

Institute of Civil Engineering

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CLASSIFICATION REPORT
UNDER EXTERNAL FIRE EXPOSURE TO
the roof covered with PLASTFOIL ECO membrane

02617.1/16/Z00NZP

for

THE HOLDER OF THE CLASSIFICATION REPORT

PENOPLEX SPb Limited

Saperny per. 1, Liter A, RF-191014

Saint Petersburg

Agreement №: 02617/16/Z00NZP

1 Introduction

This Classification Report represents the classification of roof covered with PLASTFOIL ECO membrane in accordance with technology described in PN-EN 13501-5:2016-07, method 1.

2 Roof Description

Roofing system covered with PLASTFOIL ECO membrane.

System of roofing layers on the downside:

- Base made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected - Yes, for the gaps not to exceed 5.0 mm,
- PE foil, thickness: 0.20 mm, weight: 180 g/m²,
- Thermal insulation in rotation: ESP boards, XPS boards, rock wool boards, foamed PIR boards,
- ESP thermal insulation boards, as well as XPS boards contain a separating layer made of glass fiber cloth with weight equal to 120 g/m²,
- PVC roofing membrane – PLASTFOIL ECO trademark, width range: 1.2 to 2.0 mm.

Manufacturer of PLASTFOIL ECO membrane is PENOPLEX SPb Limited, Saperny per. 1, Liter A, RF-191014, Saint Petersburg.

3 Test Report and results representing the Classification basis.

3.1 Test Report

Laboratory	Name of the applicant	Test report number	Test Method
Refractory testing laboratory	Penoplex SPb, Limited Saperny per. 1, Liter A, RF-191014, Saint Petersburg	LZP01-02617/16/ZOONZP LZP02-02617/16/ZOONZP LZP03-02617/16/ZOONZP LZP04-02617/16/ZOONZP LZP05-02617/16/ZOONZP LZP06-02617/16/ZOONZP LZP07-02617/16/ZOONZP LZP08-02617/16/ZOONZP	CEN/TS 1187:2012, method-1

3.2 Tests Results of roofing covering with EPS 100 thermal insulation and covered with 1.2 mm PLASTFOIL ECO membrane

Report LZP01-02617/16/ZOONZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.140	0.080	0.160	0.210	Yes
External upward flame propagation	< 0.700 m	0.090	0.000	0.090	0.150	Yes
Internal downward flame propagation	< 0.600 m	0.100	0.100	0.120	0.100	Yes
External downward flame propagation	< 0.600 m	0.000	0.000	0.050	0.050	Yes
Maximum internal combustion length	< 0.800 m	0.140	0.100	0.160	0.210	Yes
Maximum external combustion length	< 0.800 m	0.090	0.000	0.090	0.150	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°

- Base made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected Yes, for the gaps not to exceed 5.0 mm.

3.3 Tests Results of roofing covering with XPS thermal insulation and covered with 1.2 mm PLASTFOIL ECO membrane

Report LZP02-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.090	0.090	0.120	0.150	Yes
External upward flame propagation	< 0.700 m	0.090	0.000	0.070	0.030	Yes
Internal downward flame propagation	< 0.600 m	0.020	0.090	0.080	0.120	Yes
External downward flame propagation	< 0.600 m	0.020	0.000	0.000	0.070	Yes
Maximum internal combustion length	< 0.800 m	0,090	0,090	0,120	0,150	Yes
Maximum external combustion length	< 0.800 m	0.020	0.000	0.070	0.070	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
External downward flame propagation	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected - Yes, for the gaps not to exceeding 5.0 mm.

3.4 Tests Results of roofing covering with rock wool thermal insulation and covered with 1.2 mm PLASTFOIL ECO membrane

Report LZP03-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.000	0.000	0.000	0.000	Yes
External upward flame propagation	< 0.700 m	0.080	0.000	0.050	0.000	Yes

Internal downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
External downward flame propagation	< 0.600 m	0.020	0.000	0.040	0.020	Yes
Maximum internal combustion length	< 0.800 m	0.000	0.000	0.000	0.000	Yes
Maximum external combustion length	< 0.800 m	0.080	0.000	0.050	0.020	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected - Yes, for the gaps not to exceed 5.0 mm.

3.5 Tests Results of roofing covering with PIR boards thermal insulation and covered with 1.2 mm PLASTFOIL ECO membrane

Report LZP04-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.000	0.000	0.000	0.000	Yes
External upward flame propagation	< 0.700 m	0.000	0.030	0.000	0.020	Yes
Internal downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
External downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
Maximum internal combustion length	< 0,800 m	0.000	0,000	0,000	0,000	Yes
Maximum external combustion length	< 0.800 m	0.000	0.030	0.000	0.020	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes

Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected Yes, for the gaps not to exceed 5.0 mm.

3.6 Tests Results of roofing covering with ESP thermal insulation and covered with 2.0 mm PLASTFOIL ECO membrane

Report LZP05-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.100	0.110	0.120	0.080	Yes
External upward flame propagation	< 0.700 m	0.060	0.080	0.000	0.000	Yes
Internal downward flame propagation	< 0.600 m	0.050	0.100	0.100	0.150	Yes
External downward flame propagation	< 0.600 m	0.000	0,030	0.000	0.050	Yes
Maximum internal combustion length	< 0.800 m	0,100	0.110	0.120	0.150	Yes
Maximum external combustion length	< 0.800 m	0.060	0.080	0.000	0.050	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected - Yes, for the gaps not to exceed 5.0 mm.

3.7 Tests Results of roofing covering with XPS thermal insulation and covered with 2.0 mm PLASTFOIL ECO membrane

Report LZP06-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.120	0.040	0.120	0.120	Yes
External upward flame propagation	< 0.700 m	0.030	0.000	0.090	0.070	Yes
Internal downward flame propagation	< 0.600 m	0.090	0.070	0.080	0.080	Yes
External downward flame propagation	< 0.600 m	0.080	0.000	0.000	0.000	Yes
Maximum internal combustion length	< 0.800 m	0.120	0,070	0.120	0.120	Yes
Maximum external combustion length	< 0.800 m	0.080	0.000	0.090	0.070	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected Yes, for the gaps not to exceed 5.0 mm.

3.8 Tests Results of roofing covering with rock wool thermal insulation and covered with PLASTFOIL ECO membrane of 2.0 mm

Report LZP07-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.000	0.000	0.000	0.000	Yes
External upward flame propagation	< 0.700 m	0.090	0.000	0.050	0.070	Yes

Internal downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
External downward flame propagation	< 0.600 m	0.030	0.040	0.020	0.000	Yes
Maximum internal combustion length	< 0.800 m	0.000	0.000	0.000	0.000	Yes
Maximum external combustion length	< 0.800 m	0.090	0.040	0.050	0.070	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes
Side flame propagation	Do krawędzi*	No	No	No	No	Yes
Internal combustion w/t flame	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected Yes, for the gaps not to exceed 5.0 mm.

3.9 Tests Results of roofing covering with PIR boards thermal insulation and covered with 2.0 mm PLASTFOIL ECO membrane

Report LZP08-02617/16/Z00NZP

Parameter	Criteria	Results of the samples evaluation				Compliance with the criteria
		1	2	3	4	
Internal upward flame propagation	< 0.700 m	0.000	0.000	0.000	0,000	Yes
External upward flame propagation	< 0.700 m	0.000	0.020	0.060	0.070	Yes
Internal downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
External downward flame propagation	< 0.600 m	0.000	0.000	0.000	0.000	Yes
Maximum internal combustion length	< 0.800 m	0.000	0.000	0.000	0.000	Yes
Maximum external combustion length	< 0.800 m	0.000	0.020	0.060	0.070	Yes
Burning drops/Front side pieces	No	No	No	No	No	Yes
Burning drops/Downside pieces	No	No	No	No	No	Yes
Separate openings	< 25 mm ²	0	0	0	0	Yes
Total of openings	< 4 500 mm ²	0	0	0	0	Yes

Side flame propagation	Do krawędzi*	No	No	No	No	Yes
External downward flame propagation	No	No	No	No	No	Yes
Flame propagation radius (deck roof)	< 0.200 m	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

„0” means absence of any damages

* - measuring zone edges

Tests Results: Ambient temperature: 17.5°C

The test has been performed at the roof slope equal to 15°C

Base is made of wood laminated plastic boards, width: 250 mm, thickness: 16 mm, density: 680 kg/m³ with straight edges, tightly connected Yes, for the gaps not to exceed 5.0 mm.

4 Classification and the scope of application

4.1 Application

Classification has been described in accordance with **PN-EN 13501-5:2016-07**.

4.2 Classification

In accordance to the description of paragraph 2, the roof has been classified in terms of retention from internal fire as follows:

$$B_{\text{roof}}(t_1).$$

This Classification binds to apply end-pieces in accordance with technical specifications. The same specifications are valid for the structures and their location, as well as for flame “non-propagating” roof in accordance with the Minister of Infrastructure Decree as of April 12, 2002 (KZ No. 75 as of June 15, 2002, pos. 690 in the latest available revision).

4.3 Scope of application

This Classification is valid for the conditions as follows:

- 1) Each wooden and made of wood base with width as least 16 mm, with gaps not exceeding 5.0 mm, as well as any profile and non-profile steel base and fireproof base with thickness equal to 10 mm as minimum,
- 2) Waterproofing of PE film, as well as bitumen waterproofing of roofing material with properties in accordance with PN-EN 13707 or PN-EN 13970 and at least E reaction-to-fire class in accordance with PN-EN 13501-1,
- 3) Thermal insulation of EPS 100, EPS 80, EPS 70 boards with width > 50 mm, E reaction-to-fire class, as minimum, in accordance with PN-EN 13501-1. It is possible to apply lowing wedges of EPS 10, EPS 80, EPS 70 boards produced in accordance with PN-EN 13163, E reaction-to-fire class in accordance with PN-EN 13501-1.
- 4) Thermal insulation of XPS boards with width ≥ 50 mm, E reaction-to-fire class, as minimum, in accordance with PN-EN 13501-1. It is possible to apply lowing wedges of XPS boards with E reaction-to-fire class, as minimum, in accordance with PN-EN 13501-1.
- 5) Thermal insulation of rock wool with width ≥ 50 mm, A2 reaction-to-fire class, as minimum,- s3,d0 in accordance with PN-EN 13501-1. It is possible to apply lowing wedges of rock wool, A2 reaction-to-fire class, as minimum, - s3.d0 in accordance with PN-EN 13501-1.
- 6) Thermal insulation of PIR foam boards with width ≥ 50 mm, E reaction-to-fire class, as minimum, in accordance with PN-EN 13501-1. It is possible to apply lowing wedges of PIR foam with E reaction-to-fire class, as minimum, in accordance with PN-EN 13501-1.
- 7) Thermal insulation of EPS and XPS boards shall have a separating layer made of rock wool with weight equal to 120 g/m² as minimum.

- 8) Membrane of PVC roof with trade name PLASTFOIL ECO, width range: 1.2 – 2.0 mm.
 Manufacturer of PLASTFOIL ECO membrane is PENOPLEX SPb Limited, Saperny per. 1, Liter A,
 RF-191014, Saint Petersburg.
- 9) Roofs with a slope up to 20°.

5 Restrictions

5.1 Validity period

Classification is valid until 10.03.2020 subject to composition and production technology maintenance.

5.2 Restrictions

Classification can only be used by the applicant in full, it means, free from any applications, references, abbreviations and amendments.

Certified copy may be issued to Refractory Testing Bureau, ITB, solely under the Applicant's application.

5.3 Warning

This Classification document represents neither approval nor certificate.

Classification	Full name	Signature*	Date
Completed by	Tomasz Gwizdz	<i>/signature/</i>	10.03.2017

* - on behalf of organization issued the Report

[Stamp: HEAD OF THE LABORATORY OF
 the Development and Investigation of fire-protection
 materials */signature/*
 Dr.-Eng.. Bartłomiej K. Papis]

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