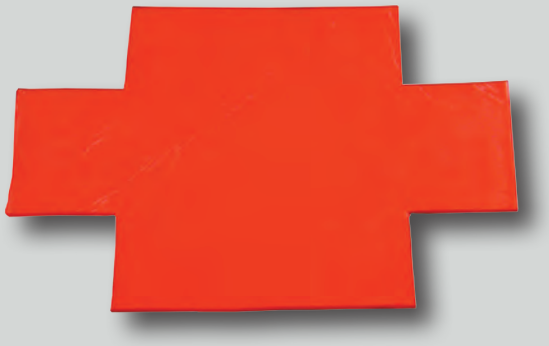
FiPP - Intumescent Putty Pad

Flexible intumescent FireStop pad, designed to maintain flexible wall partitions integrity & acoustic properties



BS EN 1366-3

BS EN 1026 Air Permeability Test Method

BS EN ISO 10140-3:1995 The laboratory measurement of airborne sound insulation of building elements

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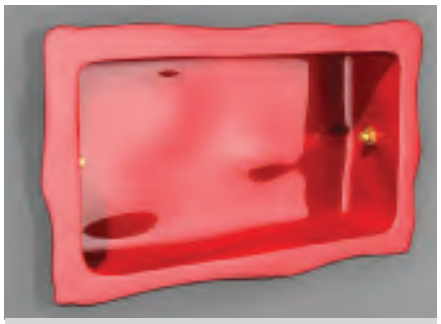
fischer innovative solutions

Developed to maintain acoustic integrity and fire resistance of plasterboard partitions

External application



Internal application

APPLICATIONS

- Most flexible partition assemblies
- Fire and insulation resistance
- Acoustic sealing
- Air permeability
- Plastic & metal electrical outlets

ADVANTAGES

- Excellent acoustic properties
- Internal & external version available
- Primerless adhesion to most substrates
- Robust detail part E handbook accepted
- No electrical conductivity
- Air permeability
- Quick and simple installation

APPROVALS

BS EN 1366-3 — Air Permeability Test Method

BS EN 1026

BS EN ISO 10140-3:1995 — The laboratory measurement of airborne sound insulation of building elements

This notification is to confirm that **Robust Details Limited** has assessed the acoustic performance of the fischer FiPP putty pad, and has accepted its use on Part E robust details timber and light steel frame seperating walls.

BUILDING MATERIAL

Suitable for:

- Most flexible wall partitions constructed from plasterboard / gypsum board, timber and steel studs

DESCRIPTION

- fischer Intumescent Putty Pads FiPP are manufactured from a red, non-setting, silicone based intumescent polymer and tested in accordance with BS EN 1366-3 for up to 2 hour fire rating and 2 hours insulation
- fischer intumescent putty pads FiPP have been developed to maintain the fire resistance and insulation requirements of flexible wall partitions, where they are penetrated by plastic or metal electrical outlets and cables
- FiPP can also be used for upgrading the acoustic performance of flexible partitions where electrical outlets have penetrated the partition, designed and tested for a single stud application where outlets are positioned back to back.

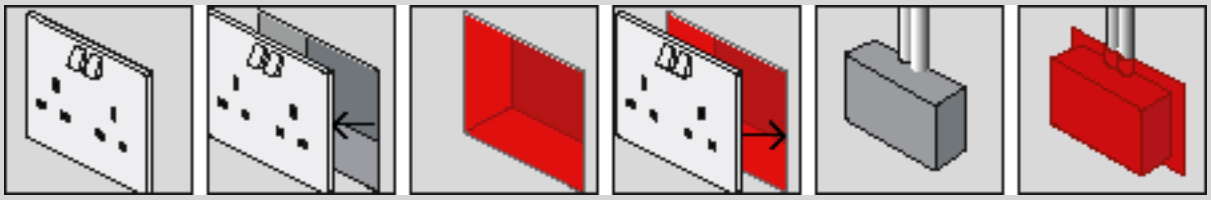
INSTALLATION

Note: FireStop material must be installed in accordance with detailed instructions or the approved system.

1. Remove the face plates of the electrical outlet
2. Clean all contact surfaces so they are free from loose debris and contaminants
3. Mould the preformed putty pads into the back of the box and around the cables
4. Replace the face plate

External

1. Clean all contact surfaces so they are free from loose debris and contaminants
2. Mould the preformed putty pads onto the back of the box and around the cables



SPECIFICATIONS

Description	Description	Size	Colour	Fire Rating / Quantity	
Item	**Order No.**	**mm**		**Hours**	**Pcs**
FiPP / I-S	53578	170 x 170	Red	2	25
FiPP / I-D	54757	230 x 170	Red	2	50
FiPP / E-S	506261	155 x 155	Red	2	25
FiPP/ E-D	506262	210 x 180	Red	2	

TECHNICAL DATA

Base material	Drywall
Specific gravity	1.55 kg/m^3
Sound transmission class	66 db
Slump	Nil
Application temperature range	+4 °C to 40 °C
Service temperature rate	-70 °C to 120 °C
Shelf life	18 months

ADDITIONAL INFORMATION

Note: Please refer to MSDS for further information

Storage

1. Storage temperatures between +5 °C and +25 °C

2. Store away from heat sources

3. Keep container closed until use

4. Monitor expiry date

fischer Intumescent Putty Pads FiPP

(according to § 14 GefStoffV and Directive 91/155/EEC)

1. Identification of the substance/preparation and company

1.1	**Trade name:**	FiPP
1.2	**Typical application:**	Fire barrier (electrical sockets)
1.3	**Manufacturer/supplier:**	fischer Fixing (UK) Ltd
1.4	**Address:**	Hithercroft Road, Wallingford, Oxfordshire, OX10 9AT
1.5	**Contact:**	Mrs Mirka Valovicova
1.6	**Telephone:**	01491 827 920
1.7	**Telefax:**	01491 827 950

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical characterization: Silicone polymer, extenders, fire retardant and pigments.

Hazardous Ingredients:

Name	CAS-No.	EINECS/ ELINCS No.	Conc. (%)	Classification R-phrases

3. HAZARDS IDENTIFICATION

Not hazardous under normal use.

4. FIRST AID MEASURES

On contact with eyes: Immediately flush with plenty of water. If irritation persists seek medical advice.

On skin contact: Remove product mechanically and wash with soap and water.

If inhaled: Move to fresh air. If shortness of breath occurs, seek medical advice.

On ingestion: Rinse mouth with water. Do not induce vomiting. Dilute stomach contents with water or milk. Seek medical advice if necessary.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: All standard extinguishing media are suitable. This is a waterborne product and does not support combustion in the uncured state. The product does contain combustible organic components which may yield smoke containing hazardous decomposition products.

 n.s. = not subject n.a. = not applicable Alterations are marked: #
Components of chemical sets are signed with A, B, ...

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear proper protective equipment.

Methods for cleaning up: Scrape up and place in a container fitted with a lid. Label clearly with contents ready for disposal. Clean residues with water and detergent.

7. HANDLING AND STORAGE

Advice on safe handling: Maintain good standards of personal hygiene. Food should not be prepared, stored or consumed in the areas of product use.

Advice on storage: Keep container tightly closed in a cool, dry and ventilated area.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protection: Wear suitable gloves and eye protection.

Skin Protection: There is no risk to health in case of contact with the chemical but hand protection is advised.

Eye protection: Safety glasses with side shields should be worn.

Hygiene measures: Avoid contact with skin, eyes and clothing. Ensure adequate ventilation, especially in confined areas. Exercise good industrial hygiene and safety practice. Wash after handling and especially before eating, drinking or smoking.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Form: Putty, non-setting.
Colour: As supplied
Odour: none

Other data:

Density: approx 1.58g/cm^3
Water solubility: Not miscible in water.

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Human experience: Our experience shows that there is no serious acute / chronic effect from handling this product under industrial conditions.

12. ECOLOGICAL INFORMATION

Ecotoxicological data: None available.

13. DISPOSAL CONSIDERATIONS

Product disposal: Dispose of in accordance with local regulations. Can be taken to an incinerator equipped with an exhaust gas cleaner.

Packaging disposal: Dispose of as unused product.

14. TRANSPORT INFORMATION

Road / Rail (ADR/RID):
Sea transport (IMDG):
Air transport (IATA):

This product is not regarded as dangerous goods according to the national and international regulations on the transport of dangerous goods.
Protect from water.
Keep away from food, foodstuffs, acids and bases.
Keep away from odour sensitive materials.

15. REGULATORY INFORMATION

Labelling according to: EC Directives 1999/45/EC

Further information: Not a hazardous substance or preparation according to EC-directives 67/548/EEC or 1999/45/EC.
The product does not need to be labelled in accordance with EC directives or respective national laws.

16. OTHER INFORMATION

The information provided in this safety sheet is correct to the best of our knowledge, information and belief at the date of it's publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such

material used in combination with any other materials or in any other process, unless specified in the text.

Bodycote

Title:

The Fire Resistance Performance Of Six Specimens Of Electrical Sockets And Sealing Systems, Utilising The General Principles Of BS EN 1364-1: 1999 In Conjunction With Additional Guidelines From BS EN 1366-3: 2004

WF Report No:

182824

Prepared for:

Fischer Fixings UK Ltd

Whitely Road
Hithercroft Industrial Estate
Wallingford
Oxfordshire
OX10 9AT
England

Date:

29th April 2009

Notified Body No:

0833

UKAS TESTING
0249

warringtonfire global safety
TESTING

Summary

Objective

To evaluate the ability of six specimens of electrical sockets and sealing systems to reinstate the integrity and insulation performance of a drywall construction, when tested utilising the general principles of BS EN 1364-1: 1999 in conjunction with additional guidelines from BS EN 1366-3: 2004.

Test Sponsor

Fischer Fixings UK Ltd, Whitely Road, Hithercroft Industrial Estate, Wallingford, Oxfordshire, OX10 9AT,England.

The specimens were referenced 'A/E, B/F, C, D, G and H', for the purposes of the test.

The assembly comprised a drywall construction of overall dimensions 3050 mm wide by 3035 mm high by 100 mm thick, constructed utilising the material specification given in BS EN 1366-3: 2004. The wall incorporated six specimens comprising a range of electrical sockets. Further details are provided in the Test Specimen, Figures 1 to 3.

Test results

Specimen	Cotton pad	Sustained flaming	Insulation
A/E	126 minutes*	126 minutes*	126 minutes*
B/F	126 minutes*	126 minutes*	126 minutes*
C	126 minutes*	126 minutes*	126 minutes*
D	126 minutes*	126 minutes*	126 minutes*
G	126 minutes*	126 minutes*	126 minutes*
H	126 minutes*	126 minutes*	126 minutes*

* The test duration. The test was discontinued after a period of 126 minutes.

Date of Test

17th March 2009

Note: This report is additional to that issued as WF Test Report No. 181205. The original report remains valid and is not replaced by this additional test report.

Signatories

Responsible Officer
S. Gilfedder*
Testing Officer

Approved
A. Kearns*
Technical Manager

Head of Department
S. Hankey *
Operations Manager

* For and on behalf of Bodycote **warringtonfire**.

Report Issued

Date : 29th April 2009

CONTENTS **PAGE NO.**

Test Procedure

Introduction

Partition walls often incorporate apertures to allow the installation of electrical sockets. The fire resistance of such elements is only as good as their weakest point and it is, therefore, important that any such installations are adequately sealed, such that weaknesses are not created at these positions.

The specimens were tested utilising the general principles given in BS EN 1364-1:1999, in conjunction with additional guidelines from BS EN 1366-3: 2004 for penetration sealing systems. This report should be read in conjunction with the above mentioned documents.

The specimens were judged on their ability to comply with the performance criteria for integrity and insulation, as required by BS EN 1364-1: 1999 and BS EN 1366-3: 2004.

Fire Test Study Group / EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions, which define common agreement of interpretations between fire test laboratories, which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

Instruction to test

The test was conducted on the 17th March 2009 at the request of Fischer Fixings UK Ltd, the sponsor of the test.

Test Specimen Construction

A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.

Installation

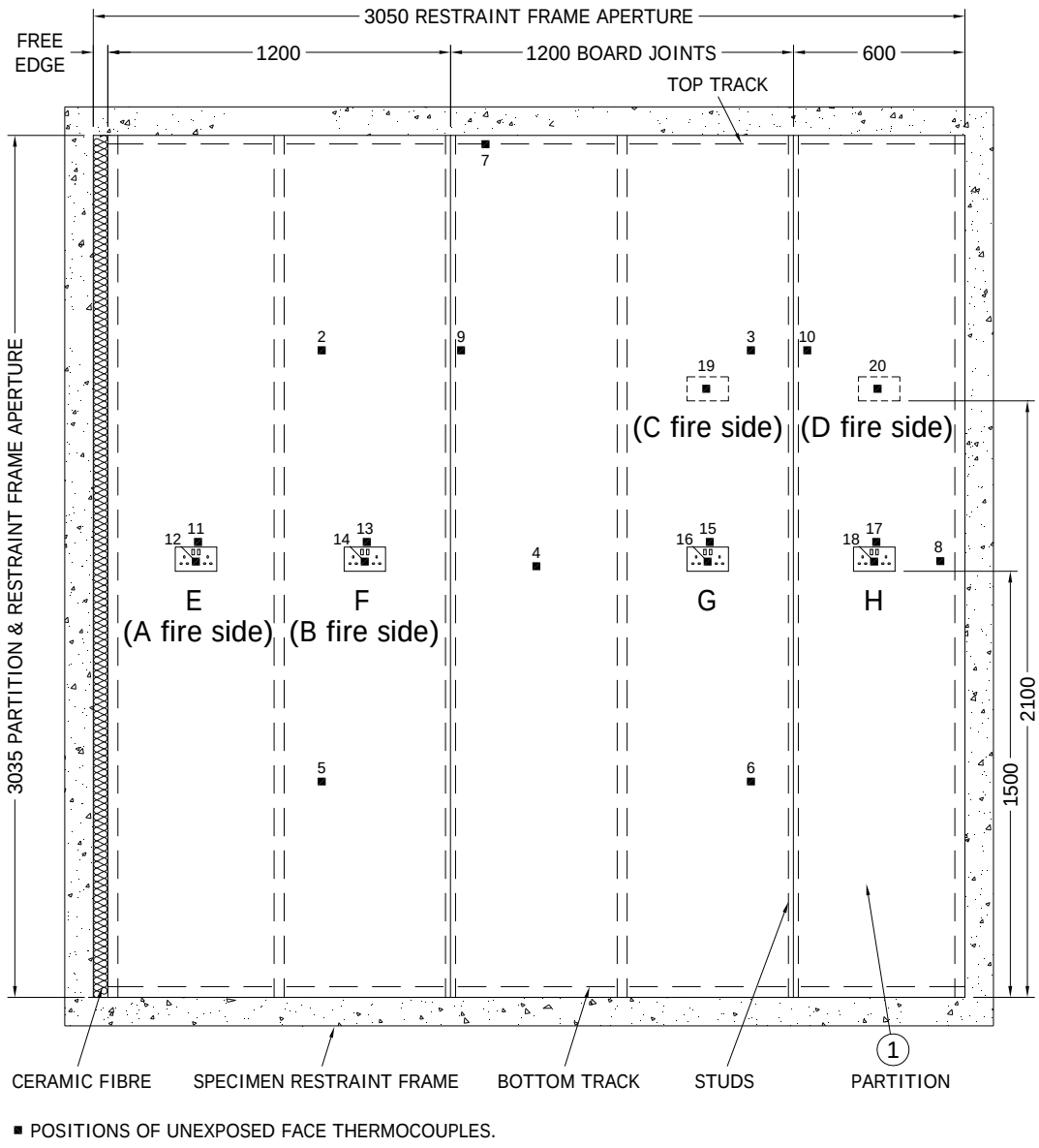
The assembly was constructed by representatives of the test sponsor on the 12th and 13th March 2009.

Sampling

Bodycote **warrington**fire was not involved in any selection or sampling procedures of the specimens or any of the components.

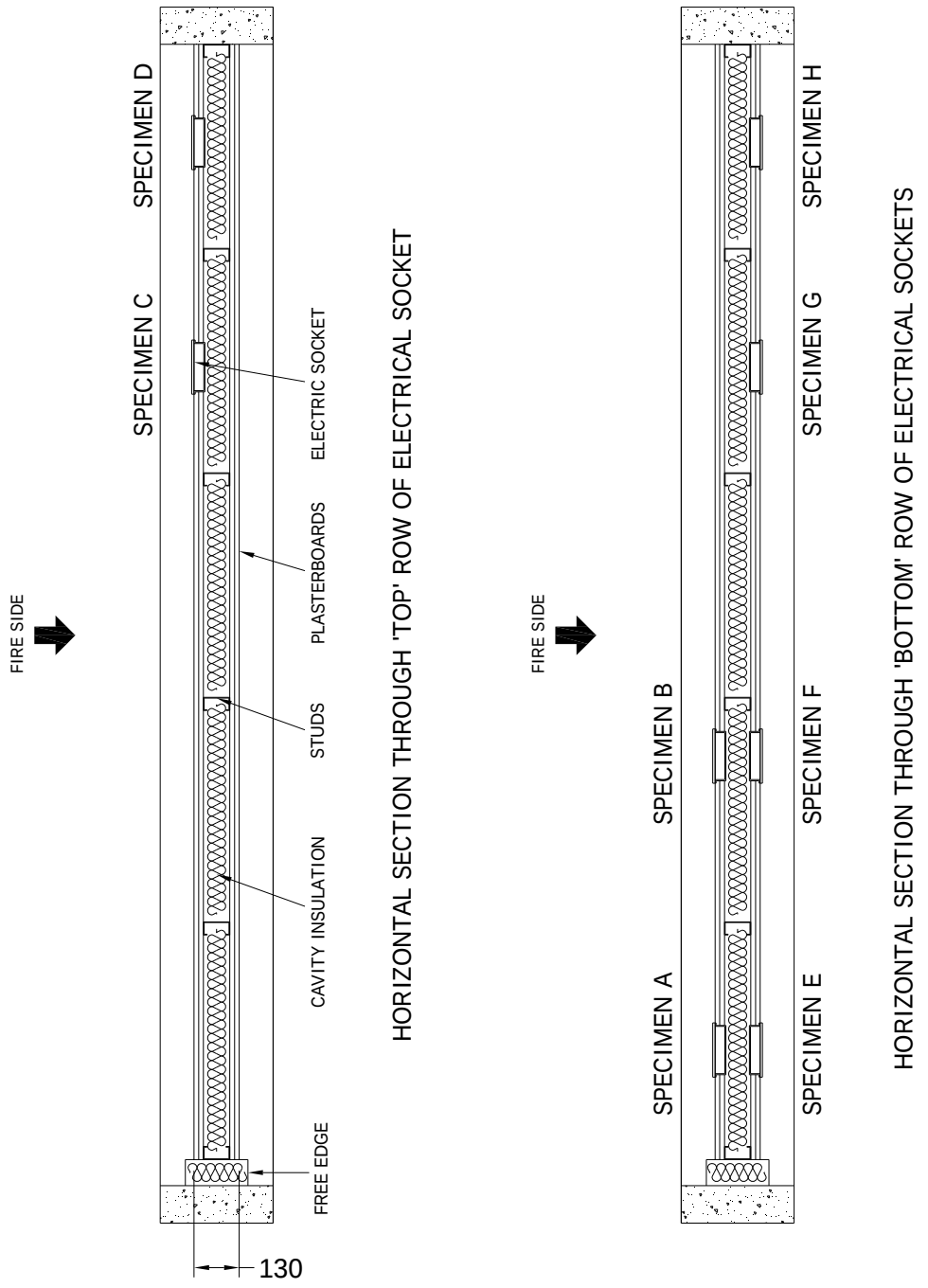
Test Specimen

Figure 1- General elevation of the unexposed face of the partition and electrical sockets



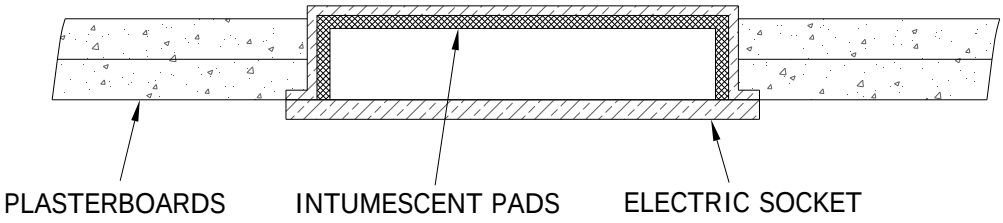
Do not scale. All dimensions are in mm

Figure 2 – Horizontal sections through the partition showing the electrical socket positions

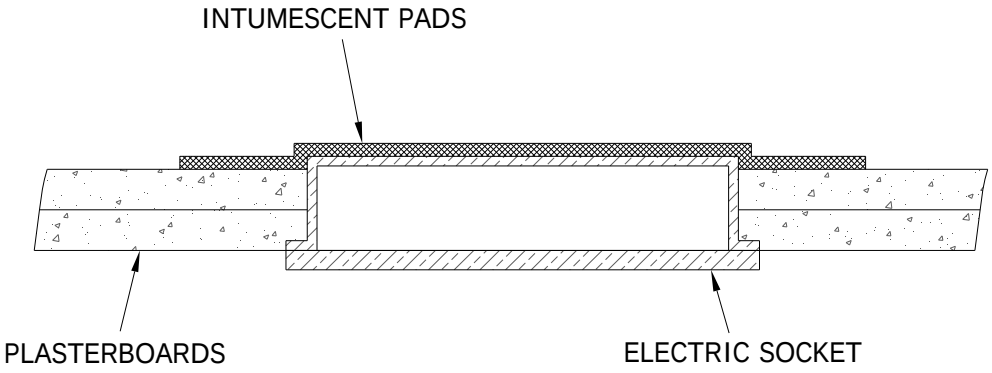


Do not scale. All dimensions are in mm

Figure 3 – Sections through the electrical sockets showing the positions of the putty pads



POSITION OF INTUMESCENT PADS
TO SPECIMENS : B, D, E, G



POSITION OF INTUMESCENT PADS
TO SPECIMENS : A, C, F, H

Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 3)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

Item		**Description**
1. Partition / drywall construction		
General description	:	The test assembly consisted of a gypsum plasterboard wall assembly with an insulated cavity
Overall size and thickness	:	3035 mm high by 3000 mm wide by 130 mm thick
Relevant requirements	:	The construction of the wall was in accordance with EN 1363-1:1999
Manufacturers		
i. steel framework	:	British Gypsum
ii. plasterboards	:	British Gypsum
iii. cavity insulation	:	Rockwool
iv. mastic	:	Fischer Fixings UK Ltd
Materials	:	
i. top and bottom track, studs	:	Galvanised mild steel
ii. plasterboards	:	Gypsum based plasterboards, to F-EN520
iii. cavity insulation	:	Rockwool mineral wool based slabs
iv. mastic	:	Intumescent acrylic sealant
References		
i. top & bottom track	:	72 C 50
ii. studs	:	72 S 50
iii. cavity insulation	:	Rockwool slabs (69 kg/m^3 recorded density)
iv. plasterboards	:	Gyproc Fireline board (836 kg/m^3 recorded density)
v. mastic	:	Fischer FiAM 310 intumescent acoustic mastic
Thickness		
i. top & bottom track	:	0.55 mm
ii. studs	:	0.6 mm
iii. cavity insulation	:	75 mm
iv. plasterboards	:	15 mm x 2 layers
v. mastic	:	Not applicable
Overall sizes		
i. top & bottom track	:	72 mm wide x 32 mm deep.
ii. studs	:	70 mm wide x 32 mm deep
iii. cavity insulation	:	Cut to full height of partition
iv. plasterboards	:	1200 mm wide x 2400 mm high for uncut boards
v. mastic	:	Not applicable
Fixing methods	:	
i. top & bottom track	:	The channels were fixed with steel screws and plugs to the concrete lining of the specimen restraint frame. The screws were fitted centrally between each stud

ii. studs	:	The studs were positioned at 600 mm nominal centres and were friction fitted into the channels, allowing approximately 20 mm at the head for expansion during the heating conditions of the test
iii. cavity insulation	:	The insulation was friction fitted between the studs
iv. plasterboards	:	Two layers of boards were fixed to each face of the partition with steel drywall screws 3.5 mm diameter x 25 mm and 42 mm long respectively for the inner and outer layer of boards at 300 mm nominal centres. All board joints were staggered with respect to the adjacent board layer and the boards on the opposite face of the partition. The outer board joints were finished with tape and plaster scrim
v. mastic	:	The mastic was applied around the perimeter edges of the assembled partition

2. Electrical double gang sockets

Type	:	Back box - standard dry lining electrical box, 13 A, 2 gang. Cover plate - switched moulded socket outlet to BS 1363
Material	:	Polyvinyl chloride (PVC)
Overall sizes		
i. back box	:	132 mm x 73 mm
ii. cover plate	:	145 mm x 85 mm
Fixing	:	The back boxes were fitted into apertures cut into the plasterboards and fixed with two steel screws. The apertures were central between the studs and at a minimum distance of 250 mm from the perimeter edges of the partition. The cover plates were fixed with steel screws onto the back boxes
Positions	:	Specimen A was fitted opposite to Specimen E Specimen B was fitted opposite to Specimen F Specimen C was fitted staggered to Specimen G Specimen D was fitted staggered to Specimen H

3. Putty pads 'new build' fitted onto the back face of the sockets – Unexposed face specimens F, H Exposed face specimens A, C

Manufacturer	:	Fischer Fixings UK Ltd
Reference	:	FiPP (Fischer intumescent Putty Pads)
Material	:	Intumescent non-setting mouldable putty pads
Sizes	:	210 mm wide x 180 mm high x 3 mm thick
Fixing	:	Fitted over the back box and overlapping the plasterboards during assembly of the partition
Shape of pads	:	Rectangle

4. Putty pads 'retro' fitted into the sockets –
Unexposed face specimens E, G
Exposed face specimens B, D

Manufacturer	:	Fischer Fixings UK Ltd
Reference	:	FiPP (Fischer intumescent Putty Pads)
Material	:	Intumescent non-setting mouldable putty pads
Sizes	:	230 mm wide x 170 mm high x 3 mm thick
Fixing	:	Inserted into the back boxes after they were fitted into the assembled partition
Shape of pads	:	Cross

Instrumentation

General	The instrumentation was provided in accordance with the requirements of the Standard.
Furnace	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 1999 Clause 5.1 using nine plate thermometers, distributed over a plane 100 mm from the surface of the test construction.
General	Thermocouples were provided to monitor the unexposed surface of the specimens. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.
Roving Thermocouple	A roving thermocouple was available to measure temperatures on the unexposed surfaces of the specimens at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
Integrity criteria	Cotton pads were available to evaluate the integrity of the specimens.
Furnace Pressure	The furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 1999, Clause 5.2.

Test Observations

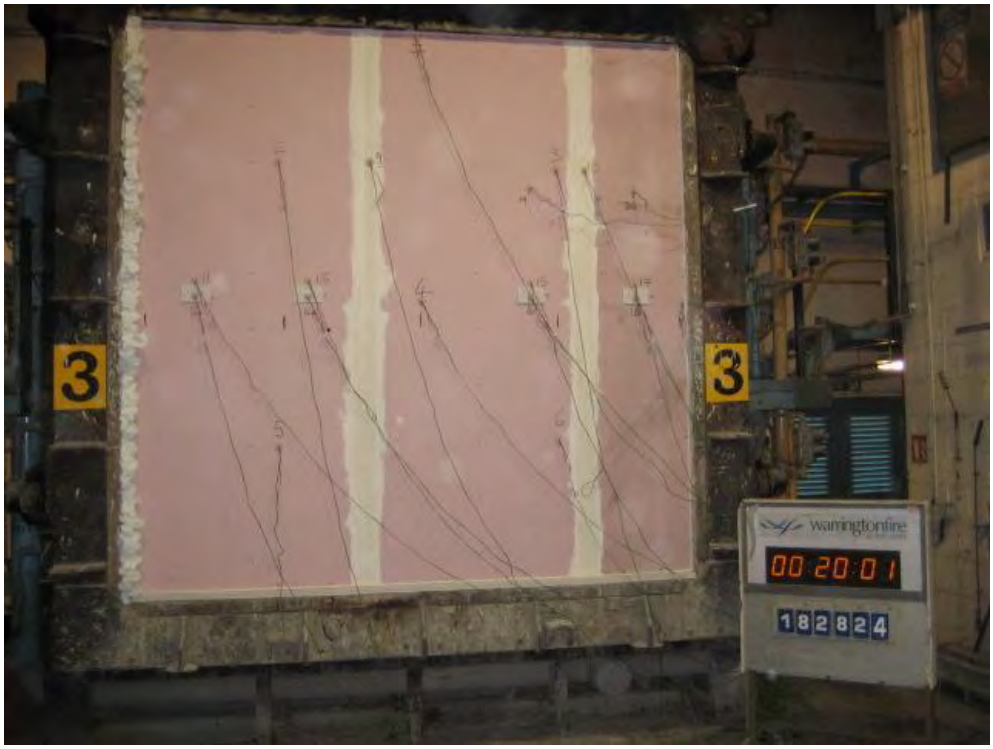
Time		All observations are from the unexposed face unless noted otherwise.
mins	**secs**	The ambient air temperature in the vicinity of the test construction was 13ºC at the start of the test with a maximum variation of 1ºC during the test.
00	**00**	**The test commences.**
02	**21**	The exposed faces of the partition and socket covers have blackened.
09	**17**	The exposed socket covers have cracked and the paperface of the plasterboard chars and starts to peel away.
13	**37**	All the exposed socket covers are still in pace some flaming is visible around specimens B and D.
21	**00**	Viewed from the exposed side, A gap starts to form along the top edges of specimens A and C as the socket covers slump down. The socket covers of specimens C & D are being pushed out as the intumescent reacts.
23	**29**	The exposed socket cover of Specimen C has fallen away; flaming can be seen from the aperture.
30	**00**	All the exposed socket covers have fallen away; intumescent material can be seen to have filled the voids of specimens B and D.
37	**01**	Viewed from the exposed side flaming is visible from specimens D and B.
40	**00**	Viewed from the exposed side, intumescent material is visible in the void of Specimen C, however there doesn't appear to be any material in the void of Specimen A.
43	**00**	The joints in the outer exposed plasterboard layer start to open up approx 10-20mm. The partition glows orange.
48	**00**	No significant visual change to the unexposed face.
51	**00**	Intumescent material has filled B & D but some dark voids are visible, flaming is visible from both sockets.
67	**14**	Flaming is still visible on the exposed face from specimens B and D; the outer layer of exposed plasterboard is still in place.
67	**26**	The patrician starts to bow in across its horizontal axis at mid height. Steam/smoke release is visible at the head of the partition just to the left of mid-span.
72	**30**	The outer layer of exposed plasterboard starts to come away on its vertical joints where the board has shrunk past the screw fixings.
74	**00**	Flaming is visible on the exposed face from specimens A and C.

mins	secs	
80	00	The outer layer of exposed plasterboard is still in place, it's peeling open and bulging out as it starts to fall away.
91	00	The outer layer of exposed plasterboard has fallen away on the right hand side; some sections still remain attached on the left hand side. On the right hand side the rock wool core is also visible where the inner layer of plasterboard has also come away in places.
94	00	Moisture runs from the bottom right hand corner of Specimen F.
96	31	Viewed from the exposed side, both layer of plasterboard have fallen away at the centre of the partition, the rock wool cone is visible. Plasterboard remains attached on the left hand side and at the right hand perimeter.
100	00	Slight smoke release visible from the top edge of Specimen F.
103	00	The central section of exposed rockwool core falls away.
105	00	Smoke release starts to increase slightly from the top edge of Specimen F.
112	00	The top edge of socket cover on Specimen F is slumping away from the plasterboard very slightly.
113	00	Slight smoke release now also visible from Specimen H.
119	30	A cotton pad is applied to Specimen F where smoke release has increases over the top edge; the cotton pad fails to ignite.
120	00	The assembly continues to satisfy the test criteria.
123	11	A gap is now visible at the top edge of Specimen F where the socket cover has slumped forward; the plasterboard discolours around the top half of the socket.
126	06	A cotton pad is applied to Specimen F over the top edge; the cotton pad discolours but fails to ignite.
126	57	The test is discontinued at the sponsors' request.

Test Photographs

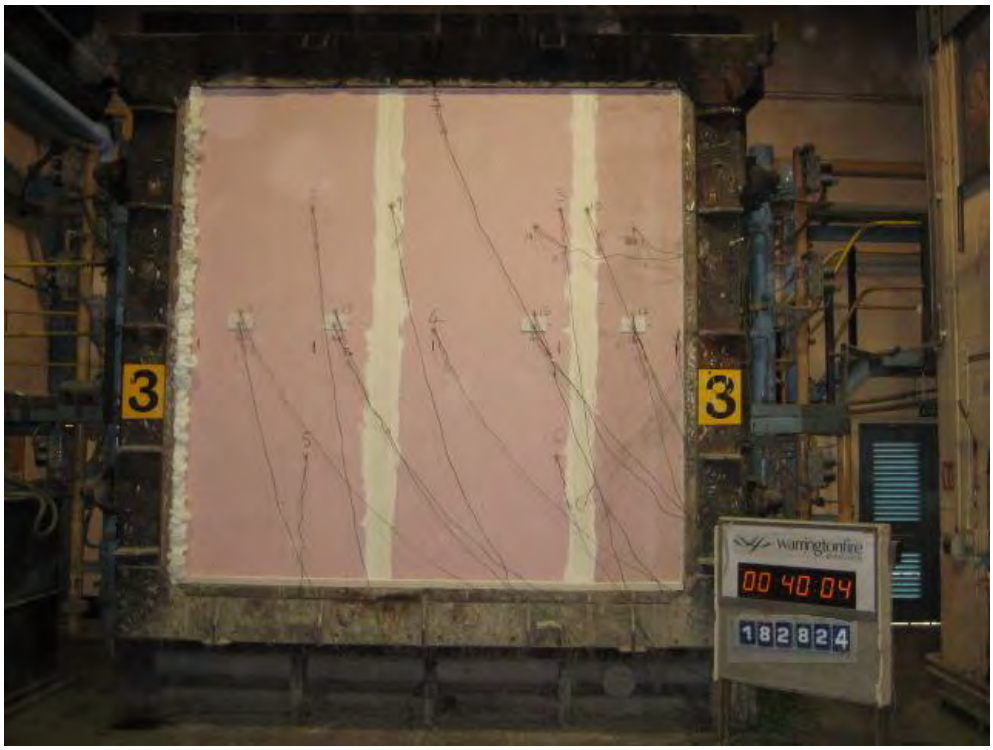
The exposed face of the specimens prior to testing

The unexposed face of the specimens after 20 minutes of testing

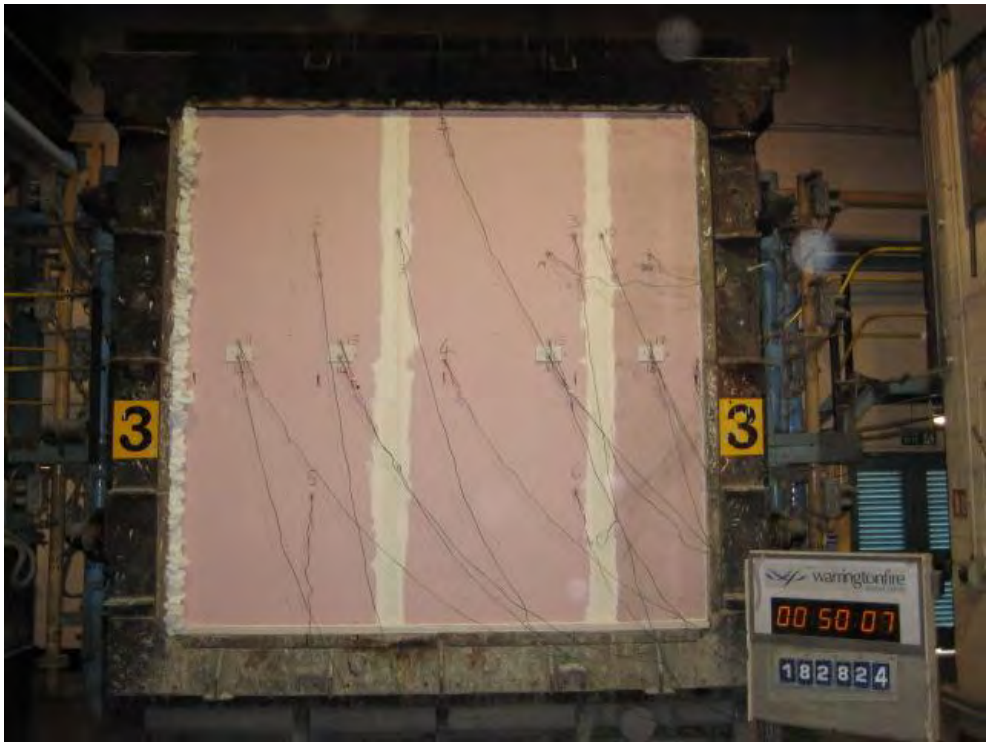


The unexposed face of the specimens after 30 minutes of the test

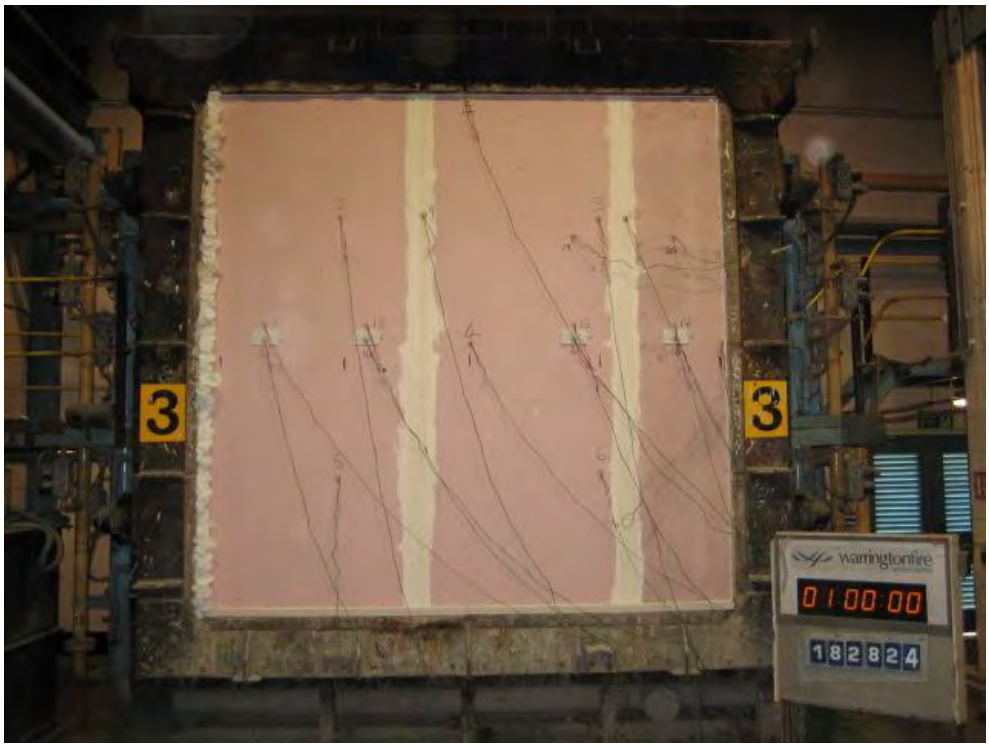
The unexposed face of the specimens after 40 minutes of the test



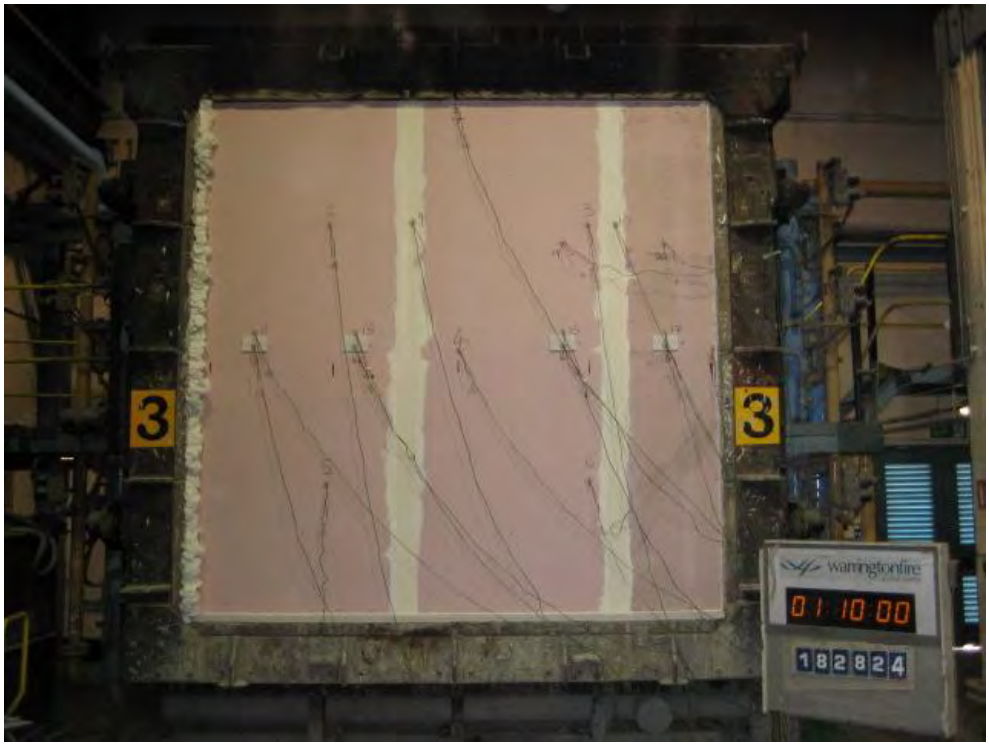
The unexposed face of the specimens after 50 minutes of the test



The unexposed face of the specimens after 60 minutes of the test



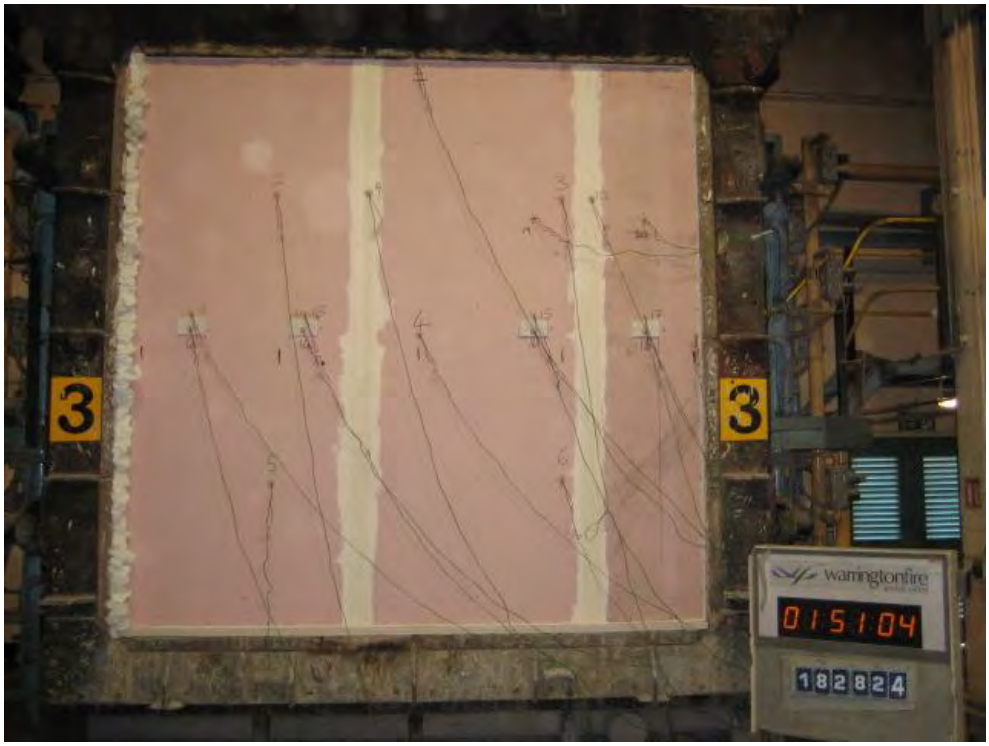
The unexposed face of the specimens after 70 minutes of the test



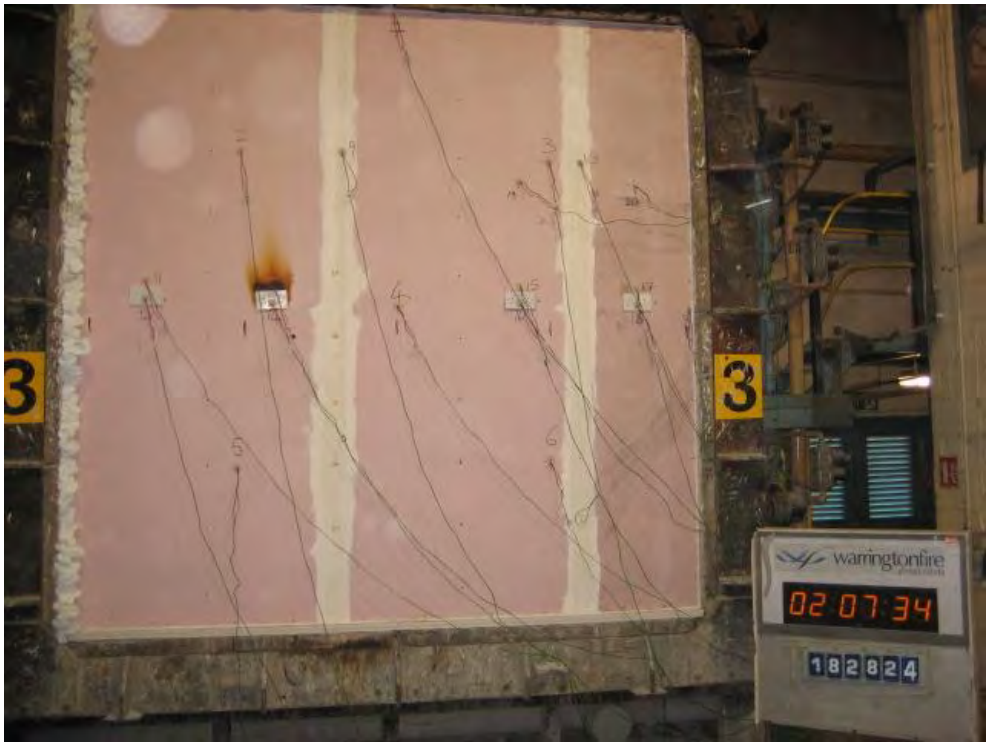
The unexposed face of the specimens after 90minutes of the test

The unexposed face of the specimens after 100 minutes of the test

The unexposed face of the specimens after 111 minutes of the test



The unexposed face of the specimens after 127 minutes of the test



The exposed face of the specimens shortly after testing

Temperature Data

Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	20
5	576	575
10	678	681
15	739	746
20	781	780
25	815	818
30	842	852
35	865	874
40	885	892
45	902	908
50	918	924
55	932	939
60	945	953
65	957	967
70	968	981
75	979	993
80	988	997
85	998	1006
90	1006	1020
95	1014	1019
100	1022	1037
105	1029	1027
110	1036	1024
115	1043	1048
120	1049	1063
125	1055	1071
126	1056	1072

Individual and Mean Temperatures Recorded On The Unexposed Surface Of The Partition

Time Mins	T/C Number 2 Deg. C	T/C Number 3 Deg. C	T/C Number 4 Deg. C	T/C Number 5 Deg. C	T/C Number 6 Deg. C	Mean Temp. Deg. C
0	16	16	16	16	16	16
5	16	16	16	16	16	16
10	16	16	16	16	16	16
15	16	16	16	16	16	16
20	16	18	16	17	17	17
25	19	27	18	19	19	20
30	23	36	21	22	22	25
35	28	43	26	27	27	30
40	34	47	31	32	32	35
45	39	49	37	38	38	40
50	44	52	42	42	43	45
55	48	53	46	47	48	48
60	51	54	49	50	52	51
65	51	53	50	50	53	51
70	49	51	48	48	52	50
75	47	48	46	46	49	47
80	45	46	45	45	47	46
85	44	45	44	44	46	45
90	45	46	44	45	47	45
95	48	49	46	48	50	48
100	52	52	50	52	54	52
105	62	57	68	63	66	63
110	72	69	81	73	83	76
115	75	76	80	77	82	78
120	75	78	88	80	87	82
125	76	79	91	79	90	83
126	78	79	91	79	91	84

Individual Temperatures Recorded On The Unexposed Surface Of The Partition

Time Mins	T/C Number 7 Deg. C	T/C Number 8 Deg. C	T/C Number 9 Deg. C	T/C Number 10 Deg. C	T/C Number 19 Deg. C	T/C Number 20 Deg. C
0	16	16	17	17	14	13
5	17	16	17	17	14	13
10	22	16	17	17	14	14
15	27	17	21	19	14	19
20	33	18	30	27	14	37
25	39	21	42	38	17	50
30	44	25	49	46	21	54
35	48	29	52	51	24	53
40	52	33	54	53	28	51
45	56	36	53	53	32	50
50	58	40	53	53	36	49
55	59	43	52	54	39	49
60	60	45	53	54	42	49
65	58	46	53	54	44	49
70	55	46	53	54	45	47
75	55	46	53	55	45	46
80	55	46	55	57	46	45
85	56	46	57	60	48	46
90	57	48	60	63	51	48
95	60	51	64	66	54	52
100	63	53	72	70	56	55
105	68	55	77	75	66	60
110	75	58	78	81	74	71
115	76	62	80	85	76	74
120	77	68	81	87	75	74
125	78	74	84	91	78	77
126	79	74	84	91	79	79

Individual Temperatures Recorded On The Unexposed Surface Of Specimen A/E

Time Mins	T/C Number 11 Deg. C	T/C Number 12 Deg. C
0	18	18
5	18	18
10	18	17
15	18	18
20	18	18
25	19	18
30	22	19
35	26	22
40	31	26
45	37	29
50	41	32
55	44	35
60	47	38
65	48	39
70	48	40
75	48	41
80	47	41
85	47	42
90	48	43
95	51	45
100	54	46
105	59	49
110	70	55
115	75	57
120	77	58
125	78	60
126	79	61

Individual Temperatures Recorded On The Unexposed Surface Of Specimen B/F

Time Mins	T/C Number 13 Deg. C	T/C Number 14 Deg. C
0	18	18
5	18	18
10	18	18
15	20	20
20	29	24
25	39	28
30	43	32
35	45	35
40	46	38
45	47	40
50	48	42
55	50	44
60	51	46
65	51	49
70	50	50
75	48	48
80	46	46
85	46	45
90	46	46
95	50	51
100	60	70
105	74	82
110	81	85
115	78	81
120	82	82
125	130	142
126	157	154

Individual Temperatures Recorded On The Unexposed Surface Of Specimen G

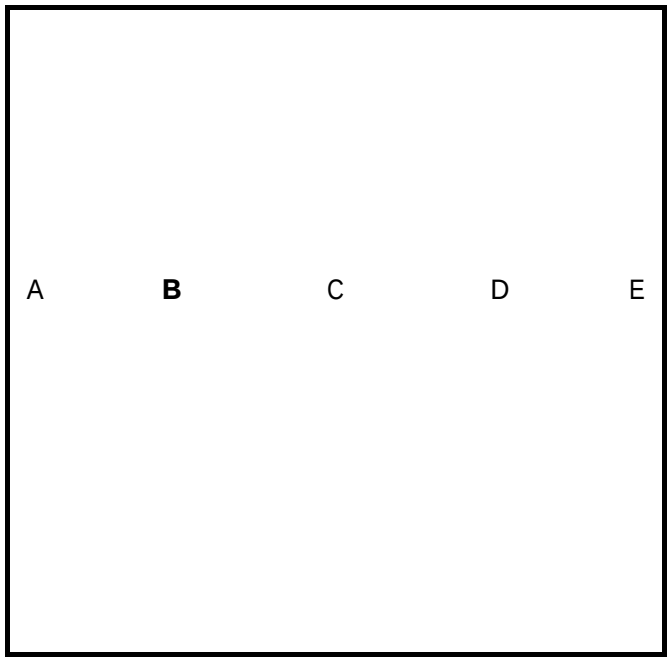
Time Mins	T/C Number 15 Deg. C	T/C Number 16 Deg. C
0	14	14
5	14	14
10	14	14
15	14	14
20	14	14
25	17	15
30	20	16
35	25	19
40	30	22
45	35	25
50	40	28
55	44	30
60	46	33
65	46	34
70	44	34
75	42	34
80	41	34
85	41	34
90	42	35
95	46	36
100	49	38
105	60	42
110	71	49
115	72	55
120	74	60
125	75	63
126	75	63

Individual Temperatures Recorded On The Unexposed Surface Of Specimen H

Time Mins	T/C Number 17 Deg. C	T/C Number 18 Deg. C
0	14	14
5	14	14
10	14	13
15	14	13
20	14	14
25	15	15
30	17	16
35	20	19
40	25	22
45	28	25
50	32	29
55	35	32
60	37	35
65	38	36
70	39	37
75	38	37
80	38	36
85	37	36
90	37	35
95	37	36
100	39	38
105	42	44
110	52	66
115	66	77
120	78	79
125	79	79
126	77	79

Recorded Deflections of the Partition during the test

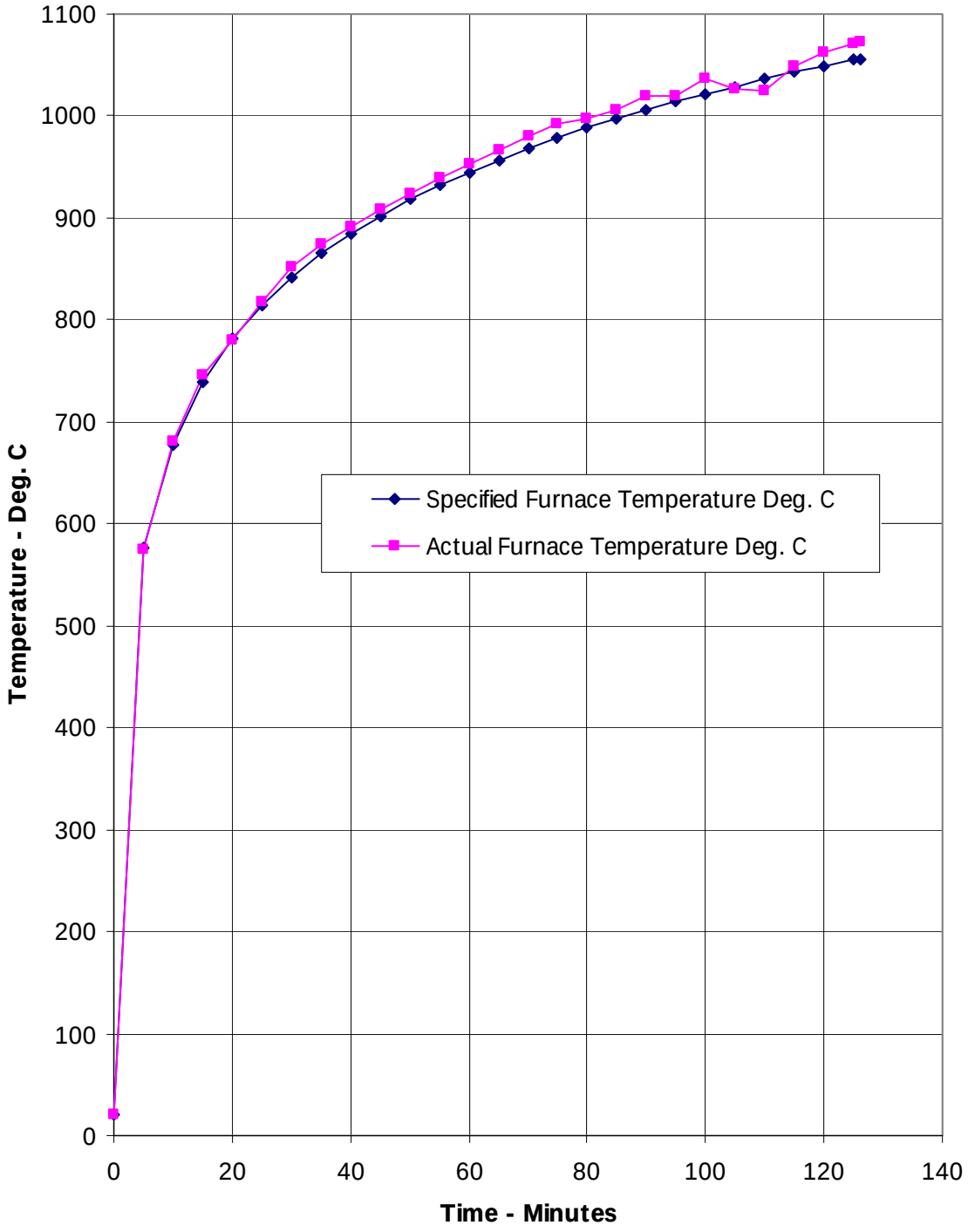
Annex B (continued)



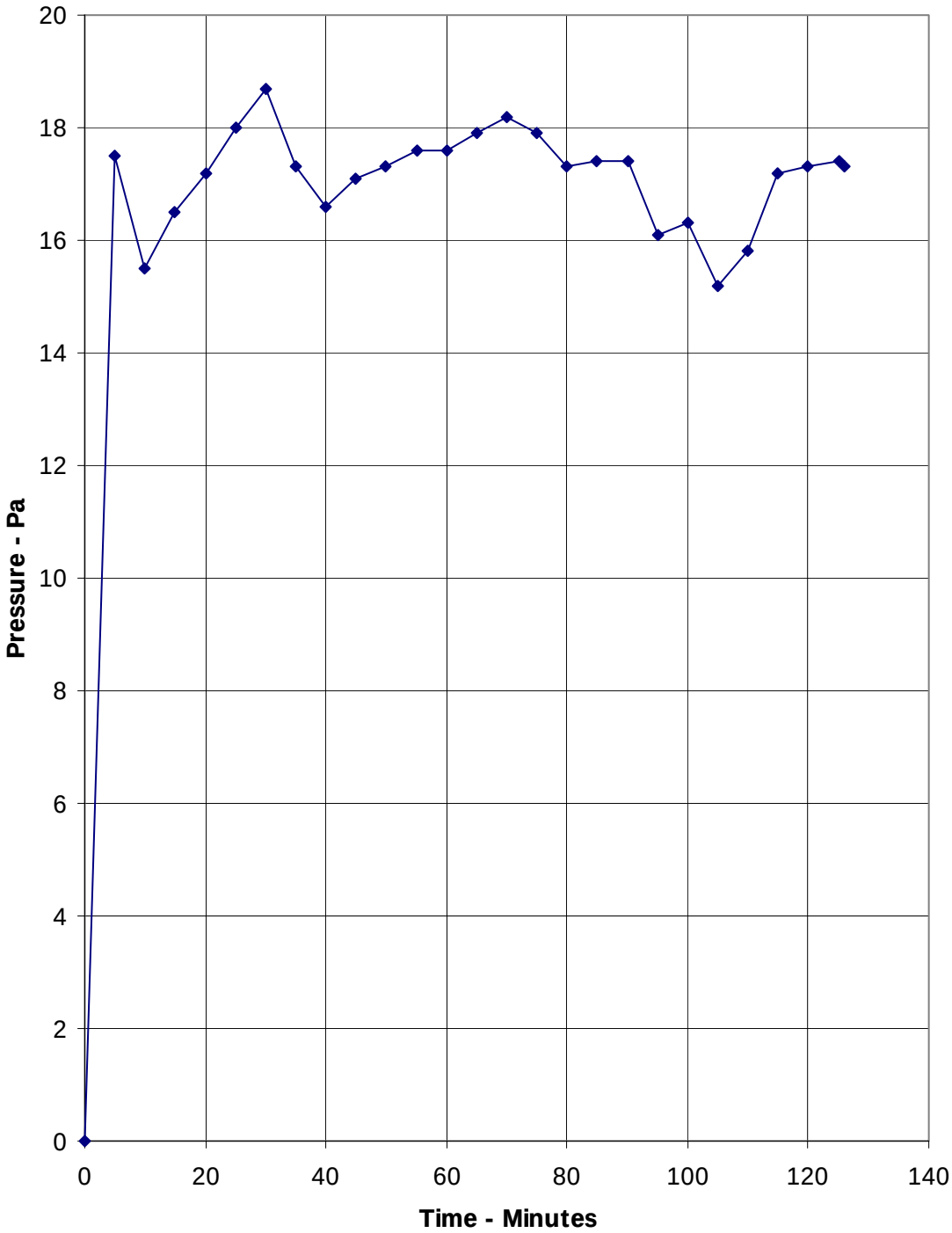
TIME mins	A	B	C	D	E
0	0	0	0	0	0
10	2	8	10	5	0
20	2	8	8	4	0
30	3	6	5	3	0
40	3	3	5	2	0
50	2	4	7	2	0
60	3	5	12	9	0
75	0	6	11	7	-1
90	2	8	13	6	-2
105	-2	0	10	5	-5
120	-7	-19	-10	-20	-15

Positive values indicate deflection towards the heating conditions

Graph Showing Mean Furnace Temperature, Together With The Temperature/Time Relationship Specified In The Standard



Graph Showing Recorded Furnace Pressure At 300 mm Below The Top Of The Partition Construction



Performance Criteria and Test Results

Integrity Performance

It is required that the specimens retain their separating function, without either causing ignition of a cotton pad when applied as specified in BS EN 1363-1:1999, or resulting in sustained flaming on the unexposed surface. **These requirements were satisfied for the periods shown below:**

Specimen	Cotton pad	Sustained flaming
A/E	126 minutes*	126 minutes*
B/F	126 minutes*	126 minutes*
C	126 minutes*	126 minutes*
D	126 minutes*	126 minutes*
G	126 minutes*	126 minutes*
H	126 minutes*	126 minutes*

* The test duration. The test was discontinued after a period of 126 minutes.

Insulation performance

The requirements of the standard are that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1363-1:1999. **These requirements were satisfied for the periods shown below:**

Specimen	Insulation
A/E	126 minutes*
B/F	126 minutes*
C	126 minutes*
D	126 minutes*
G	126 minutes*
H	126 minutes*

Ongoing Implications

Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1364-1: 1999. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report. Annex A of BS EN 1363-1: 1999, provides guidance information on the application of fire resistance tests and the interpretation of test data.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

Conclusions

Evaluation against objective

Six specimens of electrical sockets and sealing systems, have been tested to evaluate their ability to reinstate the integrity and insulation performance of a partition wall, when tested utilising the general principles of BS EN 1364-1: 1999 in conjunction with additional guidelines from BS EN 1366-3: 2004.

The evaluation of the specimens against the requirements of BS EN 1364-1: 1999 showed that they satisfied the requirements for the periods shown below.

Specimen	Cotton pad	Sustained flaming	Insulation
A/E	126 minutes*	126 minutes*	126 minutes*
B/F	126 minutes*	126 minutes*	126 minutes*
C	126 minutes*	126 minutes*	126 minutes*
D	126 minutes*	126 minutes*	126 minutes*
G	126 minutes*	126 minutes*	126 minutes*
H	126 minutes*	126 minutes*	126 minutes*

* The test duration. The test was discontinued after a period of 126 minutes.

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bre

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with fischer fixings intumescent Putty Pads

Prepared for:
fischer fixings UK Ltd.
Whitely Road
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Wallingford
Oxon
OX10 9AT

27 August 2009

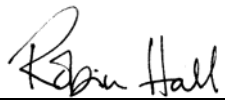
Test report number 255905

UKAS TESTING

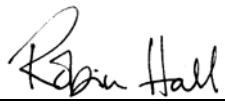
0578

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with fischer fixings intumescent Putty Pads

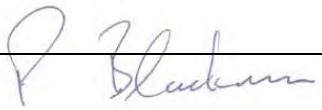
Tested by

Name	Dr R Hall
Position	Principal Consultant
Date	27 August 2009
Signature	

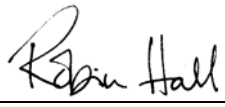
Prepared by

Name	Dr R Hall
Position	Principal Consultant
Date	27 August 2009
Signature	

Checked by

Name	Dr Paul Blackmore
Position	Associate Director, Building Technology Group
Date	27 August 2009
Signature	

Approved on behalf of BRE

Name	Dr R Hall
Position	Principal Consultant
Date	27 August 2009
Signature	

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BRE is not UKAS accredited to make opinions and interpretation. Any opinions and interpretations included as part of this report are clearly marked as such.

UKAS TESTING
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Contents

1 Introduction

BRE Acoustics was commissioned to produce this report on behalf of fischer fixings UK Ltd. It contains the results of airborne sound insulation measurements in the BRE horizontal transmission suite (Building 9), BRE, Garston, Watford, Hertfordshire, WD25 9XX.

This report details the testing outlined in BRE proposal 8053 - 123417. The data in this report were first issued in BRE report 248426

2 Testing details

2.1 Test dates and personnel

The measurements detailed in this report were made on 14 October 2008, 15 October 2008 and 16 October 2008 by Dr R Hall of BRE Acoustics.

2.2 Test method and applicable standards

Measurement of airborne sound insulation was made in accordance with BS EN ISO 140-3:1995. Single number quantities were calculated in accordance with BS EN ISO 717-1:1997.

BRE Acoustics holds UKAS accreditation for the measurement of sound insulation in the field and the laboratory. The measurements were conducted using the procedures accredited by UKAS.

2.3 Test element installation

The stud wall was installed by BRE. The socket boxes and Putty Pads were installed by Stampol Limited, 45 Bevoir Road, Leytonstone, E11 1DE.

2.4 Instrumentation

The equipment used to conduct the tests is identified in Table 1.

Table 1 Equipment list

Equipment description	Manufacturer	Type	UKAS identification number
Microphone Calibrator	NOR	1253	01/008
Microphone	GRAS	40AE	02/304, 02/305
Microphone Preamplifier	GRAS	26CA	04/304, 04/305
Microphone Adapter	NOR	1449	06/107, 06/108
Graphic Equaliser	Phonic	PEQ3300	10/002
Amplifier	NOR	260H	11/013
Real Time Analyser	NOR	840	13/003
Microphone Rotating Boom	NOR	212NA	14/004, 14/005
Loudspeaker	B&K	4224	11/006

The gain of the real time analyser was adjusted to give a reading of 124.0 dB at 250 kHz using the NOR type 1253 calibrator.

All equipment is calibrated in accordance with BRE procedures, using reference equipment calibrated by a UKAS accredited laboratory.

2.5 Test numbers

Table 2 lists each test element along with its corresponding test number. The construction details for each test element can be found from Table 3 by referring to the test number.

Table 2 Test numbers

Test number	Test element	Source room volume (m^3)	Receive room volume (m^3)	Common area (m^2)
L108-078	Wall	130	115	9.8
L108-079	Wall	130	115	9.8
L108-080	Wall	130	115	9.8

2.6 Construction details with test numbers

The construction details are shown in Table 3. When construction details are provided by a third party, they are checked by BRE where possible.

Table 3 Construction details

Test element	Test number	Construction details
Wall	L108-078	• Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle board, 14.5 kg/m², and 15 mm plasterboard,12.5 kg/m²) • Filler wall completely filled with glass wool (10 kg/m³) • Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 15 mm plasterboard (total 26 kg/m kg/m²) on each side of wall • 100 mm glass wool (10 kg/m²) between studs in each leaf
	L108-079	• As test L108-078 but with two double electrical sockets with FiPP/I-D fischer intumescent putty pads installed in each side of wall • Putty pads fitted inside socket boxes
	L108-080	• As test L108-078 but with two double sockets with FiPP/E-D fischer intumescent putty pads installed in each side of wall • Putty pads fitted behind socket boxes (on cavity side of wall leaves)

2.7 Sound insulation test results

The single number quantities for the sound insulation tests are shown in Table 4. The UKAS test result sheets are included in the appendices.

Table 4 Test results

Test number	R_w (C;C_{tr}) (dB)
L108-078	67 (-2;-7)
L108-079	67 (-2;-7)
L108-080	67 (-2;-7)

For all the tests, measurements were made in individual 1/3 octave frequency bands from 500 Hz to 5,000 Hz.

2.8 Plans

The position of the twin leaf filler wall in the transmission suite aperture is indicated in Figure 1.

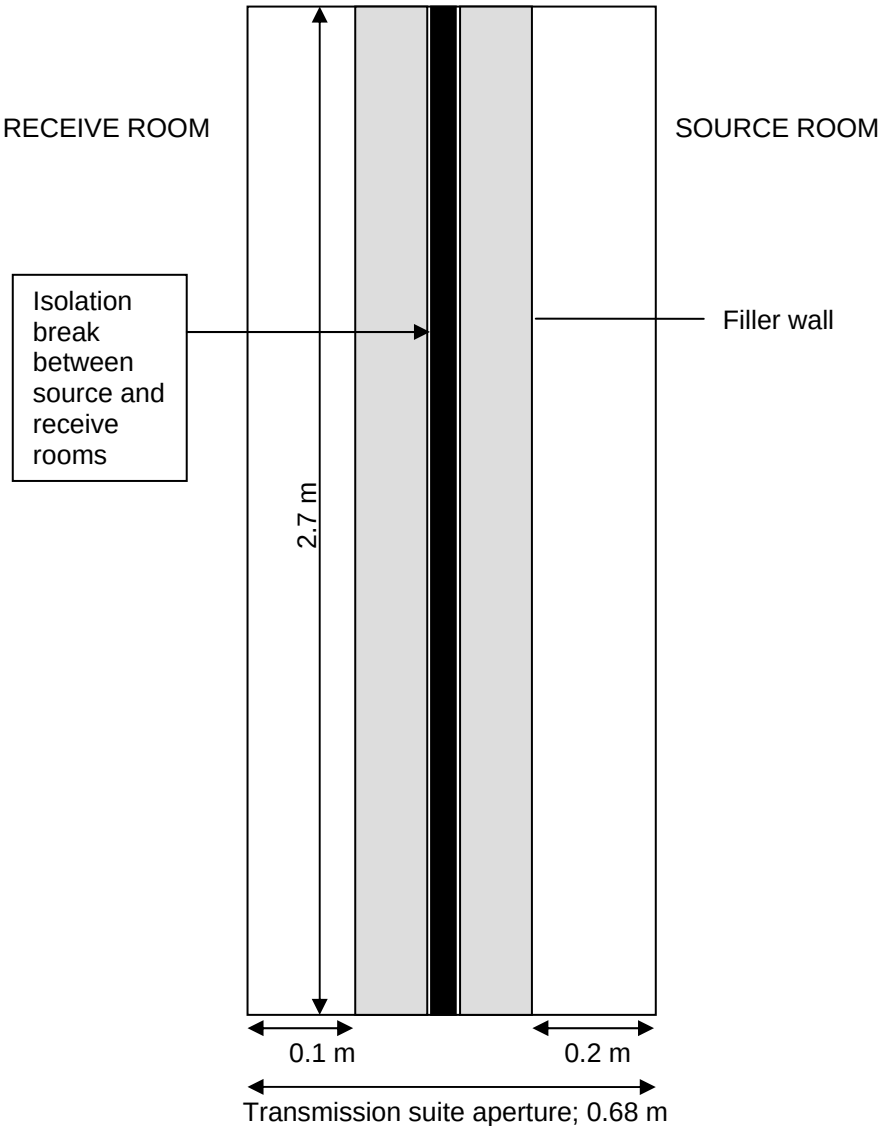

Figure 1 Section through elevation showing the position of the twin leaf stud filler wall in the transmission suite aperture. One leaf of the wall was on the source room side of the acoustic break and the other leaf on the receive room side of the acoustic break.

2.9 Photographs

Figure 2 Sockets in wall

In the source room the sockets were installed 500 mm above the base of the laboratory aperture and separated by a horizontal distance of 500 mm. In the receive room the sockets were installed at the same height but were off-set from the sockets in the source room by 150 mm. All dimensions are approximate.

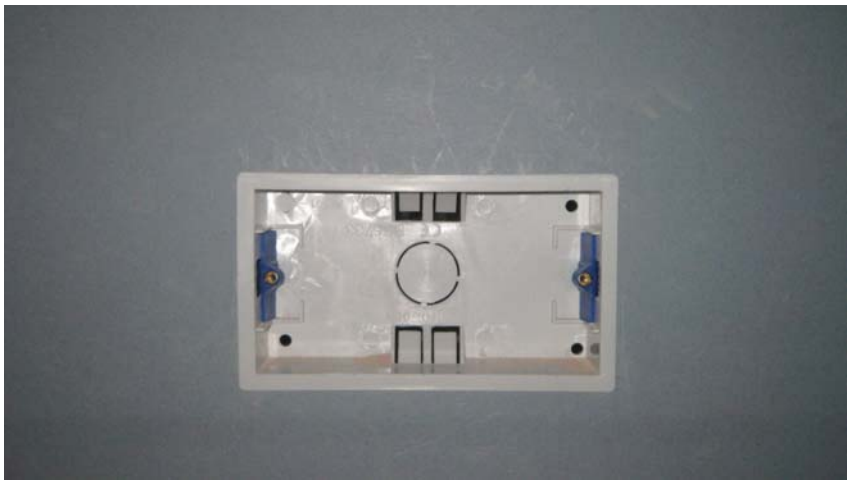

Figure 3 Switch box before installation of Putty Pad

Figure 4 Putty Pad installed inside switch box

Figure 5 Putty Pad installed outside switch box

3 Appendices

3.1 UKAS test result sheets

Page number	Test number
13	L108-078
15	L108-079
17	L108-080

UKAS TESTING
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Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 14/10/2008 **Test number:** L108-078 **Test element:** Wall

Test element area: 9.8 m²

Description:

Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle b
Filler wall completely filled with glass wool (10 kg/m³)
Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 100 mm glass wool (10 kg/m²) between studs in each leaf

Source room volume: 130 m³ **Air temperature:** 16 ºC
Receive room volume: 115 m³ **Air relative humidity:** 75 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	*R* (dB)	
50	2.04	19.9	84.7	55.5	29.6	
63	2.24	17.2	89.4	57.8	32.4	
80	1.87	16.7	91.8	54.0	37.8	
100	1.48	18.8	90.3	42.6	46.7	
125	2.14	14.7	91.4	46.4	45.7	
160	1.74	9.6	91.8	41.7	49.7	
200	1.88	8.2	91.4	37.7	53.7	
250	1.80	8.6	94.0	35.8	58.0	
315	1.77	5.8	94.1	32.7	61.2	
400	1.71	4.8	93.3	28.6	64.3	
500	1.72	11.1	108.1	43.4	64.3	
630	1.62	20.1	108.5	41.3	66.5	
800	1.57	16.5	106.2	35.6	69.7	
1,000	1.58	12.6	103.7	29.4	73.6	
1,250	1.57	15.3	106.8	27.7	78.3	+
1,600	1.60	6.4	108.2	31.1	76.5	
2,000	1.64	4.7	105.9	27.7	77.6	
2,500	1.60	5.1	104.2	22.2	81.3	
3,150	1.55	5.4	102.2	18.8	82.6	+
4,000	1.42	6.2	99.1	10.9	87.0	*
5,000	1.32	6.5	96.4	7.5	87.3	*

\+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

$R_w (C;C_{tr})$ **= 67 (-2;-7) dB**

$C_{50\text{-}3150}$ = -5 dB	$C_{50\text{-}5000}$ = -4 dB	$C_{100\text{-}5000}$ = -1 dB
$C_{tr,50\text{-}3150}$ = -16 dB	$C_{tr,50\text{-}5000}$ = -16 dB	$C_{tr,100\text{-}5000}$ = -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

0578

Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 14/10/2008 **Test number:** L108-078 **Test element:** Wall

Test element area: 9.8 m²

Description:

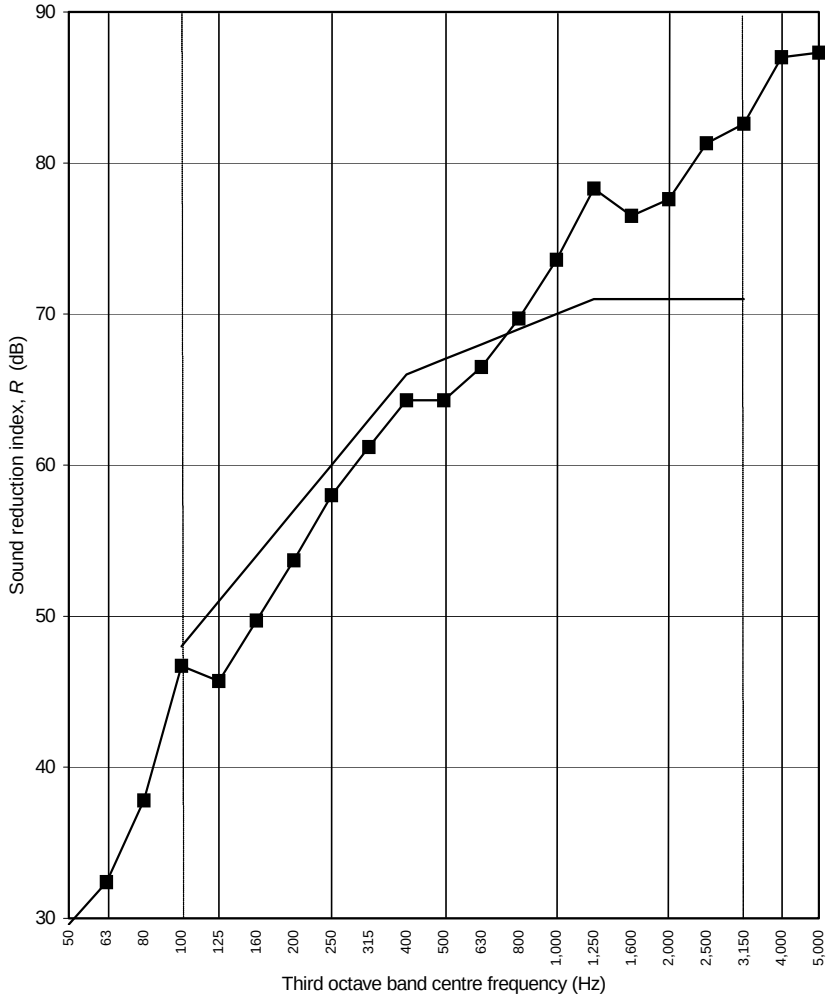
Twin leaf timber stud (100 mm x 50 mm) filler wall with four layers of wallboard (combination of 12.5 mm cement particle b
Filler wall completely filled with glass wool (10 kg/m³)
Aperture in filler wall (1.75 m wide x 2.08 m high) filled with twin leaf timber stud (100 mm x 50 mm) wall with two layers of 100 mm glass wool (10 kg/m²) between studs in each leaf

Source room volume: 130 m³ **Air temperature:** 16 ºC
Receive room volume: 115 m³ **Air relative humidity:** 75 %

Frequency (Hz)	*R* One-third octave (dB)	
50	29.6	
63	32.4	
80	37.8	
100	46.7	
125	45.7	
160	49.7	
200	53.7	
250	58.0	
315	61.2	
400	64.3	
500	64.3	
630	66.5	
800	69.7	
1,000	73.6	
1,250	78.3	+
1,600	76.5	
2,000	77.6	
2,500	81.3	
3,150	82.6	+
4,000	87.0	*
5,000	87.3	*

+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

$R_w (C;C_{tr})$	= 67 (-2;-7) dB	$C_{50\text{-}3150}$	= -5 dB	$C_{50\text{-}5000}$	= -4 dB	$C_{100\text{-}5000}$	= -1 dB
		$C_{tr,50\text{-}3150}$	= -16 dB	$C_{tr,50\text{-}5000}$	= -16 dB	$C_{tr,100\text{-}5000}$	= -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

UKAS TESTING
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Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 15/10/2008 **Test number:** L108-079 **Test element:** Wall

Test element area: 9.8 m²

Description:

As test L108-078 but with two double electrical sockets with FiPP/I-D fischer intumescent putty pads installed in each side of wall.
Putty pads fitted inside socket boxes

Source room volume:	130 m³	**Air temperature:**	16 ºC
Receive room volume:	115 m³	**Air relative humidity:**	79 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	*R* (dB)	
50	1.97	27.3	84.6	54.1	30.7	
63	2.29	19.1	89.2	56.9	33.2	
80	1.67	18.4	91.8	53.0	38.3	
100	1.43	20.4	90.1	42.8	46.1	
125	2.00	16.4	91.4	46.5	45.1	
160	1.75	15.8	92.3	42.4	49.6	
200	1.86	4.3	94.1	39.8	54.3	
250	1.79	5.0	94.2	36.3	57.6	
315	1.74	7.9	93.3	32.0	60.9	
400	1.66	5.6	92.0	27.4	64.1	
500	1.67	13.5	108.7	42.6	65.6	
630	1.62	20.3	106.7	38.6	67.4	
800	1.59	16.7	104.3	33.9	69.7	
1,000	1.62	9.2	102.3	28.1	73.6	
1,250	1.58	10.9	104.8	26.1	78.0	
1,600	1.60	4.9	106.3	29.1	76.5	
2,000	1.61	4.3	104.0	25.7	77.7	
2,500	1.60	4.6	102.8	20.3	81.8	
3,150	1.54	5.2	101.2	17.5	82.9	+
4,000	1.45	5.8	98.7	10.7	86.9	+
5,000	1.32	6.2	96.9	7.8	87.6	*

\+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

R_w (C;C_{tr}) = 67 (-2;-7) dB

$C_{50\text{-}3150}$	= -5 dB	$C_{50\text{-}5000}$	= -4 dB	$C_{100\text{-}5000}$	= -1 dB
$C_{tr,50\text{-}3150}$	= -16 dB	$C_{tr,50\text{-}5000}$	= -16 dB	$C_{tr,100\text{-}5000}$	= -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

0578

Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 15/10/2008 **Test number:** L108-079 **Test element:** Wall

Test element area: 9.8 m²

Description:

As test L108-078 but with two double electrical sockets with FiPP/I-D fischer intumescent putty pads installed in each side of wall.
Putty pads fitted inside socket boxes

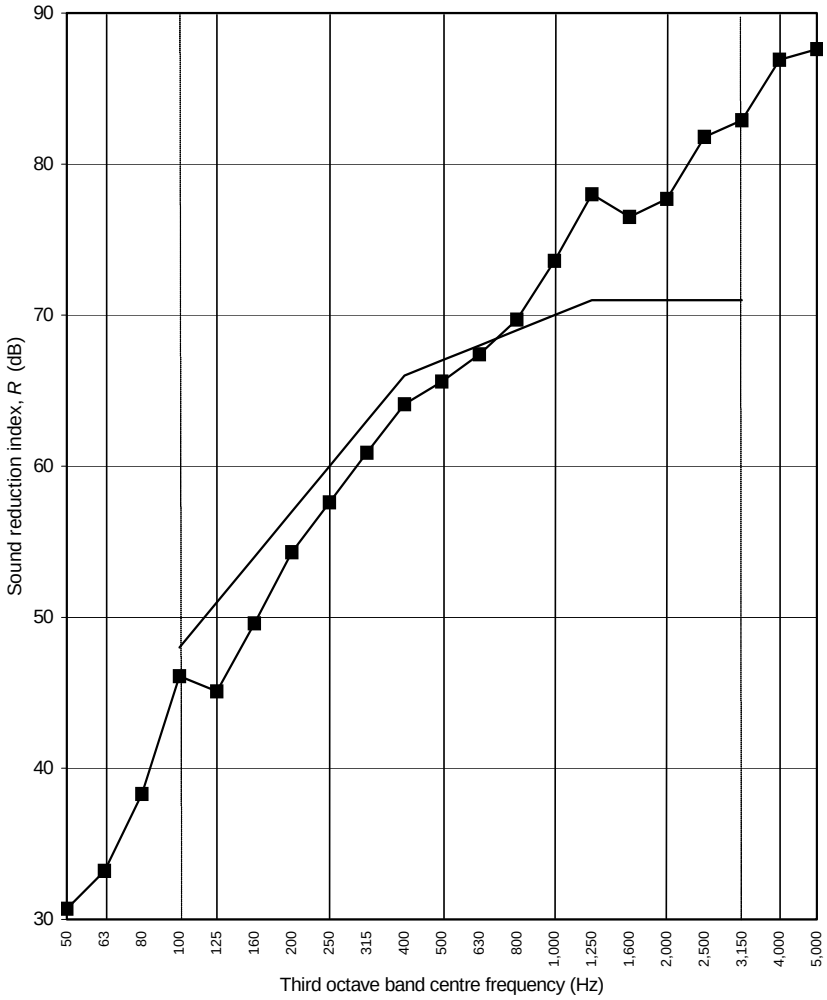
Source room volume: 130 m³ **Air temperature:** 16 ºC

Receive room volume: 115 m³ **Air relative humidity:** 79 %

Frequency (Hz)	*R* One-third octave (dB)	
50	30.7	
63	33.2	
80	38.3	
100	46.1	
125	45.1	
160	49.6	
200	54.3	
250	57.6	
315	60.9	
400	64.1	
500	65.6	
630	67.4	
800	69.7	
1,000	73.6	
1,250	78.0	
1,600	76.5	
2,000	77.7	
2,500	81.8	
3,150	82.9	+
4,000	86.9	+
5,000	87.6	*

+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

$R_w (C;C_{tr})$ **= 67 (-2;-7) dB**

$C_{50\text{-}3150}$	= -5 dB	$C_{50\text{-}5000}$	= -4 dB	$C_{100\text{-}5000}$	= -1 dB
$C_{tr,50\text{-}3150}$	= -16 dB	$C_{tr,50\text{-}5000}$	= -16 dB	$C_{tr,100\text{-}5000}$	= -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

UKAS TESTING
0578

Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 16/10/2008 **Test number:** L108-080 **Test element:** Wall

Test element area: 9.8 m²

Description:

As test L108-078 but with two double sockets with FiPP/E-D fischer intumescent putty pads installed in each side of wall.
Putty pads fitted behind socket boxes (on cavity side of wall leaves)

Source room volume: 130 m³ **Air temperature:** 15 ºC
Receive room volume: 115 m³ **Air relative humidity:** 67 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	*R* (dB)	
50	2.31	23.0	87.3	57.0	31.3	
63	2.21	20.1	90.0	58.3	32.4	
80	1.77	17.6	92.1	53.2	38.6	
100	1.46	20.1	89.8	42.7	45.9	
125	2.09	16.6	90.9	46.8	44.6	
160	1.86	17.7	91.9	42.2	49.7	
200	1.87	4.5	93.6	39.7	53.9	
250	1.81	3.9	94.0	36.5	57.4	
315	1.65	6.4	93.4	32.1	60.7	
400	1.67	4.8	92.3	27.8	64.0	
500	1.69	11.4	110.9	45.4	65.1	
630	1.64	16.0	108.7	41.1	66.9	
800	1.63	13.1	106.3	36.0	69.6	
1,000	1.61	11.4	103.7	29.7	73.3	
1,250	1.55	13.9	106.8	28.2	77.7	+
1,600	1.59	6.4	107.7	31.7	75.3	
2,000	1.58	4.4	105.4	28.1	76.5	
2,500	1.58	4.7	103.9	22.5	80.7	
3,150	1.54	5.3	101.6	18.7	82.0	+
4,000	1.42	5.9	98.4	11.2	86.0	+
5,000	1.27	6.3	95.5	7.6	86.2	*

+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background

Rating according to BS EN ISO 717-1:1997

$R_w (C;C_{tr})$ **= 67 (-2;-7) dB**

$C_{50\text{-}3150}$	= -5 dB	$C_{50\text{-}5000}$	= -4 dB	$C_{100\text{-}5000}$	= -1 dB
$C_{tr,50\text{-}3150}$	= -16 dB	$C_{tr,50\text{-}5000}$	= -16 dB	$C_{tr,100\text{-}5000}$	= -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

The laboratory airborne sound insulation of a twin leaf stud wall with and without double sockets with fischer fixings intumescent Putty Pads

Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9 051-053)

Client: Fischer fixings UK Ltd.

Test date: 16/10/2008 **Test number:** L108-080 **Test element:** Wall

0578

Test element area: 9.8 m²

Description:

As test L108-078 but with two double sockets with FiPP/E-D fischer intumescent putty pads installed in each side of wall.
Putty pads fitted behind socket boxes (on cavity side of wall leaves)

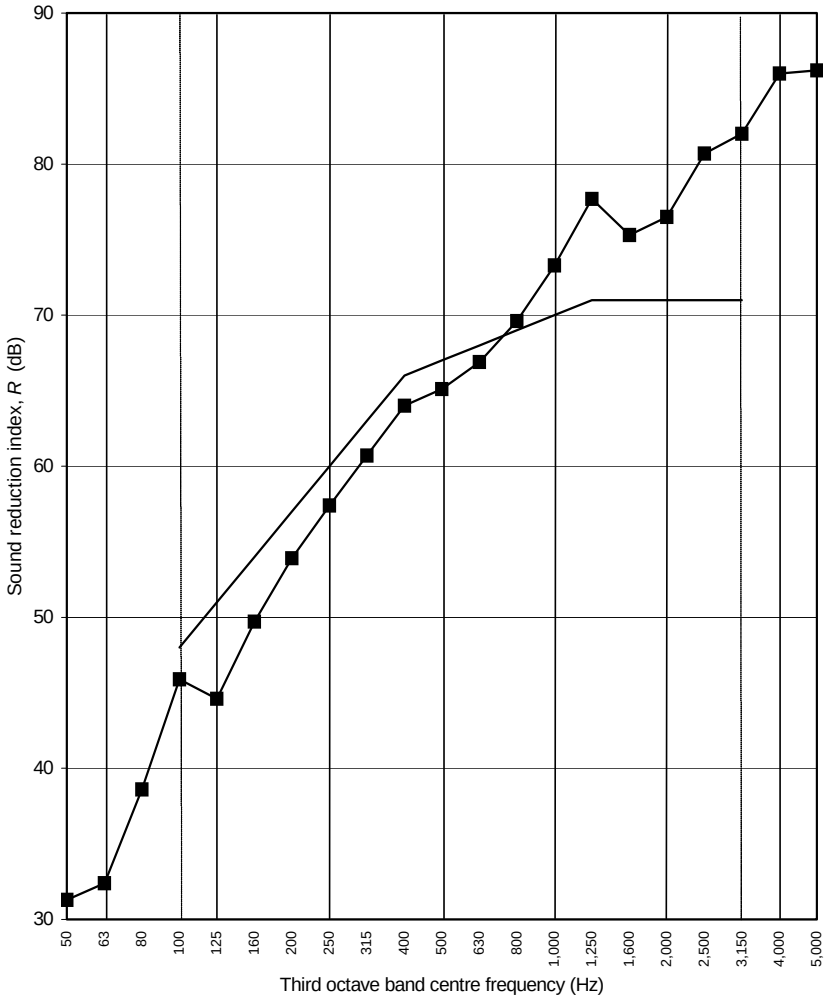
Source room volume: 130 m³ **Air temperature:** 15 ºC

Receive room volume: 115 m³ **Air relative humidity:** 67 %

Frequency (Hz)	*R* One-third octave (dB)	
50	31.3	
63	32.4	
80	38.6	
100	45.9	
125	44.6	
160	49.7	
200	53.9	
250	57.4	
315	60.7	
400	64.0	
500	65.1	
630	66.9	
800	69.6	
1,000	73.3	
1,250	77.7	+
1,600	75.3	
2,000	76.5	
2,500	80.7	
3,150	82.0	+
4,000	86.0	+
5,000	86.2	*

+ Receiving room level adjusted for background

* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

$R_w (C;C_{tr})$	= 67 (-2;-7) dB	$C_{50\text{-}3150}$	= -5 dB	$C_{50\text{-}5000}$	= -4 dB	$C_{100\text{-}5000}$	= -1 dB
		$C_{tr,50\text{-}3150}$	= -16 dB	$C_{tr,50\text{-}5000}$	= -16 dB	$C_{tr,100\text{-}5000}$	= -7 dB

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed ±1 dB for the single-number quantity (R_w) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

INTEGRITY TEST REPORT

For the **Putty Pad (IA 2484)**

FIRST FLOOR OFFICE REFURBISHMENT

Carried out on the

14th September 2009

at the

PRESSURE TEST OFFICE'S

UNIT 15, 37, IVANHOE ROAD

THE HOGWOOD INDUSTRIAL ESTATE

FINCHAMPSTEAD

WOKINGHAM

BERKSHIRE

RG40 4QQ

Introduction

The Integrity Test on the office refurbishment on the 1st Floor located at Pressure Test Limited, 37, Ivanhoe Road, Finchampstead, was carried out on Monday the 14th September 2009.

Testing was performed as part of the leakage verification: Integrity Test requirement, and witnessed by Mr. Andy Nutman on behalf of Fire and Sound Limited and Fischer Fixings UK Limited, Oxfordshire, OX10 9AT to confirm if the structure's ability to prevent fire and smoke ingress after the installation of the designated materials on known leakage paths is within the acceptable tolerances.

The Integrity of an enclosure is its ability to retain a suppressant (if utilised) in addition to this the enclosure boundaries need to be capable of preventing the ingress of both smoke and fire, in order to achieve this, the enclosure needs to be adequately sealed. In order to reduce / prevent the occurrence of a fire condition an enclosure needs to be effectively fire stopped / sealed to prevent fire / smoke entering a compartment / zone.

If the leakage rate is high any extinguishant (if utilized) will tend to escape, reducing the concentration and hence the suppression system's effectiveness and extinguishing capabilities, in addition to this a source of fire and smoke ingress may occur, both being severely detrimental to an enclosures ability to function correctly.

Test No1 – enclosure **prior** to creating service passages

Enclosure	1st Floor office Area
Volume	131.2 m^3
Maximum Risk / Enclosure Height	2.68 m
Required Protected Height	2.20 m
Measured Leakage Area (total E.L.A.)	0.0378 m^2
Simulated Extinguishant (Argon, IG 01)	43.0 %
Predicted Retention @ a Protected Height 2.2 m	17.2 minutes
Summary	Satisfies the test requirement

From these results it is concluded that the leakage area is within the required current tolerance for retention purposes, indicating that the enclosure satisfies the integrity test requirements.

Test No2 – enclosure after creating service passages – **NO Firestopping**

Enclosure	1st Floor office Area
Volume	131.2 m^3
Maximum Risk / Enclosure Height	2.68 m
Required Protected Height	2.20 m
Measured Leakage Area (total E.L.A.)	0.0959 m^2
Simulated Extinguishant (Argon, IG 01)	43.0 %
Predicted Retention @ a Protected Height 2.2 m	6.8 minutes
Summary	**FAILS** the test requirement

Test 2

From these results it is concluded that the leakage area is now greater than the current tolerance for retention purposes, indicating that the enclosure fails the integrity test requirements, as it is unable to retain the agent at the indicated concentration for a period at least equal to the 10-minute recommended minimum requirement.

This enclosure has therefore failed the integrity test requirements as it has failed to meet the required retention criteria under these conditions. This indicates that structural remedial sealing works are required around the enclosure's perimeter boundaries to reduce the leakage by a great enough degree to enable the enclosure to retain the extinguishant effectively and for the recommended minimum retention time.

Test No3 – enclosure after creating service passages – **With Firestopping IA2484**

Enclosure	**1st Floor office Area**
Volume	131.2 m^3
Maximum Risk / Enclosure Height	2.68 m
Required Protected Height	2.20 m
Measured Leakage Area (total E.L.A.)	0.0959 m^2
Simulated Extinguishant (Argon, IG 01)	43.0 %
Predicted Retention @ a Protected Height 2.2 m	17.0 minutes
Summary	Satisfies the test requirement

The enclosure was tested again, but this time all the penetrations specifically made for the installation were sealed with the advised product (No other penetrations were sealed).

Once all the new penetrations had been "effectively" sealed the retention time observed was almost identical to that highlighted during the initial test.

This indicates that if installed correctly the materials detailed are able to effectively negate leakage whilst at the same time providing a good fire barrier both in and out of the enclosure.

Observations

The enclosure was measured up and all details and criteria logged on to the data sheets. A visual inspection was carried out in order to verify the requirements for sealing and to highlight any possible leakage areas. Protection is provided to the room, floor void and ceiling void all simultaneously; as a result, the system provides a total flood capability to the risk area as all available zones are covered.

Equipment

The tallest (essential) equipment requiring protection (at the time of testing) was measured and this was taken as the required protected height. N.B. any alterations to this will affect the retention results.

Enclosure Evaluation (Leakage Sites)

An Integrity Test was conducted and a result which is within the required tolerance was achieved. As the area has satisfied the retention requirements, the recommendation is to ensure all materials remain intact for the duration of the installation, regular inspections should be undertaken.

Dampers & Ducts

Means of prompt ventilation of an enclosure following a discharge is recommended so the decomposition/combustion products & agent residue can be safely removed to atmosphere (for personnel & equipment purposes). If any additional ducts are utilised (supply or extract) then these should be fitted with dampers at the enclosure boundary, linked to the control panel and configured to close prior to a discharge to prevent the air ingress and loss of extinguishant, in order to maintain the enclosure integrity.

Pressure Relief/Venting Requirements

High pressures can occur in the event of a discharge and need to be controlled or compensated for if the extinguishing ability is not to be impaired. It is important that consideration be given to provide pressure relief in areas where structural damage may occur if there is not sufficient venting to allow the dispersal of spike pressures in the event of a discharge.

For the calculation of the pressure relief area, common wall strengths of 250 Pascals are generally utilised, if the structural strength differs then the vent area will alter.

The relief area should be compared to a proportion of the current* natural leakage area and any discrepancies compensated for by the addition of a Pressure Relief Facility. The pressure relief facility should be catered for as part of the system installation by the installation / design team regardless of these test results, to ensure that it is adequately catered for at all times.

*The current "natural" leakage area is liable to fluctuations due to natural wear and tear along with general deterioration and will actually reduce if improvements are made to the enclosure. For this reason the natural leakage on its own should not be relied upon to provide an adequate relief facility.

The nature of the putty pads means that structurally they will part before any structural damage occurs

Validity

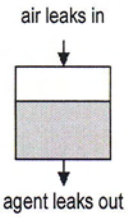
This procedure is used only to verify the ability of the enclosure to retain the Extinguishing Agent. It does not evaluate the design, equipment or installation of the fire suppression system, detection & control devices.

It assumes that these have been designed and installed in accordance with the requirements of the relevant Standards and that full conformance and regular maintenance is in place.

See photographic evidence of leakage paths before and after sealing.

PASS/FAIL Enclosure Integrity Report

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
Software Licensed to: ***Pressure Test Limited***



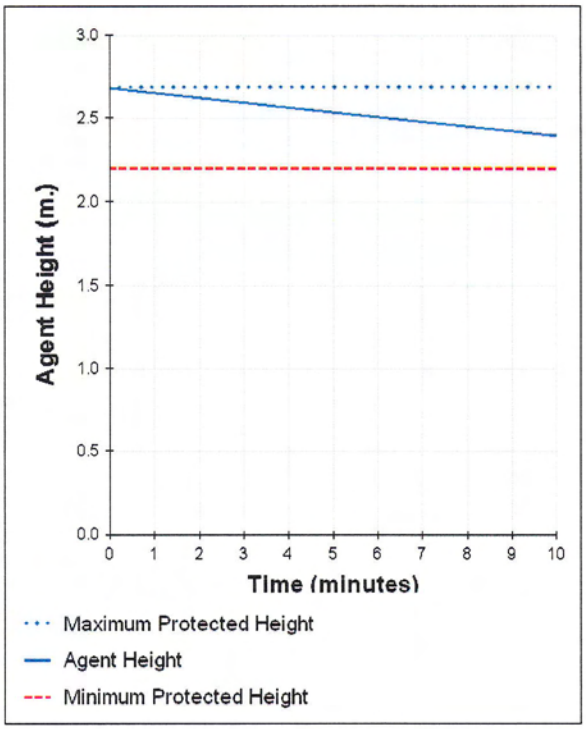
Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***1***
Calibration Certificate # ***4025*** Certificate created ***2009/03/27***

Test date/time	***2009/09/17 08:07***	Net Protected Volume, **V**	***131 m^3***
Tester	***Andy Nutman***	Maximum Protected Height, H_o	***2.68 m.***
Certified to Level:	***2 - Single fan NFPA room test***	Minimum Protected Height, **H**	***2.20 m.***
Signature	.....	Static during retention, P_{SH}	***0.0 Pa***
Elevation above sea level	***25 m.***	Operating temperature	***21 C***
Correction method	***NFPA 2001 (2000) Formula A-3-5.3.3***	Initial concentration, **C**	***43.00%***
Correction factor	***0.99***	Mixing during retention	***No***
Agent	***Argon (IG-01)***	Agent quantity	***73 m^3***
Total room leakage, **ELA**	***0.0378 m^2***	Minimum concentration, C_F	***43.00%***
Lower Leakage, **BCLA**	***0.0189 m^2***	Minimum retention time	***10.0 minutes***

Below ceiling leakage defaulting to worst case -- 50% of total leakage.

This enclosure was tested in compliance with NFPA 2001 and 12A.
Assuming no continual mixing during the retention period, enclosure leakage could allow sufficient agent to be lost to cause an air/agent interface to descend from a Maximum Protected Height of **2.68 m.** to the Minimum Protected Height specified of **2.20 m.**
The retention time would then be **17.2 minutes** which exceeds the minimum retention time of **10 minutes**. The enclosure therefore **passes** this acceptance procedure.

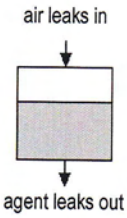
Notes ***Initial test is based on the enclosure as found prior to the installation of any cables, this test is utilised to verify the backgound leakage from the enclosure prior to any works on the enclosure perimeter boundaries***



Witnesses ***Andy Nutman***

DOOR FAN TEST -- Total Room Leakage Data

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
Software Licensed to: ***Pressure Test Limited***



Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***1***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**

Total Room Leakage

Operator In the room Smoke moves out of the room Temperature during test (C)
Static pressure 0 Pa 21 inside 21 outside

Depressurization		Range for room pressures: -10.0 to -13.0
Blower range	Room pressure	-12
	Auto corrected RP	-12.2
Ring C2	Flow Pressure	125
	Auto corrected FP	127.2
	Corrected flow (m^3/sec.)	-0.1027

Pressurization		Range for room pressures: 10.0 to 13.0
Blower range	Room pressure	12
	Auto corrected RP	12.2
Ring C2	Flow Pressure	138
	Auto corrected FP	140.6
	Corrected flow (m^3/sec.)	0.1033

	ELA m^2	@Pa	F_A
Depressurization	0.0377	12.2	
Pressurization	0.0379	12.2	
Average	**0.0378**	12.2	0.50

Slope n	Intercept k_1	Correlation	Standard Error	ELA m^2		F
0.5000	0.0297	NA	NA			
0.5000	0.0298	NA	NA			
0.5000	0.0297			**0.0378**	10.0	0.50

Lower Leakage

Below ceiling leakage of 0.0189 m^2 @ 10.0 Pa is the worst case assumption of 50%

Technician: ***Andy Nutman*** Certified to Level: ***2 - Single fan NFPA room test***

Yes Level 1 - Fire enclosure design basics for improving agent retention and passive protection
Yes Level 2 - adds single door fan operation and NFPA clean agent retention time calculations
No Level 3 - adds double door fan operation for Lower Leak measurement
No Level 4 - adds multi-point ISO door fan operation and discharge pressure relief vent

DOOR FAN TEST -- Graph

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
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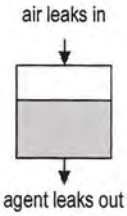
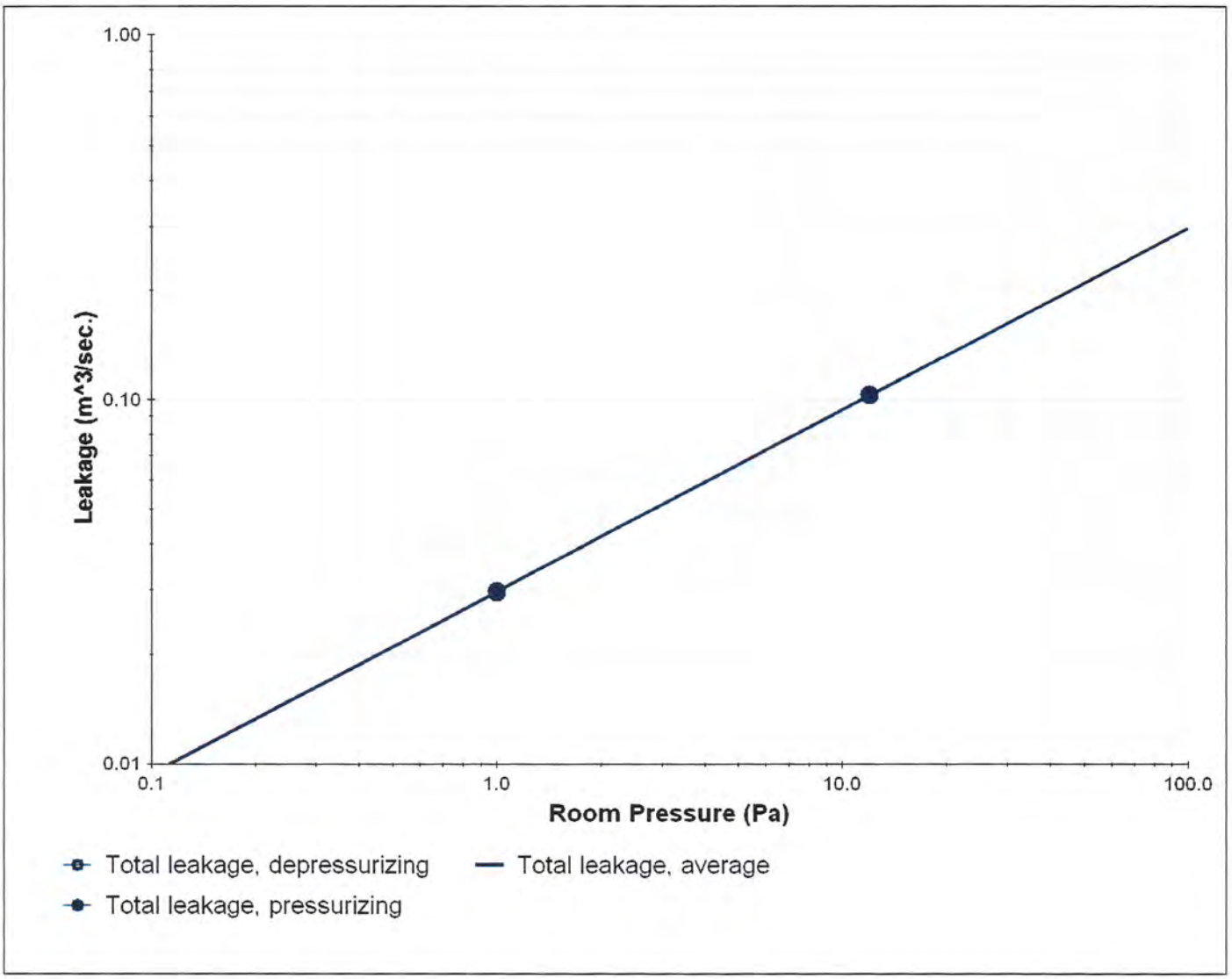


Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***1***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**



PASS/FAIL Enclosure Integrity Report

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
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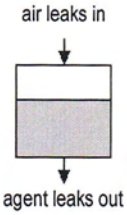
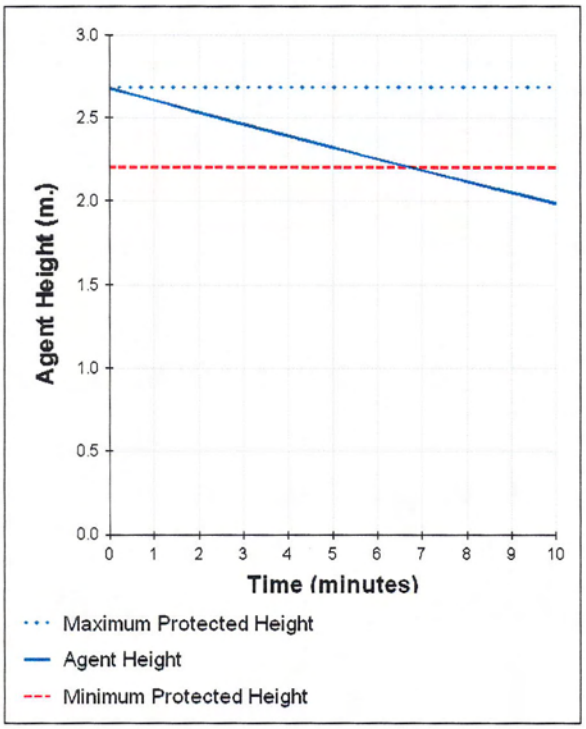


Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***2***
Calibration Certificate # ***4025*** Certificate created ***2009/03/27***

Test date/time	***2009/09/17 08:12***	Net Protected Volume, **V**	***131 m^3***
Tester	***Andy Nutman***	Maximum Protected Height, H_O	***2.68 m.***
Certified to Level:	***2 - Single fan NFPA room test***	Minimum Protected Height, **H**	***2.20 m.***
Signature	.....	Static during retention, P_{SH}	***0.0 Pa***
Elevation above sea level	***25 m.***	Operating temperature	***21 C***
Correction method	***NFPA 2001 (2000) Formula A-3-5.3.3***	Initial concentration, **C**	***43.00%***
Correction factor	***0.99***	Mixing during retention	***No***
Agent	***Argon (IG-01)***	Agent quantity	***73 m^3***
Total room leakage, **ELA**	***0.0959 m^2***	Minimum concentration, C_F	***43.00%***
Lower Leakage, **BCLA**	***0.0479 m^2***	Minimum retention time	***10.0 minutes***

Below ceiling leakage defaulting to worst case -- 50% of total leakage.

This enclosure was tested in compliance with NFPA 2001 and 12A.
Assuming no continual mixing during the retention period, enclosure leakage could allow sufficient agent to be lost to cause an air/agent interface to descend from a Maximum Protected Height of **2.68 m.** to the Minimum Protected Height specified of **2.20 m.**
The retention time would then be **6.8 minutes** which is less than the minimum retention time of **10 minutes**. The enclosure therefore **FAILS** this acceptance procedure.

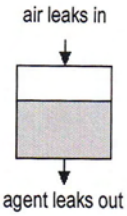


Notes ***The second test is performed with all the openings cut around the perimeter to allow the installation to take place. a set of 2" penetrations (circular) where cut to allow the ingress of power cables etc and two sets of 1" penetrations were cut to allow the transfer of both Phone and Computer networks. once all penetrations associated with the installation had been cut and prior to any fire stopping works, the enclosure was retested to indicate the leakage present. (this how they are normally left)***

Witnesses ***Andy Nutman***

DOOR FAN TEST -- Total Room Leakage Data

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
Software Licensed to: ***Pressure Test Limited***



Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***2***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**

Total Room Leakage

Operator In the room Smoke doesn't move Temperature during test (C)
Static pressure 0 Pa 21 inside 21 outside

Depressurization		Range for room pressures: -10.0 to -13.0
Blower range	Room pressure	-10
	Auto corrected RP	-10.2
Ring C4	Flow Pressure	157
	Auto corrected FP	160.2
	Corrected flow (m^3/sec.)	-0.2374

Pressurization		Range for room pressures: 10.0 to 13.0
Blower range	Room pressure	10
	Auto corrected RP	10.2
Ring C4	Flow Pressure	170
	Auto corrected FP	173.2
	Corrected flow (m^3/sec.)	0.2396

	ELA m^2	@Pa	F_A	Slope n	Intercept k_1	Correlation	Standard Error	ELA m^2		F
Depressurization	0.0954	10.2		0.5000	0.0751	NA	NA			
Pressurization	0.0963	10.2		0.5000	0.0758	NA	NA			
Average	**0.0959**	10.2	0.50	0.5000	0.0754			**0.0960**	10.0	0.50

Lower Leakage

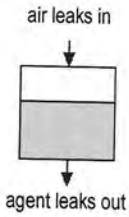
Below ceiling leakage of 0.0479 m^2 @ 10.0 Pa is the worst case assumption of 50%

Technician: ***Andy Nutman*** Certified to Level: ***2 - Single fan NFPA room test***

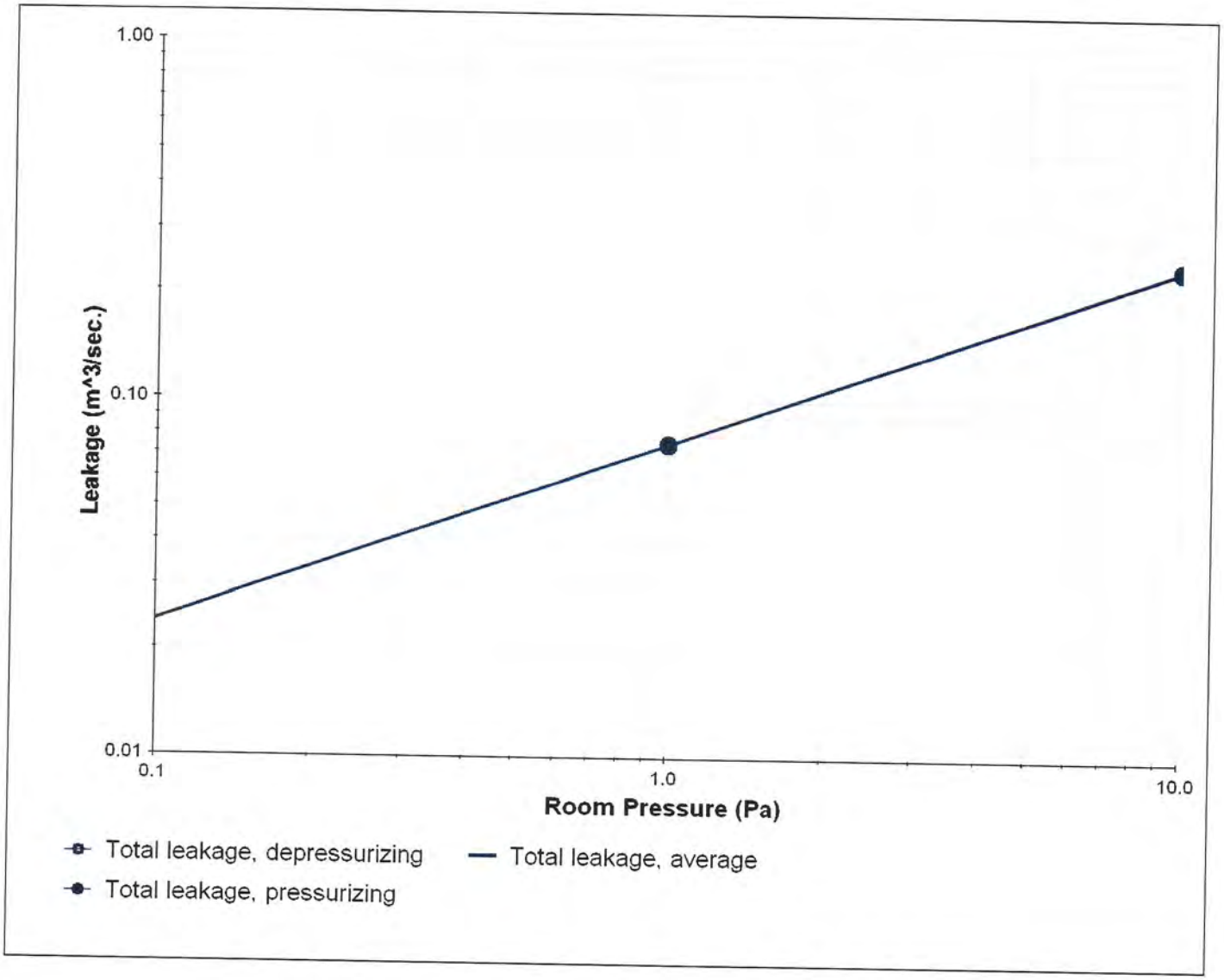
Yes Level 1 - Fire enclosure design basics for improving agent retention and passive protection
Yes Level 2 - adds single door fan operation and NFPA clean agent retention time calculations
No Level 3 - adds double door fan operation for Lower Leak measurement
No Level 4 - adds multi-point ISO door fan operation and discharge pressure relief vent

DOOR FAN TEST -- Graph

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
Software Licensed to: ***Pressure Test Limited***



Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***2***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**



PASS/FAIL Enclosure Integrity Report

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
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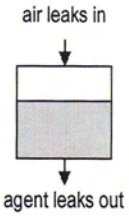


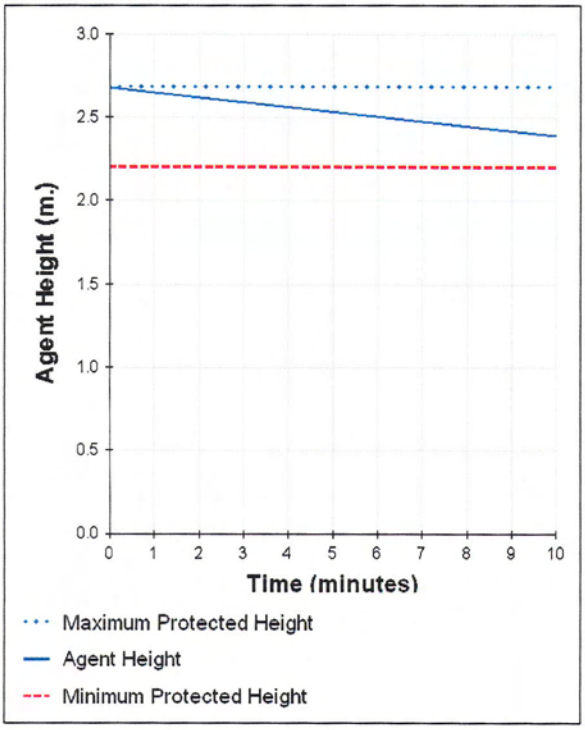
Building, Location	***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact	***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name	***1st Floor Offices*** Test number ***3***
Calibration Certificate #	***4025*** Certificate created ***2009/03/27***

Test date/time	***2009/09/17 08:21***	Net Protected Volume, **V**	***131 m^3***
Tester	***Andy Nutman***	Maximum Protected Height, H_o	***2.68 m.***
Certified to Level:	***2 - Single fan NFPA room test***	Minimum Protected Height, **H**	***2.20 m.***
Signature	.....	Static during retention, P_{SH}	***0.0 Pa***
Elevation above sea level	***25 m.***	Operating temperature	***21 C***
Correction method	***NFPA 2001 (2000) Formula A-3-5.3.3***	Initial concentration, **C**	***43.00%***
Correction factor	***0.99***	Mixing during retention	***No***
Agent	***Argon (IG-01)***	Agent quantity	***73 m^3***
Total room leakage, **ELA**	***0.0383 m^2***	Minimum concentration, C_F	***43.00%***
Lower Leakage, **BCLA**	***0.0191 m^2***	Minimum retention time	***10.0 minutes***

Below ceiling leakage defaulting to worst case -- 50% of total leakage.

This enclosure was tested in compliance with NFPA 2001 and 12A.
Assuming no continual mixing during the retention period, enclosure leakage could allow sufficient agent to be lost to cause an air/agent interface to descend from a Maximum Protected Height of **2.68 m.** to the Minimum Protected Height specified of **2.20 m.**
The retention time would then be **17.0 minutes** which exceeds the minimum retention time of **10 minutes**. The enclosure therefore **passes** this acceptance procedure.

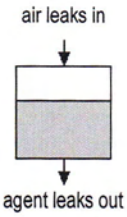
Notes ***The third test is performed with all the openings cut around the perimeter However this time they have all been specifically sealed / fire stopped with Product IA2484. this if installed corectly prevents leakage occuring through the penetrations made not only ingress but also egress. We observed that after installing this when the test was reperformed the rate of leakage was almost back to that indicated prior to breeching the perimeter wall fabric. the slight difference in leakage observed was via the "bunched cables"***



Witnesses ***Andy Nutman***

DOOR FAN TEST -- Total Room Leakage Data

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
By Retrotec, Inc, 2200 Queen Street, Bellingham, WA USA 98229 360-738-9835 www.retrotec.com
Software Licensed to: ***Pressure Test Limited***



Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***3***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**

Total Room Leakage

Operator In the room Smoke doesn't move Temperature during test (C)
Static pressure 0 Pa 21 inside 21 outside

Depressurization		Range for room pressures: -10.0 to -13.0
Blower range	Room pressure	-12
	Auto corrected RP	-12.2
Ring C2	Flow Pressure	128
	Auto corrected FP	130.3
	Corrected flow (m^3/sec.)	-0.1041

Pressurization		Range for room pressures: 10.0 to 13.0
Blower range	Room pressure	12
	Auto corrected RP	12.2
Ring C2	Flow Pressure	141
	Auto corrected FP	143.6
	Corrected flow (m^3/sec.)	0.1045

	ELA m^2	@Pa	F_A	Slope n	Intercept k_1	Correlation	Standard Error	ELA m^2		F
Depressurization	0.0382	12.2		0.5000	0.0300	NA	NA			
Pressurization	0.0384	12.2		0.5000	0.0302	NA	NA			
Average	**0.0383**	12.2	0.50	0.5000	0.0301			**0.0383**	10.0	0.50

Lower Leakage

Below ceiling leakage of 0.0191 m^2 @ 10.0 Pa is the worst case assumption of 50%

Technician: ***Andy Nutman*** Certified to Level: ***2 - Single fan NFPA room test***

Yes Level 1 - Fire enclosure design basics for improving agent retention and passive protection
Yes Level 2 - adds single door fan operation and NFPA clean agent retention time calculations
No Level 3 - adds double door fan operation for Lower Leak measurement
No Level 4 - adds multi-point ISO door fan operation and discharge pressure relief vent

DOOR FAN TEST -- Graph

CleanAgent 2001 retention time prediction program revision 2.5.4. Complies with NFPA 2001 Appendix C, year 2000 edition.
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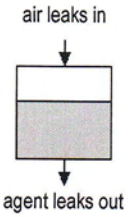
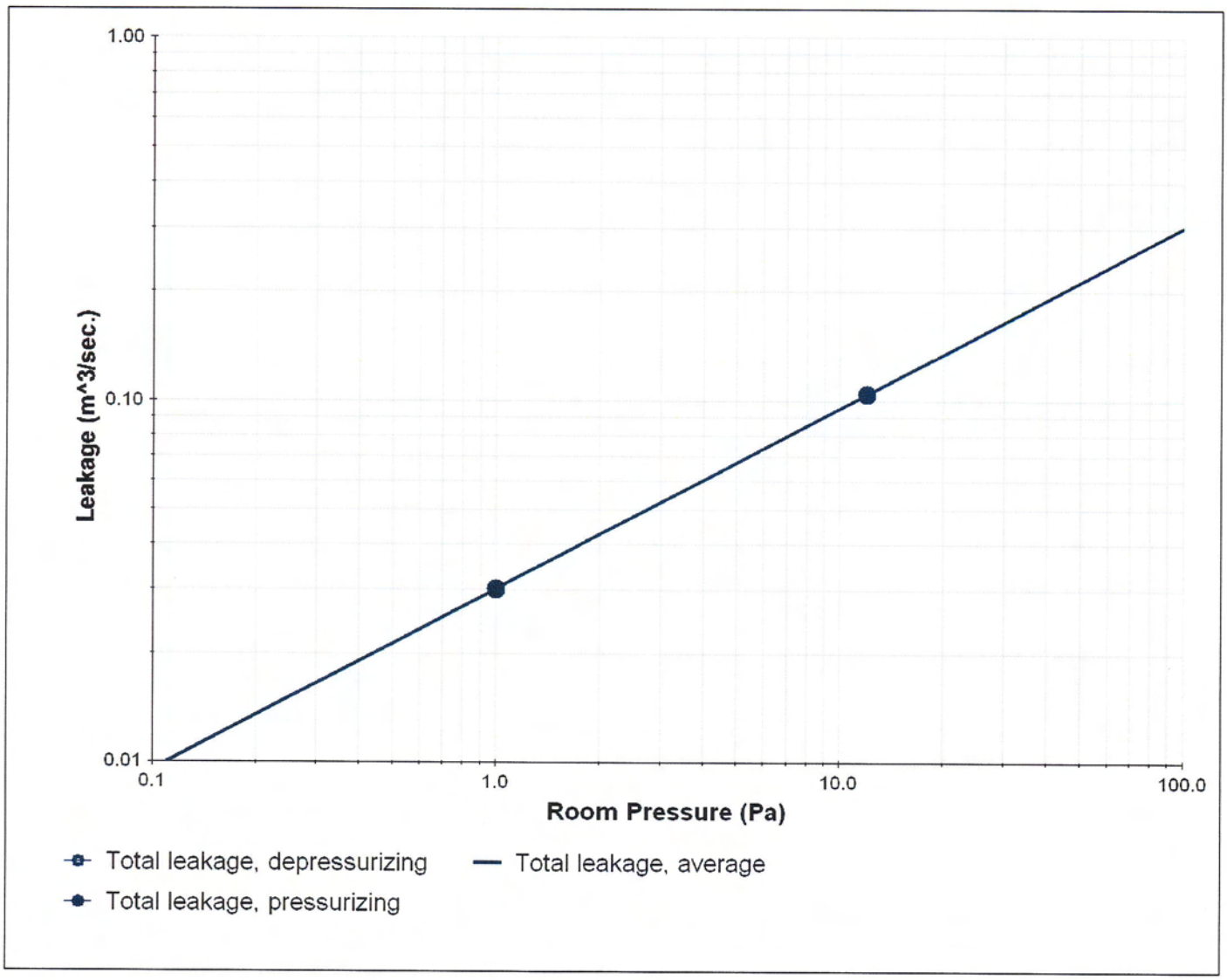


Building, Location ***Unit 15, 37 Ivanhoe Road, Finchampstead, RG40 4QQ***
Company, Contact ***Fire & Sound Limited, Andy Nutman / Cliff Miles***
Room name ***1st Floor Offices*** Test number ***3***
Calibration Certificate # ***4025*** Certificate created **2009/03/27**



One Year Calibration Certificate Certificate # ***4025*** System Model # ***Q4E***

System Owned By ***Pressure Test Limited*** Console #

For CA2001 ver 2.0 license # Equipment Calibrated by ***Retrotec Inc***

Good for one year date: ***2009/02/02*** expires: ***2010/02/02***

This certificate complies with calibration requirements of NFPA 2001 Appendix C, year 2000 edition and ISO 14520. Completed by Retrotec Inc, 2200 Queen Street, Bellingham, WA, USA 98226-4766

Digital Gauge This gauge used for All Readings

	serial #	**095563**				
to correct	mult by	& add	gauge	CR	MRC	error Pa
-486.00 - -301.00	1.01	0.17	0.0	0.0	0.0	0.0
-301.00 - -149.00	1.01	0.28	0.0	0.0	0.0	0.0
-149.00 - -74.80	1.01	0.48	0.0	0.0	0.0	0.0
-74.80 - -51.10	1.06	4.15	0.0	0.0	0.0	0.0
-51.10 - -24.40	0.94	-2.07	0.0	0.0	0.0	0.0
-24.40 - 0.00	1.03	0.00	0.0	0.0	0.0	0.0
0.00 - 24.70	1.01	0.07	0.0	0.0	0.0	0.0
24.70 - 49.60	1.02	-0.09	0.0	0.0	0.0	0.0
49.60 - 75.10	1.00	0.83	0.0	0.0	0.0	0.0
75.10 - 150.00	1.03	-1.58	0.0	0.0	0.0	0.0
150.00 - 297.00	1.00	3.20	0.0	0.0	0.0	0.0
297.00 - 600.00	1.01	-1.23	0.0	0.0	0.0	0.0
600.00 - 1,152.00	0.98	14.38	0.0	0.0	0.0	0.0
1,152.00 - 0.00	0.99	0.00	0.0	0.0	0.0	0.0

CR is the Corrected Room pressure.
CR = "gauge" reading X "mult by" factor + "& add" factor.

CF is the Corrected Flow pressure derived the same way.
The corrected readings are compared to the TRUE reading from our Master Reference Calibration (MRC) gauge and the resulting error shown in Pascals. Maximum allowable error is +/- 1 Pa from 0 to 50 Pa and +/- 5 Pa over 50 Pa.

Five Year Calibration Certificate Certificate # ***4025*** System Model # ***Q4E***

System Owned By ***Pressure Test Limited*** Console #

For CA2001 ver 2.0 license # Equipment Calibrated by ***Retrotec Inc***

Good for five years date: ***2009/02/03*** expires: ***2014/02/03***

This certificate complies with calibration requirements of NFPA 2001 Appendix C, year 2000 edition and ISO 14520. Completed by Retrotec Inc, 2200 Queen Street, Bellingham, WA, USA 98226-4766

CALIBRATION EQUATIONS WITH CALCULATION EXAMPLES:

blower #1 serial # >> 095752

blower	range	N	K	K1	K2	K3	K4	MF	CR	FF	cfm	m^3 / sec
#1	*22*	0.5214	486.9900	-0.070	0.800	-0.115	0.984	8.6				
#1	*A*	0.5030	259.0380	-0.075	1.000	0.000	1.011	12.0				
#1	*B*	0.5000	174.8820	0.000	0.300	0.000	0.916	10.0				
#1	*C8*	0.5000	78.5000	-0.020	0.500	0.016	0.949	10.0				
#1	*C4*	0.5140	39.3000	0.080	0.500	0.001	0.943	10.0				
#1	*C2*	0.5500	20.0000	0.139	0.500	-0.003	0.776	10.0				
#1	*C1*	0.5410	11.9239	0.122	0.400	0.000	0.740	10.0				

BLOWER TEST RESULTS:

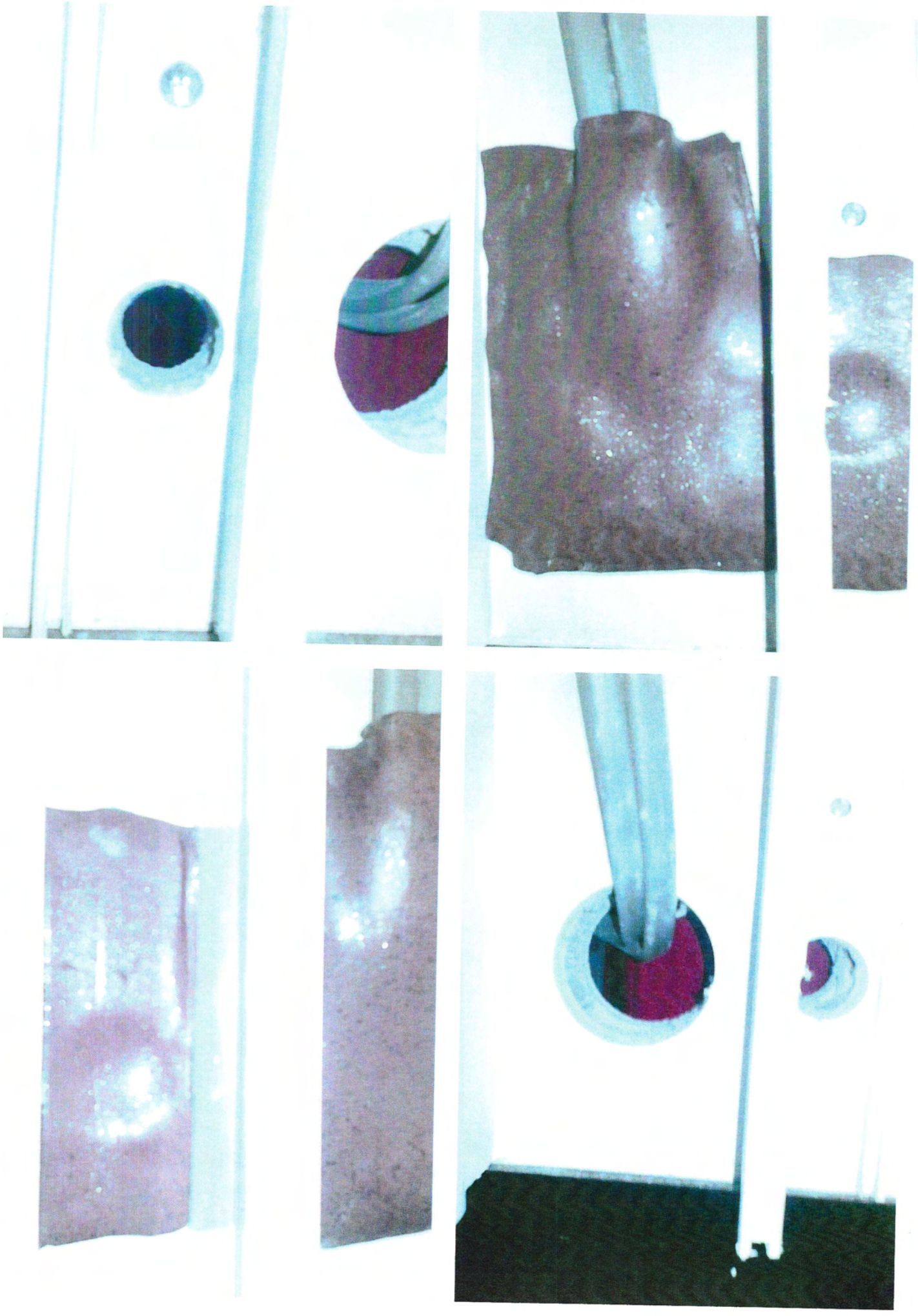
Holes	cm^2	blower	range	cm^2	error %	cm^2

This calibration certificate compares the calibration holes in the Retrotec test chamber with the tested blower's measurement of those holes. The left hand column shows the area of holes open in the Retrotec flow chamber. To the right is the comparable Retrotec Door Fan result using the above referenced CA2001 software license. Maximum allowable error is +/- 5%.

This calibration includes both gauge and blower error combined. CR and CF come from the One Year Certificate. For Flow Towards the operator, CF must be reduced by CR before calculating flow to yield FF, the symbol for the Final Flow pressure. For Flow Away from the operator CF=FF.
FF must be >=MF and (CR * K2) otherwise flow pressure is too low for accurate results
Flow in cfm = (FF-CR*K1)^N*(K+K3*FF)*K4 For m^3/sec, divide by 2118.882.

Technician: ***Andy Nutman*** Certified to Level: ***2 - Single fan NFPA room test***

Yes Level 1 - Fire enclosure design basics for improving agent retention and passive protection
Yes Level 2 - adds single door fan operation and NFPA clean agent retention time calculations
No Level 3 - adds double door fan operation for Lower Leak measurement
No Level 4 - adds multi-point ISO door fan operation and discharge pressure relief vent



robustdetails Robust Details Limited, Davy Avenue, Knowlhill, Milton Keynes, MK5 8NB.
Fax: 0870 240 8203 www.robustdetails.com

To whom it may concern,

This notification is to confirm that Robust Details Limited has assessed the acoustic performance of the **fischer FiPP putty pad**, and has accepted its use on Part E robust details timber and light steel frame separating walls provided the installation complies with the requirements published in the Robust Details Part E Handbook.

The product must be installed in accordance with the manufacturer's instructions.

Please note this assessment relates only to acoustic performance, and does not address the fire-stopping or air-tightness capabilities of the product. Reference should be made to the manufacturer at fischer.co.uk regarding these other issues.

Any queries or requests for additional information relating to the Part E robust details should be directed to Robust Details Technical department on 0870 240 8209, or via technical@robustdetails.com.

For further details of the scheme please visit www.robustdetails.com.

Yours faithfully,

Robust Details Limited

02/2017

Technical disclaimer / Decisive factors

Due to the complexity of building materials, tools, fixing elements and installation techniques a comprehensive recommendation depends on full and detailed understanding of specific site conditions.

This document is a factual record of FireStop product performance obtained under specific conditions and does not constitute an endorsement of the suitability of the product for any specific application. This responsibility remains with the customer.
The data given shall be used as a guide for assessment or FireStop product suitability. Even when our advice is given in good faith it cannot be binding for this reason and we cannot accept any liability for any anchor failure due to the wrong design, misuse or wrong installation.

For further product information please contact the fischer Technical Department:

Phone: 01491 827 920
E-mail: technical@fischer.co.uk

fischer fixings (UK) Ltd.
Whitely Road, Wallingford, Oxon, OX10 9AT.

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Your dealer:

FiPP Putty Pad Flyer_DHan_(V3)_Mktg UK_16.02.2016

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Phone 01491 827900
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