

Reaction to fire testing of Multilayer pouch filled with Phase Change Material savE®HS22 Ignitability test according to EN ISO 11925-2:2020

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1. PRODUCT IDENTIFICATION

Multilayer pouch filled with Phase Change Material savE@HS22, further referred to as 'the product'.

2. ABSTRACT

Determination of the **ignitability** properties of the product, by **direct small flame impingement** according to EN ISO 11925-2:2020, with the objective to obtain the reaction to fire classification according to EN 13501-1:2018.

3. DETAILS OF THE PRODUCT TESTED

3.1 INTENDED APPLICATION

The product will be used in as suspended ceilings tiles.

3.2 MANUFACTURER

Pluss Advanced Technologies B.V.
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3.3 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/m².
- 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/m².

4. DETAILS OF THE EXAMINATION

4.1 SAMPLES

Sampling procedure	The samples were submitted by the sponsor.
Age	At the time of receipt: no information received.
Date of receipt	October 5 th , 2022

4.2 SPECIMEN PREPARATION

Substrate used	Not applicable
Method of fixing	Not applicable

4.3 CONDITIONING

Prior to the examinations, the specimens were conditioned over a period of two weeks minimum at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % according to § 4.1 of EN 13238.

4.4 EXAMINATION

Number of tests	A total of twelve single ignitability tests were carried out according to EN ISO 11925-2.
Deviations from the test method	None
Annex B of the EN 11925-2 <i>Testing not essentially flat end-use products</i>	The 8-celled multilayer pouches have been cut down to one array of 2 pouches without piercing them, so it fits in the specimen holder mentioned in the standard.
Harmonised Product Standard	At the time of examination of the product, the sponsor was not aware of a related existing Harmonized Product Standard.
Date of examination	October 19 th , 2022
Location of examination	Efectis Nederland BV, Bleiswijk, The Netherlands
Performed by	KSB

The results are given in Table 1, Appendix: Results.

5. CONCLUSIONS

A formal classification is to be assessed in accordance with EN 13501-1, "Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests".

Remarks:

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.

Regarding the precision of the test method, following Annex B of EN ISO 11925-2, the absolute repeatability/reproducibility for this test method is estimated to lie within 3 s to 5 s for all times measured.



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APPENDIX: RESULTS

Table 1: Ignitability classification parameter results

Flame application time: 30 s					
Sample	Ignition of sample	Maximum flame Height	t ₁₅₀	Afterburning time	Ignition of filter paper
	{Y=Yes/N=No}	[mm]	[s]	[s]	{Y=Yes/N=No}
Surface ignition					
1	Y	50	not reached	0	N
2	Y	50		0	N
3	Y	50		0	N
4	Y	50		0	N
5	Y	40		0	N
6	Y	50		0	N
Maximum		50			
Classification parameters		150 mm reached within 60 s			N
		Ignition of filter paper			N
Edge ignition					
1	Y	25	not reached	0	N
2	Y	30		0	N
3	Y	25		0	N
4	Y	30		0	N
5	Y	30		0	N
6	Y	30		0	N
Maximum		30			
Classification parameters		150 mm reached within 30 s			N
		Ignition of filter paper			N

Observations of physical behaviour of the test specimen: During the edge ignition, the pouches cracks open and liquid floats out of the pouch. The liquid doesn't burn (non-flaming droplets).