GAVO B.V. Molenvaart 41-49 7364 BS Lieren Nederland www.gavo.nl

TEST REPORT

FIRE RESISTANCE TEST UTILISING THE HEATING CONDITIONS AND GENERAL PRINCIPLES OF BS 476: PART 20: 1987 ON A WALL MOUNTED AIR TRANSFER GRILLE

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TEST REPORT

TEST SPONSOR:

LORIENT POLYPRODUCTS LIMITED, Fairfax Road, Heathfield Industrial

SUMMARY:

Estate, Newton Abbot, Devon, TQ12 6UD.

**The part of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wall mounted air transfer grille has been subjected to a specimen of a wa resistance test utilising the heating conditions and general principles of

Part 20: 1987.

The specimen had overall nominal dimensions of 600 mm high by 600 mm high by 600 mm by 40 mm thick and was installed within an aperture located in a section

aerated concrete wall.

If the performance of the specimen was to be assessed against the integrity performance criteria specified in BS 476: Part 20: 1987, the results

expressed as follows:

Integrity

66 minutes

The test was discontinued after a period of 68 minutes.

DATE OF TEST:

10th January 1997

REPORT ISSUED:

21st February 1997

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during the test



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PURPOSE OF THE TEST

The report is for in the report is for in the performance of a wall mounted air transfer gralle when subjected to the heating conditions and assessed using the performance criteria for intendity executive. 1. to the heating conditions and assessed using the performance criteria for integfity 1.1 BS 476: Part 20: 1987.

INTRODUCTION

There are at present no published British Standards applicable to the fire resistance testing of the proofer grilles intended to protein the grand of fire Wall and the proofer grilles intended to protein the grand of fire Wall and the proofer grilles intended to protein the grand of fire Wall and the grand of 2. transfer grilles intended to restrict the spread of fire. Wall constructions which are required to 2.1 provide fire resistance are tested using procedures detailed within BS 476: Part 200 1987 Methods for determination of the fire resistance of elements of construction (general principles) Consequently it would seem appropriate to utilise that standard as a basis for the test. The air transfer grille was symmetrical and was fitted into an aperture within a section of an 2.2 aerated concrete wall. The specimen was assessed against the integrity performance criteria specified within part 20. 1987 2.3 Part 20: 1987. Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group has identified a number of such areas and has agreed Resolutions which desire 2.4 common agreement of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inembers of interpretations between fire test laboratories which are inemperature in the inembers of interpretations are included in the inembers of interpretations and interpretations are included in the inembers of interpretations and interpretations are included in the inemperature in the inem Group. Where such Resolutions are applicable to this test they have been followed. The test was conducted on the 10th January 1997, at the request of Lorient Polyproducts Limited, 2.5 the sponsor of the test. The test was witnessed by Mr D Boulton and Mr G Newcombe, representatives sponsor. TEST SPECIMEN CONSTRUCTION 3. A comprehensive description of the test construction is given in Annex A. The descriptions based on a detailed survey of the specimen and information supplied by the spensor of the dest. 3.1 The air transfer grille was supplied by the sponsor on the 9th January 1997. Research Centre was not involved in any sampling or selection procedure of the component 3.2 ectorof Lorient. ar product. a Director of Lorient. The specimen was installed into prepared aperture within a 150 mm thick aerated 3.3 blockwork wall by representatives of the sponsor on the 10th January 1997. ntents may no

INSTRUMENTATION AND MEASURING EQUIPMENT

4.

4.1

The instrumentation was provided in accordance with BS 476: Part 20: 1987, where appropriate. accurate and

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4.2	Total the magnitude the temperature of the furnace atmosphere.	and s to s va i the
	provided to monitor the temperature of the	
	Pressure sensors were provided within the furnace to monitor the furnace	sherië messure
4.3	Pressure sensors were provided within the furnace to monitor the furnace atmosphere.	
4.5	3. 5	집 요원크론, 및 로
	Four thermocouples distributed over a plane 100 mm from the surface of the provided to monitor the temperature of the furnace atmosphere. Pressure sensors were provided within the furnace to monitor the furnace atmosphere atmosphere.	g suffage Status 3
4.4	A roving thermocouple was available to measure temperatures on the unexpose specimen at any position. Thermocouples could not be fixed to the unexposition.	sed face of the o
	The same position in a marmoral lines will not be trace to the	on en
	specimen at any position. Thermocouples specimen due to the nature of the construction in the early stages of the test.	
_	Cotton pads and gap gauges were available to evaluate the impermeability of the	sbedimentogner g
4.5	Cotton pags and gap gauges were available to over the	s in the man
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_	macon procedying	rio de ma
5.	TEST PROCEDURE	
	Titing and ganaral principles sne	rified in BS 475:3
5.1	The test was conducted utilising the heating conditions and general principles spe	× 3 Tab
J	Part 20: 1987.	may and or
	•	on:
	The furnace was controlled so that its mean temperature complied with the recommendation	uirements of BS®
5.2	The furnace was controlled so that its mean temperature comprises	the Calle
	476: Part 20: 1987, Clause 3.1.	
	ti de la companya de	
<i>-</i> 2	After the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of testing and for the remainder of the test, the further than the first five minutes of the test of the	lace bressare was
5.3	· · · · · · · · · · · · · · · · · · ·	(· · · · · · · · · · · · · · · · · · ·
	controlled so that it complied with the requirements of the	specimen was a 5
	pressure differential relative to the laboratory atmosphere at mid height of the	i julie ja k
	± 2 Pa.	
	· · · · · · · · · · · · · · · · · · ·	at T e o X
	Throughout the test the temperatures indicated by the thermocouples provide	d to moniter the
5.4	furnace were continuously monitored and were recorded at one minute interval	ds. care
	furnace were continuously monitored and were recorded at one many	- ° ≤ ≤ S
	Service Armon	temperature 0
5.5	The thermocouples referred to in 4.2 were used to determine the mean furnage	
J.J		
	The cotton pads and gap gauges were used if considered appropriate, to dete	rmine compliance
5.6	The cotton pads and gap gauges were used it considered appropriately with the integrity criterion of the Standard. The occurrence of any sustain with the integrity criterion of the Standard.	ed flaming onsthe
	with the integrity criterion of the Standard. The occurrence of any second	nliance with this
	with the integrity criterion of the Standard. The deservence of the specimen was also monitored to determine confunctions of the specimen was also monitored to determine confunctions.	5.08
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	and the second s	in the criminal
	TEST DATA AND INFORMATION	consent of ation to any prior conse
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6.	TEST DATA AND INFORMATION	of a Dire
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<i>c</i> 1	The following data, which was recorded during the test, is given in Annex E	
6.1	The following data, which was recorded during the test, is given in the 6.1.1 Mean furnace temperature, together with a comparison with the	Directoi imilar pr of a Dir riod the
	together with a comparison with the	e temperatuge/time
	6.1.1 Mean furnace temperature, together with a comparison with	ont C
	relationship specified in the Standard.	eg o H o
		S T. Je
()	6.1.1 Mean furnace temperature, together with a comparison relationship specified in the Standard. A summary of the observations made on the general behaviour of the specime	n is givergin Amnex
6.2	A Summary of the object and an and a summer of the summer	ient.
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	120	C at the start of the
6.3	The ambient air temperature in the vicinity of the test construction was 13°	o at the state of the
0.5	test with a maximum variation of +1°C during the test.	accurate
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	7 Tarrington	and
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Director of Lorient

contents may not be

The test was discontinued after a period of 68 minutes at the request of the sponsor. he contents of reissue should be 6.4 EVALUATION AGAINST THE PERFORMANCE CRITERIA 7. The performance of the specimen was judged against the following criteria of BS 277 7.1 1987: Integrity - It is required that there is no collapse of the specimen, no sustained framing 7.1.1 on the unexposed surface and no loss of impermeability. The specimen satisfied these requirements for 66 minutes after which time a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 250 minutes after a through gap in excess of 6 mm was evident. CONCLUSIONS 8. A specimen of an air transfer grille has been subjected to a fire test utilising the heating? If the performance of the specimen was to be assessed against the integrity criteria specimen whole or in part with the specimen was to be expressed as follows:

Integrity: 66 minutes

The test was discontinued after a period of 68 minutes.

LIMITATIONS

the light was a tire test utilising the light will be used whether directly criteria as period of 68 minutes.

The test was discontinued after a period of 68 minutes.

LIMITATIONS 8.1 8.2 9. The results relate only to the behaviour of the specimen of the element of construction under the 9.1 particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use, nor do they reflect the actual behaviour in fires. The test results relate only to the specimen tested. Appendix A of BS 476: Part 26 9.2 provides guidance information on the application of fire resistance tests and the temperation of test data. Application of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results to grilles of different dimensions or supported other than the supported of the results of the supported of the suppo an aerated concrete wall as tested or incorporating different components should be the subject of



a design appraisal.

These conditions

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10.

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REVIEW

The report is valid contents of the contents of the should should be subjected a procedure which is not the subject of the su 10.1 British Standard specification but the test utilised the heating conditions and general principles of fire resistance testing given in BS 476: Part 20: 1987. Since fire tests are the subject of continuing Standardisation process, and because existing standards are the subject of review and ontinuing Standardisation process, and because existing standards are the subject of the continuing Standardisation process, and because existing standards are the subject of the process. The process of the process o possible amendment and new interpretations, it is recommended that the report the referred back

Responsible Officer

S HANKEY Technical Officer Structural Fire Protection

bj(027)

ANNEX A

Description

SPONSORS REFERENCE: LORIENT LV40 INTUMESCENT AIR TRANSFER

SCHEDULE OF COMPONENTS

(Refer to Figures 1 and 2) (All values are nominal unless stated otherwise) (All references are as stated by the sponsor)

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Chloride

horizontal slats (items 2 and 3)

Polyvinyl

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Lorient Polyproducts Limited (PA/C) containing 1 No. layer of Palusolating 1 No. layer of Palusolating 1 No. layer of Palusolating 2 No. layer of perforated steel mester whole or in particular and the containing 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 1 No. layer of Palusolating 2 no in particular and the containing 2 Each vertical perimeter member fixed to masonry aperture using 3 No. 4.2 ming diameter by 45 mm long self tapping steel screws. All perimeter members contained slots to accept the vertical and

2.

Item

l.

Vertical Slats

Perimeter Sections

PVC casing

Mesh layer

Palusol layer

Manufacturer

Section size

Material

i)

ii)

iii)

Fixing

Manufacturer Material

Section size

PVC casing i) Palusol layer ii) Mesh layer iii) Fixing

Lorient Polyproducts Limited PVC casing containing 1 No. Payerson PVC Palusol and 1 No. layer of perforate steel mesh.

40 mm wide x 6 mm thick 37.5 mm wide x 2 mm thick 37.5 mm wide x 1 mm thick Ends of each slat located into slets in the top and bottom perimeter members (item 1).

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under the following conditions:

ANNEX A (continued)

Horizontal Slats

3.

Manufacturer Material

Section size

PVC casing i) each Palusol layer ii) Fixing

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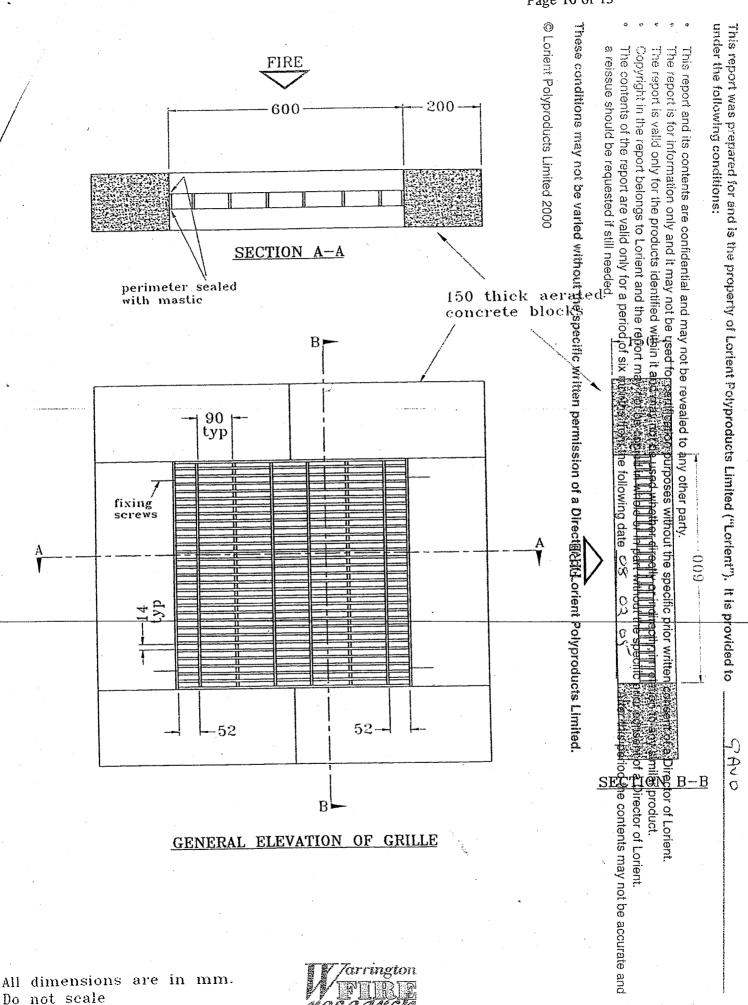
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ISOMETRIC VIEW OF INTUMESCENT AIR TRANSFER GRILLE REFERENCE LV40

dimensions are in mm. Annex A for schedule. not scale

fixing screw

(0:3)

fixing screw



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ANNEX B

DATA RECORDED DURING THE TEST

TABLE 1

RECORDED AND SPECIFIED FURNACE TEMPERATURES AND PERCENTAGE TOLERANCES

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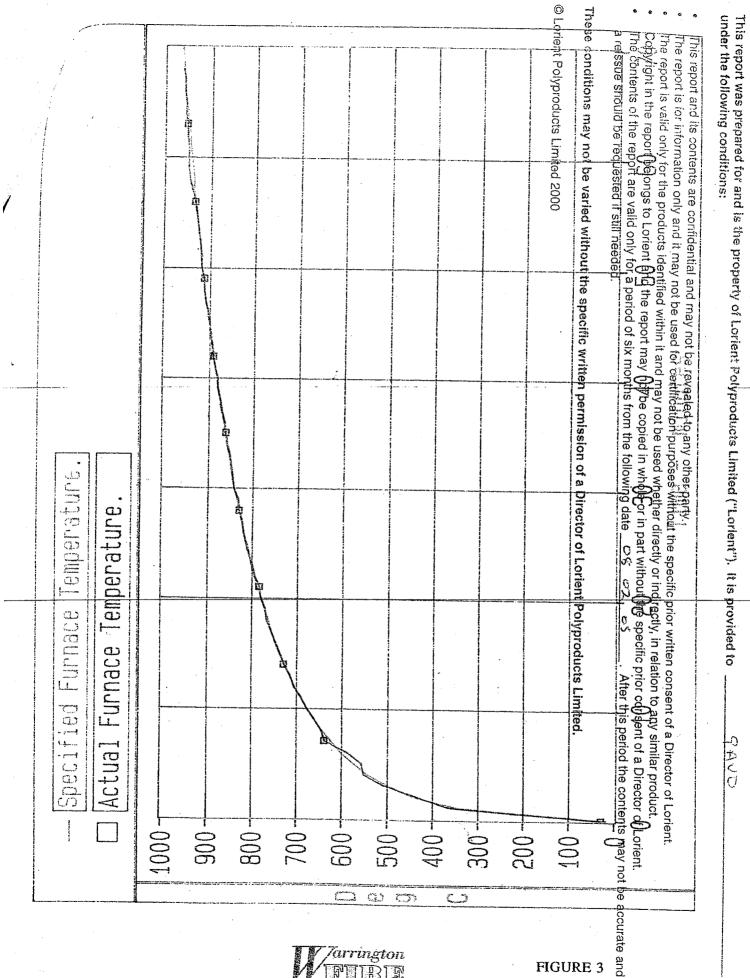


FIGURE 3

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ANNEX C

OBSERVATIONS MADE BY THE TESTING OFFICER

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	02	40	U	Approximately 50% of the total area has reacted.		5		JSe C	2 2
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	38	30	U	There is a slight through gap of approximate size	-t litte	Š. T.	eci		<u>r:</u> ‡
				long along the right hand side of the specimen.		E C	. b	relat	ž
				The top half of the specimen is deflecting to the	left ca	ψωsing	a the	oğgb	Š
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	51	00	U	There is a slight area of glowing at mid-height	on the	left h	and g	n ath	ar D
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	53	50	U	Small areas of glowing are visible along the top	cage (n uic	2 C	, 유 년	isoctor of I orio
				grille to blockwork joint. Small areas of glowing are visible along the top The area of glowing mentioned at 51 minutes	has	develo	ped a	nto F	7
	54	26	U	The area of glowing mentioned at 34 minutes through gap approximately 4 mm wide by 50 minutes	m long	, .	hay		
				through gap approximately 4 min wide by 30 min		•	ent. ay not	•	,
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Mr D Ferris **Lorient Polyproducts Limited** Fairfax Road Heathfield Industrial Estate **Newton Abbott TQ12 6UD**

Review of Test Report Referenced WFRC No. C70339

1

Introduction

The report referenced WARRES No. 70339 relates to a fire resistance test conducted. utilising the general principles of BS 476: Part 20: 1987, on an air transfer grille

The test incorporated an air transfer grille installed within a section of aerated concept

The test demonstrated the ability of the specimen to provide an integrity performance of 66 minutes. Q

2 Confirmation of Specification

It has been confirmed by Lorient Polyproducts Limited that there have been no thanks to the specification or the construction considered in the original report, referenced WARRES No. 70339, other than those which may have been addressed ingreterant WFRC assessment reports.

3 Conclusions

At present there are no additional resolutions adopted by the Fire Lest Stady Graup since the original test was performed which would affect the manne in which the fest would be conducted or the interpretation of the test results.

The procedures adopted for the original test have also been re-examined and and all singilar to those currently in use.

Therefore, with respect to the fire resistance test report referenced WARRES NO. 70239, the contents should remain valid until the 1st April 2007. may not be accurate

Validity

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Performed by:

S. Hankey **Technical Officer Technical Department** Warrington Fire Research Centre

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