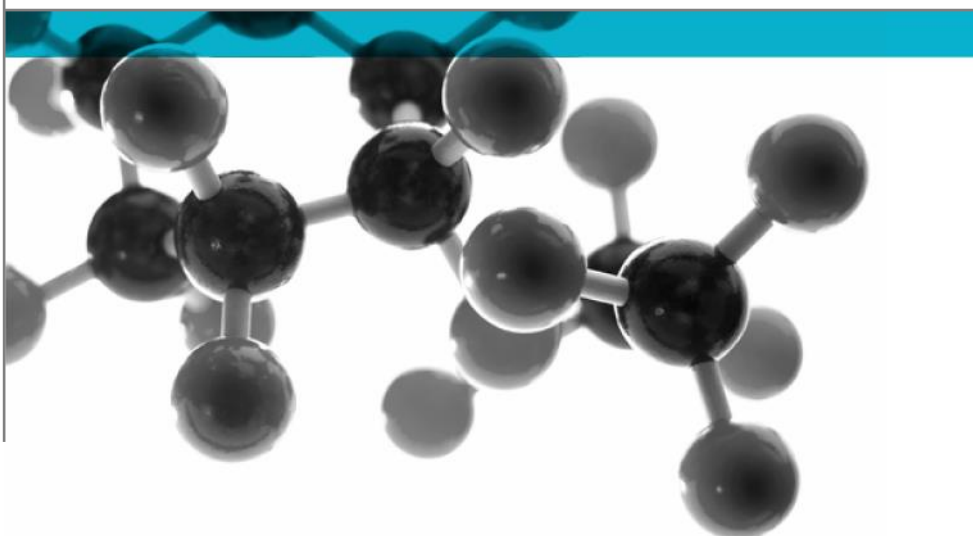


BS EN ISO 10140-2:2010



: Test of 53-120S-PD-BF-3WL-30A-ATN-2D Double leaf access panel & 51-120S-MD-PF-L12A-2D-40A Double leaf access panel.

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

Date: 07/02/2025

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Page 1

A Report To:
Panel Technologies Limited
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Document Reference: WYC538110/02/Rev1

This report is a revision to that issued as WYC538110/02 and dated 03/02/2024. The details of the test report WYC538110/02 are held on file by Warringtonfire. The original report and any previous revisions are replaced by this revised report WYC538110/02/Rev1

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1 Summary of Performance

Single number ratings of airborne sound insulation R_w ($C;C_{tr}$) were determined in accordance with BS EN ISO 717-1 from laboratory measurements in accordance with BS EN ISO 10140-2.

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

Product Name	R53-120-PD-BF-2D-L12A-DB Double leaf access panel
Product Type	Access Panel

Test No.	Certificate	Test Date	Test Rating R_w ($C;C_{tr}$)
01	WYC538110/02/Rev1 /P002	08/11/2023	40 (-2;-5) dB
02	WYC538110/02/Rev1 /P003	08/11/2023	30 (0;-3) dB

2 Introduction

The test specimen was supplied by the sponsor and delivered to WARRINGTONFIRE on 8 November 2023. 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. The testing methodology is described in Section 3.

Testing was conducted at Warringtonfire, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND. Test dates and results are given in Appendix 1. Test Certificates are attached as Appendix 2.

3 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 three 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 receiving 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 receiving 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.

Laboratory dimensions are:

	Volume (m³)	Width (m)	Length (m)	Height (m)
Source room	82.4	5.49	6.03	2.49
Receiving room	69.6	5.49	5.09	2.49

5 Specimen Construction

Product Name 1	51-120S-MD-PF-L12A-2D-40ATest P001 + P002
Product Name 2	53-120S-PD-BF-3WL-30A-ATN-2D Test P003
Product Manufacturer	Panel Technologies Limited
Product Type	Double Leaf Access Panel
Material Type	Steel
Overall Dimensions	1900mm High x 2500mm high x 27mm thick
Left Leaf Dimensions	896mm wide x 2396mm high x 27mm thick
Right Leaf	896mm wide x 2396mm high x 27mm thick
Variations between Tests	2 tests were conducted on this product with variations in: Product Refer to Results & Test Data Sheets in Appendix 1 for details of the variations.

Panels

	Material/type	Dimensions (mm)
Door Tray	Folded Zintec Steel*	1.2 thick*
Core	Siniat Sounbloc plasterboard*	12.5 thick*
Strengtheners	2No. folded Zintec steel per panel. Fixed to internal face of panels by 3.9mm x 13mm Bright Zinc Plated (BZP) Pan Pozi Head Cross Machine Self Drilling Tek Screws*	1.5 thick*
Astragal	1.5mm thick folded Zintec steel fixed to secondary panel by M5 x 12mm Bright Zinc Plated (BZP) Pan Pozi Head Cross Recess Machine Screw into a M5 Bright Zinc Plated (BZP) Round Flat Head Serrated Open End Rivet Nuts*	1.5 thick*
Joints	Welded	-

* As stated by sponsor, not checked by laboratory

Frame

	Material/type	Dimensions (mm)
Stiles and rails	1.5mm folded Zintec steel*	20 x 40 x 65 x 40 x 20*
Rebate	Single type	30 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	Bagshaw Engineering (Ref. HINGE-RF-R53) electroplated Rapid Fit Spring Hinge*	22 x 16 x 40*	Welded
Locking mechanism	1No. C.R.A International (18732) 3 Point Locking System. Manufactured from Bright Zinc Plated Mild Steel, with 18mm stroke, 1no.Lock per panel*	162 x 16 with 18 stroke*	Bolted on with 2no M5 x 25mm Bright Zinc Plated (BZP) 8.8 High Tensile Steel Hexagon Head Bolts through M5 Bright Zinc Plated (BZP) Round Flat Head Serrated Open End Rivet Nuts*
Bung & Collar	1no C.R.A International (18776-00) Aluminium Lock Hole Ferrule 25.2mm Long with a 16mm Ø hole, Manufactured from Aluminium 1no Vital Parts Ltd (BLA027) 16mm White Dome Plug, Manufactured from Nylon 66*	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
Door edges	1No. C.R.A International (18693) White 'P' Profile Compression self adhesive EPDM Seal*	9 x 5.5*	On astragal
Frame reveal	1No. C.R.A International (18693) White 'P' Profile Compression self adhesive EPDM Seal*	9 x 5.5*	Rebate upstand
	1No. Envirograph G10/10 grey self-adhesive intumescent strip*	10 x 2*	Rebate upstand
Seal continuity	Uninterrupted by hardware	-	-

* As stated by sponsor, not checked by laboratory

6 Methodology

Laboratory Test Procedure

The output of each combination of microphone and sound level meter channel was checked against a calibrated reference prior to testing.

The following measurements were recorded at each third octave frequency between 50Hz and 5000Hz.

- The background noise level in the receiving room was recorded.
- Reverberation measurements were recorded in the receiving room in accordance with BS EN ISO 3382-2:2008 (interrupted noise, engineering method). Two source and 3 microphone positions were used to provide 6 independent measurements.
- The sound pressure level was recorded in the source room and in the receiving room. For each room, 10 independent measurements were recorded as follows:
 - The noise source was a single fixed loudspeaker in two positions in the source room in accordance with BS EN ISO 10140-5 Annex D.
 - For each loudspeaker position, the microphones were in 5 fixed positions in both the source room and the receiving room in accordance with BS EN ISO 10140-4.

Calculations

Frequency-dependent values of airborne sound insulation were calculated and converted to the single number rating $R_w(C;C_{tr})$ in accordance with BS EN ISO 717-1 as follows.

- The sound reduction index R was calculated at each frequency using the following formula from BS EN ISO 10140-2:2010:

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

Where:

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

$L2$ is the logarithmic average of the receiving room measurements, corrected for background noise in accordance with BS EN ISO 10140-4

S is the area of the test specimen

A is the equivalent sound absorption area in accordance with BS EN ISO 10140-4

$$A = \frac{0.16V}{T}$$

Where:

V is the volume of the receiving room in cubic metres

T is the reverberation time in seconds

- The weighted sound reduction index R_w was calculated from values of R (rounded to one decimal place) within the required frequency range 100Hz to 3150Hz by comparison with the reference values in BS EN ISO 717-1.
- Sound spectra C (pink noise e.g. from living activities such as talking or music) and C_{tr} (low frequency noise e.g. from urban traffic) were calculated for the required frequency range as well as wider ranges between 50Hz and 5000Hz in accordance with BS EN ISO 717-1.

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

7 Parameters & Limitations

Parameters

The test fulfilled the criteria stipulated in BS EN 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 levels met the requirements of BS EN ISO 10140-4.
- Temperature was reported to within $\pm 0.1^{\circ}\text{C}$.
- Barometric pressure was reported to within ± 0.01 mbar (± 1 Pa).
- Relative 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 contribute to the single number rating R_w .
- The maximum measurable sound reduction index R'_{max} of the test chambers was measured as 65dB.
- The test chambers are two cuboid rooms 5.49m wide with a ceiling height of 2.58m. Volumes of test chambers are reported in each test certificate.

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.
- 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.

8 Authorisation

	Prepared By	Checked By	Authourised By
Signature:			
Name:	Rudy Bell-Bishop	Lee Grant-Riach	Martin Durham
Title:	Technical Officer	Advanced Technical Officer	Lab Manager

Revision Record
Amendments to page 3, 12, 8 and appendix 2

Appendix 1 – Results

Product Name	See Test Notes
Product Type	Access Panels

Data Sheet Ref.	Variations	
Test №: 01 Certificate: WYC538110/02 Rev1/P002 Test Date: 08 Nov 23 $R_w(C;C_{tr}) = 40 (-2;-5) \text{ dB}$	Panel Ref	51-120S-MD-PF-L12A-2D-40A
	Test Notes	Fully Operational
Test №: 03 Certificate: WYC538110/02 Rev1/P003 Test Date: 08 Nov 23 $R_w(C;C_{tr}) = 30 (0;-3) \text{ dB}$	Panel Ref	53-120S-PD-BF-3WL-30A-ATN-2D
	Test Notes	Fully Operational

Appendix 2 – Test Certificates (2 Pages)



Sponsor: Panel Technologies Limited

Product Name/Desc: See Variation

Product Type: Access Panel

Material Type: Steel

Variations:

Panel Ref: 51-1205-MD-PFL12-A-2D-40dB

Test Notes: Fully Operational

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

Ref No: WYC538110/02/Rev1/P002

Date of test: 08/11/2023

Specimen Installed by: Client

Area of Specimen (S): 4 m²

Source Room Receiving Room

Room Volume: 82.4 m³ 69.6 m³

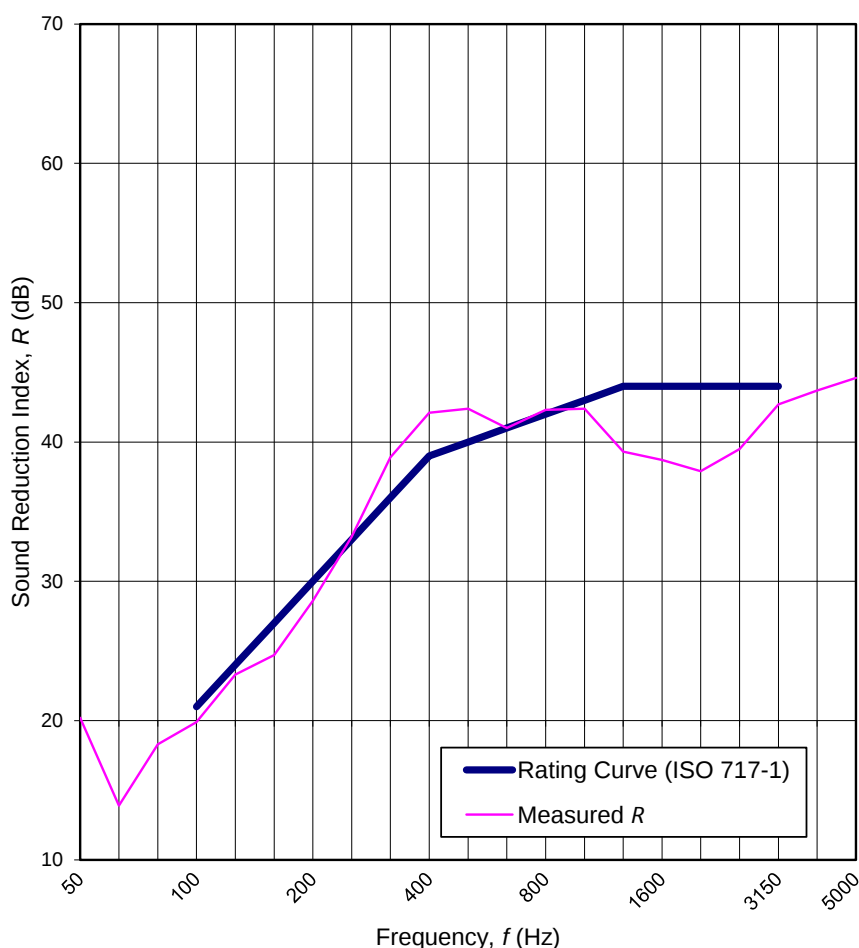
Temperature: 17.7 °C 17.5 °C

Static Pressure: 985700 Pa 985650 Pa

Relative Humidity: 72 % 73 %

f, Hz	R dB
50	20.2
63	13.9
80	18.3
100	19.9
125	23.3
160	24.7
200	28.6
250	33.2
315	38.9
400	42.1
500	42.4
630	41.0
800	42.3
1000	42.4
1250	39.3
1600	38.7
2000	37.9
2500	39.5
3150	42.7
4000	43.7
5000	44.6
AAD	28.0

Frequency range for rating in accordance with ISO 717-1.



Rating to BS EN ISO 717-1 : 2013

Frequencies 50, 63, 80, 4000 & 5000 Hz are for reference only and do not form part of the R_w calculation

$R_w (C; C_{tr}) = 40 (-2; -5) \text{ dB}$

$R_w + C = 38 \text{ dB}$

$R_w + C_{tr} = 35 \text{ dB}$

$C_{(50-3150)} = -2 \text{ dB}$

$C_{(50-5000)} = -2 \text{ dB}$

$C_{(100-5000)} = -1 \text{ dB}$

$C_{tr (50-3150)} = -8 \text{ dB}$

$C_{tr (50-5000)} = -8 \text{ dB}$

$C_{tr (100-5000)} = -5 \text{ dB}$

Lee Grant-Riach

Senior Technical Officer

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

Sponsor: Panel Technologies Limited

Product Name/Desc: See Variation

Product Type: Access Panel

Material Type: Steel

Variations:

Panel Ref: 53-1205-PD-BF-L12A-2D-30dB

Test Notes: Fully Operational

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

Ref No: WYC538110/02/Rev1/P003

Date of test: 08/11/2023

Specimen Installed by: Client

Area of Specimen (S): 4 m²

Source Room Receiving Room

Room Volume: 82.4 m³

69.6 m³

Temperature: 17.7 °C

17.5 °C

Static Pressure: 985700 Pa

985650 Pa

Relative Humidity: 72 %

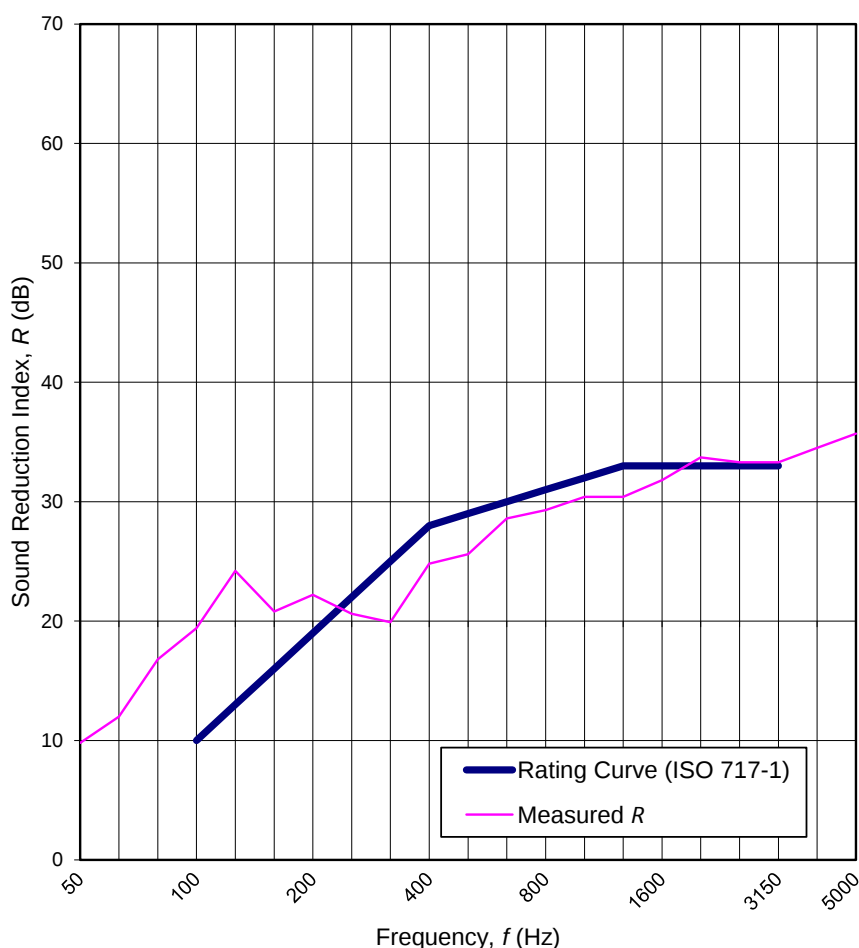
73 %

f, Hz	R dB
50	9.8
63	12.0
80	16.8
100	19.4
125	24.2
160	20.8
200	22.2
250	20.6
315	19.9
400	24.8
500	25.6
630	28.6
800	29.3
1000	30.4
1250	30.4
1600	31.8
2000	33.7
2500	33.3
3150	33.3
4000	34.5
5000	35.7
AAD	31.1

Frequency range for rating in accordance with ISO 717-1.

Rating to BS EN ISO 717-1 : 2013

Frequencies 50, 63, 80, 4000 & 5000 Hz are for reference only and do not form part of the R_w calculation



$R_w (C; C_{tr}) = 30 (0; -3) \text{ dB}$

$R_w + C = 29 \text{ dB}$

$R_w + C_{tr} = 27 \text{ dB}$

$C_{(50-3150)} = 0 \text{ dB}$

$C_{(50-5000)} = 0 \text{ dB}$

$C_{(100-5000)} = 1 \text{ dB}$

$C_{tr (50-3150)} = -4 \text{ dB}$

$C_{tr (50-5000)} = -4 \text{ dB}$

$C_{tr (100-5000)} = -2 \text{ dB}$

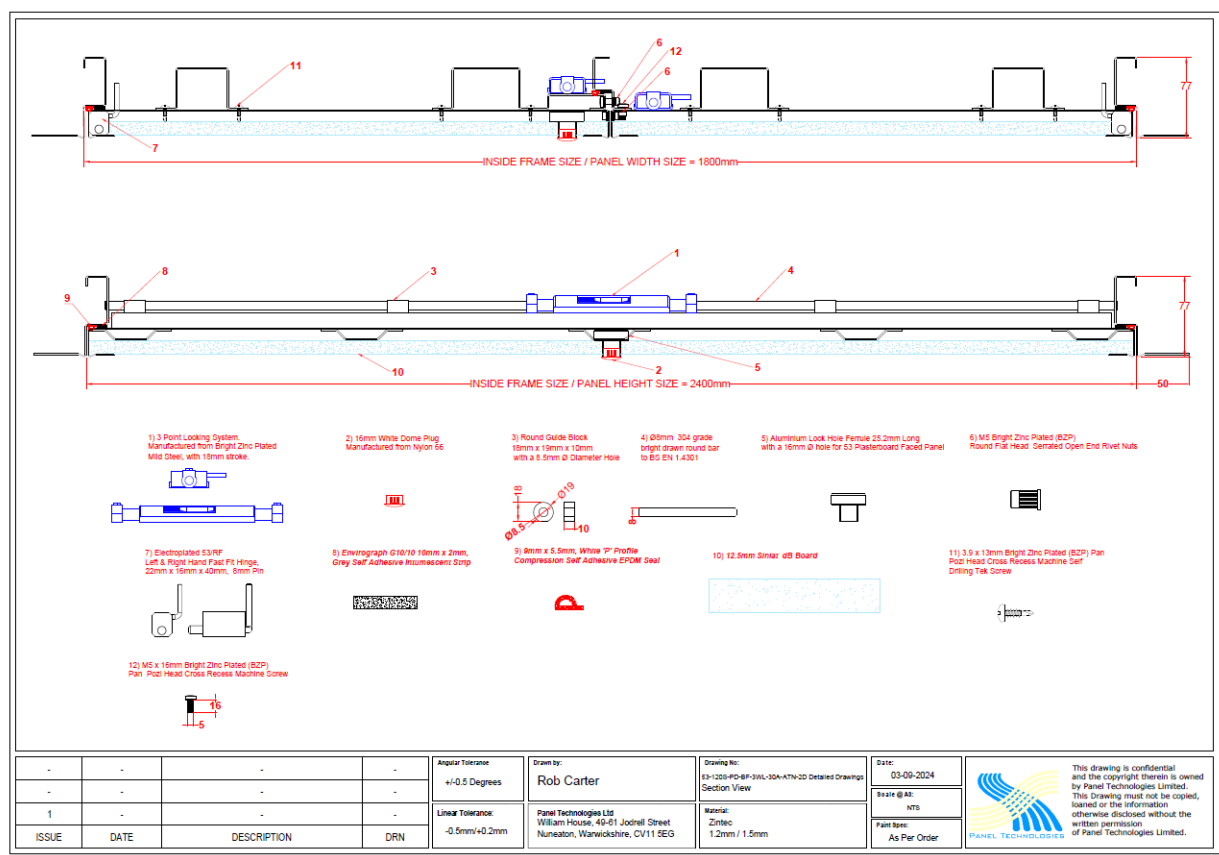
Lee Grant-Riach

Senior Technical Officer

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Appendix 3 – Drawings (2 Pages)

53-120S-PD-BF-3WL-30A-ATN-2D



51-120S-MD-PF-3WL-40A-2D

