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TEST REPORT

Sound Insulation Testing of a wall ventilation system to BS EN 13141-1:2019 in accordance with BS EN ISO 10140-2:2021.

Prepared for: SODAC Distribution Ltd.
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UKAS TESTING
0578

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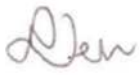
Signature	

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Position	Senior Acoustic Consultant
Date	07 April 2025
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1. Introduction

BRE Acoustics was commissioned by SODAC Distribution Ltd to carry out airborne sound insulation measurements in the BRE Horizontal Transmission Suite (Hall D, Building 14, BRE, Garston, Watford, Hertfordshire, WD25 9XX).

This report details the testing outlined in BRE proposal P129446.

2. Testing Details

2.1 Test dates and personnel

The measurement detailed in this report was completed by Mr N Dewhurst and Mr M Coleman of BRE Acoustics on the 3rd April 2025

2.2 Test methods and applicable standards

Measurement of airborne sound insulation were made in accordance with BS EN ISO 10140-1:2021 & BS EN ISO 10140-2:2021.

Airborne noise level measurements were undertaken in the source and receive rooms simultaneously, noise levels are created at pre-determined and qualified speaker positions using pink noise in the source room and the resultant noise level measured in the receive room.

The background noise level and reverberation times were measured and checked to be within limits.

Single number quantities were calculated in accordance with BS EN ISO 717-1:2020.

BRE Acoustics holds UKAS accreditation for the measurement of sound insulation in the laboratory.

The measurements were conducted using the procedures accredited by UKAS.

2.3 Room conditions and further information

Table 1: Test room conditions

Test room	Temperature (ºC)	Relative humidity (%)	Barometric pressure (kPA)
Source	15	52	101.2
Receive	15	52	101.2

Sound Insulation Test Results (1/3rd octave band Information)

The sound insulation single figure test result is calculated using the 1/3rd octave data between 100 Hz and 3.15 kHz, all other 1/3rd octave data provided in the test result graph at the end of this report (namely 50 Hz, 63 Hz, 80 Hz, 4kHz & 5 kHz) are optional and provided for information purposes only, they must not be used to determine sound insulation performance at these frequencies.

Flanking Limits

The following value (R_{max}) was obtained using a plug-panel wall and an independent lining constructed with plasterboard on a timber frame in front of the plug panel system.

Construction over acoustic break 80 dB R_W

Figure 1: R_{max} 1/3rd octave data for plug-panel wall construction

Frequency *f* [Hz]	*R* 1/3 octave [dB]
50	36.3
63	42.5
80	46.6
100	50.8
125	56.6
160	61.0
200	65.9
250	73.3
315	77.1
400	78.3
500	81.5
630	82.0
800	86.9
1000	91.9
1250	93.3
1600	96.6
2000	96.7
2500	98.6
3150	99.9
4000	94.2
5000	88.0

Test Rooms Shape and Construction

The source room is a cuboid shape approx. 112 m^3 and the perimeter walls are constructed of 102 mm thick panel (Noise-Lock 2) made up with 1.6 mm plain galvanised face sheet and a 1.2 mm galvanised back sheet with an infill that consists of two layers of 12.5 mm Gyproc board with the remaining void filled with sound absorbing material.

The receive room is a cuboid shape approx. 70 m^3 and is a room in a room cavity wall construction. The outer wall leaf is made up of 100 mm blockwork with a 100 mm void to the inner wall mounted on the inner floating floor. Inner wall consists of Gyproc board and absorbent material.

The test aperture is 3 m high by 3.6 m wide and consists of two perimeter concrete rings with 2x embedded Uni-strut channels and 1x timber channel for fixings.

2.4 Test element installation

The drywall partition system was installed by BRE.

2.5 Instrumentation

The equipment used to conduct the tests is identified in **Table 2**, below.

Table 2: Equipment list

Instrument number	Equipment description	Manufacturer	Type	Serial number	Calibrate date
3110	Microphone Calibrator	B&K	4231	2175848	12/2026
3150/3151	Microphone	GRAS	40AE	37071/117036	12/2026
5167/5168	Microphone Preamplifier	GRAS	26CA	13085/13142	12/2026
5165/5166	Real Time Analyser	NOR	850	8501142	12/2026
6206/6207	Loudspeaker (Source)	B&K	4292	020005/014005	N/A
3214/3216	Loudspeaker (Receive)	NOR	270H	26257/26258	N/A
3226	Rotating Boom (Source)	NOR	212NA	10418	N/A
5169	Rotating Boom (Receive)	NOR	265	29412	N/A
6866	Hygrometer	Rotronic	BL-1D	A23010113	09/2025

The gain of the real time analyser was adjusted to give a reading 113.9 dB at 1 kHz using the B&K Type 4231 calibrator.

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

2.6 Construction details with test numbers and sound insulation test results

Table 3 below, lists each test element along with its corresponding test number, construction details and weighted sound reduction index ($D_{n,e,w}$).

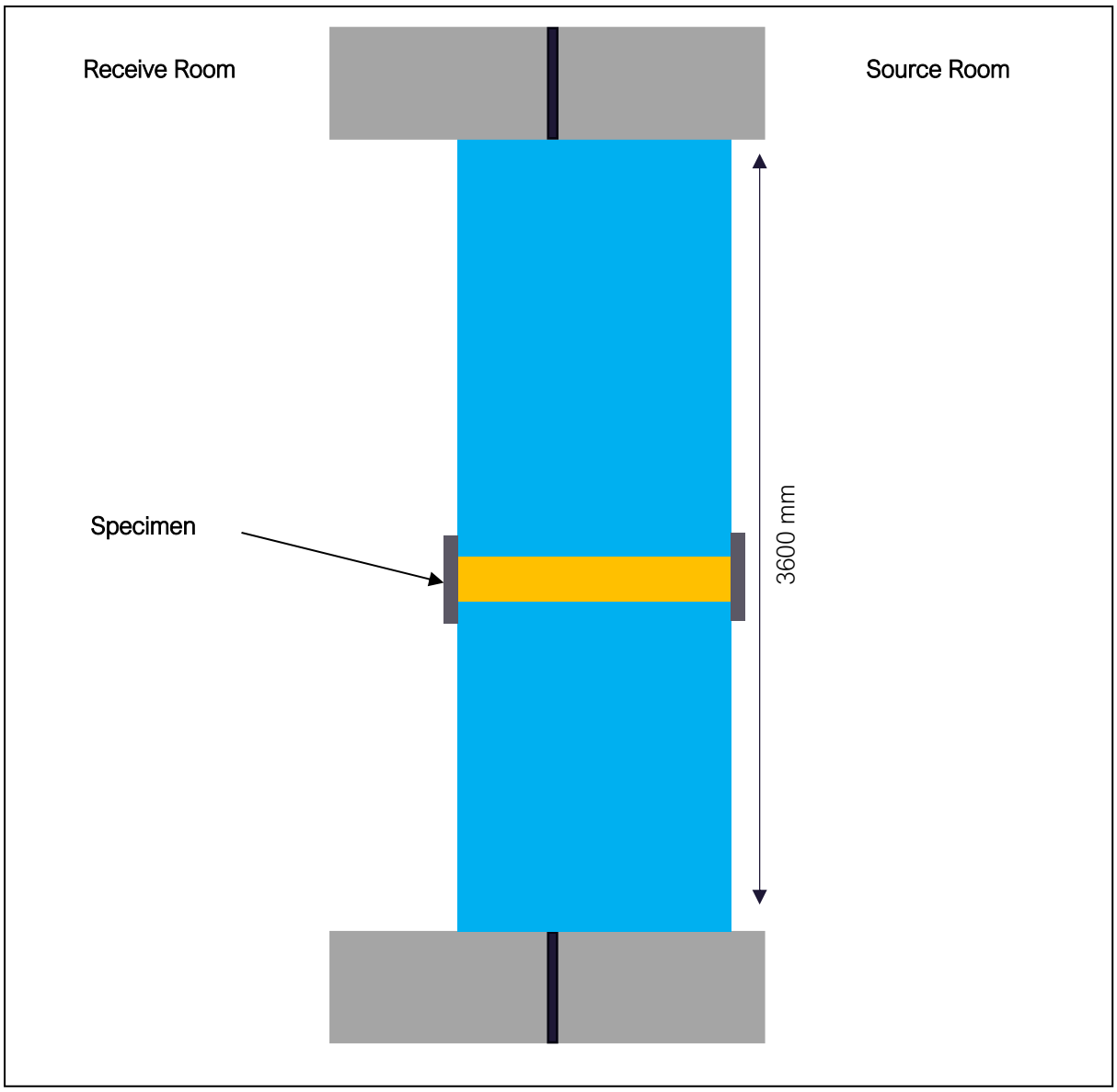
Table 3: Construction details with test numbers and sound insulation test results

Test number	Test element	Construction details	$D_{n,e,w}$ (C;Ctr) (dB)
L124-157	Drywall partition	Two layers 15 mm sound reducing board on both sides of a timber twin frame separated by 300 mm cavity, fully filled with 210 mm mineral wall. Taped joints.	66 (-1; -5)
L124-158	Wall ventilator	SODAC Throughwall ventilation – Open	42 (0; -2)
L124-159	Wall ventilator	SODAC Throughwall ventilation – Closed	47 (0; -2)

2.7 Plans

The position of the drywall partition tested in the transmission suite aperture is indicated in **Figure 2**, below.

Figure 2: Plan through elevation showing the approximate position of the test sample in the transmission suite aperture.



2.8 Photographs

Photographs taken during the testing process are shown below.

Photograph 1: SODAC passive wall ventilation, external grill surface mounted (Source room).

Photograph 2: SODAC passive wall ventilation, internal grill surface mounted (Receive room).

3. Appendices

3.1 Test results sheets

Page Number	Test Number
9	L124-157
10	L124-158
11	L124-159

4.Amendments

4.1 Amendment table

Issue	Amendment	Date of change
1	Original	19th March 2025
2	Build detail in wall construction on graph altered to match that of the tabulated results.	21st March 2025
3	Removed reference to Noise Insulation Regulations (NIR 1996) due to wrong use. Re-tested test sample as original test results were replaced with erroneous test data.	3rd April 2025

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Level difference according to BS EN ISO 10140-2

Laboratory measurement of sound insulation of building elements

Test Laboratory: BRE Transmission Suite (Hall D)
Client: SODAC

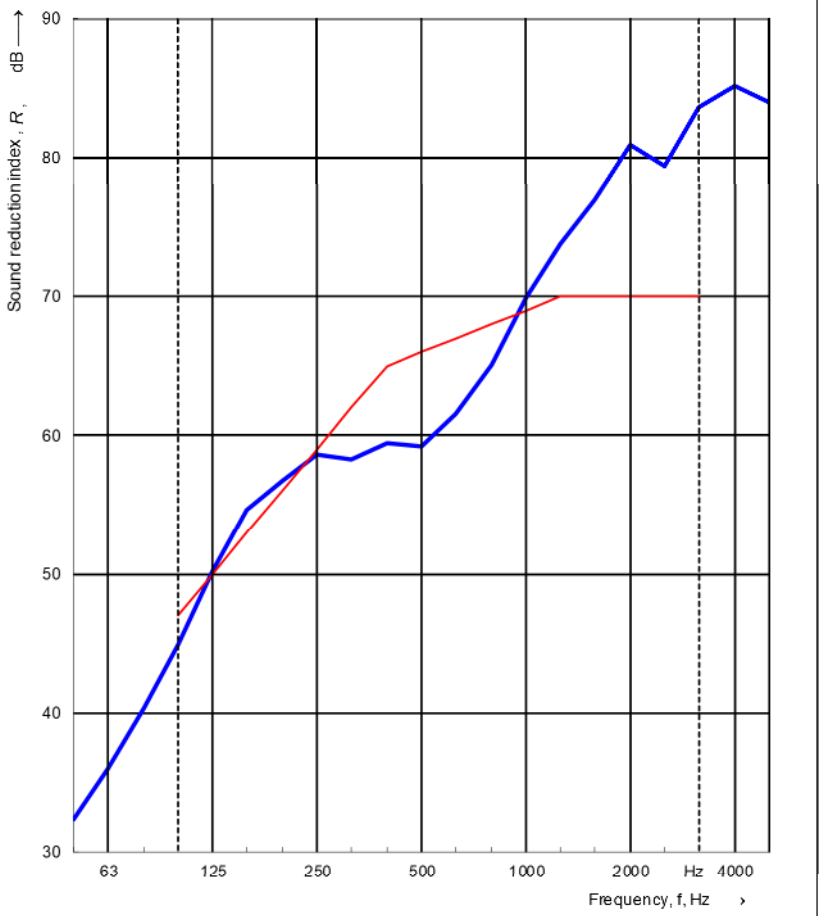
Date of test: 03/04/2025 **Test Number:** 124-157

Test specimen installed by: BRE
Product identification: Wall commissioning

Description of the specimen: Two layers 15 mm sound reducing board on both sides of a timber twin frame separated by 300 mm cavity,fully filled with 210 mm mineral wall. Taped joints.

Static pressure:	101.2 kPa	**Area, S, of test element:**	10.8 m²
Air temperature:	15 °C	**Source room volume:**	112 m³
Relative air humidity:	52 %	**Receiving room volume:**	71 m³

Frequency *f* [Hz]	*R* 1/3 octave [dB]
50	32.3
63	36.0
80	40.3
100	44.9
125	50.2
160	54.6
200	56.8
250	58.6
315	58.3
400	59.5
500	59.2
630	61.6
800	65.1
1000	69.9
1250	73.8
1600	76.9
2000	80.9
2500	79.4
3150	83.6
4000	85.1
5000	84.0



Rating according to ISO 717-1

$R_w(C;C_{tr})$ = 66 (-1 ; -5) dB

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method.

$C_{50\text{-}3150}$ = -3 dB $C_{50\text{-}5000}$ = -2 dB $C_{100\text{-}5000}$ = 0 dB

$C_{tr,50\text{-}3150}$ = -13 dB $C_{tr,50\text{-}5000}$ = -13 dB $C_{tr,100\text{-}5000}$ = -5 dB

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 (Rw) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

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Level difference according to BS EN ISO 10140-2

Laboratory measurement of sound insulation of building elements

Test Room BRE Transmission Suite (Hall D)
Client: SODAC
Manufacturer: SODAC
Date of test: 03/04/2025 **Test Number:** 124-158

Test specimen mounted by: BRE

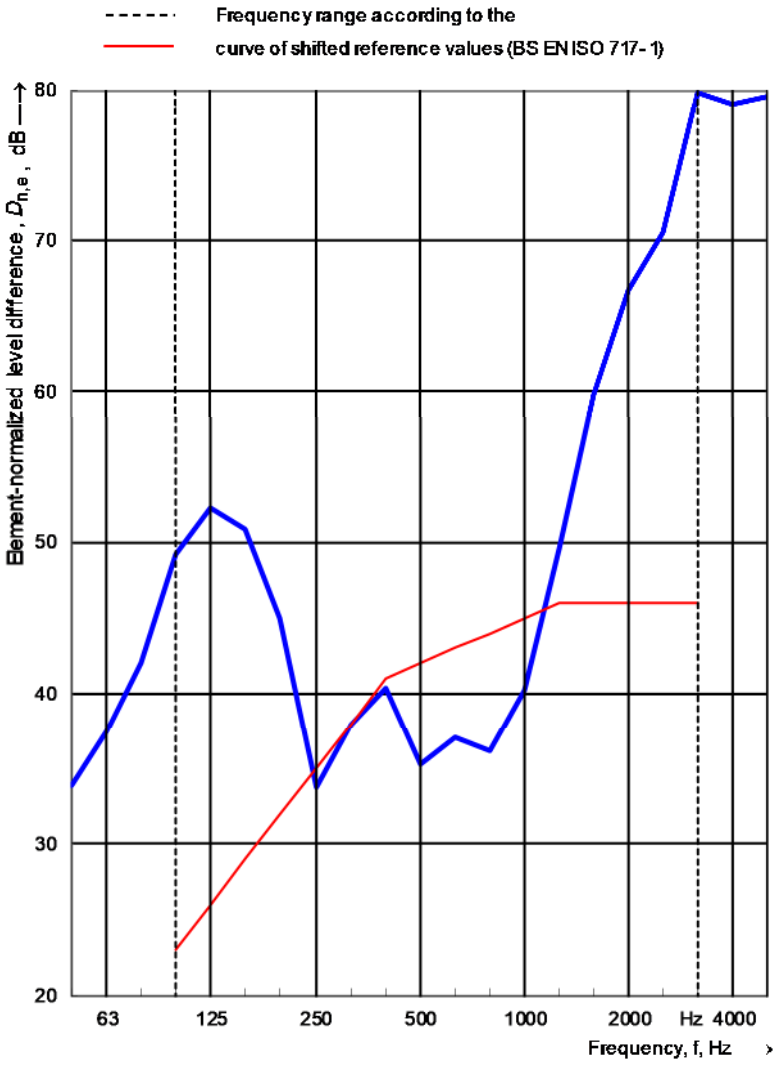
Product identification: Passive wall ventilation

Description of the specimen: SODAC Throughwall ventilation - Open

Static pressure: 101.2 kPa
Air temperature: 15.3 °C
Relative air humidity: 52.2 %

Area, S, of test element: 10.80 m²
Source room volume: 112 m³
Receiving room volume: 71.1 m³

Frequency f [Hz]	$D_{n,e}$ 1/3 octave [dB]
50	33.9
63	37.4
80	42.0
100	49.2
125	52.2
160	50.8
200	45.0
250	33.7
315	38.0
400	40.4
500	35.2
630	37.0
800	36.1
1000	40.2
1250	49.6
1600	59.8
2000	66.7
2500	70.5
3150	79.8
4000	79.1
5000	79.6



Rating according to ISO 717-1

$D_{n,e,w}(C;C_{tr})$ = 42 (0 ; -2) dB

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method.

$C_{50\text{-}3150}$ = 0 dB $C_{50\text{-}5000}$ = 1 dB $C_{100\text{-}5000}$ = 1 dB
$C_{tr,50\text{-}3150}$ = -2 dB $C_{tr,50\text{-}5000}$ = -2 dB $C_{tr,100\text{-}5000}$ = -2 dB

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 (Rw) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

Level difference according to BS EN ISO 10140-2

Laboratory measurement of sound insulation of building elements

UKAS TESTING 0578

Test Room BRE Transmission Suite (Hall D)

Client: SODAC

Manufacturer: SODAC

Date of test: 03/04/2025 **Test Number:** 124-159

Test specimen mounted by: BRE

Product identification: Passive wall ventilation

Description of the specimen: SODAC Throughwall ventilation - Closed

Static pressure: 101.2 kPa

Air temperature: 15.3 °C

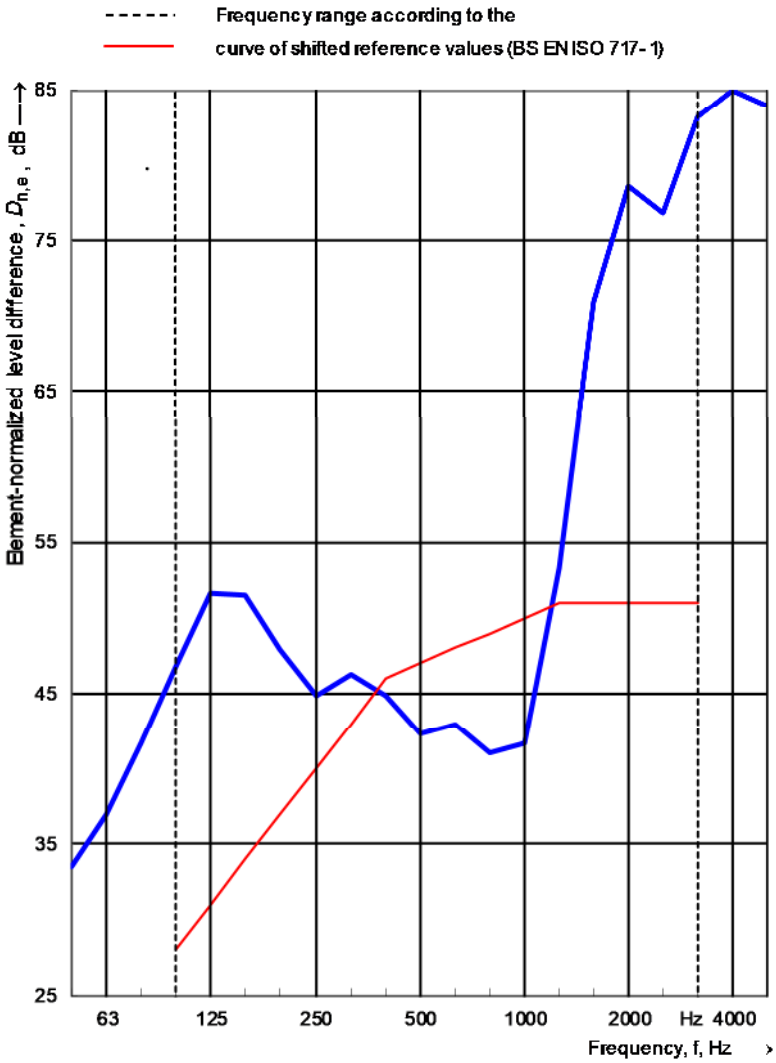
Relative air humidity: 52.2 %

Area, S, of test element: 10.80 m²

Source room volume: 112 m³

Receiving room volume: 71.1 m³

Frequency f [Hz]	$D_{n,e}$ 1/3 octave [dB]
50	33.5
63	37.0
80	41.6
100	46.8
125	51.6
160	51.5
200	47.9
250	44.8
315	46.3
400	44.8
500	42.3
630	43.0
800	41.0
1000	41.6
1250	53.3
1600	70.9
2000	78.6
2500	76.8
3150	83.1
4000	84.9
5000	83.9



Rating according to ISO 717-1

$D_{n,e,w}(C;C_{tr})$ = 47 (0 ; -2) dB

Evaluation based on laboratory measurement results obtained in one-third-octave bands by an engineering method.

$C_{50\text{-}3150}$ = 0 dB $C_{50\text{-}5000}$ = 1 dB $C_{100\text{-}5000}$ = 1 dB

$C_{tr,50\text{-}3150}$ = -3 dB $C_{tr,50\text{-}5000}$ = -3 dB $C_{tr,100\text{-}5000}$ = -2 dB

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 (Rw) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves (R)

REPORT ENDS