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Notified body 1020
Branch 0700, Ostrava

TEST REPORT

for assessment of performance

according to the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011, (Construction Products Regulation – CPR), Appendix V, Article 1.4 (system 3)

No. 1020 – CPR – 070062127

Product name:

SEMPRE TERM GRAFIT EPS 031

Type / variant: expanded polystyrene foam boards

Manufacturer:

SEMPRE Farby Sp. z o.o.

Company ID: 5471995321

Address: ul. Gen. J. Kustronia 60, 43-301 Bielsko-Biała, Poland

Manufacturing facility: SEMPRE Farby Sp. z o.o.

Address: ul. Gen. J. Kustronia 60, 43-301 Bielsko-Biała, Poland

Order: Z070220301

Number of pages of the report including the title page: 7

Number of annexes: 4

Person responsible for the contents of this report:

Ing. Tomáš Klepáč
Chief evaluator

Person responsible for correctness of this Report:

Stamp of notified body 1020

Ostrava, 12th November 2022



Ing. Vojtěch Šebek
deputy manager of notified body 1020

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Bank details (Bank): KB Prague 1 Czech Republic, Account No. 1501-931/0100, Company ID: 00015679, Tax ID: CZ00015679

1 Specification of the evaluated subject

Description and purpose of the product:

SEMPRE TERM GRAFIT EPS 031 polystyrene boards made of polystyrene foam are used for insulation requiring transmission of low mechanical loads, including thermal insulation of walls in External Thermal Insulation Composite Systems (ETICS, light - wet method), thermal insulation of multi-layer walls with a ventilated or non-ventilated air gap, thermal insulation of ring beams as stay-in-play formwork under the plastering, thermal insulation of lintels and panelling, external prefabricated composite sandwich panels, insulation of ceilings from below in External Thermal Insulation Composite Systems, insulation of sloped roof under the load-bearing structure.

Technical specification: EN 13163:2012+A2:2016.

Manufacturer: SEMPRE Farby Sp. z o.o., ul. Gen. J. Kustronia 60, 43-301 Bielsko-Biała, Poland.

Manufacturing facility: SEMPRE Farby Sp. z o.o., ul. Gen. J. Kustronia 60, 43-301 Bielsko-Biała, Poland.

2 Sampling:

Sampling date: 5 October 2022.

Sampling site: SEMPRE Farby Sp. z o.o., ul. Gen. J. Kustronia 60, 43-301 Bielsko-Biała, Poland.

Sample by AZL representative no. 1018.3 Ing. Tomáš Klepáč;
Aleksandra Drózdź present as a representative of the manufacturer.

Method of transportation: client's vehicle.

Sampling procedure: random choice from the product warehouse.

Accepted by: AZL representative 1018.3 Ing. Tomáš Klepáč.

Acceptance date: 5 October 2022.

Sample registration number: the sample is designated number VZ070220593 from the sample book.

3 Assessment of properties based on testing, calculations, table values and documentation

Assessment of properties was performed based on testing.

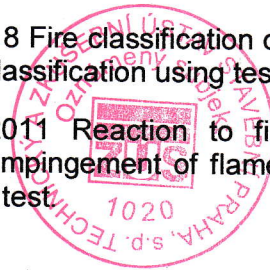
3.1 Assessment of properties based on testing

3.1.1 Reaction to fire

Sample specifications: SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards).

The assessment was performed according to the test procedure of:

- EN 13501-1+A1:2018 Fire classification of construction products and building elements – Part 1 Classification using test data from reaction to fire tests.
- EN ISO 11925-2:2011 Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test Single-flame source test



- EN 13238:2010 Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates.

Classification report approved by: Ing. Jaroslav Dufek.

Test completion date: 4 November 2022.

Further information about the test: This classification was performed pursuant to the Article 11 of ČSN EN 13501-1: 2018.

Test result: shown in the table below.

Table - Determination of reaction to fire - Classification

Determination of reaction to fire - Classification SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards)	
Class of reaction to fire	E, E _{fl}

3.1.2 Thermal conductivity and thermal resistance, thickness

Sample specifications: SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards).

The assessment was performed according to the test regulations of:

- EN 13163:2012+A2:2016 Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification.
- EN 12667:2001 Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance.
- EN 823:2013 Thermal insulating products for building applications - Determination of thickness.

Test conducted by: Ing. Tomáš Klepáč (AZL no. 1018.3).

Test completion date: 10 November 2022.

Further information about the test: The test of thermal conductivity coefficient was carried out according to the regulations listed above at the mean temperature of measuring of 10 °C on one set of samples; the set contained 10 samples of SEMPRE TERM GRAFIT EPS 031 in total.

The test to determine thickness was carried out according to the regulations listed above at the mean temperature of measuring of 22 °C on one set of samples, the set contained 5 samples of SEMPRE TERM GRAFIT EPS 031 with the nominal thickness of 50 mm in total.

Test results: are stated in the tables that follow.



Table - Thermal conductivity

Thermal conductivity of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards)										
Sample identification (TZÚS)	EPS 031/1	EPS 031/2	EPS 031/3	EPS 031/4	EPS 031/5	EPS 031/6	EPS 031/7	EPS 031/8	EPS 031/9	EPS 031/10
Measured thermal conductivity coefficient of the sample λ_i	0,03045	0,03017	0,03062	0,03075	0,02983	0,02984	0,02995	0,02997	0,02989	0,02993
Mean thermal conductivity coefficient of the samples λ_{mean}	0,03014									
Sample standard deviations s_{λ}	0,00034									
Value k for 10 test results	2,07									
Thermal conductivity coefficient $\lambda_{90/90}$	0,03085									
$\lambda_{90/90} = \lambda_{mean} + k \times s_{\lambda}$	0,031									
Thermal conductivity coefficient $\lambda_{90/90}$ (rounded)	0,031									

Table - Thermal resistance

Thermal resistance of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards)	
Nominal thickness of the product d_N	[m] 0,050
Thermal conductivity coefficient $\lambda_{90/90}$	[W/m.K] 0,03085
Thermal resistance $R_{90/90}$	[m ² .K/W] 1,621
Thermal resistance $R_{90/90}$ (rounded)	[m ² .K/W] 1,6

Table - Thickness

Thickness of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards)						
Sample identification (TZÚS)	EPS 031/1	EPS 031/2	EPS 031/3	EPS 031/4	EPS 031/5	EPS 031/6
Sample thickness [mm]	49,6	49,8	49,8	49,8	49,6	49,6
	49,5	49,8	49,5	49,6	49,7	49,7
	49,6	49,9	49,6	49,5	49,8	49,8
	49,8	49,6	49,8	49,7	49,5	49,5
Sample thickness - mean [mm]	49,6	49,8	49,7	49,7	49,7	49,7



3.1.3 Compressive strength - compressive stress at 10% compression

Sample specifications: SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards).

The assessment was performed according to the test procedures of:

- EN 13163:2012+A2:2016 Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification.
- EN 826:2013 Thermal insulating products for building applications - Determination of compression behaviour.

Test conducted by: Ing. Tomáš Klepáč (AZL no. 1018.3).

Test completion date: 10 November 2022.

Further information about the test: The test of compressive strength - compressive stress at 10% compression was carried out according to the regulations listed above on one set of samples; the set contained 5 samples of SEMPRE TERM GRAFIT EPS 031 in total.

Test result: shown in the table below.

Table - Compressive strength - compressive stress at 10% compression

Compressive strength - compressive stress at 10% compression of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards), nominal thickness 50 mm				
Sample identification (TZÚS)	Force corresponding to 10% compressive strain F_{10}	Sample cross-section A_0	Compressive strength σ_{10} $\sigma_{10} = 10^3 \times F_{10} / A_0$	Compressive strength σ_{10} $\sigma_{10} = 10^3 \times F_{10} / A_0$ (mean)
	[N]		[mm ²]	[kPa]
EPS 031/1a,b,c	1770	22891	77,3	77,0
	1770	23089	76,7	
	1760	22892	76,9	
EPS 031/2a,b,c	1720	23074	74,5	75,0
	1730	22967	75,3	
	1720	22891	75,1	
EPS 031/3a,b,c	1810	22876	79,1	78,6
	1800	23074	78,0	
	1800	22876	78,7	
EPS 031/4a,b,c	1800	22816	78,9	78,6
	1810	22907	79,0	
	1800	23119	77,9	
EPS 031/5a,b,c	1660	23013	72,1	71,3
	1620	22983	70,5	
	1640	22982	71,4	
Mean compressive strength - compressive stress at 10% compression σ_{10d}			[kPa]	76,1
Mean compressive strength - compressive stress at 10% compression σ_{10d} (rounded)			[kPa]	76



3.1.4 Water permeability - long-term water absorption by immersion

Sample specifications: SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards).

The assessment was performed according to the test regulations of:

- EN 13163:2012+A2:2016 Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification.
- EN ISO 16535:2019 Thermal insulating products for building applications – Determination of long-term water absorption by immersion.

Test conducted by: Ing. Tomáš Klepáč (AZL no. 1018.3).

Test completion date: 10 November 2022.

Further information about the test: The test was carried out according to the regulations listed above on samples of SEMPRE TERM GRAFIT EPS 031 according to methods 1A and 2A.

Test result: shown in the tables below.

Table - Water permeability - long-term water absorption by immersion

Water permeability - long-term absorption by immersion of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards) - Method 1A		
Sample identification (TZÚS)		EPS 031/1 EPS 031/2 EPS 031/3 EPS 031/4
Water permeability - absorption Method 1A W_p	[kg/m ²]	0,8
		0,7
		0,8
		0,6
Water permeability - absorption Method 1A W_p (mean)	[kg/m ²]	0,7

Water permeability - long-term absorption of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards) - Method 2A		
Sample identification (TZÚS)		EPS 031/1 EPS 031/2 EPS 031/3 EPS 031/4
Water permeability - absorption Method 2A W_{It}	[% vol.]	2,6
		2,2
		2,5
		2,8
Water permeability - absorption Method 2A W_{It} – (mean)	[% vol.]	2,5



4 Annexes

- 4.1 Report no. 070-062123 on classification according to ČSN EN 13501-1 for the product SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards). Issued by TZÚS Praha, s.p., Test laboratory TZÚS Praha, s.p. Ostrava branch no. 1018.3.
- 4.2 Report no. 070-062124 on test of thermal conductivity, thermal resistance, and thickness of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards). Issued by TZÚS Praha, s.p., Test laboratory TZÚS Praha, s.p. Ostrava branch no. 1018.3.
- 4.3 Report no. 070-062125 on test of compressive strength - compressive stress at 10% compression of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards). Issued by TZÚS Praha, s.p., Test laboratory TZÚS Praha, s.p. Ostrava branch no. 1018.3.
- 4.4 Report no. 070-062126 on test of water permeability - long-term absorption by immersion of SEMPRE TERM GRAFIT EPS 031 (expanded polystyrene foam boards). Issued by TZÚS Praha, s.p., Test laboratory TZÚS Praha, s.p. Ostrava branch no. 1018.3.

