

CLASSIFICATION OF FIRE RESISTANCE

FIRES-CR-059-13-AUPE

AITHON PV33 reactive coating for fire protection of timber members

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CLASSIFICATION OF FIRE RESISTANCE IN ACCORDANCE WITH EN 13501-2 + A1: 2009 with direct field of application

FIRES-CR-059-13-AUPE

Name of the product: AITHON PV33 reactive coating for fire protection of timber members

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1. INTRODUCTION

This classification report defines the resistance to fire classification assigned to product: AITHON PV33 reactive coating for fire protection of timber members, in accordance with the procedures given in EN 13501-2 + A1: 2009.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The product: AITHON PV33 reactive coating for fire protection of timber members, is defined as a reactive fire protection applied to timber members according ETAG018-1.

2.2 PRODUCT DESCRIPTION

The product is fully described in the test reports provided in support of classification listed in 3.1.

3. TEST REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS AND ASSESSMENT REPORT

No.	Name of laboratory	Name of sponsor	Test report No.	Date of the test	Test method
[1]	FIRES, s.r.o., Batizovce, SR	Aithon Ricerche International srl, via Mazzini 68, 21020 Ternate (VA), Italy	FIRES-FR- 0227-12-AUNE	21.12.2012	ENV 13381-7: 2002
[2]	FIRES, s.r.o., Batizovce, SR	Aithon Ricerche International srl, via Mazzini 68, 21020 Ternate (VA), Italy	FIRES-AR- 003-13-NUPE	25.03.2013	ENV 13381-7: 2002

3.2 TEST RESULTS

Test Report	Exposure conditions	
[1]	§ Temperature/time curve: § Number of exposed sides: § Load applied: § Support conditions:	Standard temperature/time curve Beams from 3-sides Slabs from 1-side Beams: according test report [1] Slabs: without load Beams: as simply supported beam

4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with clause 7.4 of EN 13501-2 + A1: 2009.



4.2 CLASSIFICATION

The product: AITHON PV33 reactive coating for fire protection of timber members, is classified according to the following combinations of performance parameters and classes as appropriate.

<p>Fire resistance classification: walls/slabs: R15 to R45 beams/columns: R15 to R60</p>

4.3 FIELD OF APPLICATION

This classification is valid according to ENV 13381-6:2002 for the following end use applications:

Type of member	results of the tested slabs are also valid for walls; results of the tested beams are also valid for columns;
Thickness of protection	for protection of walls/slabs from 0,300 g.m ⁻² to 1,060 g.m ⁻² ; for protection of beams/columns from 0,300 g.m ⁻² to 1,050 g.m ⁻² ; (product is covered by AITHON PV33 Finish Coat in thickness 50 to 70 g.m ⁻²)
Slab/wall thickness	the results from the test of timber slabs may be applied to slabs/walls construction with thickness greater than tested. The results may not be applied to thickness less than tested (100 mm);
Span or height of beams/columns	The results from the test of timber beams may be applied to timber beams or columns with spans or heights greater or less than tested (tested span 4250 mm, tested height 200 mm), provided that the resultant level of stress is no greater than tested and maximum deflection or deformation (226 mm) is not exceeded; <i>Note: Level of stress on the beginning of the test depends on the required fire resistance of the timber member as the charring progress with time. Level of stress on the beginning of the test of the loaded beam with the minimum protection thickness (calculated for fire resistance R15 and for charring rate 0,313 mm/min) was 91% of the maximum allowed bending stress.</i>
Fire resistance	of walls/slabs R15, R30, R45; of beams/columns R15, R30, R45, R60;
Load	results are valid for load inducing the same or lower stress compare to tested beams

5. LIMITATIONS

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

The classification is valid provided that the product, field of application and standards and regulations are not changed.

Approved:

Ing. Štefan Rástocký
leader of the testing laboratory



Signed:

Ing. Marek Gorlický
technician of the testing laboratory



6. NOTES TO ASSESSMENT RESULTS

Explanation of parameters used in annexes of this report (according ENV 13381-7: 2002):

β' [mm/min]	is actual unprotected charring rate determined by the testing;
β'' [mm/min]	is actual protected charring rate determined by the testing;
k_β	= β'' / β' ;
t_{pr} [min]	the failure time of the fire protection system, e.g. the time when the temperature of the timber surface of the test member reaches 300 °C.

Calculation of charring rate (according ENV 13381-7: 2002, Annex B):

$$d_{char} = \beta'' \cdot t$$

where:

d_{char} [mm]	is charring depth;
β'' [mm/min]	is actual protected charring rate determined by the testing;
t [min]	is time of fire.

Values of β'' does not include effect of the roundings at arrises. Values of β'' according annexes of this report can be used for design of timber members according EN 1995-1-2 provided this effect is considered in the calculation.

7. LIST OF ANNEXES

Annex 1	Calculated parameters for slabs/walls.
Annex 2	Calculated parameters for beams/columns.

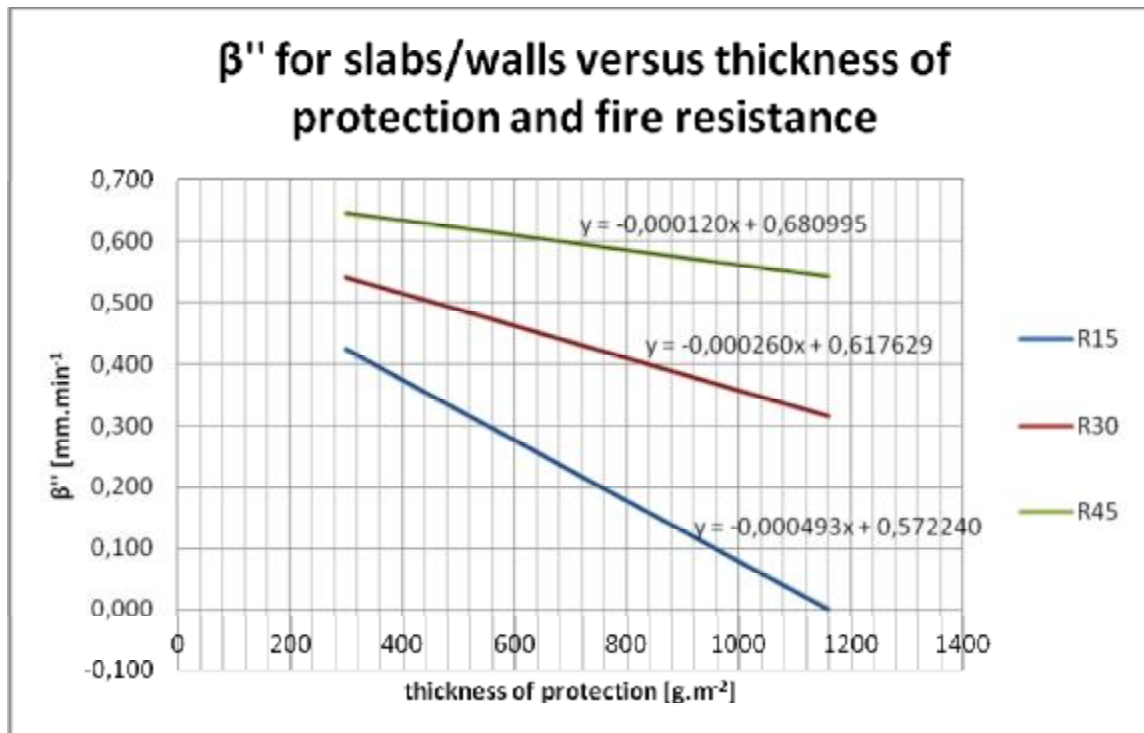
8. USED STANDARDS

ENV 13381-7: 2002	Test methods for determining the contribution to the fire resistance of structural members. Part 7: Applied protection to timber members
EN 13501-2 + A1: 2009	Fire classification of construction products and building elements. Part 2: Classification using data from fire resistance tests, excluding ventilation services

Calculated parameters for slabs/walls.

parameter	thickness [g/m ²]	R15	R30	R45
β' [mm/min]	0	0,635	0,667	0,698
β''_{min} [mm/min]	300	0,424	0,540	0,645
β''_{max} [mm/min]	1160	0,000	0,316	0,542
$k_{\beta min}$	300	0,668	0,809	0,924
$k_{\beta max}$	1160	0,000	0,474	0,776
$t_{pr min}$ [min]	300	2,02		
$t_{pr max}$ [min]	1160	15,40		

Note: Linear interpolation of the parameters for thicknesses between minimum and maximum is allowed.



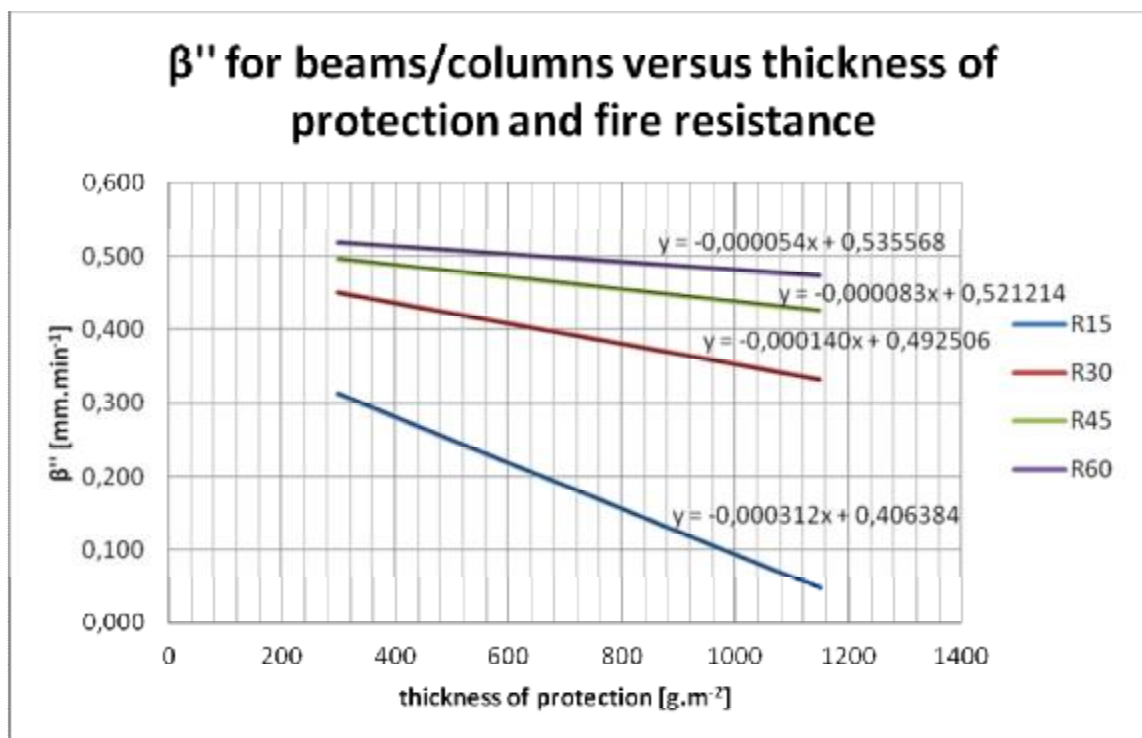
Values of charring rate β'' depended on thickness of fire protection and fire resistance.

Thickness of protection [g.m ⁻²]	Charring rate [mm.min ⁻¹]		
	R15	R30	R45
300	0,42	0,54	0,64
400	0,38	0,51	0,63
500	0,33	0,49	0,62
600	0,28	0,46	0,61
700	0,23	0,44	0,60
800	0,18	0,41	0,58
900	0,13	0,38	0,57
1000	0,08	0,36	0,56
1100	0,03	0,33	0,55
1160	0,00	0,32	0,54

Calculated parameters for beams/columns.

parameter	thickness [g/m ²]	R15	R30	R45	R60
β' [mm/min]	0	0,635	0,667	0,698	0,730
β''_{min} [mm/min]	300	0,313	0,450	0,496	0,519
β''_{max} [mm/min]	1150	0,047	0,331	0,426	0,474
$k_{\beta min}$	300	0,492	0,676	0,711	0,712
$k_{\beta max}$	1150	0,074	0,497	0,610	0,649
$t_{pr min}$ [min]	7,63				
$t_{pr max}$ [min]	15,40				

Note: Linear interpolation of the parameters for thicknesses between minimum and maximum is allowed.



Values of charring rate β'' depended on thickness of fire protection and fire resistance..

Thickness of protection [g.m ⁻²]	Charring rate [mm.min ⁻¹]			
	R15	R30	R45	R60
300	0,31	0,45	0,50	0,52
400	0,28	0,44	0,49	0,51
500	0,25	0,42	0,48	0,51
600	0,22	0,41	0,47	0,50
700	0,19	0,39	0,46	0,50
800	0,16	0,38	0,45	0,49
900	0,13	0,37	0,45	0,49
1000	0,09	0,35	0,44	0,48
1100	0,06	0,34	0,43	0,48
1150	0,05	0,33	0,43	0,47