



PAVUS, a.s.

Order No.
Z220200107

**FIRE CLASSIFICATION CERTIFICATE
ON FIRE RESISTANCE
No. PKO-20-042**

for products
Fire resistant floors and roofs made of FIRESTOP boards

performed on the basis of:
fire resistance test reports and the test result analysis

Sponsor: KRONOSPAN OSB, spol. s r.o.
Na Hranici 6
587 04 Jihlava
Czech republic

References:

**ČSN EN 1365-2 Fire resistance tests for loadbearing elements -
Part 2: Floors and roofs**

ČSN 73 0810 Fire safety of buildings – General provisions

The fire classification certificate includes 9 pages of text

Number of copies: 2

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The fire classification approval is done based on the agreement No. Z220200107 between the approval sponsor, company KRONOSPAN OSB, spol. s r.o. and its elaborator, company PAVUS, a.s.

1. TECHNICAL PRODUCT DESCRIPTION

1.1 General

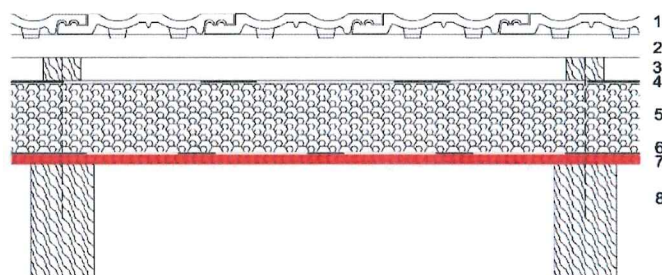
Fire resistant floors and roofs made of FIRESTOP boards have been defined as loadbearing constructions with a fire separating function with regards to their parameters of fire resistance mentioned in ČSN 73 0810.

1.2 Description of assessed structures

For a detailed description of assessed structures is given in analysis of the test result No. Z220200107.

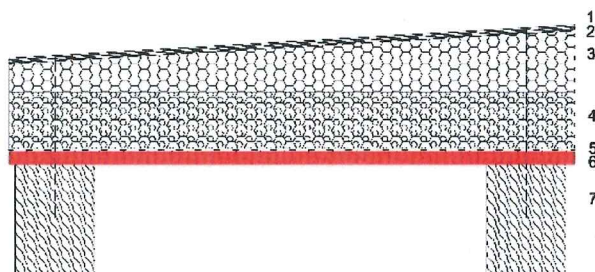
1.2.1 PR.EB.PIR

structure:	1) Roof covering	25,0 mm
	2) Laths eventually cleading	40,0 mm
	3) Counter laths + aerated layer	40,0 mm
	4) Supplementary waterproofing	1,8 mm
	5) Thermal insulation made of PIR (32 kg·m ⁻³)	160,0 mm
	6) Vapour barrier – bitumen band with glass reinforcement	2,2 mm
	7) OSB board FIRESTOP (KRONOSPAN)	16,0 mm
	8) Loadbearing timber element - rafter 200 x 100, in spans of 625 mm, GL 24h	200,0 mm



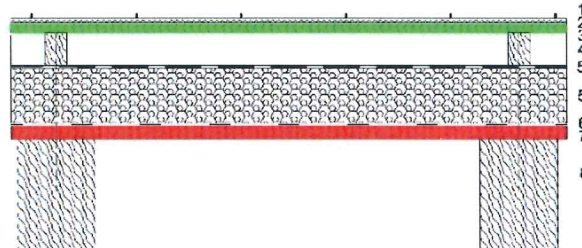
1.2.2 FR.EB.PIR.SEPS

structure:	1) Cladding waterproofing made of PVC-P / bitumen band	1,5 / 4,0 mm
	2) Separating textile / base sheet	- / 4,0 mm
	3) Thermal insulation made of EPS 100 S Stabil in pitch	60,0 and more mm
	4) Thermal insulation made of PIR boards (32 kg·m ⁻³) (alt. Min. wool 31 kg·m ⁻³)	100,0 mm
	5) Vapour barrier – bitumen band with glass reinforcement	- mm
	6) OSB board FIRESTOP (KRONOSPAN)	23,0 mm
	7) Loadbearing timber element - rafter 180 x 140 in spans of 625 mm, C 24	180,0 mm



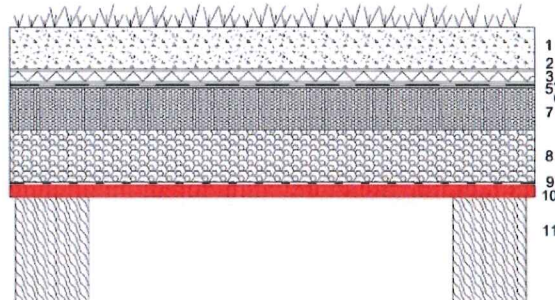
1.2.3 FR.EB.PIR.V-MET

structure:	1) Welled metal roofing	- mm
	2) Separating structured mats	10,0 mm
	3) OSB 3 board (KRONOSPAN)	15,0 mm
	4) Laths + aerated layer	60,0 mm
	5) Supplementary waterproofing	1,8 mm
	6) Thermal insulation made of PIR boards (32 kg·m ⁻³)	160,0 mm
	7) Vapour barrier – bitumen band with glass reinforcement	4,0 mm
	8) OSB board FIRESTOP (KRONOSPAN)	23,0 mm
	7) Loadbearing timber element - rafter 180 x 140 in spans of 625 mm, C 24	180,0 mm



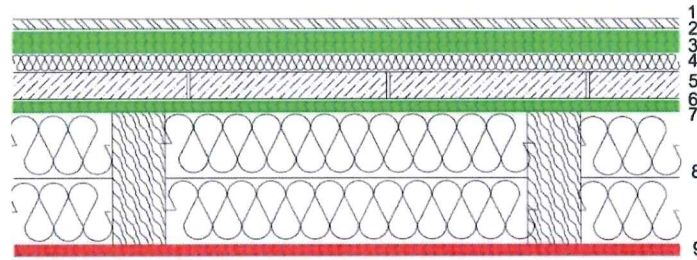
1.2.4 FR.EB.PIR.Green

structure:	1) Vegetation substrate for xerophilous plants	80,0 mm
	2) Separating foil made of 100% PP	- mm
	3) Nep foil with perforations on the upper surface	20,0 mm
	4) Separating foil made of 100% PP	- mm
	5) Waterproofing foil made of PVC-P designated for vegetation roofs	1,5 mm
	6) Separating foil made of 100% PP	- mm
	7) Thermal insulation made of XPS	80,0 mm
	8) Thermal insulation made of PIR boards (32 kg·m ⁻³) (alt. Min. wool, 31 kg·m ⁻³)	100,0 mm
	9) Vapour barrier – bitumen band with glass reinforcement	4,0 mm
	10) OSB board FIRESTOP (KRONOSPAN)	23,0 mm
	11) Loadbearing timber element - rafter 180 x 140 in spans of 625 mm, C 24	180,0 mm



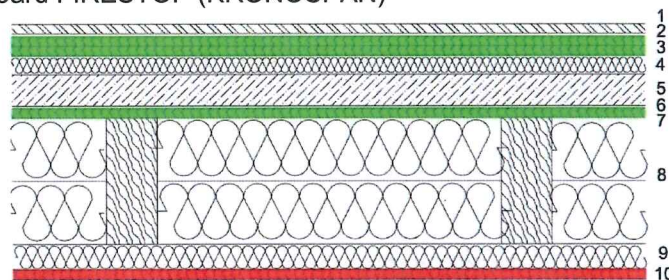
1.2.5 F.C.MW

structure:	1) Walkable layer	15,0 mm
	2) Separating foil	3,0 mm
	3) 2x bond OSB 3 board (KRONOSPAN)	30,0 mm
	4) Sound insulation	30,0 mm
	5) Concrete layer	50,0 mm
	6) Separating foil	- mm
	7) OSB 3 board (KRONOSPAN)	15,0 mm
	8) Loadbearing timber element - rafter 200 x 80 in spans of 625 mm, C 24 / the room between the studs is filled with thermal insulation made of mineral fibres Isover WDF 10 S 9 (15 kg·m ⁻³)	200,0 mm
	9) OSB board FIRESTOP (KRONOSPAN)	16,0 mm



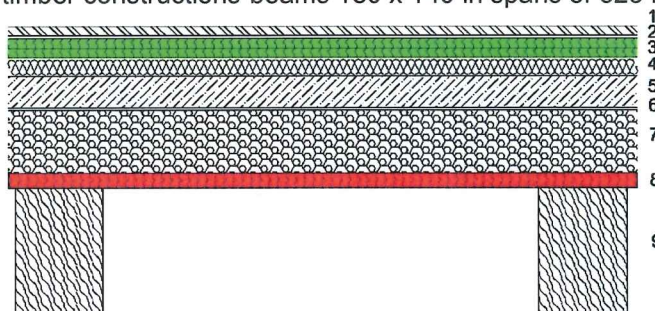
1.2.6 F.C.MW.IG

structure:	1) Walkable layer	15,0 mm
	2) Separating foil	- mm
	3) 2x bond OSB 3 board (KRONOSPAN)	30,0 mm
	4) Sound insulation	30,0 mm
	5) Concrete layer	50,0 mm
	6) Separating foil	- mm
	7) OSB 3 board (KRONOSPAN)	15,0 mm
	8) Loadbearing timber element - rafter 200 x 80 in spans of 625 mm, C 24 / the room between the studs is filled with thermal insulation made of mineral fibres Isover WDF 10 S 9 (15 kg·m ⁻³)	200,0 mm
	9) Unidirectional timber grid - laths 40 x 60, the room between the laths is filled with thermal insulation made of mineral fibres (15 kg·m ⁻³)	40,0 mm
	10) OSB board FIRESTOP (KRONOSPAN)	16,0 mm



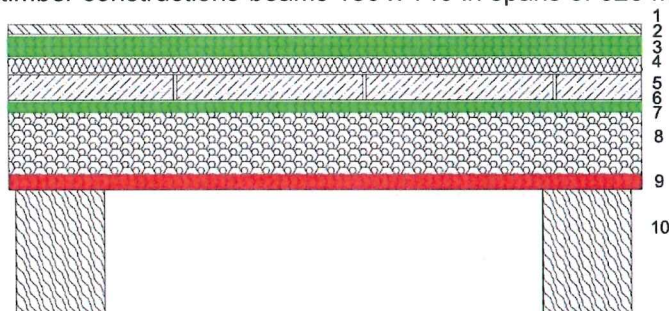
1.2.7 F.EB.PIR

structure:	1) Walkable layer	15,0 mm
	2) Separating foil	- mm
	3) 2x bond OSB 3 board (KRONOSPAN)	30,0 mm
	4) Sound insulation	30,0 mm
	5) Concrete layer	50,0 mm
	6) Separating foil	- mm
	7) Thermal insulation made of PIR (32 kg·m ⁻³)	100,0 mm
	8) OSB 3 board (KRONOSPAN)	23,0 mm
	9) Loadbearing timber constructions-beams 180 x 140 in spans of 625 mm C 24	180,0 mm



1.2.8 F.EB.PIR.2

structure:	1) Walkable layer	15,0 mm
	2) Separating foil	- mm
	3) 2x bond OSB 3 board (KRONOSPAN)	30,0 mm
	4) Sound insulation	30,0 mm
	5) Concrete tiles 300 x 300 x 40	40,0 mm
	6) Separating foil	- mm
	7) OSB 3 board (KRONOSPAN)	15,0 mm
	8) Thermal insulation made of PIR (32 kg·m ⁻³)	100,0 mm
	9) OSB board FIRESTOP (KRONOSPAN)	23,0 mm
	10) Loadbearing timber constructions-beams 180 x 140 in spans of 625 mm C 24	180,0 mm



2. LIST OF TECHNICAL STANDARDS AND REFERENCES IN SUPPORT OF FIRE CLASSIFICATION CERTIFICATE

2.1 Test reports

Name of lab. Address Accreditation No.	Test report sponsor	Test report No. Date of issue Date of testing	Test method
PAVUS, a. s. Veselí nad Lužnicí No. 1026	KRONOSPAN CR, spol. s r.o. Na Hranici 6 587 04 Jihlava Czech republic	Pr-15-2.054 20-07-2015 07-05-2015	ČSN EN 1365-2
		Pr-15-2.114 29-09-2015 01-07-2015	
		Pr-16-2.068 29-02-2016 05-11-2015	

2.2 Test result analysis

Name Address	Test report sponsor	Test report No. Date of issue	Method
PAVUS, a. s. Prosecká 412/74 190 00 Prosek	KRONOSPAN CR, spol. s r.o. Na Hranici 6 587 04 Jihlava Czech republic	Z220200107 16-06-2020	ČSN 73 0810

2.3 References

- [1] ČSN 73 0810 Fire safety of buildings – General provisions
- [2] ČSN EN 1363-1 Fire resistance tests – Part 1: General requirements
- [3] ČSN EN 1363-2 Fire resistance tests for loadbearing elements - Part 2: Floors and roofs

3. TEST RESULTS

3.1 Tested structures

3.1.1 Test of loadbearing floor, roof with timber beams 80/200 mm and with Firestop board - type LBF 80/200 - Firestop - GW (specimen No. 5)

structure from NS: -OSB 3 Superfinish P+D 15,0 mm
 -Mineral isol. Isover DOMO 2 x 100 mm + beam. 80/200 200,0 mm
 -OSB Firestop 16,0 mm

Test method and protocol	Parameter	Result	
ČSN EN 1365-2 No. Pr-15-2.054	Floor loaded with standard curve		
	Applied load	2,1 kN·m ⁻²	
	Supporting construction	Embedded as a simple beam 4,2 m	
	Criterion	Partial criterion	Measured value ¹⁾
	Loadbearing capacity	Deflection	37 min , no failure
		Rate of deflection	37 min , no failure
	Integrity	Cotton pad	37 min
		Gap gauge passage	37 min , no failure
		Sustained flaming	37 min
	Isolation	Mean temperature	37 min , no failure
		Maximum temperature	37 min , no failure

Note: ¹⁾ End of test in 38. min.

Fire resistance of sandwich floor panel REI 30.

The maximum moment from the added test load is 4,63 kN.m

The maximum shear force from the added test load is 4,41 kN

The total maximum moment (added load and self-weight) is 5,34 kN.m

The total maximum shear force (added load and self-weight) is 5,08 kN

3.1.2 Loadbearing roof construction with timber beams 100/200 mm with OSB shutter Firestop (30°) (specimen no. 8)

<u>structure from NS:</u>	-Laths 30 x 50 mm	30,0 mm
	-Topdek 022 PIR th. 100 mm (32 kg·m ⁻³)	100,0 mm
	-Topdek AL barrier	-
	-OSB Firestop	18,0 mm
	-Rafter GL24h 100 x 200 mm	200 mm

Test method and protocol	Parameter	Result	
ČSN EN 1365-2 No. Pr-15-2.114	Roof loaded with standard curve		
	Applied load	2 kN·m ⁻²	
	Supporting construction	Emb. as a simple beam, 4,85 m, 30°	
	Criterion	Partial criterion	Measured value ¹⁾
	Loadbearing capacity	Deflection	36 min , no failure
		Rate of deflection	36 min , no failure
	Integrity	Cotton pad	36 min , no failure
		Gap gauge passage	36 min , no failure
		Sustained flaming	36 min , no failure
	Isolation	Mean temperature	36 min , no failure
Maximum temperature		36 min , no failure	

Note: ¹⁾ End of test in 37. min.

Fire resistance of sandwich floor panel REI 30.

The maximum moment from the added test load is 5,09 kN.m

The maximum shear force from the added test load is 4,20 kN

The total maximum moment (added load and self-weight) is 5,79 kN.m

The total maximum shear force (added load and self-weight) is 4,87 kN

3.1.3 Loadbearing floor (roof) with PIR insulation type LBF 140/180 - Firestop 23 - PIR (specimen no. 12)

<u>structure from NS:</u>	-Board OSB Superfinish P+D	15,0 mm
	-Thermal insulation PIR th. 100 mm	100,0 mm
	-Foil vapor barrier	-
	-OSB Firestop	23,0 mm
	-Beam KVH 140 x 180 mm	180,0 mm

Test method and protocol	Parameter	Result	
ČSN EN 1365-2 No. Pr-16-2.068	Floor loaded with standard curve		
	Applied load	2,56 kN·m ⁻²	
	Supporting construction	Embedded as a simple beam, 4,2 m	
	Criterion	Partial criterion	Measured value ¹⁾
	Loadbearing capacity	Deflection	36 min , no failure
		Rate of deflection	36 min , no failure
	Integrity	Cotton pad	36 min , no failure
		Gap gauge passage	36 min , no failure
		Sustained flaming	36 min , no failure
	Isolation	Mean temperature	36 min , no failure
Maximum temperature		36 min , no failure	

Note: ¹⁾ End of test in 65. min.

Fire resistance of sandwich roof panel REI 60.

The maximum moment from the added test load is 5,64 kN.m

The maximum shear force from the added test load is 5,37 kN

The total maximum moment (added load and self-weight) is 6,59 kN.m

The total maximum shear force (added load and self-weight) is 6,28 kN

3.2 Structure assessment

The assessment of changes took place in the test results analysis No. Z220200107.

3.3 Assessment of construction type

The assessment of construction type took place in the test results analysis No. Z220200107.

4. CLASSIFICATION

4.1 Reference

This classification has been performed in compliance with ČSN 73 0810 cl. 5.2.

4.2 Classification

Fire resistant floors and roofs made of FIRESTOP boards has been classified according to the following combinations of performance parameters and fire resistance classes:

Table 1 Fire resistance of floors and roofs (structure 1-8)

	Structure	Resistancet	Inclination	The total maximum moment (added load and self-weight)	The total maximum shear force (added load and self-weight)
1	PR.EB.PIR	REI 30	Inclination from 15°C up to 45°C	5,79 kN·m	4,87 kN
2	FR.EB.PIR.SEPS	REI 20	Inclination up to 15°C	6,59 kN·m	6,28 kN
3	FR.EB.PIR.V-MET	REI 45	Inclination up to 15°C	6,59 kN·m	6,28 kN
4	FR.EB.PIR.Green	REI 20	Inclination up to 15°C	6,59 kN·m	6,28 kN
5	F.C.MW	REI 30	Inclination up to 15°C	5,34 kN·m	5,08 kN
6	F.C.MW.IG	REI 30	Inclination up to 15°C	5,34 kN·m	5,08 kN
7	F.EB.PIR	REI 60	Inclination up to 15°C	6,59 kN·m	6,28 kN
8	F.EB.PIR.2	REI 60	Inclination up to 15°C	6,59 kN·m	6,28 kN

4.3 Field of application

The test results of the assessed structures - *Fire resistant floors and roofs made of FIRESTOP boards* - are, in compliance with ČSN EN 1365-2, directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriated design code for its stiffness and stability:

- with respect to the structural building member - the maximum moments and shear forces, which when calculated on the same basis as the test load, shall not be greater than those tested, see tab. No. 1 – the calculated values are per meter of ceiling width;
- the same or better class of wood must be used than is stated in the description of individual constructions chap. 1 of this document

5. CONCLUSION

Validity of classification certificate:

the classification certificate is valid until **2023-06-16**.

This Fire Classification Approval supersedes and cancels Fire Classification Approval No. PKO-16-031, from 22nd August 2018, issued by PAVUS, a.s.

This Fire Classification Approval is valid as a whole only, while each and every page shall be provided with Fire Classification Approval identification number, page number from the total number of pages and the embossed stamp of the author. This Fire Classification Approval does not substitute the type approval or certification of the product.

Prepared by:

Reviewed by:

Approved by:



Jan Bednář



Zdeňka Stará



Jaroslav Dufek
PAVUS, a.s. Manager

In Prague, on June 16th 2020

