

bre

**Laboratory airborne  
sound insulation testing  
of Rytons Building  
Products Ltd ventilator  
systems**

Prepared for: Karen Jolley

Rytons Building Products Ltd

20 August 2007

Test report number 238655

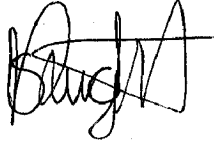


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building a better world

**Tested by**

Name Mr S Dwight  
Position Technician  
Date 20 August 2007  
Signature



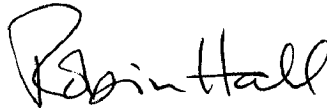
**Prepared by**

Name Mr A Heath  
Position Consultant  
Date 20 August 2007  
Signature



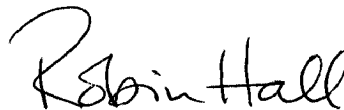
**Checked by**

Name ~~Mr~~ Mr G McCann  
Position Senior Consultant  
Date 20 August 2007  
Signature



**Approved on behalf of BRE**

Name Dr R Hall  
Position Principal Consultant  
Date 20 August 2007  
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## **1 Introduction**

BRE Acoustics was commissioned by Rytons Building Products Ltd 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 7020 - 120272.

## **2 Testing details**

### **2.1 Test dates and personnel**

The measurements detailed in this report were made between 18 July 2007 and 26 July 2007 by Mr A Heath, Mr S Dwight and Mr K Jaitly of BRE Acoustics.

### **2.2 Test method and applicable standards**

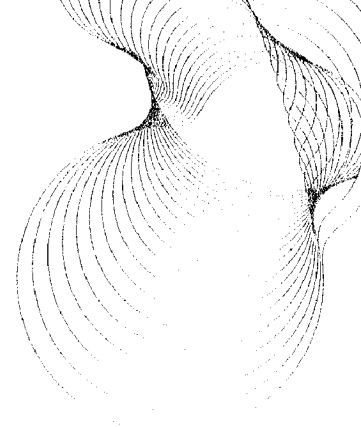
Measurement of airborne sound insulation was made in accordance with BS EN 20140-10:1992 and BS EN ISO 140-3:1995. First the airborne sound insulation of the filler wall was measured. After this, the airborne sound insulation of the filler wall with the different ventilator systems was measured.

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 filler wall was installed by BRE. The ventilator systems tested were supplied by Rytons Building Products Ltd and installed in the filler wall by BRE. Ventilators were installed with a simulated edge in the receive room in accordance with 6.2 and 6.3.1.2 of BS EN 20140-10:1992.



## 2.4 Instrumentation

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

**Table 1** Equipment list

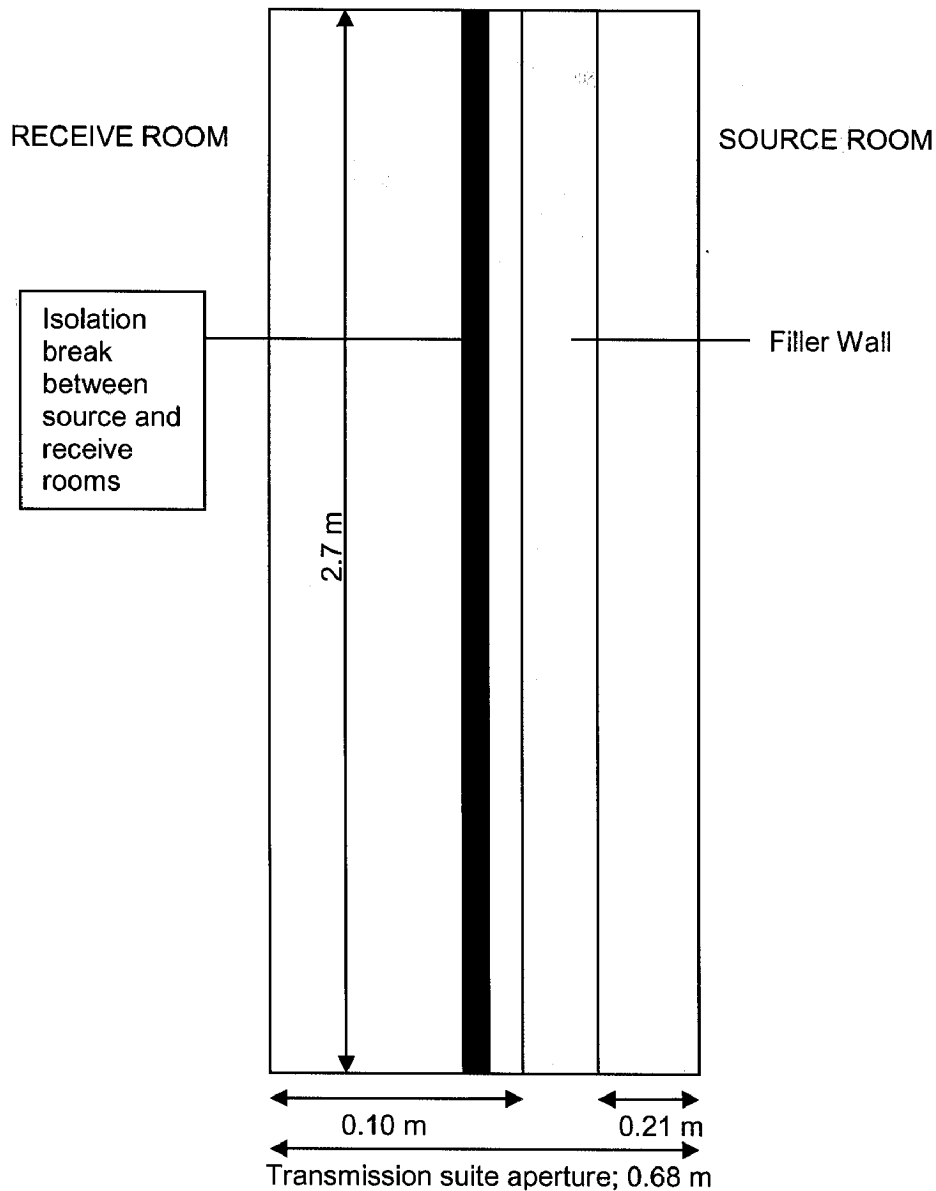
Equipment description	Manufacturer	Type	UKAS identification number
Microphone Calibrator	NOR	1253	01/006
Microphone	GRAS	40AE	02/302, 02/305
Microphone Preamplifier	GRAS	26CA	04/302, 04/305
Microphone Adapter	NOR	1449	06/105, 06/106
Graphic Equaliser	Phonic	PEQ3300	10/001
Real Time Analyser	NOR	840	13/003, 13/005
Microphone Rotating Boom	B & K	3923	14/001, 14/002
Loudspeaker	B&K	4224	11/006
Loudspeaker	NOR	270H	11/014, 11/016
Amplifier	NOR	260 H	11/013

The gain of the real time analyser was adjusted to give a reading of 124.0 dB at 250 Hz 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.

## 2.8 Plans

The position of the filler wall in the transmission suite aperture is indicated in Figure 1.



**Figure 1** Section through elevation showing the position of the filler wall in the transmission suite aperture



Laboratory airborne sound insulation testing of Rytons Building Products Ltd ventilator systems



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: Rytons Building Products Ltd

Test date: 18/07/2007

Test number: L107-131

Test element: Filler wall

0578

Test element area: 9.8 m<sup>2</sup>

Mass per unit area: 52 kg/m<sup>2</sup>

Description:

2x15 mm Standard Wallboard (10.0 kg/m<sup>2</sup>) screwed to, 50 mm x 100 mm timber studs at 600 mm centres

300 mm cavity between studs fully filled with isowool (mineral fibre),

50 mm x 100 mm timber studs at 600 mm centres

2x15 mm Standard Wallboard (10.0 kg/m<sup>2</sup>) screwed to studs.

Source room volume: 130 m<sup>3</sup>

Air temperature: 19 °C

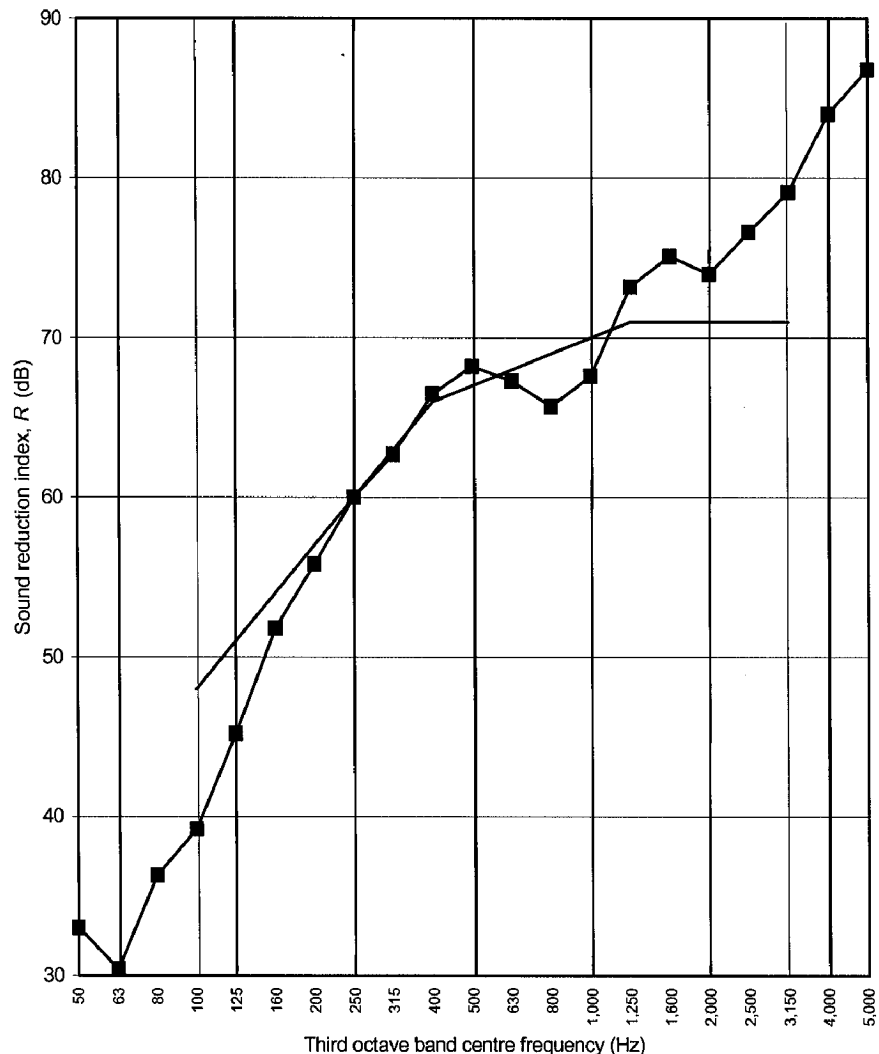
Receive room volume: 115 m<sup>3</sup>

Air relative humidity: 75 %

Frequency (Hz)	R One-third octave (dB)
50	33.0
63	30.4
80	36.3
100	39.2
125	45.2
160	51.8
200	55.8
250	60.0
315	62.7
400	66.5
500	68.2
630	67.3
800	65.7
1,000	67.6
1,250	73.2
1,600	75.1
2,000	74.0
2,500	76.6
3,150	79.1
4,000	84.0
5,000	86.8

+ Receiving room level adjusted for background

\* Receiving room level within 6 dB of background



Rating according to BS EN ISO 717-1:1997

**R<sub>w</sub> (C; C<sub>tr</sub>) = 67 (-3; -10) dB**

C <sub>50-3150</sub> = -6 dB	C <sub>50-5000</sub> = -5 dB	C <sub>100-5000</sub> = -2 dB
C <sub>tr,50-3150</sub> = -17 dB	C <sub>tr,50-5000</sub> = -17 dB	C <sub>tr,100-5000</sub> = -10 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<sub>w</sub>) 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 airborne sound insulation testing of Rytons Building Products Ltd ventilator systems



**Laboratory measurement of airborne sound insulation of small building elements**  
**Element-normalized level difference according to BS EN 20140-10:1992**  
**BRE horizontal transmission suite (B9 051-053)**

**Client:** Rytons Building Products Ltd

**Test date:** 23/07/2007

**Test number:** L107-153

**Test element:** Open window

0578

**Filler wall area:** 9.8 m<sup>2</sup>

**Description:**

TAL4SET ventilator assembly;  
 x1 MFAB, TAL4000 AirLiner, LF80 Internal

**Source room volume:** 130 m<sup>3</sup>

**Air temperature:** 19 °C

**Receive room volume:** 115 m<sup>3</sup>

**Air relative humidity:** 71 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	$D_{n,e}$ (dB)
50	2.64	26.3	91.8	58.9	35.7
63	1.76	20.8	100.0	69.4	31.7
80	1.98	14.4	99.4	64.5	36.6
100	1.69	13.0	100.3	59.1	42.1
125	1.98	9.2	102.9	60.5	44.1
160	1.74	21.1	102.3	59.8	42.7
200	2.00	37.0	102.3	57.5	45.2
250	1.80	15.4	100.1	58.0	42.0
315	1.64	15.8	100.0	66.0	33.5
400	1.66	19.2	99.6	65.3	33.9
500	1.64	11.4	99.0	61.3	37.1
630	1.58	10.8	98.4	61.7	36.1
800	1.50	10.0	97.5	62.8	33.8
1,000	1.50	17.5	96.3	60.2	35.2
1,250	1.49	10.9	98.1	56.2	40.9
1,600	1.49	5.7	99.0	58.9	39.1
2,000	1.52	6.2	97.5	56.1	40.5
2,500	1.51	7.2	97.8	55.9	41.0
3,150	1.50	9.4	98.1	54.7	42.5
4,000	1.40	10.8	98.9	52.1	45.6
5,000	1.26	8.1	95.8	47.7	46.4

x Adjusted for flanking transmission

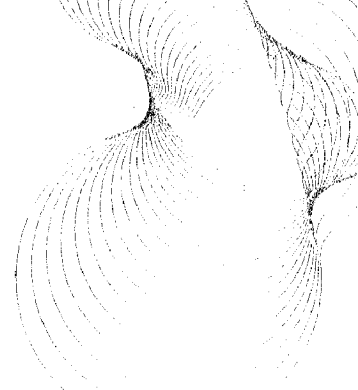
o Correction = 1.3 dB

Rating according to BS EN ISO 717-1:1997					
$D_{n,e,w}(C; C_{tr}) = 38 (0; -1) \text{ dB}$	$C_{50-3150} = 0 \text{ dB}$	$C_{50-5000} = 1 \text{ dB}$	$C_{100-5000} = 1 \text{ dB}$	$C_{tr,50-3150} = -1 \text{ dB}$	$C_{tr,100-5000} = -1 \text{ dB}$
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 ( $D_{n,e,w}$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves ( $D_{n,e,w}$ )					

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Laboratory airborne sound insulation testing of Rytons Building Products Ltd ventilator systems



Laboratory measurement of airborne sound insulation of small building elements  
 Element-normalized level difference according to BS EN 20140-10:1992  
 BRE horizontal transmission suite (B9 051-053)

Client: Rytons Building Products Ltd  
 Test date: 23/07/2007 Test number: L107-153 Test element: Open window

0578

Filler wall area: 9.8 m<sup>2</sup>

Description:

TAL4SET ventilator assembly;  
 x1 MFAB, TAL4000 AirLiner, LF80 Internal

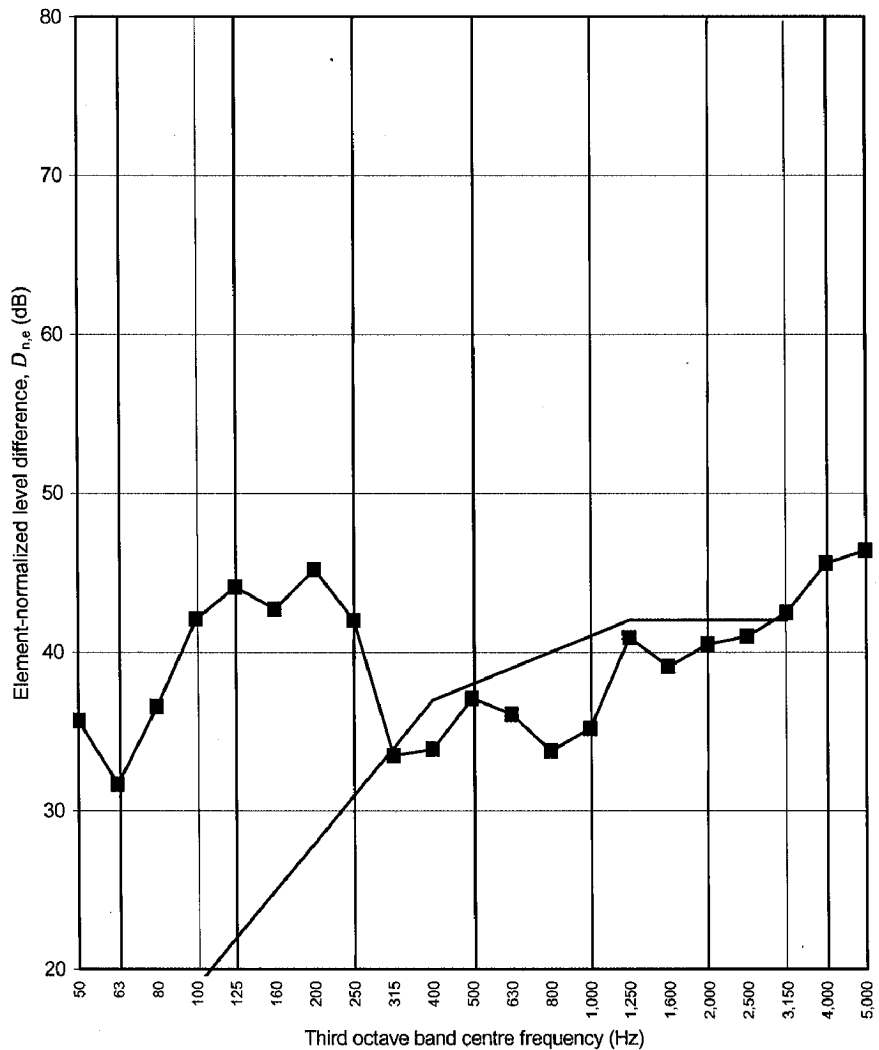
Source room volume: 130 m<sup>3</sup>

Air temperature: 19 °C

Receive room volume: 115 m<sup>3</sup>

Air relative humidity: 71 %

Frequency (Hz)	$D_{n,e}$ One-third octave (dB)
50	35.7
63	31.7
80	36.6
100	42.1
125	44.1
160	42.7
200	45.2
250	42.0
315	33.5
400	33.9
500	37.1
630	36.1
800	33.8
1,000	35.2
1,250	40.9
1,600	39.1
2,000	40.5
2,500	41.0
3,150	42.5
4,000	45.6
5,000	46.4



x Adjusted for flanking transmission

o Correction = 1.3 dB

Rating according to BS EN ISO 717-1:1997

$D_{n,e,w}(C; C_{tr}) = 38 (0; -1) \text{ dB}$      $C_{50-3150} = 0 \text{ dB}$      $C_{50-5000} = 1 \text{ dB}$      $C_{100-5000} = 1 \text{ dB}$   
 $C_{tr,50-3150} = -1 \text{ dB}$      $C_{tr,50-5000} = -1 \text{ dB}$      $C_{tr,100-5000} = -1 \text{ dB}$

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 ( $D_{n,e,w}$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves ( $D_{n,e,w}$ )

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Laboratory airborne sound insulation testing of Rytons Building Products Ltd ventilator systems



Laboratory measurement of airborne sound insulation of small building elements  
Element-normalized level difference according to BS EN 20140-10:1992  
BRE horizontal transmission suite (B9 051-053)

Client: Rytons Building Products Ltd

Test date: 23/07/2007

Test number: L107-154

Test element: Ventilator

0578

Filler wall area: 9.8 m<sup>2</sup>

Description:

TAL4CWL ventilator assembly;  
x1 MFAB, TAL4000 AirLiner, LF80 Internal, ABC3 Cowl

Source room volume: 130 m<sup>3</sup>

Air temperature: 19 °C

Receive room volume: 115 m<sup>3</sup>

Air relative humidity: 71 %

Frequency (Hz)	Reverberation time (s)	Background level (dB)	Source level (dB)	Receive level (dB)	$D_{n,e}$ (dB)
50	2.64	33.3	92.0	59.9	35.0
63	1.76	22.9	100.1	69.3	31.9
80	1.98	16.8	100.1	64.8	36.9
100	1.69	13.9	100.3	59.4	41.8
125	1.98	11.2	103.0	60.2	44.4
160	1.74	21.3	102.1	59.2	43.3
200	2.00	36.9	102.3	56.8	45.9
250	1.80	15.0	100.1	57.8	42.2
315	1.64	11.7	99.9	64.9	34.5
400	1.66	18.7	99.6	62.1	37.0
500	1.64	9.2	99.0	60.1	38.4
630	1.58	9.8	98.3	62.0	35.7
800	1.50	9.8	97.4	62.4	34.1
1,000	1.50	17.6	96.2	58.2	37.2
1,250	1.49	11.0	98.1	56.9	40.2
1,600	1.49	5.6	98.9	58.1	39.9
2,000	1.52	6.1	97.5	56.0	40.6
2,500	1.51	6.9	97.8	54.8	42.1
3,150	1.50	9.1	98.0	51.6	45.6
4,000	1.40	10.4	98.9	48.2	49.5
5,000	1.26	7.9	95.9	43.7	50.6

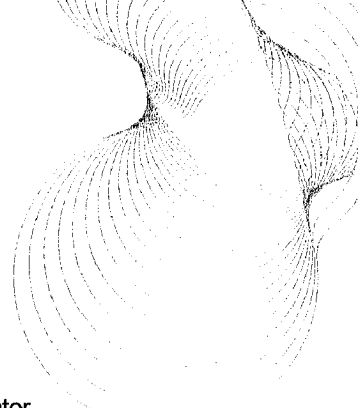
x Adjusted for flanking transmission

o Correction = 1.3 dB

Rating according to BS EN ISO 717-1:1997					
$D_{n,e,w}(C; C_{tr}) = 39 (0; -1) \text{ dB}$	$C_{50-3150} = 0 \text{ dB}$	$C_{50-5000} = 1 \text{ dB}$	$C_{100-5000} = 1 \text{ dB}$		
	$C_{tr,50-3150} = -1 \text{ dB}$	$C_{tr,50-5000} = -1 \text{ dB}$	$C_{tr,100-5000} = -1 \text{ dB}$		
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 ( $D_{n,e,w}$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves ( $D_{n,e,w}$ )					

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Laboratory airborne sound insulation testing of Rytons Building Products Ltd ventilator systems



Laboratory measurement of airborne sound insulation of small building elements  
 Element-normalized level difference according to BS EN 20140-10:1992  
 BRE horizontal transmission suite (B9 051-053)

Client: Rytons Building Products Ltd

Test date: 23/07/2007

Test number: L107-154

Test element: Ventilator

0578

Filler wall area: 9.8 m<sup>2</sup>

Description:

TAL4CWL ventilator assembly;

x1 MFAB, TAL4000 AirLiner, LF80 Internal, ABC3 Cowl

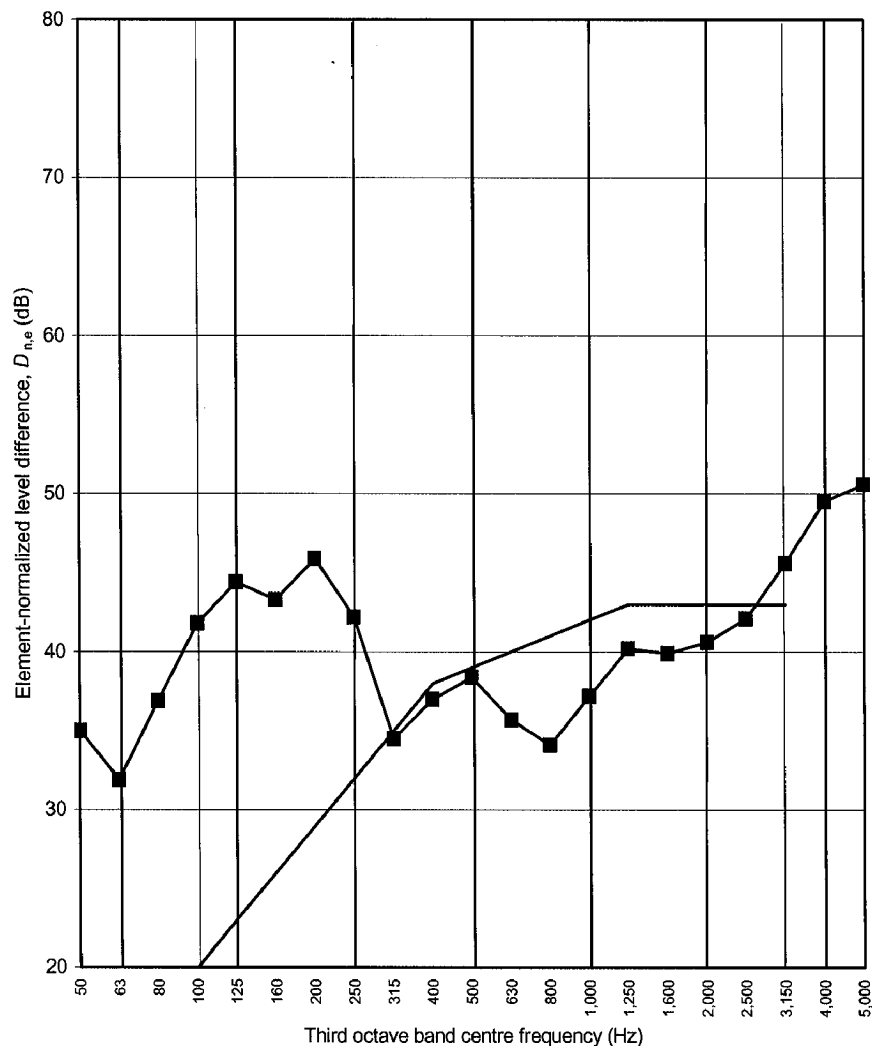
Source room volume: 130 m<sup>3</sup>

Air temperature: 19 °C

Receive room volume: 115 m<sup>3</sup>

Air relative humidity: 71 %

Frequency (Hz)	$D_{n,e}$ One-third octave (dB)
50	35.0
63	31.9
80	36.9
100	41.8
125	44.4
160	43.3
200	45.9
250	42.2
315	34.5
400	37.0
500	38.4
630	35.7
800	34.1
1,000	37.2
1,250	40.2
1,600	39.9
2,000	40.6
2,500	42.1
3,150	45.6
4,000	49.5
5,000	50.6



x Adjusted for flanking transmission

o Correction = 1.3 dB

Rating according to BS EN ISO 717-1:1997

$D_{n,e,w}(C; C_{tr}) = 39 (0; -1) \text{ dB}$	$C_{50-3150} = 0 \text{ dB}$	$C_{50-5000} = 1 \text{ dB}$	$C_{100-5000} = 1 \text{ dB}$
	$C_{tr,50-3150} = -1 \text{ dB}$	$C_{tr,50-5000} = -1 \text{ dB}$	$C_{tr,100-5000} = -1 \text{ dB}$

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 ( $D_{n,e,w}$ ) and should not exceed the values in Table A1 of BS EN 20140-2:1993 for the data in the individual third octaves ( $D_{n,e,w}$ )

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