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Laboratório de Fumo e Fogo

Reaction to Fire Tests

Test Report No. LFF.2019.133.02

SONAE – INDÚSTRIA DE REVESTIMENTOS, S.A.

U.PORTO

The presented results refer exclusively to tested specimens.
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0. DOCUMENT CONTROL AND IDENTIFICATION

0.1 DOCUMENT IDENTIFICATION

Project	---
Document Name	Test Report No. LFF.2019.133.02
Document File Name	---

0.2 VERSION CONTROL

Version	Edition	Revision	Date	Description	Approved by
1	1	0	2019-10-30	Original version	JMG

0.3 AUTHOR(S)

Name	Entity	Initials
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0.4 REVISER(S)

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0.5 LABORATORY TECHNICIANS(S)

Name	Entity	Initials
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0.6 DISTRIBUTION LIST

Name	Entity	Initials
Laboratório de Fumo e Fogo	INEGI	LFF
---	SONAE, S.A.	---

0.7 IDENTIFICATION

Cliente Sonae – Indústria de Revestimentos, S.A.

Address: Lugar do Espido – Via Norte
4470-177

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

Request Reference: PE30190597

Request Date: 2019-07-05

Material Reference: Surforma HPL AC3 (0.8 – 1.2 mm)

Reception Date: 2019-07-23

Test Date: 2019-07-30 and 2019-07-31

Report Date: 2019-10-30

INDEX

1. INTRODUCTION

This report refers to exploratory fire reaction tests and the potential classification of materials with the reference "Surforma HPL AC3 (0.8 – 1.2 mm)".

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 november 2014

3. SPECIMENS

3.1 Dimension and conditioning

The specimens were prepared by the client, having the following dimensions and masses:

Reference	Length (mm)	Width (mm)	Thickness (mm)	Mass (g)
LFF.2019.133.01	1506	1000	0.8	1732
LFF.2019.133.02	1500	500	0.8	867
LFF.2019.133.03	1504	1000	0.8	1787
LFF.2019.133.04	1503	497	0.8	849

Prior to testing, the specimens were conditioned for a period of 170 hours at 23 ± 2 °C and 50 ± 5 % relative humidity, having met the constant mass criterion.

3.2 Mounting of specimens

Specimens were tested free standing according (according to 5.2.2.a of the norm EN 13823).

4. RESULTS

Specimens	LFF.2019.133.01 and LFF.2019.133.02	LFF.2019.133.03 and LFF.2019.133.04
FIGRA $_{0,2\ MJ}$ (W/s)	1209.5	806.6
FIGRA $_{0,4\ MJ}$ (W/s)	1209.5	806.6
THR $_{600\ s}$ (MJ)	5.3	5.1
LFS (m)	No	No
FIRE BEHAVIOUR	E	E
SMOGRA (m^2/s^2) (*)	17.5	19.9
TSP $_{600s}$ (m^2) (*)	30.6	30.7
SMOKE PRODUCTION	s1	s1
FLAMING DROPLETS/PARTICLES	No	No
FLAMING DROPLETS	d0	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, October 30, 2019

[Assinatura Qualificada] José Carlos dos Santos de Mesquita Guimarães

Assinado de forma digital por [Assinatura Qualificada] José Carlos dos Santos de Mesquita Guimarães
Dados: 2019.11.04 14:07:59 Z

José Mesquita Guimarães

Laboratory Technical Director

ANNEX I

Photographs

Figure 1 – View of mounting.

Figure 2 – SBI test.

Figure 3 – Test pieces at the end of the test.

ANNEX II

SBI Reports

SBI Test Report

Laboratory name	INEGI - LFF
Operator	Bruno Nogueira
Filename	C:\SBICALC\DATA\19070004.RW1
Report identification	LFF.2019.133
Product identification	SURFORMA HPL AC 3 (0.8 - 1.2 mm)

Test

Standard used	EN 13823:2010
Date of test	30/07/2019
Date of report	30/07/2019
E'	17.2 MJ/m³

Apparatus specifications

kt	0.823
kp	1.08
Duct diameter	0.315 m
O2 calibration delay time	10 s
CO2 calibration delay time	12 s

Pre-test conditions

Baseline duct temperature	295.22 K
Ambient temperature	294.79 K
Ambient pressure	100.3 kPa
Relative humidity	50%

Baseline conditions

Baseline ambient oxygen	20.669%
Baseline oxygen	20.947%
Baseline carbon dioxide	0.0806%
Baseline smoke	100.05%

Specimen conditioning

Method	Constant mass
Time interval	173 hours
Mass 1	2598 g
Mass 2	2599 g
Temperature	23°C
RH	50%

Specimen information

Thickness	0.8 mm
Density	1443.8 kg/m³
Surface mass/area	1.15 kg/m²
Specimen number	1
Date of arrival	23/07/2019

Mounting method	5.2.2a) in EN 13823:2002
Joints	none
Fixed to substrate?	No
Fixing method	N/A
Substrate	none
Manufacturer	SONAE INDÚSTRIA DE REVESTIMENTOS, SA
Sponsor	SONAE INDÚSTRIA DE REVESTIMENTOS, SA

Test validity criteria

Test drifts

	Initial	Final	Change
Oxygen	20.947%	20.938%	0.009%
CO2	0.081%	0.093%	0.012%
Smoke	100.05%	99.87%	0.002

Exposure time 1194 s

Synchronisation details

Duct temp. dropped by 2.5 K from baseline of 320.23 K at 303 s
Oxygen rose by 0.05% from baseline of 20.645% at 306 s
CO2 dropped by 0.02% from baseline of 0.327% at 303 s

Burner details

Burner HRR	26.225 kW
Burner HRR std. dev.	0.544 kW
Burner CO2/O2 ratio	0.814
Burner SPR	0.026 m²/s
Burner SPR std. dev.	0.004 m²/s
Burner response time	12 s

Other checks

Minimum duct flow	0.424 m³/s
Maximum duct flow	0.548 m³/s

No T/C failure

Classification results

FIGRA(0.2)	1209.5 W/s at 366 s
FIGRA(0.4)	1209.5 W/s at 366 s
THR(600)	5.3 MJ
SMOGRA	17.5 m²/s² at 381 s
TSP(600)	30.6 m²

Classification observations

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

Potential classification

Class	E
Smoke production	s1
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

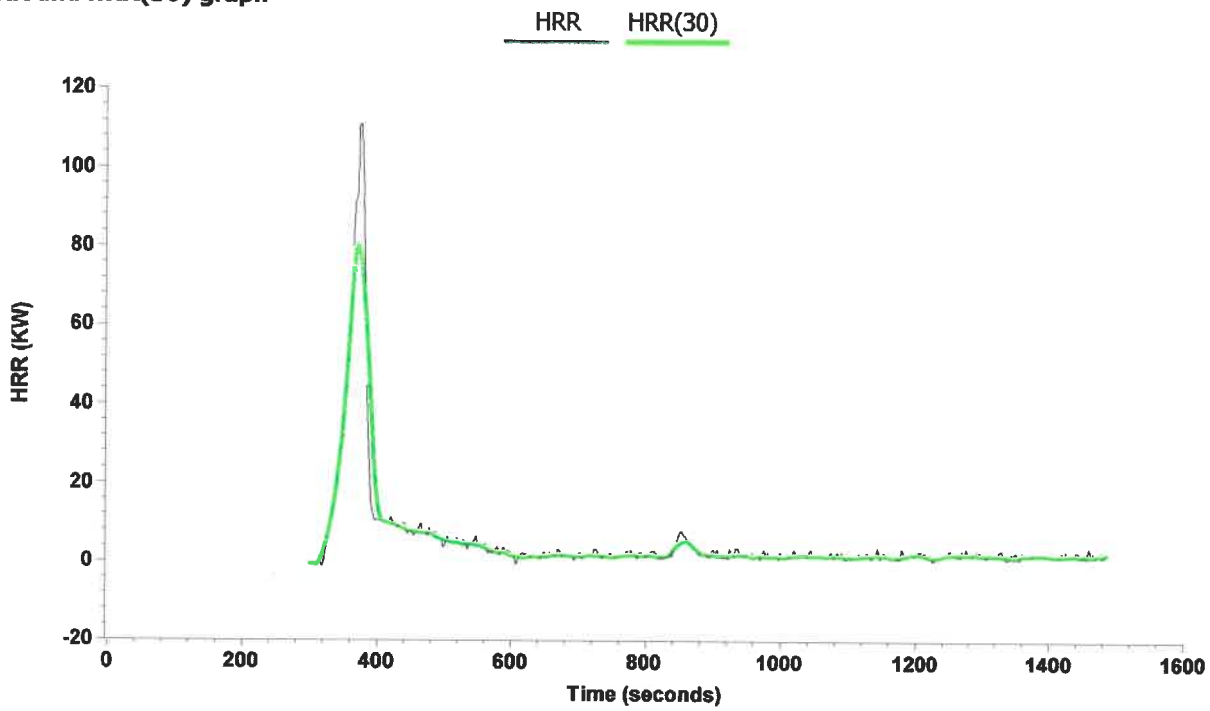
Pre-test comments

After-test comments Aos 335 s, Formação de bolas gasosas na superfície do provete, até cerca de 35 cm do canto, a toda a altura. Sucessivo rebentamento das bolhas formadas. Aos 350 s, destruição de grande parte do provete no canto, até ao topo e até cerca de 25 cm do canto. Aos 475 s, provete totalmente dstruído no canto até 75 cm de altura e ceca de 25 cm.

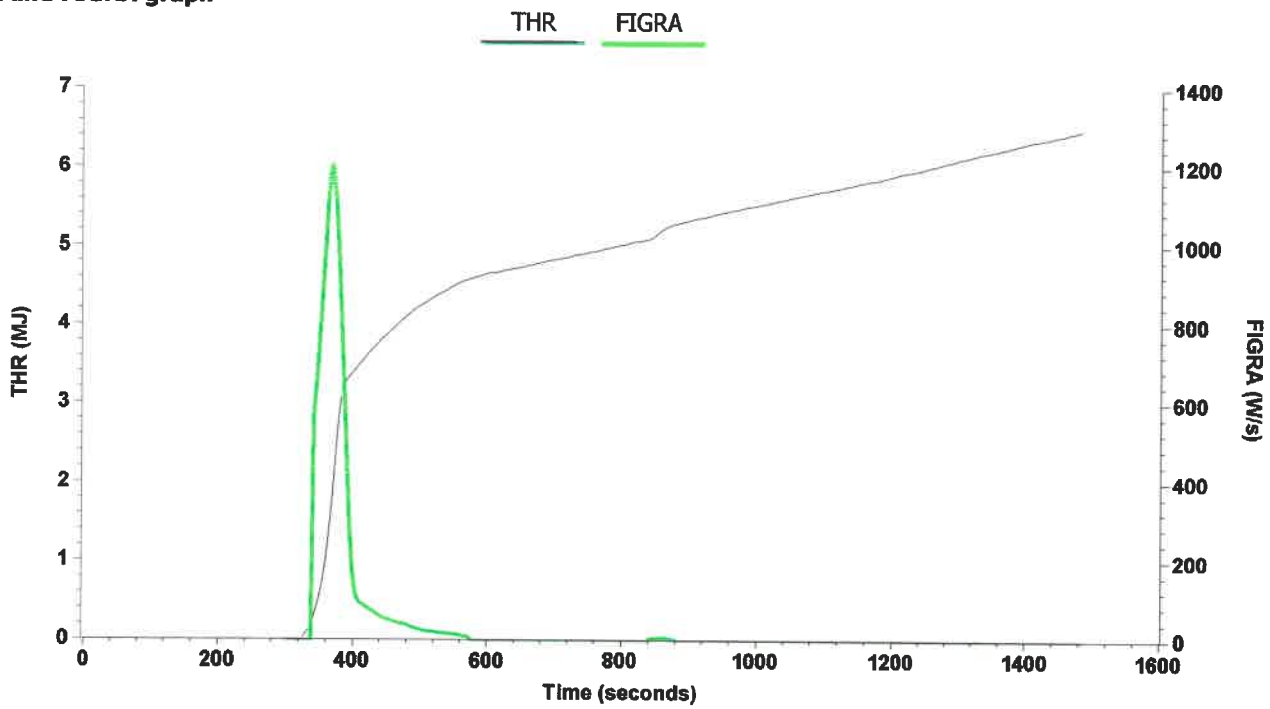
SBI Test Report

Laboratory name	INEGI - LFF
Operator	Bruno Nogueira
Filename	C:\SBICALC\DATA\19070004.RW1
Report identification	LFF.2019.133
Product identification	SURFORMA HPL AC 3 (0.8 - 1.2 mm)

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.

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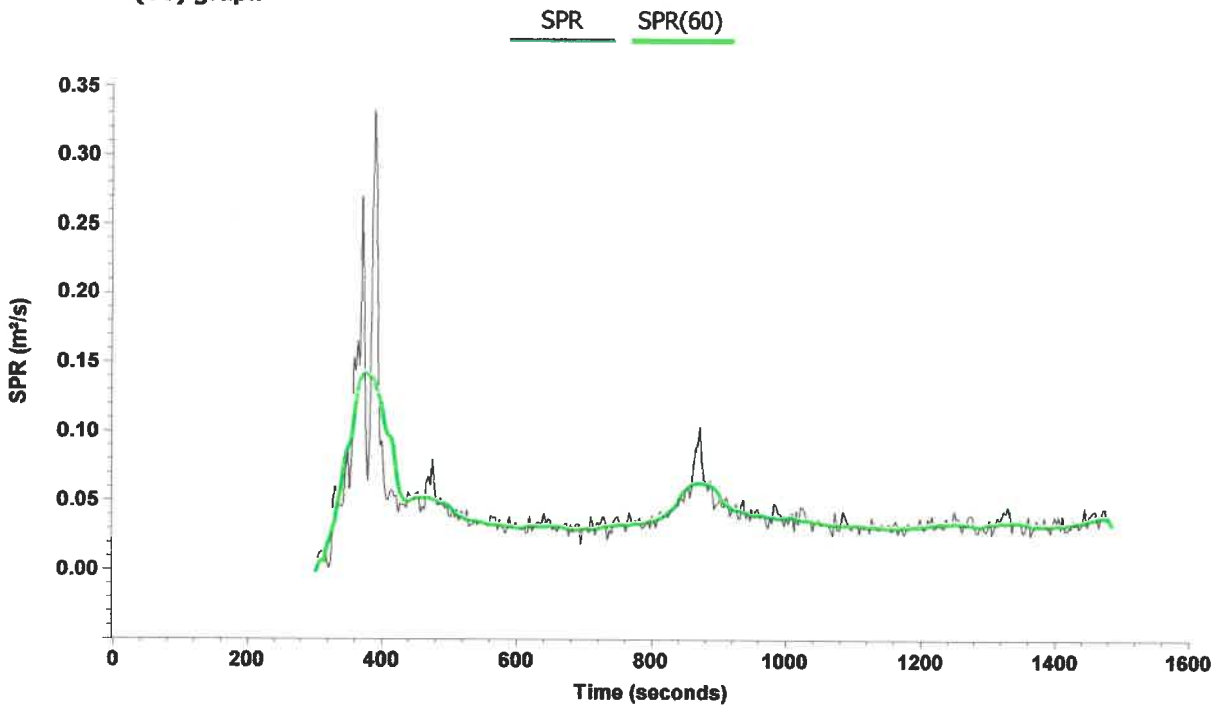
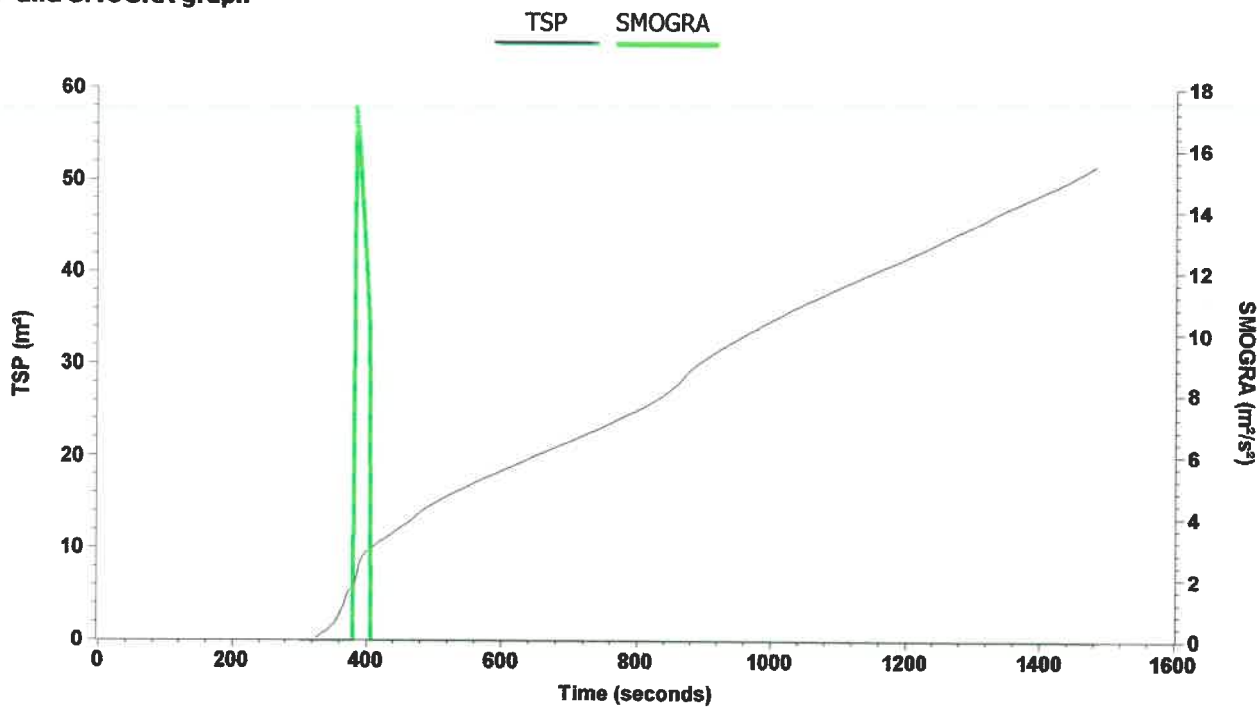
SPR and SPR(60) graph



TSP and SMOGRA graph



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Test

Standard used	EN 13823:2010
Date of test	31/07/2019
Date of report	31/07/2019
E'	17.2 MJ/m³

Apparatus specifications

kt	0.823
kp	1.08
Duct diameter	0.315 m
O2 calibration delay time	10 s
CO2 calibration delay time	12 s

Pre-test conditions

Baseline duct temperature	295.54 K
Ambient temperature	295.05 K
Ambient pressure	99.98 kPa
Relative humidity	50%

Baseline conditions

Baseline ambient oxygen	20.667%
Baseline oxygen	20.951%
Baseline carbon dioxide	0.0892%
Baseline smoke	100.01%

Specimen conditioning

Method	Constant mass
Time interval	198 hours
Mass 1	2631 g
Mass 2	2636 g
Temperature	23°C
RH	50%

Specimen information

Thickness	0.8 mm
Density	1464.4 kg/m³
Surface mass/area	1.17 kg/m²
Specimen number	2
Date of arrival	23/07/2019

Mounting method	5.2.2a) in EN 13823:2002
Joints	none
Fixed to substrate?	No
Fixing method	N/A
Substrate	none
Manufacturer	SONAE INDÚSTRIA DE REVESTIMENTOS, SA
Sponsor	SONAE INDÚSTRIA DE REVESTIMENTOS, SA

Test validity criteria

Test drifts

	Initial	Final	Change
Oxygen	20.951%	20.922%	0.030%
CO2	0.089%	0.088%	0.001%
Smoke	100.01%	99.89%	0.001

Exposure time 1254 s

Synchronisation details

Duct temp. dropped by 2.5 K from baseline of 320.42 K at 303 s
Oxygen rose by 0.05% from baseline of 20.643% at 306 s
CO2 dropped by 0.02% from baseline of 0.331% at 303 s

Burner details

Burner HRR	26.766 kW
Burner HRR std. dev.	0.556 kW
Burner CO2/O2 ratio	0.783
Burner SPR	0.026 m²/s
Burner SPR std. dev.	0.005 m²/s
Burner response time	12 s

Other checks

Minimum duct flow	0.444 m³/s
Maximum duct flow	0.552 m³/s

No T/C failure

Classification results

FIGRA(0.2)	806.6 W/s at 357 s
FIGRA(0.4)	806.6 W/s at 357 s
THR(600)	5.1 MJ
SMOGRA	19.9 m²/s² at 369 s
TSP(600)	30.7 m²

Classification observations

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

Potential classification

Class	E
Smoke production	s1
Flaming droplets/particles	d0

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

Pre-test comments

After-test comments Aos 350s, formação de bolas gasosas do provete, até cerca de 40cm do canto , a toda a altura.Sucessivo rebentamento das bolhas formadas.Aos 363s, destruição de grande parte do proveteno canto, até ao topo.Aos 495s,provete totalmente destruído no canto até 80cm de altura.

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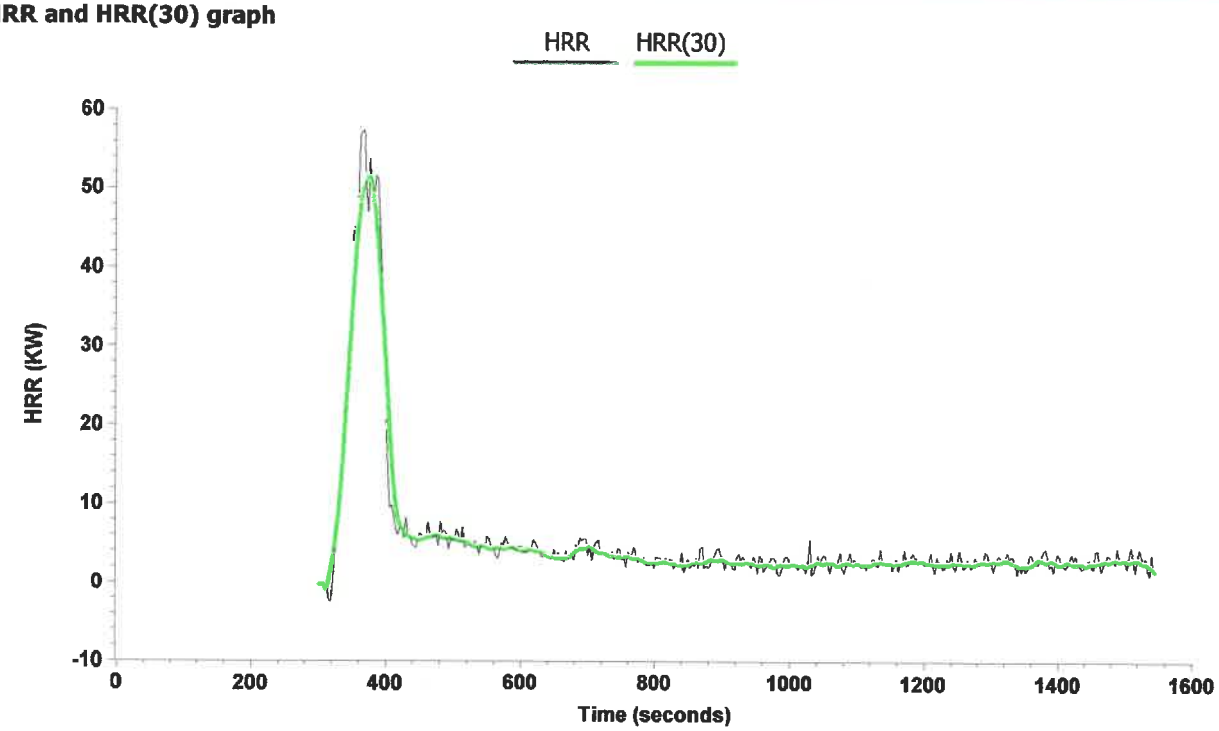
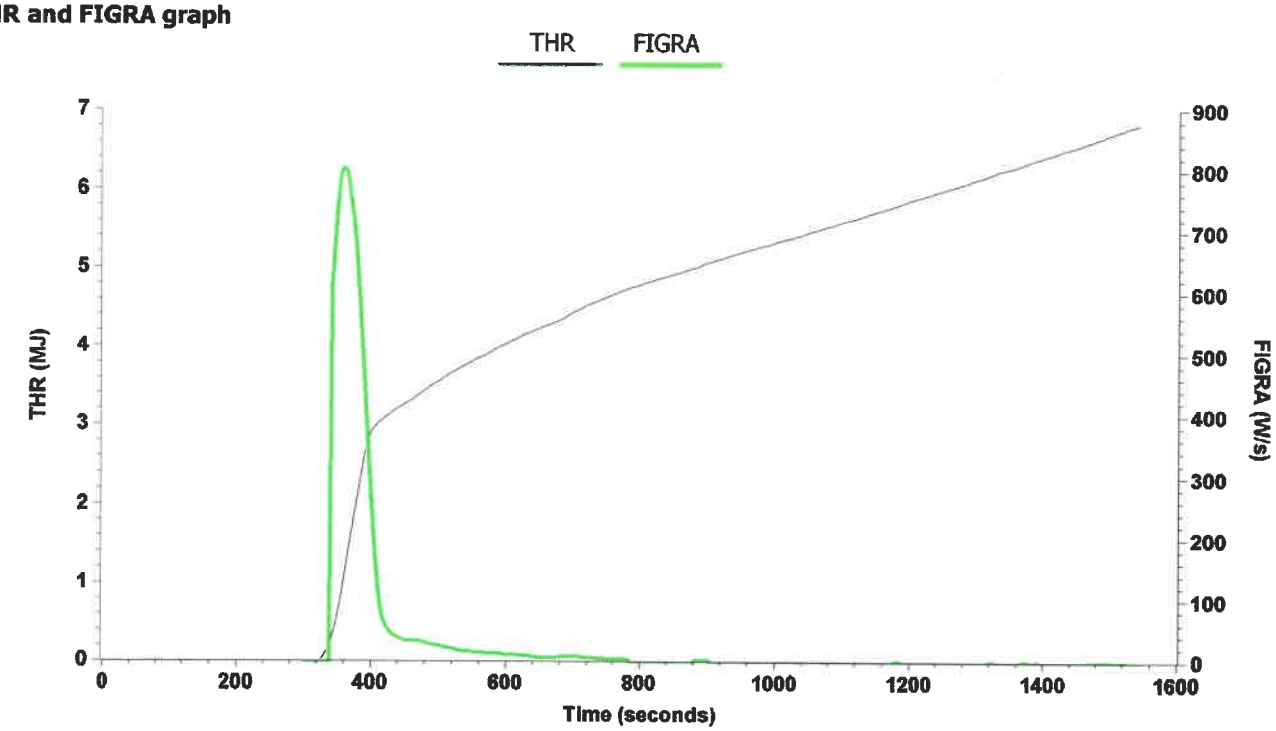
HRR and HRR(30) graph



THR and FIGRA graph



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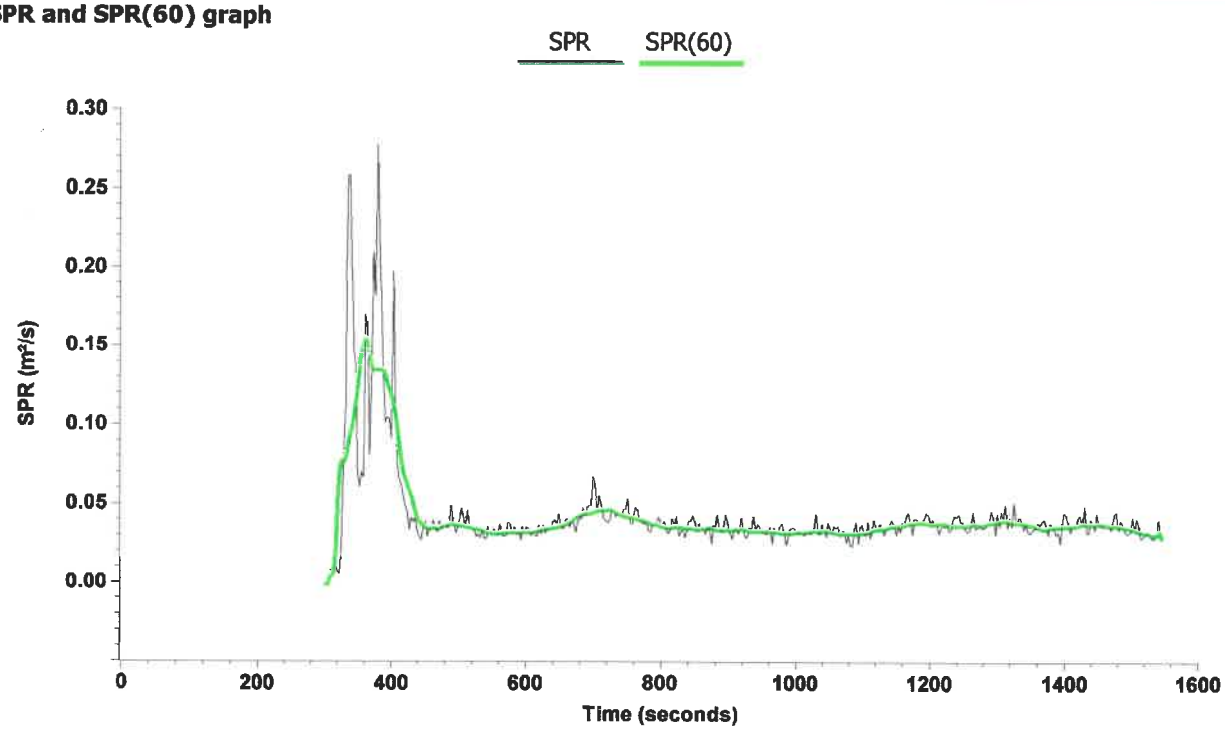
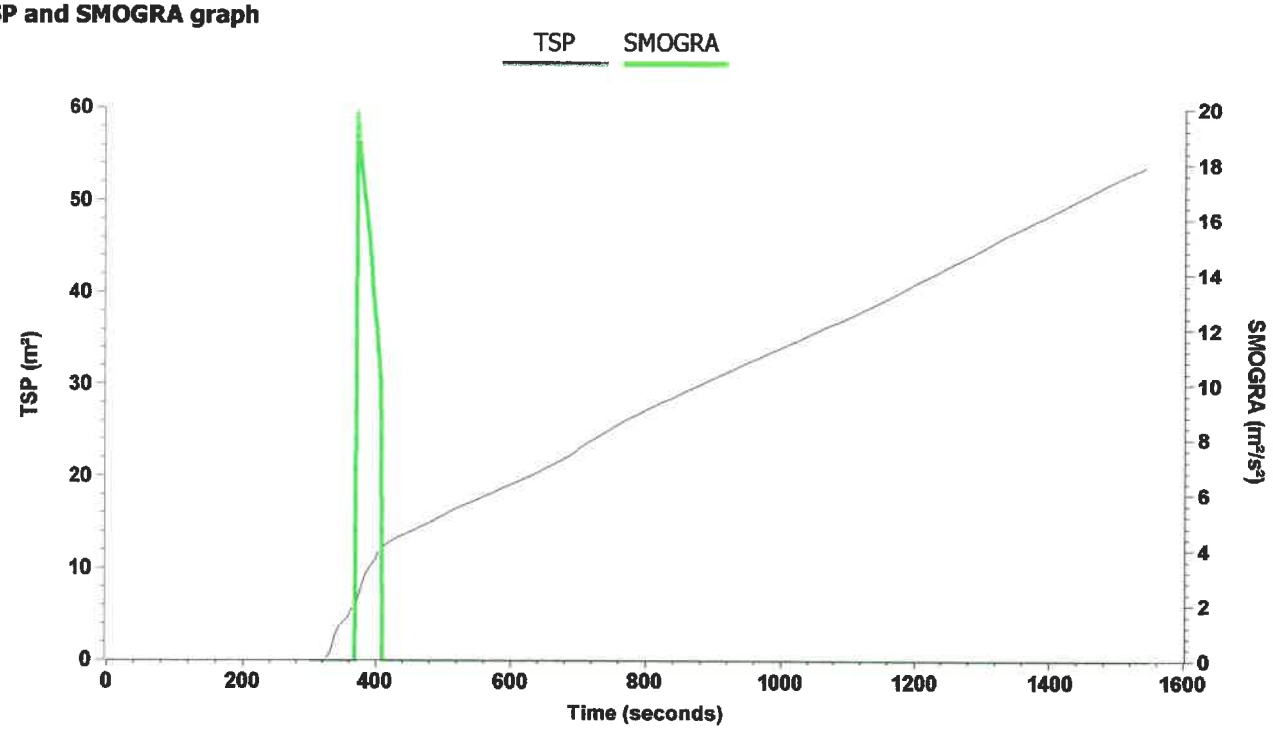
SPR and SPR(60) graph



TSP and SMOGRA graph



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