

## CLASSIFICATION OF REACTION TO FIRE PERFORMANCE IN ACCORDANCE WITH EN 13501-1:2018

Classification no.	2022-Efectis-R001342
Sponsor	Pluss Advanced Technologies B.V. Helftheuvelweg 11, A2 12 5222 AV 'S-HERTOGENBOSCH THE NETHERLANDS
Product name	<b>Multilayer pouch filled with Phase Change Material savE@HS22</b>
Prepared by	Efectis Nederland BV
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## 1. INTRODUCTION

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This classification report defines the classification assigned to **Multilayer pouch filled with Phase Change Material savE®HS22** in accordance with the procedures given in EN 13501-1:2018.

## 2. DETAILS OF CLASSIFIED PRODUCT

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### 2.1 GENERAL

The product, **Multilayer pouch filled with Phase Change Material savE®HS22**, will be used as suspended ceilings tiles to reduce HVAC energy consumption by utilizing the PCM's latent heat.

### 2.2 MANUFACTURER

Pluss Advanced Technologies B.V.  
Helftheuvelweg 11, A2 12  
5222 AV 'S-HERTOGENBOSCH  
THE NETHERLANDS

### 2.3 PRODUCT DESCRIPTION

According to the sponsor the product sample is composed of:

- 8-celled multilayer pouches filled with Phase Change Material of ref. savE®HS22 of total dimensions: 30x60cm, average thickness ~2 cm, and total weight approx. 2 kg;
- Pouch: Multilayer [REDACTED] composite of total thickness of approx. 118-135 µm [REDACTED], the layers are built up as follows:
  - [REDACTED];
  - [REDACTED];
  - [REDACTED];
  - [REDACTED];
- The pouches are painted using three colours (red, black and white), with a usage of approx. 2.4-2.5 g/m<sup>2</sup>.
- Filling: Hydrated salt savE®HS22, [REDACTED] solution with a melting point of 22 °C. [REDACTED]; each cell is filled with approx. 250 g salt diluted in water which results in a water concentration of max. 30%.

The product has a total thickness of ~20 mm, and a mass per unit area of approx. 11.1 kg/m<sup>2</sup>.

### 3. STANDARDS, REPORTS, RESULTS AND CRITERIA IN SUPPORT OF THIS CLASSIFICATION

#### 3.1 APPLICABLE (PRODUCT) STANDARDS

EN ISO 11925-2:2020	Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test
EN 13823:2020	Reaction to fire tests for building products - Building products, excluding floorings exposed to the thermal attack by a single burning item
EN 13238:2010	Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates
EN 13501-1:2018	Fire classification of construction products and building elements Part 1: Classification using data from reaction to fire tests

#### 3.2 REPORTS

Name of Laboratories	Name of sponsor	Report ref. no.	Test method
Efectis Nederland BV THE NETHERLANDS	Pluss Advanced Technologies B.V. THE NETHERLANDS	2022-Efectis-R001341 2022-Efectis-R001340	EN ISO 11925-2:2020 EN 13823:2020

#### 3.3 TEST RESULTS

Test method and test number	Parameter	No. tests	Results	
			Continuous parameter – maximum	Compliance with parameters
<b>EN ISO 11925-2</b>				
Surface flame impingement	F <sub>s</sub> ≤150 mm	6	50	-
	Ignition of filter paper		-	Compliant
Edge flame Impingement	F <sub>s</sub> ≤150 mm	6	30	-
	Ignition of filter paper		-	Compliant

Test method and test number	Parameter	No. tests	Results	
			Continuous parameter – mean (m)	Compliance with parameters
<b>EN 13823</b>				
	FIGRA <sub>0.2MJ</sub> [W/s]	3	9	-
	FIGRA <sub>0.4MJ</sub> [W/s]		9	-
	THR <sub>600s</sub> [MJ]		0.8	-
	LFS < edge		-	Compliant
	SMOGRA [m <sup>2</sup> /s <sup>2</sup> ]		0.0	-
	TSP <sub>600s</sub> [m <sup>2</sup> ]		0	-
	Flaming debris - flaming ≤ 10 s - flaming > 10 s		- -	Compliant Compliant

### 3.4 CLASSIFICATION CRITERIA

Fire classification of construction products and building elements Excluding floorings and linear pipe thermal insulation products			
Classification criteria			
Class Test method(s)	B	C	D
<b>EN ISO 11925-2</b> Exposure = 30 s	F <sub>s</sub> ≤ 150 mm within 60 s Ignition of the paper in EN ISO 11925-2 results in a d2 classification.		
<b>EN 13823</b>	FIGRA <sub>0.2 MJ</sub> ≤ 120 W/s LFS < edge of specimen THR <sub>600s</sub> ≤ 7.5 MJ	FIGRA <sub>0.4 MJ</sub> ≤ 250 W/s LFS < edge of specimen THR <sub>600s</sub> ≤ 15 MJ	FIGRA <sub>0.4 MJ</sub> ≤ 750 W/s
Additional classification			
Smoke production	<b>s1</b> = SMOGRA ≤ 30 m <sup>2</sup> /s <sup>2</sup> and TSP <sub>600s</sub> ≤ 50 m <sup>2</sup> ; <b>s2</b> = SMOGRA ≤ 180 m <sup>2</sup> /s <sup>2</sup> and TSP <sub>600s</sub> ≤ 200 m <sup>2</sup> ; <b>s3</b> = not s1 or s2		
Flaming Droplets/particles	<b>d0</b> = no flaming droplets/ particles in EN 13823 within 600 s; <b>d1</b> = no flaming droplets/ particles persisting longer than 10 s in EN 13823 within 600 s; <b>d2</b> = not d0 or d1.		

## 4. CLASSIFICATION AND FIELD OF APPLICATION

### 4.1 REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with clause 11 of EN 13501-1:2018.

## 4.2 CLASSIFICATION

The product, **Multilayer pouch filled with Phase Change Material savE®HS22**, in relation to its reaction to fire behaviour is classified:

**B**

The additional classification in relation to smoke production is:

**s1**

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

**d0**

**Reaction to fire classification: B – s1, d0**

## 4.3 FIELD OF APPLICATION

This classification is valid for the following product parameters:

Thickness	~20 mm
Surface density	11.11 kg/m <sup>2</sup>
Pouch dimensions	30x60cm (8 cells)
Pouch material	Multilayer [REDACTED] composite with the following layers: <ul style="list-style-type: none"><li>• [REDACTED];</li><li>• [REDACTED];</li><li>• [REDACTED];</li><li>• [REDACTED].</li></ul>
Pouch filling	Hydrated salt savE®HS22, [REDACTED]-water solution with melting point 22 °C. Maximum water concentration of 30%.

This classification is valid for the following end use applications:

Substrate	Non-combustible (class A1/A2, 870 ± 50 kg/m <sup>3</sup> , according to EN 13238:2010)
Application	On standard size (60x60) suspended ceilings tiles
Air gap	None
Methods and means of fixing	Loosely laid on the substrate
Joints	Yes
Other aspects of end use conditions	Closed surface, no openings or gaps between components

#### 4.4 DURATION OF THE VALIDITY OF THIS CLASSIFICATION REPORT

Consult classification standard and national laws and regulations for limitations on the period of validity of the classification.

#### 5. LIMITATIONS

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This classification document does not represent type approval or certification of the product. Please note that the classification of this product is valid only for situations where the product is used loosely laid on a non-combustible surface.



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