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Testing, calibrating, advising.

Title:

Scope of Application Assessment of: Fire & Acoustic Seals Ltd 'Fire Door Foam'

For use as a fire stopping seal: 30 and 60 Minute Fire Resisting Timber Doorsets

Issue Date: 10th July 2017

Valid Until: 10th July 2022

WF Report No:

WF385912

Prepared for:

Fire & Acoustic Seals Ltd

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Exova Warringtonfire – the new name for BM TRADA

On December 1st 2015, Chiltern International Fire Limited (trading as BM TRADA) commenced trading under the name Exova Warringtonfire.

To coincide with this change, our Technical Reports, Test Reports, Product Assessments, company stationery and marketing collateral have been updated to reflect the Exova Warringtonfire branding.

The validity of all documents previously issued by Chiltern International Fire Limited including certificates, test reports and product assessments is unaffected by this change. A letter to this effect is available upon request by e-mailing globalfire@exova.com.

About Exova Warringtonfire

Exova Warringtonfire is part of the Exova Group one of the world's leading laboratory-based testing groups, trusted by organisations to test and advice on the safety, quality and performance of their products and operations. Headquartered in Edinburgh, UK, Exova operates 143 laboratories and offices in 32 countries and employs around 4,500 people throughout Europe, the Americas, the Middle East and Asia/Asia Pacific. With over 90 years' experience, Exova specialises in testing across a number of key sectors from health sciences to aerospace, transportation, oil and gas, fire and construction.
Be assured that whilst the name will change, your service provision and primary contacts have not. What will be available to you is a wider team of testing experts and an extended range of testing capabilities including structural steelwork testing, ventilation duct and damper testing, ASTM testing, water mist system testing and smoke toxicity testing and covering additionally both the rail and marine sectors.
If you have any questions, please do not hesitate to contact a member of the team and we will do our best to answer them. We appreciate your business to date and we look forward to working with you in the future.

Kind regards

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1 Introduction

This document constitutes a scope of application relating to Fire & Acoustic Seals Ltd, 'Fire Door Foam', for use as a fire stopping seal when used with timber joinery and timber based fire resisting doorsets for 30 and 60 minute applications.

2 Proposal

The proposal is to consider the use of Fire & Acoustic Seals Ltd, 'Fire Door Foam' with specified generic types of doorset design based on the performance data summarised in section 3 of this report.

The report summarises the scope of application of the Fire & Acoustic Seals Ltd, 'Fire Door Foam' product when utilised as a fire stopping seal between structural openings and proven timber or MDF frames used in conjunction with timber joinery and timber based fire resisting doorsets; based on the test data detailed in Appendix A.

The assessment uses established extrapolation and interpretation techniques in order to extend the scope of application by determining the limits for the design, based on the tested constructions and performances obtained. The assessment is an evaluation of the potential fire resistance performance, if the elements were to be tested in accordance with BS 476-22:1987.

The assessment is conducted in terms of performance against fire resistance test standard BS 476-22:1987, and considers test evidence based on this standard, together with test evidence based on BS EN 1634-1:2014.

3 Performance Data

The assessment considers performance data from the two fire tests detailed in appendix A. and summarised in sections 3.1 and 3.2, below:

3.1 Fire Resistance Test WF379163

The fire resistance performance of a glazed single leaf single acting doorset and a one and a half leaf single acting doorset, when tested in accordance with BS 476-20:1987 and BS 476-22:1987.

The left doorset was designated doorset A and the leaf measured 2040mm high x 926mm wide x 44mm thick. The right doorset was designated doorset B and the left leaf measured 2040mm high x .926mm wide x 44mm thick and the right leaf measured 2040mm high x .425mm wide x 44mm thick. Both doorsets were hung to open in towards the furnace. The results of this test were obtained from doorsets fitted with a latch that was disengaged for the test.

The nominally 15mm wide gap between the door frames and the timber stud supporting construction, was filled with Fire & Acoustic Seals Ltd, 'Fire Door Foam'. The exposed face of each doorset was additionally fitted with a 45mm wide x 18mm thick softwood timber architrave of nominal density 510Kg/m^3; the unexposed face of doorset A had a 25mm wide x 18mm thick softwood architrave of nominal density 510Kg/m^3 fitted.

When doorset A was tested in accordance with BS 476-22:1987, *Method 7, determination of fire resistance of partially insulated doorsets and shutter assemblies,* and doorset B was tested in accordance with BS 476-22:1987, *Method 6, determination of fire resistance of fully insulated doorsets and shutter assemblies*, the requirements of the standards were satisfied for the following periods:

Specimen	Integrity	Insulation
Doorset A	37 minutes*	37 minutes
Doorset B	42 minutes	42 minutes

* In accordance with the note to clause 7.6.1.1 of BS 476-22:1987, the glazing was not evaluated for insulation.

3.2 Fire Resistance Test WF384623

The fire resistance performance of a glazed single leaf single acting doorset and a one and a half leaf single acting doorset, when tested in accordance with BS EN 1634-1:2014 and BS EN 1363-1:1999.

The left doorset was designated doorset A and the leaf measured 2040mm high x 926mm wide x 44mm thick. The right doorset was designated doorset B and the left leaf measured 2040mm high x .926mm wide x 44mm thick and the right leaf measured 2040mm high x .425mm wide x 44mm thick. Both doorsets were hung to open in towards the furnace. The results of this test were obtained from doorsets fitted with a latch that was disengaged for the test.

The nominally 25mm gap between the door frames and the steel stud supporting construction, was filled with Fire & Acoustic Seals Ltd, 'Fire Door Foam'. Half of each doorset was additionally fitted with a timber architrave; half of each doorset had no architrave fitted.

When doorsets A and B were tested in accordance with BS EN 1634-1:2014, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows* the requirements of the standard were satisfied for the following periods:

Specimen	Integrity	Insulation
Doorset A	49 minutes[1]	49 minutes
Doorset B	54 minutes[2]	54 minutes

[1] Initial integrity failure due to cotton pad test at threshold.
[2] Initial integrity failure due to continuous flaming at the bottom hinge position.

Failures were not connected to the performance of the Fire & Acoustic Seals Ltd, 'Fire Door Foam' seal and can be disregarded for the purposes of this report. No failures of the Fire & Acoustic Seals Ltd, 'Fire Door Foam' fire stopping seal had been recorded on termination of the test at 62 minutes.

4 Analysis

4.1 General

Test standard BS EN 1634-1:2014 utilises the same time temperature curve and has similar test conditions to the BS 476-22 test, with two key differences: (a) the neutral pressure point is set at 500mm above the threshold rather than 1000mm above the threshold as used for the BS 476-22 test, thus creating higher positive furnace pressures above 500mm, (b) the use of plate thermocouples for furnace temperature control, which test data has shown renders the BS EN test more onerous due to the higher thermal inertia required for the plate thermocouple to read the same temperature as the probe thermocouple used for the BS 476-22 test, particularly during the early stages of the test. It is therefore considered that the use of test data from BS EN 1634-1 tests will be at least as valid as data from BS 476-22 tests.

The methodologies adopted in this assessment are for UK national application and other jurisdictions accepting this approach. The assessment should not be used for European classification, CE marking purposes, or for claiming compliance with regulations outside the aforementioned areas of jurisdiction.

4.2 Tested Performances

The performance data summarised in section 3 demonstrates that when fully filling the frame to structural surround gap across the width of the frame, Fire & Acoustic Seals Ltd, 'Fire Door Foam' is capable of successfully maintaining the integrity of the junction between the following combinations of door frame and structural surround:

4.2.1 30 Minutes Integrity Performance

1. A nominally 15mm wide gap between a softwood timber frame of nominal density 510 kg/m³ and a timber stud structural surround with a gap of nominally 15mm. The junction was fitted with a 45mm wide x 18mm thick softwood timber architrave of nominal density 510 kg/m³ to the exposed face and a 25mm wide x 18mm thick softwood timber architrave of nominal density 510 kg/m³ to the unexposed face.

4.2.2 60 Minutes Integrity Performance

1. A nominally 25mm wide gap between a hardwood timber frame of nominal density 640 kg/m³ and a steel stud structural surround. The junction was fitted on one jamb and half the head with a 68 mm wide x 19 mm thick MDF architrave of nominal density 700 kg/m³ to both the exposed and unexposed faces.
2. A nominally 25mm wide gap between an MDF frame of nominal density 700 kg/m³ and a steel stud structural surround. The junction was fitted on one jamb and half the head with a 68 mm wide x 19mm thick MDF architrave of nominal density 700 kg/m³ to the exposed face and a 32 mm wide x 19 mm thick MDF architrave of nominal density 700 kg/m³ to the unexposed face.

4.3 Assessed Frame to Surround Gap Combinations

Based on the above performances assessment is made that Fire & Acoustic Seals Ltd, 'Fire Door Foam' would also be capable of maintaining the integrity of the junction between the combinations of door frame and structural surround detailed in sections 4.2.1 and 4.2.2 below within the following parameters:

1. Gaps between the frame and structural surround are assessed up to a maximum width of 25mm.
2. Gaps must be fully filled, across the width of the frame, with Fire & Acoustic Seals Ltd, 'Fire Door Foam'.
3. Fire & Acoustic Seals Ltd, 'Fire Door Foam' may be utilised with the following structural surrounds:
    - timber stud partitions, with or without plasterboard linings
    - steel stud partitions, with or without plasterboard linings
    - blockwork walls
    - masonry walls
    - low density concrete walls
    - high density concrete walls
4. In all cases, for both 30 and 60 minutes performance, the timber, engineered timber or MDF frames, must be proven for use with the chosen doorset design, for the applicable integrity performance and at the frame dimensions to be used.
5. Beech, *Fagus sylvatica*, is not permitted for 60 minute applications.
6. Architraves are optional

4.3.1 30 Minutes Integrity Performance

The following types of frame materials are assessed for doorsets required to achieve a minimum of 30 minutes fire resistance integrity performance if tested in accordance with BS 476-22:1987 or BS EN 1634-1.

1. Softwood timber of nominal density ≥ 510 kg/m³
2. Hardwood timber of nominal density ≥ 510 kg/m³
3. Engineered timber for 30 minute applications
4. MDF of nominal density ≥ 700 kg/m³

4.3.2 60 Minutes Integrity Performance

The following types of frame materials are assessed for doorsets required to achieve a minimum of 60 minutes fire resistance integrity performance if tested in accordance with BS 476-22:1987 or BS EN 1634-1.

1. Hardwood timber of nominal density ≥ 640 kg/m³
2. Engineered timber for 60 minute applications
3. MDF of nominal density ≥ 700 kg/m³

4.4 Doorset Types

This scope of application is valid for doorsets of the following generic types which have been successfully tested or assessed in terms of fire resistance integrity to the requirements of BS 476-22:1987 and/or BS EN 1634-1 for the required 30 or 60 minutes performance.

- Timber based flush doorsets
- Joinery timber doorsets

The scope of application only considers the fire stopping between the frame and structural surround. All other details must meet the requirements of the test or assessment data for the relevant doorset design.

5 Conclusion

Providing the Fire & Acoustic Seals Ltd, 'Fire Door Foam' is utilised in accordance with the specifications in this document and all other construction and installation details are compliant with the relevant supporting doorset documentation, it is the opinion of Exova Warringtonfire that the resulting doorset will provide a minimum 30 or 60 minutes fire resistance integrity, as appropriate, if tested in accordance with BS 476-22:1987.

6 Declaration by the Applicant

1. We the undersigned confirm that we have read and comply with obligations placed on us by FTSG Resolution No 82: 2001.
2. 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 this assessment is being made.
3. 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.
4. We are not aware of any information that could adversely affect the conclusions of this assessment.
5. If we subsequently become aware of any such information we agree to ask the assessing authority to withdraw the assessment.

Signed: 

Name: J P Vollans

For and on behalf of: Fire & Acoustic Seals Ltd

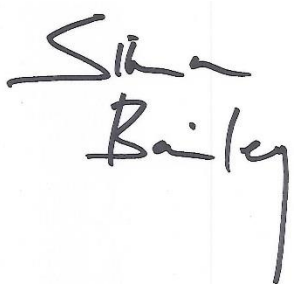
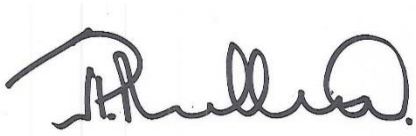
7 Limitations

The following limitations apply to this assessment:

1) This assessment addresses itself solely to the elements and subjects discussed and does not cover any other criteria. All other details not specifically referred to should remain as tested or assessed.
2) This assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, Exova Warringtonfire reserves the right to withdraw the assessment unconditionally but not retrospectively.
3) This assessment has been carried out in accordance with Fire Test Study Group Resolution No 82: 2001.
4) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
5) This assessment relates only to those aspects of design, materials and construction that influence the performance of the element(s) under fire resistance test conditions. It does not purport to be a complete specification ensuring fitness for purpose and long-term serviceability. It is the responsibility of the client to ensure that the element conforms to recognised good practice in all other respects and that, with the incorporation of the guidance given in this assessment, the element is suitable for its intended purpose.

8 Validity

1) The assessment is valid for the period shown the front cover, after which it must be submitted to Exova Warringtonfire for technical review.
2) This assessment report is not valid unless it incorporates the declaration given in Section 9 duly signed by the applicant.

Signature:		
Name:	**S Bailey**	**J P Mullett**
Title:	Senior Product Assessor	Principal Consultant

Appendix A

Performance Data

Report No	Configuration	Leaf Size (mm)	Test Standard	Performance (mins)
WF379163	A: ULSASD	2040 926 44	BS 476-22:1987 & BS 476-20: 1987	Integrity: 37 Insulation: 37
	B:ULSADD	2040 926/425 44		Integrity: 42 Insulation: 42
WF384623	A:ULSASD	2040 926 54	BS EN 1634-1: 2014 & BS EN 1363-1: 1999	Integrity: 49[1] Insulation: 49
	B: ULSADD	2040 926/425 54		Integrity: 54[2] Insulation: 54

1. Initial integrity failure due to continuous flaming at the leaf threshold. Further integrity failure at 55 and 58 minutes due to continuous flaming at the top closing corner and at 60 minutes at the top hanging corner. No other perimeter failures were observed until the test was terminated at 62 minutes.

2. Initial integrity failure due to continuous flaming at the bottom hinge position. Further integrity failure at 56 and 59 minutes due to continuous flaming at the meeting edges. No other perimeter failures were observed until the test was terminated at 62 minutes.

The failures recorded in notes 1 and 2 above have no bearing on the performance of the fire stopping seal assessed in this report and can therefore be disregarded for the purposes of this assessment.

Appendix B

Revisions

Revision	Exova Warringtonfire Reference	Date	Details