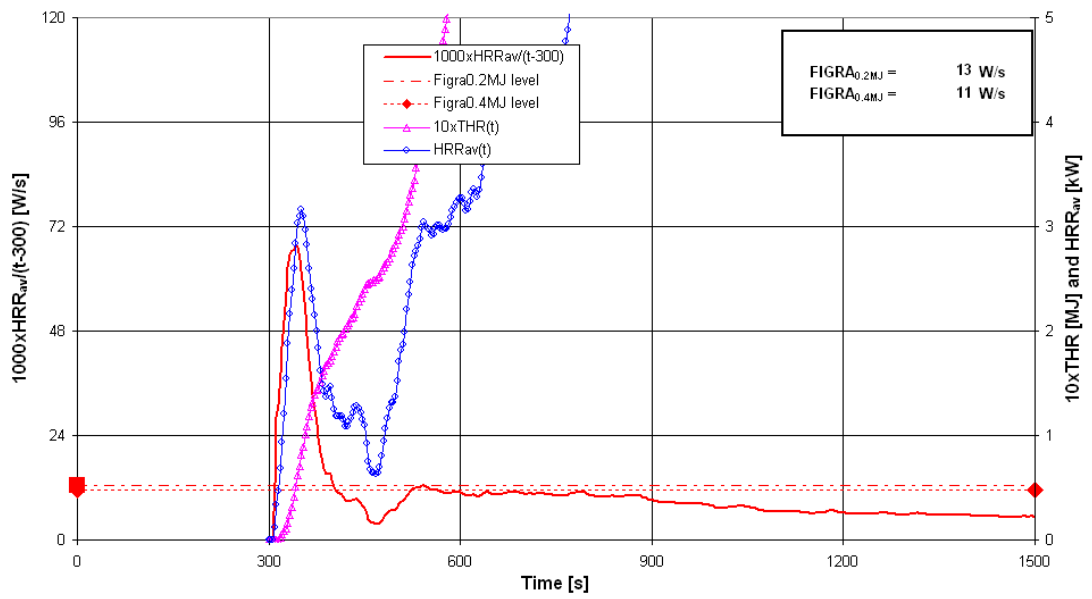
TNO  
 data processing

Productname: **Envirograf product 42 Chipboard**

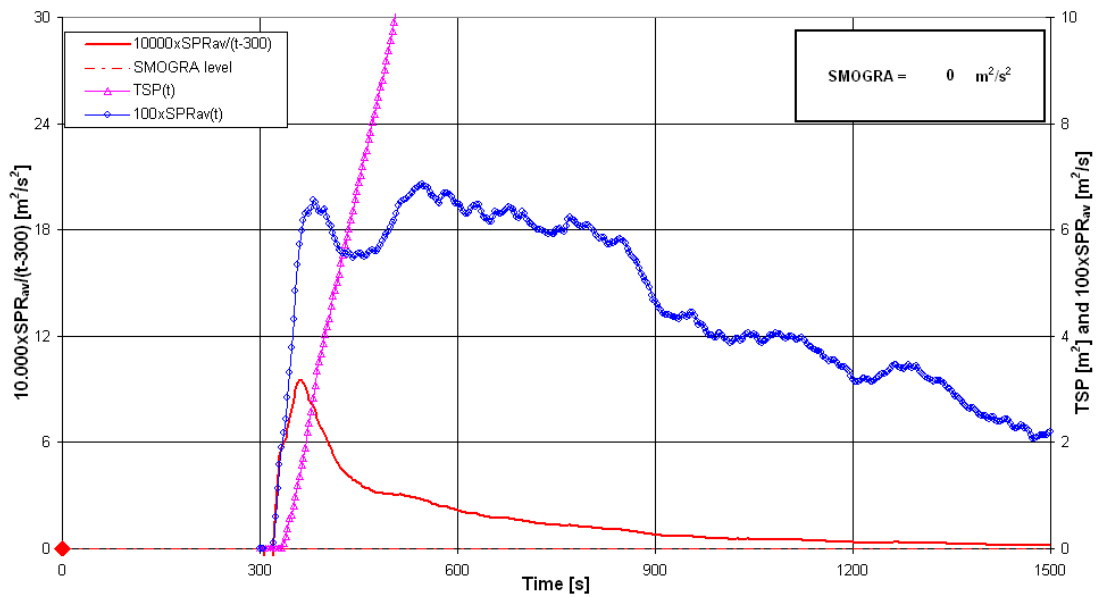
Testdate: 30 May 2006

Specimen no: 2 of 3

**FIGRA with thresholds**



**SMOGRA with thresholds**



## EN 13823 (SBI test)

TNO  
 data processing

Productname: **Envirograf product 42 Chipboard**

### Classification parameter results:

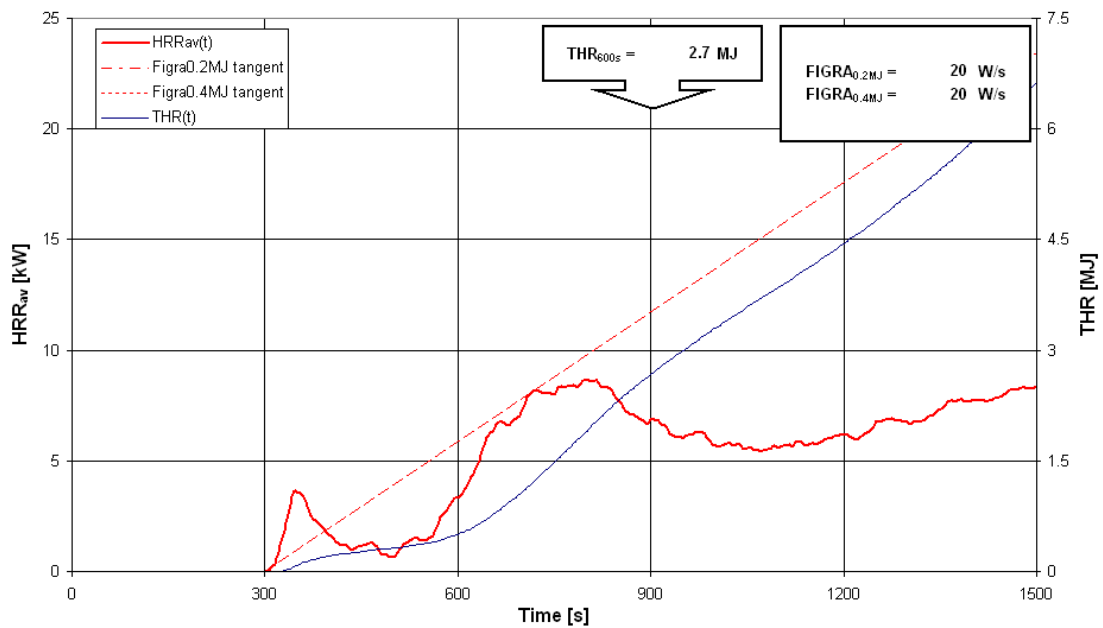
Testdate: 30 May 2006  
 Specimen no: 3 of 3

FIGRA <sub>0.2MJ</sub> [W/s]:	20	LFS till edge {Y/N}:	N
FIGRA <sub>0.4MJ</sub> [W/s]:	20	FDP (f<10s) {Y/N}:	N
THR <sub>600s</sub> [MJ]:	2.7	FDP (f>10s) {Y/N}:	N
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]:	0		
TSP <sub>600s</sub> [m <sup>2</sup> ]:	35		

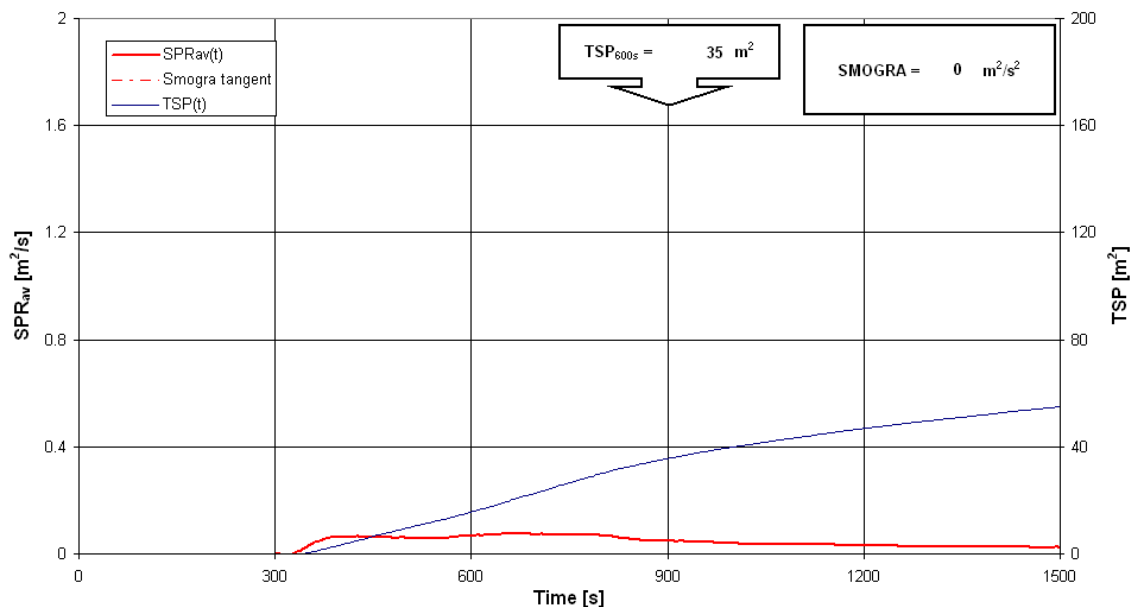
Preliminary SBI classification: **A1-B / s1 / d0**  
 (Final classification assessment is based on repetitive SBI tests and other tests)

Checks OK {Y/N}: Y

### HRR<sub>av</sub>(t) and THR(t)



### SPR<sub>av</sub>(t) and TSP(t)



**EN 13823 (SBI test)**

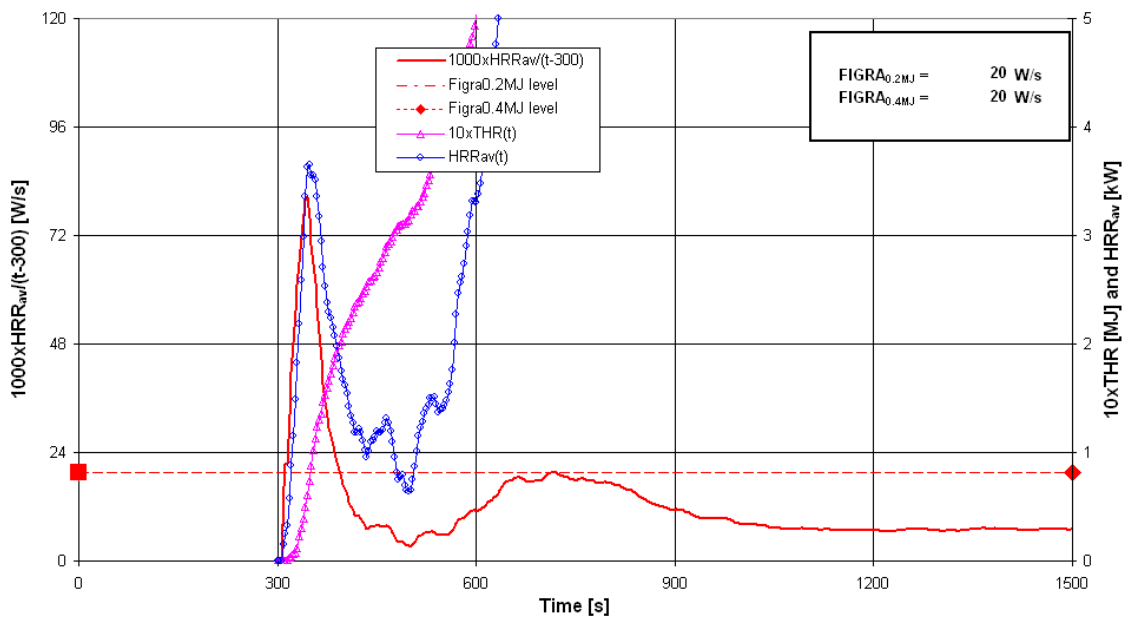
TNO  
 data processing

Productname: **Envirograf product 42 Chipboard**

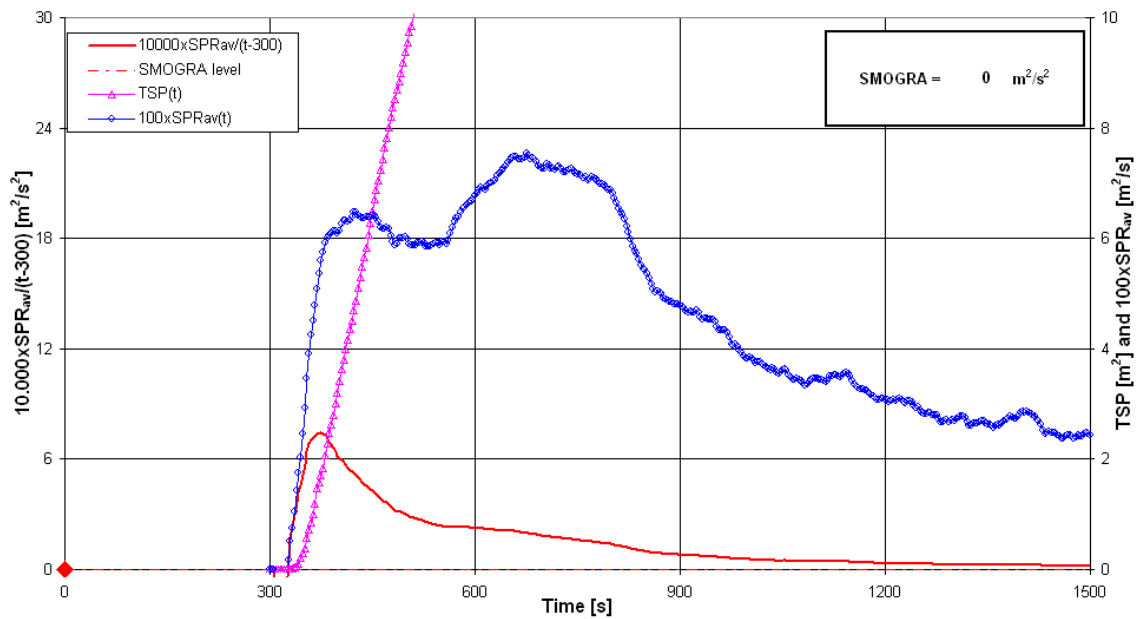
Testdate: 30 May 2006

Specimen no: 3 of 3

**FIGRA with thresholds**



**SMOGRA with thresholds**



# EN 13823 (SBI test)

TNO  
 data processing

Productname: **Product 42 on 18mm Chipboard**

## Classification parameter results:

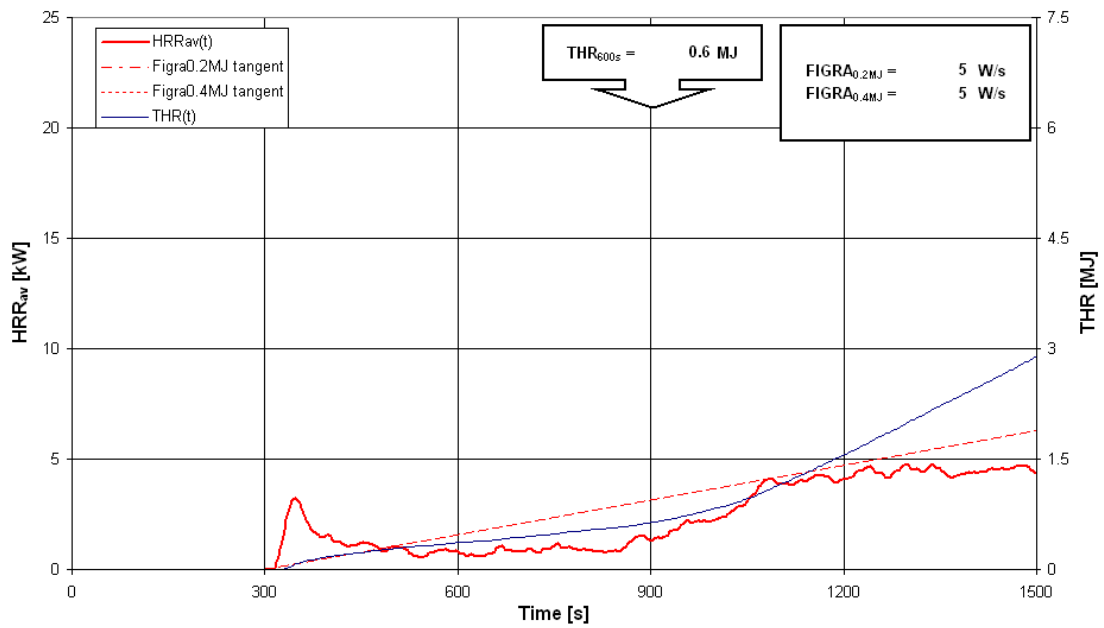
Testdate: 31 May 2006  
 Specimen no: 1 of 3

FIGRA <sub>0.2MJ</sub> [W/s]:	5	LFS till edge {Y/N}:	N
FIGRA <sub>0.4MJ</sub> [W/s]:	5	FDP (f<10s) {Y/N}:	N
THR <sub>600s</sub> [MJ]:	0.6	FDP (f>10s) {Y/N}:	N
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ):	0		
TSP <sub>600s</sub> [m <sup>2</sup> ):	40		

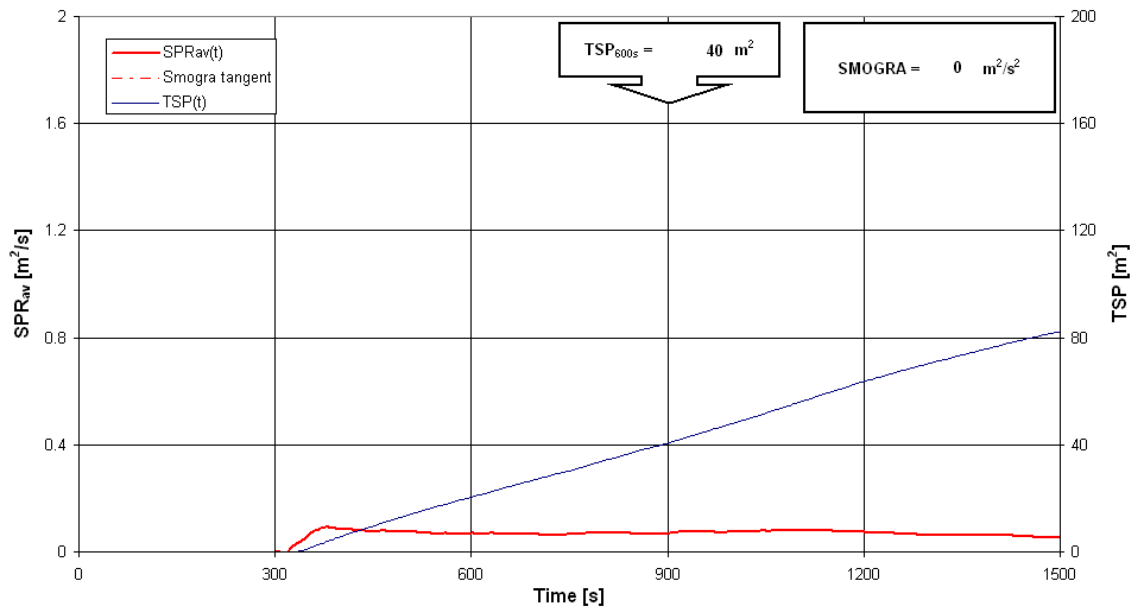
Preliminary SBI classification: **A1-B / s1 / d0**  
 (Final classification assessment is based on repetitive SBI tests and other tests)

Checks OK {Y/N}: N

**HRR<sub>av</sub>(t) and THR(t)**



**SPR<sub>av</sub>(t) and TSP(t)**



**EN 13823 (SBI test)**

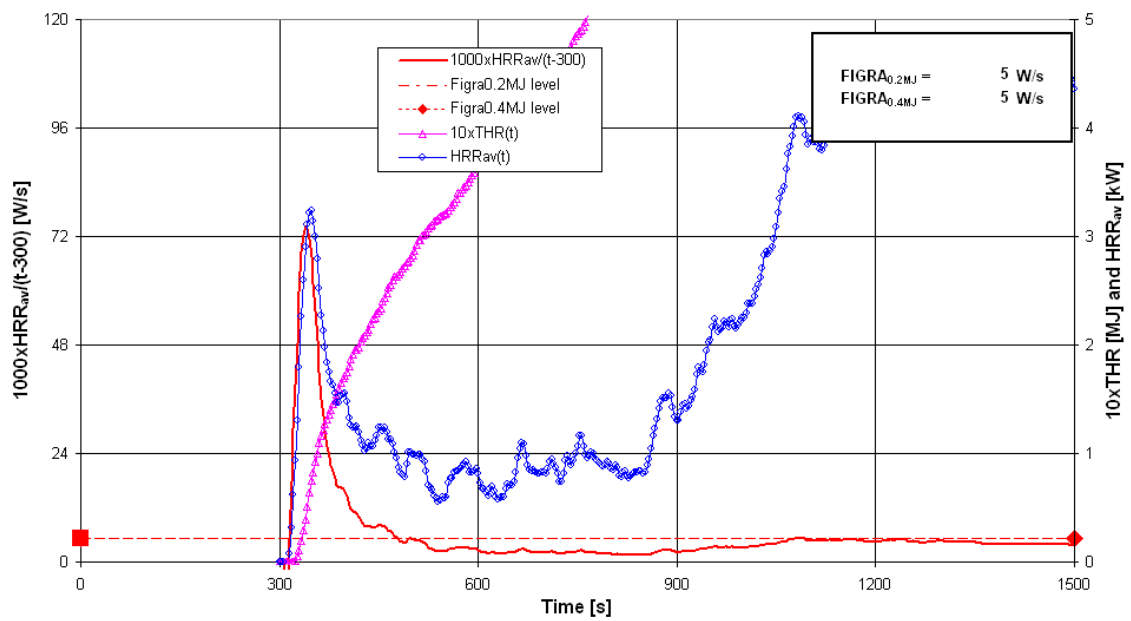
TNO  
 data processing

Productname: **Product 42 on 18mm Chipboard**

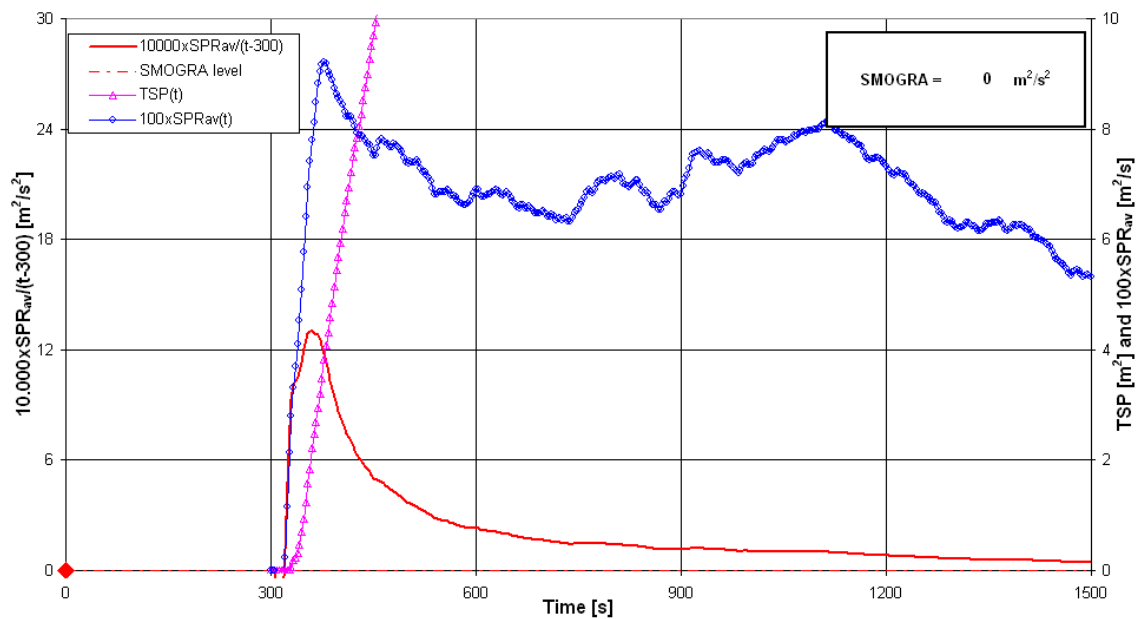
Testdate: 31 May 2006

Specimen no: 1 of 3

**FIGRA with thresholds**



**SMOGRA with thresholds**



## EN 13823 (SBI test)

TNO  
 data processing

Productname: **Product 42 on 18mm Chipboard**

### Classification parameter results:

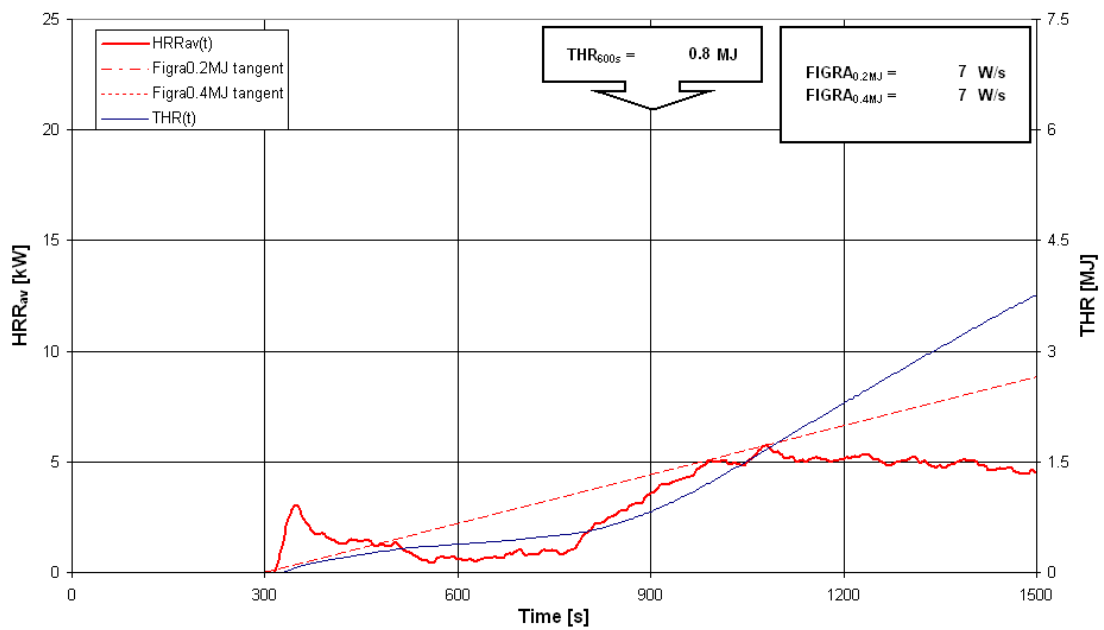
Testdate: 31 May 2006  
 Specimen no: 2 of 3

FIGRA <sub>0.2MJ</sub> [W/s]:	7	LFS till edge {Y/N}:	N
FIGRA <sub>0.4MJ</sub> [W/s]:	7	FDP (f<10s) {Y/N}:	N
THR <sub>600s</sub> [MJ]:	0.8	FDP (f>10s) {Y/N}:	N
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ):	0		
TSP <sub>600s</sub> [m <sup>2</sup> ):	44		

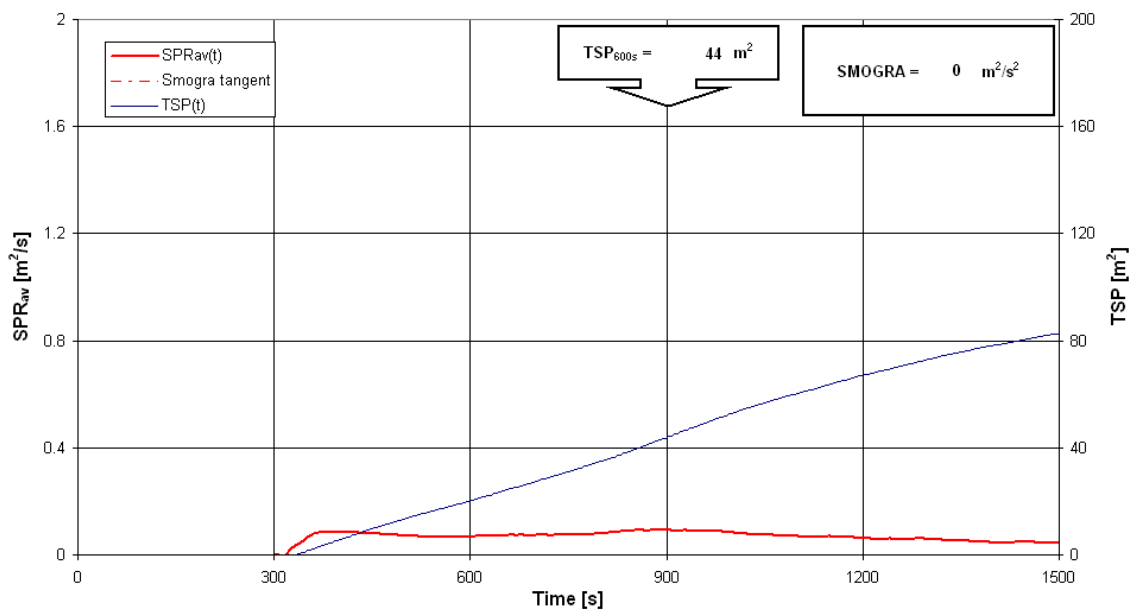
Preliminary SBI classification: **A1-B / s1 / d0**  
 (Final classification assessment is based on repetitive SBI tests and other tests)

Checks OK {Y/N}: N

### HRR<sub>av</sub>(t) and THR(t)



### SPR<sub>av</sub>(t) and TSP(t)



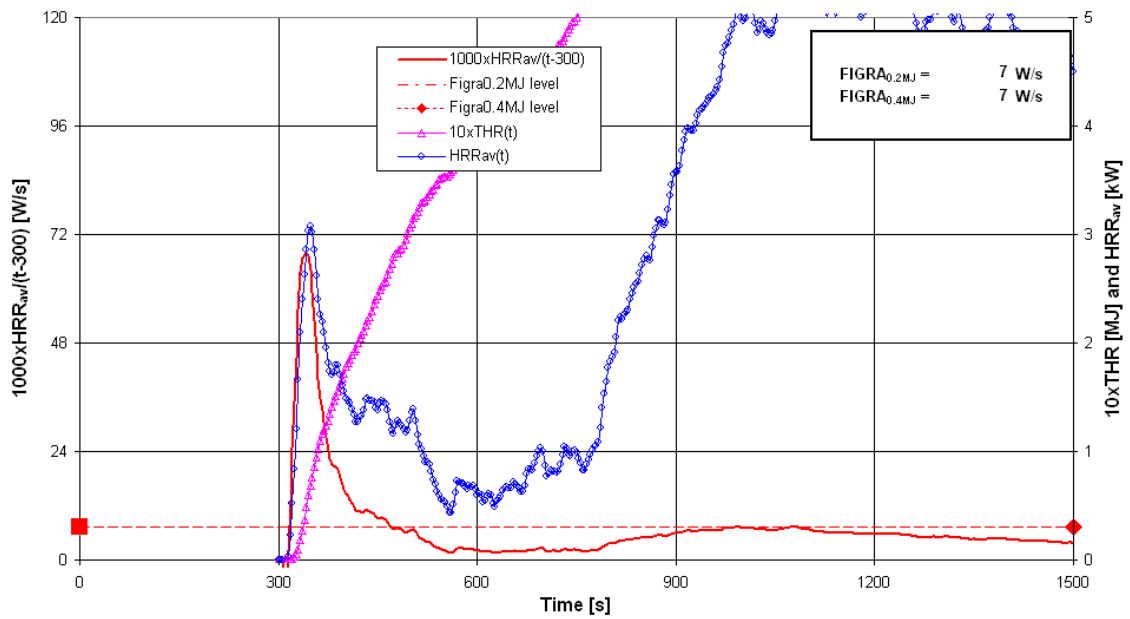
**EN 13823 (SBI test)**

TNO  
 data processing

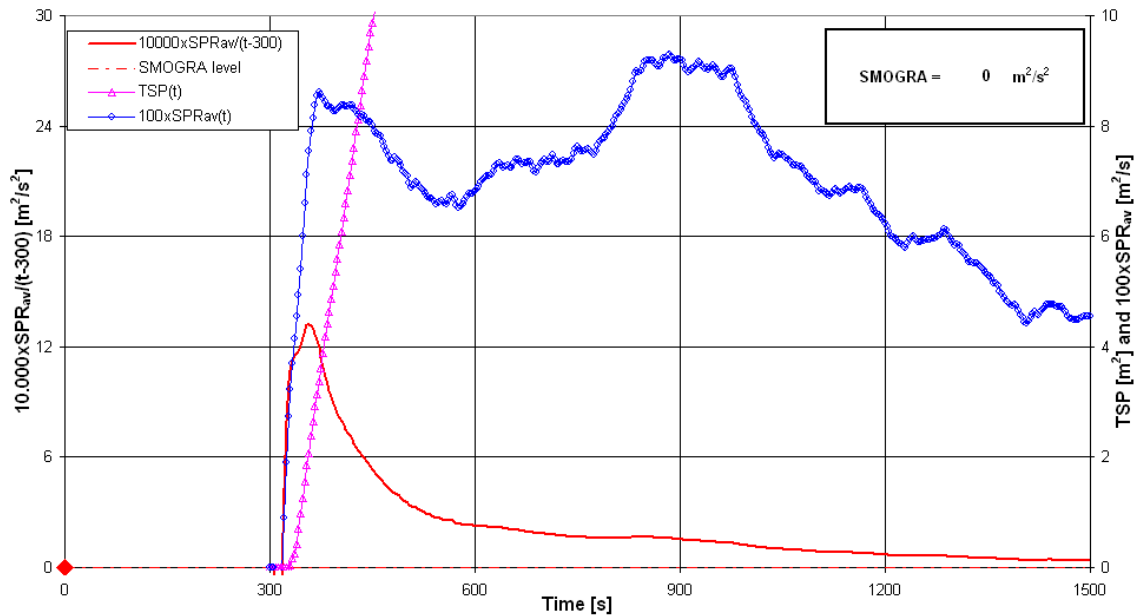
Productname: **Product 42 on 18mm Chipboard**

Testdate: 31 May 2006  
 Specimen no: 2 of 3

**FIGRA with thresholds**



**SMOGRA with thresholds**





## EN 13823 (SBI test)

TNO  
 data processing

Productname: **Product 42 on 18mm Chipboard**

### Classification parameter results:

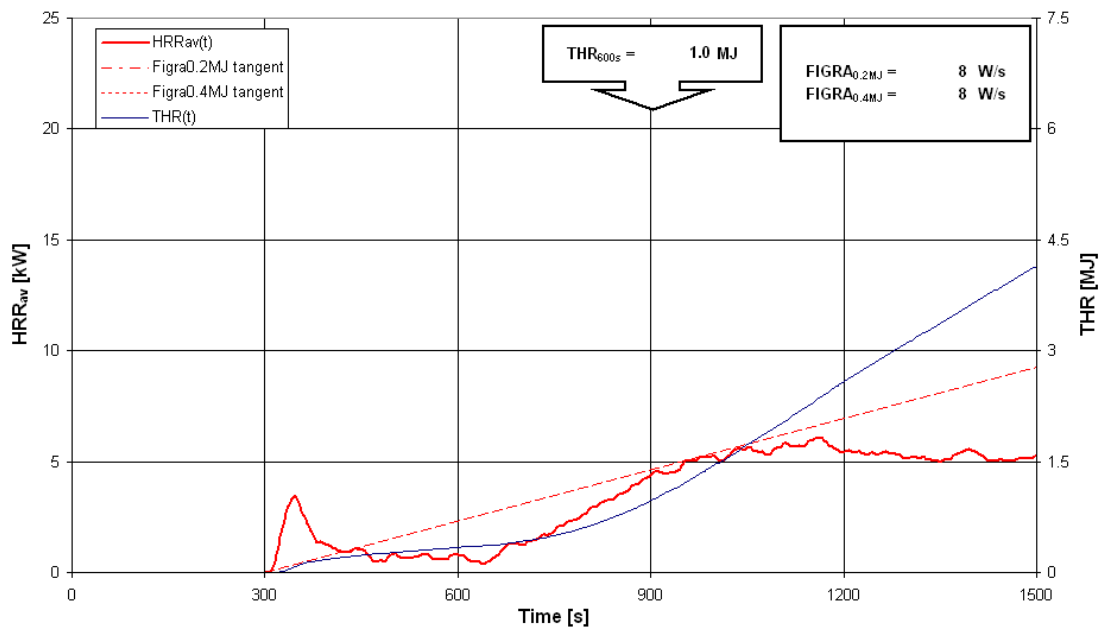
Testdate: 31 May 2006  
 Specimen no: 3 of 3

FIGRA <sub>0,2MJ</sub> [W/s]:	8	LFS till edge {Y/N}:	N
FIGRA <sub>0,4MJ</sub> [W/s]:	8	FDP (f<10s) {Y/N}:	N
THR <sub>600s</sub> [MJ]:	1.0	FDP (f>10s) {Y/N}:	N
SMOGRA [m <sup>2</sup> /s <sup>2</sup> ):	0		
TSP <sub>600s</sub> [m <sup>2</sup> ):	48		

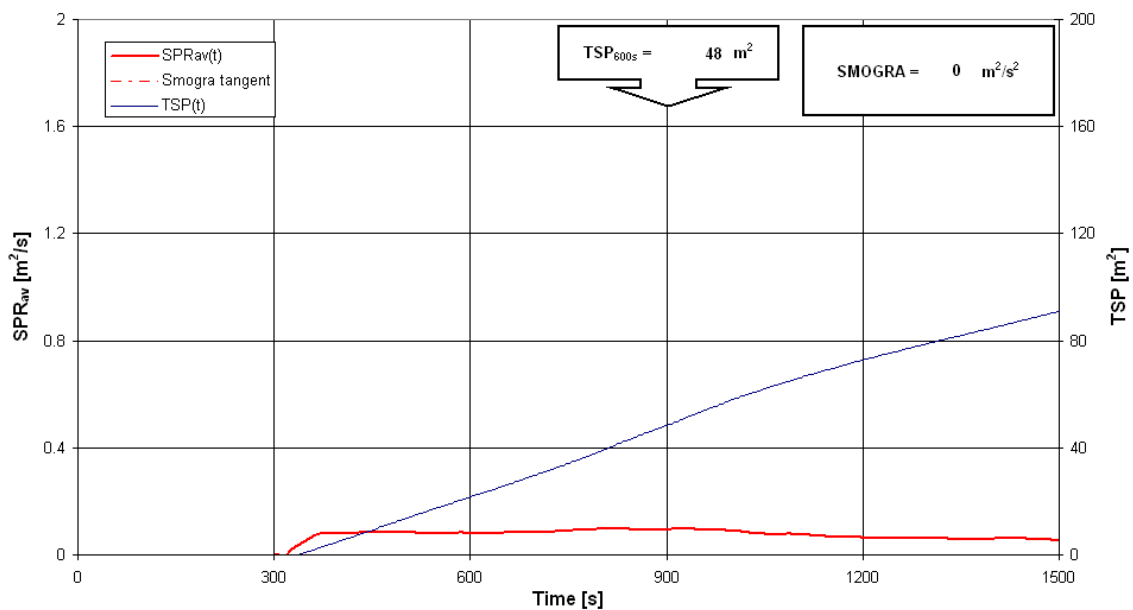
Preliminary SBI classification: **A1-B / s1 / d0**  
 (Final classification assessment is based on repetitive SBI tests and other tests)

Checks OK {Y/N}: N

### HRR<sub>av</sub>(t) and THR(t)



### SPR<sub>av</sub>(t) and TSP(t)



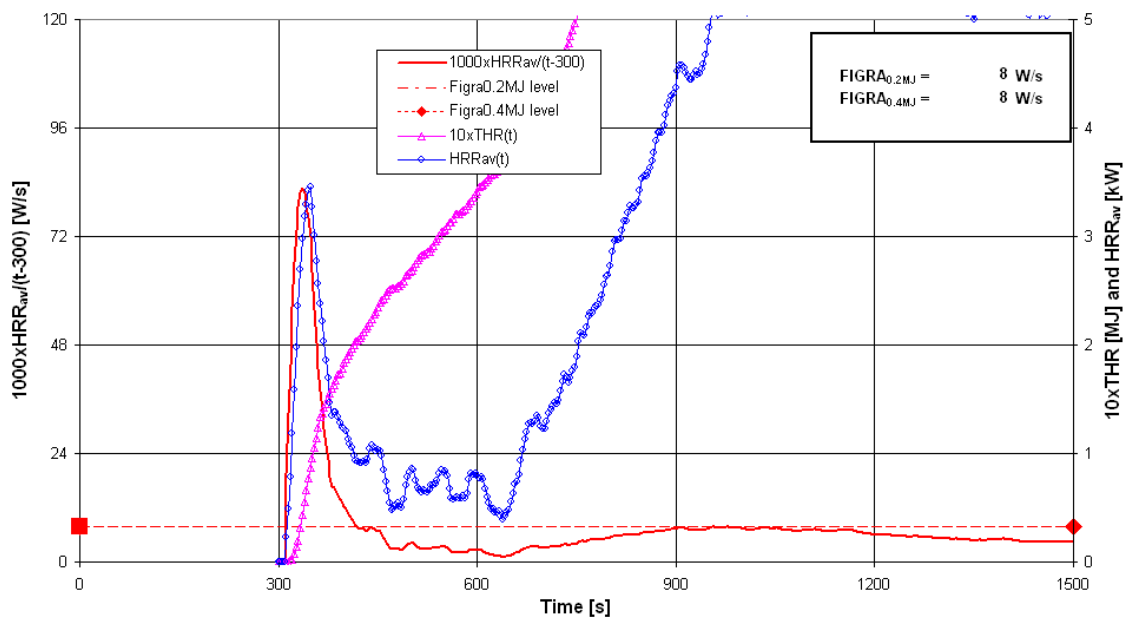
**EN 13823 (SBI test)**

TNO  
 data processing

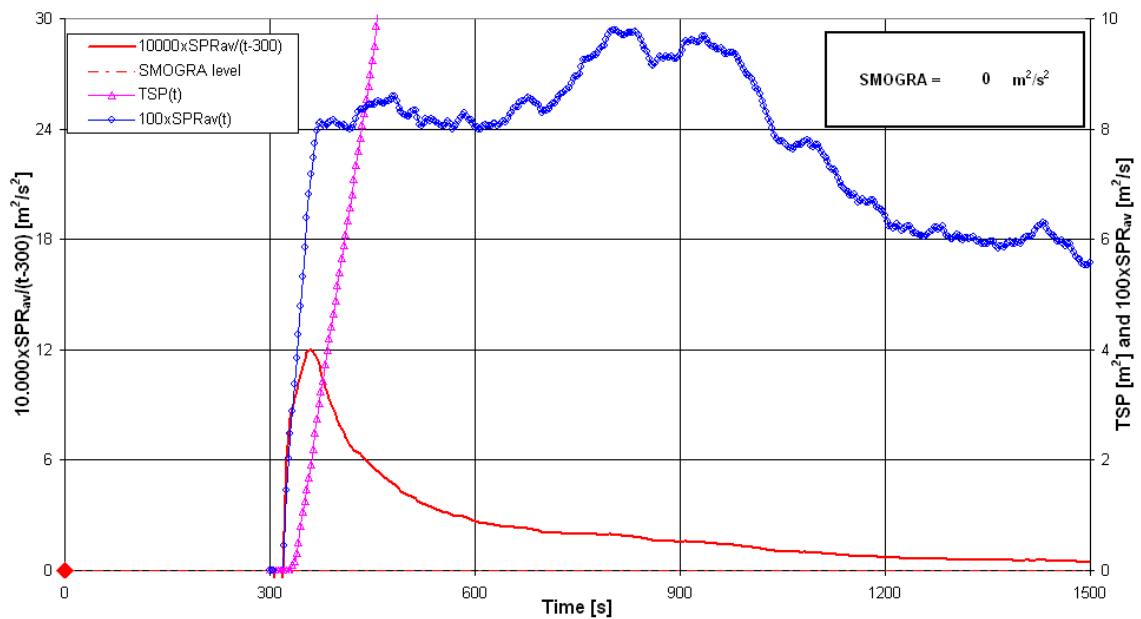
Productname: **Product 42 on 18mm Chipboard**

Testdate: 31 May 2006  
 Specimen no: 3 of 3

**FIGRA with thresholds**



**SMOGRA with thresholds**



Pictures of the test specimen before and after the test.