

Warrington Certification Ltd
Holmesfield Road
Warrington
WA1 2DS
United Kingdom

T : +44 (0) 1925 646 669
F : +44 (0) 1925 646 667
W : www.exova.com
W:: www.warringtonfire.net



Title:

The Influence of
SELECTION Agribalance®
Spray Foam Insulation on
the Fire Resistance
Performance of Typical
Partitions

WF Report No: 319716

**Prepared for: Demilec
(USA) LLC**

Demilec (USA) LLC
2925 Galleria Drive
Arlington, TX 76011
USA

Date:

10 July 2012

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Executive Summary

Objective	<p>This report presents an appraisal of influence of <i>SELECTION</i> Agribalance® Spray Foam Insulation on the fire resistance performance of typical partitions when tested in accordance with EN 1363-1: 1999.</p> <p>The <i>SELECTION</i> Agribalance® Spray Foam Insulation, which is described in this report, is required not to negatively influence the loadbearing, integrity and insulation performance of a plasterboard lined construction if subjected to a fire resistance test in accordance with EN 1363-1: 1999.</p>
Report Sponsor	Demilec (USA) LLC
Address	2925 Galleria Drive Arlington, TX 76011 USA
Summary of Conclusions	Following the considerations outlined in this report, it can be concluded that influence of <i>SELECTION</i> Agribalance® Spray Foam Insulation on the fire resistance performance of typical partitions, if tested in accordance with EN 1363-1: 1999 will not be influenced.
Valid until	1 st August 2017

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Introduction

This report presents an appraisal of the influence of *SEALECTION* Agribalance® Spray Foam Insulation on the fire resistance performance of typical partitions when tested in accordance with EN 1363-1: 1999.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

General Construction

It is assumed that the assemblies shall be constructed and installed in an identical manner to previously fire tested assemblies, unless otherwise specified.

It is assumed that the foam insulation shall be installed in an identical manner to the foam in the tested wall assembly described in this report.

Proposals

The Warringtonfire Report Nos. 318779 and 318780 describe fire resistance tests performed on a symmetrical loadbearing partition assembly consisting of a timber frame with gypsum plasterboard facings. In one of the tests the partition was modified by the application of *SEALECTION* Agribalance® Spray Foam Insulation in the cavity.

It is proposed that the *SEALECTION* Agribalance® Spray Foam Insulation can be applied to other previously fire tested partition designs which briefly comprise loadbearing timber or metal studs, with gypsum plasterboard facing on both faces. The partition shall have been previously tested without a cavity infill.

The basic partition design (excluding the proposed foam infill) shall have been previously fire tested in accordance with EN 1363-1: 1999. It is required that the inclusion of the infill will not detract from the previously achieved loadbearing capacity, integrity and insulation performance.



Basic Test Evidence

WF Test report No. 318779

A fire resistance test of a loadbearing wall assembly in accordance with BS EN 1365-1: 1999.

The wall assembly had overall nominal dimensions of 2403 mm high by 3009 mm wide by 100 mm thick and briefly comprised a softwood timber stud partition clad on each face with a single layer of 15 mm thick gypsum based plasterboard referenced 'Knauf Standard Wallboard 15TE'.

The wall construction was based on a proposal described in the 11th edition of the British Gypsum WHITE BOOK, system reference A026002/6. The applied load represented 60% of the maximum loadbearing capacity of the timber studs.

Test Results:

loadbearing 36 minutes – no failure

Integrity 36 minutes – no failure

Insulation 36 minutes – no failure

The test was discontinued after a period of 36 minutes.

Test Date 14 June 2012

Test Sponsor Demilec (USA) LLC

WF Test report No. 318780

A fire resistance test of a loadbearing wall assembly in accordance with BS EN 1365-1: 1999.

The wall assembly had overall nominal dimensions of 2403 mm high by 3009 mm wide by 100 mm thick and briefly comprised a softwood timber stud partition clad on each face with a single layer of 15 mm thick gypsum based plasterboard referenced 'Knauf Standard Wallboard 15TE'.

The cavity of the wall was filled with *SELECTION* Agribalance® Spray Foam Insulation.

The wall construction was based on a proposal described in the 11th edition of the British Gypsum WHITE BOOK, system reference A026002/6. The applied load represented 60% of the maximum loadbearing capacity of the timber studs.

Test Results:

loadbearing 36 minutes – no failure



Integrity 36 minutes – no failure

Insulation 36 minutes – no failure

The test was discontinued after a period of 36 minutes.

Test Date 14 June 2012

Test Sponsor Demilec (USA) LLC

Assessed Performance

Comparison between tested constructions

In both cases the test was stopped after 36 minutes to allow comparison of the constructions after the test. The construction behaviour was assessed on temperature rise on the unexposed side, appearance of the exposed side after the test, and damage to the loadbearing timber studs after the test.

Comparison of the temperature rise on the unexposed side (comparing thermocouples in corresponding positions) showed the wall with foam in the cavity to have a lower temperature on all positions. This indicates that during the test the foam did not give rise to any (general or localised) heating, but rather provided additional insulation performance.

Comparison of the cross-sections of the timber studs after the tests showed that the studs in the wall with foam in the cavity had experienced less charring compared to the studs in the wall with the non-filled cavity. This indicates that during the conditions of the test the foam did not increase the charring rate of the timber, but rather provided some protection.

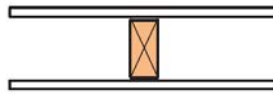
This gives confidence in the ability of the *SELECTION* Agribalance® Spray Foam Insulation not to deteriorate the fire performance regarding loadbearing, integrity and minutes insulation as defined in EN 1363-1: 1999.

Application to timber stud partitions

These types of constructions, of which some typical examples are schematically represented below, are very similar to the tested constructions. Addition of additional layers of plasterboard, or special types of plasterboard, to achieve a higher fire resistance rating, is not expected to change the influence of the *SELECTION* Agribalance® Spray Foam Insulation. The behaviour of the plasterboard will not be deteriorated by the application of foam in the cavity, and consequently it is not expected that the fire performance regarding loadbearing, integrity and insulation as defined in EN 1361-3: 1999 will be negatively influenced.

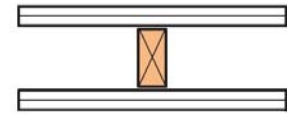


1



One layer of board each side of timber studs at 600mm centres. Insulation and board linings as in table.

2



Two layers of board each side of timber studs at 600mm centres. Insulation and board linings as in table.

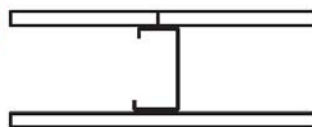
Application to plasterboard lining of external walls.

In these types of constructions a plasterboard lining is fixed onto an exterior (brick, concrete, tile, timber, etc.) wall by means of timber (or metal) studs. The behaviour of the plasterboard lining in case of fire will be very similar to the behaviour of the tested constructions. It is therefore not expected that the fire performance regarding loadbearing, integrity and insulation as defined in EN 1363-1: 1999 will be negatively influenced.

Application to metal stud partitions

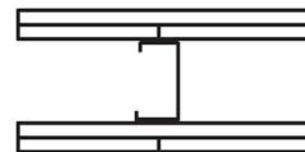
These types of constructions, of which some typical examples are schematically represented below, are very similar to the tested constructions, apart from the use of metal frame replacing the timber frame. This change of construction, nor the addition of additional layers of plasterboard, or special types of plasterboard, to achieve a higher fire resistance rating, is expected to change the influence of the *SELECTION* Agribalance® Spray Foam Insulation. As is demonstrated by the insulation behaviour of the tested partitions and the comparative charring of the timber studs, the metal studs are not expected to be thermal more exposed than in a situation without insulation in the cavity. The behaviour of the plasterboard will not be deteriorated by the application of foam in the cavity, and consequently it is not expected that the fire performance regarding integrity and insulation as defined in EN 1363-1: 1999 will be negatively influenced.

1



One layer of board each side of 48mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

3

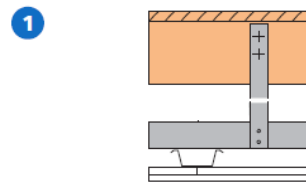


Two layers of board each side of 48mm Gypframe 'C' Studs at 600mm centres. Linings as in table.

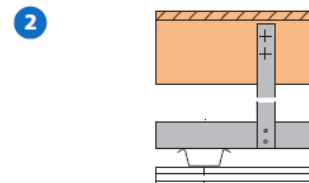


Application to timber floor constructions

In these types of constructions, of which some typical examples are schematically represented below, plasterboards are attached directly or through a suspension system onto the timber floor. As indicated in the pictures, an impermeable (closed) floor covering is required to prevent decomposition products from the foam to easily penetrate the floor. In these cases the behaviour of the plasterboard is not expected to be deteriorated by the application of foam in the cavity. As the *SELECTION Agribalance*[®] Spray Foam Insulation will be applied to the floor it is not expected to exert any additional force onto the ceiling boards or the suspension system. Consequently it is not expected that the fire performance regarding loadbearing, integrity and insulation as defined in EN 1363-1: 1999 will be negatively influenced.



1
Floor boarding of 21mm minimum t&g softwood or wood particle floor boarding. Solid timber joists 38 x 195mm at 600mm centres. *CasoLine MF* suspended ceiling fixed to joists. Ceiling linings as in table.



2
Floor boarding of 21mm minimum t&g softwood or wood particle floor boarding. Solid timber joists 38 x 195mm at 600mm centres. *CasoLine MF* suspended ceiling fixed to joists. Ceiling linings as in table.

Conclusions

Application of *SELECTION Agribalance*[®] Spray Foam Insulation in the cavity of plasterboard lined constructions (loadbearing or non-loadbearing), such as:

- Plasterboard lining to external walls
- Internal metal stud and timber stud plasterboard partitions
- Plasterboard ceiling constructions applied to timber floors

Is not expected to negatively influence the loadbearing, integrity and insulation performance, as defined in EN 1363-1: 1999.



Validity

This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to Exova **warringtonfire** the assessment will be unconditionally withdrawn and **Demilec (USA) LLC** will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion. The assessment is valid initially for a period of five years i.e. until 1st August 2017, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

Declaration by Demilec (USA) LLC

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information we agree to cease using the assessment and ask Exova **warringtonfire** to withdraw the assessment.

Signed:

For and on behalf of:



Signatories



Responsible Officer

F. Paap* - Certification Engineer



Approved

D. Hankinson* - Principal Certification Engineer

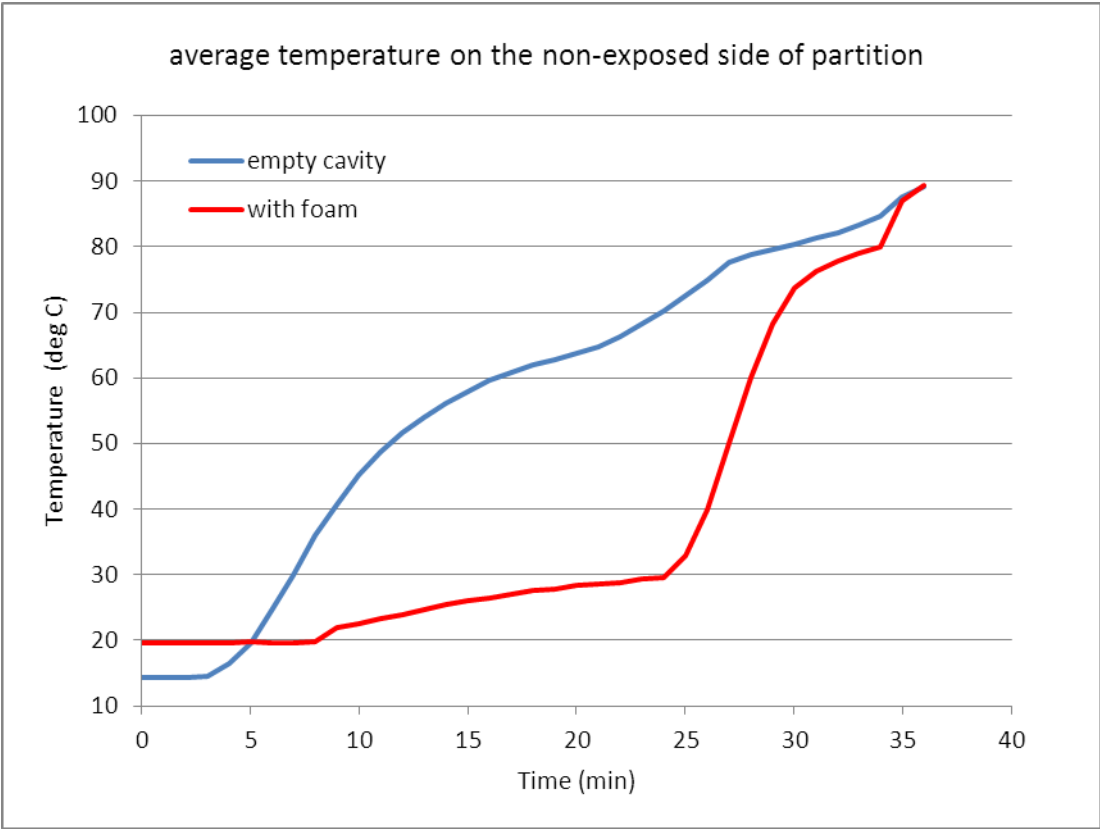
* For and on behalf of Exova **Warringtonfire**

Report Issued: 10 July 2012

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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The exposed face of the specimen (without foam in the cavity) immediately after the test.



The exposed face of the specimen (with foam in the cavity) immediately after the test





Samples of timber after the test – the specimen with foam in the cavity on the right.