

CLASSIFICATION OF REACTION TO FIRE
FIRES-CR-059-13-AUPE Edition 4

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, Edition 4

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

Sponsor: Aithon Ricerche International srl
via Mazzini 68
21020 Ternate (VA)
Italy

Prepared by: FIRES, s.r.o.
Approved Body No. SK01
Osloboditeľov 282
059 35 Batizovce
Slovak Republic

Notified Body No.: 1396

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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.

The 2nd edition of FIRES-CR-059-13-AUPE was prepared to correct mistake in the first edition of the document. In the first edition the quantity of the used material was expressed in unit g/m² which was incorrect, correct unit is kg/m². Quantity of used fire protection is referred in annexes as thickness. The 3rd edition of FIRES-CR-059-13-AUPE was prepared to correct the values of maximum thickness in table in clause 4.3.

The 4th edition of FIRES-CR-059-13-AUPE is issued on the request of the sponsor. On 12th November 2015 Aithon Ricerche International srl asked to rename the top coat from "AITHON PV33 Finish coat" to "AITHON F3". The sponsor declares that composition of the top coat as well as method of its production (technological processes) remained unchanged.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The product is defined as a reactive coating for fire protection of timber members.

2.2 PRODUCT DESCRIPTION

The product is fully described in the reports listed in paragraph 3.1 of the document.

3. 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-227-12-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-AUPE, edition 4	16.11.2015	ENV 13381-7: 2002

3.2 TEST RESULTS

Test Report	Exposure conditions
[1]	β Temperature/time curve: Standard temperature/time curve β Direction of exposure: - β Number of exposed sides: 3 β Load applied: Loaded beam: 60% of design bending strength β Support conditions: Loaded beam: 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

Timber wall (slab) and/or timber beam (column) protected by reactive coating AITHON PV33 is classified according to the following combinations of performance parameters and classes as appropriate.

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

4.3 FIELD OF APPLICATION

This classification is valid according to ENV 13381-7:2002 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 kg.m ⁻² to 1,160 kg.m ⁻² ; for protection of beams/columns from 0,300 kg.m ⁻² to 1,150 kg.m ⁻² ; (product is covered by top coat AITHON F3 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; 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.
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
Type of member	results of the tested slabs are also valid for walls; results of the tested beams are also valid for columns;



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:

Signed:

Ing. Štefan Rástocký
leader of the testing laboratory



Ing. Henrieta Lapková
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	$= \beta'' / \beta'$;
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.

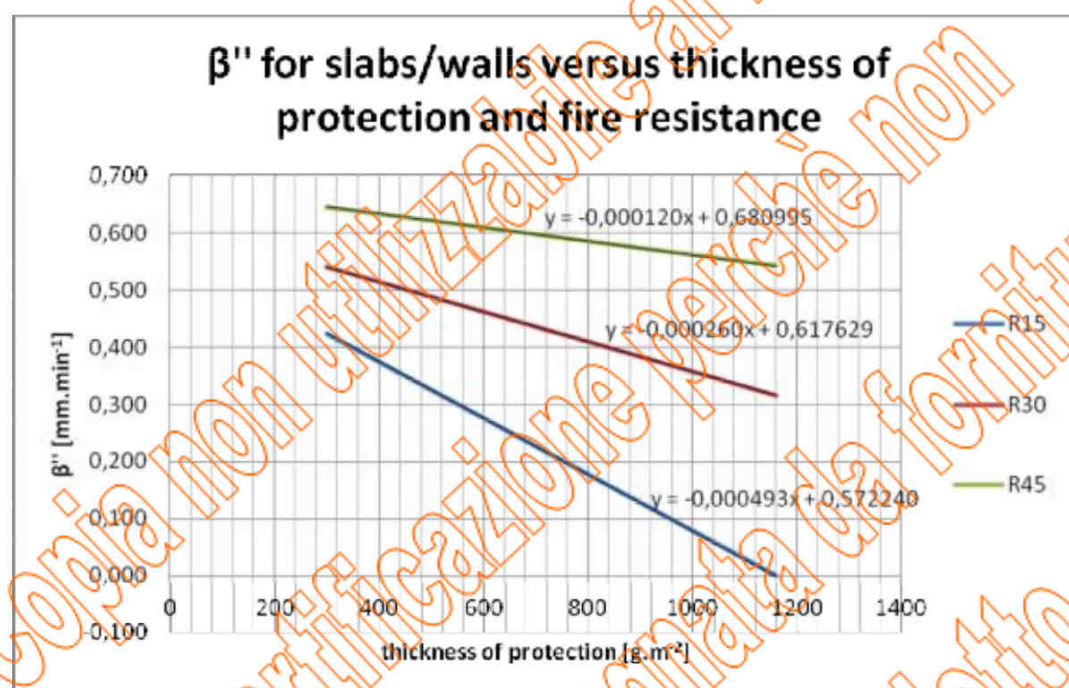
8. USED STANDARDS

ENV 13381-7: 2002	Test methods for determining the contribution to the fire resistance of structural members. Part 7: Applied protection to timber members
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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		



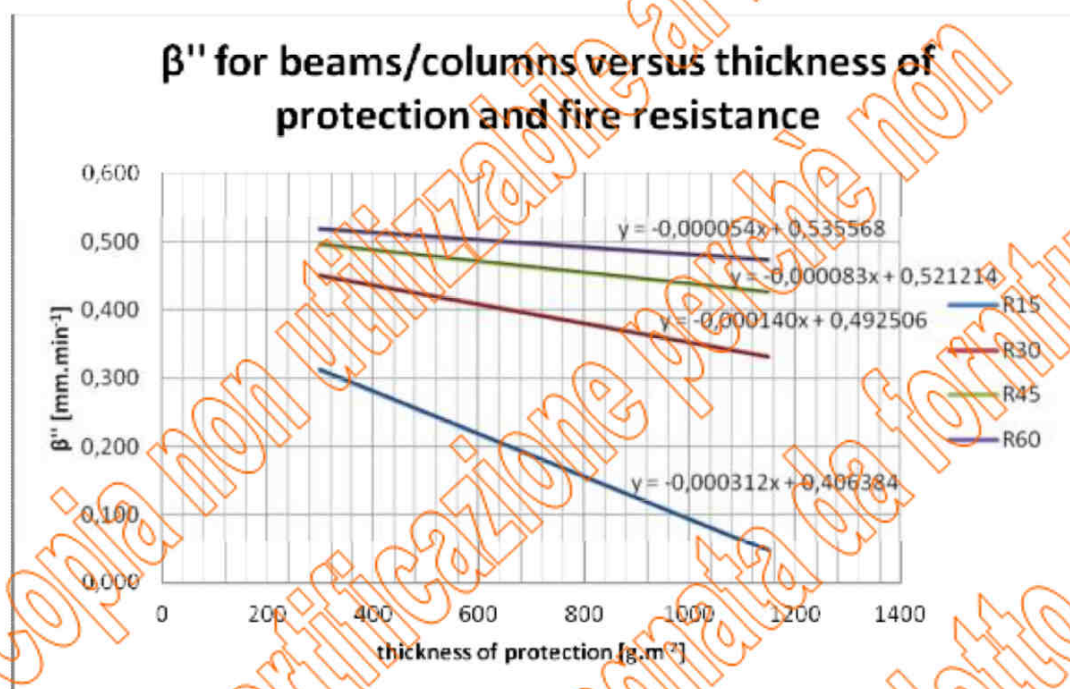
Values of charring rate β'' depended on thickness of fire protection and fire resistance.

thickness of protection [g.m ⁻²]	fire resistance		
	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				



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

thickness of protection [g.m ⁻²]	fire resistance			
	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