Dubai Acoustic Research Laboratory
ISO Acoustic Physical & Mechanical Testing Laboratory L.L.C

ACOUSTIC TEST REPORT

Customer:	**Abanos Furniture & Decoration Industry LLC** P.O. Box 114480, Dubai, UAE
Report Number:	**132T005**
Test Standard:	BS EN ISO 10140-2:2021
Classification Standard:	BS EN ISO 717-1:2020
Test Specimen:	PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk
Test date:	13th May 2025

Lic No: 711214
Dubai - U.A.E.

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LB-TEST-162

REPORT REGISTER

The following report register documents the development and issue of this and any subsequent report as undertaken by our office, in accordance with the *Quality Assurance* policy of DARL.

Our Reference	Remarks	Issue Date
132T005	Sound Insulation Test Report	13th May 2025

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Prepared by	Raees Faki Acoustic Testing Engineer	19.05.2025
Reviewed by	Paul Schwarz Laboratory Director	19.05.2025

Revision	Notes	Date
00		19.05.2025

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1.0 INTRODUCTION

General

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Purpose of Report

DARL has undertaken laboratory airborne sound insulation testing of PSB Acoustic Fire Rated, Double Leaf Door-64mm Thk at the DARL testing facilities, Jebel Ali Industries 3, Dubai.

It is understood that samples are required to be tested according to the BS EN ISO 10140-2:2021.

To achieve that DARL has conducted a sound transmission test according to EIAC accredited BS EN ISO 10140:2021 "Laboratory measurement of sound insulation of building elements Part 2: Measurement of airborne sound insulation".

The Weighted Sound Reduction Index (R_w) was determined in accordance with the BS EN ISO 717-1:2020 "Acoustics – Rating of sound insulation in buildings and of building element – Part 1: Airborne sound insulation".

Construction/mounting of the PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk System were carried out on the 13th May 2025 and measurements were undertaken on the 13th May 2025 under controlled conditions.

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2.0 RESULTS SUMMARY

Fully tabulated measurement data and plotted results can be found towards the end of this report. In summary, the specimens submitted for sound insulation testing achieved the following result:

PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk
Weighted Sound Reduction Index: **R_w (C; C_{tr}) = 39 (-1;-3) dB**

The result applies to the sample as received and is related only to the tested item and laboratory conditions as described in the report. The laboratory can make no judgment about the representativity of the tested sample. The test report ahead is valid as long as the tested constructions and/or materials are unchanged.

The laboratory certificate can be found in Appendix A.

The Weighted Sound Reduction Index (R_w) was determined in accordance with the BS EN ISO 717-1:2020 "Acoustics – Rating of sound insulation in buildings and of building element – Part 1: Airborne sound insulation" and is based on a result obtained by laboratory measurements.

3.0 MEASUREMENT & METHODOLOGY CRITERIA

Measurements were undertaken in accordance with BS EN ISO 10140-2:2021 "*Acoustics – Laboratory measurement of sound insulation of building elements – part 2: Measurement of airborne sound insulation*", and calculations undertaken and rated in accordance with BE EN ISO 717-1:2020 "*Rating of Sound Insulation in Buildings and Building Elements*", making full allowance for current acoustic industry discussions surrounding measurement methodology and accuracy concerning laboratory sound insulation testing and equipment configurations.

Laboratory conditions and construction details are presented in Appendix B.

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4.0 TEST EQUIPMENT AND PROCEDURES

Measurements were undertaken with the following calibrated equipment –

Equipment	Type	DARL Ref	Serial No.	Calibration Due Date
Type 1 professional Sound Level Meter	NTi XL2 Analyzer	DARL – NTi – XL2 – S6i1	A2A-14135-E0	25-July-26
Microphone	Nti Audio M2211	DARL–NTiMA220-7458-S6i4	7458	30-July-26
Calibrator	Castle GA607	DARL–Castle GA607-S6i2	044739	30-July-26
Nti/Neutrik	Minirator MR Pro	DARL- MR-RAHSQ-S3i3	G2P- RAHSQ–G0	-
Loudspeaker	6 x Yamaha DSR115	-	n/a	-
Loudspeaker	Yamaha DSR118W	-	n/a	-

Table 1: Test equipment details.

Calibrations of the XL2 Type 1 sound level meters were undertaken before and after each measurement session. It was noted that no significant level of calibration drift have occurred (less than 0.1dB).

Testing Methodology

Sound insulation testing was undertaken in accordance with BS EN ISO 10140-2:2021 *"Acoustics – Laboratory measurement of sound insulation of building elements – part 2: Measurement of airborne sound insulation", the reverberation time measured, as described in BS EN ISO 10140-4:2021 "Acoustics - Laboratory measurement of sound insulation of building elements - Part 4: Measurement procedures and requirements"*. The testing and data collection procedures were arranged to satisfy the following requirements of the testing standard such as:

- the number of microphone positions
- the distance between source and microphone position
- the distance between source/microphone position and the room boundaries
- the distance between two sources/microphones positions
- the distance between the microphone position and the tested specimen

The sections below provide a summary of the test procedure detailed within the standard.

Airborne Sound Insulation Testing - Summary of Test Procedure

- Pink noise is generated in the 'source' room that a diffuse sound field is created within the room. Spatially averaged noise levels in each one-third octave band (50 - 5000 Hz) are recorded in the 'source' and the 'receiving' room using the fixed microphone method. The spatially averaged measurements are recorded for 7 microphone positions in the

'receiving' and the 'source' room over a sample period of 15 seconds for each microphone position.

- Reverberation time measurements are undertaken based on interrupted noise method as described in ISO 3382-2:2008 "Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms" within the 'receiving' room using an interrupted pink noise source. Seven measurements of reverberation time are undertaken within the room using the fixed microphone method.

- Spatially averaged measurements of background noise are made within the 'receiving' room using the fixed microphone method. The spatially averaged measurements are recorded for 7 microphone positions in the 'receiving' room over a sample period of 15 seconds for each microphone position.

Airborne Sound Insulation Testing - Analysis of Results

The measured noise levels in the 'receive' room are first corrected for background noise and then subtracted from the measured noise levels in the 'source' room to obtain the sound level difference in each one-third octave band.

The sound level differences are then corrected for reverberation time in the receive room, which is taking into consideration the equivalent sound absorption area of the receive room and the area of the free test opening in which the test specimen is installed.

Following the above, each one-third octave band R-value is compared against a standard curve, as defined in BS EN ISO 717-1:2020, and shifted in 1dB increments until a point is found where the value of deviations on the measured curve from the standard curve is as close to 32dB as possible, but does not exceed this value. The value of the shifted standard curve in the 500 Hz one-third octave band center frequency band is then taken to be the single figure of the weighted sound reduction index (R_w).

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5.0 TEST SPECIMEN

It has been requested by Abanos Furniture & Decoration Industry LLC to undertake acoustic laboratory testing to acquire the acoustic rating for the PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk

On the day of testing 9th May 2025, the laboratory conditions were measured and are presented in the table below.

Air Temperature (°C)	34.6
Relative Humidity (%)	38
Static Pressure (hPa)	1024.7

Table 2: Laboratory conditions on the day of the test.

Description of the test element according to the data supplied by the client

1. PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk.
2. Frame: PSB (64X150)
3. Architrave:PSB (20X60)
4. Sealant -INCA-INSSS1186 Elastomeric Fire Caulk
5. PU Foam- Easy Foam Universal
6. Perimeter Seal On Frame -2nos Intumescent Strip 20x4mm Thk,ATHNER (FF2004D),ATHNER PS1212(BATWING)
7. Perimeter Seal On Door Leaf Meeting -Door(R) -2Nos Intumescent Strip 20x4mm Thk,ATHNER (FF2004D)
8. Perimeter Seal On Door Leaf Meeting -Door (L) -1Nos Intumescent Strip 20x4mm Thk,ATHNER (FF2004C)
9. Drop seal On Both Door -ATHMER SCHALL-EXL-14/35EK
10. 10MM Thk PU Foam (EasyFoam Universal) Around Perimeter)
11. 10mmx5mm Thk Caulking Using INCA INSS1186 Elastomeric Fire Caulk
12. 3mm Thk Mahogany Wood Lipping Around Door Leaf
13. 10mmx5mm Thk Caulking Using INCA INSS1186 Elastomeric Fire Caulk

Table 3: Test System Description

The dimensions of the test element are as follow –

Width (mm)	1900
Height (mm)	2394

Table 4: Test specimen dimensions.

During and after the testing it has been noticed that the test sample has not suffered visible damage.

Pictures of test specimen – on the day of the test

Figure 1: Tested sample- Source Side

Figure 2: Tested sample- Receiver Side

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Drawings – provided by the client

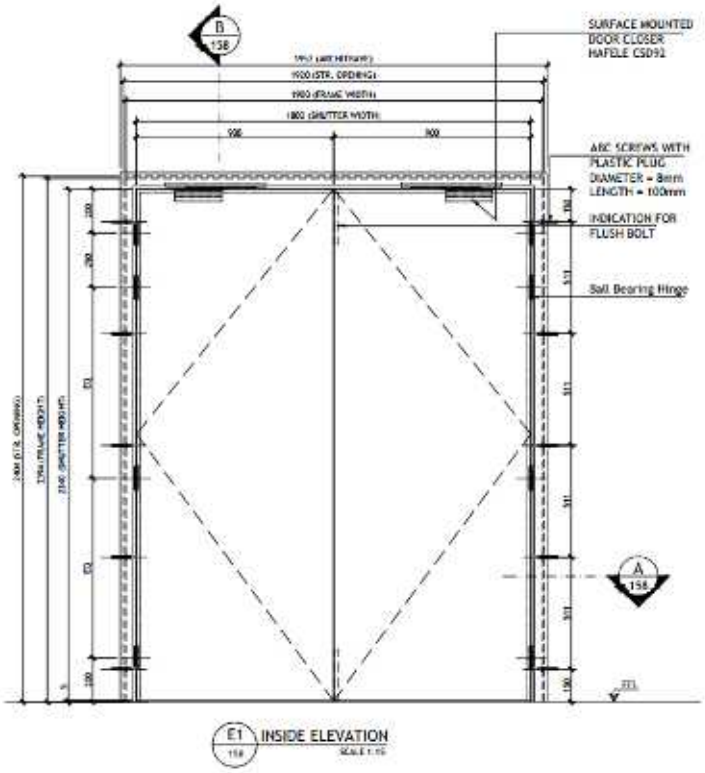

Figure 3: Inside Elevation

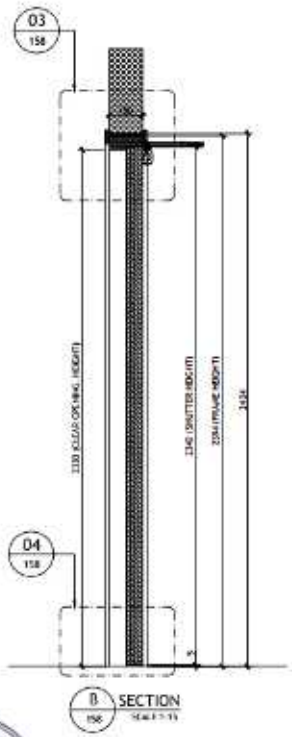

Figure 4: Section

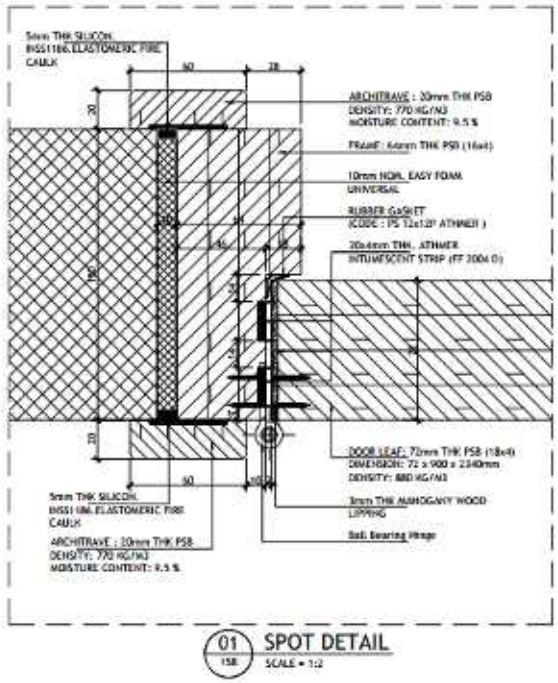

Figure 5: Door Other Details

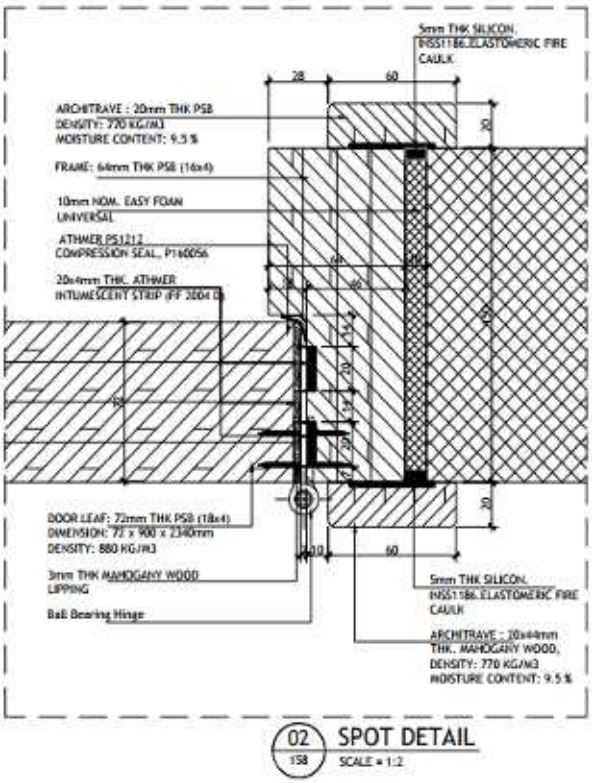

Figure 6: Door Other Details

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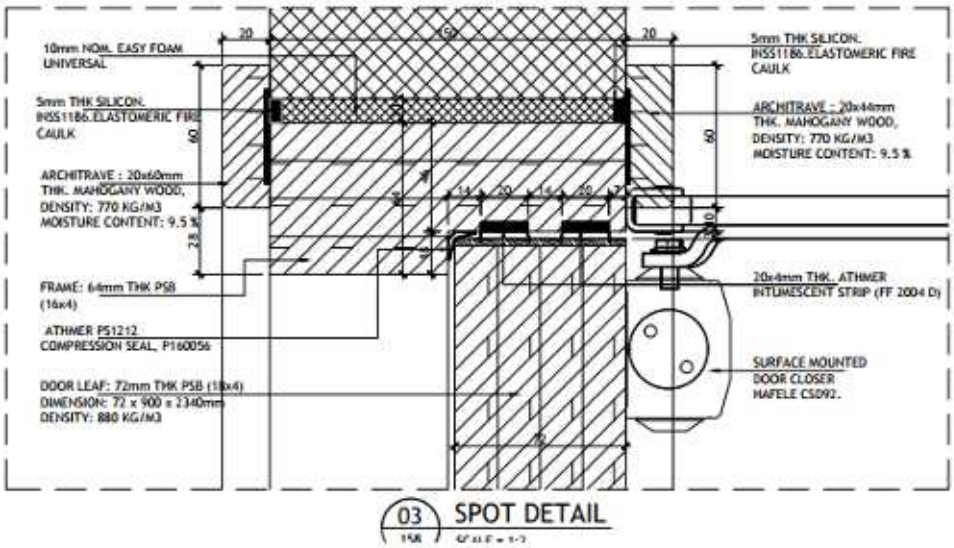

Figure 7: Door Other Details

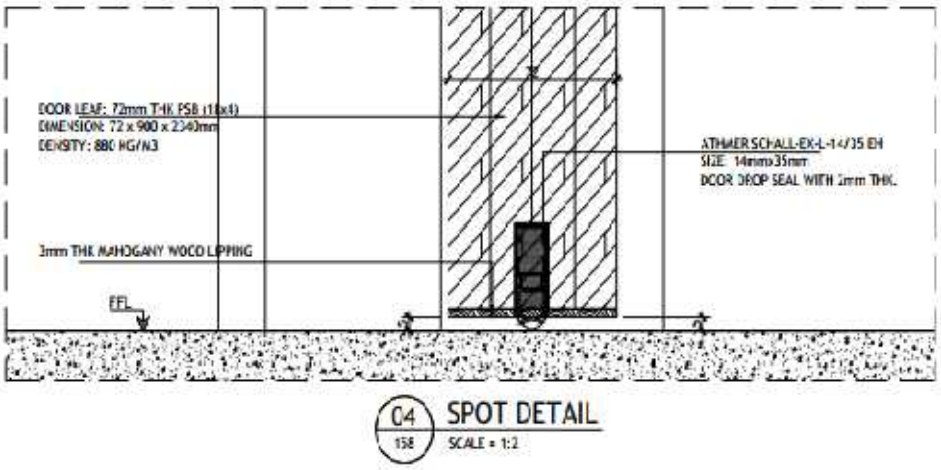

Figure 8: Door Other Details

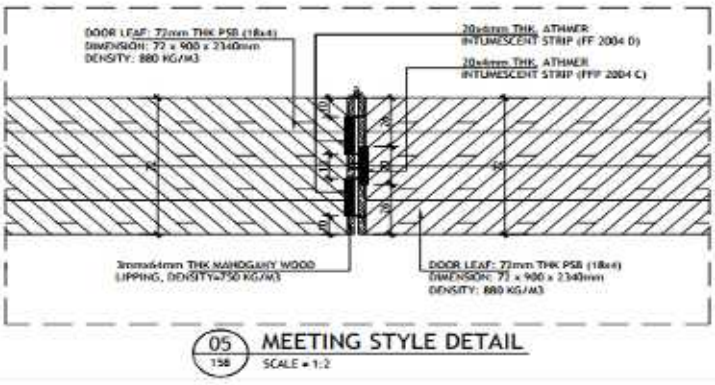

Figure 9: Door Other Details

6.0 MEASUREMENT DATA

Spatially-averaged measurement data is presented below –

Source SPL (dB)	Microphone position							
Frequency (Hz)	1	2	3	4	5	6	7	Average
50	111.6	111.4	110.0	111.4	110.4	109.1	105.3	110.3
63	116.8	114.6	112.3	117.7	113.4	112.6	111.2	114.7
80	114.1	111.6	111.7	118.6	110.9	112.9	118.7	115.2
100	117.8	112.1	110.5	116.8	113.5	113.2	116.6	115.1
125	122.8	118.3	116.4	120.4	114.0	114.6	117.6	118.7
160	118.1	112.2	112.5	116.9	114.6	115.5	117.4	115.8
200	114.8	109.6	109.0	113.2	109.8	108.8	113.7	111.9
250	115.1	114.5	113.9	113.6	111.7	112.4	113.3	113.6
315	113.0	113.3	113.6	114.3	111.7	113.0	112.4	113.1
400	112.9	112.8	111.9	111.9	110.5	111.6	111.7	112.0
500	111.8	110.3	109.7	109.7	109.9	110.1	110.8	110.4
630	109.7	108.3	108.1	109.8	107.7	108.9	109.1	108.9
800	108.1	107.8	106.9	107.6	107.5	107.9	107.1	107.6
1000	107.2	105.9	105.6	106.3	106.6	106.2	104.9	106.2
1250	104.4	103.8	103.3	103.1	103.6	102.8	102.9	103.4
1600	105.0	104.9	105.2	104.0	105.3	104.5	104.4	104.8
2000	107.4	107.7	108.0	106.8	106.7	107.1	106.6	107.2
2500	106.5	106.5	106.5	107.1	106.5	106.2	105.8	106.5
3150	105.6	105.5	105.2	105.1	105.0	105.4	104.9	105.2
4000	102.8	103.2	103.4	103.3	103.4	102.9	102.6	103.1
5000	103.6	103.2	103.5	103.0	103.3	102.9	102.5	103.2

Table 5: Measurement data - source room.

Receiver SPL (dB)	Microphone position							
Frequency (Hz)	1	2	3	4	5	6	7	Average
50	68.9	70.8	69.1	74.3	75.6	75.8	71.2	73.1
63	68.2	69.9	68.4	71.8	71.1	69.6	71.5	70.3
80	68.0	72.2	71.2	77.4	74.7	72.5	74.8	73.8
100	69.0	72.7	74.7	72.5	73.5	74.3	74.3	73.3
125	73.7	72.5	71.9	74.7	72.9	74.1	72.8	73.3
160	70.0	75.2	71.0	73.0	73.2	71.8	74.7	73.0
200	66.8	64.1	63.5	65.2	66.1	67.1	68.5	66.2
250	63.2	62.4	62.9	64.9	64.8	65.8	64.8	64.3
315	61.3	63.6	62.4	62.8	62.9	64.5	64.0	63.2
400	62.5	62.3	61.6	61.5	63.2	63.0	62.7	62.4
500	63.8	63.2	62.9	63.6	63.5	64.9	66.0	64.1
630	62.1	61.1	60.9	62.3	63.7	62.4	64.4	62.6
800	55.7	56.0	54.9	56.2	56.9	56.7	56.7	56.2
1000	55.4	53.9	54.0	54.4	54.9	53.7	54.7	54.5
1250	47.4	47.8	47.8	48.8	48.4	48.2	48.6	48.2
1600	46.3	46.4	46.7	45.8	46.4	46.4	46.8	46.4
2000	47.0	46.2	46.7	46.6	46.3	47.2	47.6	46.8
2500	45.0	45.4	45.5	45.8	46.1	46.7	47.6	46.1
3150	42.2	42.9	43.0	42.9	42.9	44.1	43.7	43.1
4000	37.6	38.4	38.5	38.4	38.5	39.8	39.6	38.7
5000	35.5	35.9	36.0	35.9	35.7	38.2	37.5	36.5

Table 6: Measurement data - receiver room.

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Background SPL (dB)	Microphone position							
Frequency (Hz)	1	2	3	4	5	6	7	Average
50	34.9	43.5	46.3	41.7	43.8	38.0	44.6	43.1
63	35.5	38.4	41.5	37.8	43.8	34.6	42.7	40.4
80	34.6	38.4	37.1	33.7	38.8	32.2	35.4	36.3
100	26.2	35.6	30.7	26.5	30.1	27.1	28.1	30.5
125	21.5	34.2	26.9	25.5	24.6	23.2	25.8	28.1
160	16.8	19.4	19.1	24.2	20.7	21.6	21.5	21.0
200	10.1	12.4	11.8	10.8	13.8	9.1	14.0	12.0
250	10.6	16.3	12.2	8.7	16.4	9.1	9.8	13.0
315	7.2	10.8	7.9	7.4	7.2	7.1	7.8	8.1
400	6.7	6.6	6.6	6.5	6.5	6.5	6.7	6.6
500	6.5	6.5	6.4	6.5	6.5	6.6	6.6	6.5
630	6.6	6.7	6.7	6.5	6.4	6.6	6.8	6.6
800	6.8	7.1	6.8	6.9	6.8	6.9	7.0	6.9
1000	7.3	7.3	7.3	7.2	7.1	7.1	7.2	7.2
1250	7.8	7.9	7.6	7.8	7.6	7.7	7.8	7.7
1600	8.9	8.5	8.7	8.5	8.2	8.3	8.3	8.5
2000	9.1	8.9	8.7	8.8	8.7	8.7	8.7	8.8
2500	9.4	9.4	9.3	9.4	9.3	9.4	9.3	9.4
3150	9.9	9.9	9.9	9.9	9.8	9.9	9.8	9.9
4000	10.3	10.4	10.4	10.3	10.3	10.3	10.4	10.3
5000	10.8	10.7	10.7	10.8	10.7	10.7	10.7	10.7

Table 7: Measurement data - background noise in the receiver room.

Frequency (Hz)	Meas. RT60 (s)
50	1.09
63	1.37
80	1.29
100	1.51
125	1.40
160	1.66
200	1.42
250	1.41
315	1.31
400	1.22
500	1.15
630	1.05
800	1.05
1000	1.08
1250	1.10
1600	1.12
2000	1.16
2500	1.13
3150	1.15
4000	1.12
5000	1.02

Table 8: Reverberation time.

One-third octave band frequency (Hz)	R One-third octave band (dB)	R Octave band (dB)	Octave band frequency (Hz)
50	21.0		
63	30.9	24.8	63
80	28.9		
100	27.8		
125	33.4	30.6	125
160	33.1		
200	34.8		
250	36.6	36.2	250
315	37.6		
400	38.4		
500	35.4	35.9	500
630	34.6		
800	35.2		
1000	38.1	37.3	1000
1250	39.9		
1600	41.8		
2000	40.4	40.9	2000
2500	40.6		
3150	44.8		
4000	49.2	47.1	4000
5000	48.9		

Table 9: R-values in one-third and octave band 1.

Receive Room Volume (m²)	249
Test Sample surface area (m²)	4.73

Table 10: Receive room and test specimen specification.

End of Report

Author

Raees Faki
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For DARL

Verified

Paul Schwarz
Laboratory Director
For DARL

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APPENDIX A – LABORATORY CERTIFICATE

Sound Reduction Index, *R*, in accordance with ISO 10140-2

Product Name: PSB Acoustic Fire Rated, Double Leaf Door-72mm Thk

Client: Abanos Furniture & Decoration Industry LLC

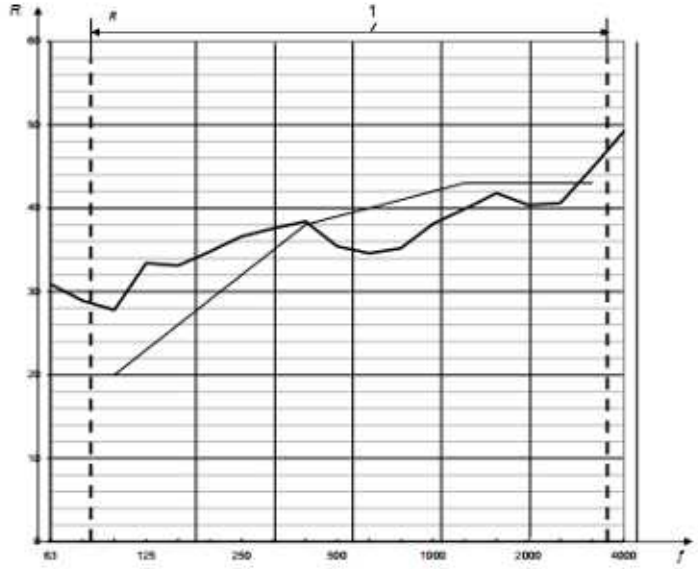
Date of test: 13/5/2025

Test room identification: DARL

Area, S, of test element: 4.73 m^2

Air temp. in the test rooms: 31.9 °C
Relative humidity in the test rooms: 37 %
Static pressure: 1019.0 *hPa*
Receiving room volume: 249 m^3

Frequency f *Hz*	*R* one-third octave dB
50	21.0
63	30.9
80	28.9
100	27.8
125	33.4
160	33.1
200	34.8
250	36.6
315	37.6
400	38.4
500	35.4
630	34.6
800	35.2
1000	38.1
1250	39.9
1600	41.8
2000	40.4
2500	40.6
3150	44.8
4000	49.2
5000	48.9



Key
R sound reduction index, in dB
f frequency, in Hz
1 frequency range for rating in accordance with the curve of reference values (ISO 717-1)

Rating in accordance with ISO 717-1:
$R_w (C; C_{tr})$ = **39 (-1;-2) dB** $C_{50\text{-}3150}$ = (0) dB; $C_{50\text{-}5000}$ = (0) dB; $C_{100\text{-}5000}$ = (0) dB

Evaluation based on laboratory measurements results obtained by an engineering method:
$C_{tr,50\text{-}3150}$ = (-3) dB; $C_{tr,50\text{-}5000}$ (-3) dB; $C_{tr,100\text{-}5000}$ = (-2) dB;

No. of test report: 132T005 Name of test institute: ISO Acoustic P&MTL

Date: 13/5/2025 Signature:

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APPENDIX B – LABORATORY CONDITIONS

The source room and receive room comprise a fully-enclosed space. The reverberant rooms are having the following details:

Room	Size (m)	Shape	Volume (m^3)	Total surface area (m^2)
Source	8.44 x 6.22	Rectangular	233	234
Receive	8.45 x 6.45	Rhombus	249	246

Table 11: Laboratory chamber dimensions and details

The source room is entirely separated from the receive room as such vibration cannot be transferred and interfere with the receive measurements.

The Laboratory frame (surrounding construction) comprises of 2040 mm reinforced concrete structure with vibration isolation pads in between the source and receive room frames. Source and receive room structures comprise of 325 mm thick isolated floating concrete floor with 450 mm thick sound insulated walls and double-leaf doors. The aperture to place the test specimen has an area size of $10m^2$.

In the receive room 14 diffusive panels of a total surface area of $28m^2$ are installed on the ceiling. Each panel (size: 1.00m x 2.00m) is made of 6mm thick MDF board.

It is considered that any potential flanking noise paths were sufficiently reduced to comply with the requirements of the ISO testing methodologies.

The maximum measurable sound reduction index ($R`_{max}$) has been measured according to the guidance provided in the ISO 10140-5, Appendix A.2.2.1.1 utilizing Type A Lightweight wall.

Frequency (Hz)	R'max (dB)
50	33.8
63	40.9
80	48.3
100	50.7
125	59.9
160	61.3
200	66.9
250	71.6
315	71.5
400	75.1
500	76.6
630	80.7
800	81.6
1000	82.6
1250	83.8
1600	83.4
2000	84.8
2500	82.3
3150	84.2
4000	83.8
5000	84.0

Table 12: Maximum measurable sound reduction index in one-third octave band.

The weighted sound reduction index is:

$R`_{w,\,max}$ = 79 dB.