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REPORT No. 13_03289-1-a

CUSTOMER BARPIMO, S.A.

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PURPOSE REACTION TO FIRE TEST REPORT
ACCORDING TO UNE-EN 13823:2012 AND UNE-EN ISO 11925-2:2011

TESTED SAMPLE 2 COMPONENTS POLYURETHANE PRIMER SOLVENT BASED
COATING

REF.«2 COMPONENTS POLYURETHANE SOLVENT BASED
PRIMER COATING, FONDIPOL IGNÍFUGO + 2 COMPONENTS
POLYURETHANE SOLVENT BASED FINISHING COATING,
LACAPOL INGÍFUGO»


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SAMPLE CHARACTERISTICS

On 2 October 2013, FUNDACIÓN TECNALIA R&I , received from the company BARPIMO, S.A., 4 litre of 2 components polyurethane solvent based primer coating “FONDIPOL IGNÍFUGO”, 2 litres of catalizer N.295, 4 litres of 2 components polyurethane solvent based finishing coating y 2 litre of catalyser N.280, referred as:

.«2 COMPONENTS POLYURETHANE PRIMER COATING SOLVENT BASED, FONDIPOL IGNÍFUGO + 2 COMPONENTS POLYURETHANE FINISHING COATING SOLVENT BASED, LACAPOL INGÍFUGO»

As mentioned later in this report this coating system was applied on wood fiber boards (MDF).

The annex includes images and the technical datasheet of the material tested.

REQUESTED TEST

The test requested is ***Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item*** according to standard UNE EN 13823:2012.

The test requested is ***Reaction to fire tests for building products. Ignitability of building products when subjected to direct impingement of flame. Part 2: Single-flame source test*** according to standard UNE EN ISO 11925-2:2011.

The uncertainties related to the main test parameters will be available for the client, upon request.



CONDITIONING

The test specimen is conditioned prior to test under the specifications set out in the standard UNE EN 13238:2011: **Reaction to fire tests for building products. Conditioning procedures and general rules for selection of substrates.**

The samples remain in a conditioning chamber at 23 ± 2 °C and $50 \pm 5\%$ relative humidity, until constant weight is achieved.

The tests were carried out under the following environmental conditions of temperature and humidity:

T (°C)= 21 RH (%)= 61



TESTS CONDUCTED

a) SBI TEST ACCORDING TO UNE EN 13823:2012

The test requested is ***Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item*** according to standard UNE EN 13823:2012.

A test sample consisted of two vertical wings that formed a right angle assembled on a sample holder cart which were exposed to a burner located in the lower section of the corner (the "main burner"). The flames were obtained by combustion of propane gas, injected through a sand bed with an output energy of (30.7 ± 2.0) kW.

The behaviour of the sample was evaluated during a 21 minute period. The behaviour parameters were the emission of heat, production of smoke, lateral propagation and falling of flaming droplets and particles.

The measurements were obtained every 3 seconds to calculate the volume flow rate, the heat release rate (HRR) and the smoke production rate (SPR).



DETAILS OF SUBSTRATE USED AND FASTENING METHOD

The samples referred as, «**2 COMPONENTS POLYURETHANE SOLVENT BASED PRIMER COATING, FONDIPOL IGNÍFUGO + 2 COMPONENTS POLYURETHANE SOLVENT BASED FINISHING COATING, LACAPOL INGÍFUGO**» is defined as two components polyurethane solvent based coating.

Each sample is supported on a gypsum plasterboard substratum, simulating the walls as specified in the UNE EN 13823:2012 standard.

Gypsum plasterboards used as substratum meets the requirements according to UNE EN 13238:2011 and EN 520 standards:

- a) Reaction to fire : A2-s1, d0 (UNE EN 13501-1)
- b) Thickness: 12 mm.

The samples are placed in compliance with sections 5.2 and 5.3 of standard UNE EN 13823:2012 regarding the assembly of samples with a T angle to ensure that the line of the corner formed by the panels does not widen during the test.

The coating system “FONDIPOL IGNÍFUGO + LACAPOL IGNÍFUGO” was applied on wood fiber boards (MDF) with following characteristics:

- a) Brown colored boards of 10 mm thick.
- b) Reaction to fire classification B-s2, d0 according to UNE EN 13501-1:2007 + A1:2010.

The coating system was applied following these instructions:

- a) Method of coating: Coating using airbrush.
- b) Weighing and coats First a coat of “FONDIPOL IGNÍFUGO” (150gr/m²) was applied and later a second coat of “LACAPOL IGNÍFUGO” (120gr/m²) was applied.
- c) The coating system was applied by staff of Tecnalía.

The simple was tested without any gap between the sample and the substrate.



TERMS AND DEFINITIONS

This test allows us to evaluate the heat contribution and the smoke production in the products submitted to the thermal attack of a propane gas burner.

These measures are the basis to determine the following rates:

FIGRA_{0.2 MJ (W/S)} AND FIGRA_{0.4 MJ (W/S)}

is defined as the maximum value of the quotient of the heat release rate of the sample and the instant in which it has started using a heat release threshold of 0.2 MJ and 0.4 MJ, respectively.

THR_{600 s (MJ)}

is defined as the total amount of heat released by the sample in the first 600 s since the start of exposure to the main burner.

TSP_{600 s (MJ)}

is defined as the total amount of smoke released by the sample within the first 600 s since the start of exposure to the main burner.

SMOGRA

is defined as the smoke production rate. The maximum value of the quotient of the smoke production rate by the sample and the moment in which it has taken place.

LFS

is defined as the lateral spread of flame through the wing of the sample.

DROP_{T≤10 s} AND DROP_{T>10 s}

are defined as the fall of flaming droplets/particles during the first 600 s of the testing period which remain burning, after falling, no more than 10 s and more than 10 s, respectively.



TEST RESULTS

TEST SPECIMEN	THR ₆₀₀ (MJ)	FIGRA _{0.2 MJ} (W/s)	FIGRA _{0.4 MJ} (W/s)	TSP _{600 S} (m ²)	SMOGRA (m ² /s ²)	LFS	DROP _{T≤10s}	DROP _{t>10s}
1	1.12	75.33	7.99	119.67	27.60	< edge	No	No
2	0.89	120.35	14.59	133.99	28.73	< edge	No	No
3	2.25	127.42	31.15	123.97	30.39	< edge	No	No
Average	1.42	107.70	17.91	125.88	28.91	< edge	No	No

NOTE: "The test results correspond to the behaviour of test samples of a product, under the particular conditions of the test. It does not pretend to constitute a single fire potential risk assessment criteria that can entail the use of the product"

The annexes include the graphics corresponding to the rates related with the heat release and the smoke release.

OBSERVATIONS

	Time (min)	Remarks
Test specimen 1	2'	Surface inflammation.
Test specimen 2	2'	Surface inflammation.
Test specimen 3	2'	Surface inflammation.

The following data was registered:

Maximum carbonised distance at a height of 500 mm from the lower border:

Test specimen 1 (mm): —

Test specimen 2 (mm): —

Test specimen 3 (mm): —

Maximum carbonised distance at a height of 1000 mm from the lower border:

Test specimen 1 (mm): —

Test specimen 2 (mm): —

Test specimen 3 (mm): —



B) IGNITABILITY TEST ACCORDING TO UNE EN ISO 11925-2:2011

The test requested is ***Reaction to fire tests for building products. Ignitability of building products when subjected to direct impingement of flame. Part 2: Single flame source test*** according to standard UNE EN ISO 11925-2:2011.

The (250 x 90 x 10) mm samples used in this test are machined at FUNDACIÖN TECNALIA R&I from surplus sandwich panels of plates received at FUNDACIÖN TECNALIA R&I and are placed on a stainless steel, U-shaped double framework hung vertically, in a way that the bottom side of the sample is directly exposed to the flame, alongside its central line and edges.

Burner spacers are used to approach the flame by 16 mm to expose the edge of the sample and 5 mm to expose its surface.

The flame height should be 20 mm.

- The exposure to flame takes place on the surface during 30 seconds, on the central line of 40 mm on the lower border.
 - a) The flame is applied on the metal surface of the panel (Surface)
 - b) The flame is applied on the centre bottom edge of the panel (Edge)



A.- SURFACE

<i>TEST SPECIMEN</i>		Sample ignition	Flame propagation to 150 mm (Fs)	Period in which Fs is reached	Filter paper ignition
Longitudinal	1	No	No	—	No
	2	No	No	—	No
	3	No	No	—	No
Transverse	4				
	5				
	6				

Observations:

B-EDGE

<i>TEST SPECIMEN</i>		Sample ignition	Flame propagation to 150 mm (Fs)	Period in which Fs is reached	Filter paper ignition
Longitudinal	1	Yes	No	—	No
	2	Yes	No	—	No
	3	Yes	No	—	No
Transverse	4				
	5				
	6				

Observations: Ignition occurs



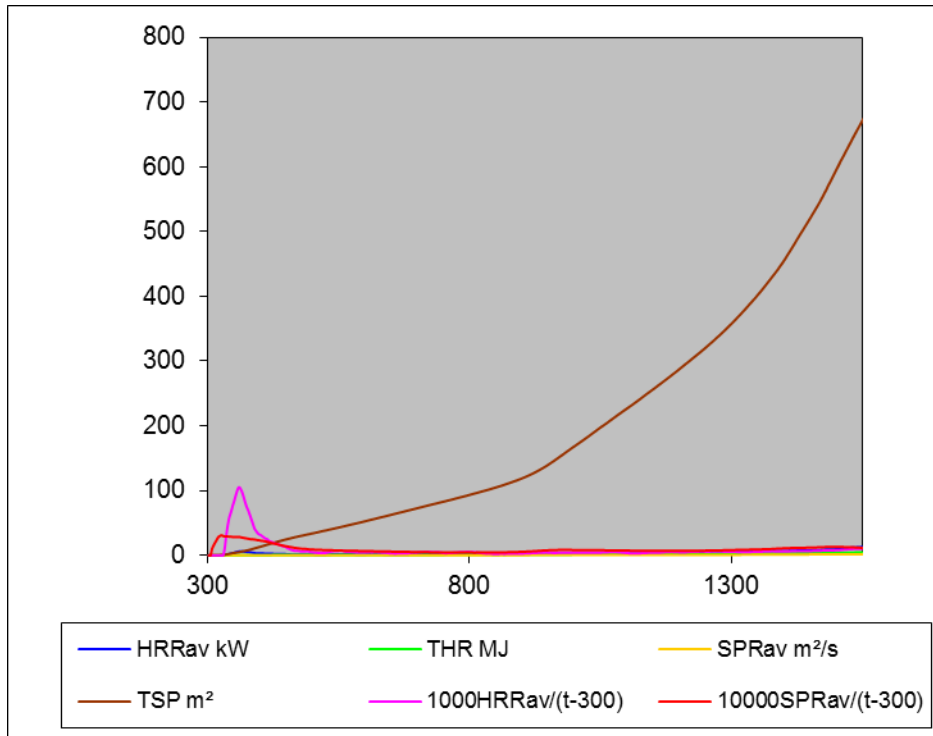
ANNEXES



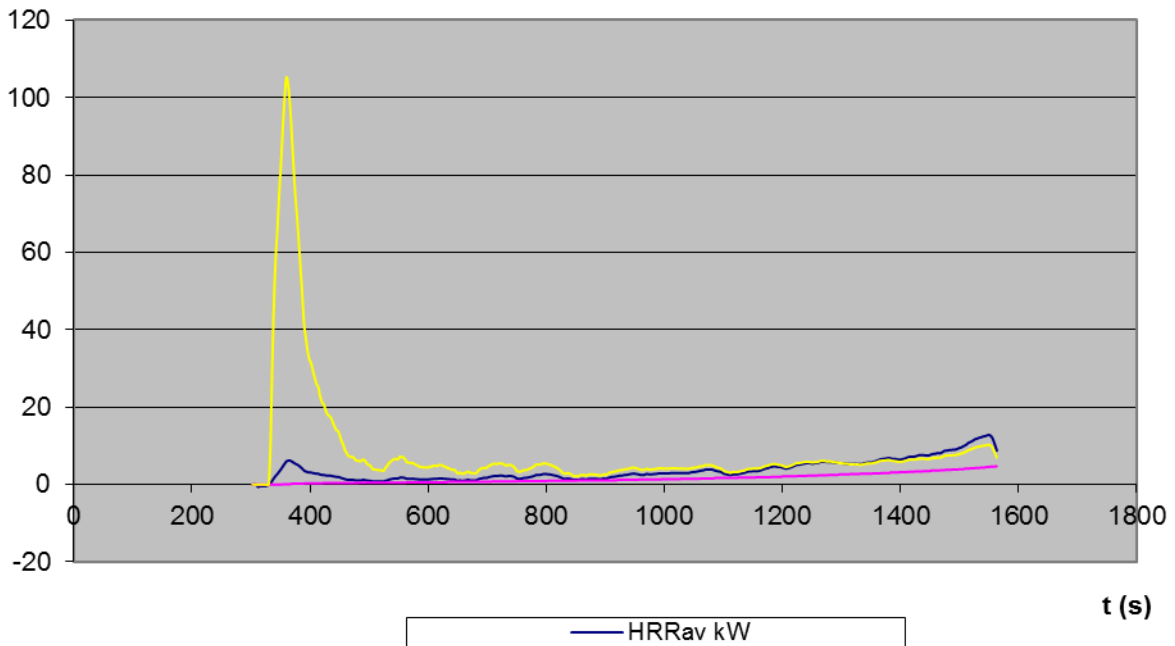
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Sample No. 1: Heat release-related rates



Heat release



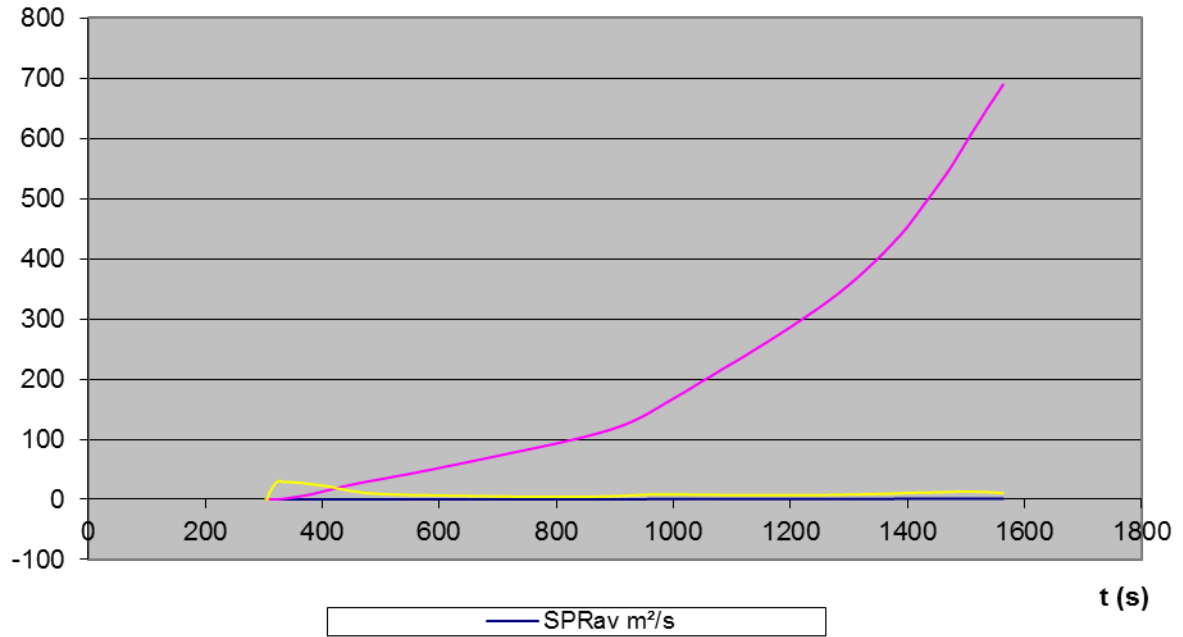


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Sample No. 1: Smoke release-related rates

Smoke production

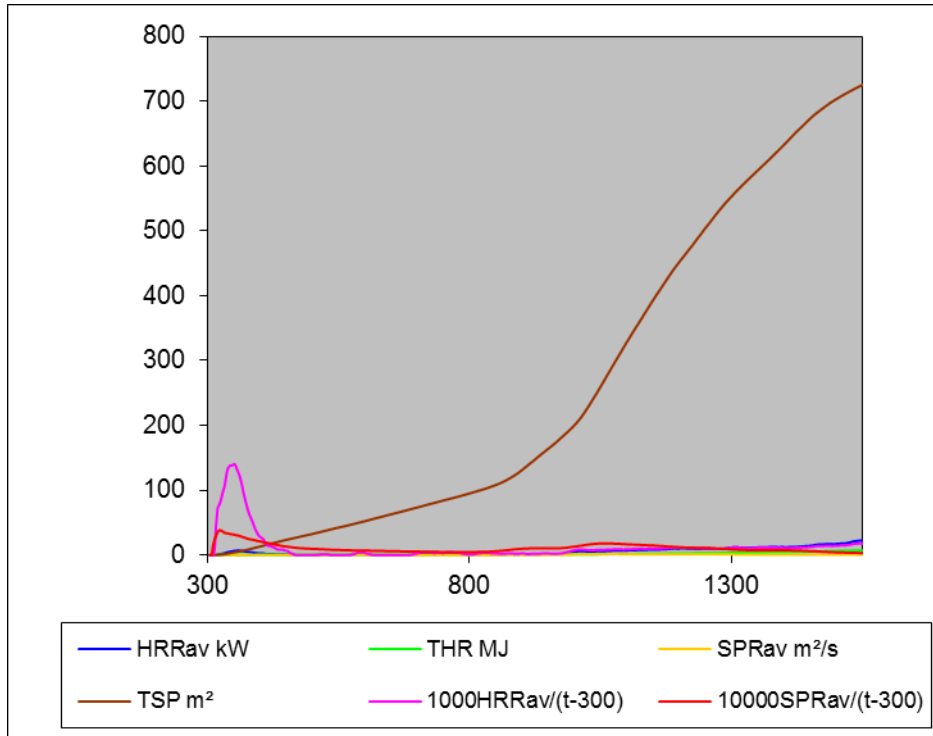




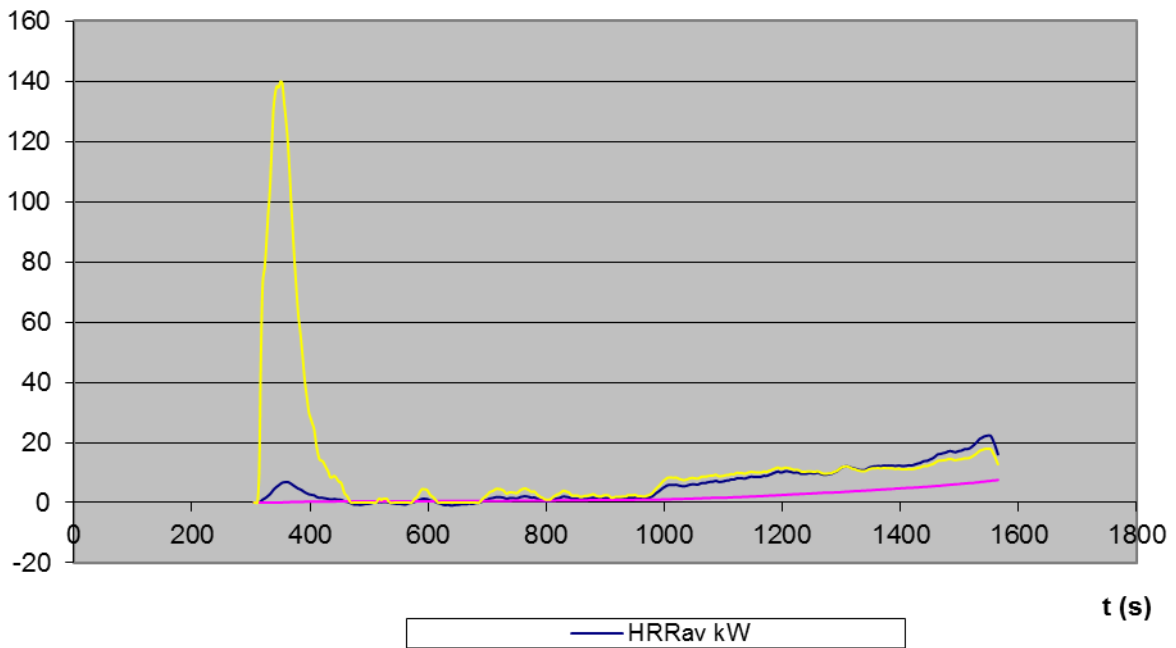
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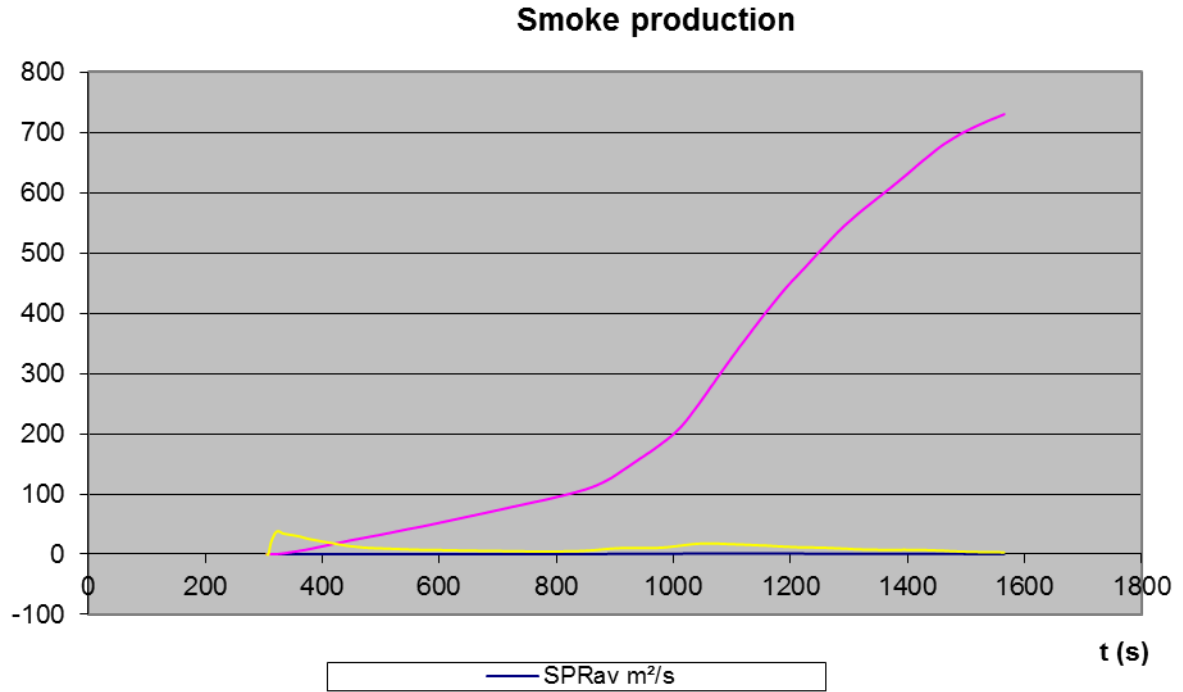
Sample No. 2: Heat release-related rates



Heat release



Sample No. 2: Smoke release-related rates

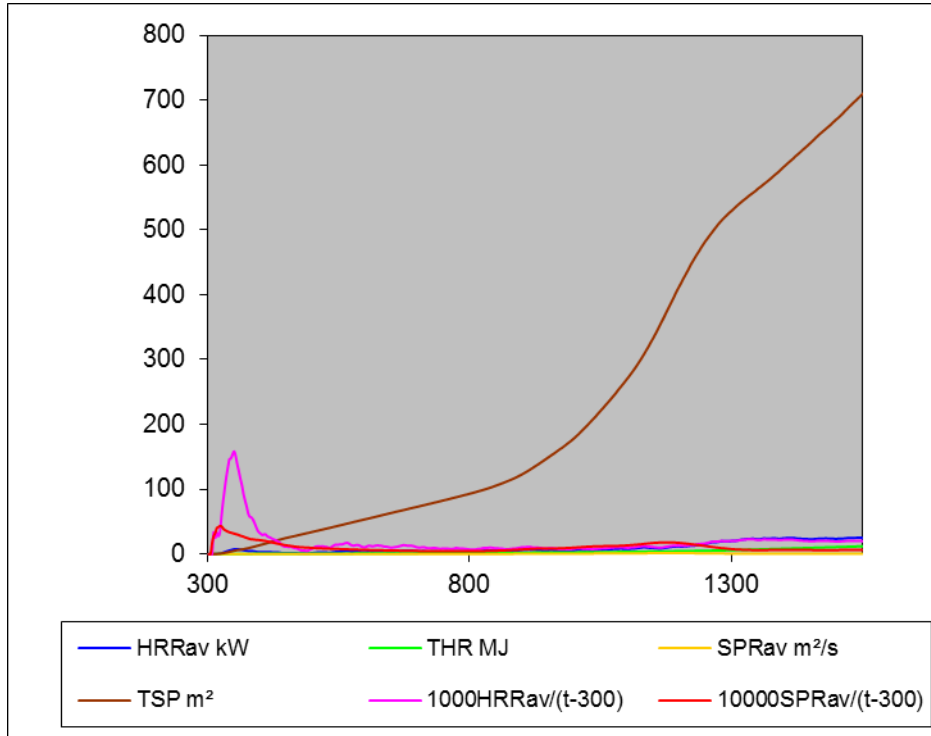




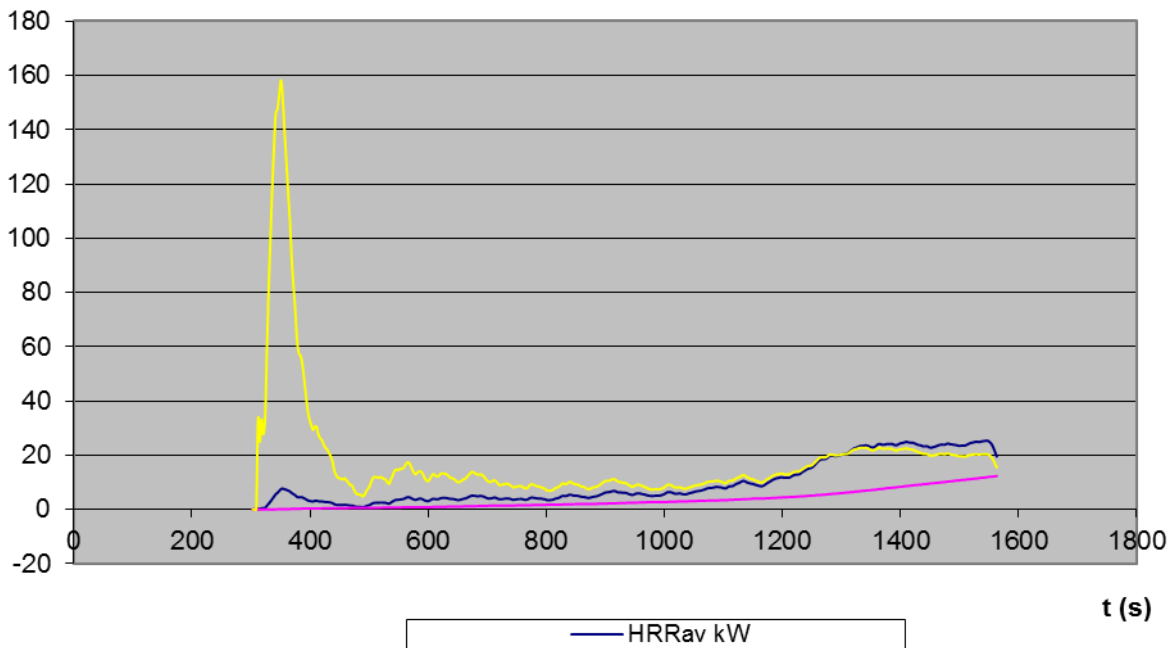
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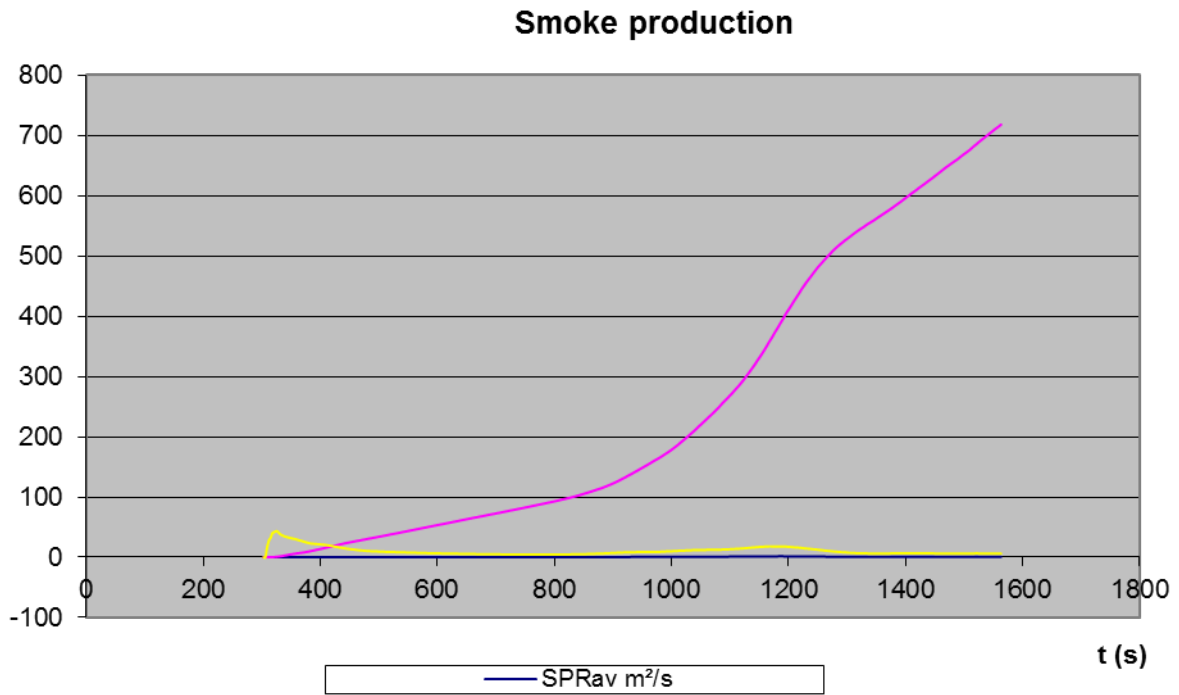
Sample No. 3: Heat release-related rates



Heat release



Sample No. 3: Smoke release-related rates





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SAMPLE PHOTOGRAPHS



**Appearance of the sample before the SBI test (short flap)
according to UNE-EN 13823:2012**



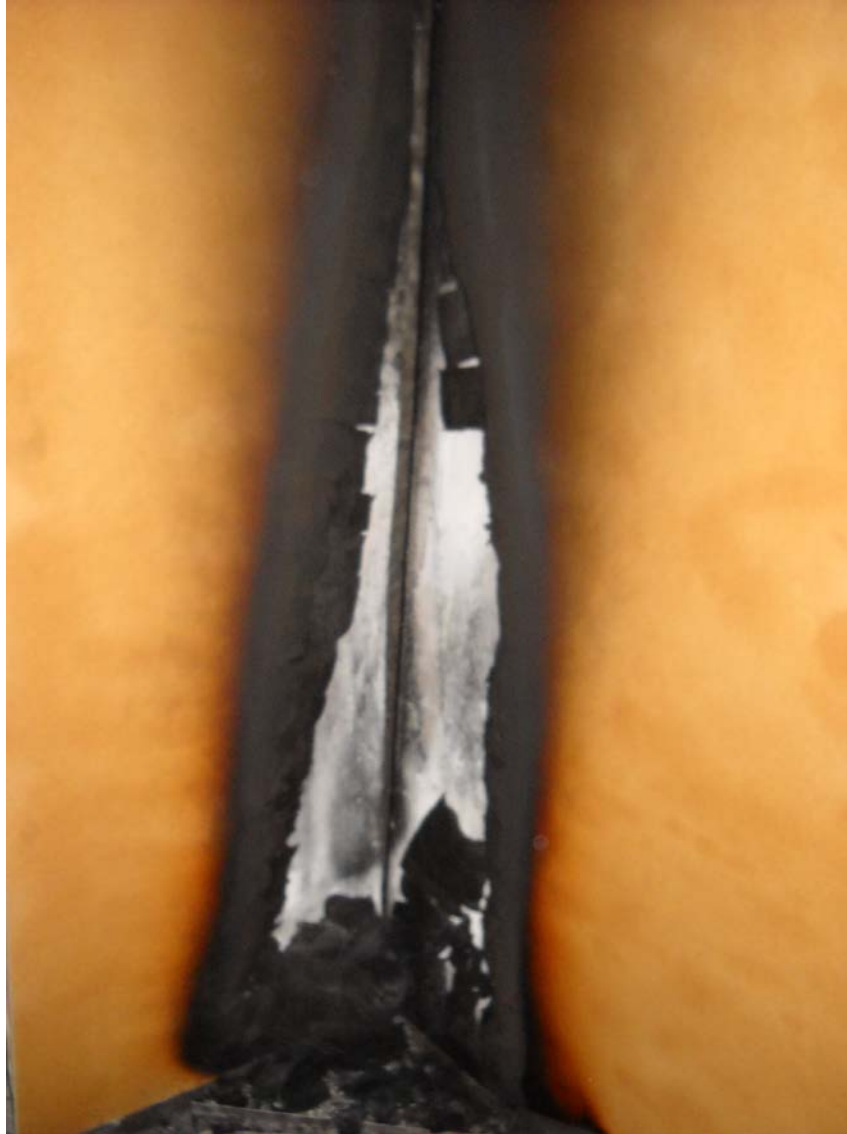
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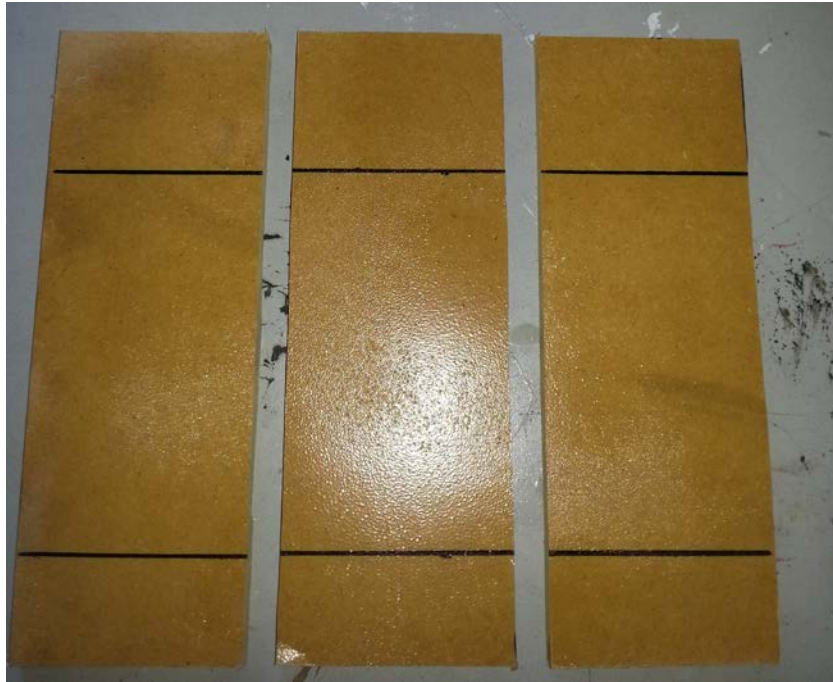
**Appearance of the sample before the SBI test (long flap)
according to UNE-EN 13823:2012**



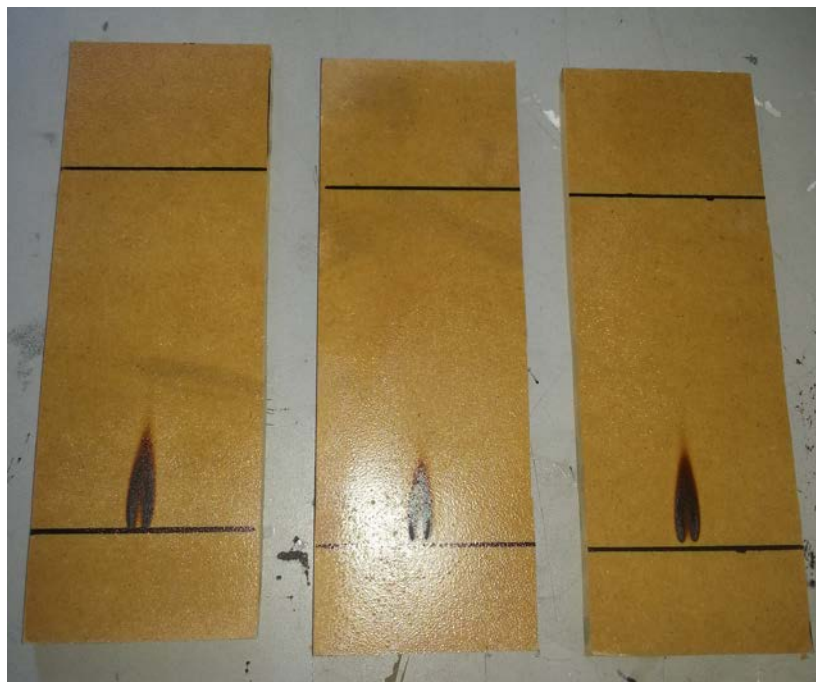
**Appearance of the sample during the SBI test
according to UNE-EN 13823:2012**



**Appearance of the sample after the SBI test
according to UNE-EN 13823:2012**



**View of the sample before ignitability test
according to UNE-EN ISO 11925-2:2011
(applied to edge)**



**View of the sample after ignitability test
according to UNE-EN ISO 11925-2:2011
(applied to edge)**



View of the sample before ignitability test according to UNE-EN ISO 11925-2:2011 (applied to edge)



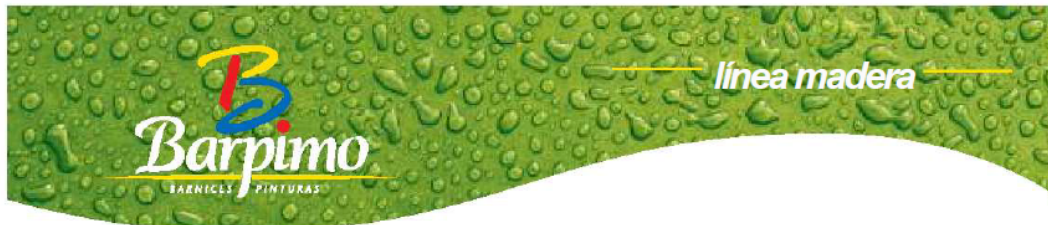
View of the sample after ignitability test according to UNE-EN ISO 11925-2:2011 (applied to edge)



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TECHNICAL DATASHEET OF THE MATERIAL (provided by the manufacturer)



FONDIPOL IGNIFUGO

Descripción del Producto	Fondo de poliuretano de dos componentes base disolvente	
Propiedades	Elevado poder cubriente Alta tixotropía Buena transparencia	
Uso Recomendado	Fondo indicado para su uso en mobiliario donde se requieran PROPIEDADES IGNIFUGAS	

Características Técnicas	Norma	Valor
Sólidos en Peso (%)	UNE EN ISO 3251	50%±2
Viscosidad (Copa Ford 4)	UNE EN ISO 2431	70±5"
Densidad (Kg/L)	UNE EN ISO 2811-1	1.030+/-0.020

Características Mezcla		
Catalizador		CATALIZADOR N. 295
Proporción Mezcla (% Volumen)		50%
Sólidos Mezcla (%)	UNE EN ISO 3251	42% ± 2
Viscosidad de Mezcla (Copa Ford 4)	UNE EN ISO 2431	20" ± 3
Vida de Mezcla	UNE EN ISO 9514	4 a 5 horas a 20°C
Disolvente		No necesita diluir. Se sirve listo para el uso

Características Aplicación		
Viscosidad Aplicación (Copa Ford 4)	UNE EN ISO 2431	Al uso
Sistema de Aplicación		Aerográfico y airless
Aplicación sobre		DM ignífugo
Espesor de Capa recomendado		150-180 gr/m ²
Seco al Tacto		40 a 60 minutos (según espesor y temperatura)
Lijado Superficial		5 - 6 horas, en función del espesor aplicado y condiciones ambientales
Lijado		16 - 24 horas, en función del espesor aplicado y condiciones ambientales

Observaciones de proceso de aplicación
 Si durante la aplicación se aprecia aumento de viscosidad, rebajar con .9130
 Si la Temperatura ambiente es elevada emplear para diluir .9020

PARA TENER UN SISTEMA IGNIFUGO ES IMPRESCINDIBLE APLICAR SOBRE FONDIPOL IGNIFUGO LIJADO Y ELIMINADO EL POLVO, LACAPOL IGNIFUGO

Observaciones

Agitar el contenido de los envases antes de ser usado.
 Aplicar con buena renovación de aire.
 No almacenar los envases abiertos o empezados.
 La estabilidad máxima del catalizador es inferior a 6 meses a 20°C. Para normas toxicológicas, consultar FICHA DE SEGURIDAD. Manténgase fuera del alcance de los niños.

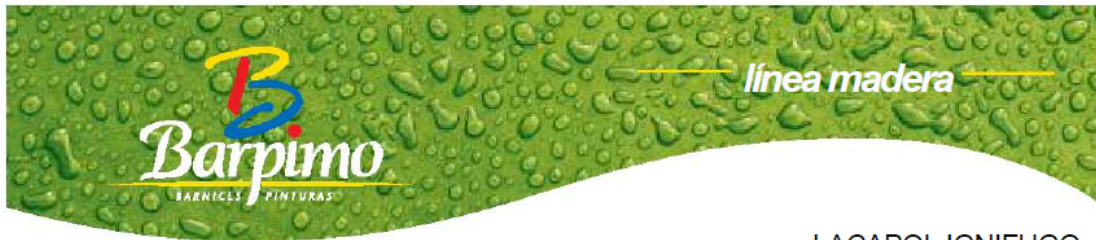
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LACAPOL IGNIFUGO

Descripción del Producto	Acabado de poliuretano de dos componentes base disolvente
Propiedades	Elevado poder cubriente Buena extensibilidad y nivelación Buena uniformidad del matizado Tacto sedoso
Uso Recomendado	Acabado indicado para su uso en mobiliario donde se requieran PROPIEDADES IGNIFUGAS

Características Técnicas		
	Norma	Valor
Sólidos en Peso (%)	UNE EN ISO 3251	46% ± 2
Viscosidad (Copa Ford 4)	UNE EN ISO 2431	60+3"
Densidad (Kg/L)	UNE EN ISO 2811-1	1.010+/-0.020
Brillo (Angulo 60°)	UNE EN ISO 2813	Mate y semimate

Características Mezcla		
Catalizador		CATALIZADOR NUM. 280
Proporción Mezcla (% Volumen)		50%
Sólidos Mezcla (%)	UNE EN ISO 3251	39% ± 2
Viscosidad de Mezcla (Copa Ford 4)	UNE EN ISO 2431	20" ± 3
Vida de Mezcla	UNE EN ISO 9514	5 a 6 horas a 20°C
Disolvente		No necesita diluir. Se sirve listo para el uso

Características Aplicación		
Viscosidad Aplicación (Copa Ford 4)		Al uso
Sistema de Aplicación		Aerográfico y airless
Aplicación sobre		FONDIPOL IGNIFUGO
Espesor de Capa recomendado		120-130 gr/m ²
Seco al Polvo		25 a 40 minutos (según espesor y temperatura)
Seco al Tacto		40 a 60 minutos (según espesor y temperatura)
Endurecimiento total		1 días

Observaciones de proceso de aplicación
 Si durante la aplicación se aprecia aumento de viscosidad, rebajar con .9130
 Si la Temperatura ambiente es elevada emplear para diluir .9020

PARA TENER UN SISTEMA IGNIFUGO ES IMPRESCINDIBLE APLICAR PREVIAMENTE COMO FONDO: FONDIPOL IGNIFUGO

Observaciones
 Agitar el contenido de los envases antes de ser usado.
 Aplicar con buena renovación de aire.
 No almacenar los envases abiertos o empezados.
 La estabilidad máxima del catalizador es inferior a 6 meses a 20°C. Para normas toxicológicas, consultar FICHA DE SEGURIDAD. Manténgase fuera del alcance de los niños.

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