Acoustic Test

Sponsor:
Panel Technologies
Clifford House
38-44 Binley Road
Coventry
Warwickshire
CV3 1JA

CONFIDENTIAL

Report: Chilt/Z13037

Report on the testing of a metal-faced and a plasterboard-faced access panel for acoustic performance to BS EN ISO 10140-2:2010

Issue date: December 2013

BM TRADA – the new name for Chiltern International Fire Ltd

From July 1st 2013, Chiltern International Fire Ltd commenced trading under the name of its parent company BM TRADA and at the same time adopted a brand new visual identity.

Historically, the group has delivered its services through a number of individual companies: BM TRADA Certification Ltd, TRADA Technology Ltd, Chiltern International Fire Ltd (including Chiltern Dynamics) and a network of international offices. Both BM TRADA Group and these individual companies will now trade under the same name - BM TRADA - and adopt the new visual identity.

To coincide with this change, our Technical Reports, Test Reports, Products Assessments, company stationery and marketing collateral have been re-designed to carry the new branding and visual identity.

The validity of all documents previously issued by the individual companies including certificates, test reports and product assessments is unaffected by this change and a letter to this effect will be available to download from our website www.bmtradagroup.com.

About BM TRADA.

With origins dating back to 1934, we have a deep history and services which are highly valued by our customers. We offer independent certification, testing, inspection, training and technical services around the world. In all these areas we continue to use industry-leading experts in their chosen fields to develop and deliver services – an ethos that has been at the heart of our approach since we began.

In all these areas we use industry-leading experts in their chosen fields to develop and deliver services – an ethos that has been at the heart of our approach since we began.

A recent review of our businesses and customers revealed that the individual identities sometimes make communications confusing, and that in an already complex business area, clarity and simplicity in communications is rare, but valued. It also revealed that a single identity and combined offer would help us strengthen our appeal.

With this in mind, we brought the companies together under the name BM TRADA and took the opportunity to create a fresh new visual identity.

We have modernised our image and combined our strengths. However, our values, our people and the integrity of our services remain the same. I hope you will welcome these changes and the improvements they will bring.

Jon Osborn
Chief Operating Officer

Contents

1 Introduction

The specimens were supplied by the client and delivered to BM TRADA on 30 September 2013. The specimens were installed into a timber stud partition within the test chamber by BM TRADA.

Test Details

The specimens were 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 BM TRADA, Chiltern House, Stocking Lane, Hughenden Valley, Buckinghamshire. HP14 4ND on the 30 September 2013.

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

Supporting Construction Description

The partition consisted of two wall leaves separated by a 150mm 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 Rockwool insulation.

2 Test Specimens

The specimens were identified as Access Panels with 2No.facing variations. The overall frame dimensions were 1050mm wide x 1050mm high x 72mm deep and the opening panel dimensions were 990mm wide x 990mm high x 29mm thick.

Test No.	Product Name & Description
P001	**Panel A** Metal faced access panel
P002	**Panel A** Metal faced access panel, caulked
P003	**Panel B** Plasterboard faced access panel, with face and perimeter skim bead edge plastered
P004	**Panel B** Plasterboard faced access panel, with face and perimeter skim bead edge plastered, caulked

3 Detailed Specimen Description

3.1 Panel A

Panel

	Material/type	Dimensions (mm)	Density (kg/m³)
Door tray	Steelco Zinctec Steel*	2 thick	-
Core	Knauf SoundBloc*, see appendix 2, drawing Metal Faced DB 1for core details	990 wide x 990 long x 15 thick	840**
Door strengtheners	2No Steelco Zinctec Steel* profiles, fixed with 4No. M5 x 15 screws	820 long	-

* As stated by client, not checked by laboratory ** Nominal density not checked by laboratory

Frame

	Material/type	Dimensions (mm)
Stiles and rails	Steelco Zinctec Steel*	72 x 45 x 2
Rebate	Single type	26 x 20
Joints	Mitred and welded	-

* As stated by client, not checked by laboratory

Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
Hinges	2No. Rapid Access Spring Hinge*	58 long	2No. Mm5 x 12 screws
Locking mechanism	Mifti 3 Point Lock*	985 long	2No. M5 x 28 screws
Bung	Mifti Flip Bung*	21ø	-

* As stated by client, not checked by laboratory

Perimeter sealing details

	Make/type	Size (mm)	Location
Door Edges	Lorient IS1020 White P Shaped Compression Seal *	9 wide	Around perimeter of panel edge
Seal continuity	Uninterrupted by hardware	-	-

* As stated by client, not checked by laboratory

3.2 Panel B

Panel

	Material/type	Dimensions (mm)	Density (kg/m³)
Door tray	Steelco Zinctec Steel*	2	-
Core	Knauf SoundBloc*, see appendix 2, drawing Plasterboard Faced DB 1for core details	990 wide x 990 long x 12.5 thick	850**
Door strengtheners	2No. Steelco Zinctec Steel* profiles, fixed with 10No. push rivets	950 long	-

* As stated by client, not checked by laboratory ** Nominal density not checked by laboratory

Frame

	Material/type	Dimensions (mm)
Stiles and rails	Steelco Zinctec Steel*	72 x 45 x 2
Rebate	Single type	34 x 14
Joints	Mitred and welded	-

* As stated by client, not checked by laboratory

Hardware

	Make/type	Size (mm)	Fixing details (dimensions in mm)
Hinges	2No. Rapid Access Spring Hinge*	58 long	2No. Mm5 x 12 screws
Locking mechanism	Mifti 3 Point Lock*	985 long	2No. M5 x 28 screws
Bung	Mifti Flip Bung*	21ø	-

* As stated by client, not checked by laboratory

Perimeter sealing details

	Make/type	Size (mm)	Location
Frame reveal	Lorient IS1020 White P Shaped Compression Seal *	9 wide	Around perimeter of rebate upstand
Seal continuity	Uninterrupted by hardware	-	-

* As stated by client, not checked by laboratory

4 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

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

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

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 L1s from L2s
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 & Kjear Sound Level Meter (Type 2270)	ACT-009
Bruel & Kjear Microphones (Type 4189)	ACT-010 & ACT-016
Bruel & Kjear Calibrator (Type 4231)	ACT-011
Amplifiers	ACT-007 & ACT-020
Noise Generators	ACT-008 & ACT-009
Loudspeakers (EV ZX1-90PA)	ACT-006, ACT-021, ACT-022
Graphic Equaliser (DBX Dual Channel)	ACT-023

5 Results

Certificate Ref.	Test Identification	Test Result R_w (C;C_{tr})
MTZ/F13037/P001	Panel A, metal faced access panel	36 (-1;-2) dB
MTZ/F13037/P002	Panel A, metal faced access panel, caulked	39 (-1;-3) dB
MTZ/F13037/P003	Panel B, plasterboard faced access panel, with face and perimeter skim bead edge plastered	37 (0;-3) dB
MTZ/F13037/P004	Panel B, plasterboard faced access panel, with face and perimeter skim bead edge plastered, caulked	40 (-1;-4) dB

The results only relate to the performance of the samples under the particular conditions of test.

Full test results for each test are presented in Appendix 1.

6 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 ± 0.1°C
- Barometric pressure was reported to within ± 0.01 Mbar (±1 Pa)
- Humidity was reported to within ± 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

7 Authorisation

	Issued by:	Checked by:
Signature:		
Name:	Martin Durham	Vincent Kerrigan
Title:	Technical Officer	Technical Manager
Date of Issue	16th December 2013	

Appendix 1 - Test Data

Certificate Ref.	Test Identification
MTZ/F13037/P001	Panel A, metal faced access panel
MTZ/F13037/P002	Panel A, metal faced access panel, caulked
MTZ/F13037/P003	Panel B, plasterboard faced access panel, with face and perimeter skim bead edge plastered
MTZ/F13037/P004	Panel B, plasterboard faced access panel, with face and perimeter skim bead edge plastered, caulked

BM TRADA

Laboratory measurement to BS EN ISO 10140-2 - Airborne Sound Insulation of Building Elements

UKAS TESTING No. 1762

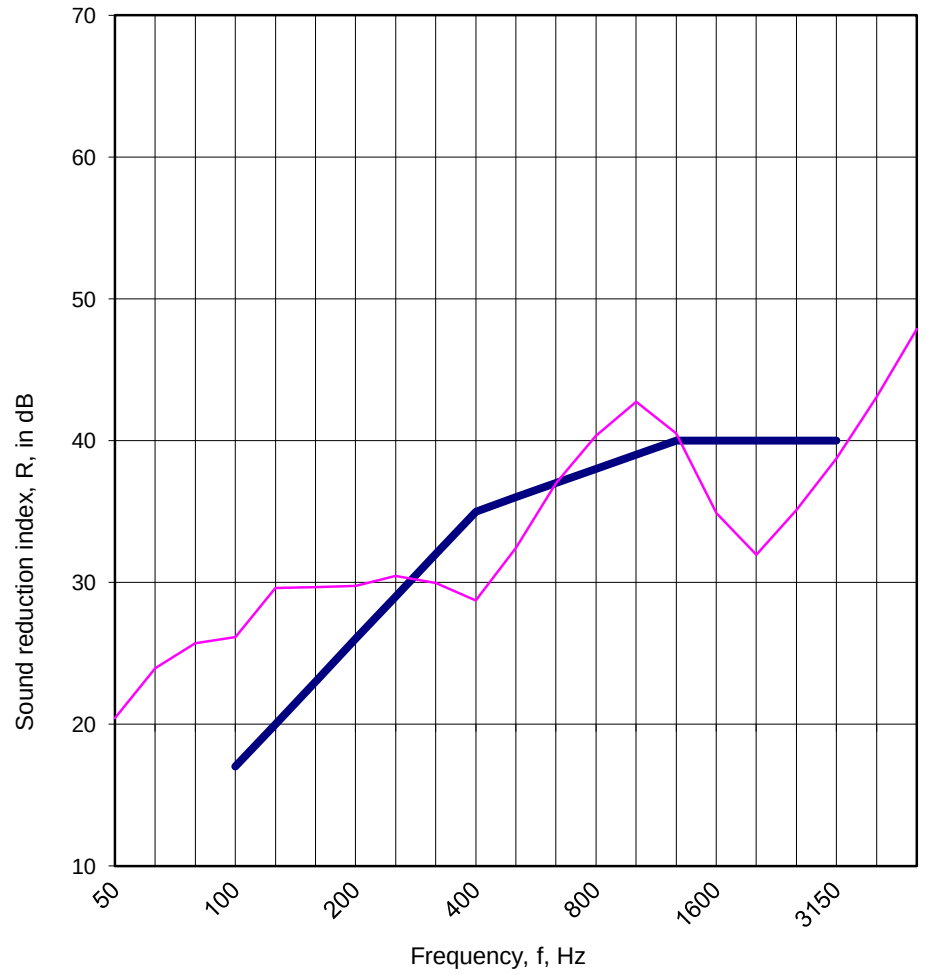
Test Specimen Name: Panel A
Client: Panel Technologies
Test Specimen Installed By: BM TRADA
Area of Specimen (S): 1.10
Temperature in Test Rooms: 17.3 °C
Static Pressure: 99200.0 Pa
Humidity in Test Rooms: 71.0 %
Test Specimen Description: Metal faced access panel

Ref. No.: MTZ/F13037/P001
Date of Test: 30/09/2013

Source Room Volume: 86.00 m^3
Receive Room Volume: 63.00 m^3

f, Hz		*R* ,dB
50+		20.4
63+		24.0
80+		25.7
100		26.1
125		29.6
160		29.7
200		29.8
250		30.5
315		30.0
400		28.7
500		32.5
600		37.0
800		40.3
1000		42.7
1250		40.5
1600		34.9
2000		32.0
2500		35.1
3150		38.8
4000		43.1
5000		47.9
AAD		-31.2

Frequency range for rating in accordance with ISO 717-1



R_w =	**36 dB**	$C_{(50-3150)}$ =	-1 dB	$C_{tr\ (50-3150)}$ =	-3 dB
R_w+C =	**35 dB**	$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-3 dB
R_w+C_{tr} =	**34 dB**	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-2 dB

Martin Durham
Technical Officer

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

BM TRADA

Laboratory measurement to BS EN ISO 10140-2 - Airborne Sound Insulation of Building Elements

UKAS TESTING No. 1762

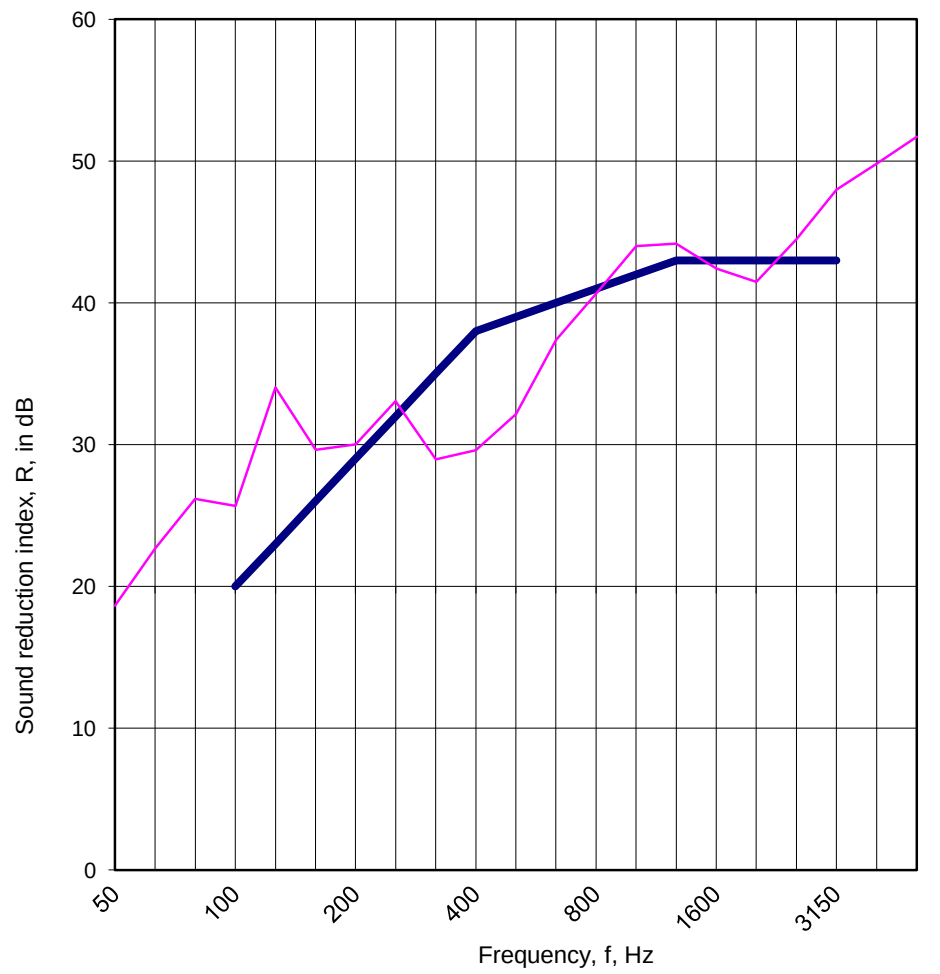
Test Specimen Name: Panel A
Client: Panel Technologies
Test Specimen Installed By: BM TRADA
Area of Specimen (S): 1.10
Temperature in Test Rooms: 17.3 °C
Static Pressure: 99200.0 Pa
Humidity in Test Rooms: 71.0 %
Test Specimen Description: Metal faced access panel, caulked

Ref. No.: MTZ/F13037/P002
Date of Test: 30/09/2013

Source Room Volume: 86.00 m^3
Receive Room Volume: 63.00 m^3

f, Hz	*R* ,dB
50+	18.6
63+	22.7
80+	26.2
100	25.7
125	34.0
160	29.6
200	30.0
250	33.1
315	29.0
400	29.6
500	32.2
600	37.4
800	40.6
1000	44.0
1250	44.2
1600	42.4
2000	41.5
2500	44.5
3150	48.0
4000	49.8
5000	51.7
AAD	-26.4

Frequency range for rating in accordance with ISO 717-1



R_w =	39 dB
R_w+C =	38 dB
R_w+C_{tr} =	36 dB

$C_{(50-3150)}$ =	-1 dB	$C_{tr\ (50-3150)}$ =	-5 dB
$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-5 dB
$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-4 dB

Martin Durham
Technical Officer

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BM TRADA

Laboratory measurement to BS EN ISO 10140-2 - Airborne Sound Insulation of Building Elements

UKAS TESTING No. 1762

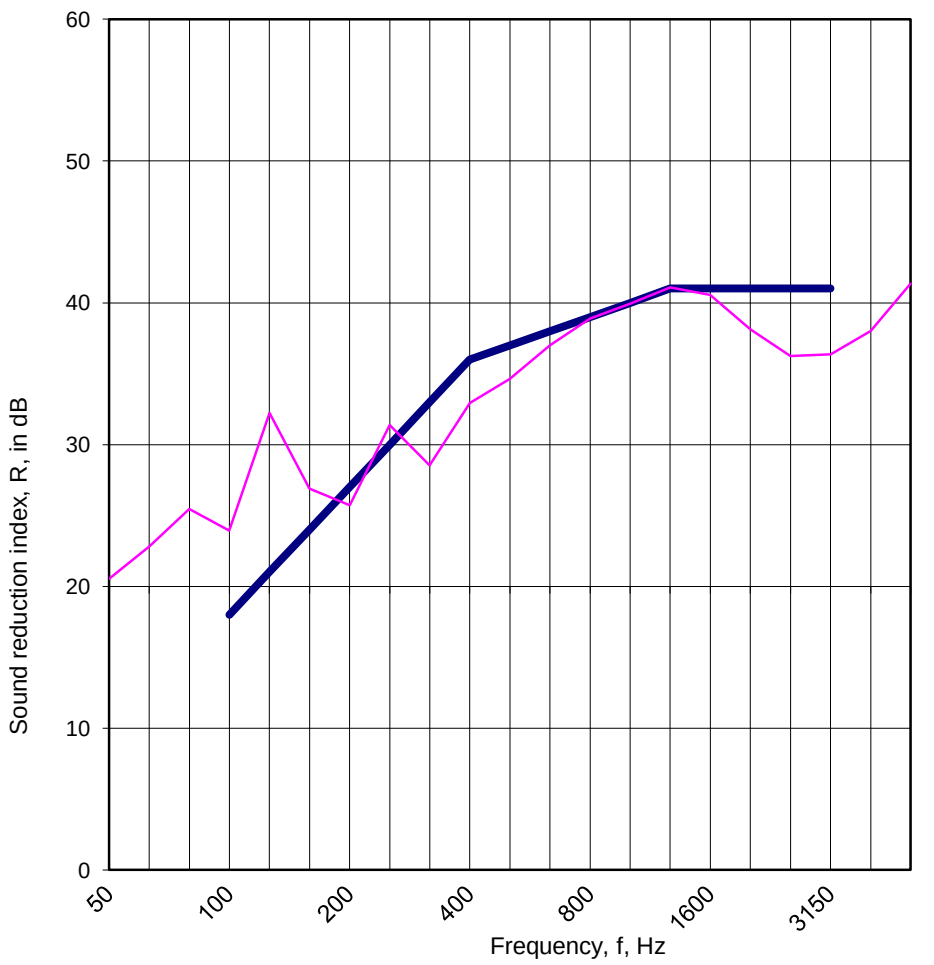
Test Specimen Name: Panel B
Client: Panel Technologies
Test Specimen Installed By: BM TRADA
Area of Specimen (S): 1.10
Temperature in Test Rooms: 17.3 °C
Static Pressure: 99200.0 Pa
Humidity in Test Rooms: 71.0 %
Test Specimen Description: Plasterboard faced access panel, with face and perimeter skim bead edge plastered

Ref. No.: MTZ/F13037/P003
Date of Test: 30/09/2013

Source Room Volume: 86.00 m^3
Receive Room Volume: 63.00 m^3

f, Hz	*R* ,dB
50+	20.5
63+	22.8
80+	25.5
100	23.9
125	32.2
160	26.9
200	25.7
250	31.4
315	28.5
400	32.9
500	34.6
600	37.0
800	38.9
1000	40.0
1250	41.1
1600	40.6
2000	38.1
2500	36.2
3150	36.4
4000	38.0
5000	41.4
AAD	-25.1

Frequency range for rating in accordance with ISO 717-1



R_w =	**37 dB**	$C_{(50-3150)}$ =	0 dB	$C_{tr\ (50-3150)}$ =	-4 dB
R_w+C =	**37 dB**	$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-4 dB
R_w+C_{tr} =	**34 dB**	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-3 dB

Martin Durham
Technical Officer

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BM TRADA

Laboratory measurement to BS EN ISO 10140-2 - Airborne Sound Insulation of Building Elements

UKAS TESTING No. 1762

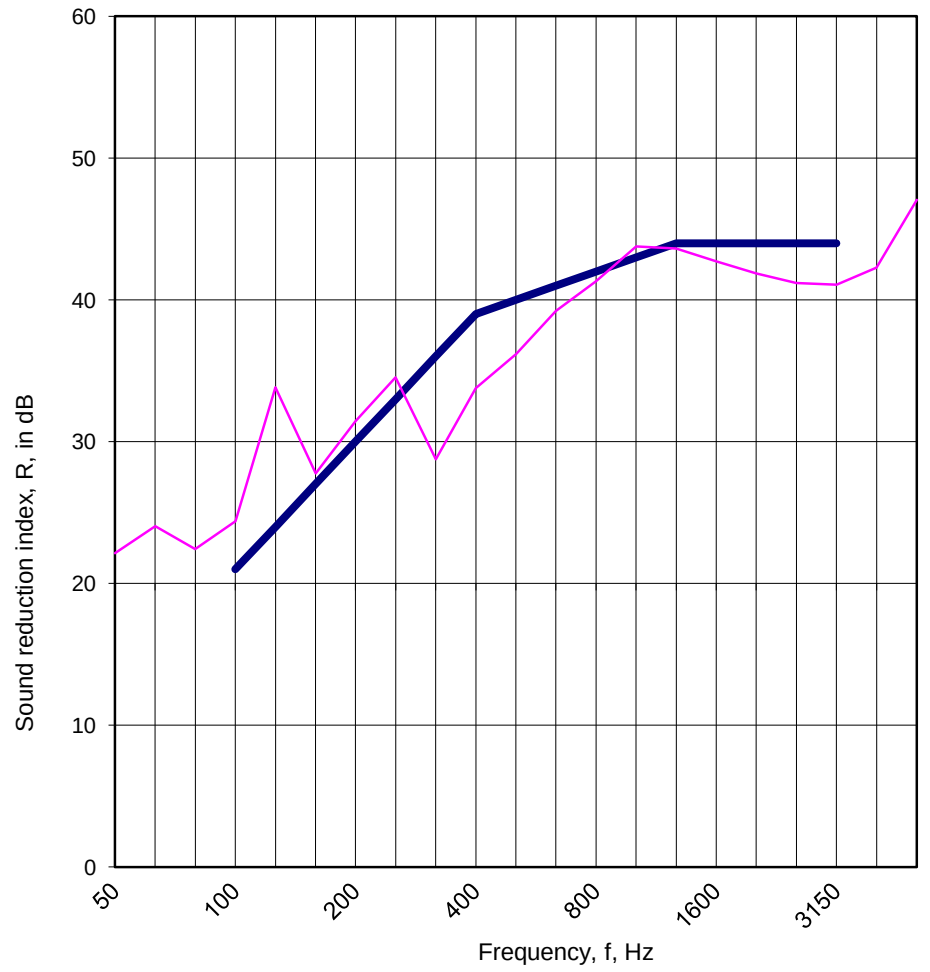
Test Specimen Name: Panel B
Client: Panel Technologies
Test Specimen Installed By: BM TRADA
Area of Specimen (S): 1.10
Temperature in Test Rooms: 17.3 °C
Static Pressure: 99200.0 Pa
Humidity in Test Rooms: 71.0 %
Test Specimen Description: Plasterboard faced access panel, with face and perimeter skim bead edge plastered, caulked

Ref. No.: MTZ/F13037/P004
Date of Test: 30/09/2013

Source Room Volume: 86.00 m^3
Receive Room Volume: 63.00 m^3

f, Hz	*R* ,dB
50+	22.1
63+	24.0
80+	22.4
100	24.4
125	33.8
160	27.8
200	31.5
250	34.5
315	28.8
400	33.8
500	36.2
600	39.2
800	41.3
1000	43.8
1250	43.6
1600	42.7
2000	41.9
2500	41.2
3150	41.1
4000	42.3
5000	47.0
AAD	-28.4

Frequency range for rating in accordance with ISO 717-1



R_w =	**40 dB**	$C_{(50-3150)}$ =	-1 dB	$C_{tr\ (50-3150)}$ =	-5 dB
R_w+C =	**39 dB**	$C_{(50-5000)}$ =	0 dB	$C_{tr\ (50-5000)}$ =	-5 dB
R_w+C_{tr} =	**36 dB**	$C_{(100-5000)}$ =	0 dB	$C_{tr\ (100-5000)}$ =	-4 dB

Martin Durham
Technical Officer

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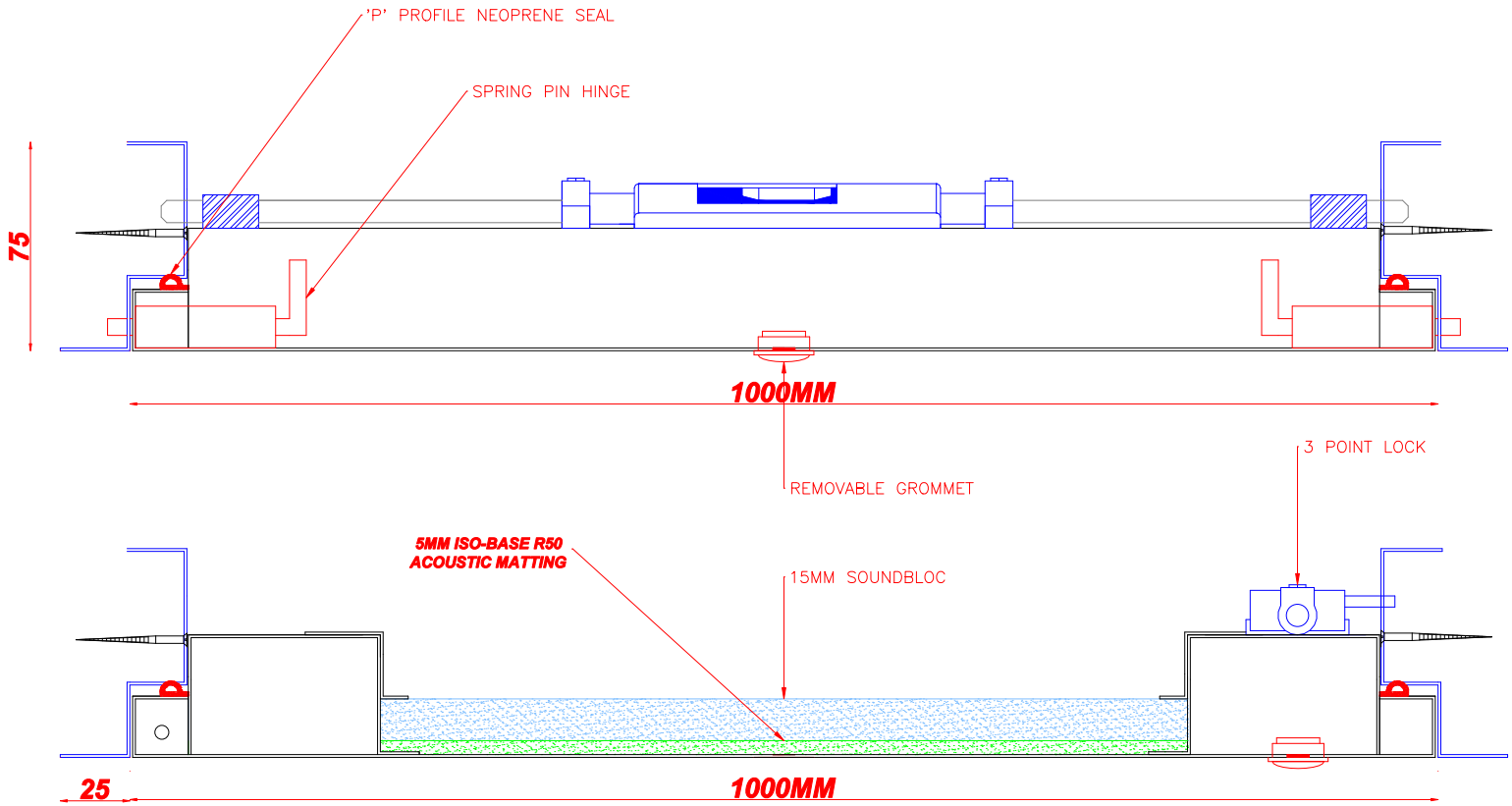
Appendix 2 - Drawings

List of Drawings

Drawing Reference
Metal Faced DB 1
Plasterboard DB 1

ISSUE No:	CHANGE DETAIL'S:

DRAWING KEY:	



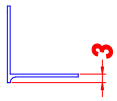
PANEL TECHNOLOGIES

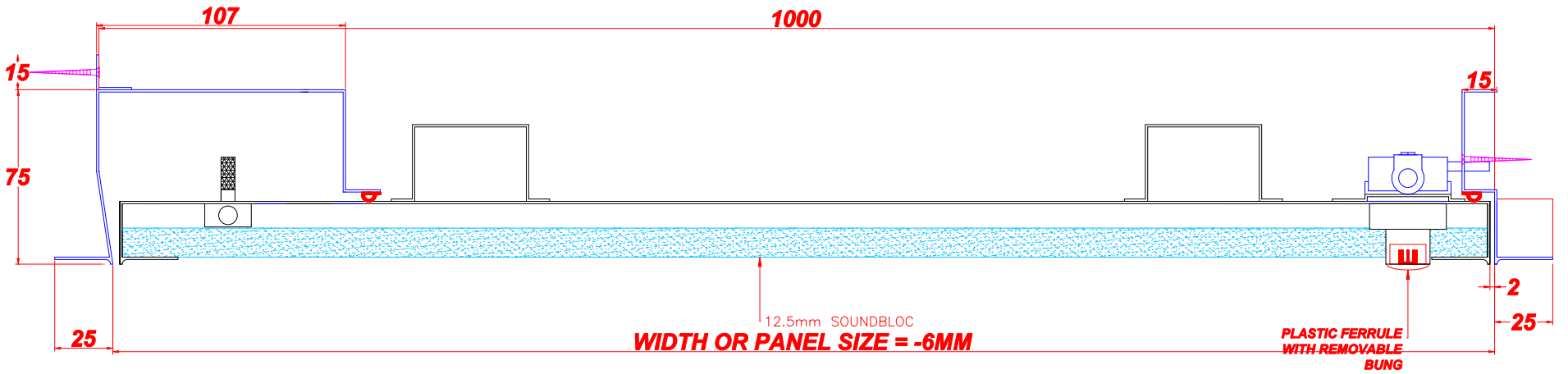
ADDRESS:	EVOLUTION HOUSE ASTON ROAD NUNEATON CV11 - 5EL
DRAWING NUMBER:	METAL FACED DB
ISSUE NUMBER:	1
LINEAR TOLERANCES :	-0.5mm / +0.2mm

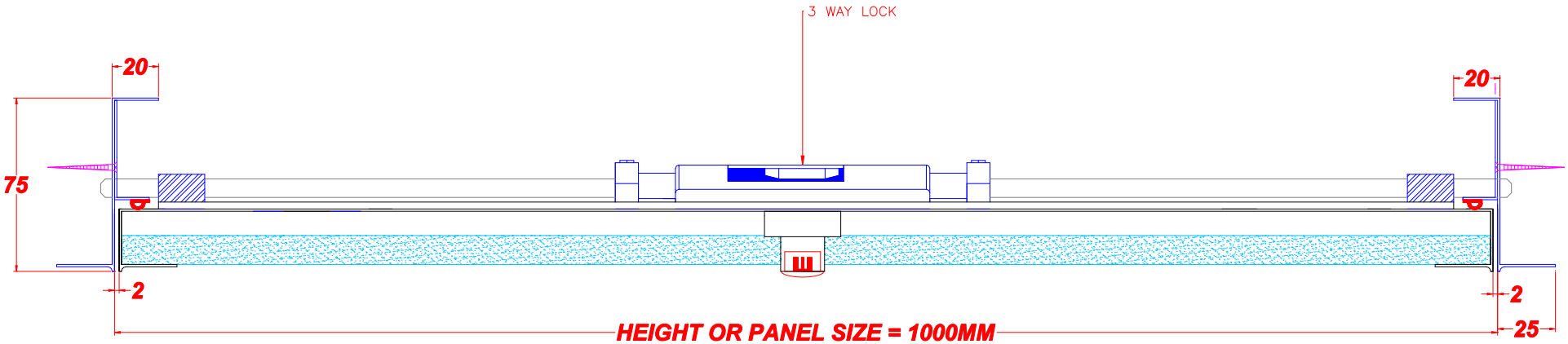
DESCRIPTION OF PANEL:	METAL FACED DB
ITEM OF PANEL:	ASSEMBLY DRAWING
DATE DRAWN:	26/09/13
DATE APPROVED:	26/09/13
SIGNATURE :	
ANGULAR TOLERANCES :	+/- 0.5 Degree

MATERIAL :	ZINTEC
B.S No:	BSEN 101522003
GAUGE:	0.9mm/1.2mm/1.5mm
PAINT SPEC:	AS PER ORDER
SCALE:	NOT TO SCALE
DRAWN BY:	ROSS STOKES

ISSUE No:	CHANGE DETAIL'S:

DRAWING KEY:	
STANDARD 3MM ARRIS	





PANEL TECHNOLOGIES

ADDRESS:	EVOLUTION HOUSE ASTON ROAD NUNEATON CV11 - 5EL
DRAWING NUMBER:	PLASTERBOARD DB
ISSUE NUMBER:	1
LINEAR TOLERANCES :	-0.5mm / +0.2mm

DESCRIPTION OF PANEL:	PLASTERBOARD DB
ITEM OF PANEL:	ASSEMBLY DRAWING
DATE DRAWN:	26/09/13
DATE APPROVED:	26/09/13
SIGNATURE :	
ANGULAR TOLERANCES :	+ / - 0.5 Degree

MATERIAL :	ZINTEC
B.S No:	BSEN 101522003
GAUGE:	0.9mm/1.2mm
PAINT SPEC:	AS PER ORDER
SCALE:	NOT TO SCALE
DRAWN BY:	ROSS STOKES

CHILTERN INTERNATIONAL FIRE LTD *(trading as BM TRADA)*

BM TRADA provides independent certification, testing, inspection, training and technical services around the world. We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.

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