

bre

**Laboratory Airborne
Sound Insulation of Stud
Walls with Warmcel 500
Insulation**

Prepared for:

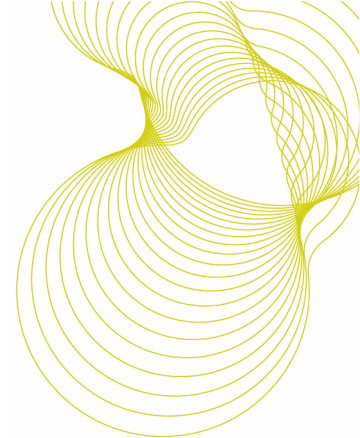
**Excel Industries Limited
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18th June 2010

Test report number 262776



0578



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Position Acoustics Laboratory Manager

Date 18th June 2010

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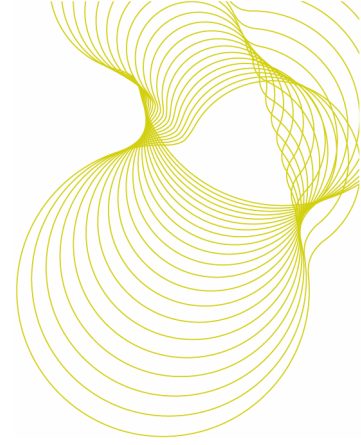
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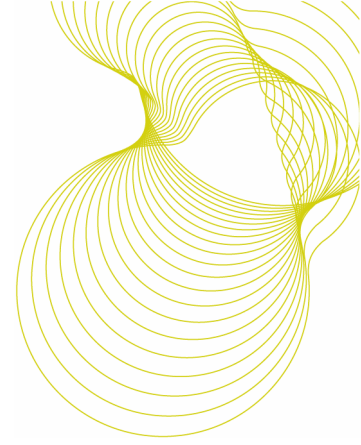
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1 Introduction

BRE Acoustics was commissioned by Excel Industries Limited to carry out airborne sound insulation measurements in the BRE horizontal transmission suite (Building 9) on stud walls with Warmcel 500 insulation, BRE, Garston, Watford, Hertfordshire, WD25 9XX. The materials were received on 3rd June to B9.

This report details the testing outlined in BRE proposal 10009 - 127091.

2 Testing details

2.1 Test dates and personnel

The measurements detailed in this report were made on 7th-8th June 2010 by Mr I West of BRE Acoustics.

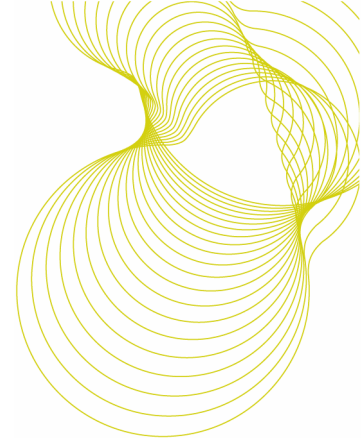
2.2 Test method and applicable standards

Measurement of airborne sound insulation was made in accordance with BS EN ISO 140-3:1995. Single number quantities were calculated in accordance with BS EN ISO 717-1:1997.

BRE Acoustics holds UKAS accreditation for the measurement of sound insulation in the field and the laboratory. The measurements were conducted using the procedures accredited by UKAS.

2.3 Test element installation

The test constructions were installed by BRE.



2.4 Instrumentation

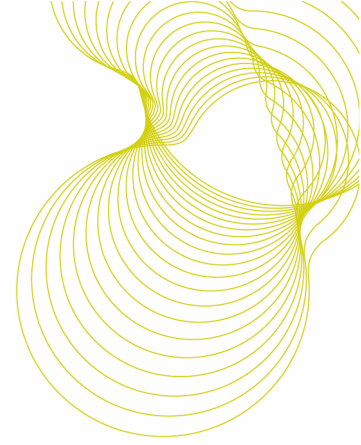
The equipment used to conduct the tests is identified in Table 1.

Table 1 Equipment list

Equipment description	Manufacturer	Type	UKAS identification number
Microphone Calibrator	NOR	1253	01/008
Microphone	B&K	4188-A-O	02/203
Microphone Preamplifier	B&K	2671	04/203
Microphone	B&K	4188-A-O	02/204
Microphone Preamplifier	B&K	2671	04/204
Microphone Adapter	NOR	NE1449	06/101, 06/102
Graphic Equaliser	Phonic	PEQ3300	10/002
Amplifier	NOR	260H	11/013
Real Time Analyser	NOR	840	13/003
Microphone Rotating Boom	NOR	212NA	14/004, 14/005
Loudspeaker	B&K	4224	11/006
Dodec speaker	Norsonic	270H	11/014, 11/016

The gain of the real time analyser was adjusted to give a reading of 124.0 dB at 250 Hz using the NOR type 1253 calibrator.

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

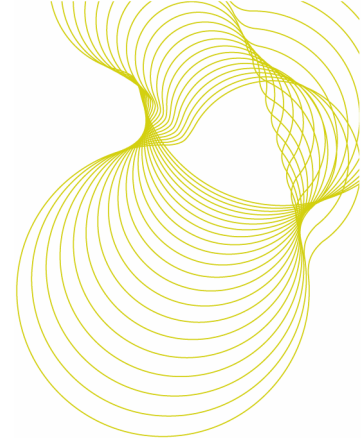


2.5 Test numbers

Table 2 lists each test element along with its corresponding test number. The construction details for each test element can be found from **Table 3** by referring to the test number.

Table 2 Test numbers

Test number	Test element	Source room volume (m ³)	Receive room volume (m ³)	Common area (m ²)
L110-057	Wall	130	115	9.8
L110-058	Wall	130	115	9.8

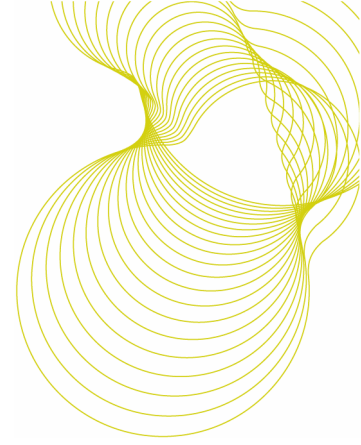


2.6 Construction details with test numbers & sound insulation test results

The construction details are shown in **Table 3**. When construction details are provided by a third party, they are checked by BRE where possible.

Table 3 Construction details

Test element	Test number	Construction details	R_w (C; C_{tr}) (dB)
Wall	L110-057	<ul style="list-style-type: none"> •1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed) •89mm Canadian timber studs (4.2kg/m²) •89mm cavity filled with Warmcel 500 (4.1kg/m²) •1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed) 	43(-2; -7)
	L110-058	<ul style="list-style-type: none"> •1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed) •89mm Canadian timber studs (4.2kg/m²) •89mm cavity filled with Warmcel 500 (4.1kg/m²) •1x12.5mm Knauf Soundshield (12.0kg/m²) (taped and sealed, perimeter sealed) 	45(-1; -7)



2.7 Plans

The position of the test element in the transmission suite aperture is indicated in

Figure 1.

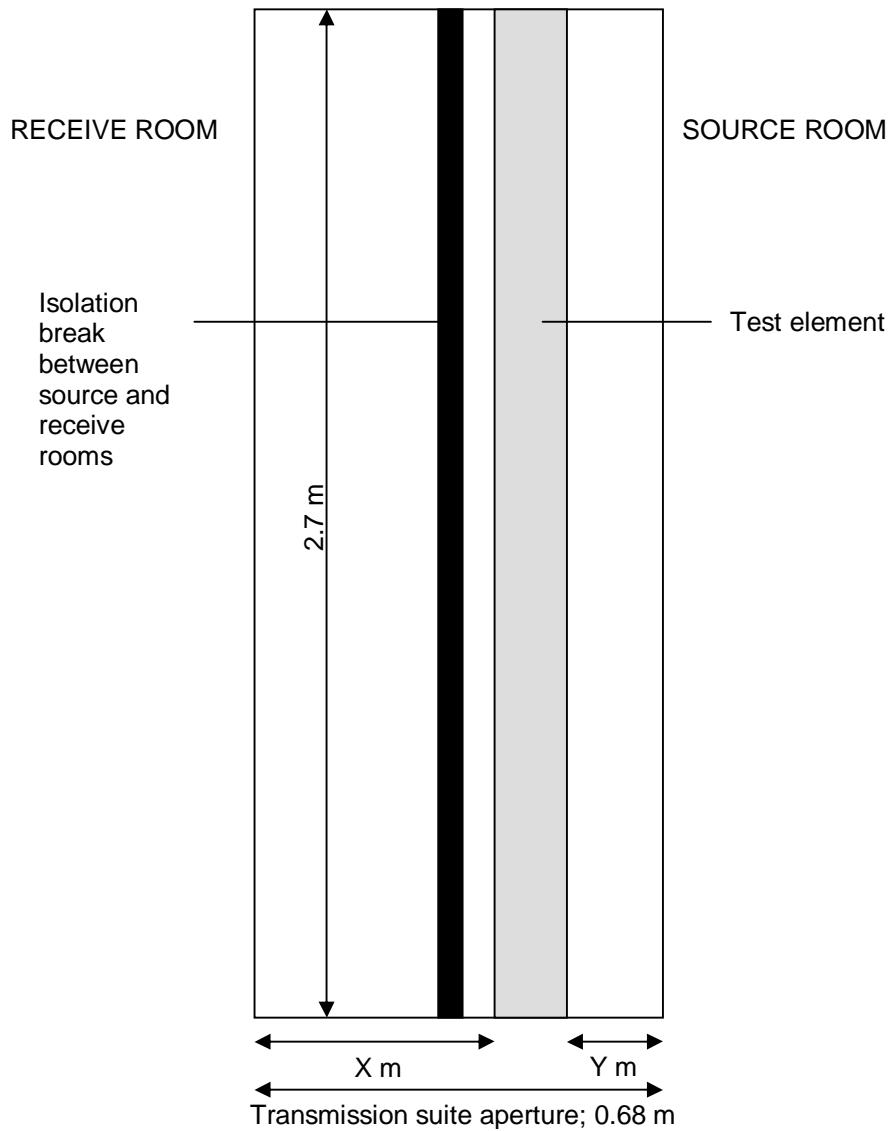
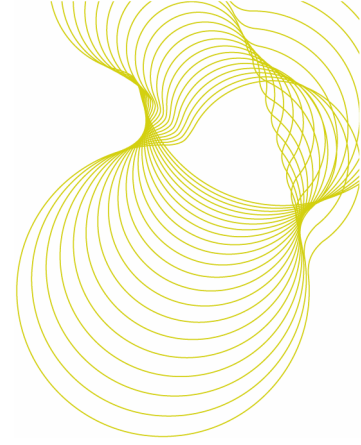


Figure 1 Section through elevation showing the position of the walls in the transmission suite aperture

L110-057 & 058

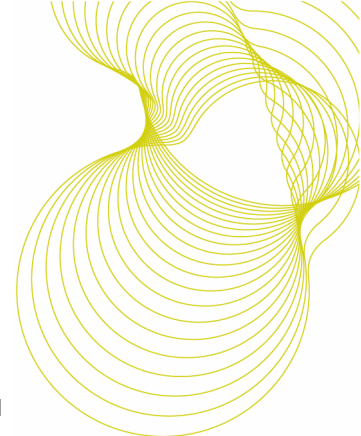
X = 0.38m and Y = 0.08m



3 Appendices

3.1 UKAS test result sheets

Page number	Test number
10	L110-057
12	L110-058



Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9)

Client: Excel Industries Limited

Test date: 07/06/2010

Test number: L110-057

Test element: wall

0578

Test element area: 9.8 m²

Mass per unit area:

25 kg/m²

Description:

- 1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed)
- 89mm Canadian timber studs (4.2kg/m²) •89mm cavity filled with Warmcel 500 (4.1kg/m²)
- 1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed)

Source room volume: 130 m³

Air temperature:

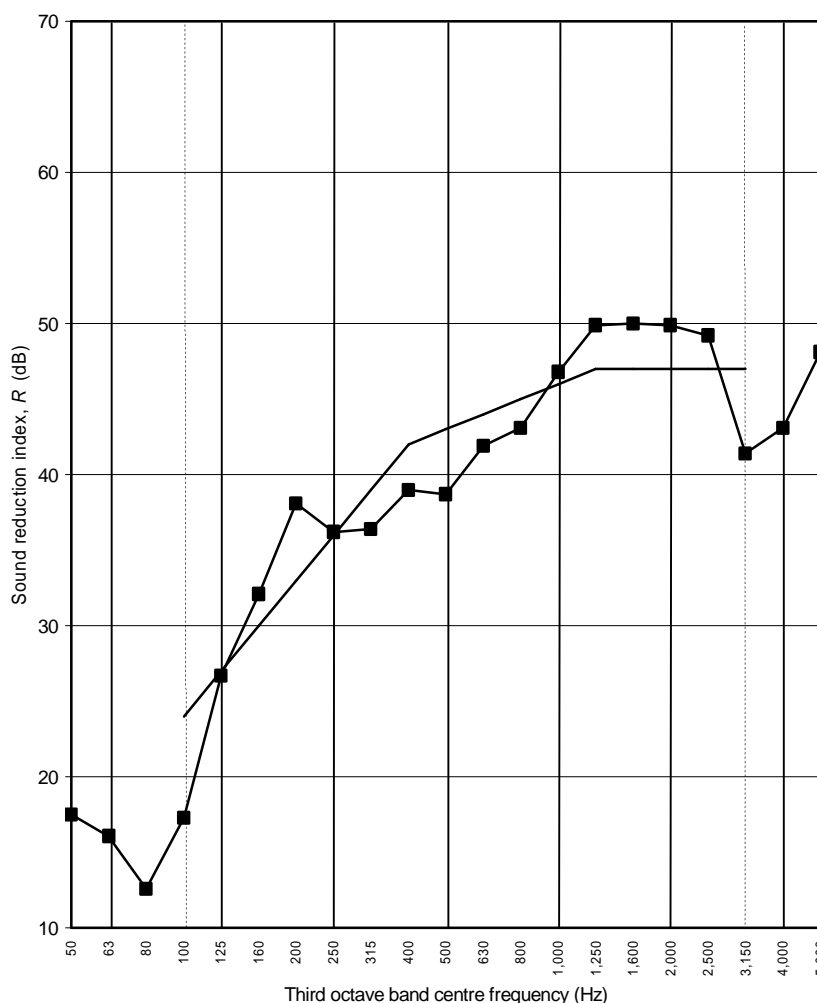
19 °C

Receive room volume: 115 m³

Air relative humidity:

65 %

Frequency (Hz)	R One-third octave (dB)
50	17.5
63	16.1
80	12.6
100	17.3
125	26.7
160	32.1
200	38.1
250	36.2
315	36.4
400	39.0
500	38.7
630	41.9
800	43.1
1,000	46.8
1,250	49.9
1,600	50.0
2,000	49.9
2,500	49.2
3,150	41.4
4,000	43.1
5,000	48.1



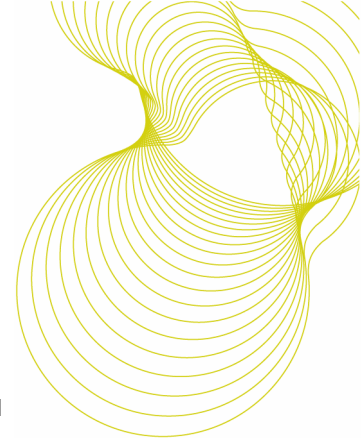
Rating according to BS EN ISO 717-1:1997

$R_w (C; C_{tr}) = 43 (-2; -7) \text{ dB}$ $C_{50-3150} = -3 \text{ dB}$ $C_{50-5000} = -3 \text{ dB}$ $C_{100-5000} = -1 \text{ dB}$
 $C_{tr,50-3150} = -12 \text{ dB}$ $C_{tr,50-5000} = -12 \text{ dB}$ $C_{tr,100-5000} = -7 \text{ dB}$

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed $\pm 1 \text{ dB}$ for the single-number quantity (R_w) 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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Laboratory measurement of airborne sound insulation of building elements
Sound reduction index according to BS EN ISO 140-3:1995
BRE horizontal transmission suite (B9)

Client: Excel Industries Limited

Test date: 08/06/2010

Test number: L110-058

Test element: wall

0578

Test element area: 9.8 m²

Mass per unit area: 29 kg/m²

Description:

- 1x12.5mm Knauf standard wallboard (8.2kg/m²) (taped and sealed, perimeter sealed)
- 89mm Canadian timber studs (4.2kg/m²) •89mm cavity filled with Warmcel 500 (4.1kg/m²)
- 1x12.5mm Knauf Soundshield (12.0kg/m²) (taped and sealed, perimeter sealed)

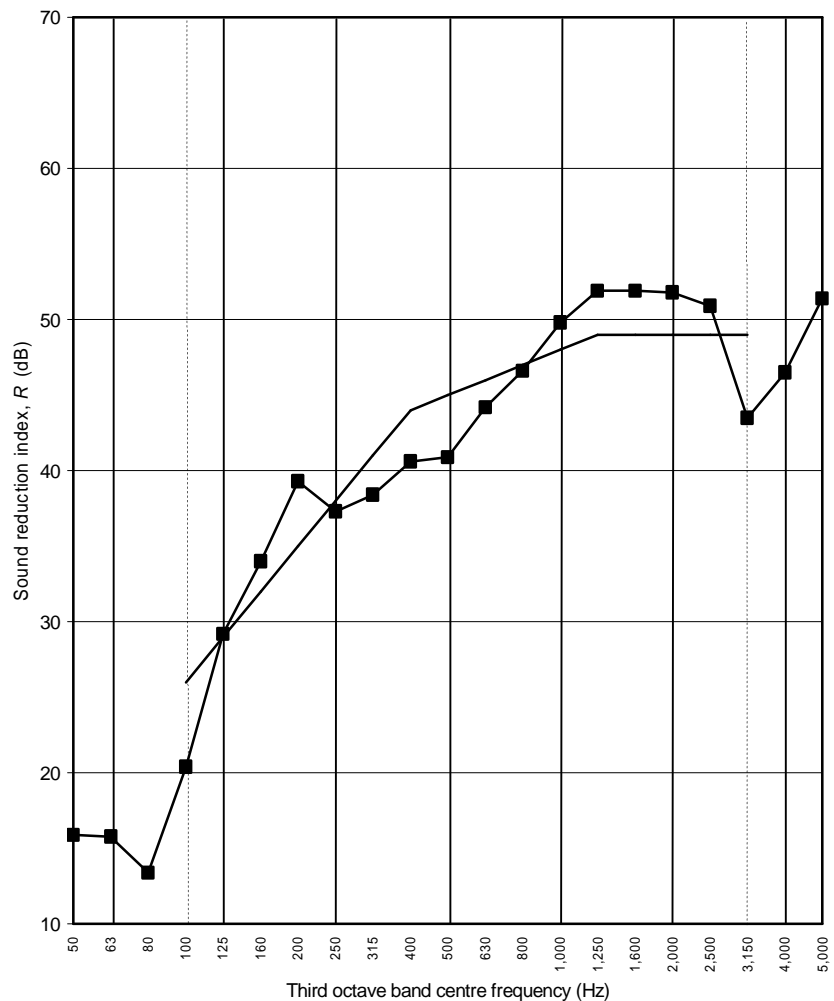
Source room volume: 130 m³

Air temperature: 20 °C

Receive room volume: 115 m³

Air relative humidity: 67 %

Frequency (Hz)	R One-third octave (dB)
50	15.9
63	15.8
80	13.4
100	20.4
125	29.2
160	34.0
200	39.3
250	37.3
315	38.4
400	40.6
500	40.9
630	44.2
800	46.6
1,000	49.8
1,250	51.9
1,600	51.9
2,000	51.8
2,500	50.9
3,150	43.5
4,000	46.5
5,000	51.4



Rating according to BS EN ISO 717-1:1997

$R_w (C; C_{tr}) = 45 (-1; -7) \text{ dB}$ $C_{50-3150} = -4 \text{ dB}$ $C_{50-5000} = -3 \text{ dB}$ $C_{100-5000} = -1 \text{ dB}$
 $C_{tr,50-3150} = -14 \text{ dB}$ $C_{tr,50-5000} = -14 \text{ dB}$ $C_{tr,100-5000} = -7 \text{ dB}$

Evaluation based on laboratory measurement results obtained by an engineering method

Based on the data provided in BS EN 20140-2:1993 it is estimated that the measurement uncertainty should not exceed $\pm 1 \text{ dB}$ for the single-number quantity (R_w) 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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