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CLASSIFICATION OF REACTION TO FIRE IN ACCORDANCE WITH *EN 13501-1:2007+A1:2009*

Sponsor:	**PYROGUARD UK LIMITED** International House, Millfield Lane Haydock, WA11 9GA UNITED KINGDOM
Prepared by:	**LGAI Technological Center, S.A. (APPLUS)** Campus UAB Ronda de la Font del Carme, s/n E - 08193 Bellaterra (Barcelona)
Product name:	**PYROGUARD T**
Classification report nº:	**21/24533-317 M2**
Date of issue:	**16th May, 2022**

Tests marked with (*) are not covered by the ENAC accreditation.

Description of the modification: An error at the year of the classification standard on the introduction section has been corrected. The modifications are shown in italics.

The present report supersedes the classification report number 21/24533-317 M1 issued on 27th May, 2021. It is responsibility of the client to replace the original and all the copies.

1.-INTRODUCTION

This classification report defines the classification assigned to "PYROGUARD T" in accordance with the procedures given in the *EN 13501-1:2007+A1:2009* standard.

2.- DETAILS OF CLASSIFIED PRODUCT

2.1.-General

The product, PYROGUARD T, is defined as transparent laminated fire resistance safety glass according to the petitioner.

2.2.-Product description

In accordance with the technical specifications provided by the petitioner:

Product trade name: **PYROGUARD T**

Product range was tested:

SAMPLE 1:

EW/13-1, thickness of 13 mm, superficial density 29,5 kg/m^2, transparent laminated fire resistance safety glass.

The product is compose by 3 layers + perimeter sealant:

- Layer 1: Toughened glass
- Layer 2: Nano composite Gel interlayer
- Layer 3: Toughened glass

- Perimeter sealant (grey-black):
  - Primary sealant
  - Secondary sealant (EW)

EW/13-1	Nano composite Gel interlayer	Primary sealant	Secondary sealant (EW)	Toughened glass
m^3/m^2 for the tested 1500 x 1000 panel	2.89×10^{-3}	4.96×10^{-5}	6.0×10^{-5}	1.0×10^{-2}
ρ (g/cm^3)	1.7	1.5	1.8	2.5

SAMPLE 2:

EI/47-3, thickness of 47 mm, superficial density 96 kg/m^2, transparent laminated fire resistance safety glass.

The product is compose by 7 layers + perimeter sealant:

- Layer 1: Toughened glass
- Layer 2: Nano composite Gel interlayer
- Layer 3: Toughened glass
- Layer 4: Nano composite Gel interlayer
- Layer 5: Toughened glass
- Layer 6: Nano composite Gel interlayer
- Layer 7: Toughened glass

- Perimeter sealant (grey-black):
  - Primary sealant
  - Secondary sealant (EI)

EI/47-3	Nano composite Gel interlayer	Primary sealant	Secondary sealant (EI)	Toughened glass
m^3/m^2 for the tested 1500 x 1000 panel	2.01×10^{-2}	1.13×10^{-4}	5.60×10^{-4}	2.60×10^{-2}
ρ (g/cm^3)	1.7	1.5	1.8	2.5

Manufacturer: PYROGUARD UK LIMITED, International House, Millfield Lane, Haydock, WA11 9GA, UNITED KINGDOM.

3.-REPORT AND RESULTS IN SUPPORT OF THIS CLASSIFICATION

3.1- Reports

Name of Laboratory	Name of sponsor	Report ref. no.	Test method and date
Applus – LGAI	PYROGUARD UK LIMITED	19/19491-1009 M2 Part 1	UNE-EN ISO 1716:2011 03-06-2019
			UNE-EN 13823:2012+A1:2016 20-05-2019

3.2- Results of the Tests

SAMPLE 1 (EW/13-1)

Test Method	RESULTS			
	CRITERIA CLASS A2	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
UNE-EN ISO 1716:2011	PCS ≤ 3.0 MJ/kg (1)	15	-0.36 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (2)		-0.23 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (1)		-0.36 MJ/kg	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		0.27 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		0.27 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		0.27 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		0.27 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (4)		0.12 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (4)		0.12 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (4)		0.12 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (4)		0.12 MJ/m^2	**YES**
	PCS ≤ 3.0 MJ/kg (6)		1.57 MJ/kg	**YES**
UNE-EN 13823:2012 +A1:2016	$FIGRA_{0.2\ MJ}$ ≤ 120 W/s	3	0.00	**YES**
	LFS < edge of the sample	3	< to edge	**YES**
	THR_{600s} ≤ 7.5 MJ	3	0.14	**YES**
	CRITERIA subclass 's1'	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
	SMOGRA ≤ 30 m^2/s^2	3	0.00	**YES**
	TSP_{600s} ≤ 50 m^2	3	19.72	**YES**
	CRITERIA subclass 'd0'	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
	Fall of droplets/particles in flames within 600 s	3	NO	**YES**

(1)(2) Substantial component
(3)(4) Non substantial external component
(6) Product as a whole

SAMPLE 2 (EI/47-3)

Test Method	RESULTS			
	CRITERIA CLASS A2	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
UNE-EN ISO 1716:2011	PCS ≤ 3.0 MJ/kg (1)	15	-0.36 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (2)		-0.23 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (1)		-0.36 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (2)		-0.23 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (1)		-0.36 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (2)		-0.23 MJ/kg	**YES**
	PCS ≤ 3.0 MJ/kg (1)		-0.36 MJ/kg	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		*0.62 MJ/m^2*	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		*0.62 MJ/m^2*	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		*0.62 MJ/m^2*	**YES**
	PCS ≤ 4.0 MJ/m^2 (3)		*0.62 MJ/m^2*	**YES**
	PCS ≤ 4.0 MJ/m^2 (5)		1.66 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (5)		1.66 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (5)		1.66 MJ/m^2	**YES**
	PCS ≤ 4.0 MJ/m^2 (5)		1.66 MJ/m^2	**YES**
	PCS ≤ 3.0 MJ/kg (6)		*0.04 MJ/kg*	**YES**
UNE-EN 13823:2012 +A1:2016	FIGRA$_{0.2\ MJ}$ ≤ 120 W/s	3	0.00	**YES**
	LFS < edge of the sample	3	< to edge	**YES**
	THR$_{600s}$ ≤ 7.5 MJ	3	0.19	**YES**
	CRITERIA subclass 's1'	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
	SMOGRA ≤ 30 m^2/s^2	3	0.00	**YES**
	TSP$_{600s}$ ≤ 50 m^2	3	15.62	**YES**
	CRITERIA subclass 'd0'	**Nº TESTS**	**AVERAGE**	**COMPLIANCE**
	Fall of droplets/particles in flames within 600 s	3	NO	**YES**

(1)(2) Substantial component
(3)(5) Non substantial external component
(6) Product as a whole

4.- CLASSIFICATION AND FIELD OF APPLICATION

4.1- Reference of classification

This classification has been carried out in accordance with *EN 13501-1:2007+A1:2009*: "Classification in terms of the behaviour to fire of construction products and building elements. Part 1: Classification made from the data gathered during fire reaction tests".

4.2- Classification

The product, PYROGUARD T (EW/13-1), in relation to its reaction to fire behaviour is classified:

A2

The additional classification in relation to smoke production is:

s1

The additional classification in relation to flaming droplets / particles is:

d0

Fire Behaviour		Smoke Production			Flaming droplets	
A2	-	s	1	,	d	0

REACTION TO FIRE CLASSIFICATION : A2-s1,d0

This classification is only valid for the final conditions of use described in the present report.

The product, PYROGUARD T (EI/47-3), in relation to its reaction to fire behaviour is classified:

A2

The additional classification in relation to smoke production is:

s1

The additional classification in relation to flaming droplets / particles is:

d0

Fire Behaviour		Smoke Production			Flaming droplets	
A2	-	s	1	,	d	0

REACTION TO FIRE CLASSIFICATION : A2-s1,d0

This classification is only valid for the final conditions of use described in the present report.

4.3- Field of application (*)

- This classification is valid for the following product parameters:

The classification is only valid for the product characteristics shown, with the following parameters being extended:

- Variable parameter 1: THICKNESS

Products with commercial reference: PYROGUARD T is manufactured in different thickness, which depend on the number of toughened glass + nanocomposite gel interlayer layers in the system composed with.

1,5 x 1,0 m	L = layer TG = toughened glass NGI = nanocomposite gel interlayer						
	L1	L2	L3	L4	L5	L6	L7
EW30/13-1	TG	NGI	TG				
EW60/13-1	TG	NGI	TG				
EW90/13-1	TG	NGI	TG				
EW120/13-1	TG	NGI	TG				
EW/15-1	TG	NGI	TG				
EW/19-1	TG	NGI	TG				
EW/22-1	TG	NGI	TG				
EW/23-1	TG	NGI	TG				
EI30/16-1	TG	NGI	TG				
EI30/18-1	TG	NGI	TG				
EW30/15-1	TG	NGI	TG				
EW/24-1	TG	NGI	TG				
EW/25-1	TG	NGI	TG				
EW/26-1	TG	NGI	TG				
EW/27-1	TG	NGI	TG				
EI30/18-2	TG	NGI	TG	NGI	TG		
EI30/20-2	TG	NGI	TG	NGI	TG		
EI30/24-2	TG	NGI	TG	NGI	TG		
EI60/25-3	TG	NGI	TG	NGI	TG	NGI	TG
EI60/26-2	TG	NGI	TG	NGI	TG		
EI60/33-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/32-2	TG	NGI	TG	NGI	TG		
EI90/35-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/37-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/38-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/39-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/40-3	TG	NGI	TG	NGI	TG	NGI	TG
EI90/42-3	TG	NGI	TG	NGI	TG	NGI	TG
EI120/47-3	TG	NGI	TG	NGI	TG	NGI	TG
EI30/24-2 SWS	TG	NGI	TG	NGI	TG		
EI30/32-2 SWS	TG	NGI	TG	NGI	TG		
EI60/32-2 SWS	TG	NGI	TG	NGI	TG		
EI60/36-3 SWS	TG	NGI	TG	NGI	TG	NGI	TG
EI30/36-3 SWS	TG	NGI	TG	NGI	TG	NGI	TG
EI90/47-3 SWS	TG	NGI	TG	NGI	TG	NGI	TG

After performing the test with the thinnest and the thickest products of the range, by extension it is concluded that PYROGUARD T intermediate thicknesses product range, is included in the following Euroclass:

Fire Reaction Classification: A2-s1,d0

This classification is only valid for the final conditions of use described in the present report.

- The classification is valid for the following final use applications:

Fire resistance safety laminated glass for integrity, radiation reduction and insulation.

Substrate	Non
Fixing method	N/A
Joints	No
Air gap	200 mm separation and ventilated
Others	-

4.4.- LIMITATIONS

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

Digitally signed by Salvador Suñol Gálvez

Laboratory Manager
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Technician Responsible of Euroclasses
LGAI Technological Center S.A. (APPLUS)