

**WFRC Assessment report
No. 144508/A**

**The Fire Resistance Performance of
Wall & Floor Mounted Linear Gap Sealing
Systems Incorporating 'Pyrocoustic' Sealant**

Report for

Firestopit.com

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Executive Summary

Objective	This report presents an appraisal of the fire resistance performance of 'Pyrocoustic' linear gap sealing systems when used in various supporting constructions, if tested utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft European Standard prEN 1366-4.
Report Sponsor	Firestopit.com
Address	Swadlincote Road Woodville Swadlincote Derbyshire DE11 8DD
Summary of Conclusions	Should the recommendations given in this report be followed, it can be concluded that 'Pyrocoustic' linear gap seals, should provide up to 300 minutes integrity and insulation performance depending upon dimensions and supporting construction (as shown in the Annex to this report), if tested utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft European Standard prEN 1366-4.
Valid until	1 st February 2010

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Introduction

This report provides a considered opinion regarding the fire resistance performance of 'Pyrocoustic' wall and floor mounted linear gap sealing systems.

The proposed linear gap seals are required to provide up to 300 minutes integrity and insulation performance with respect to BS 476: Part 20: 1987, when installed into various supporting constructions.

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

Installation

It is assumed that the sealants will be installed into the gaps in the proposed supporting construction in a similar manner to the tested specimens and that adequate curing time will be provided.

Proposals

It is proposed that 'Pyrocoustic' linear gap sealing systems will provide up to 300 minutes integrity and insulation performance, when used in various supporting constructions, if tested utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft European Standard prEN 1366-4.

Basic Test Evidence

WARRES No. 141438

The test referenced WFRC No. 141438 and described briefly in the supporting data section of this report describes a fire resistance test utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft document prEN 1366-4, on four specimens of horizontal and four specimens of vertical linear gap sealing systems.

The test demonstrated the ability of the seals to provide the following performances:

Ref.	Gap width	Seal depth	Gap faces	Backing material	Integrity	Insulation
A (Floor)	30 mm	15 mm	AAC/ AAC	PE-Rod	300 mins	66 mins
B (Floor)	20 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	133 mins
C (Floor)	10 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	-
D (Floor)	50 mm	25 mm	AAC/ AAC	PE-Rod	300 mins	214 mins
A (Wall)	30 mm	15 mm	AAC/ Steel	PE-Rod	300 mins	91 mins
B (Wall)	20 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	300 mins
C (Wall)	10 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	-
D (Wall)	30 mm	15 mm	AAC/ AAC	PE-Rod	300 mins	215 mins

Assessed Performance

Test Methodology There is not at present any published British Standard relating to the testing of linear gap sealing systems, used to reinstate the integrity and insulation performance of the elements they are installed into. The current test methodology, therefore adopts the principles of testing given within BS 476: Part 20: 1987, which forms the basis of the test method used to evaluate the performance of the element itself.

The draft European test standard prEN 1366-4: 2001, 'Fire resistance tests for service installations – Part 4: Linear joint seals' provides guidance regarding the testing of these systems and where appropriate these guidelines have been followed.

Due to the relatively small area of the wall structure occupied by a linear gap sealing system only the maximum temperature rise criterion is used for evaluation of the insulation performance.

Critical Seal aspects

In order to interpolate alternative seal dimensions/configurations, it is essential to identify the features which are critical to the performance of the seal. These critical features are considered to be:

- Gap width
- Seal depth
- Aspect ratio

Gap width

Increases in gap width from that tested would be expected to produce lower integrity and insulation performances since increasing the span of the seal will make collapse and separation from the supporting construction more likely. Equally a reduction in gap width would be expected reduce this risk and therefore gaps of reduced width would be expected to perform at least as well as those tested, all other details being equal.

Seal depth

Decreases in seal depth from that tested would be expected to produce lower integrity and insulation performances since the quantity of material separating the heating conditions of the test from the unexposed surface of the construction will be reduced. Equally an increase in seal depth would be expected reduce this risk and therefore seals of increased depth would be expected to perform at least as well as those tested, all other details being equal.

Aspect ratio

The ratio between seal width and depth is also critical to the stability of the seal, however if the principles for gap width and seal depth are maintained as discussed above, then a favourable aspect ratio should always be maintained.

AAC/AAC Walls

Three different dimensions of seals were mounted between the leaves of an AAC (autoclaved aerated concrete) wall in the test referenced WARRES No. 141438 and based upon the tested dimensions in conjunction with the principles discussed above, the following seals/performances may be positively appraised:

Gap width	Seal depth	Backing material	Integrity	Insulation
5 mm	10 mm	PE-Rod	300 mins	300 mins
10 mm	10 mm	PE-Rod	300 mins	300 mins
15 mm	10 mm	PE-Rod	300 mins	300 mins
20 mm	10 mm	PE-Rod	300 mins	300 mins
25 mm	15 mm	PE-Rod	300 mins	215 mins
30 mm	15 mm	PE-Rod	300 mins	215 mins

No wider seals were included within the wall, however a 50 mm wide seal was incorporated within the floor specimen. Since identical seals were incorporated in both the wall and floor at dimensions of 30 wide by 15 mm deep, 20 mm wide by 10 mm deep and 10 mm wide by 10 mm deep and in each case the wall mounted seals out performed the floor mounted seals, it is considered reasonable to utilise the floor data for wider wall mounted seals, as follows:

Gap width	Seal depth	Backing material	Integrity	Insulation
35 mm	20 mm	PE-Rod	300 mins	214 mins
40 mm	20 mm	PE-Rod	300 mins	214 mins
45 mm	25 mm	PE-Rod	300 mins	214 mins
50 mm	25 mm	PE-Rod	300 mins	214 mins

AAC/Steel Walls

One seal was mounted between the AAC and mild steel leaves of the wall in the test referenced WARRES No. 141438 and based upon the tested dimensions in conjunction with the principles discussed above, the following seals/performances may be positively appraised:

Gap width	Seal depth	Backing material	Integrity	Insulation
5 mm	15 mm	PE-Rod	300 mins	91 mins
10 mm	15 mm	PE-Rod	300 mins	91 mins
15 mm	15 mm	PE-Rod	300 mins	91 mins
20 mm	15 mm	PE-Rod	300 mins	91 mins
25 mm	15 mm	PE-Rod	300 mins	91 mins
30 mm	15 mm	PE-Rod	300 mins	91 mins

AAC/AAC Floors

Four different dimensions of seals were mounted between the leaves of an AAC (autoclaved aerated concrete) floor in the test referenced WARRES No. 141438 and based upon the tested dimensions in conjunction with the principles discussed above, the following seals/performances may be positively appraised:

Gap width	Seal depth	Backing material	Integrity	Insulation
5 mm	10 mm	PE-Rod	300 mins	133 mins
10 mm	10 mm	PE-Rod	300 mins	133 mins
15 mm	10 mm	PE-Rod	300 mins	133 mins
20 mm	10 mm	PE-Rod	300 mins	133 mins
25 mm	15 mm	PE-Rod	300 mins	66 mins
30 mm	15 mm	PE-Rod	300 mins	66 mins
35 mm	20 mm	PE-Rod	300 mins	66 mins

40 mm	20 mm	PE-Rod	300 mins	66 mins
45 mm	25 mm	PE-Rod	300 mins	214 mins
50 mm	25 mm	PE-Rod	300 mins	214 mins

Colours

It is proposed that the colour of the seals may be changed from the white tested to various alternatives. Addition of pigments to the sealant to alter the colour is for aesthetic purposes only and would not be expected to have any effect on the fire resistance performance of the seals

Conclusions

'Pyrocoustic' linear gap seals, should provide up to 300 minutes integrity and insulation performance depending upon dimensions and supporting construction (as shown in the Annex to this report), if tested utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft European Standard prEN 1366-4.

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 Warrington Fire Research Centre the assessment will be unconditionally withdrawn and Firestopit.com 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 February 2010, 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.

Summary of Primary Supporting Data

WARRES No. 141438

The test referenced WFRC No. 141438 describes a fire resistance test utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines from the draft document prEN 1366-4, on four specimens of horizontal and four specimens of vertical linear gap sealing systems.

The results of the test are as follows:

Ref.	Gap width	Seal depth	Gap faces	Backing material	Integrity	Insulation
A (Floor)	30 mm	15 mm	AAC/ AAC	PE-Rod	300 mins	66 mins
B (Floor)	20 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	133 mins
C (Floor)	10 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	-
D (Floor)	50 mm	25 mm	AAC/ AAC	PE-Rod	300 mins	214 mins
A (Wall)	30 mm	15 mm	AAC/ Steel	PE-Rod	300 mins	91 mins
B (Wall)	20 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	300 mins
C (Wall)	10 mm	10 mm	AAC/ AAC	PE-Rod	300 mins	-
D (Wall)	30 mm	15 mm	AAC/ AAC	PE-Rod	300 mins	215 mins

Test date : 6th October 2004

Test sponsor : Firestopit.com Limited

Declaration by Firestopit.com

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 Warrington Fire Research Centre to withdraw the assessment.

Signed:

For and on behalf of:

Signatories


Responsible Officer
C Johnson* - Technical Officer


Approved
D Hankinson* - Technical Consultant

* For and on behalf of Warrington Fire Research Centre.

Report Issued: 14 th February 2005

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

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Annex

Pyrocoustic Fire & Sound Sealant (various colours)

Wall Mounted Seals					
Gap width/mm	Seal depth/mm	Backing material	Gap face material	Integrity	Insulation
5	10	PE open cell foam	AAC/AAC	300	300
10	10	PE open cell foam	AAC/AAC	300	300
15	10	PE open cell foam	AAC/AAC	300	300
20	10	PE open cell foam	AAC/AAC	300	300
25	15	PE open cell foam	AAC/AAC	300	215
30	15	PE open cell foam	AAC/AAC	300	215
35	20	PE open cell foam	AAC/AAC	300	214
40	20	PE open cell foam	AAC/AAC	300	214
45	25	PE open cell foam	AAC/AAC	300	214
50	25	PE open cell foam	AAC/AAC	300	214
5	15	PE open cell foam	AAC/Steel	300	91
10	15	PE open cell foam	AAC/Steel	300	91
15	15	PE open cell foam	AAC/Steel	300	91
20	15	PE open cell foam	AAC/Steel	300	91
25	15	PE open cell foam	AAC/Steel	300	91
30	15	PE open cell foam	AAC/Steel	300	91

Floor Mounted Seals					
Gap width/mm	Seal depth/mm	Backing material	Gap face material	Integrity	Insulation
5	10	PE open cell foam	AAC/AAC	300	133
10	10	PE open cell foam	AAC/AAC	300	133
15	10	PE open cell foam	AAC/AAC	300	133
20	10	PE open cell foam	AAC/AAC	300	133
25	15	PE open cell foam	AAC/AAC	300	66
30	15	PE open cell foam	AAC/AAC	300	66
35	20	PE open cell foam	AAC/AAC	300	66
40	20	PE open cell foam	AAC/AAC	300	66
45	25	PE open cell foam	AAC/AAC	300	214
50	25	PE open cell foam	AAC/AAC	300	214

AAC - Autoclaved aerated concrete
PE - Polyethylene