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The Fire Resistance Performance of Lorient Polyproducts 'Banked' LVH44 Air Transfer Grilles

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Report for

Lorient Polyproducts Limited

Warrington FIRE research
CONSULTANCY • TESTING

The Professionals in Fire Safety

JMP(2643)

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The Fire Resistance Performance of Lorient Polyproducts 'Banked' LVH44 Air Transfer Grilles

Report for

Lorient Polyproducts Limited
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Report	Name	Signature*
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Reviewed By	C. W. Miles M. THOMPSON	

*For and on behalf of Warrington Fire Research Centre.

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant. This is included in Appendix 2 to this report.

Report Issued: 23rd September 1998

The Fire Resistance Performance of Lorient Polyproducts 'Banked' LVH44 Air Transfer Grilles

1 Introduction

1.1 This report presents a considered opinion regarding the fire resistance performance of LVH44 air transfer grilles, similar to previously fire tested and assessed air transfer grilles but modified to form banked assemblies.

1.2 The grilles are required to provide a fire resistance performance of 120 minutes integrity when subjected to a fire resistance test using the heating conditions and performance criteria of BS 476: Part 20: 1987.

1.3 The data referred to in Appendix 1 has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 64A: 1993.

2 Proposals

2.1 It is proposed to provide Lorient Polyproducts LVH44 air transfer grilles, similar in material specification and design to those tested under reference WARRES No. 63297 and assessed under reference WFRC. No. 81735, but installed to form a 'banked' assembly of maximum dimensions 2400 mm by 1200 mm .

2.2 The proposed assembly will be installed within masonry wall constructions which have been previously shown to be capable of providing the required period of fire resistance performance of 120 minutes integrity.

3 Discussion

Basic Test Evidence

3.1 The basic test evidence for the LVH44 air transfer grilles under consideration is provided in the fire resistance test report referenced WARRES No. 63297 which is summarised in Appendix 1 of this report.

3.2 The report demonstrates that when the LVH44 grille of dimensions 440 mm by 387 mm is installed within an aerated concrete wall and subjected on one face to the heating conditions specified in BS 476: Part 20: 1987, it is capable of satisfying the integrity performance criteria for 194 minutes.

3.3 In the above case, the specimen can be seen to have achieved an overrun of 57% in excess of the required period of integrity performance.

3.4 The assessment report referenced WFRC No. 81735 discusses the ability of LVH44 grilles, of increased dimensions up to 600 mm by 600 mm, to provide 120 minutes integrity when installed within various supporting constructions.

3.5 Test referenced WFRA No. F91675a included a group of four LVH20 air transfer grilles each of dimensions 450 mm by 450 mm banked together to form a specimen of total dimensions 910 mm high by 910 mm wide.

3.6 The above referenced specimen continued to satisfy the integrity performance criteria of the Standard for 185 minutes, after which time the test was discontinued.

3.7 The margin of performance achieved in the above referenced test represents 54% overrun compared to the required 120 minutes.

Assessed Performance

3.8 The installation of banked air transfer grilles into the proposed masonry wall constructions presents concerns with regard to the following:

a) The sealing of the junction between the grille and the perimeter edges of the aperture and between adjacent grilles.

b) The likely increase in distortion due to the banking of the grille assemblies.

3.9 The aforementioned test referenced WARRES No. 63297 and subsequent assessment WFRC No. C81735 regarding the performance of the LVH44 grille, shows the ability of the proposed grilles of dimensions up to 600 mm square to effectively seal the junction between the perimeter edge of the grille and the associated construction, when used in a masonry wall, for a period in excess of 120 minutes.

3.10 It is proposed to utilise the test evidence provided under reference WFRA No. F91675a to justify the acceptability of banked dampers of the above specification.

3.11 The above test was carried out using the general principles of AS1530.4-1990 using a similar time/temperature relationship and pressure conditions (20 Pa at the head of the specimen) as those detailed within BS476: Part 20: 1987.

3.12 It is therefore considered appropriate to employ the empirical evidence provided by the above test report.

3.13 The method of joining adjacent grilles utilised for the above mentioned test, which has been proven to be capable of providing the necessary support for a duration of 120 minutes, shall be used for the proposed banked grille assemblies.

3.14 The method of fixing to the supporting construction shall consist of screw fixings into the masonry or steel angles as shown in Figure 2 below. Either method would be expected to provide adequate mechanical restraint.

3.15 The proposed grille assemblies may be provided in banks up to 2400 mm high or wide and may consist of rows or columns no greater than two grilles wide. Maximum dimensions and configurations are detailed below within Figure 1.

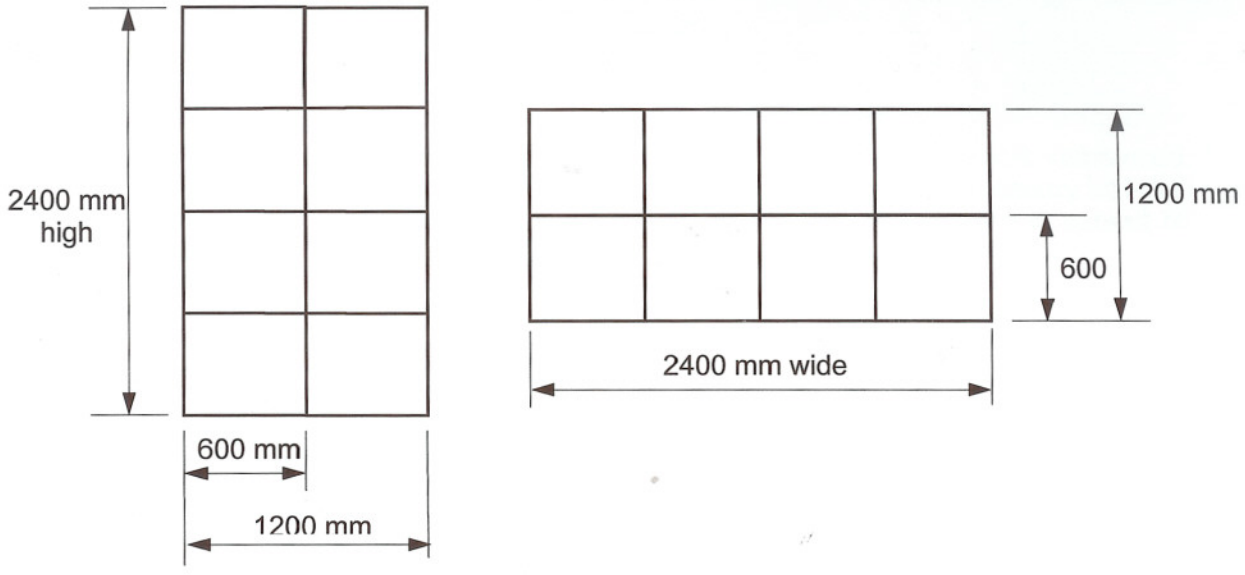

Figure 1. Maximum Permitted Dimensions

3.16 The restriction of the proposed banked systems to two grilles high or wide, as detailed above, would be expected to replicate the performance of the system when compared against the tested arrangement which effectively spanned nominally 910 mm and included a central joint where four grilles joined.

3.17 The central joints would be exactly as per the test referenced WFRA No. F91675a and detailed within Figure 2 below, which displayed no modes of integrity failure co-incident with this position. Thus, the rigidity of the proposed banked construction under standard fire test conditions when compared to that tested would be expected to be similar.

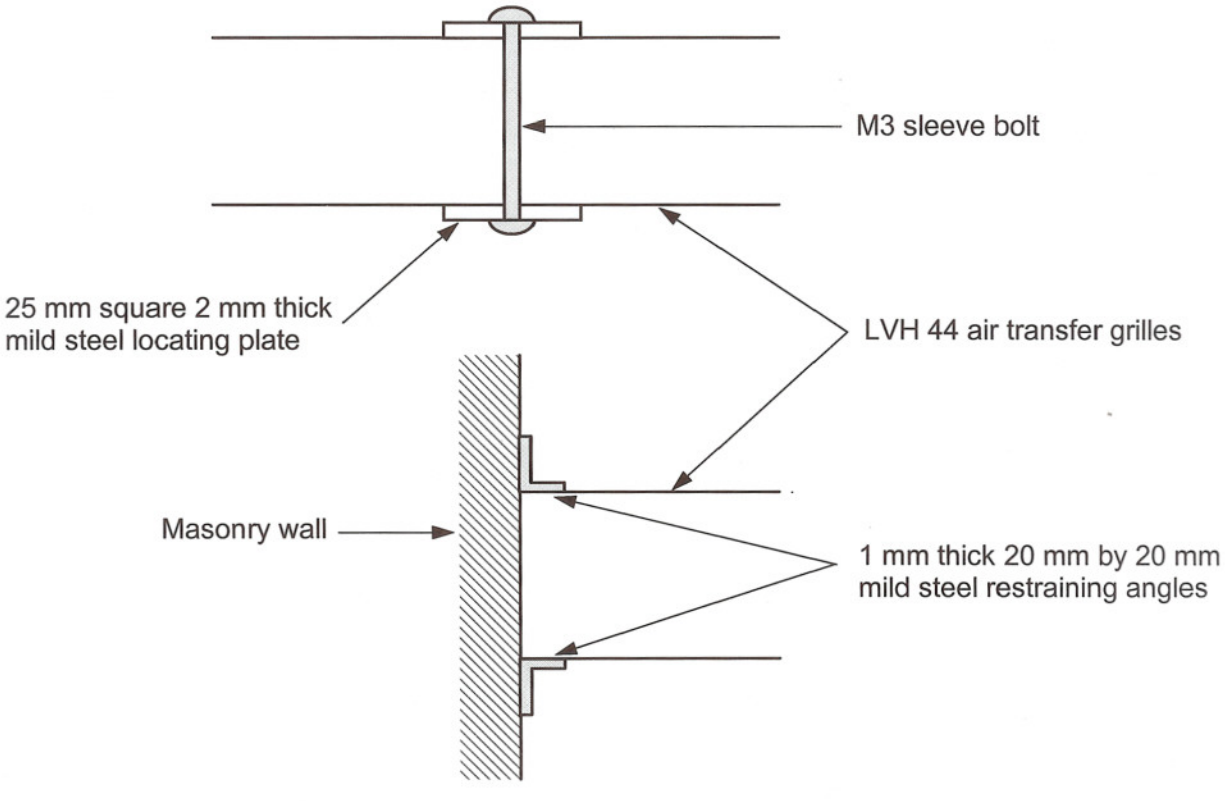

Figure 2. Proposed Installation details

4 Conclusion

4.1 The air transfer grilles referenced LVH44 as described in the report referenced WFRC No. C81735, when installed in a banked arrangement within a masonry wall, as discussed in this report, are expected to provide an integrity performance in excess of 120 minutes, with respect to BS 476: Part 20: 1987.

5 Validity

5.1 This assessment is issued on the basis of test data and information available at the time of issue. If contradictory evidence becomes available to WFRC the assessment will be unconditionally withdrawn and Lorient Polyproducts Limited 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 two years, i.e. until 1st October 2000, at which time it is recommended that it be returned for re-appraisal.

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

23rd September 1998

JMP(2643)

Appendix 1

Summary of Supporting Data

A1.1 **Warrington Fire Research Centre**
WARRES No. 63297

A report on a fire resistance test which utilised the heating conditions and general principles of BS 476: Part 20: 1987, conducted on two specimens of LVH44 air transfer grilles mounted within a section of an aerated concrete wall and floor. Each grille was of overall nominal dimensions 440 mm by 387 mm.

The test results were expressed as follows:

Specimen	Integrity (mins)	Insulation (mins)
Horizontal	194	22
Vertical	189	22

Test date : 21st March 1998
Test sponsor : Lorient Polyproducts Limited

A1.2 **Warrington Fire Research Centre**
WFRC No. C81735

An assessment report detailing the fire resistance performance of Lorient Polyproducts LVH44 air transfer grilles up to maximum dimensions of 600 mm high by 600 mm wide. The appraisal concluded that such grilles would be expected to provide a fire resistance performance in excess of 120 minutes integrity.

Sponsor : Lorient Polyproducts Limited

A1.3 **Warrington Fire Research Centre**
WFRA No. F91675a

A report on a fire resistance test performed generally in accordance with AS1530.4-1990, conducted on four units of Lorient Polyproducts LVH20 air transfer grilles installed 'banked' together within a steel duct. Each grille was of overall nominal dimensions 450 mm by 450 mm to form an overall assembly of dimensions 910 mm high by 910 mm wide.

The test results were expressed as follows:

Integrity : 185 minutes (test discontinued)
Insulation (on duct walls) : 185 minutes

Test date : 5th June 1997
Test sponsor : Lorient Polyproducts Limited

Appendix 2

Declaration by Lorient Polyproducts Limited

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. 64A: 1993.

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: LORIENT POLYPRODUCTS LTD.

Warrington FIRE research

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WFRC No. C123546/R
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4th March 2002

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Review of Assessment Report Referenced WFRC No. C104301

1 Introduction

The assessment referenced WFRC No C104301 provided an opinion regarding the fire resistance performance of modified LVH 44 air transfer grilles, should they be subjected to a test in accordance with BS 476: Part 20: 1987.

The appraisal report concluded that the proposed modified LVH 44 air transfer grilles assemblies should, if tested in accordance with BS 476: Part 20: 1987, provide a fire resistance performance of 120 minutes integrity

This review considers both the original appraisal and any subsequent reviews.

2 Confirmation of Specification

It has been confirmed by Lorient Polyproducts Limited that there have been no changes to the specification of the construction considered in the original appraisal referenced WFRC No. C104301 other than those considered in other WFRC reports.

3 Conclusions

The data used for the original appraisal has been re-examined and found to be satisfactory.

The procedures adopted for the original assessment have also been re-examined and are similar to those currently in use.

Therefore, with respect to the assessment of performance given in WFRC No. C104301, the contents should remain valid until the 1st April 2007.

4 Validity

This review is based on information used to formulate the original assessment. No other information or data has been provided by Lorient Polyproducts Limited which could affect this review.

The original appraisal report was performed in accordance with the principles of the UK Fire Test Study Group Resolution 64A: 1993. This has subsequently been superseded by Fire Test Study Group Resolution 82: 2001. This review has therefore been conducted using these principles.

Performed by:

S. Hankey

S. Hankey
Technical Officer
Technical Department
Warrington Fire Research Centre

Reviewed By:

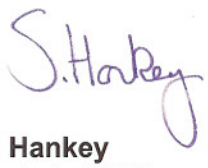
D. Hankinson
Technical Officer
Technical Department
Warrington Fire Research Centre

4 Validity

This review is based on information used to formulate the original assessment. No other information or data has been provided by Lorient Polyproducts Limited which could affect this review.

The original appraisal report was performed in accordance with the principles of the UK Fire Test Study Group Resolution 64A: 1993. This has subsequently been superseded by Fire Test Study Group Resolution 82: 2001. This review has therefore been conducted using these principles.

Performed by:



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