



## PAVUS, a.s.

AUTHORIZED BODY 216  
NOTIFIED BODY 1391  
ACCREDITED CERTIFICATION BODY FOR  
PRODUCTS CERTIFICATION N° 3041

Address:  
Prosecká 412/74, CZ 190 00 Praha 9 - Prosek  
Phone: +420 286 019 587  
Mail to: mail@pavus.cz, http://www.pavus.cz

Branch: FIRE TESTING LABORATORY  
VESELÍ NAD LUŽNICÍ  
Čtvrť J. Hybeše 879  
CZ 391 81 Veselí nad Lužnicí  
Czech Republic  
Phone: +420 381 477 418  
Mail to: veseli@pavus.cz

# REACTION TO FIRE CLASSIFICATION REPORT

**Object of classification:** *Construction products excluding floorings and linear pipe thermal insulation products in accordance with EN 13501-1:2018, cl. 11*

**Classification report No:**

***PK1-01-20-048-E-0***

**Type and product name:** Fire protection coating *FRED*

**Sponsor:**

***Intelligent Membranes Ltd***  
*Clopton Farm  
Lower Road  
Croydon  
SG 80EF  
Cambridgeshire  
United Kingdom*

**Prepared by:**

*PAVUS, a.s.  
Authorized body AO 216  
Notified body 1391  
Accredited certification body for products certification No. 3041  
– Accreditation issued by Czech Accreditation Institute,  
Public Service,  
– Certificate of Accreditation No. 310/2020  
Prosecká 412/74  
190 00 PRAHA 9  
Order No. Z210200262*

**Date of issue:** *2020-09-04*

**Copies in total:** *3*

**Issue number:** *1*

**Pages in total:** *4*

## 1. INTRODUCTION

- 1.1. This classification report defines the classification assigned to *FRED* in accordance with the procedures given in EN 13501-1:2018.
- 1.2. This classification report consists of 4 pages and may only be used or reproduced in its entirety.

## 2. DETAILS OF CLASSIFIED PRODUCT

### 2.1. General

The product *FRED* is supplied by company Intelligent Membranes Ltd, Clopton Farm, Croydon, SG 80EF, Cambridgeshire, United Kingdom. It is a reactive coating for fire protection.

### 2.2. Product description

Colour:	white
Composition:	waterbased intumescent coating
Coating density:	$(1.35 \pm 0.1)$ kg/l
Total indicative consumption:	580 g/m <sup>2</sup>
Solids:	$(70 \pm 2)$ %

## 3. REPORTS AND RESULTS IN SUPPORT OF THIS CLASSIFICATION

### 3.1. Reports

Name of Laboratory Address Accreditation No.	Name of sponsor	Report ref. No. Date of issue	Test method and date Field of application rules and date
PAVUS, a.s. Veselí nad Lužnicí ATL No. 1026	Intelligent Membranes Ltd Clopton Farm, Lower Road, Croydon, SG 80EF, Cambridgeshire United Kingdom	Pr-20-1.164-En 2020-09-03	EN ISO 1716:2018
		Pr-20-1.165-En 2020-09-03	EN 13823:2010+A1:2014 13238:2010

### 3.2. Results

#### 3.2.1 Testing according to EN ISO 1716

The gross heat of combustion in MJ/kg was determined for the coating itself.

Test method	Parameter	No. Tests	Results
EN ISO 1716	PCS <sup>1)</sup> (MJ/kg)	3	9.83 MJ/kg

<sup>1)</sup> Identification of the gross heat of combustion according to EN ISO 1716:2018 is Q<sub>PCS</sub>.

The value of the gross heat of combustion in MJ/m<sup>2</sup> is determined through basis weight of the dry coating. The required reaction to fire class A2 is satisfies with basis weight of the dry coating  $\leq 0.4$  kg/m<sup>2</sup>.

Test method	Parameter	No. Tests	Results	
			Continuous parameter - mean	Compliance with parameters
EN ISO 1716 <i>FRED</i> – external non-substantial component	PCS (MJ/m <sup>2</sup> )	3	3.9	≤ 4 (A2)
EN ISO 1716 substrate – substantial component	PCS (MJ/kg)	-	≤ 2	≤ 3 (A2)
EN ISO 1716 product as whole	PCS (MJ/kg)	-	≤ 3	≤ 3 (A2)

In order to be the coating classified as reaction to fire class A2 together with the substrate to which is applied, the gross heat of combustion of the coating together with the substrate must be  $PCS_{total} \leq 3$  MJ/kg. A substrate with reaction to fire class A1 will be considered as a substrate. When calculating the minimum basis weight of the substrate  $M_{substrate}$ , the gross heat of combustion of the substrate  $PCS_{substrate} = 2$  MJ/kg will be considered. It is the maximum value of the gross heat of combustion for reaction to fire class A1.

$$PCS_{total} = \frac{PCS_{Mcoating} + PCS_{Msubstrate}}{M_{coating} + M_{substrate}} = \frac{PCS_{coating}M_{coating} + PCS_{substrate}M_{substrate}}{M_{coating} + M_{substrate}}$$

where:  $M_{coating}$  is the basis weight of the coating in kg/m<sup>2</sup>;  
 $PCS_{Mcoating}$  is the gross heat of combustion in MJ/m<sup>2</sup>;  
 $PCS_{Msubstrate}$  is the gross heat of combustion in MJ/m<sup>2</sup>.

After editing:  $M_{substrate} = M_{coating} \frac{PCS_{coating} - PCS_{total}}{PCS_{total} - PCS_{substrate}}$

From this formula a value for basis weight of the substrate is obtained to be  $\geq 2.73$  kg/m<sup>2</sup>.

### 3.2.2 Testing according to EN 13823+A1

The coating was applied on the calcium silicate substrate of a thickness of 12 mm, density of 870 kg/m<sup>3</sup> and reaction to fire class A1 for test according to EN 13823+A1. The substrate did not meet the requirement for a standard substrate according to EN 13238, because its reaction to fire class was not A2-s1,d0.

Test method	Parameter	No. Tests	Results	
			Continuous parameter - mean	Compliance with parameters
EN 13823+A1	FIGRA <sub>0.2MJ</sub> (W/s)	3	0.0	≤ 120 (A2)
	THR <sub>600s</sub> (MJ)		0.5	≤ 7.5 (A2)
	LFS < edge of specimen		-	yes (A2)
	SMOGR <sup>1)</sup> (m <sup>2</sup> /s <sup>2</sup> )		0.0	≤ 30 (s1)
	TSP <sub>600s</sub> <sup>1)</sup> (m <sup>2</sup> )		37.1	≤ 50 (s1)
	No flaming droplets/ particles		-	yes (d0)

<sup>1)</sup> The alternative method of smoke calculation according to EN 13823+A1, cl. A.6.1.2 Note is used.

## 4. CLASSIFICATION AND FIELD OF APPLICATION

### 4.1. Reference of Classification

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

#### 4.2. Classification

The product *FRED* in relation to its reaction to fire behaviour is classified:

**Reaction to fire classification: A2 – s1, d0**

#### 4.3. Field of application

This classification is valid for the following product parameters:

Product composition and ratio of components:	cannot be changed
Thickness of wet layer:	no more than ca. 420 $\mu\text{m}$
Mass of wet layer:	no more than 580 $\text{g/m}^2$
Mass of dry layer:	no more than 0.4 $\text{kg/m}^2$

The classification is valid for the following end use applications:

The product *FRED* is intended as a reactive coating for fire protection. Said reaction to fire class is valid only together with the substrate, to which the product is applied. This substrate must be homogeneous, reaction to fire class A1 and a basis weight of at least 10.4  $\text{kg/m}^2$ .

### 5. LIMITATIONS

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

This classification is valid, unless the conditions, under which it was issued, have been changed. The sponsor may request the issuing authority to review the influence of changes to the classification validity.

*Elaborated by:*

*Approved by:*

.....  
Ladislav MĚSTKA  
Fire testing laboratory

.....  
Jaroslav DUFEK

This copy has been produced from a PDF format file that has been provided by PAVUS Fire Testing Laboratory to the sponsor of the document and must only be reproduced in full. Extract or abridgements of the document must not be published without permission of PAVUS Fire Testing Laboratory. The original signed paper versions of this document are the sole authentic versions. Only original paper versions of this document bear authentic signatures of the responsible PAVUS staff.