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CLASSIFICATION OF FIRE RESISTANCE IN ACCORDANCE WITH PN-EN 13501-2:2008

Sponsor:

ORION Sp. z o.o

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PL 58-200 Dzierżoniów

Prepared by:

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Product name:

Linear joint seals – Polyurethane Foam
1PU/Premium B1 - gun recipe and pipe
recipe.

Classification report No.:

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1. Introduction

This classification report defines the resistance to fire classification assigned to the elements – linear joint seals – Polyurethane Foam1PU/Premium B1 - gun recipe and pipe recipe in accordance with the procedures given in PN-EN 13501-2:2008.

2. Details of classified product

2.1. General

The element, linear joint seal – Polyurethane Foam1PU/Premium B1 - gun recipe and pipe recipe is defined as vertical and horizontal linear joints seals in vertical building supporting construction.

2.2. Description

The element, linear joint seals – Polyurethane Foam1PU/Premium B1 - gun recipe and pipe recipe manufactured by ORION Sp. z o.o., is described below.

Linear joint seals are made of:

- a) fire protection polyurethane foam with fire retardant - 1PU/Premium B1 - GUN VERSION (gun recipe – adjusted to application by using application's gun), or
- b) fire protection polyurethane foam with fire retardant - 1PU/Premium B1 - PIPE VERSION (pipe recipe – adjusted to application by using application's elastic pipe).

View and cross section and construction details are presented in figures No. 1 and 2.

2.2.1. Type 1. Vertical linear joints seals in vertical building supporting construction.

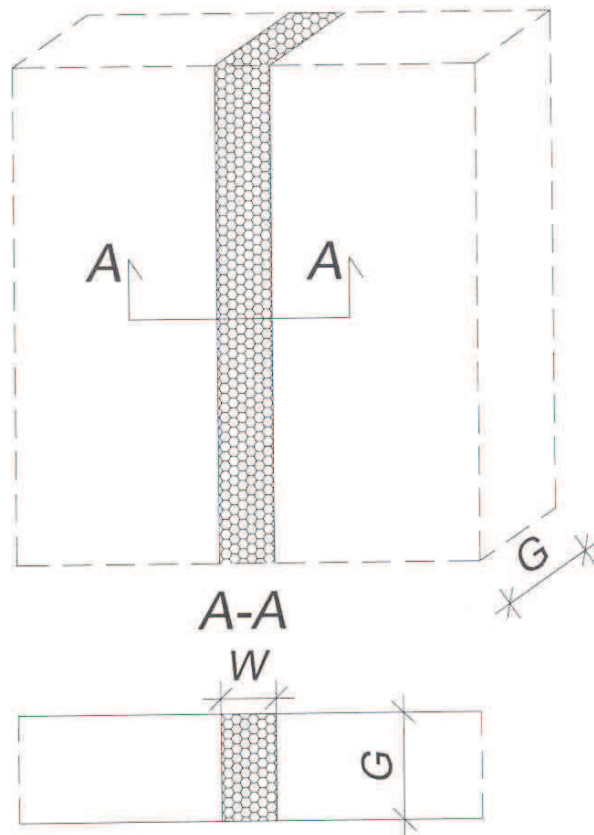


Fig. 1. View and horizontal cross-section.

2.2.2. Type 2. Horizontal linear joints seals in vertical building supporting construction.

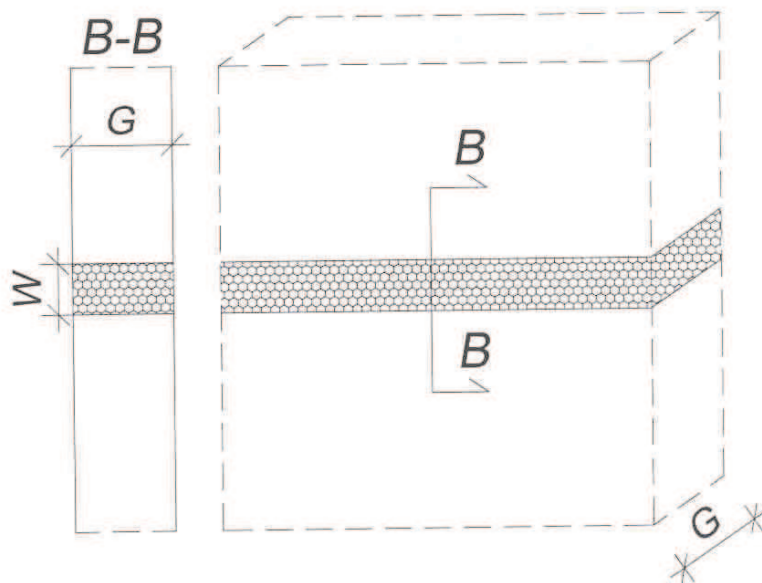


Fig. 1. View and vertical cross-section.

3. Test reports/extended application reports and test results in support of the classification

3.1. Test reports/extended application reports

Name of Laboratory	Name of sponsor	Test and date	Test method
Fire Research Laboratory of Building Research Institute Ksawerów St. 21 PL 02-656 Warsaw	ORION Sp. z o.o.	LP-02393/09 10.07.2009	PN-EN 1366-4:2008

3.2. Test results

Test method, number and date	Parameter	Results
PN-EN 1366-4:2008 LP-02393/09 10.07.2009	Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 30 mm	
	supporting construction	G = 20 cm trick wall made of aerated concrete blocks
	integrity cotton pad gap gauges sustained flaming	110 minutes no failure 110 minutes no failure 110 minutes
	insulation	110 minutes no failure
PN-EN 1366-4:2008 LP-02393/09 10.07.2009	Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 30 mm	
	supporting construction	G = 20 cm trick wall made of aerated concrete blocks
	integrity cotton pad gap gauges sustained flaming	120 minutes no failure 120 minutes no failure 120 minutes
	insulation	120 minutes no failure

<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 11 mm</p>	
supporting construction	G = 20 cm trick wall made of aerated concrete blocks
integrity	
cotton pad	240 minutes no failure
gap gauges	240 minutes no failure
sustained flaming	240 minutes no failure
insulation	240 minutes no failure
<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 11 mm</p>	
supporting construction	G = 20 cm trick wall made of aerated concrete blocks
integrity	
cotton pad	132 minutes
gap gauges	132 minutes no failure
sustained flaming	132 minutes no failure
insulation	132 minutes no failure
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 10 mm</p>	
supporting construction	G = 20 cm trick wall made of aerated concrete blocks
integrity	
cotton pad	240 minutes no failure
gap gauges	240 minutes no failure
sustained flaming	240 minutes no failure
insulation	240 minutes no failure
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 20 mm</p>	
supporting construction	G = 20 cm trick wall made of aerated concrete blocks
integrity	
cotton pad	186 minutes no failure
gap gauges	186 minutes no failure
sustained flaming	186 minutes
insulation	184 minutes

<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 20 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 20 cm trick wall made of aerated concrete blocks</p> <p>184 minutes no failure</p> <p>184 minutes no failure</p> <p>184 minutes</p> <p>184 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 10 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 20 cm trick wall made of aerated concrete blocks</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 32 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 20 cm trick wall made of aerated concrete blocks</p> <p>145 minutes no failure</p> <p>145 minutes no failure</p> <p>145 minutes</p> <p>145 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 32 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>ściana o grubości G = 20 cm z bloków z betonu lekkiego</p> <p>125 minutes no failure</p> <p>125 minutes no failure</p> <p>125 minutes</p> <p>125 minutes no failure</p>

<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION)</p> <p>- width of joint – W = 30 mm</p>	
<p>supporting construction</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p>
<p>integrity</p>	
<p style="text-align: right;">cotton pad</p>	160 minutes no failure
<p style="text-align: right;">gap gauges</p>	160 minutes no failure
<p style="text-align: right;">sustained flaming</p>	160 minutes
<p>insulation</p>	160 minutes no failure
<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION)</p> <p>- width of joint – W = 30 mm</p>	
<p>supporting construction</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p>
<p>integrity</p>	
<p style="text-align: right;">cotton pad</p>	183 minutes no failure
<p style="text-align: right;">gap gauges</p>	183 minutes no failure
<p style="text-align: right;">sustained flaming</p>	183 minutes
<p>insulation</p>	183 minutes no failure
<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION)</p> <p>- width of joint – W = 11 mm</p>	
<p>supporting construction</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p>
<p>integrity</p>	
<p style="text-align: right;">cotton pad</p>	240 minutes no failure
<p style="text-align: right;">gap gauges</p>	240 minutes no failure
<p style="text-align: right;">sustained flaming</p>	240 minutes no failure
<p>insulation</p>	240 minutes no failure
<p>Linear joint seal Type 2 - see clause 2.2.2 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION)</p> <p>- width of joint – W = 11 mm</p>	
<p>supporting construction</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p>
<p>integrity</p>	
<p style="text-align: right;">cotton pad</p>	240 minutes no failure
<p style="text-align: right;">gap gauges</p>	240 minutes no failure
<p style="text-align: right;">sustained flaming</p>	240 minutes no failure
<p>insulation</p>	240 minutes no failure

<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 10 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 32 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p> <p>192 minutes no failure</p> <p>192 minutes no failure</p> <p>192 minutes</p> <p>192 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 32 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p> <p>181 minutes no failure</p> <p>181 minutes no failure</p> <p>181 minutes</p> <p>181 minutes no failure</p>
<p>Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 11 mm</p>	
<p>supporting construction</p> <p>integrity</p> <p style="text-align: right;">cotton pad</p> <p style="text-align: right;">gap gauges</p> <p style="text-align: right;">sustained flaming</p> <p>insulation</p>	<p>G = 24 cm trick wall made of aerated concrete blocks</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p> <p>240 minutes no failure</p>

Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – PIPE VERSION) - width of joint – W = 22 mm	
supporting construction integrity cotton pad gap gauges sustained flaming insulation	G = 24 cm trick wall made of aerated concrete blocks 240 minutes no failure 240 minutes no failure 240 minutes no failure 240 minutes no failure
Linear joint seal Type 1 - see clause 2.2.1 (fire protection polyurethane foam 1PU/Premium B1 – GUN VERSION) - width of joint – W = 22 mm	
supporting construction integrity cotton pad gap gauges sustained flaming insulation	G = 24 cm trick wall made of aerated concrete blocks 172 minutes no failure 172 minutes no failure 172 minutes 172 minutes no failure

4. Classification and field of application

4.1. Reference of classification

This classification has been carried out in accordance with Clause 7 of PN-EN 13501-2:2008.

4.2. Classification

The element, linear joint seals – Polyurethane Foam 1PU/Premium B1 - gun recipe and pipe recipe is classified according to the following combinations of performance parameters and classes as appropriate.

***) Key:**

- E - fire integrity
- I - fire insulation
- V - orientation: vertical construction – vertical joint
- T - orientation: vertical construction – horizontal joint
- X - movement capacity – no movement
- F - type of splices - field
- W - joint widths range (in mm)

4.2.1.1. Linear joint seal Type 1 according to 2.2.1 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - **GUN VERSION** (according to Fig. 1)

– joint width **from 6 to 10 mm**

– minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	240	240											

Resistance to fire class: EI 240 – V – X – F – W 6 to 10

*)

– joint width **from 11 to 20 mm**

– minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	180	180											

Resistance to fire class: EI 180 – V – X – F – W 11 to 20

*)

– joint width **from 21 to 32 mm**

– minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	120	120											

Resistance to fire class: EI 120 – V – X – F – W 21 to 32

*)

4.2.1.2. Linear joint seal Type 1 according to 2.2.1 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - **PIPE VERSION** (according to Fig. 1)

– joint width **from 6 to 10 mm**

– minimum wall thickness - **20 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	240													
		240												

Resistance to fire class: EI 240 – V – X – F – W 6 to 10

*)

– joint width **from 11 to 20 mm**

– minimum wall thickness - **20 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	180													
		180												

Resistance to fire class: EI 180 – V – X – F – W 11 to 20

*)

– joint width **from 21 to 32 mm**

– minimum wall thickness - **20 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	120													
		120												

Resistance to fire class: EI 120 – V – X – F – W 21 to 32

*)

4.2.1.3. Linear joint seal Type 1 according to 2.2.1 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - **GUN VERSION** (according to Fig. 1)

– joint width **from 6 to 11 mm**

– minimum wall thickness - **24 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	240	240											

Resistance to fire class: EI 240 – V – X – F – W 6 to 11

*)

– joint width **from 12 to 22 mm**

– minimum wall thickness - **24 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	120	120											

Resistance to fire class: EI 120 – V – X – F – W 12 to 22

*)

– joint width **from 23 to 32 mm**

– minimum wall thickness - **24 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	180	180											

Resistance to fire class: EI 180 – V – X – F – W 22 to 32

*)

4.2.1.4. Linear joint seal Type 1 according to 2.2.1 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - PIPE VERSION (according to Fig. 1)

– joint width from **6 to 10 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	240													
		240												

Resistance to fire class: EI 240 – V – X – F – W 6 to 10 *)

– joint width from **11 to 22 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	240													
		240												

Resistance to fire class: EI 240 – V – X – F – W 12 to 22 *)

– joint width from **22 to 32 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	180													
		180												

Resistance to fire class: EI 180 – V – X – F – W 22 to 32 *)

4.2.2.1. Linear joint seal Type 2 according to 2.2.2 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - GUN VERSION (according to Fig. 2)

- joint width **from 6 to 30 mm**
- minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	120	120											

Resistance to fire class: EI 120 – T – X – F – W 6 to 30 *)

4.2.2.2. Linear joint seal Type 2 according to 2.2.2 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - PIPE VERSION (according to Fig. 2)

- joint width **from 6 to 11 mm**
- minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	240	240											

Resistance to fire class: EI 240 – T – X – F – W 6 to 11 *)

- joint width **from 12 to 30 mm**
- minimum wall thickness - **20 cm**

R	E	I	W	t	t	-	M	C	S	IncSlow	sn	ef	r
	90	90											

Resistance to fire class: EI 90 – T – X – F – W 12 to 30 *)

4.2.2.3. Linear joint seal Type 2 according to 2.2.2 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - GUN VERSION (according to Fig. 2)

– joint width **from 6 to 11 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	240													
		240												

Resistance to fire class: EI 240 – T – X – F – W 6 to 11

*)

– joint width **from 12 to 30 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	180													
		180												

Resistance to fire class: EI 180 – T – X – F – W 12 to 30

*)

4.2.2.4. Linear joint seal Type 2 according to 2.2.2 - joints sealed with fire protection polyurethane foam 1PU/Premium B1 - PIPE VERSION (according to Fig. 2)

– joint width **from 6 to 11 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	240													
		240												

Resistance to fire class: EI 240 – T – X – F – W 6 to 11

*)

– joint width **from 12 to 30 mm**

– minimum wall thickness - **24 cm**

R	E	I	W		t	t	-	M	C	S	IncSlow	sn	ef	r
	120													
		120												

Resistance to fire class: EI 120 – T – X – F – W 12 to 30 *)

4.3. Field of application

This classification is valid for the following end use applications:

4.3.1. Permitted orientation in accordance with PN-EN 1366-4:2008:

– **B** – vertical linear joint seals in vertical building elements – joints classified in 4.2.1.1 - 4.2.1.4,

– **C** – vertical linear joint seals in vertical building elements – joints classified in 4.2.2.1 - 4.2.2.4,

4.3.2. Application to supporting constructions elements in accordance with 13.2 of PN-EN 1366-4:2008 made of aerated concrete blocks, concrete, concrete works and masonry with full filled mortar density at least 600 kg/m^3 and thickness given in 4.2.

4.3.3. Application to straight linear joints with parallel surfaces of elements sealed edges in accordance with Fig. 3.

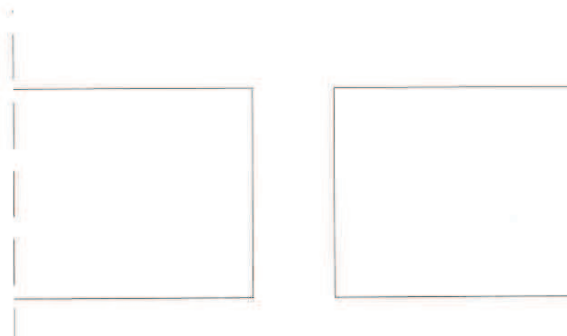


Fig. 3.

5. Limitations

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

SIGNED


M.Sc. Civil Eng. Marek Łukomski

APPROVED

Head of Fire Research Department


Ph.D. Andrzej Borowy