

bre

**Laboratory sound
insulation of Xella VHP
panel wall constructions**

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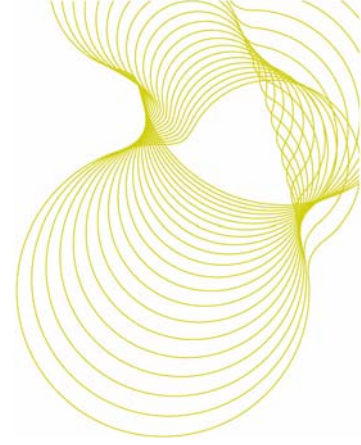
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13 December 2006

Test report number 233784



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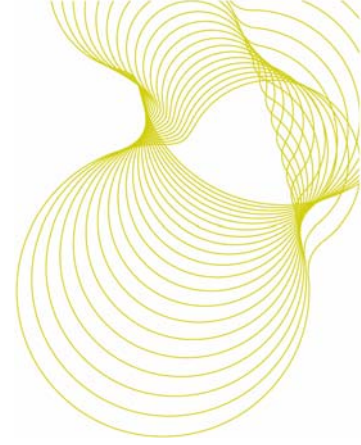
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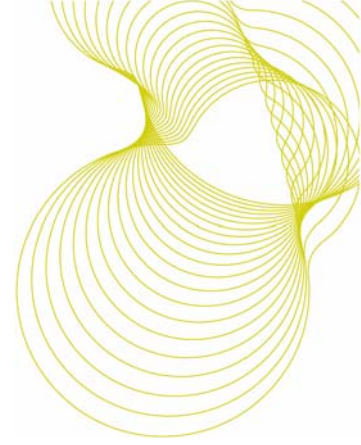
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1 Introduction

BRE Acoustics was commissioned by Xella to carry out airborne sound insulation measurements in the BRE horizontal transmission suite (Building 9), BRE, Garston, Watford, Hertfordshire, WD25 9XX.

This report details the testing outlined in BRE proposal 6087 - 118873.

2 Testing details

2.1 Test dates and personnel

The measurements detailed in this report were made on 05 December 2006 and 11 December 2006 by Mr M Robinson of BRE Acoustics.

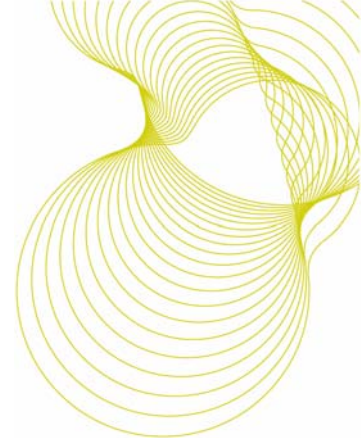
2.2 Test method and applicable standards

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 Xella.



2.4 Instrumentation

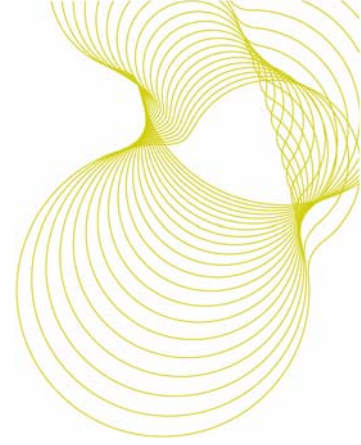
The equipment used to conduct the tests is identified in Table 1.

Table 1 Equipment list

Equipment description	Manufacturer	Type	UKAS identification number
Microphone Calibrator	B & K	4231	01/002
Microphone	GRAS	40AE	02/301, 02/306
Microphone Preamplifier	GRAS	26CA	04/301, 04/306
Microphone Adapter	NOR	1449	06/105, 06/106
Graphic Equaliser	Phonic	PEQ3300	10/001
Loudspeaker	B & K	4224	11/006
Amplifier	NOR	260H	11/013
Loudspeaker	NOR	270H	11/014
Real Time Analyser	NOR	840	13/003
Microphone Rotating Boom	B & K	3923	14/001, 14/002

The gain of the real time analyser was adjusted to give a reading of 94.0 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.

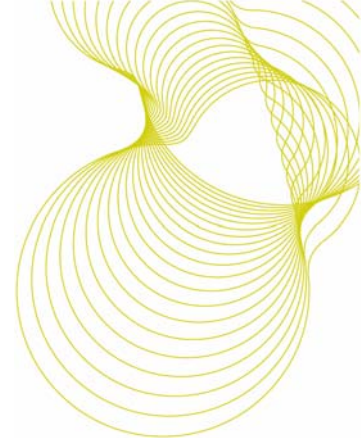


2.5 Test numbers

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 (m³)	Receive room volume (m³)	Common area (m²)
L106-203	Wall	130	115	9.8
L106-204	Wall	130	115	9.8

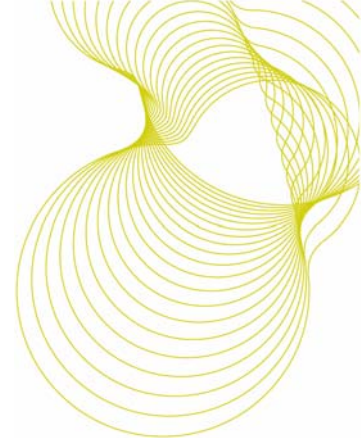


2.6 Construction details with test numbers

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
Wall	L106-203	<ul style="list-style-type: none"> • 12.5 mm Gyproc WallBoard (8.9 kg/m²) on dabs • 500 mm x 100 mm x 2720 mm Xella aircrete VHP panels, type G5/800 (750 kg/m³) • 12.5 mm Gyproc WallBoard (8.9 kg/m²) on dabs • all joints and perimeter sealed with Xella thin joint mortar
	L106-204	<ul style="list-style-type: none"> • Alltek Universal Red 200 skim coating (2 mm nominal thickness) (3.5 kg/m²) • Alltek Blue Lissage skim coating (2 mm nominal thickness) (3.5 kg/m²) • 500 mm x 100 mm x 2720 mm Xella aircrete VHP panels, type G5/800 (750 kg/m³) • Alltek Blue Lissage skim coating (2 mm nominal thickness) (3.5 kg/m²) • Alltek Universal Red 200 skim coating (2 mm nominal thickness) (3.5 kg/m²)

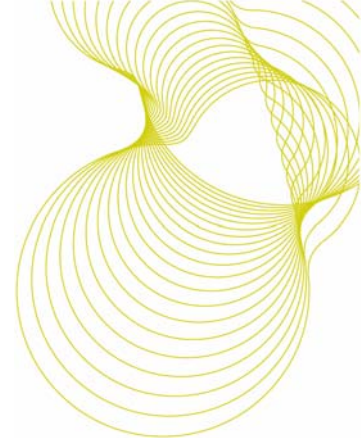


2.7 Sound insulation test results

The single number quantities for the sound insulation tests are shown in Table 4. The UKAS test result sheets are included in the appendices.

Table 4 Test results

Test number	$R_w (C; C_{tr})$ (dB)
L106-203	38 (-1;-5)
L106-204	41 (-1;-3)



2.8 Plans

The position of the VHP panel wall construction in the transmission suite aperture is indicated in Figure 1.

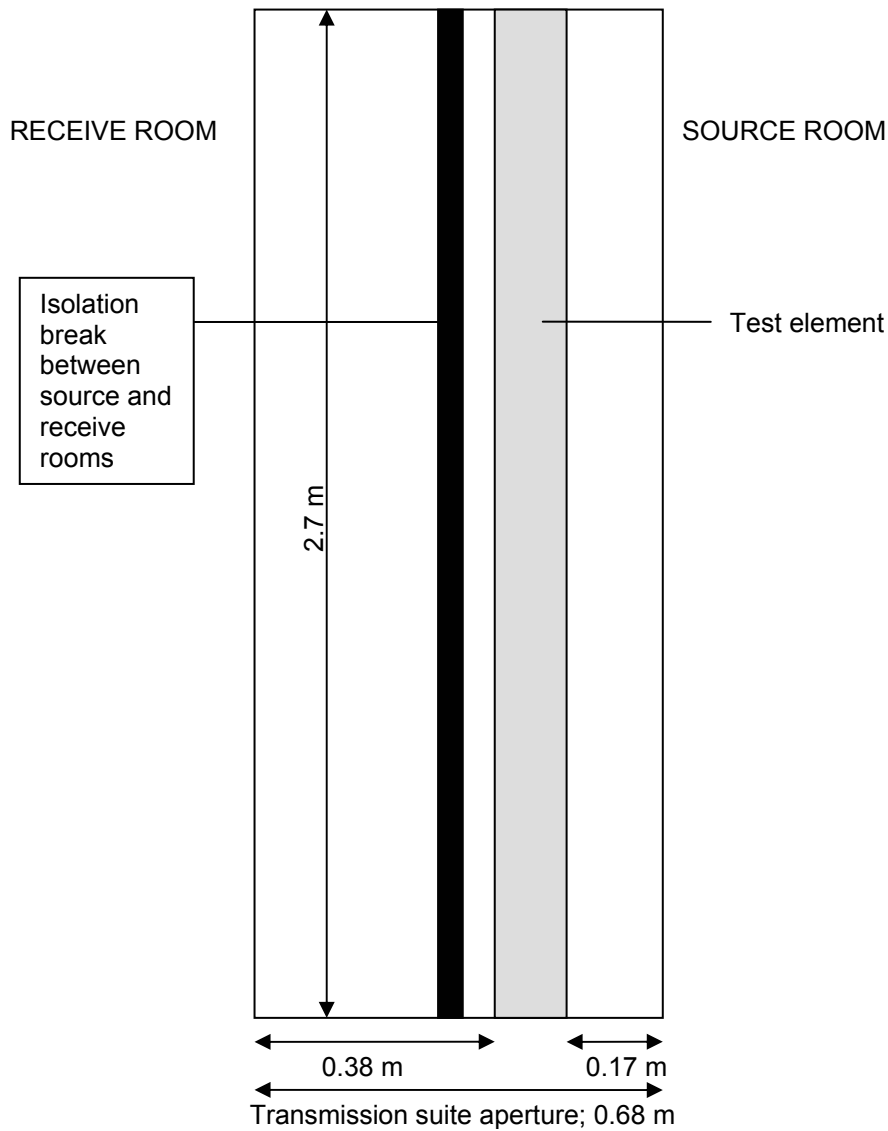
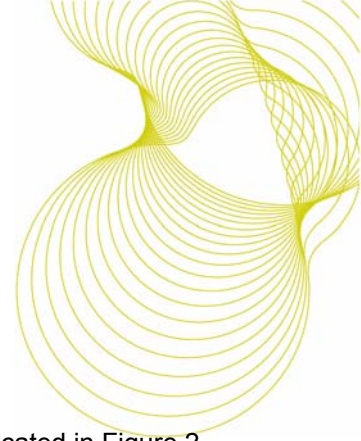


Figure 1 Section through elevation showing the position of the VHP panel wall construction in the transmission suite aperture as for test L106-203.



The position of the VHP panel wall construction in the transmission suite aperture is indicated in Figure 2.

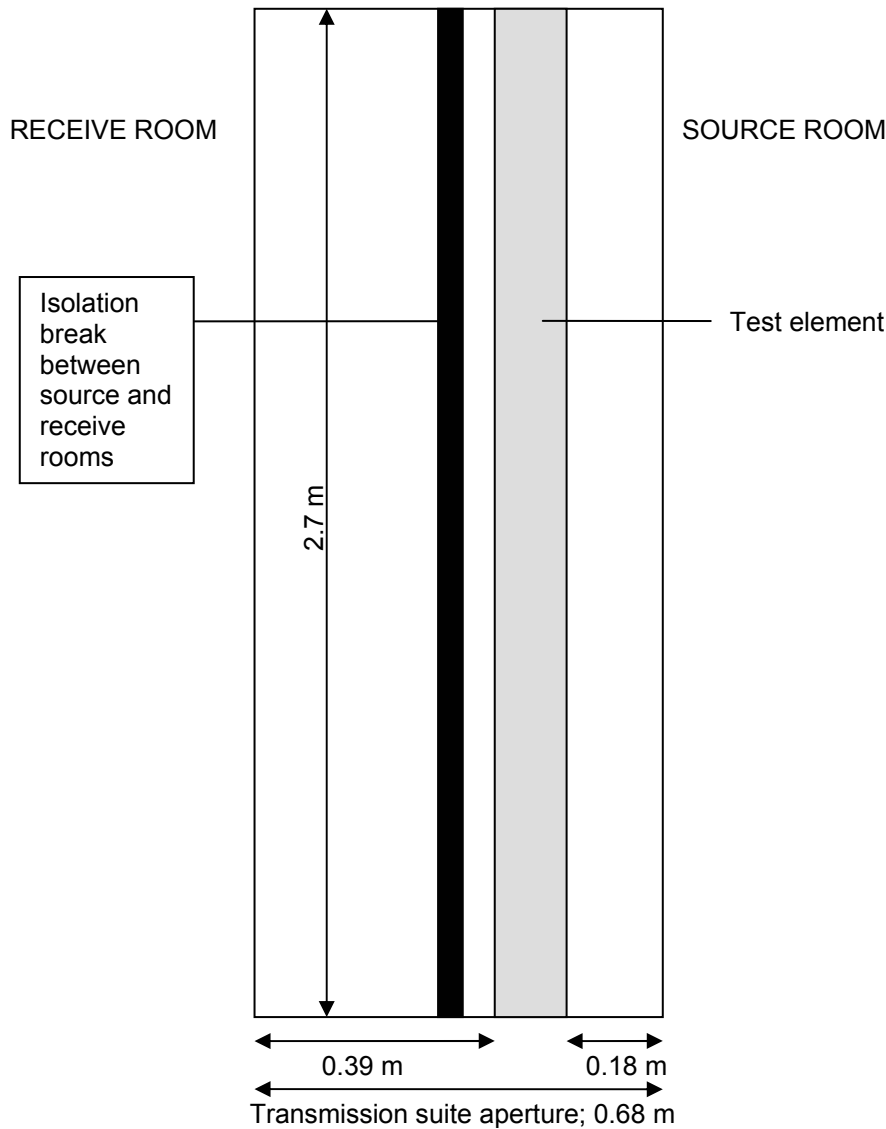
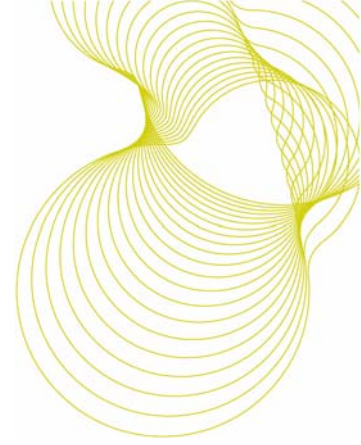


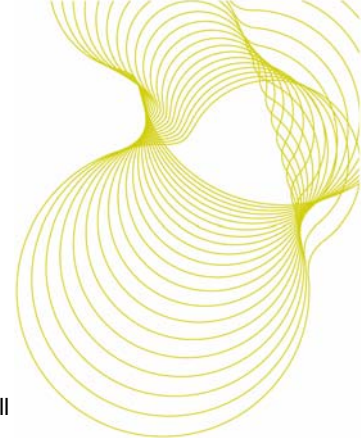
Figure 2 Section through elevation showing the position of the VHP panel wall construction in the transmission suite aperture as for test L106-204.



3 Appendices

3.1 UKAS test result sheets

Page number	Test number
12	L106-203
14	L106-204



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 051-053)

Client: Xella
Test date: 05/12/2006
Test number: L106-203
Test element: Wall

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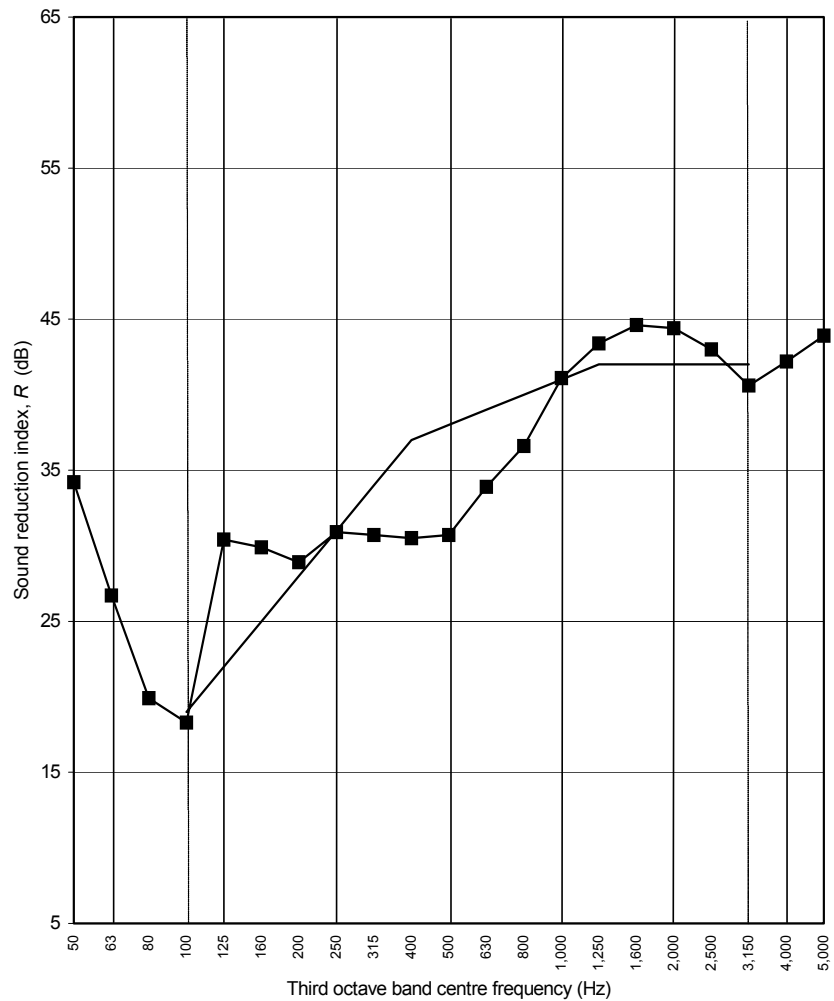
Test element area: 9.8 m² **Mass per unit area:** 93 kg/m²

Description:

12.5 mm Gyproc WallBoard (8.9 kg/m²) on dabs
 500 mm x 100 mm x 2720 mm Xella aircrete VHP panels, type G5/800 (750 kg/m³)
 12.5 mm Gyproc WallBoard (8.9 kg/m²) on dabs
 all joints and perimeter sealed with Xella thin joint mortar

Source room volume: 130 m³ **Air temperature:** 16 °C
Receive room volume: 115 m³ **Air relative humidity:** 69 %

Frequency (Hz)	R One-third octave (dB)
50	34.2
63	26.7
80	19.9
100	18.3
125	30.4
160	29.9
200	28.9
250	30.9
315	30.7
400	30.5
500	30.7
630	33.9
800	36.6
1,000	41.1
1,250	43.4
1,600	44.6
2,000	44.4
2,500	43.0
3,150	40.6
4,000	42.2
5,000	43.9



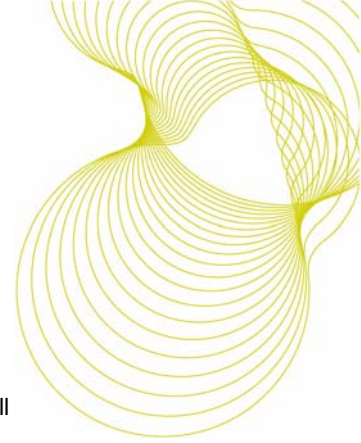
Rating according to BS EN ISO 717-1:1997

R_w (C; C_{tr}) = 38 (-1; -5) dB C₅₀₋₃₁₅₀ = -1 dB C₅₀₋₅₀₀₀ = -1 dB C₁₀₀₋₅₀₀₀ = -1 dB
 C_{tr,50-3150} = -5 dB C_{tr,50-5000} = -5 dB C_{tr,100-5000} = -5 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 ±1 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 051-053)

Client: Xella
Test date: 11/12/2006
Test number: L106-204
Test element: Wall

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Test element area: 9.8 m² **Mass per unit area:** 89 kg/m²

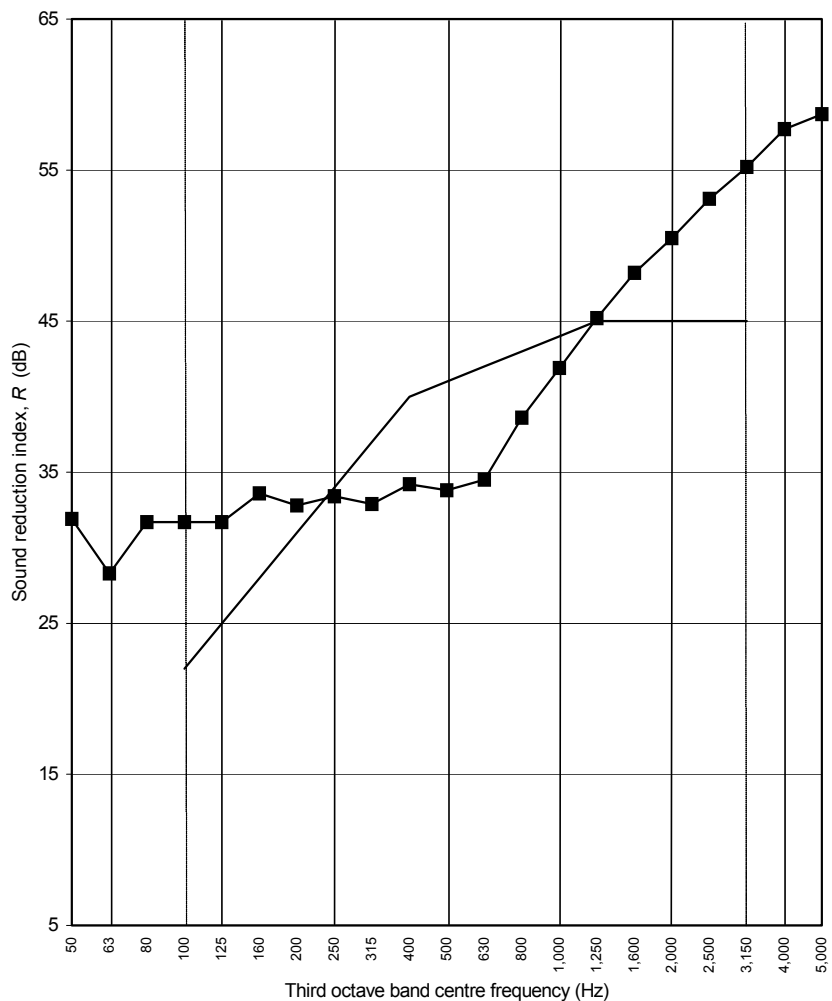
Description:

Alltek Universal Red 200 skim coating (2 mm nominal thickness) (3.5 kg/m²), Alltek Blue Lissage skim coating (2 mm nominal thickness) (3.5 kg/m²), 500 mm x 100 mm x 2720 mm Xella aircrete VHP panels, type G5/800 (750 kg/m³), Alltek Blue Lissage skim coating (2 mm nominal thickness) (3.5 kg/m²), Alltek Universal Red 200 skim coating (2 mm nominal thickness) (3.5 kg/m²).

Source room volume: 130 m³ **Air temperature:** 14 °C

Receive room volume: 115 m³ **Air relative humidity:** 77 %

Frequency (Hz)	R One-third octave (dB)
50	31.9
63	28.3
80	31.7
100	31.7
125	31.7
160	33.6
200	32.8
250	33.4
315	32.9
400	34.2
500	33.8
630	34.5
800	38.6
1,000	41.9
1,250	45.2
1,600	48.2
2,000	50.5
2,500	53.1
3,150	55.2
4,000	57.7
5,000	58.7



Rating according to BS EN ISO 717-1:1997

R_w (C; C_{tr}) = 41 (-1; -3) dB C₅₀₋₃₁₅₀ = -1 dB C₅₀₋₅₀₀₀ = 0 dB C₁₀₀₋₅₀₀₀ = 0 dB
 C_{tr,50-3150} = -4 dB C_{tr,50-5000} = -4 dB C_{tr,100-5000} = -3 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 ±1 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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