inegi driving science & innovation

Since 1986

MAIS DE 30 ANOS
A CONVERTER
CONHECIMENTO
EM VALOR

Laboratório de Fumo e Fogo

Reaction to Fire Tests

Test Report No. LFF.2020.035.01

SONAE – INDÚSTRIA DE REVESTIMENTOS, SA

U.PORTO

The presented results refer exclusively to tested specimens.

This document may not be reproduced, except in its integrity, without permission in writing by INEGI.

0. DOCUMENT CONTROL AND IDENTIFICATION

0.1 DOCUMENT IDENTIFICATION

Project	---
Document Name	Test Report No. LFF.2020.035.01
Document File Name	---

0.2 VERSION CONTROL

Version	Edition	Revision	Date	Description	Approved by
1	1	0	2020-01-28	Original version	JMG

0.3 AUTHOR(S)

Name	Entity	Initials
Anabela Martins - Laboratory Technician	INEGI	AM

0.4 REVISER(S)

Name	Entity	Initials
José Mesquita Guimarães - Technical Director of the Laboratory	INEGI	JMG

0.5 LABORATORY TECHNICIANS(S)

Name	Entity	Initials
Bruno Nogueira - Laboratory Technician	INEGI	BN

0.6 DISTRIBUTION LIST

Name	Entity	Initials
Laboratório de Fumo e Fogo	INEGI	LFF
---	SONAE –INDÚSTRIA DE REVESTIMENTOS, SA	---

0.7 IDENTIFICATION

Cliente Sonae – Indústria de Revestimentos, SA

Address: Lugar do Espido – Via Norte
4470-177 Maia

Request: Tests according to EN 13823:2010 A1 November 2014

Request Reference: PE30200122

Request Date: 2020-01-15

Material Reference: "Surforma HPL FR"

Reception Date: 2020-01-20

Test Date: 2020-01-27

Report Date: 2020-01-28

INDEX

1. SCOPE

This report refers to exploratory reaction to fire tests of the product with the reference "Surforma HPL FR" and its potential classification according to EN 13501.

2. METHODOLOGY

Test	Test procedure
Reaction to fire tests for building products. Building products exposed to the thermal attack by a single burning item.	EN 13823:2010 + A1 Novembro 2014

3. SPECIMENS

3.1 Dimension and conditioning

The specimens, with the following dimensions and masses, were supplied by the customer.

Reference	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)
LFF.2020.035.01	1501	1000	1.0	1989
LFF.2020.035.02	1502	499	1.0	1030

Prior to testing, the specimens were conditioned for a period of 95 hours at 23 ± 2 ºC and 50 ± 5 % relative humidity, having met the constant mass criterion.

3.2 Mounting of specimens

Following customer request, specimens were mechanically fixed onto an inert substrate – calcium silicate, in accordance with clause 5.2.2. b) of the standard EN 13823.

4. RESULTS

The following facts, potentially relevant for the test results analysis, were observed during the test:

1. At 323 s of testing (23 s of flame incidence), surface bubbles were formed and burst.
2. At 365 s of testing, destruction of the specimen up to 50 cm high and 20 cm from the corner, with abundant smoke release.
3. At 550 seconds of testing, cracks were opened up to 75 cm high and 30 cm wide, with progressive propagation.
4. At 700 s of testing, fragments dropped outside the burner area.

In accordance with the customer's instructions, only one specimen was submitted to testing, which are summarized in the following table.

Table 1. SBI test results.

Specimens	LFF.2020.035.01 and LFF.2020.035.02
FIGRA $_{0,2\ MJ}$ (W/s)	223.7
FIGRA $_{0,4\ MJ}$ (W/s)	142.0
THR $_{600\ s}$ (MJ)	4.7
LFS (m)	No
FIRE BEHAVIOUR	C
SMOGRA (m^2/s^2) (*)	48.2
TSP $_{600s}$ (m^2) (*)	86.8
SMOKE PRODUCTION	s2
FLAMING DROPLETS/PARTICLES	No
FLAMING DROPLETS	d0

FIGRA: Fire growth rate THR: Total heat release LFS: Lateral flame spread (*): With smoke correction
SMOGRA: Smoke growth rate TSP: Total smoke production TNR: Threshold not reached

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

5. LIMITATIONS

All the information on this document regarding the product description has been supplied by the sponsor at no responsibility by INEGI's laboratory.

This document does not represent any type of approval or certification of the product.

This classification document is valid for 5 (five) years.

Porto, January 28th, 2020

José Mesquita Guimarães

Laboratory Technical Director

[Assinatura Qualificada] José Carlos dos Santos de Mesquita Guimarães

Assinado de forma digital por [Assinatura Qualificada] José Carlos dos Santos de Mesquita Guimarães
Dados: 2020.01.28 16:41:45 Z

ANNEX I

Photographs

Figure 1 – Mounted specimen.

Figure 2 – SBI ongoing test.

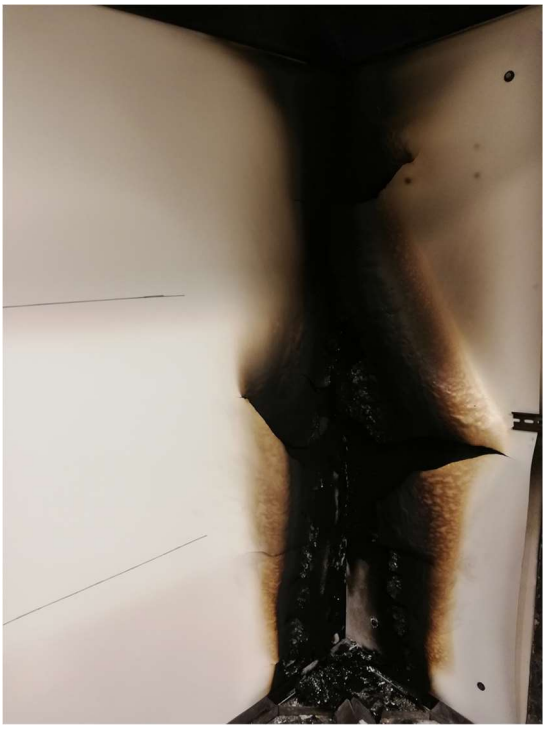


Figure 3 – Tested specimen.

ANNEX II

SBI Report

SBI Test Report

Laboratory name	INEGI - LFF
Operator	Bruno Nogueira
Filename	C:\SBICALC\DATA\20010002.RW1
Report identification	LFF.2020.035
Product identification	SURFORMA HPL FR

Test

Standard used	EN 13823:2010
Date of test	27/01/2020
Date of report	27/01/2020
E'	17.2 MJ/m³

Apparatus specifications

kt	0.88
kp	1.08
Duct diameter	0.315 m
O2 calibration delay time	9 s
CO2 calibration delay time	12 s

Pre-test conditions

Baseline duct temperature	295.18 K
Ambient temperature	295.72 K
Ambient pressure	100.34 kPa
Relative humidity	48.8%

Baseline conditions

Baseline ambient oxygen	20.675%
Baseline oxygen	20.946%
Baseline carbon dioxide	0.0877%
Baseline smoke	99.91%

Specimen conditioning

Method	Constant mass
Time interval	95 hours
Mass 1	3020.5 g
Mass 2	3019.2 g
Temperature	23°C
RH	50%

Specimen information

Thickness	1 mm
Density	1342 kg/m³
Surface mass/area	1.342 kg/m²
Specimen number	1
Date of arrival	23/01/2020

Mounting method	5.2.2b) in EN 13823:2002
Joints	none
Fixed to substrate?	Yes
Fixing method	screw
Substrate	Calcium silicate
Manufacturer	SONAE INDÚSTRIA DE REVESTIMENTOS, SA
Sponsor	SONAE INDÚSTRIA DE REVESTIMENTOS, SA

Test validity criteria

Test drifts

	Initial	Final	Change
Oxygen	20.946%	20.776%	0.170%
CO2	0.088%	0.175%	0.087%
Smoke	99.91%	99.40%	0.005

Exposure time 1254 s

Synchronisation details

Duct temp. dropped by 2.5 K from baseline of 316.49 K at 303 s
Oxygen rose by 0.05% from baseline of 20.654% at 303 s
CO2 dropped by 0.02% from baseline of 0.318% at 303 s

Burner details

Burner HRR	30.675 kW
Burner HRR std. dev.	0.845 kW
Burner CO2/O2 ratio	0.789
Burner SPR	0.029 m²/s
Burner SPR std. dev.	0.006 m²/s
Burner response time	9 s

Other checks

Minimum duct flow	0.553 m³/s
Maximum duct flow	0.640 m³/s

No T/C failure

Classification results

FIGRA(0.2)	223.7 W/s at 348 s
FIGRA(0.4)	142.0 W/s at 366 s
THR(600)	4.7 MJ
SMOGRA	48.2 m²/s² at 357 s
TSP(600)	86.8 m²

Classification observations

LFS to edge?	No
FDP flaming <= 10s?	No
FDP flaming > 10s?	No

Potential classification

Class	C
Smoke production	s2
Flaming droplets/particles	d0

Recorded events Surface flashes? No; Falling specimen parts? Yes; Smoke not entering hood? No
Mutual fixing of backing board failed? No; Distortion/collapse of specimen? No

Pre-test comments

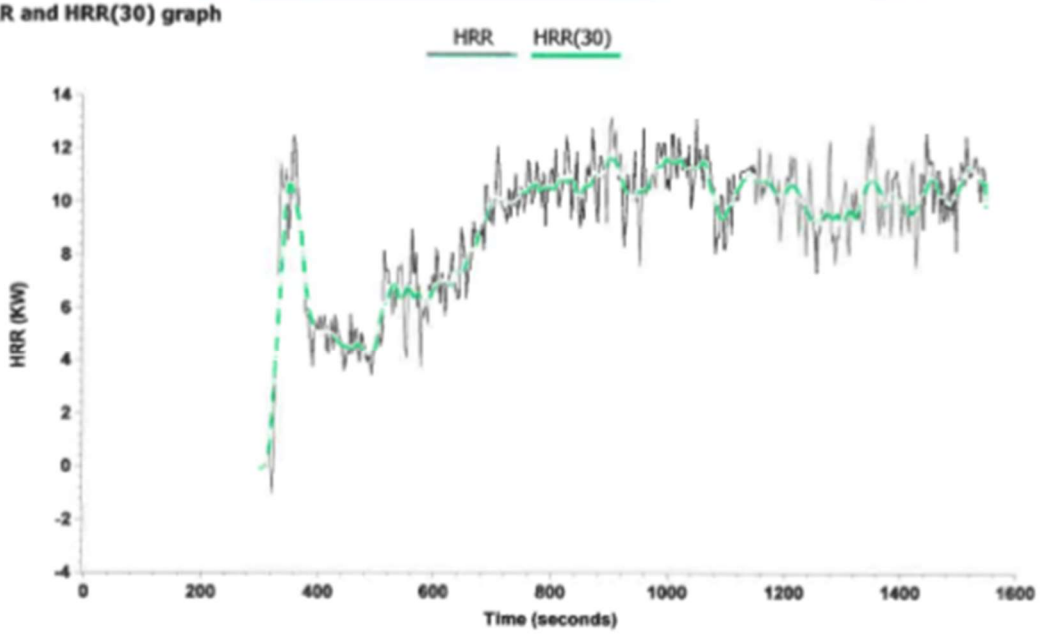
After-test comments Aos 323 s, Formação de bihas e seu rebentamento. Aos 365 s, destruição do provete no canto até 50 cm de altura e 20 cm de largura; fumo abundante. Aos 550 s, abertura de fendas até 75 cm de altra e 30 cm de largura, com progressiva propagação. Aos 700 s, queda de fragmetos fora da zona do queimador.

The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

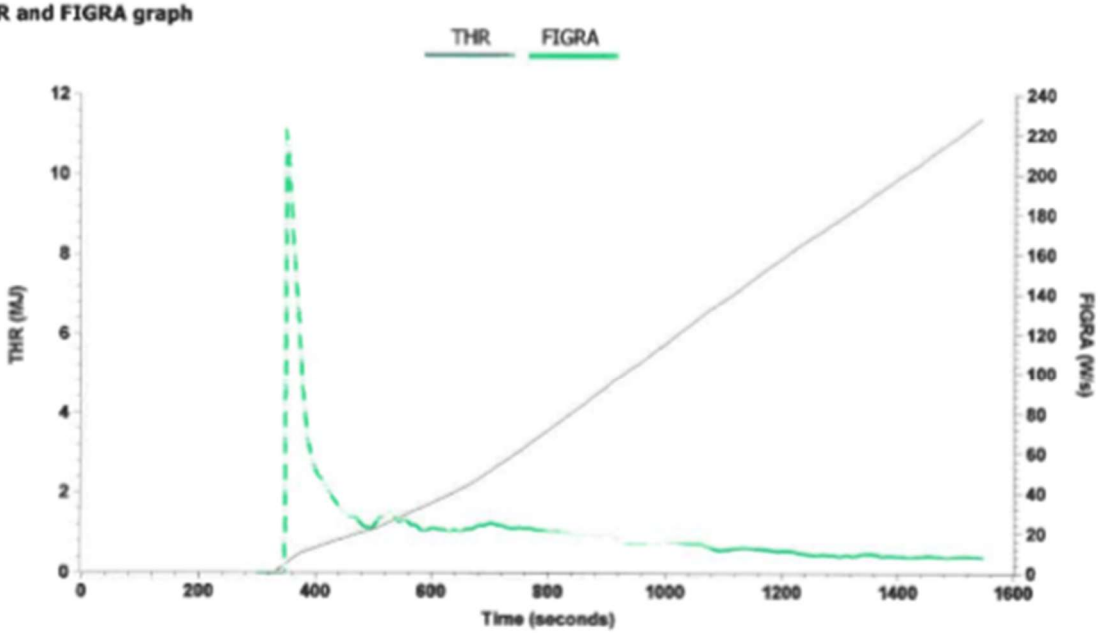
SBI Test Report

Laboratory name	INEGI - LFF
Operator	Bruno Nogueira
Filename	C:\SBICALC\DATA\20010002.RW1
Report identification	LFF.2020.035
Product identification	SURFORMA HPL FR

HRR and HRR(30) graph



THR and FIGRA graph

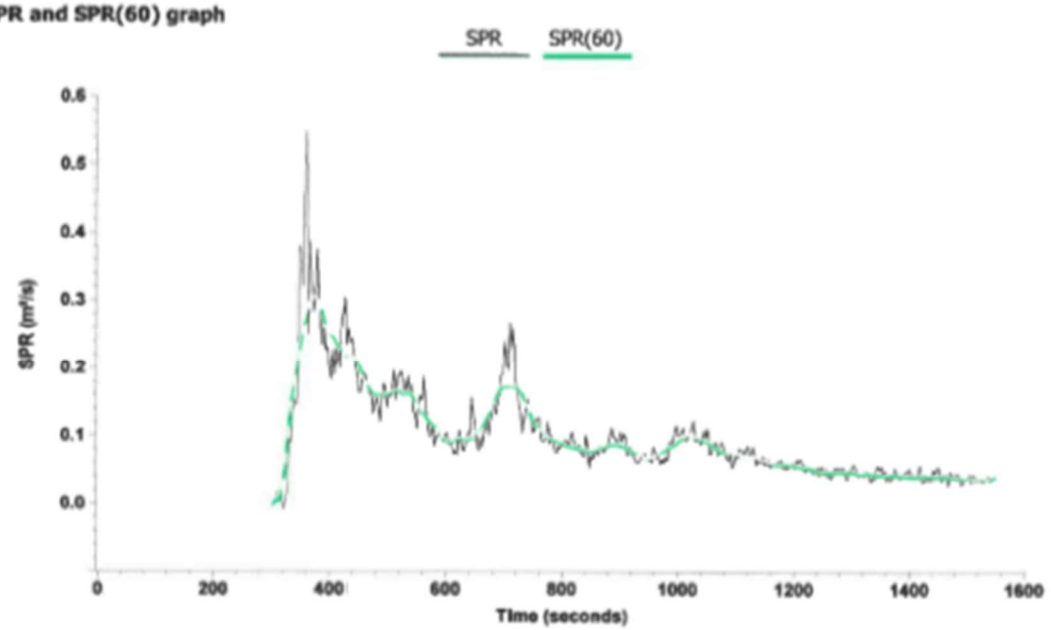


The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

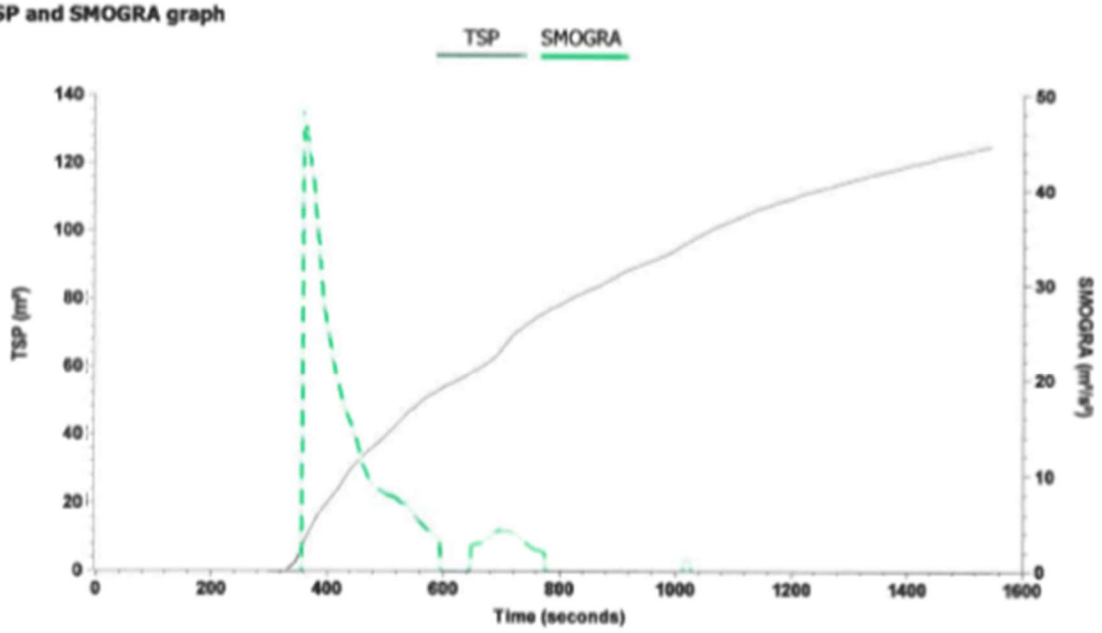
SBI Test Report

Laboratory name	INEGI - LFF
Operator	Bruno Nogueira
Filename	C:\SBICALC\DATA\20010002.RW1
Report identification	LFF.2020.035
Product identification	SURFORMA HPL FR

SPR and SPR(60) graph



TSP and SMOGRA graph



The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

Since 1986

U.PORTO

Since 1986

U.PORTO

inegi driving science & innovation

Since 1986

MAIS DE 30 ANOS
A CONVERTER
CONHECIMENTO
EM VALOR

INEGI - Instituto de Ciência e Inovação
em Engenharia Mecânica e Engenharia Industrial

Campus da FEUP | Rua Dr. Roberto Frias, 400 | 4200-465 Porto | PORTUGAL
T. +351 22 957 87 10 | F. +351 22 953 73 52 | inegi@inegi.up.pt

www.inegi.up.pt