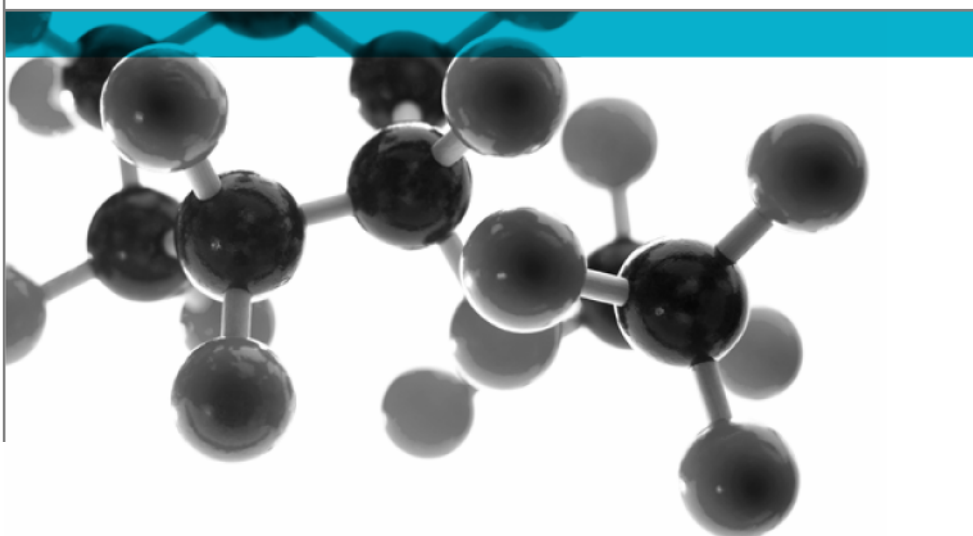


BS EN ISO 10140-2:2010



Test of: 53-FR120-PD-BF-3WL-30DB Single leaf Access Panel

Acoustics - Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation

A Report To:
Panel Technologies
49-61 Jodrell Street
Nuneaton
Warwickshire
CV11 5EG

Document Reference:
WYC432286

Date: 08/10/2020

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Page 1

Contents

Page No.

Summary of Performance	3
1 Introduction.....	4
2 Test Specimen Details	6
3 Methodology.....	8
4 Parameters & Limitations	9
5 Authorisation	10
Appendix 1 – Summary of Results & Test Data Sheets (2 Pages)	11
Appendix 2 – Sponsors Drawing (1 Page)	12

Summary of Performance

The following performance was achieved from the specimens tested. Full details of the testing and specimen construction are described in the report.

Test No.	Product Name	Product Type	Caulked	Test Result $R_w (C; C_{tr})$
1	R53.120.BF.L12A.30dB	Single leaf access panel	Fully Caulked	31 (0;-3) dB
2	R53.120.BF.L12A.30dB	Single leaf access panel	No	30 (-1;-4) dB

1 Introduction

The test specimen was supplied by the sponsor and delivered to WARRINGTONFIRE on 8 September 2020. The specimen was installed into a timber stud partition within the test chamber by Warringtonfire.

Test Details

The specimen was tested to BS EN ISO 10140-2:2010 Acoustics - Laboratory measurement of sound insulation of building elements. Measurement of airborne sound insulation

Testing was conducted at Warringtonfire, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND on the 8 September 2020.

For details of the testing, please see Section 3, Methodology.

Sampling

Warringtonfire was not involved in factory sampling of the products and materials used for the test specimen described in this report, and as such the results apply to the sample as received.

Supporting Construction Description

The partition consisted of two wall leaves separated by a 400mm air gap. Each wall leaf was constructed of nominal 45mm x 90mm softwood studs at 600mm centres with two layers of 15mm plasterboard on each face. The stud wall cavities were filled with 100mm thick mineral wool insulation.

Laboratory Construction Details

The laboratory consists of a source room and a receive room that are completely separated by a 50mm gap filled with mineral wool. Intersections of the floor, wall and ceiling planes are all perpendicular. The rooms have opposite openings for the installation of the test specimen formed by masonry piers and lintels. The depth of the piers is greater in the source room than the receive room.

The walls are of timber frame construction, approx. 190mm thick, symmetrical through the thickness. Studs are 90mm deep at 600mm centres with mineral wool insulation between them. Resilient bars approx. 20mm deep are fixed to the studwork. Two layers of 15mm gypsum board are fixed to the bars on both the inner and outer face.

The ceilings consist of 150mm deep timber joists with mineral wool insulation installed between joists. Resilient bars approx. 20mm deep are fixed to the lower edge of the joists. Two layers of 15mm gypsum board are fixed to the bars on the inner face only.

The floors are assembled from sound absorbing boards on a rubber underlay.

Dimensions:

	Volume	Width	Length	Height
	m ³	m	m	m
Source room	82.4	5.49	6.03	2.49
Receive room	69.6	5.49	5.09	2.49

2 Test Specimen Details

Product Name	53-FR120-PD-BF-3WL-30DB
Product Manufacturer	Panel Technologies
Product Type	Single leaf access panel
Material Type	Steel
Overall Dimensions	907mm wide x 2007mm high x 80mm deep
LeafDimensions	900mm wide x 2000mm high x 54mm deep
Variations between Tests	2 tests were conducted on this product with variations in: Caulked Refer to Summary of Results & Test Data Sheets in Appendix 1 for details of the variations.

Panel

	Material/type	Dimensions (mm)	Density (kg/m³)
Door Tray	Folded Zintec Steel*	1.5 thick	-
Core	Siniat Soundbloc Plasterboard*	12.5 thick	848*
Door Strengtheners	Zintec Steel*	40 x 90*	-

* As stated by sponsor, not checked by laboratory

Frame

	Material/type	Dimensions (mm)
Stiles and rails	1.5mm thick folded zintec steel*	80 x 50
Rebate	Single type	45 x 20
Joints	Mitred and welded	-

* As stated by sponsor, not checked by laboratory

Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
Hinges	Electroplated spring hinge*	20 x 8 x 40	Welded into panel leaf
Locking mechanism	3 point locking mechanism manufactured from Bright Zintec Plated Mild Steel*	2345 length	2No. M5 x 29 machine bolts into panel
Grommet	White dome plug manufactured from Nylon*	16Ø	Push fit
Bung	Aluminium lock hole ferrule	16Ø	Push fit
keeps	All keeps are cut outs in frame / leaf	-	-

* As stated by sponsor, not checked by laboratory

Perimeter Sealing details

	Make/type	Size (mm)	Location
Leaf Edges	None Present	-	-
Frame reveal Head and jambs	Norseal (Ref. FS1000)* intumescent foam seal	10 x 4	On rebate upstand
Seal continuity	Seals Uninterrupted by hardware	-	-

* As stated by sponsor, not checked by laboratory

3 Methodology

Airborne Sound Insulation Test

- The loudspeakers were placed in the corners of the source room
- The sound level meter was calibrated prior to testing.
- 5 measurements were taken in the source room, at fixed positions.
- 5 measurements were taken in the receive room at fixed positions.
- Background measurements were taking at each third octave frequency between 50Hz and 5000Hz.
- 6 Reverberation measurements were taken in the receive room, in accordance with BS EN ISO 3382-2:2008 interrupted, engineering method.
- Calculations, including C & C_{tr} , were carried out in accordance with BS EN ISO 717-1
- Single number ratings in accordance with BS EN ISO 717-1 are based on results obtained by laboratory measurements.
- The sound reduction index was calculated using the following formula from BS EN ISO 10140-2:2010:

$$R_w = L1 - L2 + 10 \log \left(\frac{S}{A} \right) \text{ dB}$$

Where:

$L1$ is the logarithmic average of the source room measurements

$L2$ is the logarithmic average of the receive room measurements

S is the area of the test specimen

A is the equivalent absorption area, where $A = \frac{0.16V}{T}$

Where:

V = The volume of the receive room

T = the reverberation time measured in seconds

1. Logarithmic average of 5 Measurements ($L1$ & $L2$)
2. Deduction of $L1$ s from $L2$ s
3. Area of test specimen (S) divided by equivalent sound absorption area (A)
4. Weighted Final Result R_w dB

Test Equipment

Equipment	Equipment reference number
Bruel & Kjaer Sound Level Meter (Type 2270)	ACT-009
Bruel & Kjaer Microphones (Type 4189)	ACT-010 & ACT-016
Bruel & Kjaer Calibrator (Type 4231)	ACT-011
Amplifiers	ACT-007 & ACT-049
Noise Generators	ACT-008 & ACT-009
Loudspeakers (EV ZX1-90PA)	ACT-006, ACT-021, ACT-022
Graphic Equaliser (DBX Dual Channel)	ACT-023

4 Parameters & Limitations

Parameters

The test fulfilled all criteria required of ISO 10140-2, including:

- Sound level meter (microphone) was located as required
- Sound sources (loudspeakers) were located as required
- Reverberation Time readings were greater than 20dB but not so large that the observed decay cannot be represented by a straight line.
- Background noise measurements were 10dB below L2 measurements.
- Temperature was reported to within $\pm 0.1^{\circ}\text{C}$
- Barometric pressure was reported to within ± 0.01 Mbar (± 1 Pa)
- Humidity was reported to within $\pm 1\%$
- Frequencies 50Hz, 63Hz and 80Hz are outside of our UKAS accreditation, and are for reference only. These frequencies do not affect the over R_w figure.
- $R'_{\max}$ of the test chambers was measured to be 65dB
- The test chambers are two cuboid rooms 5.49m wide and a ceiling height of 2.58m, volumes of chambers for testing are reported with the individual test data

Limitations

- The results only relate to the behaviour of the specimen submitted for test, as described in the Technical Specification (Section 2), and under the particular conditions of test.
- The results are not intended to be the sole criteria for assessing the acoustic performance of the element in use nor do they necessarily reflect the actual behaviour once installed on site.
- The specification and interpretation of test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. WARRINGTONFIRE will be able to offer a review of the procedures adopted for a particular test to ensure that they are consistent with current practices.
- The results are solely for use by the sponsor and the stated purpose.
- The sponsor cannot rely on information provided without consent from WARRINGTONFIRE.
- Any recommendations are specific to the assignment and the sponsor.
- Extracts from the report are not permitted.

5 Authorisation

	Issued by:	Authorised by:
Signature:		
Name:	Jamie Nelson	Lee Grant-Riach
Title:	Technical Officer	Lead Technical-Officer
Date of Issue	24/09/2020	24/09/2020

Appendix 1 – Summary of Results & Test Data Sheets (2 Pages)

Product Name	53-FR120-PD-BF-3WL-30DB
Product Type	Single leaf access panel

Data Sheet Ref.	Variations		Test Result $R_w (C; C_{tr})$
WYC432286/P001	Caulked	Fully Caulked	31 (0;-3) dB
WYC432286/P002	Caulked	No	30 (-1;-4) dB

Sponsor:	Panel Technologies
Product Name/Desc.	R53.120.BF.L12A.30dB
Product Type	Single leaf access panel
Material Type	Steel
Variations:	
Caulked	Fully Caulked

For detailed technical specification, please refer to Section 2 of the report

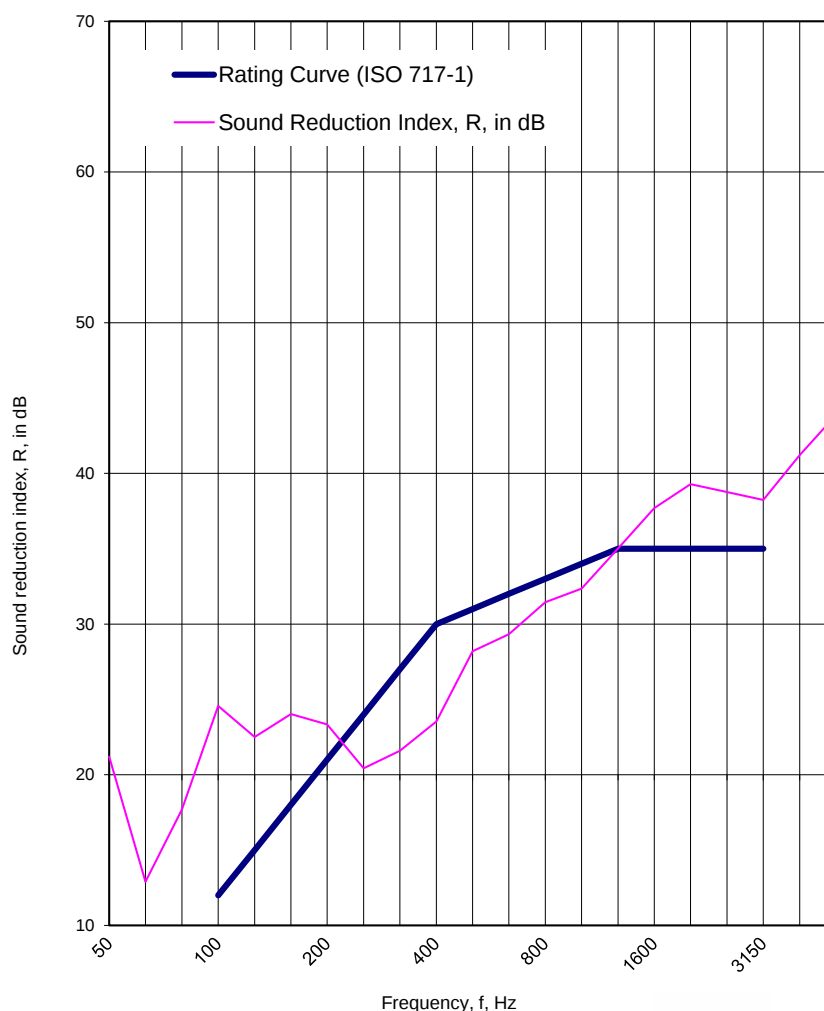
Data sheet Ref. WYC432286/P001

Date of Test: 08/09/2020

Source Room Volume:	82.40 m ³
Receive Room Volume:	69.60 m ³
Specimen Installed By:	Client
Area of Specimen (S):	1.80 m ²
Temp. in Test Rooms:	<u>Sour.</u> 18.1 <u>Rec.</u> 17.9 °C
Static Pressure:	101020.0 100960.0 Pa
Humidity in Test Rooms:	81.1 81.1 %

f, Hz	R, dB
50*	21.2
63*	12.9
80*	17.7
100	24.6
125	22.5
160	24.0
200	23.3
250	20.4
315	21.6
400	23.5
500	28.2
630	29.3
800	31.5
1000	32.3
1250	35.0
1600	37.7
2000	39.3
2500	38.8
3150	38.2
4000	41.2
5000	43.9
AAD	-24.1

Frequency range for rating in accordance with ISO 717-1



$R_w = 31 \text{ dB}$	$C_{(50-3150)} = 0 \text{ dB}$	$C_{tr(50-3150)} = -4 \text{ dB}$
$R_w + C = 31 \text{ dB}$	$C_{(50-5000)} = 1 \text{ dB}$	$C_{tr(50-5000)} = -4 \text{ dB}$
$R_w + C_{tr} = 28 \text{ dB}$	$C_{(100-5000)} = 1 \text{ dB}$	$C_{tr(100-5000)} = -3 \text{ dB}$

[Signature]

Jamie Nelson
Technical Officer

* indicates that the frequency is outside of our UKAS accreditation and is for information only

The legal validity of this report can only be claimed on presentation of the complete report

Sponsor:	Panel Technologies
Product Name/Desc.	R53.120.BF.L12A.30dB
Product Type	Single leaf access panel
Material Type	Steel
Variations:	
Caulked	No

For detailed technical specification, please refer to Section 2 of the report

Data sheet Ref. WYC432286/P002

Date of Test: 08/09/2020

Source Room Volume: 82.40 m³

Receive Room Volume: 69.60 m³

Specimen Installed By: Client

Area of Specimen (S): 1.80 m²

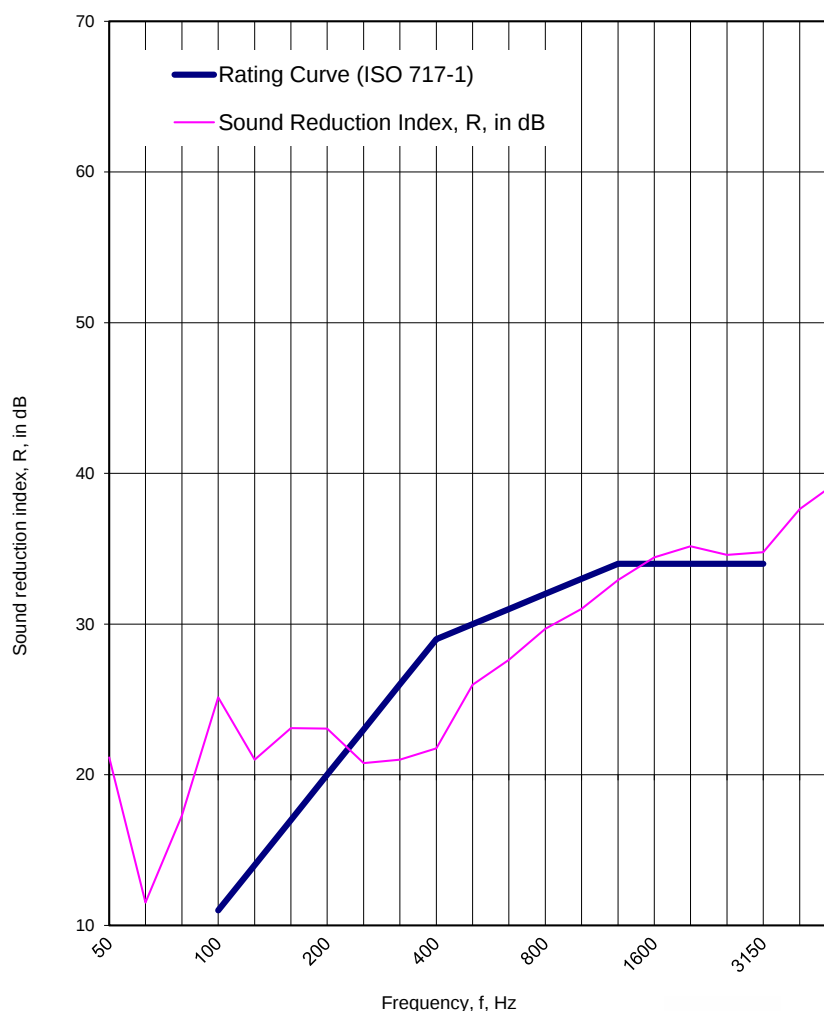
Temp. in Test Rooms: Sour. 18.1 Rec. 17.9 °C

Static Pressure: 101020.0 100960.0 Pa

Humidity in Test Rooms: 81.1 81.1 %

f, Hz	R, dB
50*	21.1
63*	11.5
80*	17.3
100	25.1
125	21.0
160	23.1
200	23.1
250	20.8
315	21.0
400	21.8
500	26.0
630	27.6
800	29.7
1000	31.0
1250	32.9
1600	34.4
2000	35.2
2500	34.6
3150	34.8
4000	37.6
5000	39.4
AAD	-27.3

Frequency range for rating in accordance with ISO 717-1



$R_w = 30$ dB	$C_{(50-3150)} = 0$ dB	$C_{tr(50-3150)} = -4$ dB
$R_w + C = 30$ dB	$C_{(50-5000)} = 0$ dB	$C_{tr(50-5000)} = -4$ dB
$R_w + C_{tr} = 27$ dB	$C_{(100-5000)} = 0$ dB	$C_{tr(100-5000)} = -3$ dB

Jamie Nelson
Technical Officer

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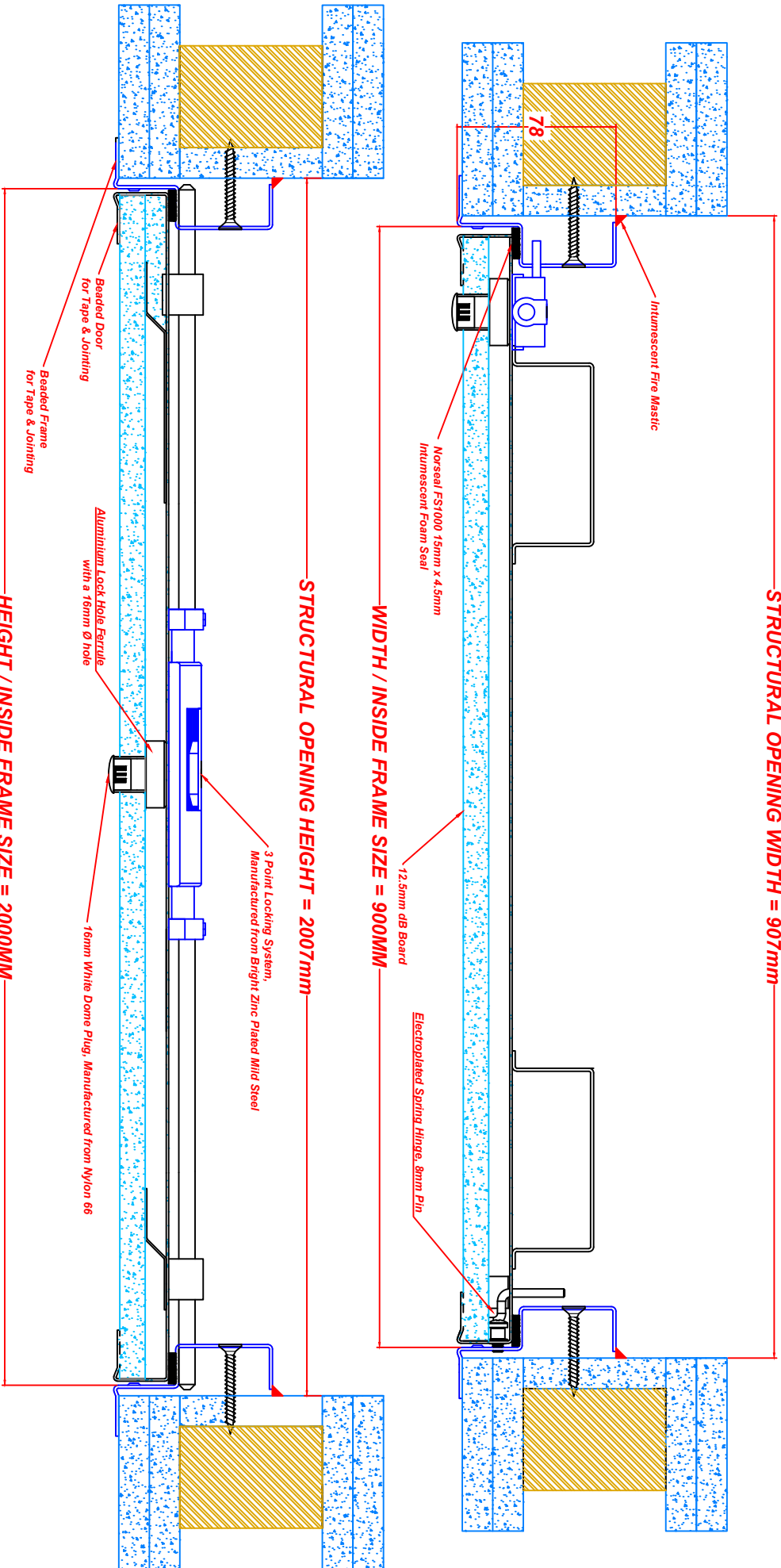
Report for: Panel Technologies

Report Ref: WYC432286

Appendix 2 – Sponsors Drawing (1 Page)



ISSUE No:	CHANGE DETAIL'S:



Critical Faces if applicable - - - - -

Scale	Date drawn	Drawn by	Material	Material Thickness	Paint Spec	Description of Panel or Trim
Do Not Scale	11/08/20	RS	ZINTEC	0.9mm/1.2mm	AS PER ORDER	53-FR120-PD-BF-3WL-DB
PLASTERBOARD FACED WALL DOOR						
Issue no:	Drawing no:	Linear Tolerances	Address:	Item of Panel or Trim		
1	53-FR120-PD-BF-3WL-DB (ACOUSTIC TEST)	+/- 0.5 DEGREES	WILLIAM HOUSE, 49-61 JODRELL STREET, NUNEATON WARWICKSHIRE, CV11 5EG	PD-BF-3WL-DB ASSEMBLY		