

THE BUILDING PERFORMANCE CENTRE
SCHOOL OF THE BUILT ENVIRONMENT
NAPIER UNIVERSITY

Standardised Level Difference Data Sheets

($D_{2m,nT}$, $D_{0.01m,nT}$)

NANR116: 'OPEN/CLOSED WINDOW RESEARCH'

SOUND INSULATION THROUGH VENTILATED DOMESTIC WINDOWS

April 2007

**Research Study Conducted for Department for
Environment, Food and Rural Affairs (Defra)**

Submitted by

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*The view expressed in this report are those of the
researchers and do not necessarily reflect those of the
Project Sponsors.*

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Chapter 1 Introduction

1.1 Introduction to study

This publication presents measured data from a set of laboratory measurements made in support of the Defra (Department for Environment, Food and Rural Affairs) Research Contract NANR 116 ‘Open/Closed Window Research: Sound Insulation Through Ventilated Domestic Windows’.

The data presented are the laboratory measured standardised level difference, defined for the data-sets presented as:

$$D_{2m,nT} = L_{2m} - L_2' + 10 \log_{10} \left(\frac{T}{T_0} \right)$$

$$D_{0.01m,nT} = L_{0.01m} - L_2' + 10 \log_{10} \left(\frac{T}{T_0} \right)$$

where $L_{1, 2m}$ (dB) is the temporally averaged non-diffuse sound pressure level 2 m in front of the façade (S1 microphone position) whilst $L_{0.01m}$ is the sound pressure level measured with a microphone attached to, or located approximately 0.01 m from the façade line (S3 microphone position). L_2 is the averaged sound pressure level in the receiving room (dB), T is the reverberation time in the receiving room (s) and T_0 is a reverberation time reference (0.5 s).

Chapter 2 Test Methodology

2.1 Experimental Details

The test laboratory consisted of a 300 m³ anechoic 'Source' chamber, connected via a 12 m² test aperture, to a 210 m³ reverberation chamber into which new partitions had been built to create a 38 m³ 'residential' room (4.4 x 3.6 x 2.4 m).

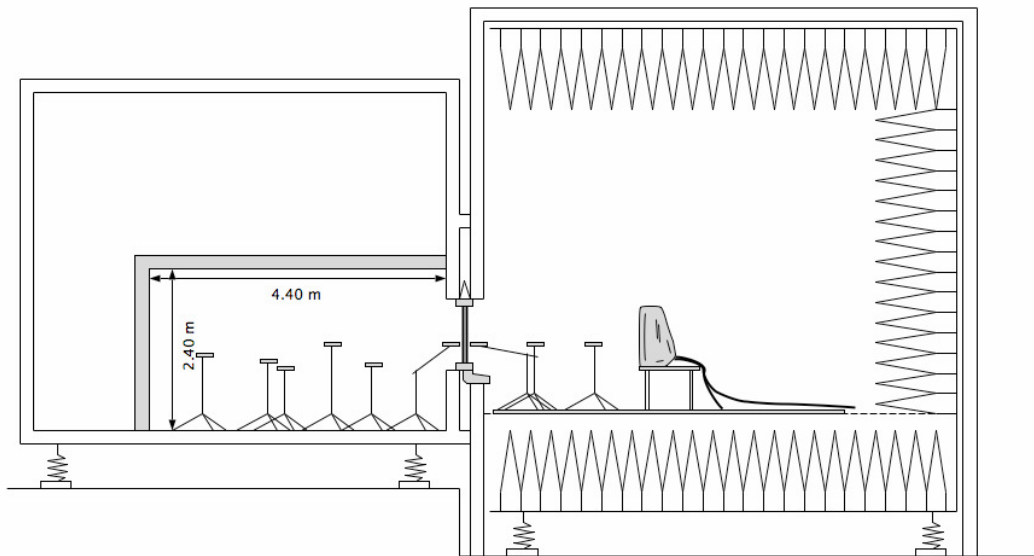


Figure 2-1. Section through laboratory

2.2 Test Procedure

A *Brüel & Kjær Pulse* nine channel data acquisition system was used with 3 fixed 'Source' microphones and 6 fixed 'Receiver' microphones.

The source signal was pink noise generated by the data acquisition system over a 30 second period. The signal was reproduced through amplifying cabinet loudspeakers.

Five loudspeaker configurations (L1-L5) were set at a distance of 2.72 m from the centre of the window specimen and at angles of 15°, 55°, 90°, 125° and 165° to the facade. Loudspeaker position, L6, was located 5 m normal to the centre of the test

specimen. A coherent line source, provided by four parallel loudspeakers, was positioned opposite the façade at a separation of 2.72 m.

The three 'Source' microphones S1 to S3, were positioned at heights between 1.2 m and 1.5 m. These microphones were rotated around the centre of the test window at fixed radii, depending on the location of the source loudspeaker.

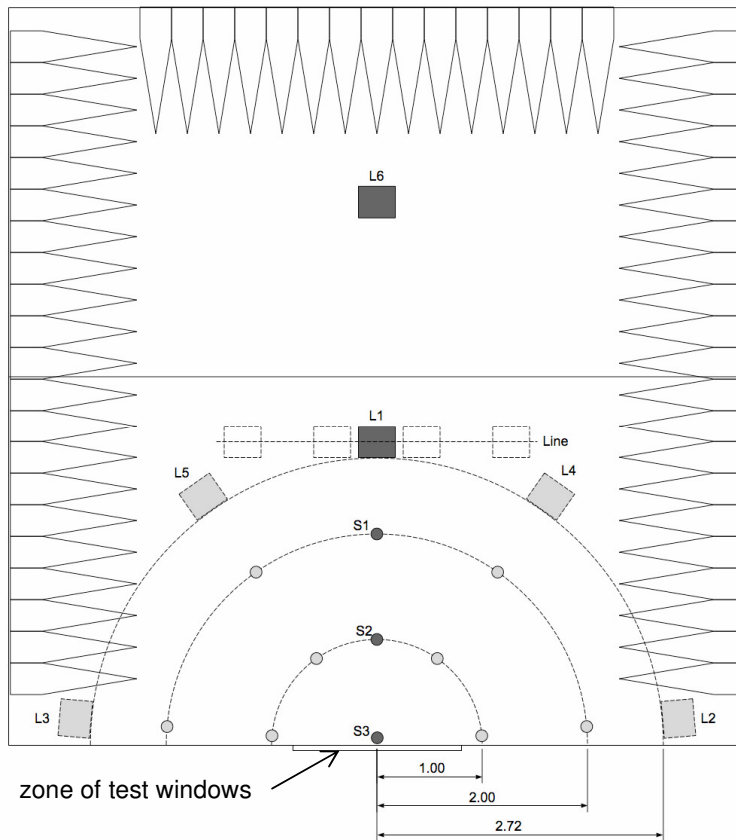


Figure 2-2 Plan of source room microphone and loudspeaker positions

The six 'Receiver' microphones were positioned at heights between 1.2 m and 1.5 m and were all, with exception of R1, at least 700 mm away from any other surface or measurement position. Position R1 was adjacent to the internal face of the window.

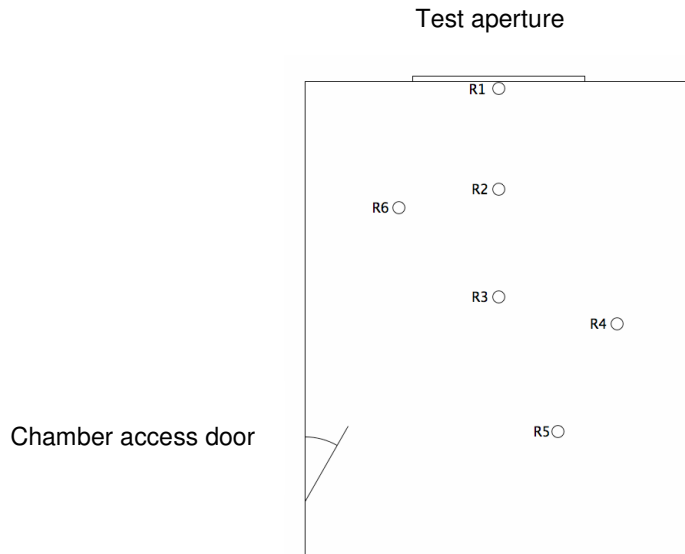


Figure 2-3. Plan of receiver room microphone locations

2.3 Filler Wall

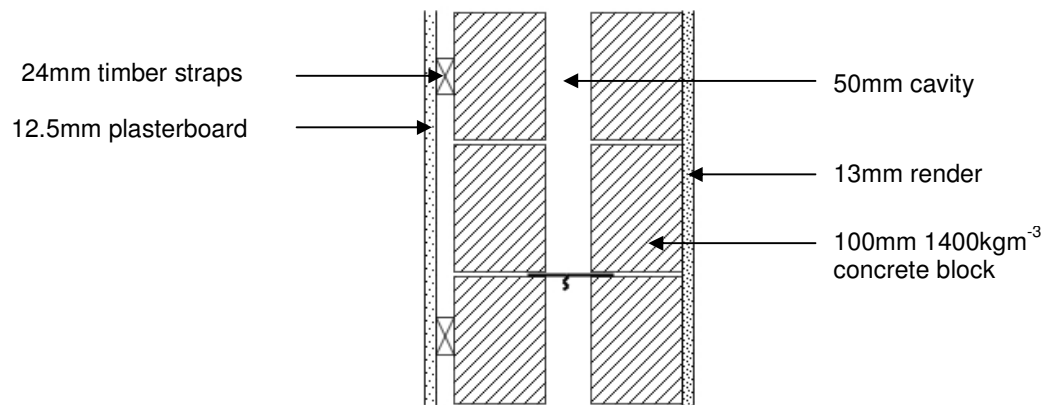


Figure 2-4. Filler wall construction

2.4 Window Assemblies

Sample	Description	Frame dimensions (mm) (area)	Frame depth (mm)	Glass dimensions (mm)	Mass (kg)	Seals
A	Vent + side hung (double)	2400 x 1050 (2.52 m ²)	60	424 x 834 560 x 600 464 x 194 424 x 834 560 x 600 464 x 194	75.6	Foam
B	Reversible	1200 x 1050 (1.26 m ²)	71	1004 x 854	35.2	Rubber
C	Tilt & turn (inwards)	900 x 1050 (0.95 m ²)	70	696 x 846	29.2	Rubber
D	Sliding sash	900 x 1200 (1.08 m ²)	135	725 x 485 725 x 485	34.8	double brush
E	Top hung London	600 x 1050 (0.63 m ²)	70	452 x 493 403 x 362	16.9	Rubber
F	Top hung London (Aluminium)	600 x 1050 (0.63 m ²)	48	530 x 473 487 x 430	16.9	Rubber
G	Side hung (Timber)	600 x 900 (0.54 m ²)	94	414 x 695	18	foam, nylon sheath

Table 2-1. Physical specification of window test samples

Term	Description	Configuration
A-1	Window A, outward opening casement - left hand side	
A-2	Window A, outward opening casement - right hand side	
A-3	Window A, top hung outward opening casements	
B	Window B, side swing reversible	
C-1	Window C, horizontal inward tilt	
C-2	Window C, vertical inward turn	
C-3	Window C, laminate glass, bottom hung inward tilt	
C-4	Window C, laminate glass, side hung inward tilt	
D-1	Window D, sliding sash upper section open	
D-2	Window D, sliding sash lower section open	
D-3	Window D, bottom hung inward opening	
E	Window E, top hung outward opening (PVC-U)	
F	Window F, top hung outward opening (Aluminum)	
G	Window G, side hung outward tilt (timber)	

Table 2-2. Test window units and opening configurations

2.5 - Window test arrangements

The window opening areas are calculated from the combined plane areas between the opening light and static frame, perpendicular to the plane of the open window.

Term	Description
Closed	Window was closed.
UT	The window catch was released such that the window seals were not compressed.
50K	The window was opened to an open area value of approximately 50,000 mm ² .
100K	The window was opened to an open area value of approximately 100,000 mm ² .
200K	The window was opened to an open area value of approximately 200,000 mm ² .

Table 2-3. Window test conditions descriptors

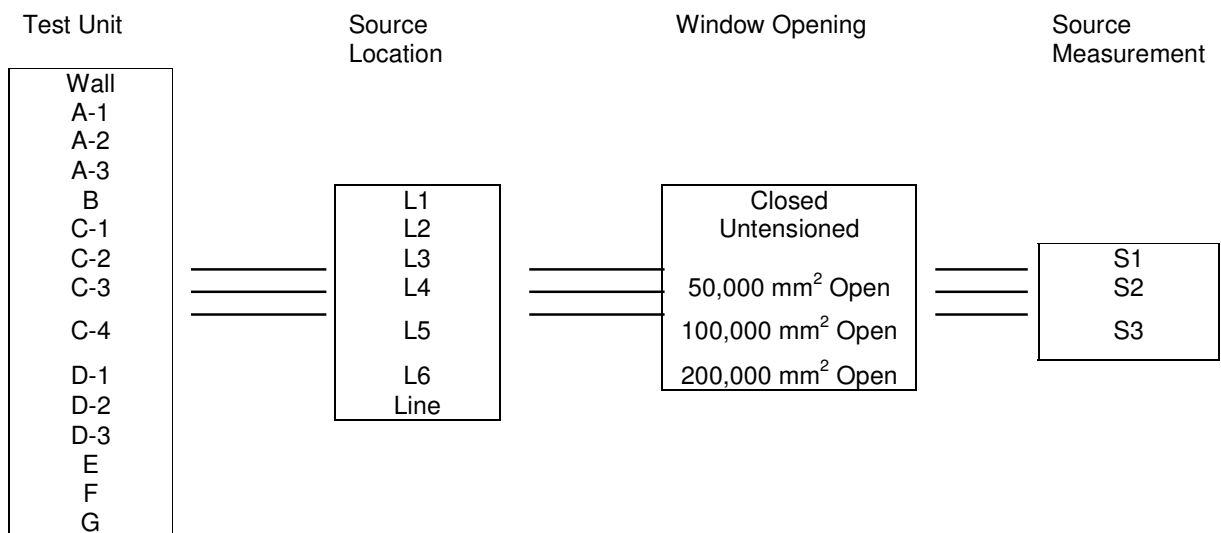


Table 2-4. Primary Variables Investigated

Investigation was also undertaken of the reverberation time characteristics of the receiving room, which was varied through the inclusion of progressively greater quantities of acoustically absorbent material. The resulting reverberation times are presented in Appendix A.

Appendix A. Receiving Room Reverberation Time

	Condition D ₀	Condition D ₁	Condition D ₂	Condition D ₃	Condition D ₄
100	0.73	0.77	0.85	0.88	0.67
125	0.75	0.74	0.74	0.69	0.39
160	0.77	0.89	0.85	0.84	0.43
200	0.72	0.58	0.55	0.55	0.29
250	1.26	0.73	0.67	0.65	0.27
315	1.18	0.68	0.60	0.59	0.28
400	1.52	0.62	0.61	0.58	0.26
500	1.44	0.53	0.49	0.48	0.32
630	1.44	0.62	0.52	0.52	0.33
800	1.52	0.73	0.61	0.58	0.37
1000	1.46	0.74	0.70	0.64	0.36
1250	1.48	0.84	0.73	0.70	0.35
1600	1.50	0.84	0.67	0.69	0.32
2000	1.35	0.79	0.61	0.59	0.30
2500	1.17	0.73	0.59	0.57	0.31
3150	0.98	0.61	0.49	0.49	0.28

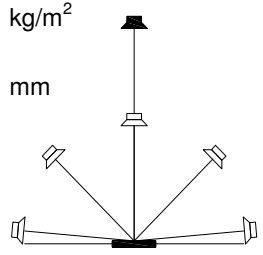
Table A.1 Reverberation time of receiver room (s)

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

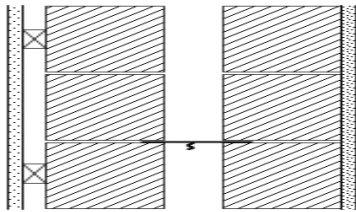
Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

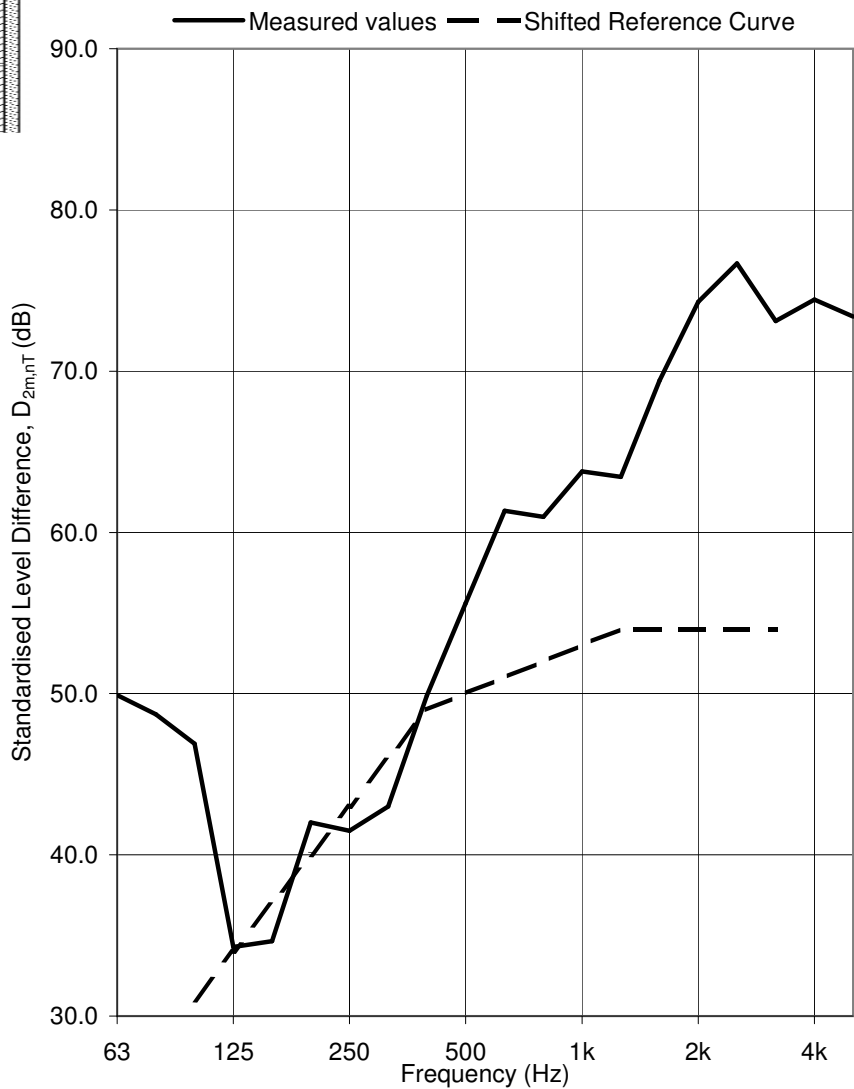


Test ID: 622006

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	31.4
63	49.9
80	48.7
100	46.9
125	34.3
160	34.7
200	42.0
250	41.5
315	43.0
400	49.9
500	55.6
630	61.3
800	61.0
1k	63.8
1.25k	63.4
1.6k	69.4
2k	74.3
2.5k	76.7
3.15k	73.1
4k	74.4
5k	73.4

b
b
b
B
B

$D_{2m,nT,w} (C;C_{tr})$ 54 (-2; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

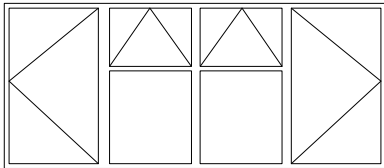
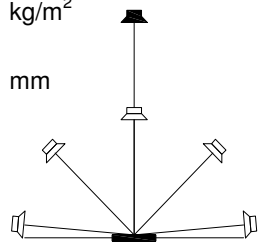
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

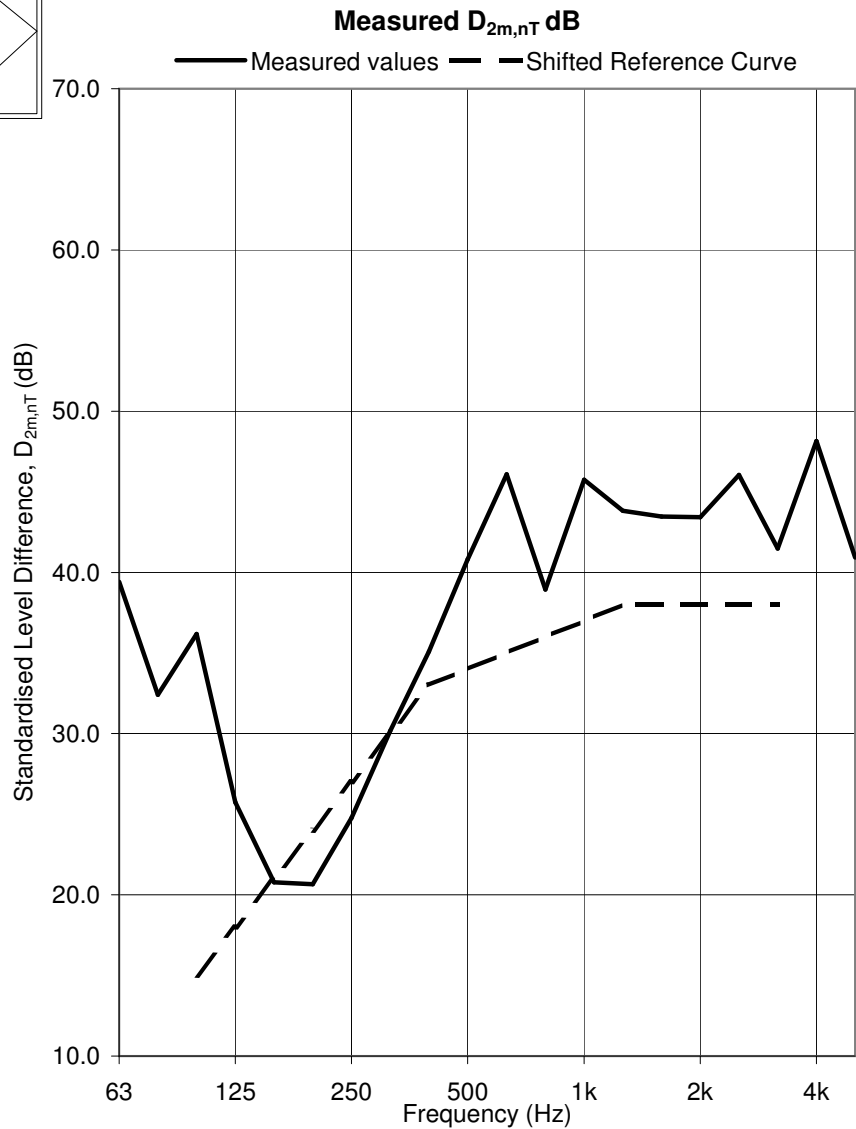
Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628017

Test Sample: Window A-1 Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	30.3
63	39.4
80	32.4
100	36.2
125	25.7
160	20.8
200	20.7
250	24.8
315	30.2
400	35.1
500	40.8
630	46.1
800	38.9
1k	45.7
1.25k	43.8
1.6k	43.5
2k	43.4
2.5k	46.0
3.15k	41.5
4k	48.1
5k	40.9



D_{2m,nT,w} (C;C_{tr}) 38 (-2; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

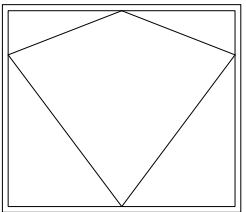
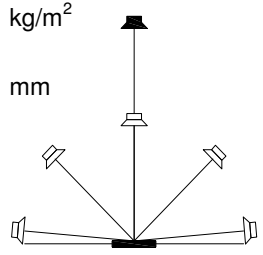
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

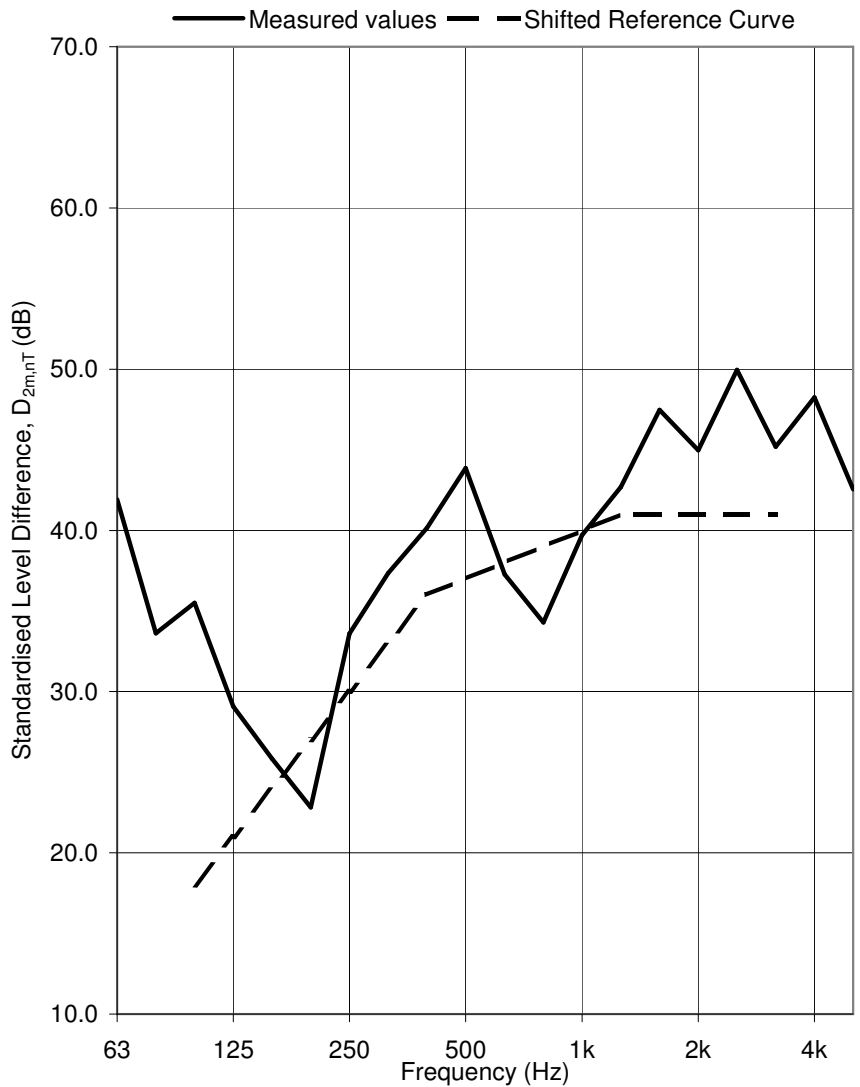
Test Sample: Window B Closed.
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705026

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.5
63	41.9
80	33.6
100	35.5
125	29.1
160	25.8
200	22.8
250	33.6
315	37.3
400	40.2
500	43.9
630	37.3
800	34.3
1k	39.7
1.25k	42.7
1.6k	47.5
2k	45.0
2.5k	50.0
3.15k	45.2
4k	48.2
5k	42.5

$D_{2m,nT,w}$ (C;C_{tr}) 41 (-3; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

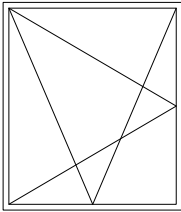
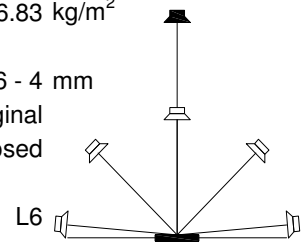
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711014

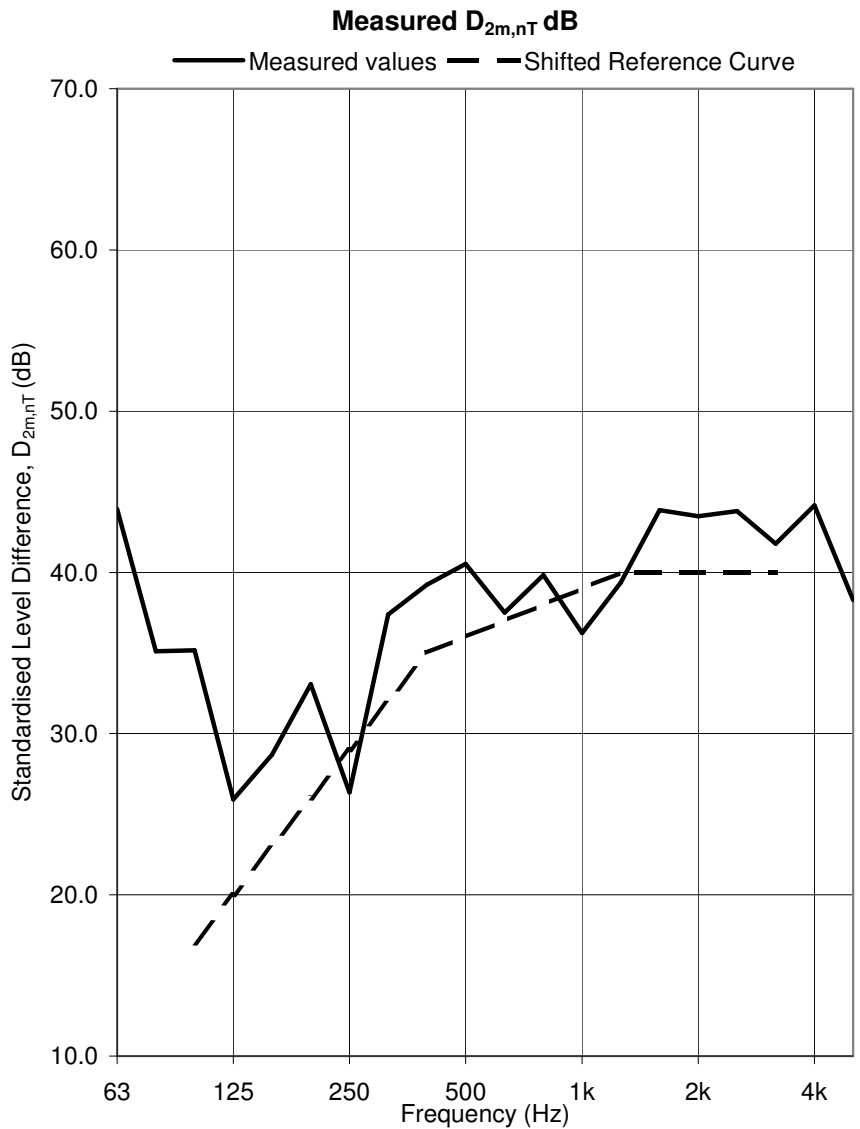
Test Sample: Window C-1 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Frequency Hz	D _{2m,nT} dB
50	30.4
63	43.9
80	35.1
100	35.2
125	25.9
160	28.7
200	33.1
250	26.4
315	37.4
400	39.2
500	40.5
630	37.5
800	39.8
1k	36.2
1.25k	39.4
1.6k	43.9
2k	43.5
2.5k	43.8
3.15k	41.8
4k	44.2
5k	38.3



D_{2m,nT,w} (C;C_{tr}) 40 (-1; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

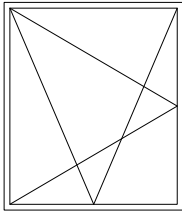
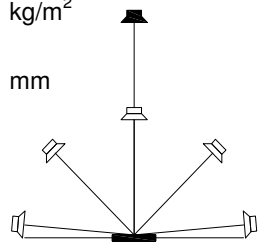
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

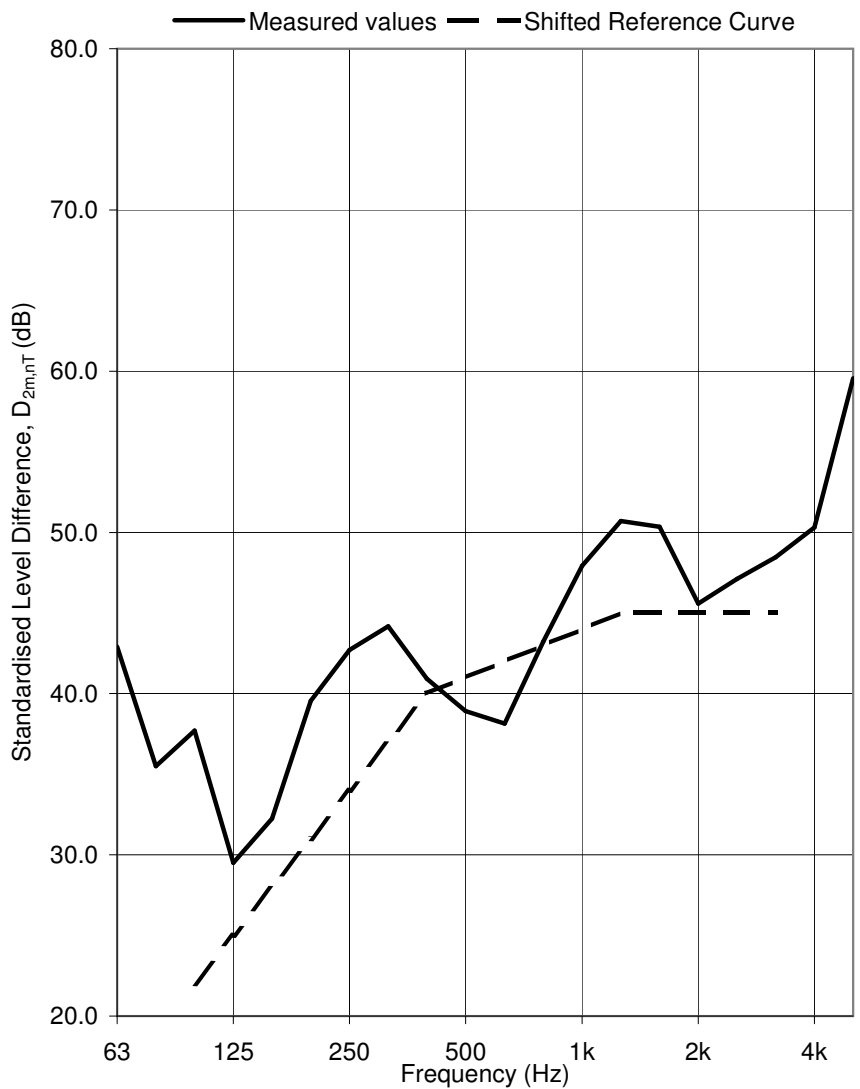
Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0044 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717073

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	33.2
63	42.9
80	35.5
100	37.7
125	29.5
160	32.2
200	39.6
250	42.7
315	44.2
400	40.9
500	38.9
630	38.1
800	43.2
1k	47.9
1.25k	50.7
1.6k	50.4
2k	45.6
2.5k	47.1
3.15k	48.5
4k	50.3
5k	59.6

$D_{2m,nT,w} (C;C_{tr})$ 45 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

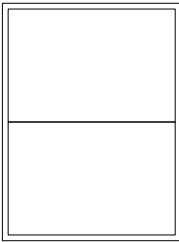
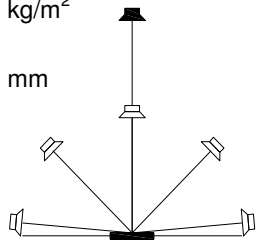
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

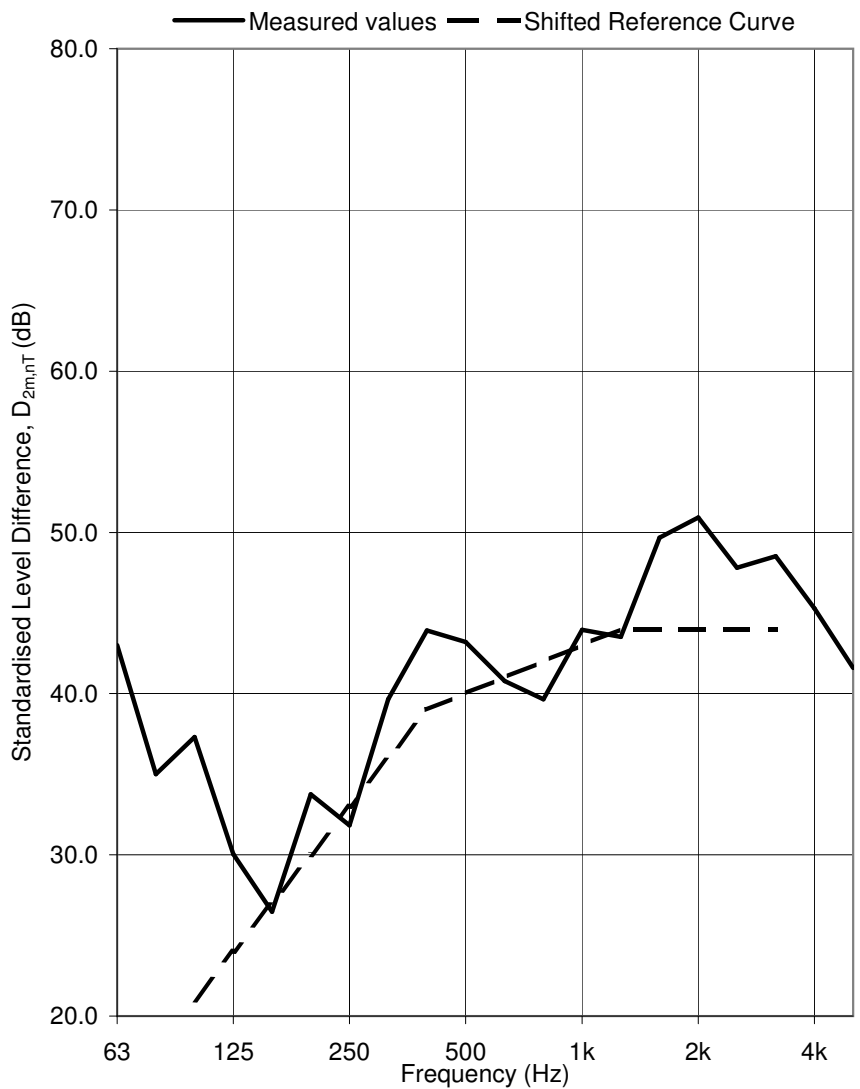
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713015

Test Sample: Window D-1 Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	28.3
63	43.0
80	35.0
100	37.3
125	30.0
160	26.5
200	33.8
250	31.8
315	39.6
400	43.9
500	43.2
630	40.8
800	39.6
1k	44.0
1.25k	43.5
1.6k	49.7
2k	50.9
2.5k	47.8
3.15k	48.5
4k	45.3
5k	41.6

$D_{2m,nT,w}$ (C;C_{tr}) 44 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

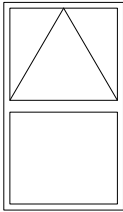
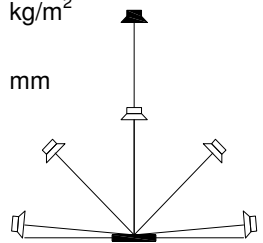
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

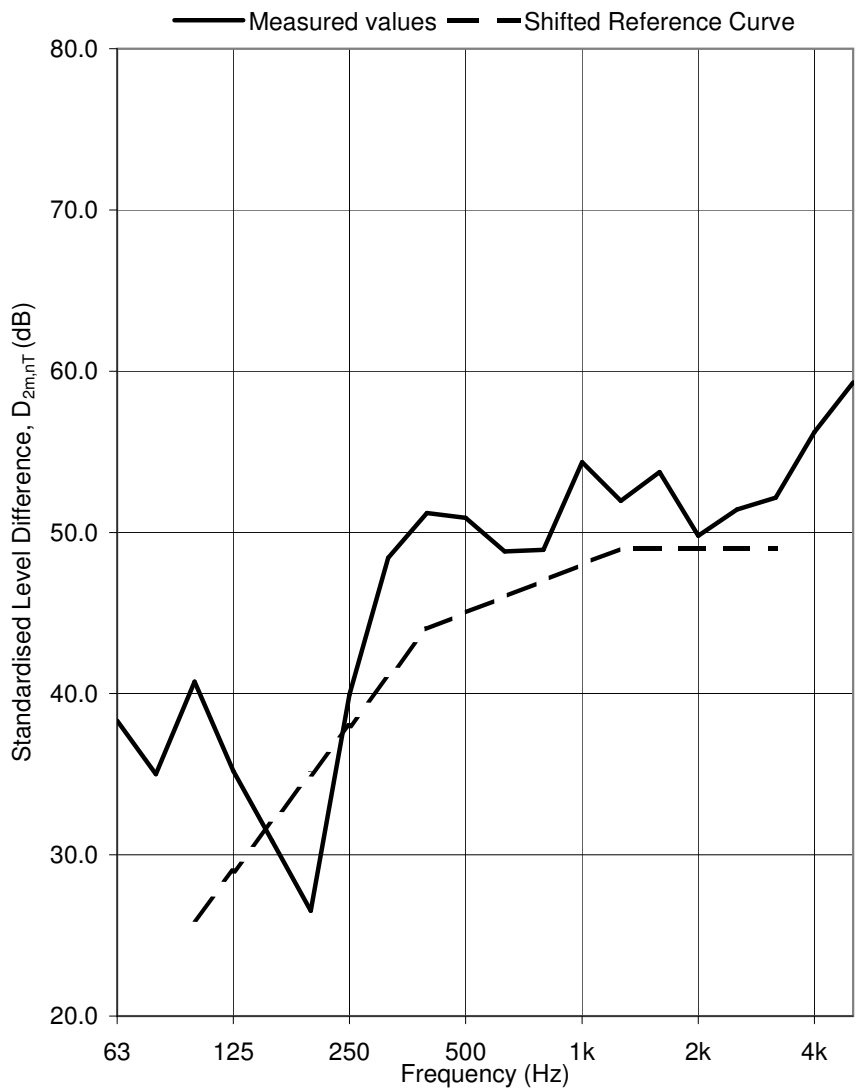
Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718028

Test Sample: Window E Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.5
63	38.3
80	35.0
100	40.7
125	35.2
160	30.9
200	26.5
250	39.9
315	48.4
400	51.2
500	50.9
630	48.8
800	48.9
1k	54.3
1.25k	52.0
1.6k	53.7
2k	49.8
2.5k	51.4
3.15k	52.1
4k	56.2
5k	59.3

$D_{2m,nT,w}$ (C;C_{tr}) 49 (-4; -8) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

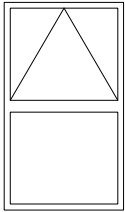
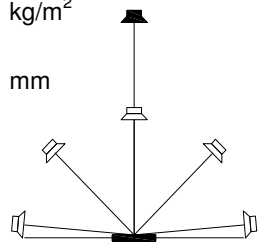
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

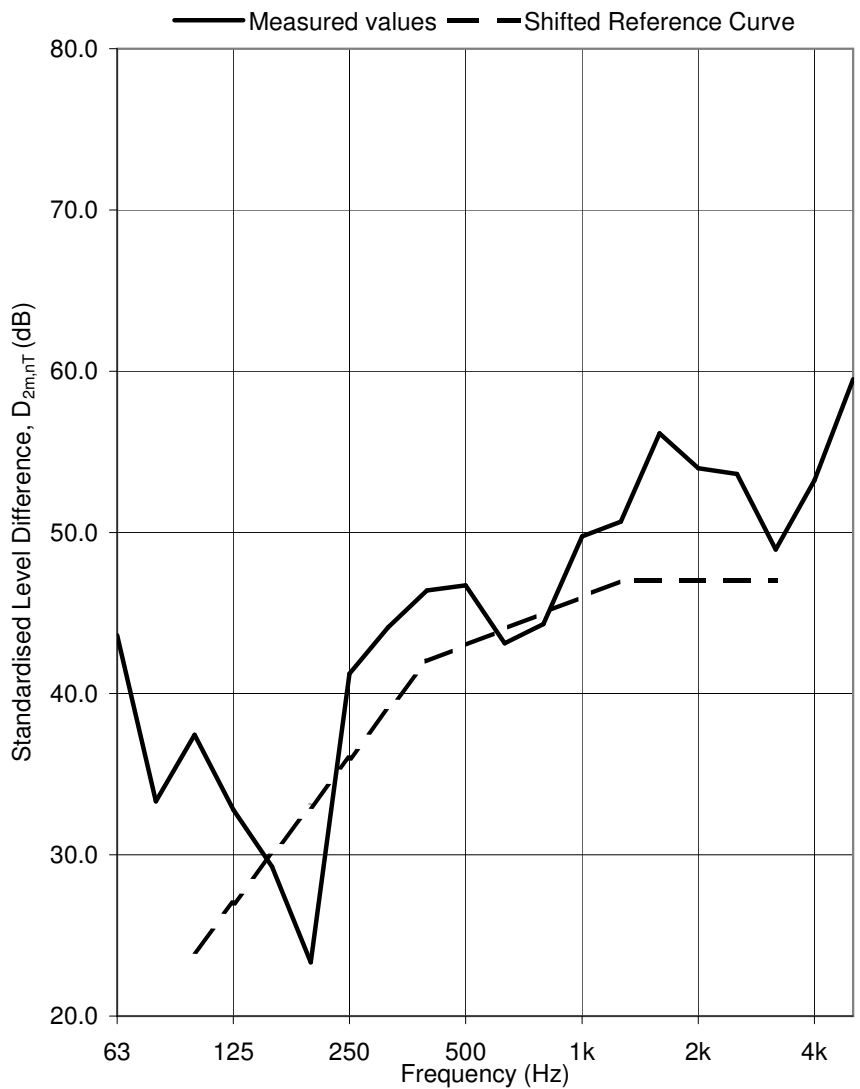
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719001

Test Sample: Window F Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	34.5
63	43.6
80	33.3
100	37.4
125	32.8
160	29.3
200	23.3
250	41.2
315	44.1
400	46.4
500	46.7
630	43.1
800	44.3
1k	49.7
1.25k	50.7
1.6k	56.1
2k	54.0
2.5k	53.6
3.15k	48.9
4k	53.2
5k	59.5

$D_{2m,nT,w}$ (C;C_{tr}) 47 (-5; -9) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

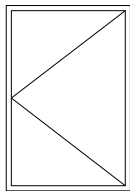
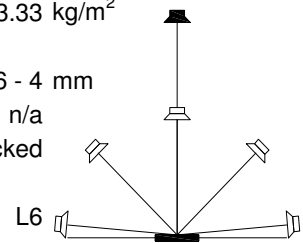
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720001

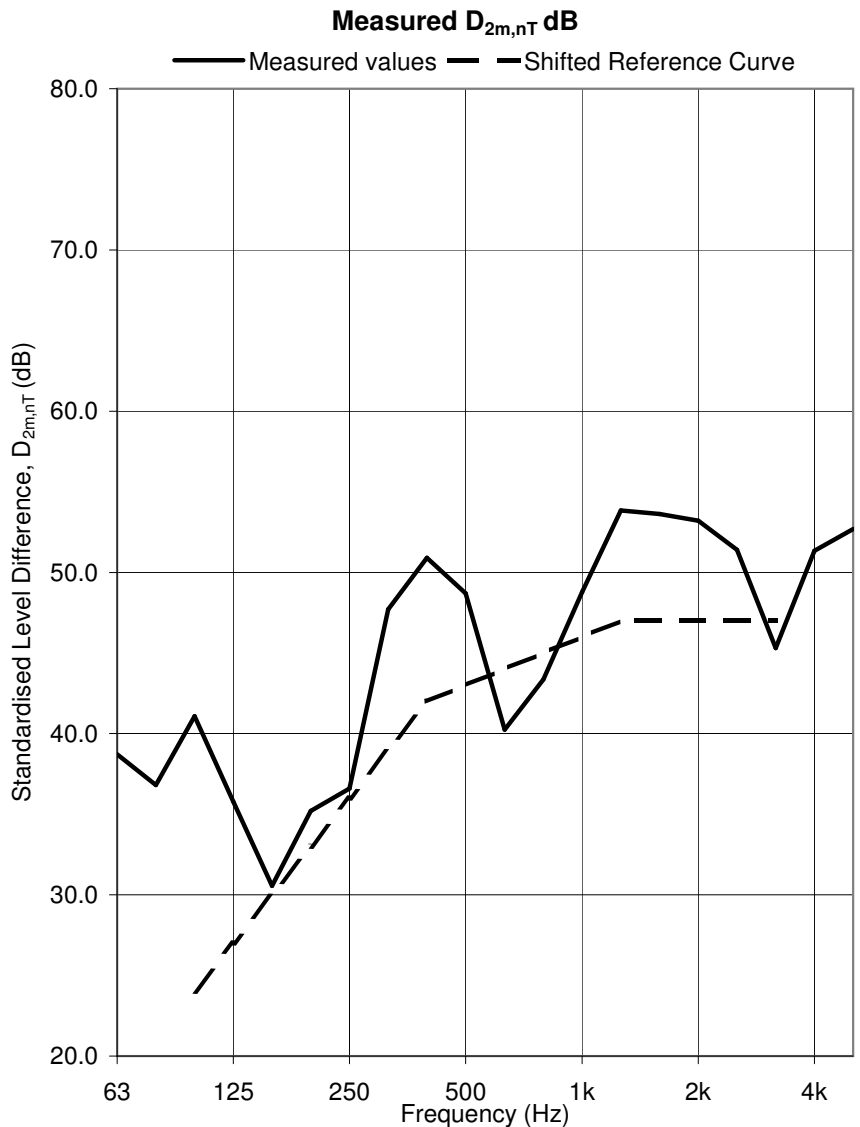
Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked

Loudspeaker Configuration:



Frequency Hz	D _{2m,nT} dB
50	33.6
63	38.7
80	36.8
100	41.1
125	35.8
160	30.6
200	35.2
250	36.6
315	47.7
400	50.9
500	48.7
630	40.2
800	43.4
1k	48.8
1.25k	53.8
1.6k	53.6
2k	53.2
2.5k	51.4
3.15k	45.3
4k	51.3
5k	52.7



D_{2m,nT,w} (C;C_{tr}) 47 (-2; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

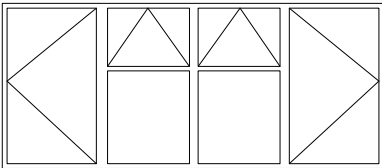
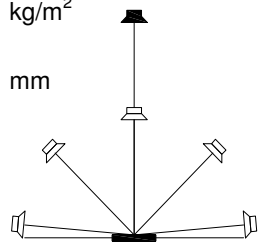
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628028

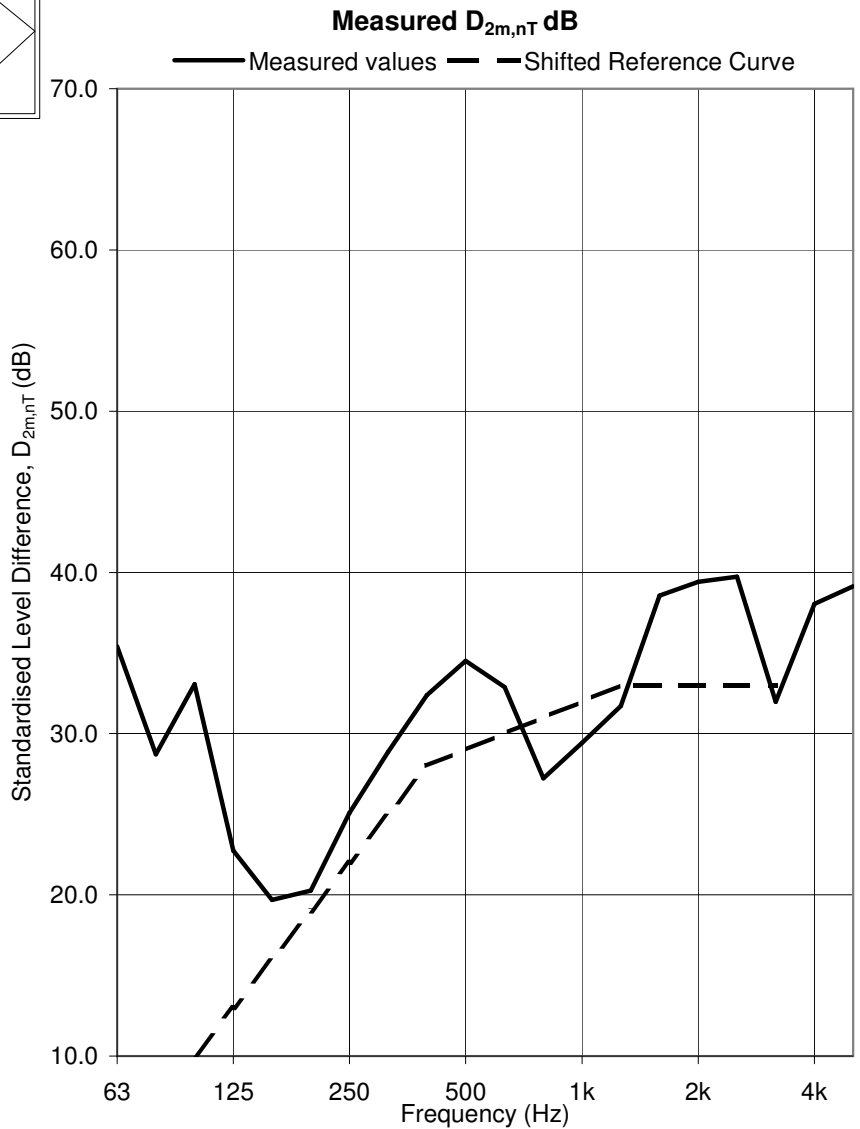
Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	27.2
63	35.4
80	28.7
100	33.1
125	22.7
160	19.7
200	20.3
250	25.1
315	28.9
400	32.4
500	34.5
630	32.9
800	27.2
1k	29.4
1.25k	31.7
1.6k	38.6
2k	39.4
2.5k	39.7
3.15k	32.0
4k	38.0
5k	39.1

b



D_{2m,nT,w} (C;C_{tr}) 33 (-2; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

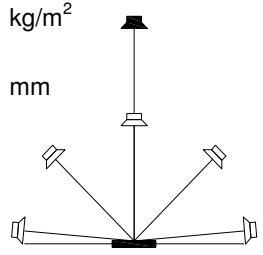
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

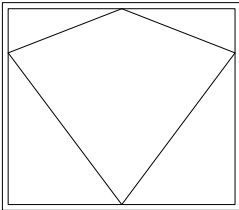
Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

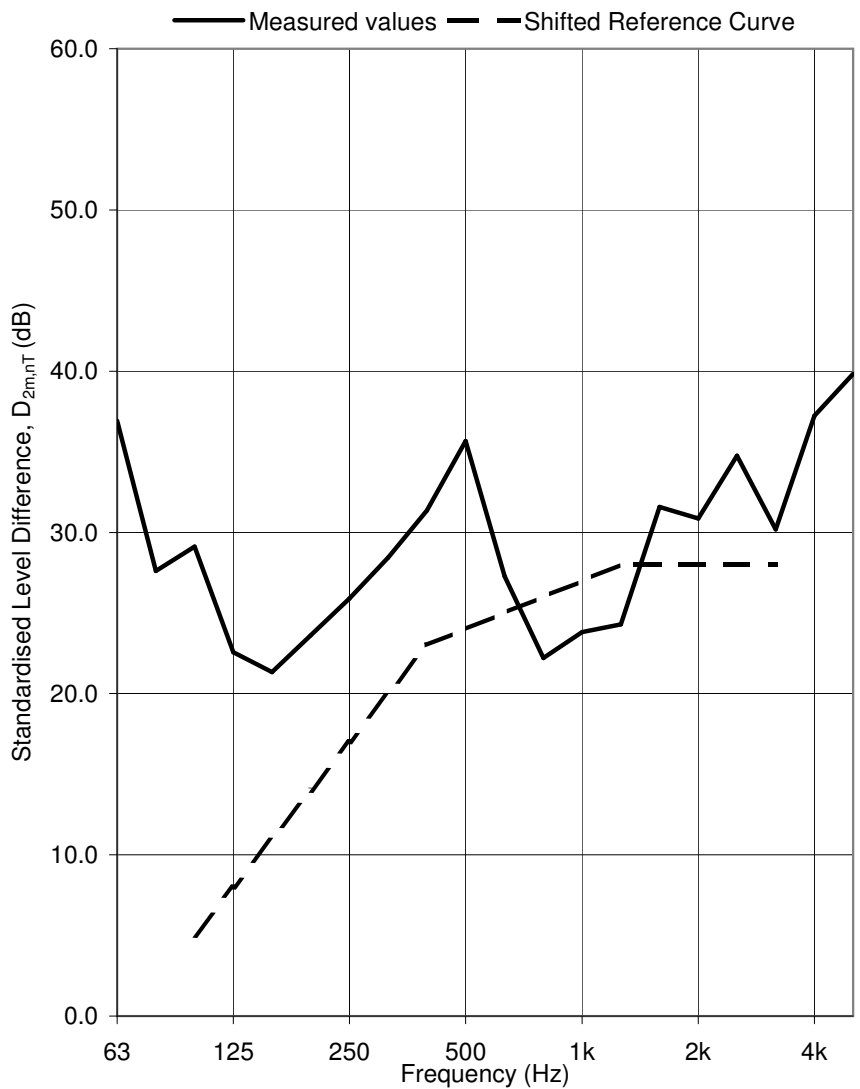


Test ID: 705027

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.3
63	36.9
80	27.6
100	29.1
125	22.6
160	21.3
200	23.6
250	25.9
315	28.4
400	31.4
500	35.7
630	27.3
800	22.2
1k	23.8
1.25k	24.3
1.6k	31.6
2k	30.9
2.5k	34.8
3.15k	30.2
4k	37.2
5k	39.8

b

$D_{2m,nT,w}$ (C;C_{tr}) 28 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

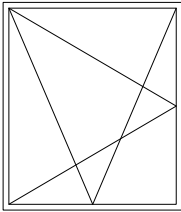
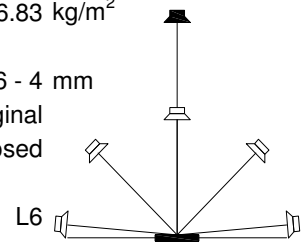
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711018

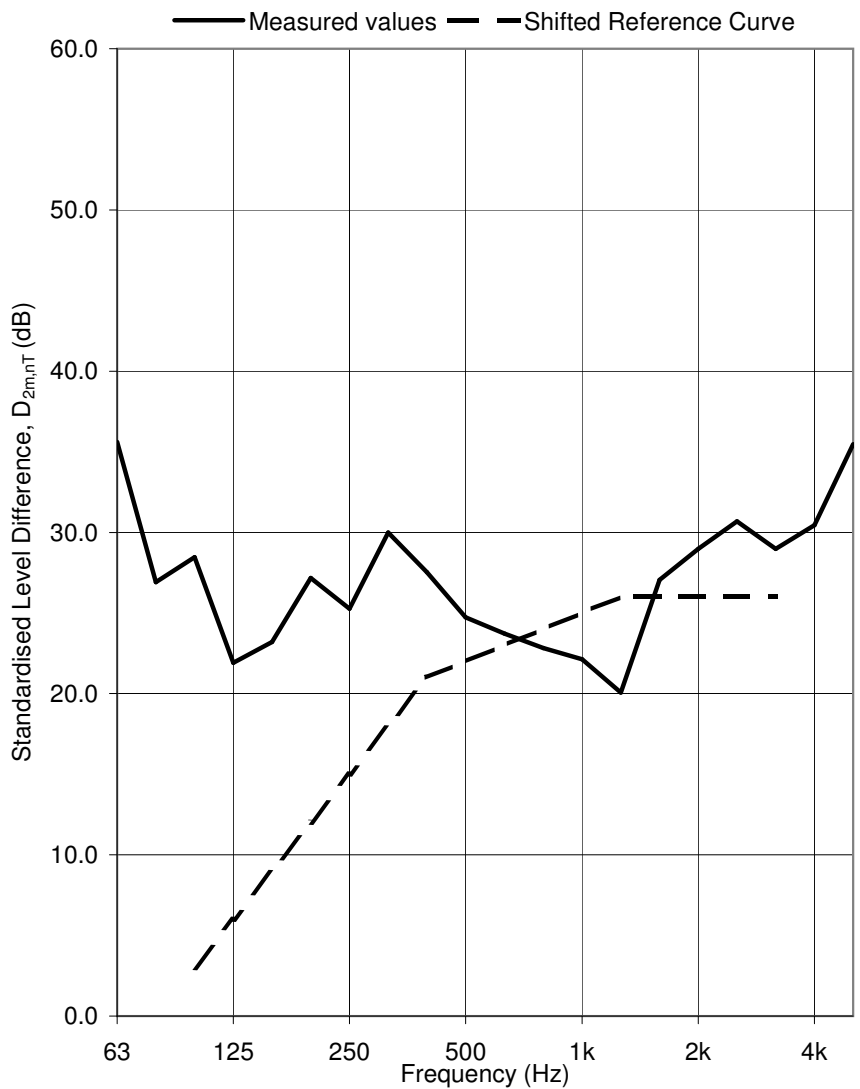
Test Sample: Window C-1 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Measured D_{2m,nT} dB



Frequency Hz	D _{2m,nT} dB
50	27.6
63	35.6
80	26.9
100	28.5
125	21.9
160	23.2
200	27.2
250	25.3
315	30.0
400	27.5
500	24.7
630	23.7
800	22.8
1k	22.1
1.25k	20.1
1.6k	27.1
2k	29.0
2.5k	30.7
3.15k	29.0
4k	30.5
5k	35.5

D_{2m,nT,w} (C;C_{tr}) 26 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

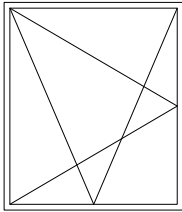
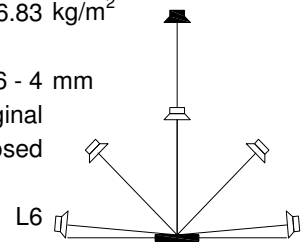
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711022

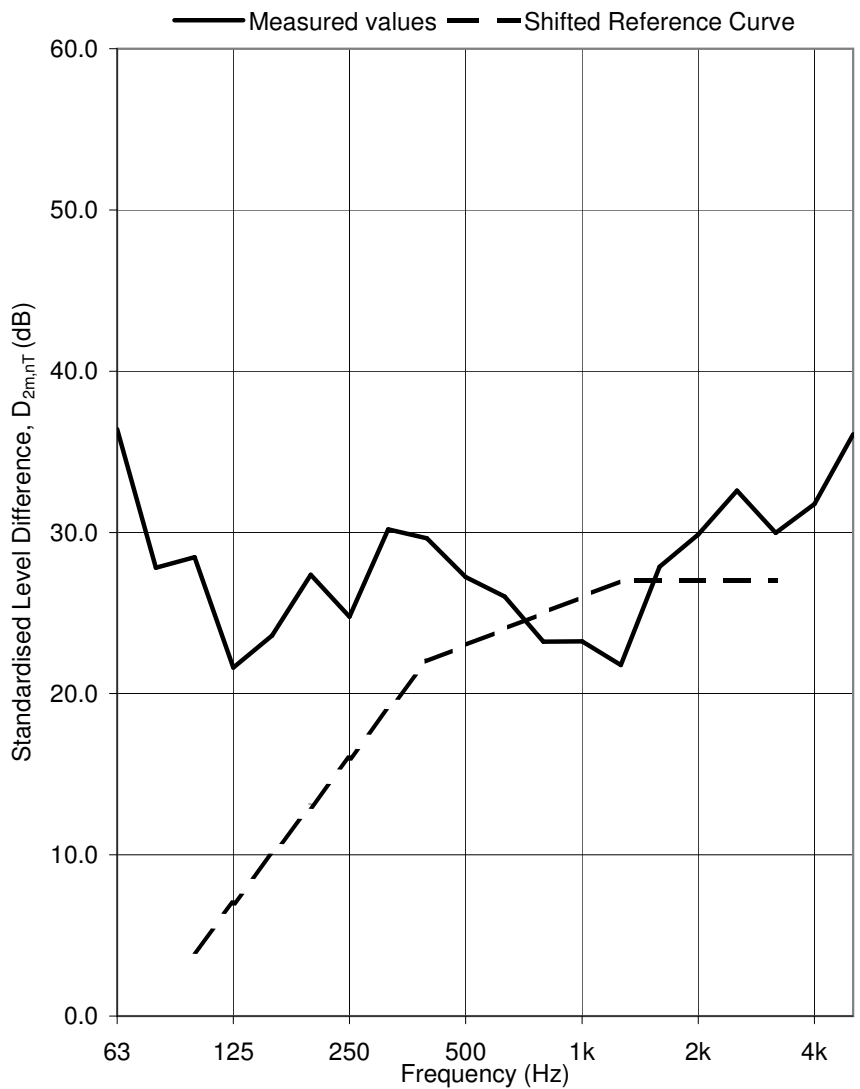
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	26.7
63	36.4
80	27.8
100	28.5
125	21.6
160	23.6
200	27.4
250	24.8
315	30.2
400	29.6
500	27.2
630	26.0
800	23.2
1k	23.2
1.25k	21.8
1.6k	27.9
2k	29.9
2.5k	32.6
3.15k	30.0
4k	31.8
5k	36.1

$D_{2m,nT,w}$ (C;C_{tr}) 27 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

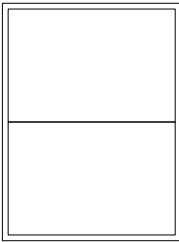
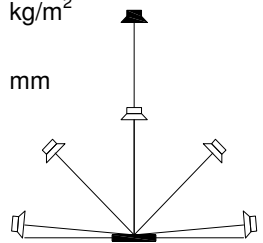
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

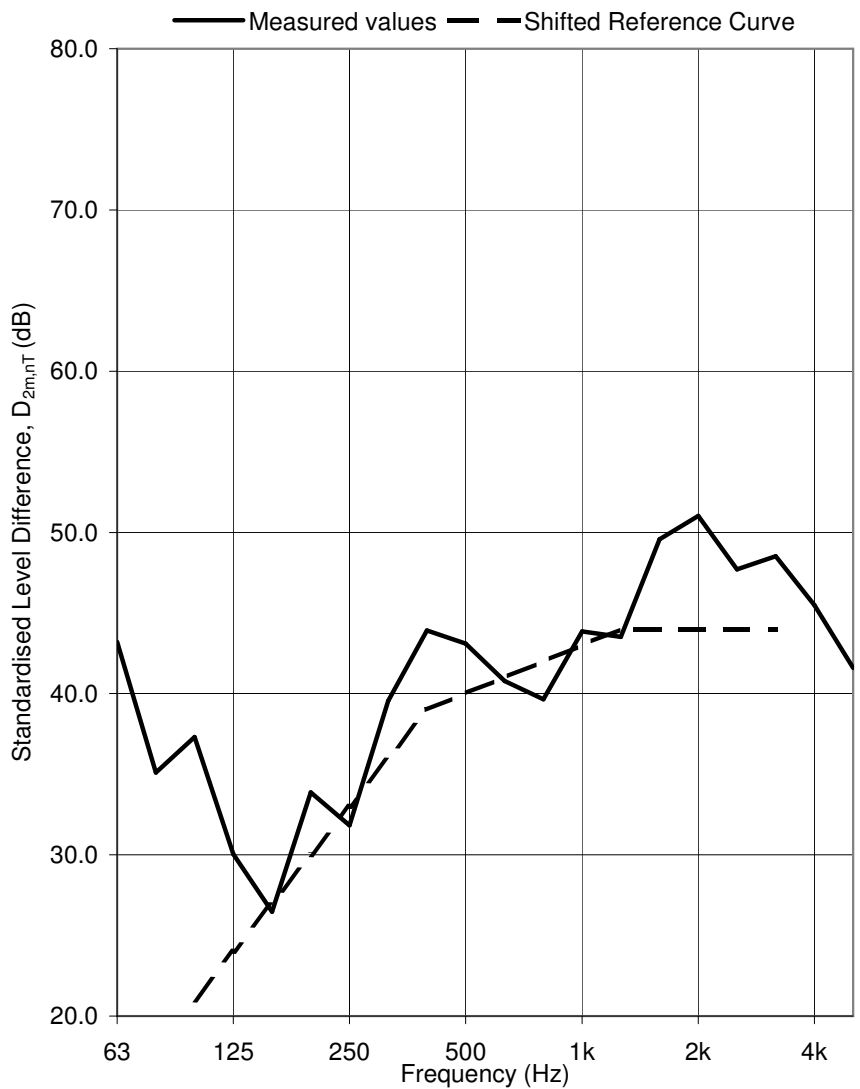
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713016

Test Sample: Window D-1 Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.1
63	43.2
80	35.1
100	37.3
125	30.0
160	26.5
200	33.9
250	31.8
315	39.5
400	43.9
500	43.1
630	40.8
800	39.6
1k	43.9
1.25k	43.5
1.6k	49.6
2k	51.0
2.5k	47.7
3.15k	48.5
4k	45.5
5k	41.6

$D_{2m,nT,w}$ (C;C_{tr}) 44 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

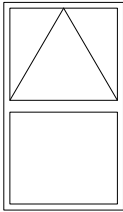
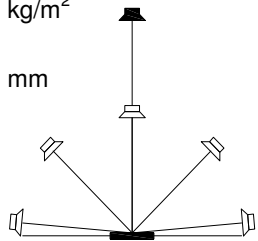
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

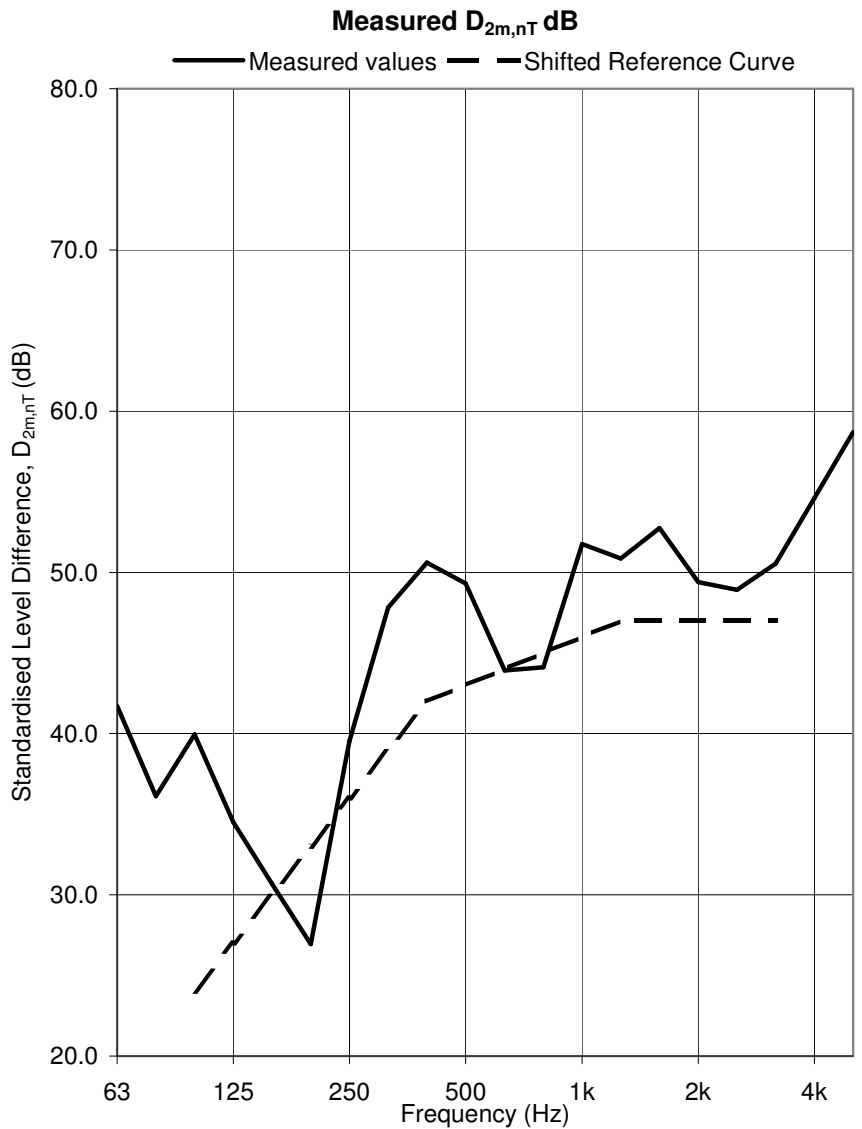
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718027

Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	31.8
63	41.7
80	36.1
100	39.9
125	34.5
160	30.7
200	26.9
250	39.5
315	47.8
400	50.6
500	49.3
630	43.9
800	44.1
1k	51.7
1.25k	50.9
1.6k	52.7
2k	49.4
2.5k	48.9
3.15k	50.5
4k	54.6
5k	58.7



D_{2m,nT,w} (C;C_{tr}) 47 (-3; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

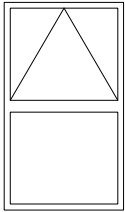
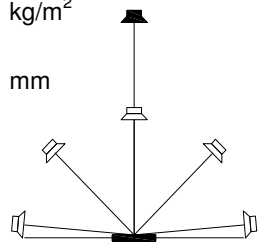
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

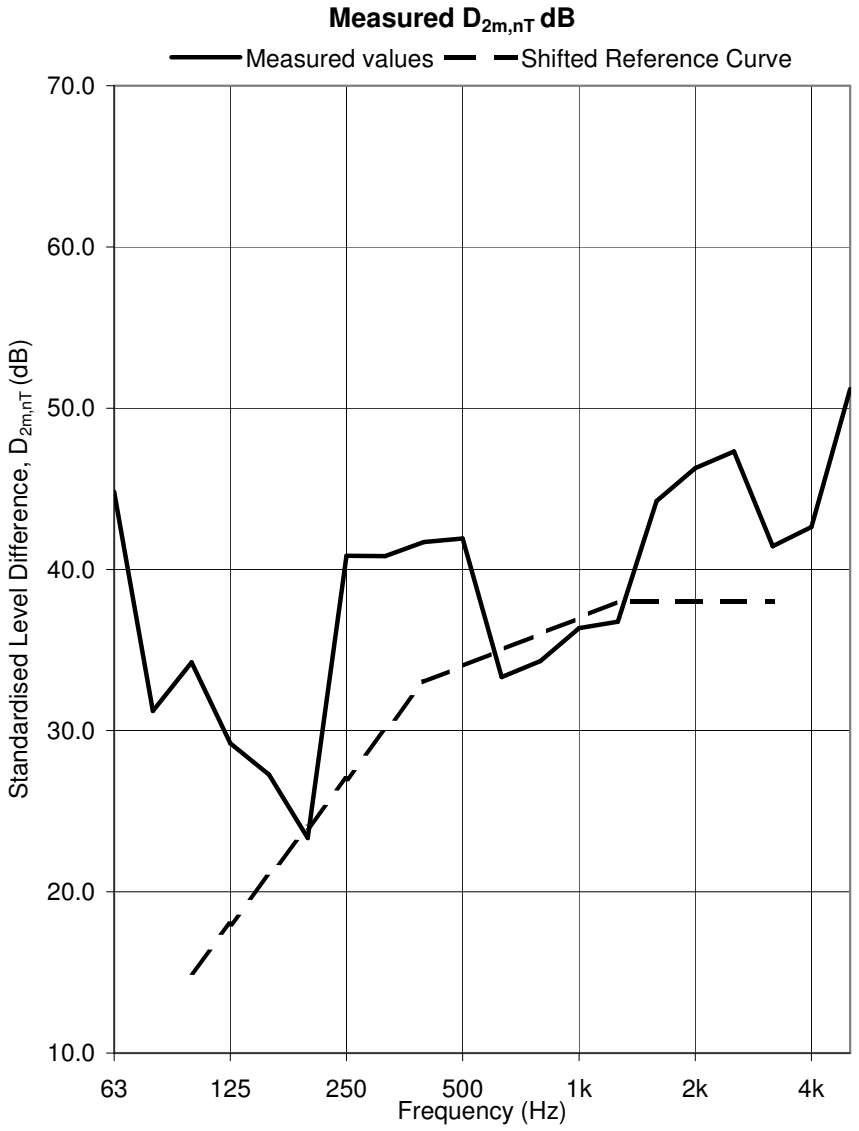
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719002

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	34.3
63	44.8
80	31.2
100	34.2
125	29.2
160	27.3
200	23.3
250	40.8
315	40.8
400	41.7
500	41.9
630	33.3
800	34.3
1k	36.3
1.25k	36.8
1.6k	44.2
2k	46.3
2.5k	47.3
3.15k	41.4
4k	42.6
5k	51.2



D_{2m,nT,w} (C;C_{tr}) 38 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

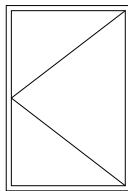
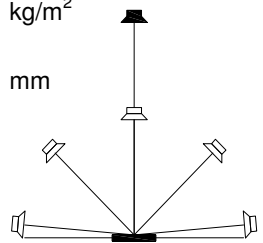
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

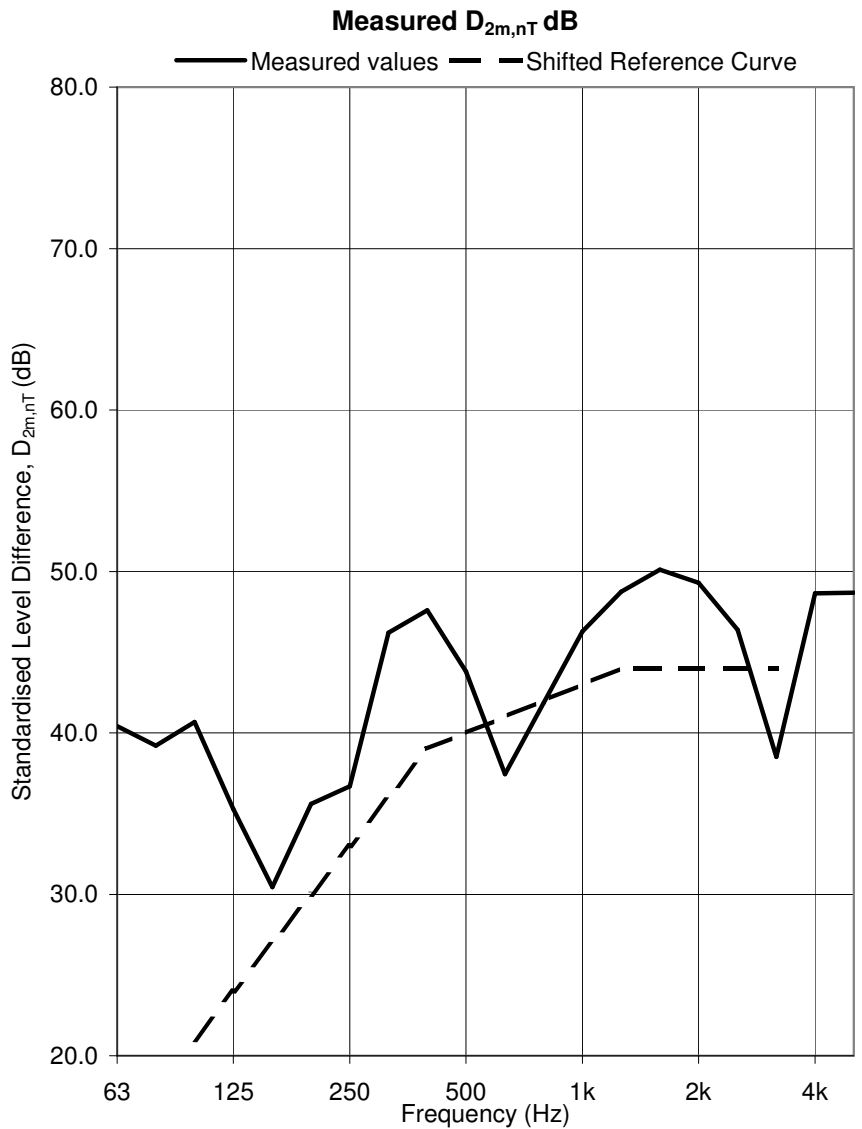
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720002

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.5
63	40.4
80	39.2
100	40.7
125	35.3
160	30.5
200	35.6
250	36.7
315	46.2
400	47.6
500	43.8
630	37.4
800	41.9
1k	46.3
1.25k	48.7
1.6k	50.1
2k	49.3
2.5k	46.4
3.15k	38.5
4k	48.6
5k	48.7



D_{2m,nT,w} (C;C_{tr}) 44 (-2; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

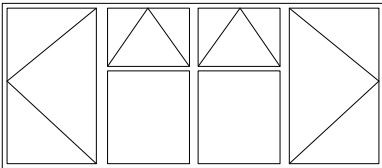
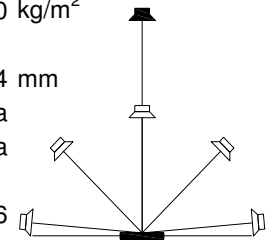
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

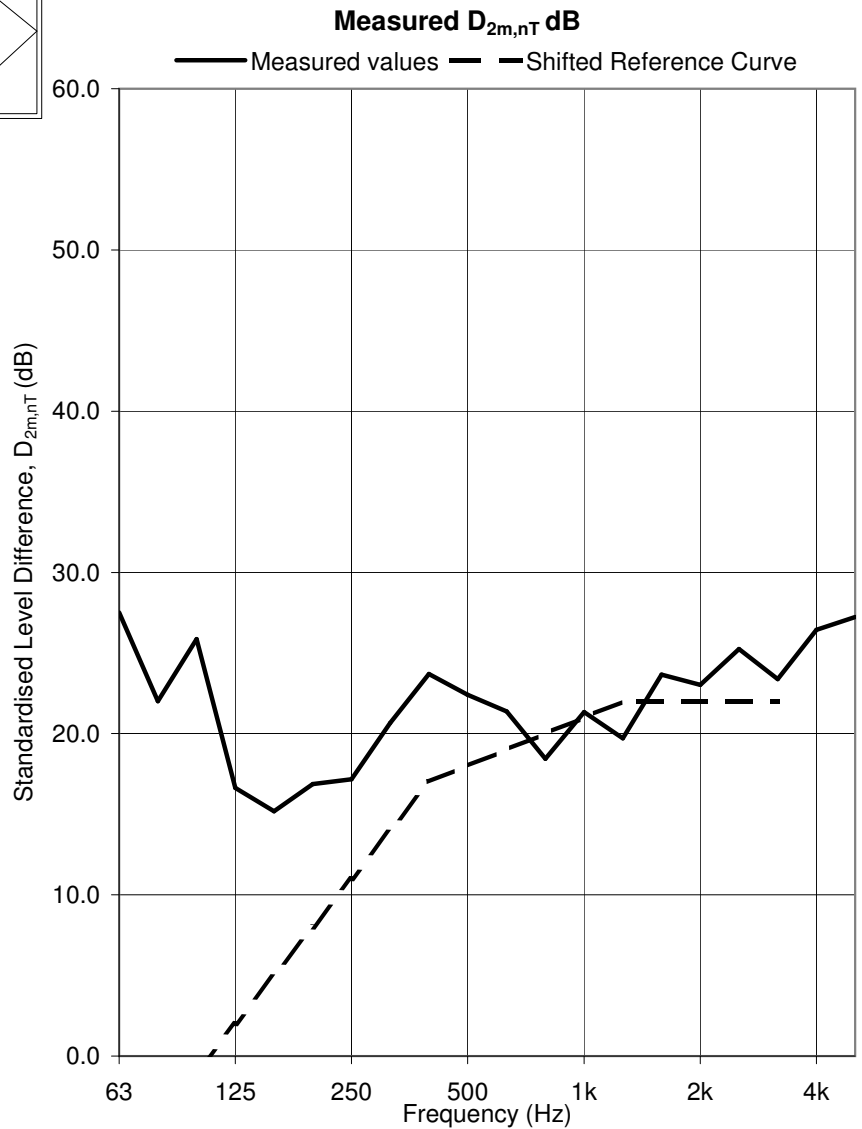
Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628030

Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	20.5
63	27.5
80	22.0
100	25.9
125	16.6
160	15.2
200	16.9
250	17.2
315	20.7
400	23.7
500	22.4
630	21.4
800	18.4
1k	21.3
1.25k	19.7
1.6k	23.7
2k	23.0
2.5k	25.2
3.15k	23.4
4k	26.4
5k	27.2



D_{2m,nT,w} (C;C_{tr}) 22 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

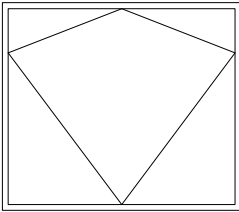
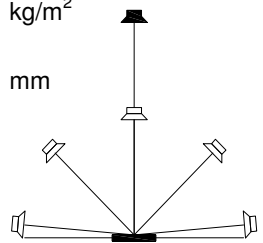
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 705028

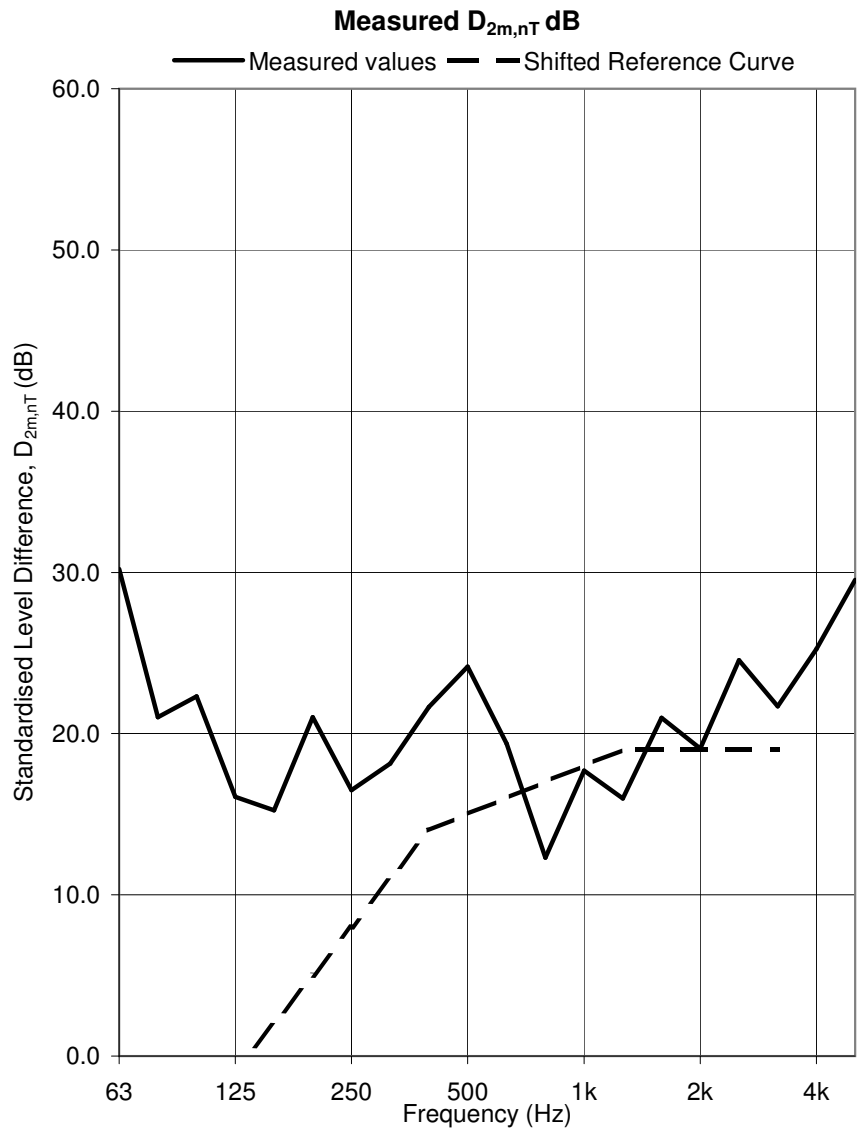
Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.0
63	30.2
80	21.0
100	22.3
125	16.1
160	15.2
200	21.0
250	16.5
315	18.1
400	21.7
500	24.2
630	19.4
800	12.3
1k	17.7
1.25k	16.0
1.6k	21.0
2k	19.1
2.5k	24.6
3.15k	21.7
4k	25.2
5k	29.5



D_{2m,nT,w} (C;C_{tr}) 19 (-1; -2) dB

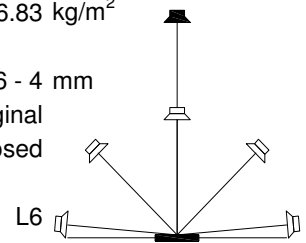
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

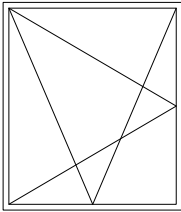
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

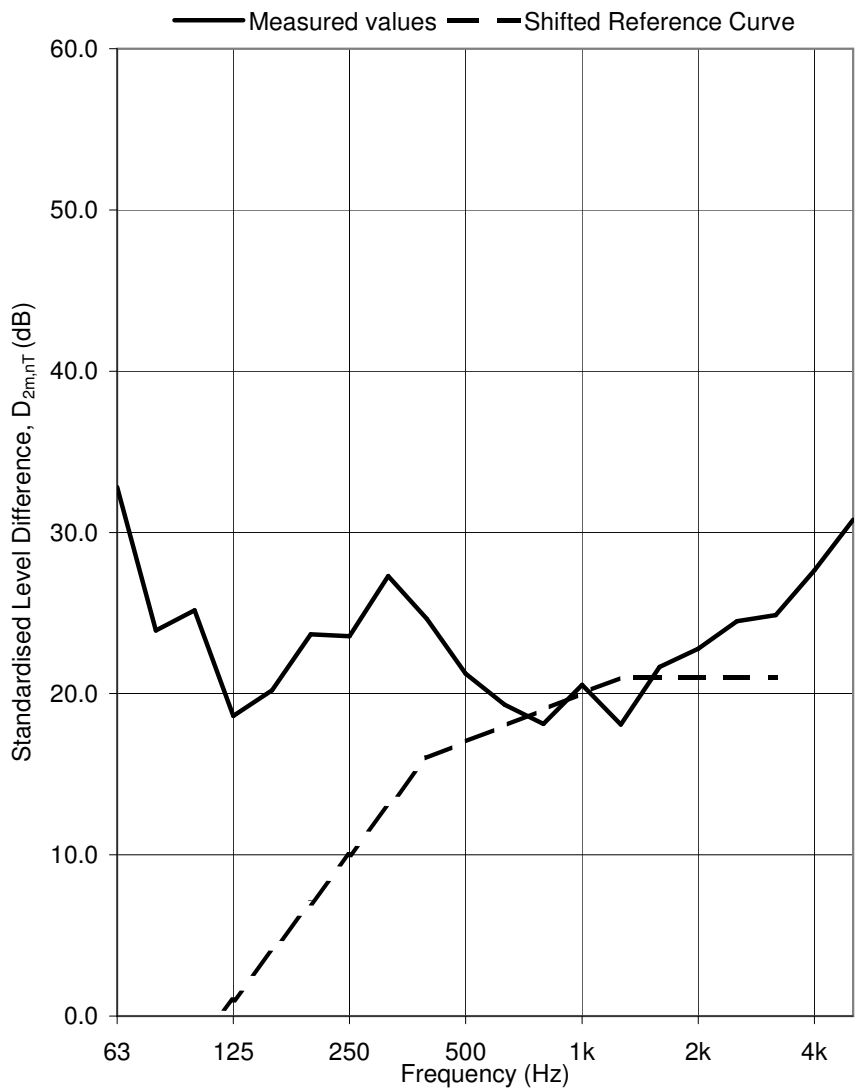


Test ID: 711019

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	26.4
63	32.8
80	23.9
100	25.2
125	18.6
160	20.2
200	23.7
250	23.6
315	27.3
400	24.6
500	21.2
630	19.3
800	18.1
1k	20.5
1.25k	18.1
1.6k	21.7
2k	22.8
2.5k	24.5
3.15k	24.9
4k	27.7
5k	30.8

$D_{2m,nT,w} (C;C_{tr})$ 21 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

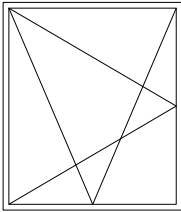
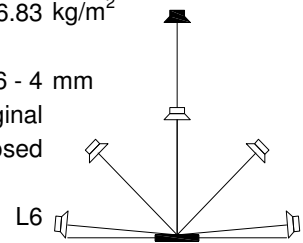
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

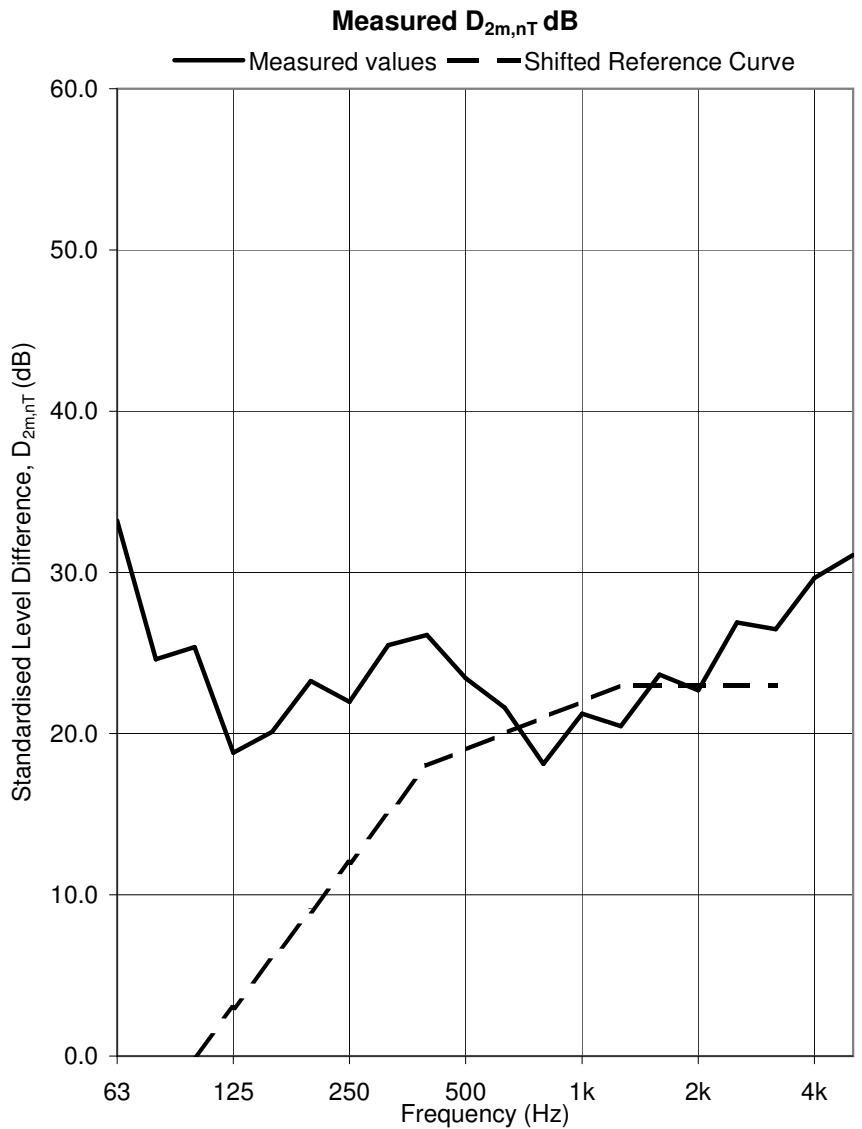
Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711023

Loudspeaker Configuration:



Frequency Hz	D _{2m,nT} dB
50	26.3
63	33.2
80	24.6
100	25.4
125	18.8
160	20.1
200	23.3
250	22.0
315	25.5
400	26.1
500	23.4
630	21.6
800	18.1
1k	21.2
1.25k	20.5
1.6k	23.7
2k	22.7
2.5k	26.9
3.15k	26.5
4k	29.7
5k	31.1



D_{2m,nT,w} (C;C_{tr}) 23 (-1; -1) dB

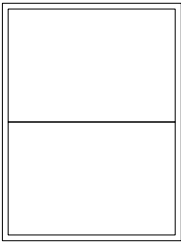
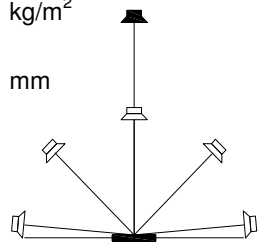
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

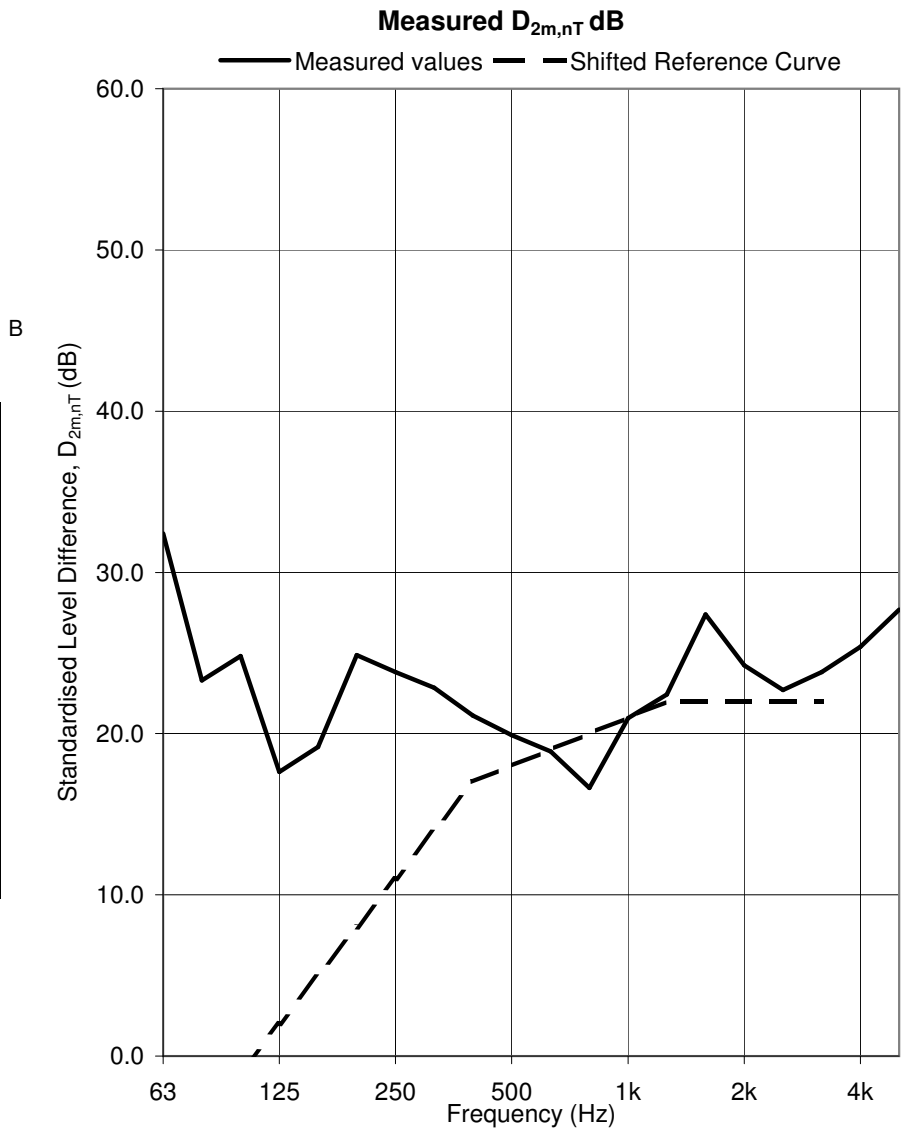
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713025

Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	26.3
63	32.4
80	23.3
100	24.8
125	17.6
160	19.2
200	24.9
250	23.8
315	22.8
400	21.1
500	19.9
630	18.9
800	16.6
1k	21.0
1.25k	22.4
1.6k	27.4
2k	24.2
2.5k	22.7
3.15k	23.8
4k	25.4
5k	27.7



D_{2m,nT,w} (C;C_{tr}) 22 (0; -1) dB

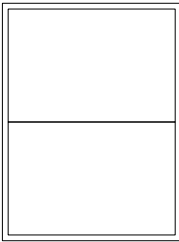
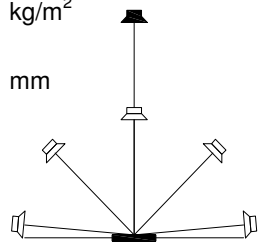
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

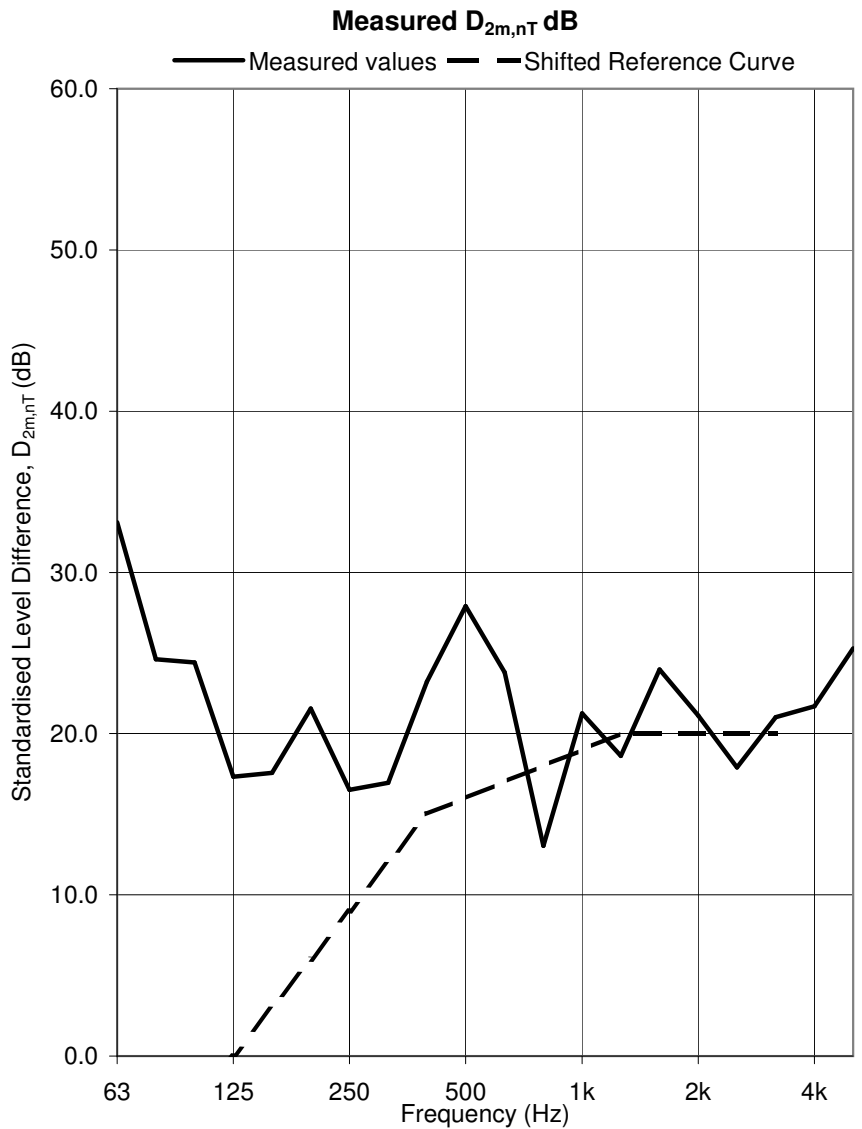
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713017

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	26.7
63	33.1
80	24.6
100	24.4
125	17.3
160	17.6
200	21.6
250	16.5
315	16.9
400	23.2
500	27.9
630	23.8
800	13.0
1k	21.3
1.25k	18.6
1.6k	24.0
2k	21.1
2.5k	17.9
3.15k	21.0
4k	21.7
5k	25.3

B



D_{2m,nT,w} (C;C_{tr}) 20 (-1; -2) dB

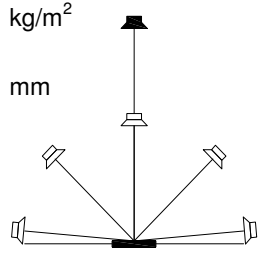
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

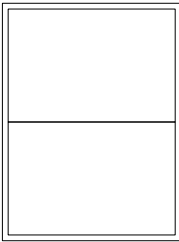
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

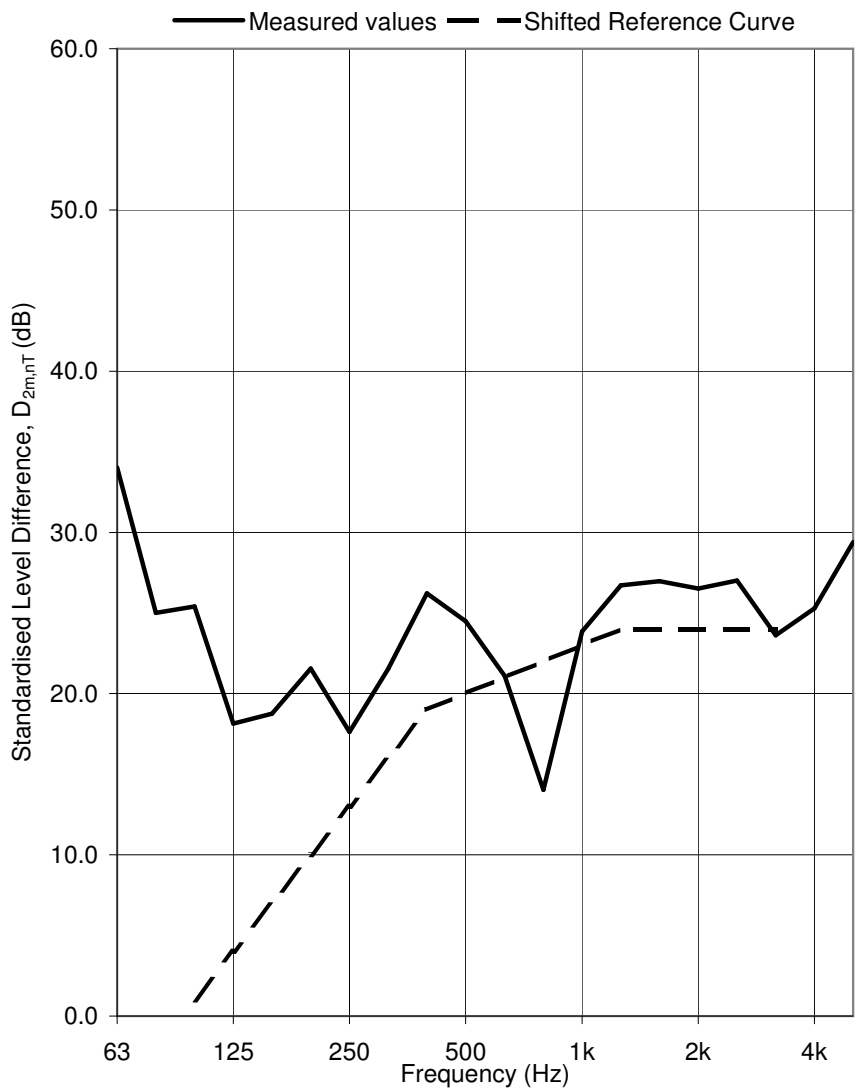


Test ID: 713021

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	27.6
63	34.0
80	25.0
100	25.4
125	18.1
160	18.8
200	21.6
250	17.6
315	21.5
400	26.2
500	24.5
630	21.1
800	14.0
1k	23.9
1.25k	26.7
1.6k	27.0
2k	26.5
2.5k	27.0
3.15k	23.6
4k	25.3
5k	29.4

$D_{2m,nT,w}$ (C;C_{tr}) 24 (-2; -3) dB

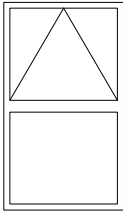
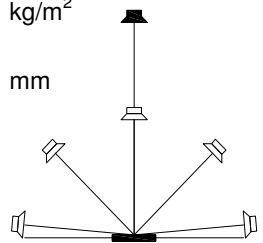
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

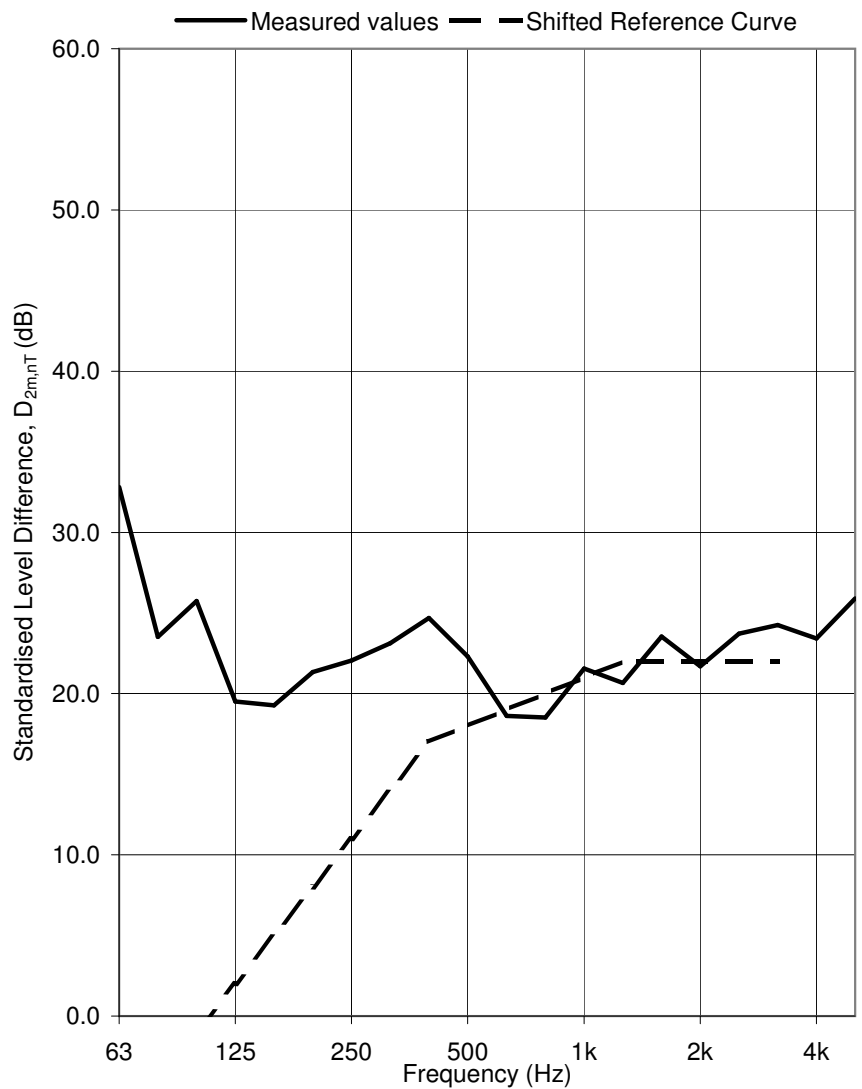
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718025

Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	26.3
63	32.8
80	23.5
100	25.7
125	19.5
160	19.3
200	21.3
250	22.0
315	23.1
400	24.7
500	22.3
630	18.6
800	18.5
1k	21.5
1.25k	20.7
1.6k	23.5
2k	21.7
2.5k	23.7
3.15k	24.2
4k	23.4
5k	25.9

$D_{2m,nT,w} (C;C_{tr})$ 22 (0; -1) dB

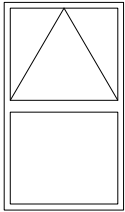
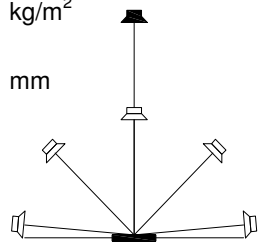
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

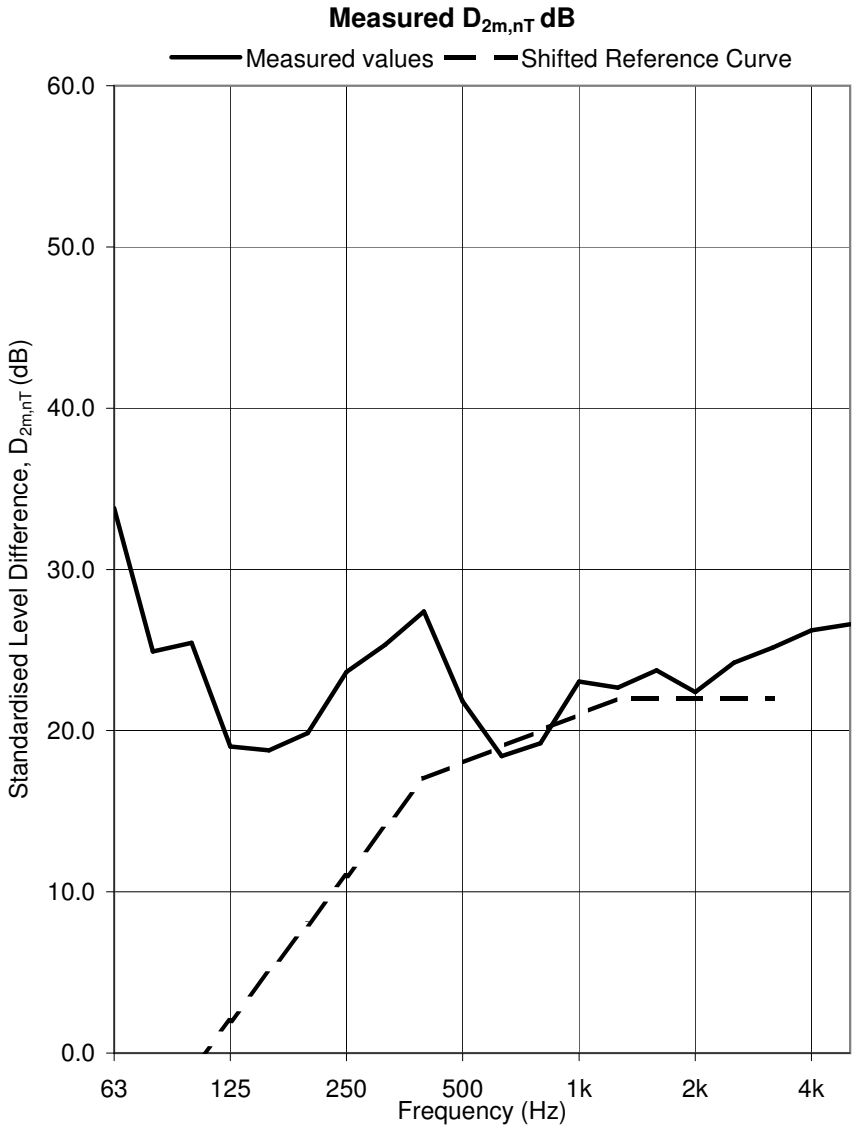
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719004

Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	27.0
63	33.8
80	24.9
100	25.4
125	19.0
160	18.8
200	19.8
250	23.6
315	25.3
400	27.4
500	21.8
630	18.4
800	19.2
1k	23.0
1.25k	22.7
1.6k	23.7
2k	22.4
2.5k	24.2
3.15k	25.1
4k	26.2
5k	26.6



D_{2m,nT,w} (C;C_{tr}) 22 (0; 0) dB

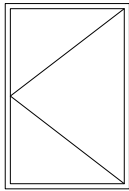
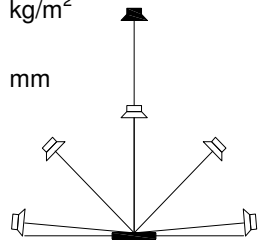
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

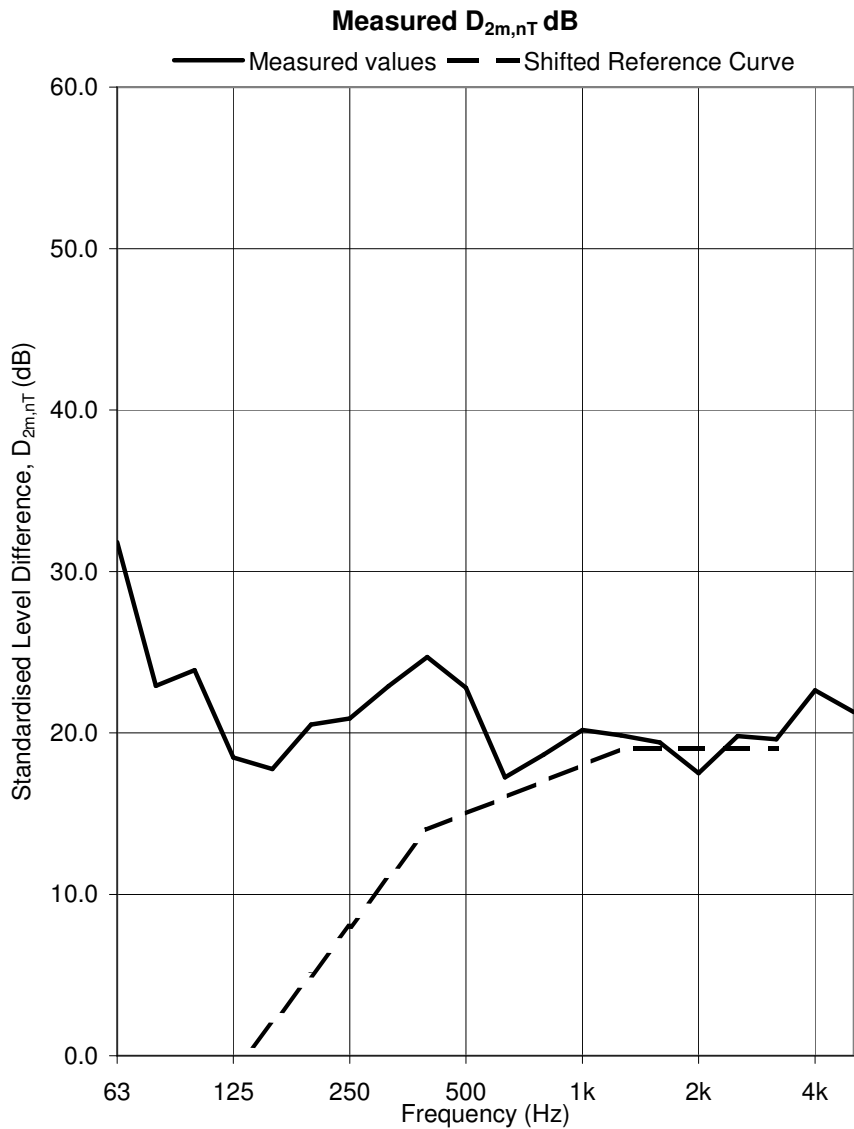
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720004

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.9
63	31.8
80	22.9
100	23.9
125	18.5
160	17.8
200	20.5
250	20.9
315	22.9
400	24.7
500	22.8
630	17.2
800	18.7
1k	20.2
1.25k	19.8
1.6k	19.4
2k	17.5
2.5k	19.8
3.15k	19.6
4k	22.6
5k	21.3



D_{2m,nT,w} (C;C_{tr}) 19 (0; 1) dB

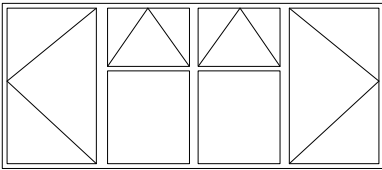
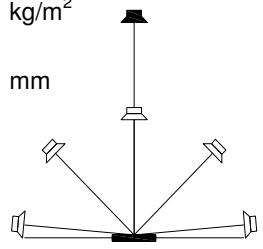
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

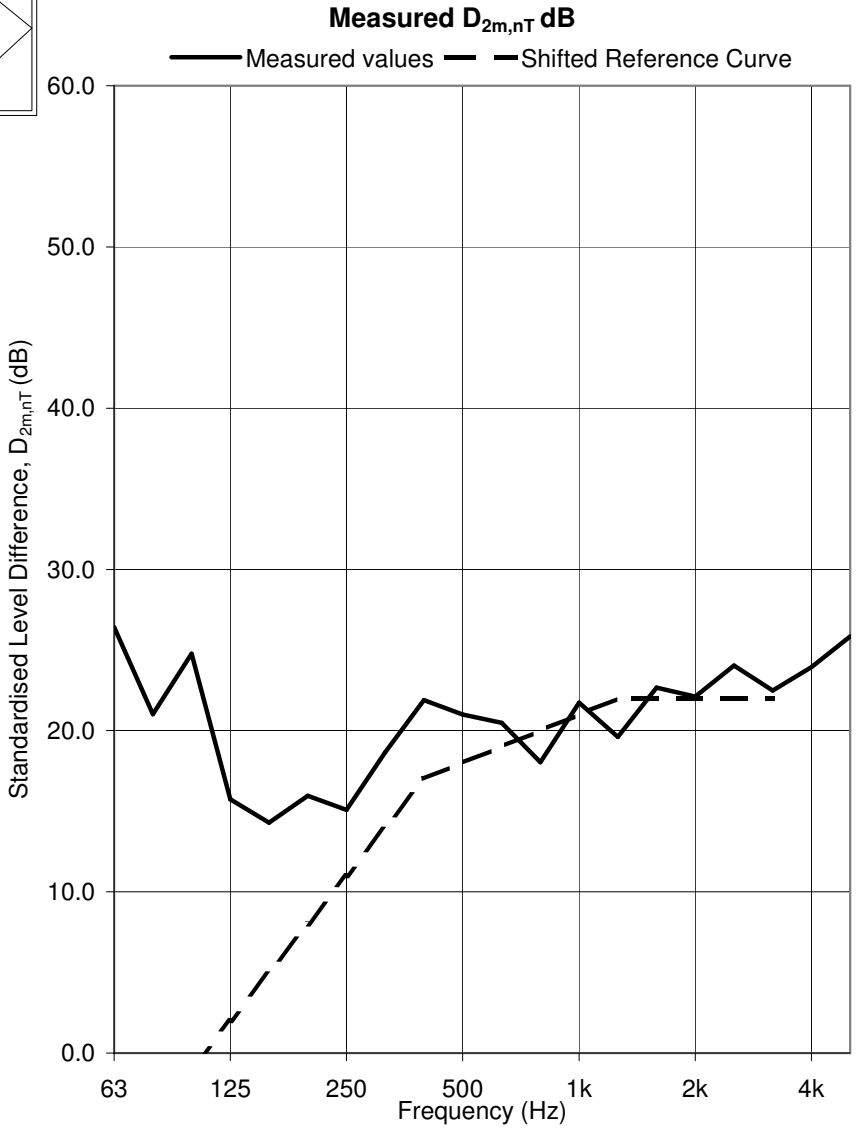
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628031

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	19.3
63	26.4
80	21.0
100	24.8
125	15.7
160	14.3
200	16.0
250	15.1
315	18.7
400	21.9
500	21.0
630	20.5
800	18.0
1k	21.7
1.25k	19.6
1.6k	22.7
2k	22.1
2.5k	24.0
3.15k	22.5
4k	23.9
5k	25.8



D_{2m,nT,w} (C;C_{tr}) 22 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

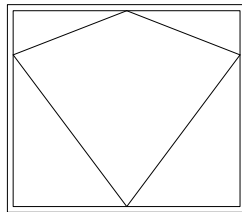
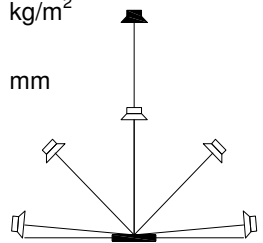
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

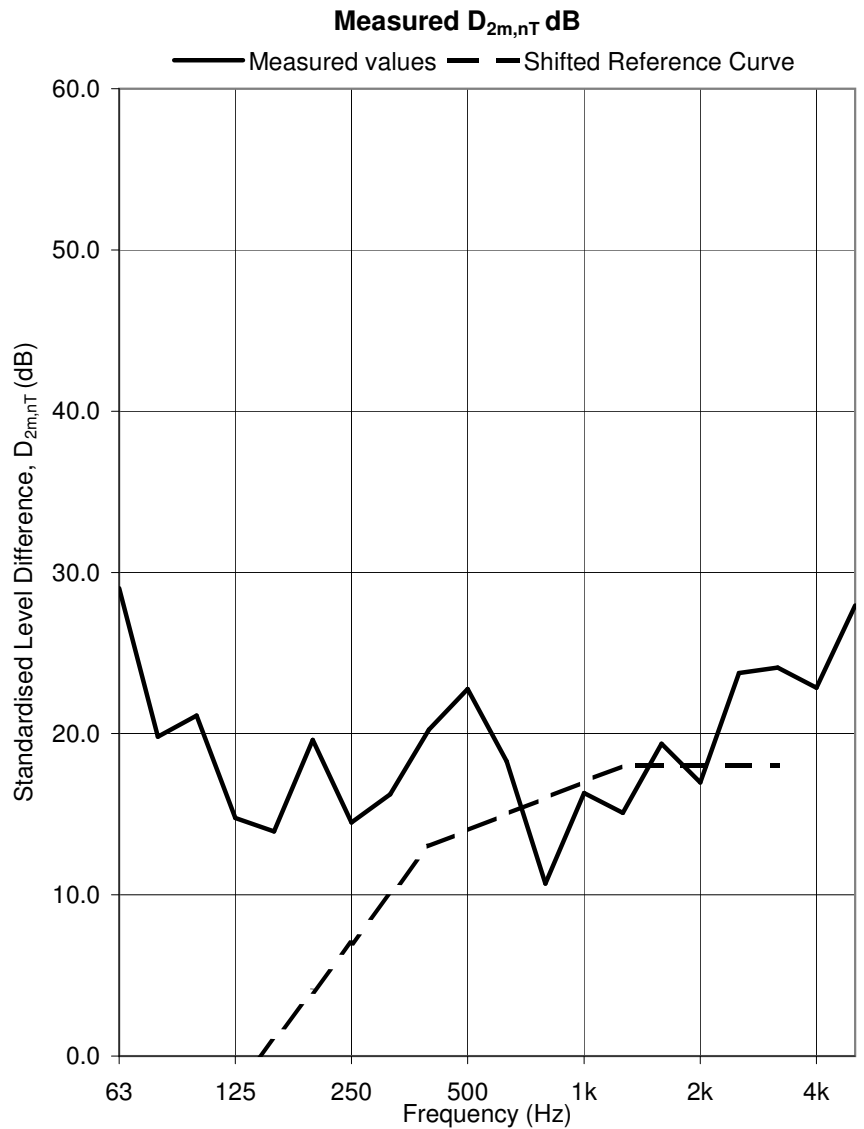
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	23.8
63	29.0
80	19.8
100	21.1
125	14.8
160	13.9
200	19.6
250	14.5
315	16.2
400	20.3
500	22.8
630	18.3
800	10.7
1k	16.3
1.25k	15.1
1.6k	19.4
2k	17.0
2.5k	23.8
3.15k	24.1
4k	22.8
5k	27.9



D_{2m,nT,w} (C;C_{tr}) 18 (-1; -2) dB

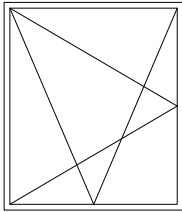
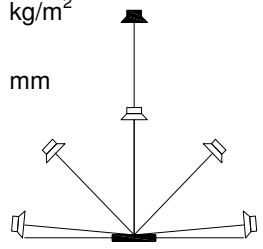
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

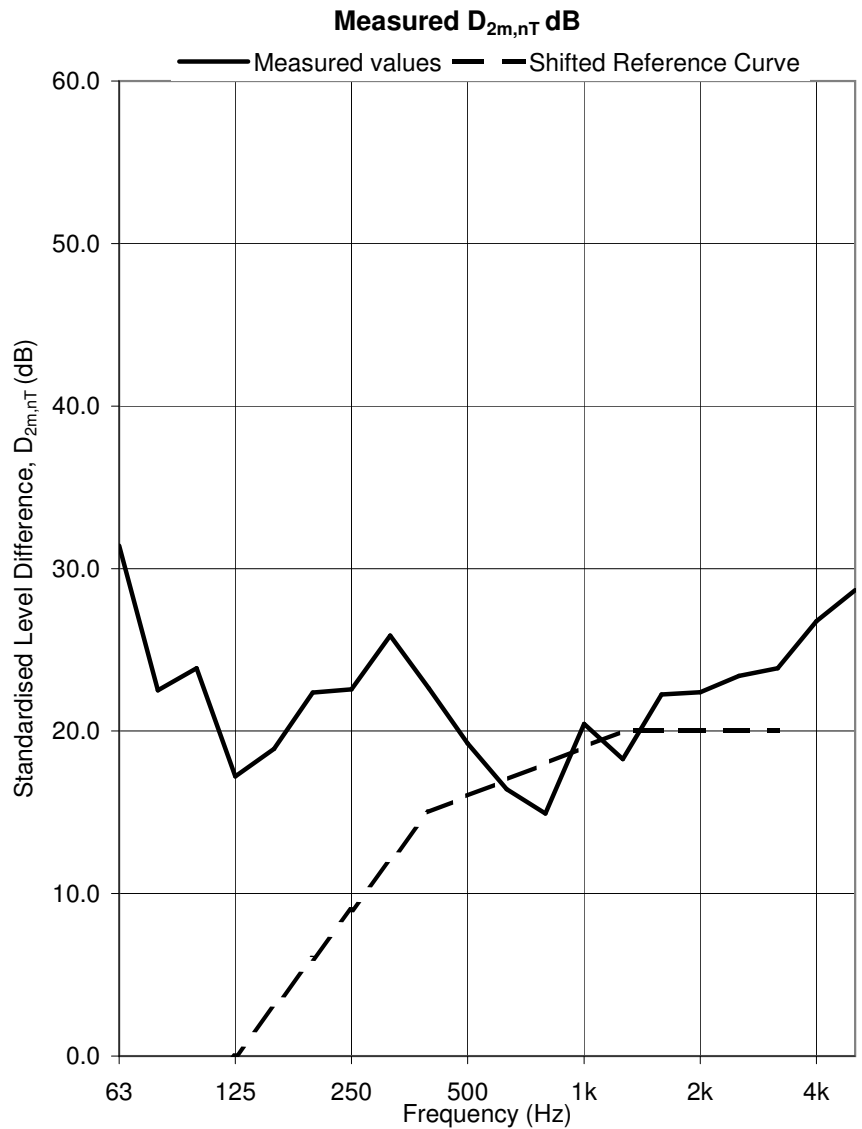
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711020

Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.2
63	31.4
80	22.5
100	23.9
125	17.2
160	18.9
200	22.4
250	22.6
315	25.9
400	22.6
500	19.2
630	16.4
800	14.9
1k	20.4
1.25k	18.3
1.6k	22.3
2k	22.4
2.5k	23.4
3.15k	23.9
4k	26.8
5k	28.7

b



D_{2m,nT,w} (C;C_{tr}) 20 (0; -1) dB

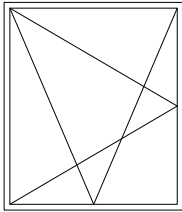
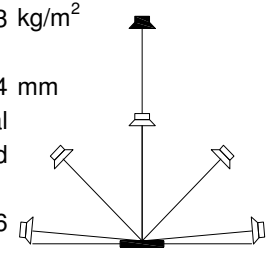
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

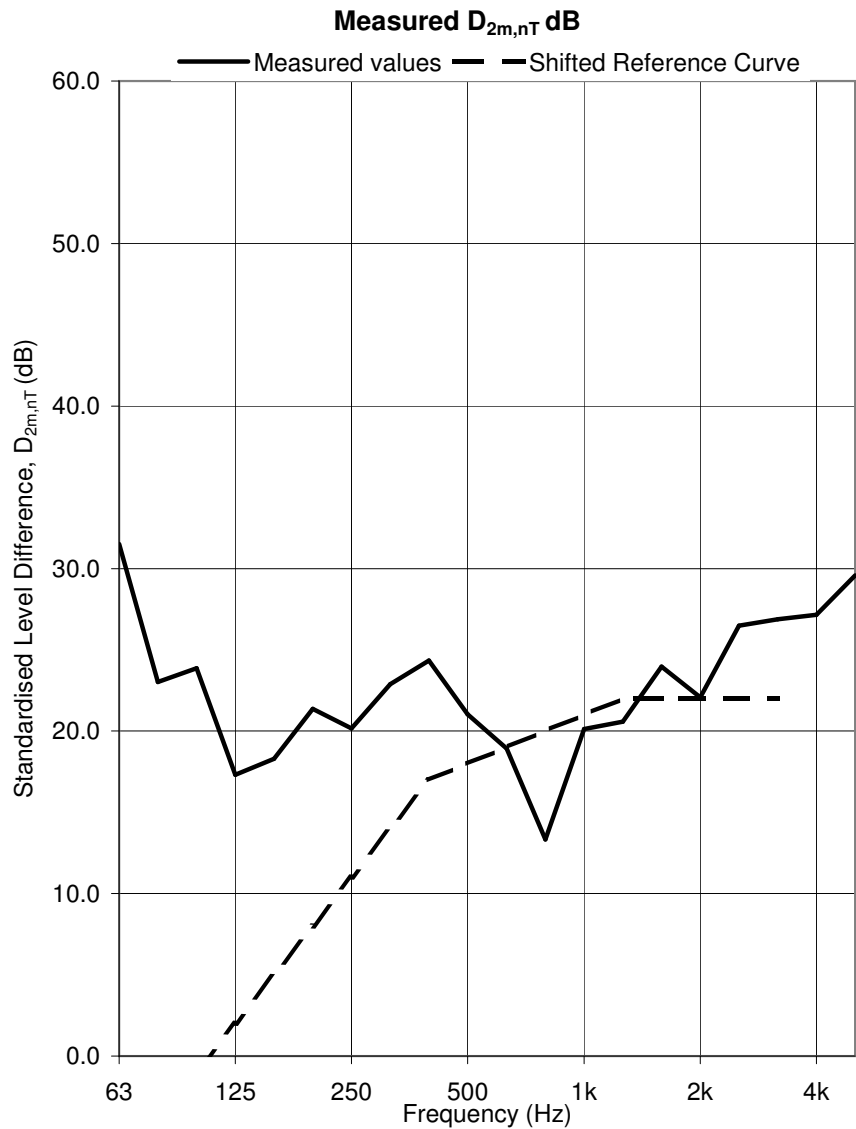
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711024

Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.4
63	31.5
80	23.0
100	23.9
125	17.3
160	18.3
200	21.4
250	20.2
315	22.9
400	24.3
500	21.0
630	18.9
800	13.3
1k	20.1
1.25k	20.6
1.6k	24.0
2k	22.1
2.5k	26.5
3.15k	26.9
4k	27.2
5k	29.6

B



D_{2m,nT,w} (C;C_{tr}) 22 (-2; -3) dB

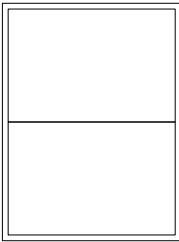
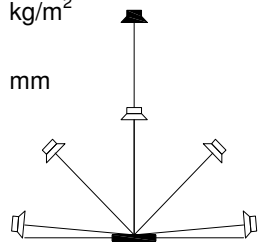
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

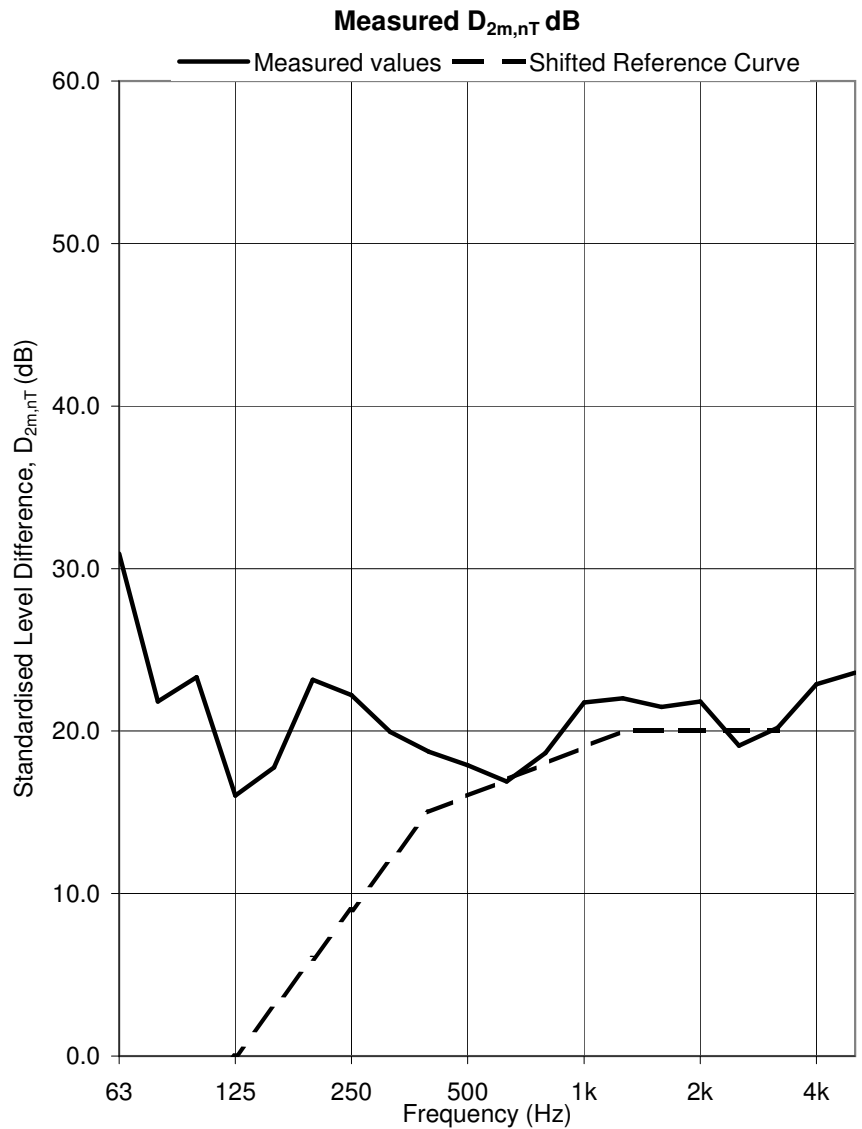
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713026

Test Sample: Window D-1 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.5
63	30.9
80	21.8
100	23.3
125	16.0
160	17.8
200	23.2
250	22.2
315	19.9
400	18.7
500	17.9
630	16.9
800	18.6
1k	21.8
1.25k	22.0
1.6k	21.5
2k	21.8
2.5k	19.1
3.15k	20.2
4k	22.9
5k	23.6



D_{2m,nT,w} (C;C_{tr}) 20 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

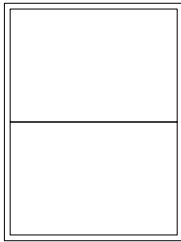
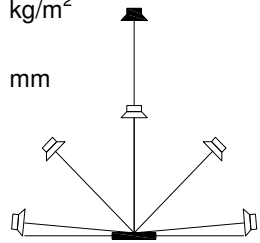
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

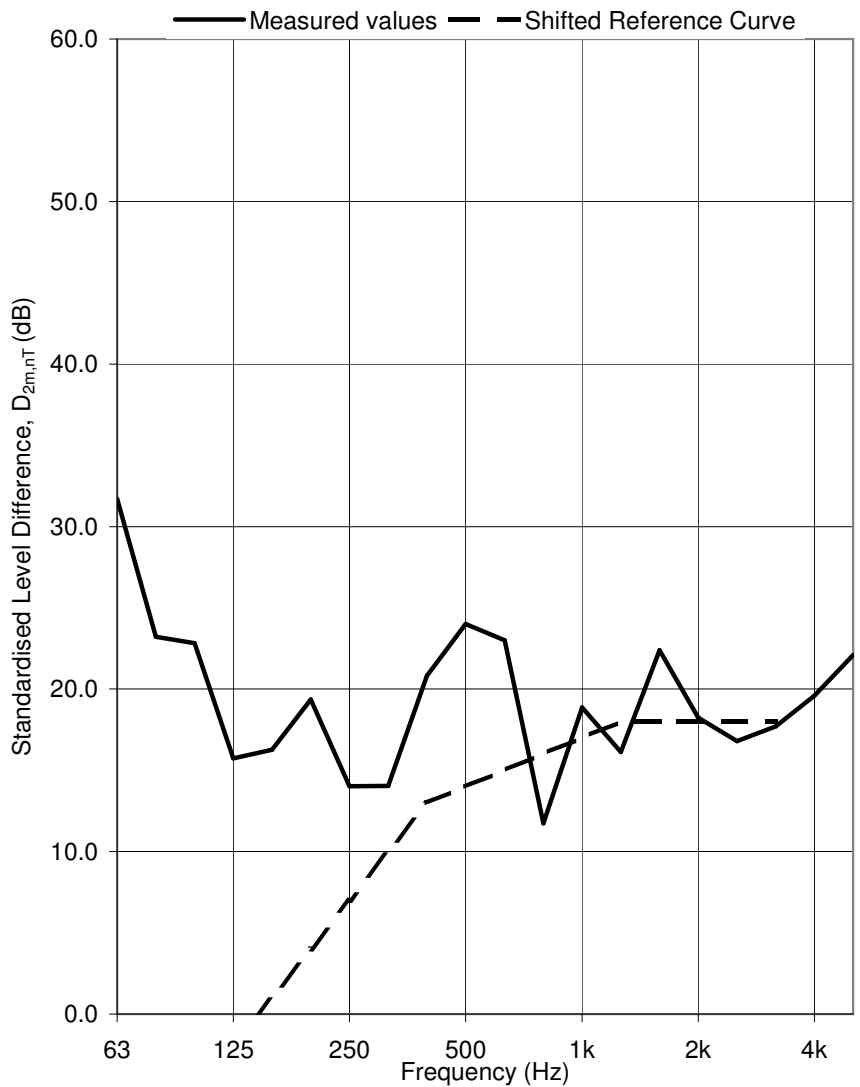
Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713018

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	26.0
63	31.7
80	23.2
100	22.8
125	15.7
160	16.3
200	19.4
250	14.0
315	14.0
400	20.8
500	24.0
630	23.0
800	11.7
1k	18.9
1.25k	16.1
1.6k	22.4
2k	18.2
2.5k	16.8
3.15k	17.7
4k	19.6
5k	22.1

$D_{2m,nT,w}$ (C;C_{tr}) 18 (-1; -1) dB

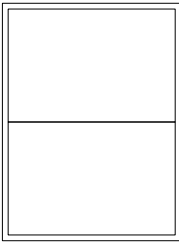
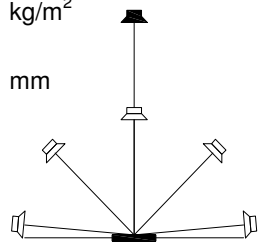
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

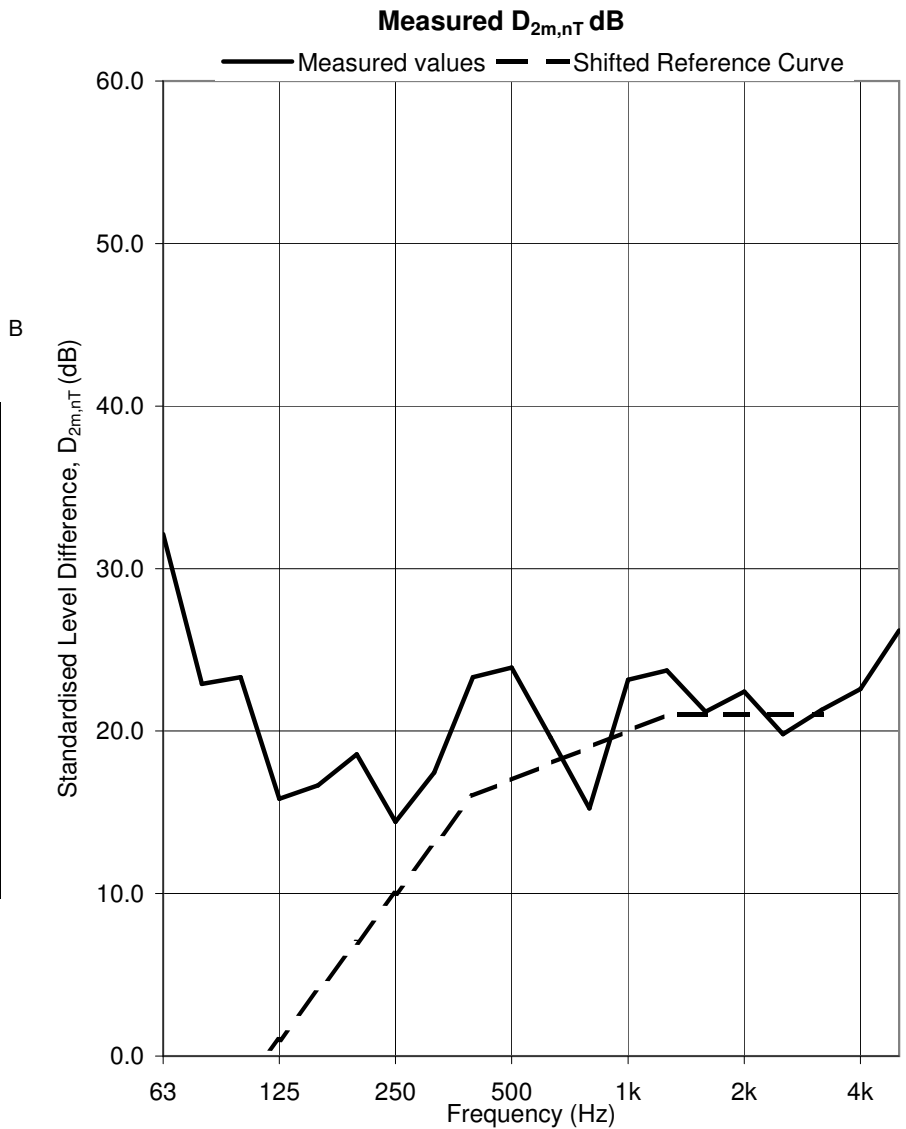
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713022

Test Sample: Window D-3 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	27.0
63	32.1
80	22.9
100	23.3
125	15.8
160	16.7
200	18.6
250	14.4
315	17.4
400	23.3
500	23.9
630	19.6
800	15.2
1k	23.2
1.25k	23.7
1.6k	21.2
2k	22.4
2.5k	19.8
3.15k	21.3
4k	22.6
5k	26.2



D_{2m,nT,w} (C;C_{tr}) 21 (-1; -2) dB

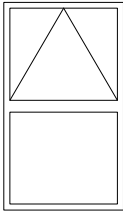
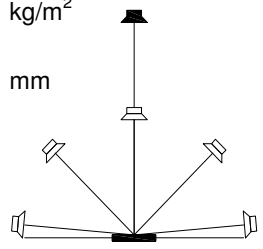
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

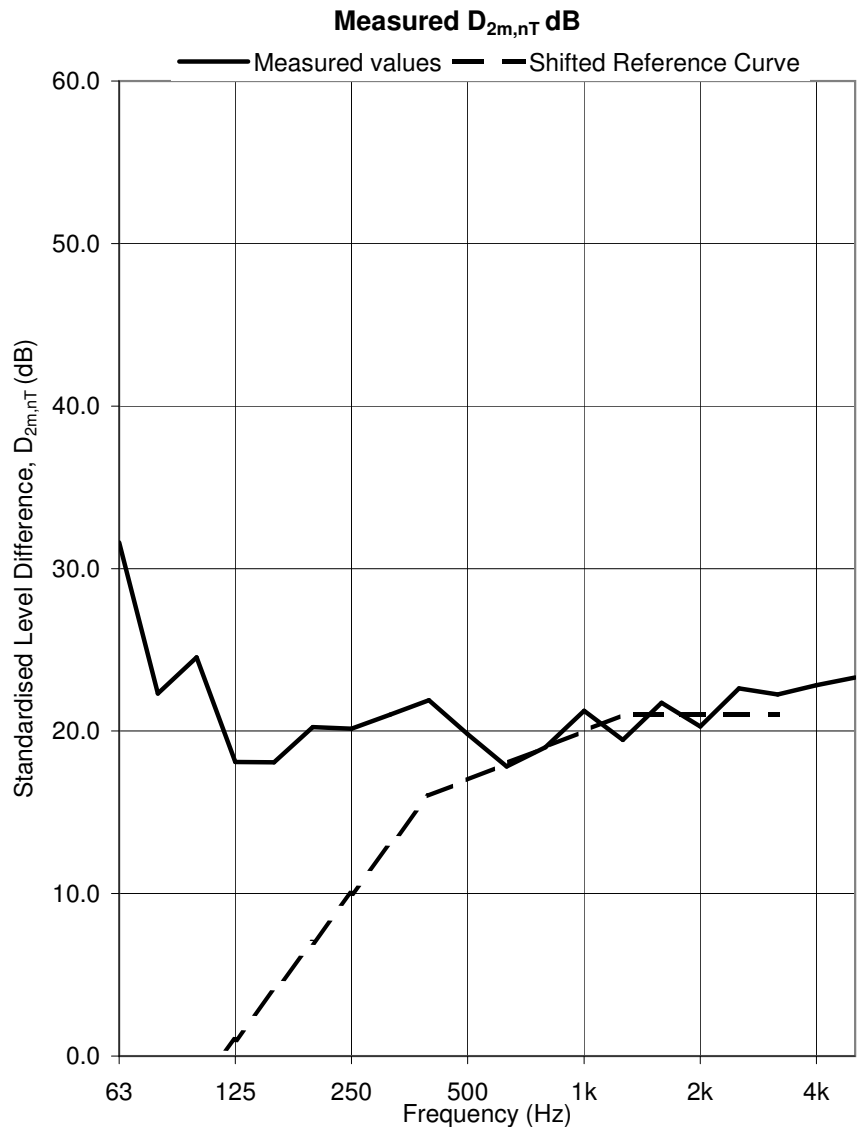
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718024

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.1
63	31.6
80	22.3
100	24.5
125	18.1
160	18.1
200	20.2
250	20.1
315	21.0
400	21.9
500	19.8
630	17.8
800	19.0
1k	21.2
1.25k	19.5
1.6k	21.7
2k	20.3
2.5k	22.6
3.15k	22.2
4k	22.8
5k	23.3



D_{2m,nT,w} (C;C_{tr}) 21 (0; -1) dB

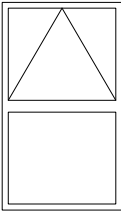
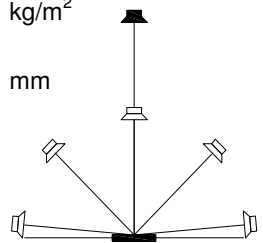
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

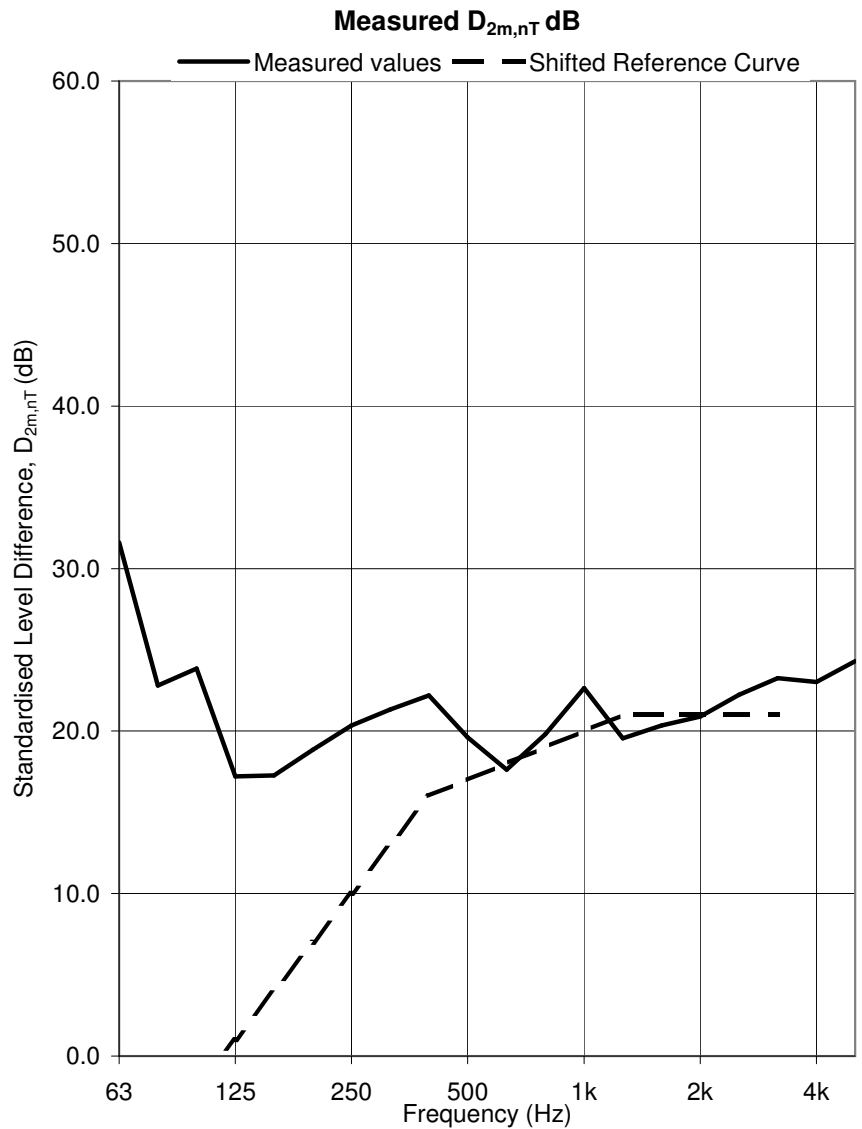
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719005

Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	25.0
63	31.6
80	22.8
100	23.8
125	17.2
160	17.3
200	18.8
250	20.3
315	21.3
400	22.2
500	19.6
630	17.6
800	19.8
1k	22.6
1.25k	19.6
1.6k	20.3
2k	20.9
2.5k	22.2
3.15k	23.2
4k	23.0
5k	24.3



D_{2m,nT,w} (C;C_{tr}) 21 (0; -1) dB

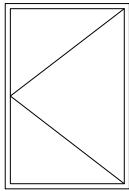
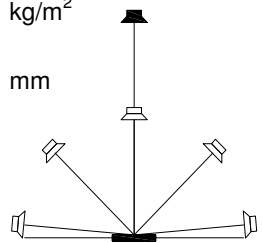
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

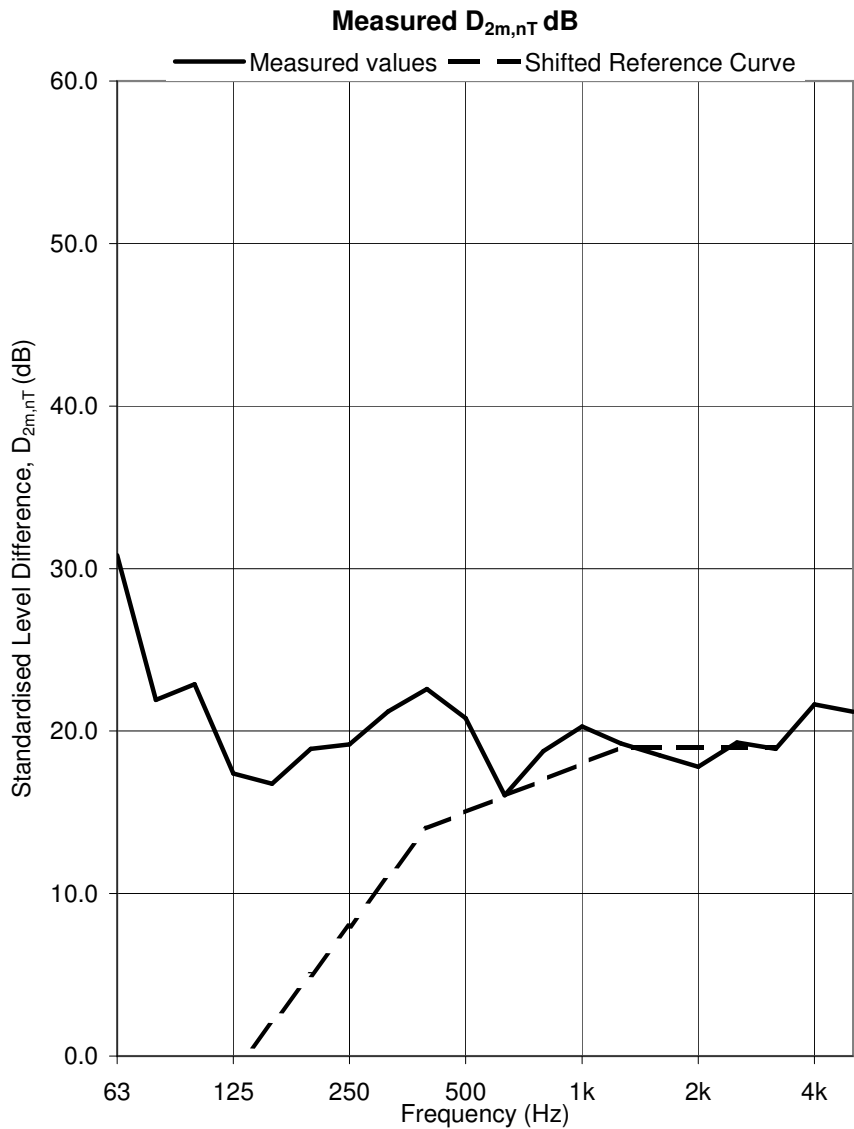
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720005

Test Sample: Window G Open 0.10 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	24.8
63	30.8
80	21.9
100	22.9
125	17.4
160	16.8
200	18.9
250	19.2
315	21.2
400	22.6
500	20.8
630	16.0
800	18.8
1k	20.3
1.25k	19.2
1.6k	18.5
2k	17.8
2.5k	19.3
3.15k	18.9
4k	21.6
5k	21.2



D_{2m,nT,w} (C;C_{tr}) 19 (0; 0) dB

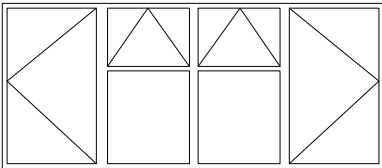
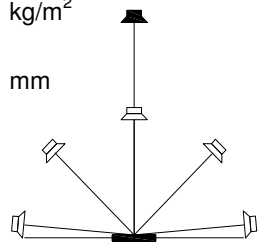
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

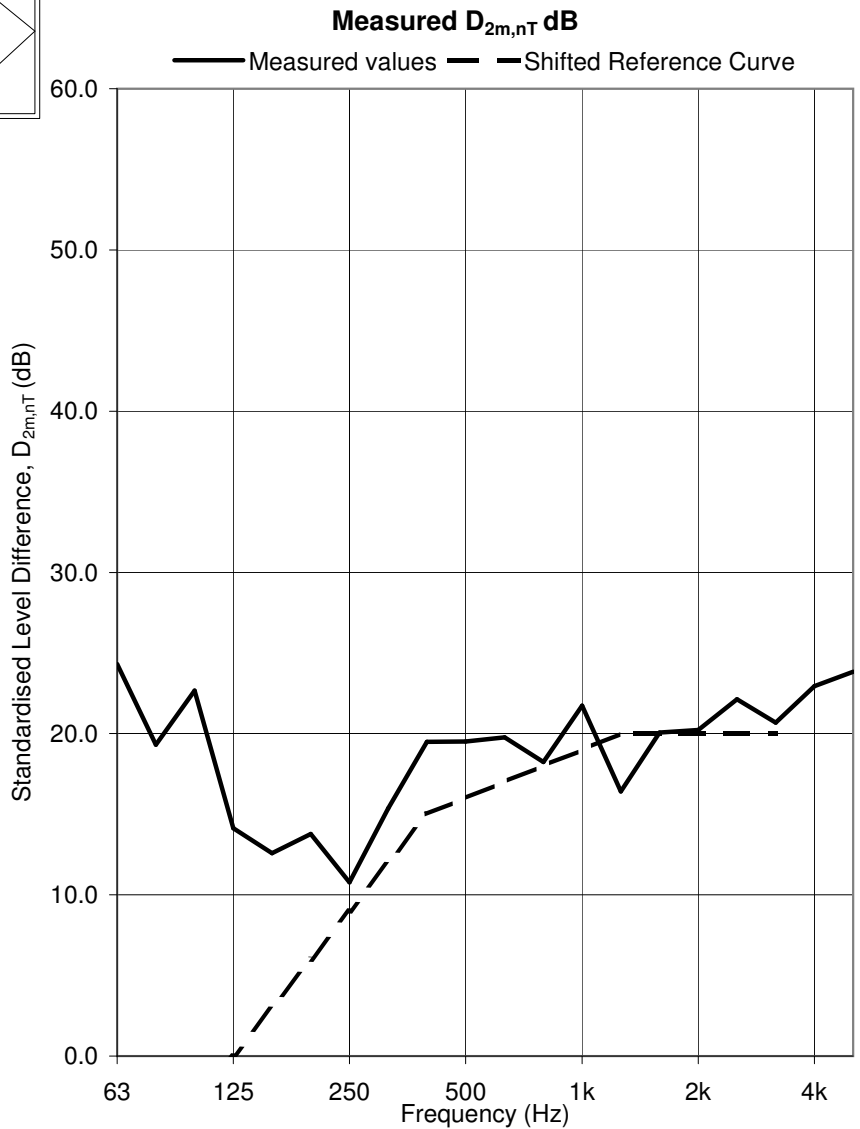
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628032

Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	17.3
63	24.3
80	19.3
100	22.7
125	14.1
160	12.6
200	13.8
250	10.8
315	15.4
400	19.5
500	19.5
630	19.8
800	18.2
1k	21.7
1.25k	16.4
1.6k	20.1
2k	20.2
2.5k	22.1
3.15k	20.7
4k	22.9
5k	23.8



D_{2m,nT,w} (C;C_{tr}) 20 (-1; -2) dB

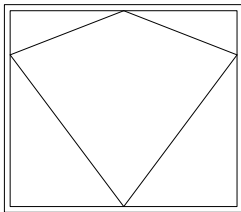
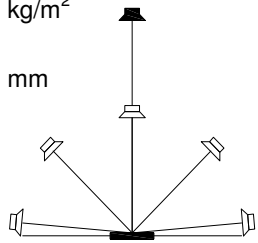
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

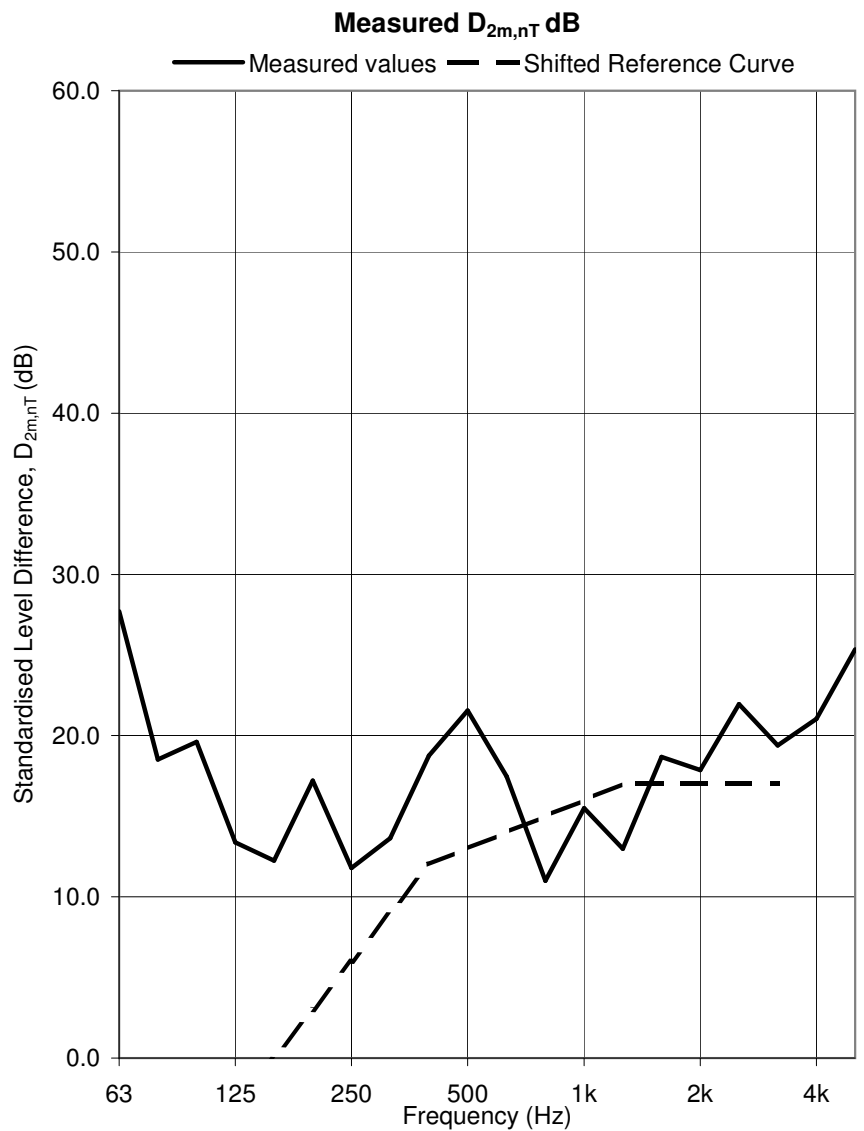
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705030

Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	22.7
63	27.7
80	18.5
100	19.6
125	13.4
160	12.2
200	17.2
250	11.8
315	13.6
400	18.8
500	21.6
630	17.5
800	11.0
1k	15.5
1.25k	13.0
1.6k	18.7
2k	17.9
2.5k	22.0
3.15k	19.4
4k	21.0
5k	25.3



D_{2m,nT,w} (C;C_{tr}) 17 (-1; -2) dB

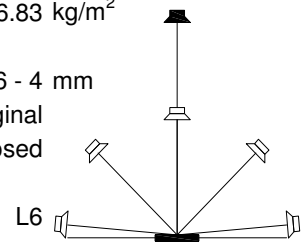
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

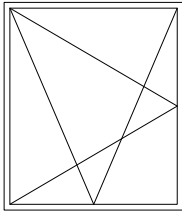
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

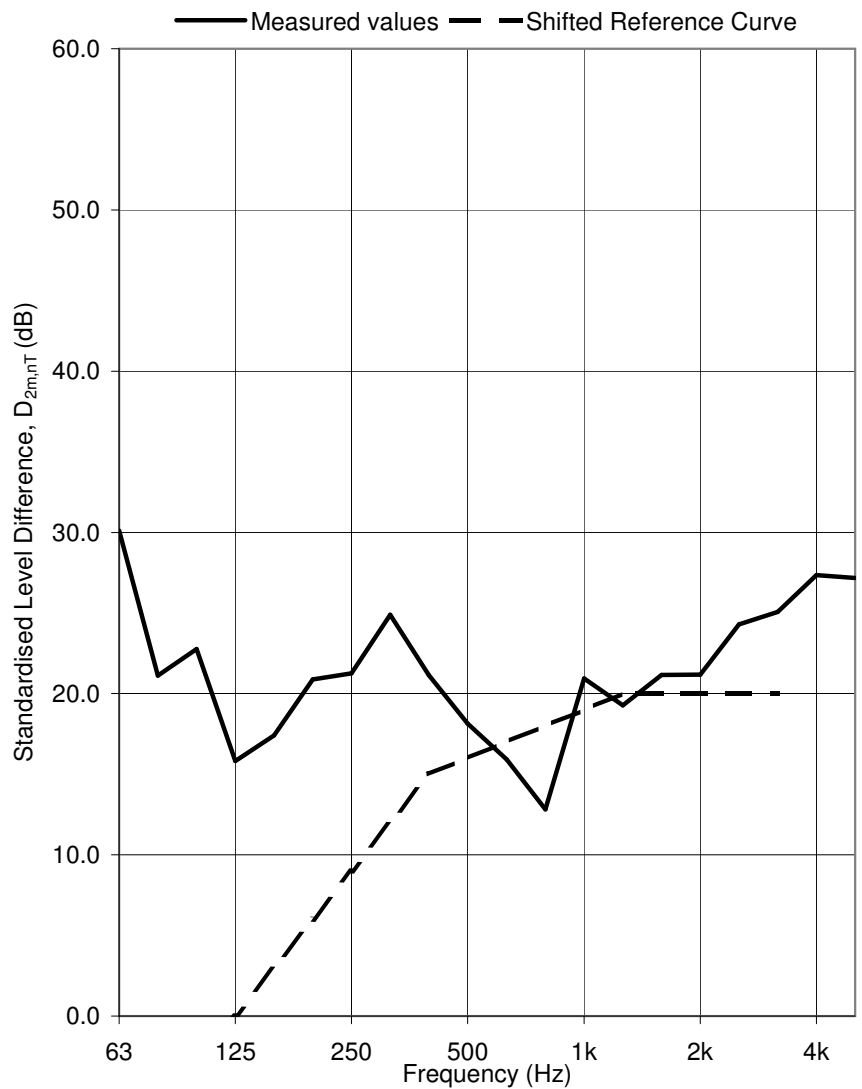


Test ID: 711021

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	24.5
63	30.1
80	21.1
100	22.8
125	15.8
160	17.4
200	20.9
250	21.3
315	24.9
400	21.1
500	18.1
630	15.9
800	12.8
1k	20.9
1.25k	19.3
1.6k	21.2
2k	21.2
2.5k	24.3
3.15k	25.1
4k	27.4
5k	27.2

$D_{2m,nT,w}$ (C;C_{tr}) 20 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

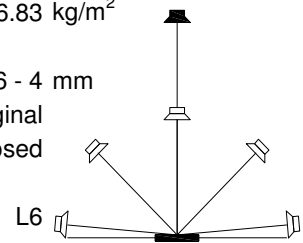
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

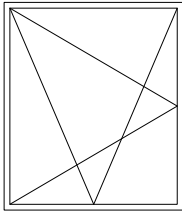
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

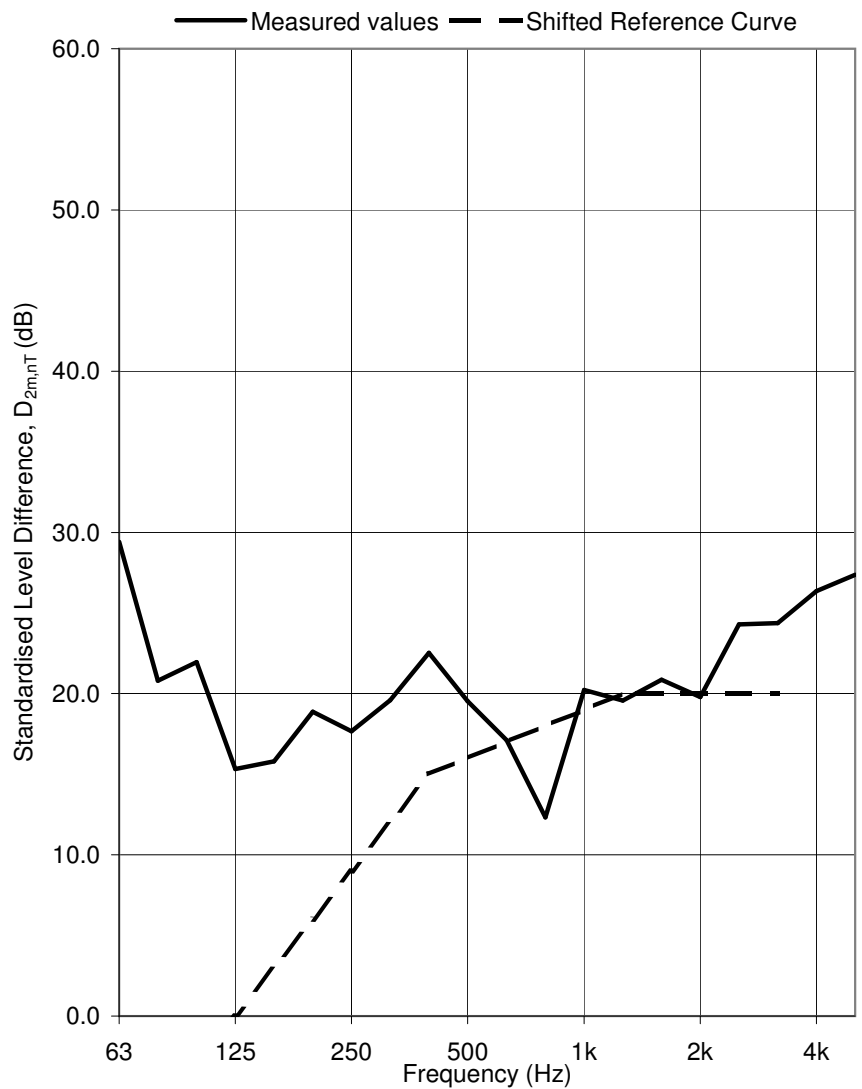
Loudspeaker Configuration:



Test ID: 711025



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	23.2
63	29.4
80	20.8
100	22.0
125	15.3
160	15.8
200	18.9
250	17.7
315	19.6
400	22.5
500	19.5
630	17.1
800	12.3
1k	20.2
1.25k	19.6
1.6k	20.9
2k	19.8
2.5k	24.3
3.15k	24.4
4k	26.4
5k	27.4

$D_{2m,nT,w}$ (C;C_{tr}) 20 (-1; -2) dB

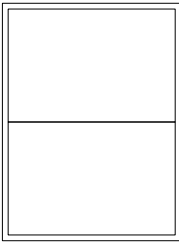
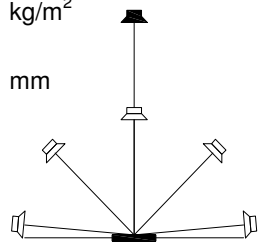
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

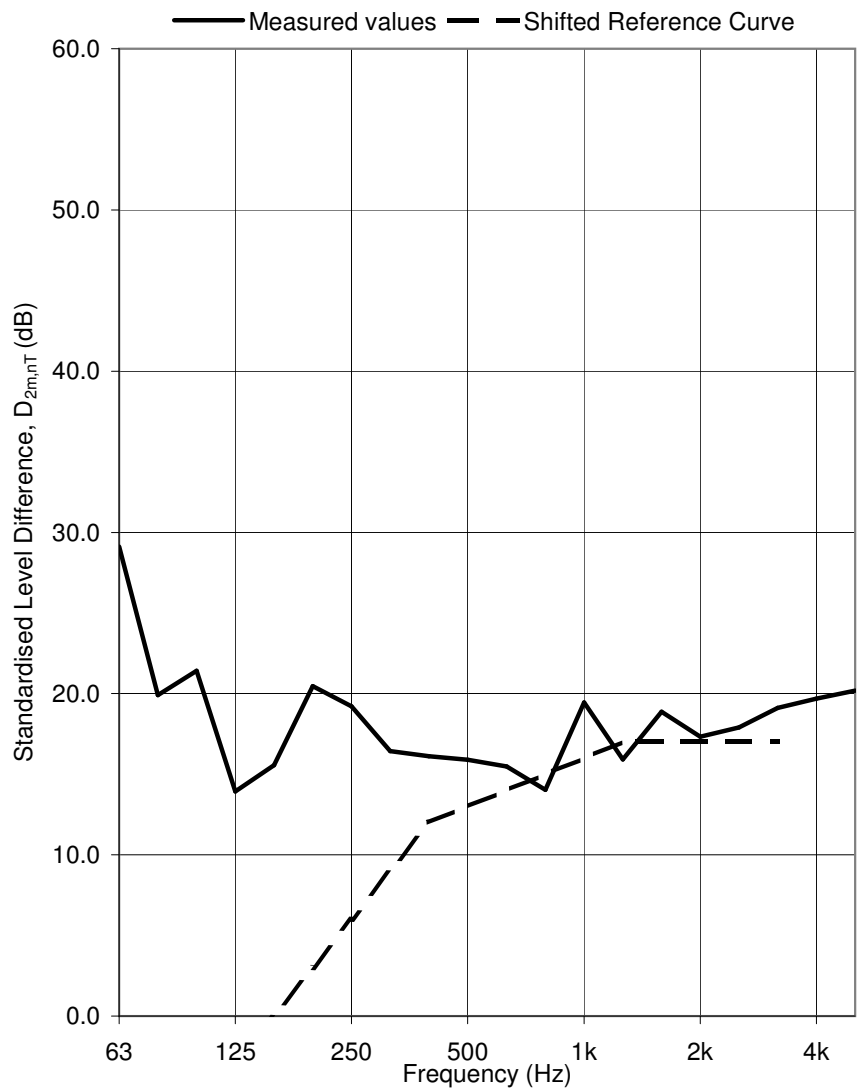
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713027

Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	24.0
63	29.1
80	19.9
100	21.4
125	13.9
160	15.6
200	20.5
250	19.2
315	16.4
400	16.1
500	15.9
630	15.5
800	14.0
1k	19.5
1.25k	15.9
1.6k	18.9
2k	17.3
2.5k	17.9
3.15k	19.1
4k	19.7
5k	20.2

$D_{2m,nT,w}$ (C;C_{tr}) 17 (0; 0) dB

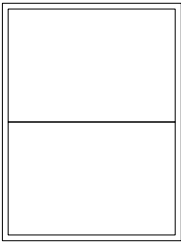
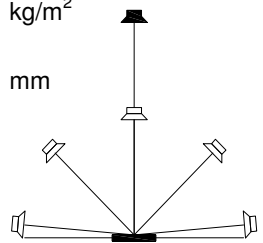
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

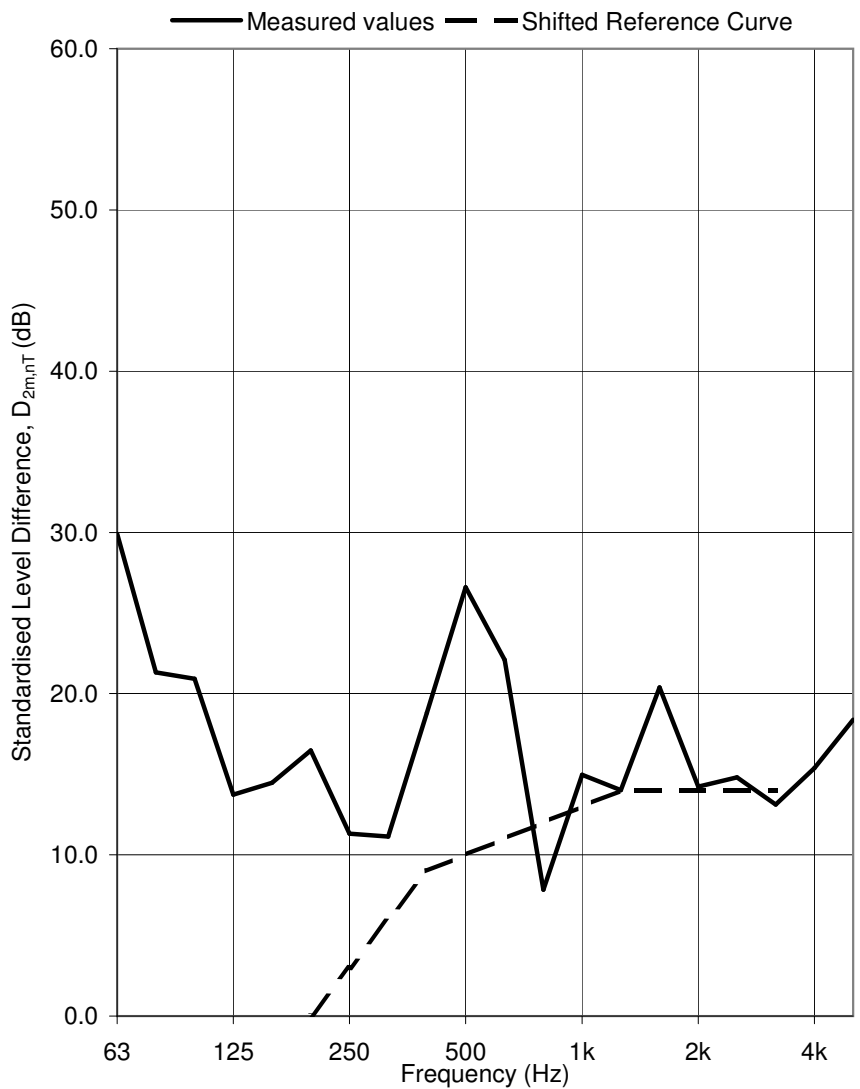
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713019

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	24.9
63	29.9
80	21.3
100	20.9
125	13.7
160	14.5
200	16.5
250	11.3
315	11.1
400	18.8
500	26.6
630	22.1
800	7.8
1k	15.0
1.25k	14.0
1.6k	20.4
2k	14.2
2.5k	14.8
3.15k	13.1
4k	15.4
5k	18.4

$D_{2m,nT,w}$ (C;C_{tr}) 14 (0; -1) dB

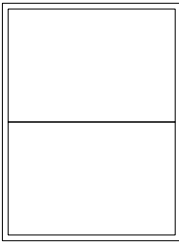
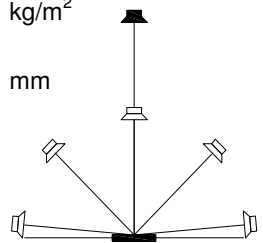
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

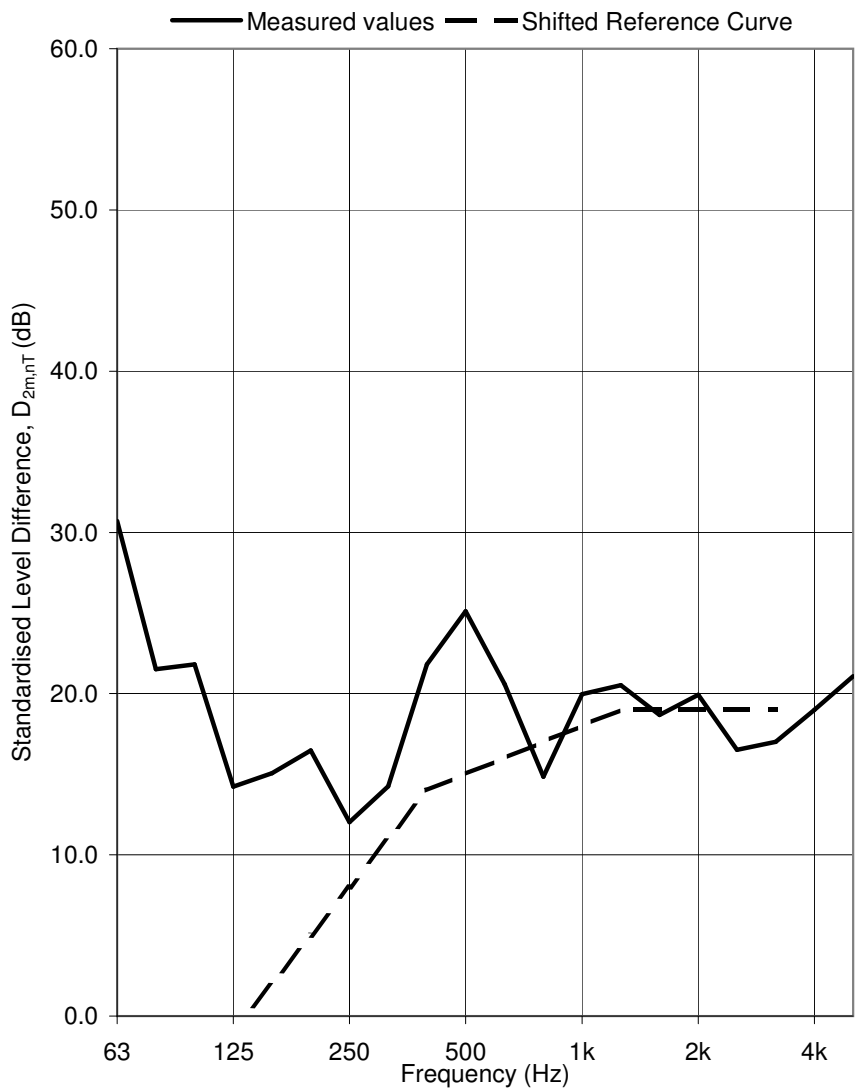
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713023

Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured D_{2m,nT} dB



Frequency Hz	D _{2m,nT} dB
50	25.6
63	30.7
80	21.5
100	21.8
125	14.2
160	15.1
200	16.5
250	12.0
315	14.2
400	21.8
500	25.1
630	20.6
800	14.8
1k	20.0
1.25k	20.5
1.6k	18.7
2k	19.9
2.5k	16.5
3.15k	17.0
4k	19.0
5k	21.1

D_{2m,nT,w} (C;C_{tr}) 19 (-1; -1) dB

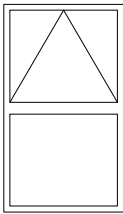
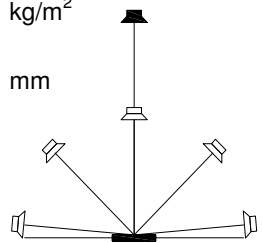
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

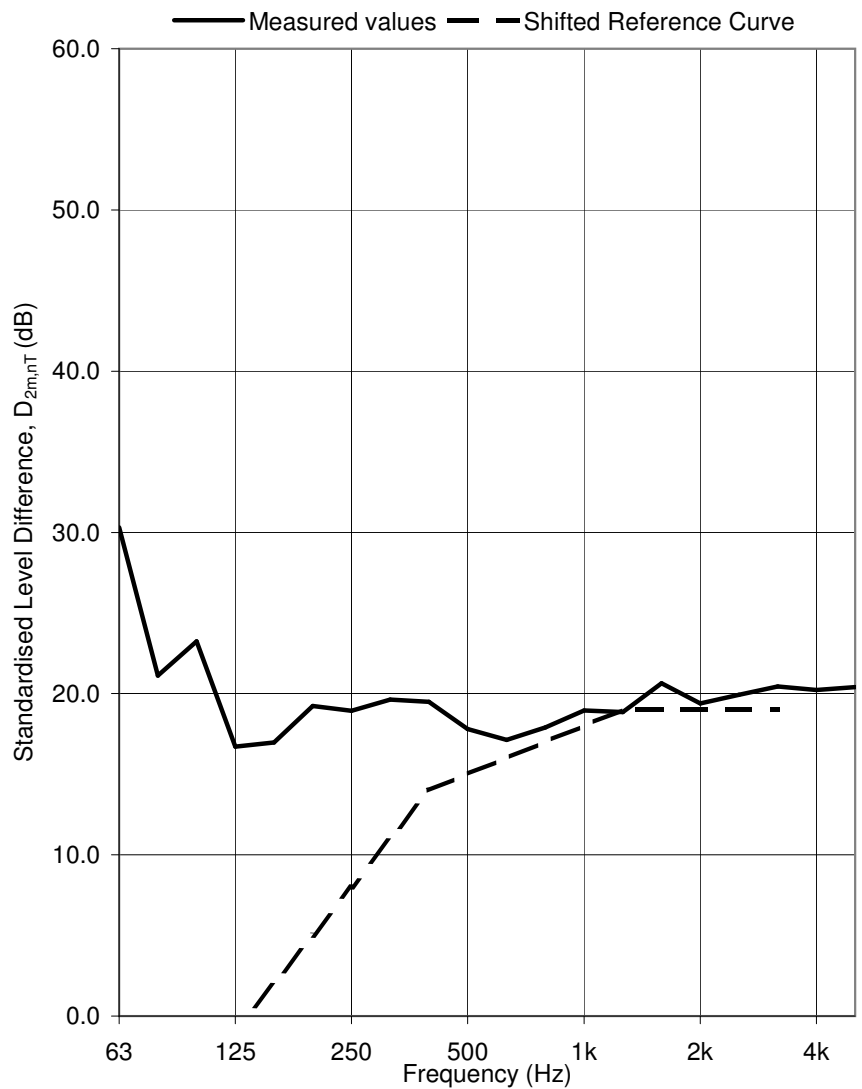
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718023

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	23.8
63	30.3
80	21.1
100	23.2
125	16.7
160	17.0
200	19.2
250	18.9
315	19.6
400	19.5
500	17.8
630	17.1
800	17.9
1k	18.9
1.25k	18.9
1.6k	20.6
2k	19.4
2.5k	19.9
3.15k	20.4
4k	20.2
5k	20.4

$D_{2m,nT,w} (C;C_{tr})$ 19 (0; 0) dB

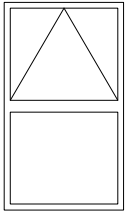
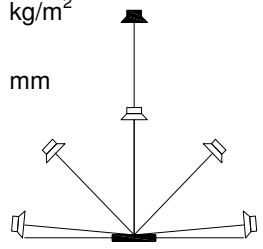
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

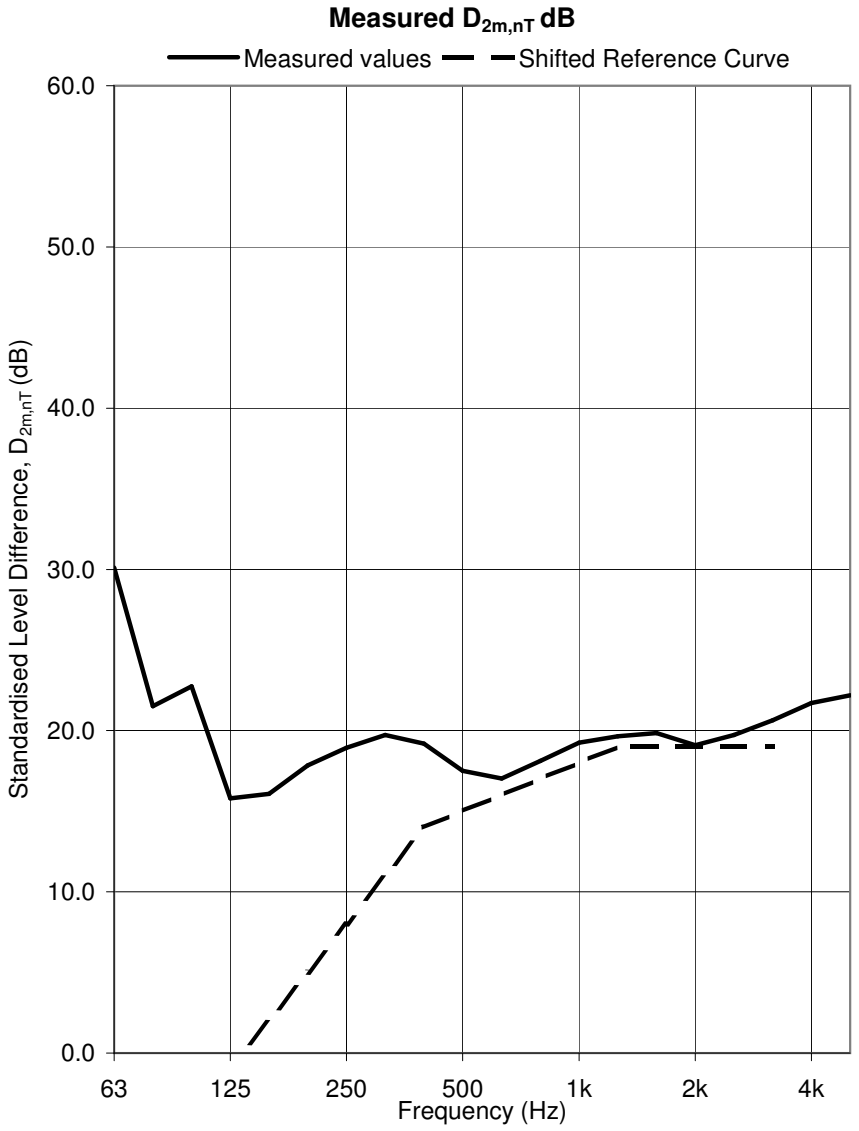
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719006

Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	23.6
63	30.1
80	21.5
100	22.7
125	15.8
160	16.1
200	17.8
250	18.9
315	19.7
400	19.2
500	17.5
630	17.0
800	18.1
1k	19.2
1.25k	19.7
1.6k	19.8
2k	19.1
2.5k	19.7
3.15k	20.6
4k	21.7
5k	22.2



D_{2m,nT,w} (C;C_{tr}) 19 (0; 0) dB

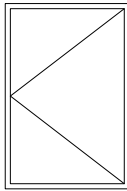
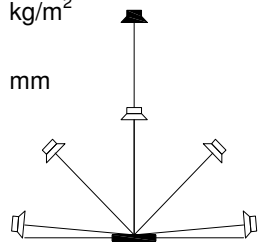
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

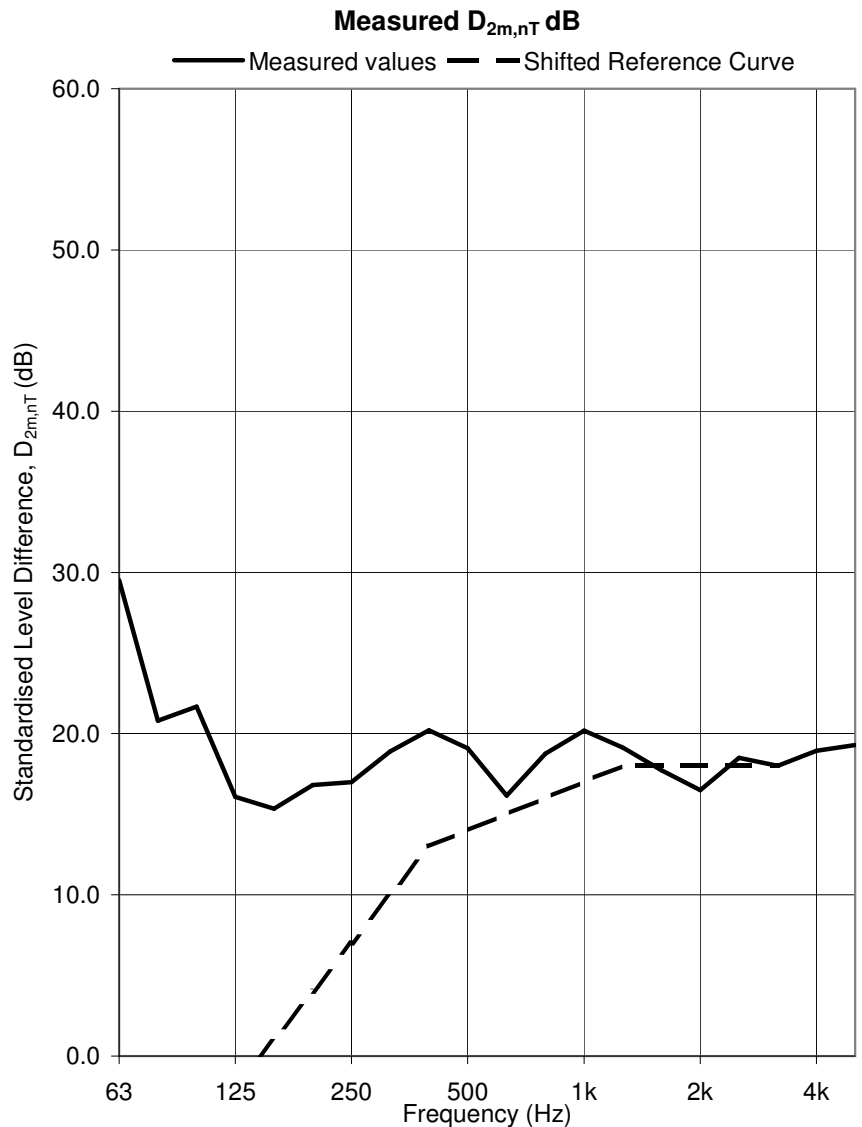
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720006

Test Sample: Window G Open 0.20 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	23.5
63	29.5
80	20.8
100	21.7
125	16.1
160	15.4
200	16.8
250	17.0
315	18.9
400	20.2
500	19.1
630	16.1
800	18.8
1k	20.2
1.25k	19.1
1.6k	17.7
2k	16.5
2.5k	18.5
3.15k	18.0
4k	18.9
5k	19.3



D_{2m,nT,w} (C;C_{tr}) 18 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

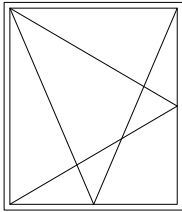
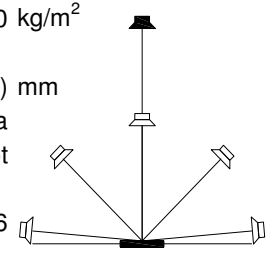
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

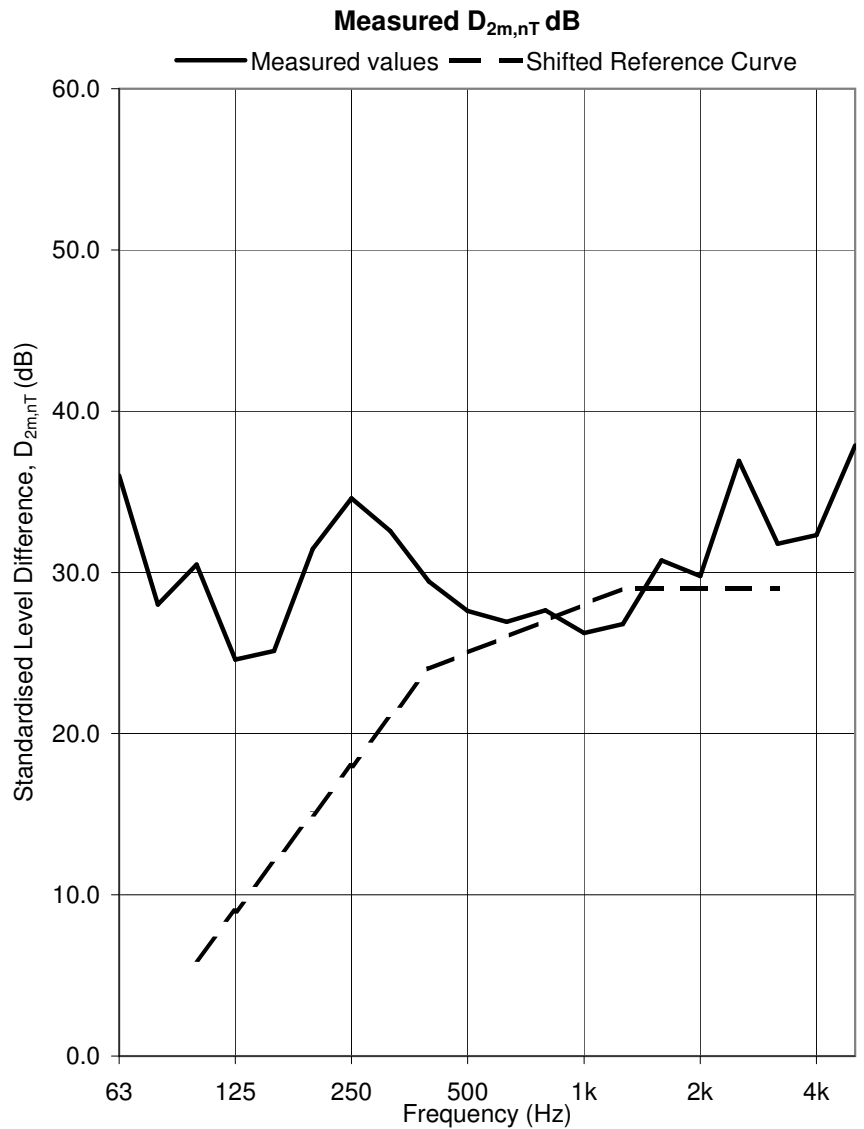
Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0047 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717071

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Half slot
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	30.0
63	36.0
80	28.0
100	30.5
125	24.6
160	25.1
200	31.5
250	34.6
315	32.6
400	29.4
500	27.6
630	26.9
800	27.6
1k	26.2
1.25k	26.8
1.6k	30.8
2k	29.8
2.5k	36.9
3.15k	31.8
4k	32.3
5k	37.9



D_{2m,nT,w} (C;C_{tr}) 29 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

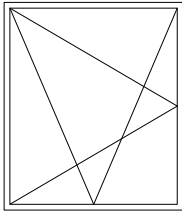
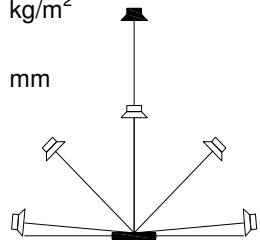
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0047 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717067

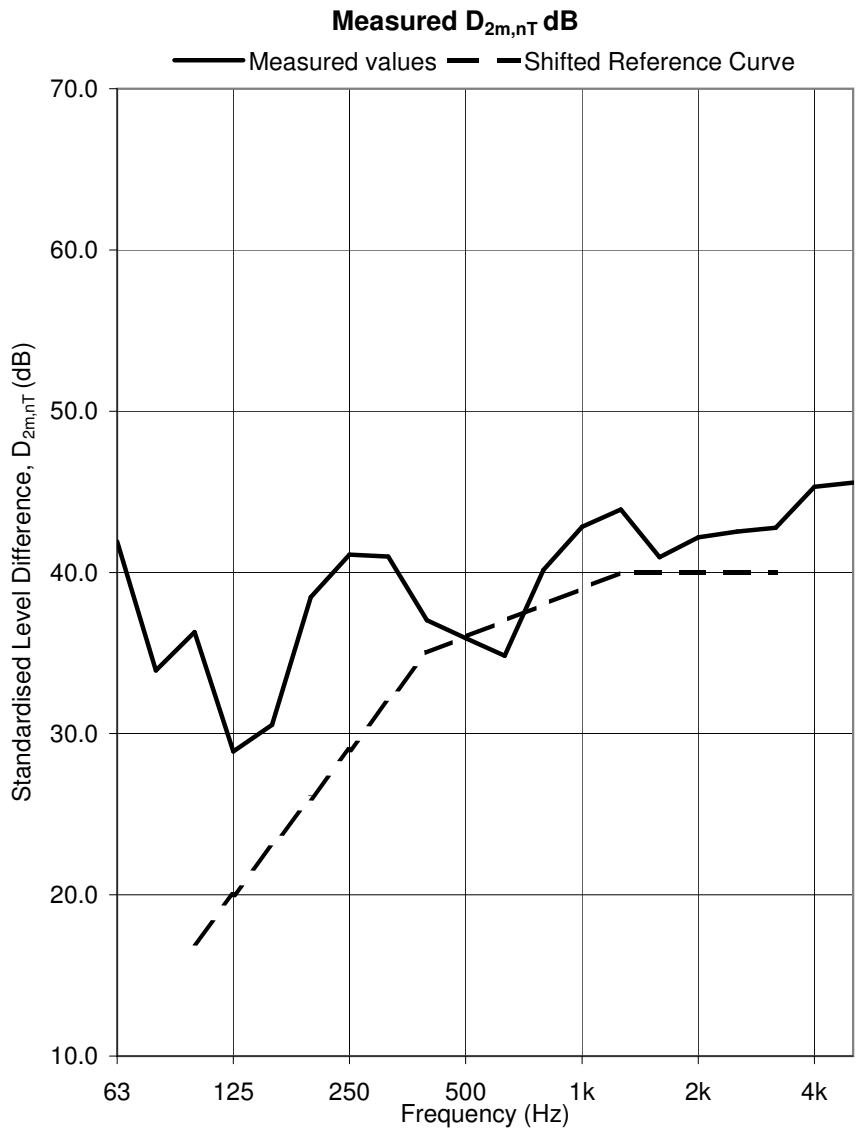
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Half Size Vent Closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.0
63	41.9
80	33.9
100	36.3
125	28.9
160	30.5
200	38.5
250	41.1
315	41.0
400	37.0
500	35.9
630	34.8
800	40.1
1k	42.8
1.25k	43.9
1.6k	41.0
2k	42.2
2.5k	42.5
3.15k	42.8
4k	45.3
5k	45.6

b



D_{2m,nT,w} (C;C_{tr}) 40 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

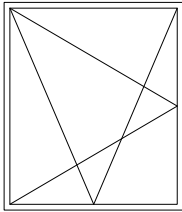
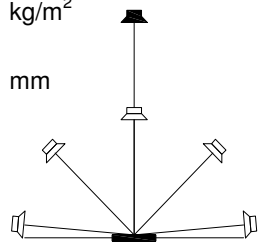
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0047 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717068

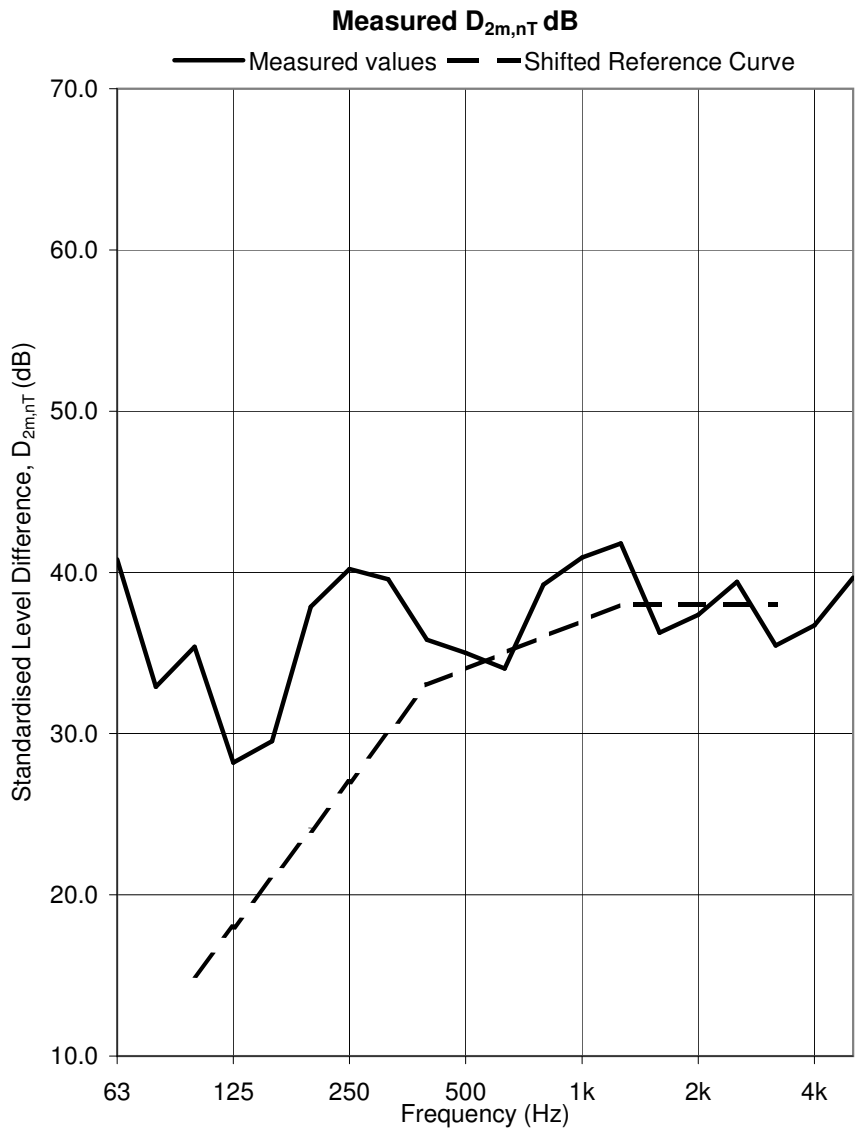
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Half Size Vent Open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.6
63	40.8
80	32.9
100	35.4
125	28.2
160	29.5
200	37.9
250	40.2
315	39.6
400	35.8
500	35.0
630	34.0
800	39.2
1k	40.9
1.25k	41.8
1.6k	36.3
2k	37.4
2.5k	39.4
3.15k	35.5
4k	36.7
5k	39.7

b



D_{2m,nT,w} (C;C_{tr}) 38 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

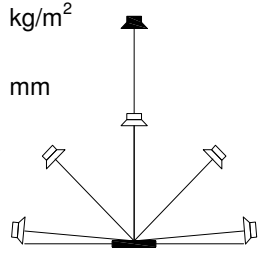
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0076 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

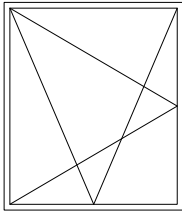
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Slot only

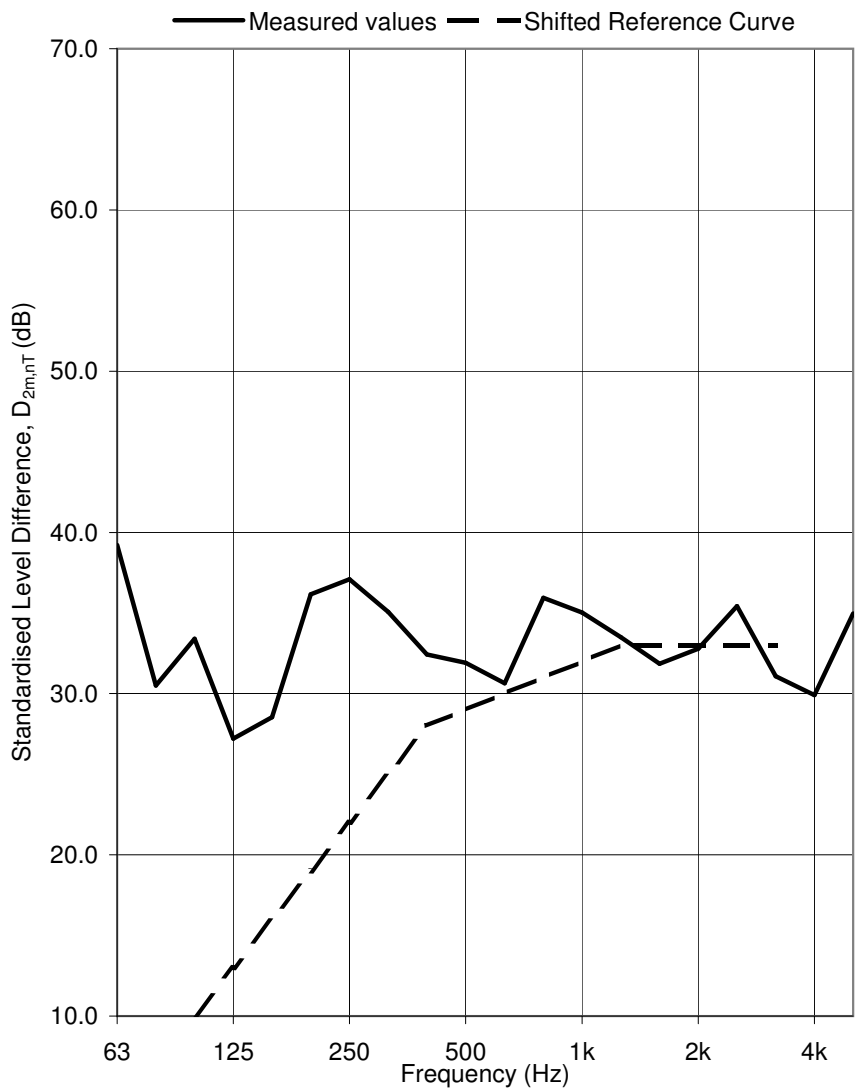


Test ID: 717018

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.3
63	39.2
80	30.5
100	33.4
125	27.2
160	28.5
200	36.2
250	37.1
315	35.1
400	32.4
500	31.9
630	30.6
800	35.9
1k	35.0
1.25k	33.5
1.6k	31.9
2k	32.8
2.5k	35.4
3.15k	31.1
4k	29.9
5k	35.0

$D_{2m,nT,w} (C;C_{tr})$ 33 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

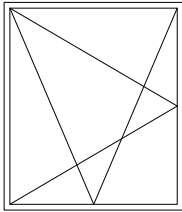
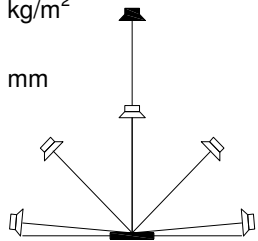
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

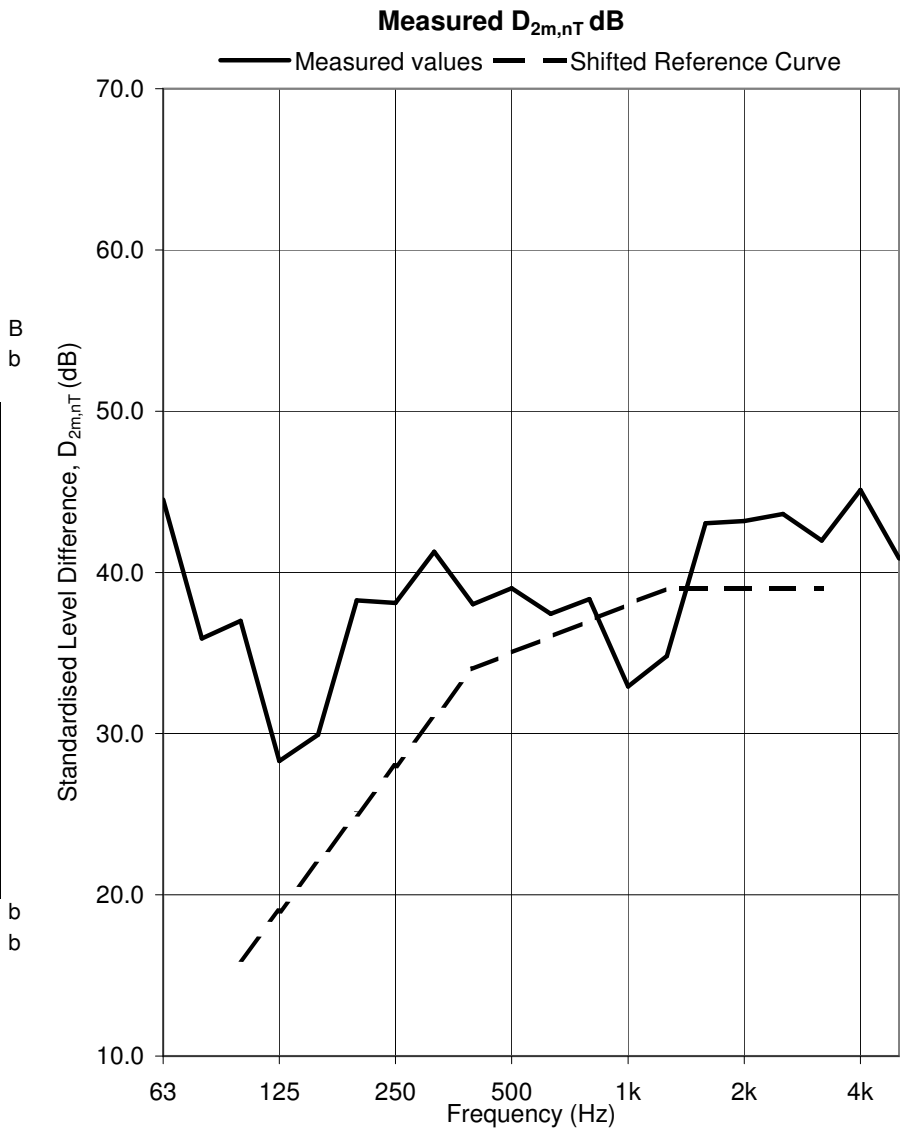
Test ID: 712014

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	29.6
63	44.5
80	35.9
100	37.0
125	28.3
160	29.9
200	38.3
250	38.1
315	41.3
400	38.0
500	39.0
630	37.4
800	38.3
1k	32.9
1.25k	34.8
1.6k	43.1
2k	43.2
2.5k	43.6
3.15k	42.0
4k	45.1
5k	40.9



D_{2m,nT,w} (C;C_{tr}) 39 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

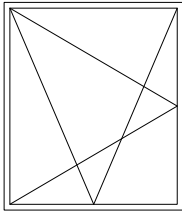
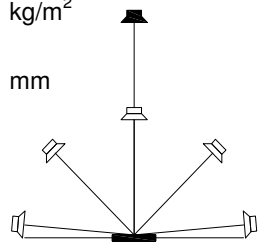
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0049 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717058

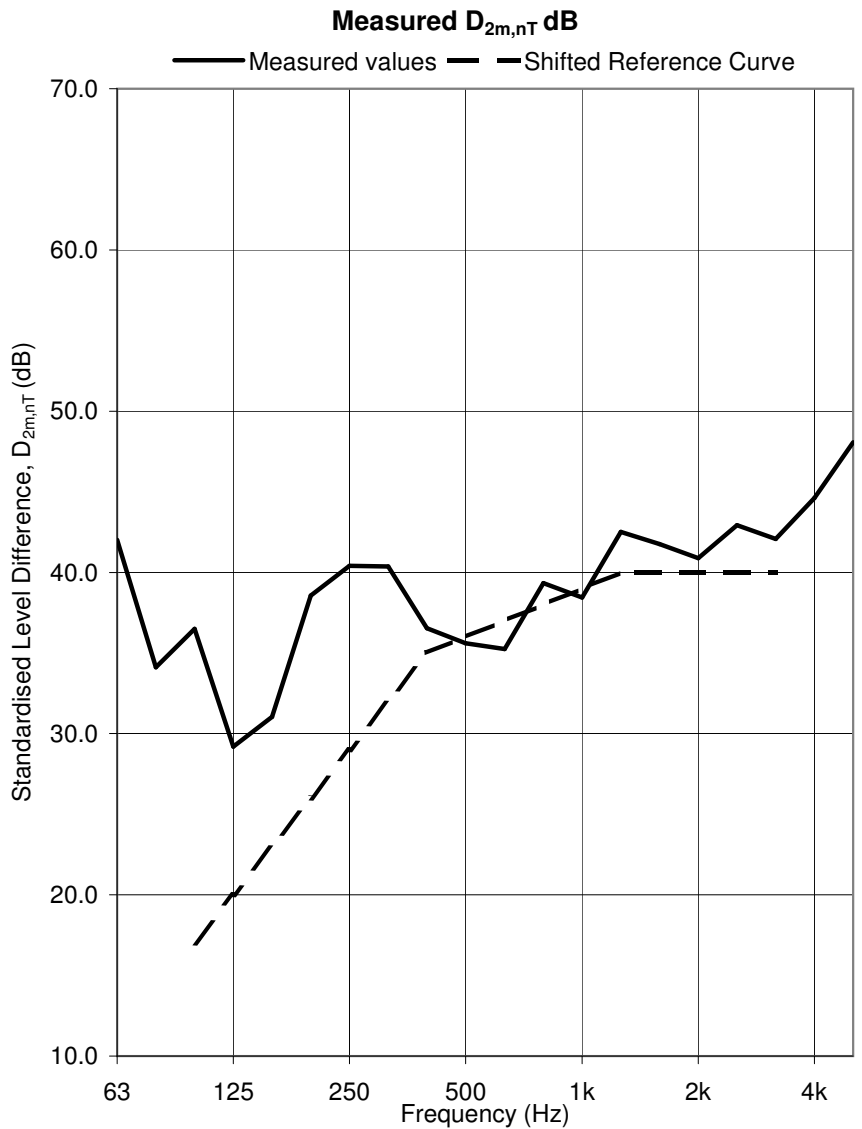
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.1
63	42.0
80	34.1
100	36.5
125	29.2
160	31.0
200	38.6
250	40.4
315	40.4
400	36.5
500	35.6
630	35.2
800	39.3
1k	38.4
1.25k	42.5
1.6k	41.8
2k	40.9
2.5k	42.9
3.15k	42.1
4k	44.6
5k	48.1

b



D_{2m,nT,w} (C;C_{tr}) 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

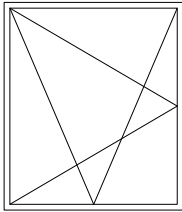
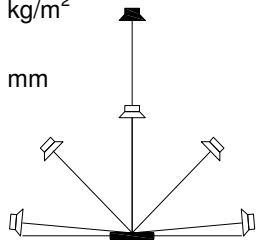
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0049 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717062

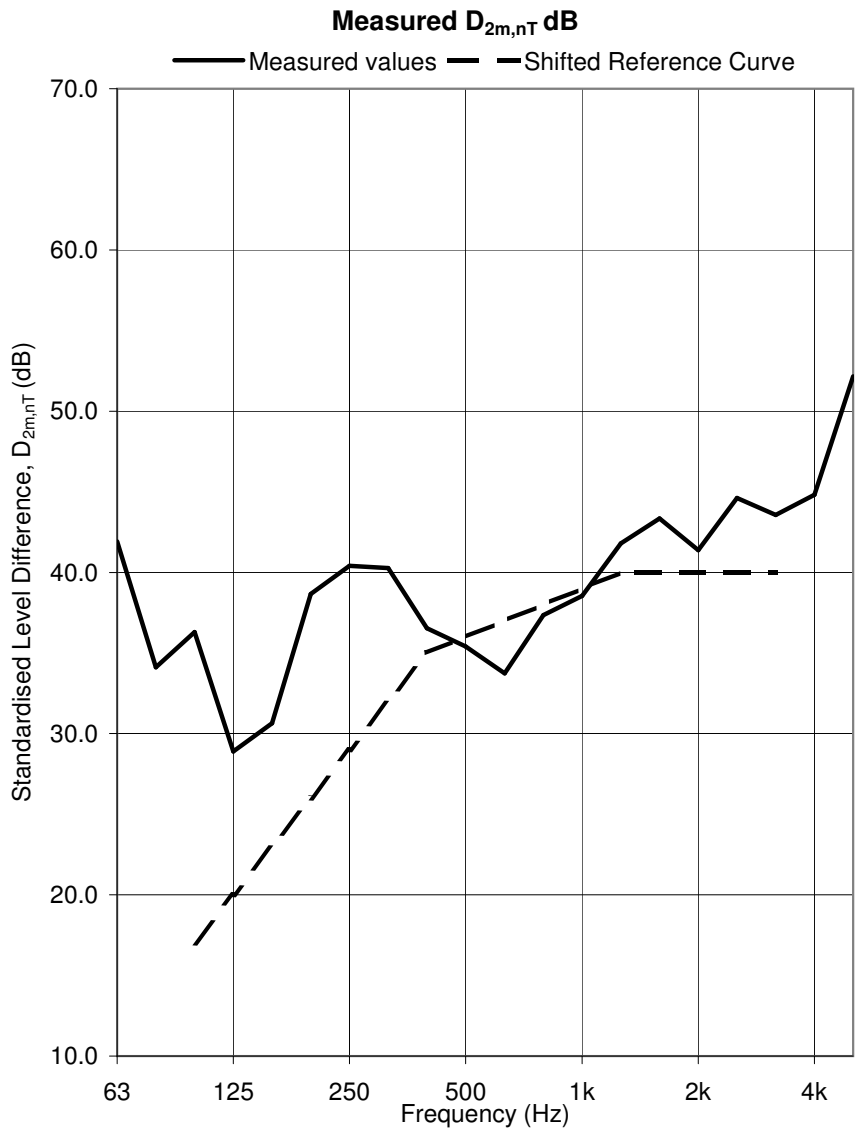
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 6
 Vent: Vent 1 closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.6
63	41.9
80	34.1
100	36.3
125	28.9
160	30.6
200	38.7
250	40.4
315	40.3
400	36.5
500	35.4
630	33.7
800	37.3
1k	38.5
1.25k	41.8
1.6k	43.4
2k	41.4
2.5k	44.6
3.15k	43.6
4k	44.8
5k	52.2

b



D_{2m,nT,w} (C;C_{tr}) 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

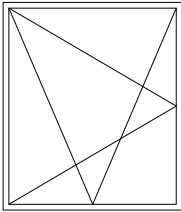
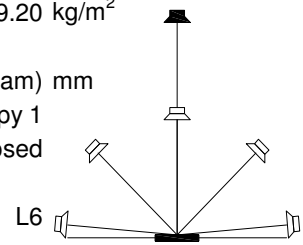
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0079 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717010

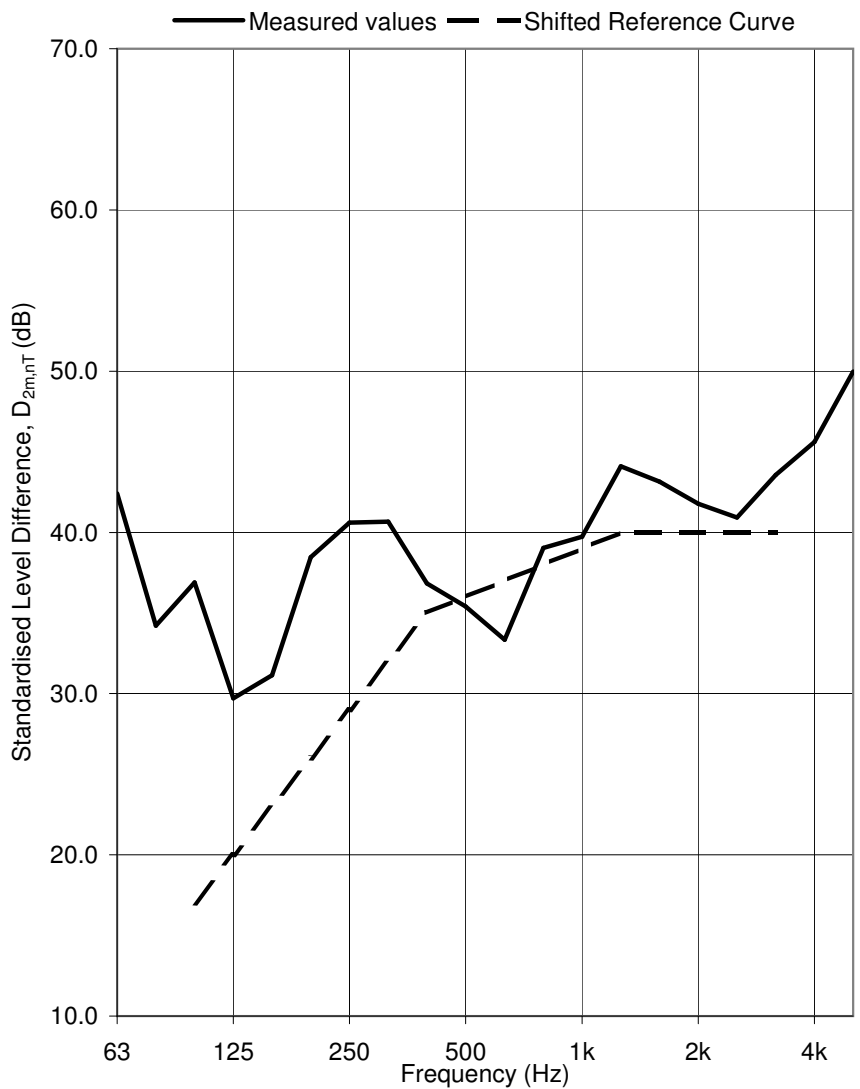
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 1
 Vent: Vent 1 closed

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	33.5
63	42.4
80	34.2
100	36.9
125	29.7
160	31.1
200	38.5
250	40.6
315	40.7
400	36.8
500	35.4
630	33.3
800	39.0
1k	39.7
1.25k	44.1
1.6k	43.2
2k	41.8
2.5k	40.9
3.15k	43.6
4k	45.6
5k	50.0

$D_{2m,nT,w}$ (C;C_{tr}) 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

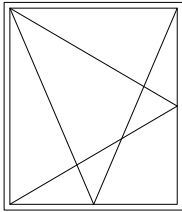
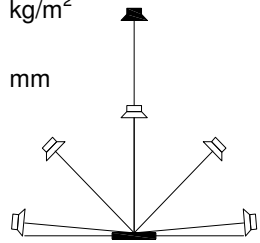
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

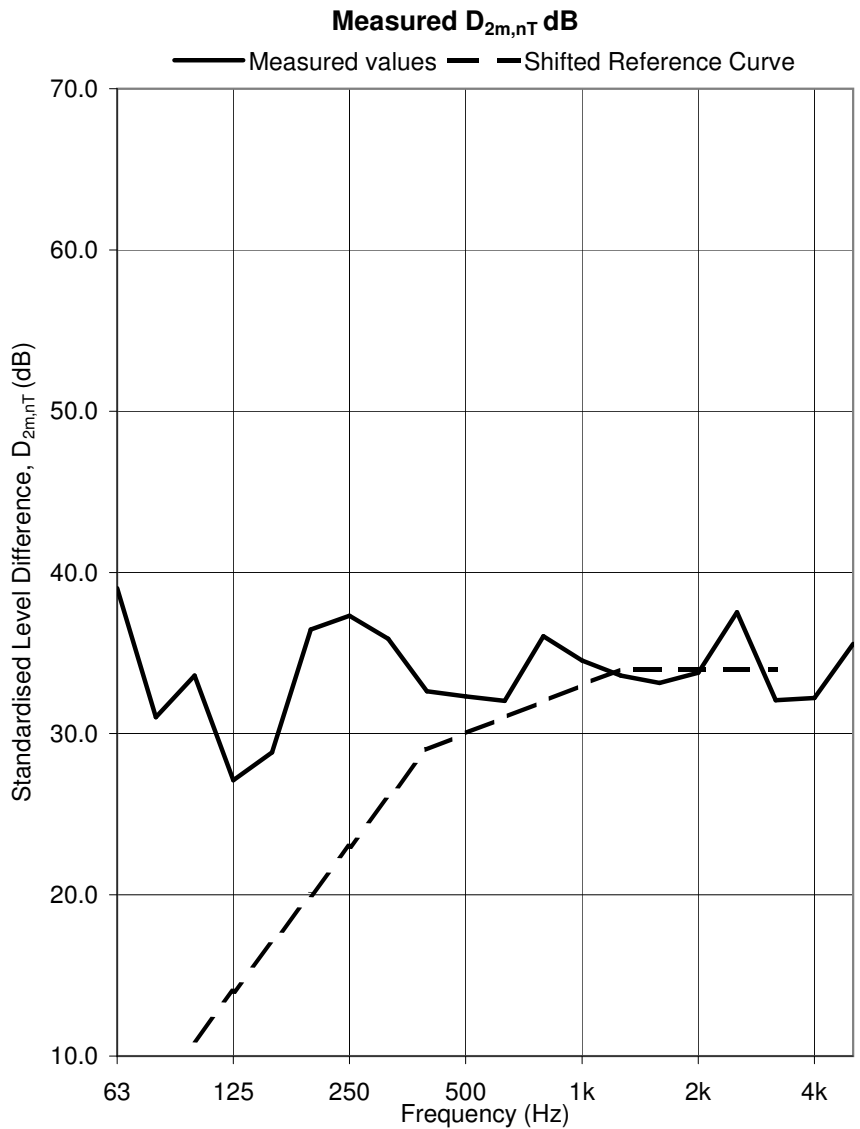
Date: 17/7/2005
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0049 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717057

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	31.9
63	39.0
80	31.0
100	33.6
125	27.1
160	28.8
200	36.5
250	37.3
315	35.9
400	32.6
500	32.3
630	32.0
800	36.0
1k	34.5
1.25k	33.6
1.6k	33.2
2k	33.8
2.5k	37.5
3.15k	32.1
4k	32.2
5k	35.6



D_{2m,nT,w} (C;C_{tr}) 34 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

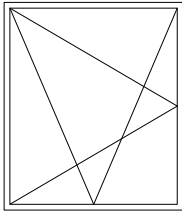
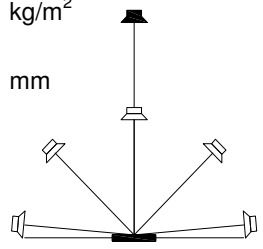
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

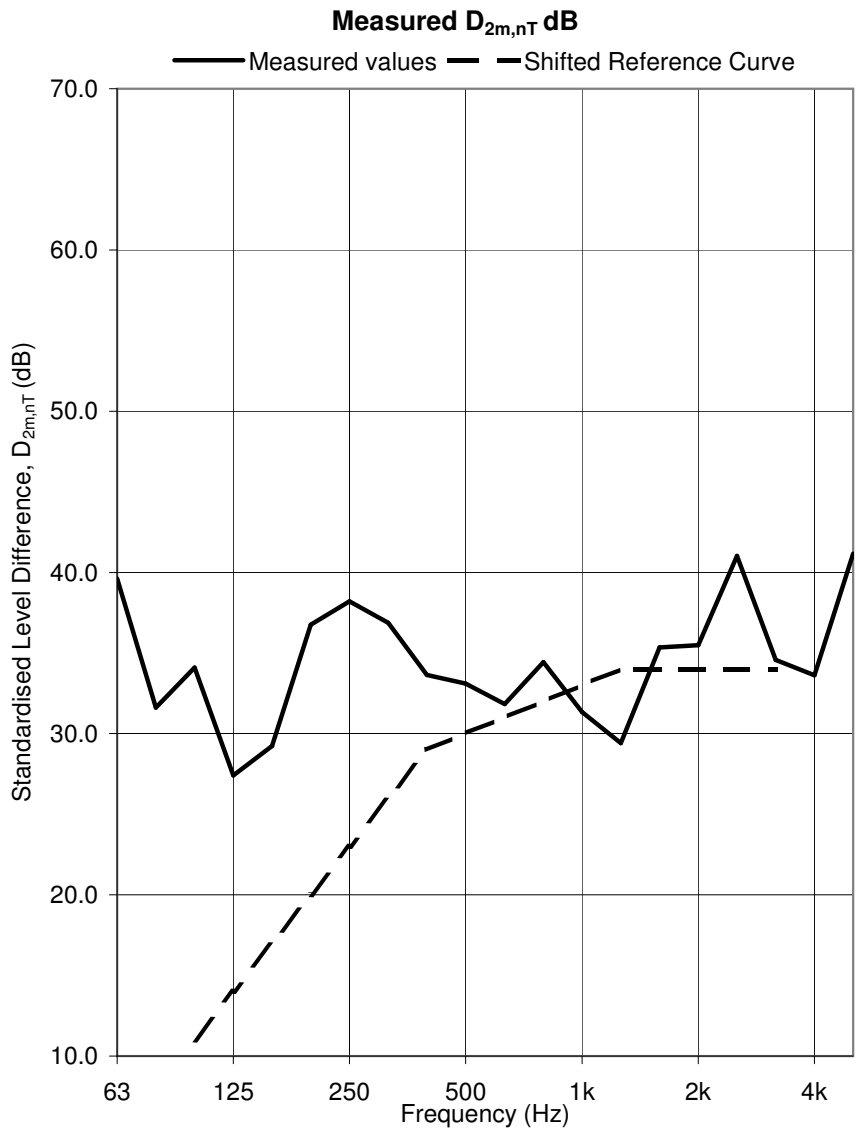
Date: 17/7/2005
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0049 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717061

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 6
 Vent: Vent 1 open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.5
63	39.6
80	31.6
100	34.1
125	27.4
160	29.2
200	36.8
250	38.2
315	36.9
400	33.6
500	33.1
630	31.8
800	34.4
1k	31.3
1.25k	29.4
1.6k	35.4
2k	35.5
2.5k	41.0
3.15k	34.6
4k	33.6
5k	41.2



D_{2m,nT,w} (C;C_{tr}) 34 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

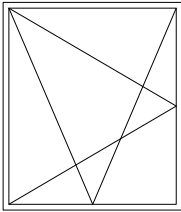
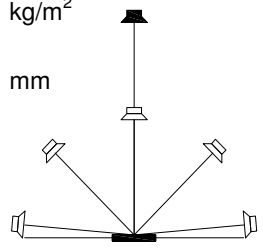
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0079 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717009

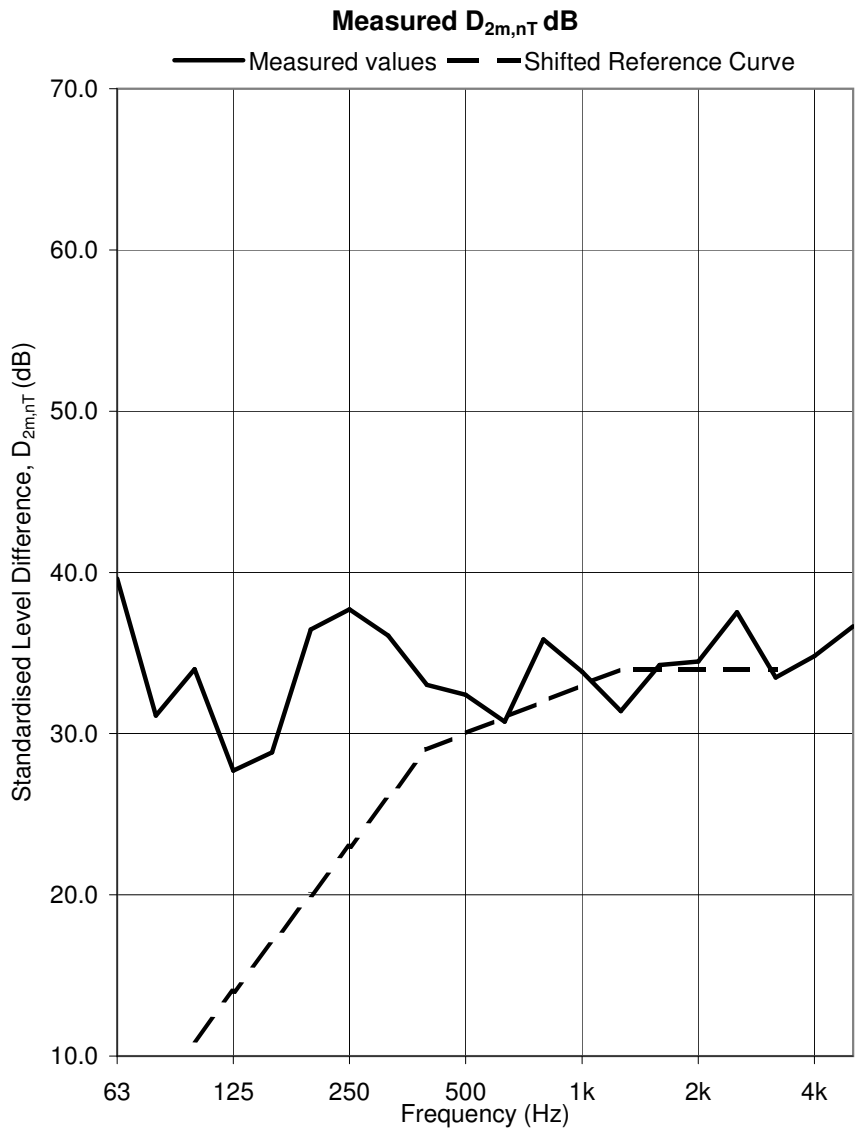
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 1
 Vent: Vent 1 open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.1
63	39.6
80	31.1
100	34.0
125	27.7
160	28.8
200	36.5
250	37.7
315	36.1
400	33.0
500	32.4
630	30.7
800	35.8
1k	33.8
1.25k	31.4
1.6k	34.3
2k	34.5
2.5k	37.5
3.15k	33.5
4k	34.8
5k	36.7

b



D_{2m,nT,w} (C;C_{tr}) 34 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

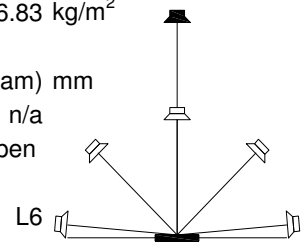
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

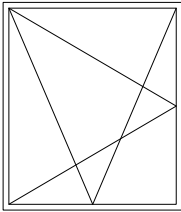
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 open

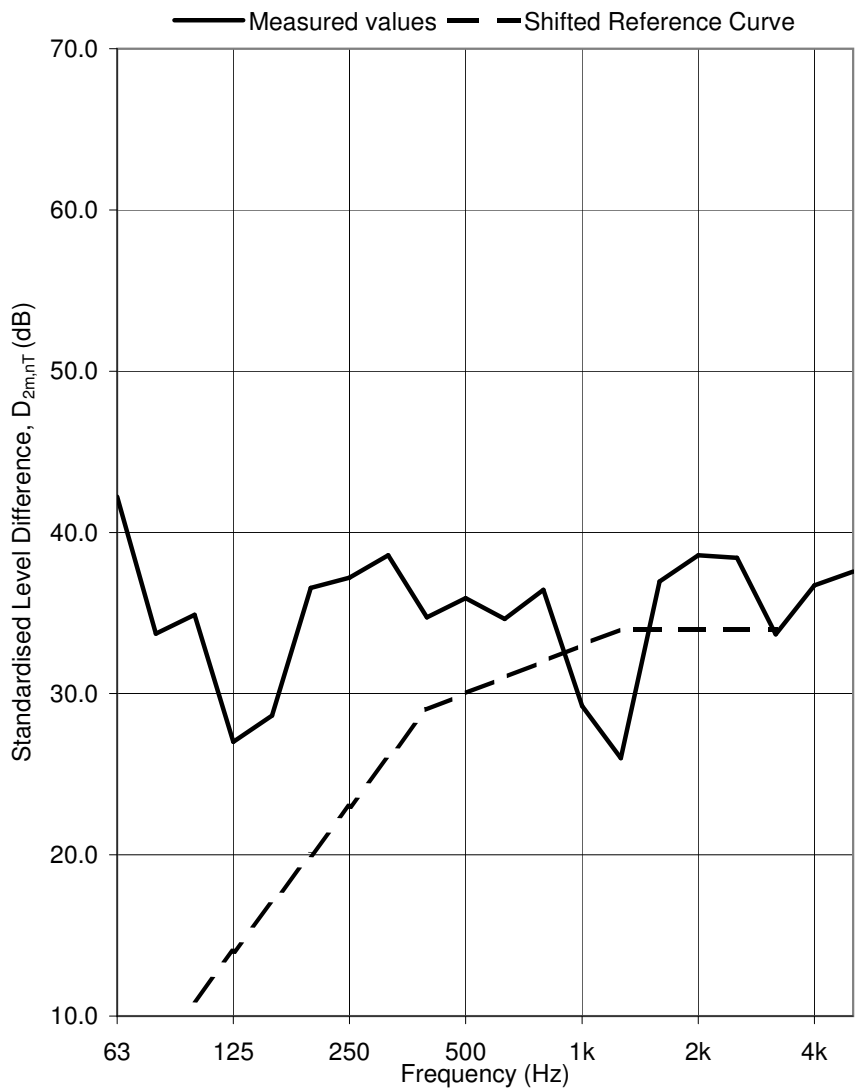
Loudspeaker Configuration:



Test ID: 712017



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.3
63	42.2
80	33.7
100	34.9
125	27.0
160	28.6
200	36.6
250	37.2
315	38.6
400	34.7
500	35.9
630	34.6
800	36.4
1k	29.2
1.25k	26.0
1.6k	37.0
2k	38.6
2.5k	38.4
3.15k	33.7
4k	36.7
5k	37.6

$D_{2m,nT,w}$ (C;C_{tr}) 34 (-2; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

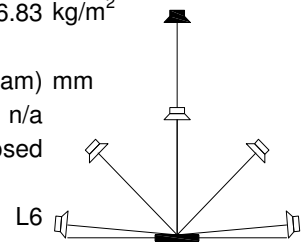
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

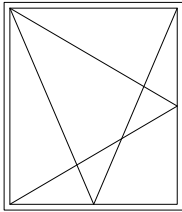
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 2 closed

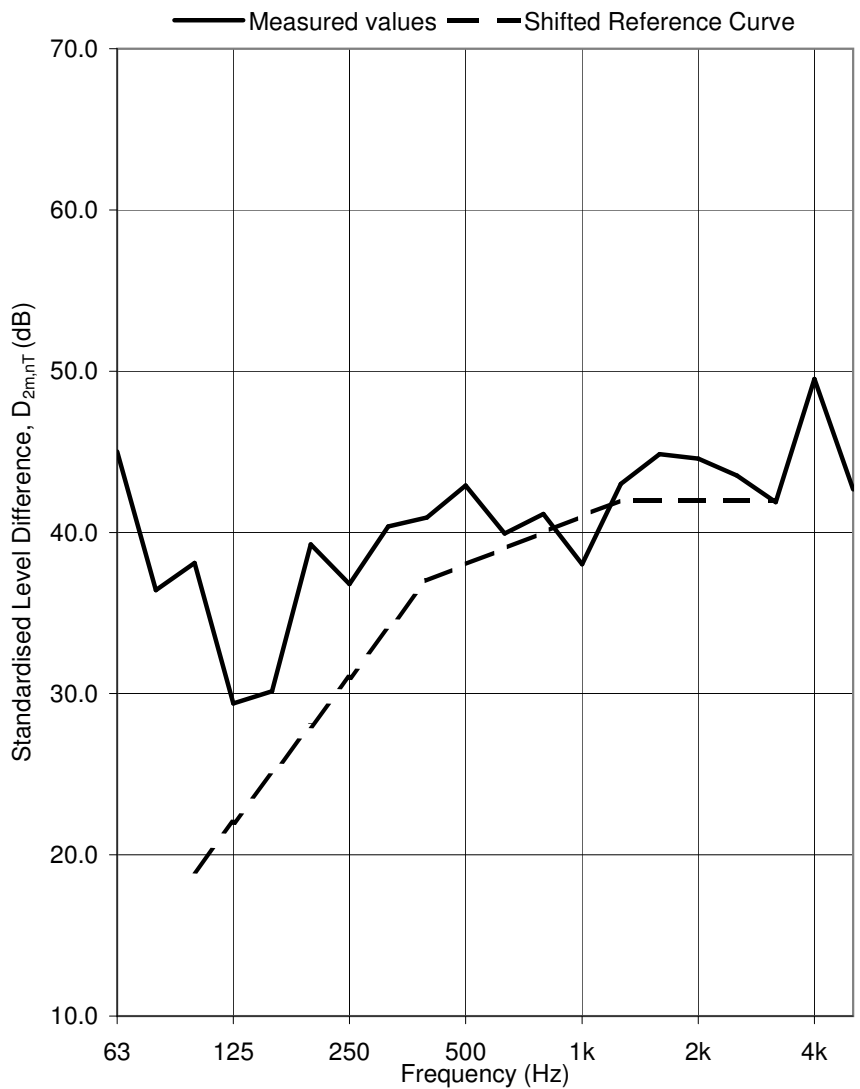
Loudspeaker Configuration:



Test ID: 712083



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	30.2
63	45.0
80	36.4
100	38.1
125	29.4
160	30.1
200	39.3
250	36.8
315	40.4
400	40.9
500	42.9
630	39.9
800	41.1
1k	38.0
1.25k	43.0
1.6k	44.9
2k	44.6
2.5k	43.5
3.15k	41.9
4k	49.5
5k	42.7

$D_{2m,nT,w}$ (C;C_{tr}) 42 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

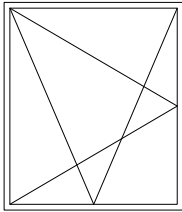
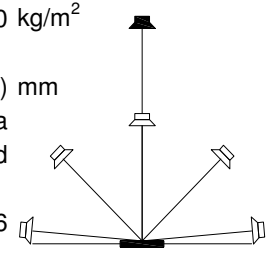
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0076 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717019

Test Sample: Window C-3 Closed.

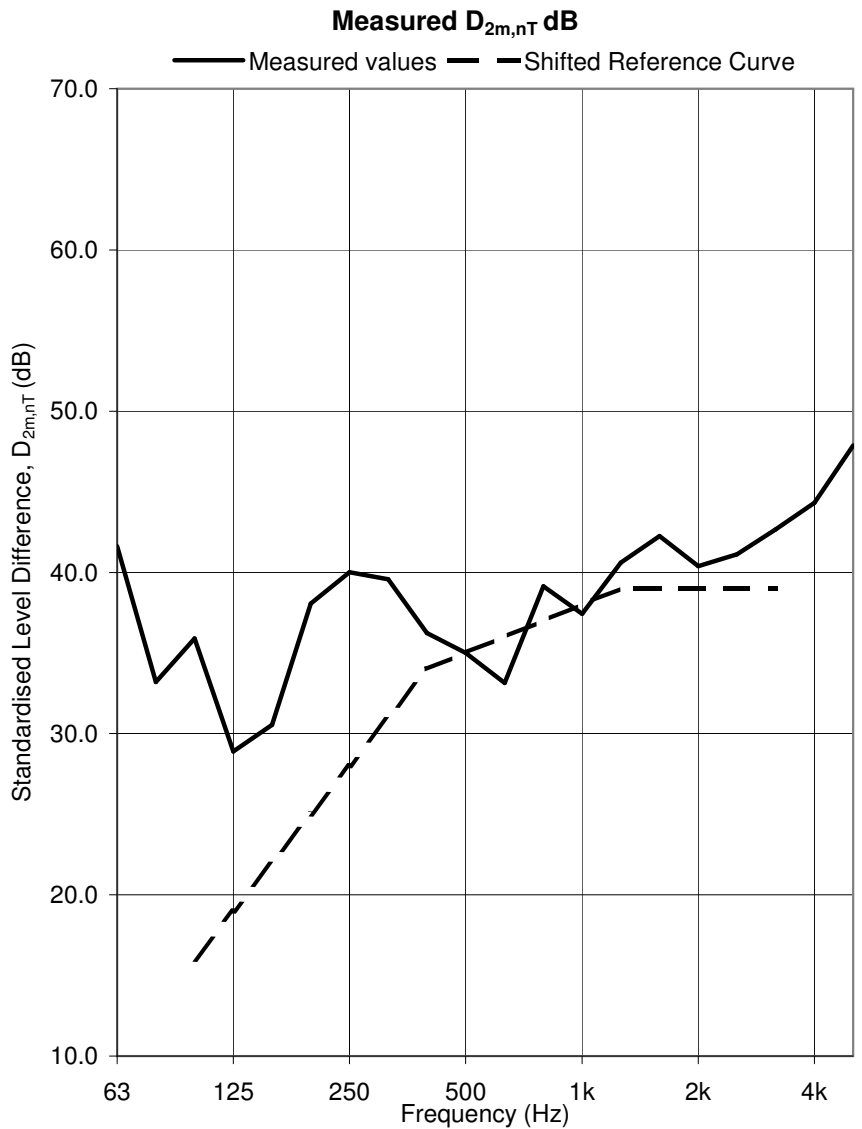
Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 2 closed

Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.7
63	41.6
80	33.2
100	35.9
125	28.9
160	30.5
200	38.1
250	40.0
315	39.6
400	36.2
500	35.0
630	33.1
800	39.1
1k	37.4
1.25k	40.6
1.6k	42.3
2k	40.4
2.5k	41.1
3.15k	42.7
4k	44.3
5k	47.9

b



D_{2m,nT,w} (C;C_{tr}) 39 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

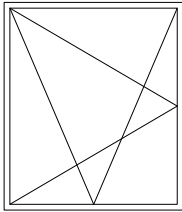
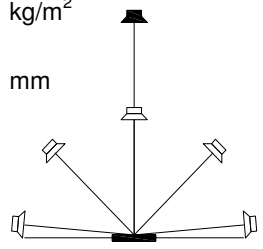
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0075 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717023

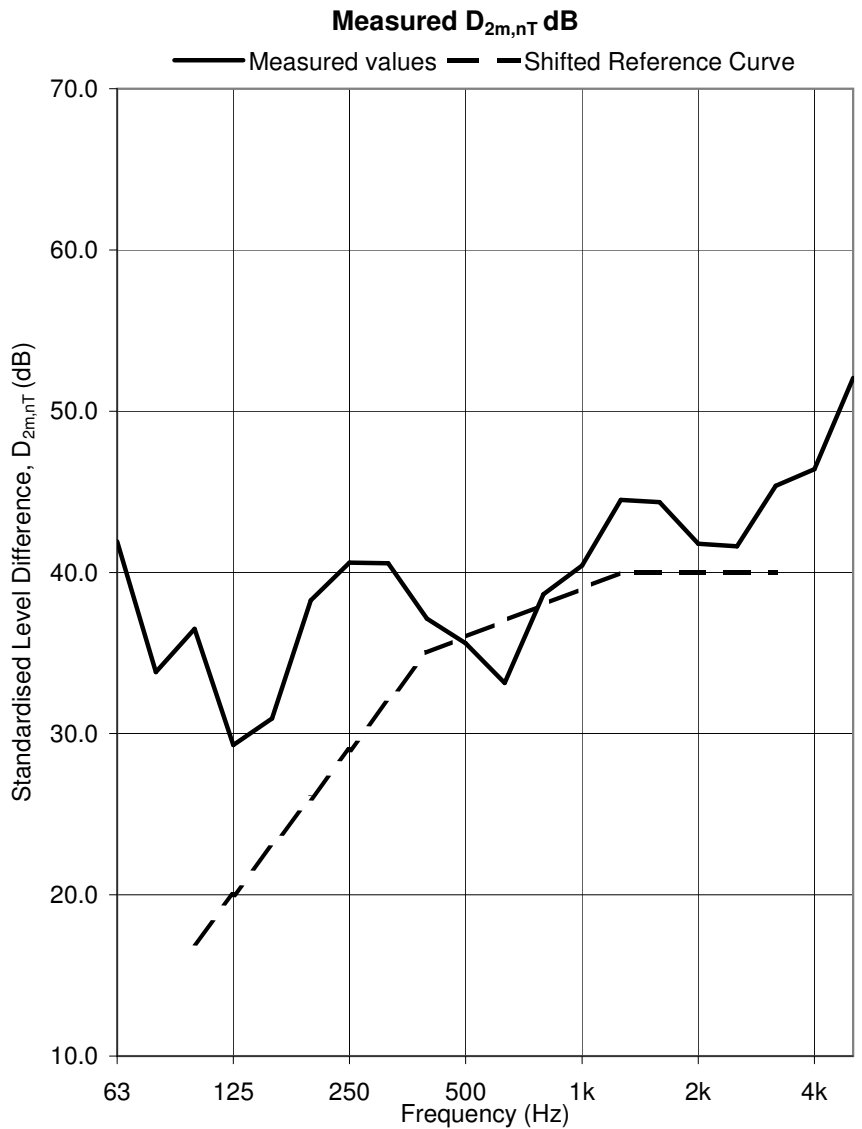
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 2
 Vent: Vent 2 closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.2
63	41.9
80	33.8
100	36.5
125	29.3
160	30.9
200	38.3
250	40.6
315	40.6
400	37.1
500	35.6
630	33.1
800	38.6
1k	40.4
1.25k	44.5
1.6k	44.4
2k	41.8
2.5k	41.6
3.15k	45.4
4k	46.4
5k	52.1

b



D_{2m,nT,w} (C;C_{tr}) 40 (0; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

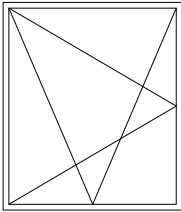
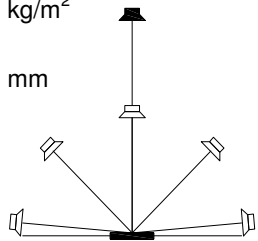
Date: 12/7/05
 Air temperature: 21.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 712082

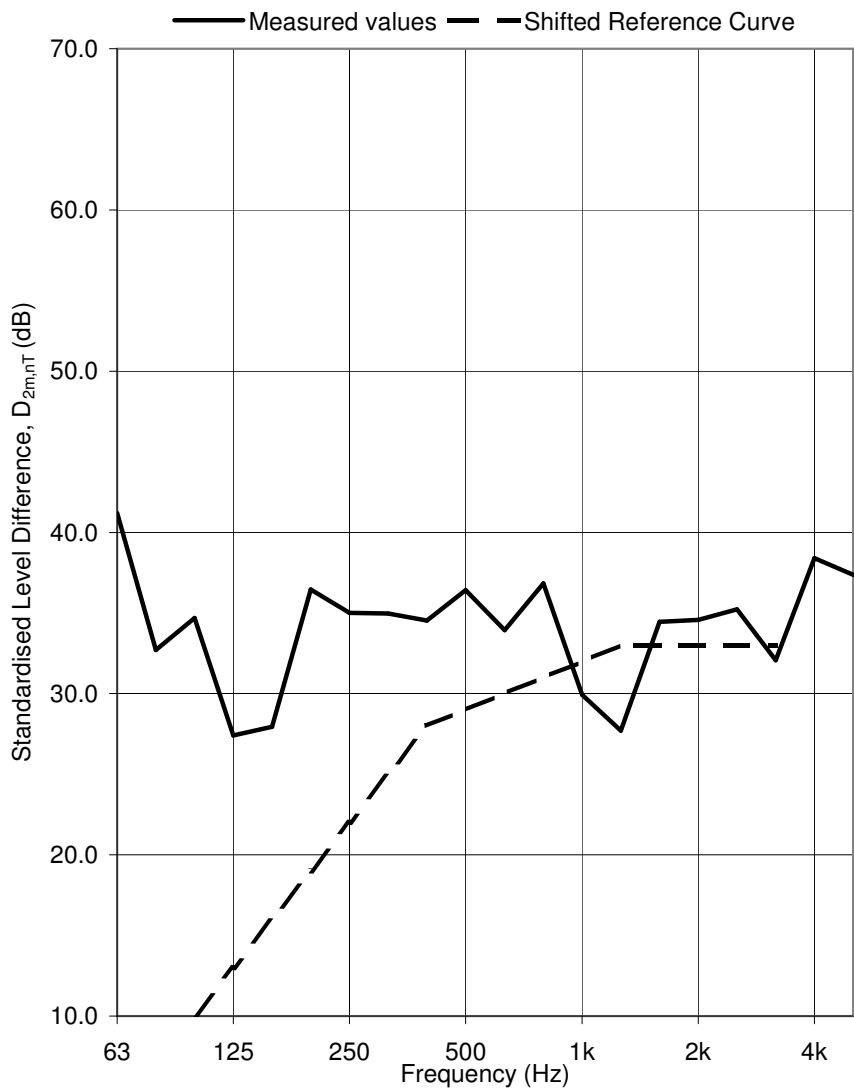
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 2 open

Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	30.1
63	41.2
80	32.7
100	34.7
125	27.4
160	27.9
200	36.5
250	35.0
315	35.0
400	34.5
500	36.4
630	33.9
800	36.8
1k	29.9
1.25k	27.7
1.6k	34.5
2k	34.6
2.5k	35.2
3.15k	32.1
4k	38.4
5k	37.4

$D_{2m,nT,w} (C;C_{tr})$ 33 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

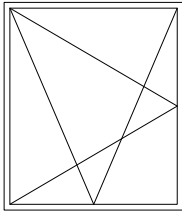
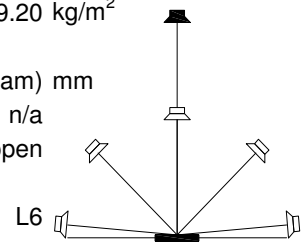
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0076 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717020

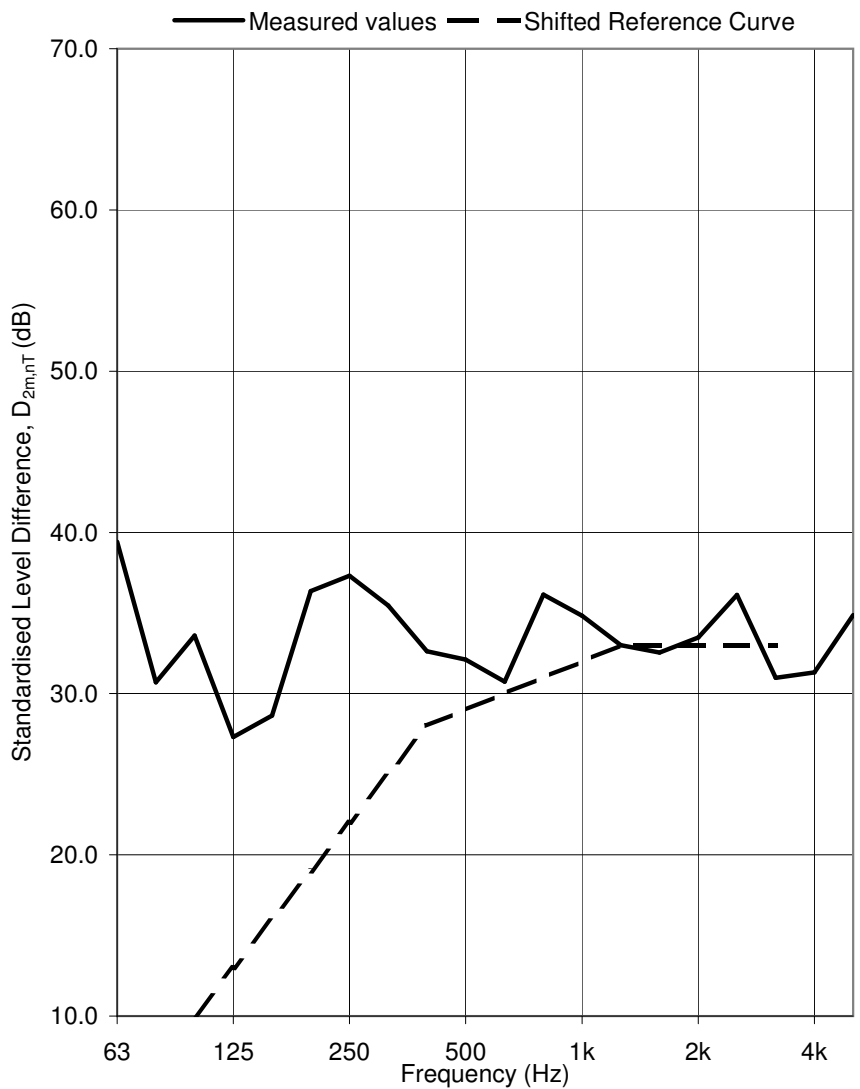
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 2 open

Loudspeaker Configuration:



Measured D_{2m,nT} dB



Frequency Hz	D _{2m,nT} dB
50	32.6
63	39.4
80	30.7
100	33.6
125	27.3
160	28.6
200	36.4
250	37.3
315	35.5
400	32.6
500	32.1
630	30.7
800	36.1
1k	34.8
1.25k	33.0
1.6k	32.6
2k	33.5
2.5k	36.1
3.15k	31.0
4k	31.3
5k	34.9

D_{2m,nT,w} (C;C_{tr}) 33 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

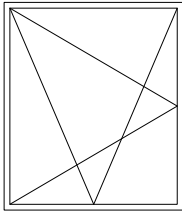
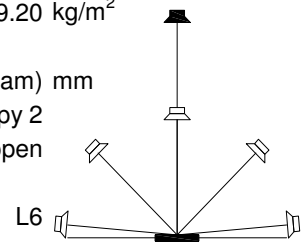
Date: 17/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0075 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 717024

Test Sample: Window C-3 Closed.

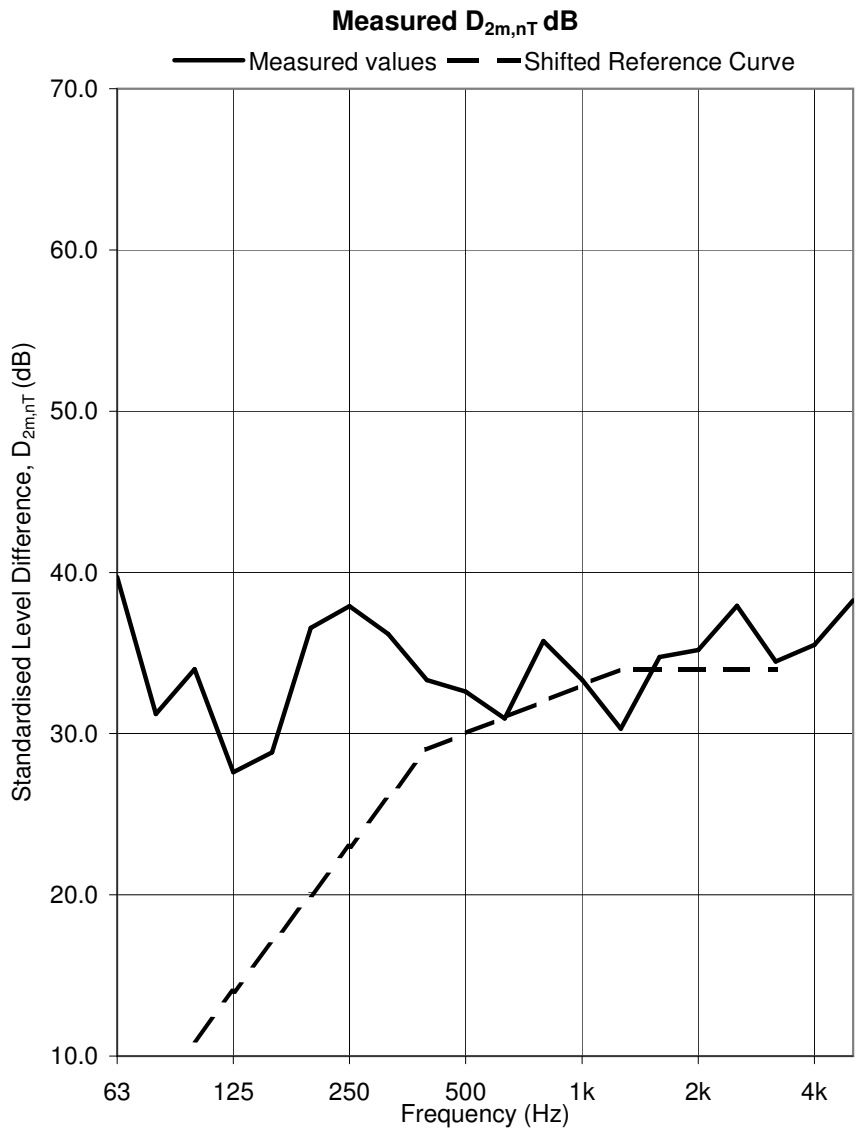
Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 2
 Vent: Vent 2 open

Loudspeaker Configuration:



Frequency Hz	D _{2m,nT} dB
50	32.3
63	39.7
80	31.2
100	34.0
125	27.6
160	28.8
200	36.6
250	37.9
315	36.2
400	33.3
500	32.6
630	30.9
800	35.7
1k	33.3
1.25k	30.3
1.6k	34.8
2k	35.2
2.5k	37.9
3.15k	34.5
4k	35.5
5k	38.3

b



D_{2m,nT,w} (C;C_{tr}) 34 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

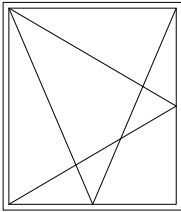
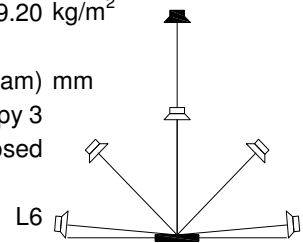
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0075 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717027

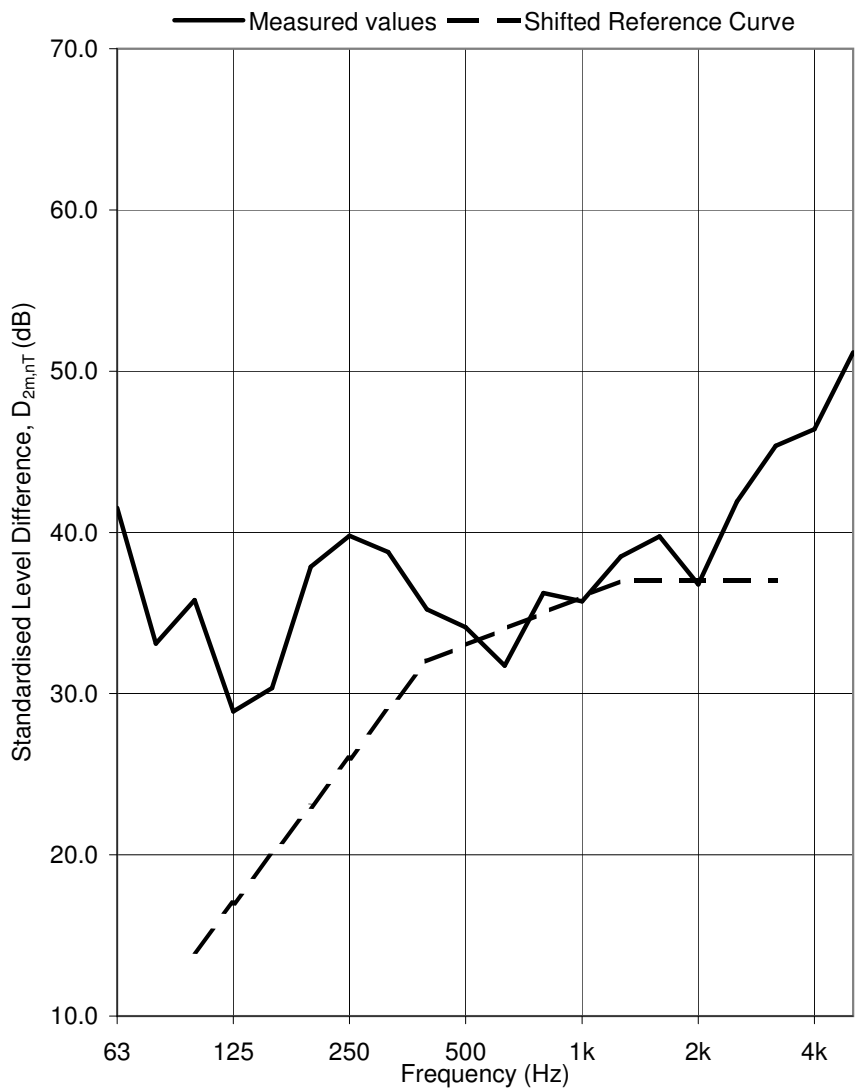
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 3
 Vent: Vent 3 closed

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	33.4
63	41.5
80	33.1
100	35.8
125	28.9
160	30.3
200	37.9
250	39.8
315	38.8
400	35.2
500	34.1
630	31.7
800	36.2
1k	35.7
1.25k	38.5
1.6k	39.8
2k	36.8
2.5k	41.9
3.15k	45.4
4k	46.4
5k	51.2

$D_{2m,nT,w} (C; C_{tr})$ 37 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

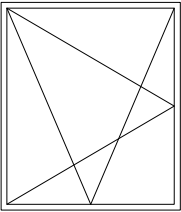
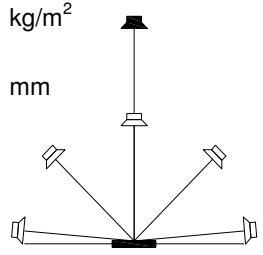
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0075 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717028

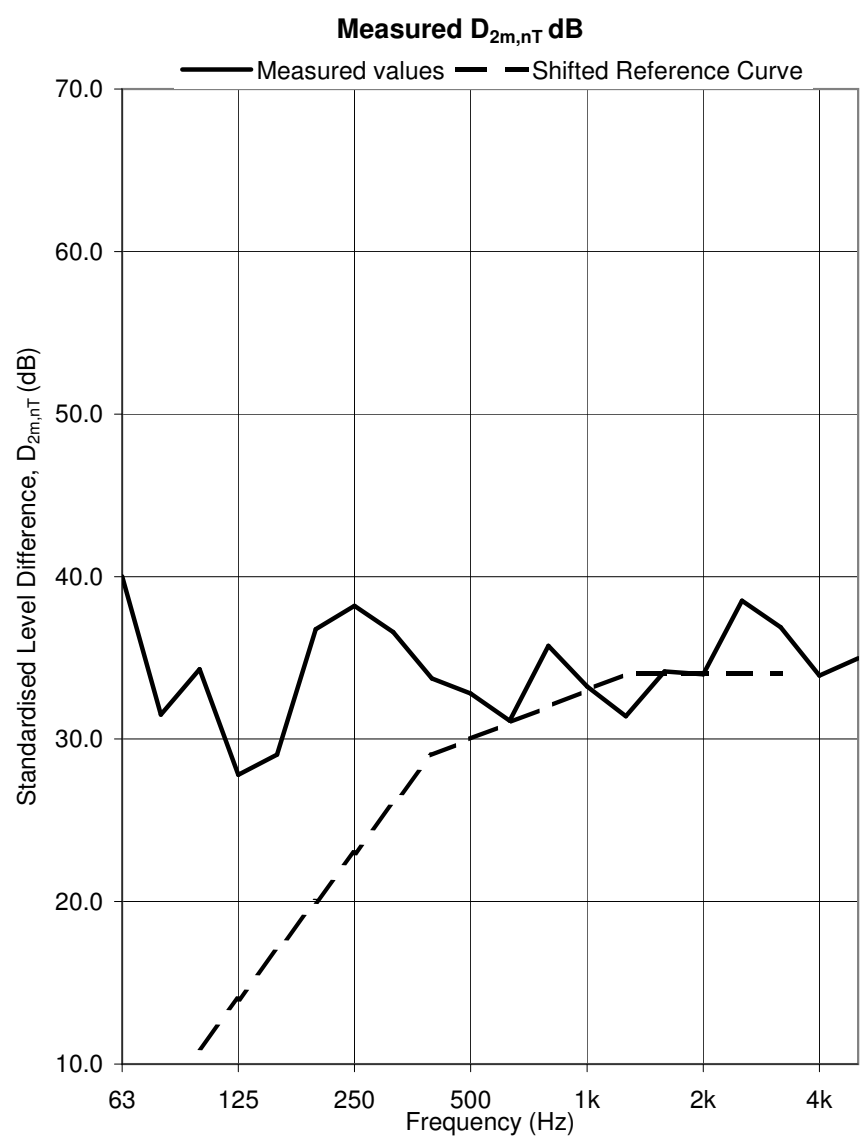
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 3
 Vent: Vent 3 open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.3
63	40.0
80	31.5
100	34.3
125	27.8
160	29.0
200	36.8
250	38.2
315	36.6
400	33.7
500	32.8
630	31.1
800	35.7
1k	33.2
1.25k	31.4
1.6k	34.2
2k	34.0
2.5k	38.5
3.15k	36.9
4k	33.9
5k	35.0

b



D_{2m,nT,w} (C;C_{tr}) 34 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

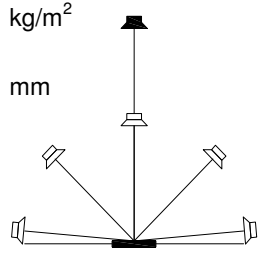
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.007 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

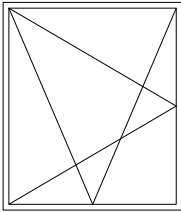
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 4 closed



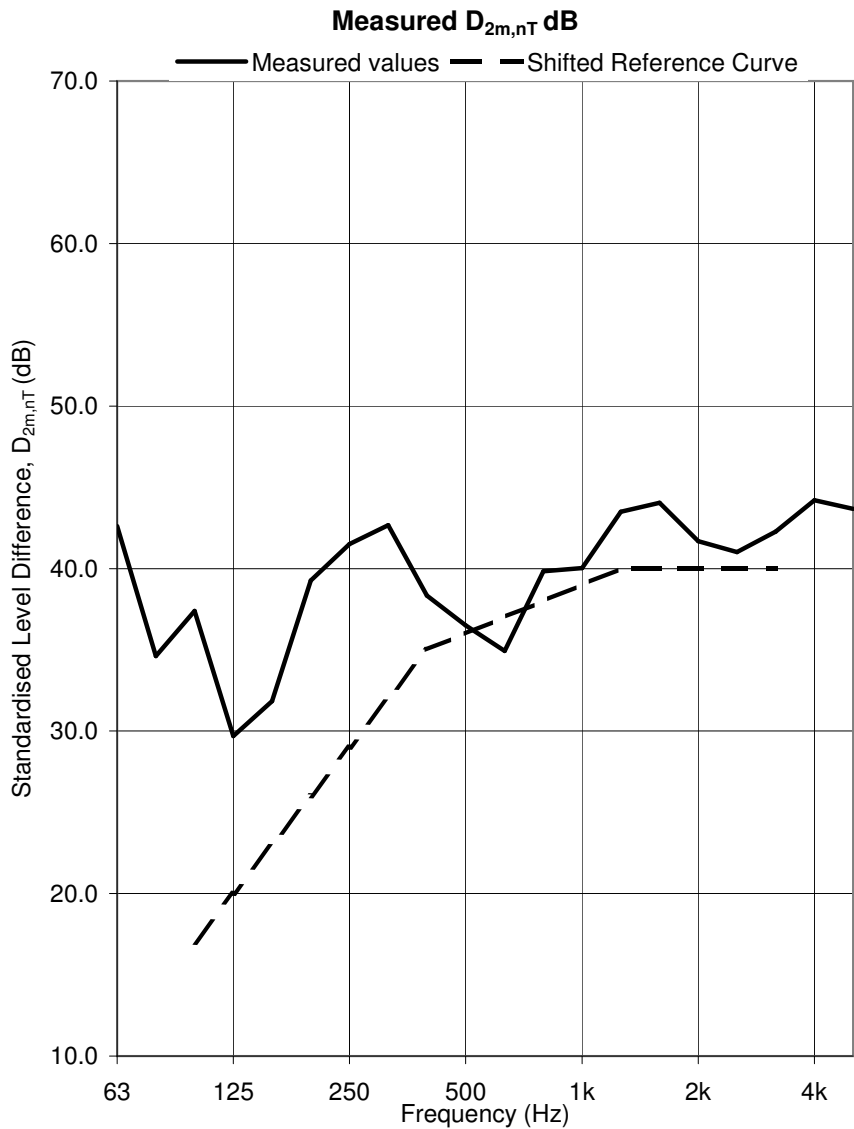
Test ID: 717031

Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.3
63	42.6
80	34.6
100	37.4
125	29.7
160	31.8
200	39.3
250	41.5
315	42.7
400	38.3
500	36.5
630	34.9
800	39.8
1k	40.0
1.25k	43.5
1.6k	44.1
2k	41.7
2.5k	41.0
3.15k	42.3
4k	44.2
5k	43.7

b



D_{2m,nT,w} (C;C_{tr}) 40 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

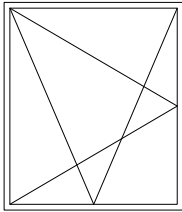
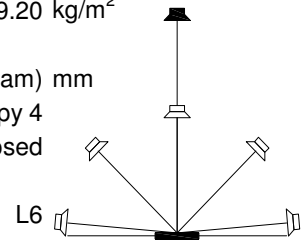
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.007 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717035

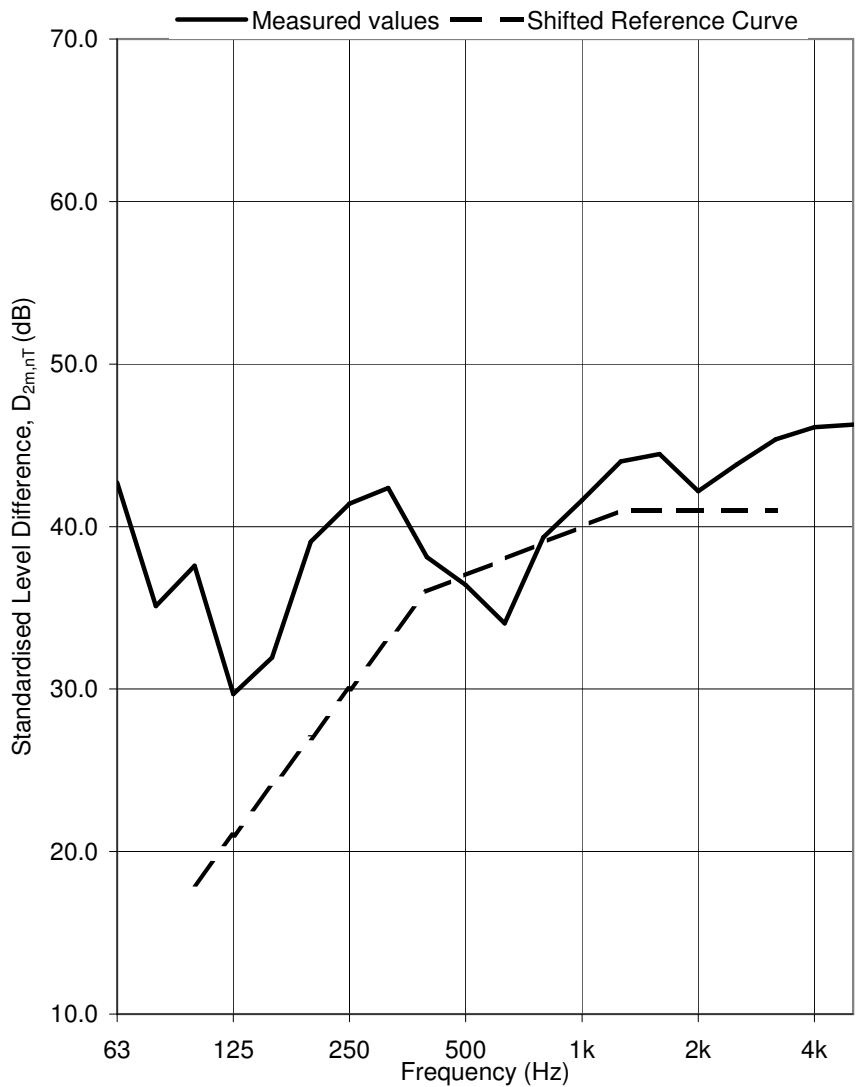
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 4
 Vent: Vent 4 closed

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	33.4
63	42.7
80	35.1
100	37.6
125	29.7
160	31.9
200	39.1
250	41.4
315	42.4
400	38.1
500	36.4
630	34.0
800	39.3
1k	41.6
1.25k	44.0
1.6k	44.5
2k	42.2
2.5k	43.8
3.15k	45.4
4k	46.1
5k	46.3

$D_{2m,nT,w}$ (C;C_{tr}) 41 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

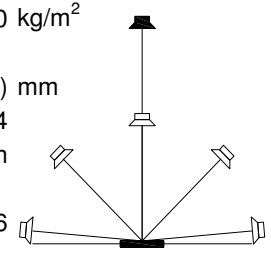
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.007 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

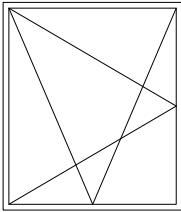
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 4
 Vent: Vent 4 open

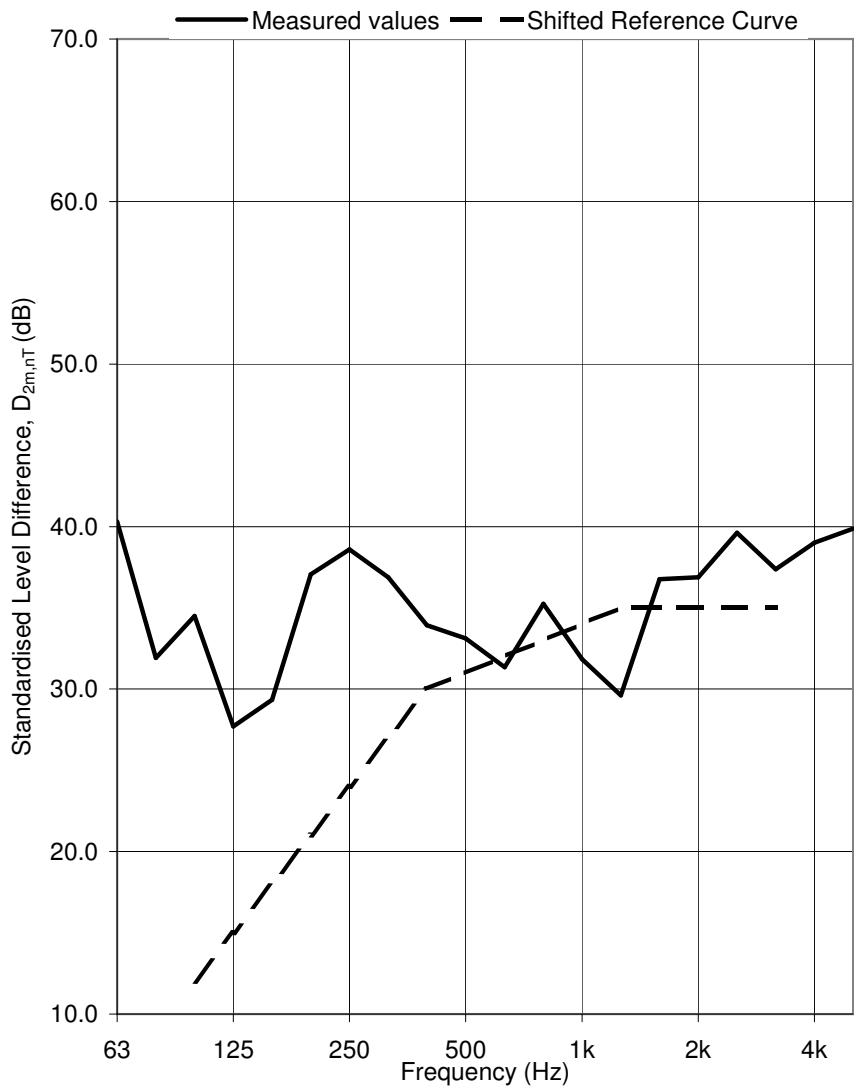


Test ID: 717036

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.5
63	40.3
80	31.9
100	34.5
125	27.7
160	29.3
200	37.1
250	38.6
315	36.9
400	33.9
500	33.1
630	31.3
800	35.2
1k	31.8
1.25k	29.6
1.6k	36.8
2k	36.9
2.5k	39.6
3.15k	37.4
4k	39.0
5k	39.9

$D_{2m,nT,w}$ (C;C_{tr}) 35 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

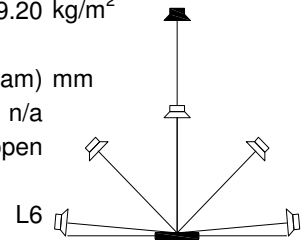
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.007 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

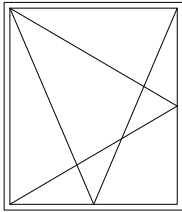
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 5 open

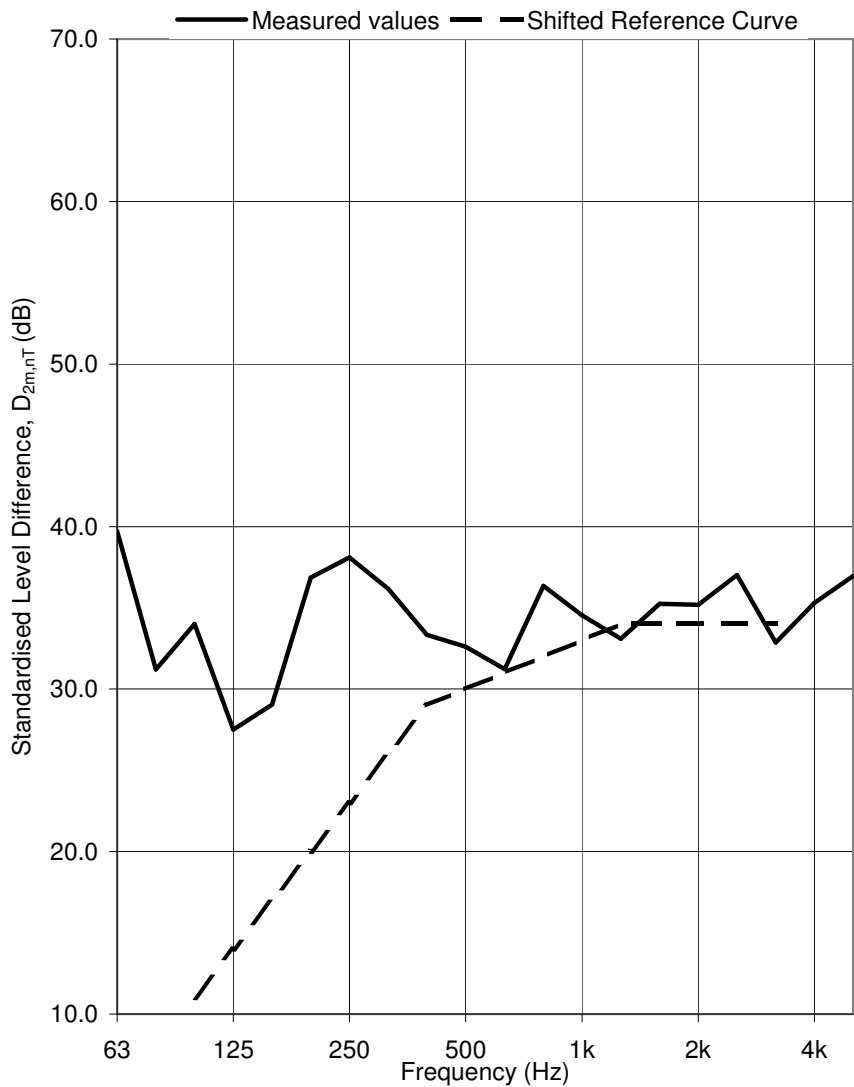
Loudspeaker Configuration:



Test ID: 717032



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.2
63	39.7
80	31.2
100	34.0
125	27.5
160	29.0
200	36.9
250	38.1
315	36.2
400	33.3
500	32.6
630	31.2
800	36.3
1k	34.5
1.25k	33.1
1.6k	35.3
2k	35.2
2.5k	37.0
3.15k	32.9
4k	35.3
5k	37.0

$D_{2m,nT,w}$ (C;C_{tr}) 34 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

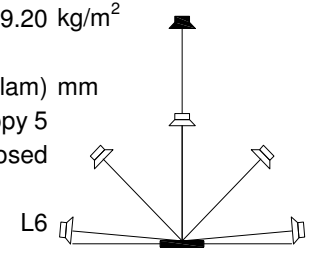
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0067 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

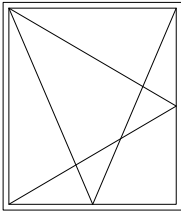
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 5
 Vent: Vent 6 closed

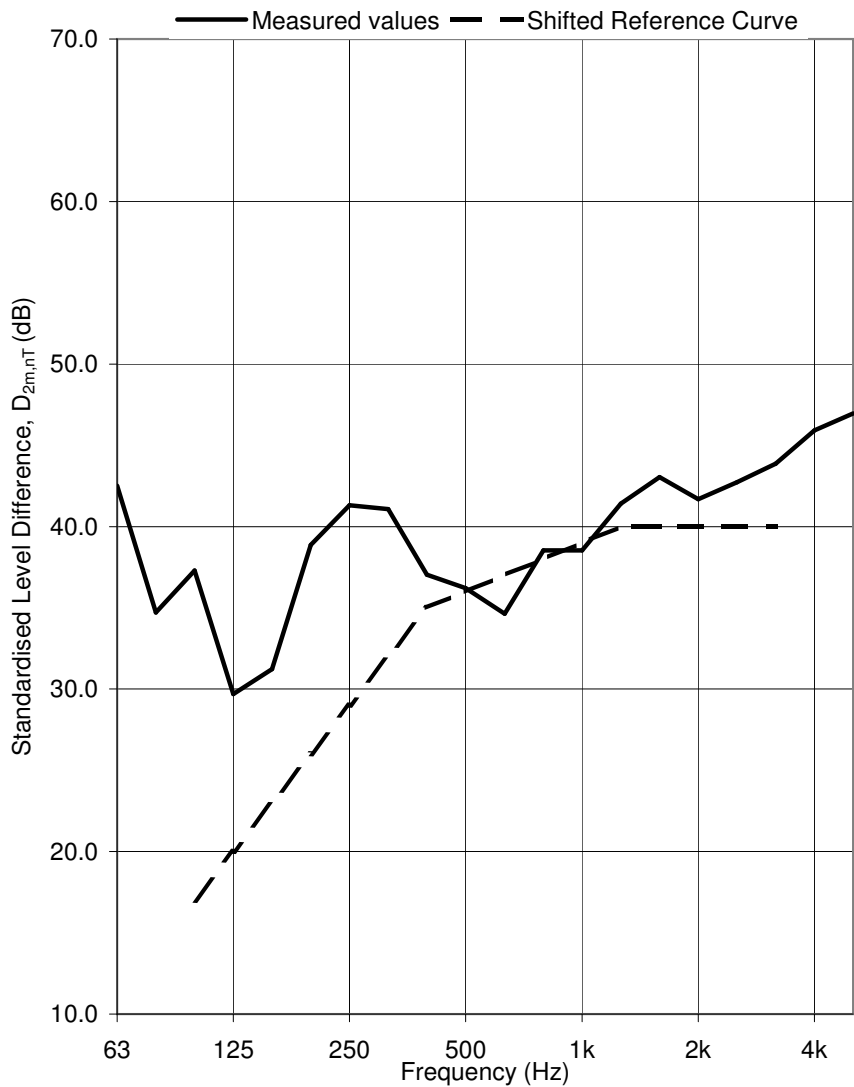


Test ID: 717041

Loudspeaker Configuration:



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	32.9
63	42.5
80	34.7
100	37.3
125	29.7
160	31.2
200	38.9
250	41.3
315	41.1
400	37.0
500	36.2
630	34.6
800	38.5
1k	38.5
1.25k	41.4
1.6k	43.1
2k	41.7
2.5k	42.7
3.15k	43.9
4k	45.9
5k	47.0

$D_{2m,nT,w} (C;C_{tr})$ 40 (0; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

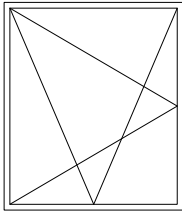
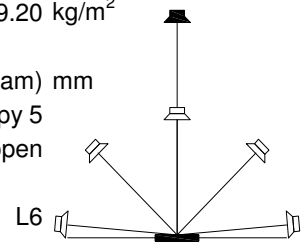
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0067 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717042

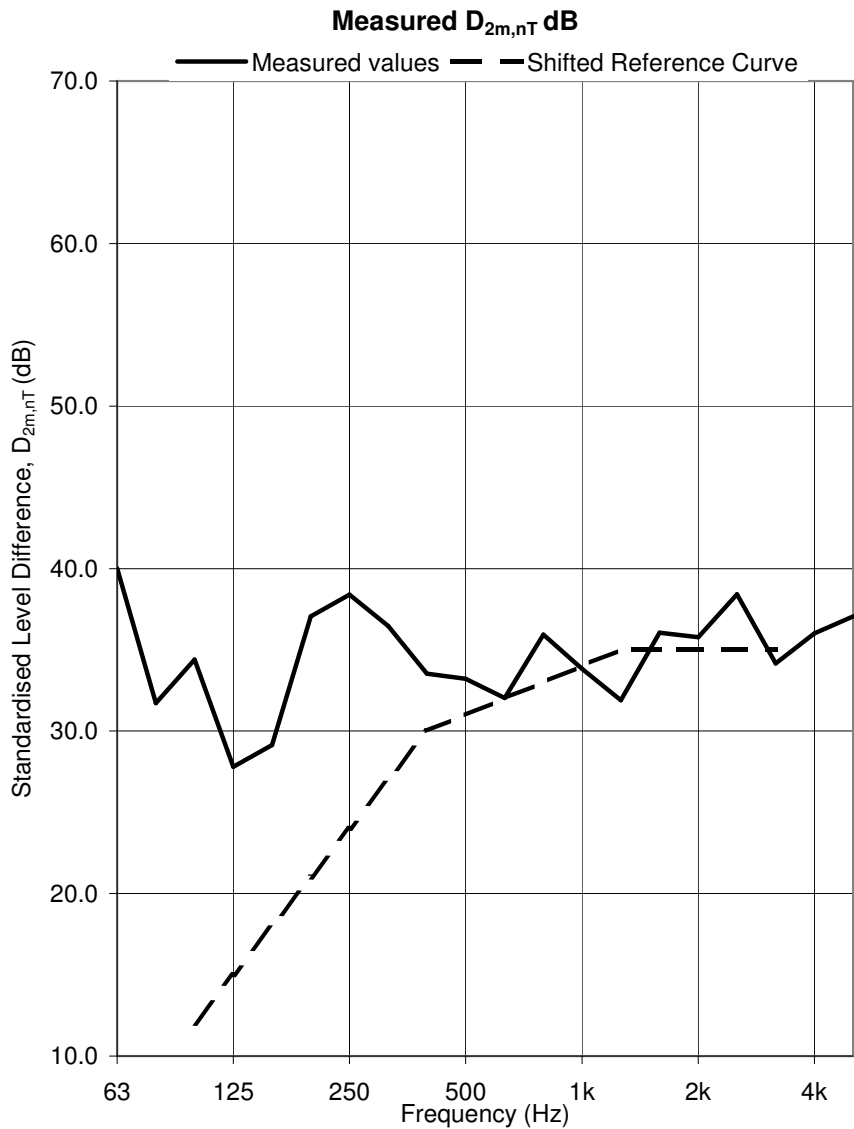
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Canopy 5
 Vent: Vent 6 open

Loudspeaker Configuration:



Frequency Hz	D _{2m,nT} dB
50	32.0
63	40.0
80	31.7
100	34.4
125	27.8
160	29.1
200	37.1
250	38.4
315	36.5
400	33.5
500	33.2
630	32.0
800	35.9
1k	33.8
1.25k	31.9
1.6k	36.1
2k	35.8
2.5k	38.4
3.15k	34.2
4k	36.0
5k	37.1



D_{2m,nT,w} (C;C_{tr}) 35 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

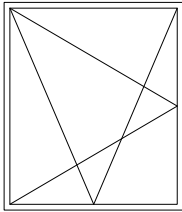
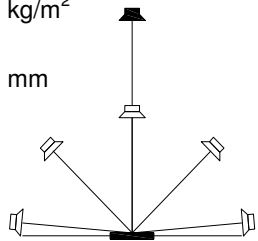
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0044 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717074

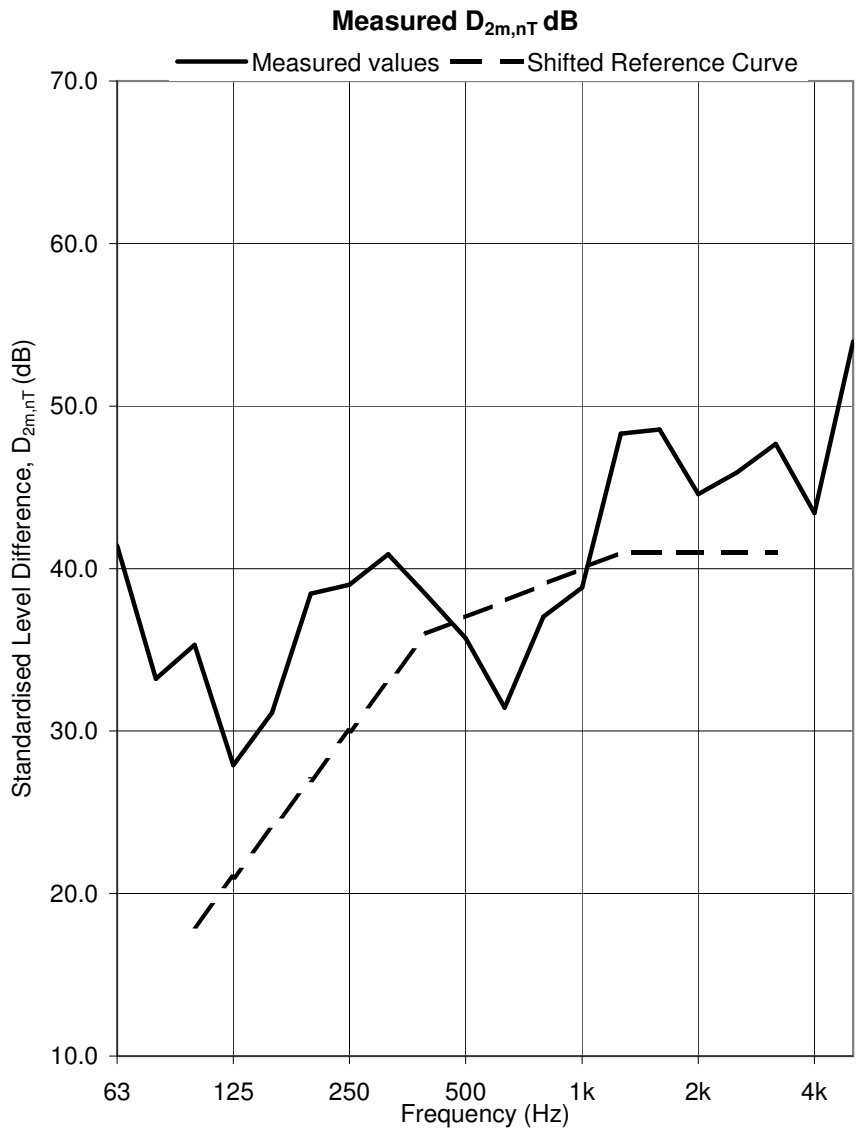
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 -18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Overframe A closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.2
63	41.4
80	33.2
100	35.3
125	27.9
160	31.1
200	38.5
250	39.0
315	40.9
400	38.3
500	35.7
630	31.4
800	37.0
1k	38.8
1.25k	48.3
1.6k	48.6
2k	44.6
2.5k	45.9
3.15k	47.7
4k	43.4
5k	54.0

b



D_{2m,nT,w} (C;C_{tr}) 41 (-2; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

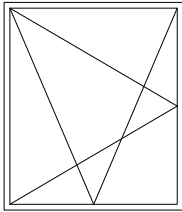
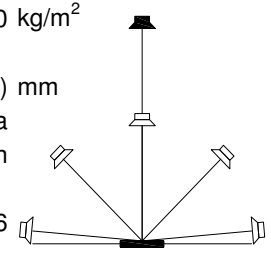
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

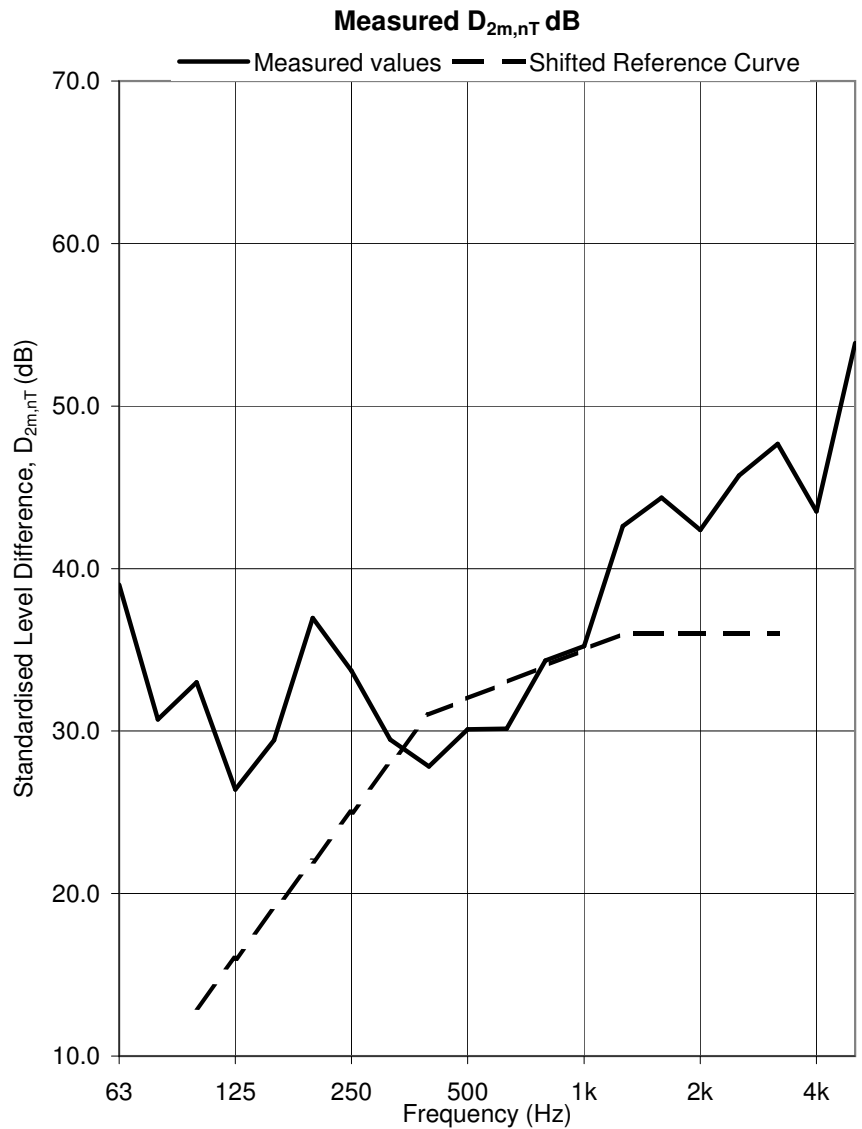
Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0044 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717075

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Overframe A open
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	32.2
63	39.0
80	30.7
100	33.0
125	26.4
160	29.4
200	37.0
250	33.7
315	29.5
400	27.8
500	30.1
630	30.1
800	34.3
1k	35.2
1.25k	42.6
1.6k	44.4
2k	42.4
2.5k	45.7
3.15k	47.7
4k	43.5
5k	53.9



D_{2m,nT,w} (C;C_{tr}) 36 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

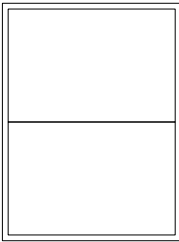
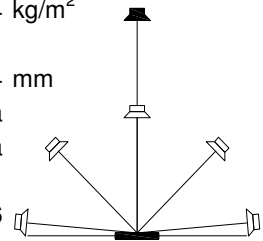
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

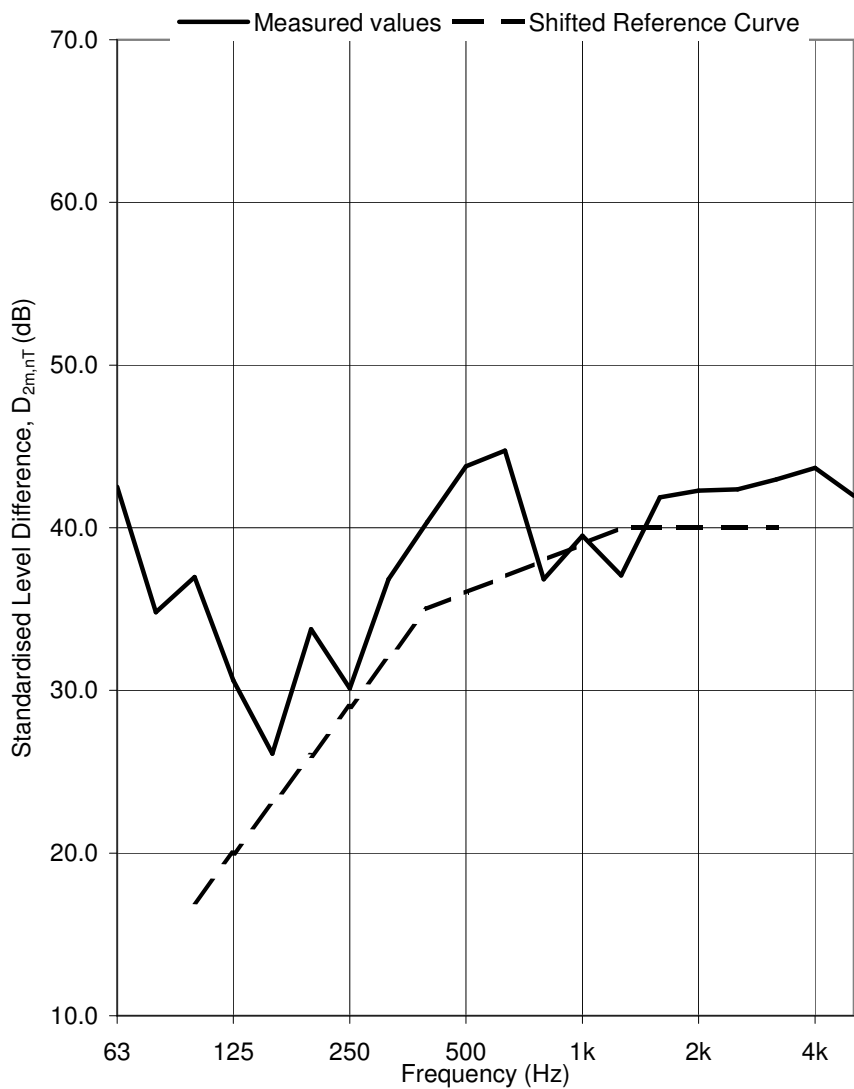
Date: 14/7/2005
 Air temperature: 21.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0096 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714025

Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D1)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.9
63	42.5
80	34.8
100	37.0
125	30.6
160	26.1
200	33.8
250	30.1
315	36.8
400	40.3
500	43.8
630	44.7
800	36.8
1k	39.5
1.25k	37.1
1.6k	41.9
2k	42.3
2.5k	42.4
3.15k	43.0
4k	43.7
5k	42.0

$D_{2m,nT,w}$ (C;C_{tr}) 40 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

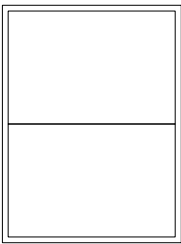
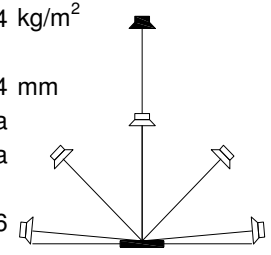
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

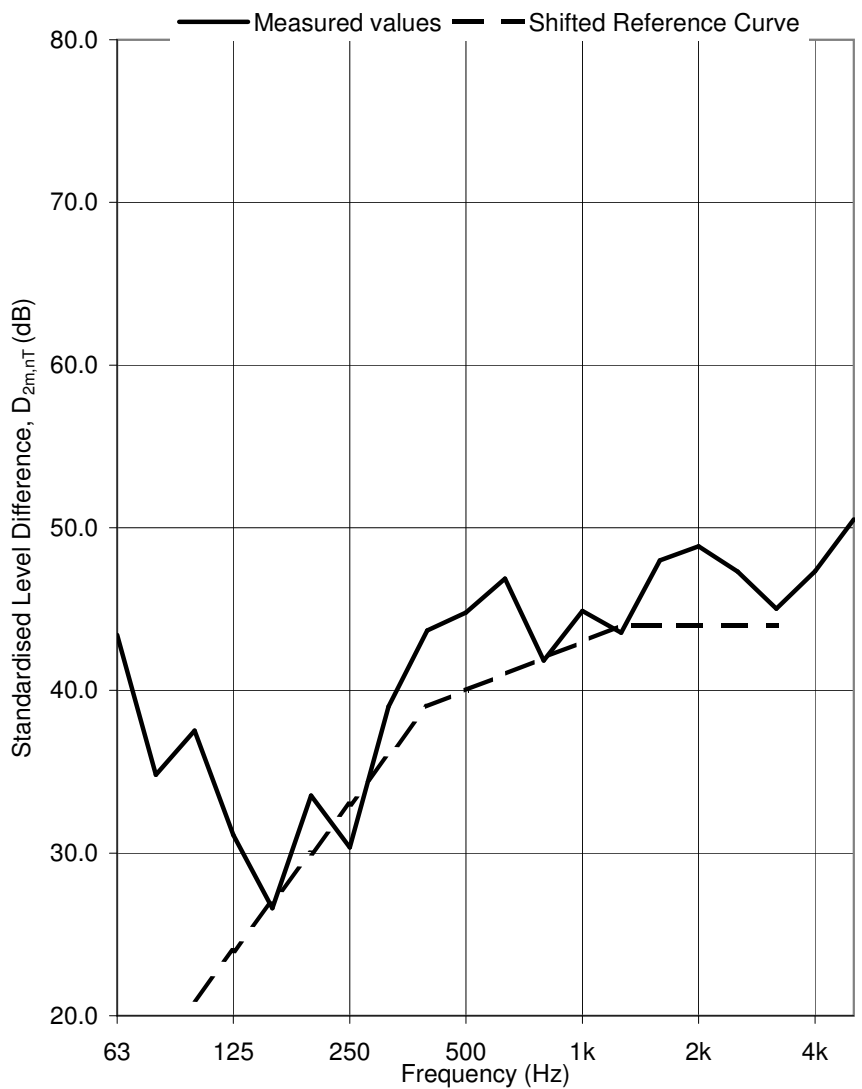
Date: 14/7/2005
 Air temperature: 21.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714031

Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D2)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.3
63	43.4
80	34.8
100	37.5
125	31.1
160	26.6
200	33.5
250	30.3
315	39.0
400	43.7
500	44.8
630	46.9
800	41.8
1k	44.9
1.25k	43.5
1.6k	48.0
2k	48.9
2.5k	47.3
3.15k	45.0
4k	47.3
5k	50.5

$D_{2m,nT,w}$ (C;C_{tr}) 44 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

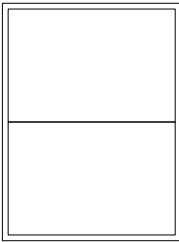
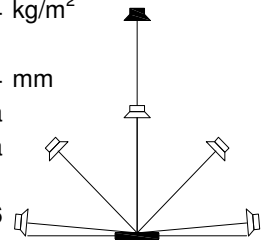
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

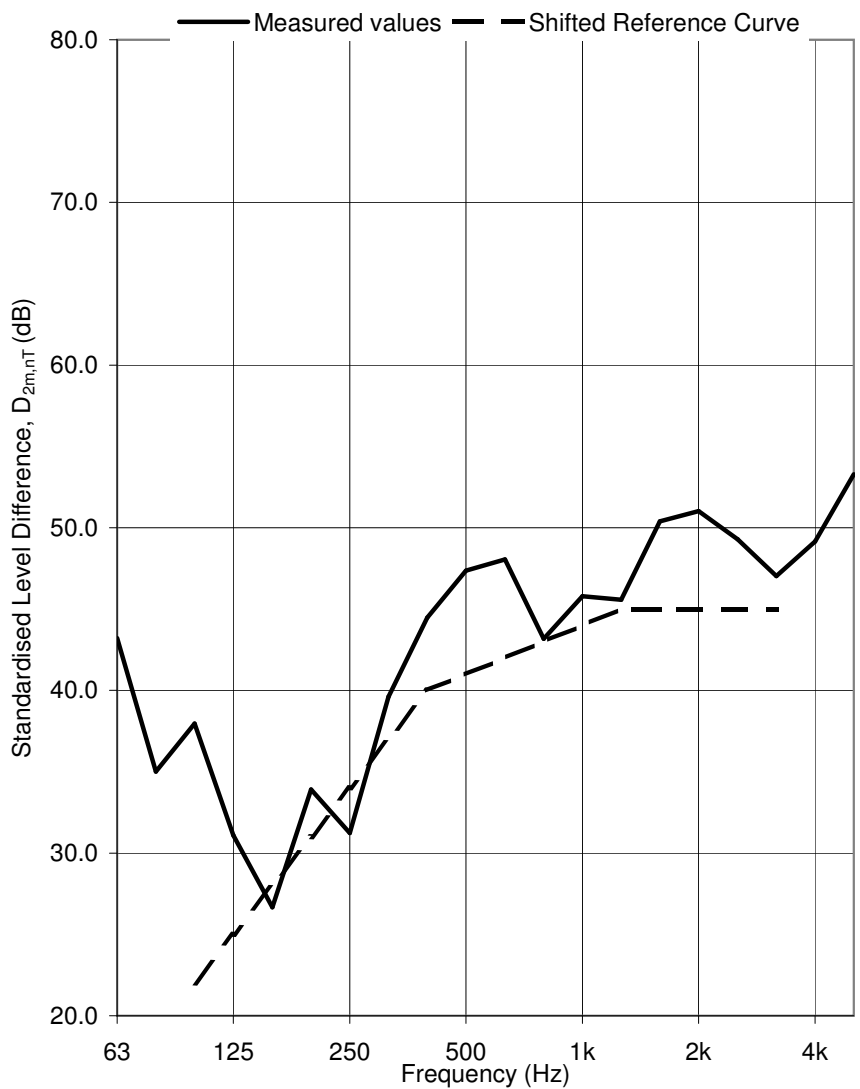
Date: 14/7/2005
 Air temperature: 22.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0078 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714080

Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D3)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	28.0
63	43.2
80	35.0
100	38.0
125	31.1
160	26.7
200	33.9
250	31.2
315	39.6
400	44.5
500	47.4
630	48.0
800	43.2
1k	45.8
1.25k	45.6
1.6k	50.4
2k	51.0
2.5k	49.3
3.15k	47.0
4k	49.2
5k	53.3

$D_{2m,nT,w} (C;C_{tr})$ 45 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

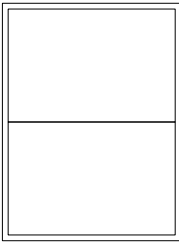
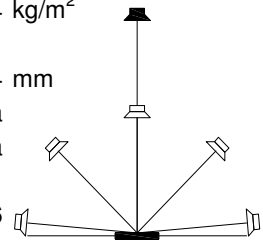
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

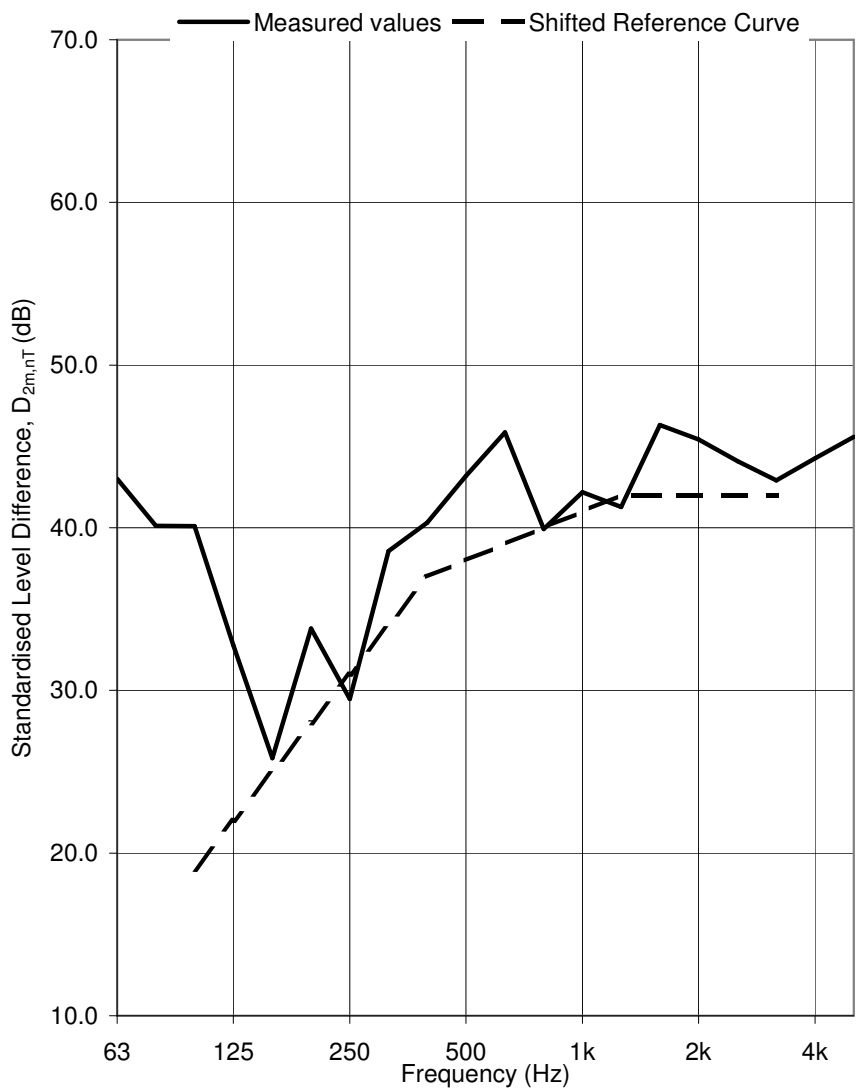
Date: 14/7/2005
 Air temperature: 22.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.008 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714086

Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D4)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	30.6
63	43.0
80	40.1
100	40.1
125	32.8
160	25.8
200	33.8
250	29.5
315	38.6
400	40.3
500	43.2
630	45.9
800	39.9
1k	42.2
1.25k	41.3
1.6k	46.3
2k	45.4
2.5k	44.1
3.15k	42.9
4k	44.3
5k	45.6

$D_{2m,nT,w}$ (C;C_{tr}) 42 (-1; -4) dB

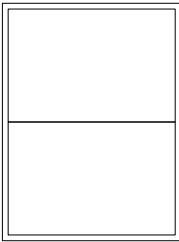
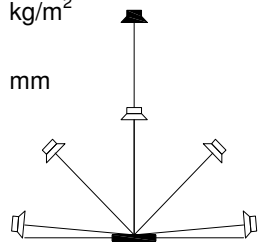
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

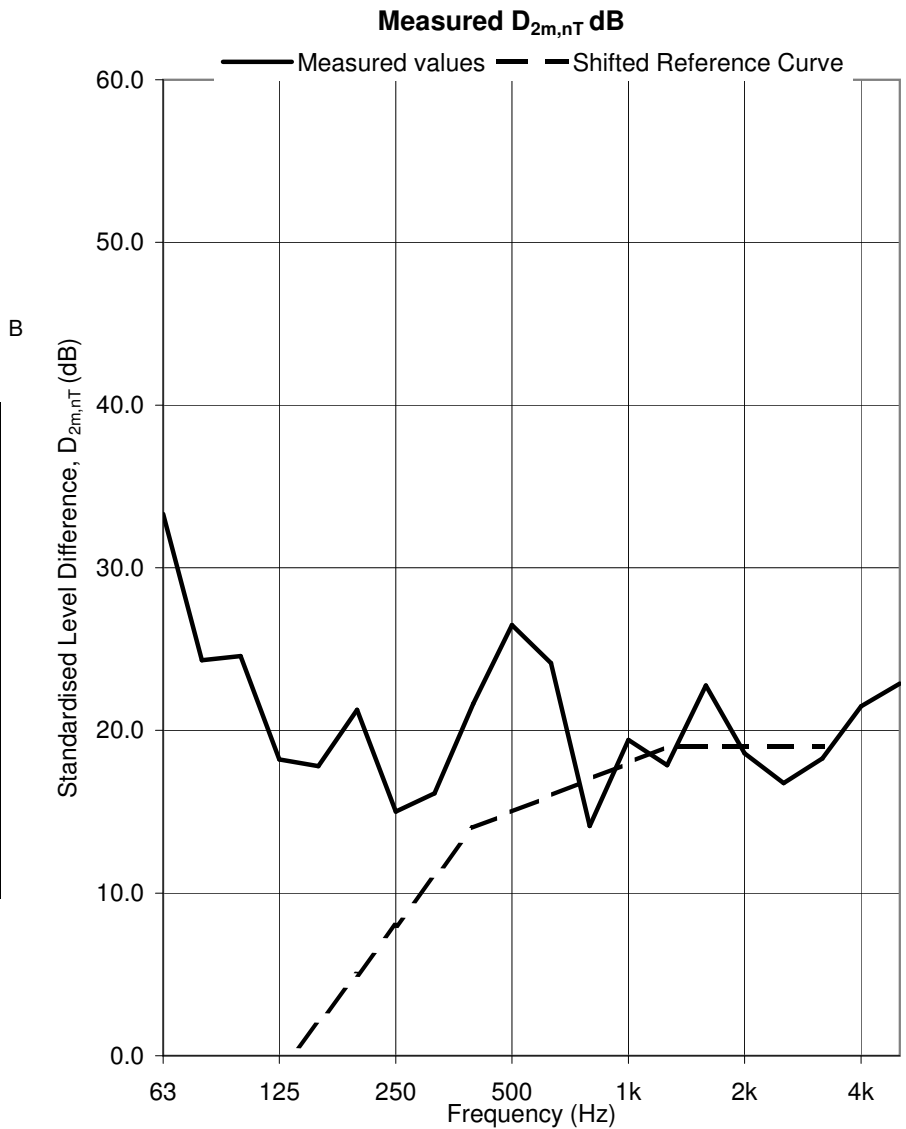
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 21.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0096 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714027

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D1)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	26.9
63	33.3
80	24.3
100	24.6
125	18.2
160	17.8
200	21.3
250	15.0
315	16.1
400	21.6
500	26.5
630	24.1
800	14.1
1k	19.4
1.25k	17.9
1.6k	22.8
2k	18.6
2.5k	16.8
3.15k	18.3
4k	21.5
5k	22.9



D_{2m,nT,w} (C;C_{tr}) 19 (-1; -1) dB

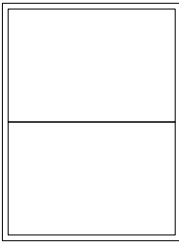
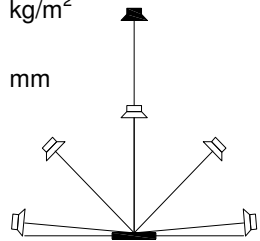
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

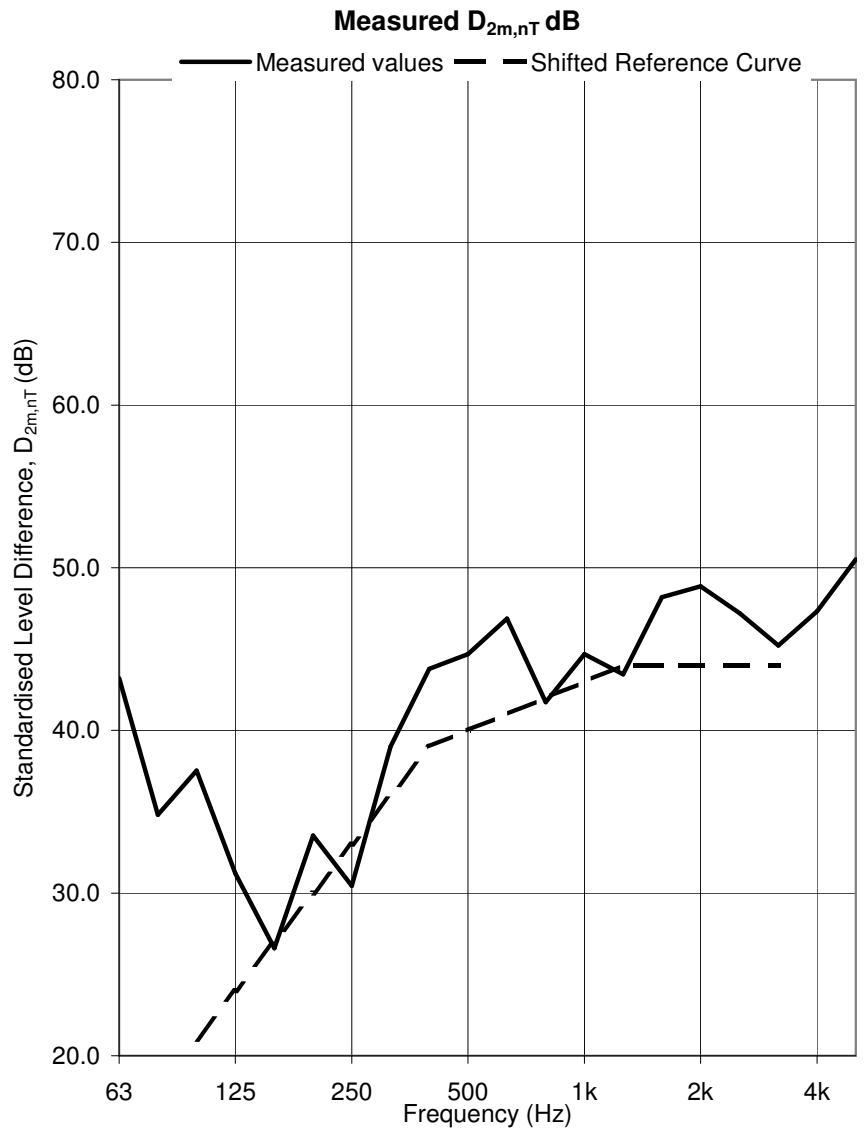
Date: 14/7/2005
 Air temperature: 21.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714062

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D2)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	28.8
63	43.2
80	34.8
100	37.5
125	31.2
160	26.6
200	33.5
250	30.4
315	39.0
400	43.8
500	44.7
630	46.9
800	41.7
1k	44.7
1.25k	43.4
1.6k	48.2
2k	48.9
2.5k	47.2
3.15k	45.2
4k	47.3
5k	50.5

B
b



D_{2m,nT,w} (C;C_{tr}) 44 (-2; -5) dB

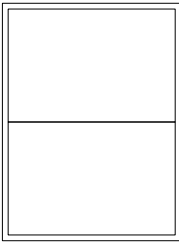
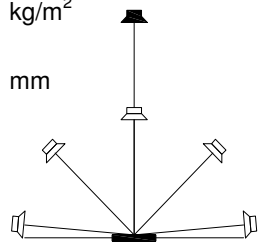
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

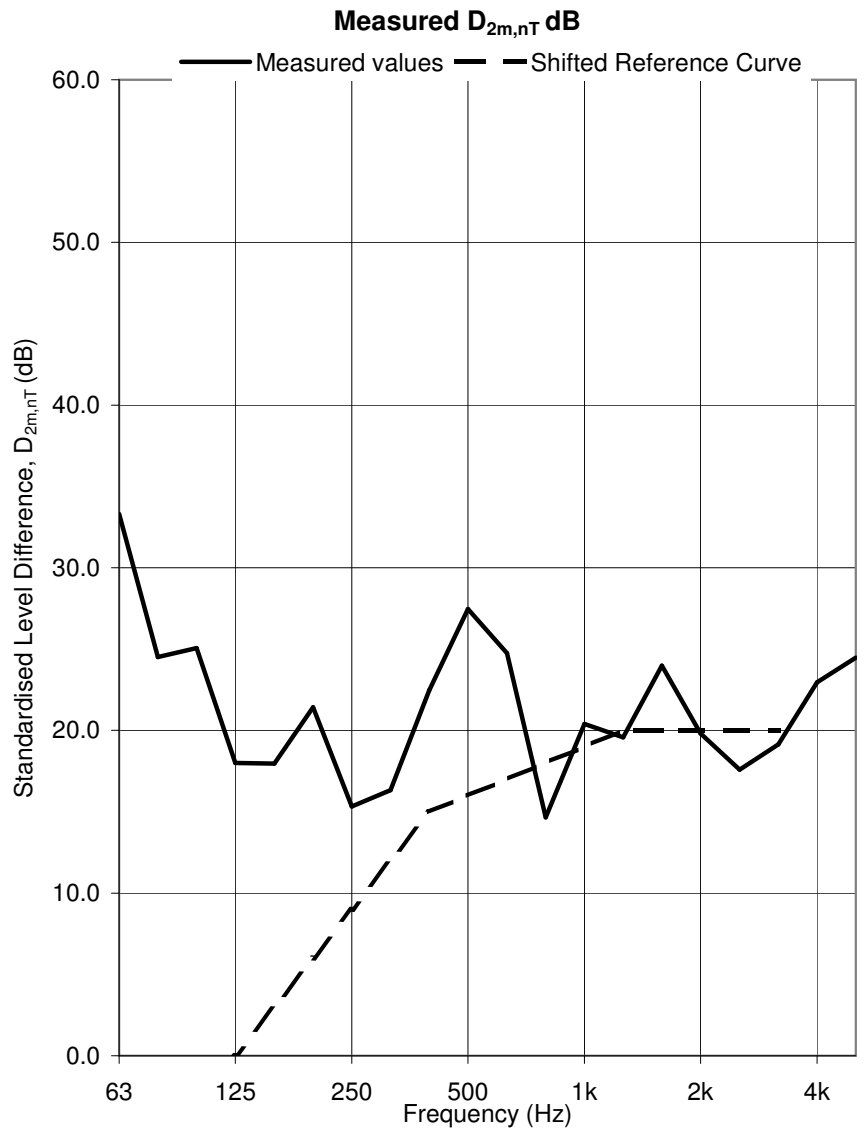
Date: 14/7/2005
 Air temperature: 22 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.008 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714072

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D3)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	20.9
63	33.3
80	24.5
100	25.1
125	18.0
160	18.0
200	21.4
250	15.3
315	16.3
400	22.5
500	27.5
630	24.7
800	14.7
1k	20.4
1.25k	19.6
1.6k	24.0
2k	19.8
2.5k	17.6
3.15k	19.1
4k	23.0
5k	24.5

b



D_{2m,nT,w} (C;C_{tr}) 20 (-1; -1) dB

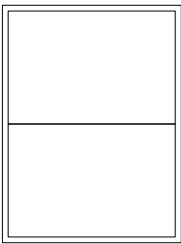
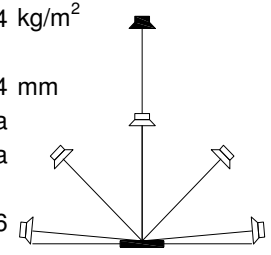
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

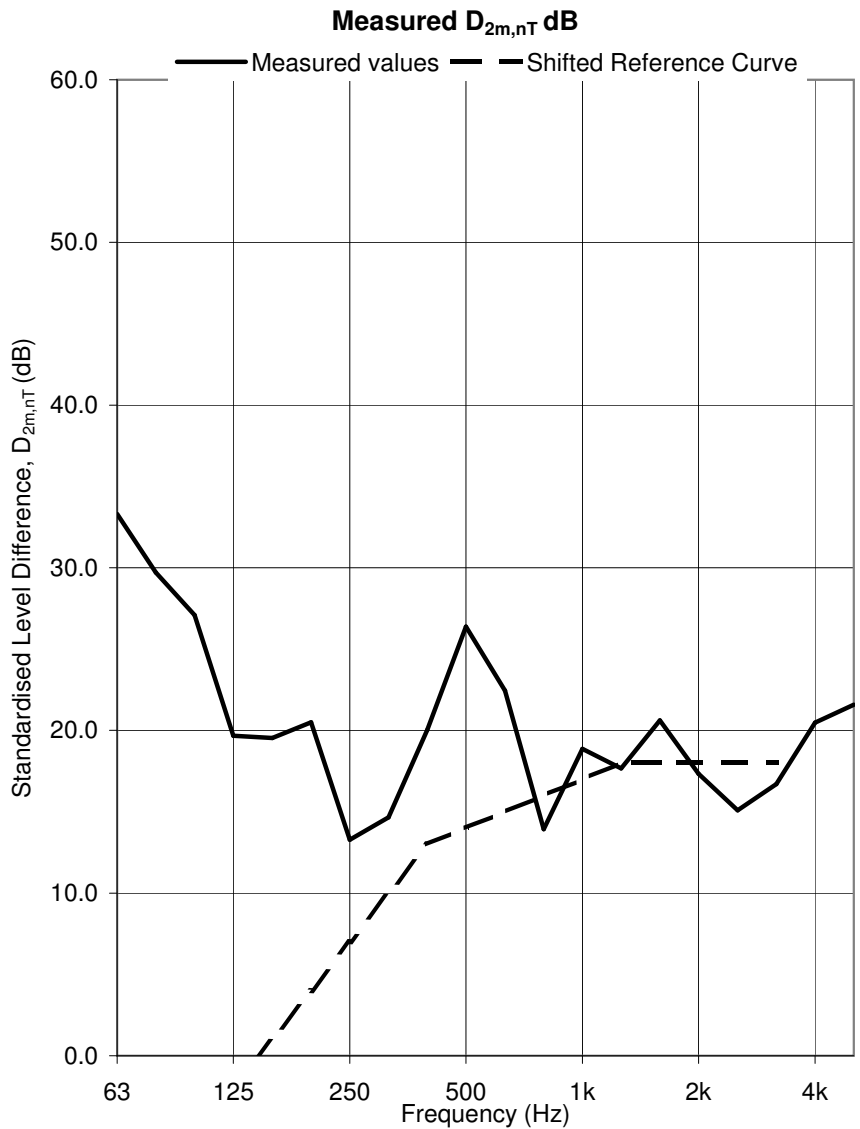
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 22.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.008 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714088

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D4)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	28.9
63	33.3
80	29.7
100	27.1
125	19.7
160	19.5
200	20.5
250	13.3
315	14.7
400	20.0
500	26.4
630	22.5
800	13.9
1k	18.9
1.25k	17.7
1.6k	20.6
2k	17.3
2.5k	15.1
3.15k	16.7
4k	20.5
5k	21.6



D_{2m,nT,w} (C;C_{tr}) 18 (-1; -1) dB

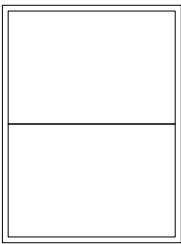
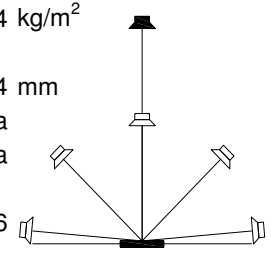
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

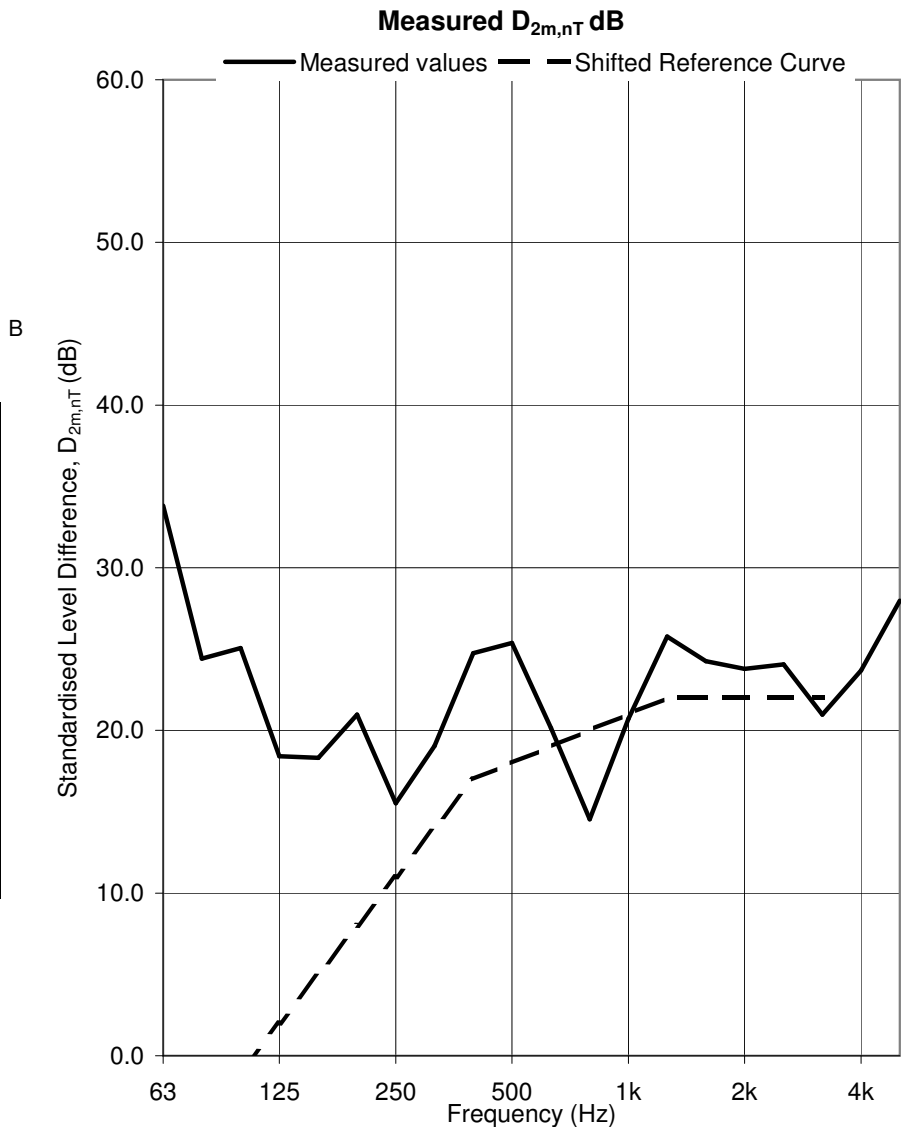
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 21.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0096 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714024

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D1)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	27.5
63	33.8
80	24.4
100	25.1
125	18.4
160	18.3
200	21.0
250	15.5
315	19.0
400	24.7
500	25.4
630	20.1
800	14.5
1k	20.7
1.25k	25.8
1.6k	24.3
2k	23.8
2.5k	24.1
3.15k	21.0
4k	23.7
5k	28.0



D_{2m,nT,w} (C;C_{tr}) 22 (-1; -2) dB

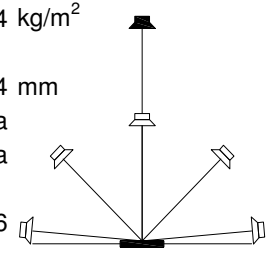
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

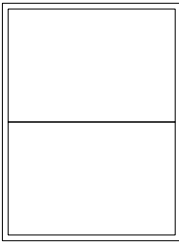
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 21.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

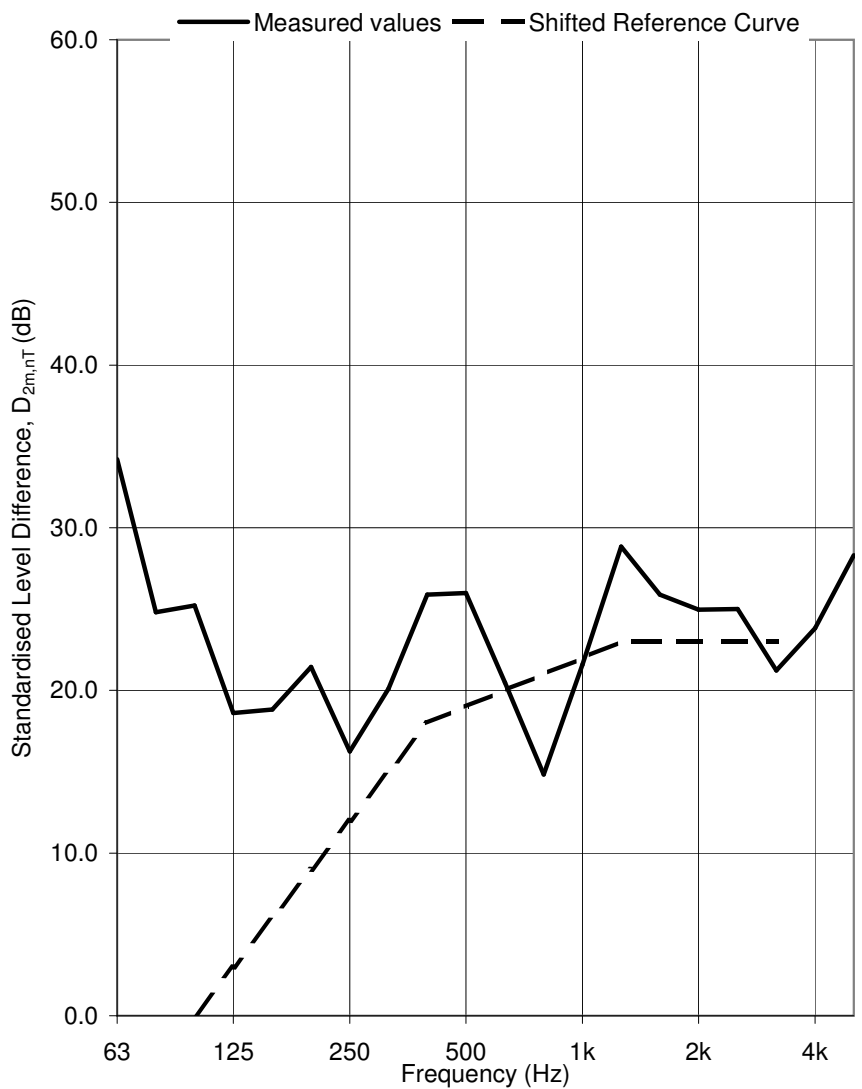
Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D2)
 Loudspeaker Configuration: L6



Test ID: 714066



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	28.1
63	34.2
80	24.8
100	25.2
125	18.6
160	18.8
200	21.4
250	16.2
315	20.1
400	25.9
500	26.0
630	20.5
800	14.8
1k	21.6
1.25k	28.8
1.6k	25.9
2k	25.0
2.5k	25.0
3.15k	21.2
4k	23.8
5k	28.3

$D_{2m,nT,w}$ (C;C_{tr}) 23 (-1; -3) dB

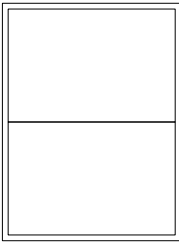
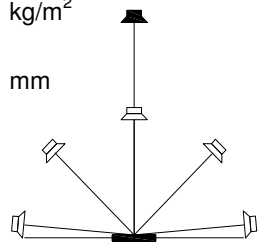
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

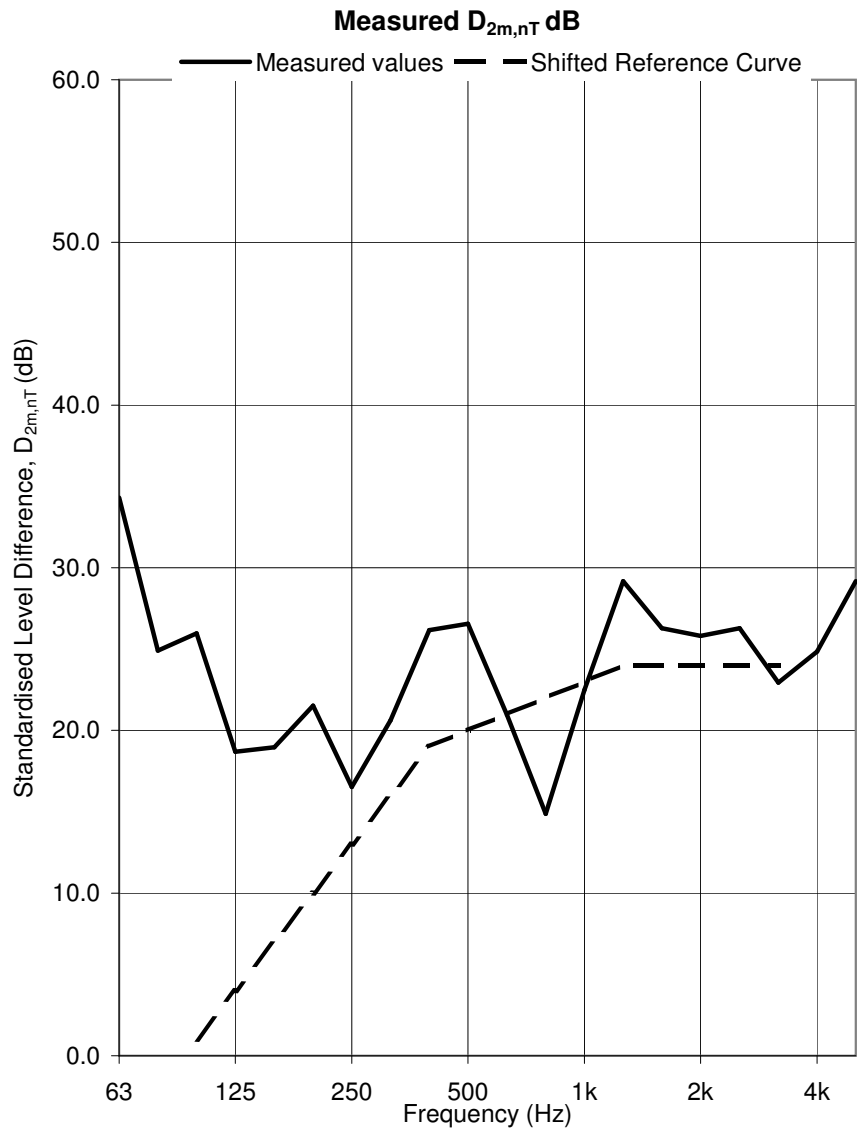
Date: 14/7/2005
 Air temperature: 22 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.008 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714076

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D3)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	27.4
63	34.3
80	24.9
100	26.0
125	18.7
160	19.0
200	21.5
250	16.5
315	20.6
400	26.2
500	26.6
630	20.9
800	14.9
1k	22.5
1.25k	29.2
1.6k	26.3
2k	25.8
2.5k	26.3
3.15k	22.9
4k	24.9
5k	29.2

B



D_{2m,nT,w} (C;C_{tr}) 24 (-2; -3) dB

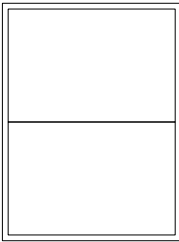
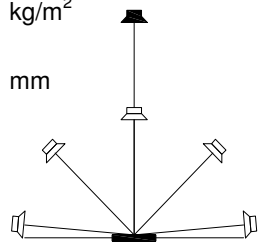
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

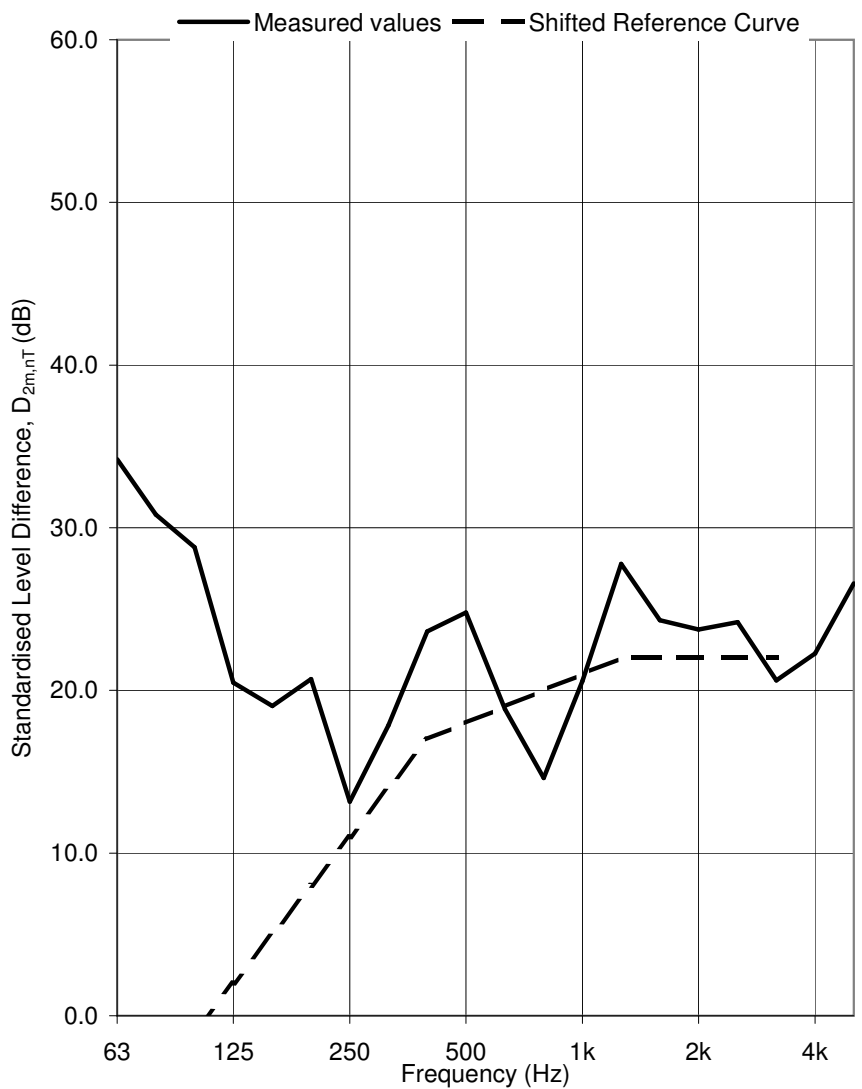
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 22.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.008 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714092

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D4)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	29.6
63	34.2
80	30.8
100	28.8
125	20.5
160	19.0
200	20.7
250	13.2
315	17.9
400	23.6
500	24.8
630	18.9
800	14.6
1k	20.6
1.25k	27.8
1.6k	24.3
2k	23.7
2.5k	24.2
3.15k	20.6
4k	22.3
5k	26.6

$D_{2m,nT,w}$ (C;C_{tr}) 22 (-1; -3) dB

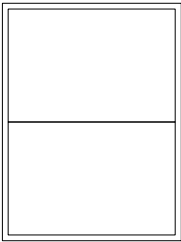
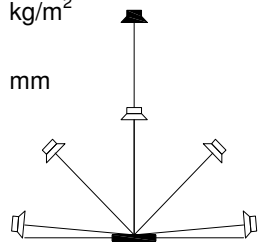
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

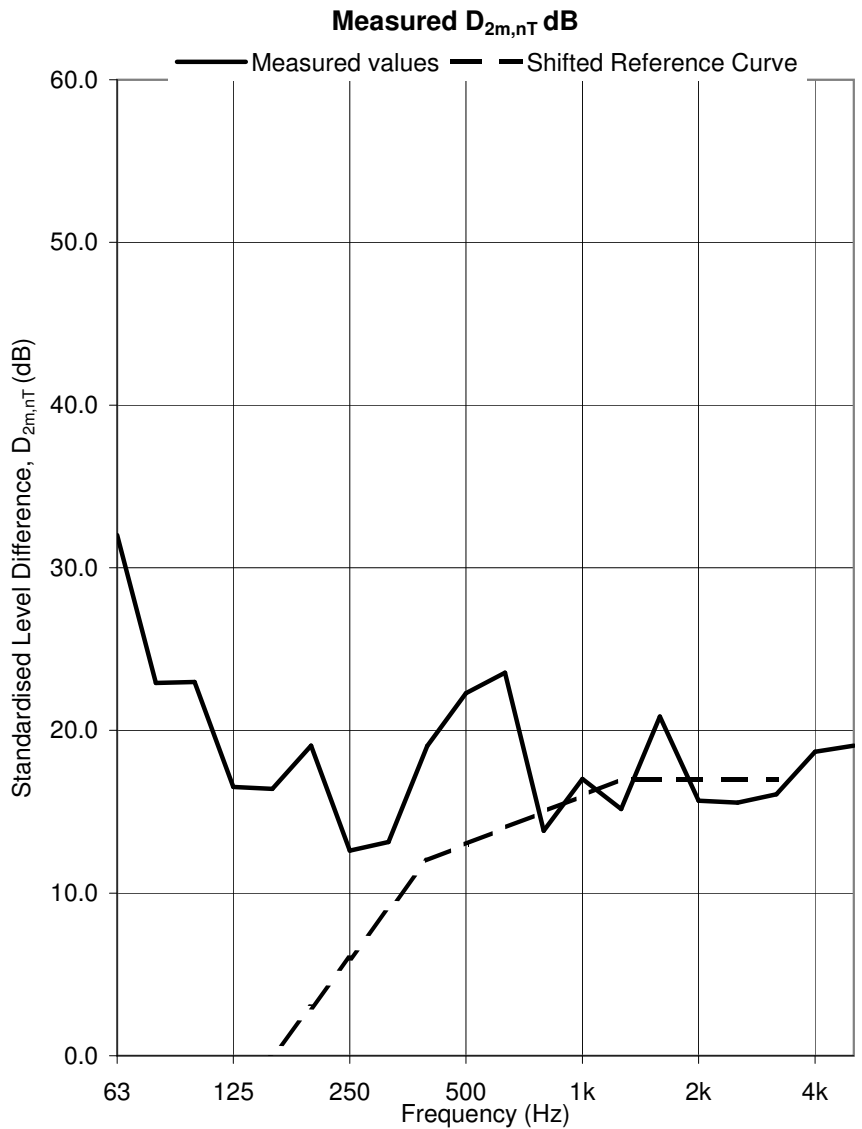
Date: 14/7/2005
 Air temperature: 21.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0096 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714028

Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D1)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	26.4
63	32.0
80	22.9
100	23.0
125	16.5
160	16.4
200	19.1
250	12.6
315	13.1
400	19.0
500	22.3
630	23.5
800	13.8
1k	17.0
1.25k	15.2
1.6k	20.9
2k	15.7
2.5k	15.6
3.15k	16.1
4k	18.7
5k	19.1

B



D_{2m,nT,w} (C;C_{tr}) 17 (-1; -1) dB

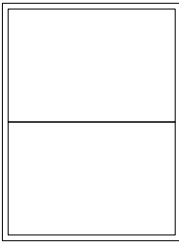
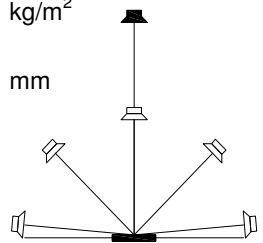
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

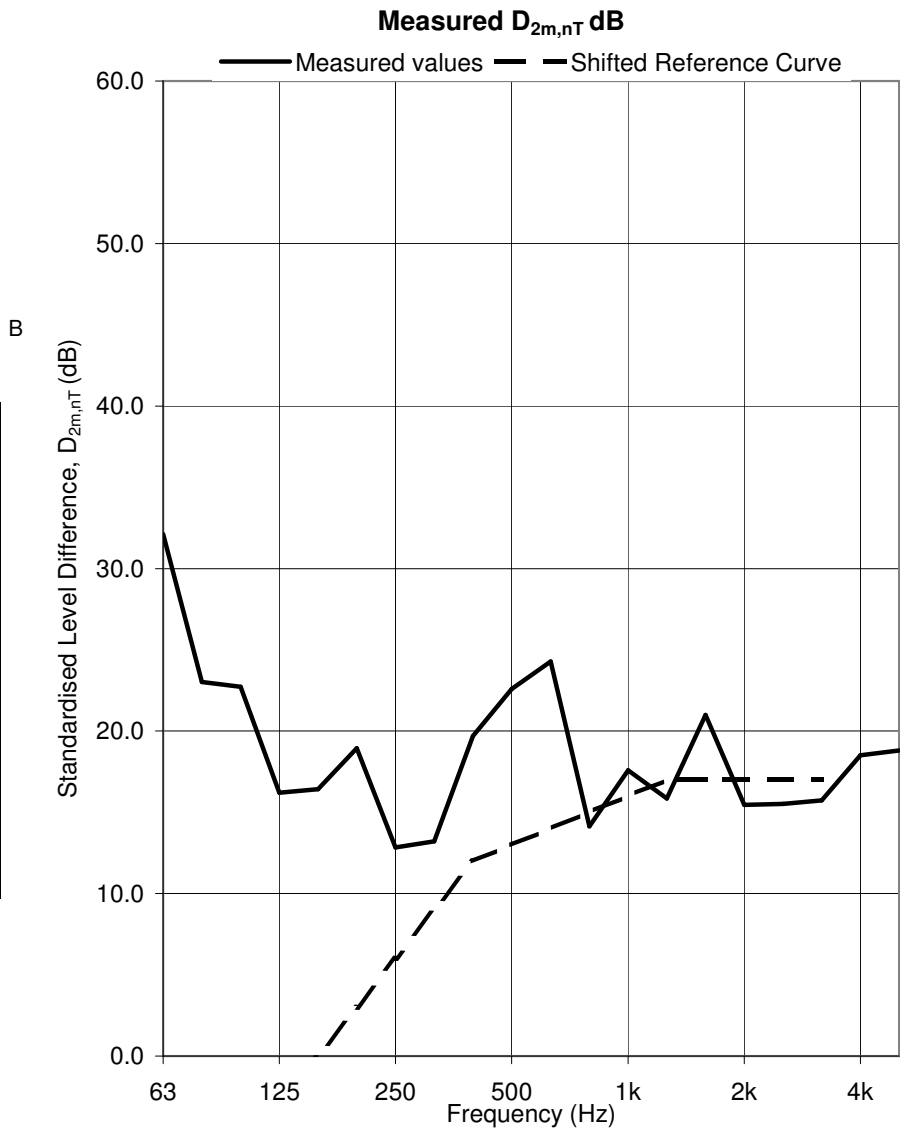
Standardised Level Difference. Simulated residential receiver environment

Date: 14/7/2005
 Air temperature: 21.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 714063

Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Condition D2)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	26.4
63	32.1
80	23.0
100	22.7
125	16.2
160	16.4
200	18.9
250	12.8
315	13.2
400	19.7
500	22.6
630	24.3
800	14.1
1k	17.6
1.25k	15.8
1.6k	21.0
2k	15.5
2.5k	15.5
3.15k	15.7
4k	18.5
5k	18.8



D_{2m,nT,w} (C;C_{tr}) 17 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

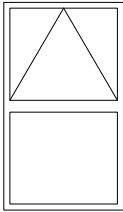
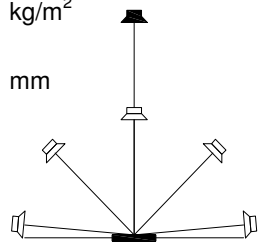
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

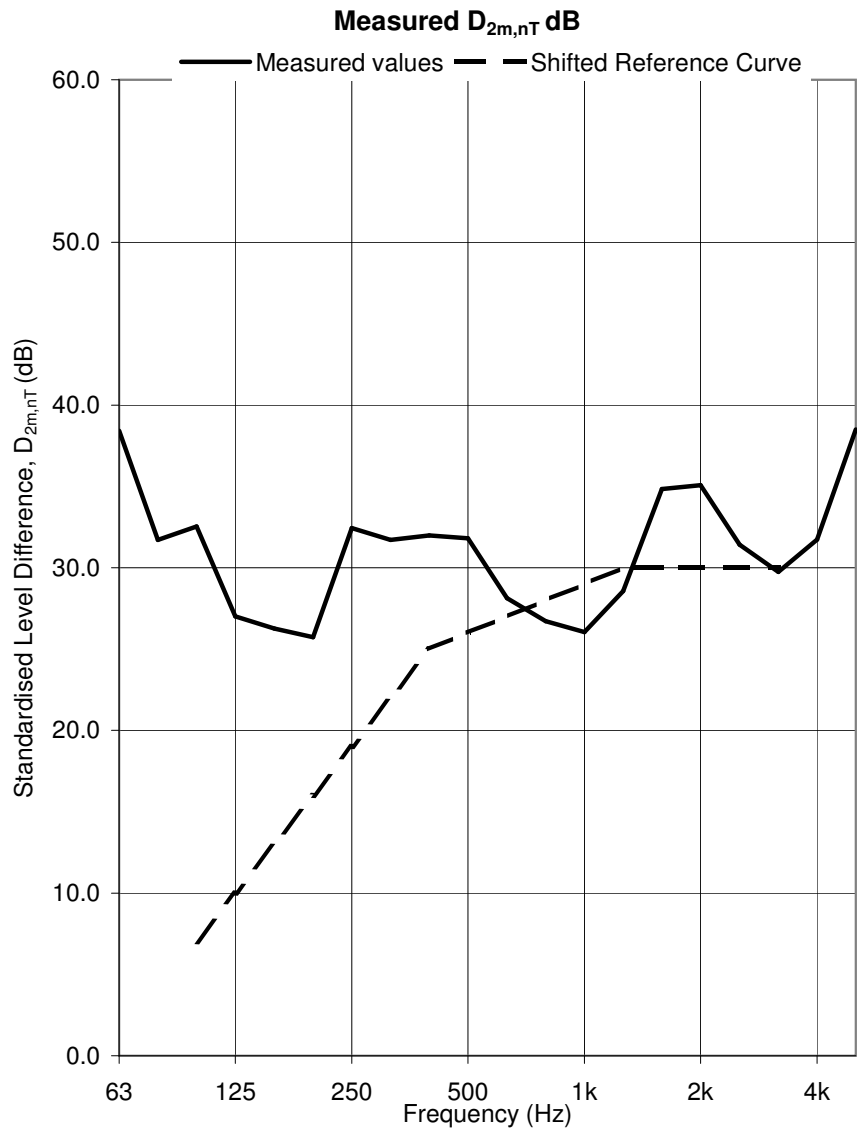
Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9961 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718042

Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Frame and light seals removed)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	30.7
63	38.4
80	31.7
100	32.5
125	27.0
160	26.3
200	25.7
250	32.4
315	31.7
400	32.0
500	31.8
630	28.1
800	26.7
1k	26.0
1.25k	28.6
1.6k	34.8
2k	35.1
2.5k	31.4
3.15k	29.7
4k	31.7
5k	38.5



D_{2m,nT,w} (C;C_{tr}) 30 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

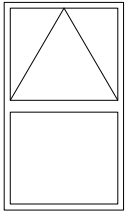
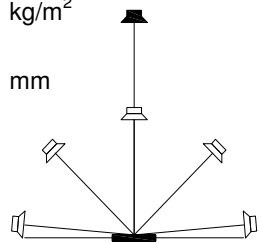
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

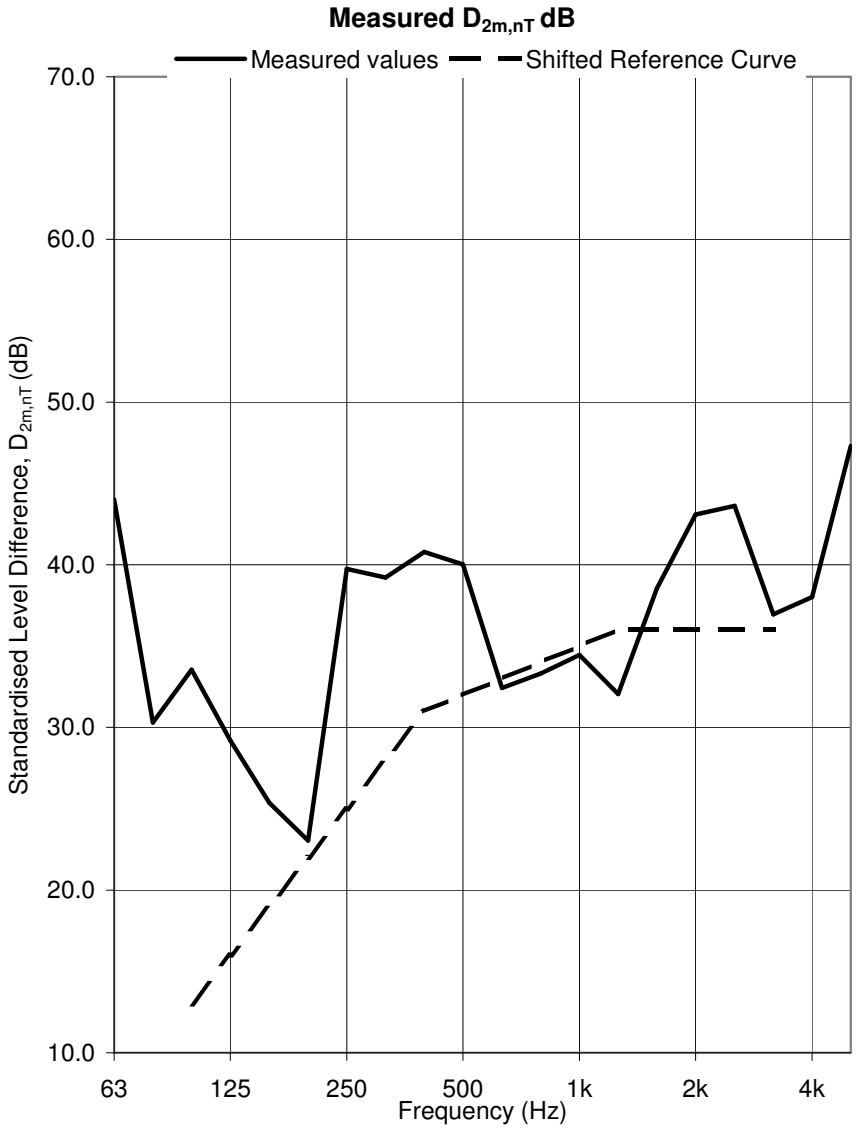
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719036

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Bottom light seal removed)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.6
63	44.0
80	30.3
100	33.5
125	29.2
160	25.4
200	23.0
250	39.7
315	39.2
400	40.8
500	40.0
630	32.4
800	33.3
1k	34.4
1.25k	32.1
1.6k	38.5
2k	43.1
2.5k	43.6
3.15k	36.9
4k	38.0
5k	47.3



D_{2m,nT,w} (C;C_{tr}) 36 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

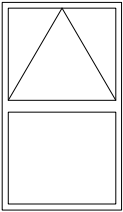
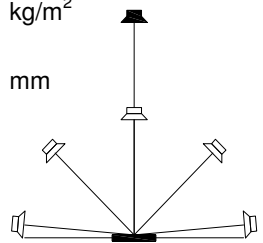
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

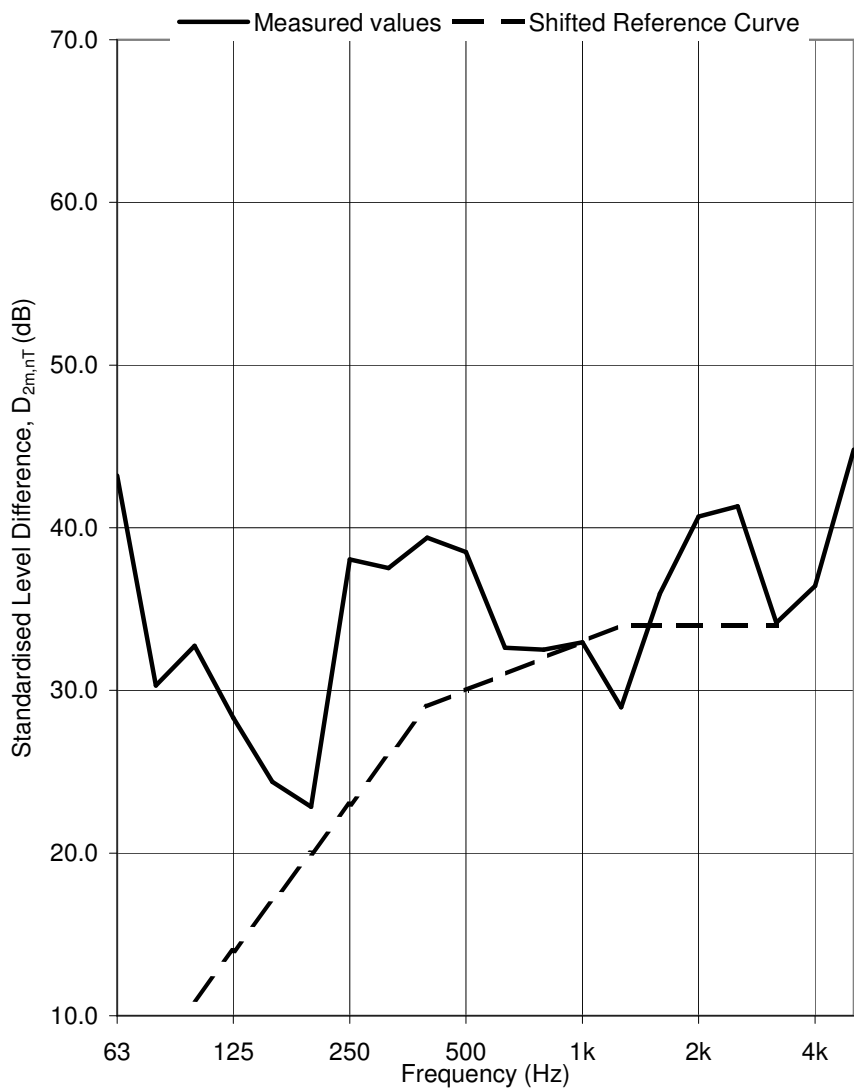
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719038

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Top and bottom light seals removed)
 Loudspeaker Configuration: L6



Measured $D_{2m,nT}$ dB



Frequency Hz	$D_{2m,nT}$ dB
50	33.1
63	43.2
80	30.3
100	32.7
125	28.3
160	24.4
200	22.8
250	38.0
315	37.5
400	39.4
500	38.5
630	32.6
800	32.5
1k	32.9
1.25k	29.0
1.6k	35.9
2k	40.7
2.5k	41.3
3.15k	34.1
4k	36.4
5k	44.8

$D_{2m,nT,w}$ (C;C_{tr}) 34 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

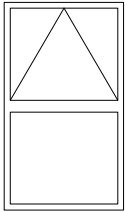
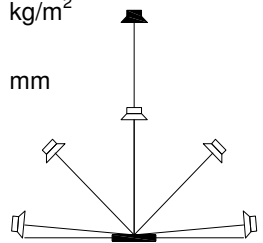
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

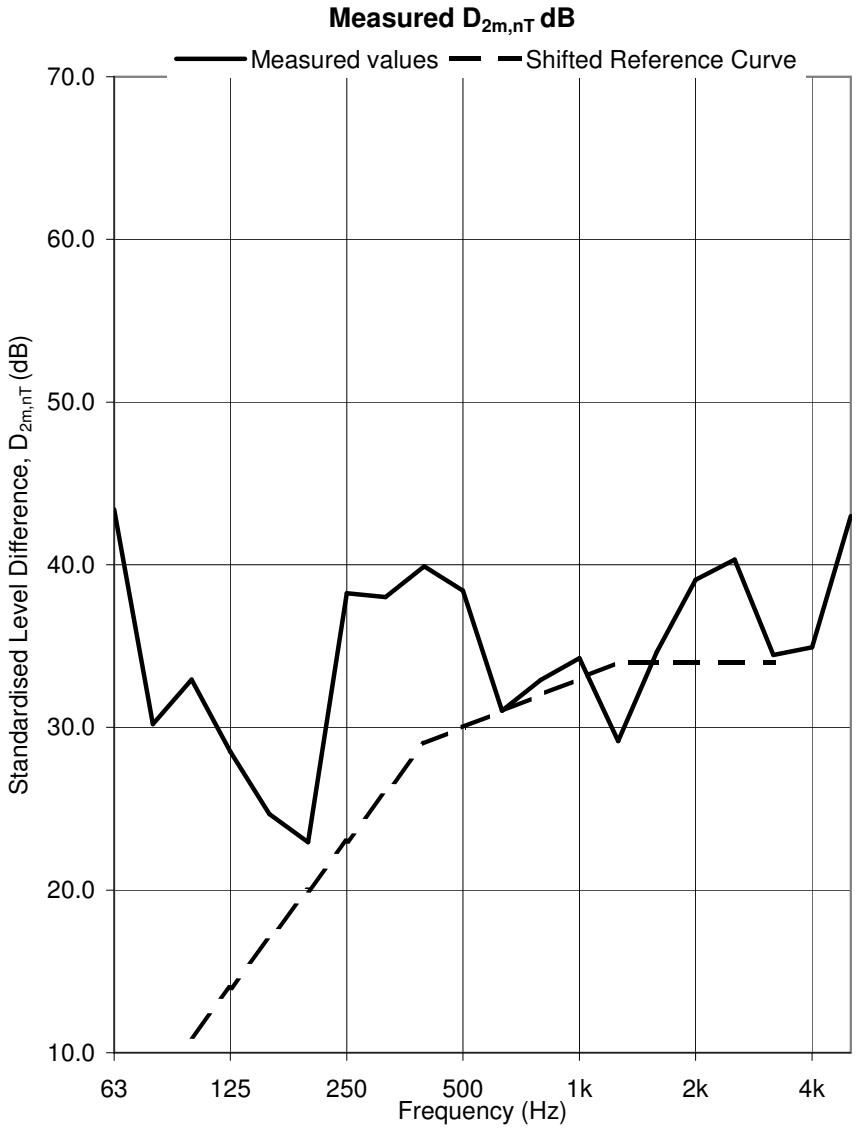
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0026 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719040

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Light seals removed)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	33.1
63	43.4
80	30.2
100	32.9
125	28.5
160	24.7
200	22.9
250	38.2
315	38.0
400	39.9
500	38.4
630	31.0
800	32.9
1k	34.2
1.25k	29.2
1.6k	34.6
2k	39.1
2.5k	40.3
3.15k	34.4
4k	34.9
5k	43.0



D_{2m,nT,w} (C;C_{tr}) 34 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

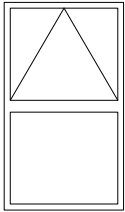
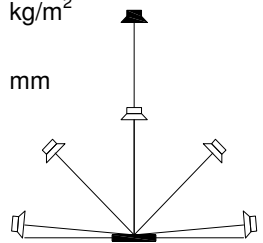
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

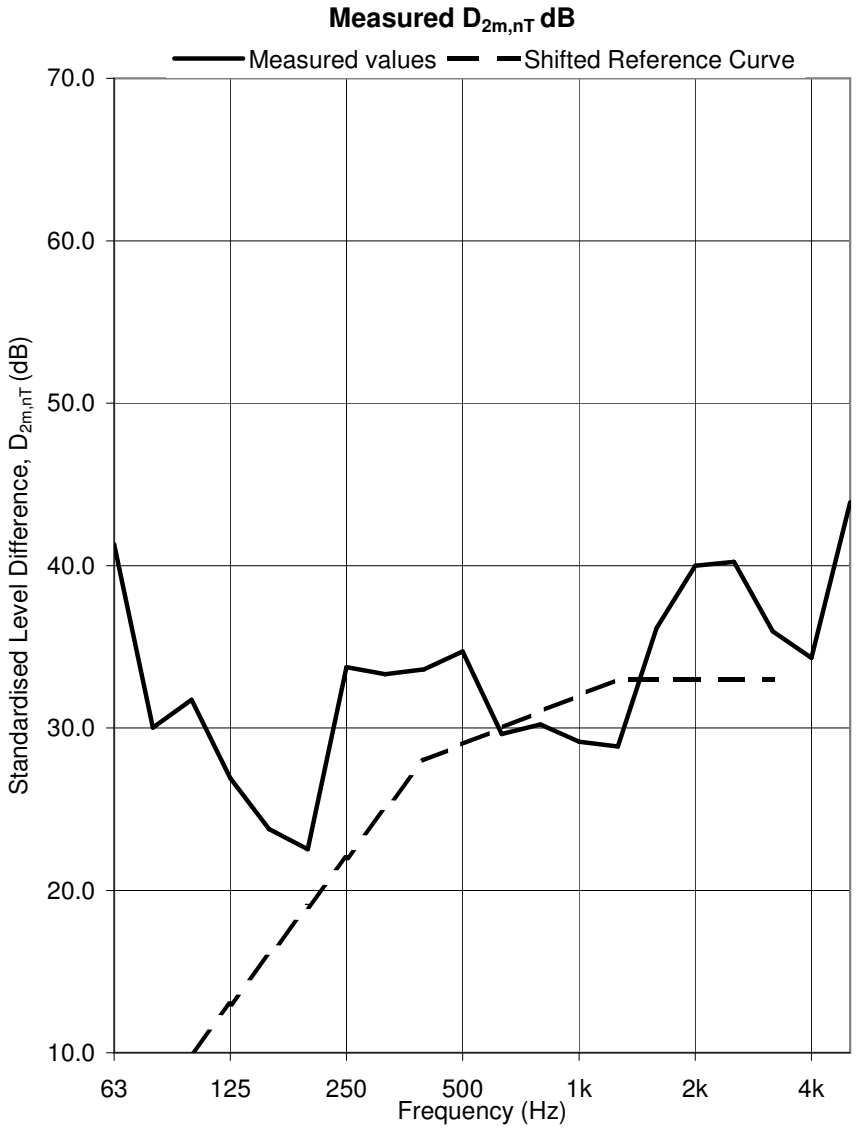
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0026 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719042

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 (Frame and light seals removed)
 Loudspeaker Configuration: L6



Frequency Hz	D _{2m,nT} dB
50	31.9
63	41.3
80	30.0
100	31.7
125	26.9
160	23.8
200	22.5
250	33.7
315	33.3
400	33.6
500	34.7
630	29.6
800	30.2
1k	29.1
1.25k	28.9
1.6k	36.1
2k	40.0
2.5k	40.2
3.15k	35.9
4k	34.3
5k	43.9



D_{2m,nT,w} (C;C_{tr}) 33 (-1; -3) dB

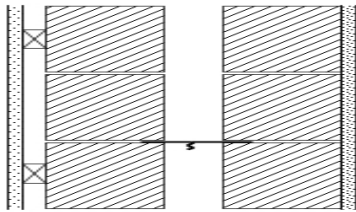
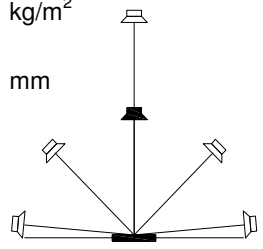
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

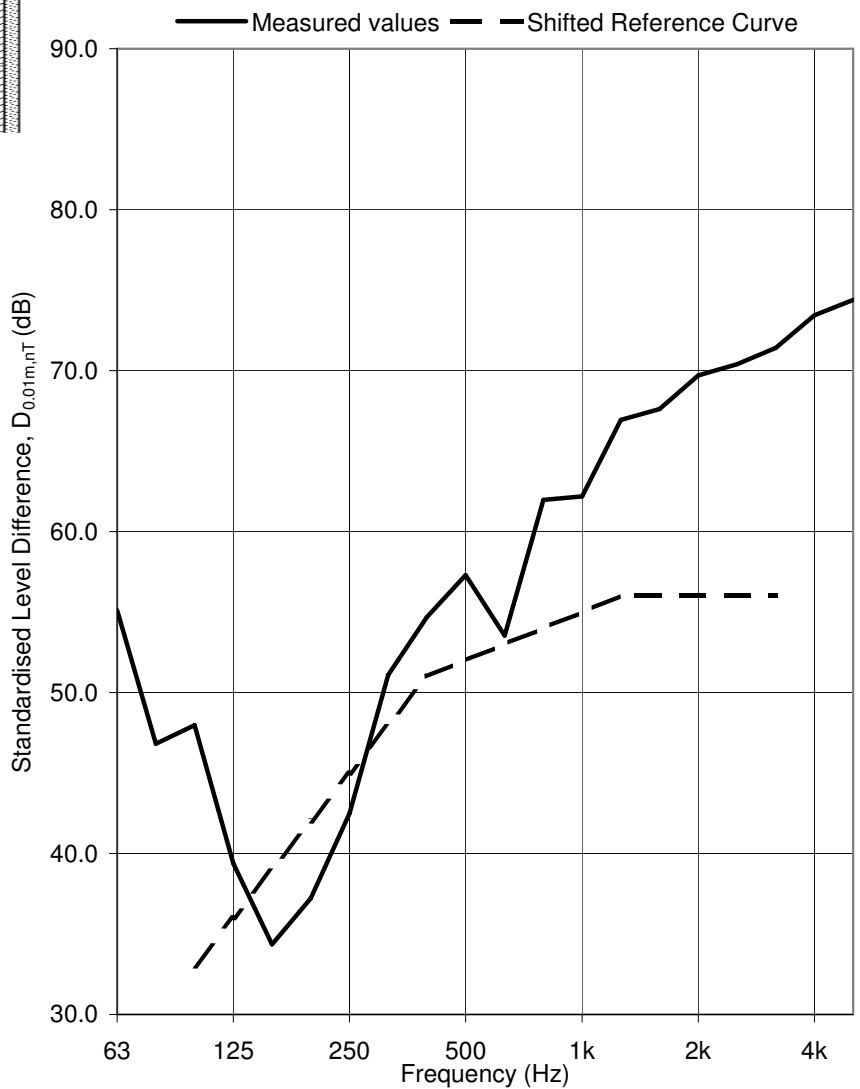
Standardised Level Difference. Simulated residential receiver environment

Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0107 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 622001

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	41.5
63	55.1
80	46.8
100	48.0
125	39.4
160	34.4
200	37.2
250	42.5
315	51.1
400	54.7
500	57.3
630	53.5
800	62.0
1k	62.2
1.25k	66.9
1.6k	67.6
2k	69.7
2.5k	70.4
3.15k	71.4
4k	73.4
5k	74.4

b
b
B
B

$D_{0.01m,nT,w(C;C_{tr})}$ 56 (-3; -8) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

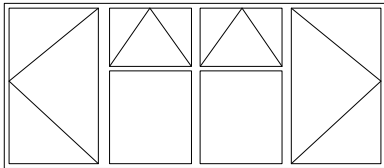
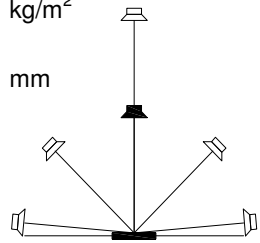
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

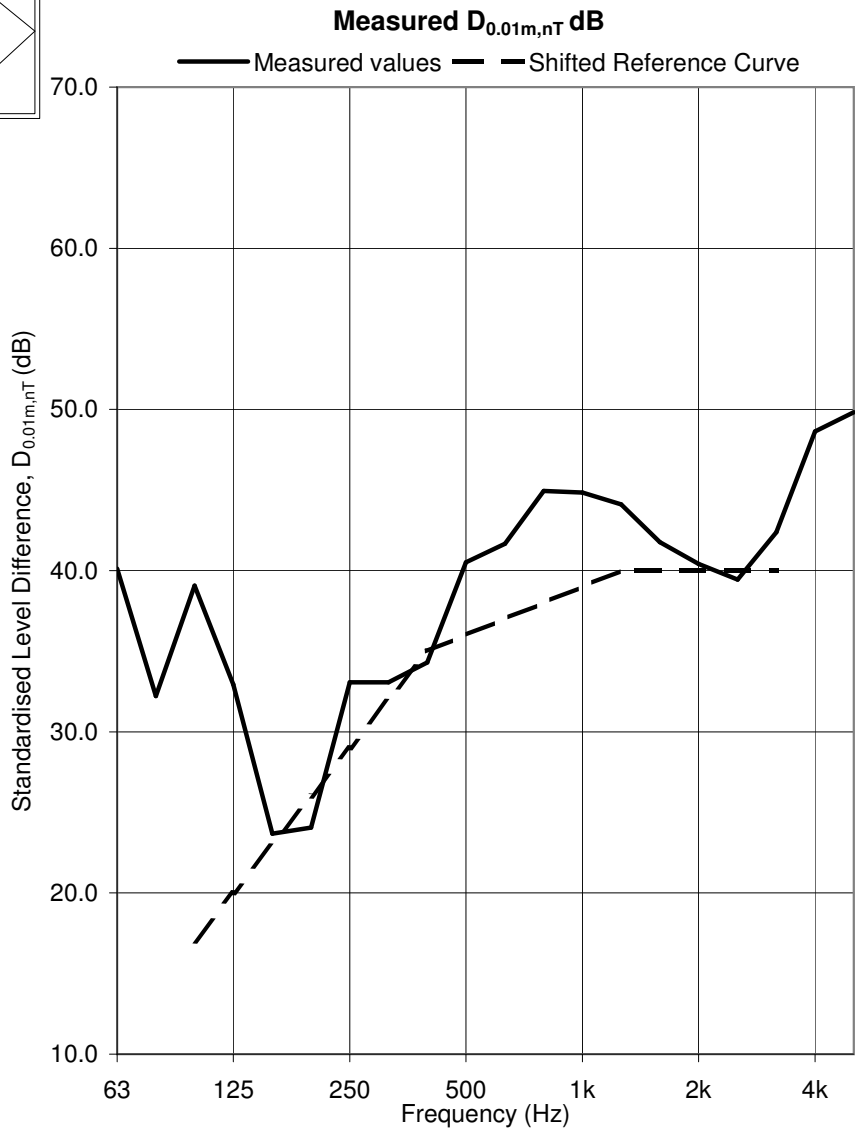
Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628001

Test Sample: Window A Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	34.4
63	40.1
80	32.2
100	39.1
125	32.9
160	23.7
200	24.1
250	33.1
315	33.1
400	34.3
500	40.5
630	41.7
800	44.9
1k	44.8
1.25k	44.1
1.6k	41.8
2k	40.4
2.5k	39.4
3.15k	42.4
4k	48.6
5k	49.8



D_{0.01m,nT,w(C;C_{tr}) 40 (-2; -4) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

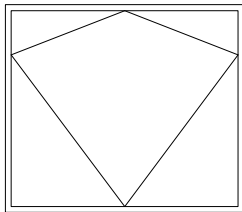
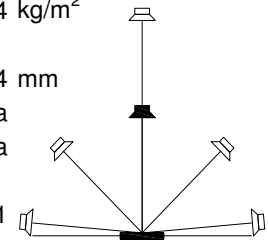
Date: 5/7/05
 Air temperature: 18.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9984 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Closed.

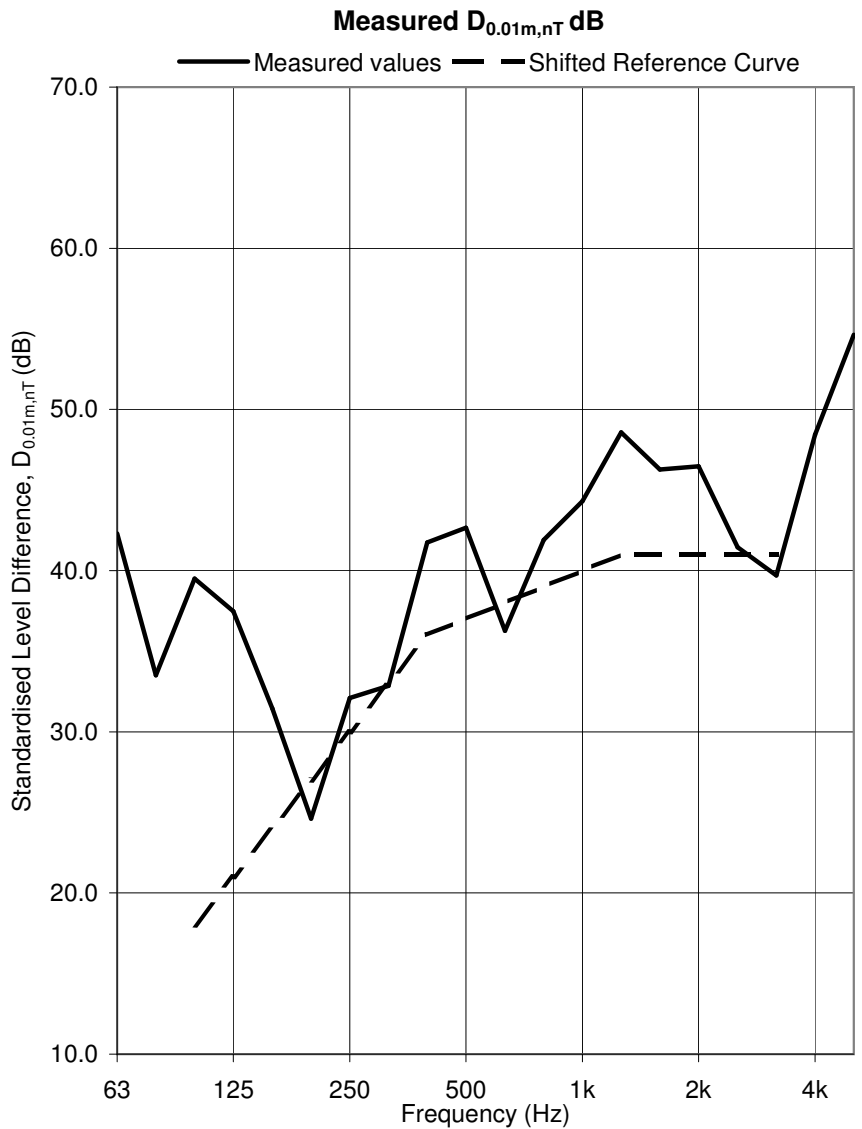
Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	40.5
63	42.3
80	33.5
100	39.5
125	37.5
160	31.4
200	24.6
250	32.1
315	32.8
400	41.8
500	42.7
630	36.3
800	41.9
1k	44.3
1.25k	48.6
1.6k	46.3
2k	46.5
2.5k	41.5
3.15k	39.7
4k	48.4
5k	54.6



D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -4) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

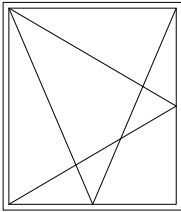
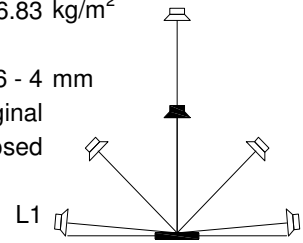
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0282 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

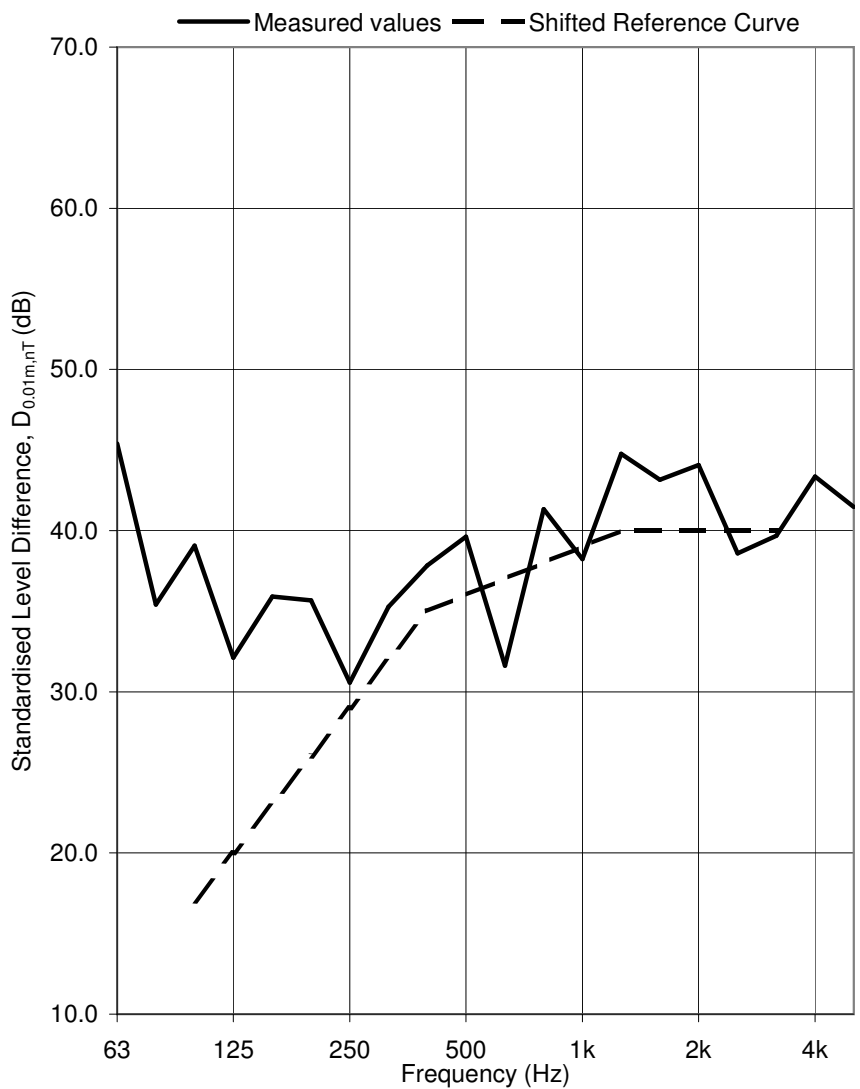
Test Sample: Window C Closed.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711001

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	38.6
63	45.4
80	35.4
100	39.1
125	32.1
160	35.9
200	35.7
250	30.6
315	35.3
400	37.8
500	39.6
630	31.6
800	41.3
1k	38.2
1.25k	44.8
1.6k	43.2
2k	44.1
2.5k	38.6
3.15k	39.7
4k	43.4
5k	41.5

$D_{0.01m,nT,w(C;C_{tr})}$ 40 (-2; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

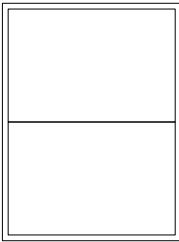
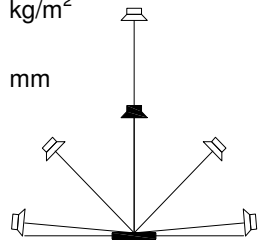
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713002

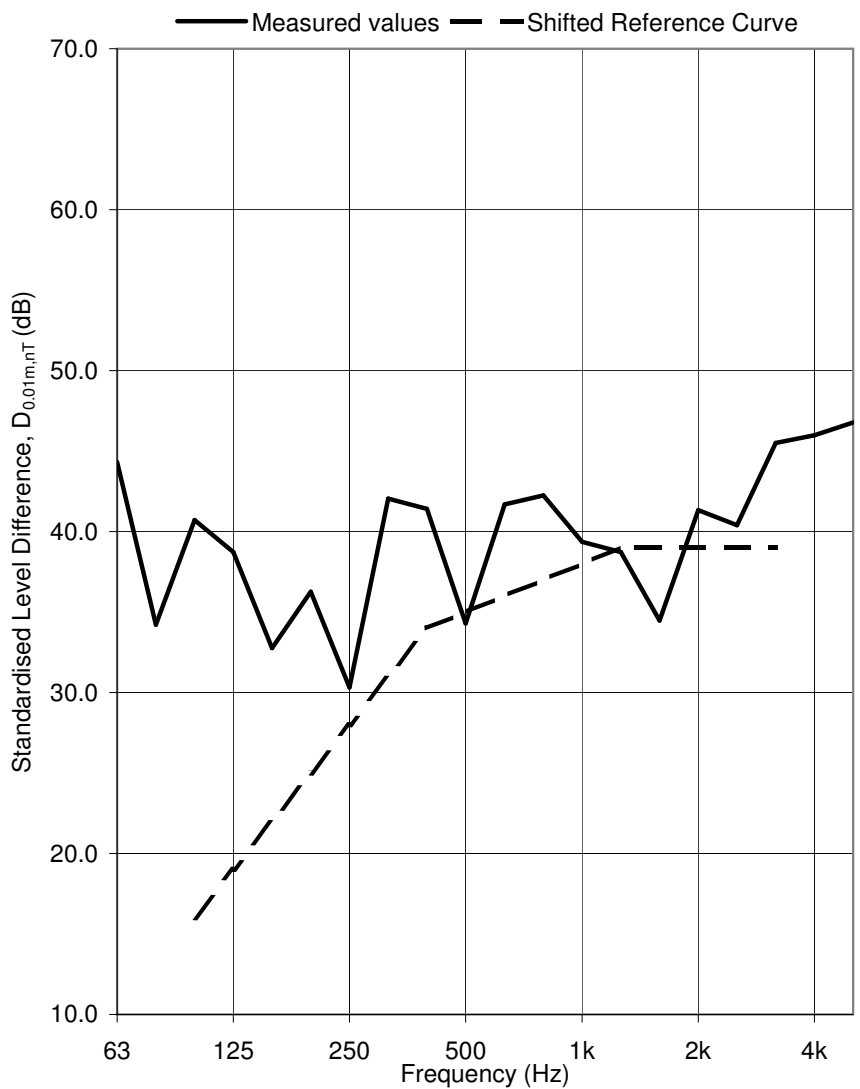
Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.1
63	44.3
80	34.2
100	40.7
125	38.7
160	32.8
200	36.3
250	30.3
315	42.0
400	41.4
500	34.3
630	41.7
800	42.2
1k	39.4
1.25k	38.7
1.6k	34.5
2k	41.3
2.5k	40.4
3.15k	45.5
4k	46.0
5k	46.8

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

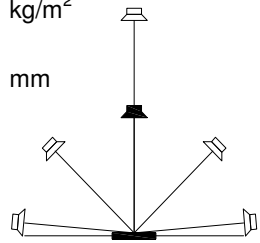
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.996 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

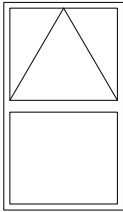
Test Sample: Window E Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

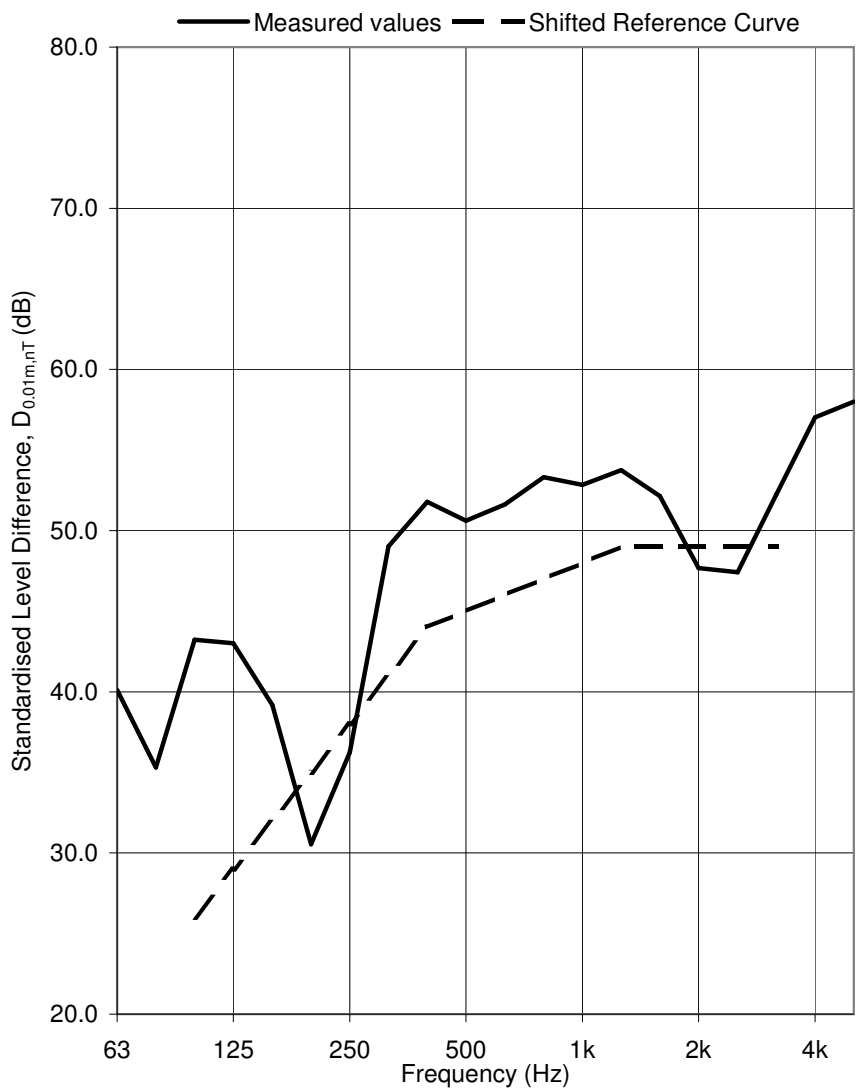


Test ID: 718001

Loudspeaker Configuration: L1



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	44.6
63	40.1
80	35.3
100	43.2
125	43.0
160	39.2
200	30.5
250	36.2
315	49.0
400	51.8
500	50.6
630	51.6
800	53.3
1k	52.8
1.25k	53.8
1.6k	52.1
2k	47.7
2.5k	47.4
3.15k	52.2
4k	57.0
5k	58.0

D_{0.01m,nT,w(C;C_{tr}) 49 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

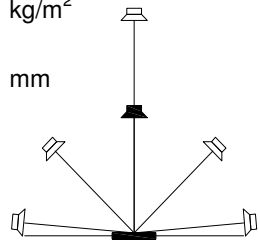
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

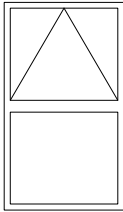
Test Sample: Window F Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

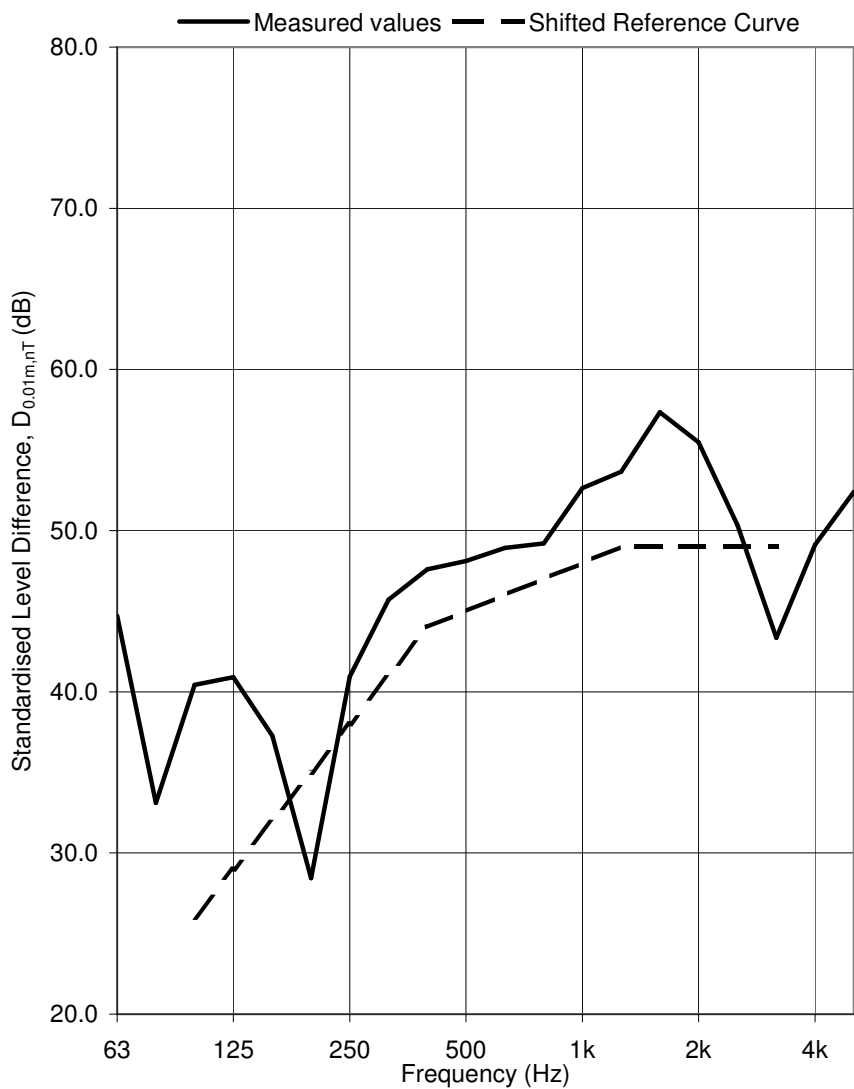


Test ID: 719015

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	45.5
63	44.7
80	33.1
100	40.4
125	40.9
160	37.3
200	28.4
250	40.9
315	45.7
400	47.6
500	48.1
630	48.9
800	49.2
1k	52.6
1.25k	53.7
1.6k	57.3
2k	55.5
2.5k	50.3
3.15k	43.3
4k	49.1
5k	52.4

$D_{0.01m,nT,w(C;C_{tr})}$ 49 (-3; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

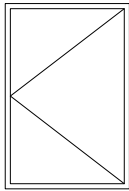
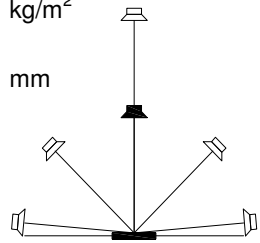
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

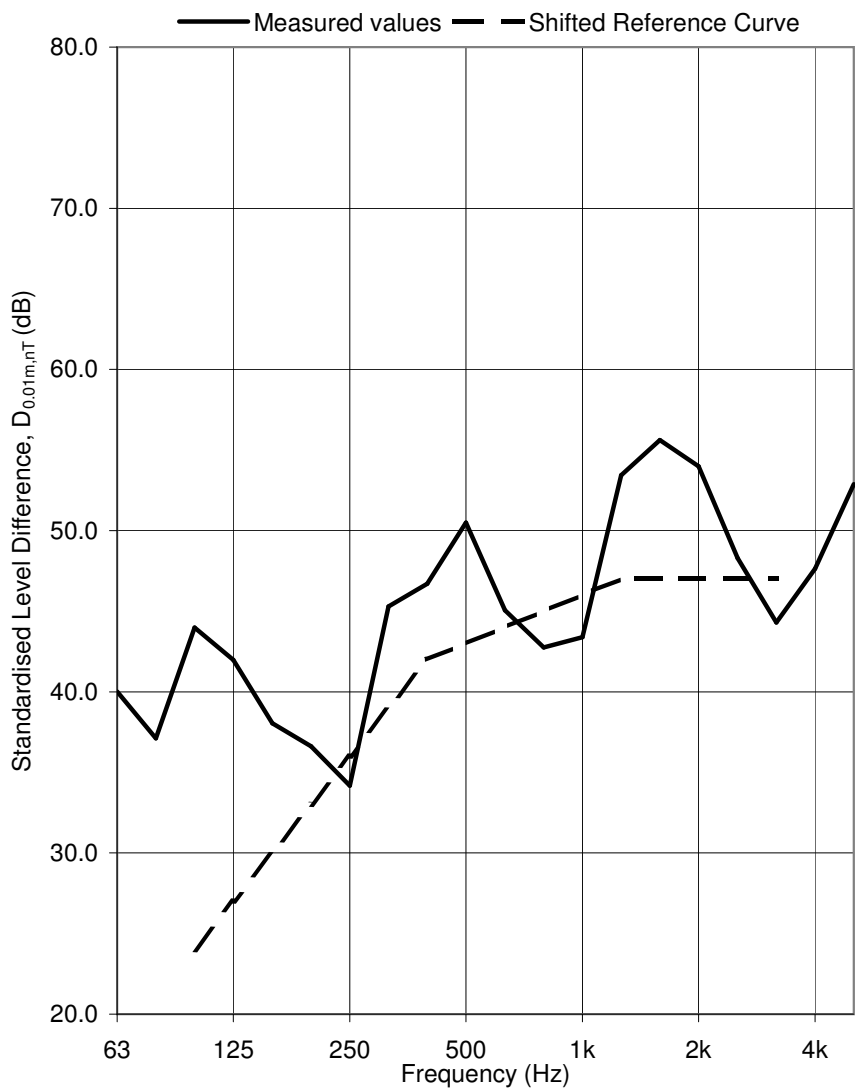
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720014

Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	45.5
63	40.0
80	37.1
100	44.0
125	42.0
160	38.1
200	36.6
250	34.2
315	45.3
400	46.7
500	50.5
630	45.0
800	42.8
1k	43.4
1.25k	53.4
1.6k	55.6
2k	54.0
2.5k	48.3
3.15k	44.3
4k	47.6
5k	52.9

$D_{0.01m,nT,w}(C;C_{tr})$ 47 (-1; -3) dB

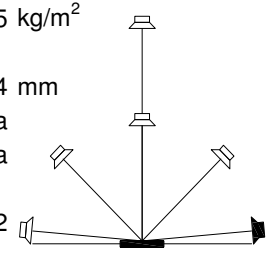
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

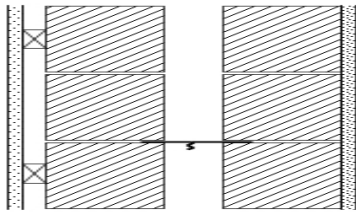
Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0107 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

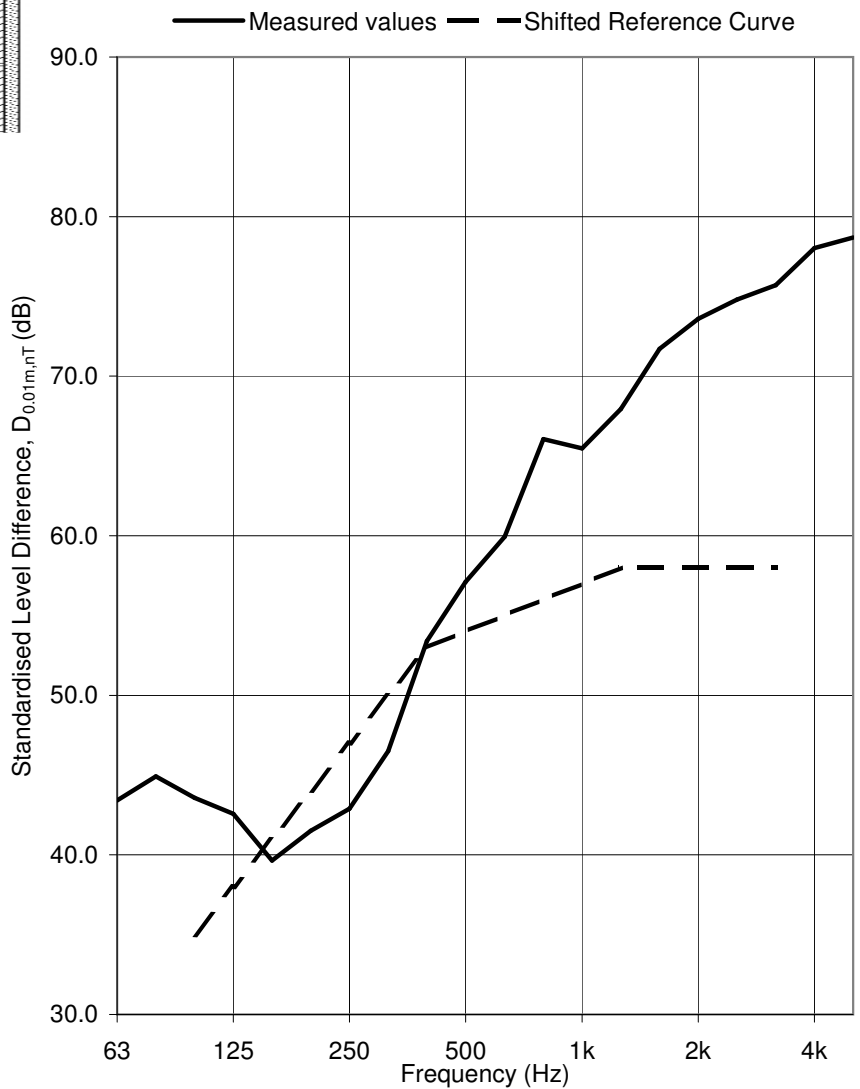


Test ID: 622002

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	39.2
63	43.4
80	44.9
100	43.6
125	42.6
160	39.7
200	41.5
250	42.9
315	46.5
400	53.4
500	57.1
630	59.9
800	66.1
1k	65.5
1.25k	67.9
1.6k	71.7
2k	73.6
2.5k	74.8
3.15k	75.7
4k	78.0
5k	78.7

b

$D_{0.01m,nT,w}(C;C_{tr})$ 58 (-2; -7) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

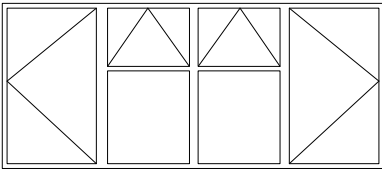
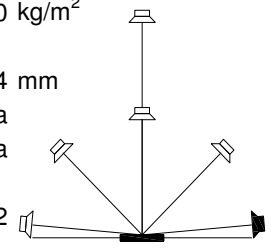
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

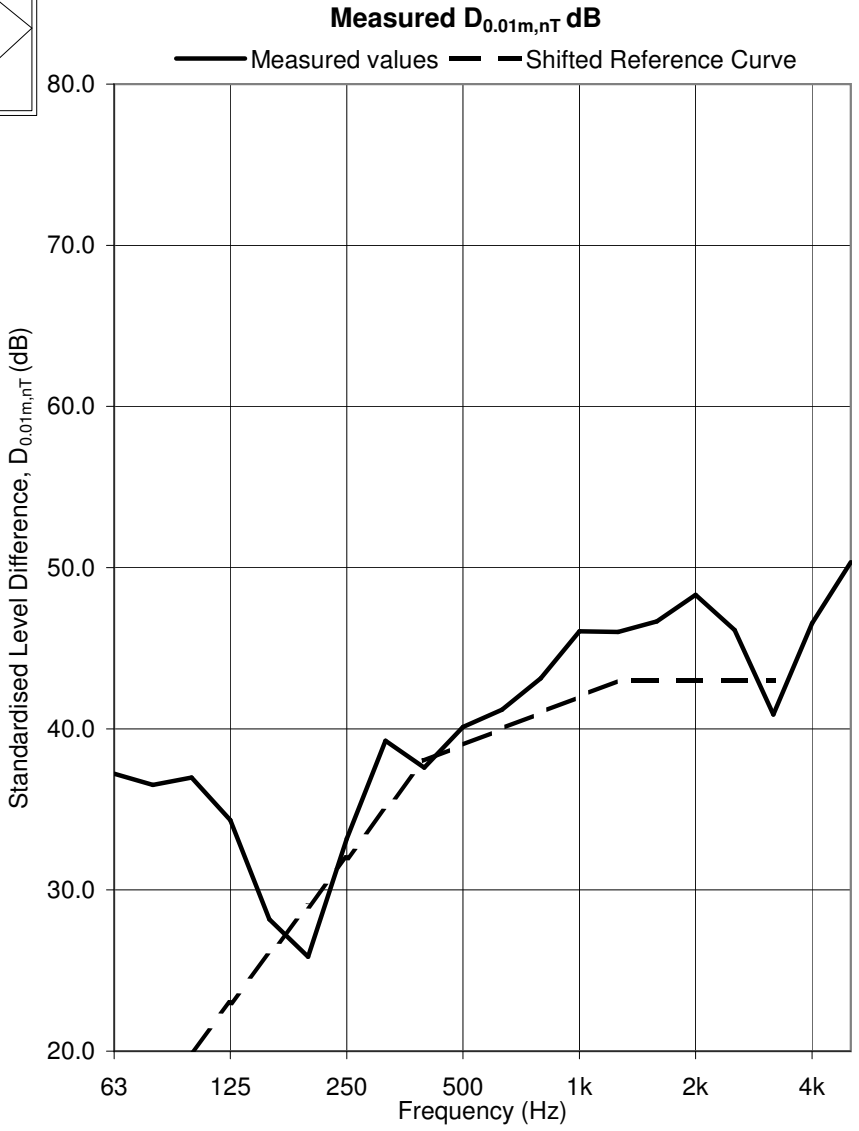
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0102 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628033

Test Sample: Window A Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	28.4
63	37.2
80	36.5
100	37.0
125	34.3
160	28.2
200	25.9
250	33.2
315	39.3
400	37.6
500	40.1
630	41.2
800	43.1
1k	46.0
1.25k	46.0
1.6k	46.7
2k	48.3
2.5k	46.1
3.15k	40.9
4k	46.5
5k	50.3



D_{0.01m,nT,w(C;C_{tr}) 43 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

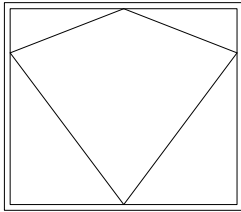
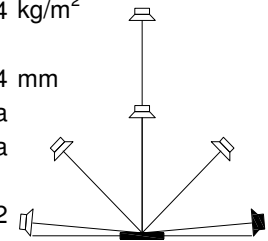
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

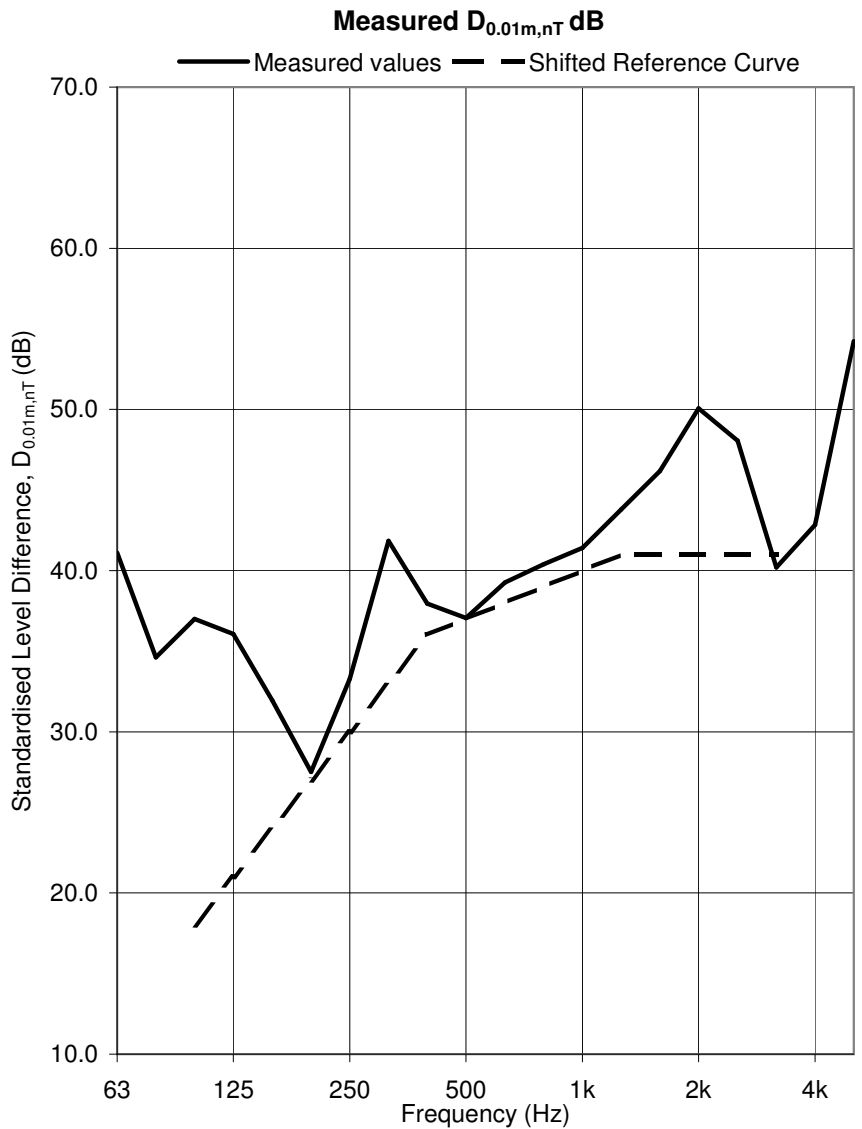
Date: 28/6/2005
 Air temperature: 18.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705006

Test Sample: Window B Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	34.2
63	41.1
80	34.6
100	37.0
125	36.1
160	31.9
200	27.5
250	33.3
315	41.8
400	38.0
500	37.1
630	39.3
800	40.4
1k	41.4
1.25k	43.8
1.6k	46.2
2k	50.1
2.5k	48.1
3.15k	40.2
4k	42.8
5k	54.2



D_{0.01m,nT,w(C;C_{tr}) 41 (0; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

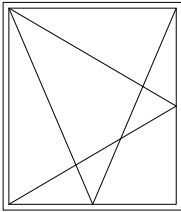
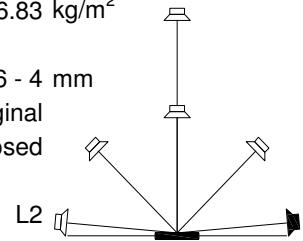
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711027

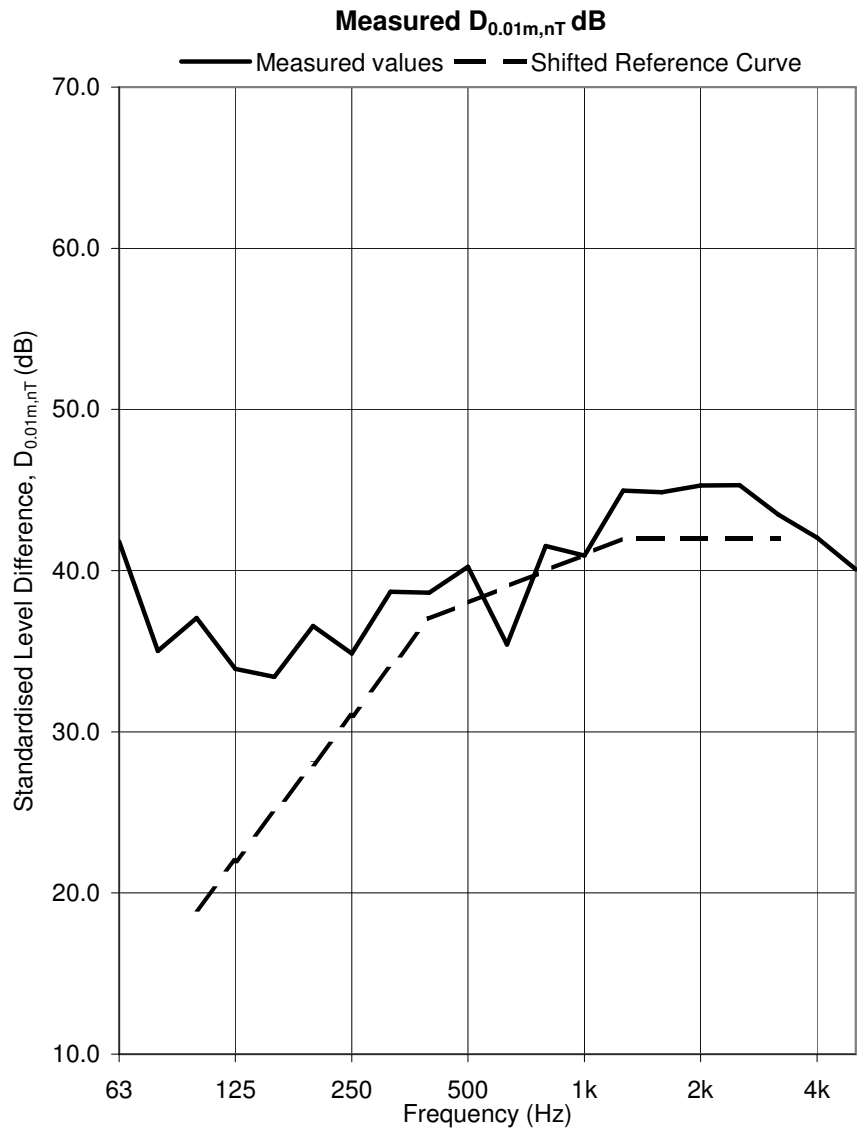
Test Sample: Window C Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Frequency Hz	D _{0.01m,nT} dB
50	33.1
63	41.8
80	35.0
100	37.1
125	33.9
160	33.4
200	36.6
250	34.9
315	38.7
400	38.6
500	40.2
630	35.4
800	41.5
1k	40.9
1.25k	45.0
1.6k	44.9
2k	45.3
2.5k	45.3
3.15k	43.5
4k	42.1
5k	40.1



D_{0.01m,nT,w(C;C_{tr}) 42 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

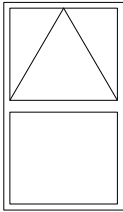
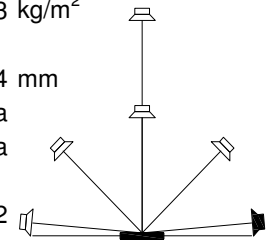
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

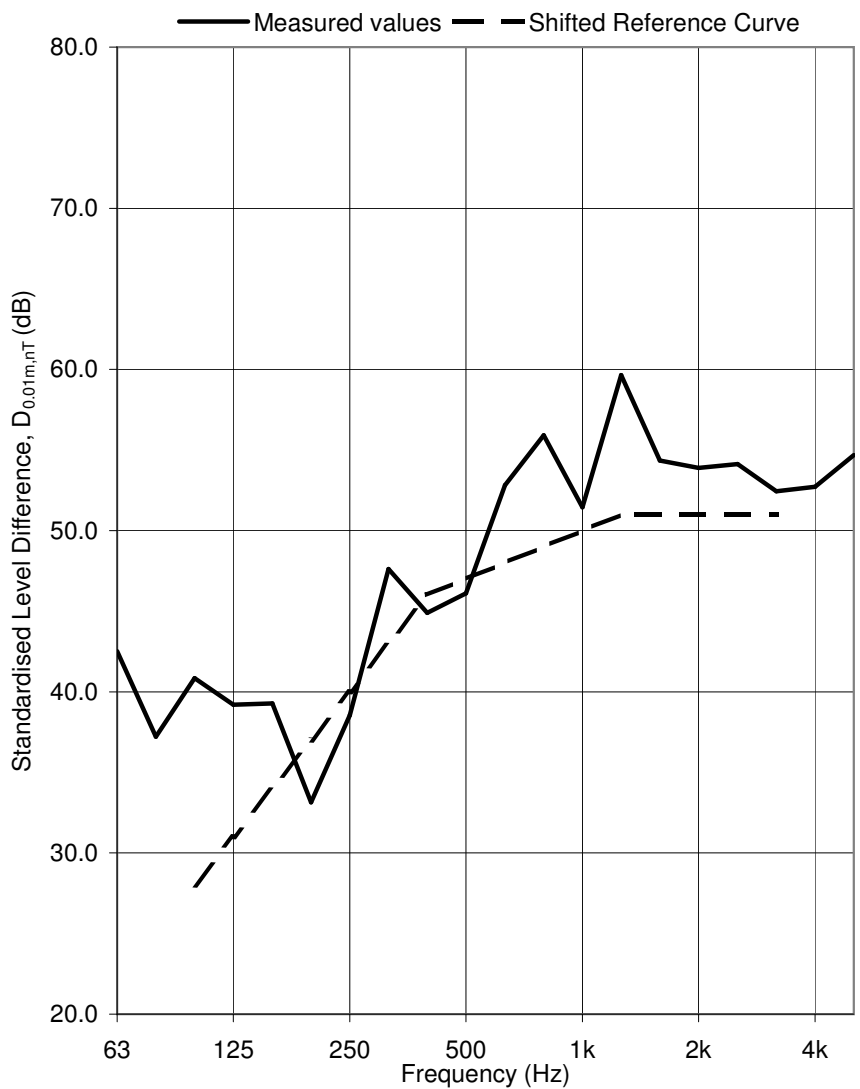
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718015

Test Sample: Window E Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	40.1
63	42.5
80	37.2
100	40.8
125	39.2
160	39.3
200	33.1
250	38.5
315	47.6
400	44.9
500	46.1
630	52.8
800	55.9
1k	51.4
1.25k	59.7
1.6k	54.3
2k	53.9
2.5k	54.1
3.15k	52.4
4k	52.7
5k	54.7

D_{0.01m,nT,w(C;C_{tr}) 51 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

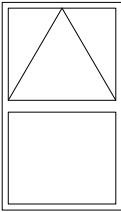
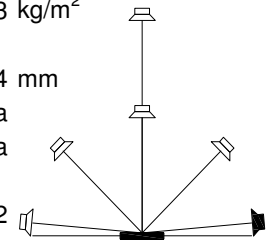
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

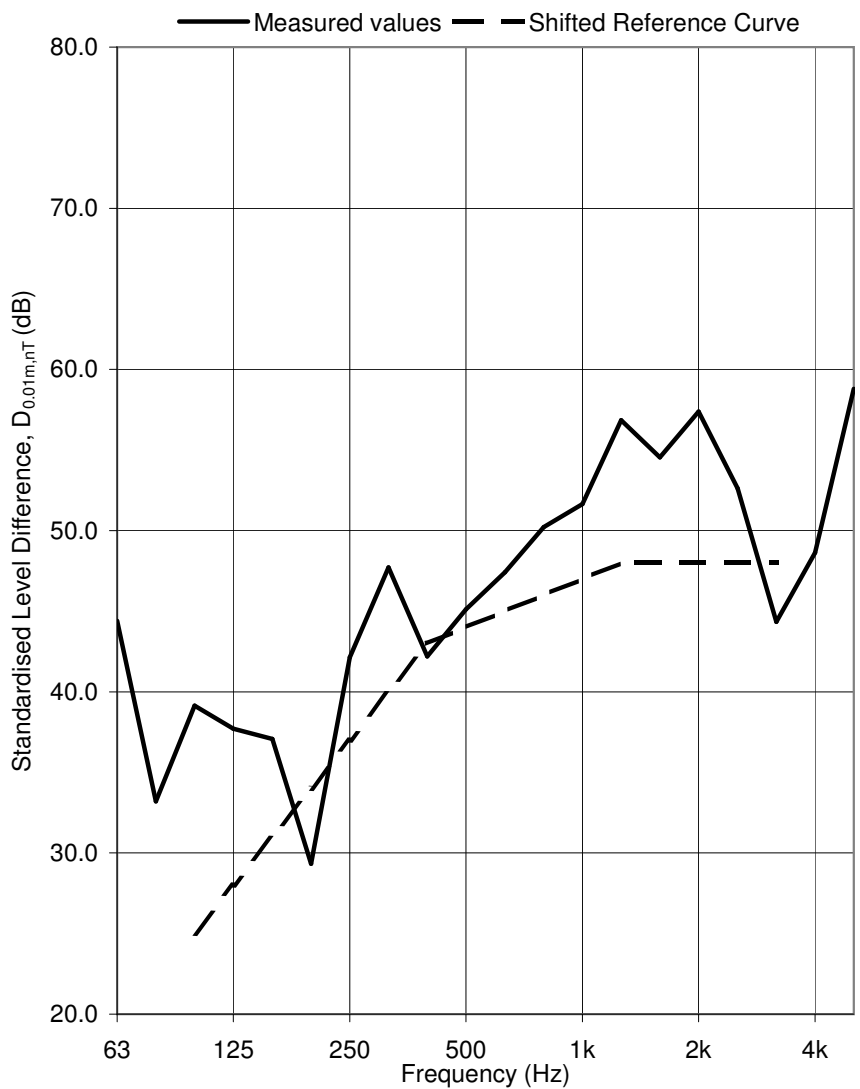
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719029

Test Sample: Window F Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	39.9
63	44.4
80	33.2
100	39.1
125	37.7
160	37.1
200	29.3
250	42.1
315	47.7
400	42.2
500	45.1
630	47.4
800	50.2
1k	51.6
1.25k	56.9
1.6k	54.5
2k	57.4
2.5k	52.6
3.15k	44.3
4k	48.6
5k	58.8

$D_{0.01m,nT,w}(C;C_{tr})$ 48 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

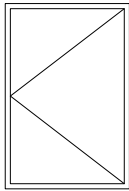
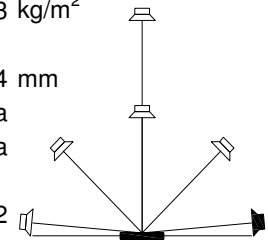
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

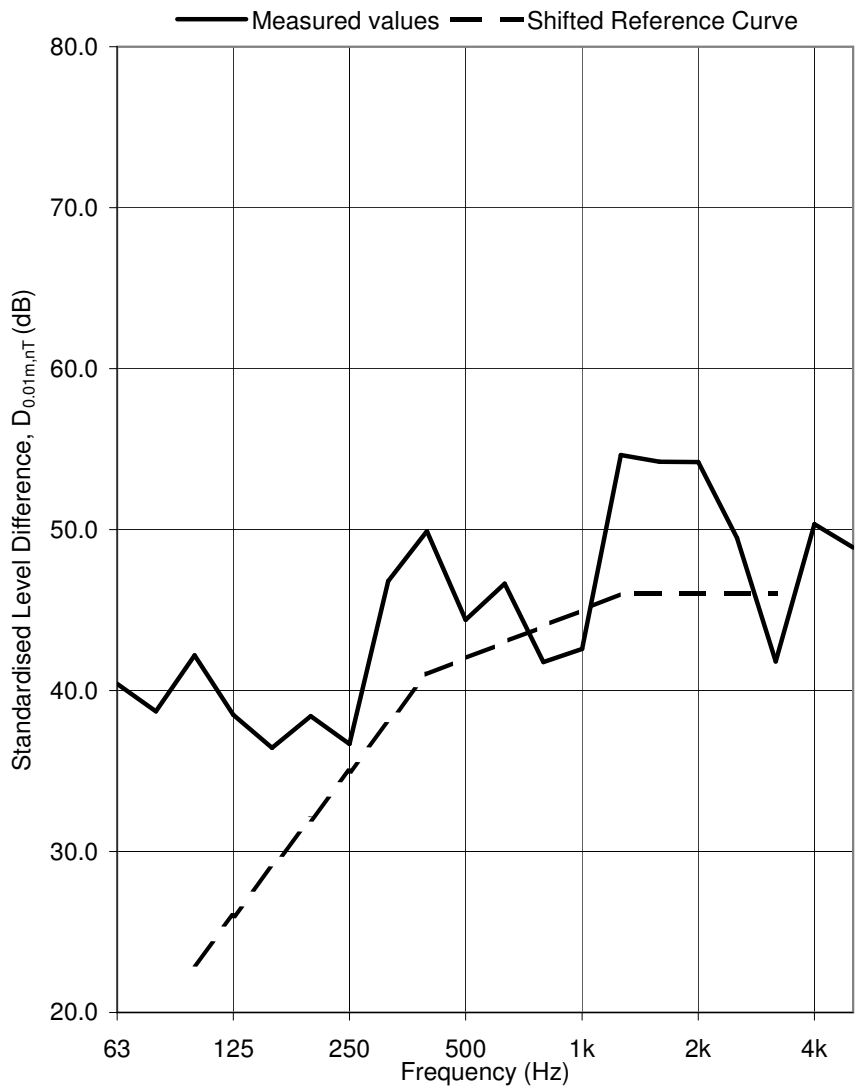
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720042

Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	39.9
63	40.4
80	38.7
100	42.2
125	38.5
160	36.5
200	38.4
250	36.7
315	46.8
400	49.9
500	44.4
630	46.6
800	41.8
1k	42.6
1.25k	54.6
1.6k	54.2
2k	54.2
2.5k	49.5
3.15k	41.8
4k	50.3
5k	48.9

$D_{0.01m,nT,w}(C;C_{tr})$ 46 (-1; -2) dB

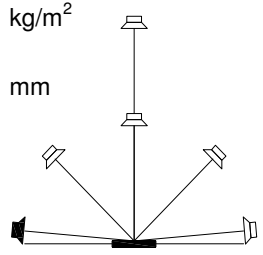
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

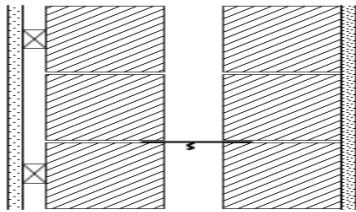
Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0107 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

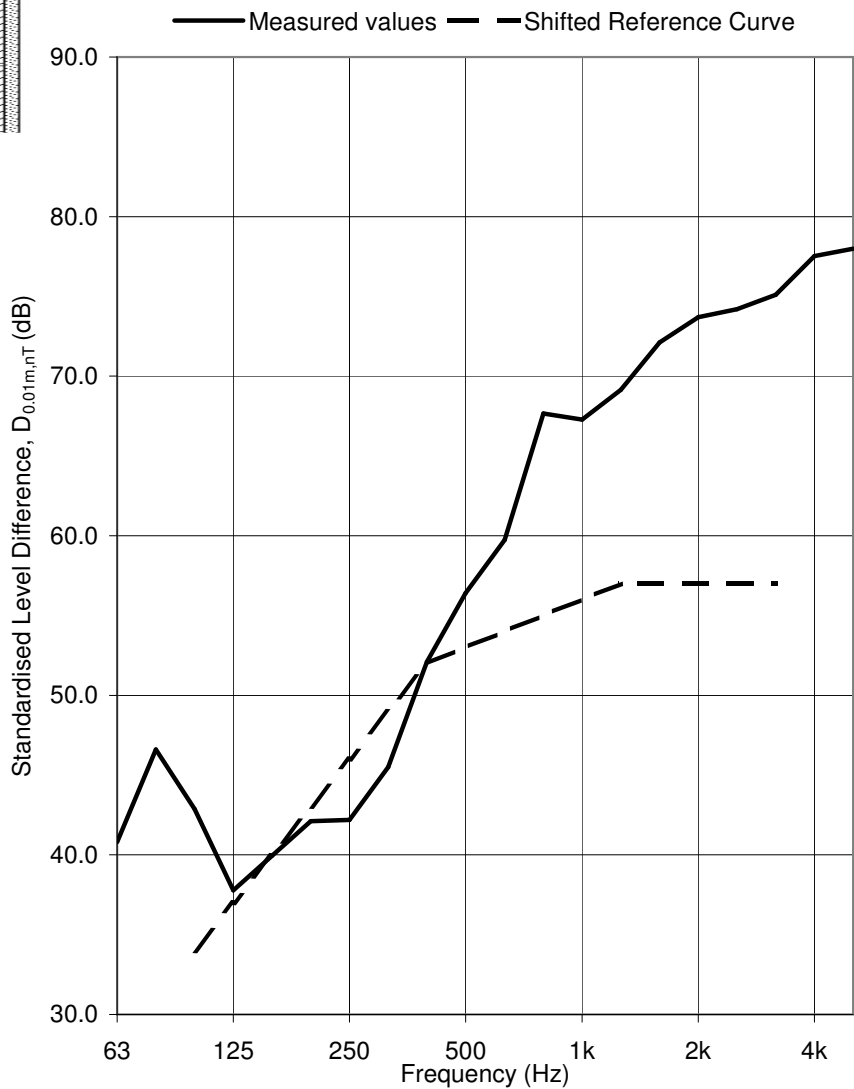


Test ID: 622003

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	39.3
63	40.8
80	46.6
100	42.9
125	37.8
160	40.0
200	42.1
250	42.2
315	45.5
400	52.1
500	56.4
630	59.7
800	67.7
1k	67.3
1.25k	69.1
1.6k	72.1
2k	73.7
2.5k	74.2
3.15k	75.1
4k	77.5
5k	78.0

$D_{0.01m,nT,w}(C;C_{tr})$ 57 (-2; -7) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

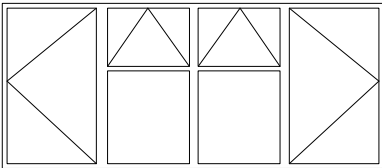
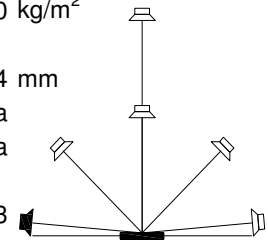
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

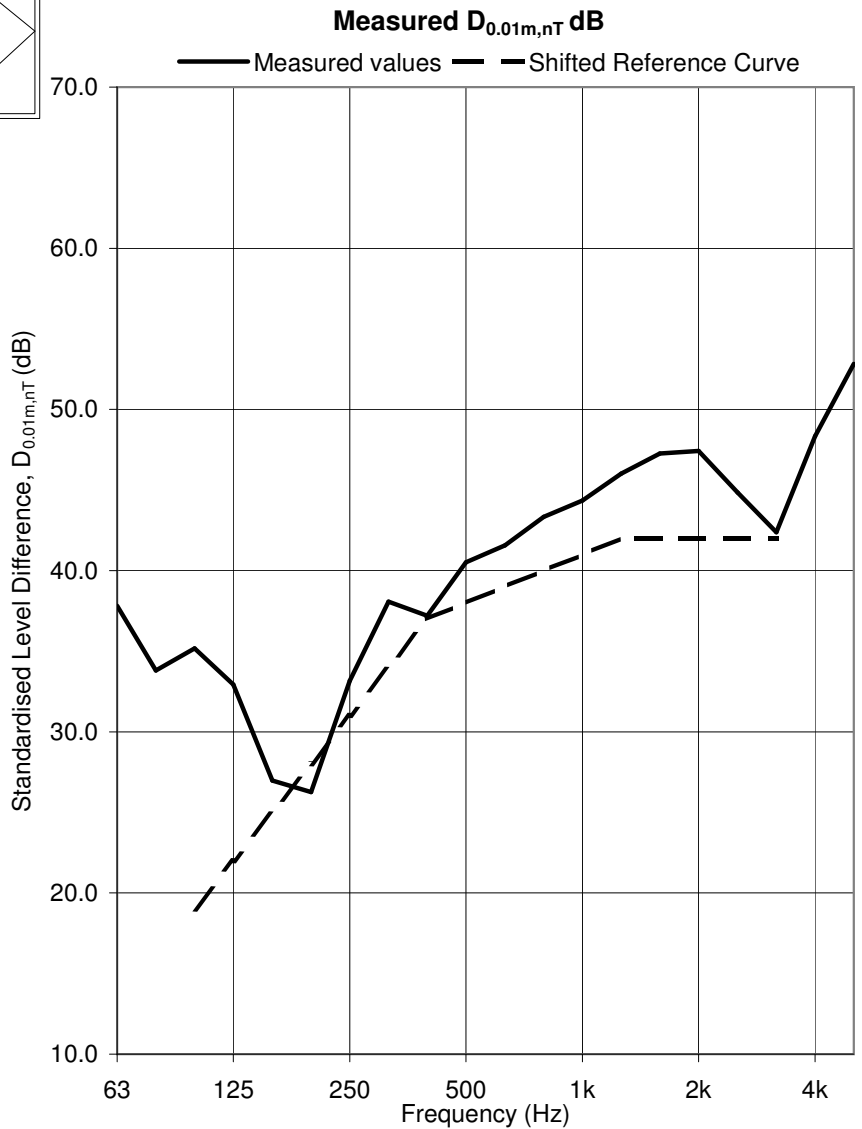
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628049

Test Sample: Window A-1 Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	29.2
63	37.8
80	33.8
100	35.2
125	32.9
160	27.0
200	26.3
250	33.2
315	38.1
400	37.2
500	40.5
630	41.6
800	43.3
1k	44.3
1.25k	46.0
1.6k	47.3
2k	47.4
2.5k	44.8
3.15k	42.4
4k	48.3
5k	52.8



D_{0.01m,nT,w(C;C_{tr}) 42 (-1; -4) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

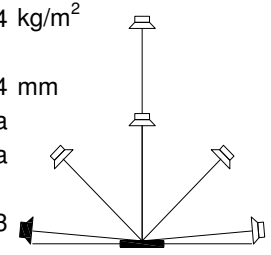
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9974 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

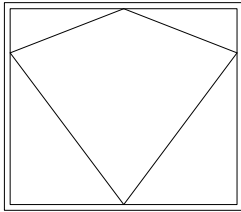
Test Sample: Window B Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

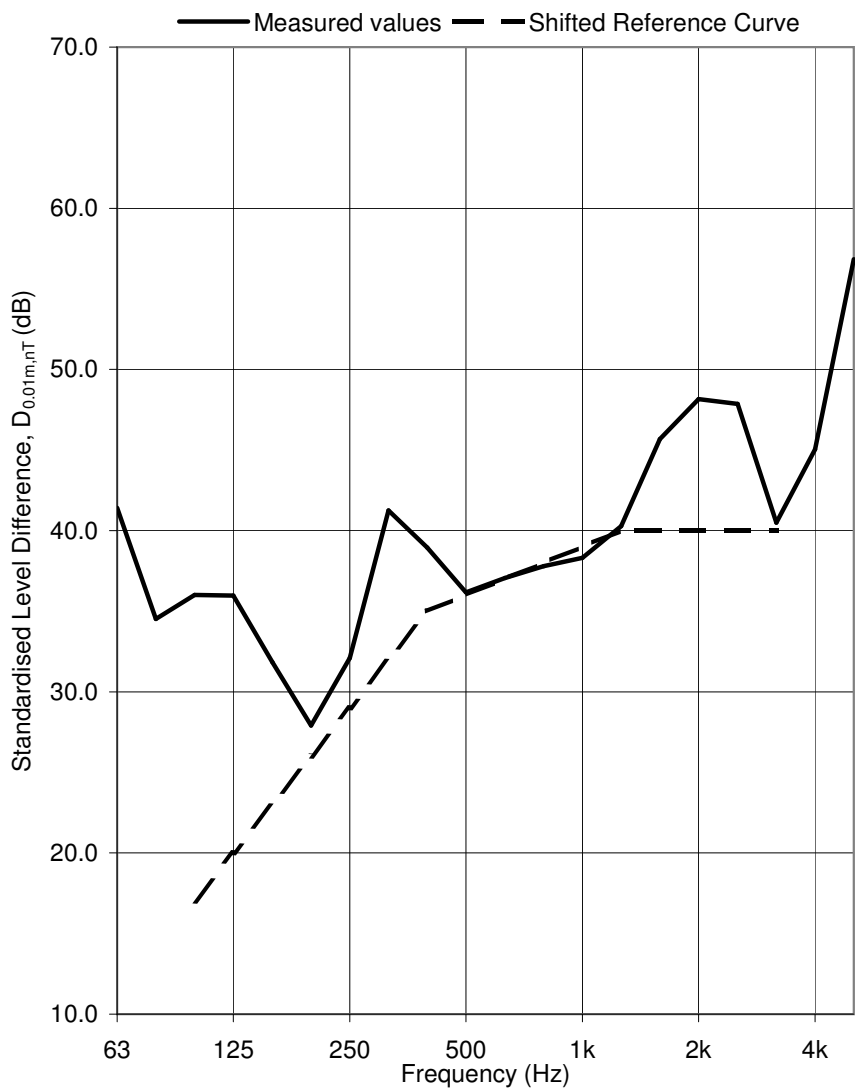


Test ID: 705011

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	37.0
63	41.4
80	34.5
100	36.0
125	36.0
160	31.8
200	27.9
250	32.1
315	41.2
400	39.0
500	36.2
630	37.1
800	37.8
1k	38.3
1.25k	40.3
1.6k	45.7
2k	48.2
2.5k	47.9
3.15k	40.5
4k	45.0
5k	56.8

$D_{0.01m,nT,w}(C;C_{tr})$ 40 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

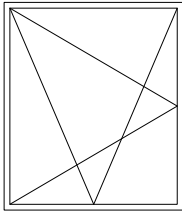
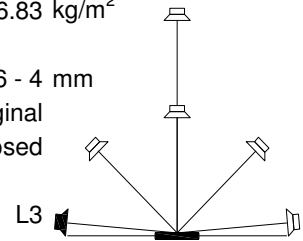
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

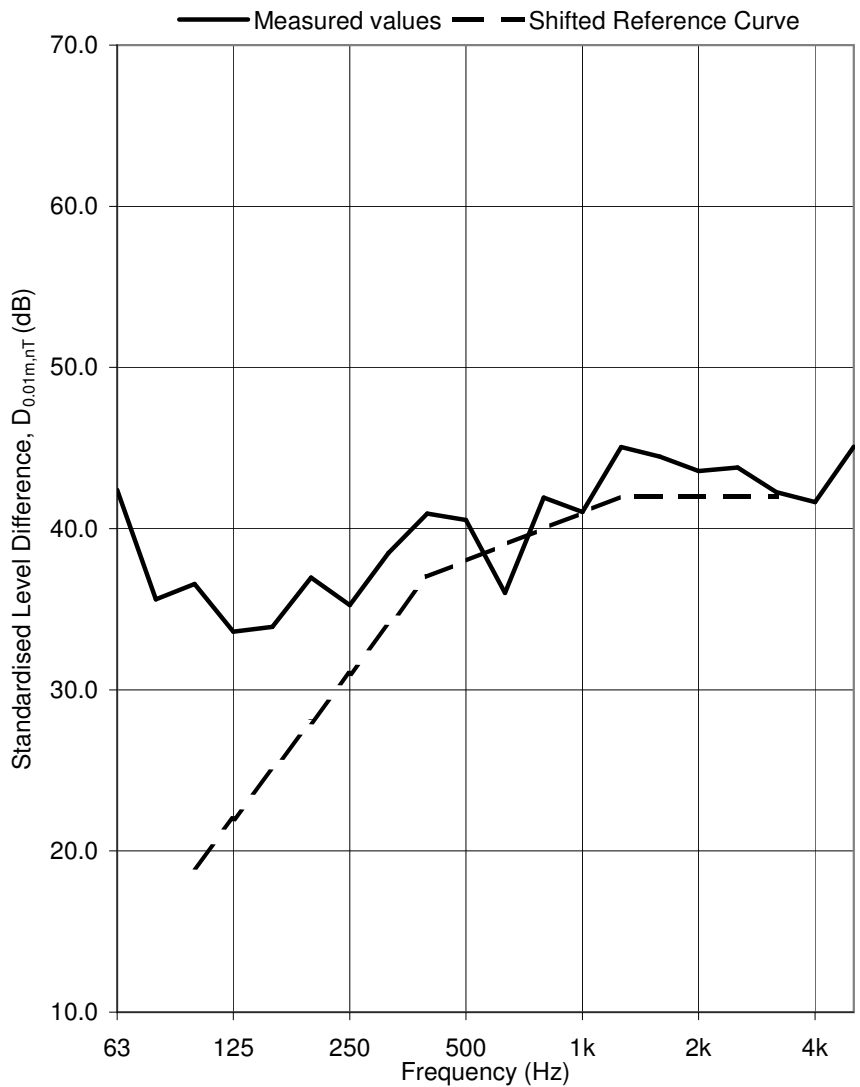
Test Sample: Window C Closed.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711040

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.8
63	42.4
80	35.6
100	36.6
125	33.6
160	33.9
200	37.0
250	35.3
315	38.5
400	40.9
500	40.5
630	36.0
800	41.9
1k	41.0
1.25k	45.1
1.6k	44.5
2k	43.6
2.5k	43.8
3.15k	42.3
4k	41.7
5k	45.1

$D_{0.01m,nT,w}(C;C_{tr})$ 42 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

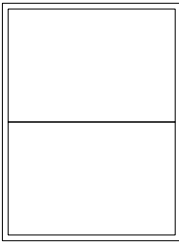
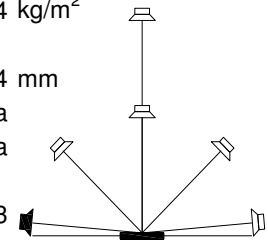
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713043

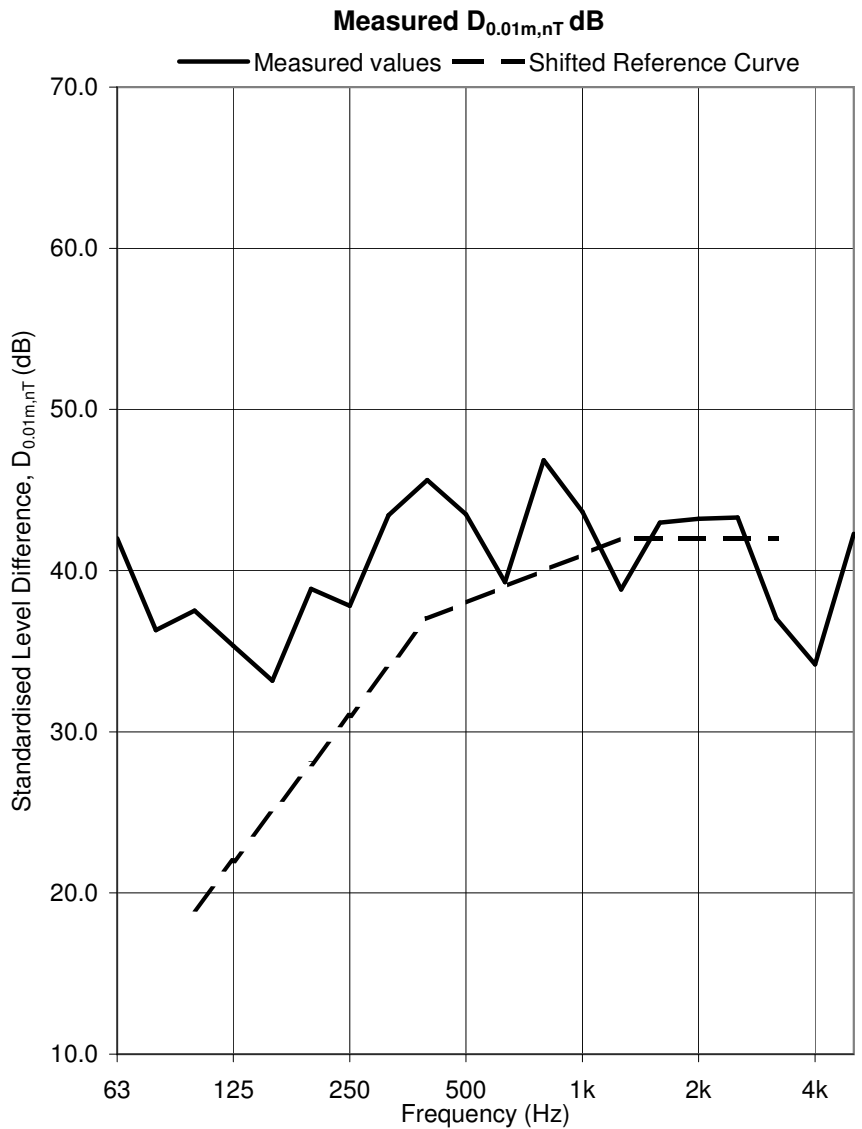
Test Sample: Window D Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	28.2
63	42.0
80	36.3
100	37.5
125	35.3
160	33.2
200	38.9
250	37.8
315	43.4
400	45.6
500	43.5
630	39.3
800	46.8
1k	43.7
1.25k	38.8
1.6k	43.0
2k	43.2
2.5k	43.3
3.15k	37.0
4k	34.2
5k	42.3



D_{0.01m,nT,w(C;C_{tr}) 42 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

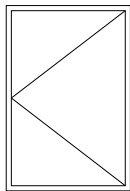
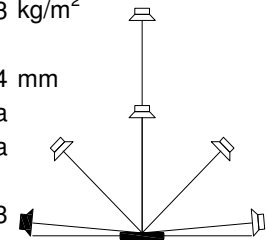
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

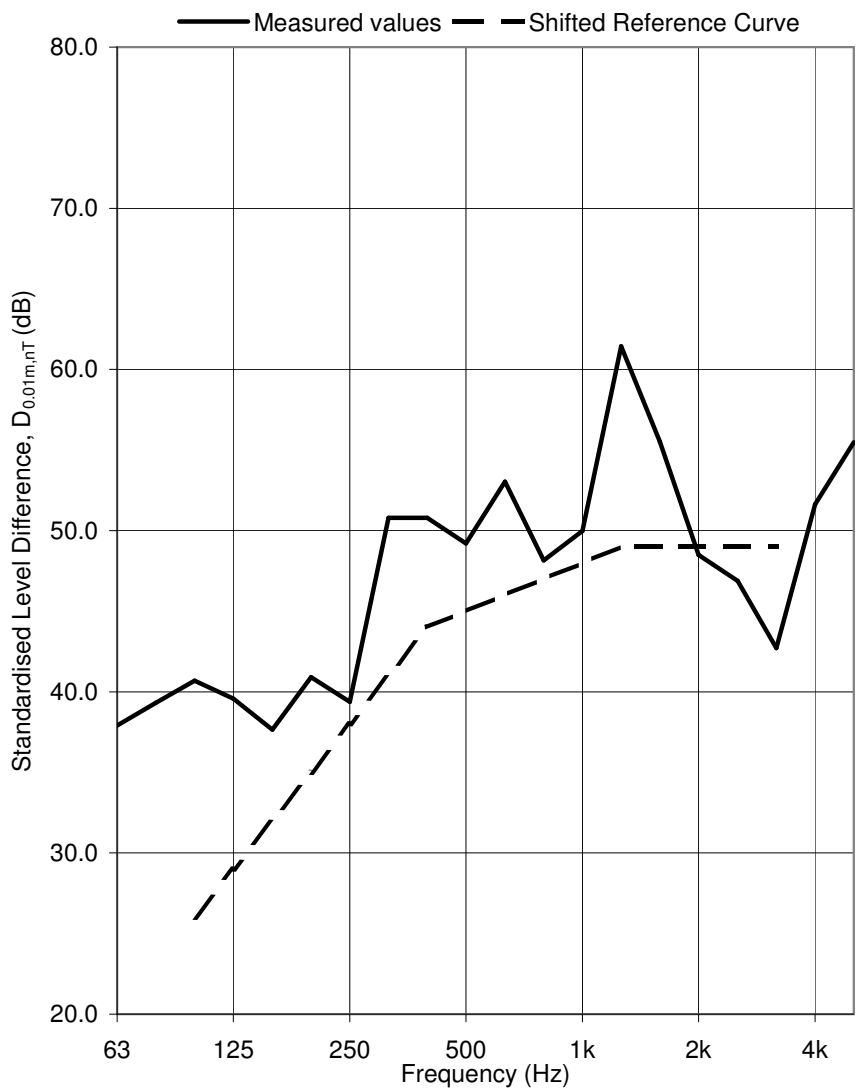
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720041

Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	42.0
63	37.9
80	39.3
100	40.7
125	39.6
160	37.7
200	40.9
250	39.4
315	50.8
400	50.8
500	49.2
630	53.0
800	48.2
1k	50.0
1.25k	61.4
1.6k	55.5
2k	48.5
2.5k	46.9
3.15k	42.7
4k	51.6
5k	55.5

$D_{0.01m,nT,w}(C;C_{tr})$ 49 (-2; -2) dB

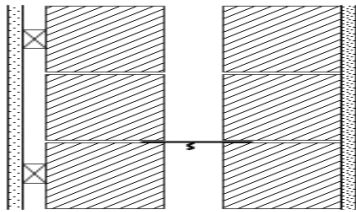
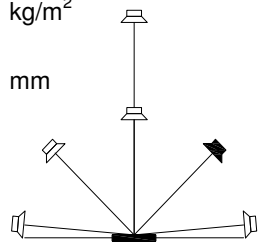
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

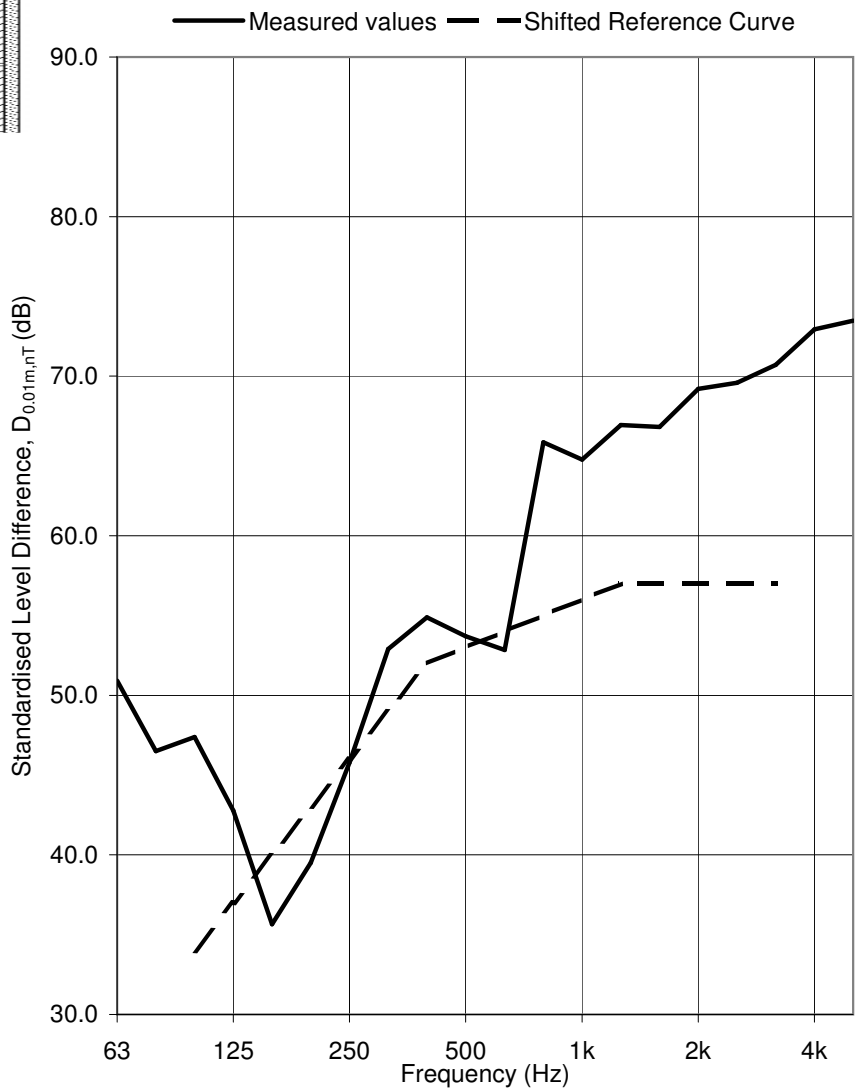
Standardised Level Difference. Simulated residential receiver environment

Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 622004

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	41.0
63	50.9
80	46.5
100	47.4
125	42.8
160	35.7
200	39.5
250	45.8
315	52.9
400	54.9
500	53.7
630	52.8
800	65.9
1k	64.8
1.25k	66.9
1.6k	66.8
2k	69.2
2.5k	69.6
3.15k	70.7
4k	72.9
5k	73.5

$D_{0.01m,nT,w}(C;C_{tr})$ 57 (-3; -7) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

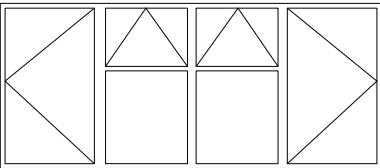
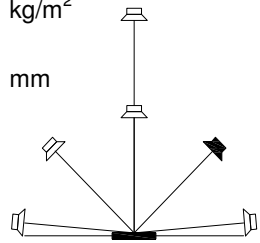
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628065

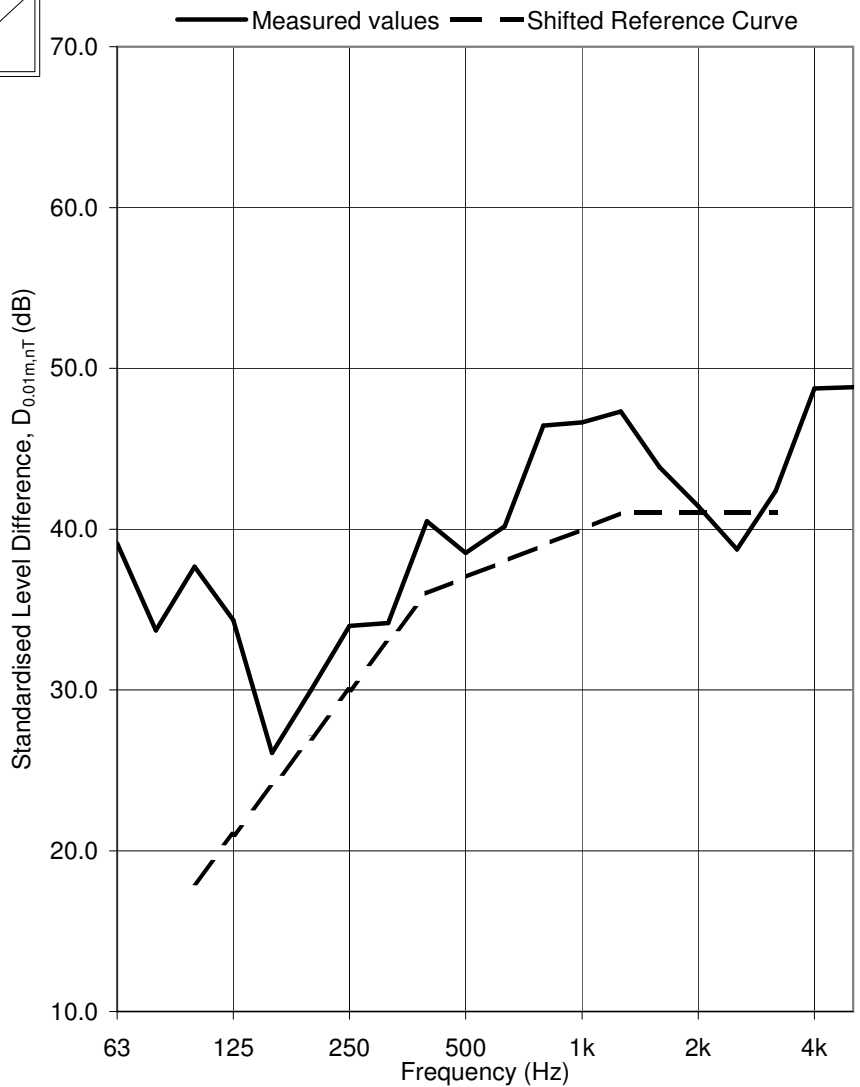
Test Sample: Window A-1 Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L4



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	32.5
63	39.1
80	33.7
100	37.7
125	34.3
160	26.1
200	30.0
250	34.0
315	34.2
400	40.5
500	38.5
630	40.2
800	46.4
1k	46.6
1.25k	47.3
1.6k	43.9
2k	41.4
2.5k	38.7
3.15k	42.4
4k	48.7
5k	48.8

D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

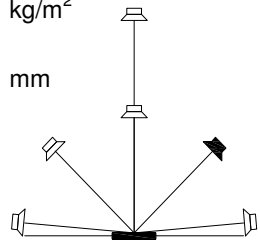
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9978 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

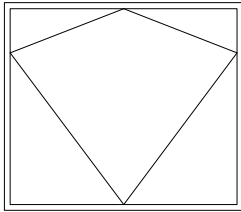
Test Sample: Window B Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

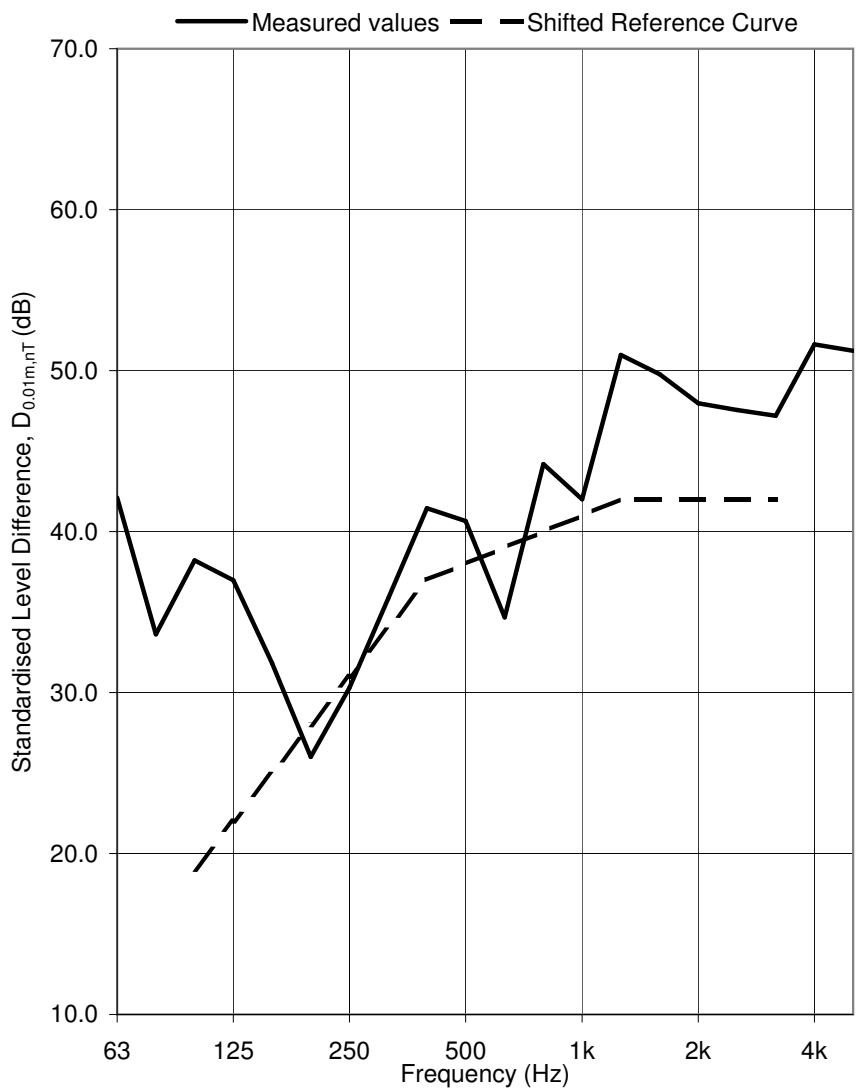


Test ID: 705016

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	40.3
63	42.1
80	33.6
100	38.2
125	37.0
160	31.8
200	26.0
250	30.3
315	35.8
400	41.5
500	40.7
630	34.7
800	44.2
1k	42.0
1.25k	51.0
1.6k	49.8
2k	48.0
2.5k	47.6
3.15k	47.2
4k	51.6
5k	51.2

$D_{0.01m,nT,w(C;C_{tr})}$ 42 (-1; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

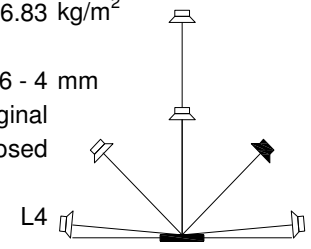
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

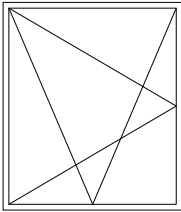
Test Sample: Window C-1 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

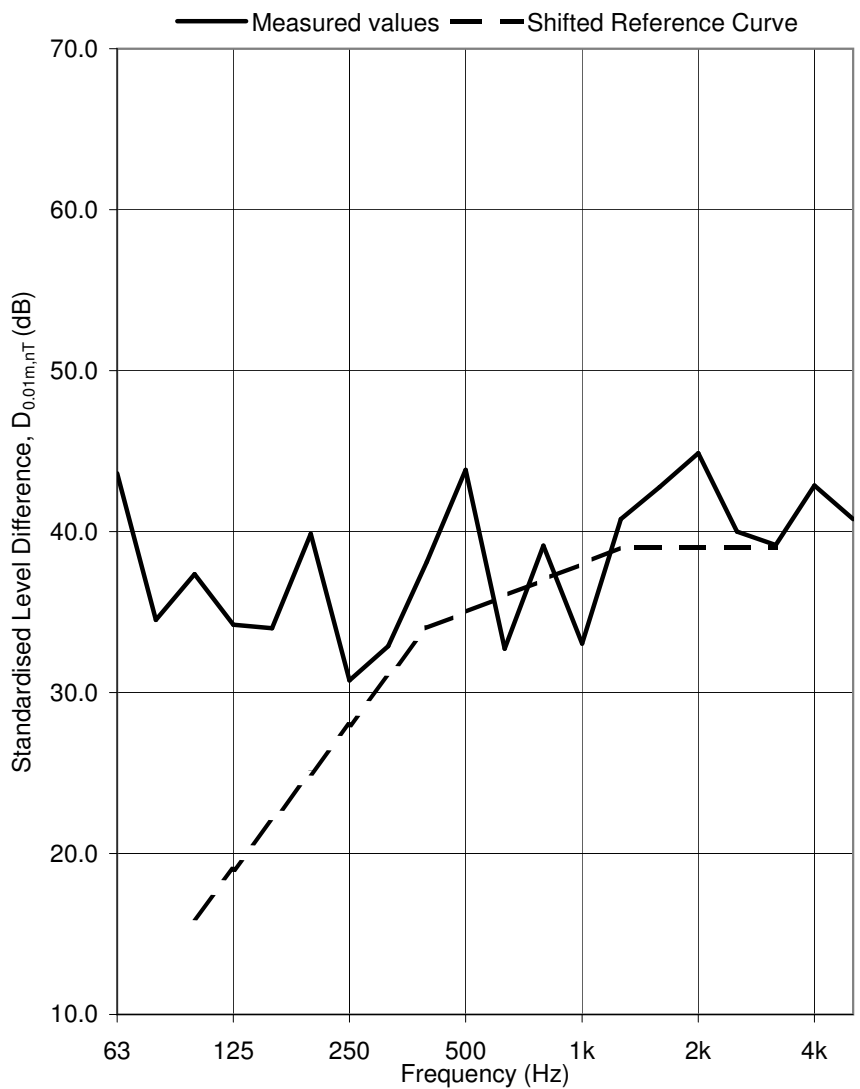


Test ID: 711059

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	36.5
63	43.6
80	34.5
100	37.4
125	34.2
160	34.0
200	39.9
250	30.8
315	32.9
400	38.1
500	43.8
630	32.7
800	39.1
1k	33.0
1.25k	40.8
1.6k	42.8
2k	44.9
2.5k	40.0
3.15k	39.2
4k	42.9
5k	40.8

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

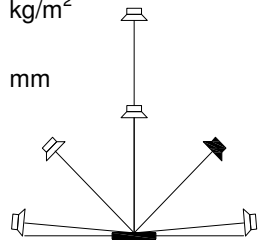
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

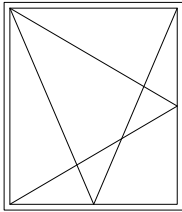
Test Sample: Window C-3 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 2 closed

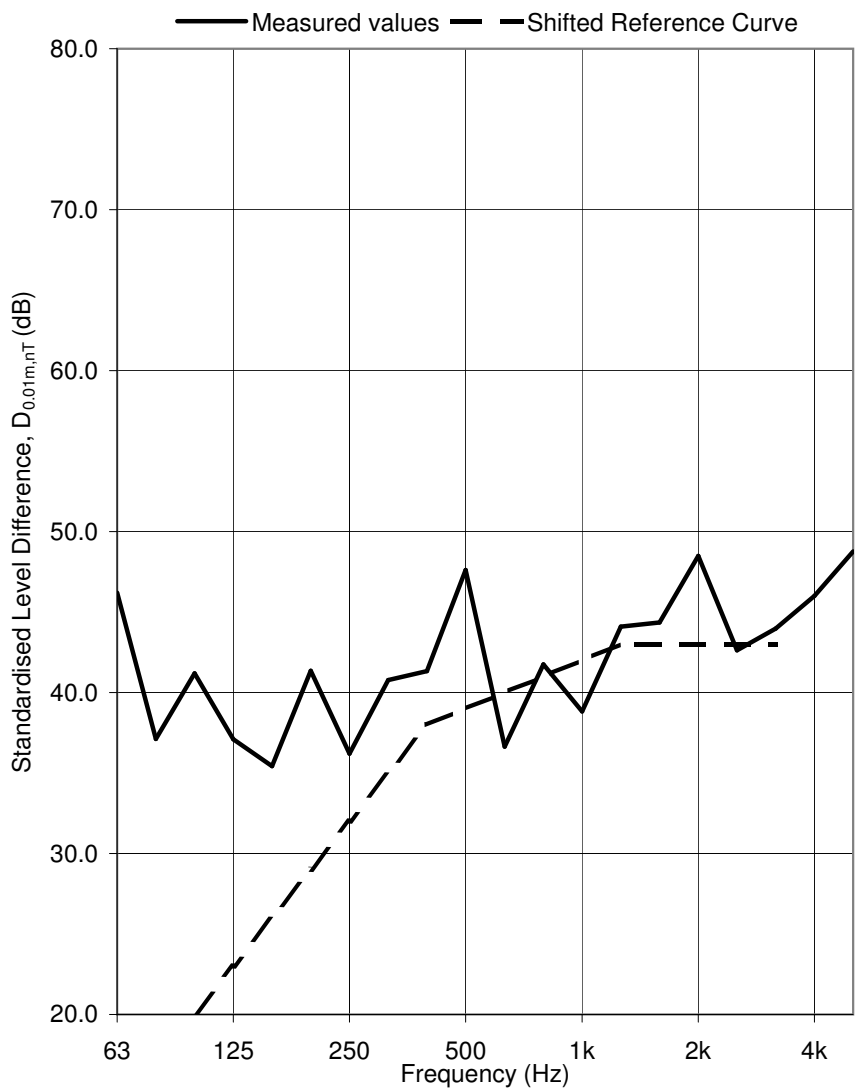


Test ID: 712076

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	38.2
63	46.2
80	37.1
100	41.2
125	37.1
160	35.4
200	41.4
250	36.2
315	40.8
400	41.3
500	47.6
630	36.6
800	41.7
1k	38.8
1.25k	44.1
1.6k	44.4
2k	48.5
2.5k	42.6
3.15k	44.0
4k	46.0
5k	48.8

$D_{0.01m,nT,w}(C;C_{tr})$ 43 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

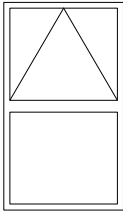
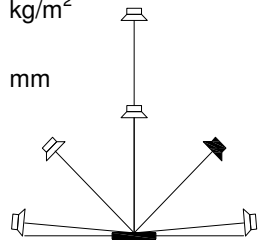
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718014

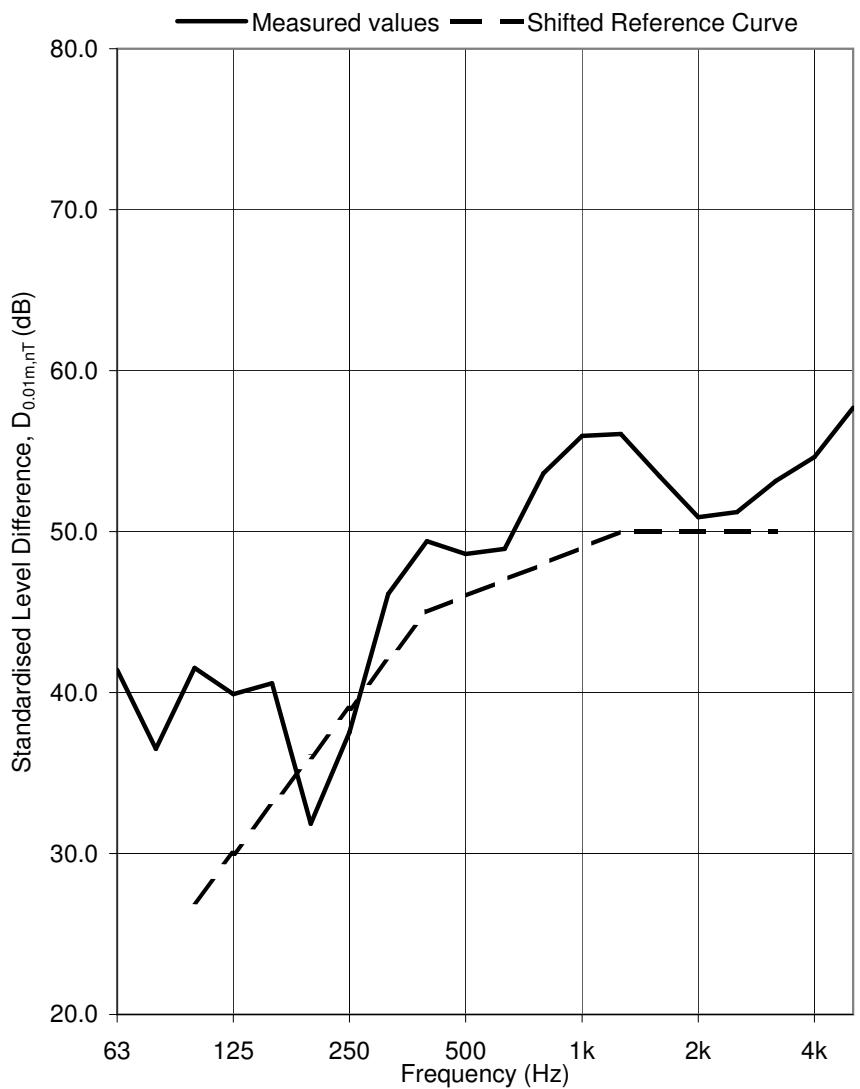
Test Sample: Window E Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	44.0
63	41.4
80	36.5
100	41.5
125	39.9
160	40.6
200	31.8
250	37.5
315	46.1
400	49.4
500	48.6
630	48.9
800	53.6
1k	55.9
1.25k	56.1
1.6k	53.4
2k	50.9
2.5k	51.2
3.15k	53.1
4k	54.6
5k	57.7

$D_{0.01m,nT,w}(C;C_{tr})$ 50 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

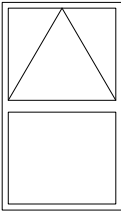
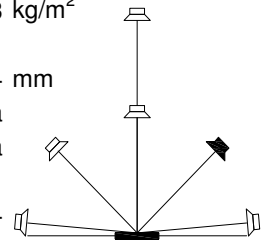
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719028

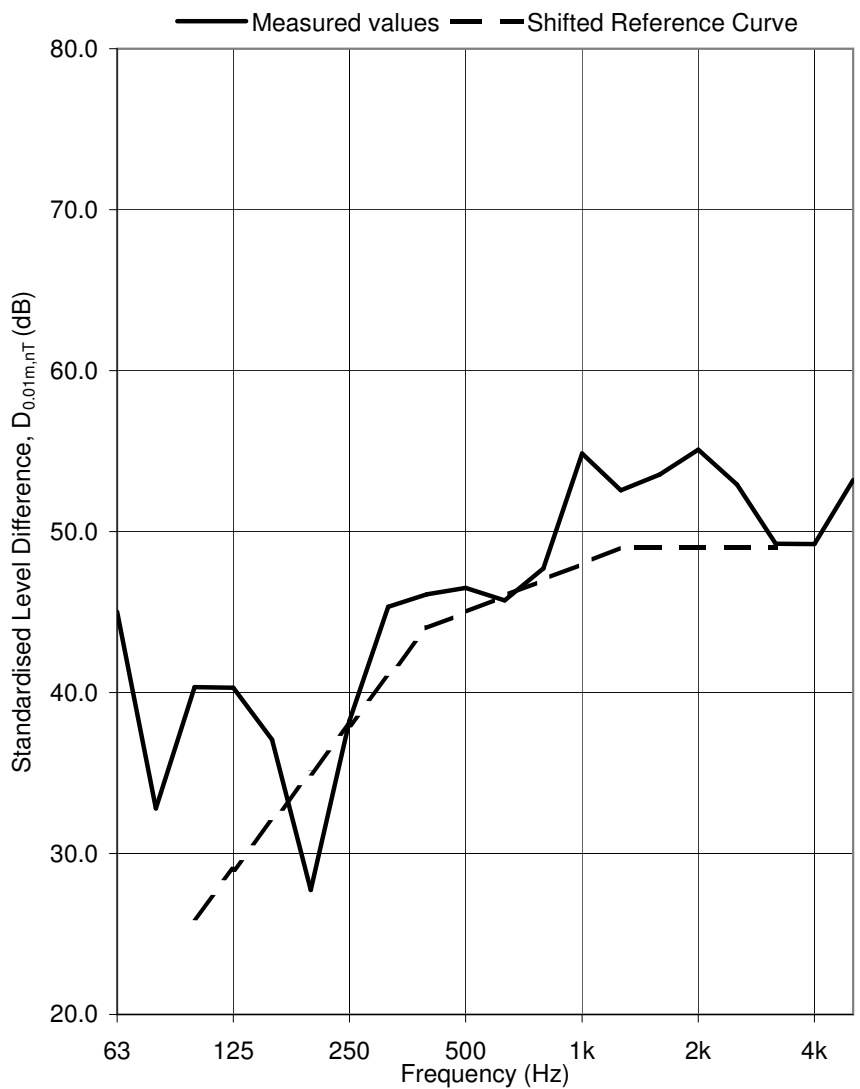
Test Sample: Window F Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	44.6
63	45.0
80	32.8
100	40.3
125	40.3
160	37.1
200	27.7
250	38.2
315	45.3
400	46.1
500	46.5
630	45.7
800	47.7
1k	54.8
1.25k	52.6
1.6k	53.5
2k	55.1
2.5k	52.9
3.15k	49.2
4k	49.2
5k	53.2

$D_{0.01m,nT,w}(C;C_{tr})$ 49 (-3; -7) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

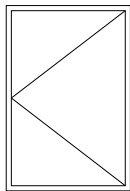
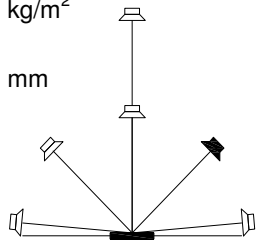
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720028

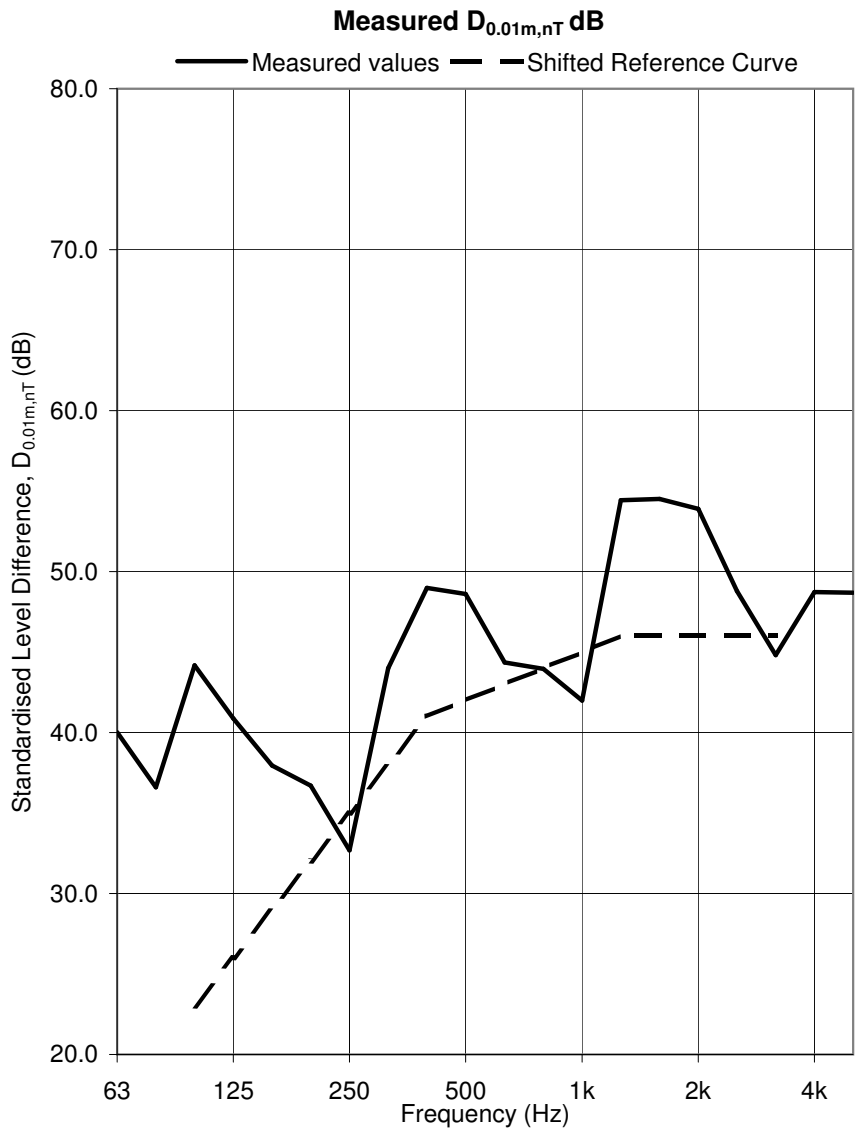
Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	36.7
63	40.0
80	36.6
100	44.2
125	40.9
160	38.0
200	36.7
250	32.7
315	44.0
400	49.0
500	48.6
630	44.3
800	44.0
1k	42.0
1.25k	54.4
1.6k	54.5
2k	53.9
2.5k	48.8
3.15k	44.8
4k	48.7
5k	48.7

b



D_{0.01m,nT,w(C;C_{tr}) 46 (-1; -3) dB}

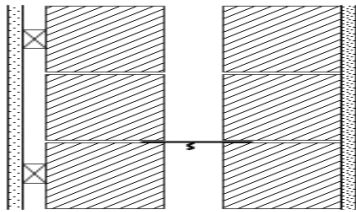
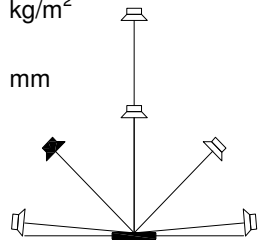
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

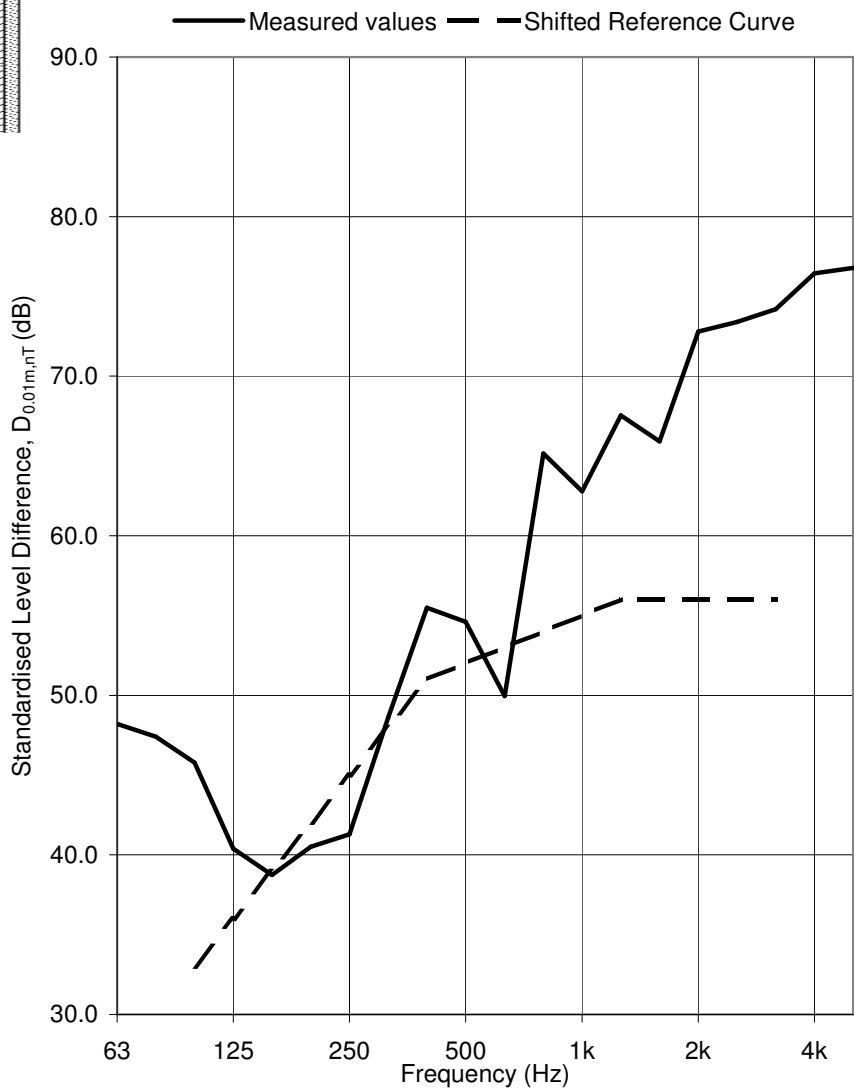
Standardised Level Difference. Simulated residential receiver environment

Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 622005

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	39.4
63	48.2
80	47.4
100	45.8
125	40.4
160	38.8
200	40.5
250	41.3
315	48.6
400	55.5
500	54.6
630	49.9
800	65.2
1k	62.8
1.25k	67.5
1.6k	65.9
2k	72.8
2.5k	73.4
3.15k	74.2
4k	76.4
5k	76.8

$D_{0.01m,nT,w}(C;C_{tr})$ 56 (-2; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

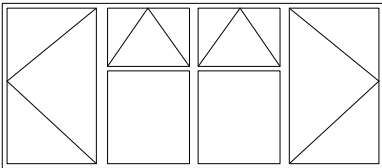
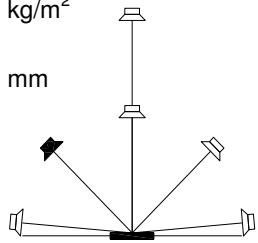
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

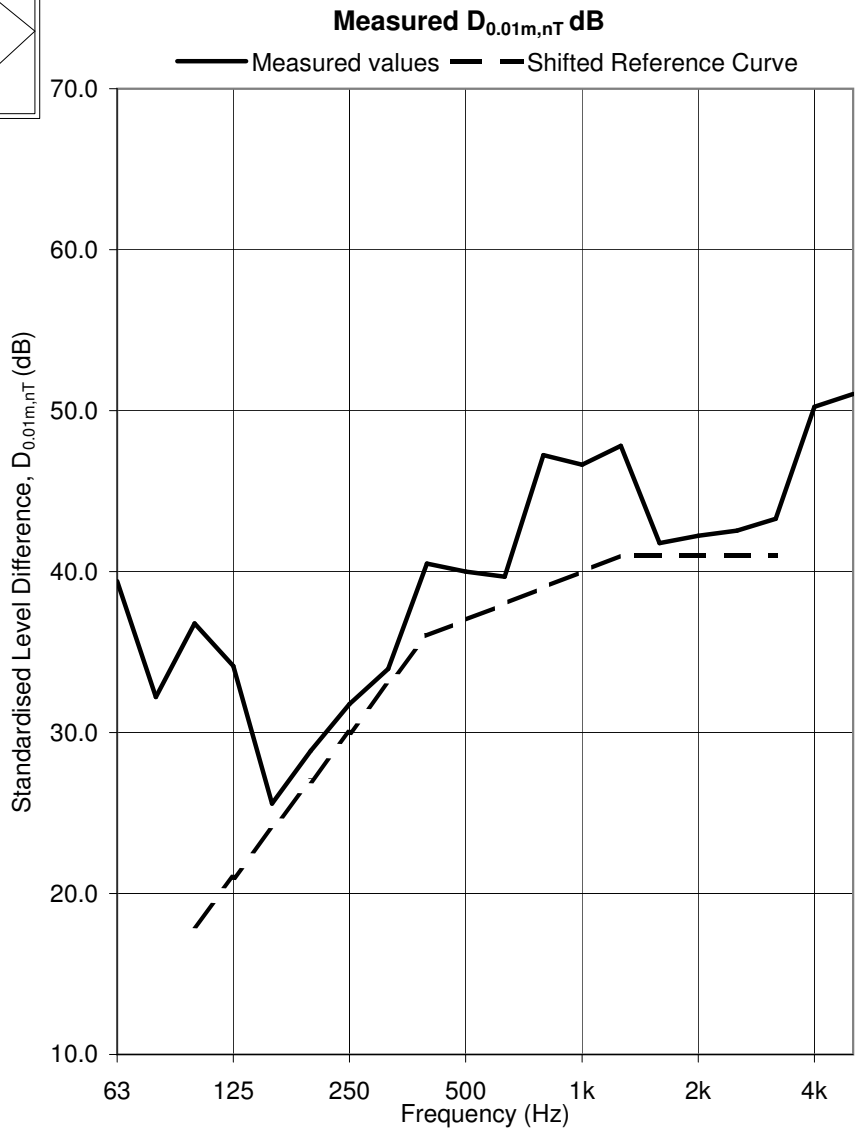
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628081

Test Sample: Window A-1 Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	33.8
63	39.4
80	32.2
100	36.8
125	34.1
160	25.6
200	28.9
250	31.8
315	34.0
400	40.5
500	40.0
630	39.7
800	47.2
1k	46.6
1.25k	47.8
1.6k	41.8
2k	42.2
2.5k	42.5
3.15k	43.3
4k	50.2
5k	51.0



D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

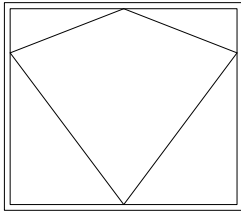
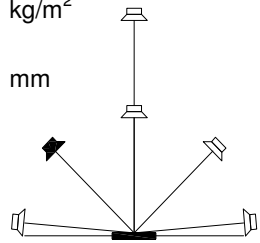
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

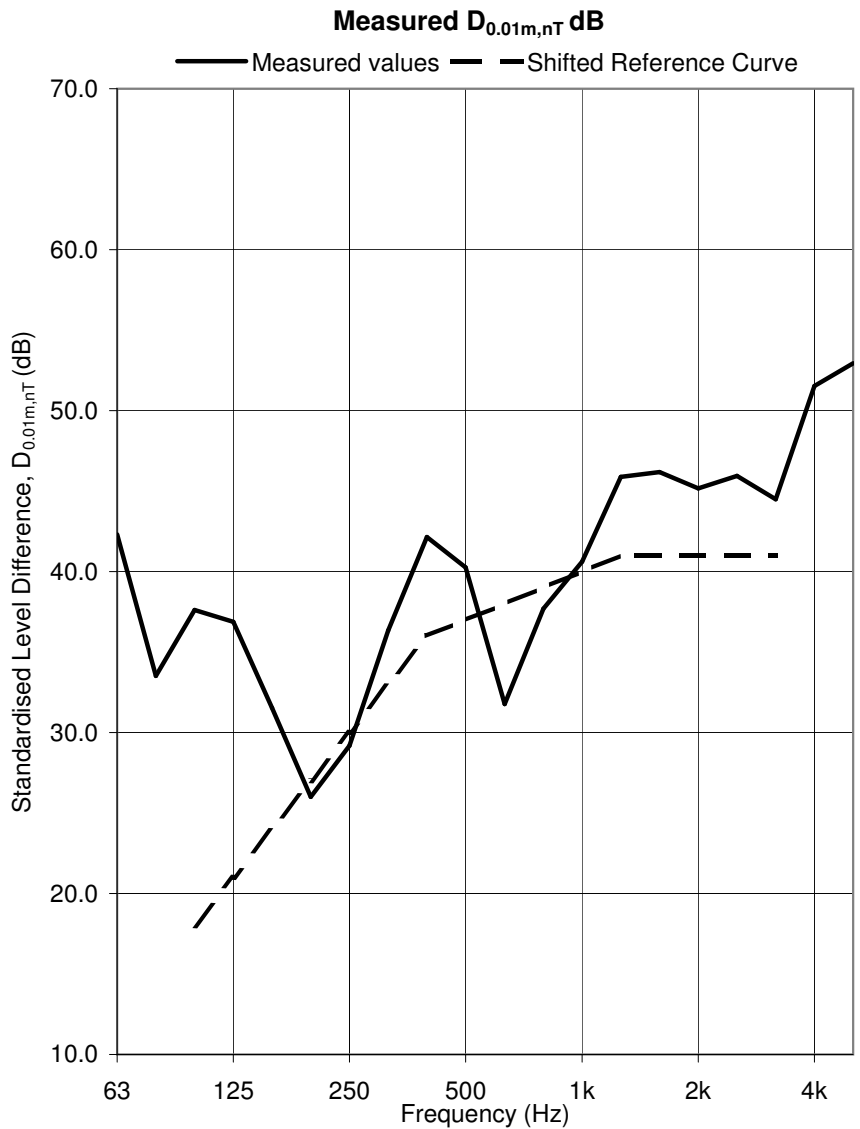
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705021

Test Sample: Window B Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	38.0
63	42.3
80	33.5
100	37.6
125	36.9
160	31.5
200	26.0
250	29.2
315	36.3
400	42.2
500	40.3
630	31.8
800	37.7
1k	40.6
1.25k	45.9
1.6k	46.2
2k	45.2
2.5k	46.0
3.15k	44.5
4k	51.5
5k	52.9



D_{0.01m,nT,w(C;C_{tr}) 41 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

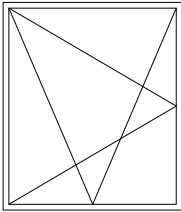
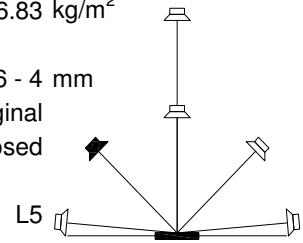
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711046

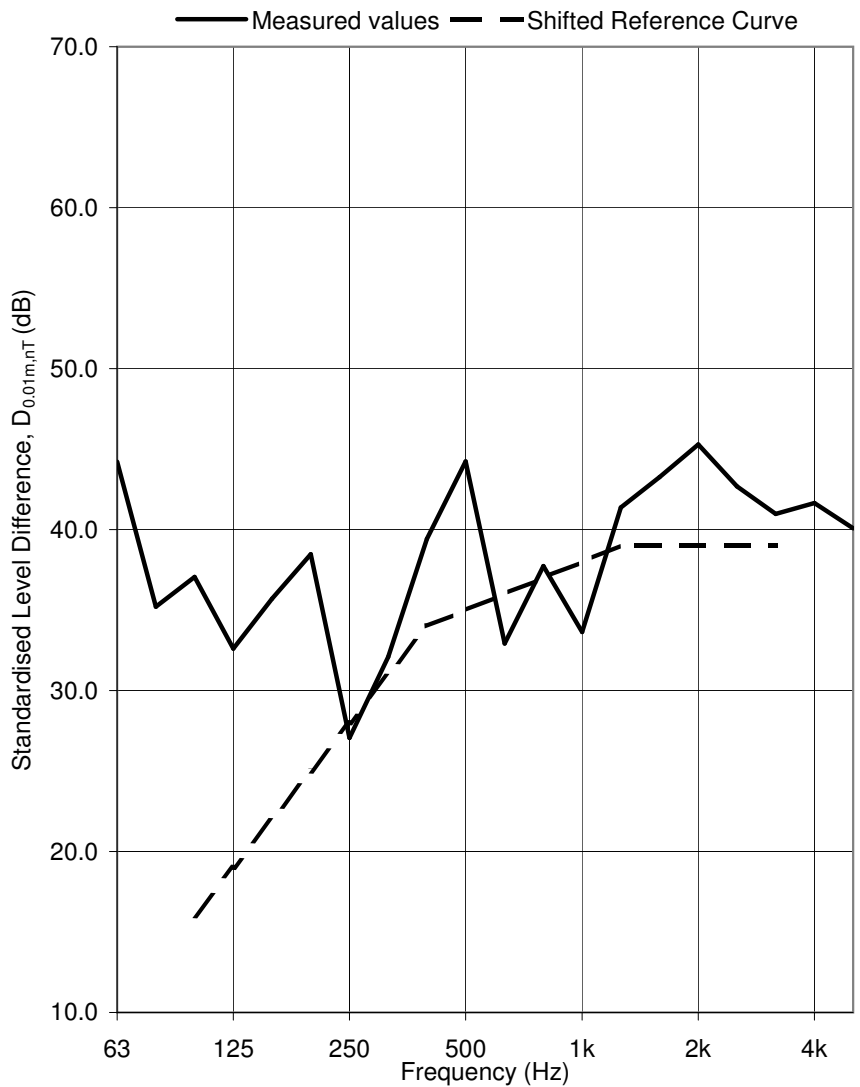
Test Sample: Window C-1 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	37.6
63	44.2
80	35.2
100	37.1
125	32.6
160	35.7
200	38.5
250	27.1
315	32.1
400	39.4
500	44.2
630	32.9
800	37.7
1k	33.6
1.25k	41.4
1.6k	43.3
2k	45.3
2.5k	42.7
3.15k	41.0
4k	41.7
5k	40.1

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

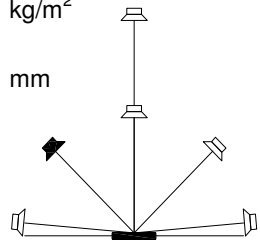
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

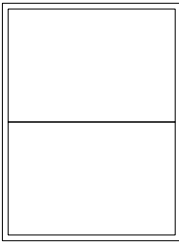
Test Sample: Window D-1 Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

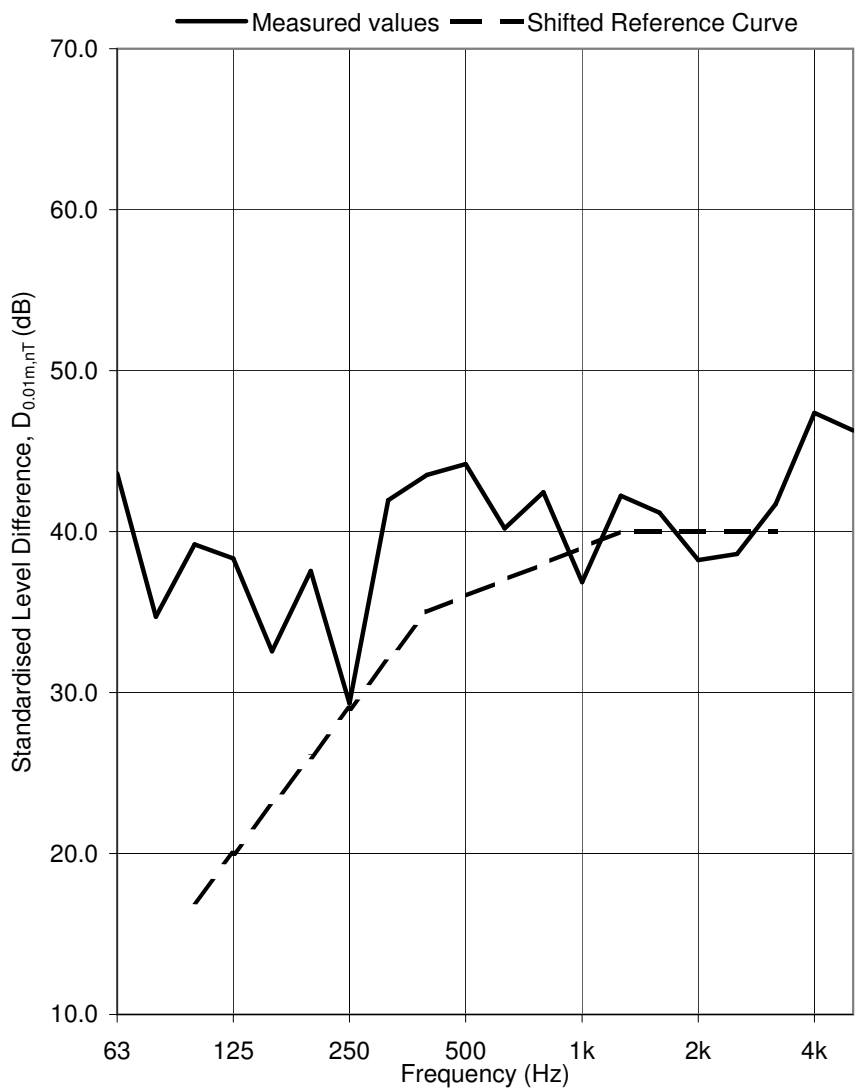


Test ID: 713029

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	30.6
63	43.6
80	34.7
100	39.2
125	38.3
160	32.6
200	37.6
250	29.3
315	41.9
400	43.5
500	44.2
630	40.2
800	42.4
1k	36.9
1.25k	42.2
1.6k	41.2
2k	38.2
2.5k	38.6
3.15k	41.7
4k	47.4
5k	46.3

$D_{0.01m,nT,w}(C;C_{tr})$ 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

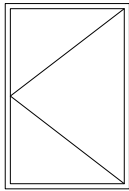
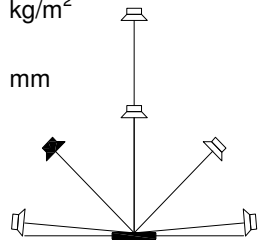
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

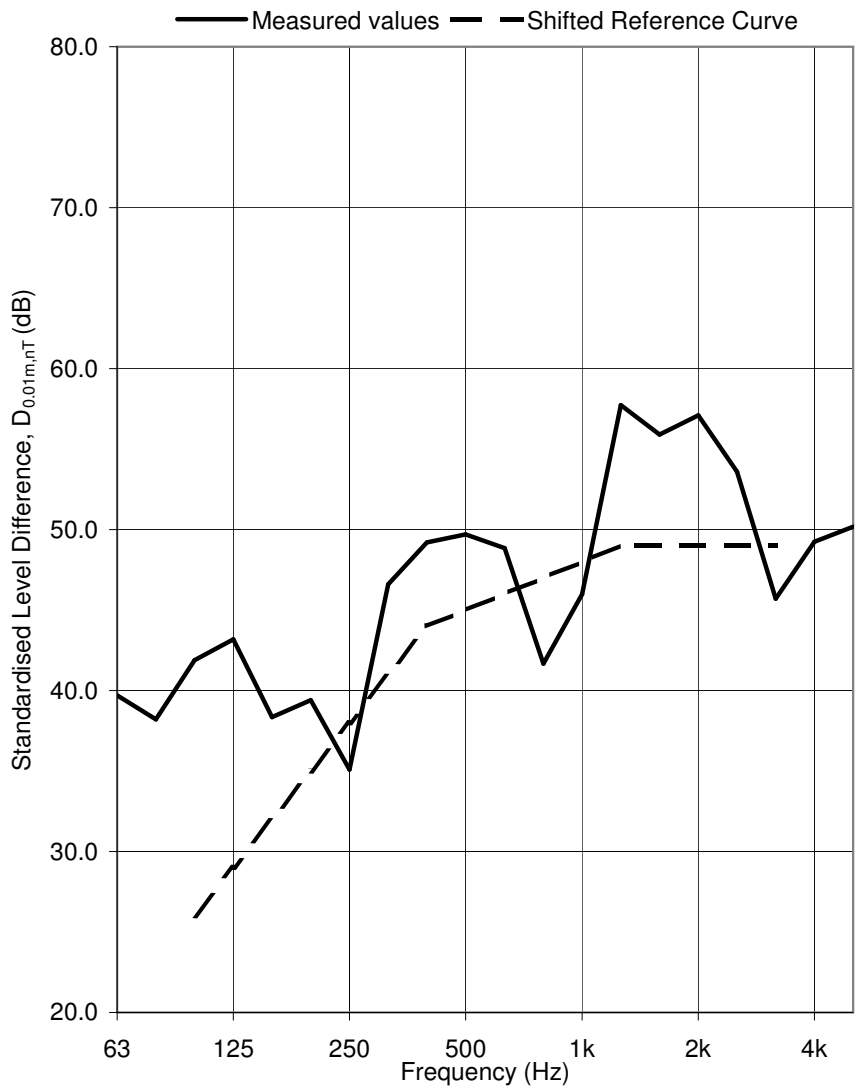
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720027

Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	43.4
63	39.7
80	38.2
100	41.9
125	43.2
160	38.4
200	39.4
250	35.1
315	46.6
400	49.2
500	49.7
630	48.8
800	41.7
1k	46.0
1.25k	57.7
1.6k	55.9
2k	57.1
2.5k	53.6
3.15k	45.7
4k	49.2
5k	50.2

$D_{0.01m,nT,w}(C;C_{tr})$ 49 (-2; -4) dB

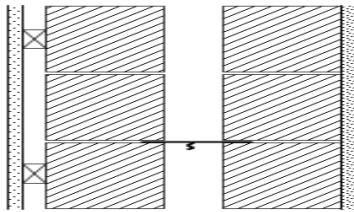
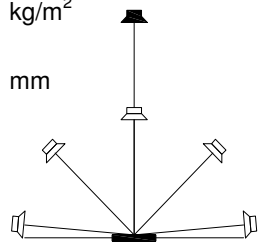
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

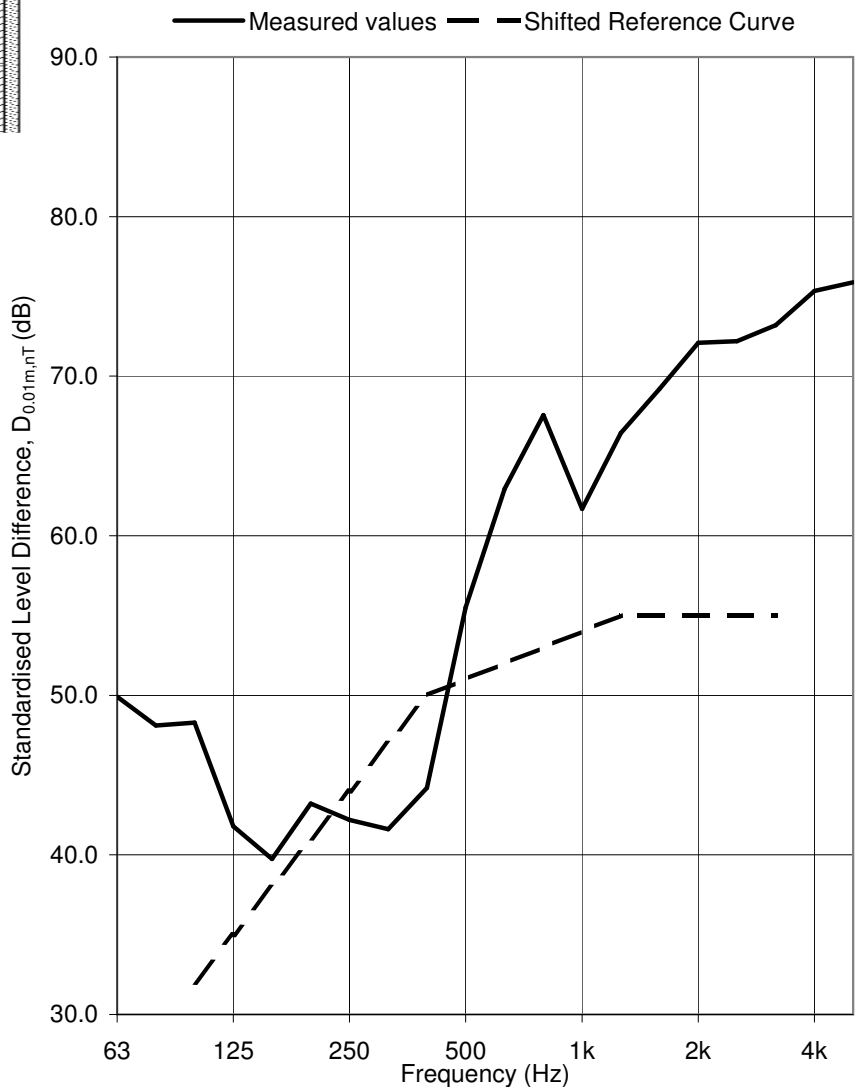
Standardised Level Difference. Simulated residential receiver environment

Date: 22/6/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 622006

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	32.3
63	49.9
80	48.1
100	48.3
125	41.8
160	39.8
200	43.2
250	42.2
315	41.6
400	44.2
500	55.5
630	62.9
800	67.6
1k	61.7
1.25k	66.4
1.6k	69.2
2k	72.1
2.5k	72.2
3.15k	73.2
4k	75.3
5k	75.9

$D_{0.01m,nT,w}(C;C_{tr})$ 55 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

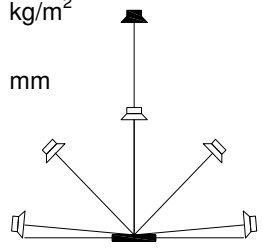
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

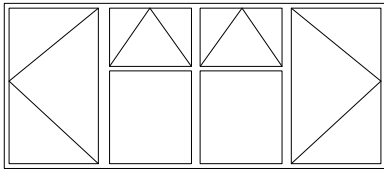
Test Sample: Window A-1 Closed.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

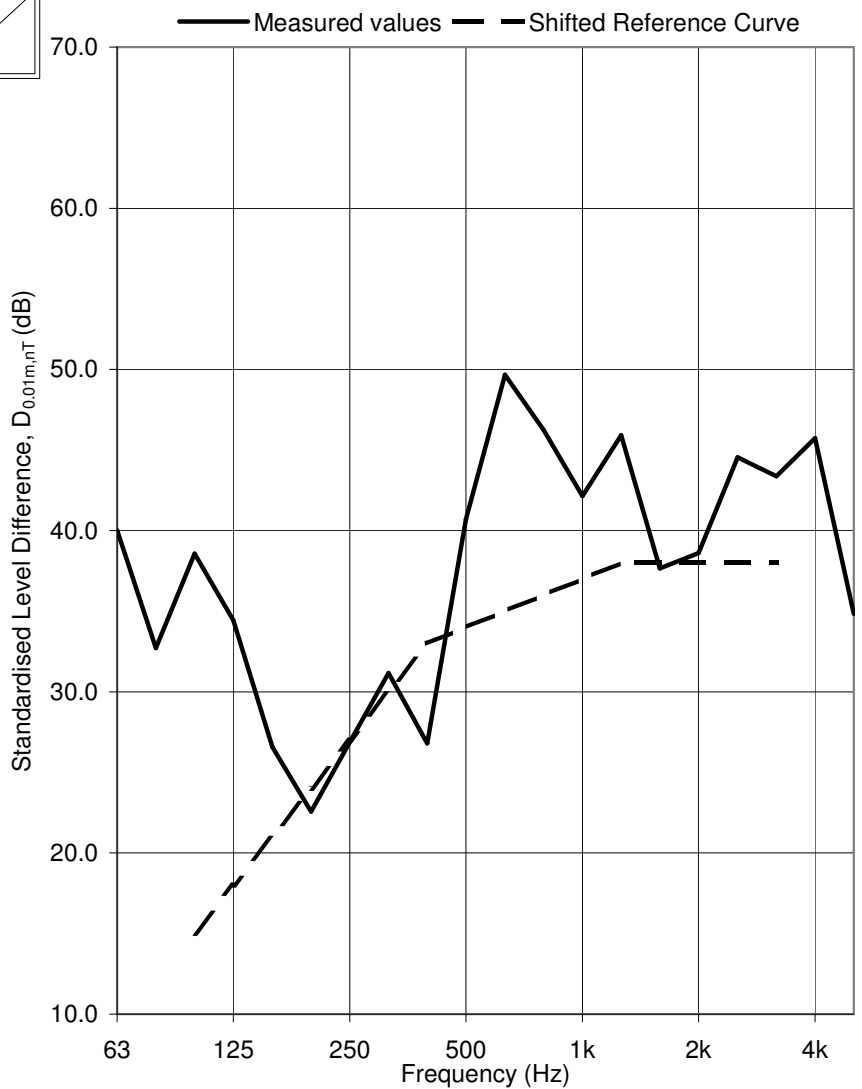


Test ID: 628017

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	31.9
63	40.0
80	32.7
100	38.6
125	34.4
160	26.6
200	22.6
250	26.9
315	31.2
400	26.8
500	40.7
630	49.7
800	46.2
1k	42.1
1.25k	45.9
1.6k	37.7
2k	38.6
2.5k	44.5
3.15k	43.4
4k	45.7
5k	34.8

$D_{0.01m,nT,w}(C;C_{tr})$ 38 (-2; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

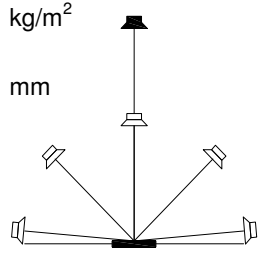
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

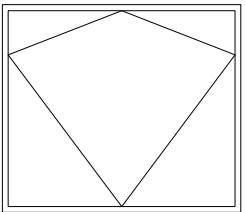
Test Sample: Window B Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

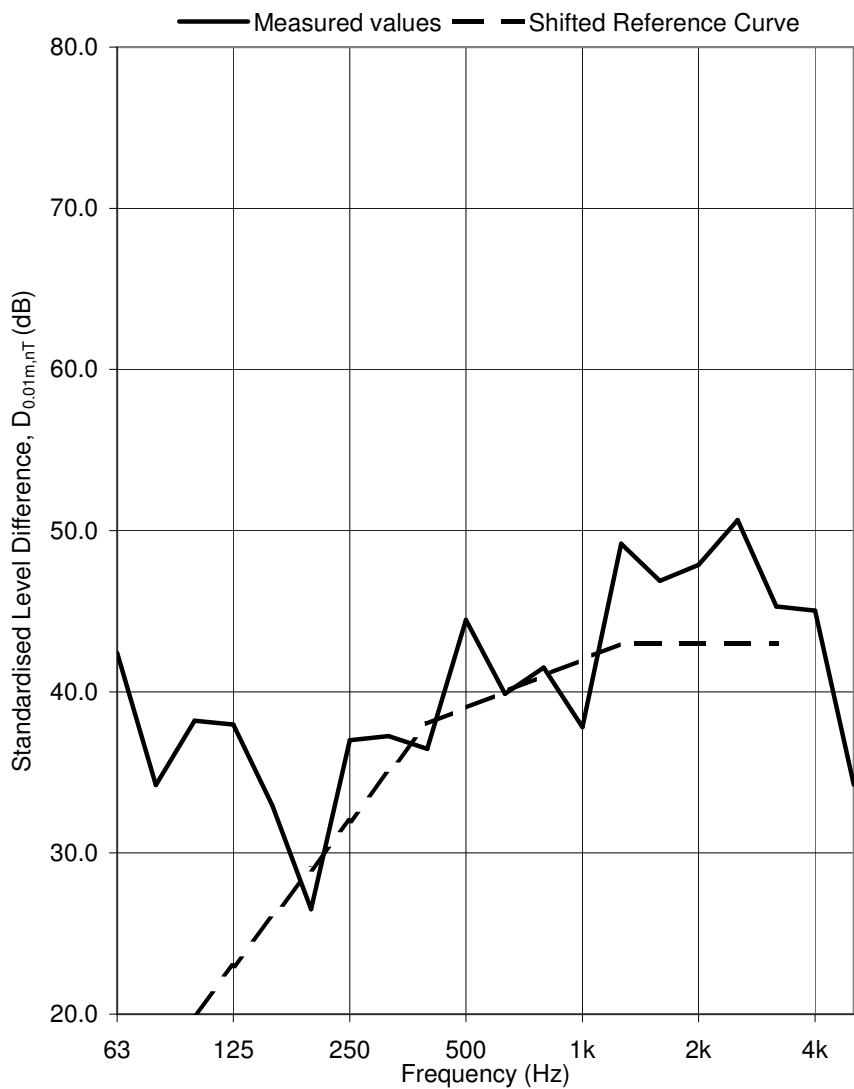


Test ID: 705026

Loudspeaker Configuration: L6



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	33.9
63	42.4
80	34.2
100	38.2
125	38.0
160	32.9
200	26.5
250	37.0
315	37.2
400	36.5
500	44.5
630	39.9
800	41.5
1k	37.8
1.25k	49.2
1.6k	46.9
2k	47.9
2.5k	50.7
3.15k	45.3
4k	45.0
5k	34.2

D_{0.01m,nT,w(C;C_{tr}) 43 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

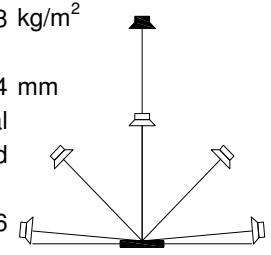
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

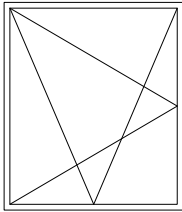
Test Sample: Window C-1 Closed.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

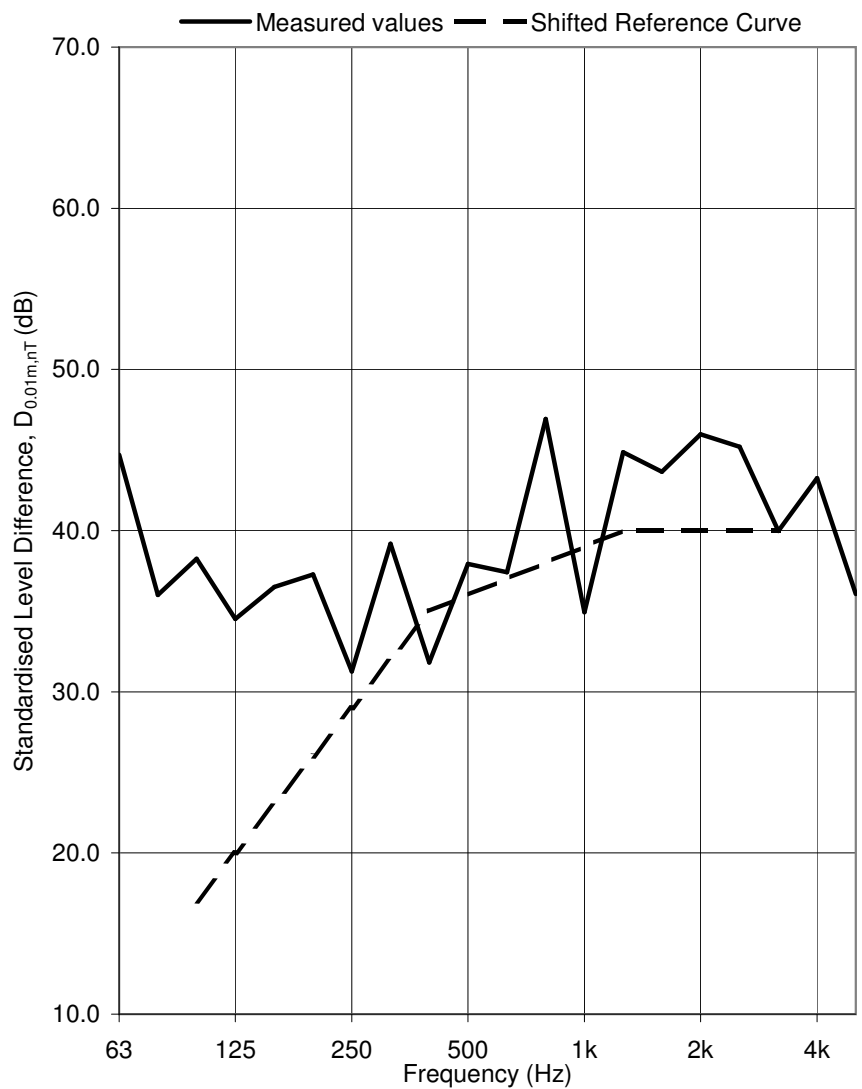


Test ID: 711014

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	32.0
63	44.7
80	36.0
100	38.3
125	34.5
160	36.5
200	37.3
250	31.3
315	39.2
400	31.8
500	37.9
630	37.4
800	46.9
1k	34.9
1.25k	44.9
1.6k	43.7
2k	46.0
2.5k	45.2
3.15k	40.0
4k	43.3
5k	36.1

$D_{0.01m,nT,w}(C;C_{tr})$ 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

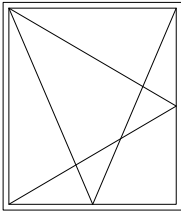
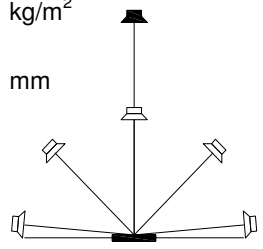
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

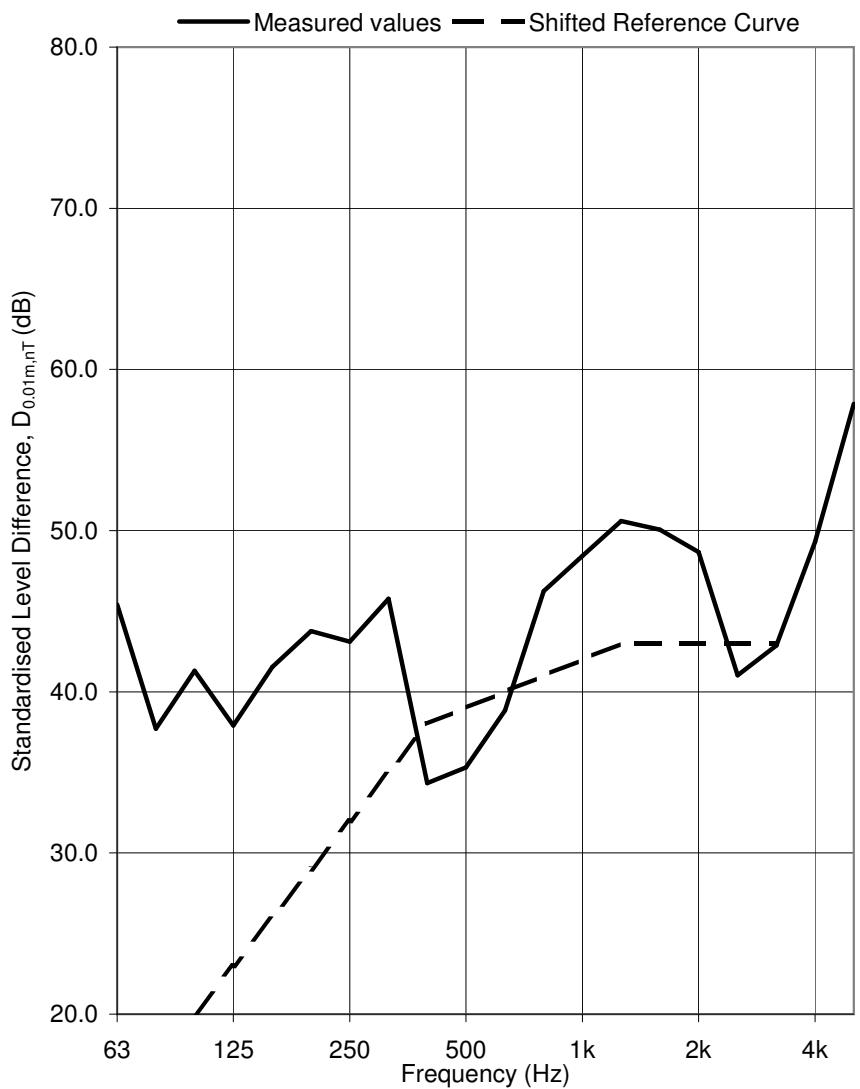
Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0044 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717073

Test Sample: Window C-3 Closed.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	35.7
63	45.4
80	37.7
100	41.3
125	37.9
160	41.5
200	43.8
250	43.1
315	45.8
400	34.3
500	35.3
630	38.8
800	46.2
1k	48.4
1.25k	50.6
1.6k	50.1
2k	48.7
2.5k	41.0
3.15k	42.9
4k	49.3
5k	57.9

$D_{0.01m,nT,w}(C;C_{tr})$ 43 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

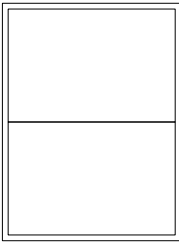
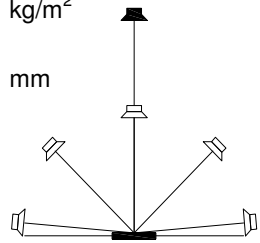
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

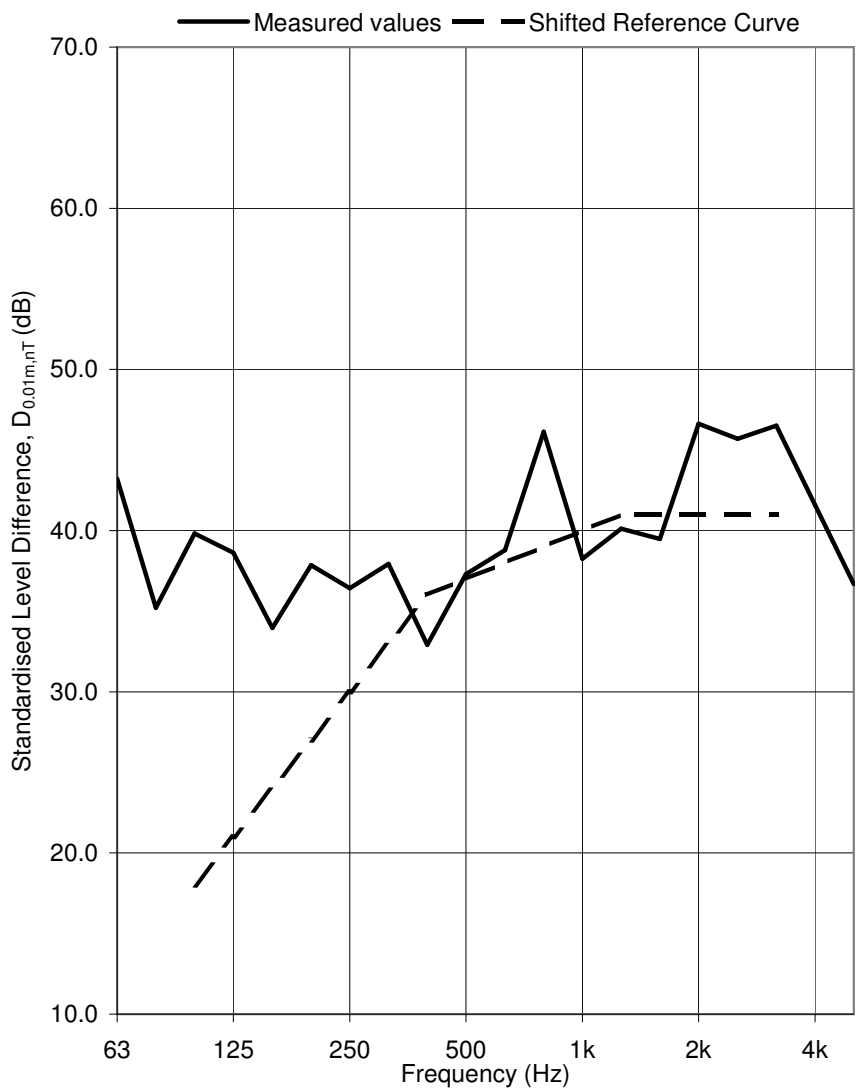
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713015

Test Sample: Window D-1 Closed.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	29.1
63	43.2
80	35.2
100	39.8
125	38.6
160	34.0
200	37.9
250	36.4
315	37.9
400	32.9
500	37.3
630	38.8
800	46.1
1k	38.3
1.25k	40.1
1.6k	39.5
2k	46.6
2.5k	45.7
3.15k	46.5
4k	41.6
5k	36.7

D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

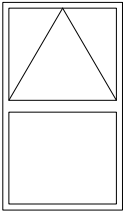
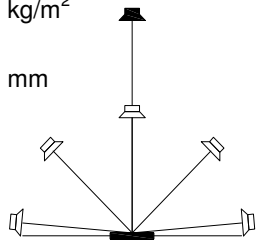
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

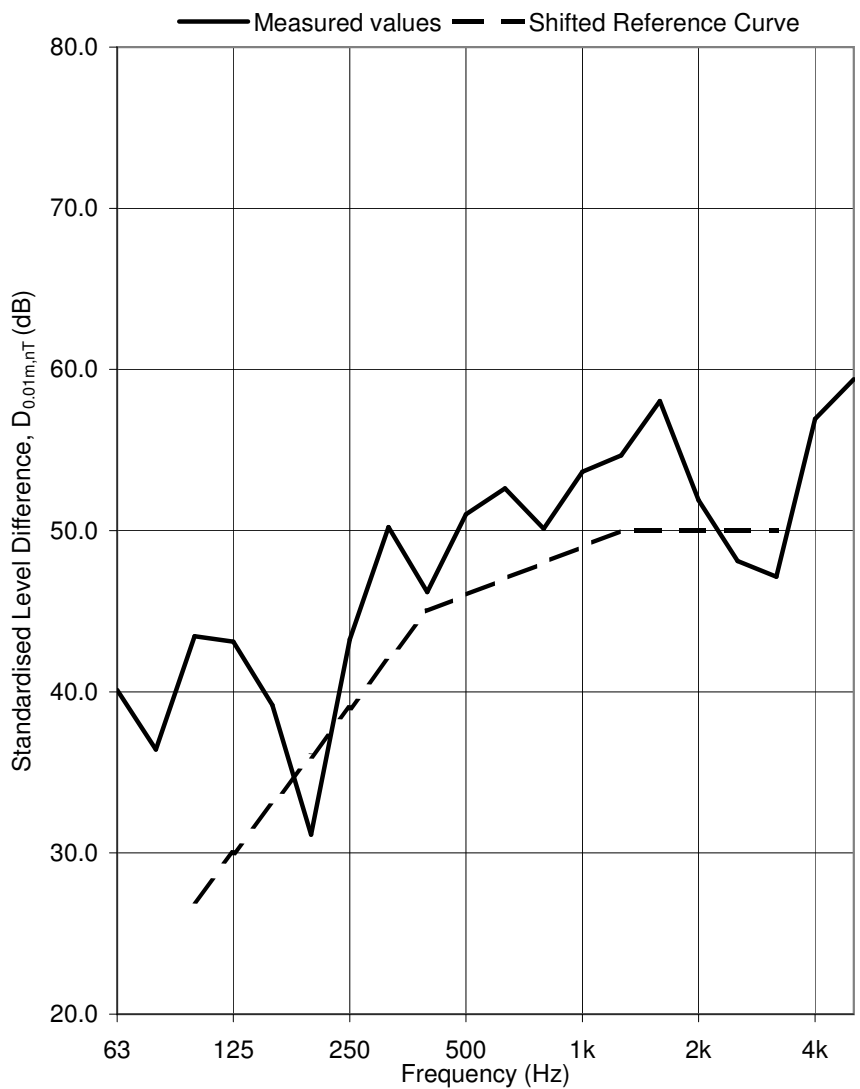
Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718028

Test Sample: Window E Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.2
63	40.1
80	36.4
100	43.4
125	43.1
160	39.2
200	31.1
250	43.2
315	50.2
400	46.2
500	51.0
630	52.6
800	50.1
1k	53.6
1.25k	54.7
1.6k	58.0
2k	51.9
2.5k	48.1
3.15k	47.1
4k	56.9
5k	59.4

$D_{0.01m,nT,w}(C;C_{tr})$ 50 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

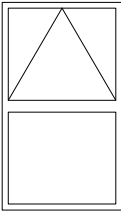
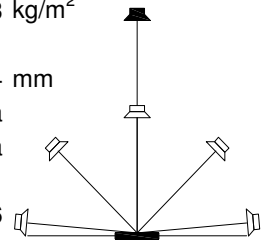
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

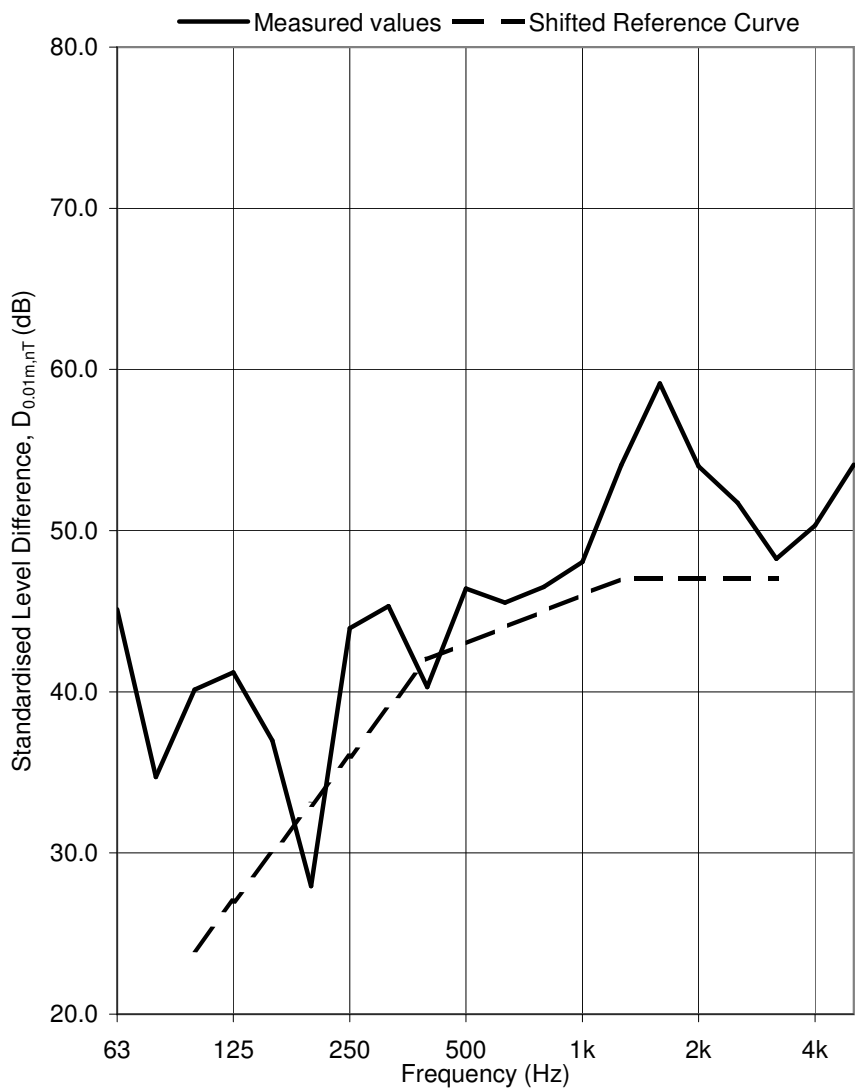
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719001

Test Sample: Window F Closed.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	35.7
63	45.1
80	34.7
100	40.1
125	41.2
160	37.0
200	27.9
250	43.9
315	45.3
400	40.3
500	46.4
630	45.5
800	46.5
1k	48.0
1.25k	54.1
1.6k	59.1
2k	54.0
2.5k	51.7
3.15k	48.2
4k	50.3
5k	54.1

$D_{0.01m,nT,w}(C;C_{tr})$ 47 (-2; -5) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

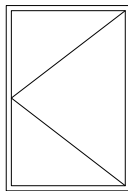
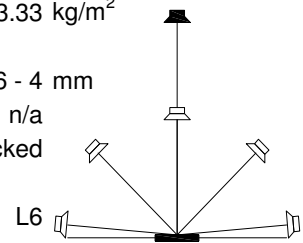
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720001

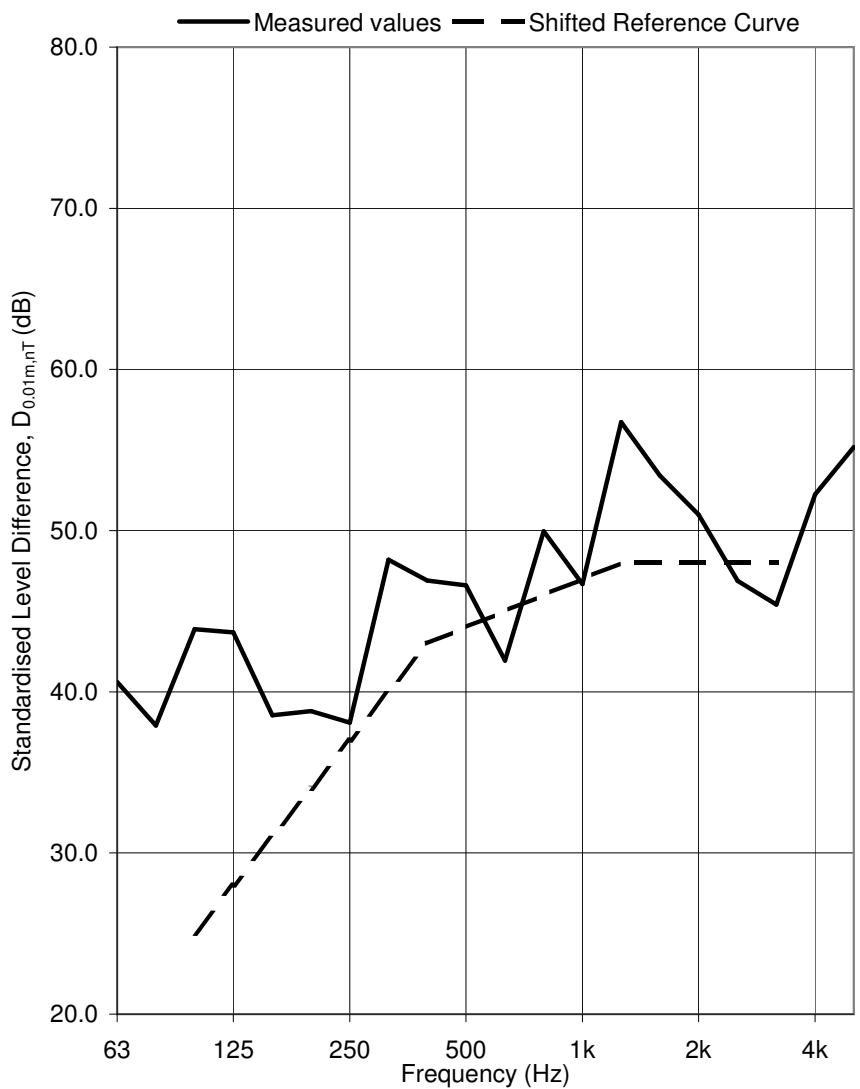
Test Sample: Window G Closed.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked

Loudspeaker Configuration:



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	35.2
63	40.6
80	37.9
100	43.9
125	43.7
160	38.6
200	38.8
250	38.1
315	48.2
400	46.9
500	46.6
630	41.9
800	50.0
1k	46.7
1.25k	56.7
1.6k	53.4
2k	51.0
2.5k	46.9
3.15k	45.4
4k	52.2
5k	55.2



D_{0.01m,nT,w(C;C_{tr}) 48 (-1; -2) dB}

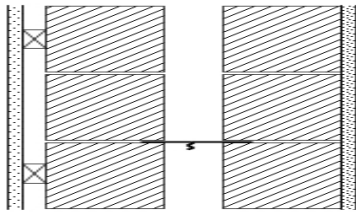
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

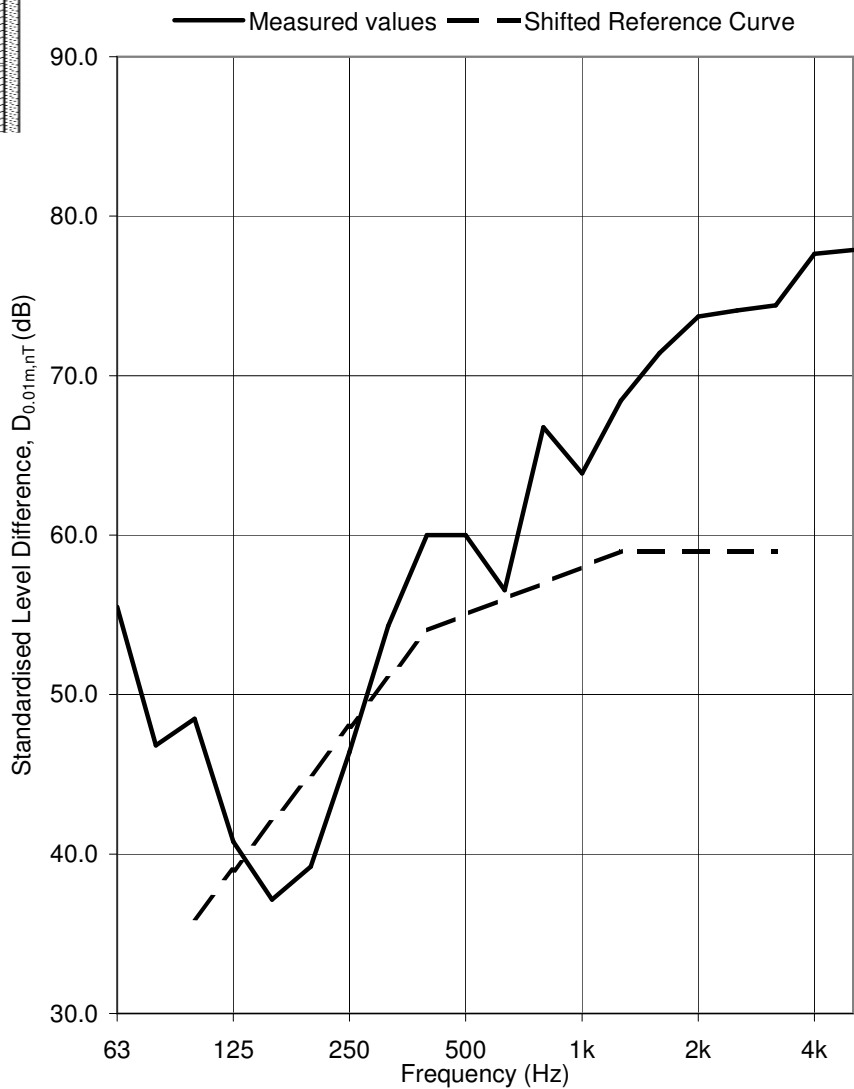
Standardised Level Difference. Simulated residential receiver environment

Date: 22/6/2005
 Air temperature: 20.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0103 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 622007

Test Sample: Wall
 Area of window unit, S: 8.64 m²
 Window mass per unit area: 289.35 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	44.5
63	55.5
80	46.8
100	48.5
125	40.8
160	37.2
200	39.2
250	46.4
315	54.3
400	60.0
500	60.0
630	56.5
800	66.8
1k	63.9
1.25k	68.4
1.6k	71.4
2k	73.7
2.5k	74.1
3.15k	74.4
4k	77.6
5k	77.9

b
b
b
B
B



$D_{0.01m,nT,w}(C;C_{tr})$ 59 (-4; -8) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

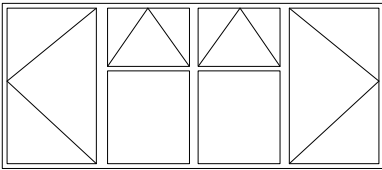
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

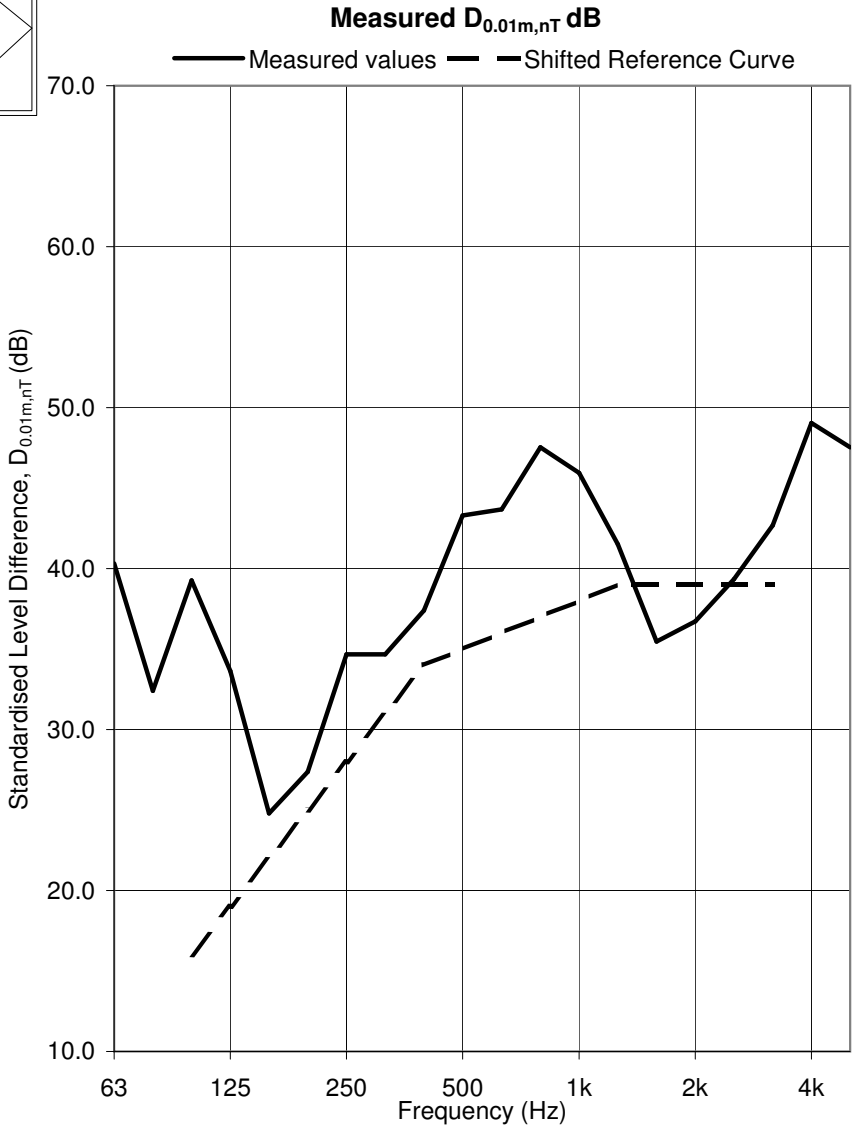
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window A-1 Closed.
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 628097



Frequency Hz	D _{0.01m,nT} dB
50	34.5
63	40.3
80	32.4
100	39.3
125	33.6
160	24.8
200	27.4
250	34.7
315	34.7
400	37.4
500	43.3
630	43.7
800	47.5
1k	45.9
1.25k	41.5
1.6k	35.5
2k	36.7
2.5k	39.3
3.15k	42.7
4k	49.0
5k	47.5





D_{0.01m,nT,w(C;C_{tr}) 39 (-1; -2) dB}

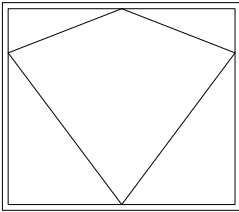
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

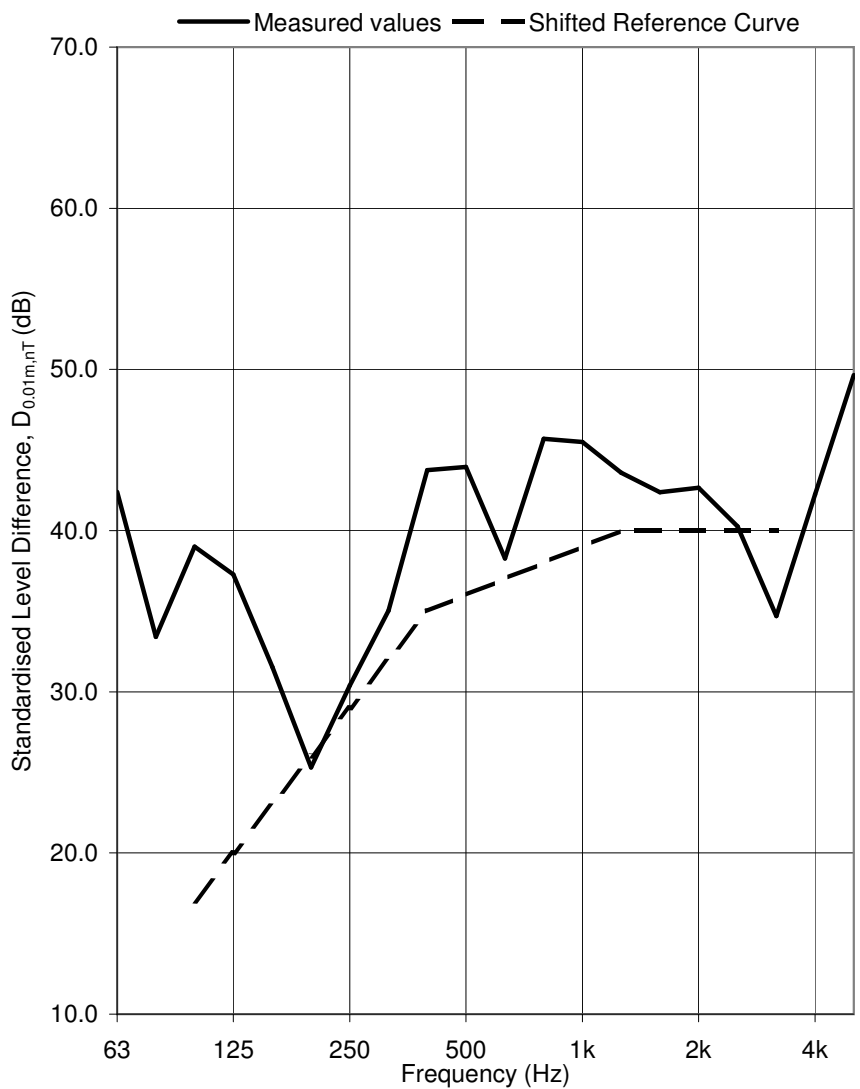
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705031

Test Sample: Window B Closed.
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	41.0
63	42.4
80	33.4
100	39.0
125	37.3
160	31.5
200	25.3
250	30.4
315	35.0
400	43.8
500	44.0
630	38.3
800	45.7
1k	45.5
1.25k	43.6
1.6k	42.4
2k	42.7
2.5k	40.3
3.15k	34.7
4k	42.2
5k	49.6



$D_{0.01m,nT,w(C;C_{tr})}$ 40 (-1; -3) dB

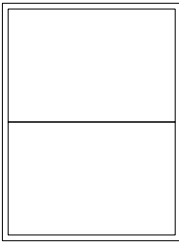
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

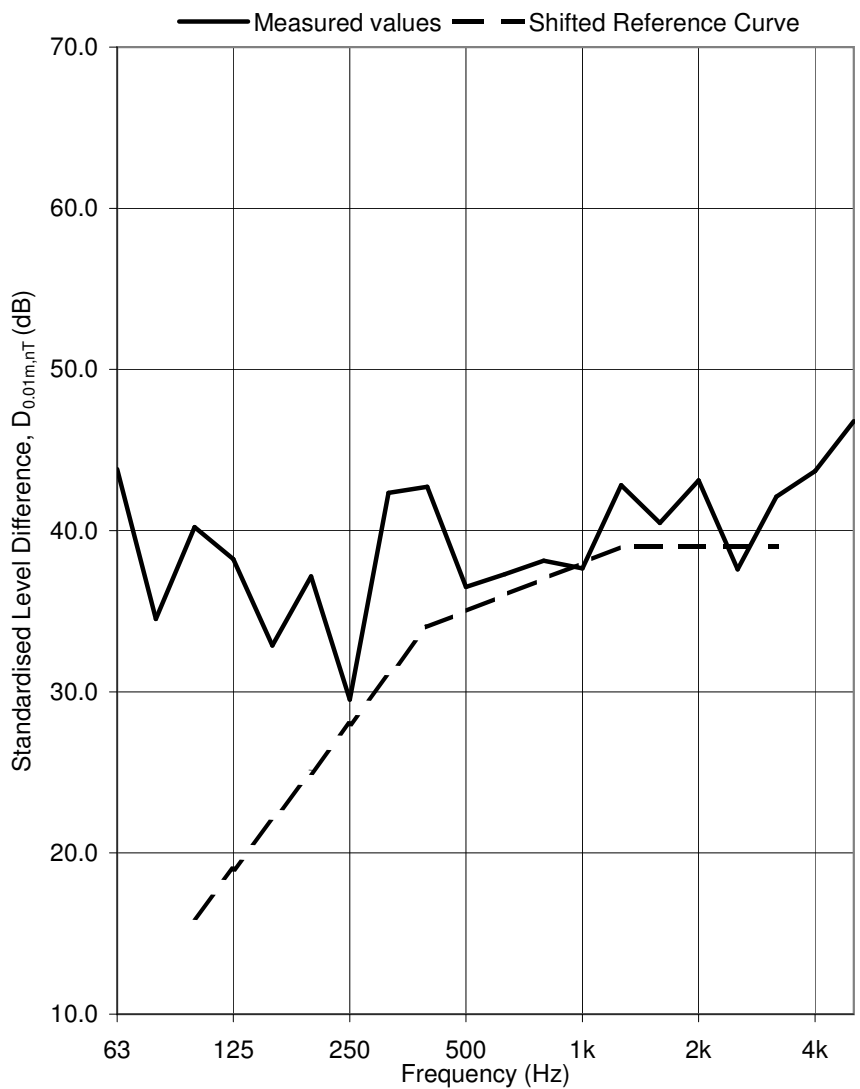
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713057

Test Sample: Window D-1 Closed.
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.7
63	43.8
80	34.5
100	40.2
125	38.2
160	32.9
200	37.2
250	29.5
315	42.3
400	42.7
500	36.5
630	37.3
800	38.1
1k	37.7
1.25k	42.8
1.6k	40.5
2k	43.1
2.5k	37.6
3.15k	42.1
4k	43.7
5k	46.8



$D_{0.01m,nT,w}(C;C_{tr})$ 39 (0; -1) dB

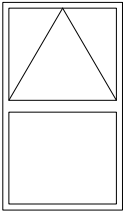
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

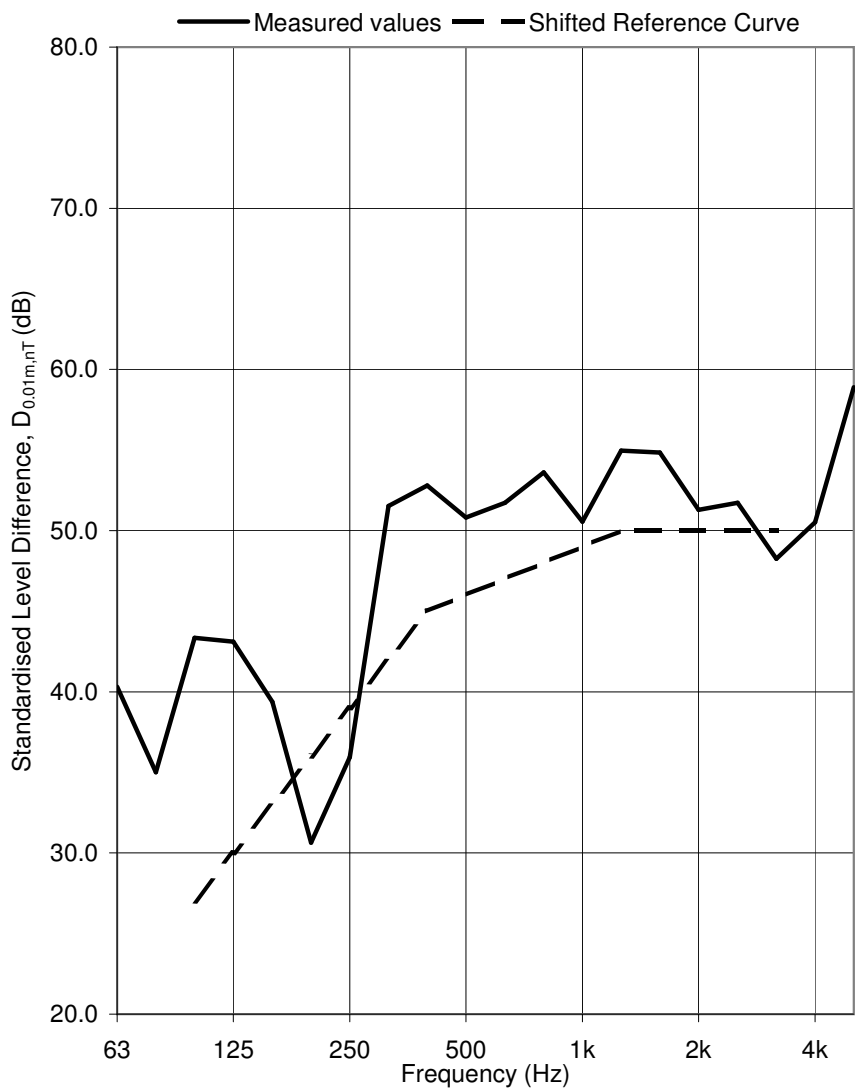
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718029

Test Sample: Window E Closed.
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	44.8
63	40.3
80	35.0
100	43.3
125	43.1
160	39.4
200	30.6
250	35.9
315	51.5
400	52.8
500	50.8
630	51.7
800	53.6
1k	50.5
1.25k	55.0
1.6k	54.8
2k	51.3
2.5k	51.7
3.15k	48.2
4k	50.5
5k	58.9



$D_{0.01m,nT,w(C;C_{tr})}$ 50 (-3; -6) dB

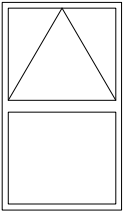
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

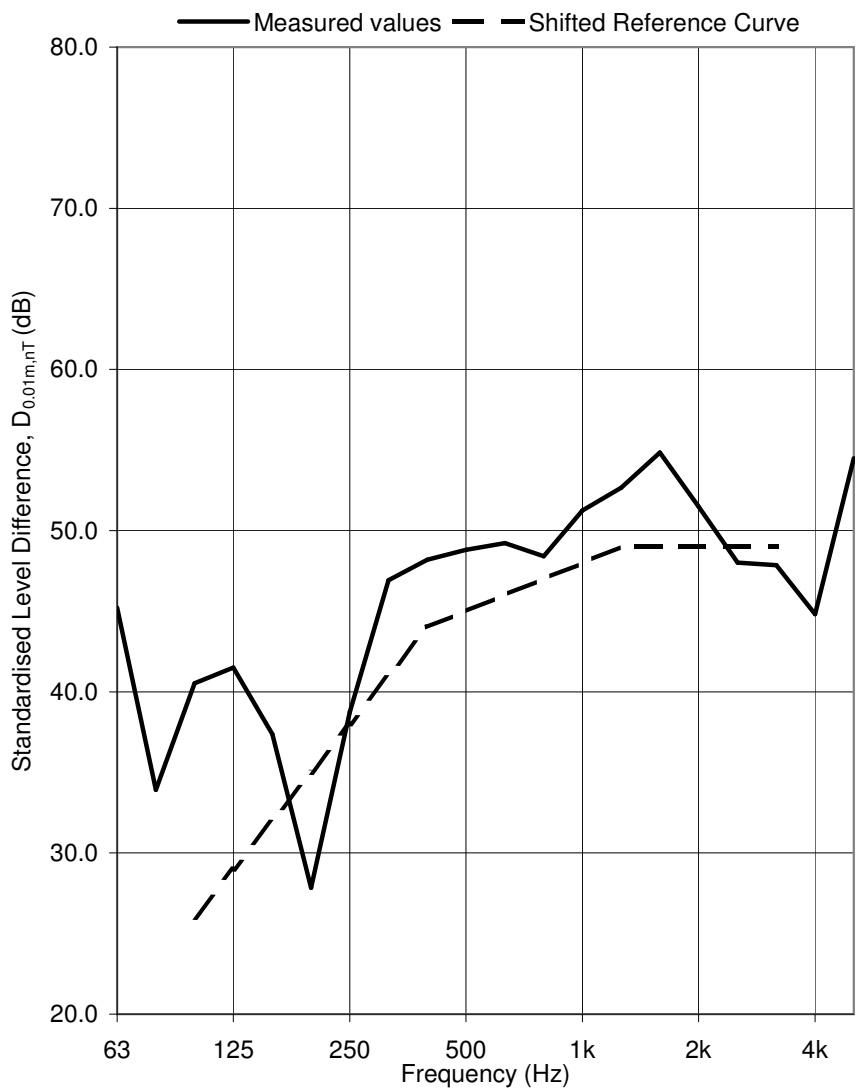
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719014

Test Sample: Window F Closed.
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	45.4
63	45.2
80	33.9
100	40.5
125	41.5
160	37.4
200	27.8
250	38.7
315	46.9
400	48.2
500	48.8
630	49.2
800	48.4
1k	51.2
1.25k	52.7
1.6k	54.8
2k	51.5
2.5k	48.0
3.15k	47.8
4k	44.8
5k	54.5


$D_{0.01m,nT,w(C;C_{tr})}$ 49 (-3; -7) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

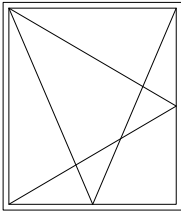
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

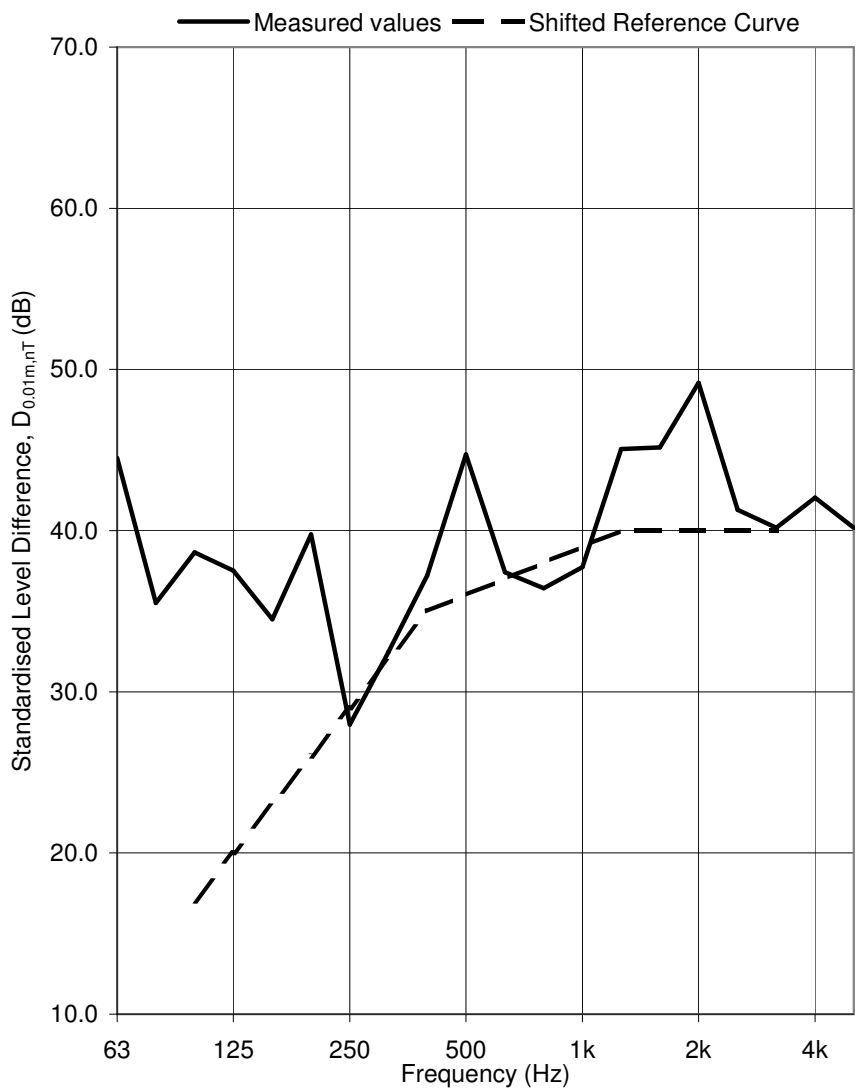
Test Sample: Window C-1 Closed.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711065

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	38.1
63	44.5
80	35.5
100	38.7
125	37.5
160	34.5
200	39.8
250	28.0
315	32.5
400	37.2
500	44.7
630	37.4
800	36.4
1k	37.7
1.25k	45.1
1.6k	45.2
2k	49.2
2.5k	41.3
3.15k	40.2
4k	42.1
5k	40.2

$D_{0.01m,nT,w}(C;C_{tr})$ 40 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

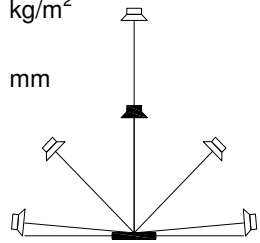
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

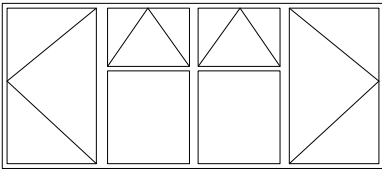
Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

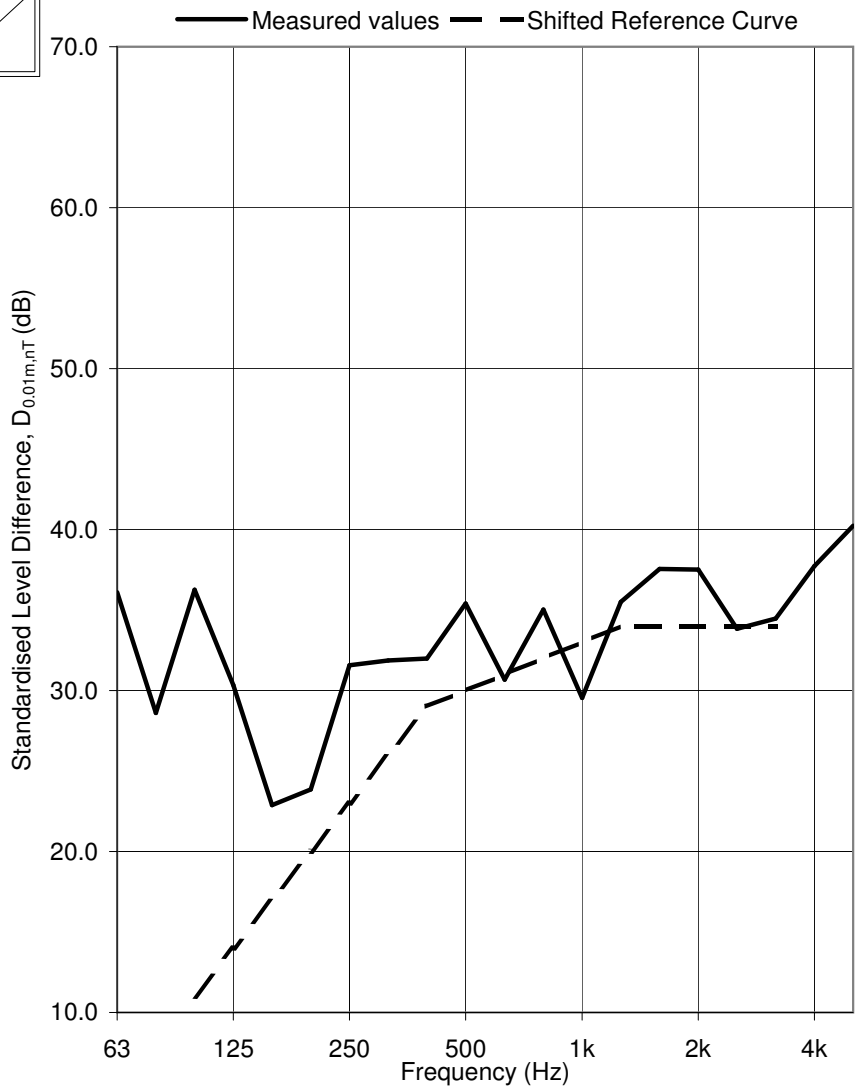


Test ID: 628012

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.7
63	36.1
80	28.6
100	36.3
125	30.3
160	22.9
200	23.9
250	31.6
315	31.9
400	32.0
500	35.4
630	30.7
800	35.0
1k	29.5
1.25k	35.5
1.6k	37.6
2k	37.5
2.5k	33.8
3.15k	34.5
4k	37.7
5k	40.2

$D_{0.01m,nT,w}(C;C_{tr})$ 34 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

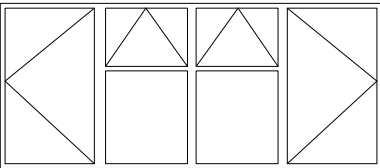
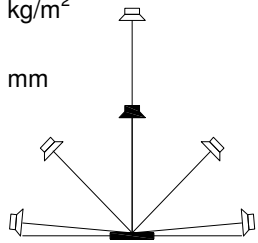
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

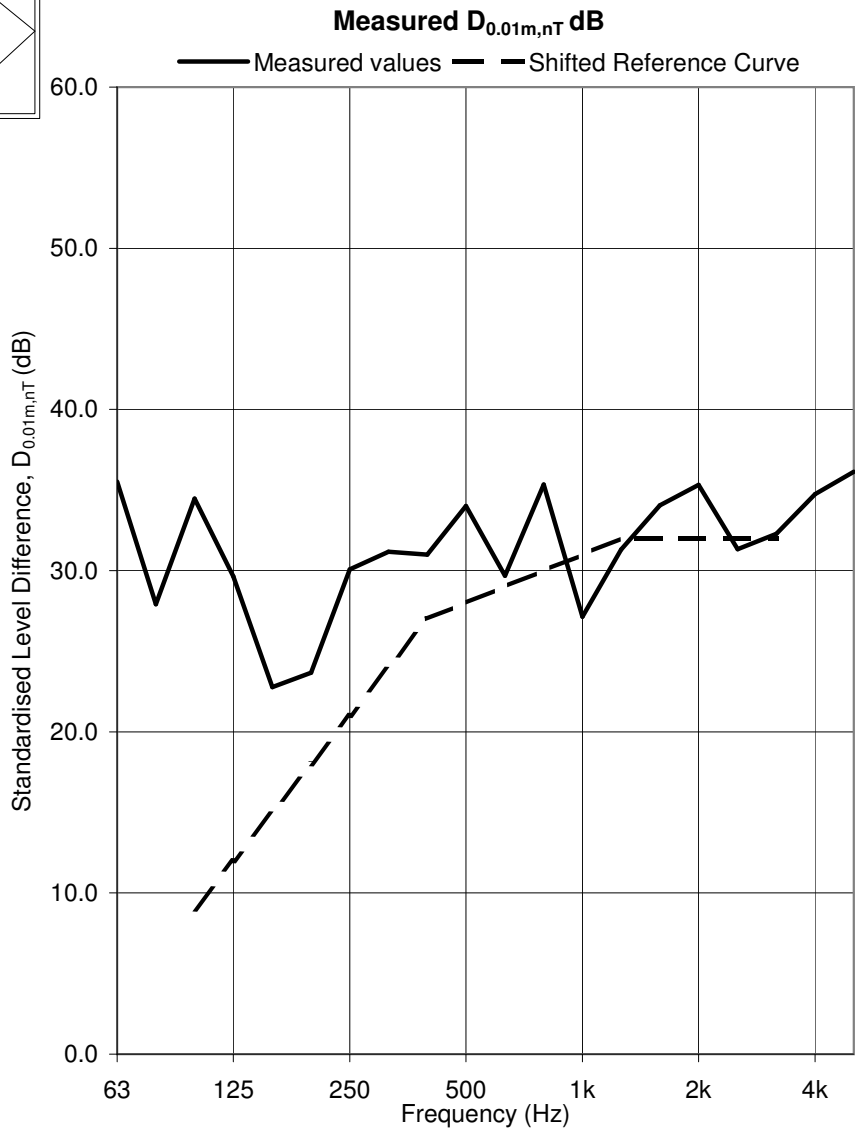
Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628007

Test Sample: Window A-2 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	30.1
63	35.5
80	27.9
100	34.5
125	29.6
160	22.8
200	23.7
250	30.1
315	31.2
400	31.0
500	34.0
630	29.7
800	35.3
1k	27.1
1.25k	31.3
1.6k	34.1
2k	35.3
2.5k	31.3
3.15k	32.3
4k	34.7
5k	36.1



D_{0.01m,nT,w(C;C_{tr}) 32 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

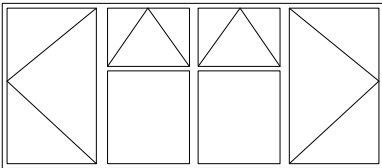
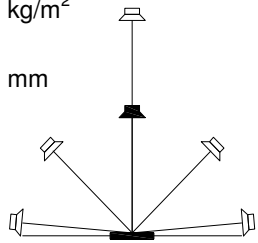
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

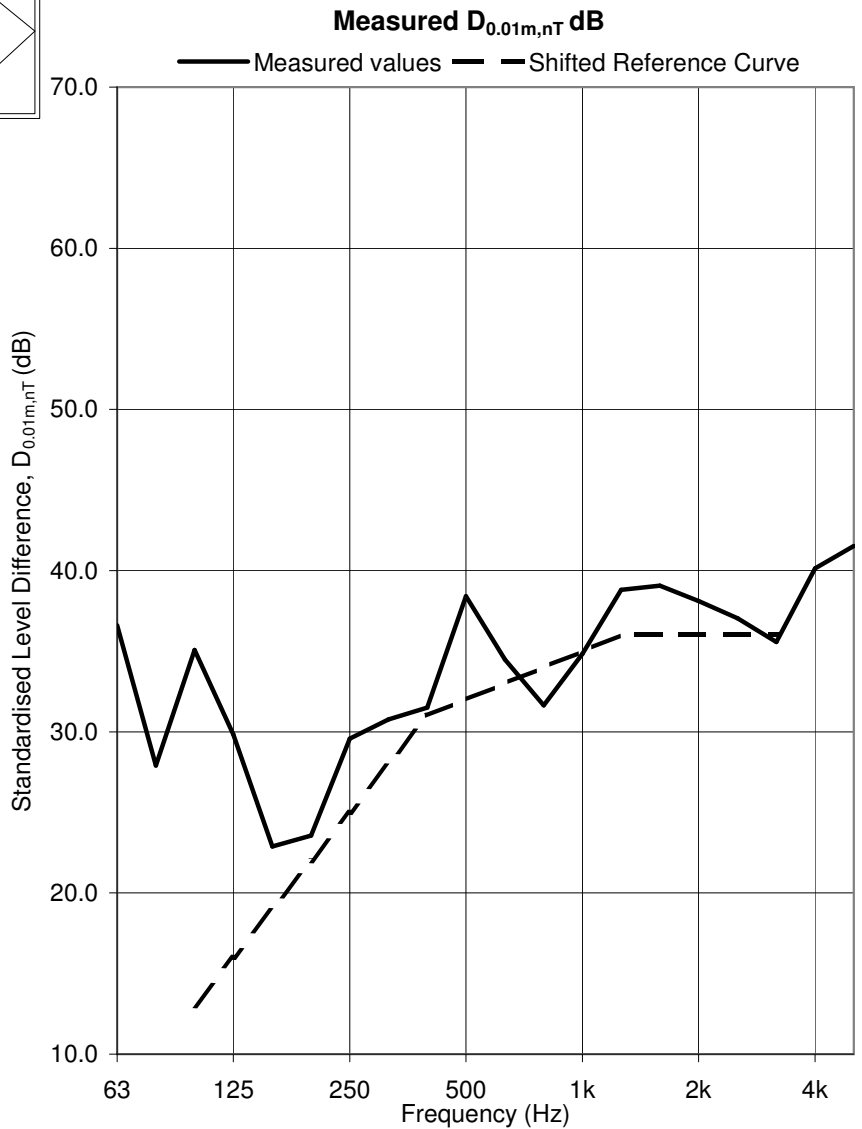
Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628002

Test Sample: Window A-3 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	31.2
63	36.6
80	27.9
100	35.1
125	29.8
160	22.9
200	23.6
250	29.6
315	30.8
400	31.5
500	38.4
630	34.5
800	31.6
1k	34.8
1.25k	38.8
1.6k	39.1
2k	38.1
2.5k	37.0
3.15k	35.6
4k	40.1
5k	41.5



D_{0.01m,nT,w(C;C_{tr}) 36 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

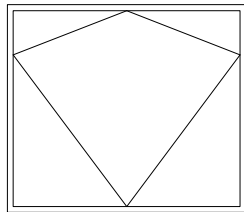
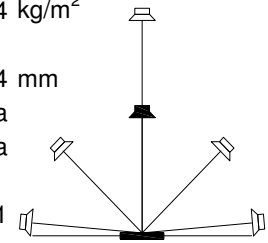
Date: 5/7/05
 Air temperature: 18.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9984 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Untensioned.

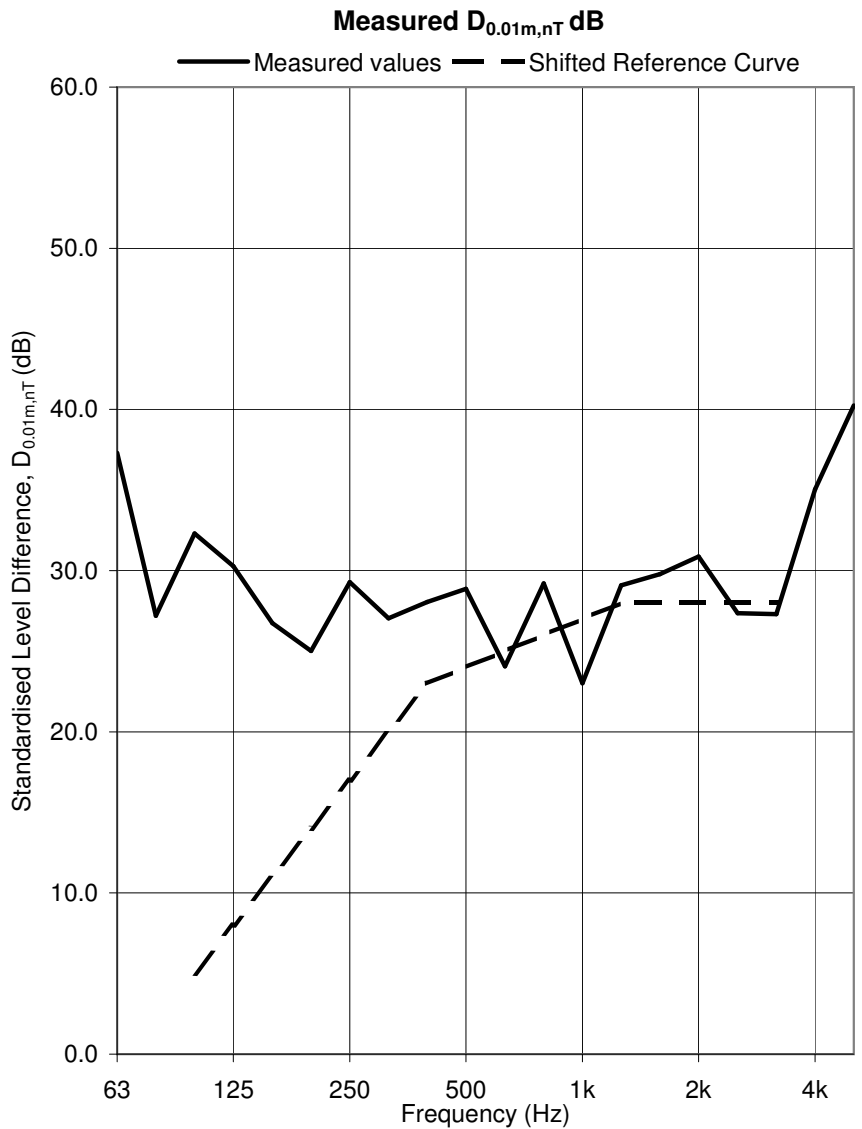
Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	32.4
63	37.3
80	27.2
100	32.3
125	30.3
160	26.7
200	25.0
250	29.3
315	27.0
400	28.1
500	28.9
630	24.1
800	29.2
1k	23.0
1.25k	29.1
1.6k	29.8
2k	30.9
2.5k	27.4
3.15k	27.3
4k	35.0
5k	40.2



D_{0.01m,nT,w(C;C_{tr}) 28 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

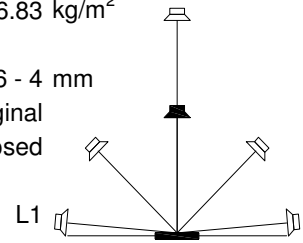
Date: 11/7/05
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0282 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Untensioned.

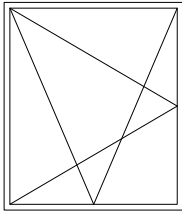
Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Vent 1 closed

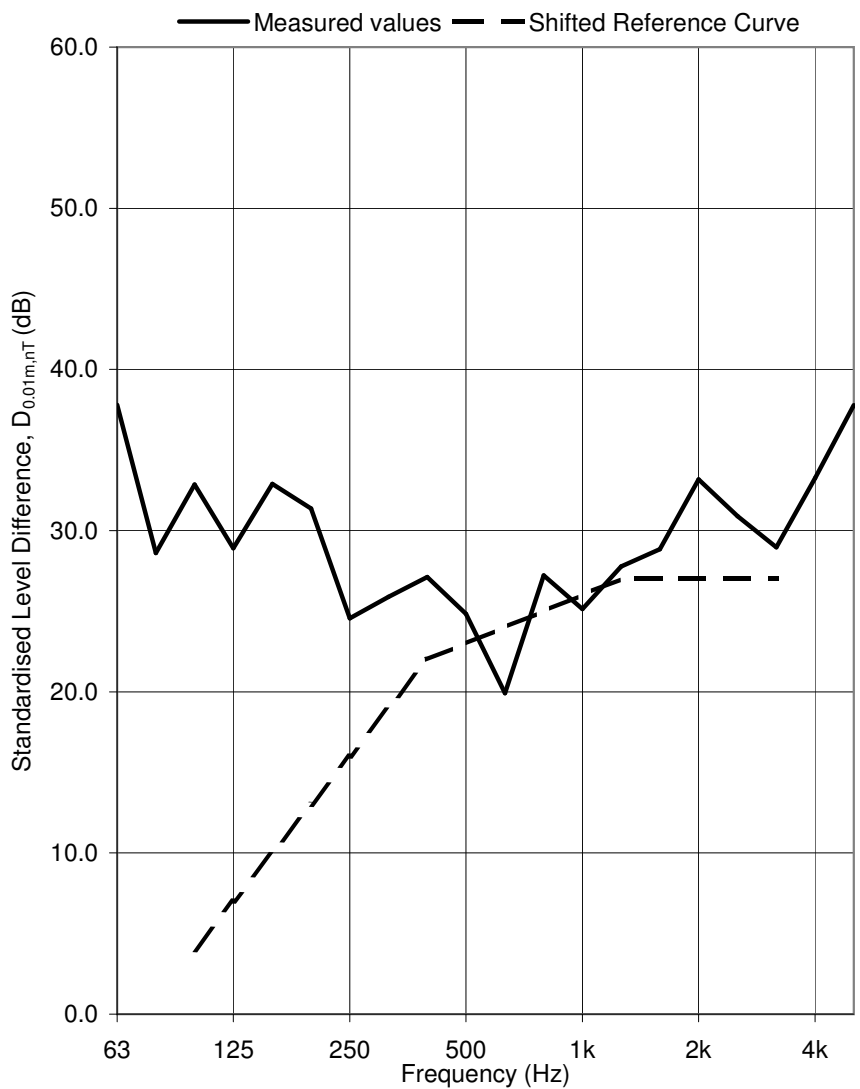
Loudspeaker Configuration:



Test ID: 711003



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	32.3
63	37.8
80	28.6
100	32.9
125	28.9
160	32.9
200	31.4
250	24.6
315	25.9
400	27.1
500	24.8
630	19.9
800	27.2
1k	25.1
1.25k	27.8
1.6k	28.9
2k	33.2
2.5k	30.9
3.15k	29.0
4k	33.3
5k	37.8

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

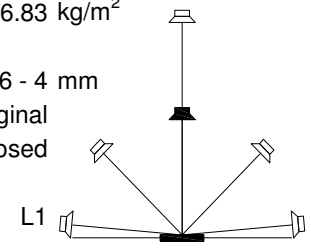
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

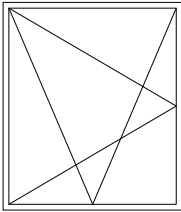
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Vent 1 closed

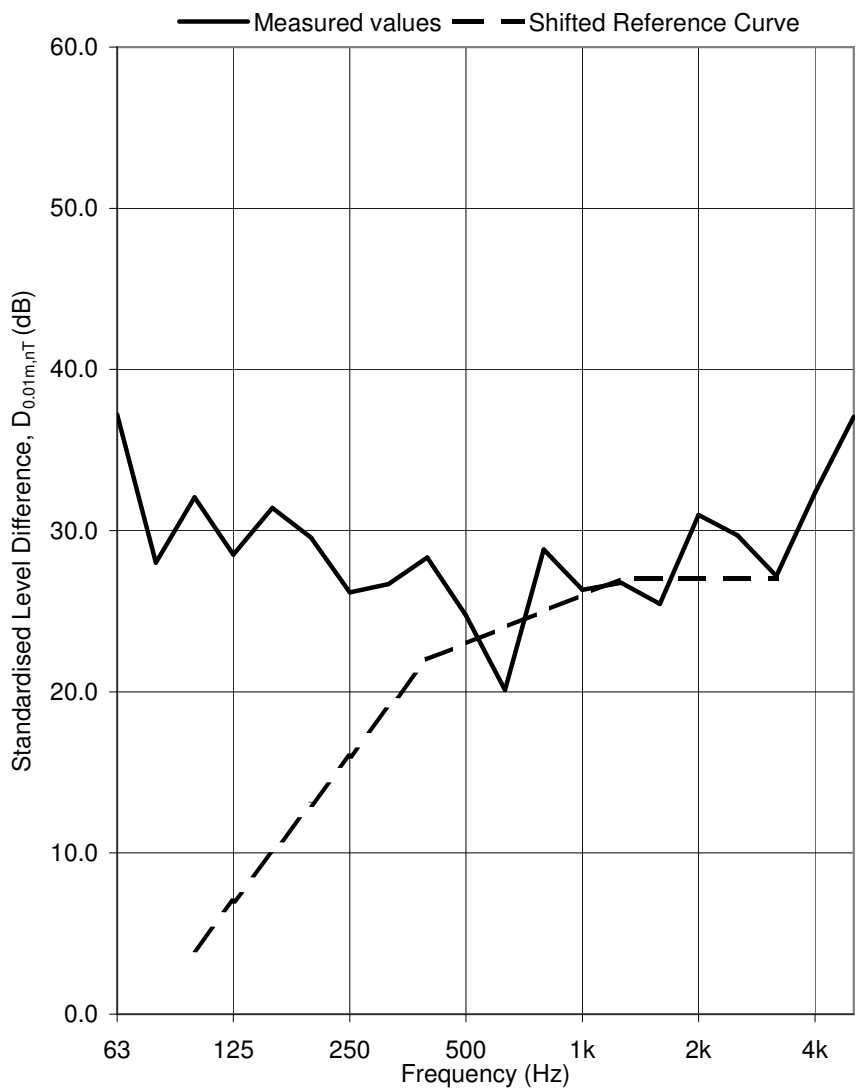


Test ID: 711009

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	31.7
63	37.2
80	28.0
100	32.1
125	28.5
160	31.4
200	29.6
250	26.2
315	26.7
400	28.3
500	24.7
630	20.1
800	28.8
1k	26.3
1.25k	26.8
1.6k	25.5
2k	31.0
2.5k	29.7
3.15k	27.2
4k	32.4
5k	37.1

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

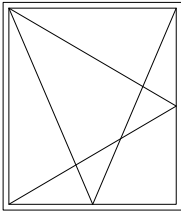
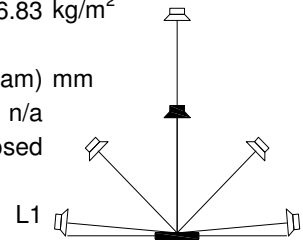
Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Untensioned.

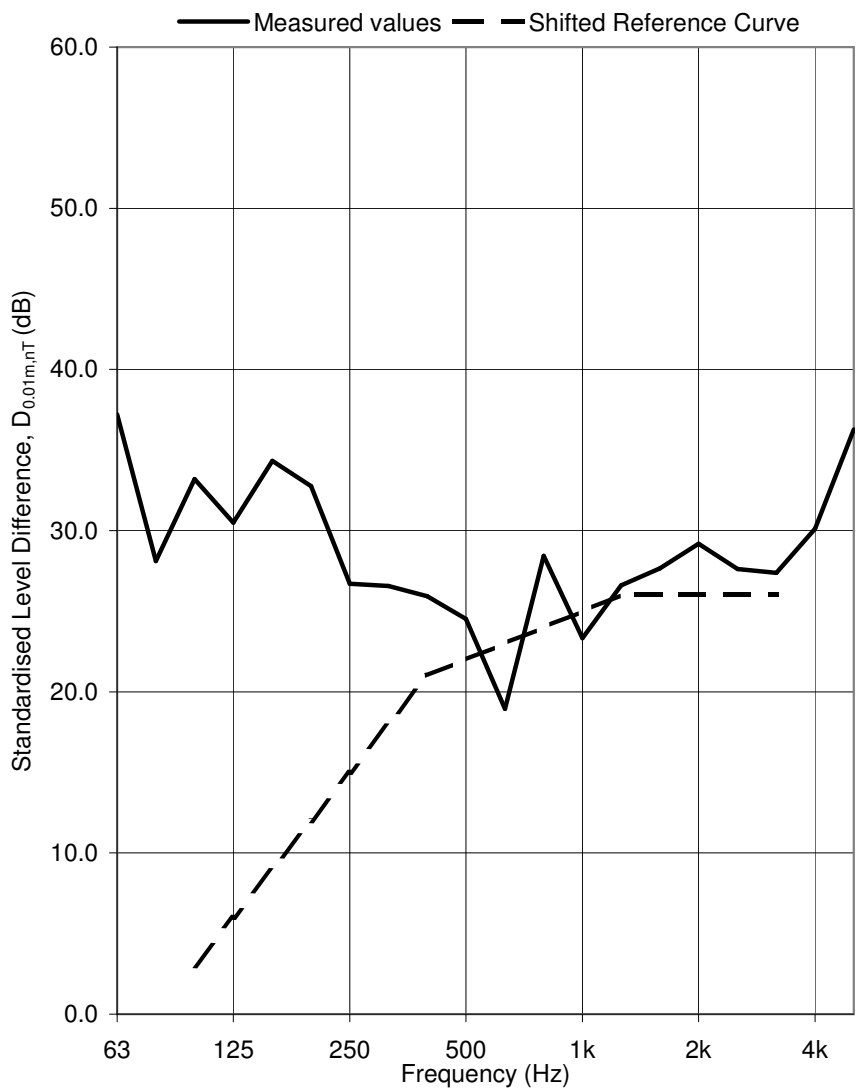
Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712031

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	30.9
63	37.2
80	28.1
100	33.2
125	30.5
160	34.3
200	32.8
250	26.7
315	26.6
400	25.9
500	24.5
630	18.9
800	28.4
1k	23.3
1.25k	26.6
1.6k	27.7
2k	29.2
2.5k	27.6
3.15k	27.4
4k	30.1
5k	36.3

$D_{0.01m,nT,w}(C;C_{tr})$ 26 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

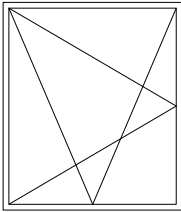
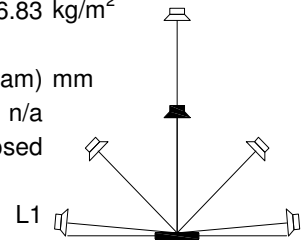
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Untensioned.

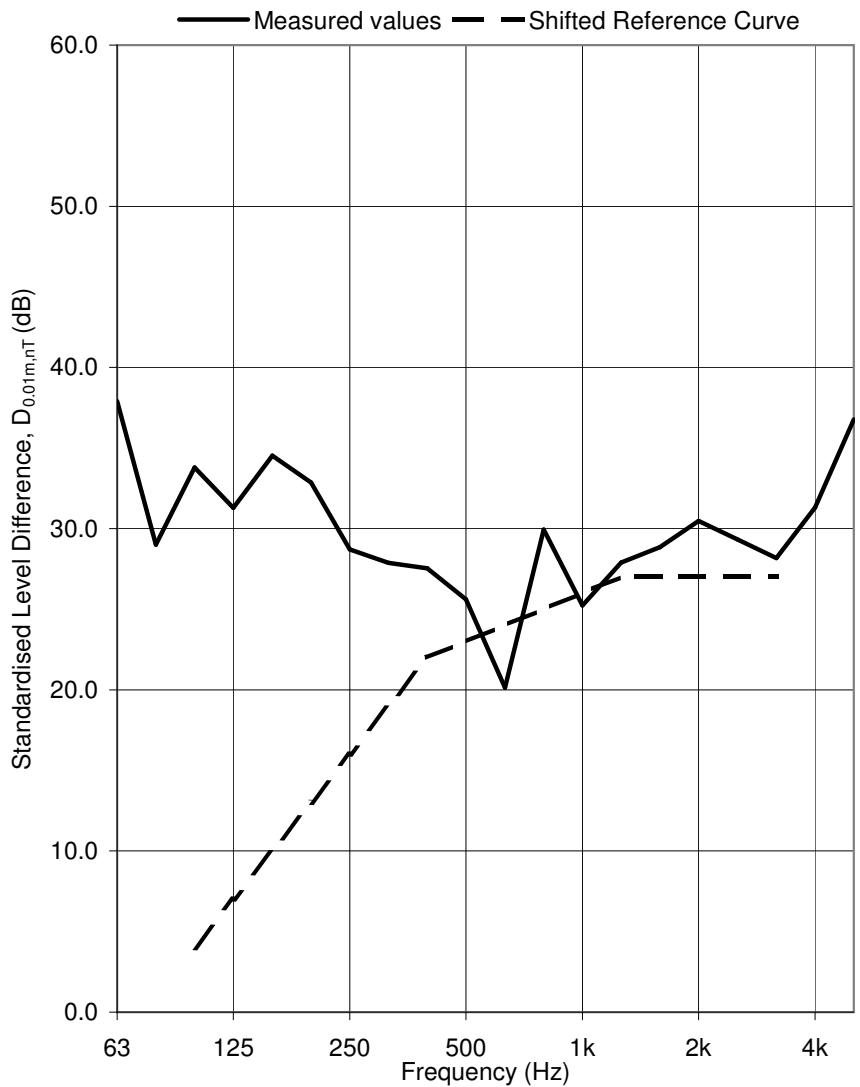
Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712035

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	31.7
63	37.9
80	29.0
100	33.8
125	31.3
160	34.5
200	32.9
250	28.7
315	27.9
400	27.5
500	25.6
630	20.1
800	29.9
1k	25.2
1.25k	27.9
1.6k	28.9
2k	30.5
2.5k	29.3
3.15k	28.2
4k	31.3
5k	36.8

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

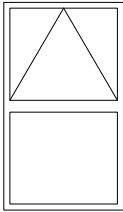
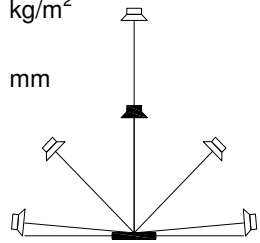
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

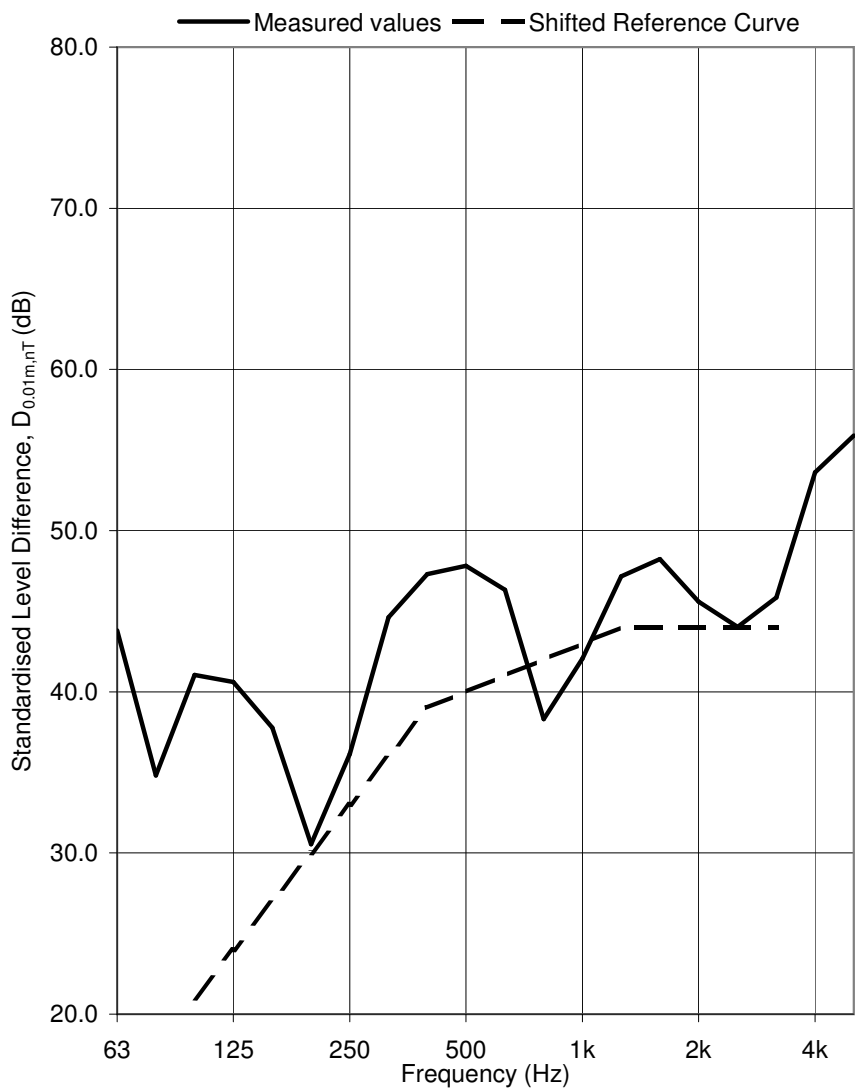
Date: 18/7/2005
 Air temperature: 20.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718002

Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	42.4
63	43.8
80	34.8
100	41.0
125	40.6
160	37.8
200	30.5
250	36.1
315	44.6
400	47.3
500	47.8
630	46.3
800	38.3
1k	42.0
1.25k	47.2
1.6k	48.2
2k	45.6
2.5k	44.0
3.15k	45.8
4k	53.6
5k	55.9

$D_{0.01m,nT,w}(C;C_{tr})$ 44 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

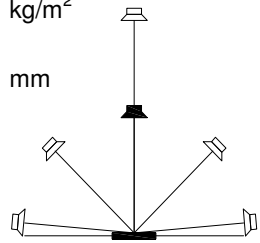
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

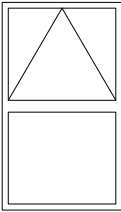
Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

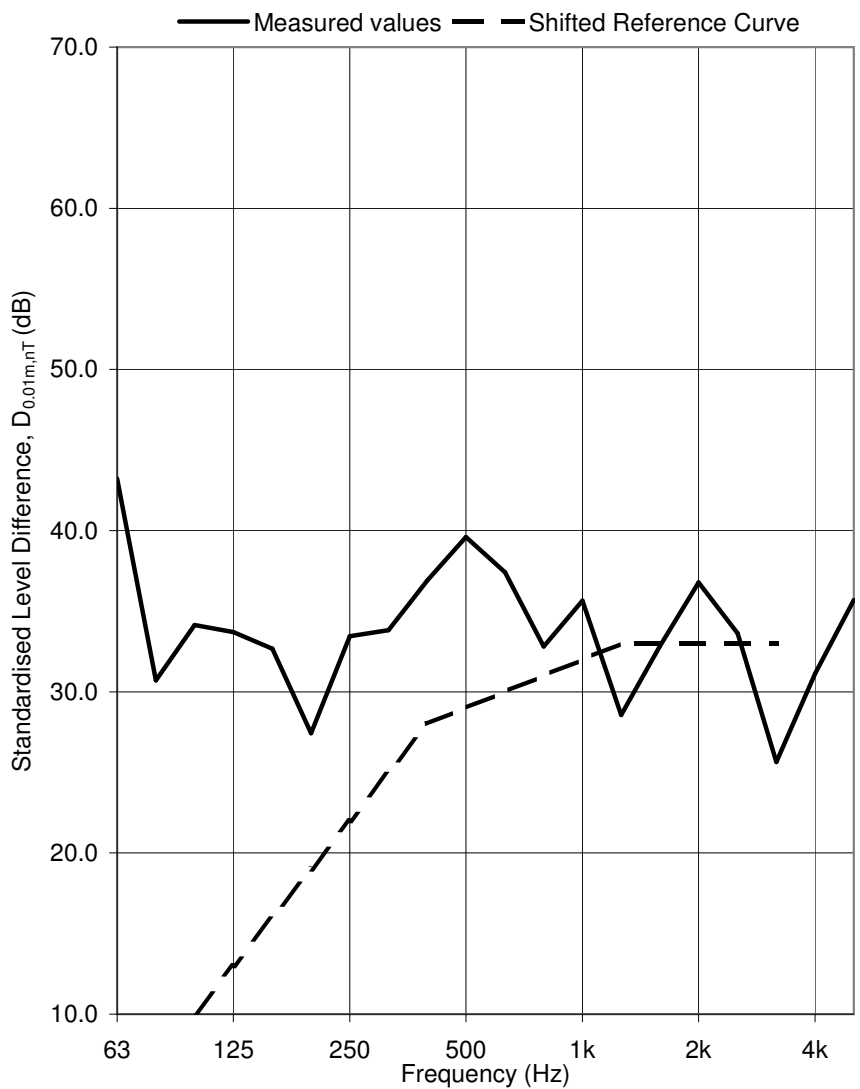


Test ID: 719016

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	37.9
63	43.2
80	30.7
100	34.1
125	33.7
160	32.7
200	27.4
250	33.4
315	33.8
400	36.9
500	39.6
630	37.4
800	32.8
1k	35.6
1.25k	28.6
1.6k	32.8
2k	36.8
2.5k	33.6
3.15k	25.6
4k	31.1
5k	35.7

$D_{0.01m,nT,w}(C;C_{tr})$ 33 (-2; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

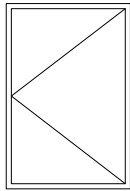
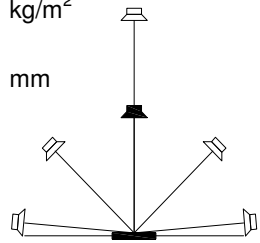
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

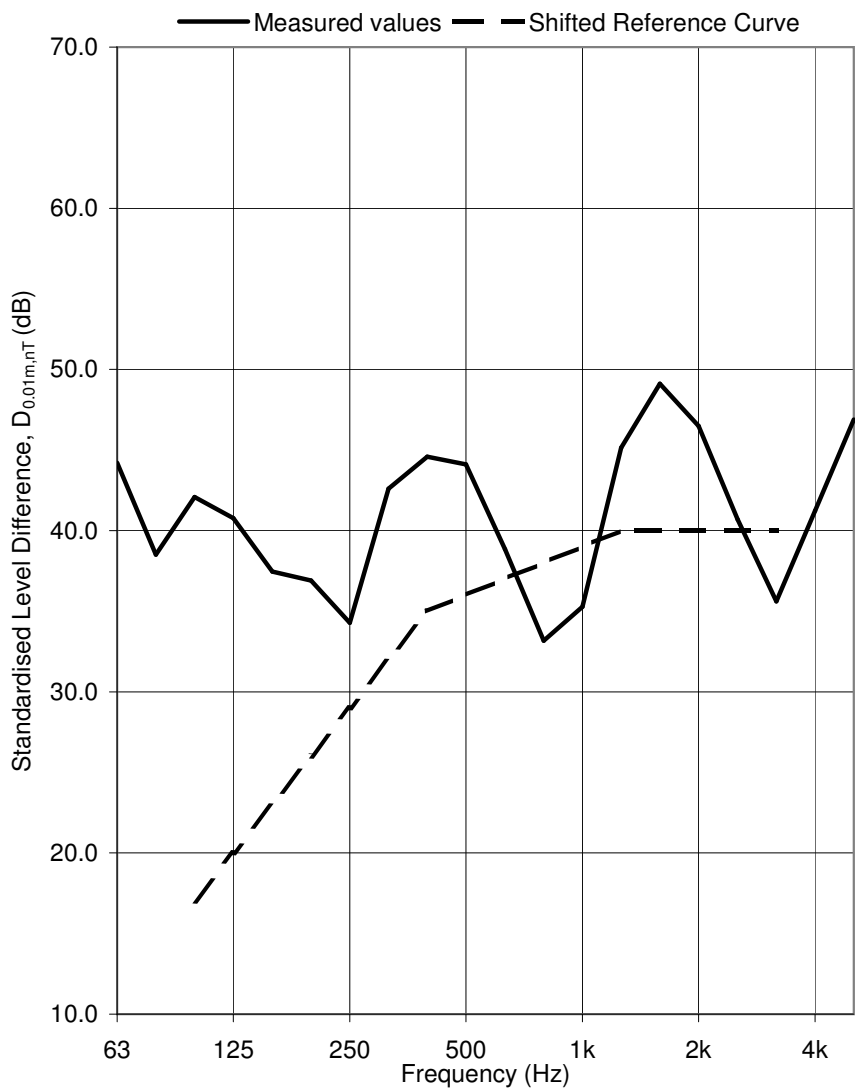
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720015

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	41.2
63	44.2
80	38.5
100	42.1
125	40.8
160	37.5
200	36.9
250	34.3
315	42.6
400	44.6
500	44.1
630	38.8
800	33.2
1k	35.3
1.25k	45.1
1.6k	49.1
2k	46.5
2.5k	40.7
3.15k	35.6
4k	41.2
5k	46.9

$D_{0.01m,nT,w}(C;C_{tr})$ 40 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

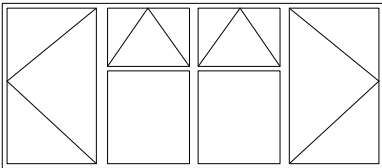
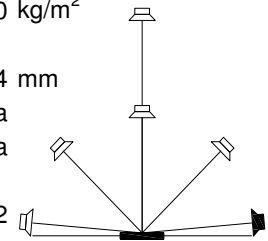
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

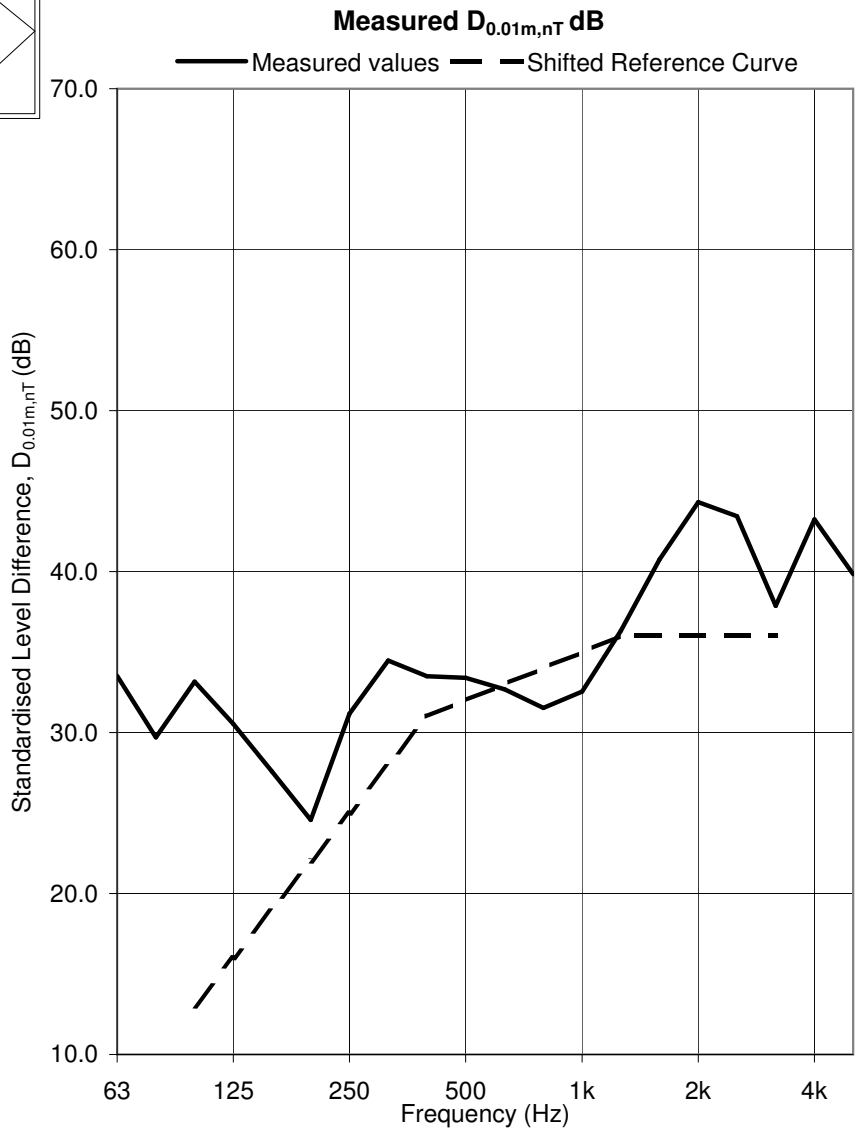
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0102 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628044

Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	24.8
63	33.5
80	29.7
100	33.2
125	30.5
160	27.6
200	24.6
250	31.2
315	34.5
400	33.5
500	33.4
630	32.7
800	31.5
1k	32.5
1.25k	36.3
1.6k	40.8
2k	44.3
2.5k	43.4
3.15k	37.9
4k	43.2
5k	39.8



D_{0.01m,nT,w(C;C_{tr}) 36 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

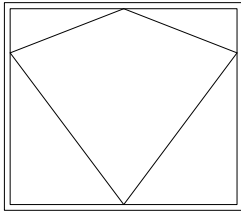
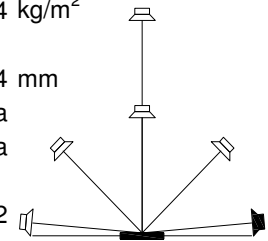
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

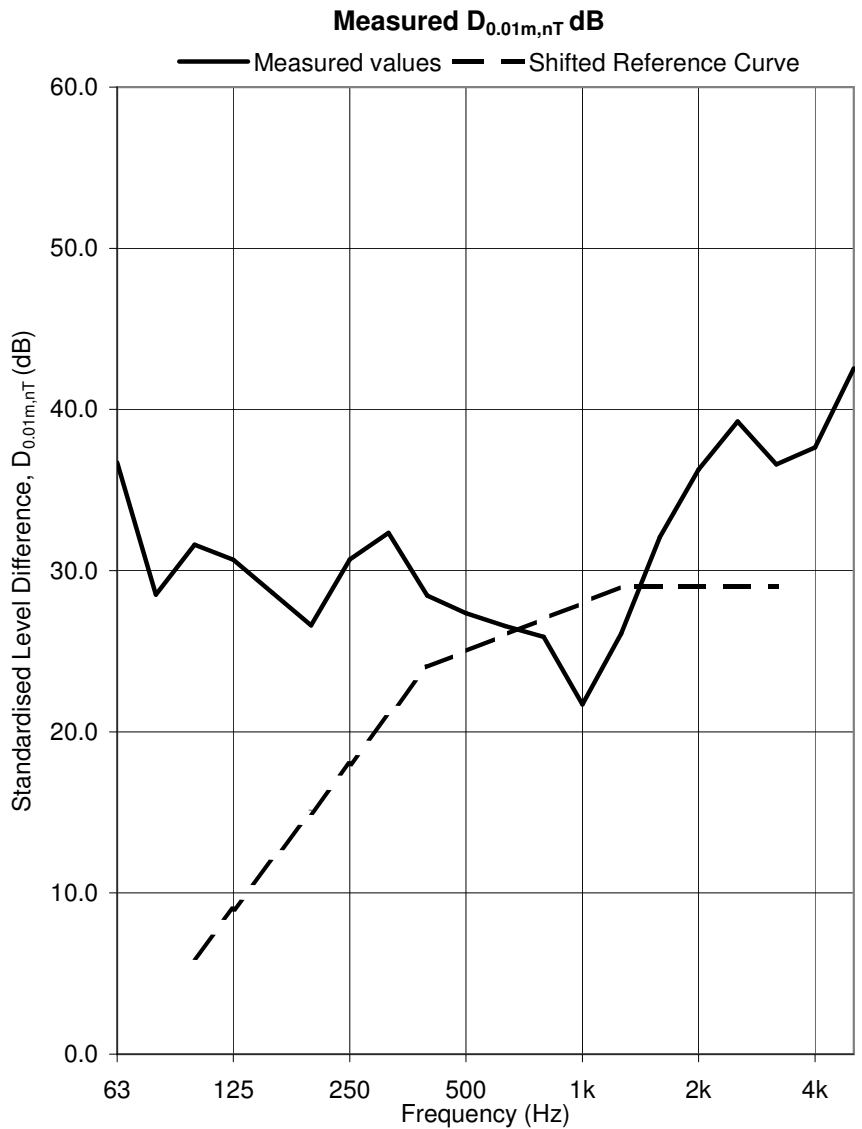
Date: 5/7/05
 Air temperature: 19.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705007

Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	26.7
63	36.7
80	28.5
100	31.6
125	30.7
160	28.6
200	26.6
250	30.7
315	32.3
400	28.5
500	27.4
630	26.6
800	25.9
1k	21.7
1.25k	26.1
1.6k	32.1
2k	36.3
2.5k	39.3
3.15k	36.6
4k	37.6
5k	42.5



D_{0.01m,nT,w(C;C_{tr}) 29 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

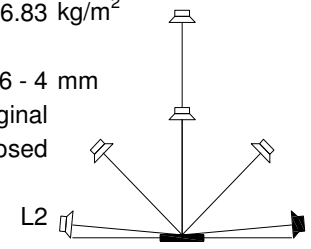
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

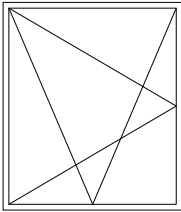
Test Sample: Window C-1 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

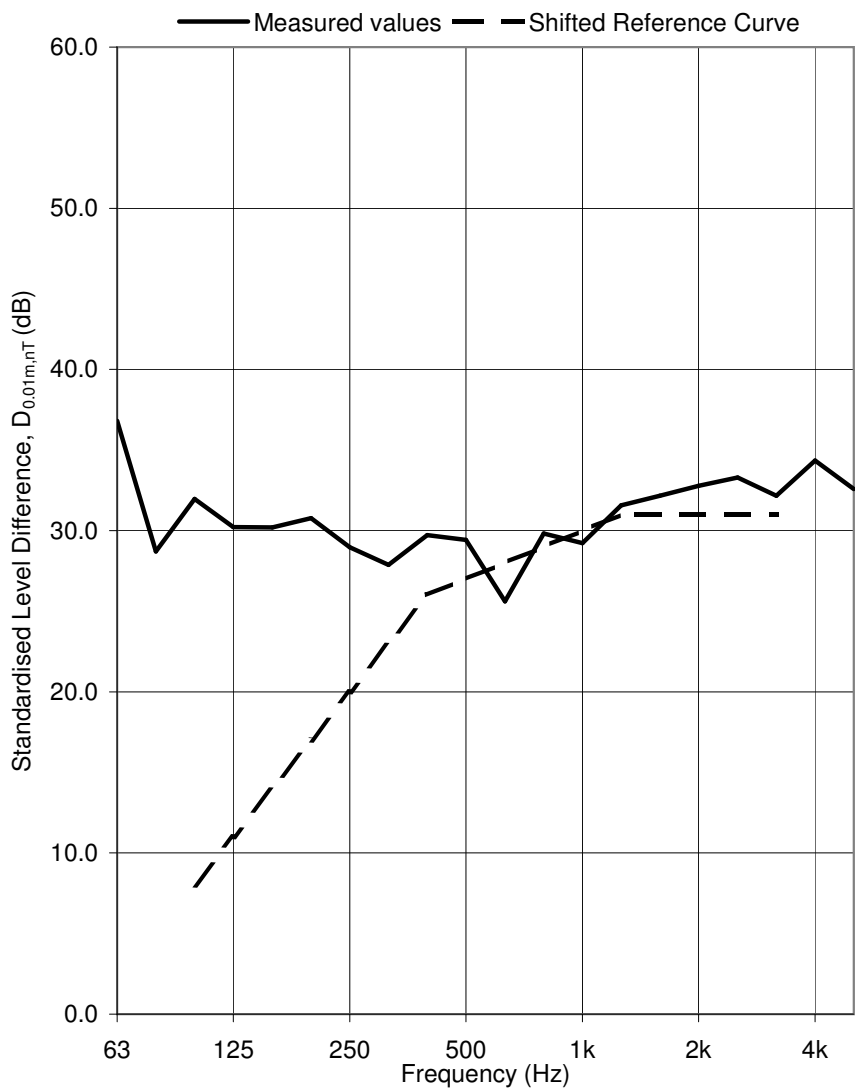


Test ID: 711031

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.0
63	36.8
80	28.7
100	32.0
125	30.2
160	30.2
200	30.8
250	29.0
315	27.9
400	29.7
500	29.4
630	25.6
800	29.8
1k	29.2
1.25k	31.6
1.6k	32.2
2k	32.8
2.5k	33.3
3.15k	32.2
4k	34.4
5k	32.6

$D_{0.01m,nT,w}(C;C_{tr})$ 31 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

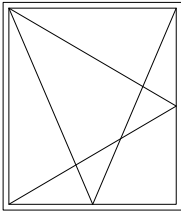
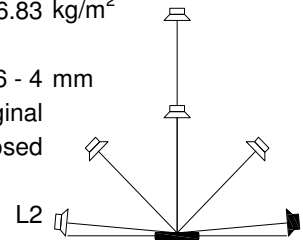
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711035

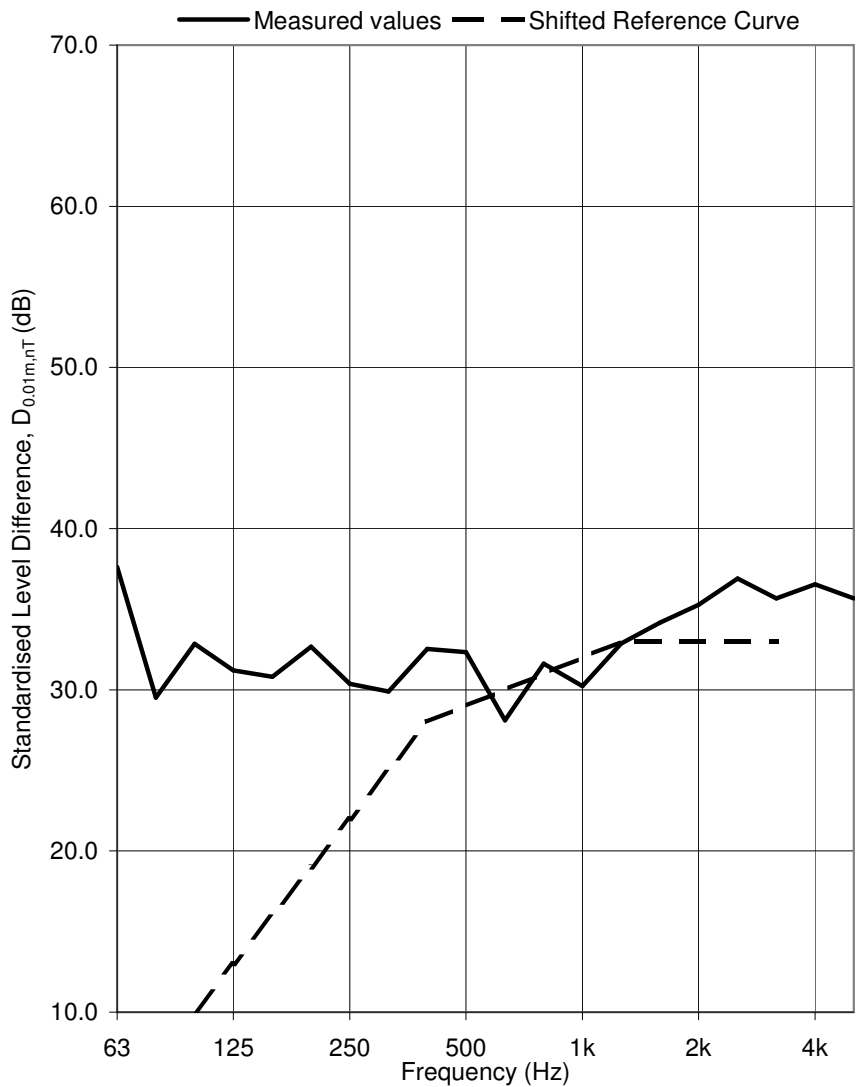
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.0
63	37.6
80	29.5
100	32.9
125	31.2
160	30.8
200	32.7
250	30.4
315	29.9
400	32.5
500	32.3
630	28.1
800	31.6
1k	30.2
1.25k	32.9
1.6k	34.2
2k	35.3
2.5k	36.9
3.15k	35.7
4k	36.6
5k	35.7

$D_{0.01m,nT,w}(C;C_{tr})$ 33 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

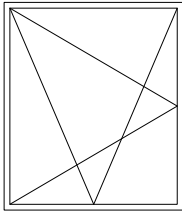
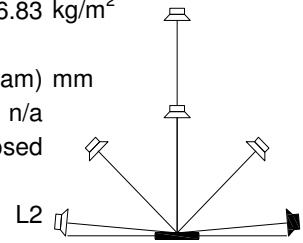
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712044

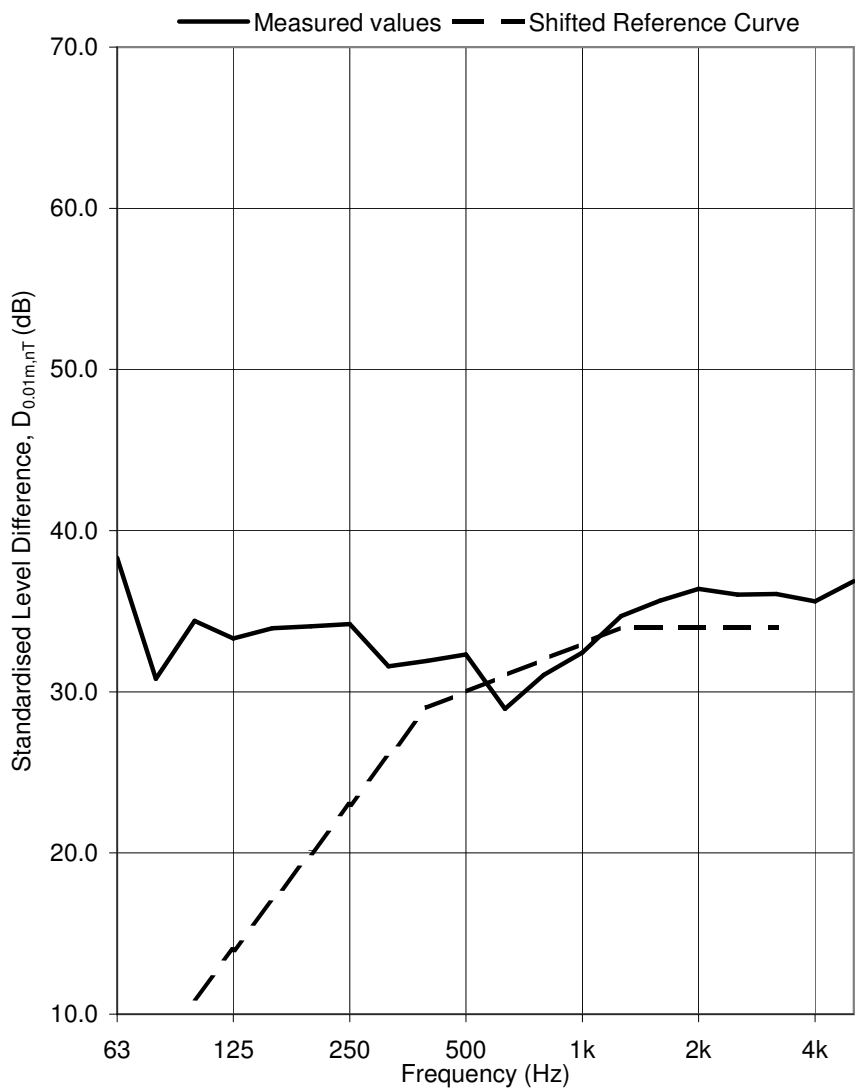
Test Sample: Window C-3 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.6
63	38.3
80	30.8
100	34.4
125	33.3
160	33.9
200	34.1
250	34.2
315	31.6
400	31.9
500	32.3
630	28.9
800	31.0
1k	32.4
1.25k	34.7
1.6k	35.7
2k	36.4
2.5k	36.0
3.15k	36.1
4k	35.6
5k	36.9

$D_{0.01m,nT,w}(C;C_{tr})$ 34 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

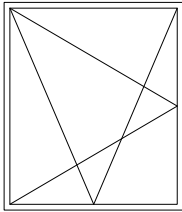
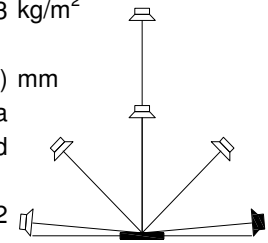
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

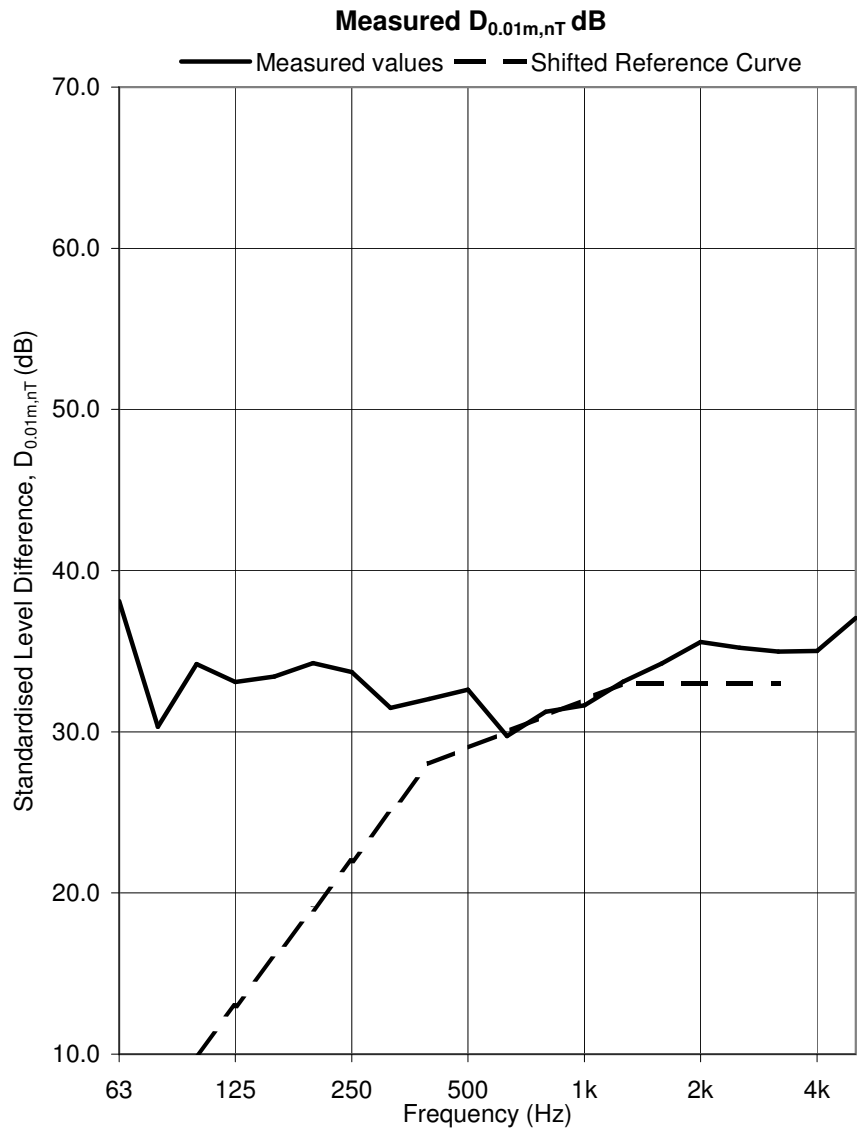
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712048

Test Sample: Window C-4 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	27.3
63	38.1
80	30.3
100	34.2
125	33.1
160	33.4
200	34.3
250	33.7
315	31.5
400	32.0
500	32.6
630	29.7
800	31.2
1k	31.6
1.25k	33.1
1.6k	34.3
2k	35.6
2.5k	35.2
3.15k	35.0
4k	35.0
5k	37.1



D_{0.01m,nT,w(C;C_{tr}) 33 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

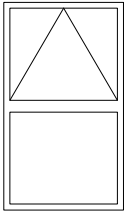
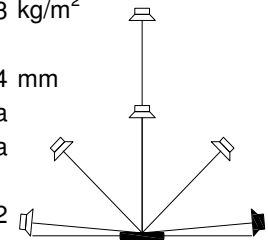
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

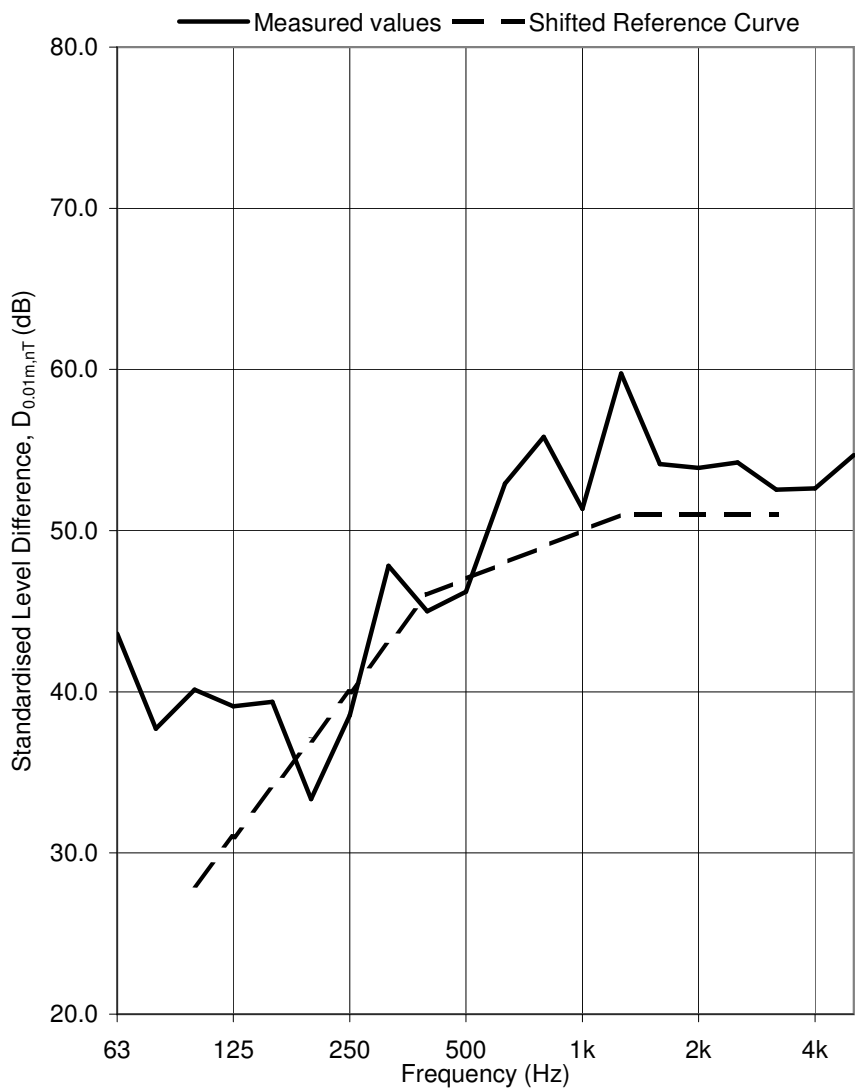
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718016

Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	40.0
63	43.6
80	37.7
100	40.1
125	39.1
160	39.4
200	33.3
250	38.5
315	47.8
400	45.0
500	46.2
630	52.9
800	55.8
1k	51.3
1.25k	59.8
1.6k	54.1
2k	53.9
2.5k	54.2
3.15k	52.5
4k	52.6
5k	54.7

D_{0.01m,nT,w(C;C_{tr}) 51 (-2; -5) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

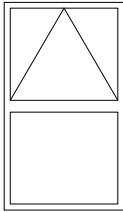
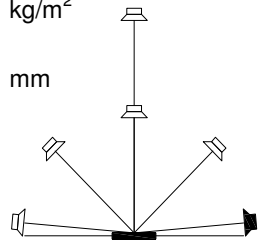
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

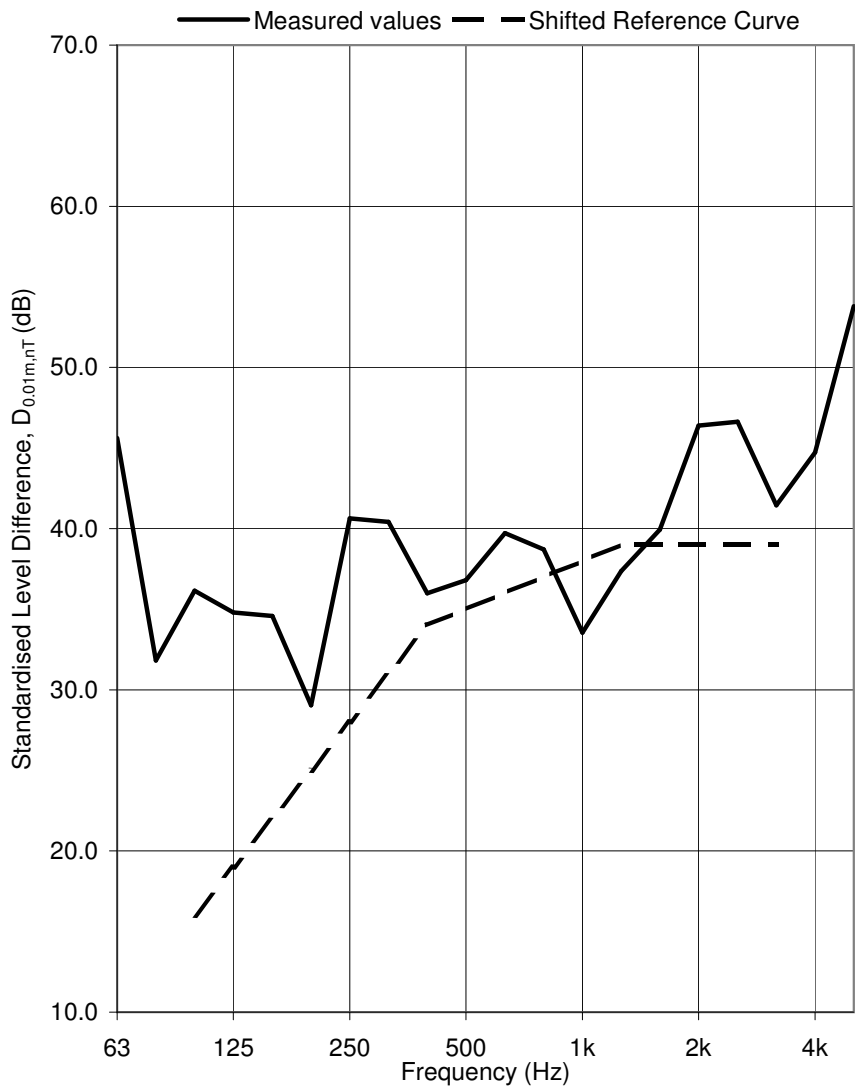
Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719030

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	36.3
63	45.6
80	31.8
100	36.1
125	34.8
160	34.6
200	29.0
250	40.6
315	40.4
400	36.0
500	36.8
630	39.7
800	38.7
1k	33.5
1.25k	37.4
1.6k	39.9
2k	46.4
2.5k	46.6
3.15k	41.4
4k	44.7
5k	53.8

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

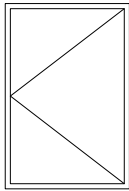
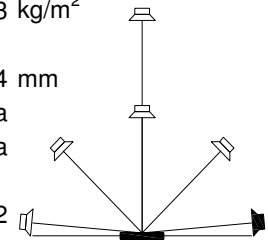
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

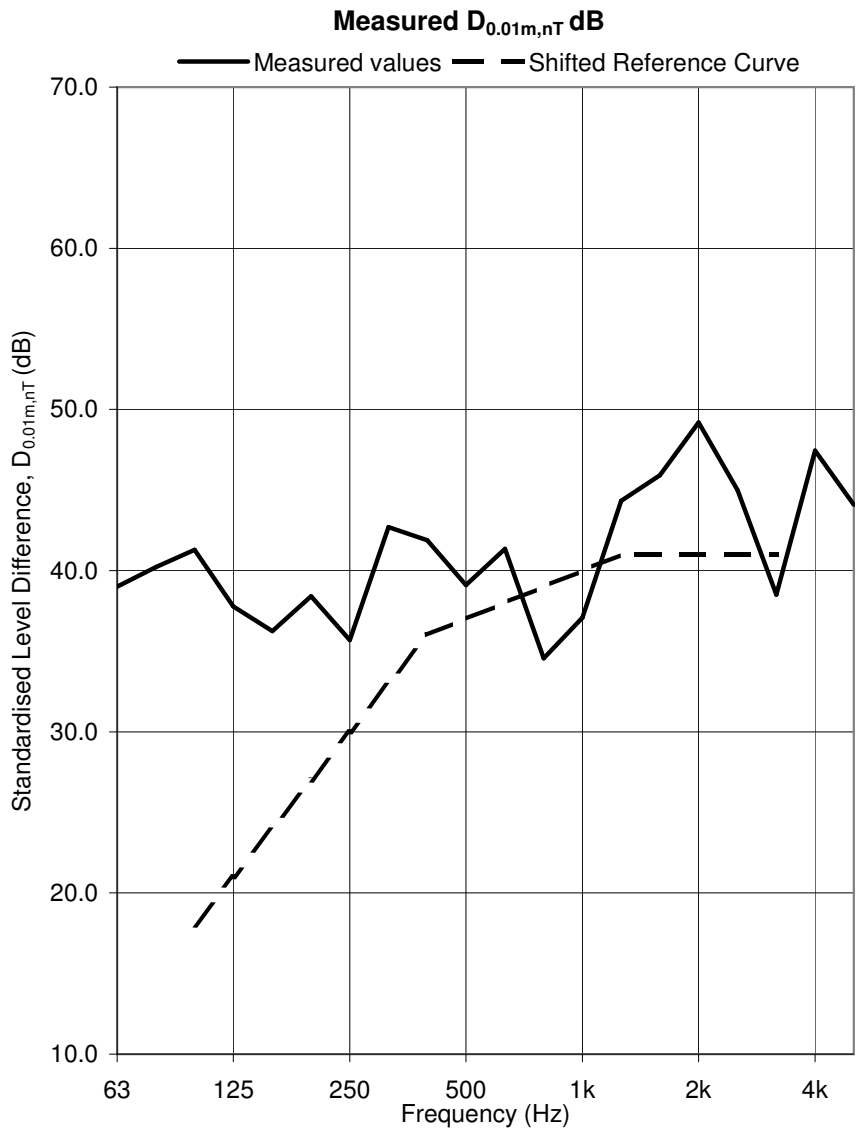
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720043

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	39.0
63	39.0
80	40.2
100	41.3
125	37.8
160	36.3
200	38.4
250	35.7
315	42.7
400	41.9
500	39.1
630	41.3
800	34.6
1k	37.1
1.25k	44.3
1.6k	45.9
2k	49.2
2.5k	45.0
3.15k	38.5
4k	47.4
5k	44.1



D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

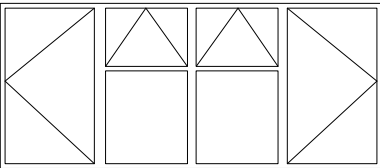
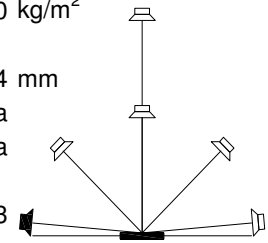
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

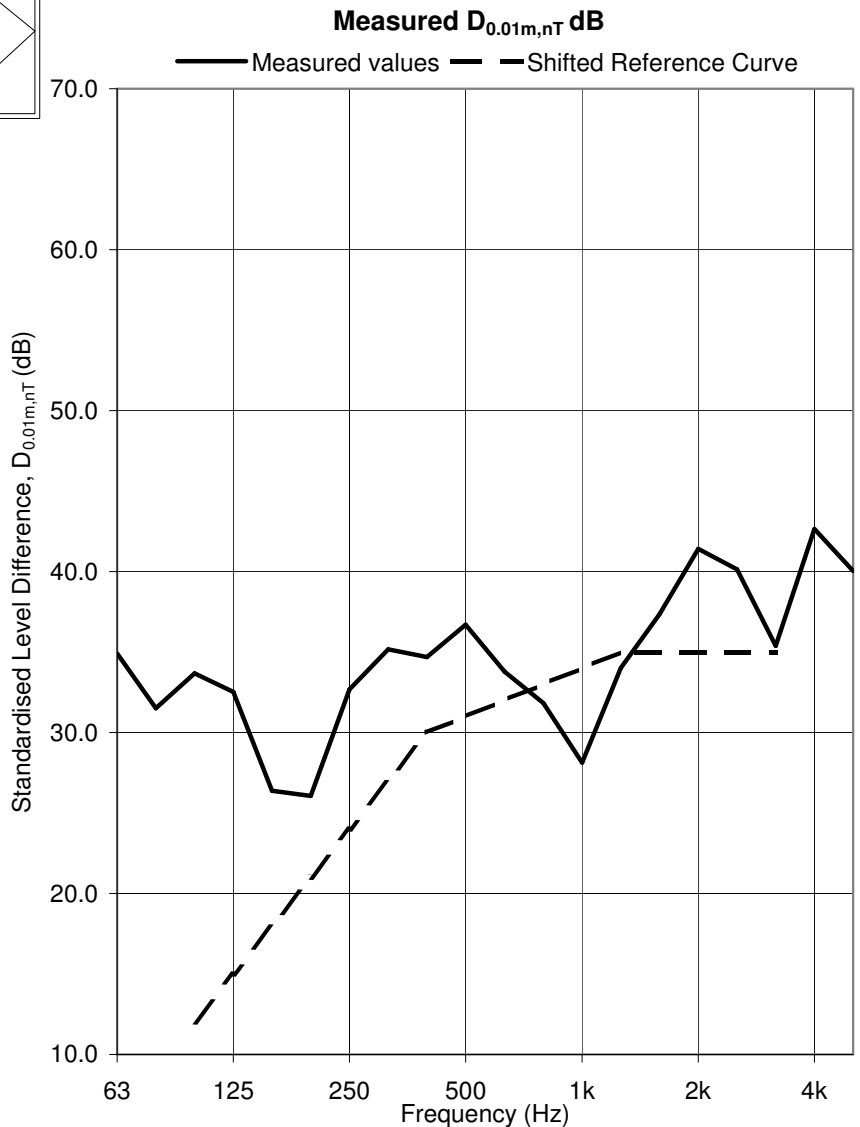
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628060

Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	26.2
63	34.9
80	31.5
100	33.7
125	32.5
160	26.4
200	26.1
250	32.7
315	35.2
400	34.7
500	36.7
630	33.8
800	31.8
1k	28.1
1.25k	34.0
1.6k	37.4
2k	41.4
2.5k	40.1
3.15k	35.4
4k	42.6
5k	40.0



D_{0.01m,nT,w(C;C_{tr}) 35 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

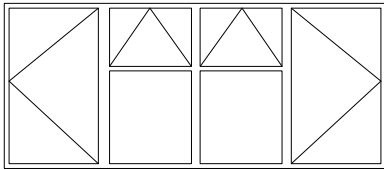
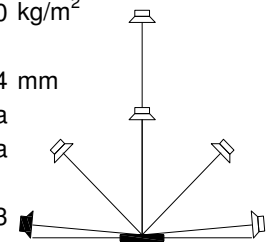
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

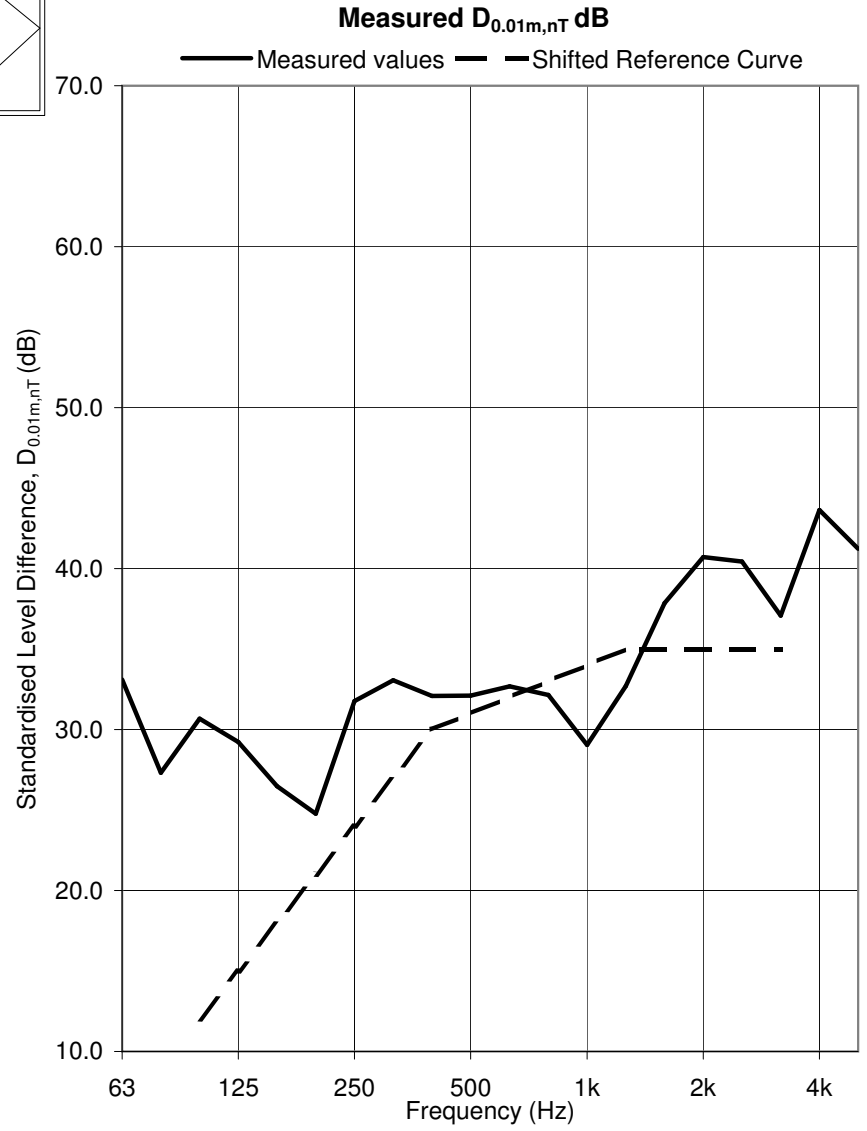
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628055

Test Sample: Window A-2 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	25.6
63	33.1
80	27.3
100	30.7
125	29.2
160	26.5
200	24.8
250	31.8
315	33.1
400	32.1
500	32.1
630	32.7
800	32.1
1k	29.0
1.25k	32.7
1.6k	37.9
2k	40.7
2.5k	40.4
3.15k	37.1
4k	43.6
5k	41.2



D_{0.01m,nT,w(C;C_{tr}) 35 (-2; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

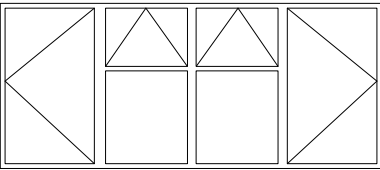
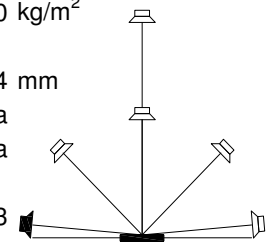
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

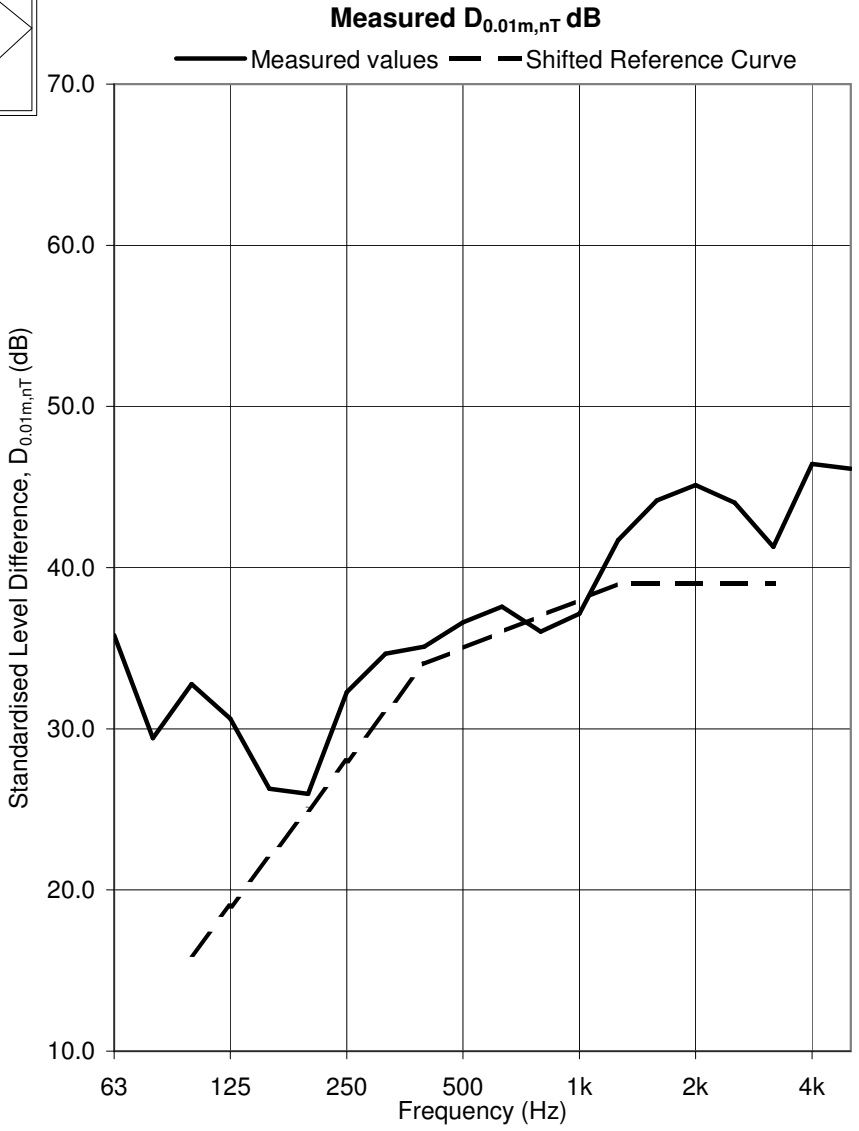
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628050

Test Sample: Window A-3 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	26.1
63	35.8
80	29.4
100	32.8
125	30.6
160	26.3
200	26.0
250	32.3
315	34.7
400	35.1
500	36.6
630	37.6
800	36.0
1k	37.1
1.25k	41.7
1.6k	44.2
2k	45.1
2.5k	44.0
3.15k	41.3
4k	46.4
5k	46.1



D_{0.01m,nT,w(C;C_{tr}) 39 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

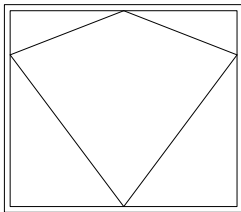
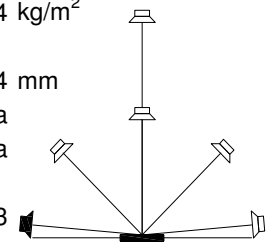
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

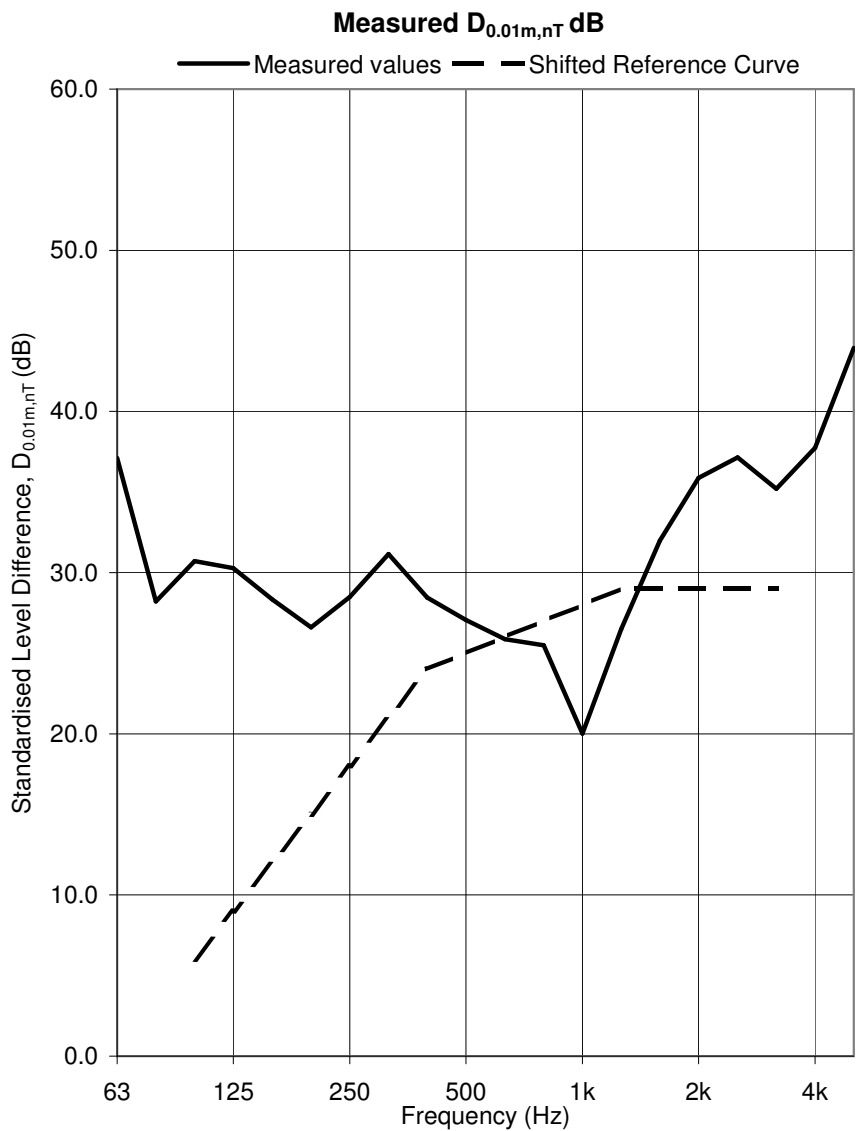
Date: 5/7/05
 Air temperature: 19.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9974 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705012

Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	27.8
63	37.1
80	28.2
100	30.7
125	30.3
160	28.3
200	26.6
250	28.5
315	31.1
400	28.5
500	27.1
630	25.9
800	25.5
1k	20.0
1.25k	26.5
1.6k	32.0
2k	35.9
2.5k	37.2
3.15k	35.2
4k	37.7
5k	43.9



D_{0.01m,nT,w(C;C_{tr}) 29 (-2; -4) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

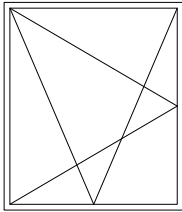
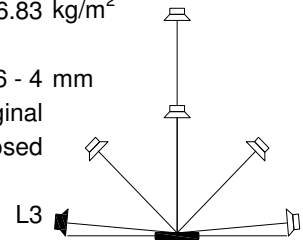
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711041

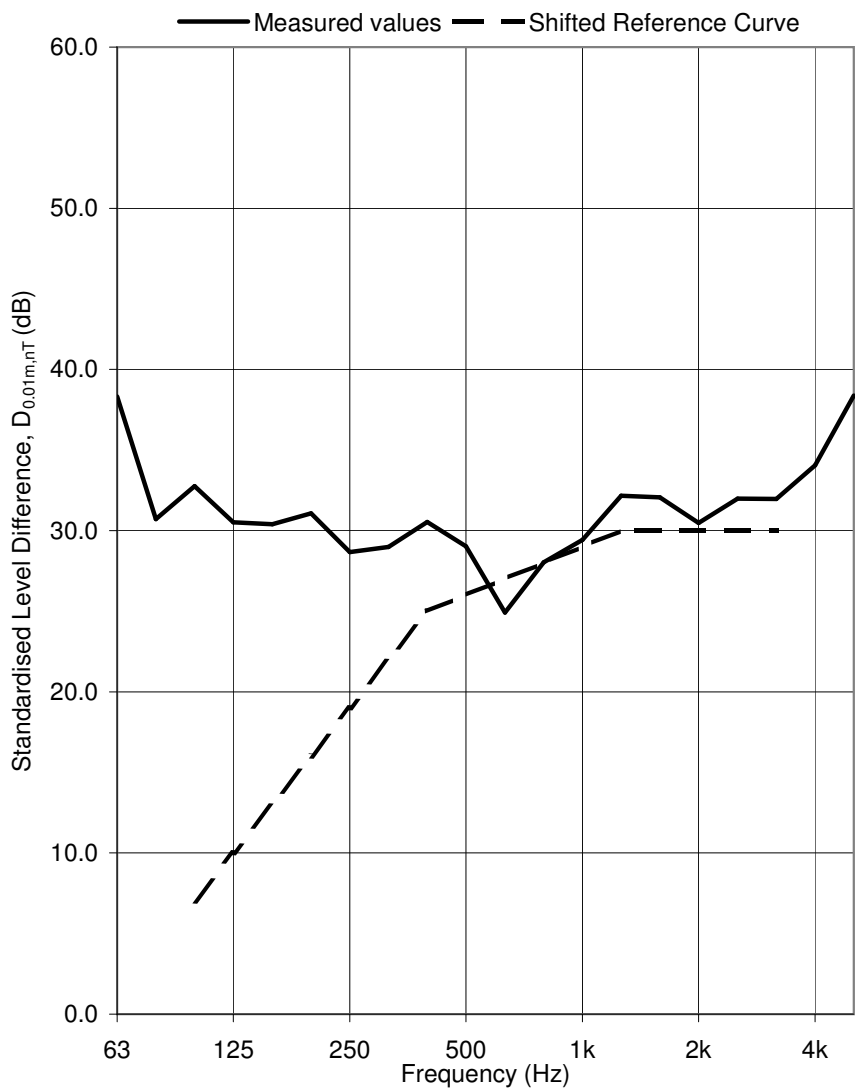
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.0
63	38.3
80	30.7
100	32.8
125	30.5
160	30.4
200	31.1
250	28.7
315	29.0
400	30.5
500	29.0
630	24.9
800	28.0
1k	29.4
1.25k	32.2
1.6k	32.1
2k	30.5
2.5k	32.0
3.15k	32.0
4k	34.1
5k	38.4

$D_{0.01m,nT,w}(C;C_{tr})$ 30 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

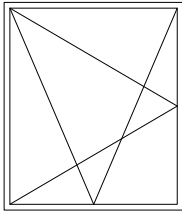
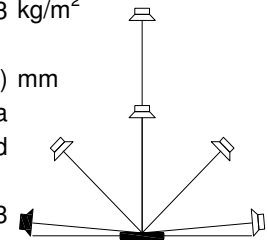
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0243 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712071

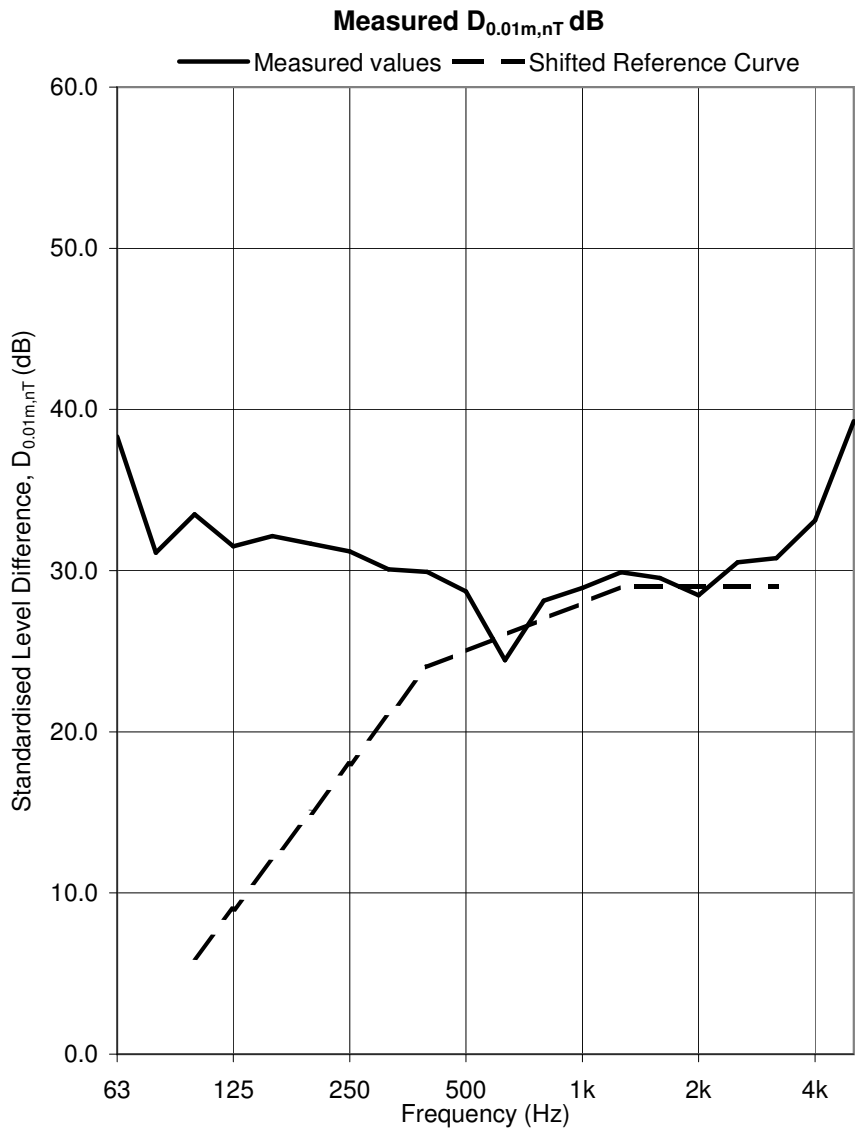
Test Sample: Window C-4 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	28.6
63	38.3
80	31.1
100	33.5
125	31.5
160	32.1
200	31.7
250	31.2
315	30.1
400	29.9
500	28.7
630	24.4
800	28.1
1k	28.9
1.25k	29.9
1.6k	29.6
2k	28.5
2.5k	30.5
3.15k	30.8
4k	33.1
5k	39.3



D_{0.01m,nT,w(C;C_{tr}) 29 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

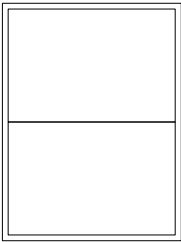
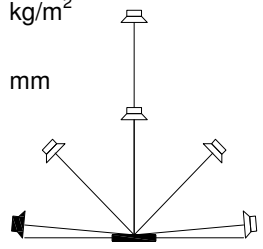
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

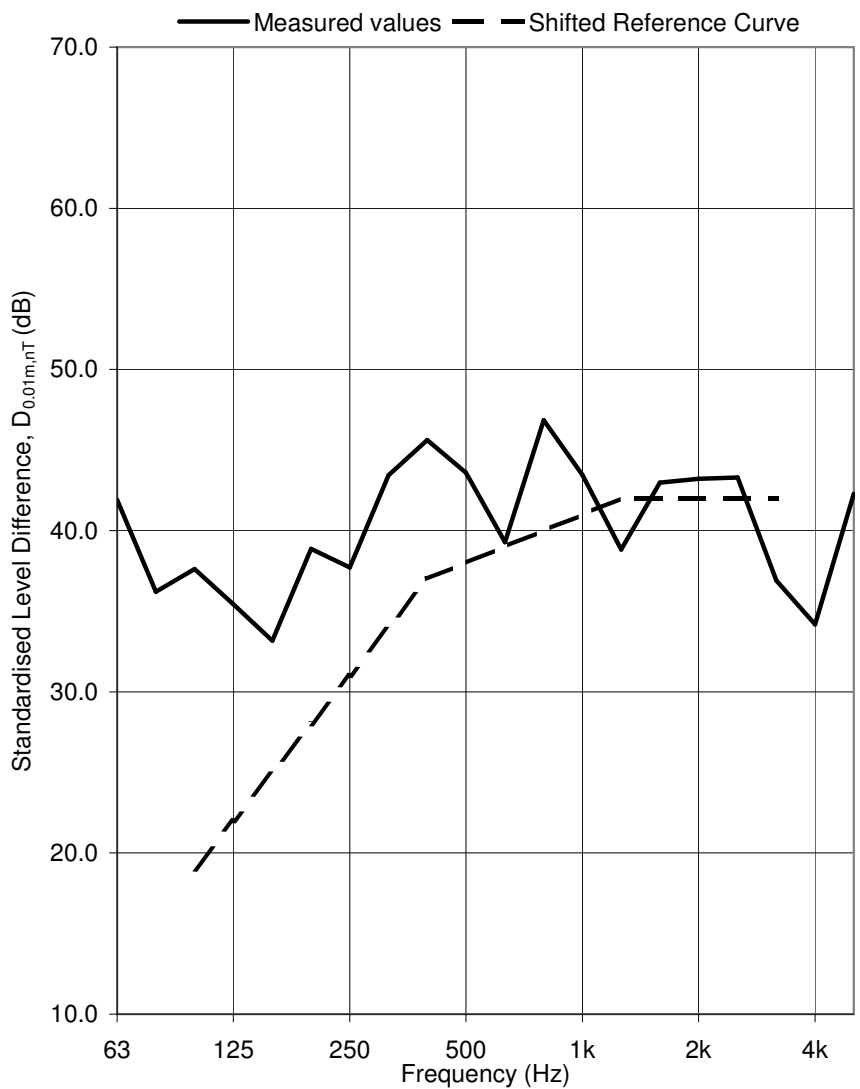
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713044

Test Sample: Window D-1 Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	28.6
63	41.9
80	36.2
100	37.6
125	35.4
160	33.2
200	38.9
250	37.7
315	43.4
400	45.6
500	43.6
630	39.3
800	46.8
1k	43.5
1.25k	38.8
1.6k	43.0
2k	43.2
2.5k	43.3
3.15k	36.9
4k	34.2
5k	42.3

$D_{0.01m,nT,w}(C;C_{tr})$ 42 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

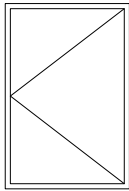
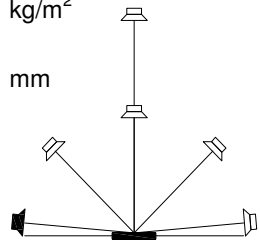
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

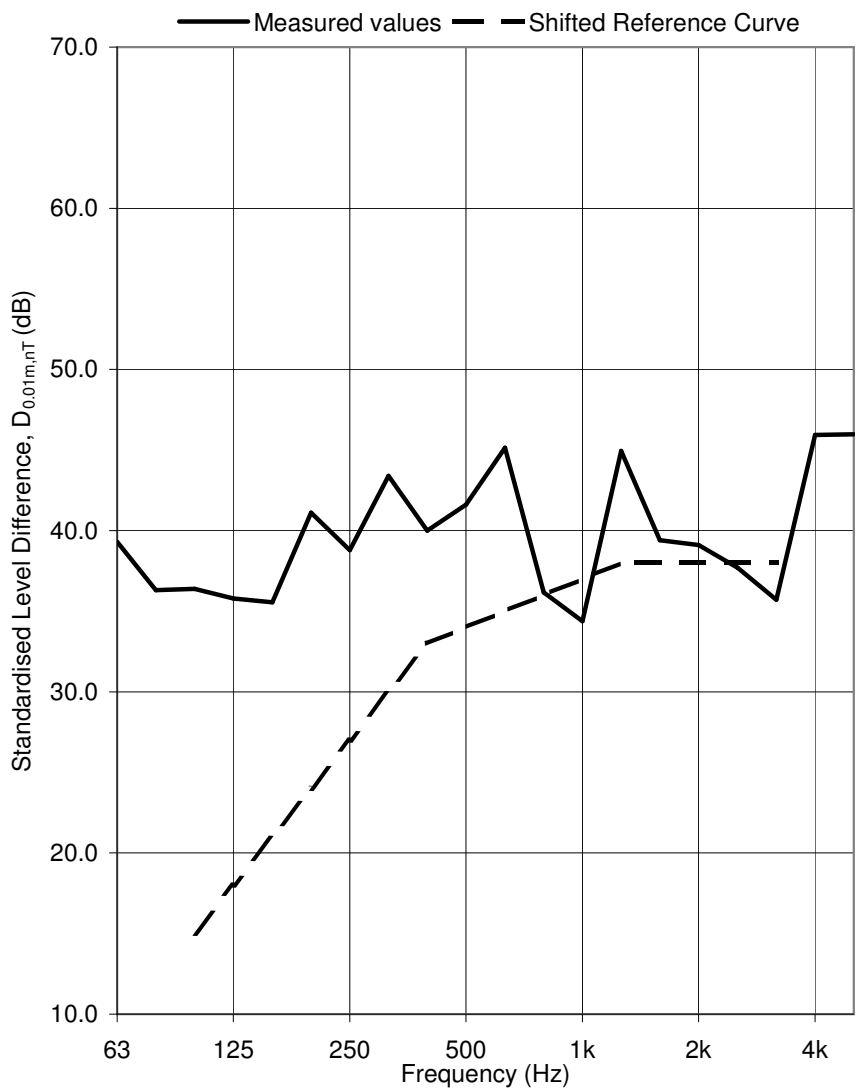
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720040

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	35.5
63	39.3
80	36.3
100	36.4
125	35.8
160	35.6
200	41.1
250	38.8
315	43.4
400	40.0
500	41.6
630	45.1
800	36.2
1k	34.4
1.25k	44.9
1.6k	39.4
2k	39.1
2.5k	37.7
3.15k	35.7
4k	45.9
5k	46.0

$D_{0.01m,nT,w}(C;C_{tr})$ 38 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

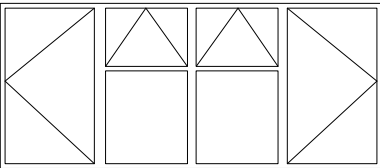
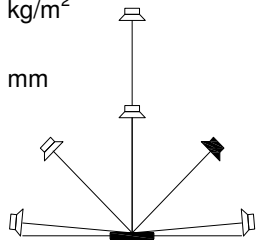
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

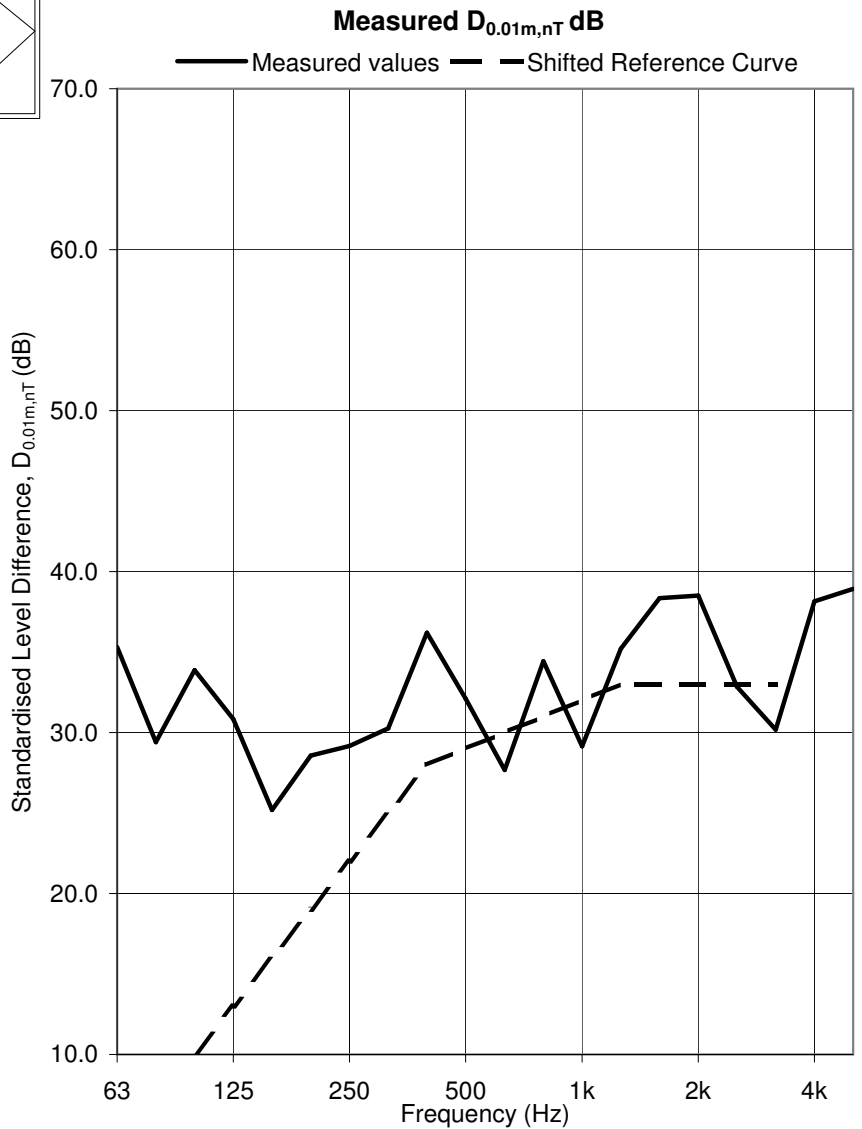
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628076

Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	28.3
63	35.3
80	29.4
100	33.9
125	30.8
160	25.2
200	28.6
250	29.2
315	30.3
400	36.2
500	32.1
630	27.7
800	34.4
1k	29.1
1.25k	35.2
1.6k	38.4
2k	38.5
2.5k	32.8
3.15k	30.2
4k	38.1
5k	38.9



D_{0.01m,nT,w(C;C_{tr}) 33 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

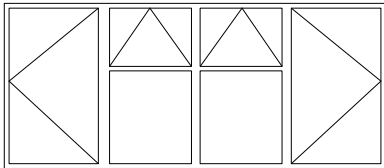
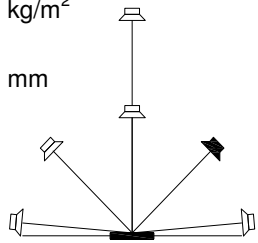
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

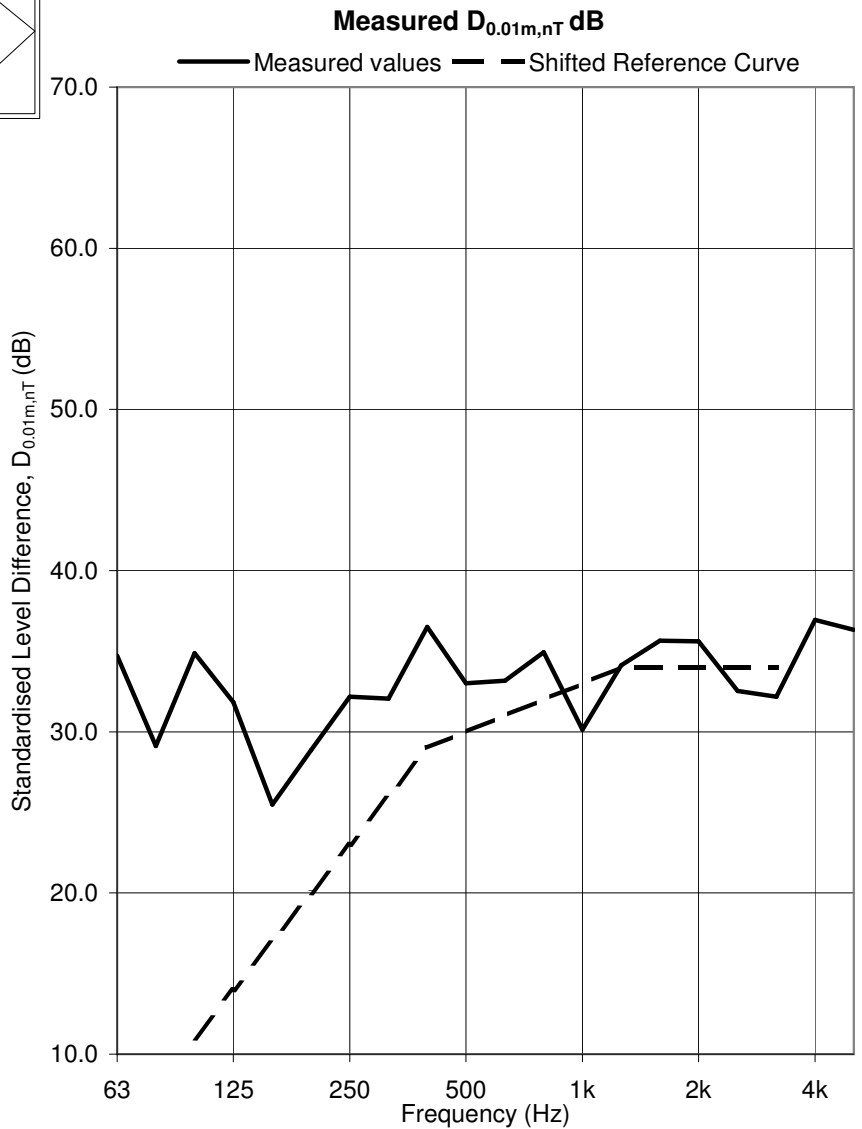
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628071

Test Sample: Window A-2 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	29.7
63	34.7
80	29.1
100	34.9
125	31.8
160	25.5
200	28.9
250	32.2
315	32.1
400	36.5
500	33.0
630	33.2
800	34.9
1k	30.1
1.25k	34.1
1.6k	35.7
2k	35.6
2.5k	32.5
3.15k	32.2
4k	36.9
5k	36.3



D_{0.01m,nT,w(C;C_{tr}) 34 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

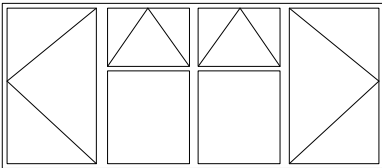
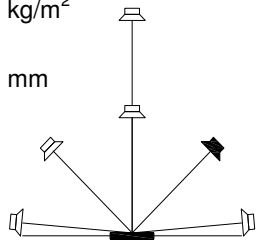
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

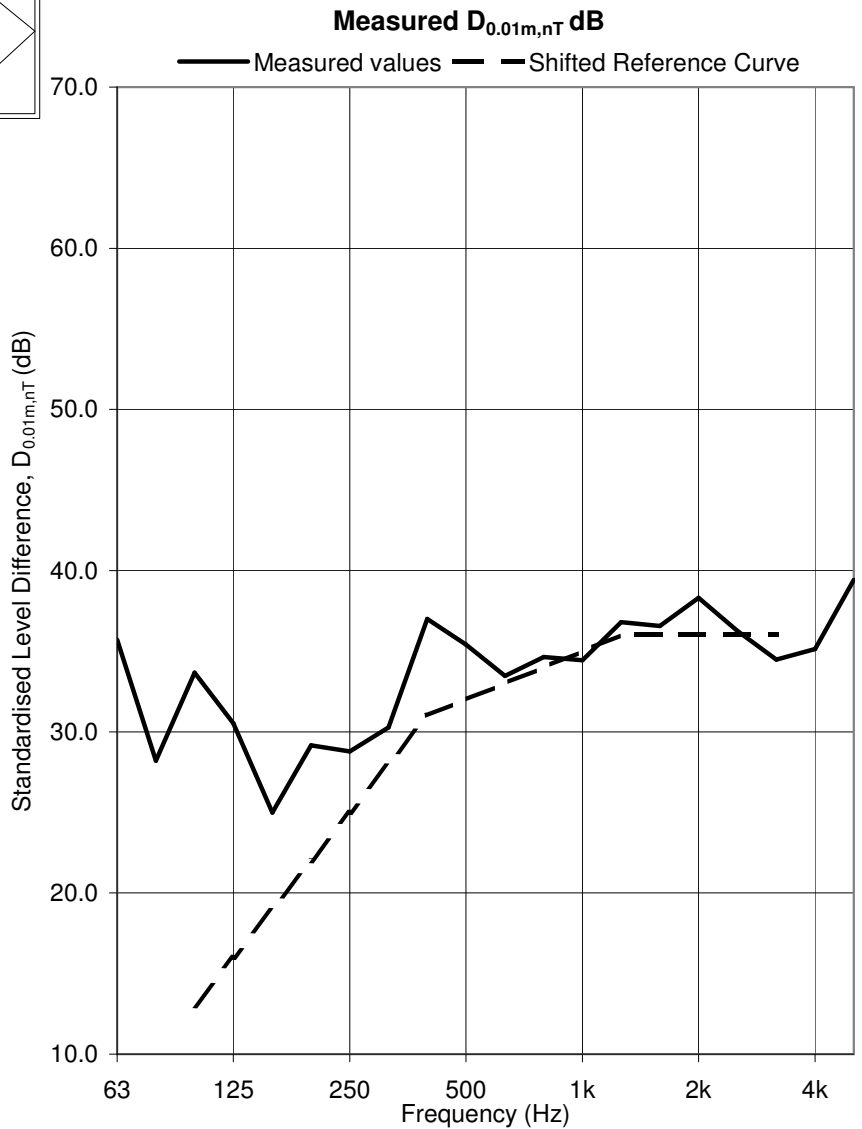
Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628066

Test Sample: Window A-3 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	29.4
63	35.7
80	28.2
100	33.7
125	30.5
160	25.0
200	29.2
250	28.8
315	30.3
400	37.0
500	35.4
630	33.5
800	34.6
1k	34.4
1.25k	36.8
1.6k	36.6
2k	38.3
2.5k	36.2
3.15k	34.5
4k	35.1
5k	39.4



D_{0.01m,nT,w(C;C_{tr}) 36 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

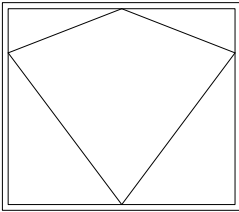
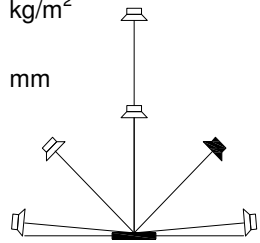
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

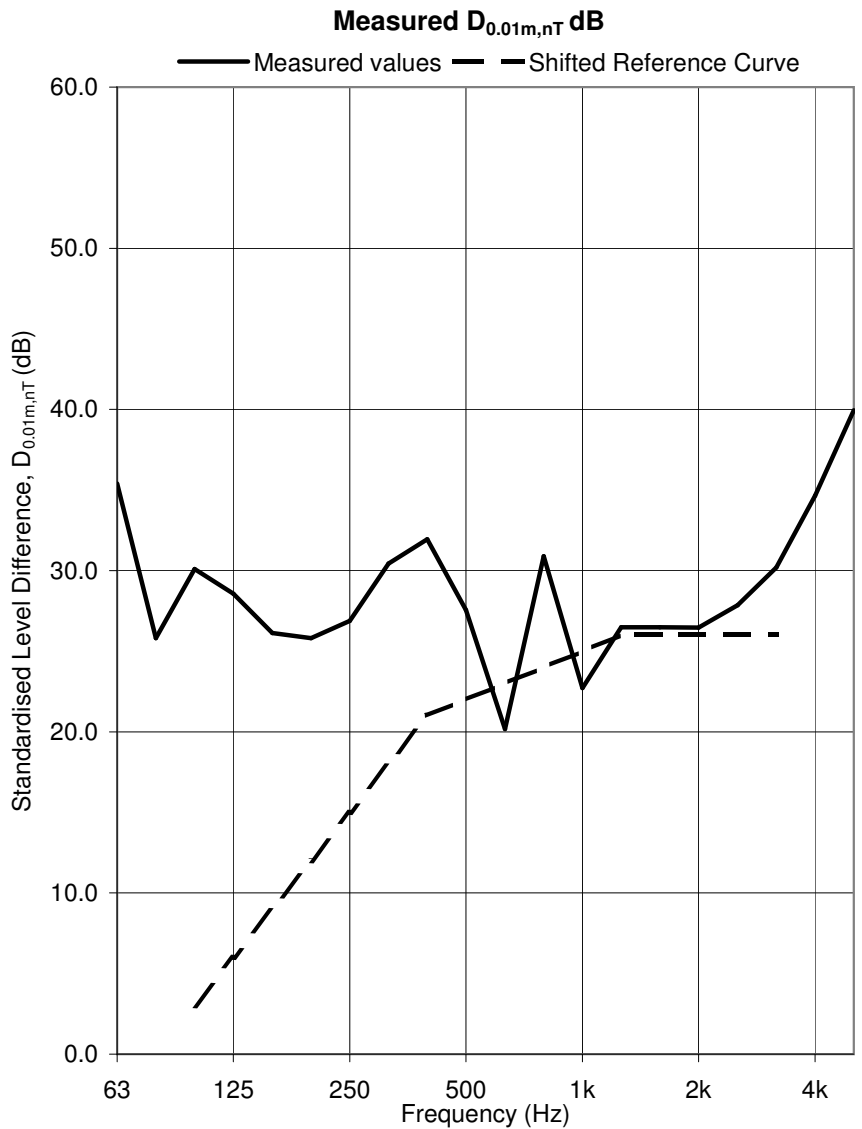
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705017

Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	29.6
63	35.4
80	25.8
100	30.1
125	28.6
160	26.1
200	25.8
250	26.9
315	30.4
400	32.0
500	27.6
630	20.2
800	30.9
1k	22.7
1.25k	26.5
1.6k	26.5
2k	26.5
2.5k	27.9
3.15k	30.2
4k	34.6
5k	39.9



D_{0.01m,nT,w(C;C_{tr}) 26 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

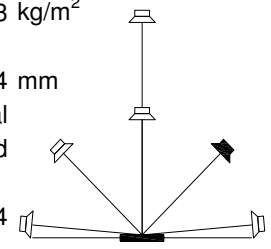
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

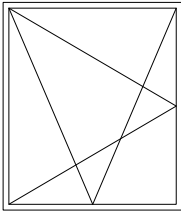
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

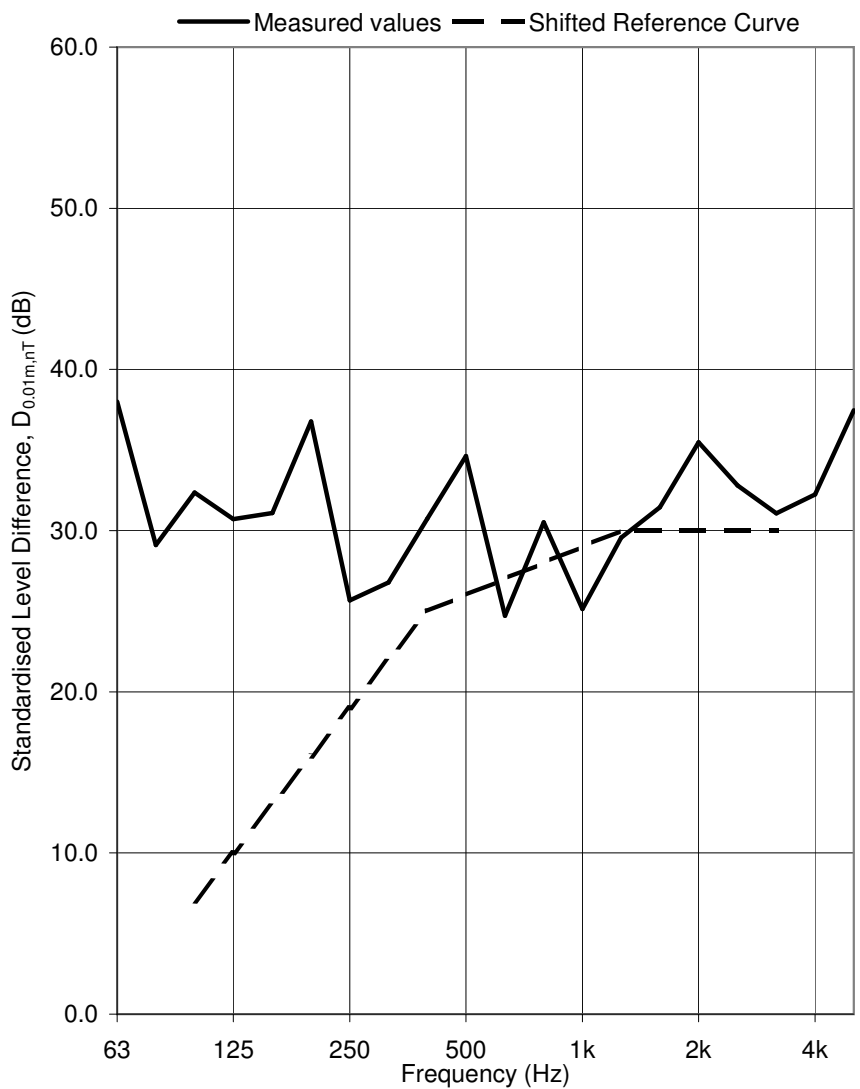


Test ID: 711060

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	30.6
63	38.0
80	29.1
100	32.4
125	30.7
160	31.1
200	36.8
250	25.7
315	26.8
400	30.7
500	34.6
630	24.7
800	30.5
1k	25.1
1.25k	29.6
1.6k	31.5
2k	35.5
2.5k	32.8
3.15k	31.1
4k	32.3
5k	37.5

$D_{0.01m,nT,w}(C;C_{tr})$ 30 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

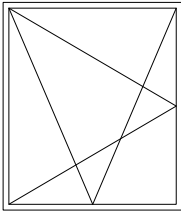
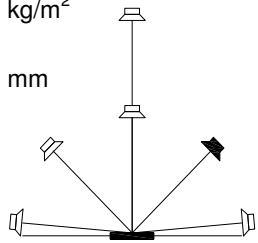
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712057

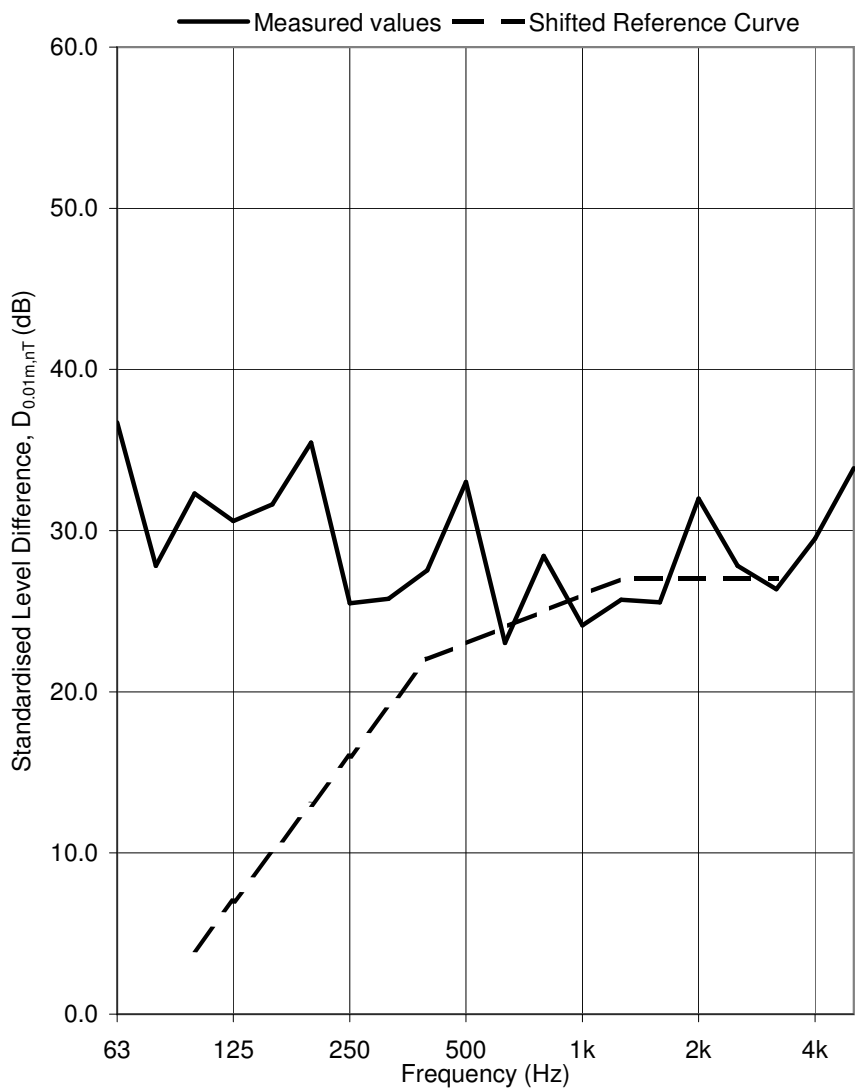
Test Sample: Window C-3 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.4
63	36.7
80	27.8
100	32.3
125	30.6
160	31.6
200	35.5
250	25.5
315	25.8
400	27.5
500	33.0
630	23.0
800	28.4
1k	24.1
1.25k	25.7
1.6k	25.6
2k	32.0
2.5k	27.8
3.15k	26.4
4k	29.5
5k	33.9

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

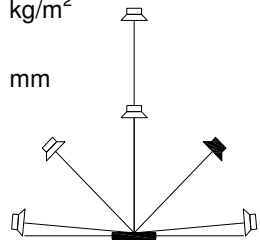
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

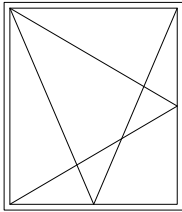
Test Sample: Window C-4 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

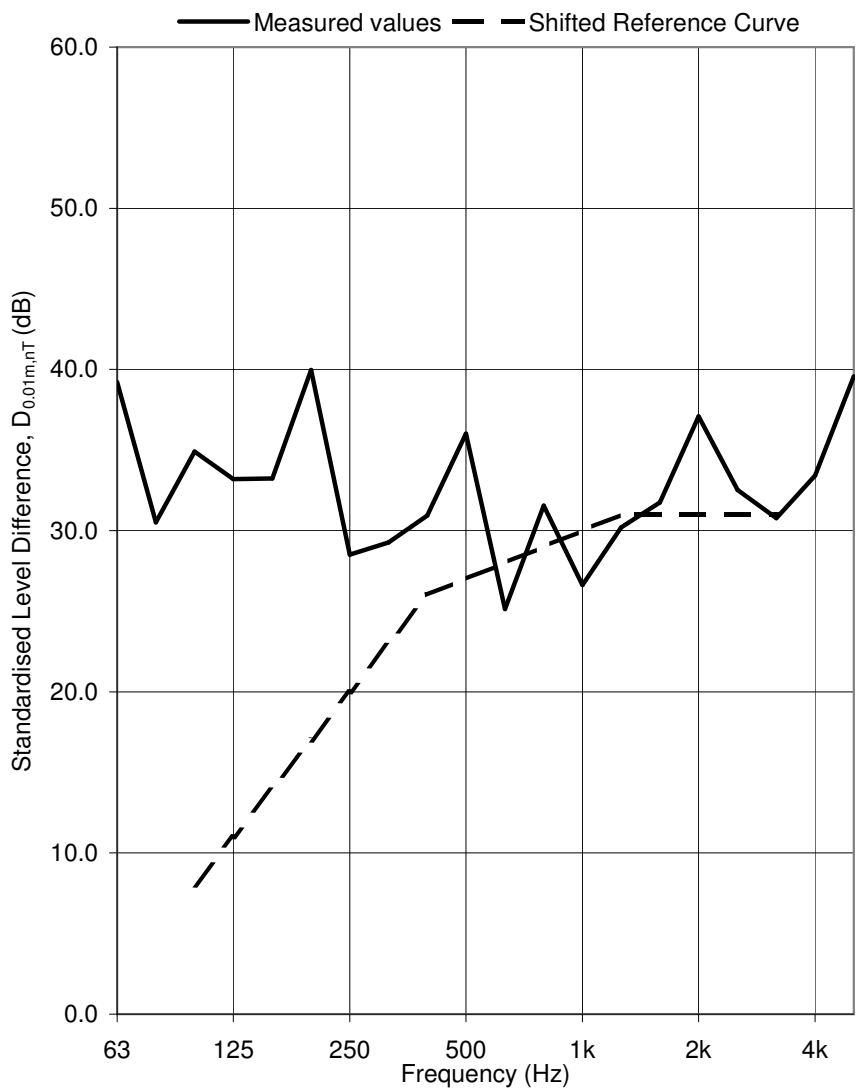


Test ID: 712061

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	32.5
63	39.2
80	30.5
100	34.9
125	33.2
160	33.2
200	40.0
250	28.5
315	29.3
400	30.9
500	36.0
630	25.1
800	31.5
1k	26.6
1.25k	30.2
1.6k	31.8
2k	37.1
2.5k	32.5
3.15k	30.8
4k	33.4
5k	39.6

$D_{0.01m,nT,w}(C;C_{tr})$ 31 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

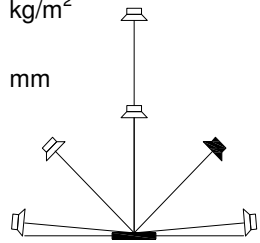
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

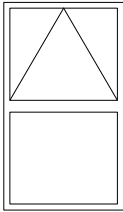
Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

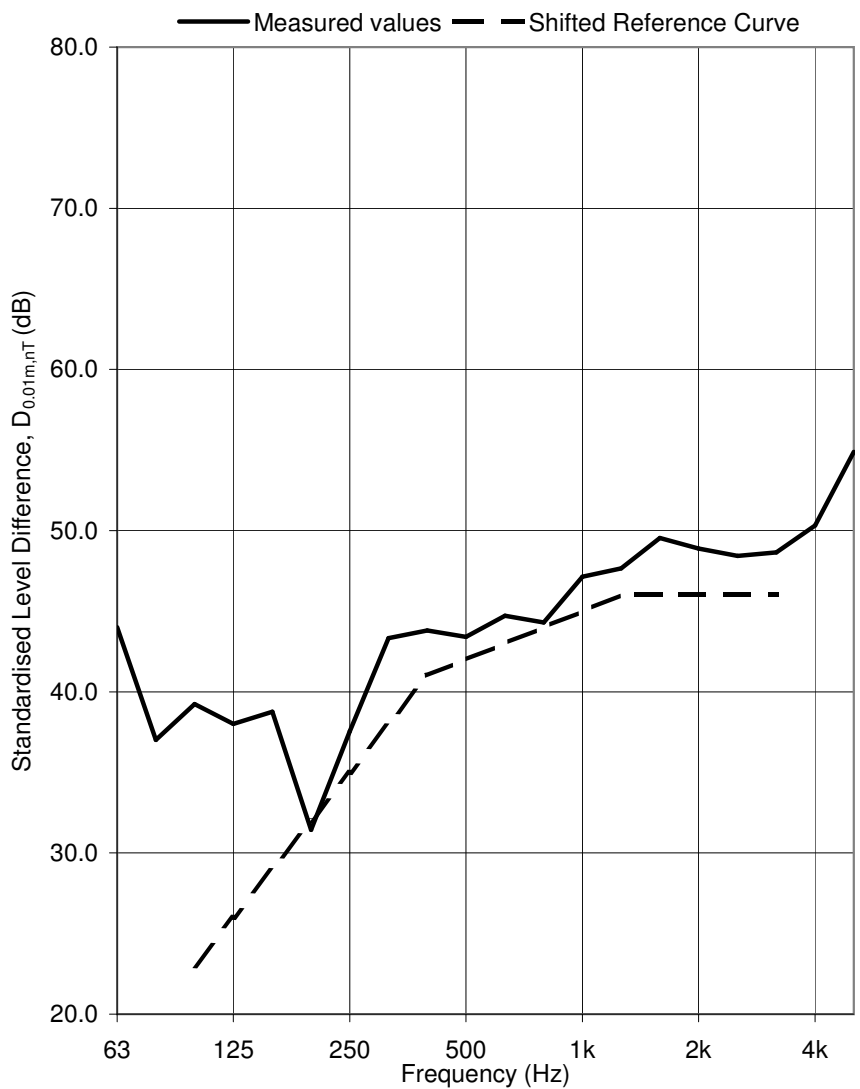


Test ID: 718012

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	43.1
63	44.0
80	37.0
100	39.2
125	38.0
160	38.8
200	31.4
250	37.5
315	43.3
400	43.8
500	43.4
630	44.7
800	44.3
1k	47.1
1.25k	47.7
1.6k	49.5
2k	48.9
2.5k	48.4
3.15k	48.6
4k	50.3
5k	54.9

$D_{0.01m,nT,w}(C;C_{tr})$ 46 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

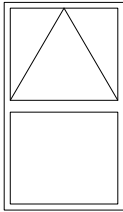
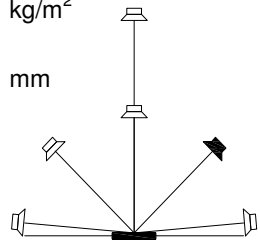
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

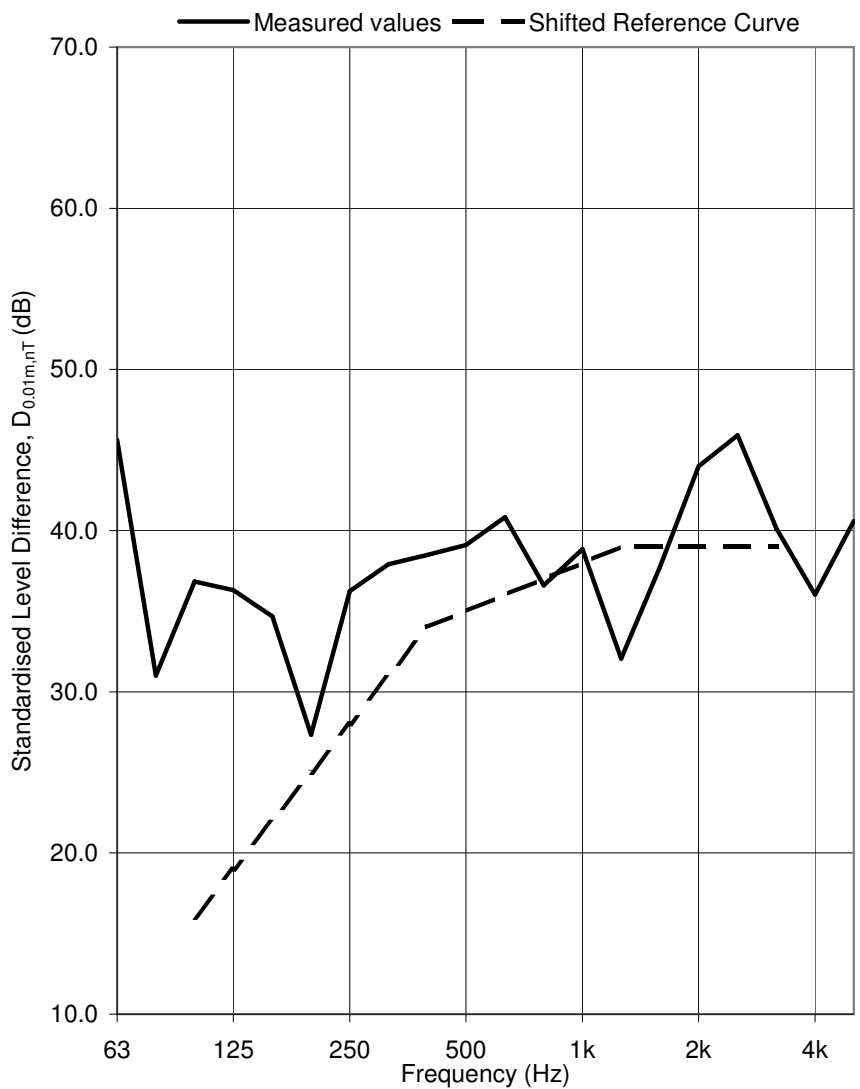
Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719027

Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	42.0
63	45.6
80	31.0
100	36.8
125	36.3
160	34.7
200	27.3
250	36.2
315	37.9
400	38.5
500	39.1
630	40.8
800	36.6
1k	38.8
1.25k	32.1
1.6k	37.7
2k	44.0
2.5k	45.9
3.15k	40.1
4k	36.0
5k	40.6

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-2; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

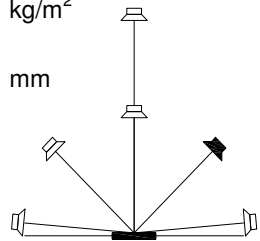
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

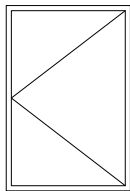
Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

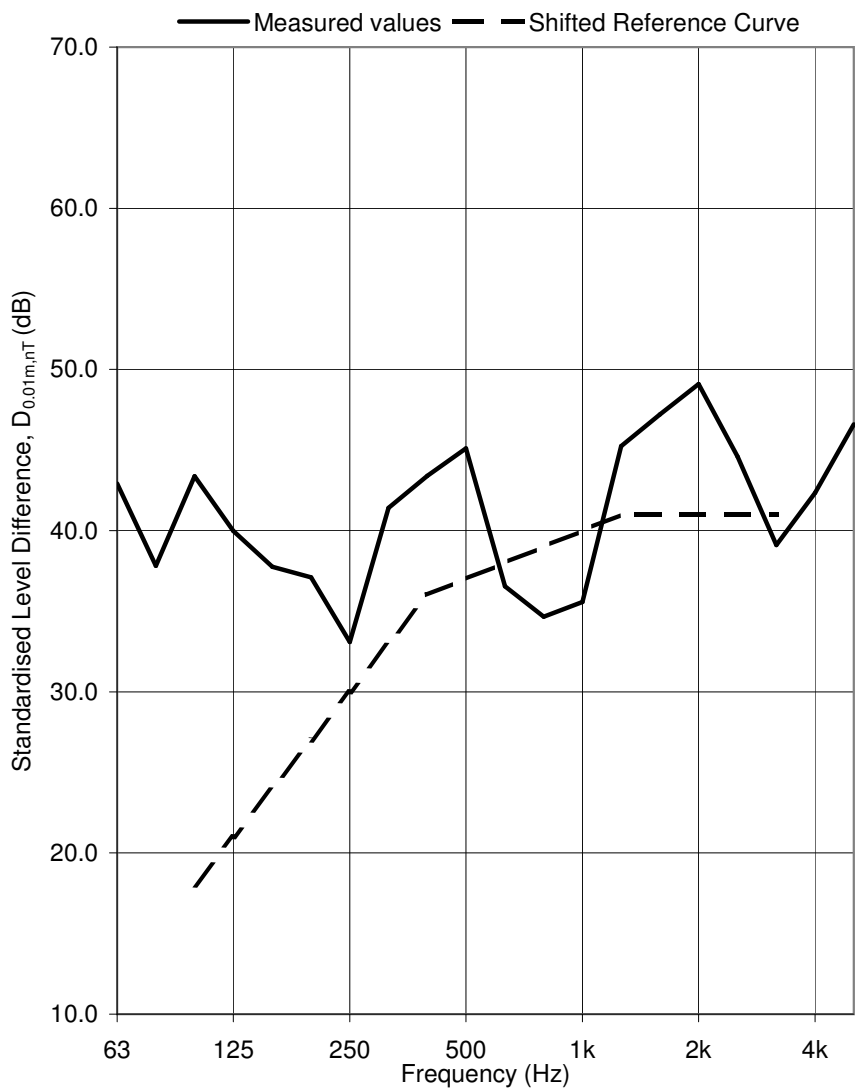


Test ID: 720029

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	40.2
63	42.9
80	37.8
100	43.4
125	40.0
160	37.8
200	37.1
250	33.1
315	41.4
400	43.4
500	45.1
630	36.5
800	34.7
1k	35.6
1.25k	45.2
1.6k	47.2
2k	49.1
2.5k	44.6
3.15k	39.1
4k	42.3
5k	46.6

$D_{0.01m,nT,w}(C;C_{tr})$ 41 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

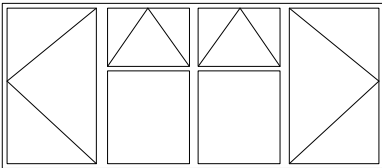
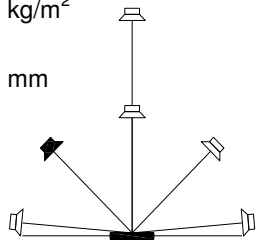
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

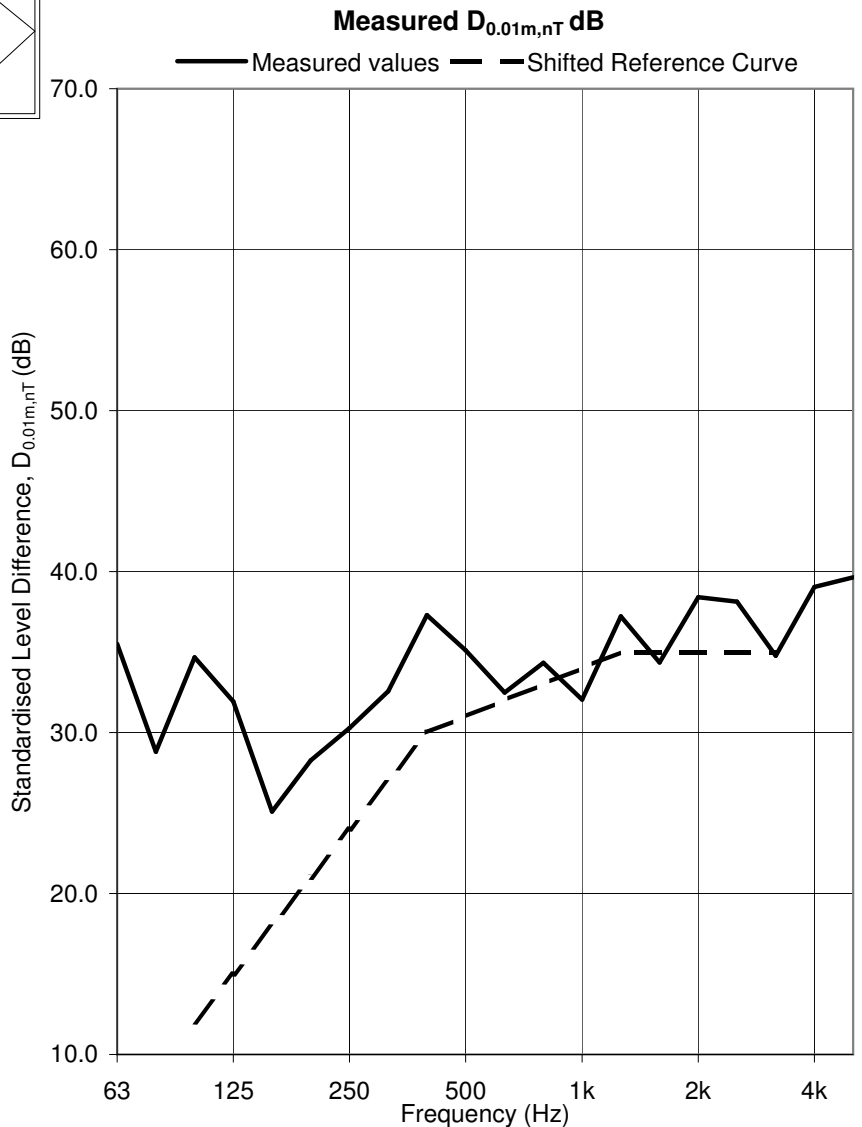
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628092

Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	29.5
63	35.5
80	28.8
100	34.7
125	31.9
160	25.1
200	28.3
250	30.3
315	32.6
400	37.3
500	35.1
630	32.5
800	34.3
1k	32.0
1.25k	37.2
1.6k	34.4
2k	38.4
2.5k	38.1
3.15k	34.8
4k	39.0
5k	39.6



D_{0.01m,nT,w(C;C_{tr}) 35 (0; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

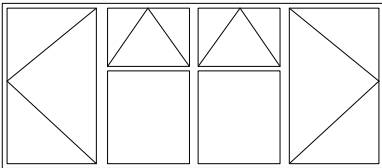
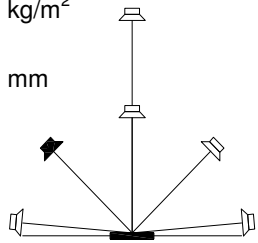
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

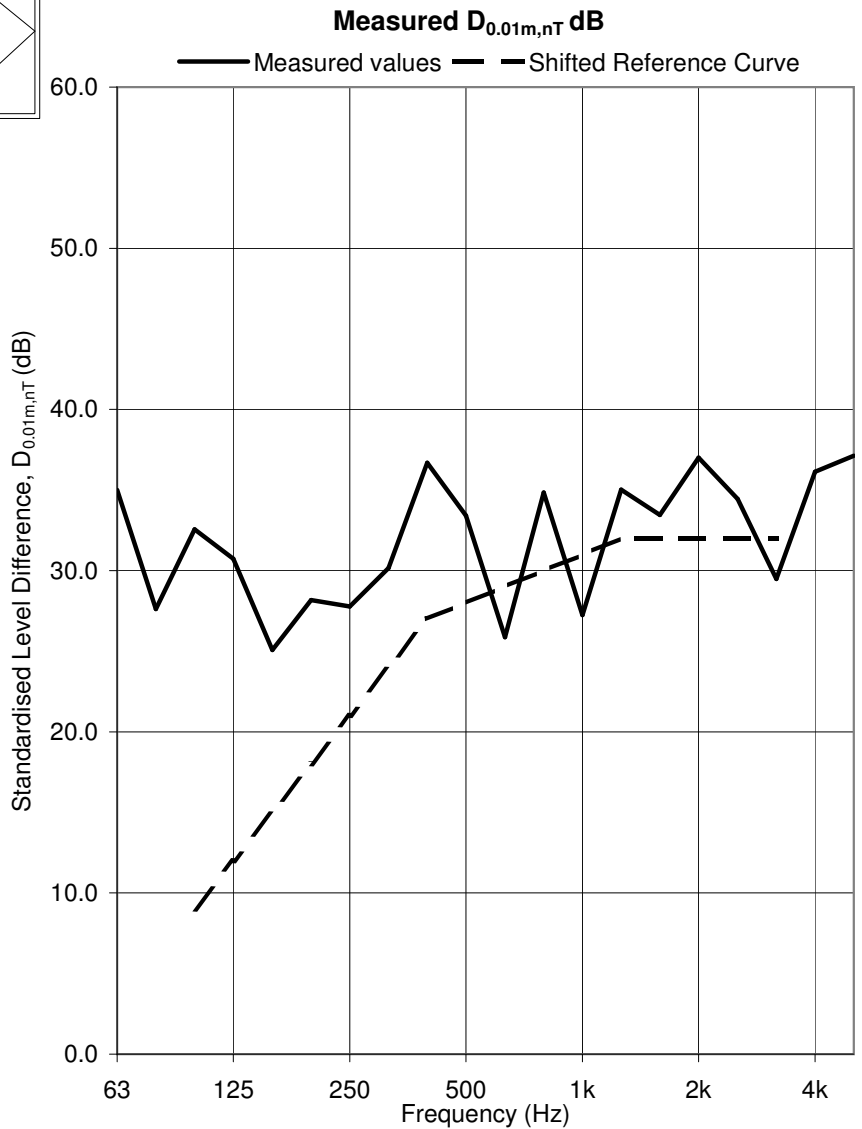
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628087

Test Sample: Window A-2 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	29.3
63	35.0
80	27.6
100	32.6
125	30.7
160	25.1
200	28.2
250	27.8
315	30.2
400	36.7
500	33.4
630	25.9
800	34.8
1k	27.2
1.25k	35.0
1.6k	33.5
2k	37.0
2.5k	34.4
3.15k	29.5
4k	36.1
5k	37.1



D_{0.01m,nT,w(C;C_{tr}) 32 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

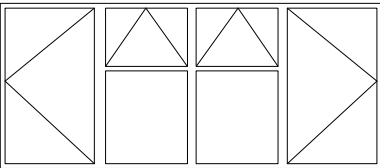
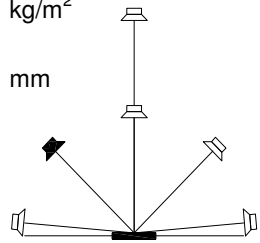
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

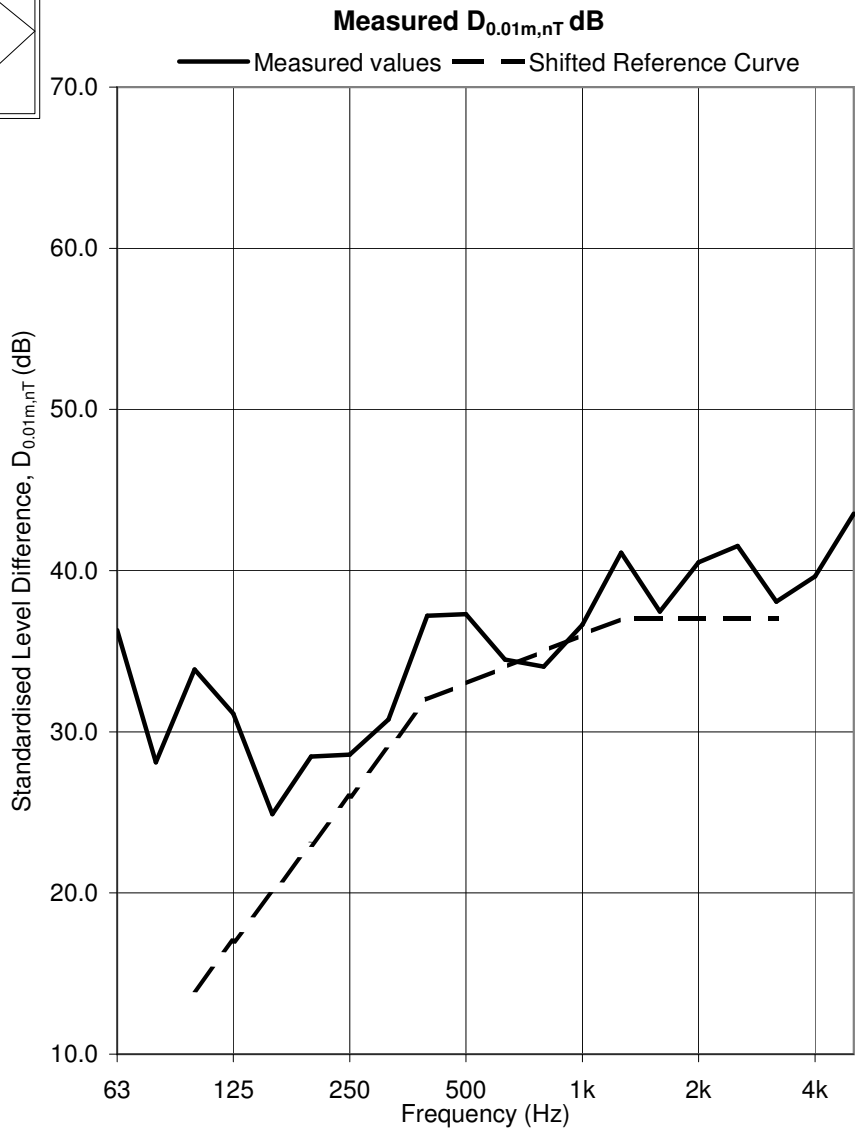
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628082

Test Sample: Window A-3 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	30.7
63	36.3
80	28.1
100	33.9
125	31.1
160	24.9
200	28.5
250	28.6
315	30.8
400	37.2
500	37.3
630	34.5
800	34.0
1k	36.6
1.25k	41.1
1.6k	37.5
2k	40.5
2.5k	41.5
3.15k	38.1
4k	39.6
5k	43.5



D_{0.01m,nT,w(C;C_{tr}) 37 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

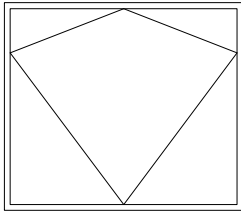
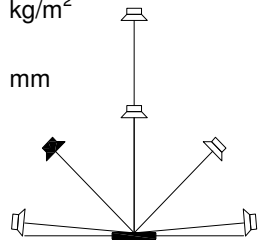
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

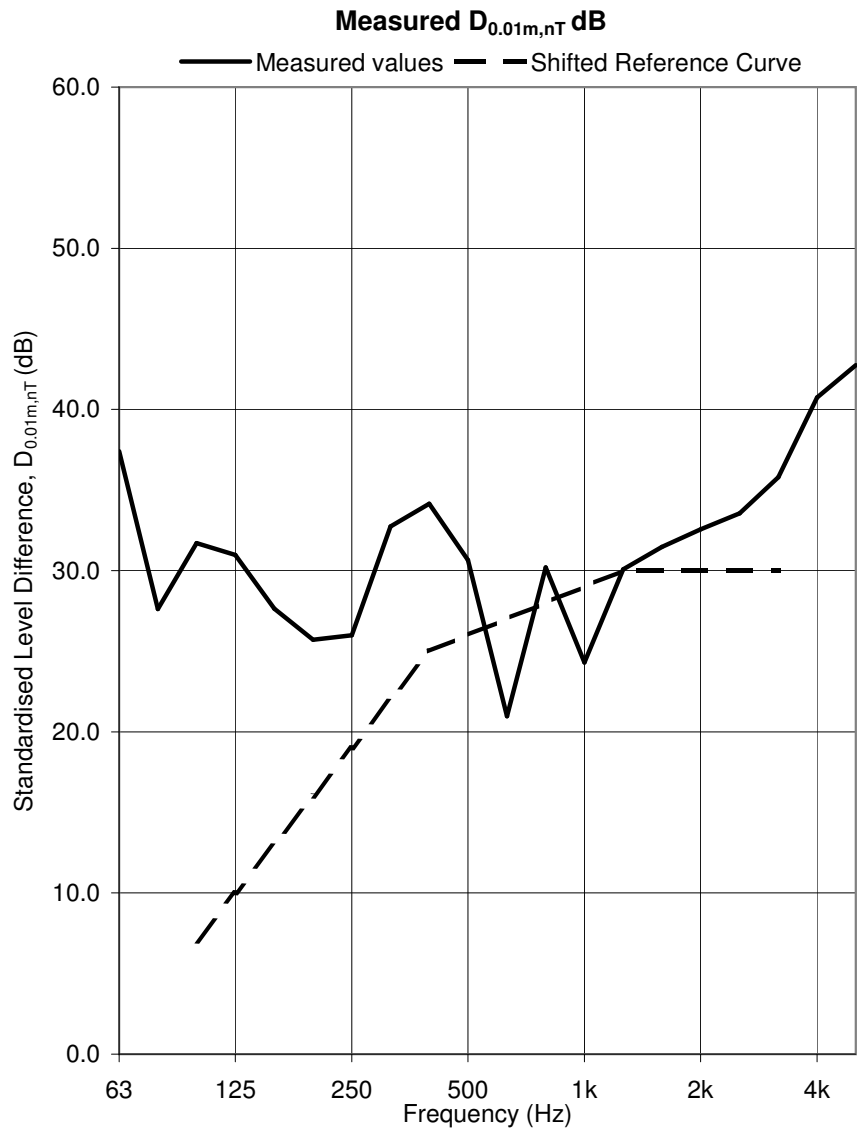
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705022

Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	31.1
63	37.4
80	27.6
100	31.7
125	31.0
160	27.6
200	25.7
250	26.0
315	32.7
400	34.2
500	30.7
630	21.0
800	30.2
1k	24.3
1.25k	30.1
1.6k	31.5
2k	32.6
2.5k	33.6
3.15k	35.8
4k	40.7
5k	42.7



D_{0.01m,nT,w(C;C_{tr}) 30 (-2; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

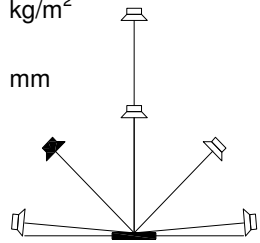
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

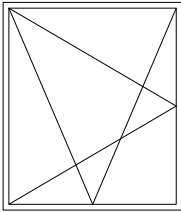
Test Sample: Window C-1 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

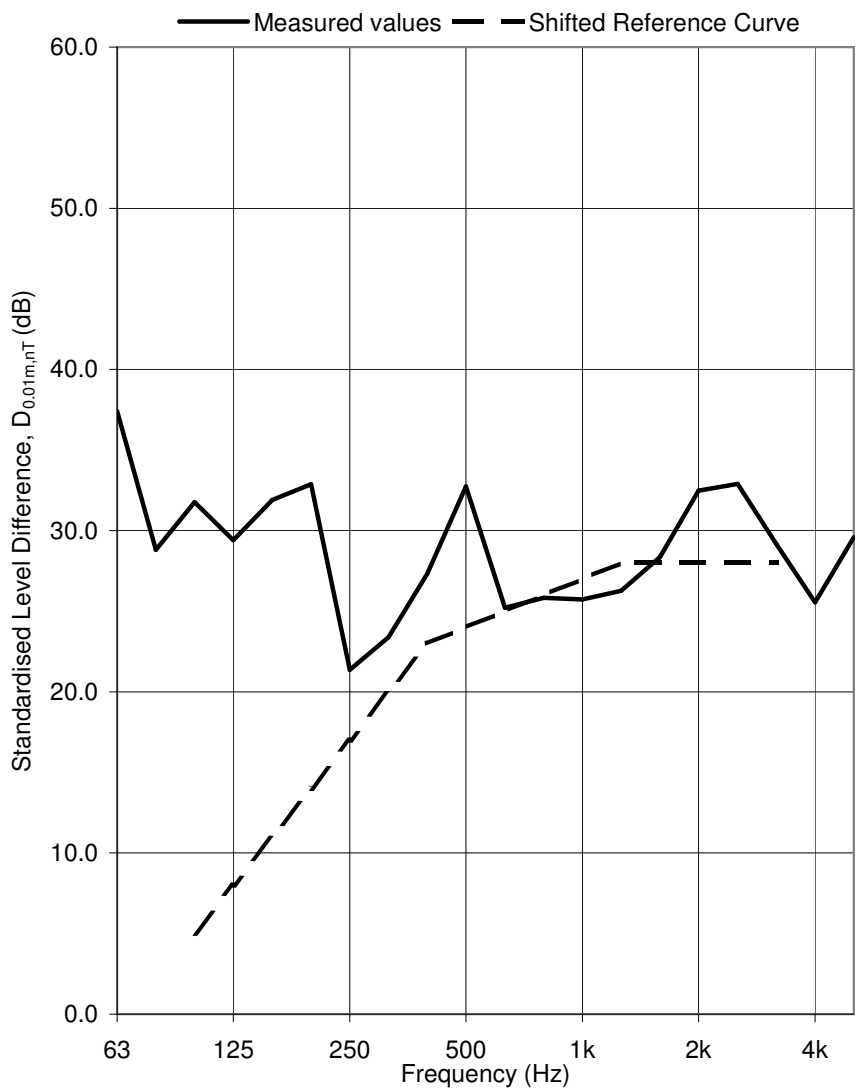


Test ID: 711055

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	30.0
63	37.4
80	28.8
100	31.8
125	29.4
160	31.9
200	32.9
250	21.4
315	23.4
400	27.3
500	32.7
630	25.2
800	25.8
1k	25.7
1.25k	26.3
1.6k	28.4
2k	32.5
2.5k	32.9
3.15k	29.2
4k	25.6
5k	29.6

$D_{0.01m,nT,w}(C;C_{tr})$ 28 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

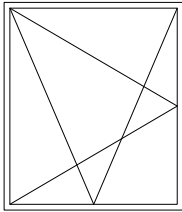
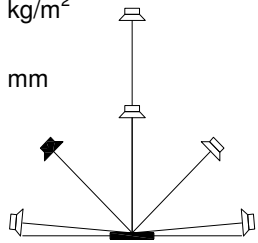
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711048

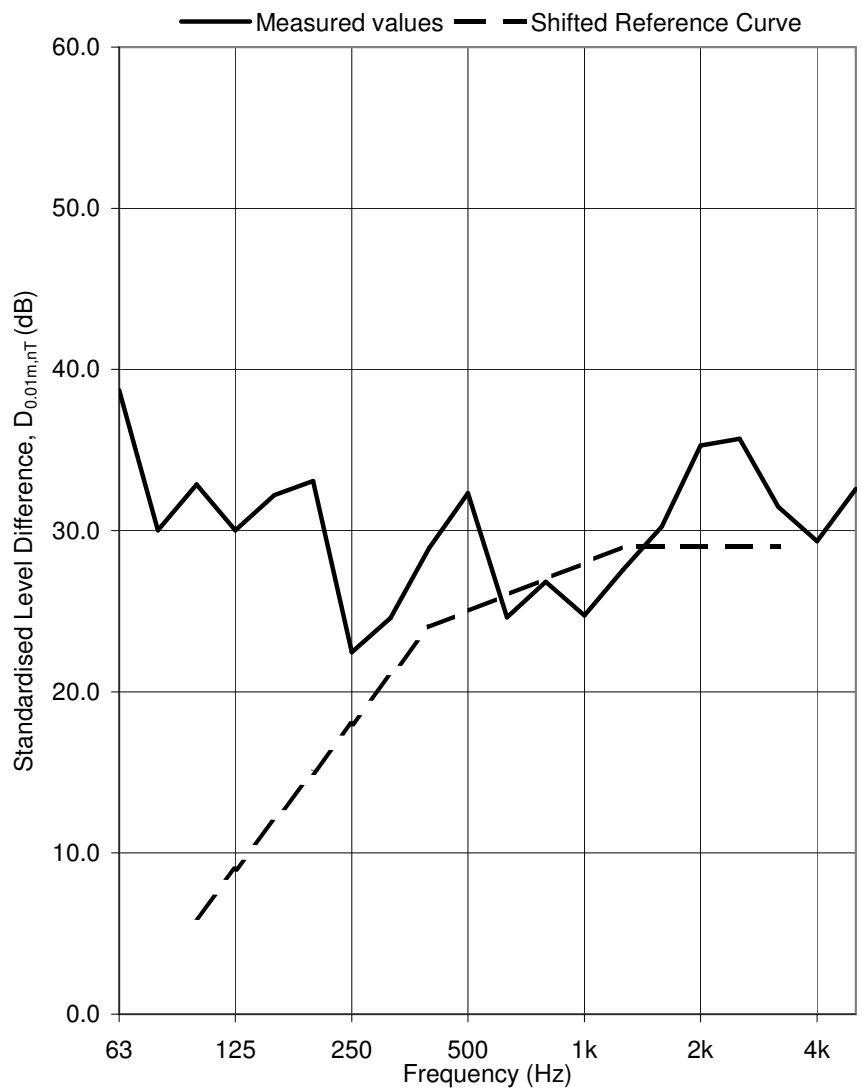
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	31.6
63	38.7
80	30.0
100	32.9
125	30.0
160	32.2
200	33.1
250	22.5
315	24.6
400	28.9
500	32.3
630	24.6
800	26.8
1k	24.7
1.25k	27.6
1.6k	30.3
2k	35.3
2.5k	35.7
3.15k	31.5
4k	29.4
5k	32.6

$D_{0.01m,nT,w}(C;C_{tr})$ 29 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

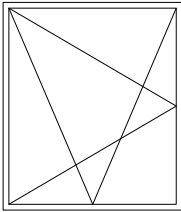
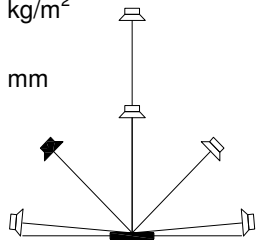
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712066

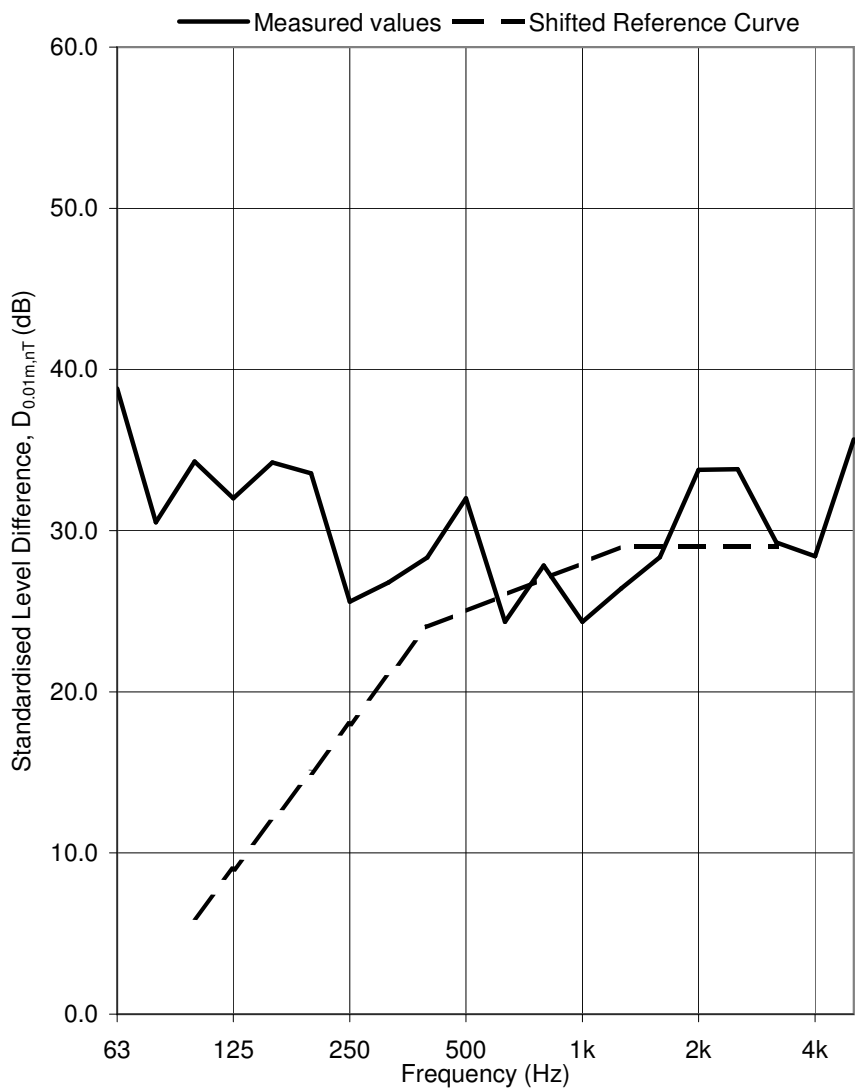
Test Sample: Window C-4 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	32.0
63	38.8
80	30.5
100	34.3
125	32.0
160	34.2
200	33.6
250	25.6
315	26.8
400	28.3
500	32.0
630	24.3
800	27.8
1k	24.3
1.25k	26.4
1.6k	28.4
2k	33.8
2.5k	33.8
3.15k	29.3
4k	28.4
5k	35.7

$D_{0.01m,nT,w}(C;C_{tr})$ 29 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

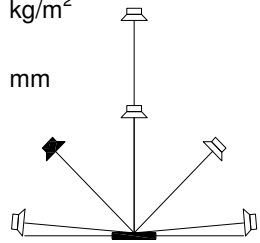
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

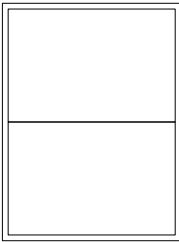
Test Sample: Window D-1 Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

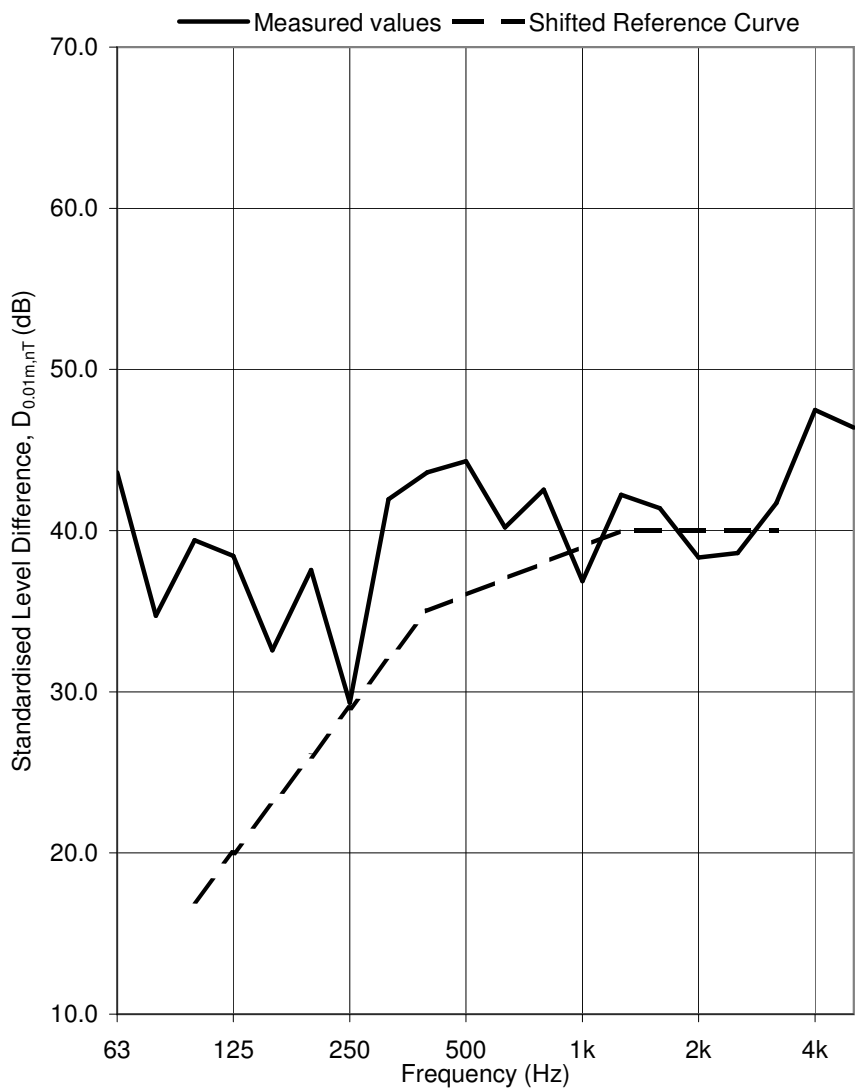


Test ID: 713030

Loudspeaker Configuration: L5



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	31.2
63	43.6
80	34.7
100	39.4
125	38.4
160	32.6
200	37.6
250	29.3
315	41.9
400	43.6
500	44.3
630	40.2
800	42.5
1k	36.9
1.25k	42.2
1.6k	41.4
2k	38.3
2.5k	38.6
3.15k	41.7
4k	47.5
5k	46.4

D_{0.01m,nT,w(C;C_{tr}) 40 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

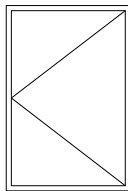
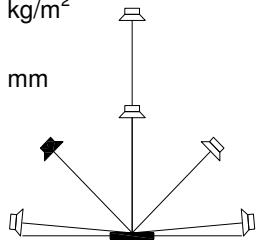
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

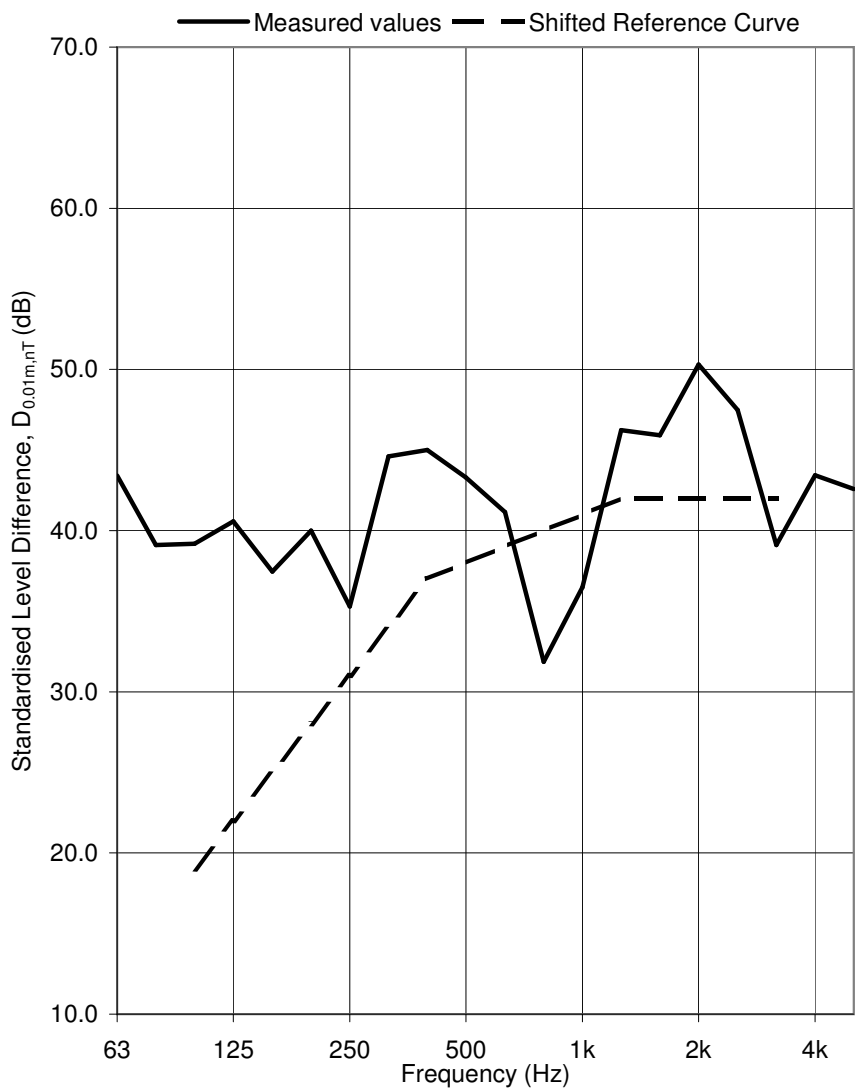
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720026

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	40.6
63	43.4
80	39.1
100	39.2
125	40.6
160	37.5
200	40.0
250	35.3
315	44.6
400	45.0
500	43.3
630	41.1
800	31.9
1k	36.5
1.25k	46.2
1.6k	45.9
2k	50.3
2.5k	47.5
3.15k	39.1
4k	43.4
5k	42.6

$D_{0.01m,nT,w}(C;C_{tr})$ 42 (-3; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

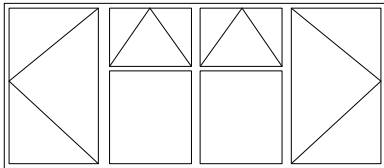
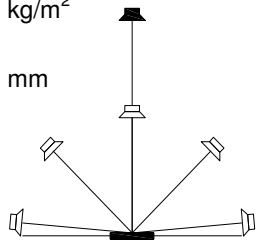
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628028

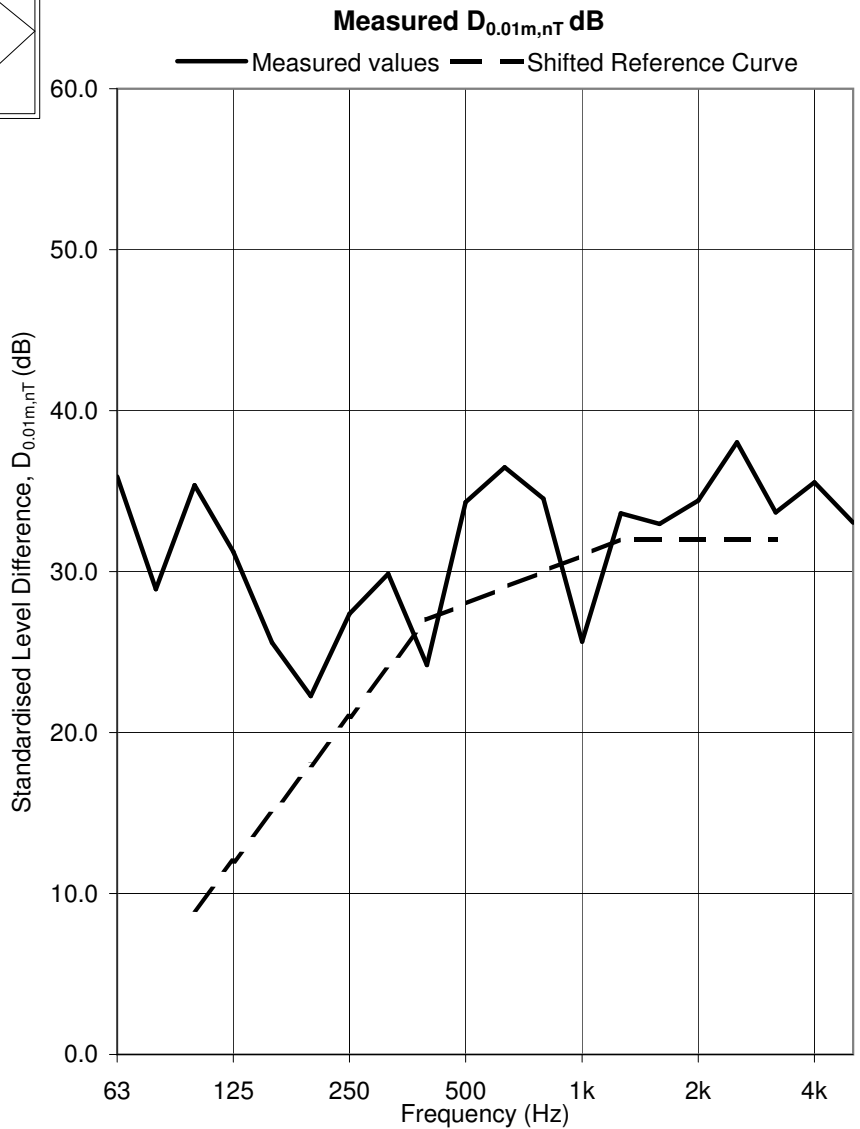
Test Sample: Window A-1 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	28.5
63	35.9
80	28.9
100	35.4
125	31.2
160	25.6
200	22.3
250	27.4
315	29.9
400	24.2
500	34.3
630	36.5
800	34.5
1k	25.6
1.25k	33.6
1.6k	33.0
2k	34.4
2.5k	38.0
3.15k	33.7
4k	35.5
5k	33.0

b



D_{0.01m,nT,w(C;C_{tr}) 32 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

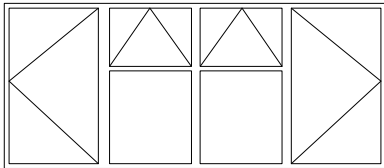
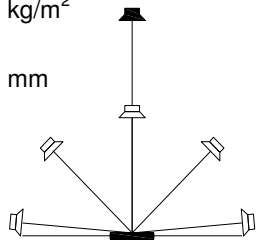
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628023

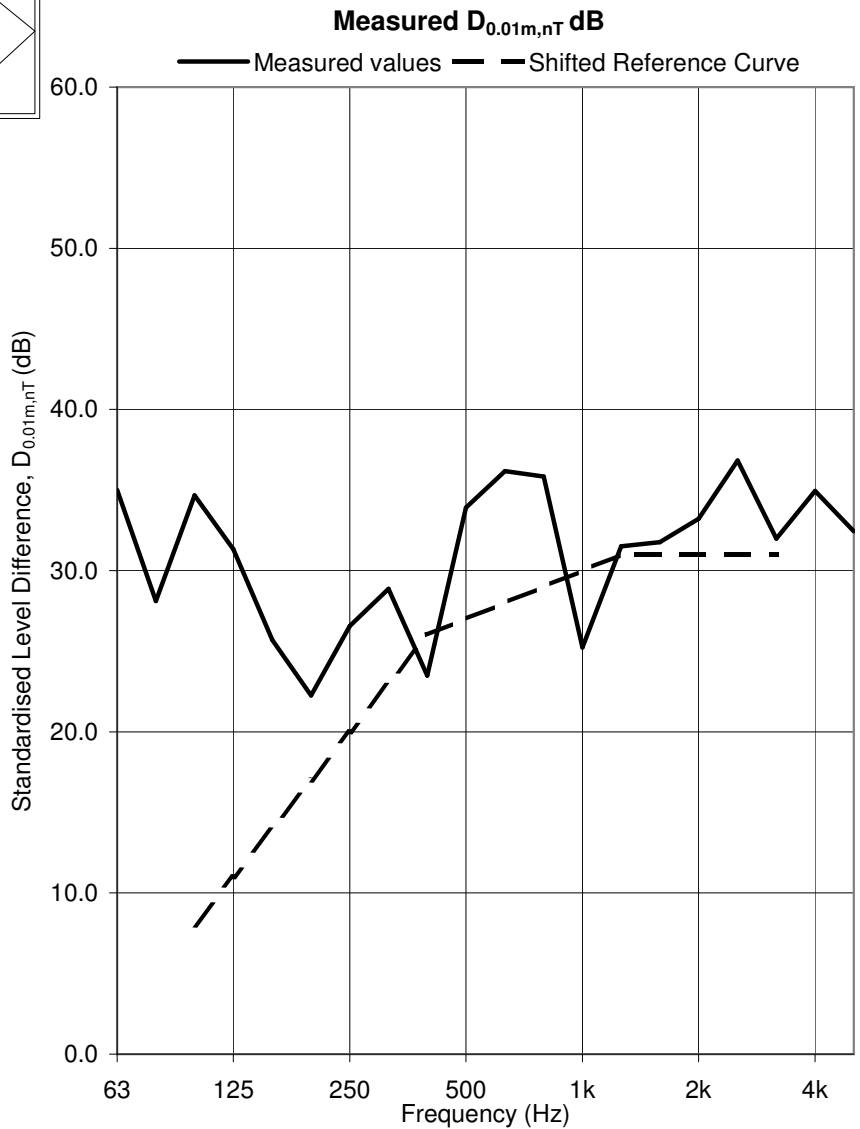
Test Sample: Window A-2 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	29.8
63	35.0
80	28.1
100	34.7
125	31.3
160	25.7
200	22.3
250	26.6
315	28.9
400	23.5
500	33.9
630	36.2
800	35.8
1k	25.2
1.25k	31.5
1.6k	31.8
2k	33.2
2.5k	36.8
3.15k	32.0
4k	34.9
5k	32.4

b



D_{0.01m,nT,w(C;C_{tr}) 31 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

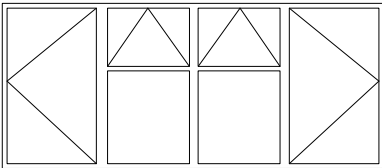
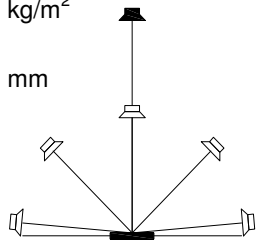
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628018

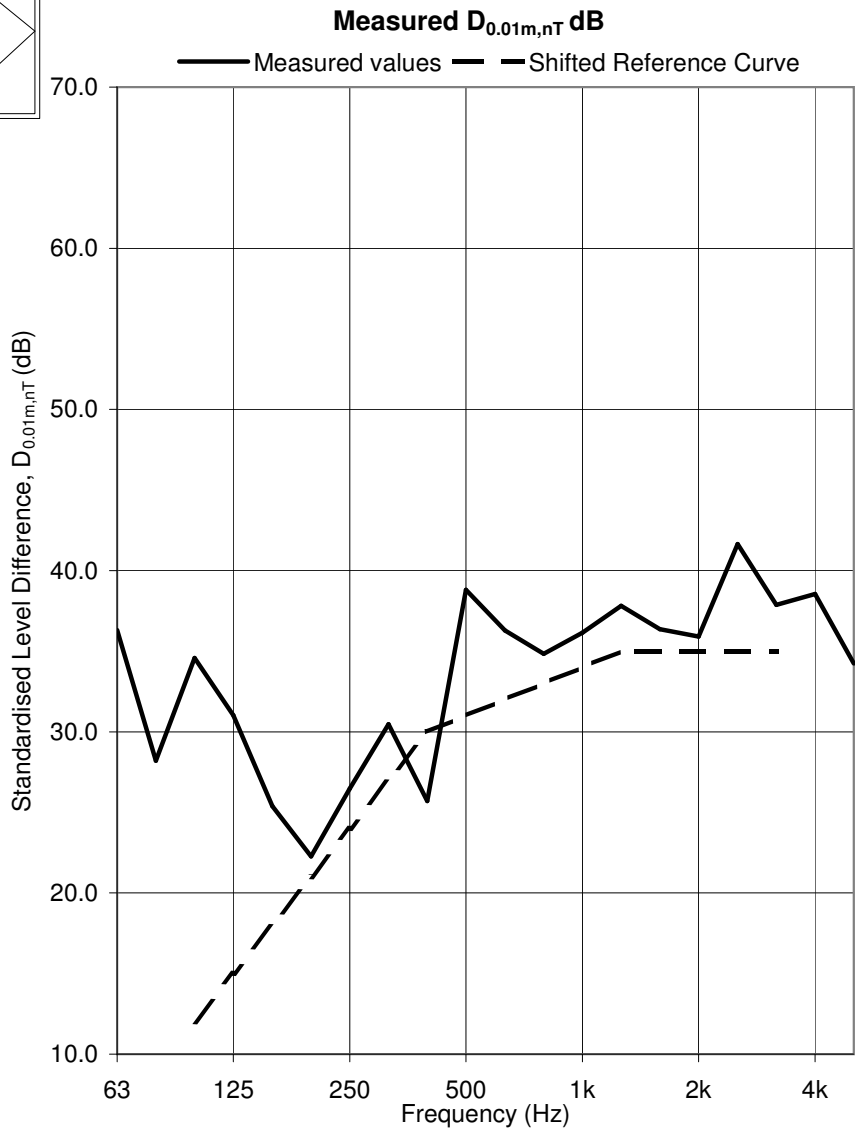
Test Sample: Window A-3 Untensioned.

Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	29.9
63	36.3
80	28.2
100	34.6
125	31.0
160	25.4
200	22.3
250	26.5
315	30.5
400	25.7
500	38.8
630	36.3
800	34.8
1k	36.1
1.25k	37.8
1.6k	36.4
2k	35.9
2.5k	41.6
3.15k	37.9
4k	38.5
5k	34.2

b



D_{0.01m,nT,w(C;C_{tr}) 35 (-1; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

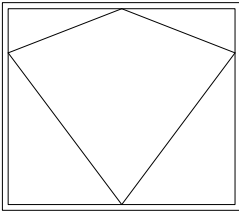
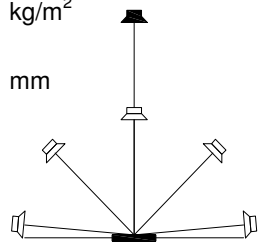
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705027

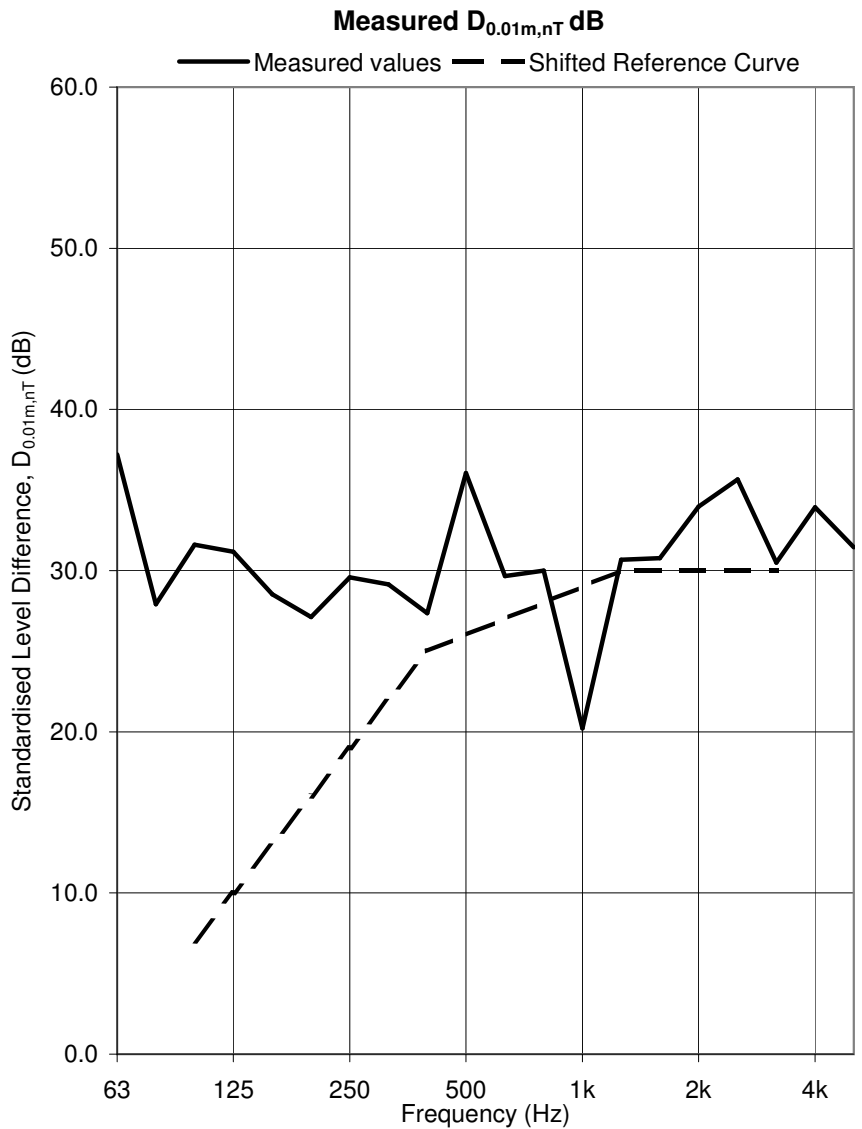
Test Sample: Window B Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	30.5
63	37.2
80	27.9
100	31.6
125	31.2
160	28.5
200	27.1
250	29.6
315	29.1
400	27.4
500	36.1
630	29.7
800	30.0
1k	20.2
1.25k	30.7
1.6k	30.8
2k	34.0
2.5k	35.7
3.15k	30.5
4k	33.9
5k	31.4

b



D_{0.01m,nT,w(C;C_{tr}) 30 (-2; -4) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

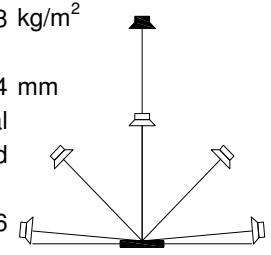
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

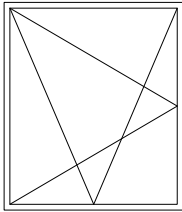
Test Sample: Window C-1 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

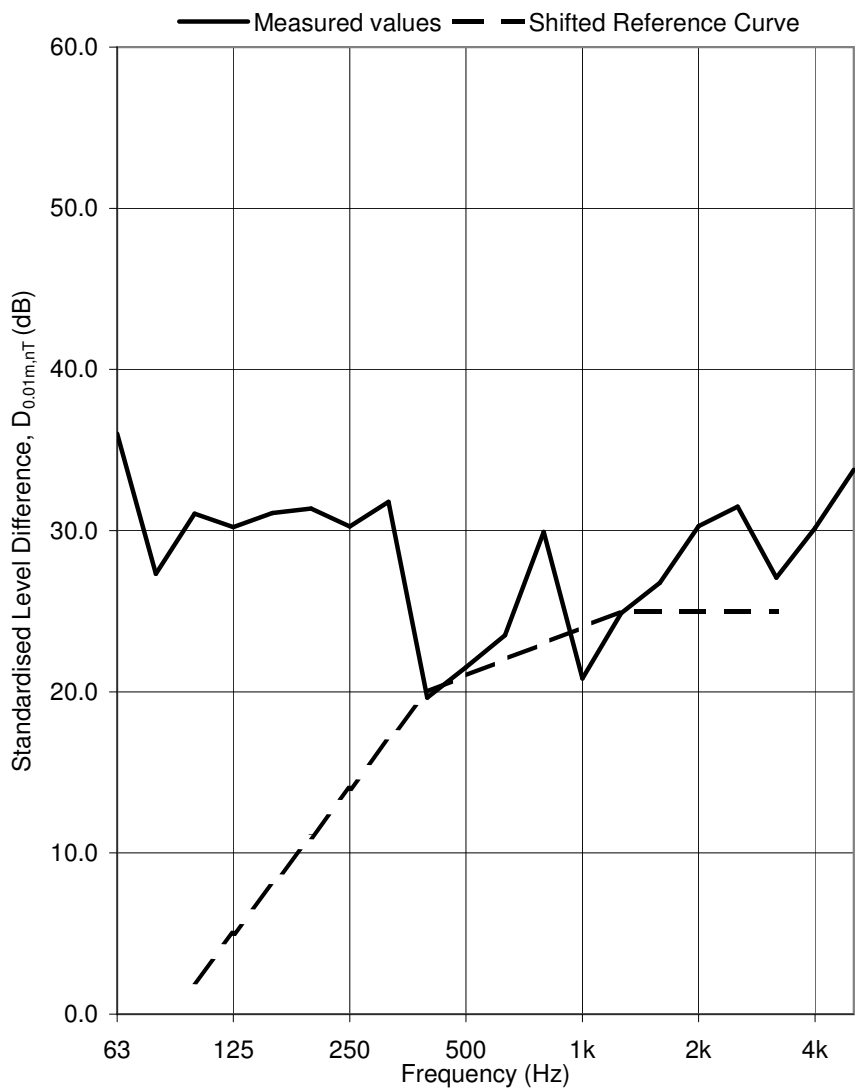


Test ID: 711018

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	28.7
63	36.0
80	27.3
100	31.1
125	30.2
160	31.1
200	31.4
250	30.3
315	31.8
400	19.6
500	21.5
630	23.5
800	29.9
1k	20.8
1.25k	24.9
1.6k	26.8
2k	30.3
2.5k	31.5
3.15k	27.1
4k	30.2
5k	33.8

$D_{0.01m,nT,w}(C;C_{tr})$ 25 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

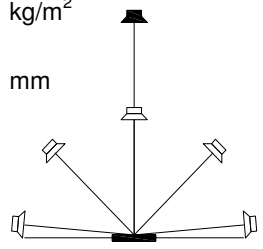
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

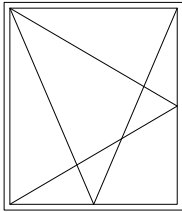
Test Sample: Window C-2 Untensioned.

Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

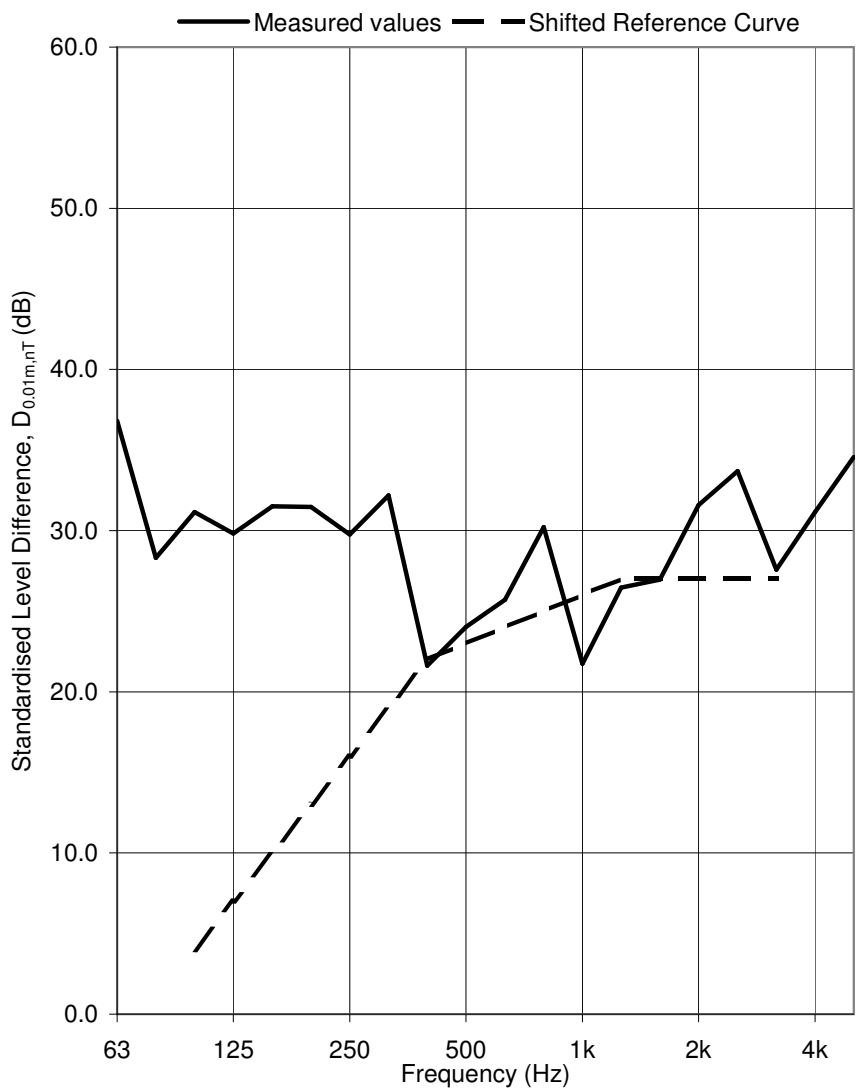


Test ID: 711022

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.8
63	36.8
80	28.3
100	31.2
125	29.8
160	31.5
200	31.5
250	29.8
315	32.2
400	21.6
500	24.0
630	25.7
800	30.2
1k	21.7
1.25k	26.5
1.6k	27.0
2k	31.6
2.5k	33.7
3.15k	27.6
4k	31.2
5k	34.6

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

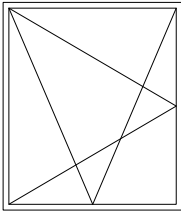
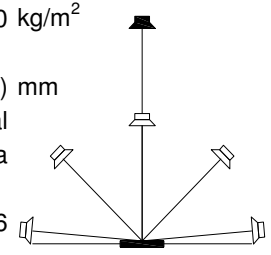
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

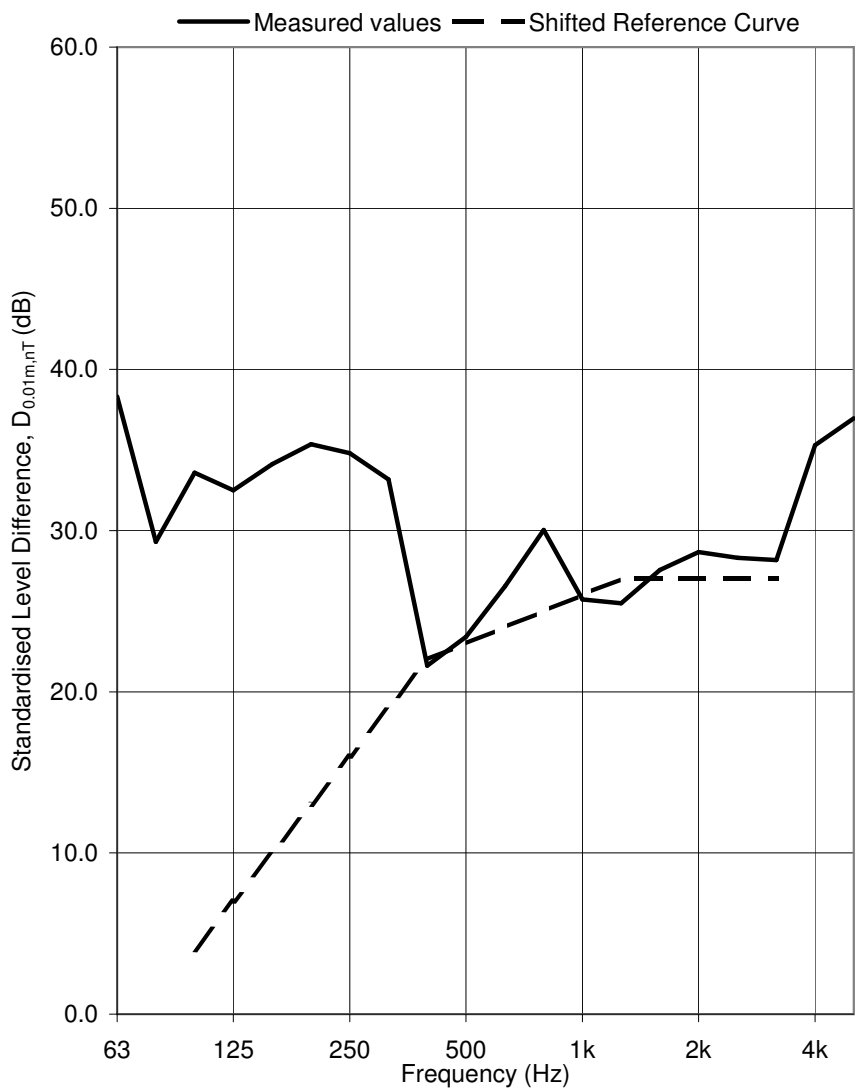
Date: 17/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0076 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717016

Test Sample: Window C-4 Untensioned.

Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: Original
 Vent: n/a
 Loudspeaker Configuration: L6



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	31.5
63	38.3
80	29.3
100	33.6
125	32.5
160	34.1
200	35.4
250	34.8
315	33.2
400	21.6
500	23.4
630	26.5
800	30.0
1k	25.7
1.25k	25.5
1.6k	27.6
2k	28.7
2.5k	28.3
3.15k	28.2
4k	35.3
5k	37.0

D_{0.01m,nT,w(C;C_{tr}) 27 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

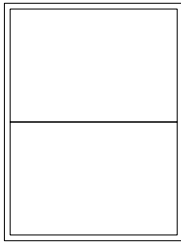
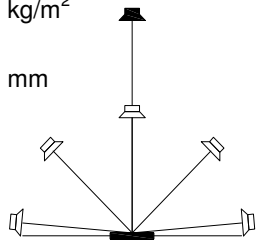
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

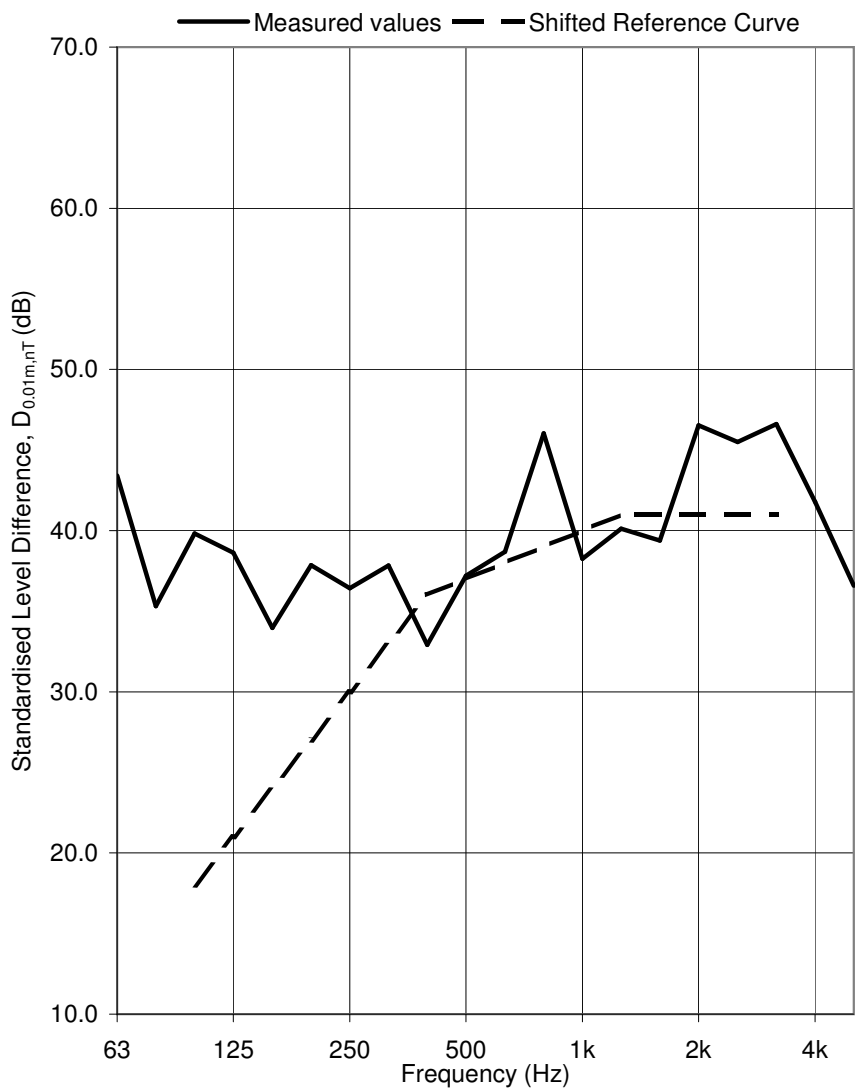
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713016

Test Sample: Window D-1 Untensioned.

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	29.9
63	43.4
80	35.3
100	39.8
125	38.6
160	34.0
200	37.9
250	36.4
315	37.8
400	32.9
500	37.2
630	38.7
800	46.0
1k	38.3
1.25k	40.1
1.6k	39.4
2k	46.5
2.5k	45.5
3.15k	46.6
4k	41.8
5k	36.6

D_{0.01m,nT,w(C;C_{tr}) 41 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

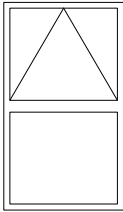
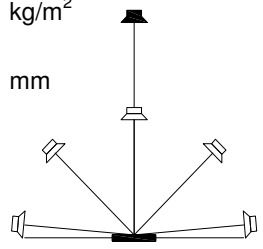
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

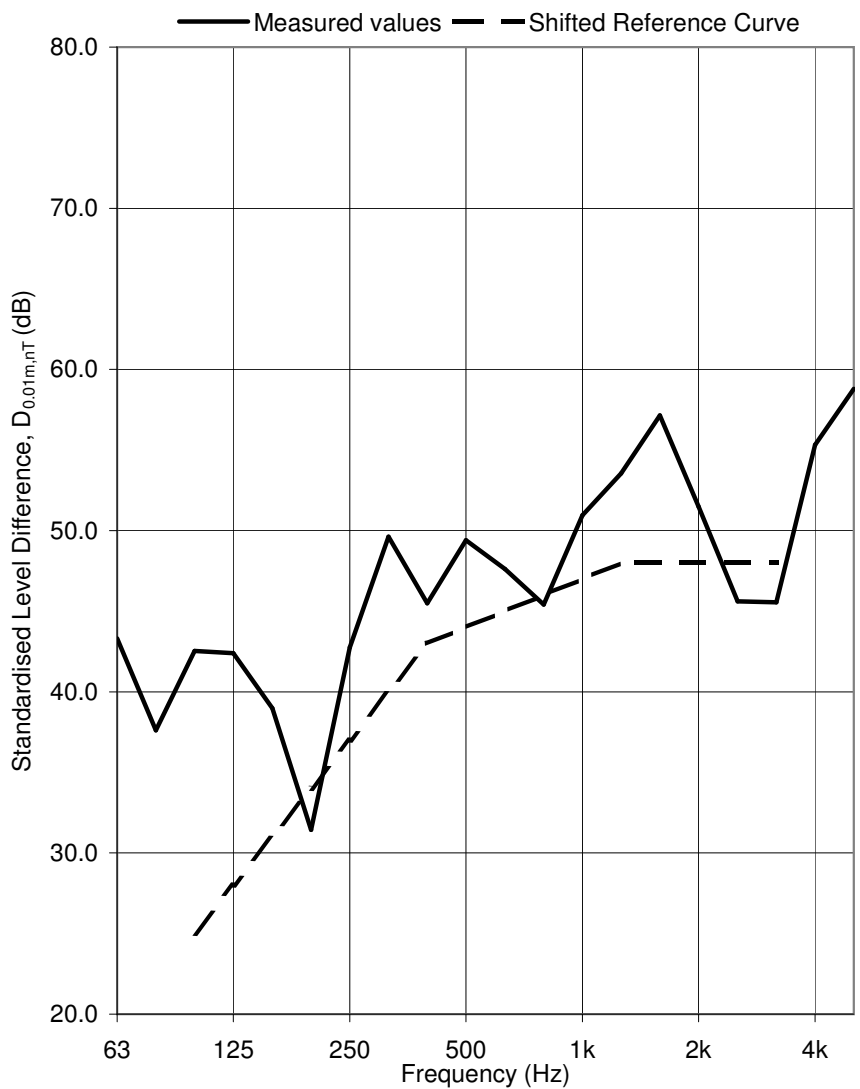
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718027

Test Sample: Window E Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	33.5
63	43.3
80	37.6
100	42.5
125	42.4
160	39.0
200	31.4
250	42.7
315	49.6
400	45.5
500	49.4
630	47.6
800	45.4
1k	50.9
1.25k	53.6
1.6k	57.1
2k	51.5
2.5k	45.6
3.15k	45.5
4k	55.3
5k	58.8

$D_{0.01m,nT,w}(C;C_{tr})$ 48 (-1; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

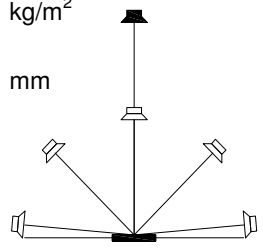
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

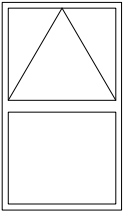
Test Sample: Window F Untensioned.

Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

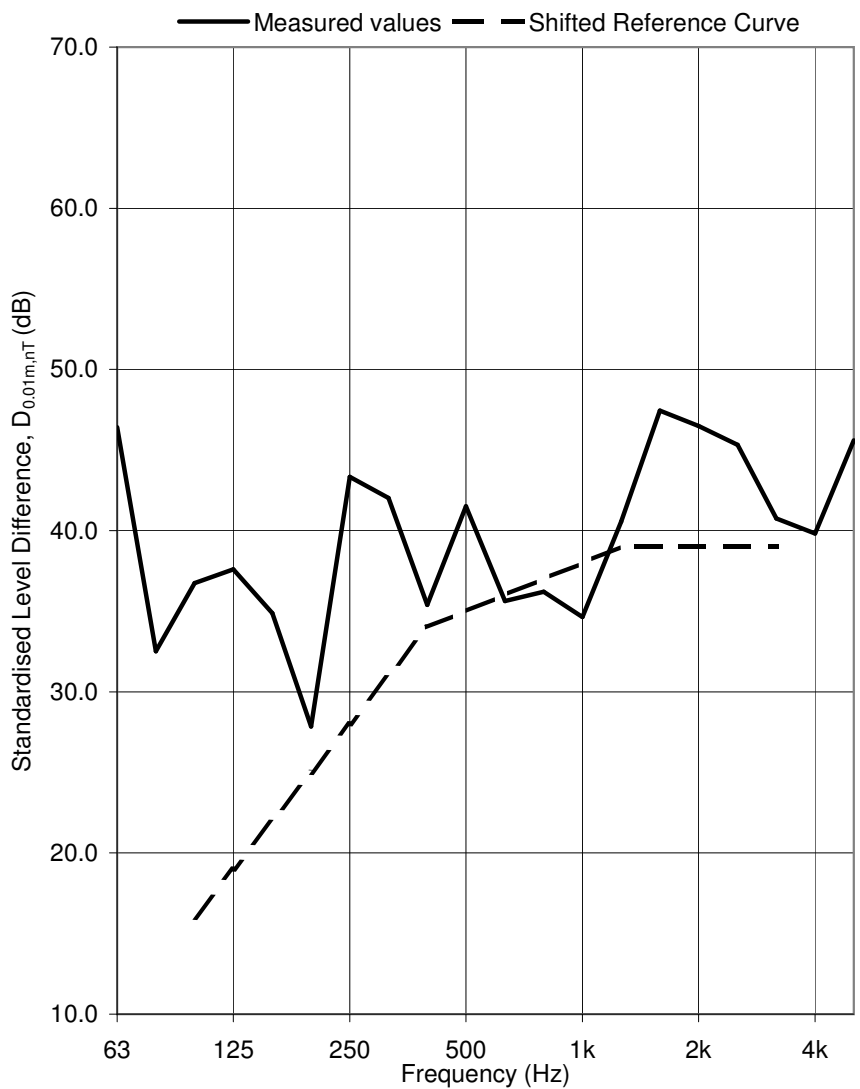


Test ID: 719002

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	35.2
63	46.4
80	32.5
100	36.7
125	37.6
160	34.9
200	27.8
250	43.3
315	42.0
400	35.4
500	41.5
630	35.6
800	36.2
1k	34.6
1.25k	40.6
1.6k	47.4
2k	46.5
2.5k	45.3
3.15k	40.7
4k	39.8
5k	45.6

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (0; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

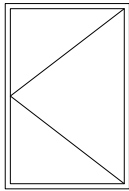
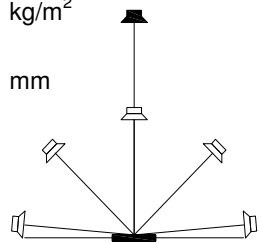
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

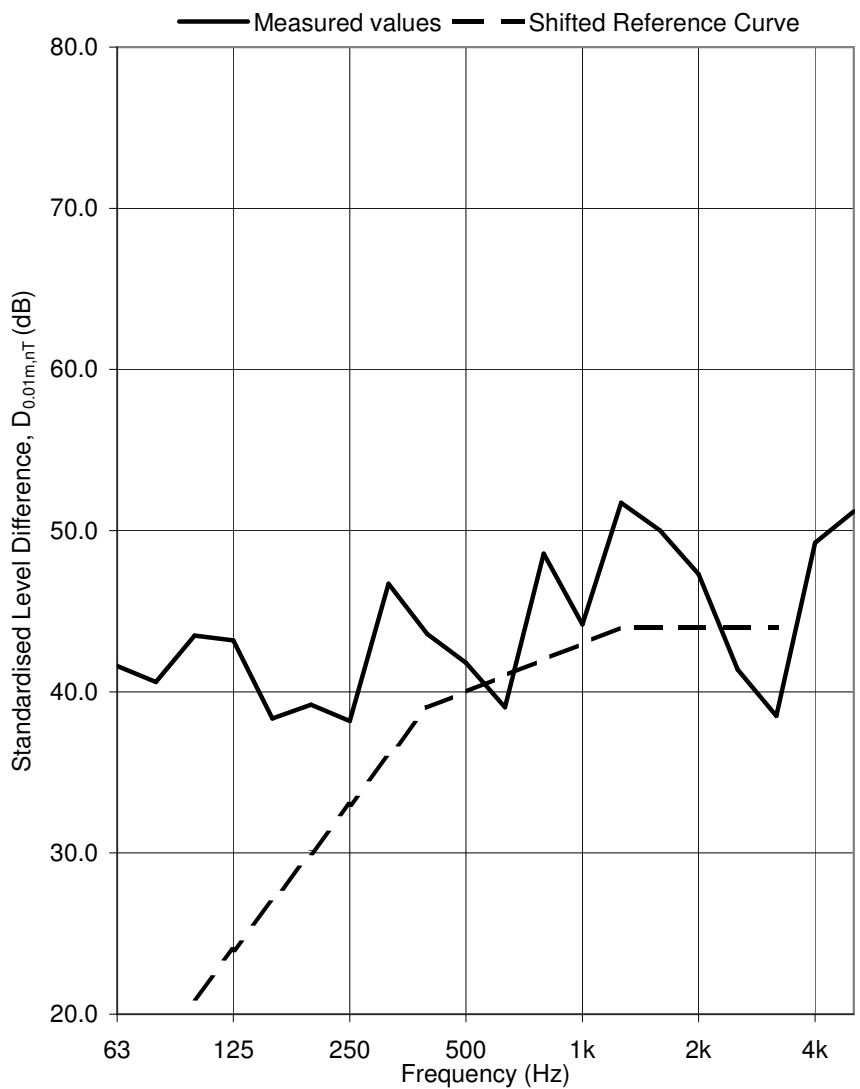
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720002

Test Sample: Window G Untensioned.

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: Blocked
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.2
63	41.6
80	40.6
100	43.5
125	43.2
160	38.4
200	39.2
250	38.2
315	46.7
400	43.6
500	41.8
630	39.0
800	48.6
1k	44.2
1.25k	51.7
1.6k	50.0
2k	47.3
2.5k	41.4
3.15k	38.5
4k	49.2
5k	51.2



$D_{0.01m,nT,w}(C;C_{tr})$ 44 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

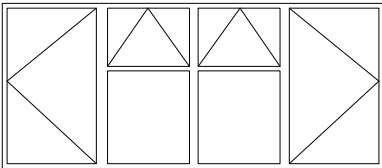
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

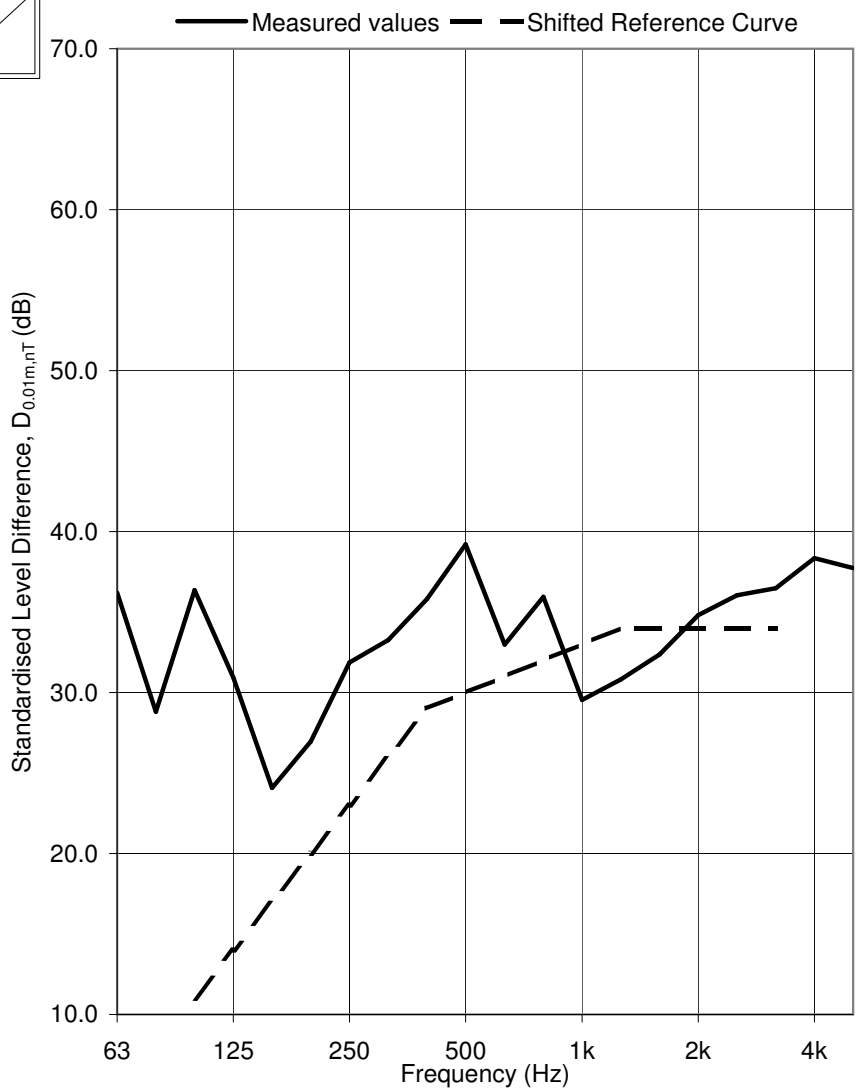
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window A-1 Untensioned.
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 628108



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.7
63	36.2
80	28.8
100	36.4
125	30.9
160	24.1
200	27.0
250	31.9
315	33.3
400	35.8
500	39.2
630	33.0
800	35.9
1k	29.5
1.25k	30.8
1.6k	32.4
2k	34.8
2.5k	36.0
3.15k	36.5
4k	38.3
5k	37.7



$D_{0.01m,nT,w}(C;C_{tr})$ 34 (-1; -2) dB

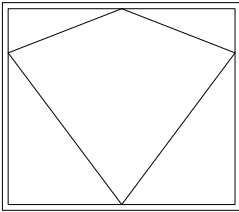
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

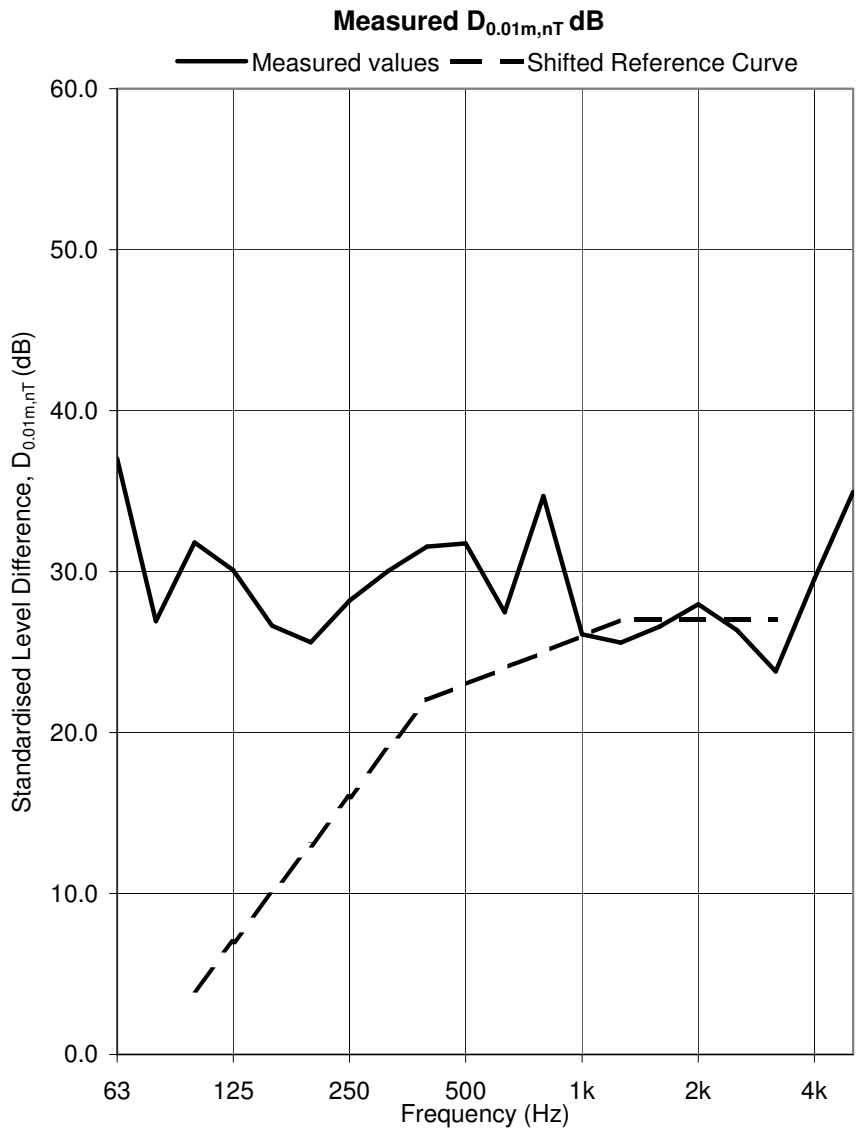
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705032

Test Sample: Window B Untensioned.
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	32.1
63	37.0
80	26.9
100	31.8
125	30.1
160	26.6
200	25.6
250	28.2
315	30.0
400	31.6
500	31.8
630	27.5
800	34.7
1k	26.1
1.25k	25.6
1.6k	26.6
2k	28.0
2.5k	26.4
3.15k	23.8
4k	29.5
5k	34.9




D_{0.01m,nT,w(C;C_{tr}) 27 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

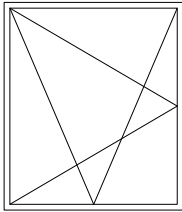
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

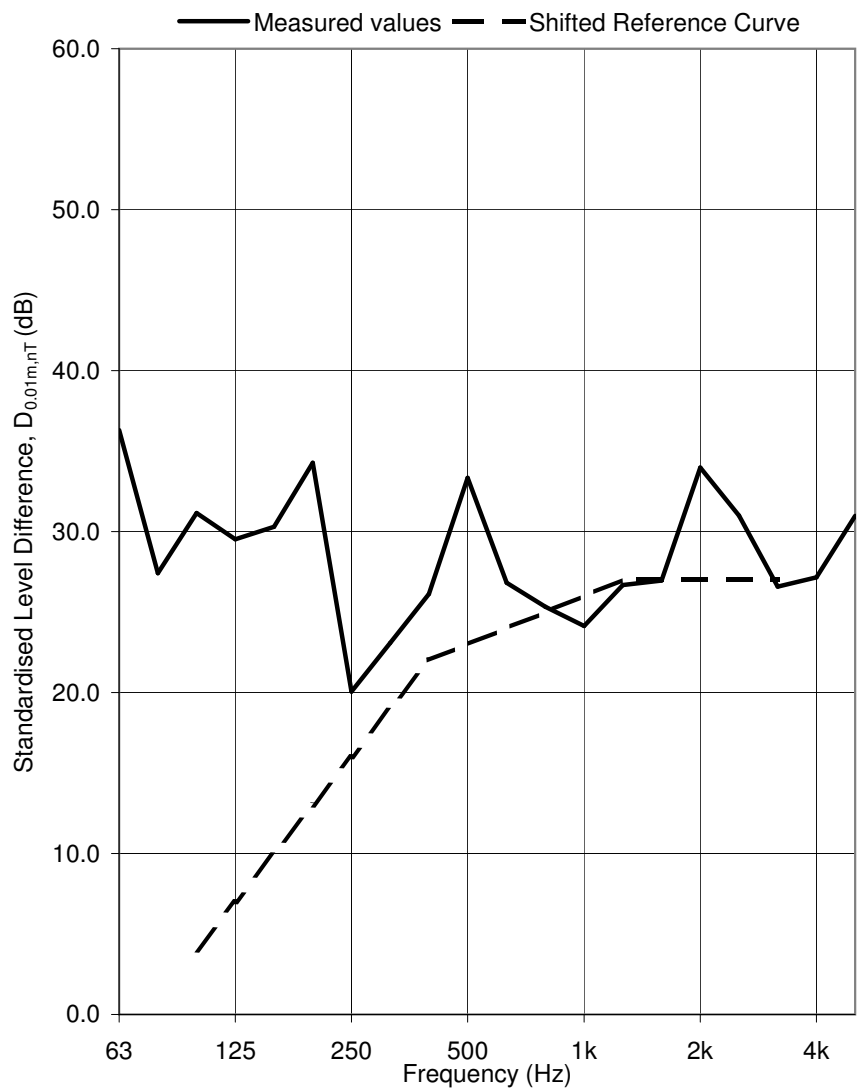
Test Sample: Window C-1 Untensioned.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711069

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.4
63	36.3
80	27.4
100	31.2
125	29.5
160	30.3
200	34.3
250	20.1
315	23.1
400	26.1
500	33.3
630	26.8
800	25.3
1k	24.1
1.25k	26.7
1.6k	27.0
2k	34.0
2.5k	31.0
3.15k	26.6
4k	27.2
5k	31.0


$D_{0.01m,nT,w}(C;C_{tr})$ 27 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

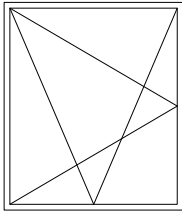
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

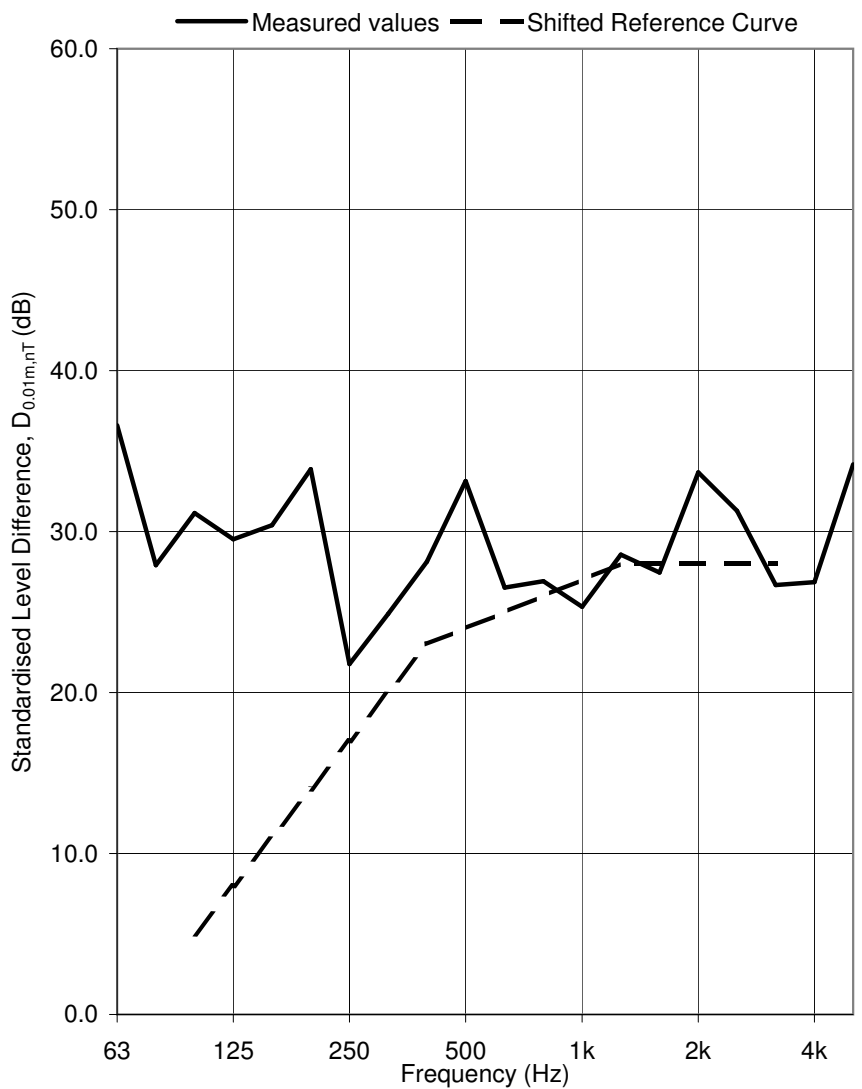
Test Sample: Window C-2 Untensioned.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711073

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.7
63	36.6
80	27.9
100	31.2
125	29.5
160	30.4
200	33.9
250	21.8
315	24.9
400	28.1
500	33.1
630	26.5
800	26.9
1k	25.3
1.25k	28.6
1.6k	27.5
2k	33.7
2.5k	31.3
3.15k	26.7
4k	26.9
5k	34.2



$D_{0.01m,nT,w}(C;C_{tr})$ 28 (0; -1) dB

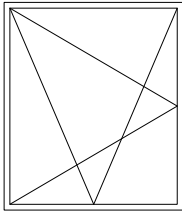
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

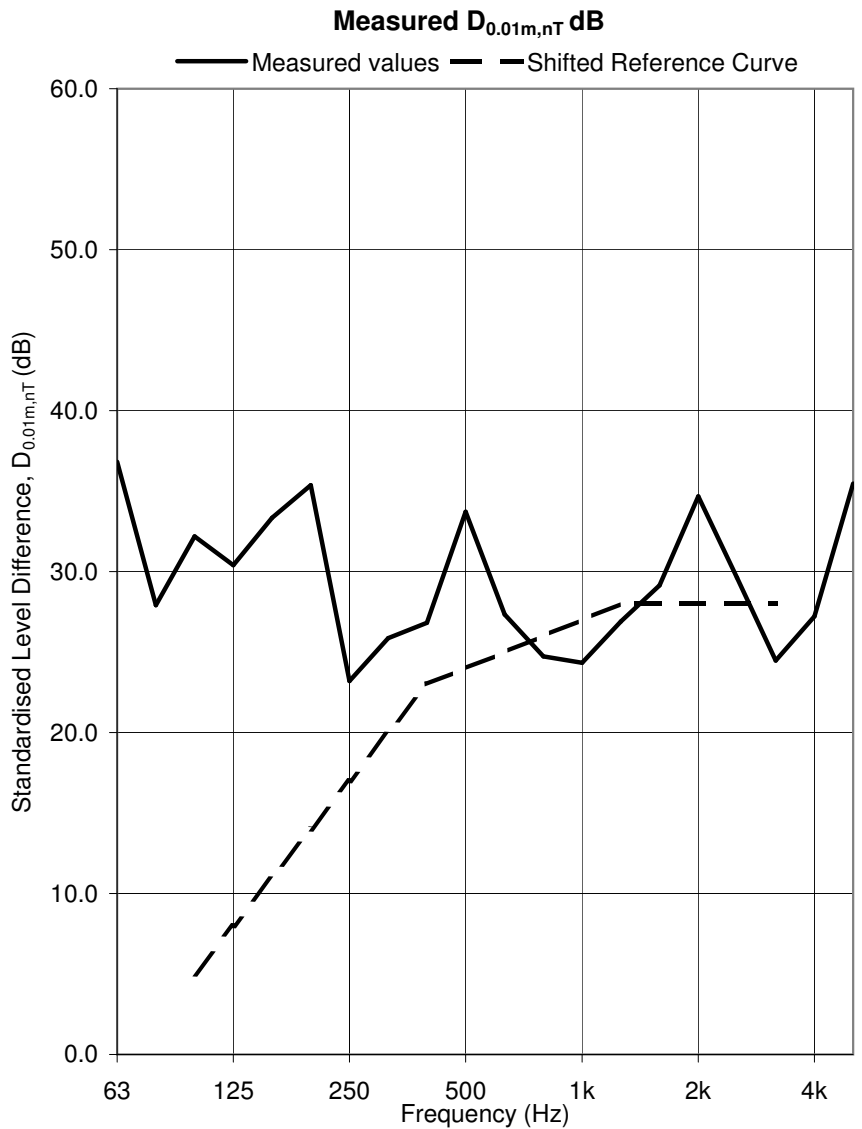
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712005

Test Sample: Window C-3 Untensioned.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	30.4
63	36.8
80	27.9
100	32.2
125	30.4
160	33.3
200	35.4
250	23.2
315	25.9
400	26.8
500	33.7
630	27.3
800	24.7
1k	24.3
1.25k	26.9
1.6k	29.2
2k	34.7
2.5k	29.6
3.15k	24.5
4k	27.2
5k	35.5




D_{0.01m,nT,w(C;C_{tr}) 28 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

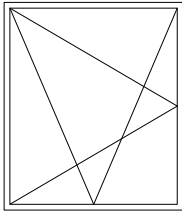
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

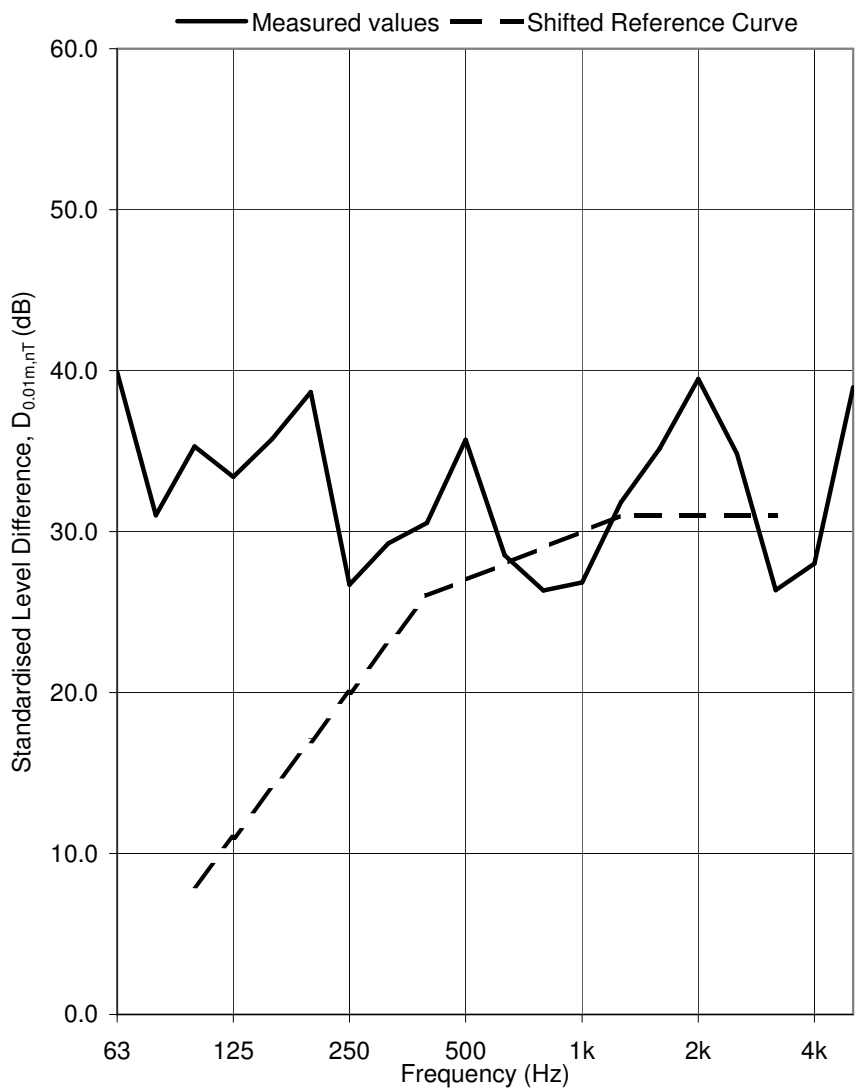
Test Sample: Window C-4 Untensioned.
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712009

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	33.7
63	39.9
80	31.0
100	35.3
125	33.4
160	35.7
200	38.7
250	26.7
315	29.3
400	30.5
500	35.7
630	28.5
800	26.3
1k	26.8
1.25k	31.8
1.6k	35.2
2k	39.5
2.5k	34.8
3.15k	26.4
4k	28.0
5k	39.0



$D_{0.01m,nT,w}(C;C_{tr})$ 31 (-1; -2) dB

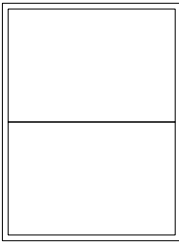
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

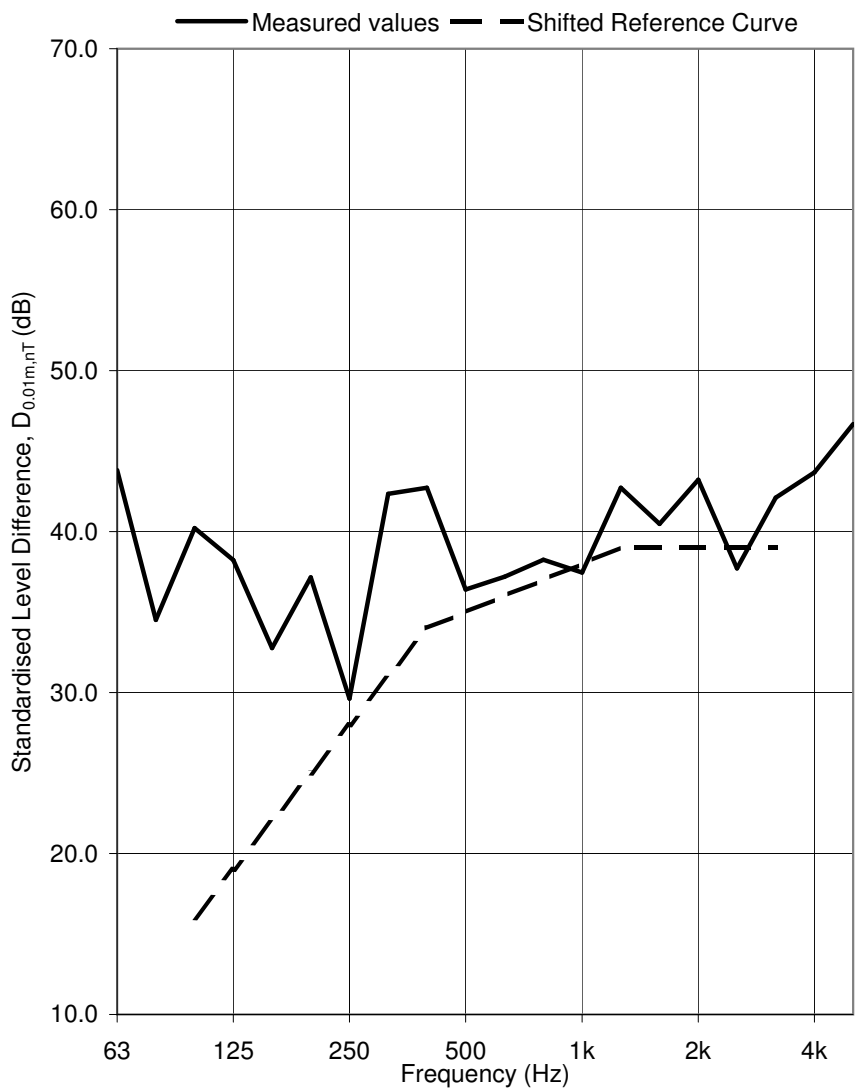
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713058

Test Sample: Window D-1 Untensioned.
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	34.9
63	43.8
80	34.5
100	40.2
125	38.2
160	32.8
200	37.2
250	29.6
315	42.3
400	42.7
500	36.4
630	37.2
800	38.2
1k	37.5
1.25k	42.7
1.6k	40.5
2k	43.2
2.5k	37.7
3.15k	42.1
4k	43.7
5k	46.7



$D_{0.01m,nT,w}(C;C_{tr})$ 39 (0; -1) dB

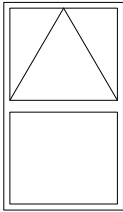
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

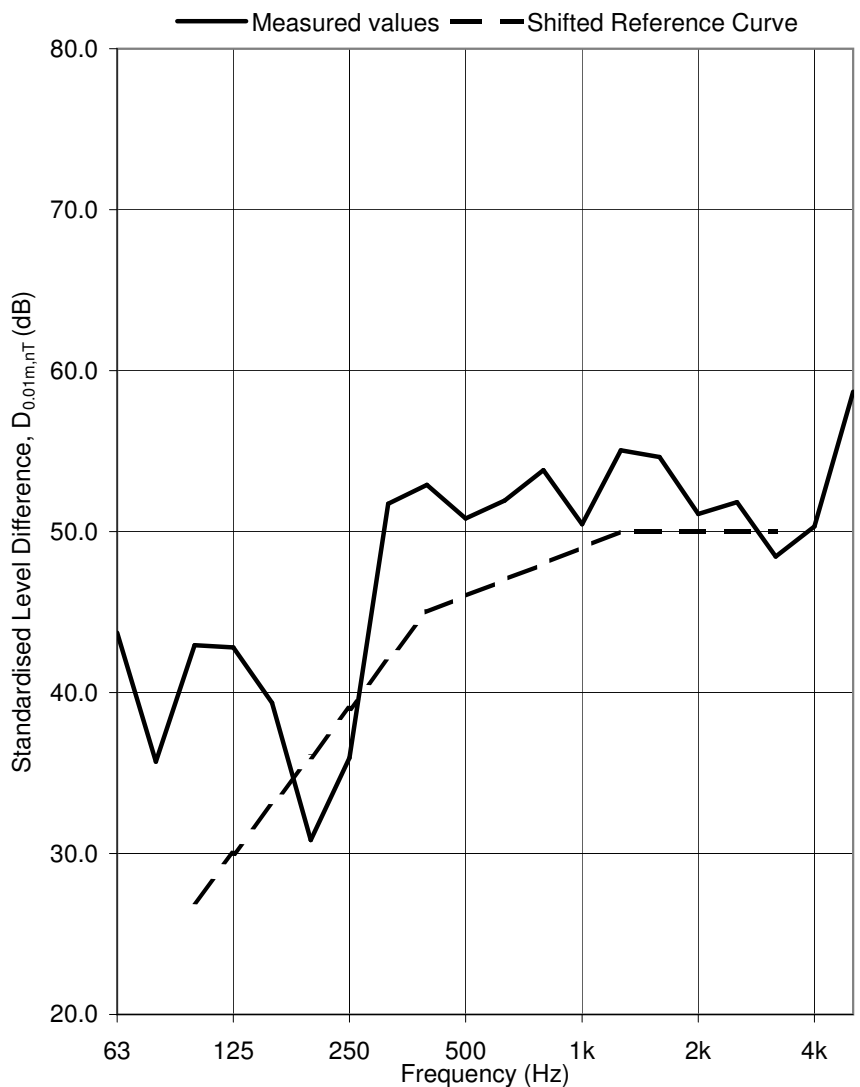
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718030

Test Sample: Window E Untensioned.
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	43.9
63	43.7
80	35.7
100	42.9
125	42.8
160	39.4
200	30.8
250	35.9
315	51.7
400	52.9
500	50.8
630	51.9
800	53.8
1k	50.4
1.25k	55.1
1.6k	54.6
2k	51.1
2.5k	51.8
3.15k	48.4
4k	50.3
5k	58.7


$D_{0.01m,nT,w(C;C_{tr})}$ 50 (-2; -6) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

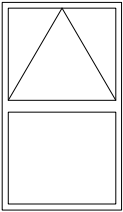
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

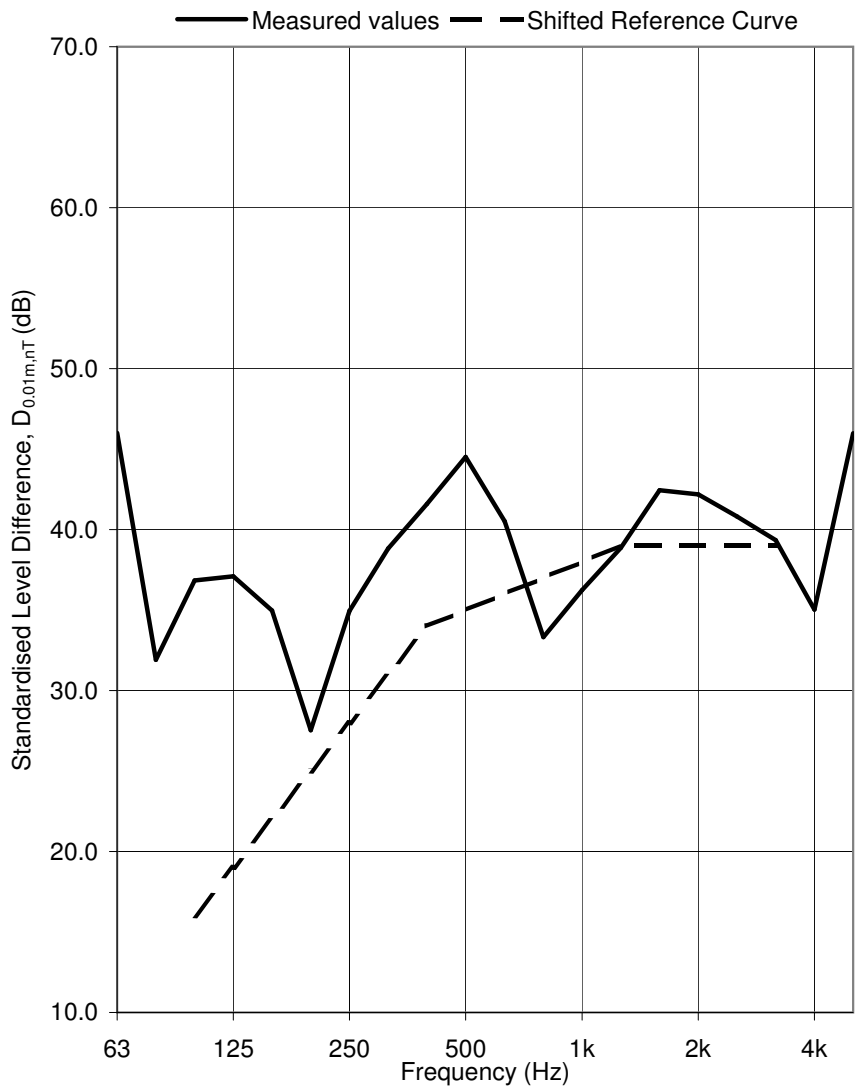
Test Sample: Window F Untensioned.
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 719013

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	42.3
63	46.0
80	31.9
100	36.8
125	37.1
160	35.0
200	27.5
250	34.9
315	38.8
400	41.6
500	44.5
630	40.5
800	33.3
1k	36.2
1.25k	38.9
1.6k	42.4
2k	42.2
2.5k	40.8
3.15k	39.3
4k	35.0
5k	46.0



$D_{0.01m,nT,w(C;C_{tr})}$ 39 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

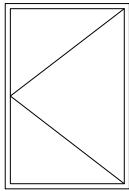
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

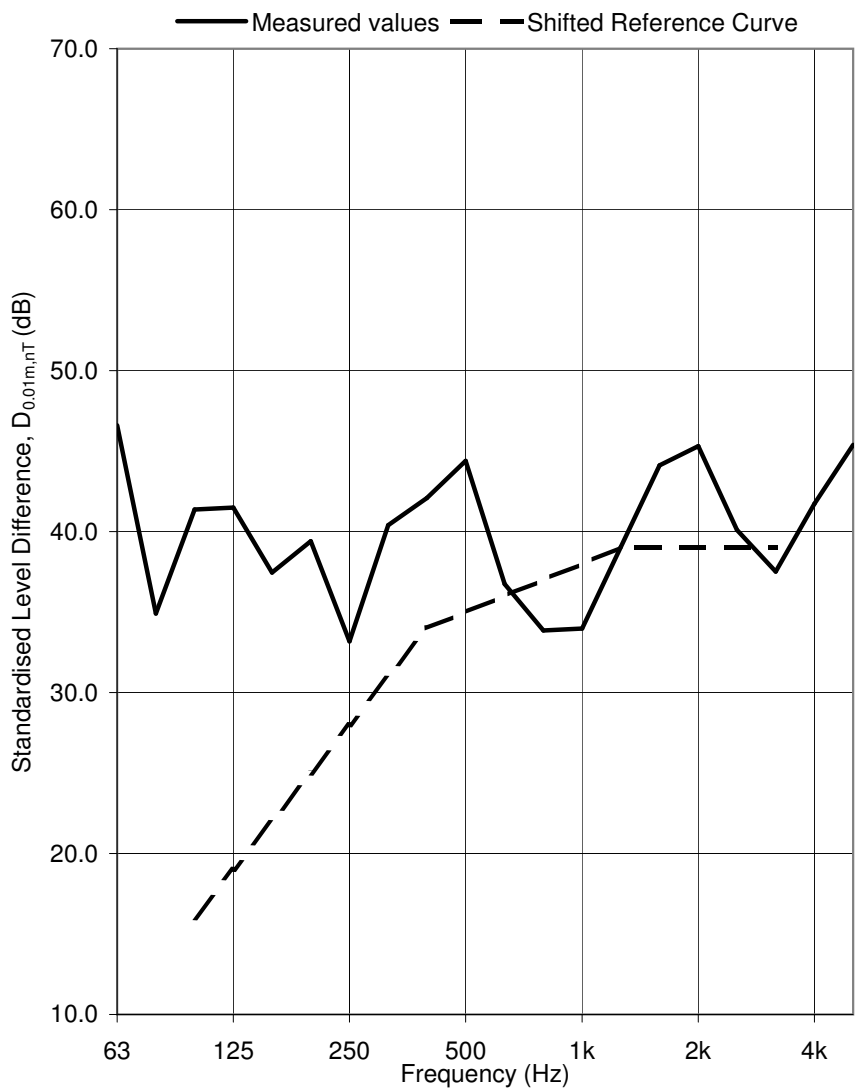
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window G Untensioned.
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 720013



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	42.7
63	46.6
80	34.9
100	41.4
125	41.5
160	37.5
200	39.4
250	33.2
315	40.4
400	42.1
500	44.4
630	36.7
800	33.9
1k	34.0
1.25k	39.0
1.6k	44.1
2k	45.3
2.5k	40.1
3.15k	37.5
4k	41.7
5k	45.4

$D_{0.01m,nT,w}(C;C_{tr})$ 39 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

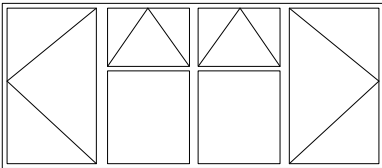
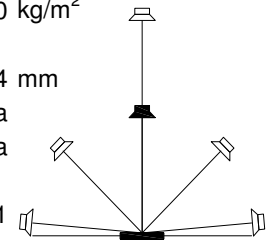
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

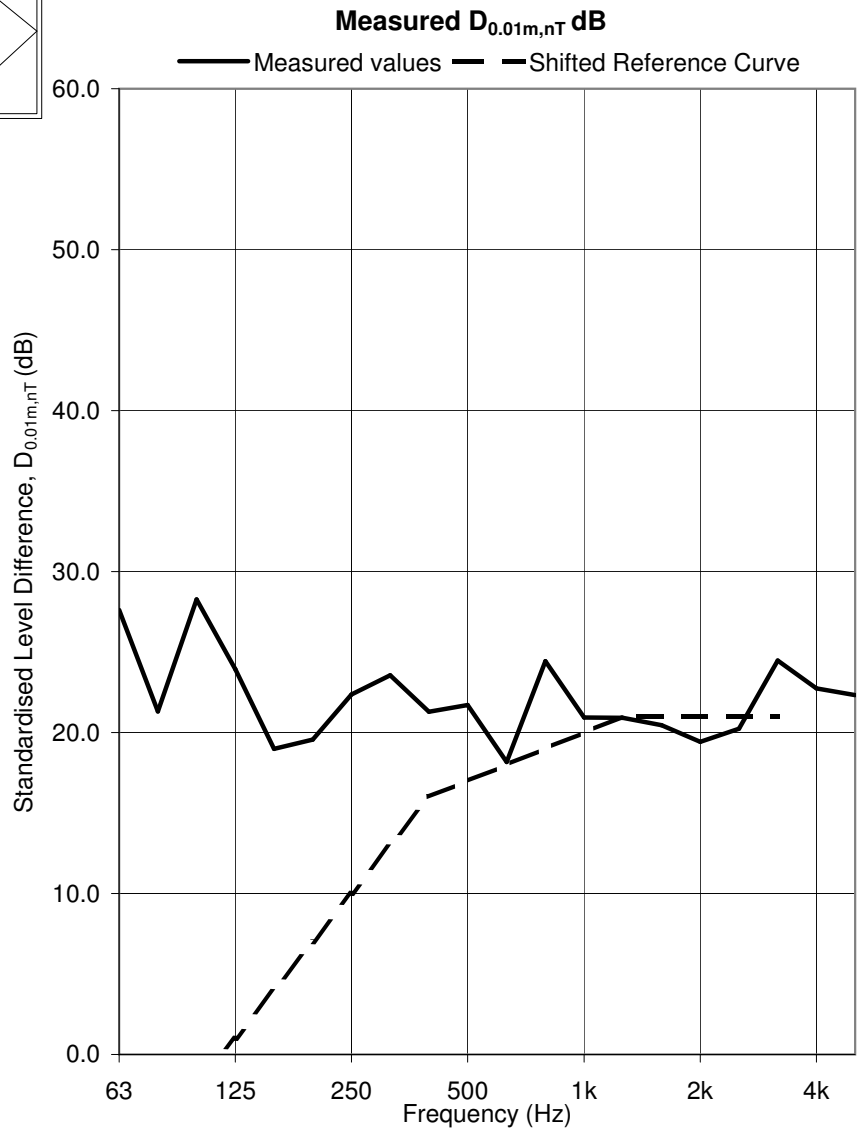
Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628014

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	20.9
63	27.6
80	21.3
100	28.3
125	23.9
160	19.0
200	19.6
250	22.4
315	23.6
400	21.3
500	21.7
630	18.2
800	24.4
1k	20.9
1.25k	20.9
1.6k	20.5
2k	19.4
2.5k	20.2
3.15k	24.5
4k	22.7
5k	22.3



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

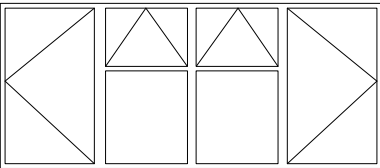
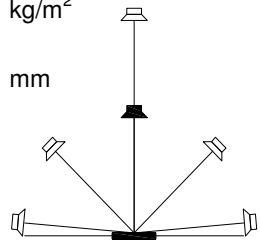
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

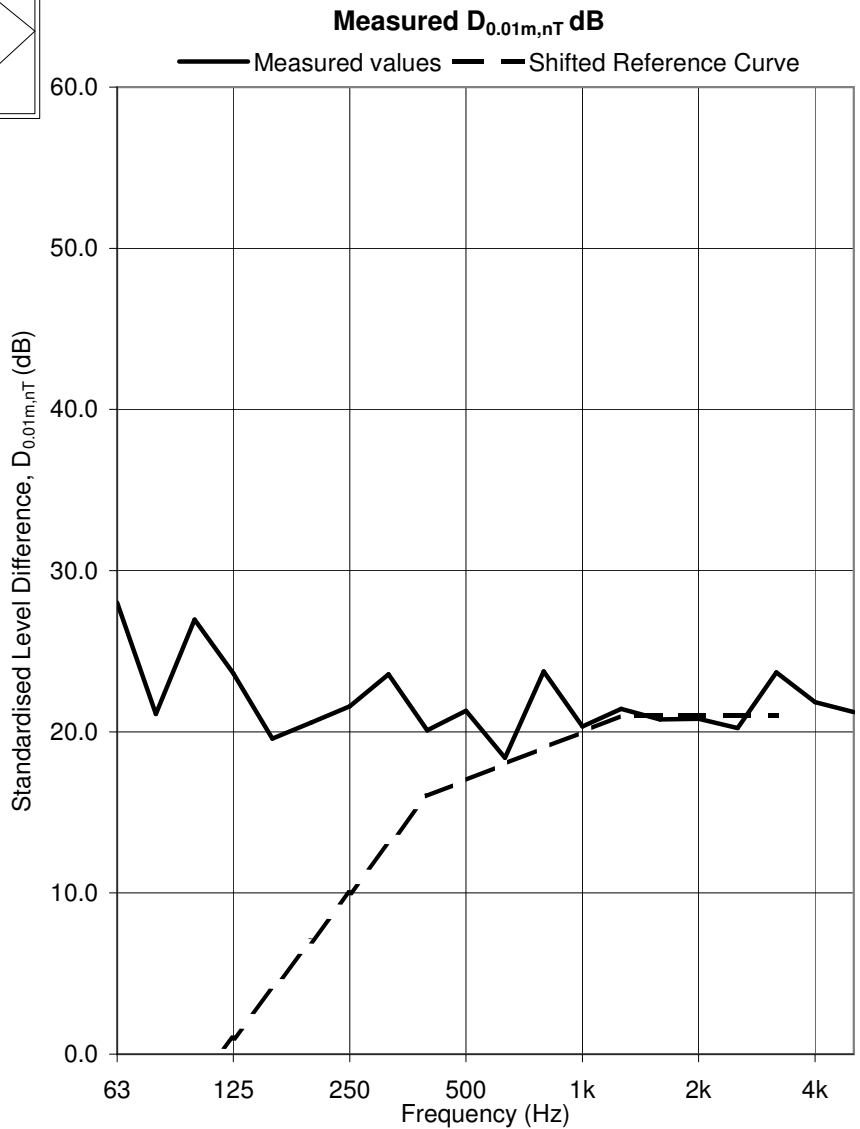
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628009

Test Sample: Window A-2 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	21.0
63	28.0
80	21.1
100	27.0
125	23.6
160	19.6
200	20.6
250	21.6
315	23.6
400	20.1
500	21.3
630	18.4
800	23.7
1k	20.3
1.25k	21.4
1.6k	20.8
2k	20.8
2.5k	20.2
3.15k	23.7
4k	21.8
5k	21.2



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

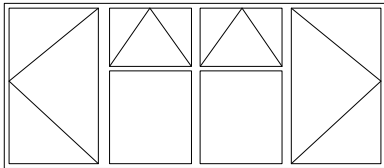
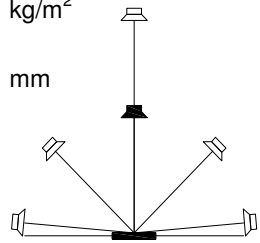
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

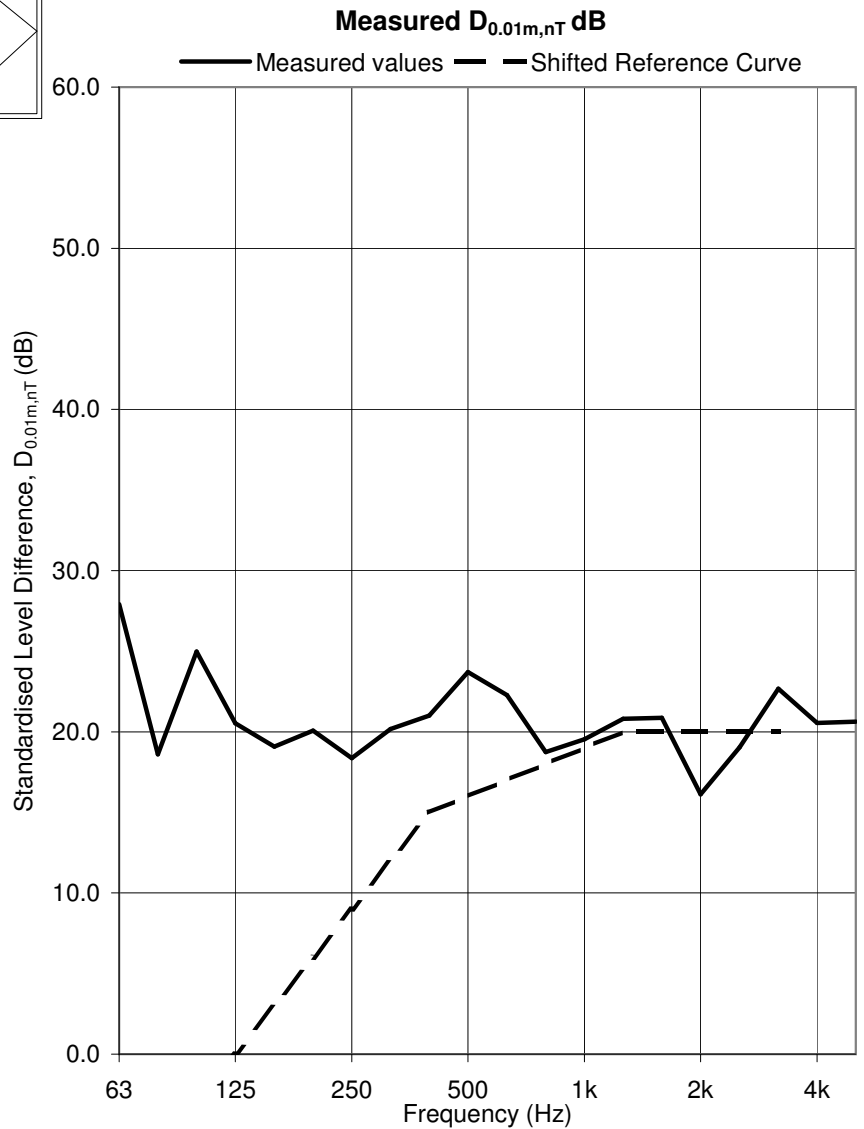
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628004

Test Sample: Window A-3 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	21.6
63	27.9
80	18.6
100	25.0
125	20.5
160	19.1
200	20.1
250	18.4
315	20.2
400	21.0
500	23.7
630	22.3
800	18.7
1k	19.5
1.25k	20.8
1.6k	20.9
2k	16.1
2.5k	19.0
3.15k	22.7
4k	20.5
5k	20.6



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

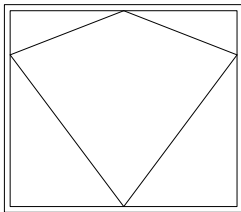
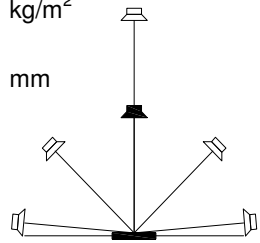
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

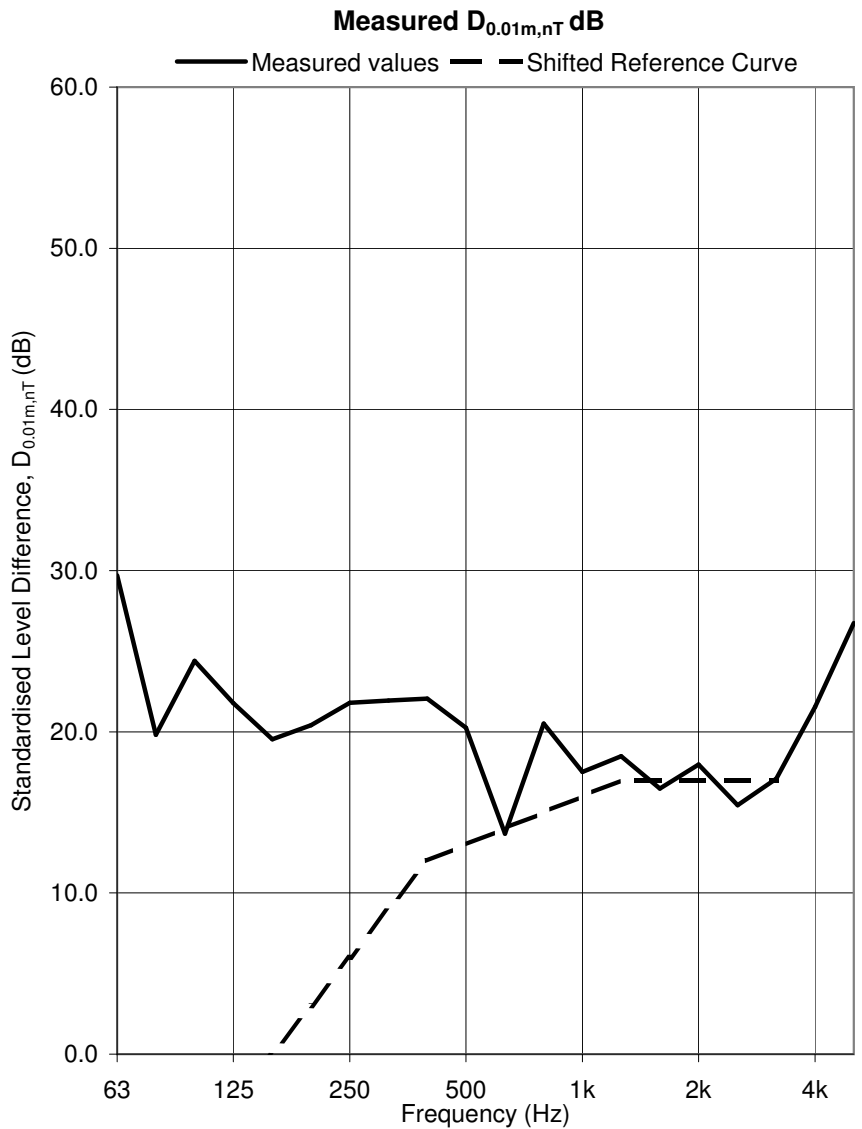
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 18.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9984 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705003

Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	24.4
63	29.7
80	19.8
100	24.4
125	21.8
160	19.5
200	20.4
250	21.8
315	21.9
400	22.1
500	20.3
630	13.7
800	20.5
1k	17.5
1.25k	18.5
1.6k	16.5
2k	18.0
2.5k	15.5
3.15k	17.1
4k	21.5
5k	26.7



D_{0.01m,nT,w(C;C_{tr}) 17 (0; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

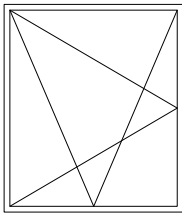
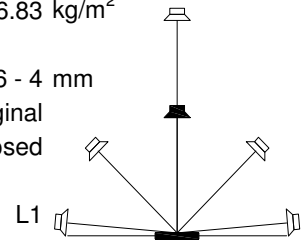
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0282 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

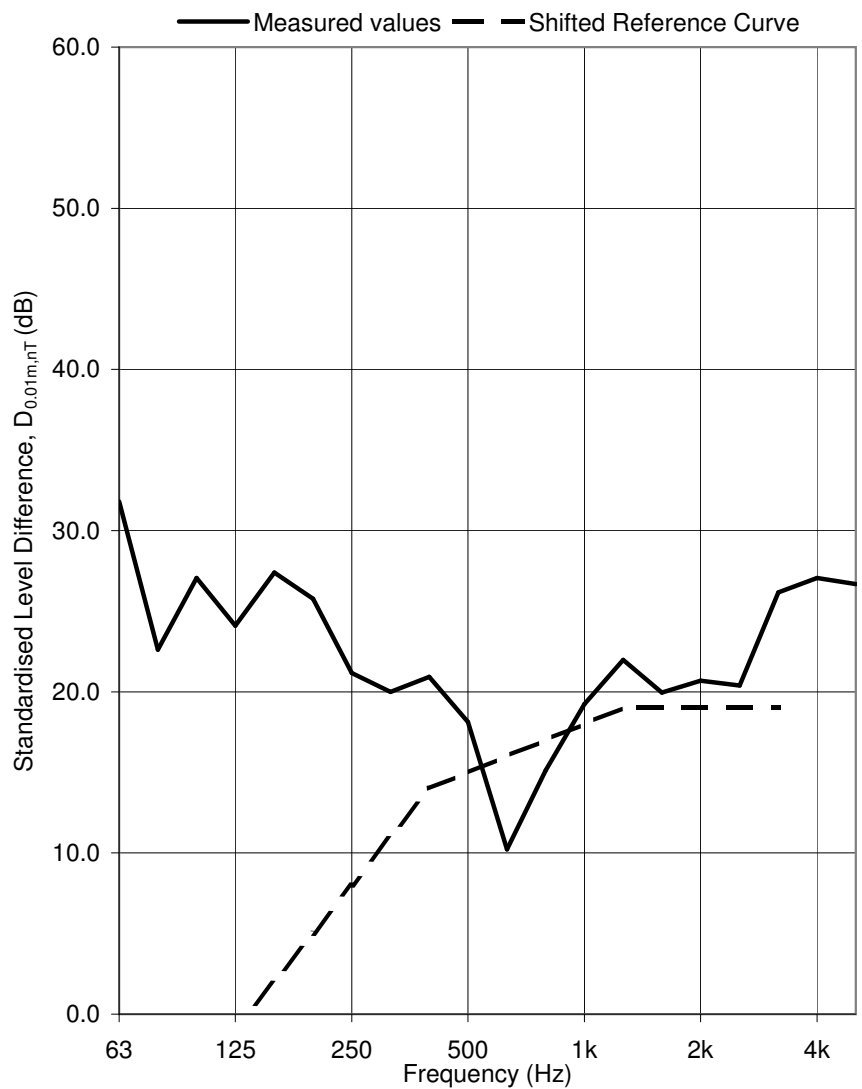
Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711006

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.3
63	31.8
80	22.6
100	27.1
125	24.1
160	27.4
200	25.8
250	21.2
315	20.0
400	20.9
500	18.1
630	10.2
800	15.1
1k	19.2
1.25k	22.0
1.6k	20.0
2k	20.7
2.5k	20.4
3.15k	26.2
4k	27.1
5k	26.7

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

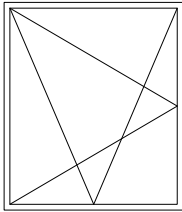
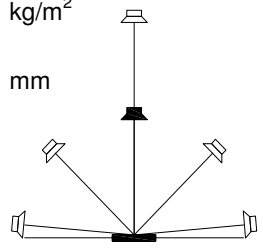
Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711010

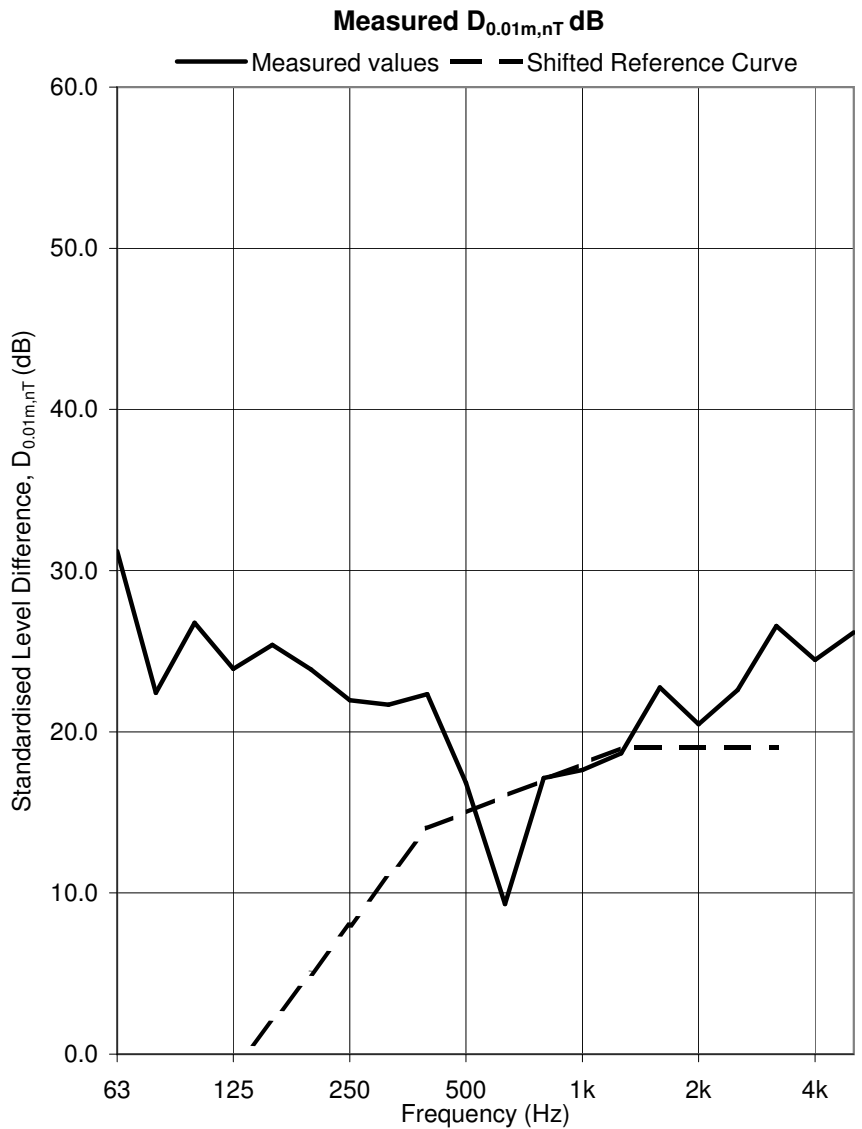
Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	24.7
63	31.2
80	22.4
100	26.8
125	23.9
160	25.4
200	23.9
250	22.0
315	21.7
400	22.3
500	16.8
630	9.3
800	17.1
1k	17.6
1.25k	18.7
1.6k	22.8
2k	20.5
2.5k	22.6
3.15k	26.6
4k	24.5
5k	26.2



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -2) dB}

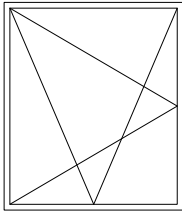
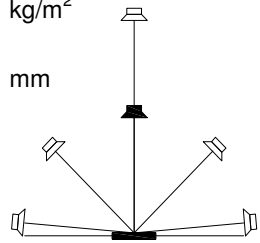
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

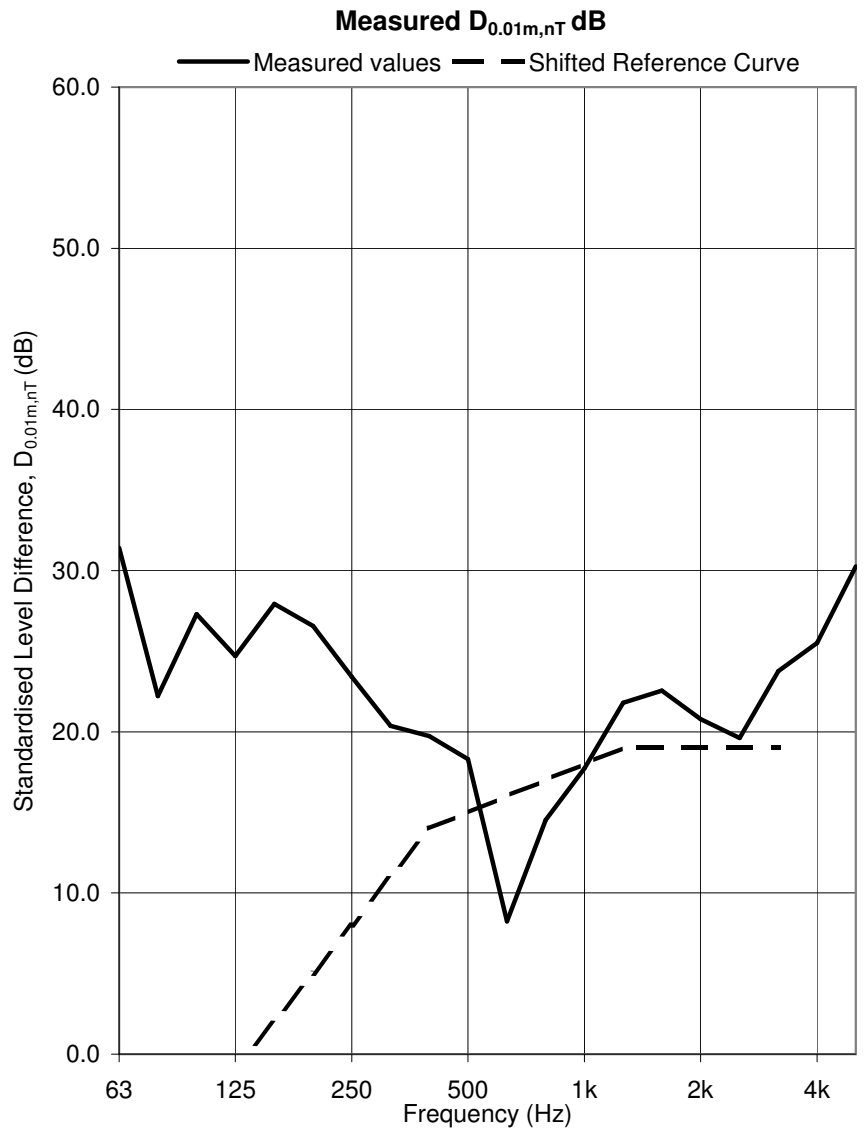
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712032

Test Sample: Window C-3 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	24.4
63	31.4
80	22.2
100	27.3
125	24.7
160	27.9
200	26.6
250	23.4
315	20.4
400	19.7
500	18.3
630	8.2
800	14.5
1k	17.7
1.25k	21.8
1.6k	22.6
2k	20.8
2.5k	19.6
3.15k	23.8
4k	25.5
5k	30.3



D_{0.01m,nT,w(C;C_{tr}) 19 (-2; -3) dB}

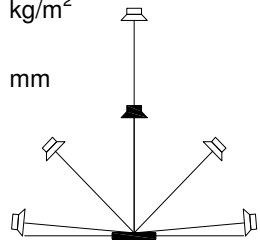
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

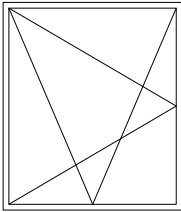
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

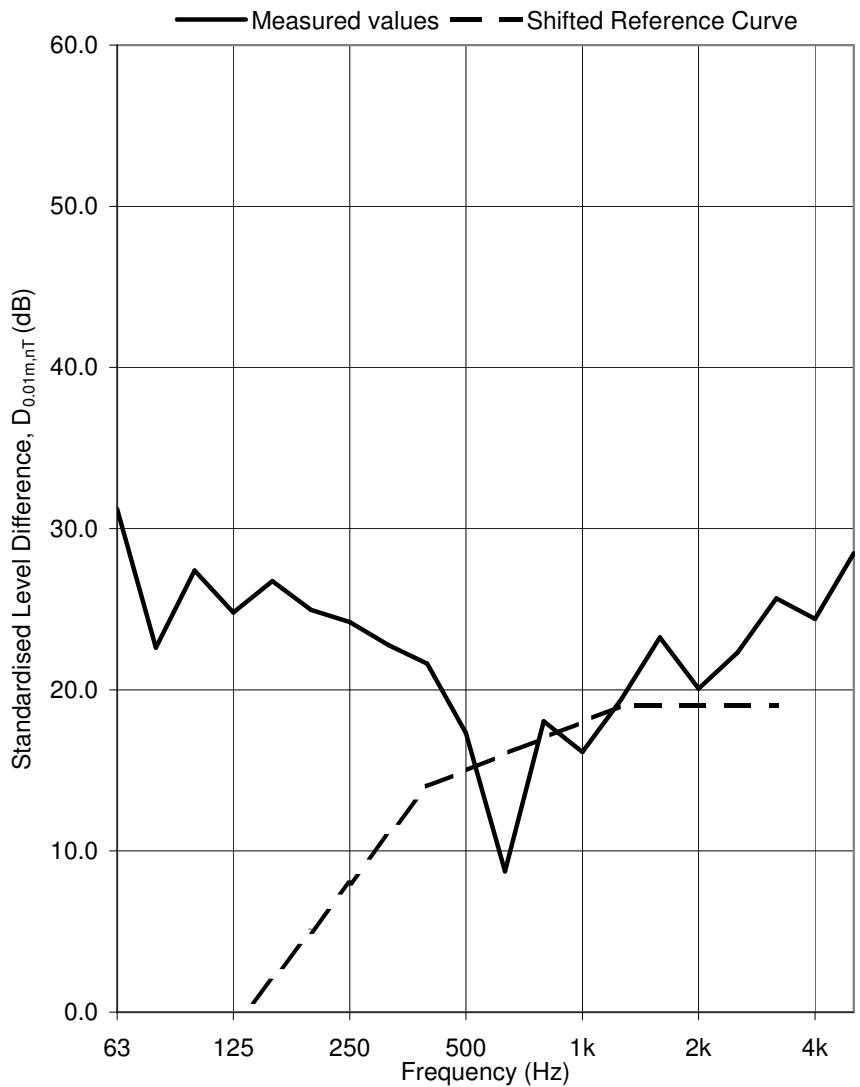


Test ID: 712036

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.3
63	31.2
80	22.6
100	27.4
125	24.8
160	26.7
200	25.0
250	24.2
315	22.8
400	21.6
500	17.3
630	8.7
800	18.0
1k	16.1
1.25k	19.4
1.6k	23.3
2k	20.1
2.5k	22.3
3.15k	25.7
4k	24.4
5k	28.5

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-2; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

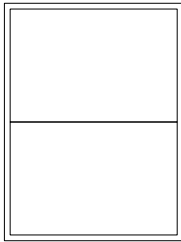
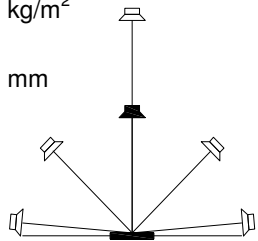
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

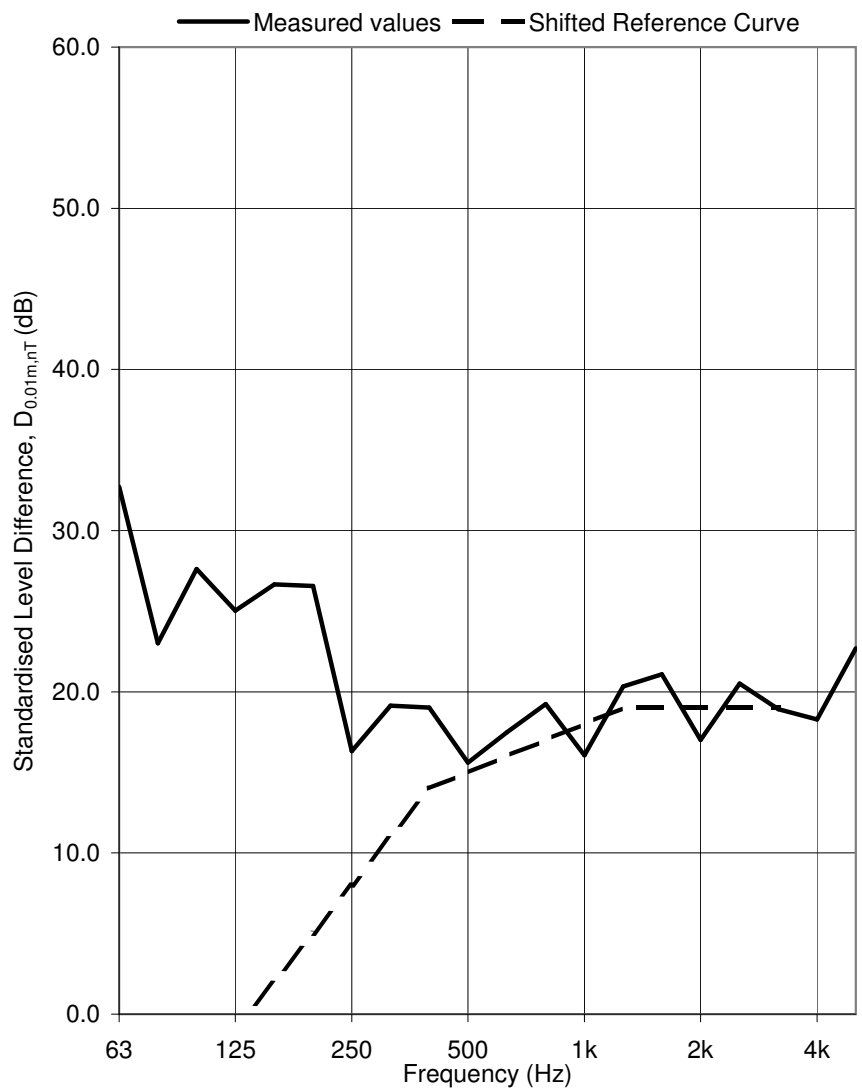
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713011

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.0
63	32.7
80	23.0
100	27.6
125	25.0
160	26.7
200	26.6
250	16.3
315	19.1
400	19.0
500	15.6
630	17.5
800	19.2
1k	16.1
1.25k	20.3
1.6k	21.1
2k	17.0
2.5k	20.5
3.15k	18.9
4k	18.3
5k	22.7

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

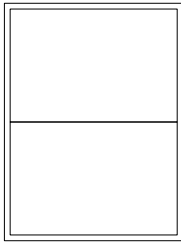
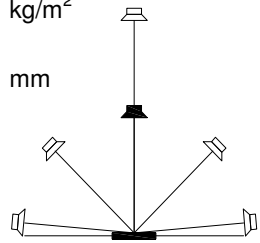
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

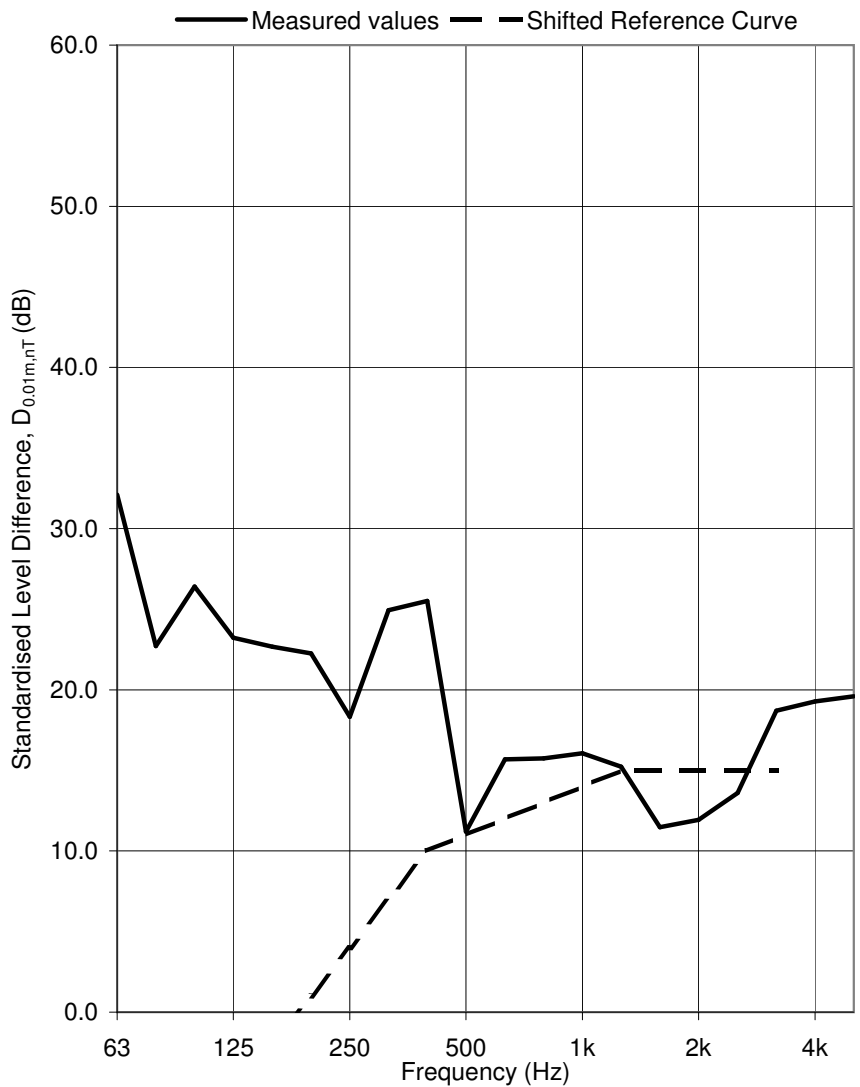
Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713003

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.7
63	32.1
80	22.7
100	26.4
125	23.2
160	22.7
200	22.3
250	18.3
315	24.9
400	25.5
500	11.2
630	15.7
800	15.7
1k	16.1
1.25k	15.2
1.6k	11.5
2k	11.9
2.5k	13.6
3.15k	18.7
4k	19.3
5k	19.6

$D_{0.01m,nT,w}(C;C_{tr})$ 15 (-1; 0) dB

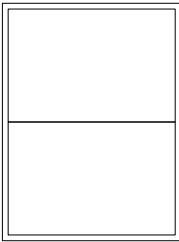
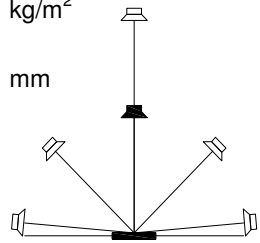
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

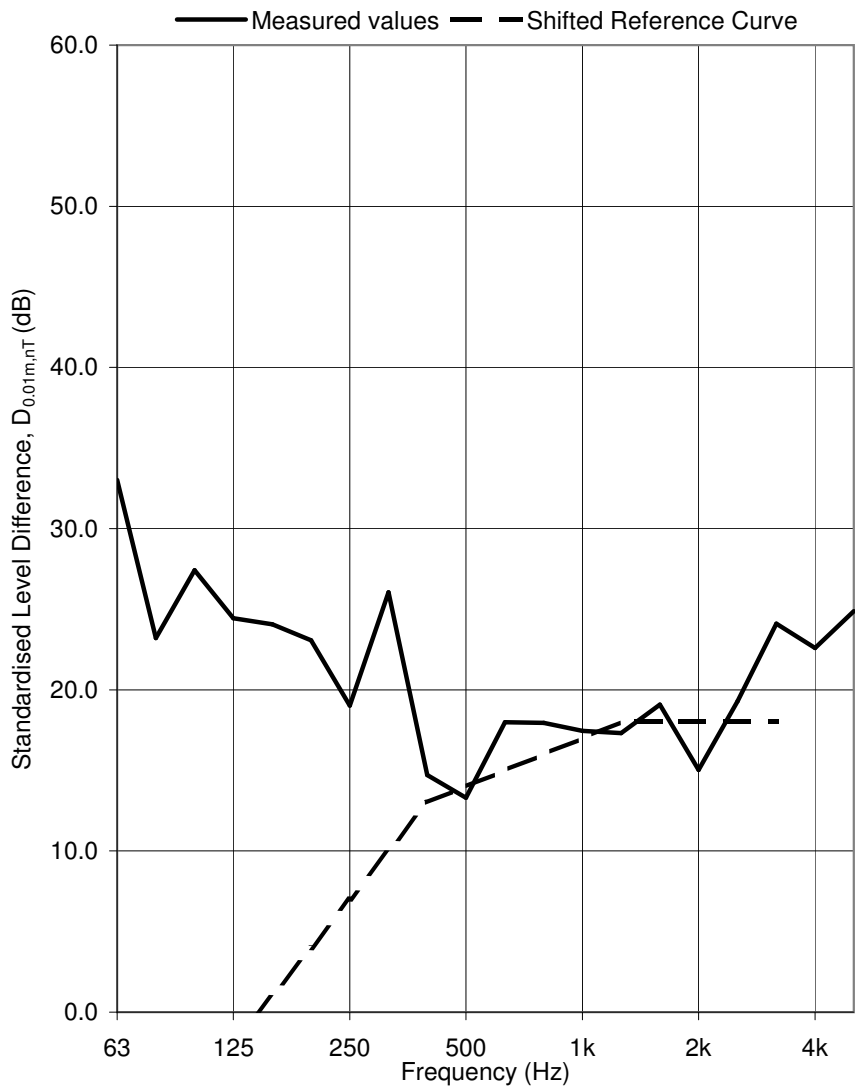
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713007

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	29.1
63	33.0
80	23.2
100	27.4
125	24.4
160	24.1
200	23.1
250	19.0
315	26.0
400	14.7
500	13.3
630	18.0
800	17.9
1k	17.5
1.25k	17.3
1.6k	19.1
2k	15.0
2.5k	19.3
3.15k	24.1
4k	22.6
5k	24.9

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; -1) dB

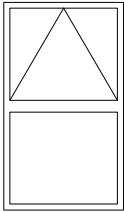
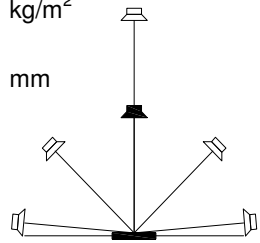
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

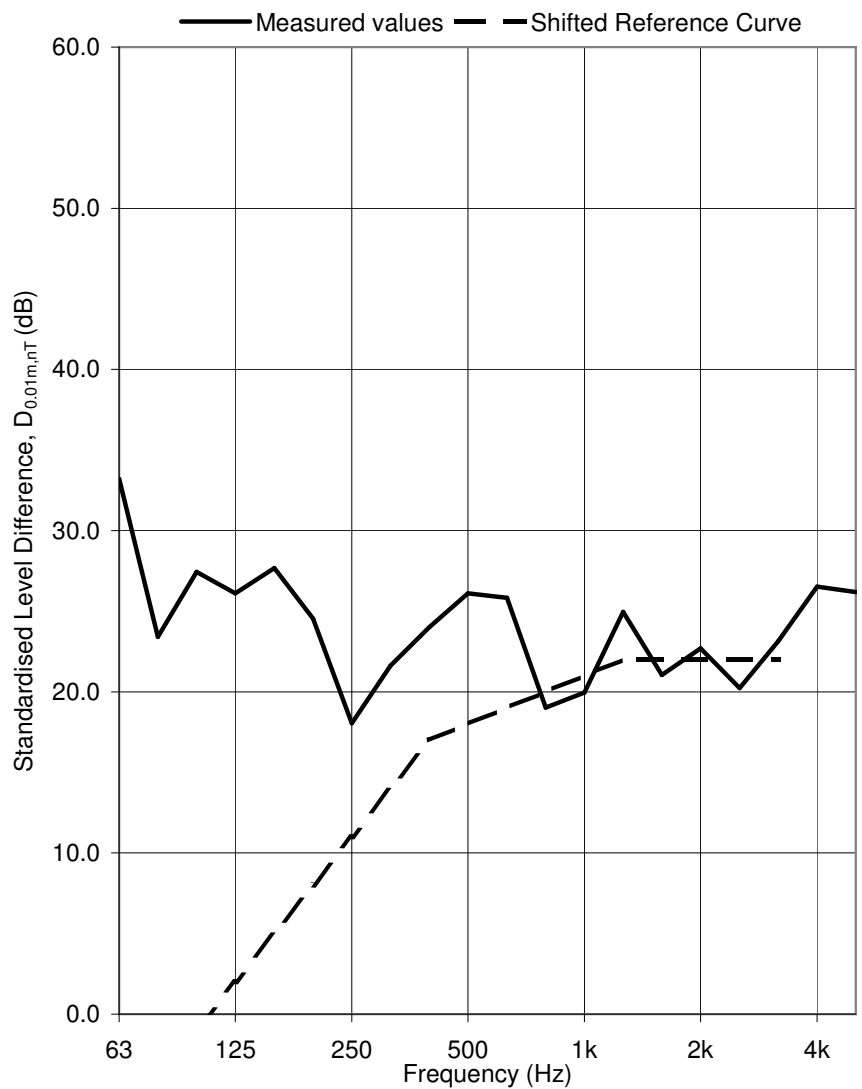
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718004

Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.7
63	33.2
80	23.4
100	27.4
125	26.1
160	27.7
200	24.5
250	18.0
315	21.6
400	24.0
500	26.1
630	25.8
800	19.0
1k	19.9
1.25k	25.0
1.6k	21.0
2k	22.7
2.5k	20.2
3.15k	23.1
4k	26.5
5k	26.2

$D_{0.01m,nT,w(C;C_{tr})}$ 22 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

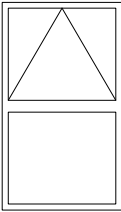
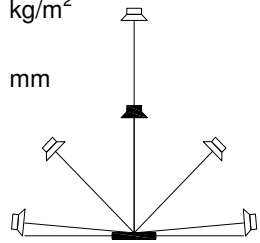
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

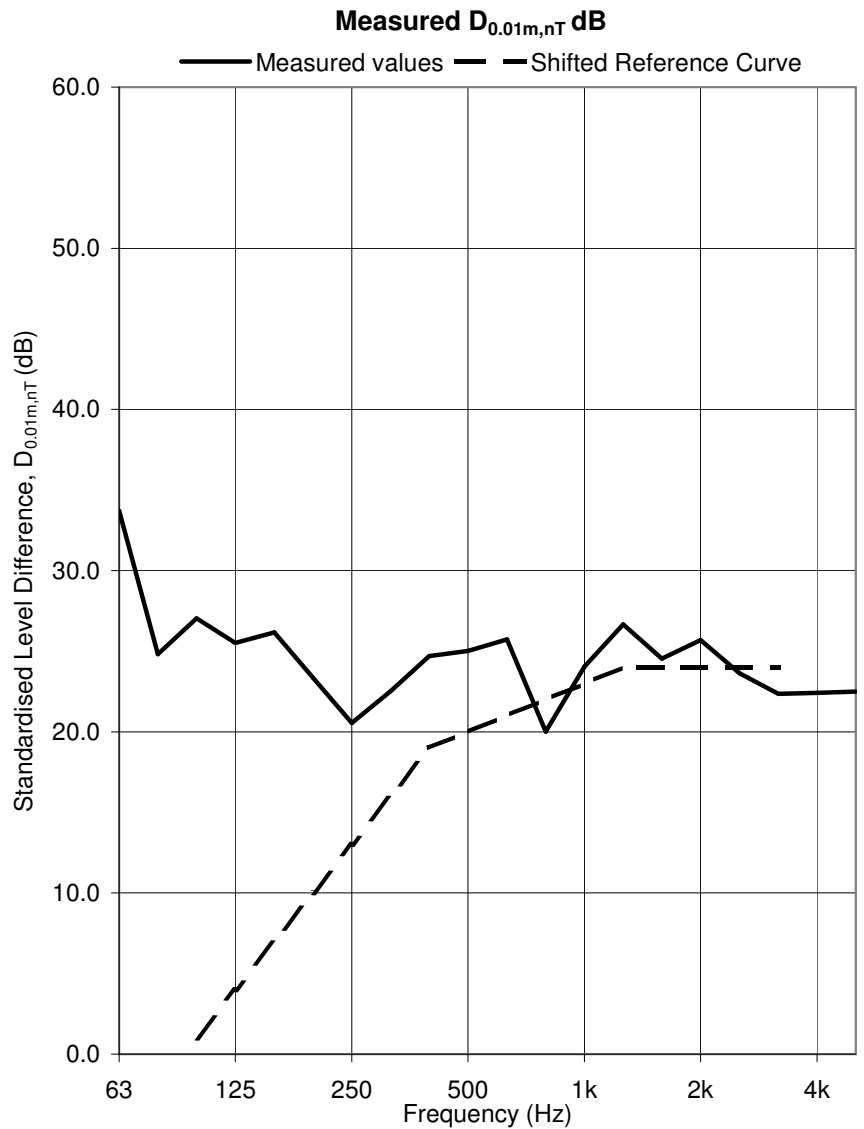
Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	27.6
63	33.7
80	24.8
100	27.0
125	25.5
160	26.2
200	23.3
250	20.5
315	22.5
400	24.7
500	25.0
630	25.7
800	20.0
1k	24.0
1.25k	26.7
1.6k	24.5
2k	25.7
2.5k	23.6
3.15k	22.3
4k	22.4
5k	22.5



D_{0.01m,nT,w(C;C_{tr}) 24 (0; 0) dB}

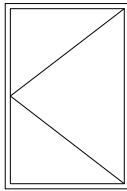
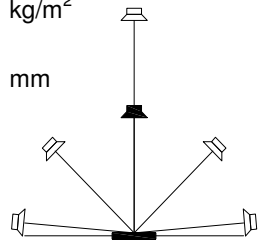
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

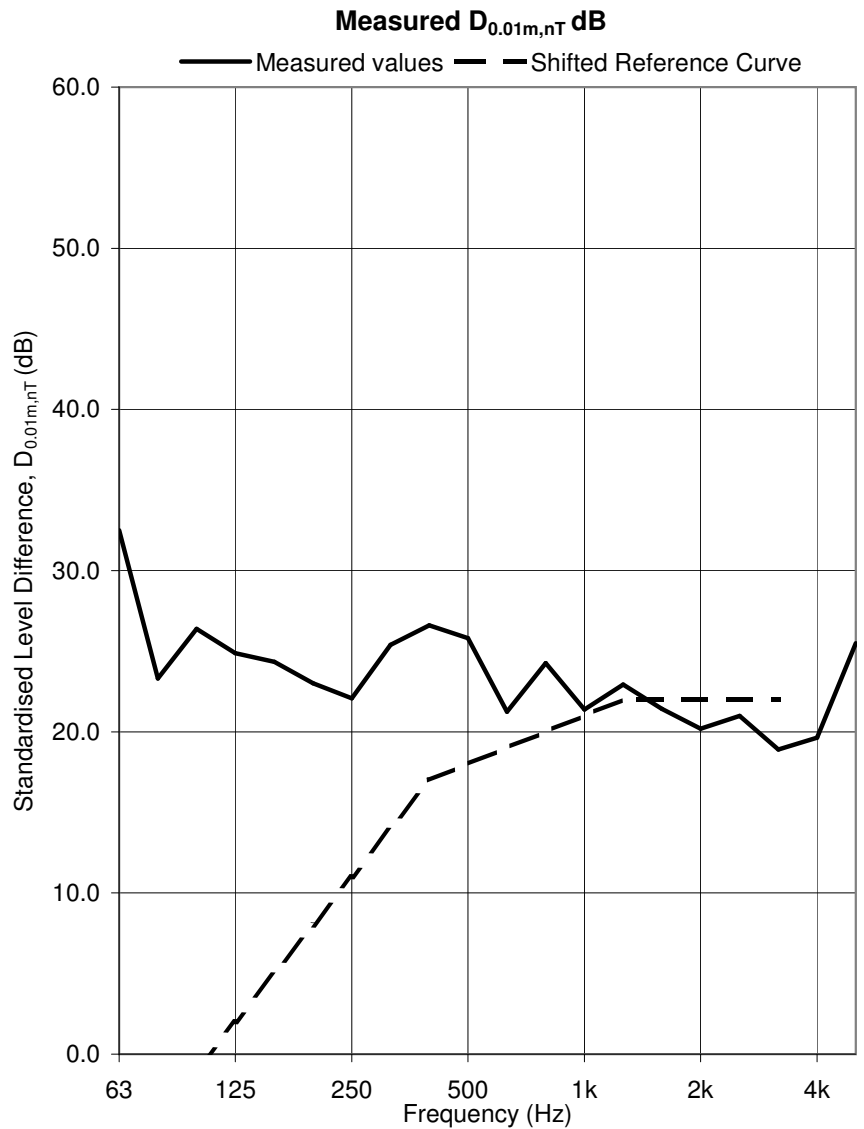
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720017

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	23.2
63	32.5
80	23.3
100	26.4
125	24.9
160	24.4
200	23.0
250	22.1
315	25.4
400	26.6
500	25.8
630	21.2
800	24.3
1k	21.4
1.25k	22.9
1.6k	21.4
2k	20.2
2.5k	21.0
3.15k	18.9
4k	19.6
5k	25.5



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; 0) dB}

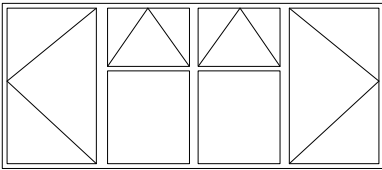
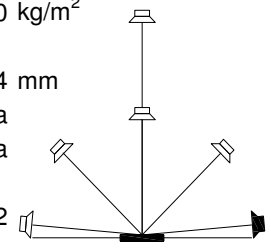
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

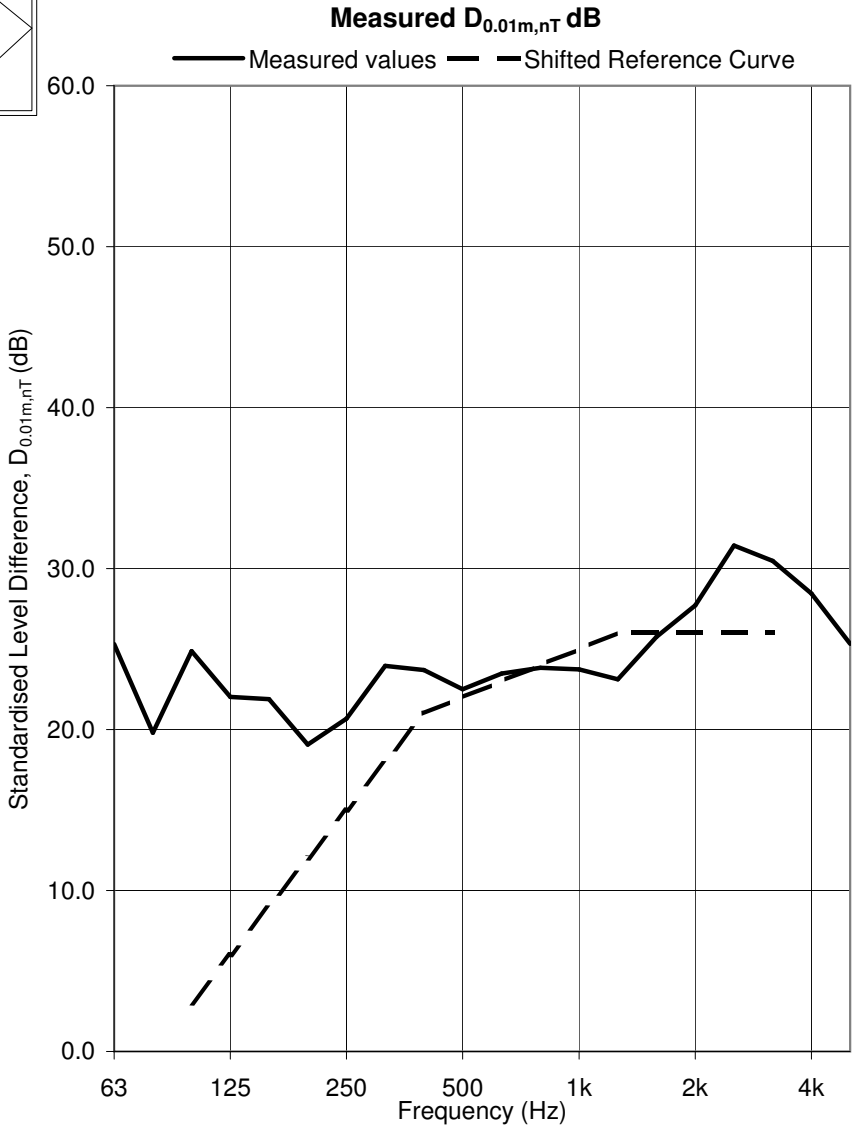
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0102 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628046

Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	15.7
63	25.3
80	19.8
100	24.9
125	22.0
160	21.9
200	19.1
250	20.7
315	24.0
400	23.7
500	22.5
630	23.5
800	23.8
1k	23.7
1.25k	23.1
1.6k	25.8
2k	27.7
2.5k	31.4
3.15k	30.5
4k	28.4
5k	25.3



D_{0.01m,nT,w(C;C_{tr}) 26 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

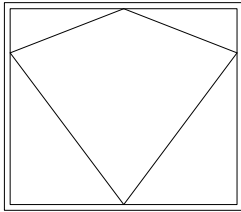
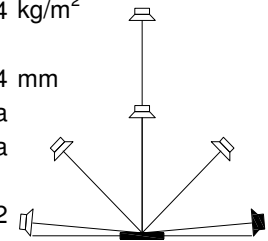
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

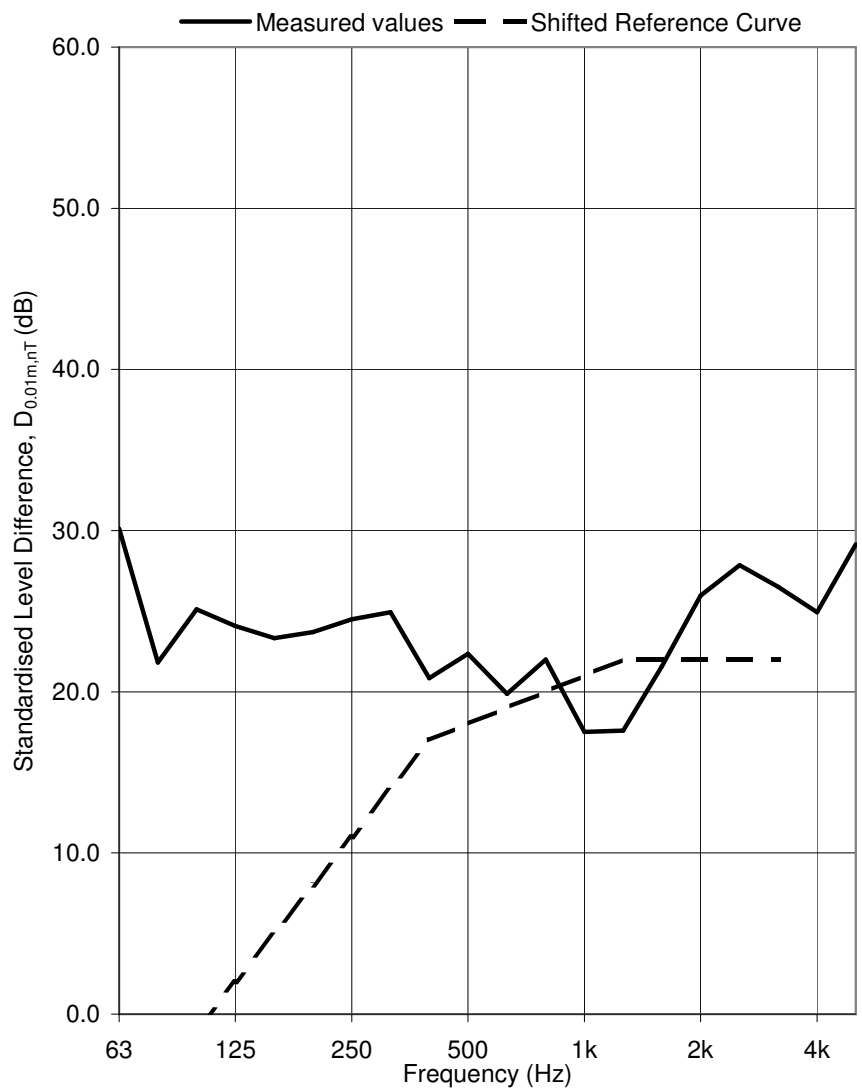
Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705008

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	19.1
63	30.1
80	21.8
100	25.1
125	24.1
160	23.3
200	23.7
250	24.5
315	24.9
400	20.9
500	22.4
630	19.9
800	22.0
1k	17.5
1.25k	17.6
1.6k	21.6
2k	26.0
2.5k	27.9
3.15k	26.5
4k	24.9
5k	29.1

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -2) dB

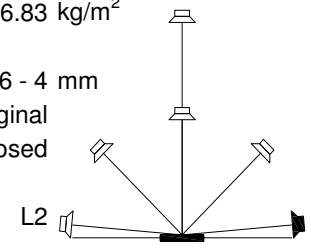
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

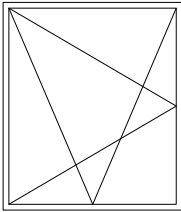
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

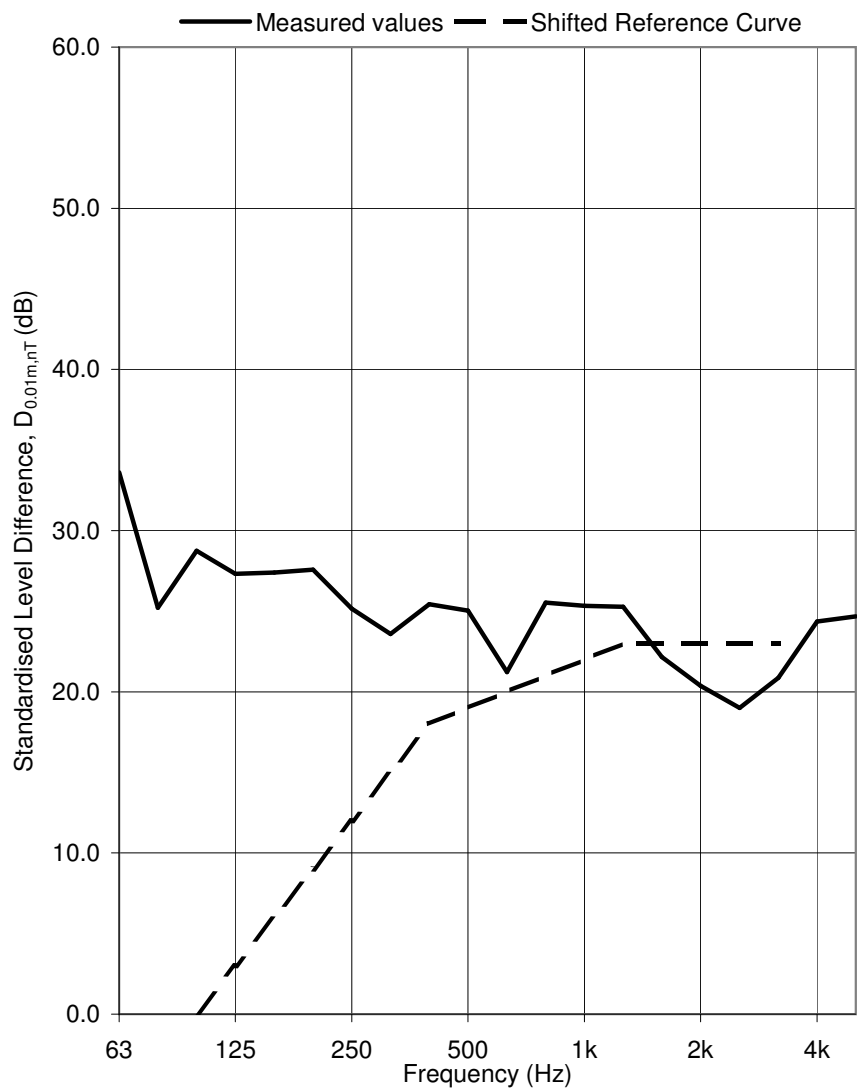


Test ID: 711032

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.1
63	33.6
80	25.2
100	28.8
125	27.3
160	27.4
200	27.6
250	25.2
315	23.6
400	25.4
500	25.0
630	21.2
800	25.5
1k	25.3
1.25k	25.3
1.6k	22.2
2k	20.4
2.5k	19.0
3.15k	20.9
4k	24.4
5k	24.7

$D_{0.01m,nT,w}(C;C_{tr})$ 23 (-1; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

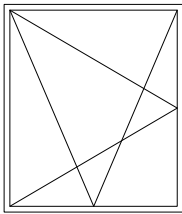
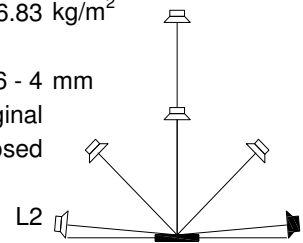
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

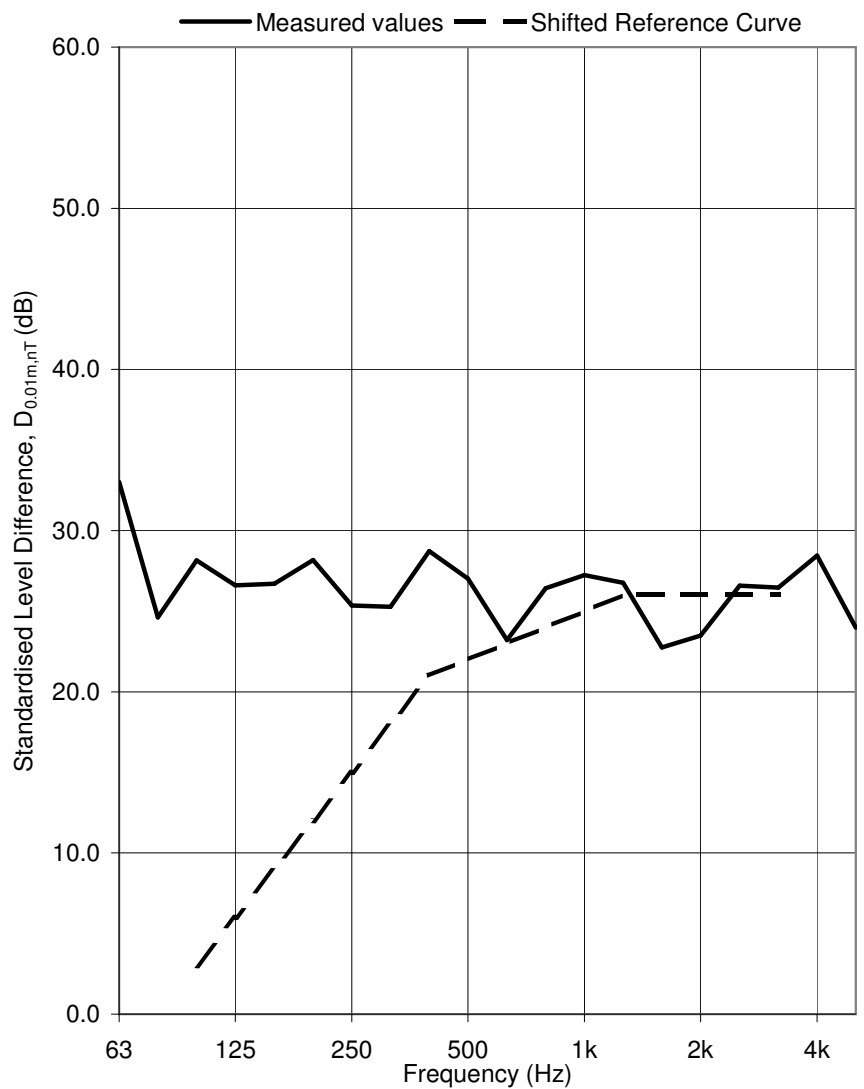
Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711036

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.4
63	33.0
80	24.6
100	28.2
125	26.6
160	26.7
200	28.2
250	25.4
315	25.3
400	28.7
500	27.0
630	23.2
800	26.4
1k	27.2
1.25k	26.8
1.6k	22.8
2k	23.5
2.5k	26.6
3.15k	26.5
4k	28.5
5k	24.0

$D_{0.01m,nT,w}(C;C_{tr})$ 26 (-1; 0) dB

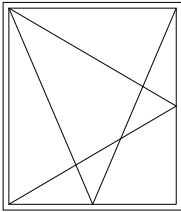
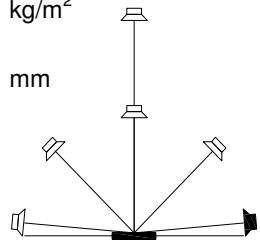
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

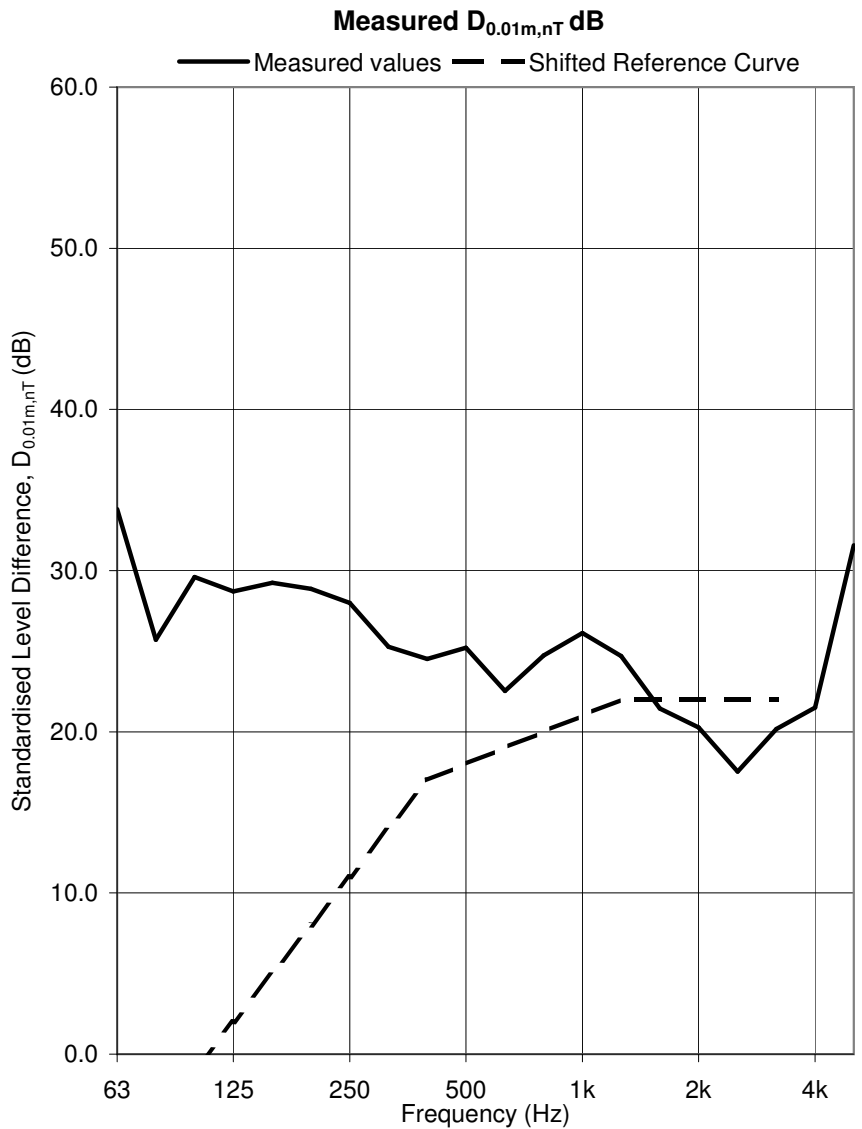
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712045

Test Sample: Window C-3 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	22.2
63	33.8
80	25.7
100	29.6
125	28.7
160	29.2
200	28.9
250	28.0
315	25.3
400	24.5
500	25.2
630	22.5
800	24.7
1k	26.1
1.25k	24.7
1.6k	21.5
2k	20.3
2.5k	17.5
3.15k	20.2
4k	21.5
5k	31.6



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

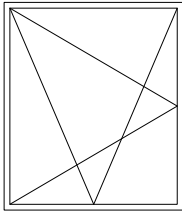
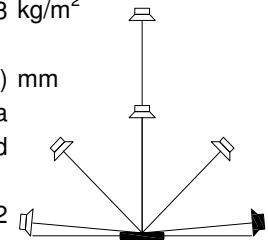
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

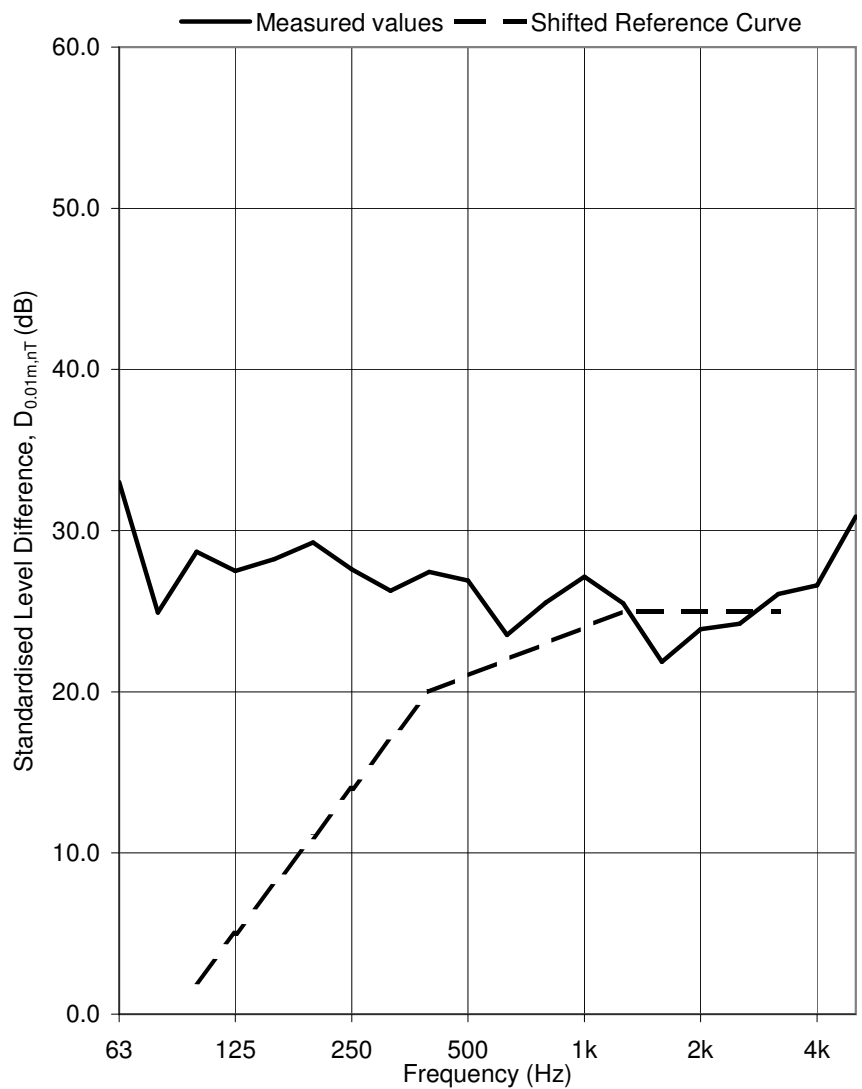
Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712049

Loudspeaker Configuration: L2



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	21.3
63	33.0
80	24.9
100	28.7
125	27.5
160	28.2
200	29.3
250	27.6
315	26.3
400	27.4
500	26.9
630	23.5
800	25.5
1k	27.1
1.25k	25.5
1.6k	21.9
2k	23.9
2.5k	24.2
3.15k	26.1
4k	26.6
5k	30.9

D_{0.01m,nT,w(C;C_{tr}) 25 (0; 0) dB}

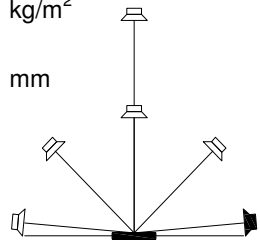
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

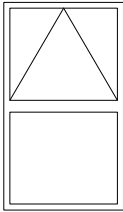
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

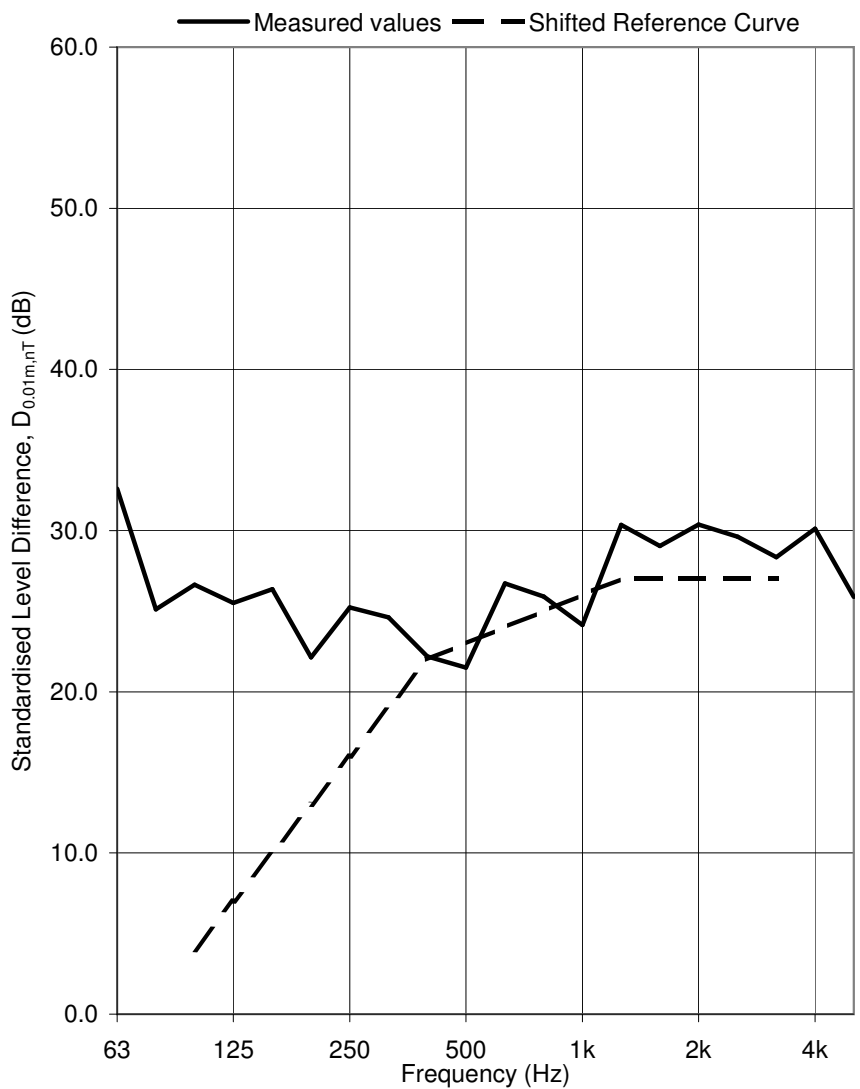


Test ID: 718018

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.3
63	32.6
80	25.1
100	26.6
125	25.5
160	26.4
200	22.1
250	25.2
315	24.6
400	22.2
500	21.5
630	26.7
800	25.9
1k	24.1
1.25k	30.4
1.6k	29.0
2k	30.4
2.5k	29.6
3.15k	28.3
4k	30.1
5k	25.9

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (0; -1) dB

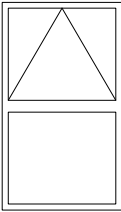
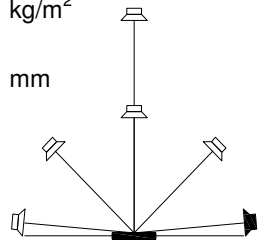
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

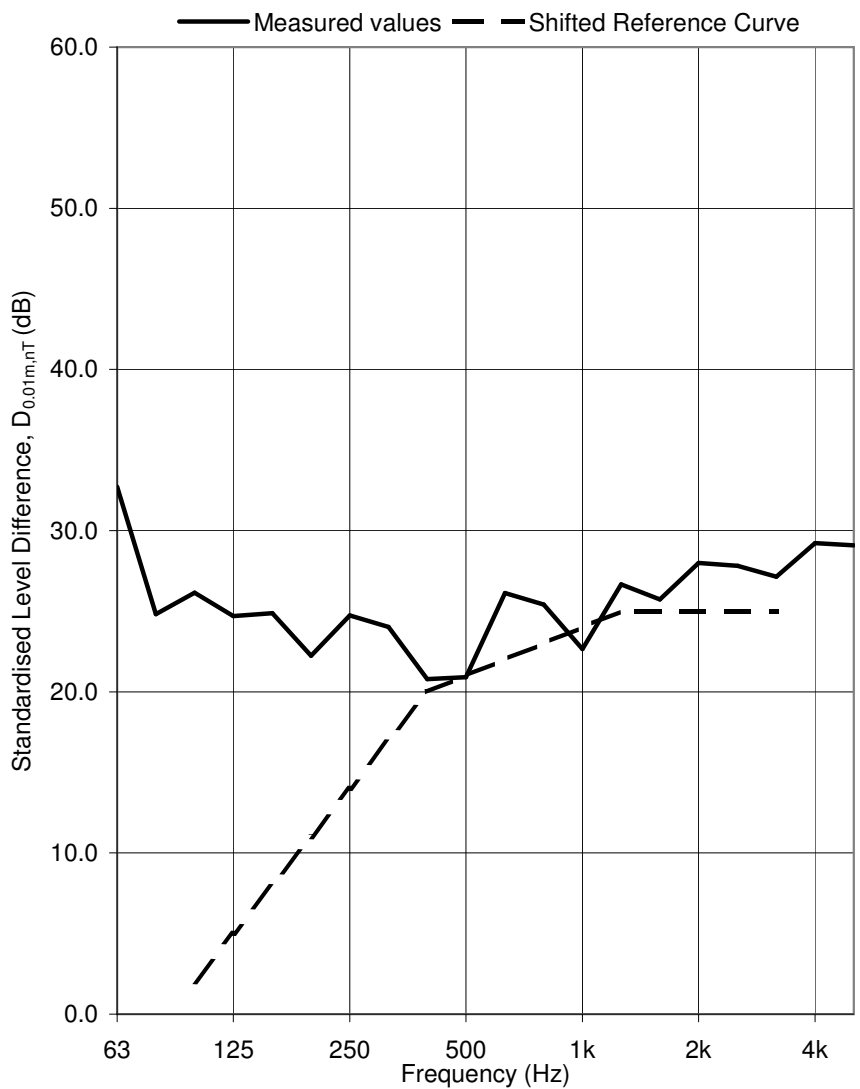
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719032

Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.8
63	32.7
80	24.8
100	26.1
125	24.7
160	24.9
200	22.2
250	24.7
315	24.0
400	20.8
500	20.9
630	26.1
800	25.4
1k	22.6
1.25k	26.7
1.6k	25.7
2k	28.0
2.5k	27.8
3.15k	27.1
4k	29.2
5k	29.1

$D_{0.01m,nT,w}(C;C_{tr})$ 25 (0; -1) dB

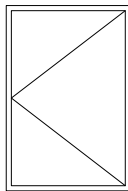
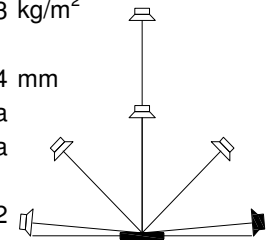
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

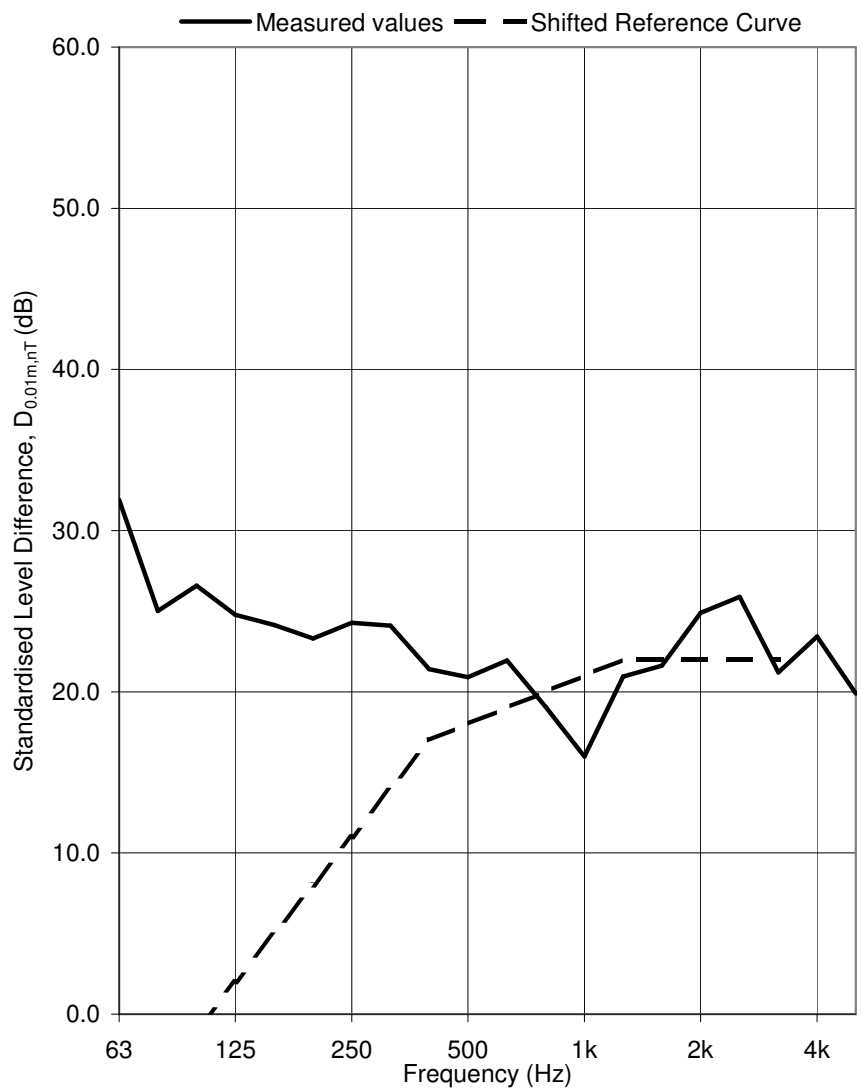
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720045

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.4
63	31.9
80	25.0
100	26.6
125	24.8
160	24.2
200	23.3
250	24.3
315	24.1
400	21.4
500	20.9
630	21.9
800	19.1
1k	16.0
1.25k	20.9
1.6k	21.6
2k	24.9
2.5k	25.9
3.15k	21.2
4k	23.4
5k	19.9

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -2) dB

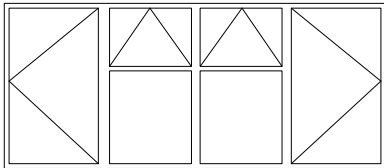
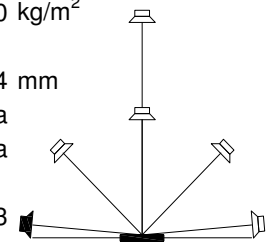
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

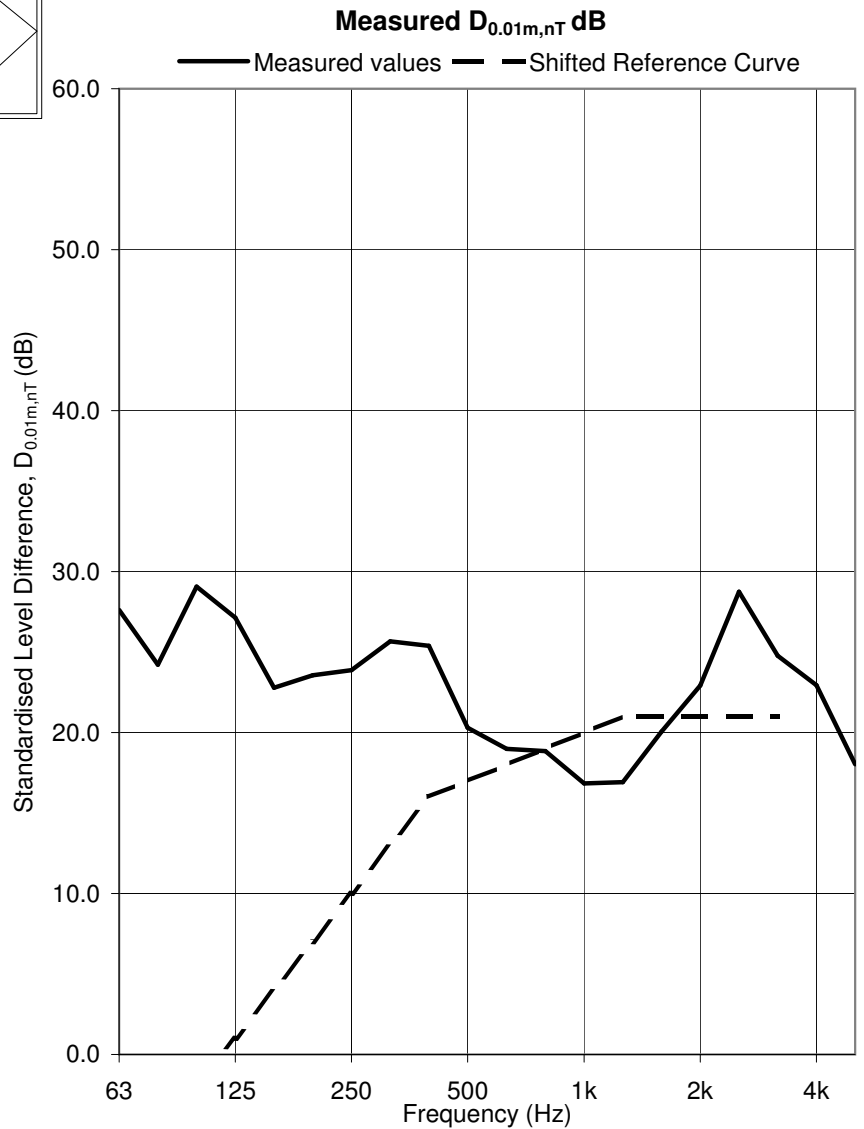
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628062

Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	19.1
63	27.6
80	24.2
100	29.1
125	27.1
160	22.8
200	23.6
250	23.9
315	25.7
400	25.4
500	20.3
630	19.0
800	18.8
1k	16.8
1.25k	16.9
1.6k	20.1
2k	22.9
2.5k	28.7
3.15k	24.8
4k	22.9
5k	18.0



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

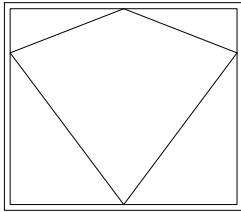
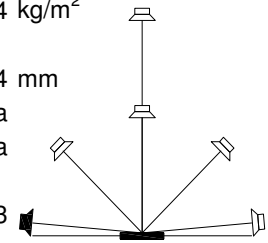
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9975 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

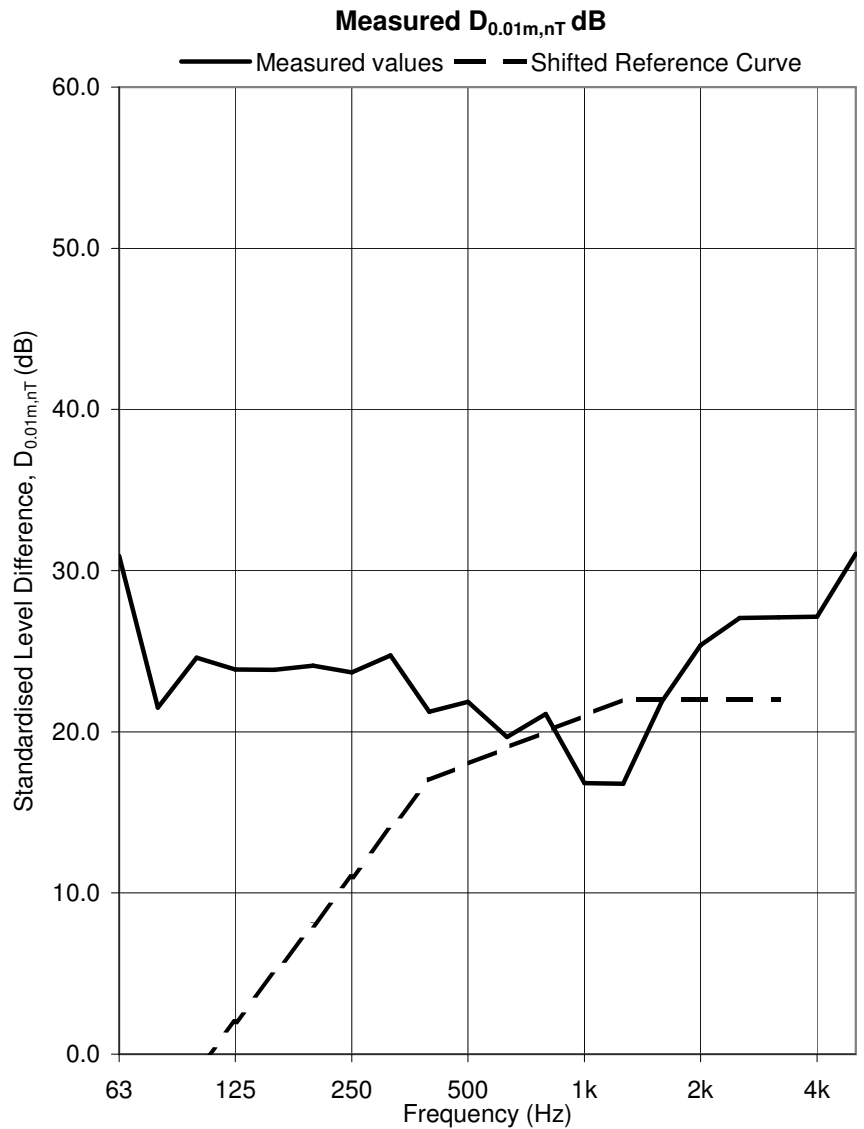
Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705013

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	19.8
63	30.9
80	21.5
100	24.6
125	23.9
160	23.8
200	24.1
250	23.7
315	24.7
400	21.3
500	21.9
630	19.7
800	21.1
1k	16.8
1.25k	16.8
1.6k	21.9
2k	25.4
2.5k	27.1
3.15k	27.1
4k	27.1
5k	31.0



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; -2) dB}

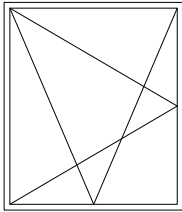
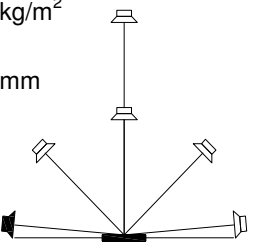
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

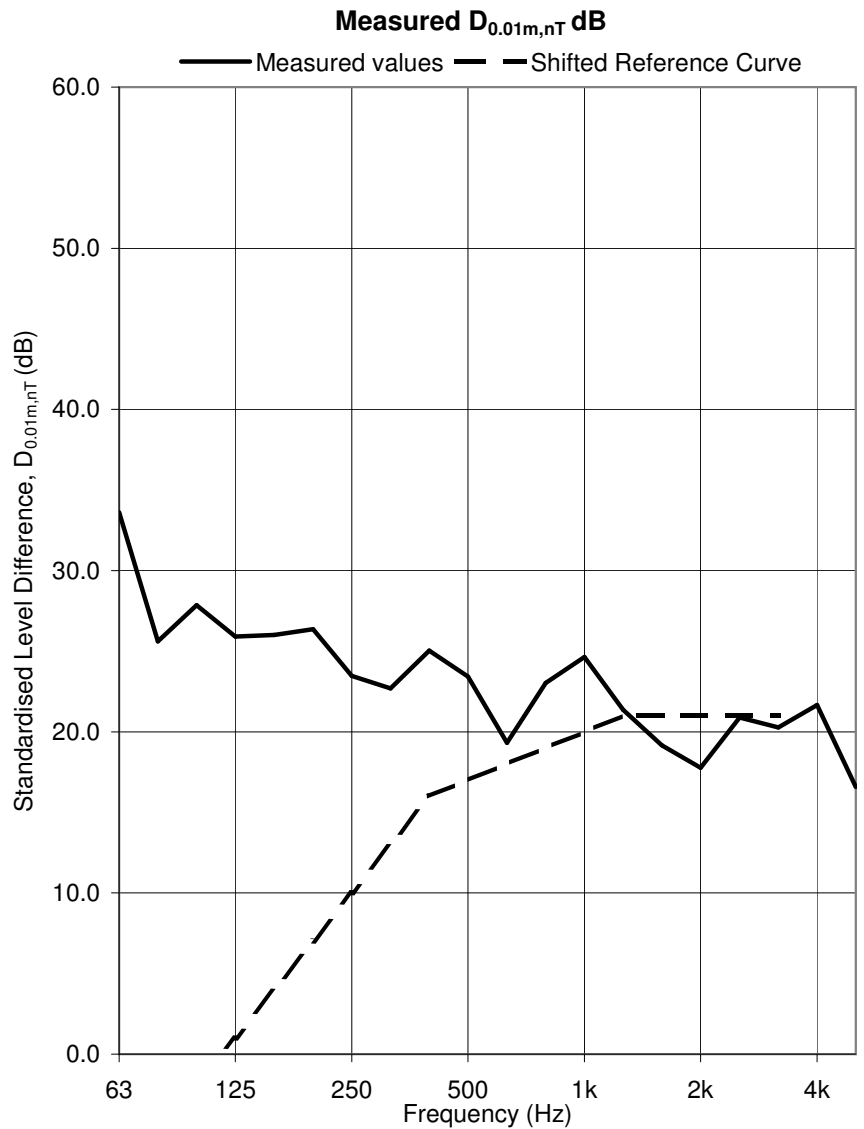
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711042

Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	22.7
63	33.6
80	25.6
100	27.9
125	25.9
160	26.0
200	26.4
250	23.5
315	22.7
400	25.0
500	23.4
630	19.3
800	23.0
1k	24.6
1.25k	21.4
1.6k	19.2
2k	17.8
2.5k	20.9
3.15k	20.3
4k	21.7
5k	16.6



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

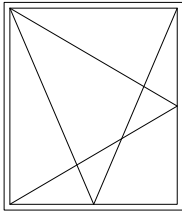
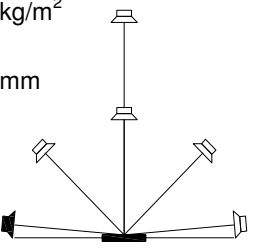
Date: 12/7/05
 Air temperature: 21.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0243 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 712072

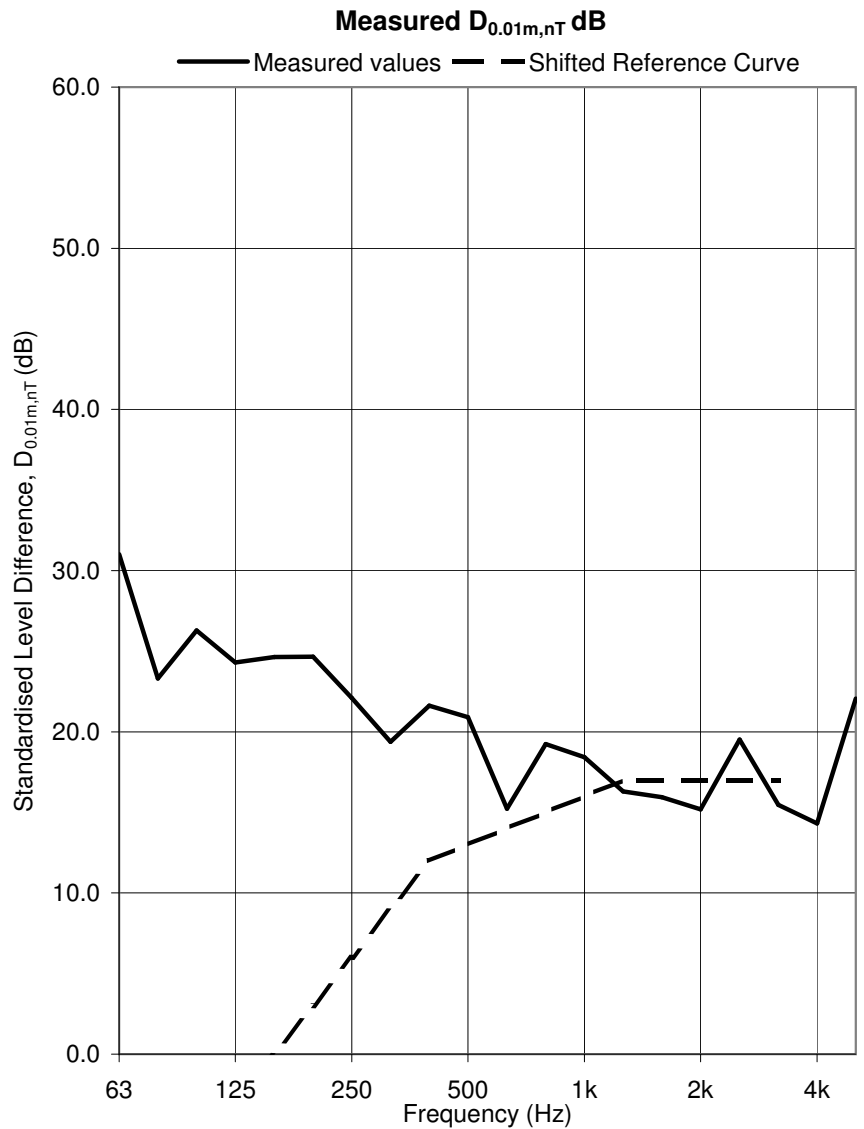
Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	19.3
63	31.0
80	23.3
100	26.3
125	24.3
160	24.6
200	24.7
250	22.1
315	19.4
400	21.6
500	20.9
630	15.2
800	19.2
1k	18.4
1.25k	16.3
1.6k	16.0
2k	15.2
2.5k	19.5
3.15k	15.5
4k	14.3
5k	22.1



D_{0.01m,nT,w(C;C_{tr}) 17 (0; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

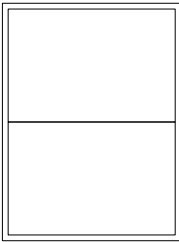
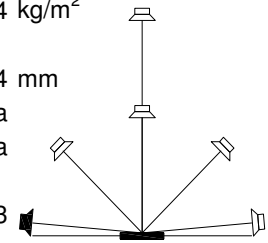
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

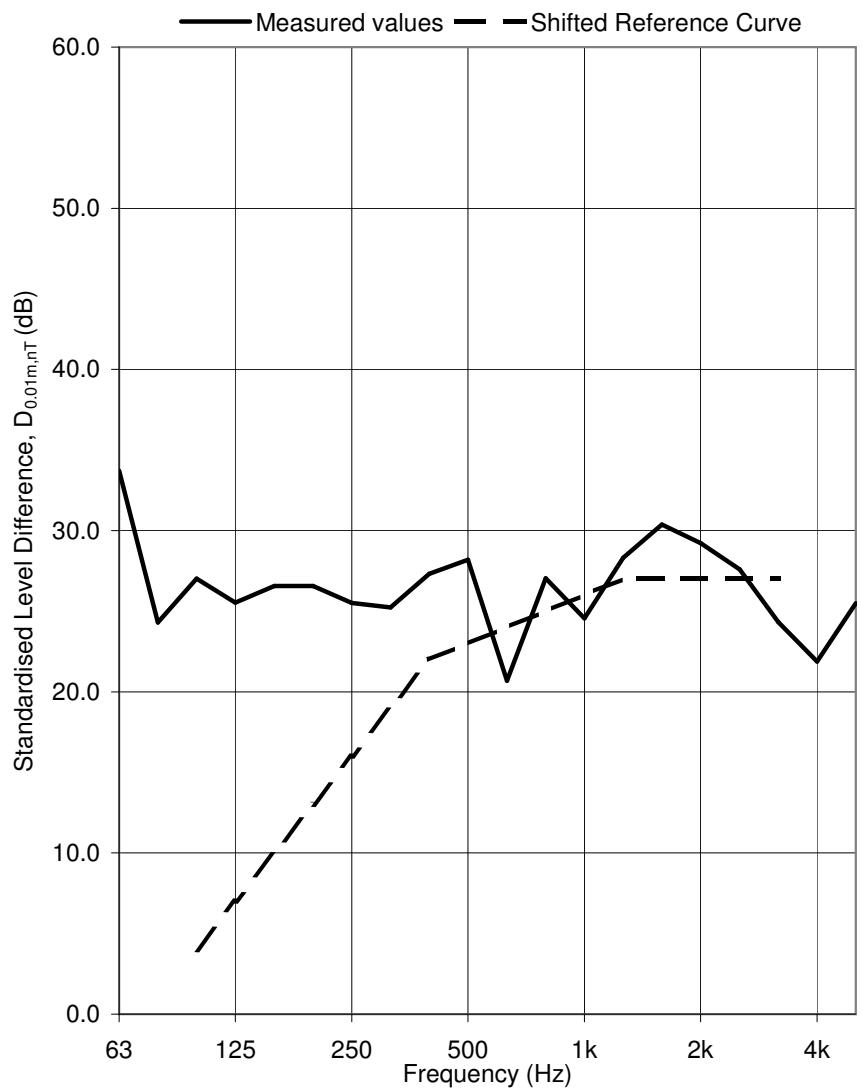
Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713053

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.4
63	33.7
80	24.3
100	27.0
125	25.5
160	26.6
200	26.6
250	25.5
315	25.2
400	27.3
500	28.2
630	20.7
800	27.0
1k	24.6
1.25k	28.3
1.6k	30.4
2k	29.2
2.5k	27.6
3.15k	24.3
4k	21.9
5k	25.5

$D_{0.01m,nT,w}(C;C_{tr})$ 27 (-1; -1) dB

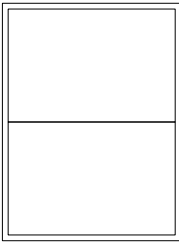
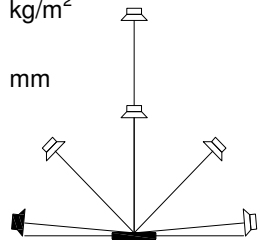
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

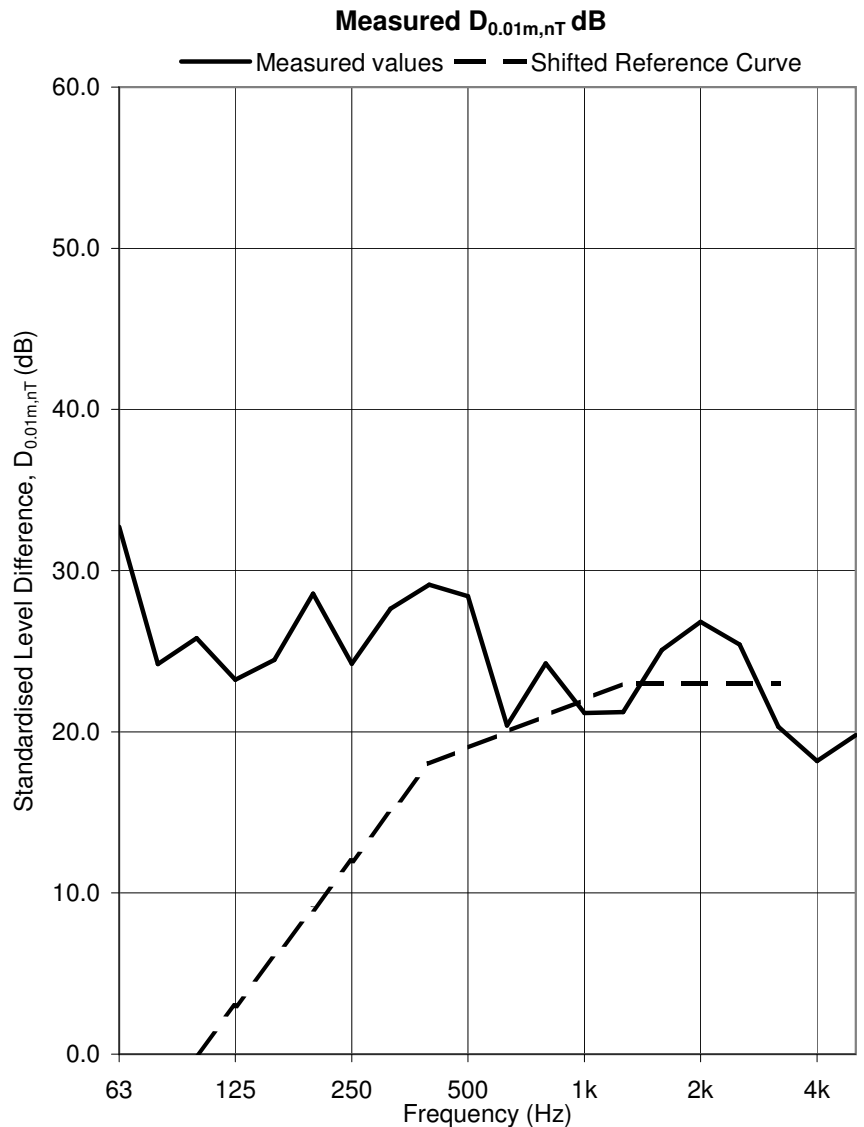
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713045

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	21.4
63	32.7
80	24.2
100	25.8
125	23.2
160	24.5
200	28.6
250	24.2
315	27.6
400	29.1
500	28.4
630	20.4
800	24.2
1k	21.2
1.25k	21.2
1.6k	25.1
2k	26.8
2.5k	25.4
3.15k	20.3
4k	18.2
5k	19.8



D_{0.01m,nT,w(C;C_{tr}) 23 (0; 0) dB}

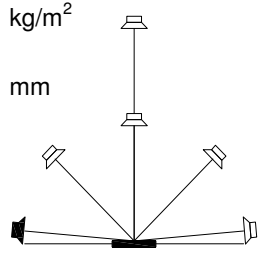
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

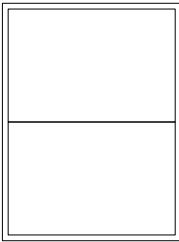
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

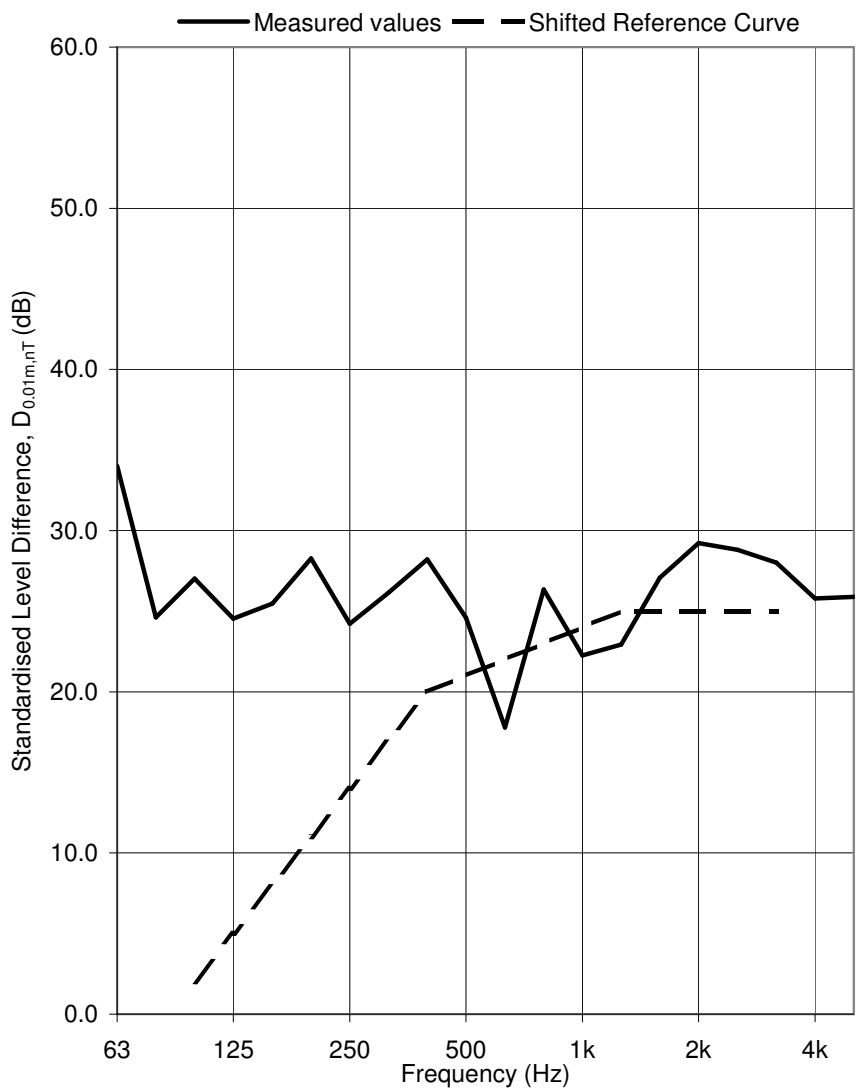


Test ID: 713049

Loudspeaker Configuration: L3



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	23.7
63	34.0
80	24.6
100	27.0
125	24.5
160	25.5
200	28.3
250	24.2
315	26.1
400	28.2
500	24.6
630	17.8
800	26.3
1k	22.3
1.25k	22.9
1.6k	27.1
2k	29.2
2.5k	28.8
3.15k	28.0
4k	25.8
5k	25.9

D_{0.01m,nT,w(C;C_{tr}) 25 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

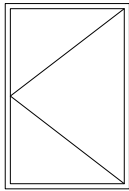
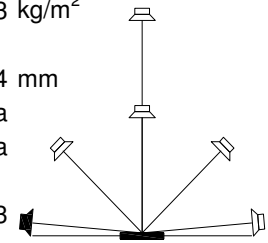
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

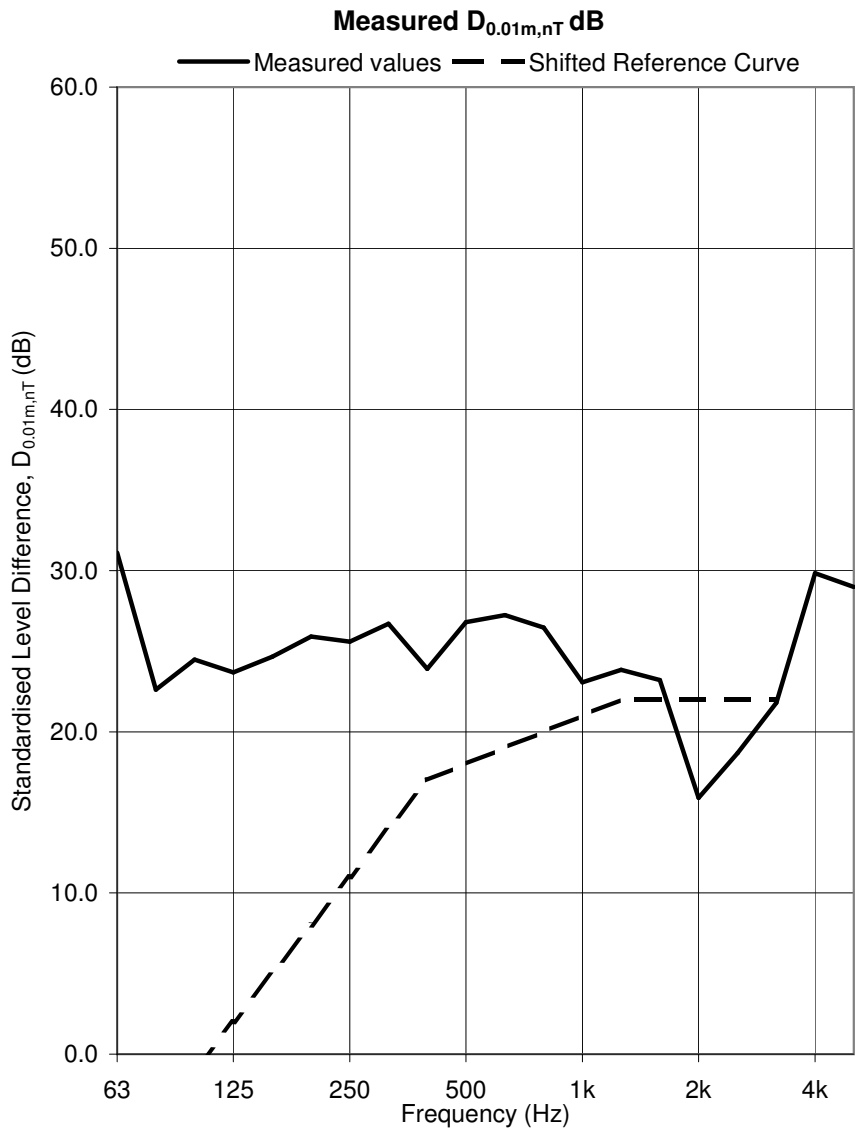
Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 720038

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	20.9
63	31.1
80	22.6
100	24.5
125	23.7
160	24.7
200	25.9
250	25.6
315	26.7
400	23.9
500	26.8
630	27.2
800	26.5
1k	23.1
1.25k	23.8
1.6k	23.2
2k	15.9
2.5k	18.7
3.15k	21.8
4k	29.8
5k	29.0



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

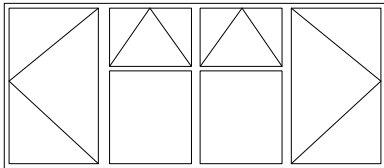
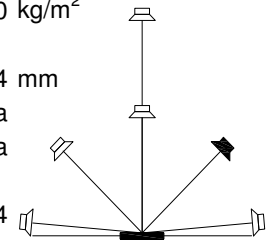
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

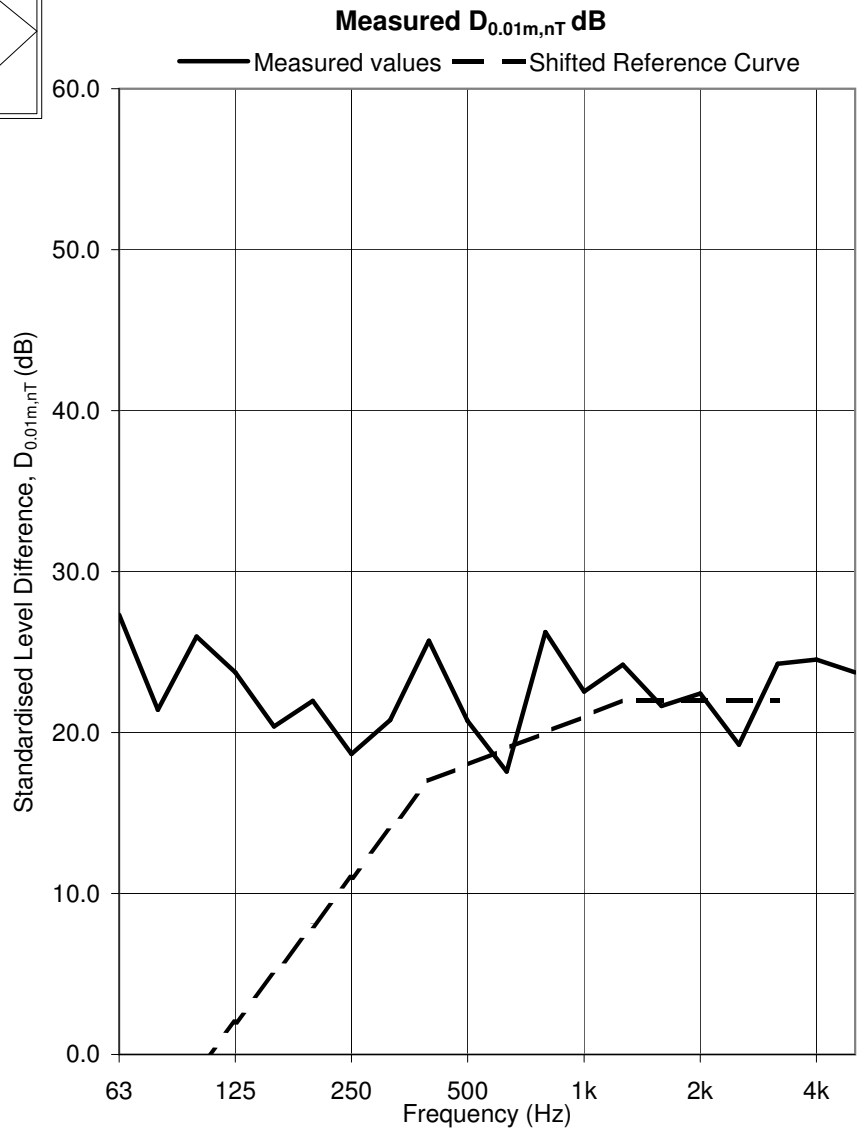
Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628078

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	19.3
63	27.3
80	21.4
100	26.0
125	23.7
160	20.4
200	22.0
250	18.7
315	20.8
400	25.7
500	20.7
630	17.6
800	26.2
1k	22.5
1.25k	24.2
1.6k	21.7
2k	22.4
2.5k	19.2
3.15k	24.3
4k	24.5
5k	23.7



D_{0.01m,nT,w(C;C_{tr}) 22 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

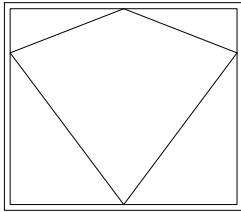
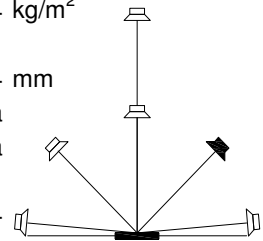
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

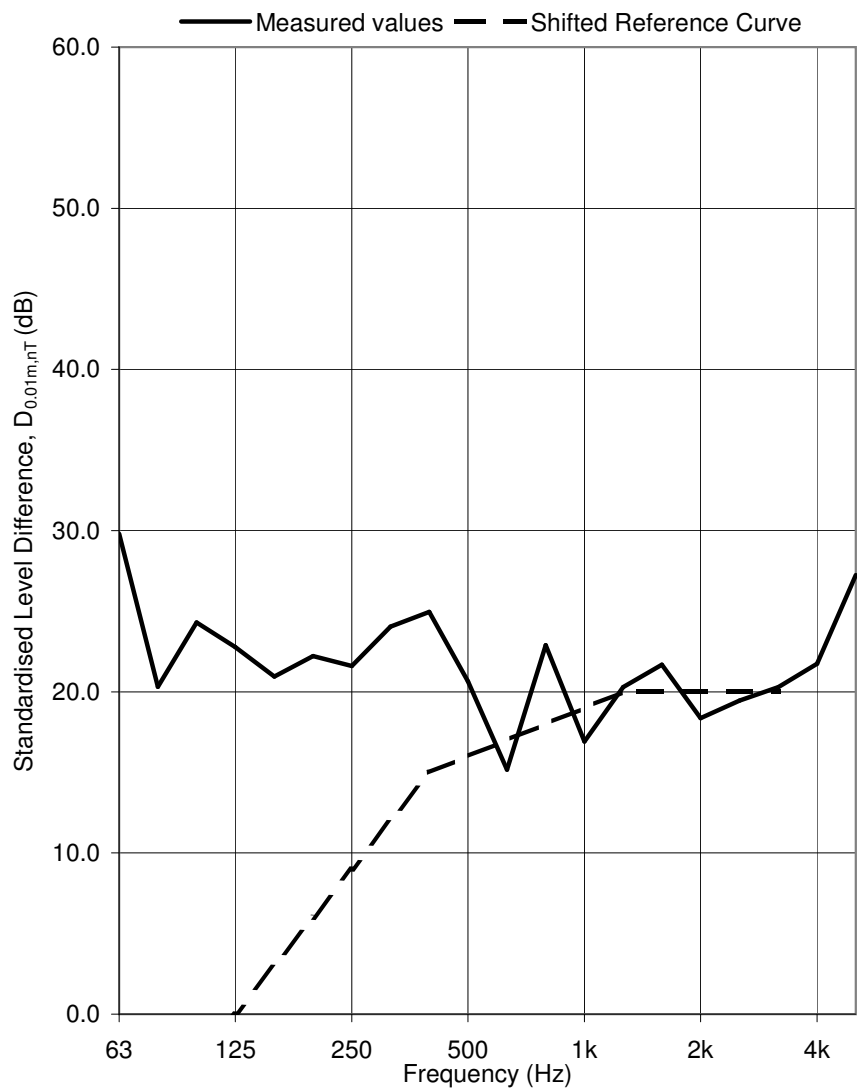
Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705018

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.6
63	29.8
80	20.3
100	24.3
125	22.8
160	20.9
200	22.2
250	21.6
315	24.0
400	25.0
500	20.7
630	15.2
800	22.9
1k	16.9
1.25k	20.3
1.6k	21.7
2k	18.4
2.5k	19.5
3.15k	20.3
4k	21.7
5k	27.2

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

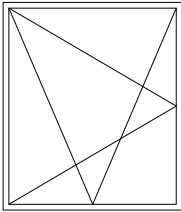
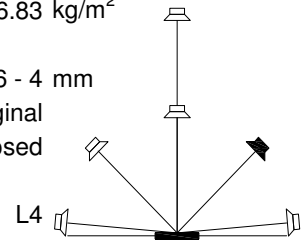
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

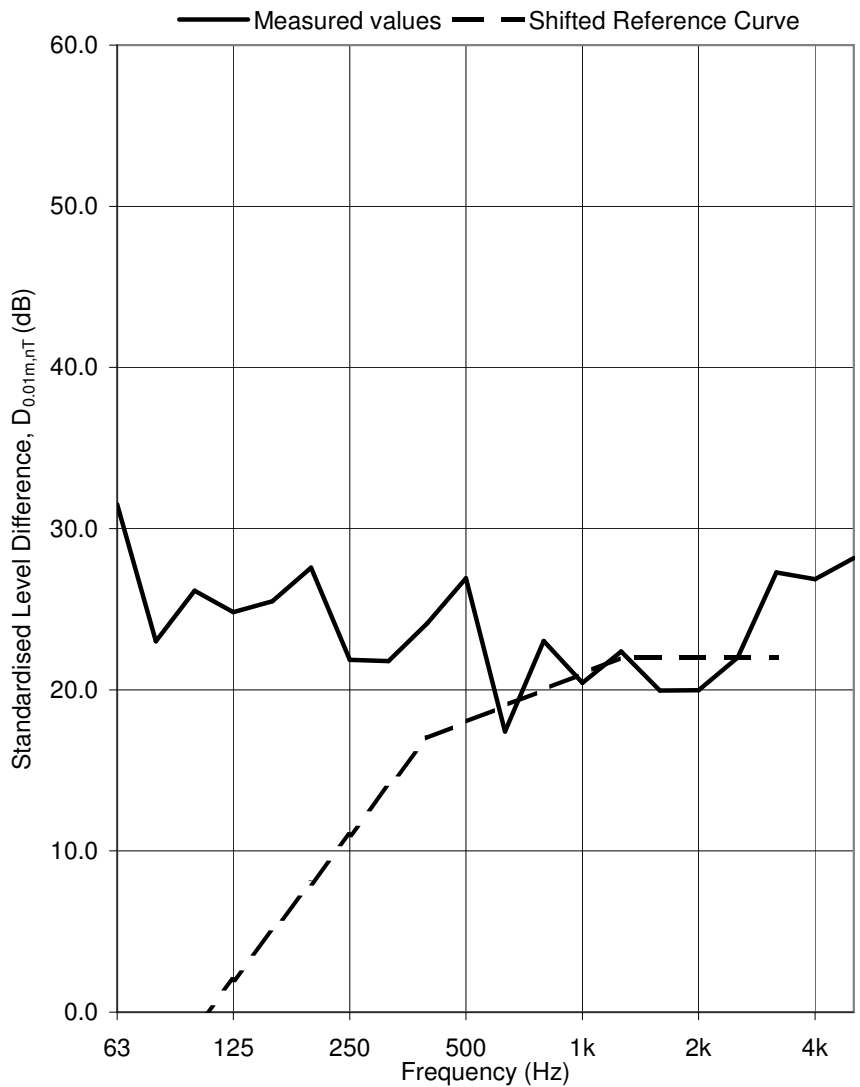
Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711061

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.7
63	31.5
80	23.0
100	26.2
125	24.8
160	25.5
200	27.6
250	21.9
315	21.8
400	24.1
500	26.9
630	17.4
800	23.0
1k	20.4
1.25k	22.4
1.6k	20.0
2k	20.0
2.5k	22.0
3.15k	27.3
4k	26.9
5k	28.2

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

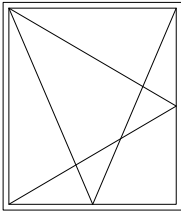
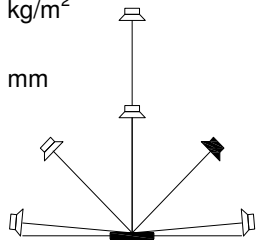
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

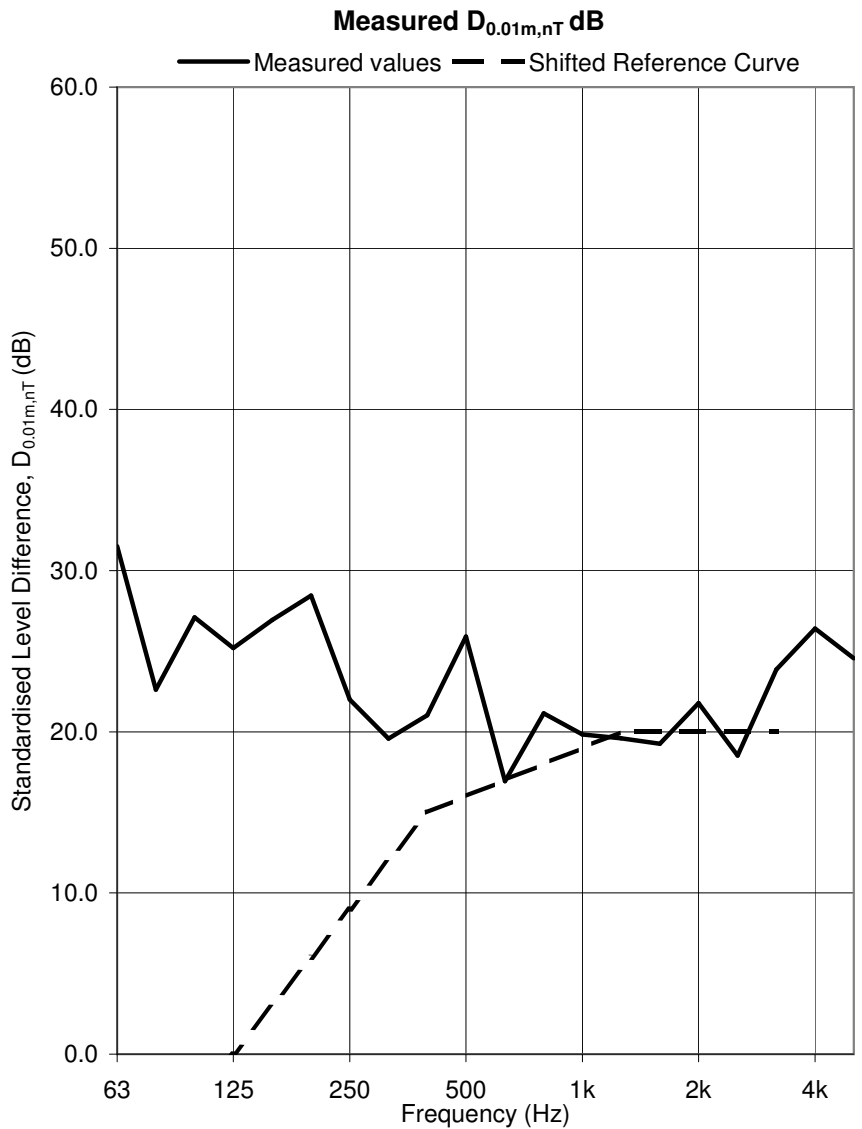
Test Sample: Window C-3 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712058

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	23.6
63	31.5
80	22.6
100	27.1
125	25.2
160	26.9
200	28.5
250	22.0
315	19.6
400	21.0
500	25.9
630	16.9
800	21.1
1k	19.8
1.25k	19.6
1.6k	19.3
2k	21.8
2.5k	18.5
3.15k	23.9
4k	26.4
5k	24.6



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

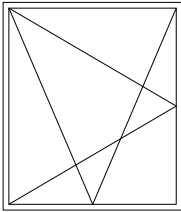
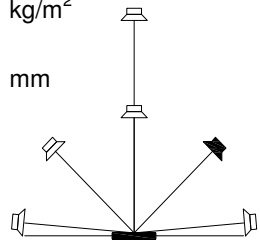
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 712062

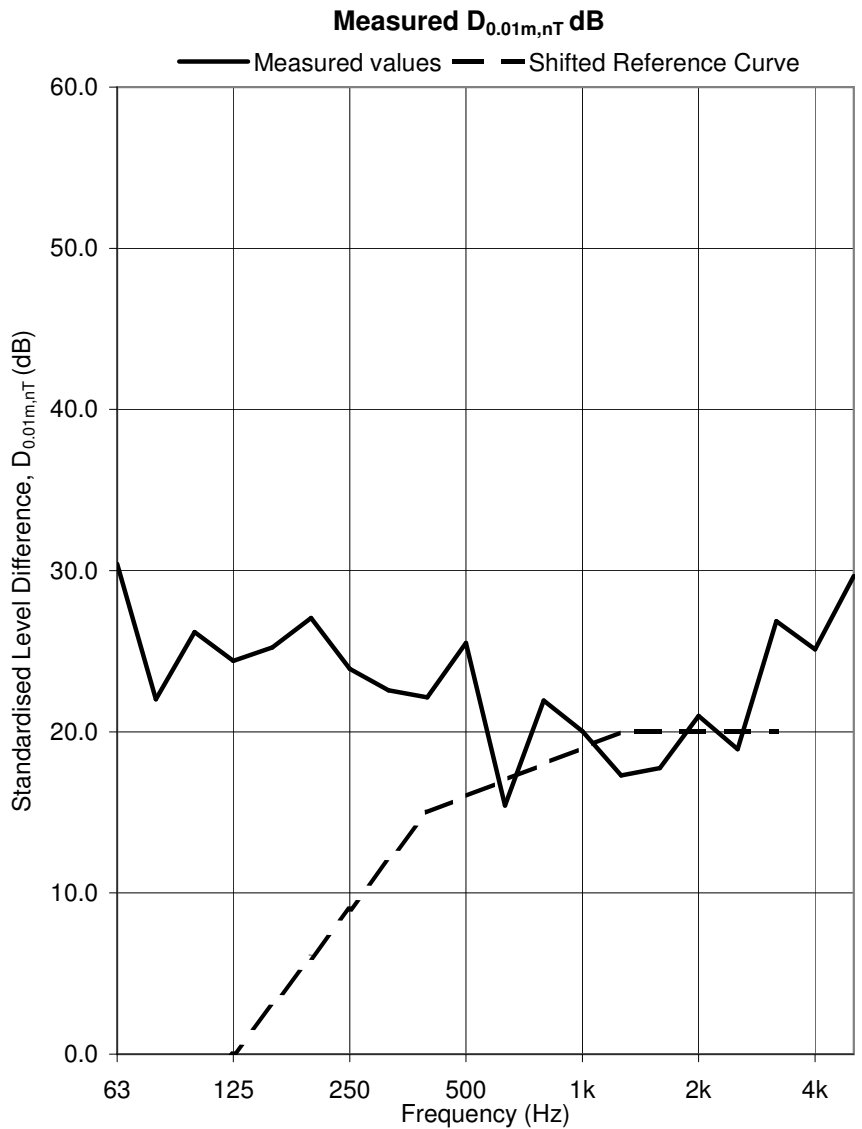
Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	22.5
63	30.4
80	22.0
100	26.2
125	24.4
160	25.2
200	27.1
250	23.9
315	22.6
400	22.1
500	25.5
630	15.4
800	21.9
1k	20.0
1.25k	17.3
1.6k	17.8
2k	21.0
2.5k	18.9
3.15k	26.9
4k	25.1
5k	29.7



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

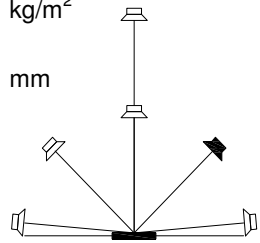
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

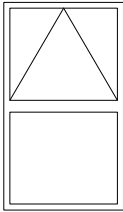
Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

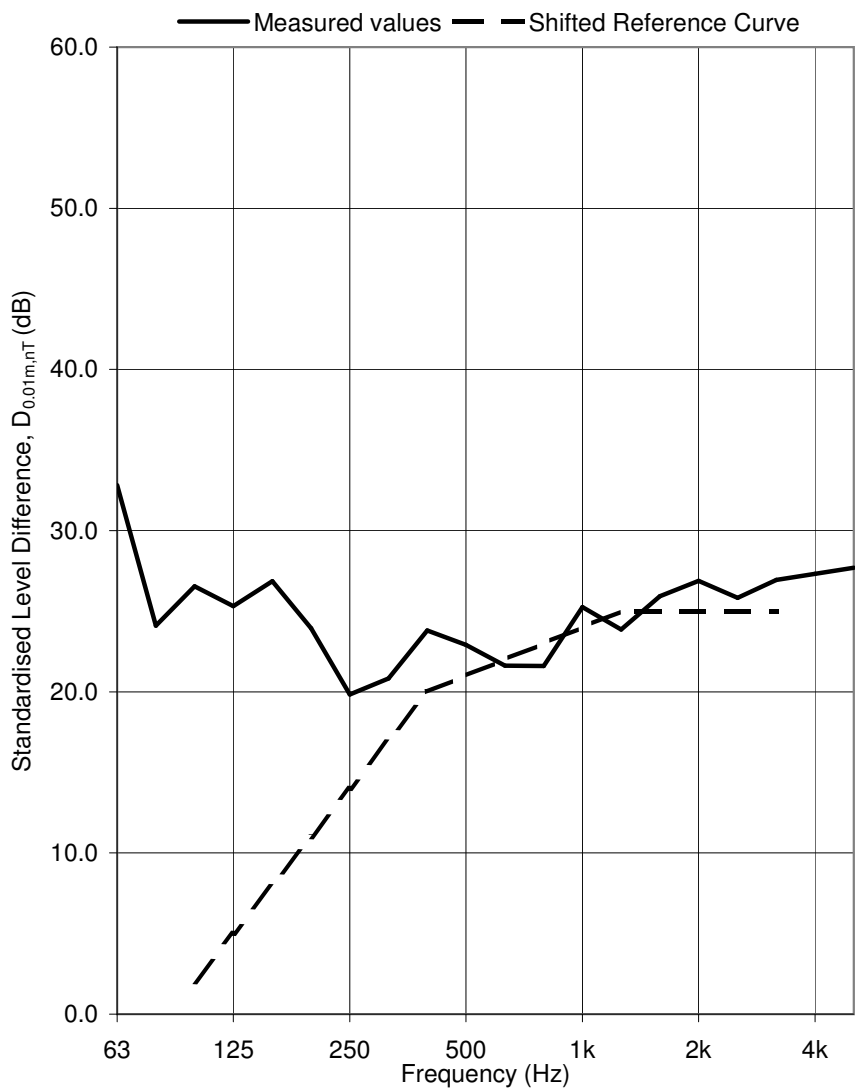


Test ID: 718011

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.1
63	32.8
80	24.1
100	26.5
125	25.3
160	26.9
200	23.9
250	19.8
315	20.8
400	23.8
500	22.9
630	21.6
800	21.6
1k	25.2
1.25k	23.9
1.6k	25.9
2k	26.9
2.5k	25.8
3.15k	26.9
4k	27.3
5k	27.7

$D_{0.01m,nT,w}(C;C_{tr})$ 25 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

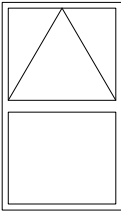
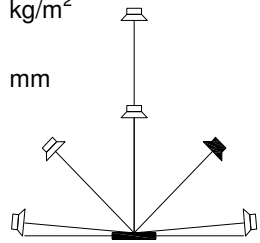
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

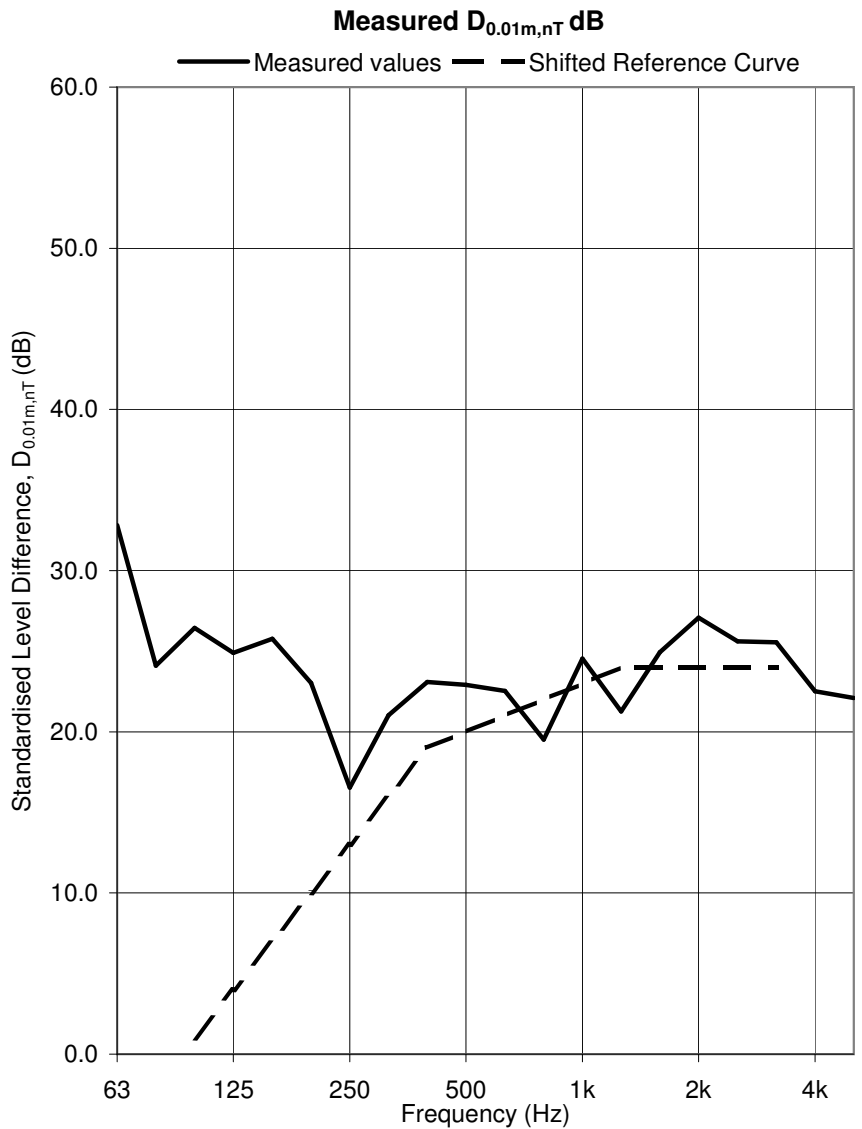
Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	26.3
63	32.8
80	24.1
100	26.4
125	24.9
160	25.8
200	23.0
250	16.5
315	21.0
400	23.1
500	22.9
630	22.5
800	19.5
1k	24.5
1.25k	21.3
1.6k	24.9
2k	27.1
2.5k	25.6
3.15k	25.5
4k	22.5
5k	22.1



D_{0.01m,nT,w(C;C_{tr}) 24 (-1; -2) dB}

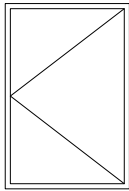
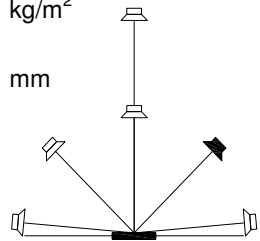
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

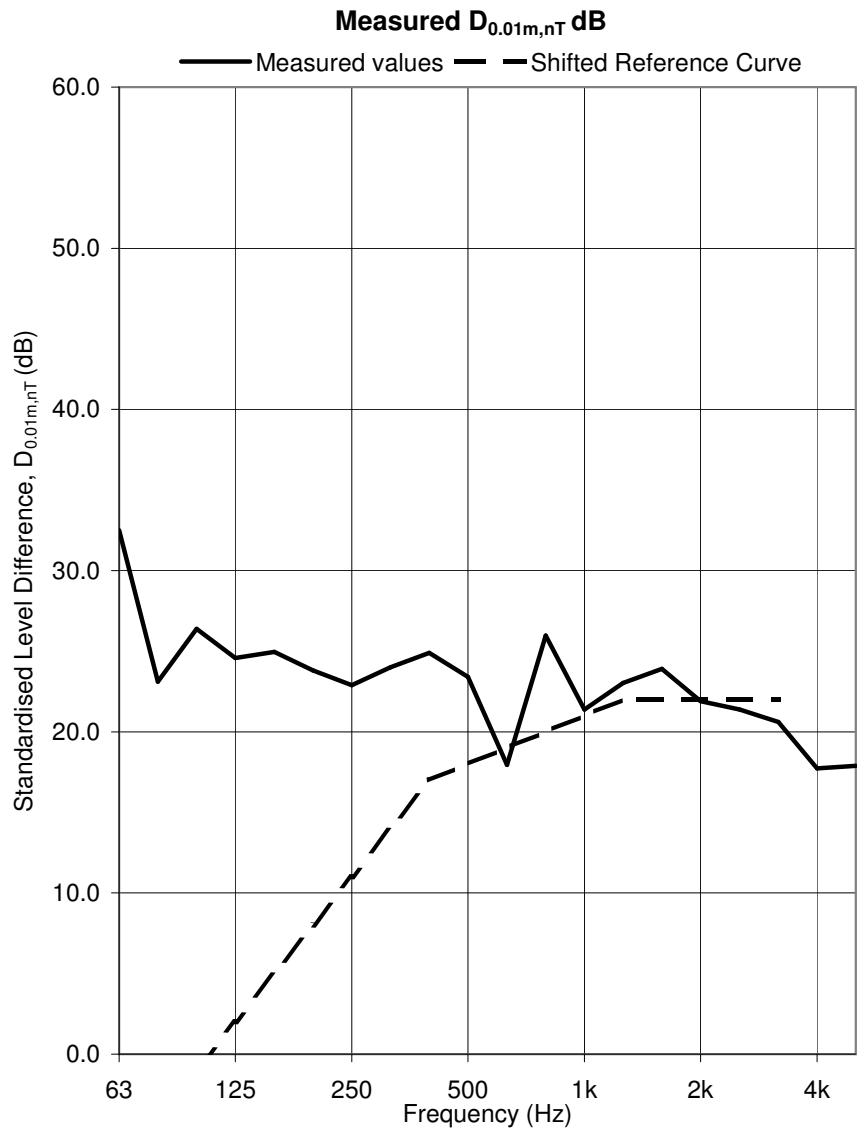
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720031

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	26.4
63	32.5
80	23.1
100	26.4
125	24.6
160	25.0
200	23.8
250	22.9
315	24.0
400	24.9
500	23.4
630	17.9
800	26.0
1k	21.4
1.25k	23.0
1.6k	23.9
2k	21.9
2.5k	21.4
3.15k	20.6
4k	17.7
5k	17.9



D_{0.01m,nT,w(C;C_{tr}) 22 (0; 0) dB}

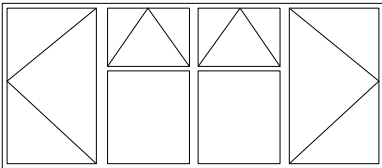
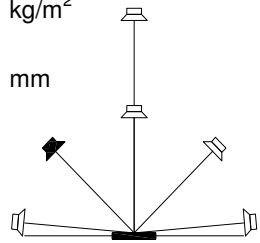
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

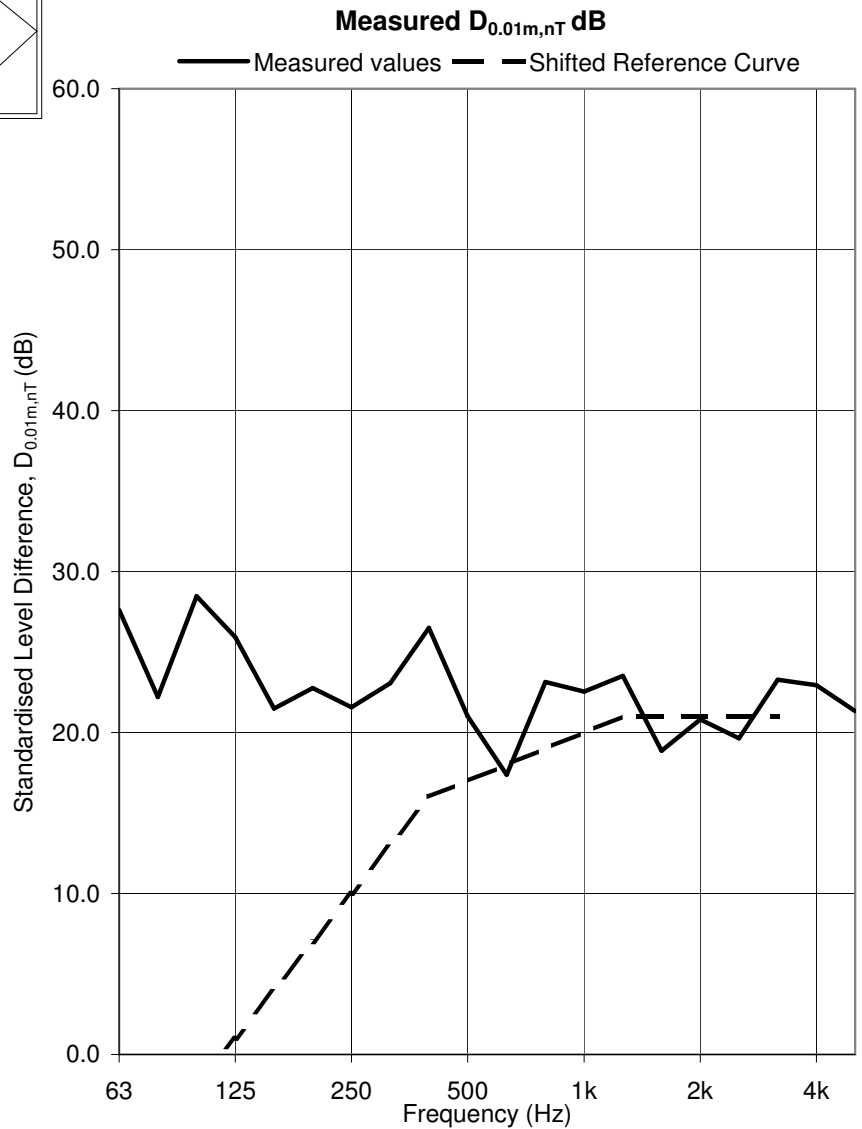
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628094

Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	20.9
63	27.6
80	22.2
100	28.5
125	25.9
160	21.5
200	22.8
250	21.6
315	23.1
400	26.5
500	21.0
630	17.4
800	23.1
1k	22.5
1.25k	23.5
1.6k	18.9
2k	20.8
2.5k	19.6
3.15k	23.3
4k	22.9
5k	21.3



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

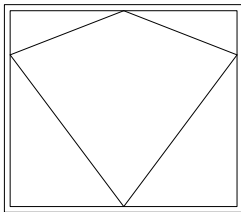
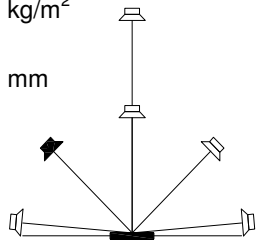
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

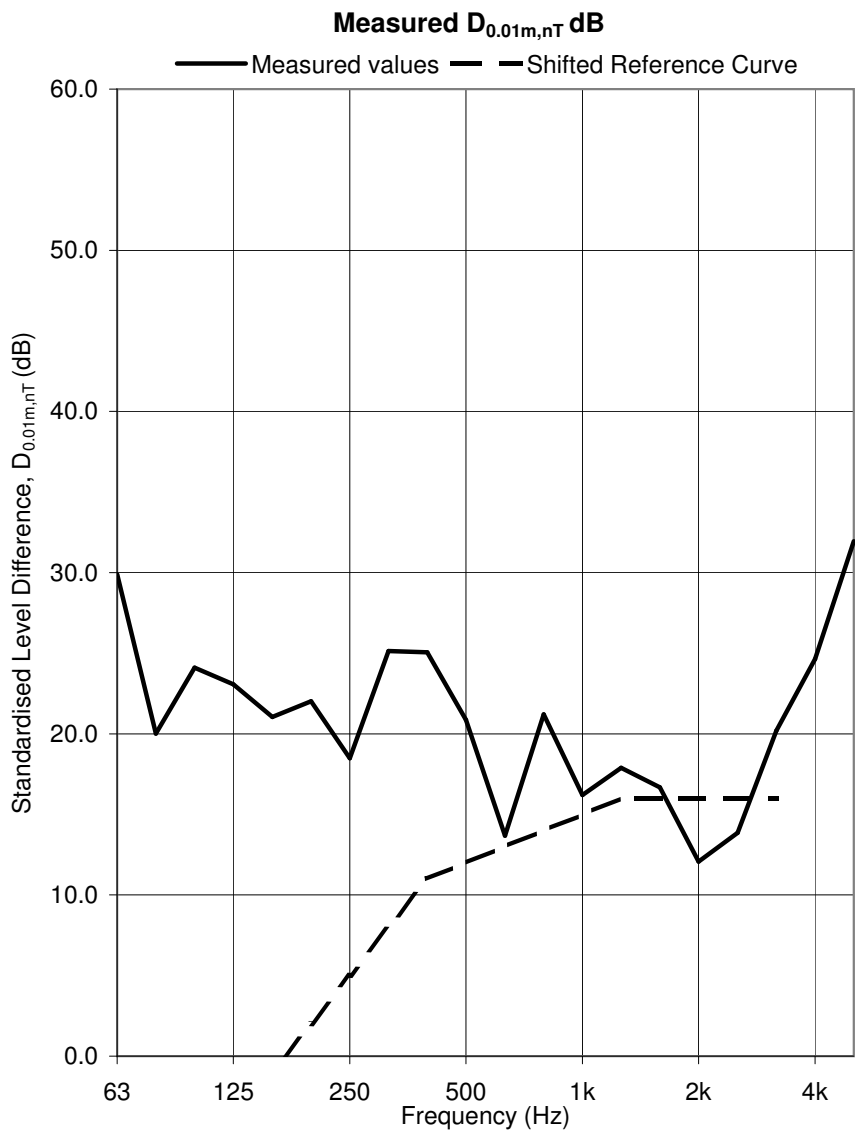
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705023

Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	23.6
63	29.9
80	20.0
100	24.1
125	23.1
160	21.0
200	22.0
250	18.5
315	25.1
400	25.1
500	20.9
630	13.7
800	21.2
1k	16.2
1.25k	17.9
1.6k	16.7
2k	12.1
2.5k	13.9
3.15k	20.2
4k	24.6
5k	31.9



D_{0.01m,nT,w(C;C_{tr}) 16 (0; 1) dB}

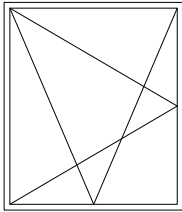
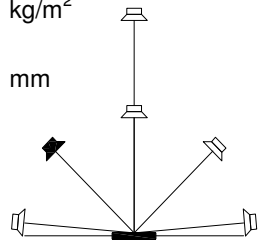
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

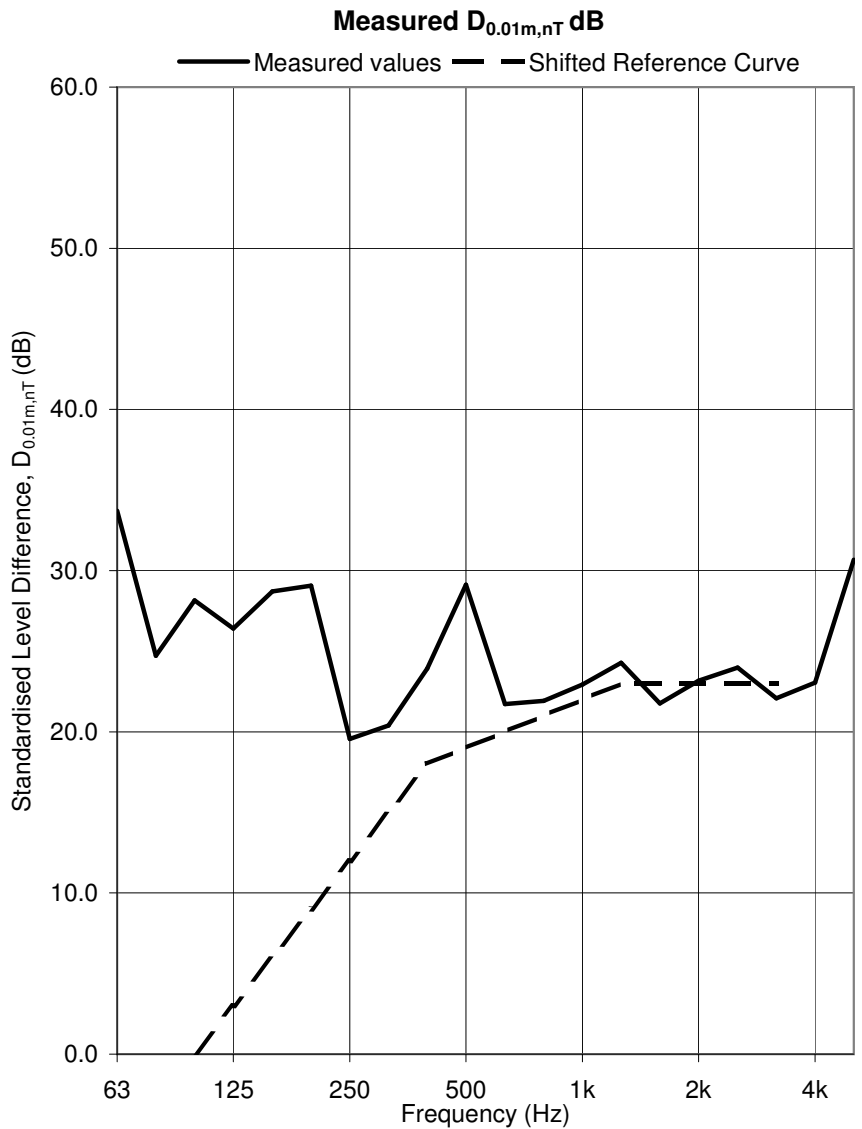
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711056

Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	25.8
63	33.7
80	24.7
100	28.2
125	26.4
160	28.7
200	29.1
250	19.6
315	20.4
400	23.9
500	29.1
630	21.7
800	21.9
1k	22.9
1.25k	24.3
1.6k	21.8
2k	23.2
2.5k	24.0
3.15k	22.1
4k	23.1
5k	30.7



D_{0.01m,nT,w(C;C_{tr}) 23 (0; 0) dB}

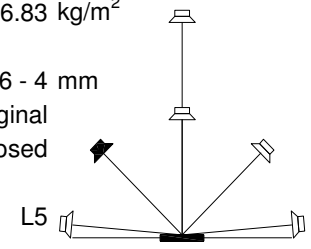
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

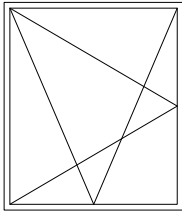
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

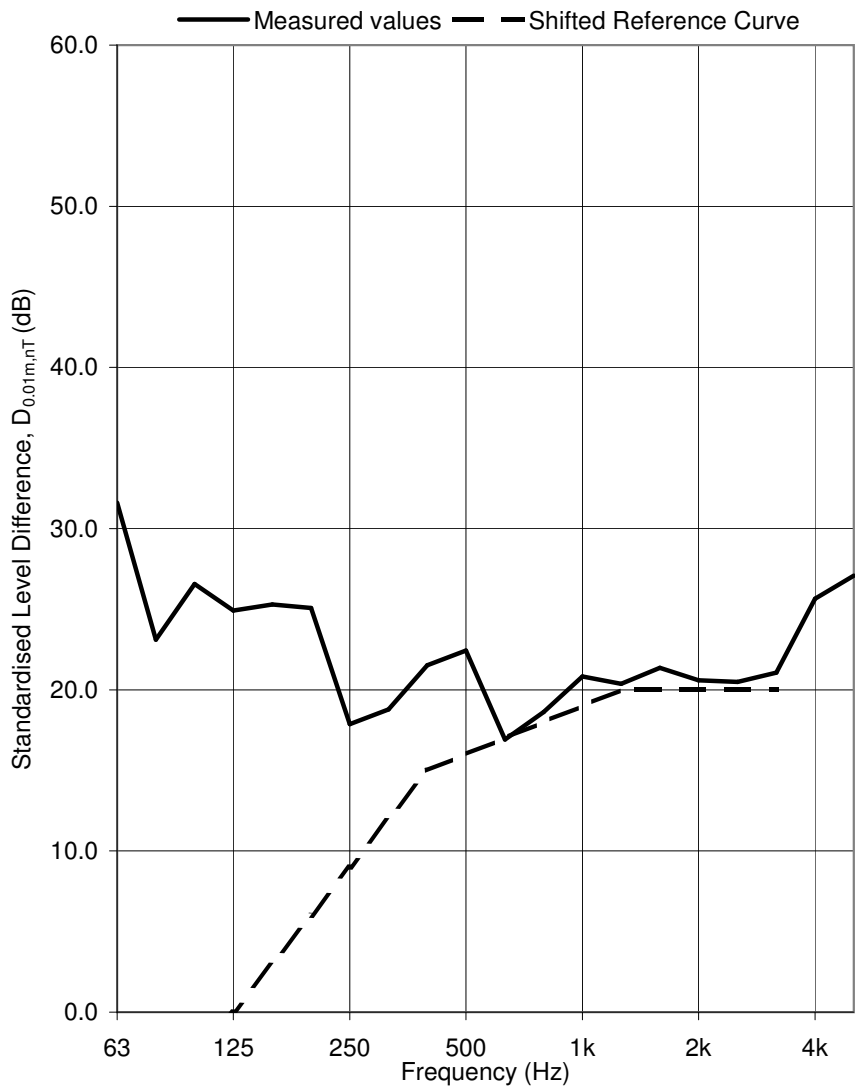


Test ID: 711051

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.7
63	31.6
80	23.1
100	26.6
125	24.9
160	25.3
200	25.1
250	17.9
315	18.8
400	21.5
500	22.4
630	16.9
800	18.6
1k	20.8
1.25k	20.4
1.6k	21.4
2k	20.6
2.5k	20.5
3.15k	21.1
4k	25.7
5k	27.1

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (0; 0) dB

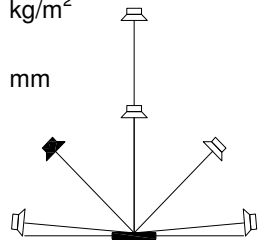
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

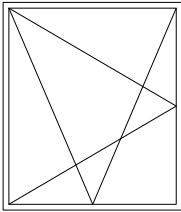
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

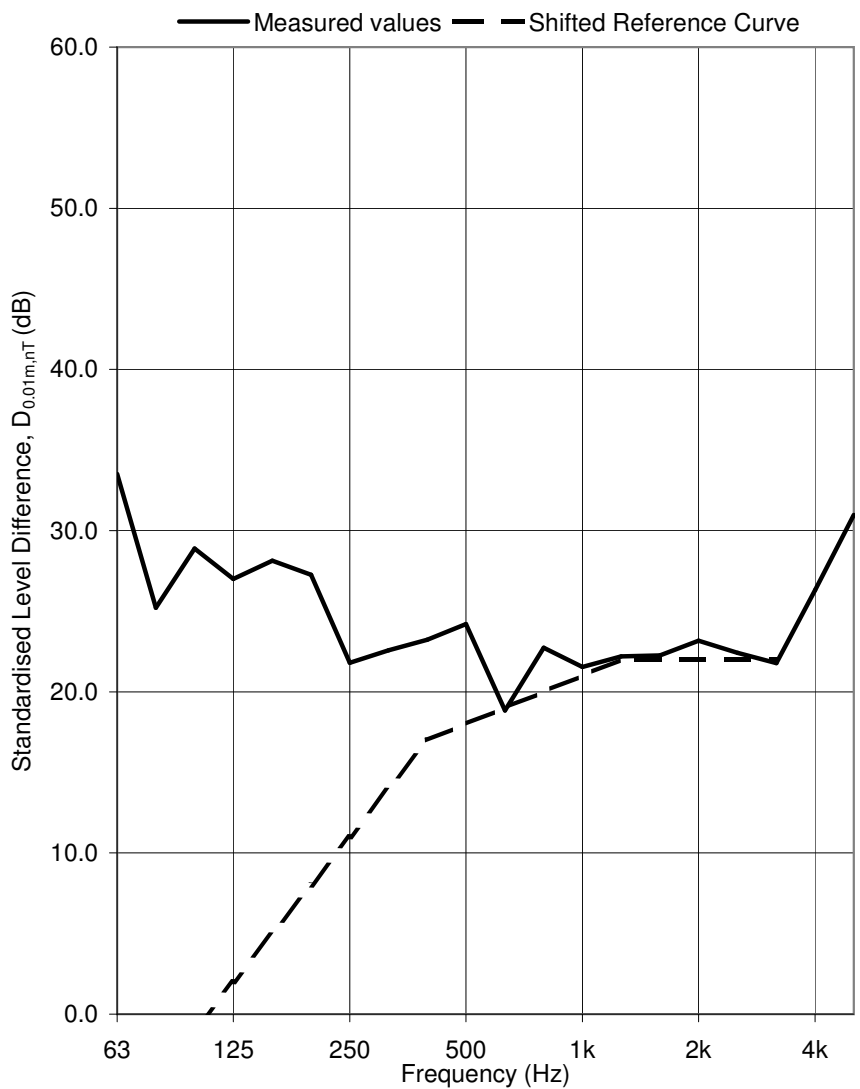


Test ID: 712067

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.2
63	33.5
80	25.2
100	28.9
125	27.0
160	28.1
200	27.3
250	21.8
315	22.6
400	23.2
500	24.2
630	18.8
800	22.7
1k	21.5
1.25k	22.2
1.6k	22.3
2k	23.2
2.5k	22.4
3.15k	21.8
4k	26.3
5k	31.0

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (0; 0) dB

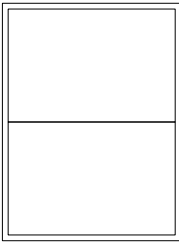
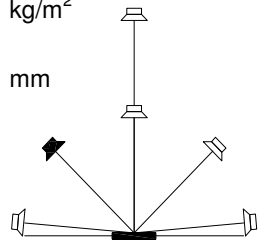
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

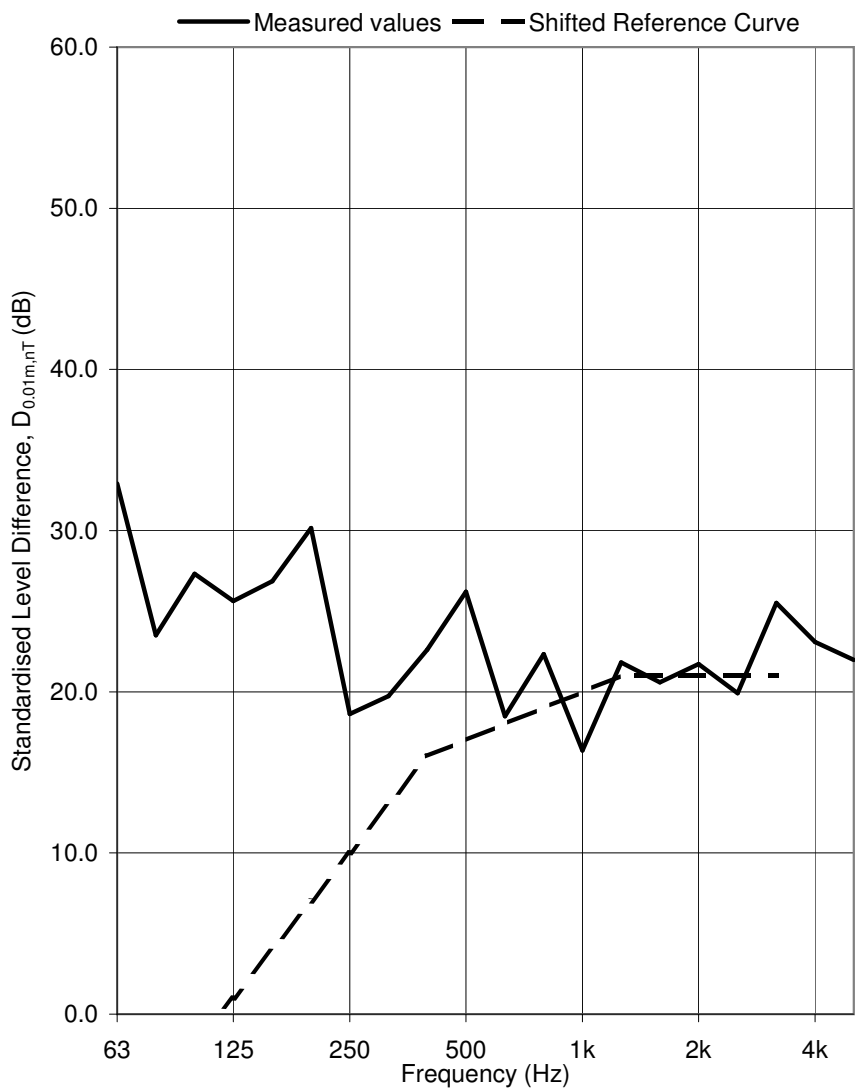
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713039

Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.5
63	32.9
80	23.5
100	27.3
125	25.6
160	26.9
200	30.2
250	18.6
315	19.7
400	22.6
500	26.2
630	18.5
800	22.3
1k	16.4
1.25k	21.8
1.6k	20.6
2k	21.7
2.5k	19.9
3.15k	25.5
4k	23.1
5k	22.0

$D_{0.01m,nT,w}(C;C_{tr})$ 21 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

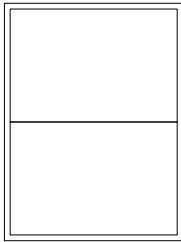
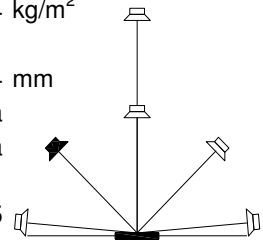
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

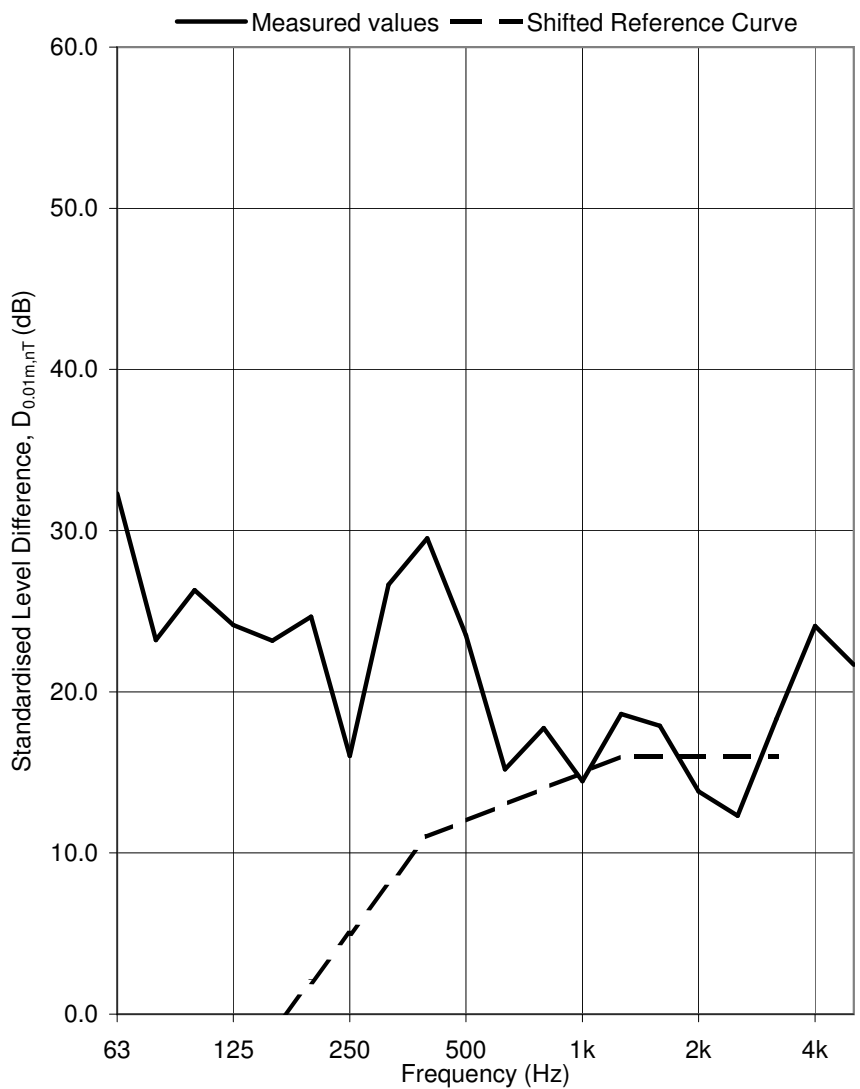
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713031

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.9
63	32.3
80	23.2
100	26.3
125	24.1
160	23.2
200	24.7
250	16.0
315	26.6
400	29.5
500	23.5
630	15.2
800	17.7
1k	14.5
1.25k	18.6
1.6k	17.9
2k	13.8
2.5k	12.3
3.15k	18.3
4k	24.1
5k	21.7

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (0; 1) dB

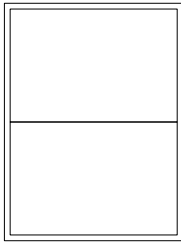
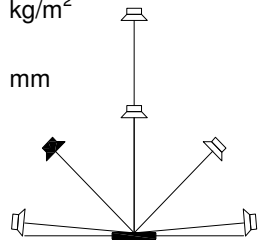
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

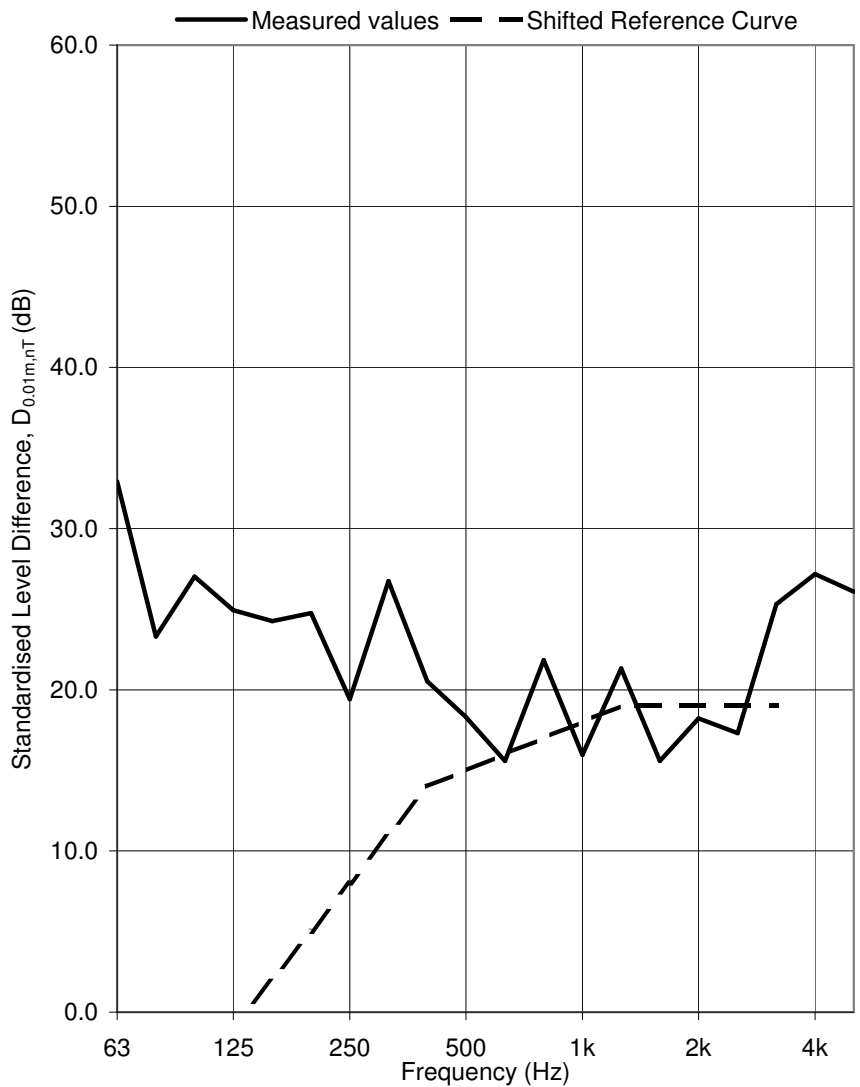
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713035

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.9
63	32.9
80	23.3
100	27.0
125	24.9
160	24.3
200	24.8
250	19.4
315	26.7
400	20.5
500	18.3
630	15.6
800	21.8
1k	16.0
1.25k	21.3
1.6k	15.6
2k	18.2
2.5k	17.3
3.15k	25.3
4k	27.2
5k	26.1

$D_{0.01m,nT,w(C;C_{tr})}$ 19 (-1; -1) dB

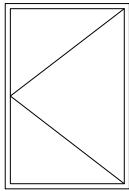
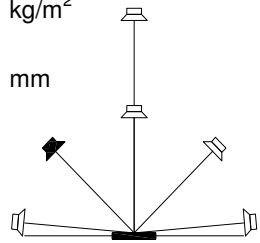
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

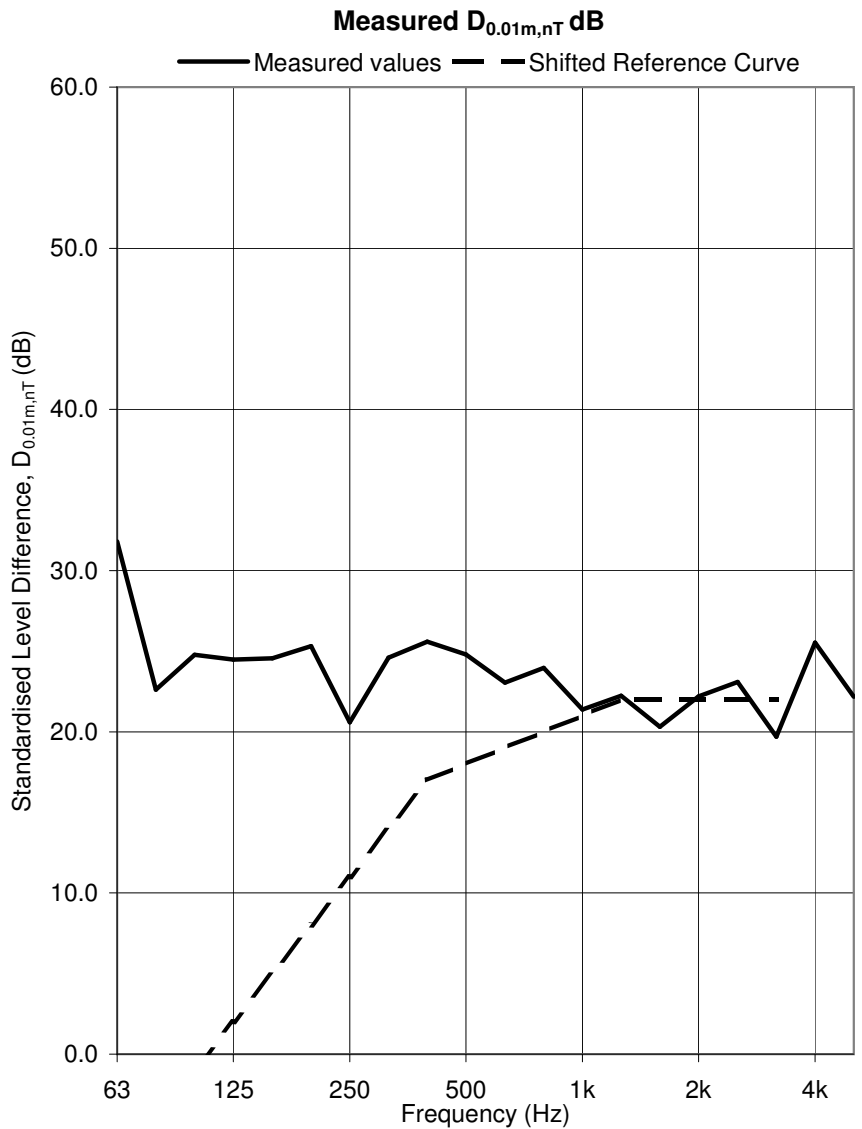
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720024

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	25.1
63	31.8
80	22.6
100	24.8
125	24.5
160	24.6
200	25.3
250	20.6
315	24.6
400	25.6
500	24.8
630	23.0
800	24.0
1k	21.4
1.25k	22.2
1.6k	20.3
2k	22.2
2.5k	23.1
3.15k	19.7
4k	25.5
5k	22.2



D_{0.01m,nT,w(C;C_{tr}) 22 (0; 0) dB}

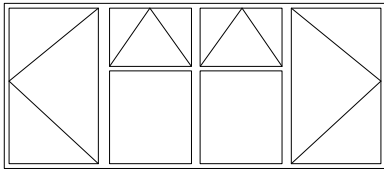
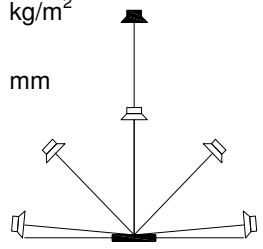
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

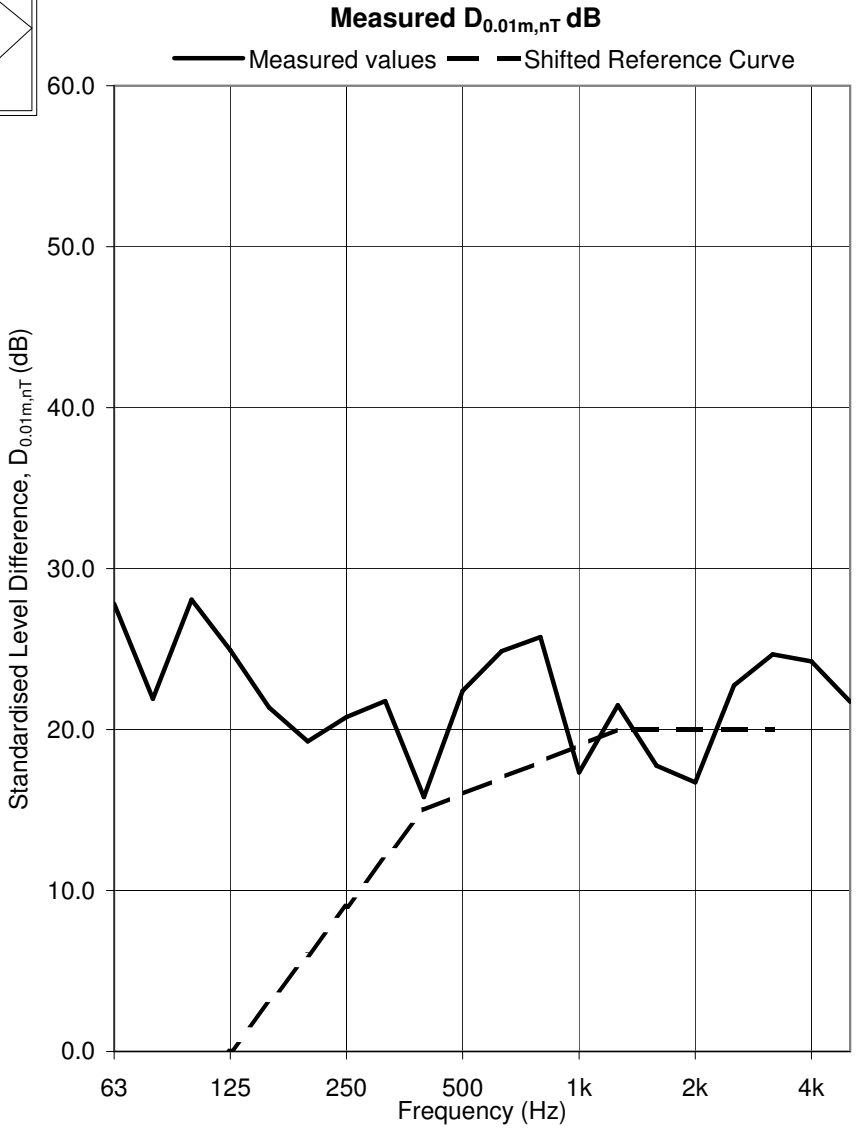
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628030

Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	21.3
63	27.8
80	21.9
100	28.1
125	24.9
160	21.4
200	19.3
250	20.8
315	21.8
400	15.8
500	22.4
630	24.9
800	25.7
1k	17.3
1.25k	21.5
1.6k	17.8
2k	16.7
2.5k	22.7
3.15k	24.7
4k	24.2
5k	21.7



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

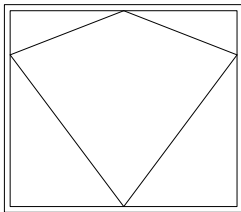
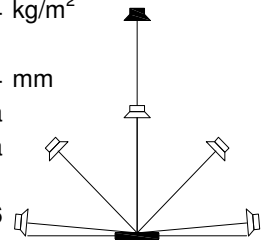
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

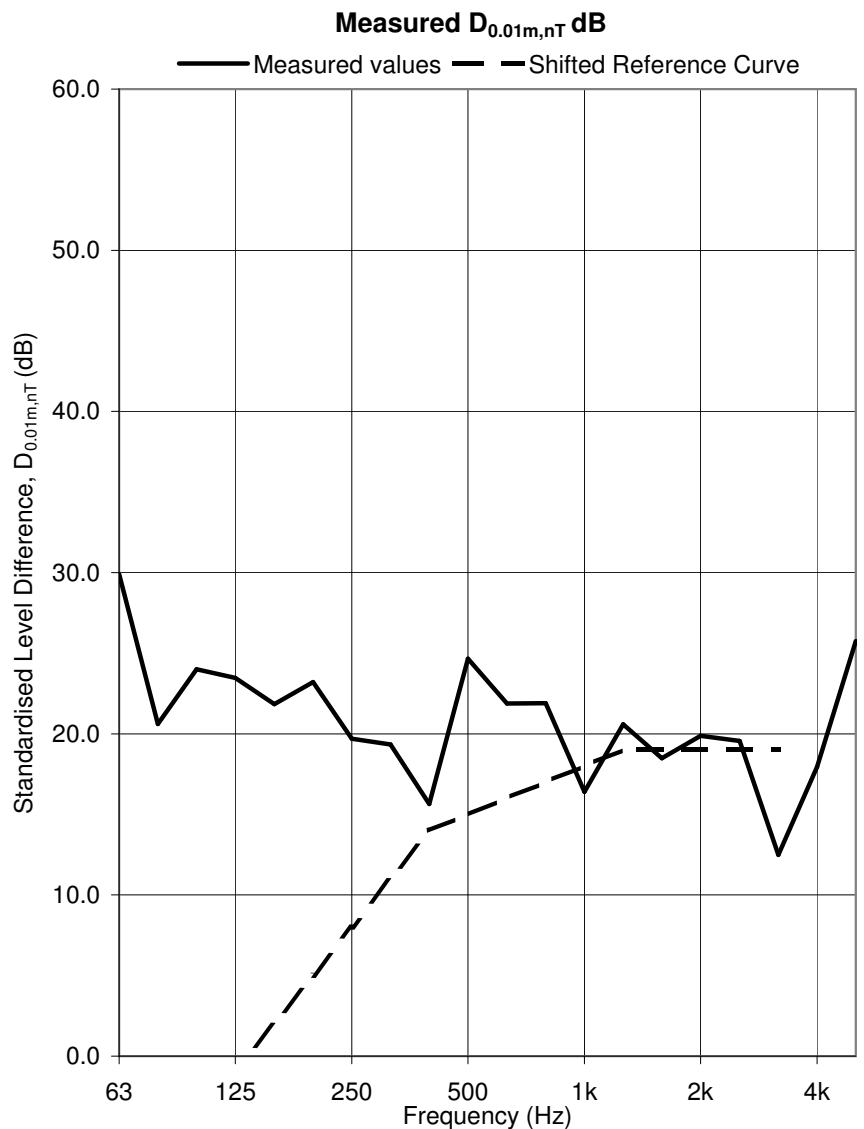
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705028

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.3
63	29.9
80	20.6
100	24.0
125	23.5
160	21.8
200	23.2
250	19.7
315	19.3
400	15.7
500	24.7
630	21.9
800	21.9
1k	16.4
1.25k	20.6
1.6k	18.5
2k	19.9
2.5k	19.6
3.15k	12.5
4k	17.9
5k	25.7



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

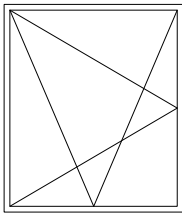
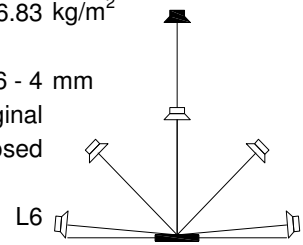
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

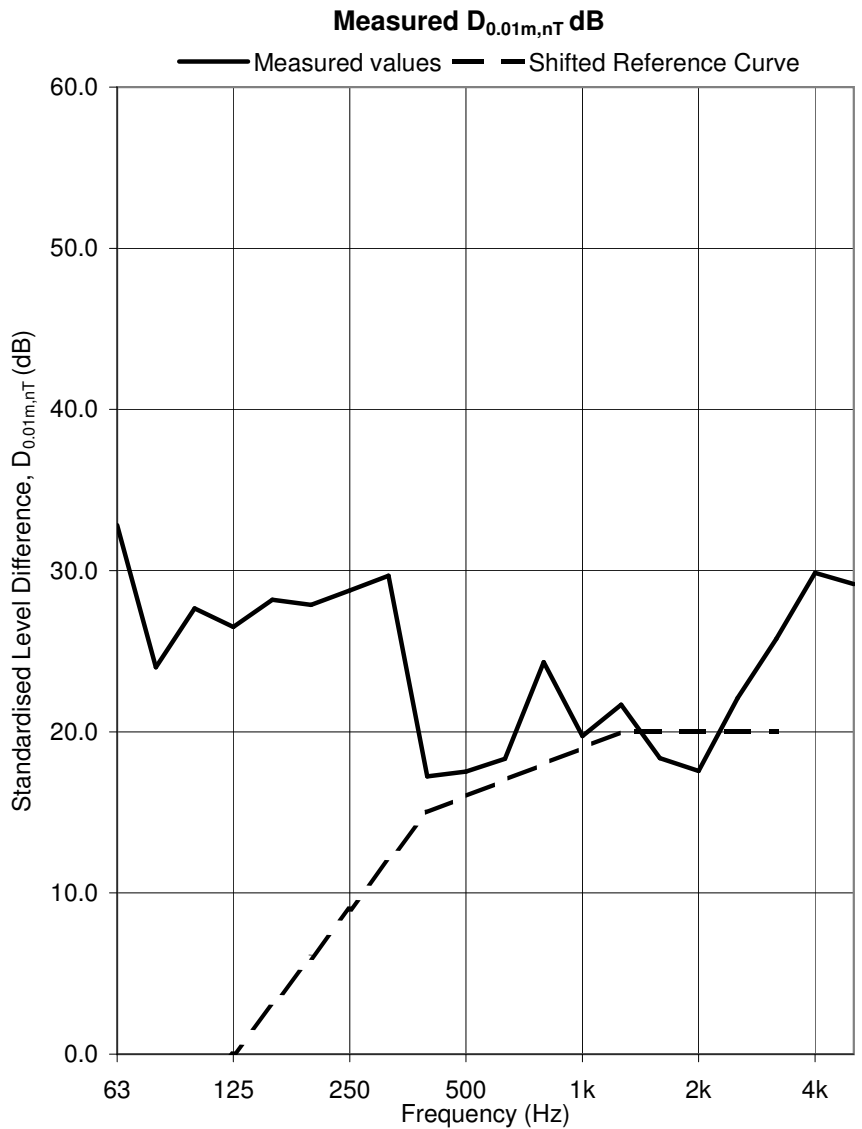
Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	27.0
63	32.8
80	24.0
100	27.7
125	26.5
160	28.2
200	27.9
250	28.8
315	29.7
400	17.2
500	17.5
630	18.3
800	24.3
1k	19.7
1.25k	21.7
1.6k	18.4
2k	17.6
2.5k	22.1
3.15k	25.8
4k	29.9
5k	29.2



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

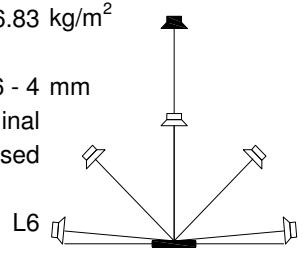
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

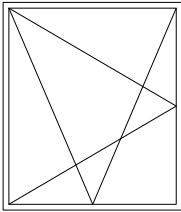
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

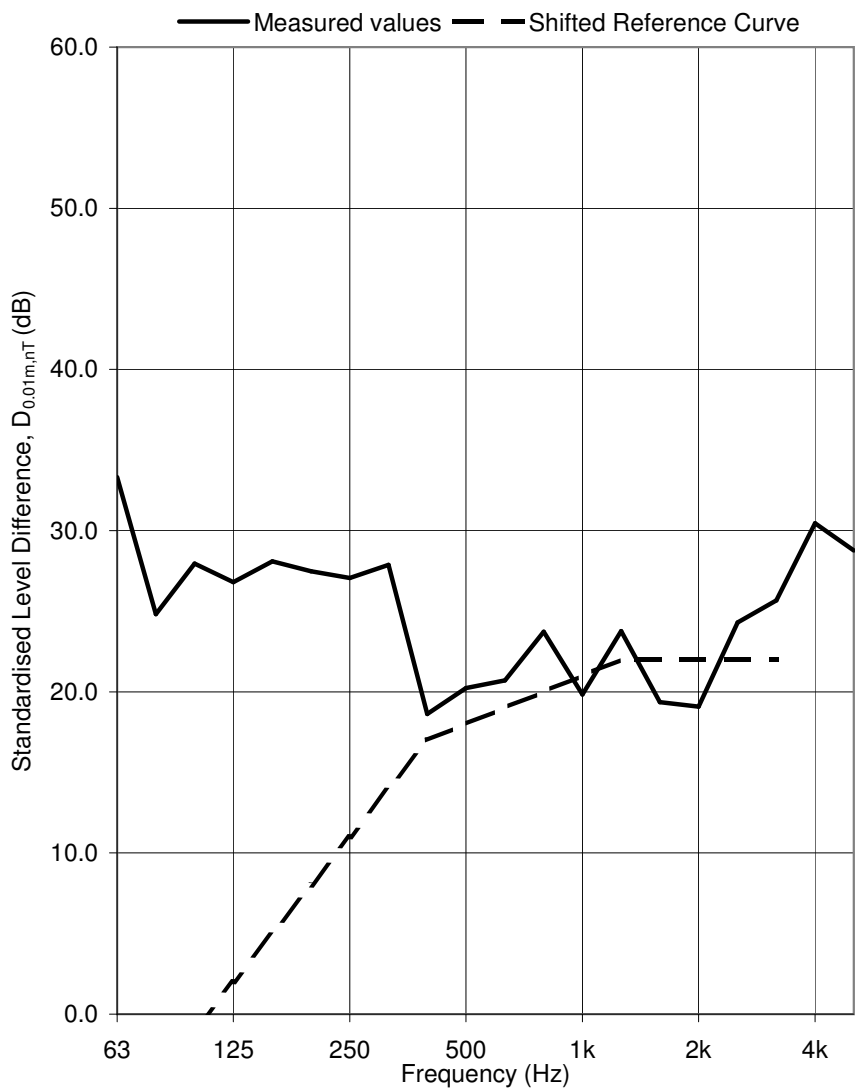


Test ID: 711023

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.0
63	33.3
80	24.8
100	28.0
125	26.8
160	28.1
200	27.5
250	27.1
315	27.9
400	18.6
500	20.2
630	20.7
800	23.7
1k	19.8
1.25k	23.8
1.6k	19.4
2k	19.1
2.5k	24.3
3.15k	25.7
4k	30.5
5k	28.8

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

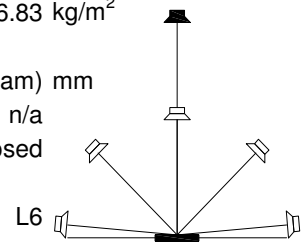
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

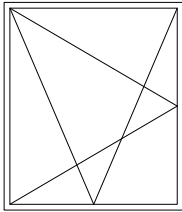
Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

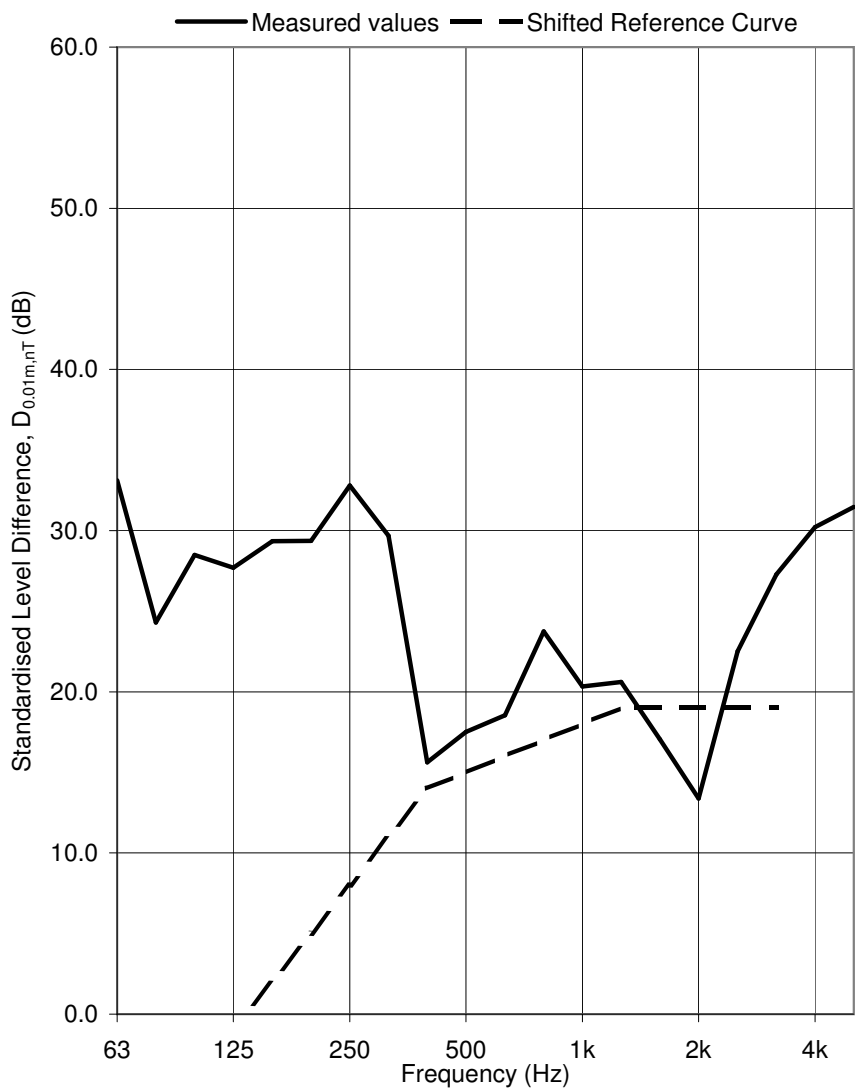
Loudspeaker Configuration:



Test ID: 712019



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.0
63	33.1
80	24.3
100	28.5
125	27.7
160	29.3
200	29.4
250	32.8
315	29.7
400	15.6
500	17.5
630	18.5
800	23.7
1k	20.3
1.25k	20.6
1.6k	17.1
2k	13.4
2.5k	22.5
3.15k	27.3
4k	30.2
5k	31.5

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-1; 0) dB

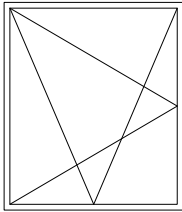
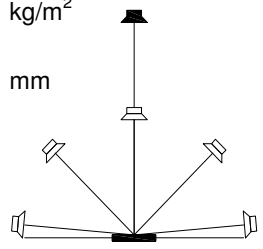
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

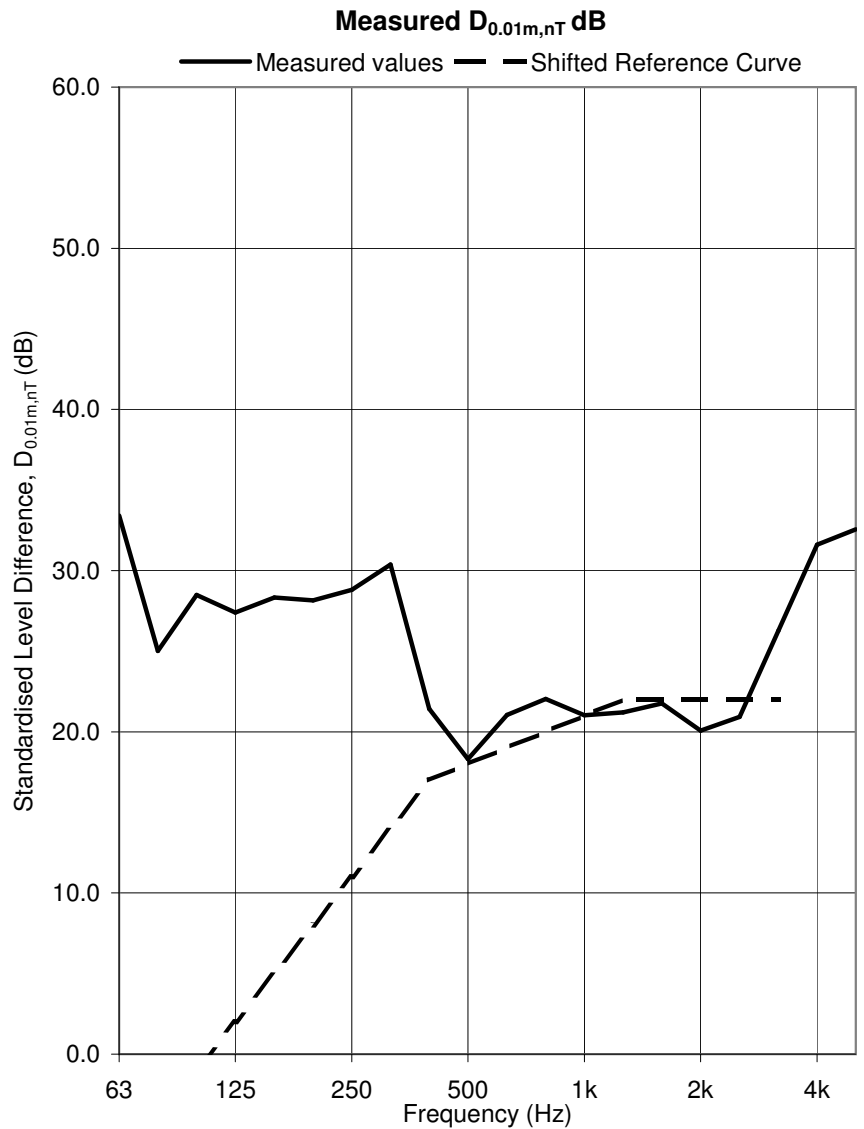
Standardised Level Difference. Simulated residential receiver environment

Date: 17/7/2005
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0044 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 717078

Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.995 m²
 Window mass per unit area: 39.20 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Overframe A closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	28.1
63	33.4
80	25.0
100	28.5
125	27.4
160	28.3
200	28.2
250	28.8
315	30.4
400	21.4
500	18.3
630	21.0
800	22.0
1k	21.0
1.25k	21.2
1.6k	21.8
2k	20.1
2.5k	20.9
3.15k	26.3
4k	31.6
5k	32.6



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; 0) dB}

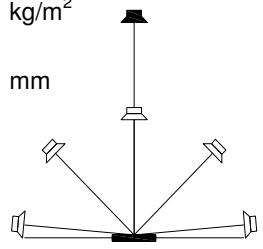
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

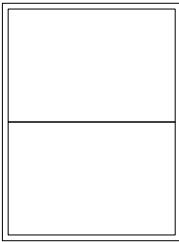
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

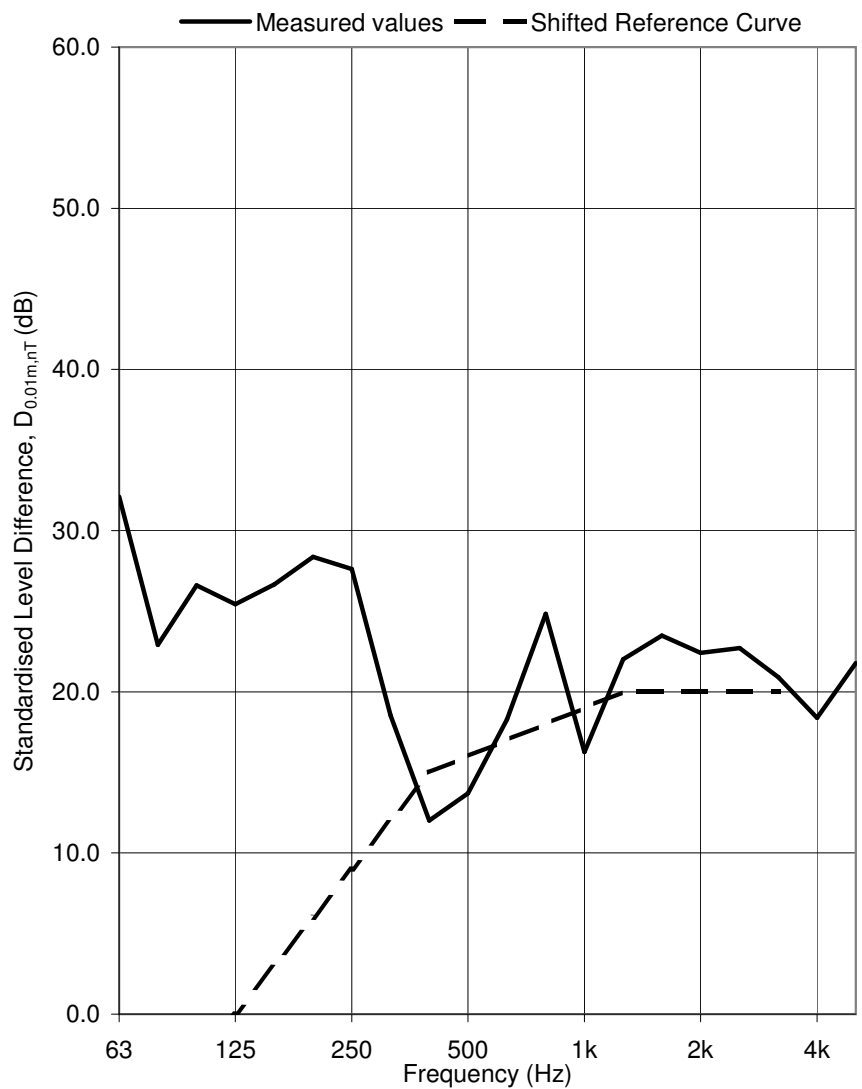


Test ID: 713025

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.2
63	32.1
80	22.9
100	26.6
125	25.4
160	26.7
200	28.4
250	27.6
315	18.5
400	12.0
500	13.7
630	18.3
800	24.8
1k	16.3
1.25k	22.0
1.6k	23.5
2k	22.4
2.5k	22.7
3.15k	20.9
4k	18.4
5k	21.8

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -1) dB

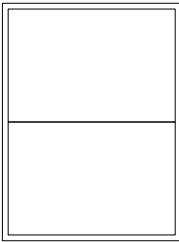
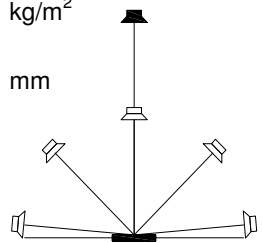
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

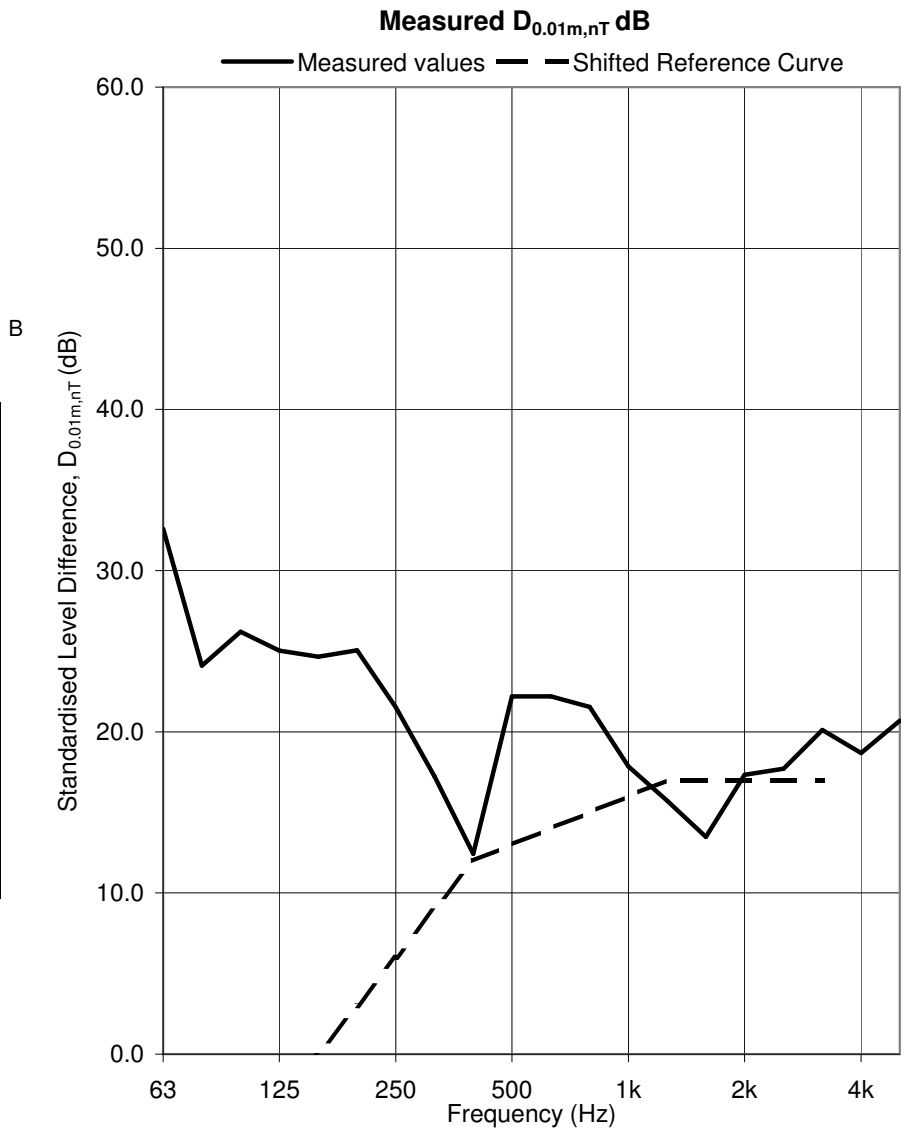
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713017

Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	26.5
63	32.6
80	24.1
100	26.2
125	25.0
160	24.7
200	25.1
250	21.5
315	17.2
400	12.4
500	22.2
630	22.2
800	21.5
1k	17.9
1.25k	15.7
1.6k	13.5
2k	17.3
2.5k	17.7
3.15k	20.1
4k	18.7
5k	20.7



D_{0.01m,nT,w(C;C_{tr}) 17 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

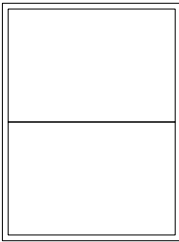
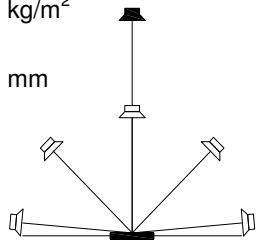
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

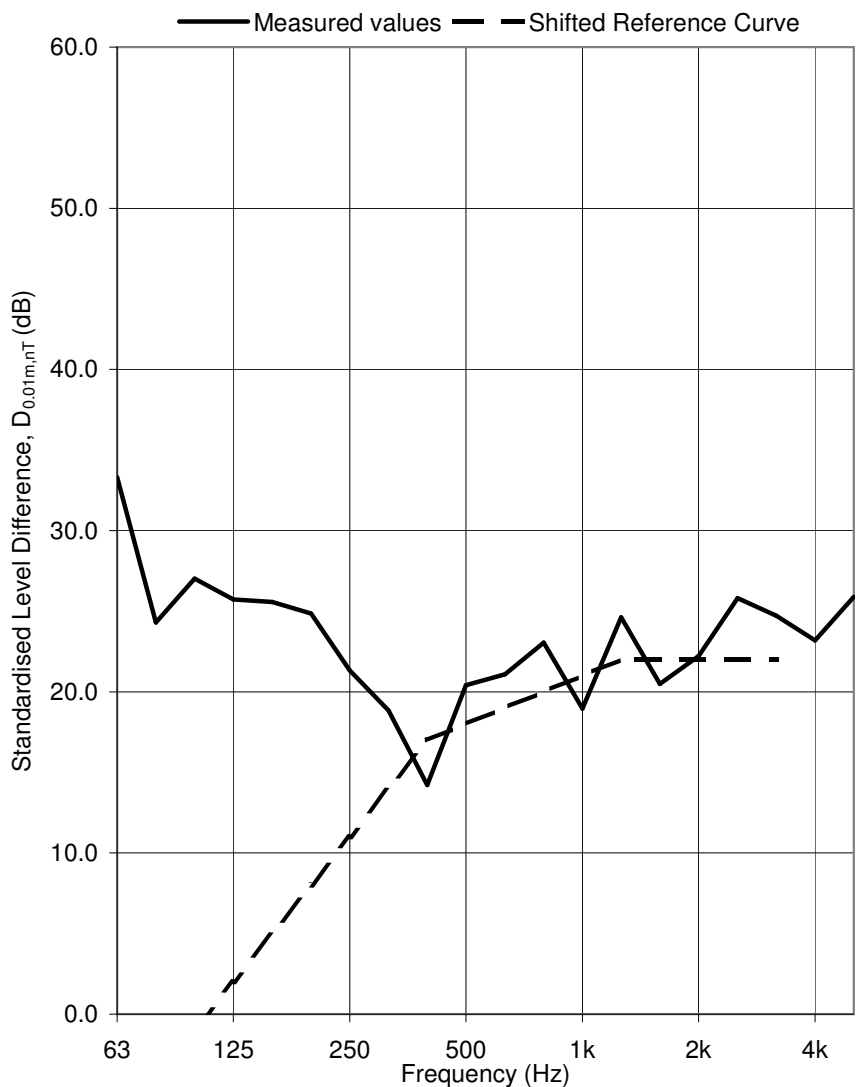
Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713021

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	27.3
63	33.3
80	24.3
100	27.0
125	25.7
160	25.6
200	24.9
250	21.3
315	18.8
400	14.2
500	20.4
630	21.1
800	23.0
1k	19.0
1.25k	24.6
1.6k	20.5
2k	22.2
2.5k	25.8
3.15k	24.7
4k	23.2
5k	25.9

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -1) dB

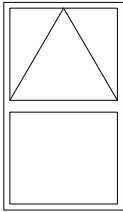
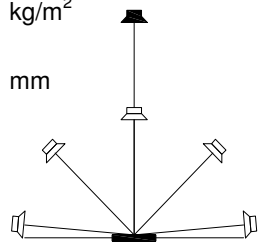
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

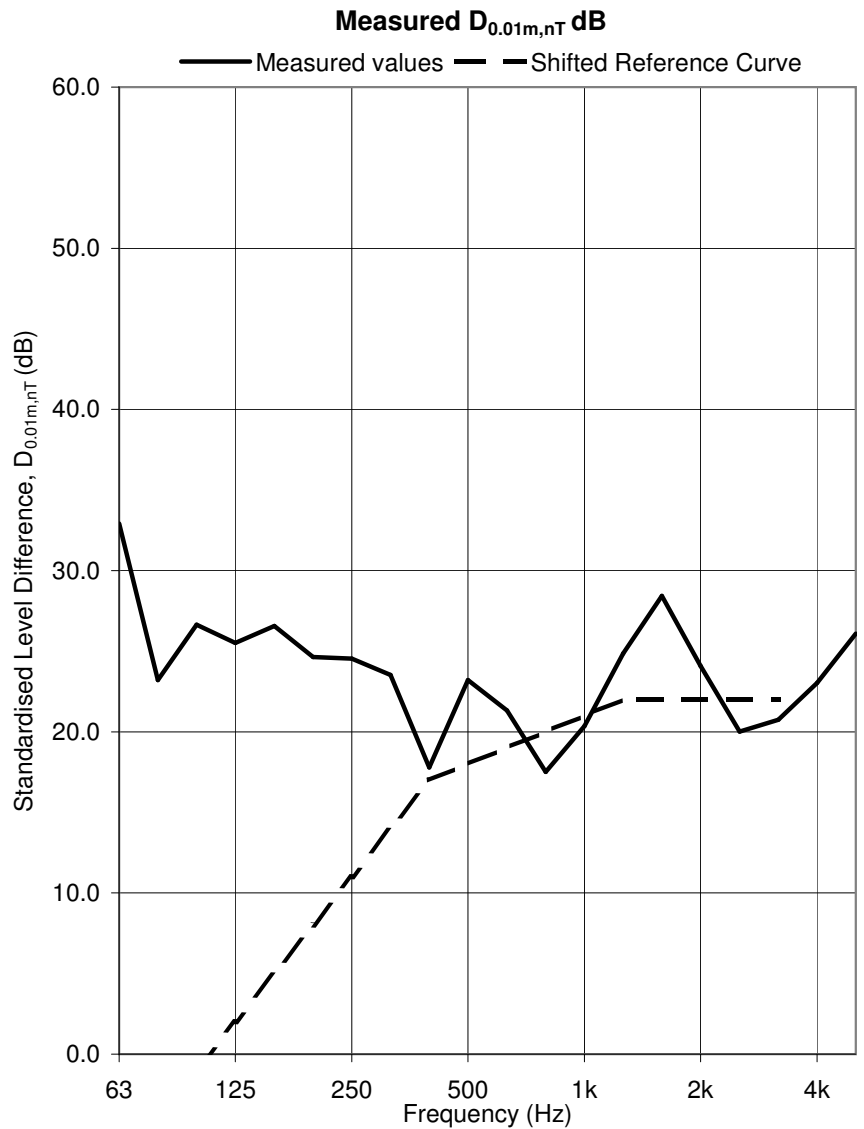
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718025

Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.3
63	32.9
80	23.2
100	26.6
125	25.5
160	26.6
200	24.6
250	24.5
315	23.5
400	17.8
500	23.2
630	21.3
800	17.5
1k	20.3
1.25k	24.9
1.6k	28.4
2k	24.1
2.5k	20.0
3.15k	20.7
4k	23.0
5k	26.1



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; -1) dB}

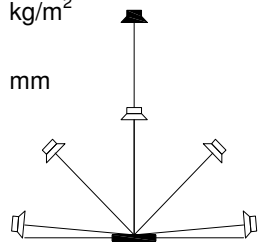
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

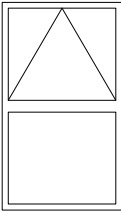
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

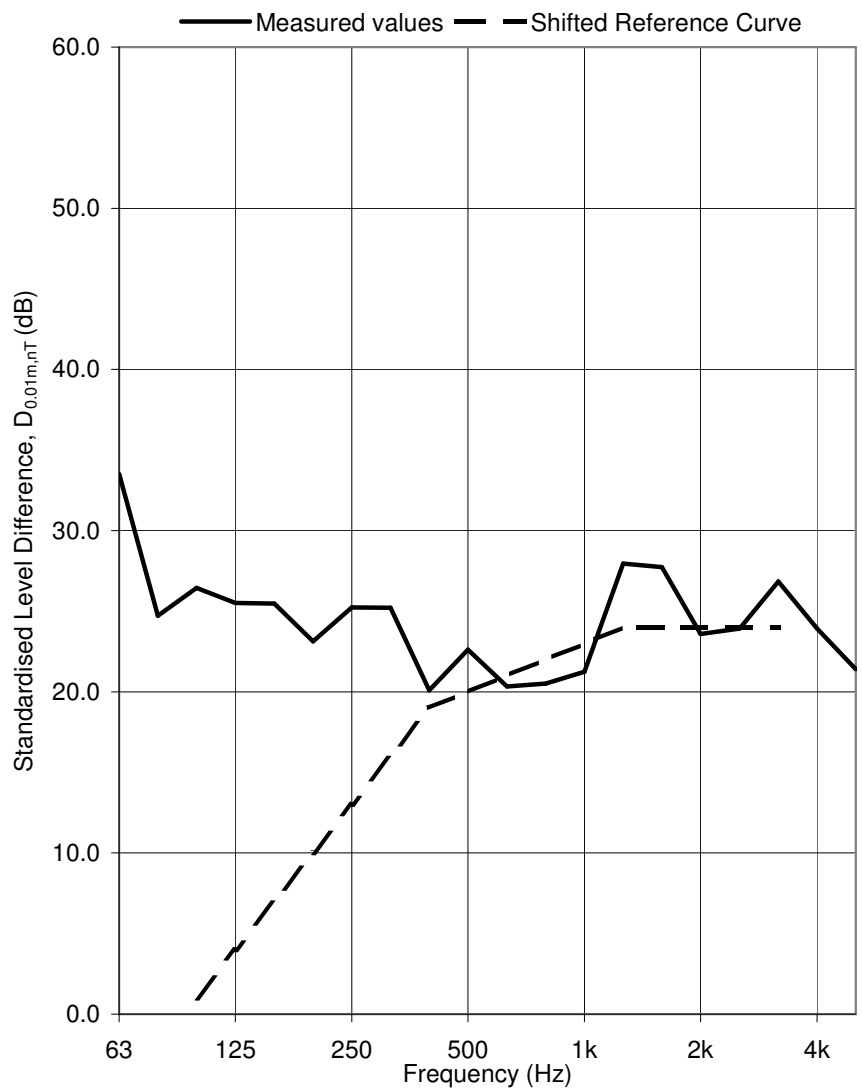


Test ID: 719004

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.6
63	33.5
80	24.7
100	26.4
125	25.5
160	25.5
200	23.1
250	25.2
315	25.2
400	20.1
500	22.6
630	20.3
800	20.5
1k	21.2
1.25k	28.0
1.6k	27.7
2k	23.6
2.5k	23.9
3.15k	26.8
4k	23.9
5k	21.4



$D_{0.01m,nT,w}(C;C_{tr})$ 24 (-1; -1) dB

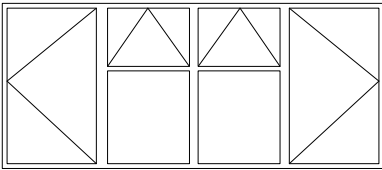
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

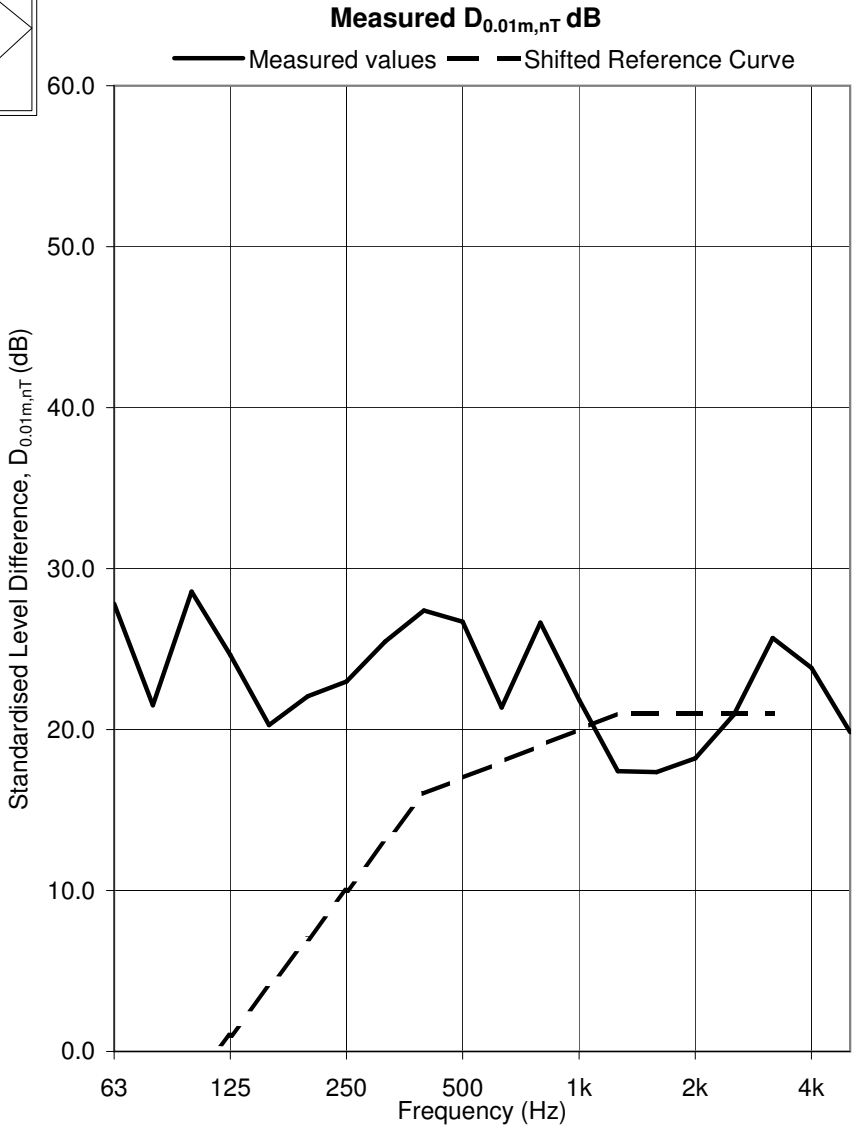
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628110

Test Sample: Window A-1 Open 0.05 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	20.8
63	27.8
80	21.5
100	28.6
125	24.6
160	20.3
200	22.1
250	23.0
315	25.5
400	27.4
500	26.7
630	21.4
800	26.6
1k	21.8
1.25k	17.4
1.6k	17.4
2k	18.2
2.5k	20.9
3.15k	25.7
4k	23.8
5k	19.8





D_{0.01m,nT,w(C;C_{tr}) 21 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

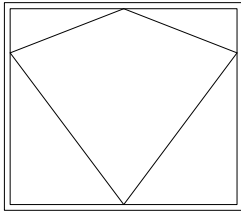
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

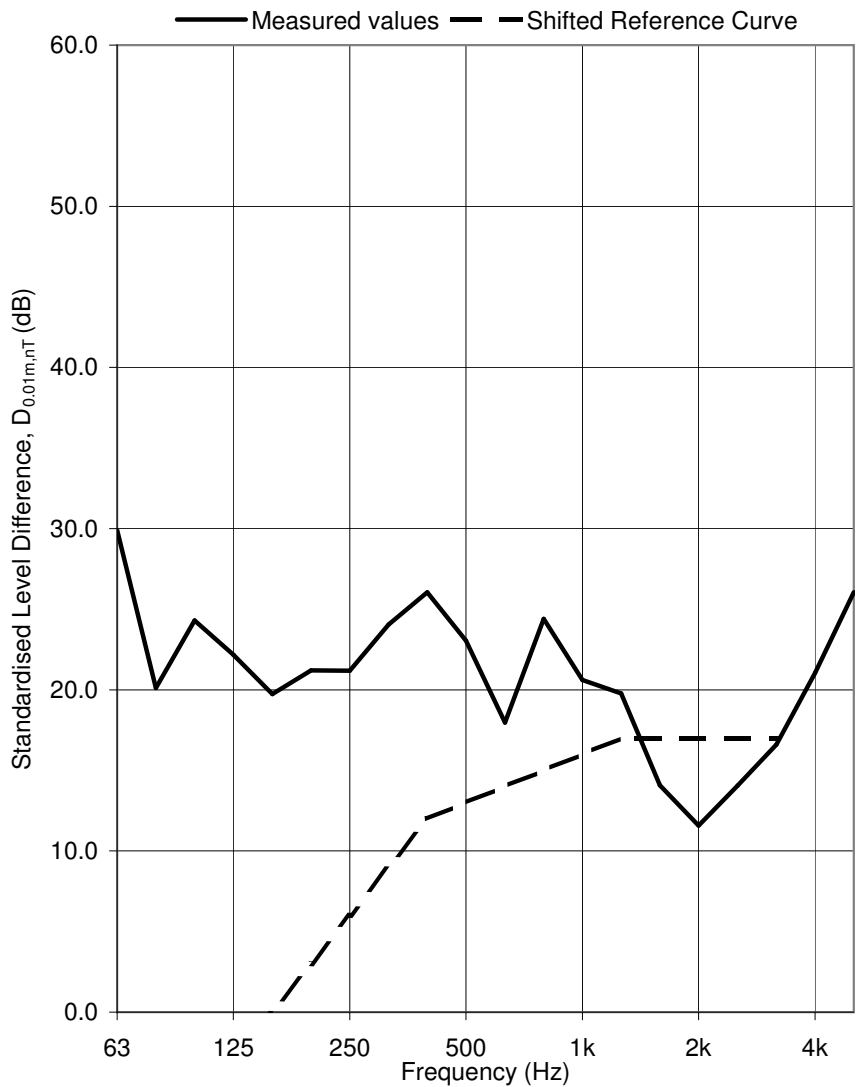
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 705033



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.5
63	29.9
80	20.1
100	24.3
125	22.2
160	19.7
200	21.2
250	21.2
315	24.0
400	26.1
500	23.1
630	18.0
800	24.4
1k	20.6
1.25k	19.8
1.6k	14.1
2k	11.6
2.5k	14.1
3.15k	16.6
4k	21.0
5k	26.0


$D_{0.01m,nT,w(C;C_{tr})}$ 17 (-1; 1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

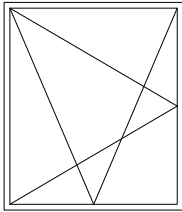
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

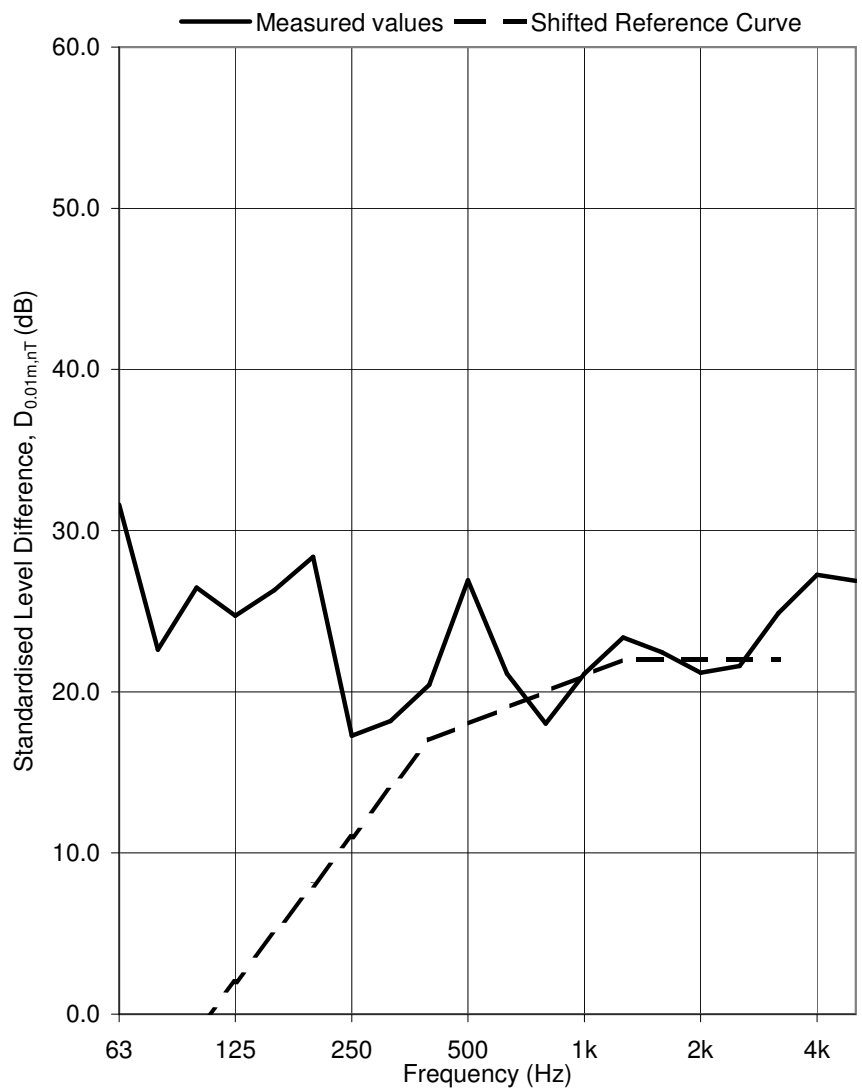
Test Sample: Window C-1 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711070

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	23.9
63	31.6
80	22.6
100	26.5
125	24.7
160	26.3
200	28.4
250	17.3
315	18.2
400	20.4
500	26.9
630	21.1
800	18.0
1k	21.1
1.25k	23.4
1.6k	22.5
2k	21.2
2.5k	21.6
3.15k	24.9
4k	27.3
5k	26.9


D_{0.01m,nT,w(C;C_{tr}) 22 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

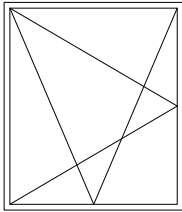
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

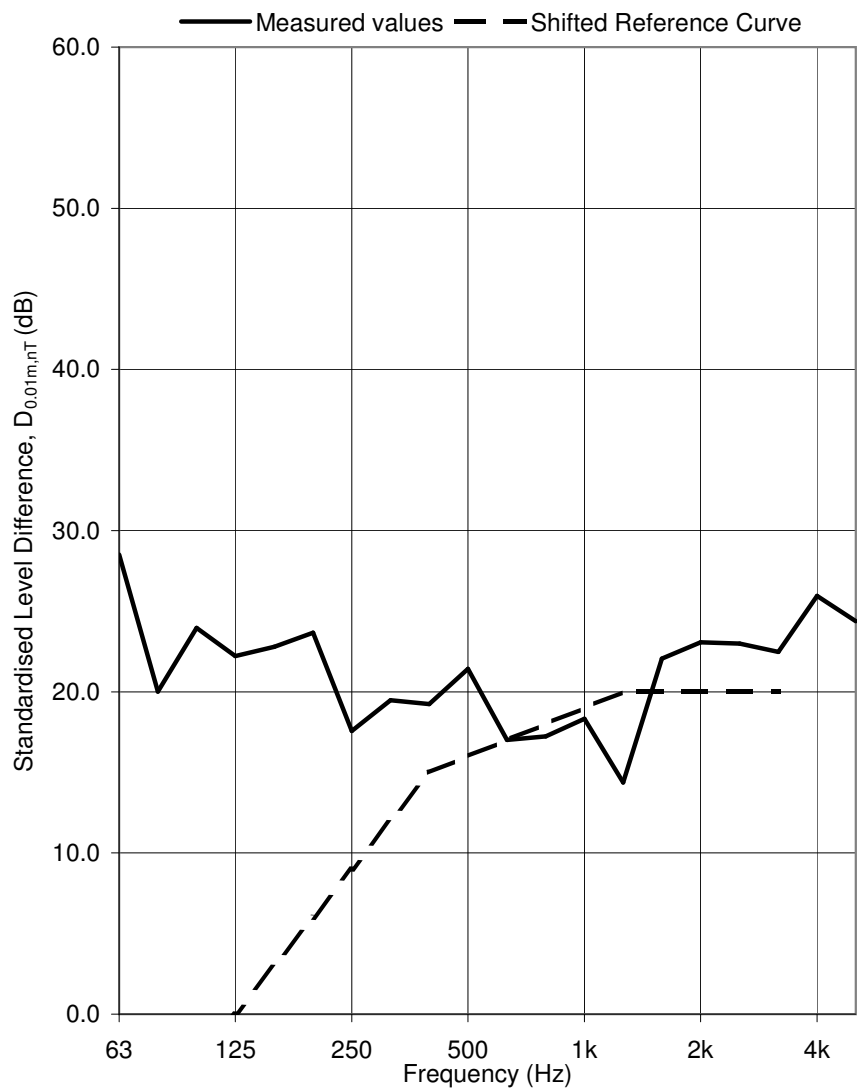
Test Sample: Window C-2 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711074

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	20.7
63	28.5
80	20.0
100	24.0
125	22.2
160	22.8
200	23.7
250	17.6
315	19.5
400	19.2
500	21.4
630	17.0
800	17.2
1k	18.3
1.25k	14.4
1.6k	22.1
2k	23.1
2.5k	23.0
3.15k	22.5
4k	26.0
5k	24.4

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -2) dB


Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

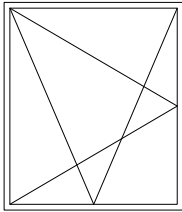
Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

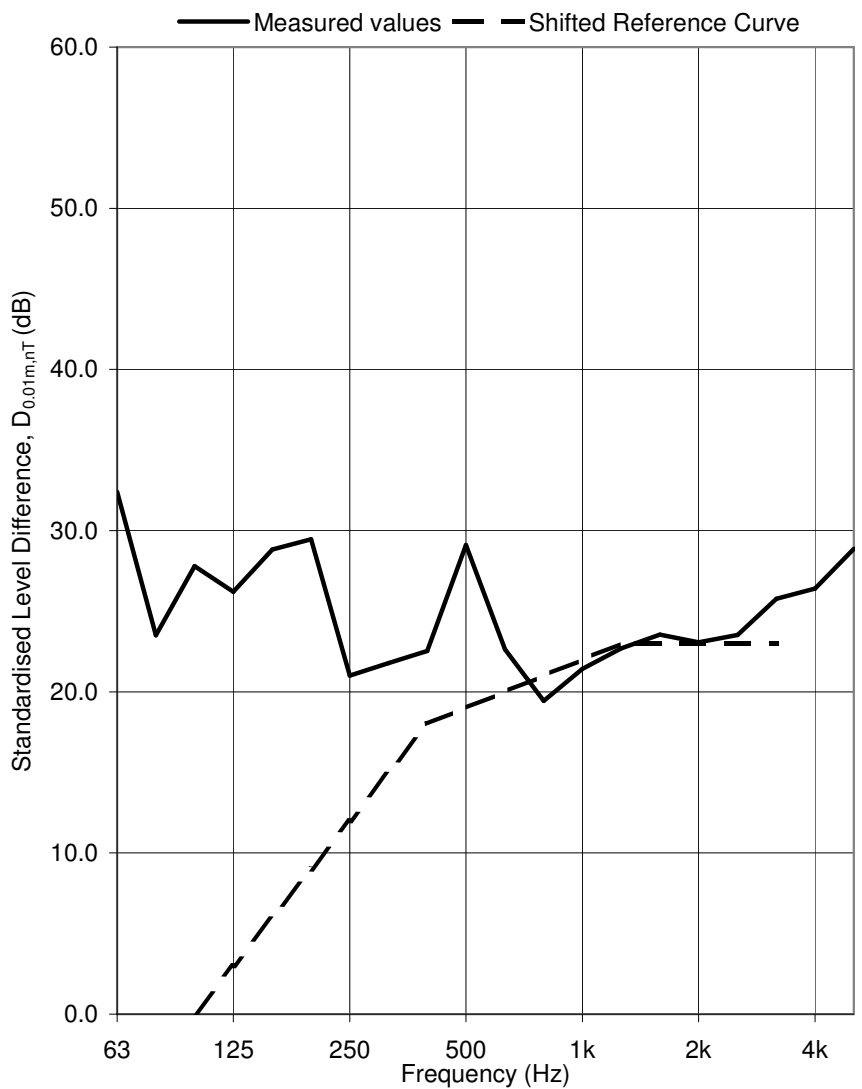
Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712006

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	25.7
63	32.4
80	23.5
100	27.8
125	26.2
160	28.8
200	29.5
250	21.0
315	21.8
400	22.5
500	29.1
630	22.6
800	19.4
1k	21.4
1.25k	22.7
1.6k	23.6
2k	23.1
2.5k	23.5
3.15k	25.8
4k	26.4
5k	28.9

D_{0.01m,nT,w(C;C_{tr}) 23 (0; -1) dB}


Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

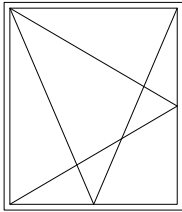
Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.05 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

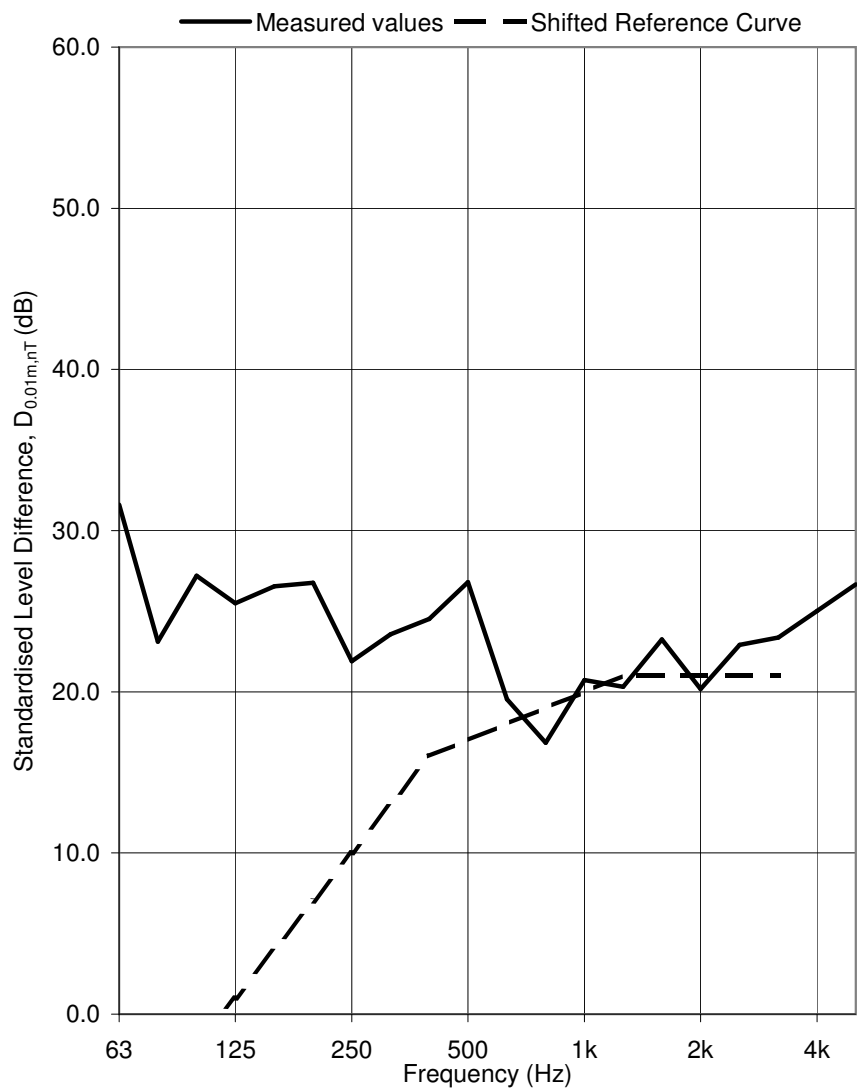
Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712010

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	24.9
63	31.6
80	23.1
100	27.2
125	25.5
160	26.5
200	26.8
250	21.9
315	23.6
400	24.5
500	26.8
630	19.5
800	16.8
1k	20.7
1.25k	20.3
1.6k	23.3
2k	20.2
2.5k	22.9
3.15k	23.4
4k	25.0
5k	26.7


D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

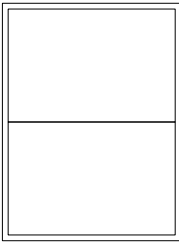
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

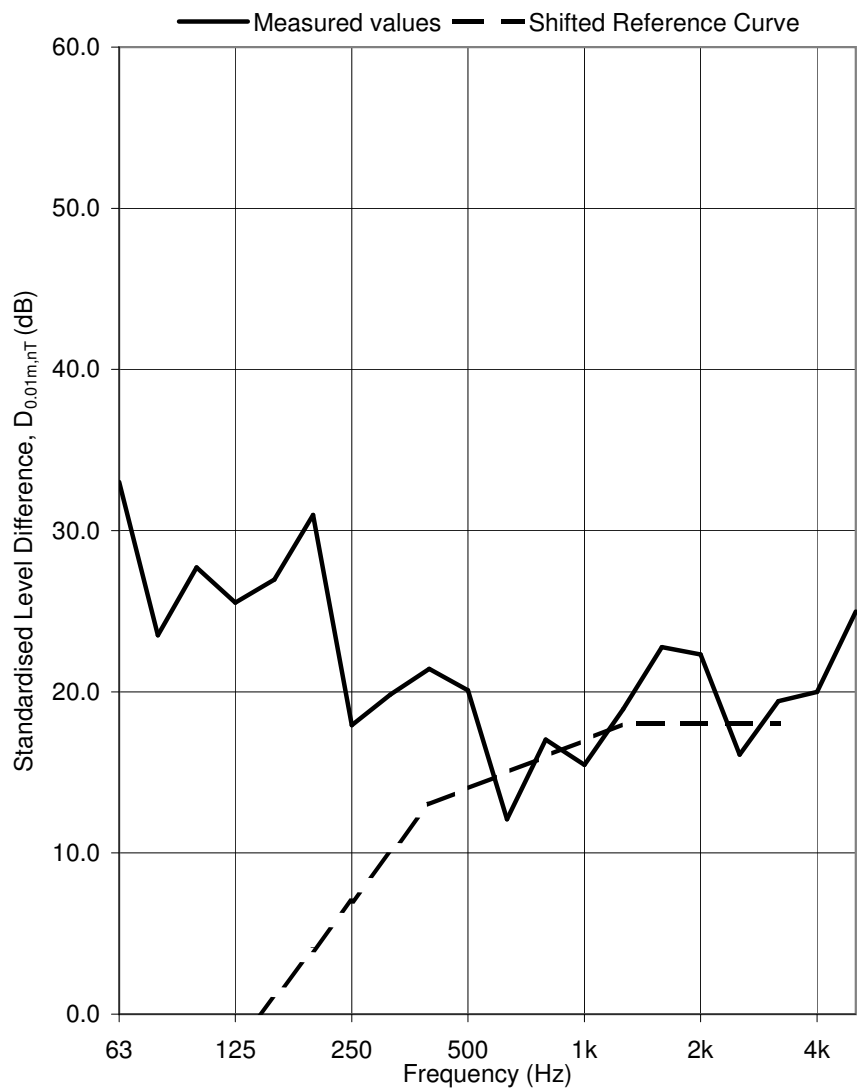
Test Sample: Window D-1 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 713067

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.4
63	33.0
80	23.5
100	27.7
125	25.5
160	27.0
200	31.0
250	17.9
315	19.8
400	21.4
500	20.1
630	12.1
800	17.0
1k	15.5
1.25k	18.9
1.6k	22.8
2k	22.3
2.5k	16.1
3.15k	19.4
4k	20.0
5k	25.0


$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

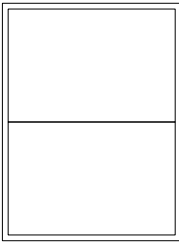
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

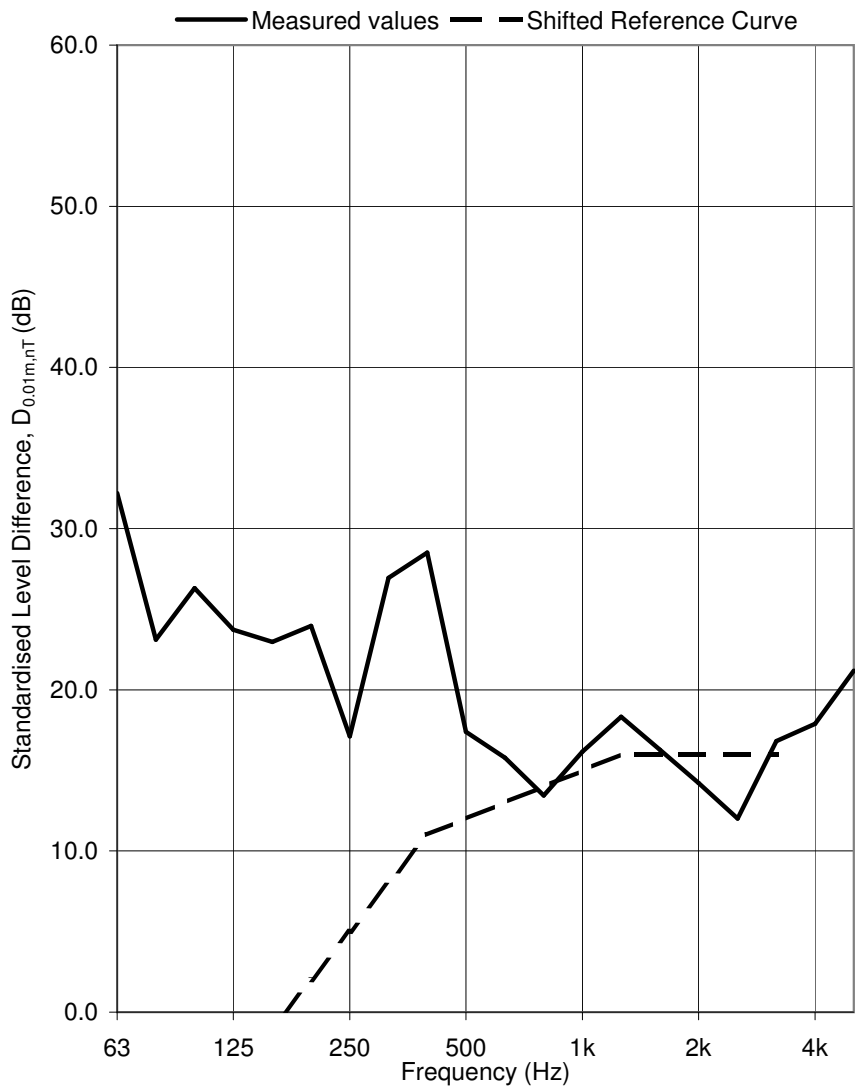
Test Sample: Window D-2 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 713059

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.6
63	32.2
80	23.1
100	26.3
125	23.7
160	23.0
200	24.0
250	17.1
315	26.9
400	28.5
500	17.4
630	15.8
800	13.4
1k	16.2
1.25k	18.3
1.6k	16.3
2k	14.2
2.5k	12.0
3.15k	16.8
4k	17.9
5k	21.2



$D_{0.01m,nT,w(C;C_{tr})}$ 16 (-1; 0) dB

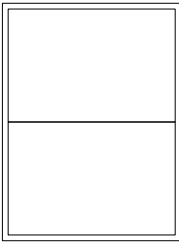
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

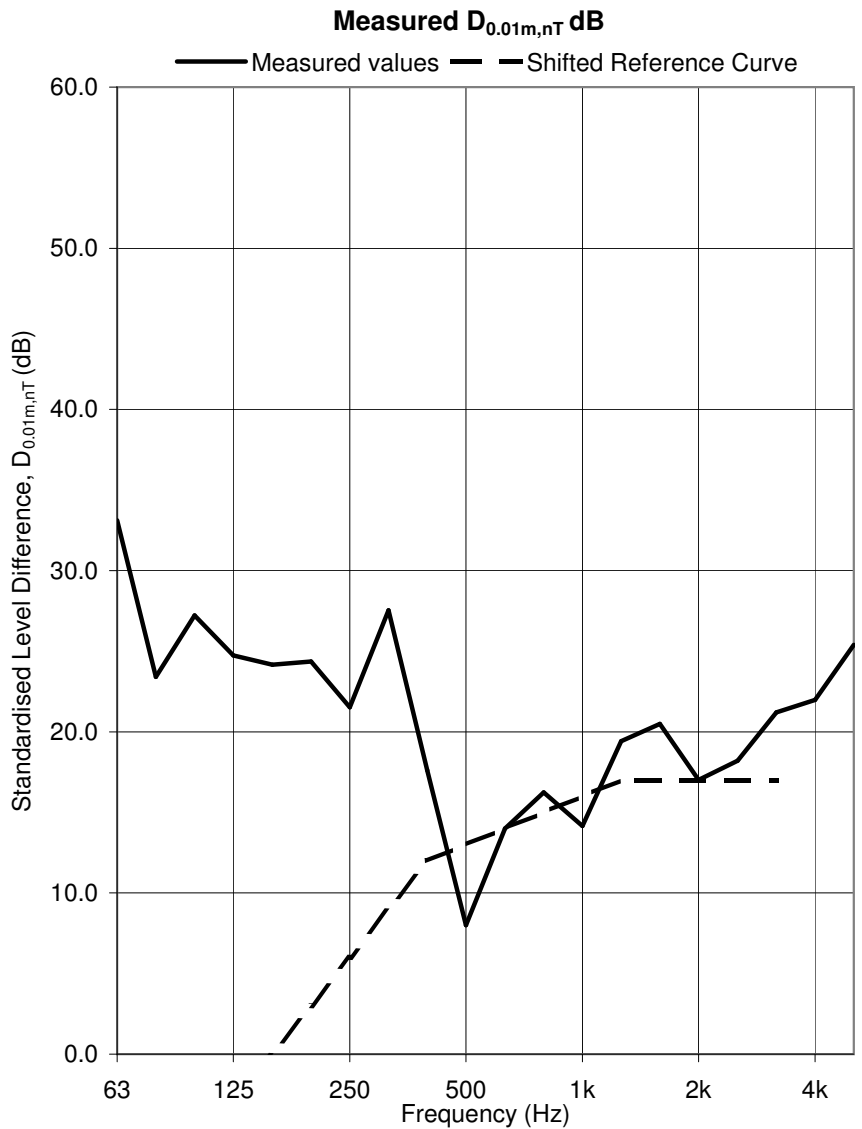
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713063

Test Sample: Window D-3 Open 0.05 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	28.5
63	33.1
80	23.4
100	27.2
125	24.7
160	24.2
200	24.4
250	21.5
315	27.5
400	17.6
500	8.0
630	14.0
800	16.2
1k	14.2
1.25k	19.4
1.6k	20.5
2k	17.0
2.5k	18.2
3.15k	21.2
4k	22.0
5k	25.4




D_{0.01m,nT,w(C;C_{tr}) 17 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

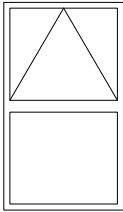
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

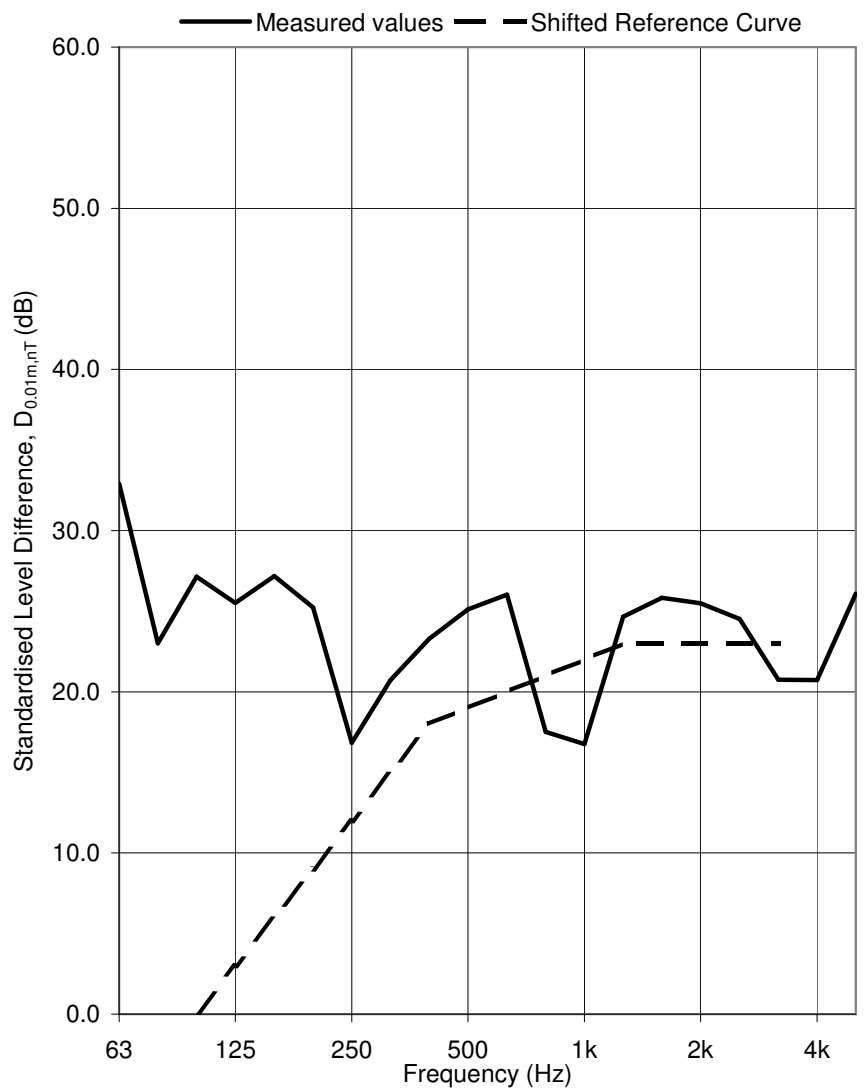
Test Sample: Window E Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 718032

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	27.4
63	32.9
80	23.0
100	27.1
125	25.5
160	27.2
200	25.2
250	16.8
315	20.7
400	23.3
500	25.1
630	26.0
800	17.5
1k	16.7
1.25k	24.7
1.6k	25.8
2k	25.5
2.5k	24.5
3.15k	20.7
4k	20.7
5k	26.1


D_{0.01m,nT,w(C;C_{tr}) 23 (-2; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

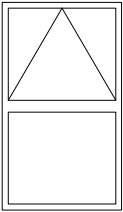
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

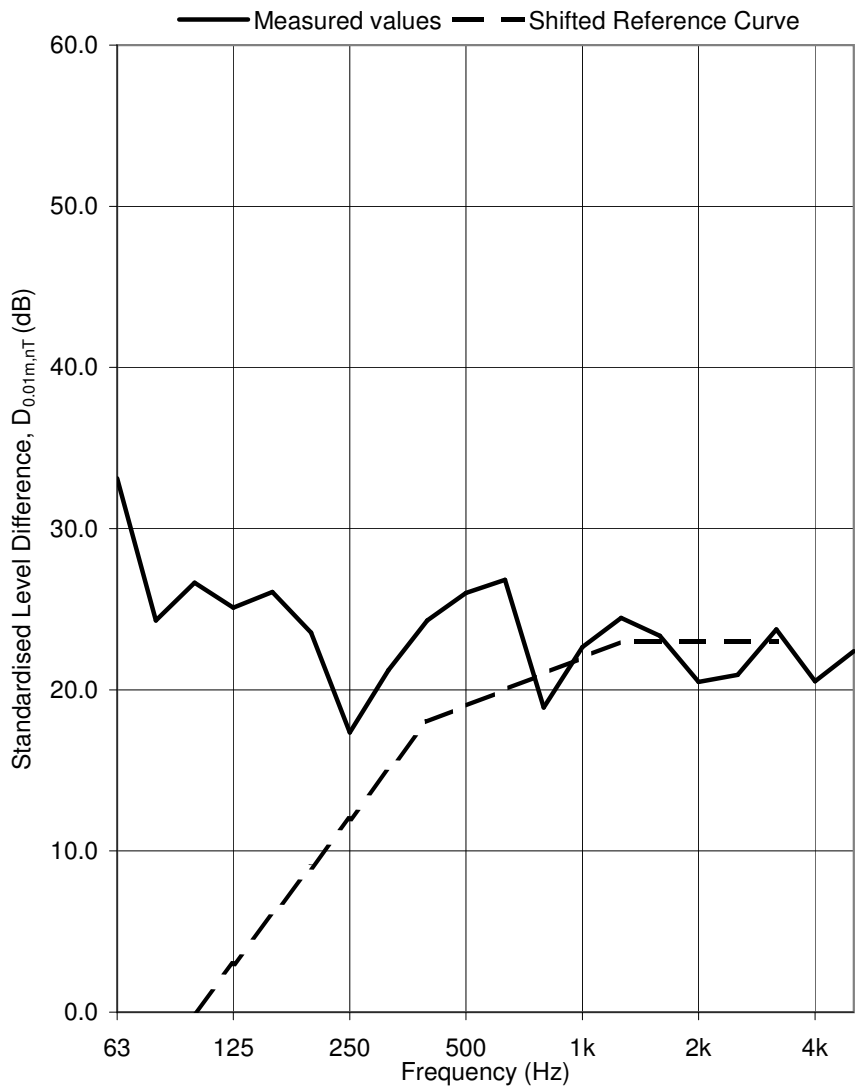
Test Sample: Window F Open 0.05 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 719011

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.8
63	33.1
80	24.3
100	26.6
125	25.1
160	26.1
200	23.5
250	17.3
315	21.2
400	24.3
500	26.0
630	26.8
800	18.9
1k	22.6
1.25k	24.5
1.6k	23.3
2k	20.5
2.5k	20.9
3.15k	23.7
4k	20.5
5k	22.4



$D_{0.01m,nT,w}(C;C_{tr})$ 23 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

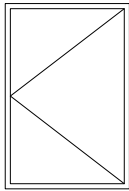
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

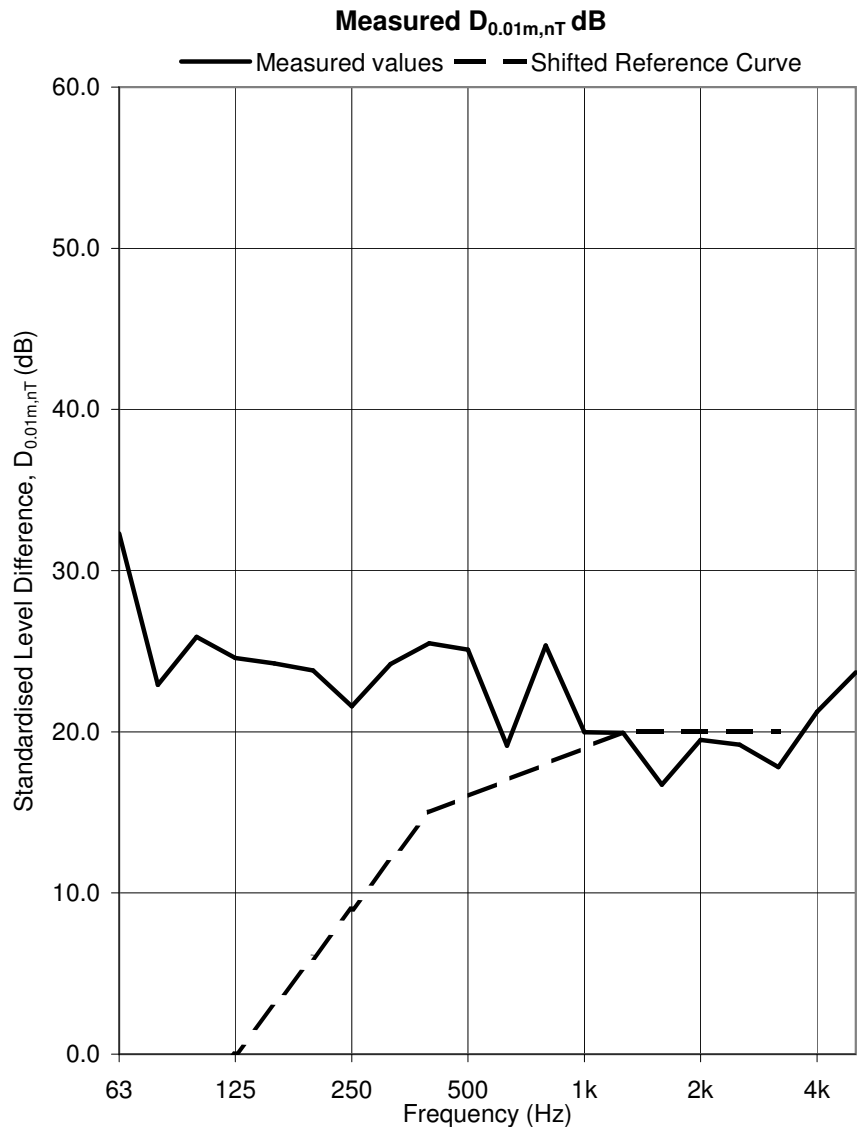
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window G Open 0.05 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 720011



Frequency Hz	D _{0.01m,nT} dB
50	26.2
63	32.3
80	22.9
100	25.9
125	24.6
160	24.3
200	23.8
250	21.6
315	24.2
400	25.5
500	25.1
630	19.1
800	25.4
1k	20.0
1.25k	19.9
1.6k	16.7
2k	19.5
2.5k	19.2
3.15k	17.8
4k	21.2
5k	23.7



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; 0) dB}

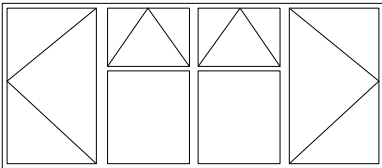
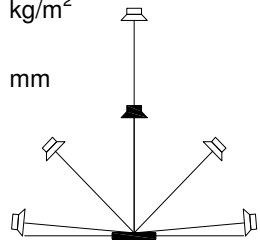
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

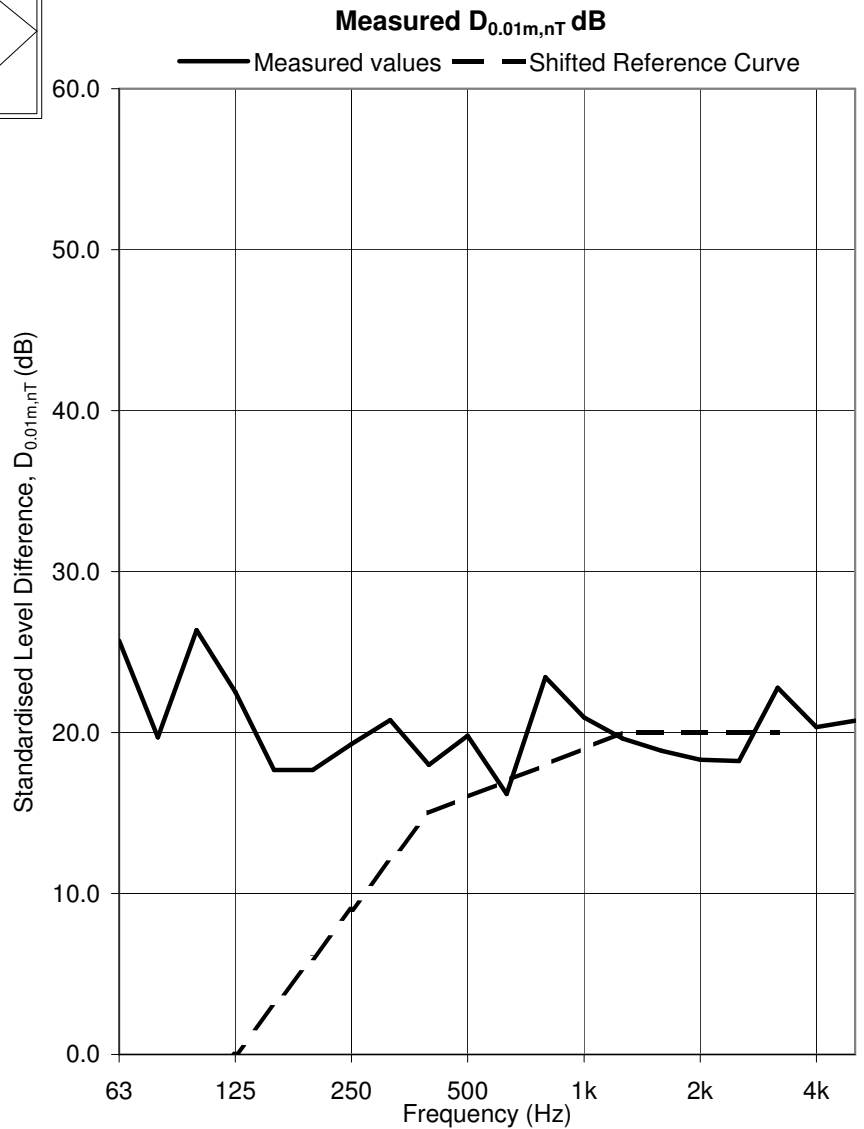
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628015

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	18.9
63	25.7
80	19.7
100	26.4
125	22.5
160	17.7
200	17.7
250	19.3
315	20.8
400	18.0
500	19.8
630	16.2
800	23.4
1k	20.9
1.25k	19.6
1.6k	18.9
2k	18.3
2.5k	18.2
3.15k	22.8
4k	20.3
5k	20.7



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -1) dB}

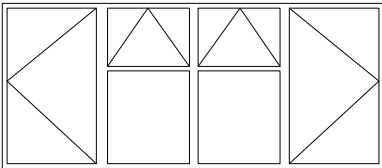
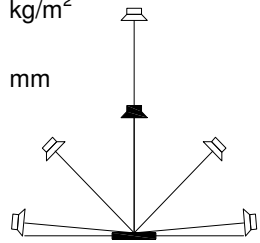
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

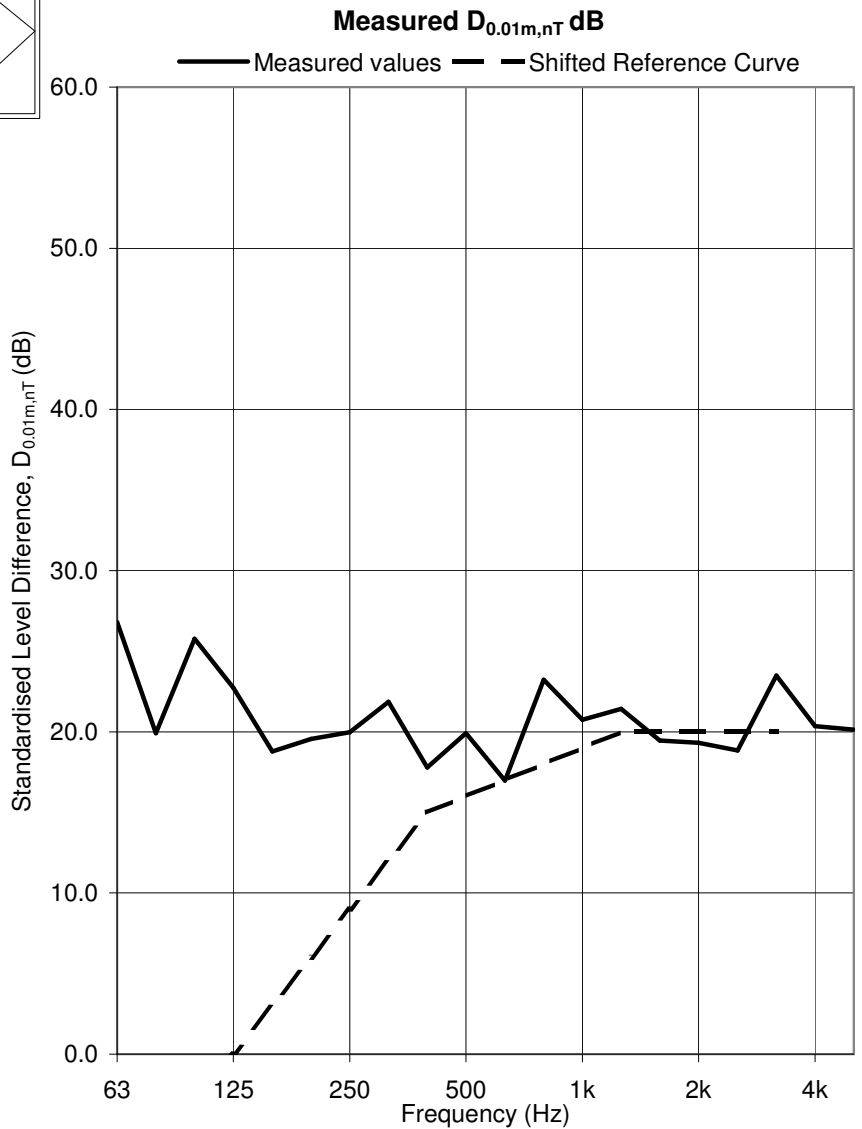
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628010

Test Sample: Window A-2 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	19.7
63	26.8
80	19.9
100	25.8
125	22.7
160	18.8
200	19.6
250	20.0
315	21.9
400	17.8
500	19.9
630	17.0
800	23.2
1k	20.7
1.25k	21.4
1.6k	19.5
2k	19.3
2.5k	18.8
3.15k	23.5
4k	20.3
5k	20.1



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

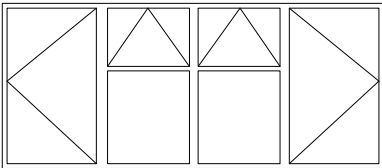
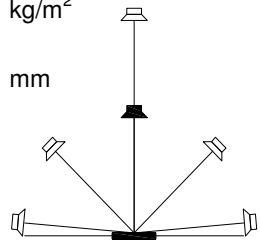
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

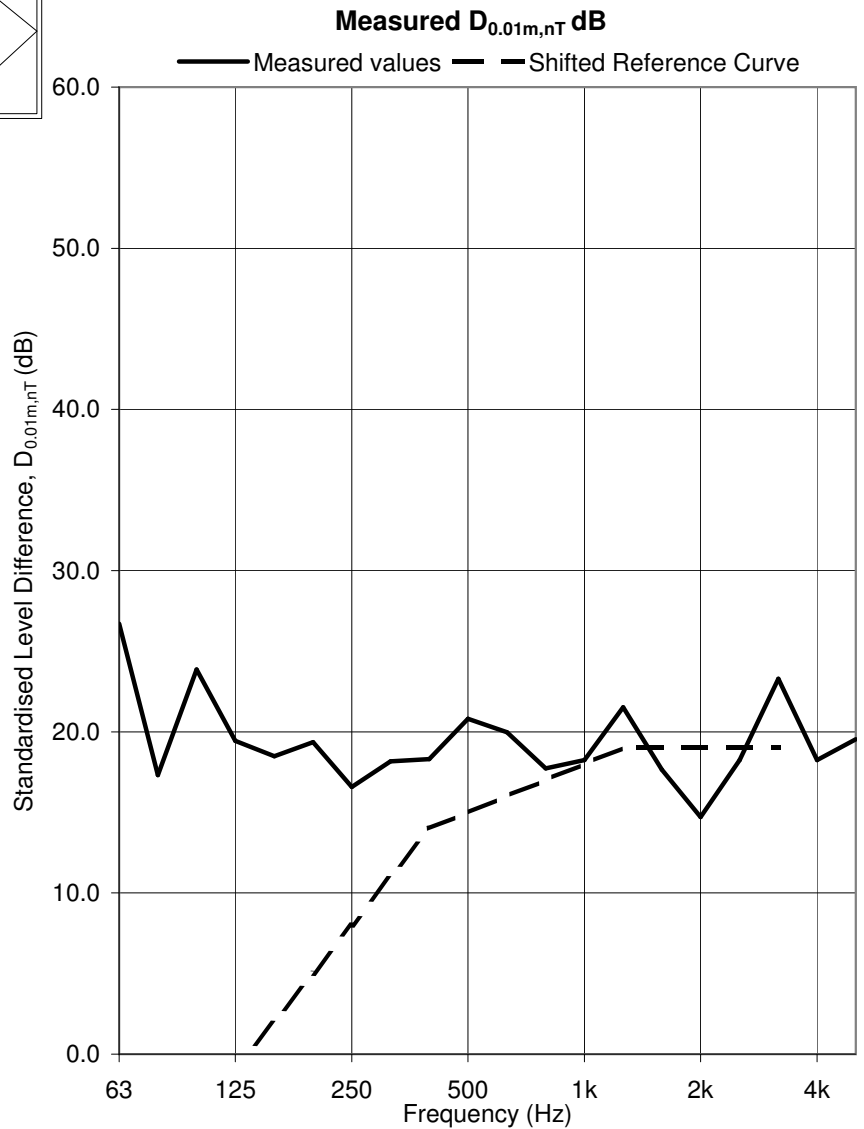
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628005

Test Sample: Window A-3 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	20.2
63	26.7
80	17.3
100	23.9
125	19.4
160	18.5
200	19.4
250	16.6
315	18.2
400	18.3
500	20.8
630	20.0
800	17.7
1k	18.2
1.25k	21.5
1.6k	17.7
2k	14.7
2.5k	18.2
3.15k	23.3
4k	18.2
5k	19.5



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 18.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705004

Test Sample: Window B Open 0.10 m²

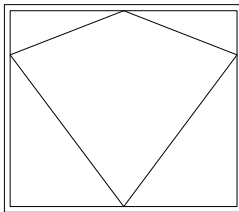
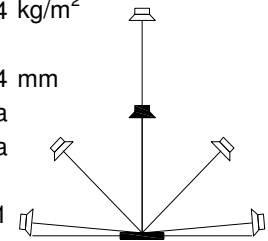
Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

Glass Specification: 4 -16 - 4 mm

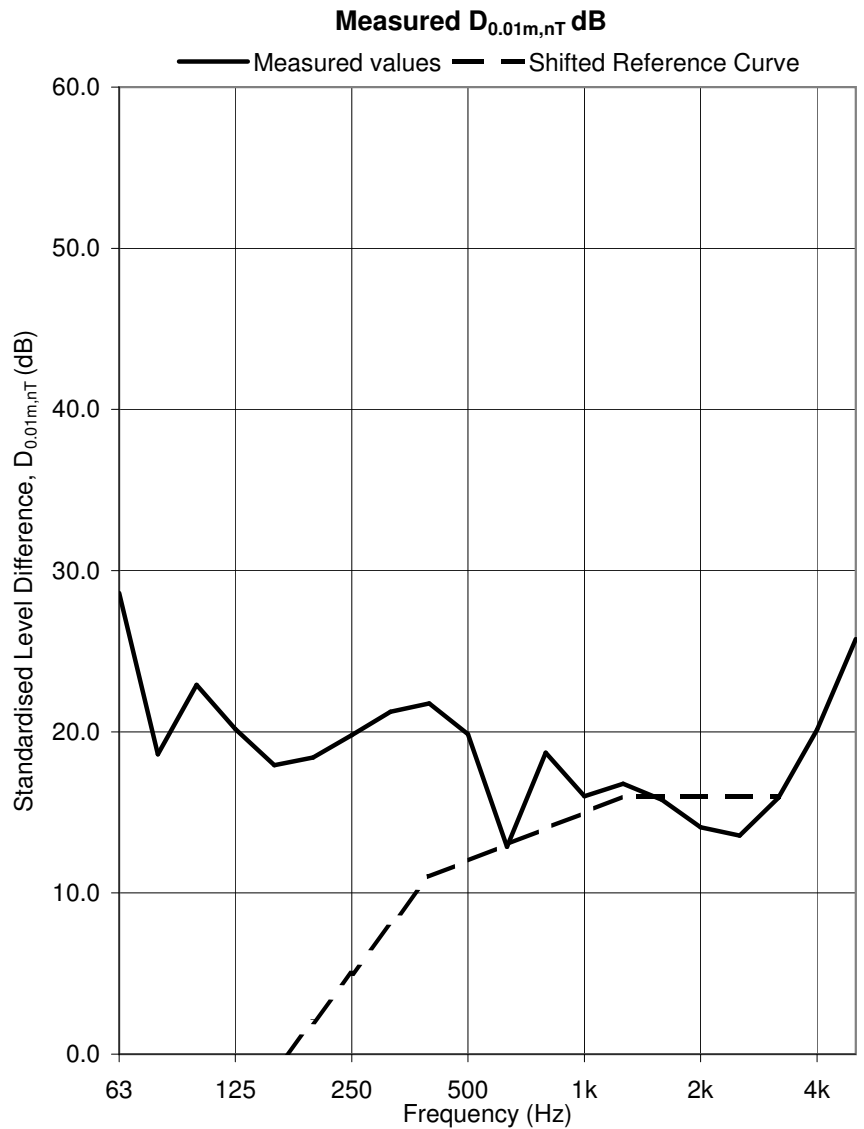
Canopy: n/a

Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	22.9
63	28.6
80	18.6
100	22.9
125	20.2
160	17.9
200	18.4
250	19.8
315	21.2
400	21.8
500	19.9
630	12.9
800	18.7
1k	16.0
1.25k	16.8
1.6k	15.8
2k	14.1
2.5k	13.6
3.15k	15.9
4k	20.1
5k	25.7



D_{0.01m,nT,w(C;C_{tr}) 16 (0; 0) dB}

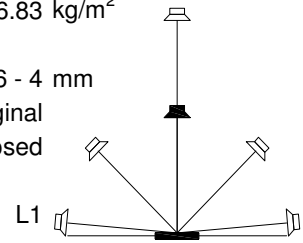
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

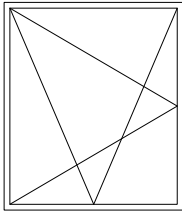
Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

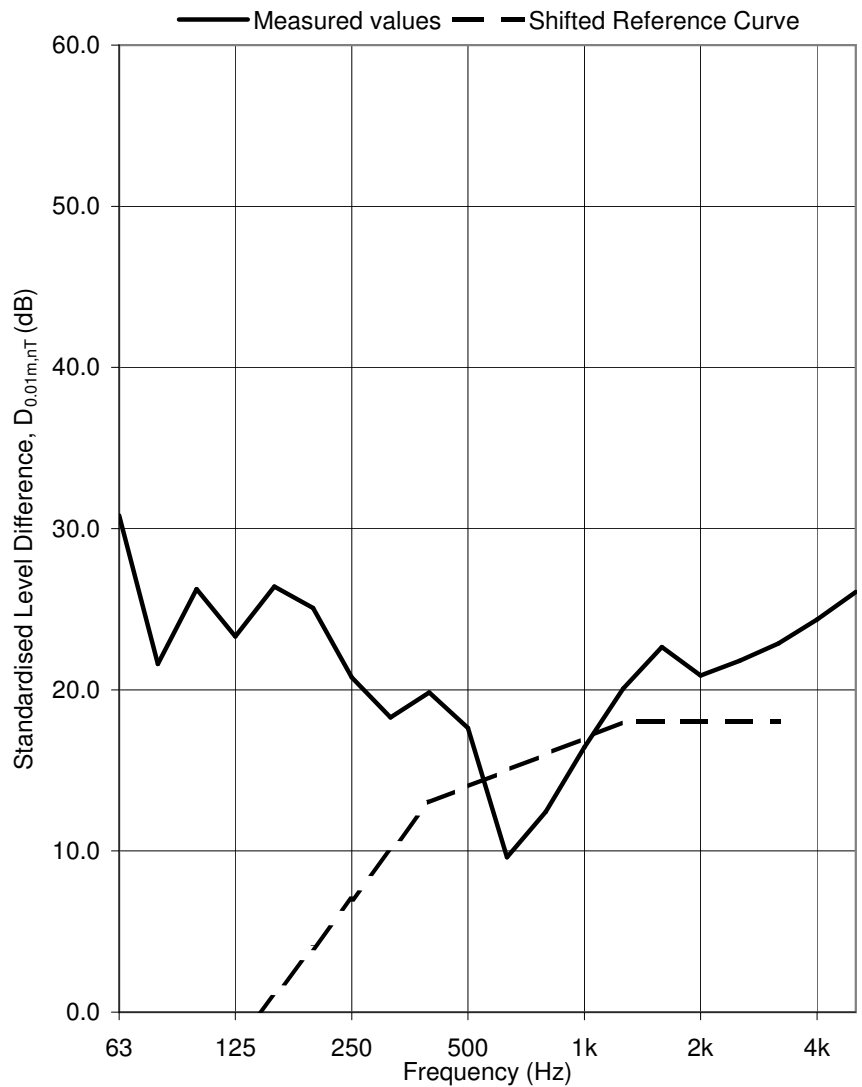


Test ID: 711007

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.1
63	30.8
80	21.6
100	26.3
125	23.3
160	26.4
200	25.1
250	20.8
315	18.3
400	19.8
500	17.6
630	9.6
800	12.4
1k	16.4
1.25k	20.1
1.6k	22.7
2k	20.9
2.5k	21.8
3.15k	22.9
4k	24.4
5k	26.1

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (-1; -2) dB

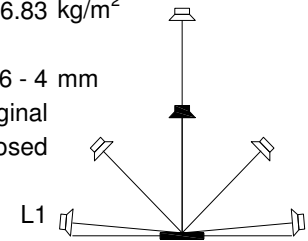
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

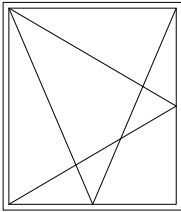
Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

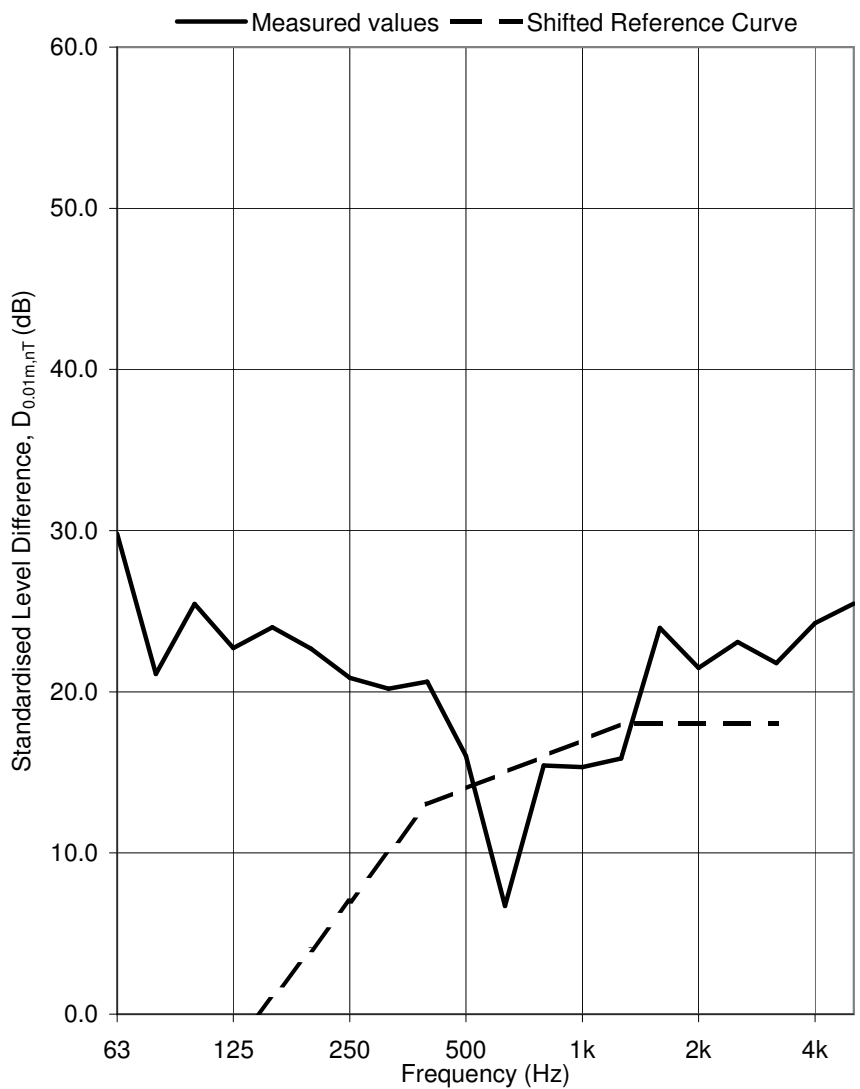


Test ID: 711011

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.1
63	29.8
80	21.1
100	25.5
125	22.7
160	24.0
200	22.7
250	20.9
315	20.2
400	20.6
500	16.0
630	6.7
800	15.4
1k	15.3
1.25k	15.9
1.6k	24.0
2k	21.5
2.5k	23.1
3.15k	21.8
4k	24.3
5k	25.5

$D_{0.01m,nT,w(C;C_{tr})}$ 18 (-2; -3) dB

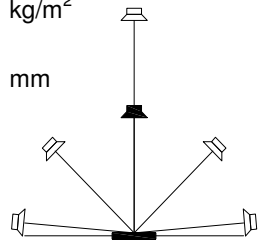
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

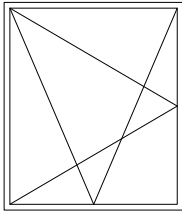
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

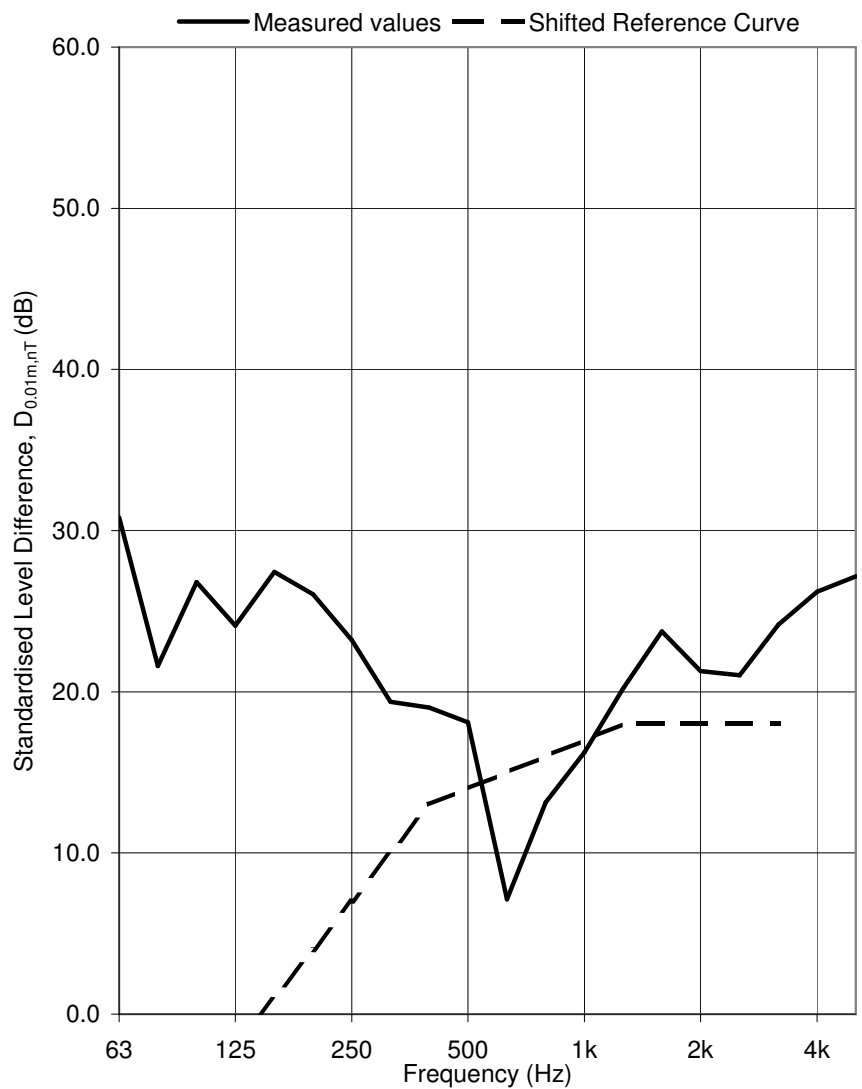


Test ID: 712033

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.8
63	30.8
80	21.6
100	26.8
125	24.1
160	27.4
200	26.1
250	23.2
315	19.4
400	19.0
500	18.1
630	7.1
800	13.1
1k	16.2
1.25k	20.2
1.6k	23.8
2k	21.3
2.5k	21.0
3.15k	24.2
4k	26.2
5k	27.2

$D_{0.01m,nT,w(C;C_{tr})}$ 18 (-2; -3) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

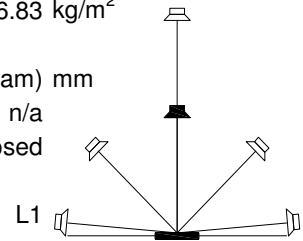
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

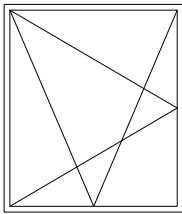
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

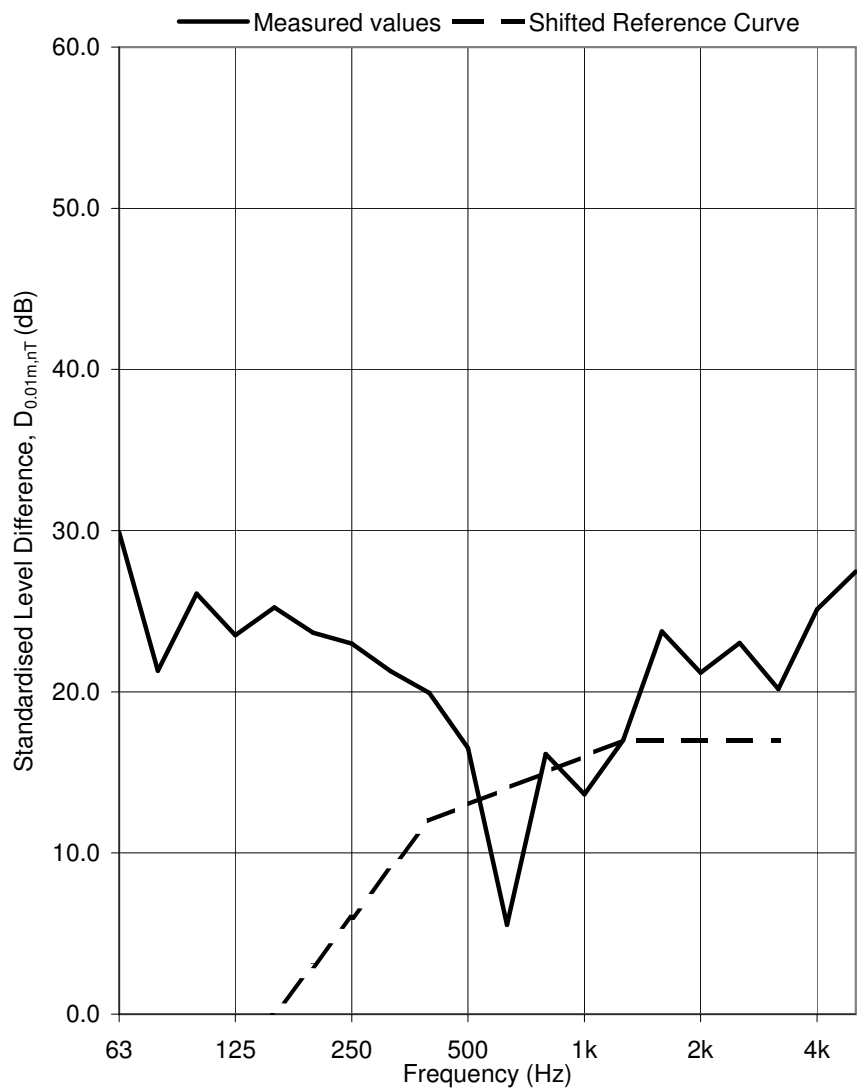
Loudspeaker Configuration:



Test ID: 712037



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.0
63	29.9
80	21.3
100	26.1
125	23.5
160	25.2
200	23.7
250	23.0
315	21.3
400	19.9
500	16.5
630	5.5
800	16.1
1k	13.6
1.25k	17.0
1.6k	23.8
2k	21.2
2.5k	23.0
3.15k	20.2
4k	25.1
5k	27.5

$D_{0.01m,nT,w(C;C_{tr})}$ 17 (-2; -3) dB

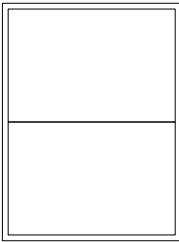
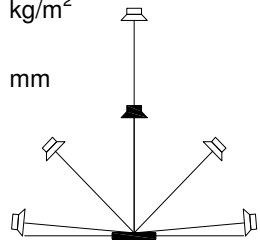
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

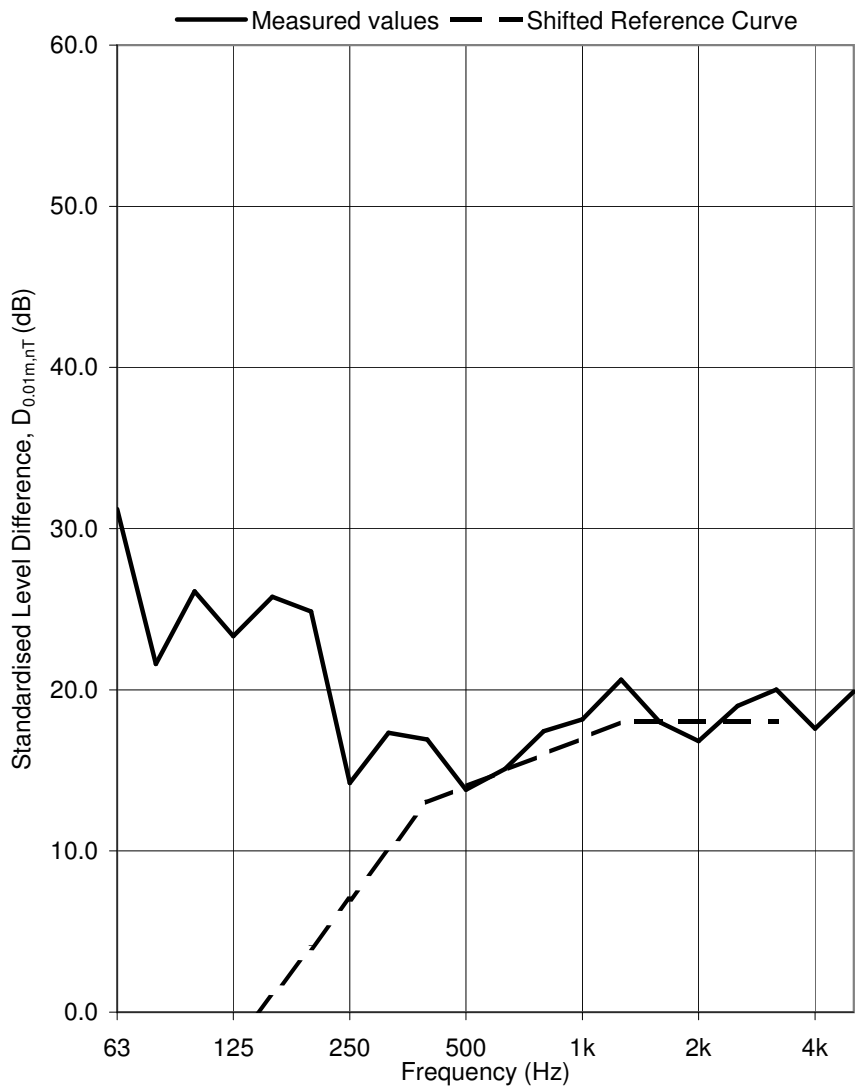
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713012

Test Sample: Window D-1 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.1
63	31.2
80	21.6
100	26.1
125	23.3
160	25.8
200	24.9
250	14.2
315	17.3
400	16.9
500	13.8
630	15.1
800	17.4
1k	18.2
1.25k	20.6
1.6k	18.0
2k	16.8
2.5k	19.0
3.15k	20.0
4k	17.6
5k	19.9

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

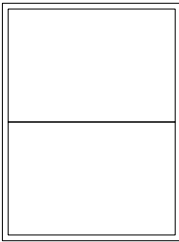
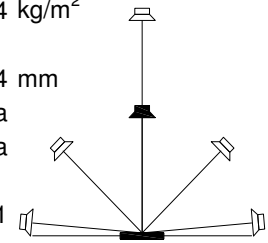
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

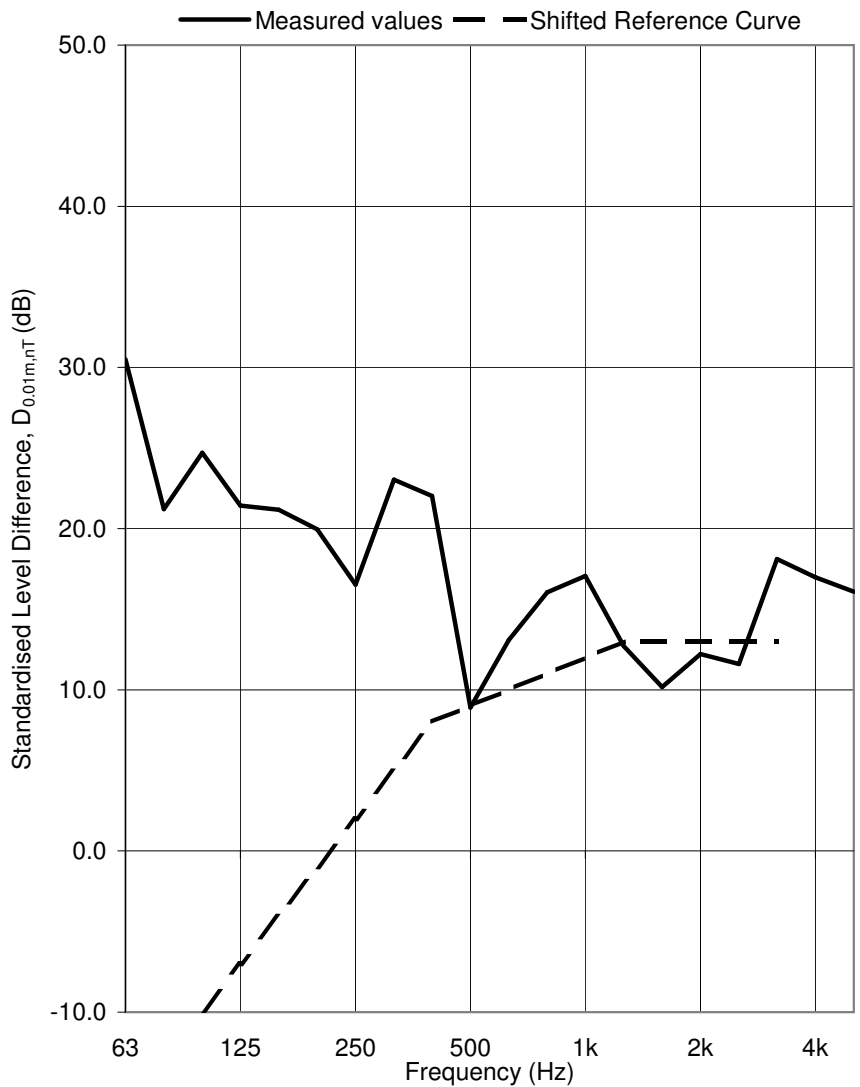
Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713004

Loudspeaker Configuration: L1



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	25.0
63	30.5
80	21.2
100	24.7
125	21.4
160	21.2
200	20.0
250	16.5
315	23.0
400	22.0
500	8.9
630	13.1
800	16.0
1k	17.1
1.25k	12.7
1.6k	10.2
2k	12.2
2.5k	11.6
3.15k	18.1
4k	17.0
5k	16.1

D_{0.01m,nT,w(C;C_{tr}) 13 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

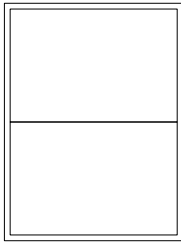
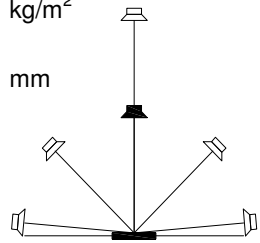
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

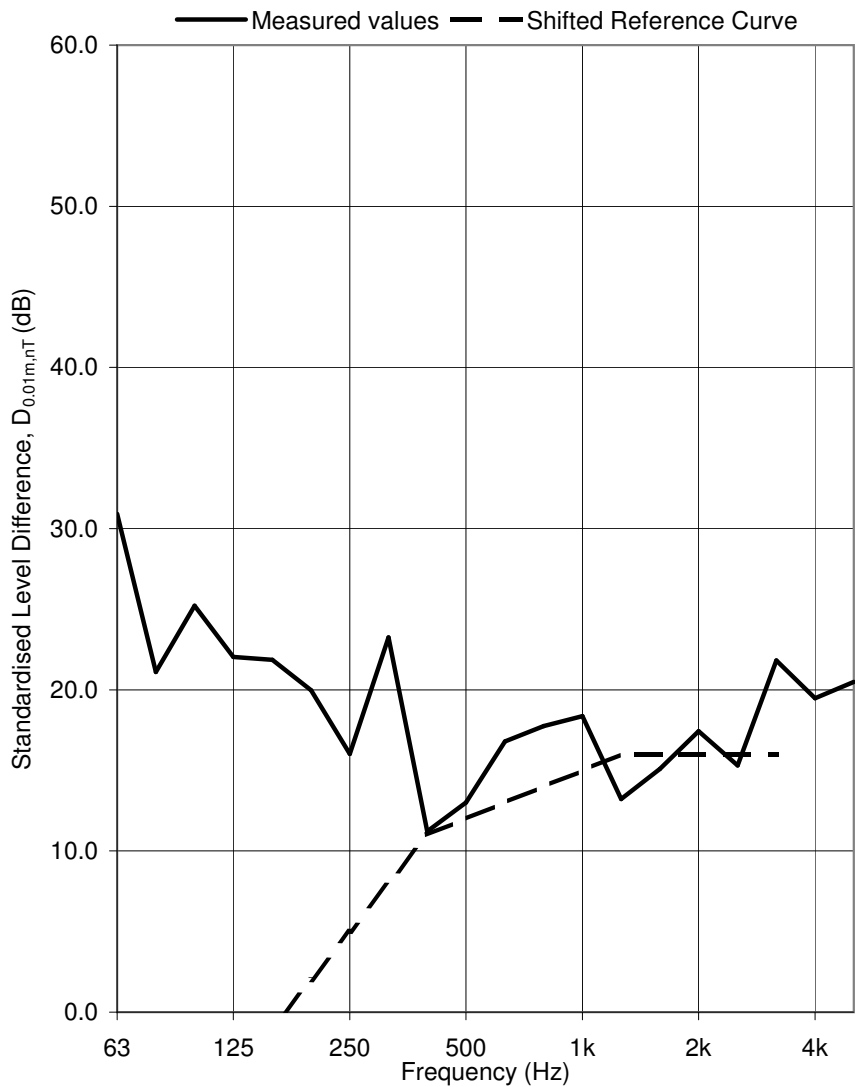
Test Sample: Window D-3 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713008

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.4
63	30.9
80	21.1
100	25.2
125	22.0
160	21.9
200	20.0
250	16.0
315	23.2
400	11.2
500	13.0
630	16.8
800	17.7
1k	18.4
1.25k	13.2
1.6k	15.1
2k	17.4
2.5k	15.3
3.15k	21.8
4k	19.5
5k	20.5

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

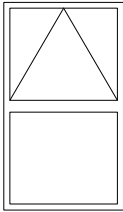
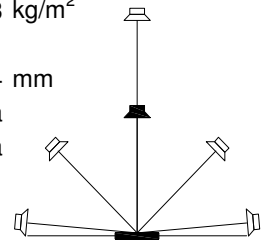
Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²

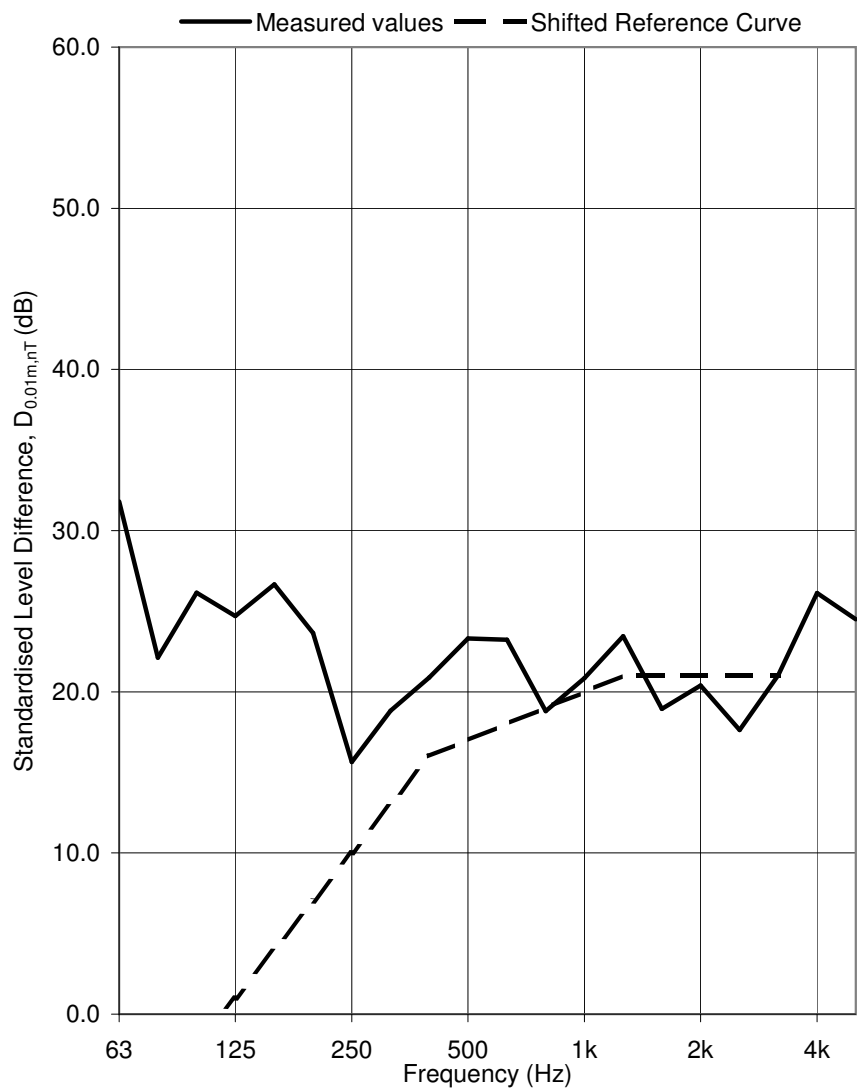
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 718005

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.7
63	31.8
80	22.1
100	26.1
125	24.7
160	26.7
200	23.6
250	15.6
315	18.8
400	20.9
500	23.3
630	23.2
800	18.8
1k	20.8
1.25k	23.5
1.6k	18.9
2k	20.4
2.5k	17.6
3.15k	21.0
4k	26.1
5k	24.5

$D_{0.01m,nT,w}(C;C_{tr})$ 21 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

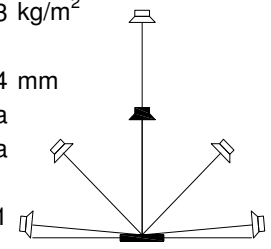
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

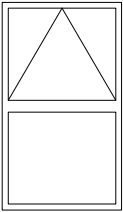
Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

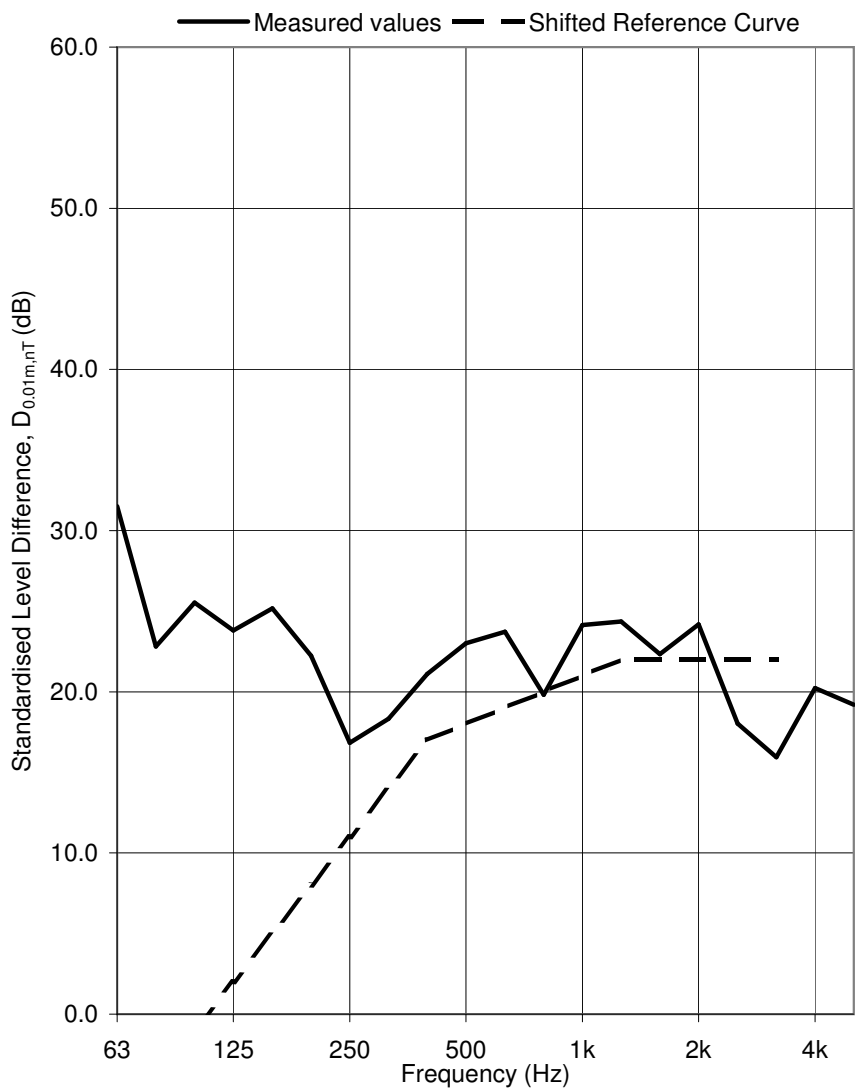
Loudspeaker Configuration: L1



Test ID: 719019



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	25.1
63	31.5
80	22.8
100	25.5
125	23.8
160	25.2
200	22.2
250	16.8
315	18.3
400	21.1
500	23.0
630	23.7
800	19.8
1k	24.1
1.25k	24.4
1.6k	22.3
2k	24.2
2.5k	18.0
3.15k	15.9
4k	20.2
5k	19.2

D_{0.01m,nT,w(C;C_{tr}) 22 (-2; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

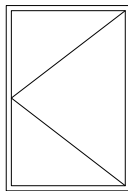
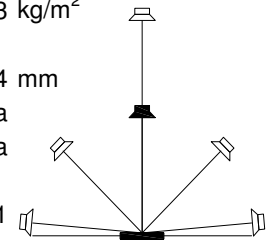
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720018

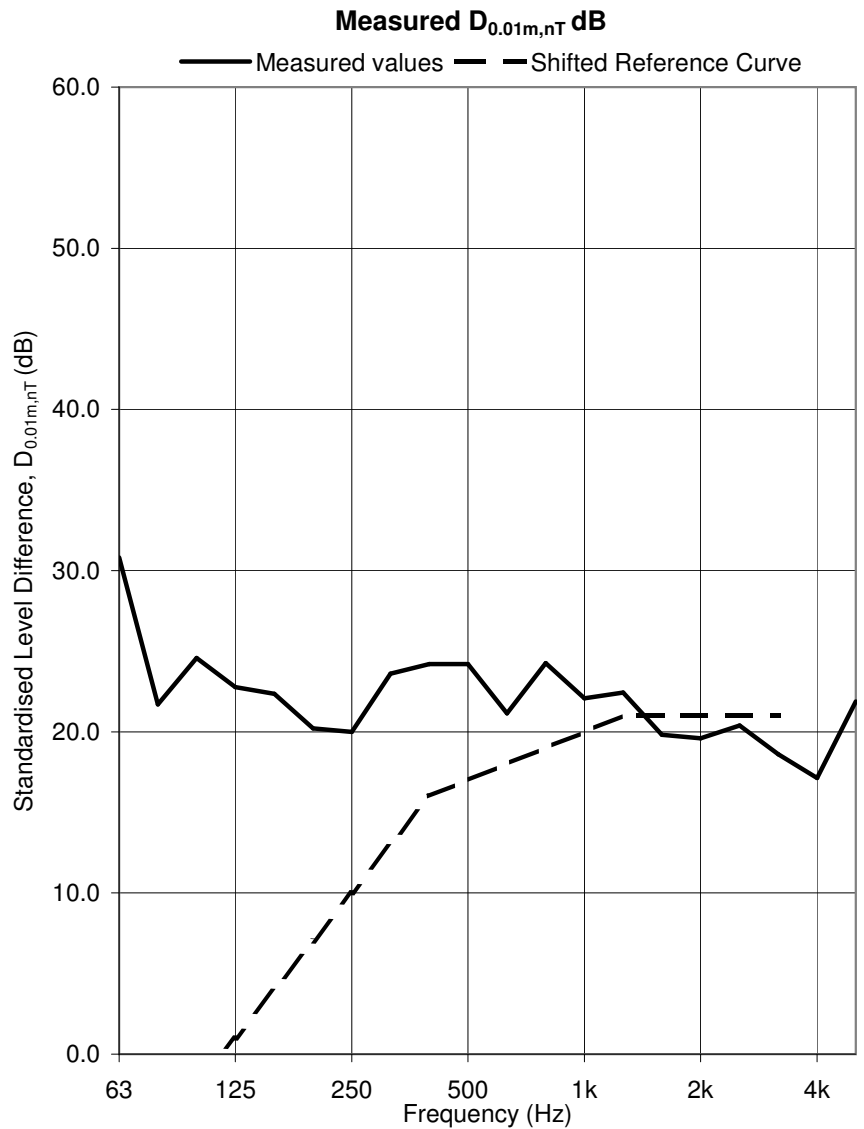
Test Sample: Window G Open 0.10 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	24.7
63	30.8
80	21.7
100	24.6
125	22.8
160	22.4
200	20.2
250	20.0
315	23.6
400	24.2
500	24.2
630	21.1
800	24.3
1k	22.1
1.25k	22.4
1.6k	19.8
2k	19.6
2.5k	20.4
3.15k	18.6
4k	17.1
5k	21.9



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

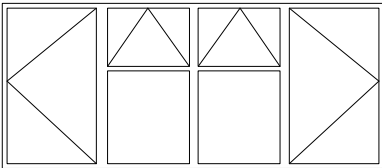
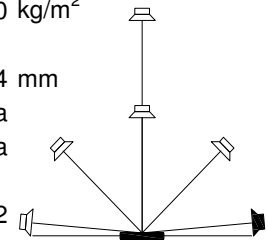
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0102 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

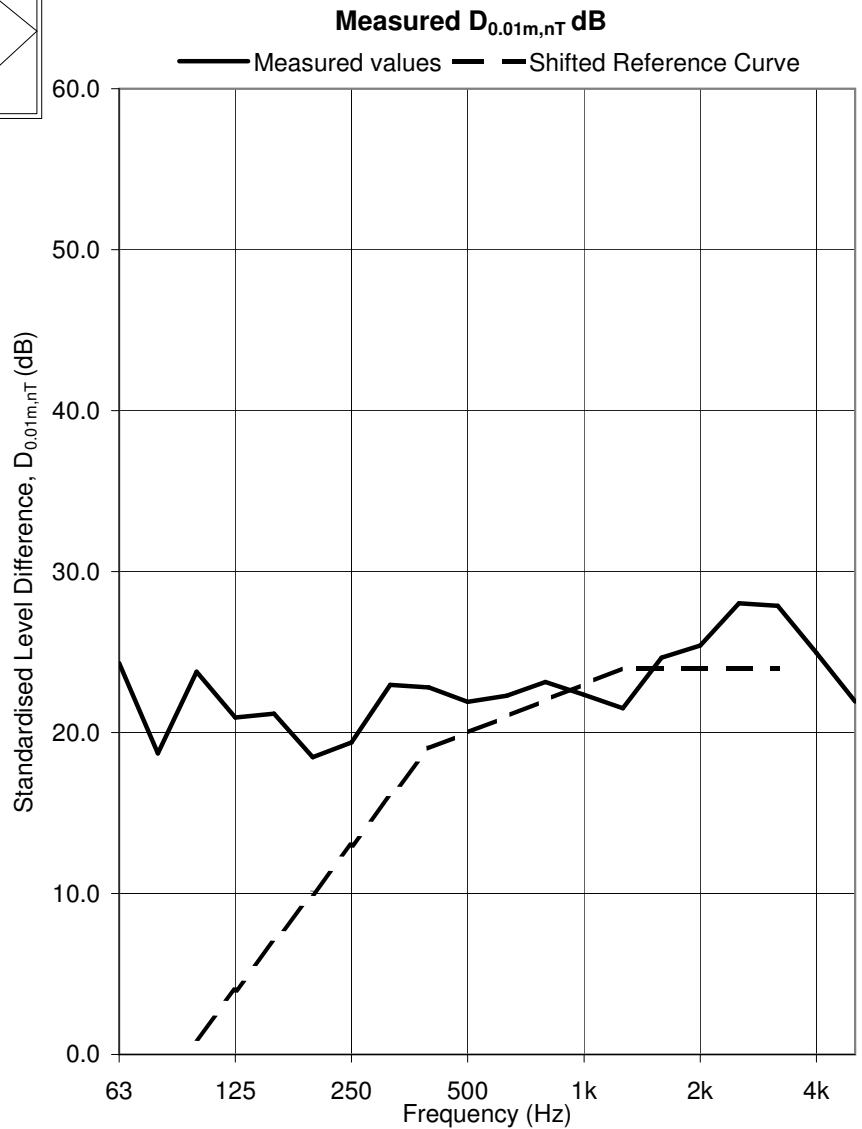
Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628047

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	14.5
63	24.3
80	18.7
100	23.8
125	20.9
160	21.2
200	18.5
250	19.4
315	23.0
400	22.8
500	21.9
630	22.3
800	23.1
1k	22.3
1.25k	21.5
1.6k	24.7
2k	25.4
2.5k	28.0
3.15k	27.9
4k	24.9
5k	21.9



D_{0.01m,nT,w(C;C_{tr}) 24 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

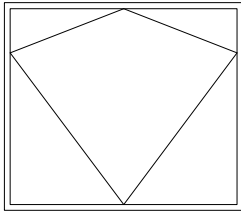
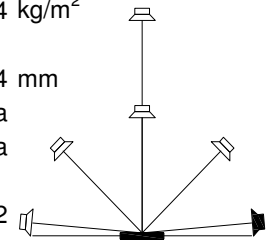
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

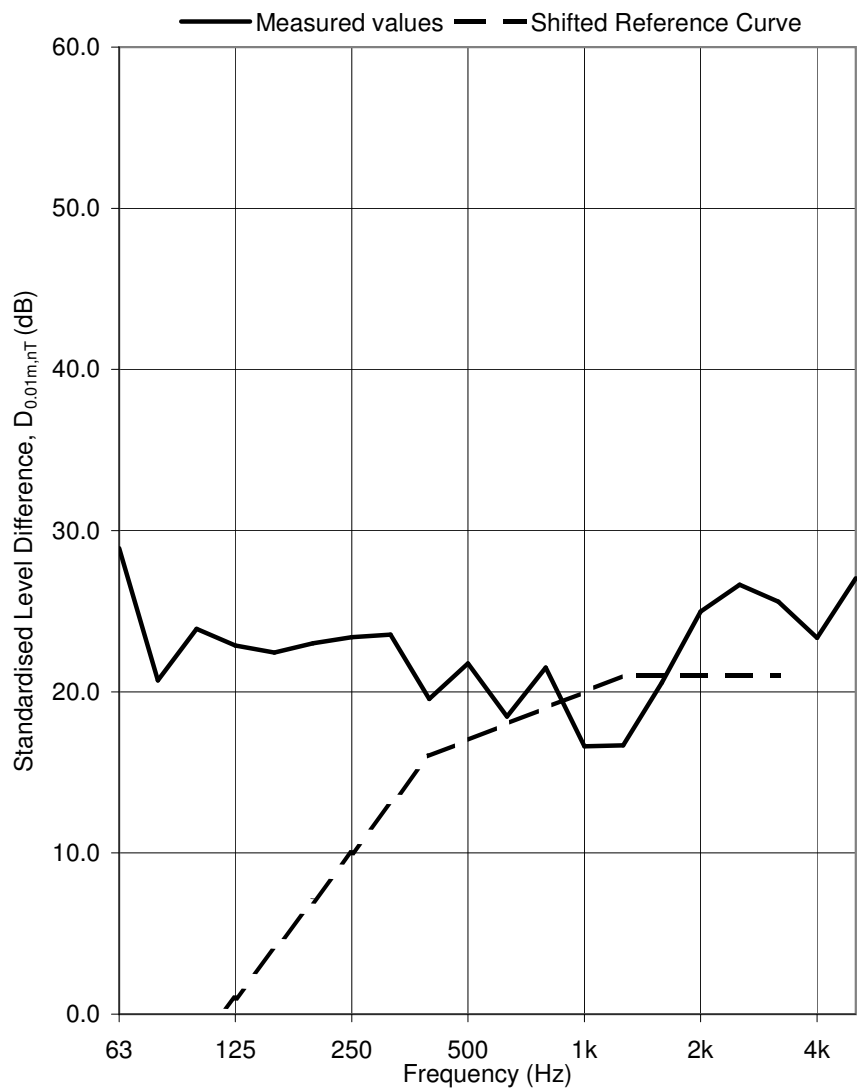
Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705009

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	17.6
63	28.9
80	20.7
100	23.9
125	22.9
160	22.4
200	23.0
250	23.4
315	23.5
400	19.6
500	21.8
630	18.5
800	21.5
1k	16.6
1.25k	16.7
1.6k	20.6
2k	25.0
2.5k	26.7
3.15k	25.6
4k	23.3
5k	27.0

$D_{0.01m,nT,w}(C;C_{tr})$ 21 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

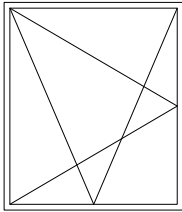
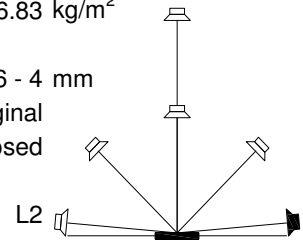
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

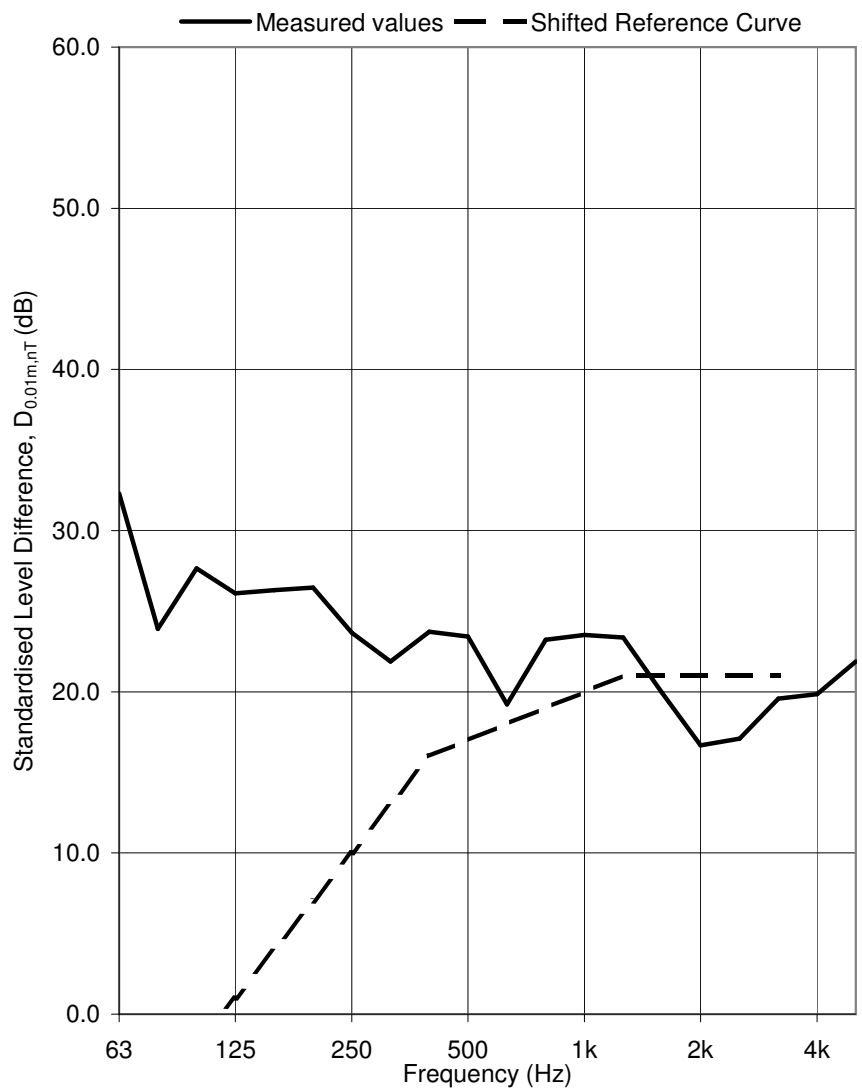
Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711033

Loudspeaker Configuration:



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	20.5
63	32.3
80	23.9
100	27.7
125	26.1
160	26.3
200	26.5
250	23.7
315	21.9
400	23.7
500	23.4
630	19.2
800	23.2
1k	23.5
1.25k	23.4
1.6k	20.0
2k	16.7
2.5k	17.1
3.15k	19.6
4k	19.9
5k	21.9

D_{0.01m,nT,w(C;C_{tr}) 21 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

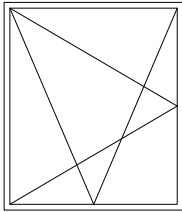
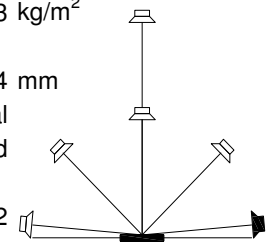
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711037

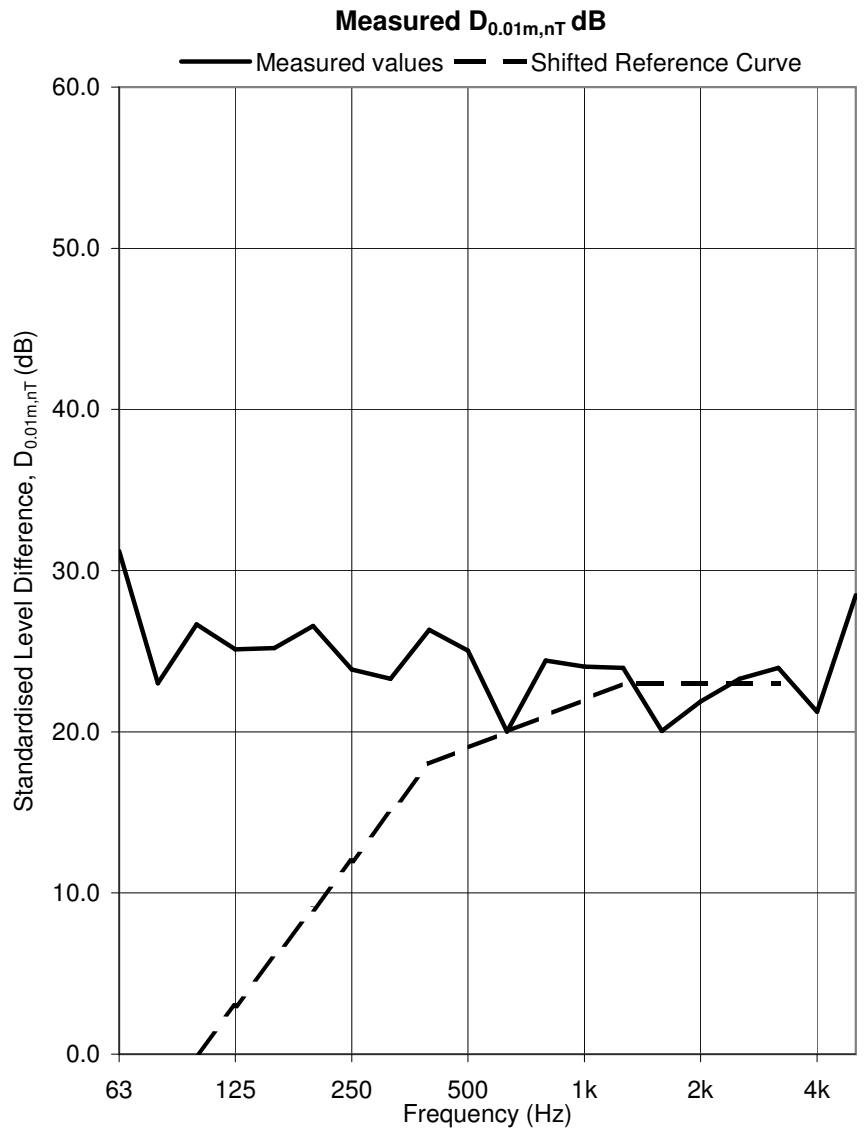
Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	19.5
63	31.2
80	23.0
100	26.7
125	25.1
160	25.2
200	26.6
250	23.9
315	23.3
400	26.3
500	25.0
630	20.0
800	24.4
1k	24.0
1.25k	24.0
1.6k	20.1
2k	21.9
2.5k	23.3
3.15k	24.0
4k	21.3
5k	28.5



D_{0.01m,nT,w(C;C_{tr}) 23 (0; 0) dB}

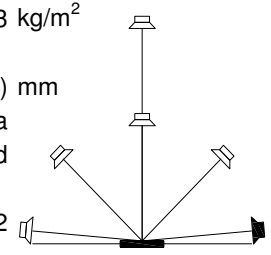
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

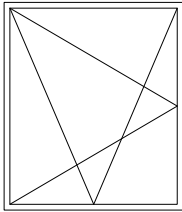
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

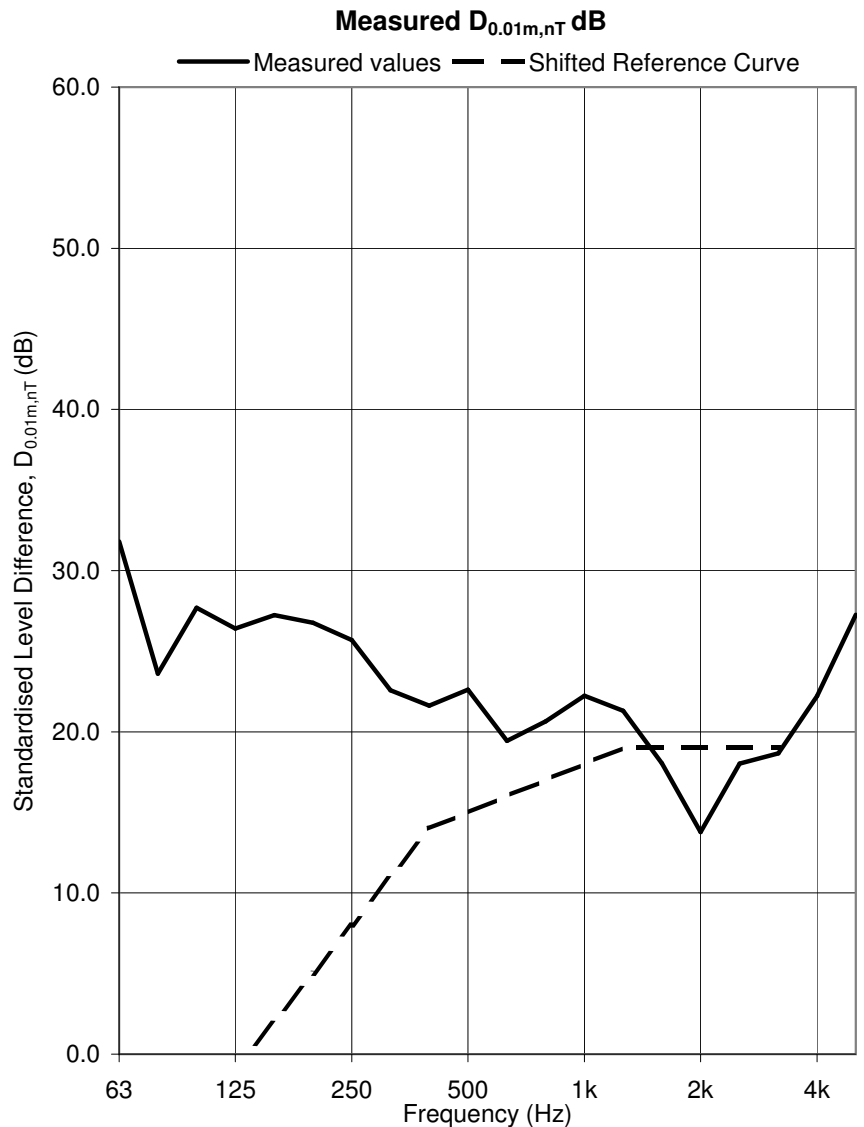


Test ID: 712046

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	19.6
63	31.8
80	23.6
100	27.7
125	26.4
160	27.2
200	26.8
250	25.7
315	22.6
400	21.6
500	22.6
630	19.4
800	20.6
1k	22.2
1.25k	21.3
1.6k	18.1
2k	13.8
2.5k	18.0
3.15k	18.7
4k	22.2
5k	27.3



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; 1) dB}

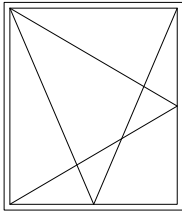
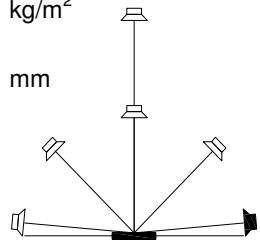
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

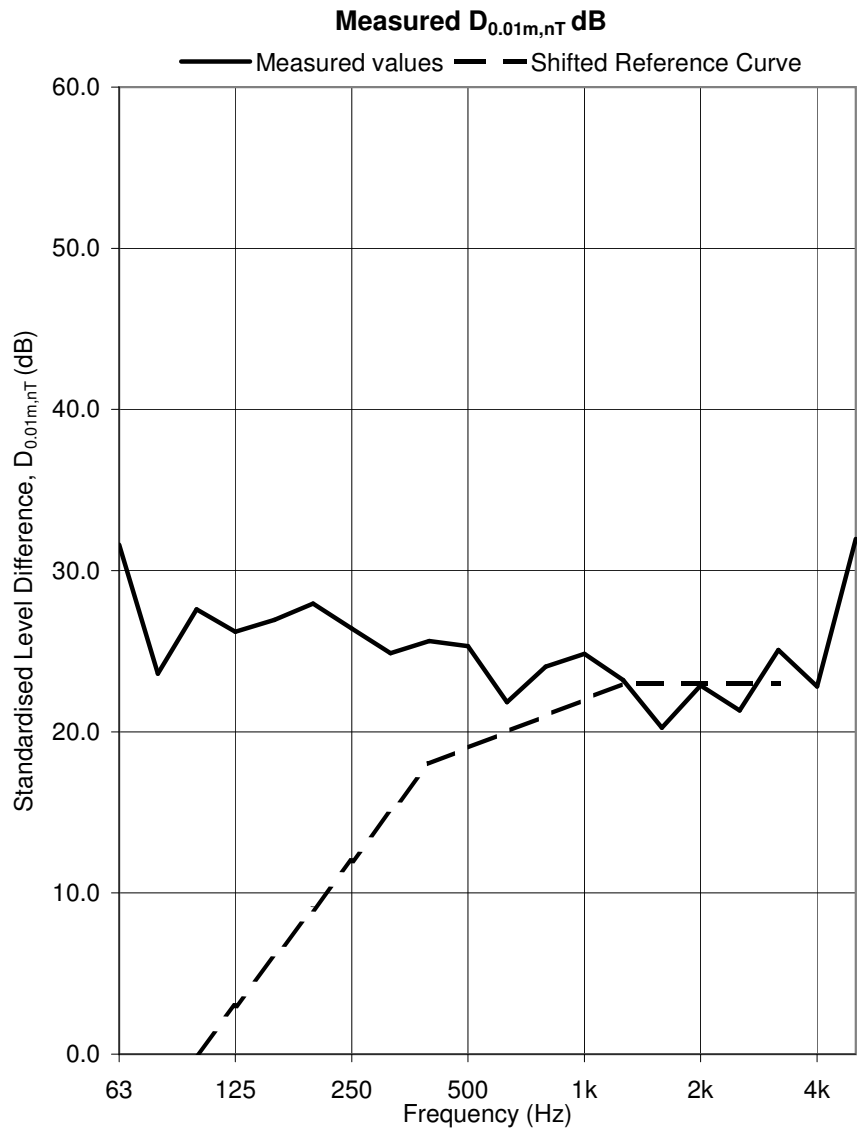
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712050

Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	19.7
63	31.6
80	23.6
100	27.6
125	26.2
160	26.9
200	28.0
250	26.4
315	24.9
400	25.6
500	25.3
630	21.8
800	24.0
1k	24.8
1.25k	23.2
1.6k	20.3
2k	22.9
2.5k	21.3
3.15k	25.1
4k	22.8
5k	32.0



D_{0.01m,nT,w(C;C_{tr}) 23 (0; 0) dB}

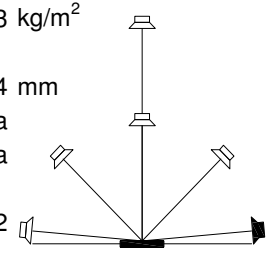
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

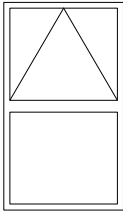
Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

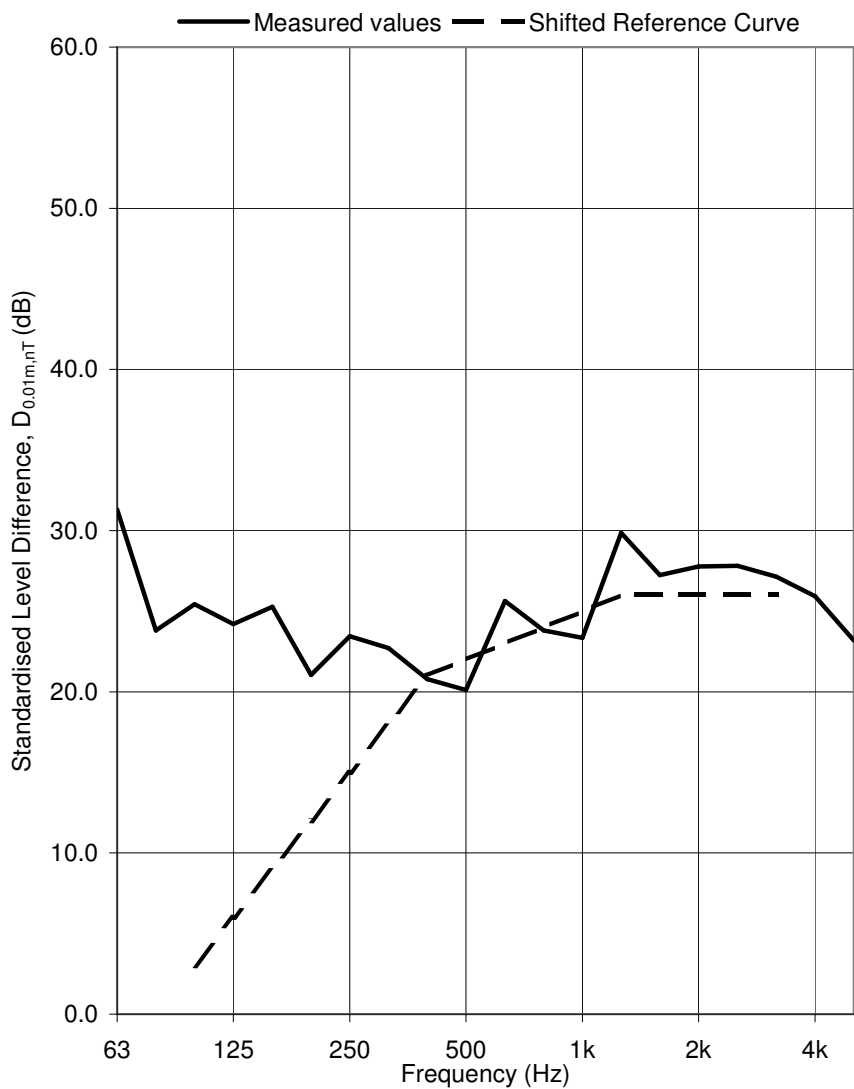


Test ID: 718019

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	20.6
63	31.3
80	23.8
100	25.4
125	24.2
160	25.3
200	21.0
250	23.4
315	22.7
400	20.8
500	20.1
630	25.6
800	23.8
1k	23.3
1.25k	29.9
1.6k	27.2
2k	27.8
2.5k	27.8
3.15k	27.1
4k	25.9
5k	23.2

$D_{0.01m,nT,w}(C;C_{tr})$ 26 (-1; -2) dB

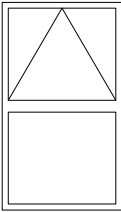
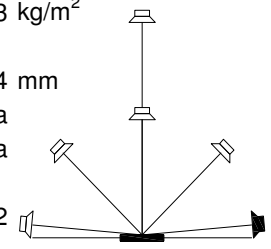
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

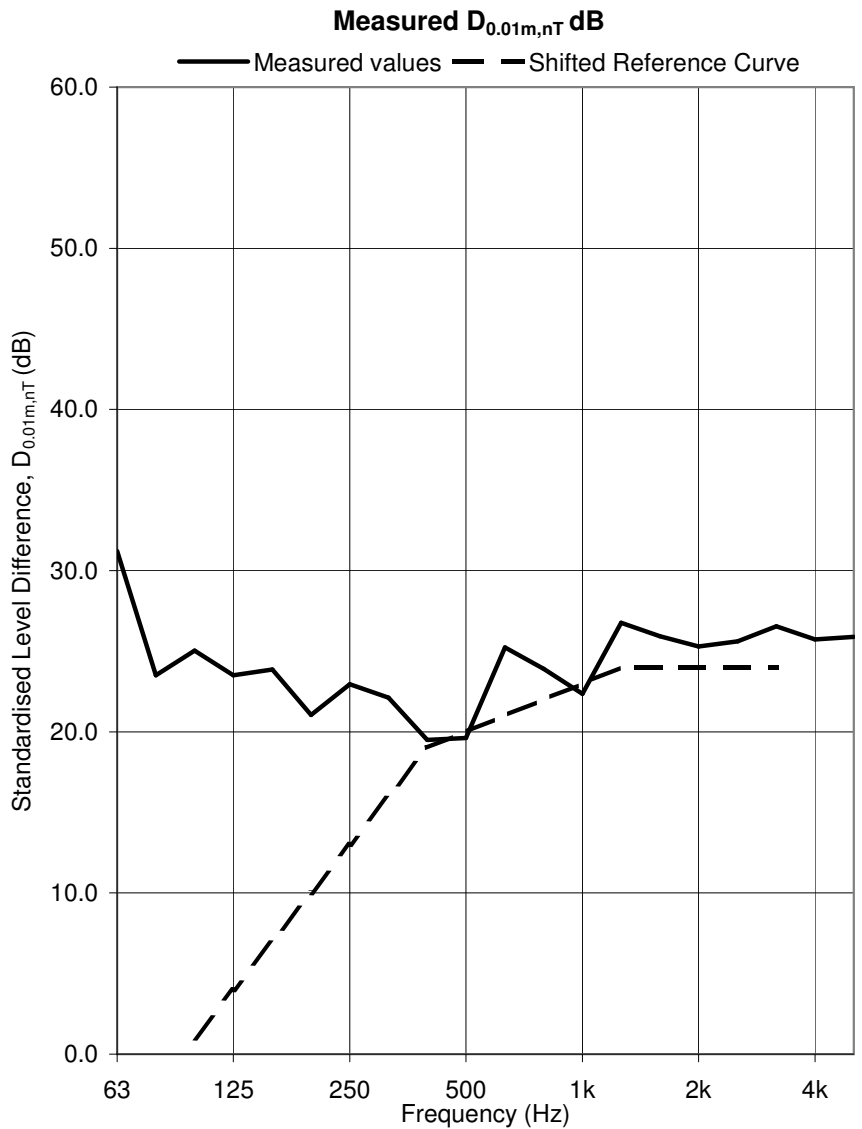
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719033

Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	20.1
63	31.2
80	23.5
100	25.0
125	23.5
160	23.9
200	21.0
250	22.9
315	22.1
400	19.5
500	19.6
630	25.2
800	23.9
1k	22.3
1.25k	26.8
1.6k	25.9
2k	25.3
2.5k	25.6
3.15k	26.5
4k	25.7
5k	25.9



D_{0.01m,nT,w(C;C_{tr}) 24 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

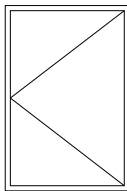
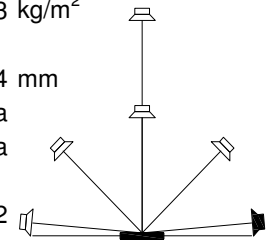
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

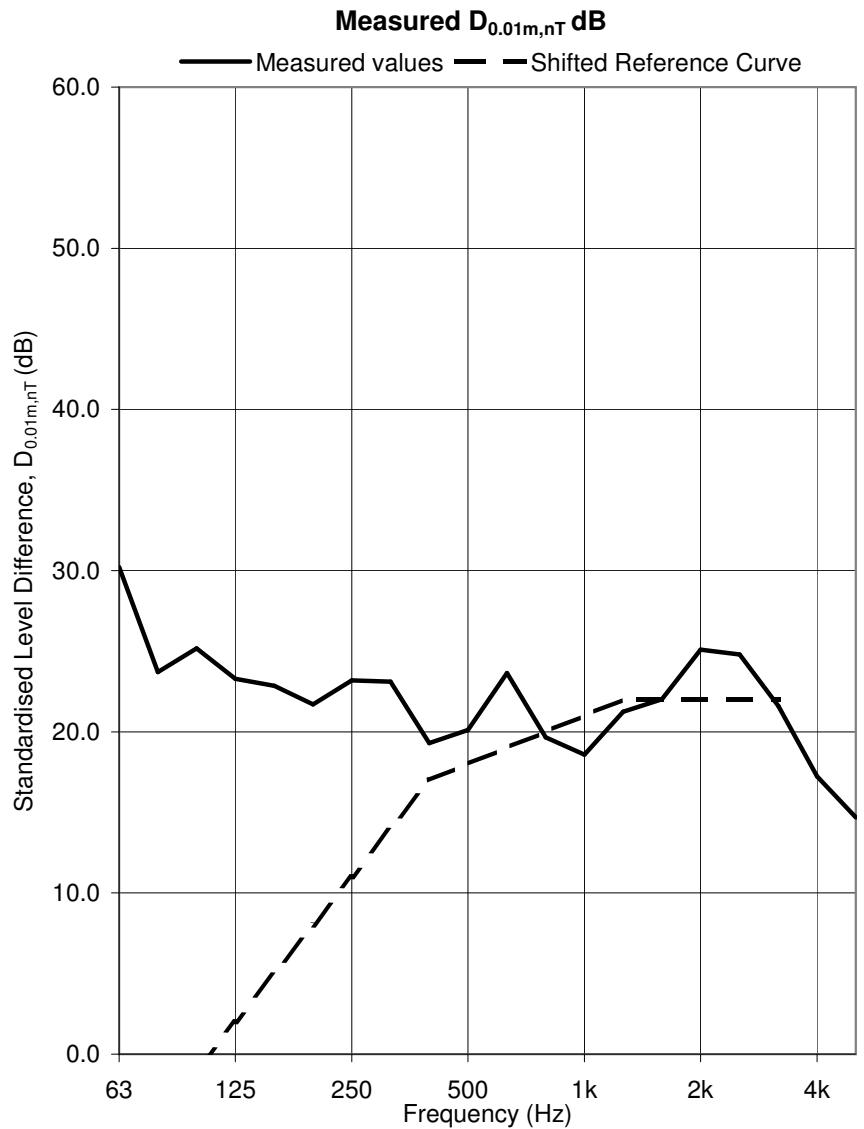
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720046

Test Sample: Window G Open 0.10 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	20.6
63	30.2
80	23.7
100	25.2
125	23.3
160	22.9
200	21.7
250	23.2
315	23.1
400	19.3
500	20.1
630	23.6
800	19.7
1k	18.6
1.25k	21.2
1.6k	22.0
2k	25.1
2.5k	24.8
3.15k	21.6
4k	17.2
5k	14.7



D_{0.01m,nT,w(C;C_{tr}) 22 (0; -1) dB}

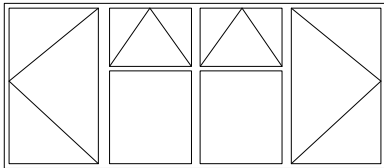
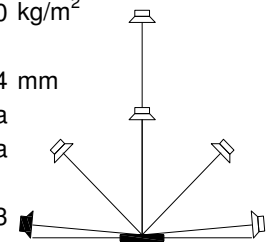
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

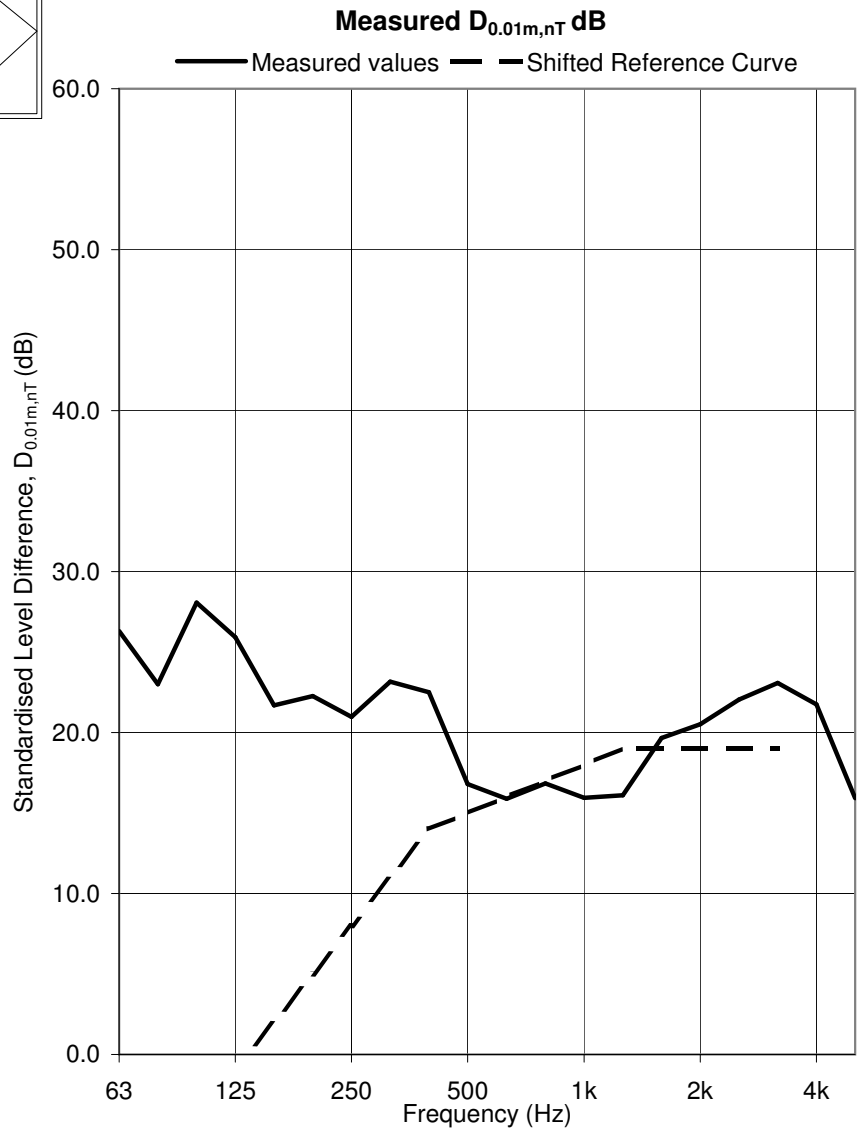
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628063

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	17.9
63	26.3
80	23.0
100	28.1
125	25.9
160	21.7
200	22.3
250	21.0
315	23.2
400	22.5
500	16.8
630	15.9
800	16.8
1k	15.9
1.25k	16.1
1.6k	19.7
2k	20.5
2.5k	22.0
3.15k	23.1
4k	21.7
5k	15.9



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

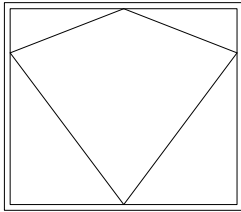
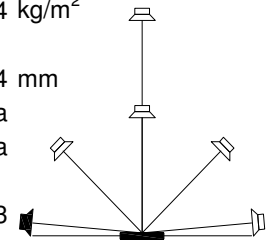
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9975 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

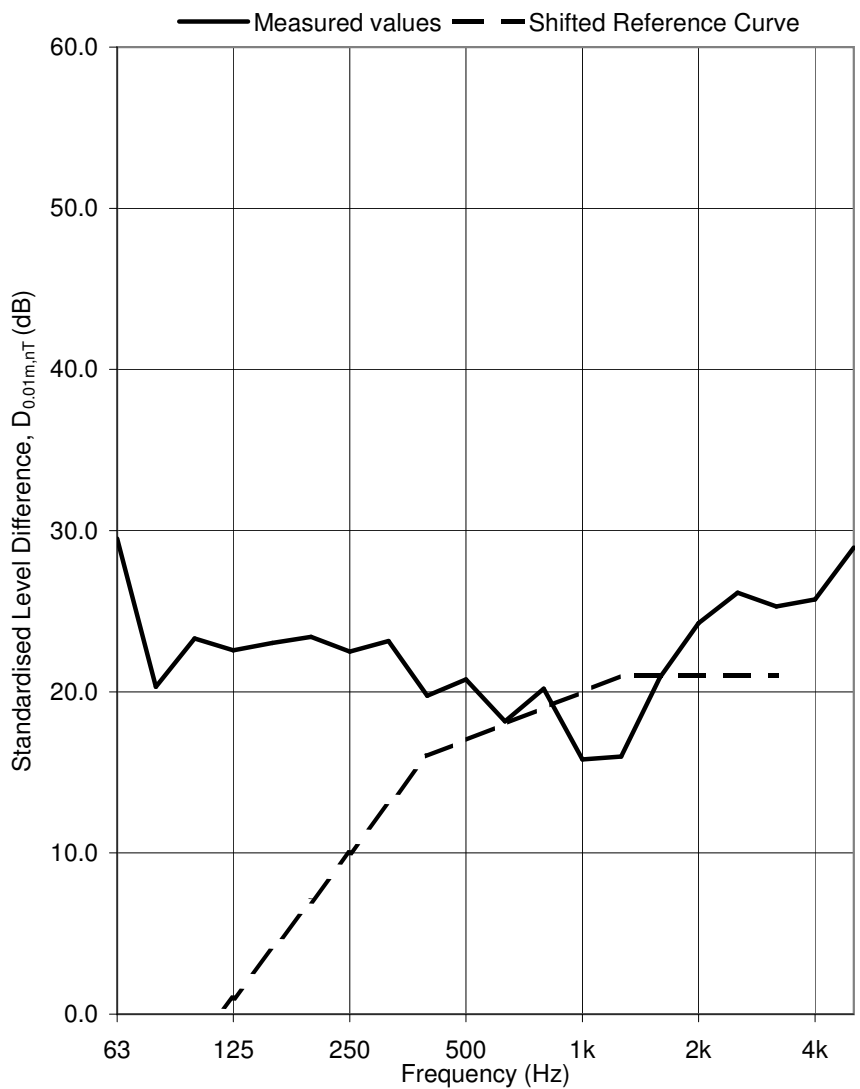
Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705014

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	18.0
63	29.5
80	20.3
100	23.3
125	22.6
160	23.0
200	23.4
250	22.5
315	23.1
400	19.8
500	20.8
630	18.2
800	20.2
1k	15.8
1.25k	16.0
1.6k	20.9
2k	24.3
2.5k	26.2
3.15k	25.3
4k	25.7
5k	28.9

$D_{0.01m,nT,w}(C;C_{tr})$ 21 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

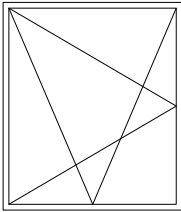
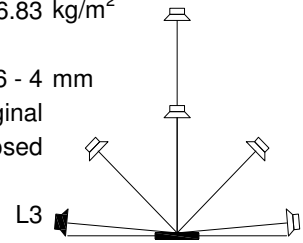
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

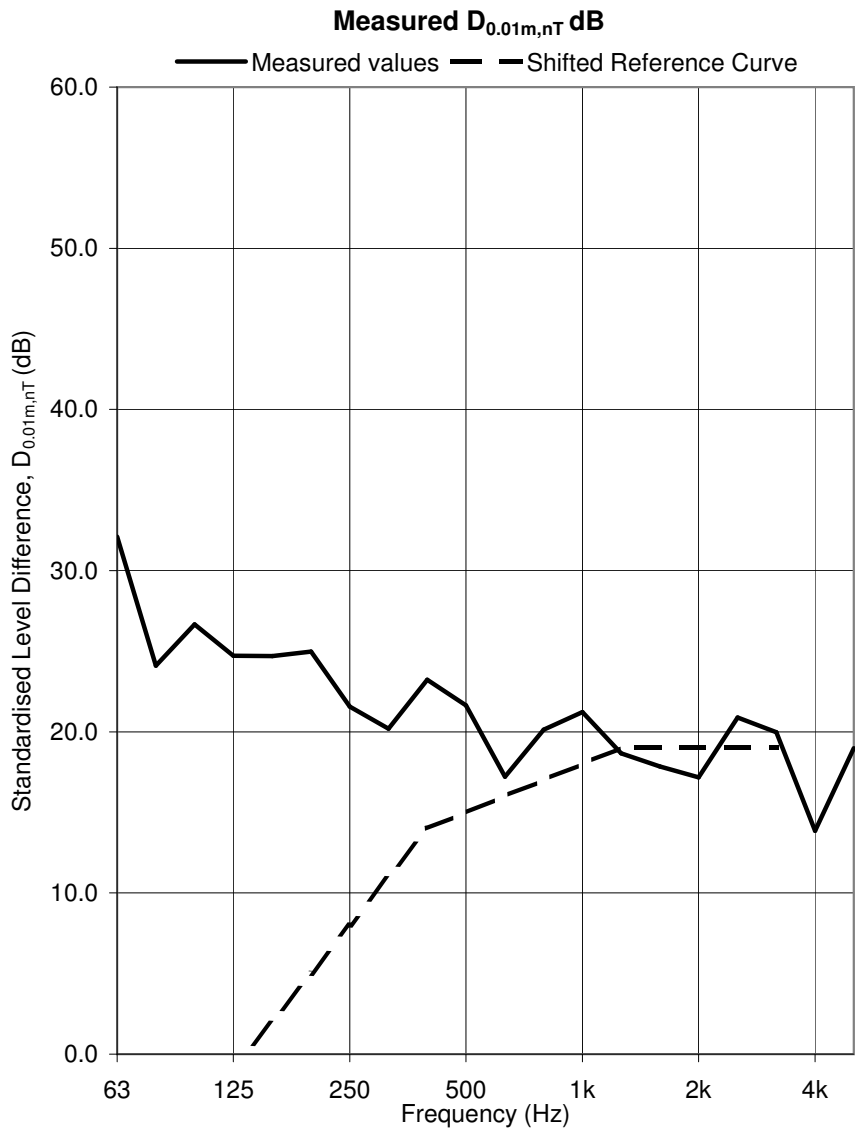
Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711043

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	21.0
63	32.1
80	24.1
100	26.7
125	24.7
160	24.7
200	25.0
250	21.6
315	20.2
400	23.2
500	21.6
630	17.2
800	20.1
1k	21.2
1.25k	18.7
1.6k	17.9
2k	17.2
2.5k	20.9
3.15k	20.0
4k	13.9
5k	19.0



D_{0.01m,nT,w(C;C_{tr}) 19 (0; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

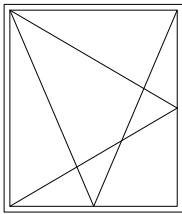
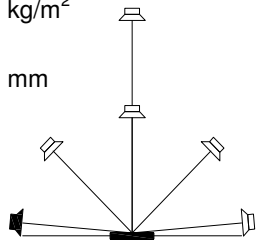
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

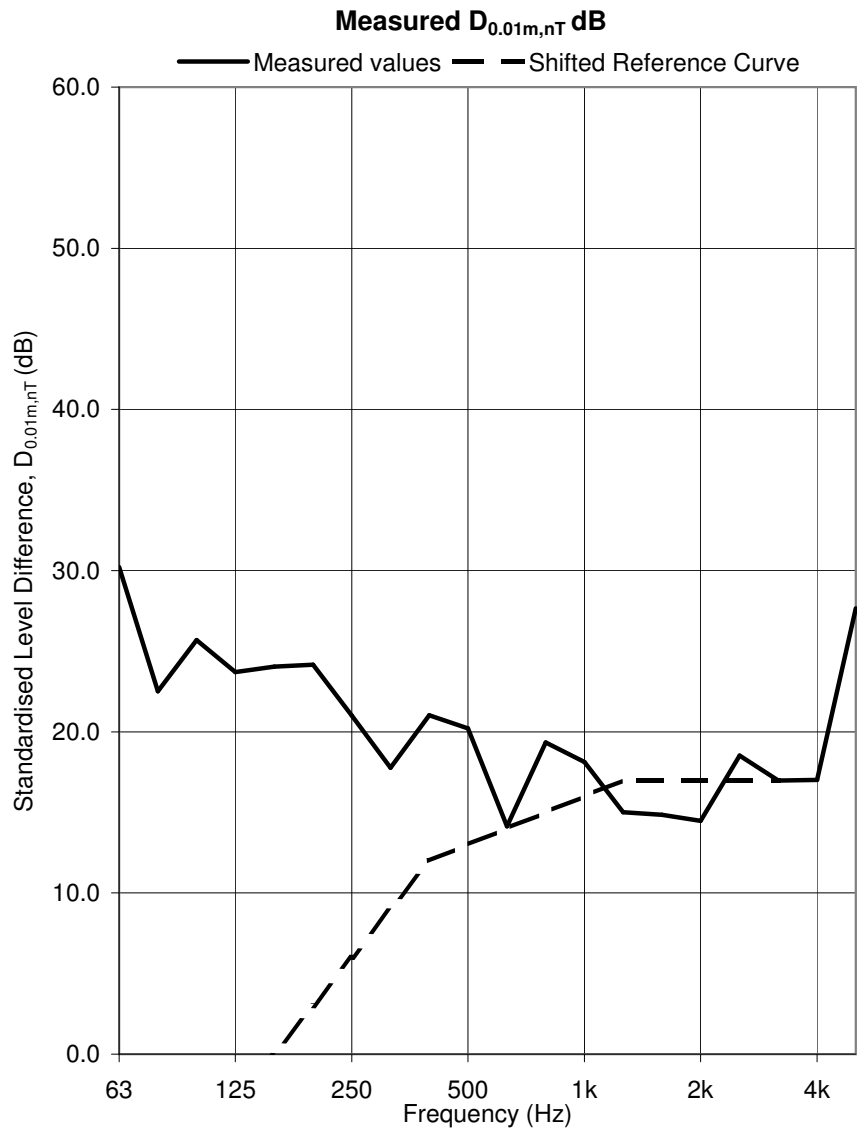
Date: 12/7/05
 Air temperature: 21.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0243 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	18.5
63	30.2
80	22.5
100	25.7
125	23.7
160	24.0
200	24.2
250	21.0
315	17.8
400	21.0
500	20.2
630	14.1
800	19.3
1k	18.1
1.25k	15.0
1.6k	14.9
2k	14.5
2.5k	18.5
3.15k	17.0
4k	17.0
5k	27.7



D_{0.01m,nT,w(C;C_{tr}) 17 (-1; 0) dB}

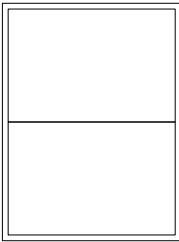
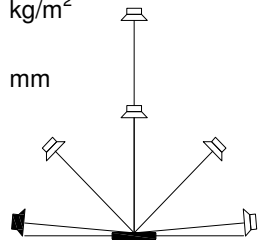
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

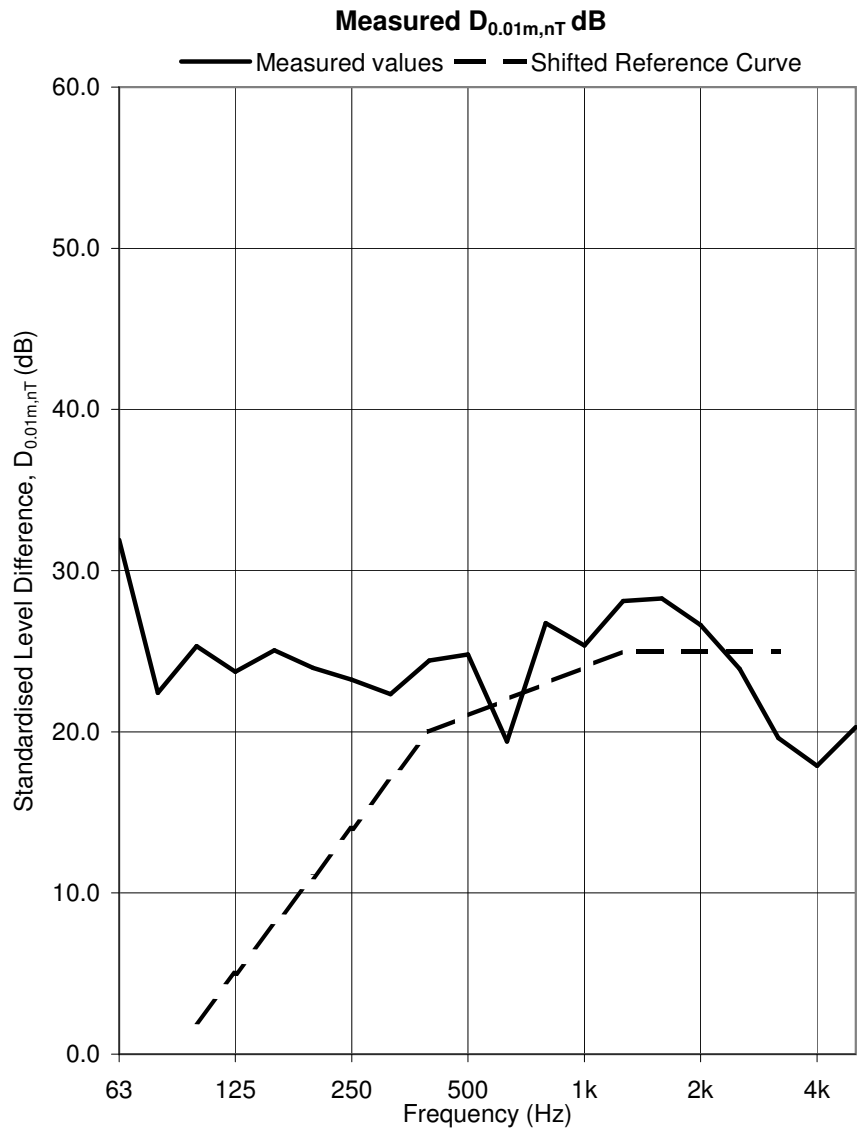
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713054

Test Sample: Window D-1 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	19.4
63	31.9
80	22.4
100	25.3
125	23.7
160	25.1
200	24.0
250	23.2
315	22.3
400	24.4
500	24.8
630	19.4
800	26.7
1k	25.4
1.25k	28.1
1.6k	28.3
2k	26.6
2.5k	23.9
3.15k	19.6
4k	17.9
5k	20.3



D_{0.01m,nT,w(C;C_{tr}) 25 (-1; -1) dB}

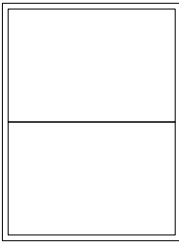
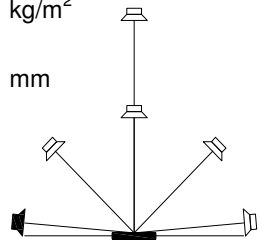
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

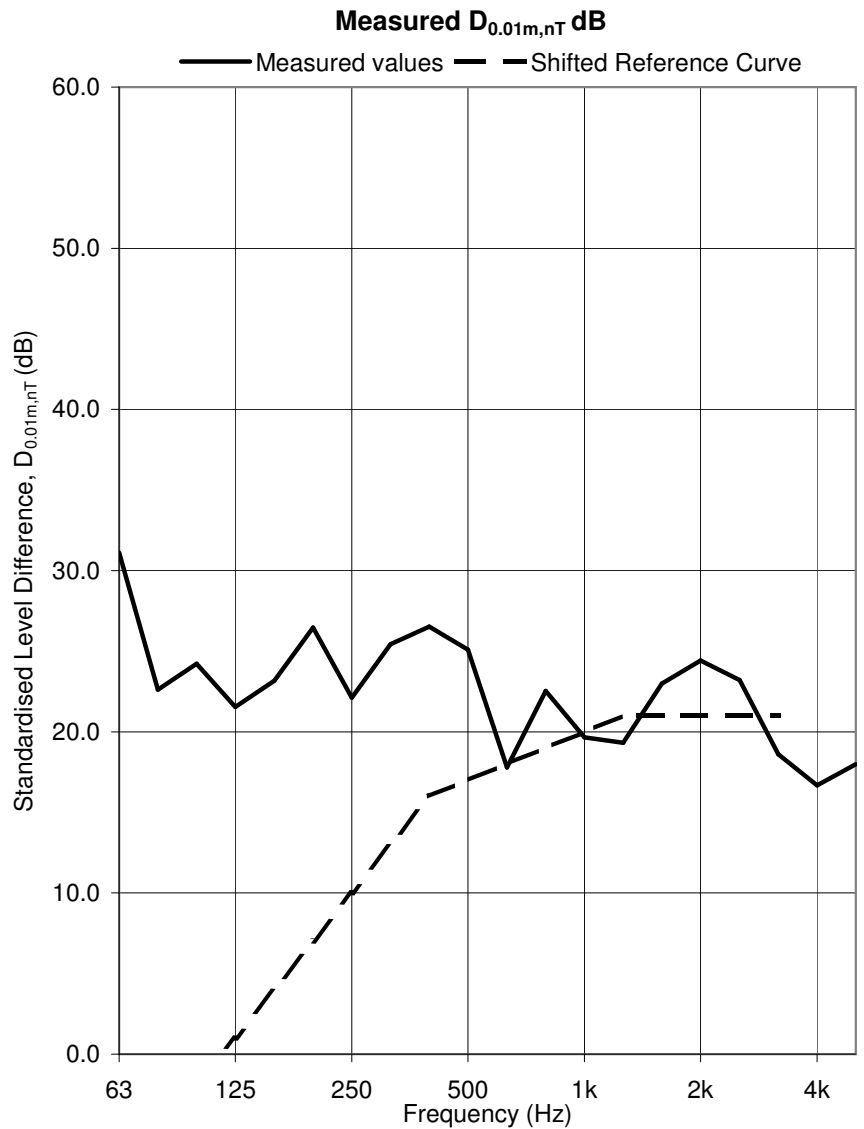
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713046

Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	19.8
63	31.1
80	22.6
100	24.2
125	21.5
160	23.2
200	26.5
250	22.1
315	25.4
400	26.5
500	25.1
630	17.8
800	22.5
1k	19.7
1.25k	19.3
1.6k	23.0
2k	24.4
2.5k	23.2
3.15k	18.6
4k	16.7
5k	18.0



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

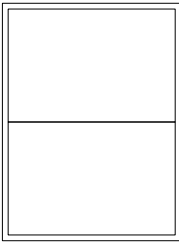
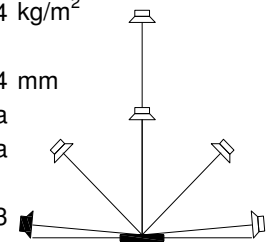
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

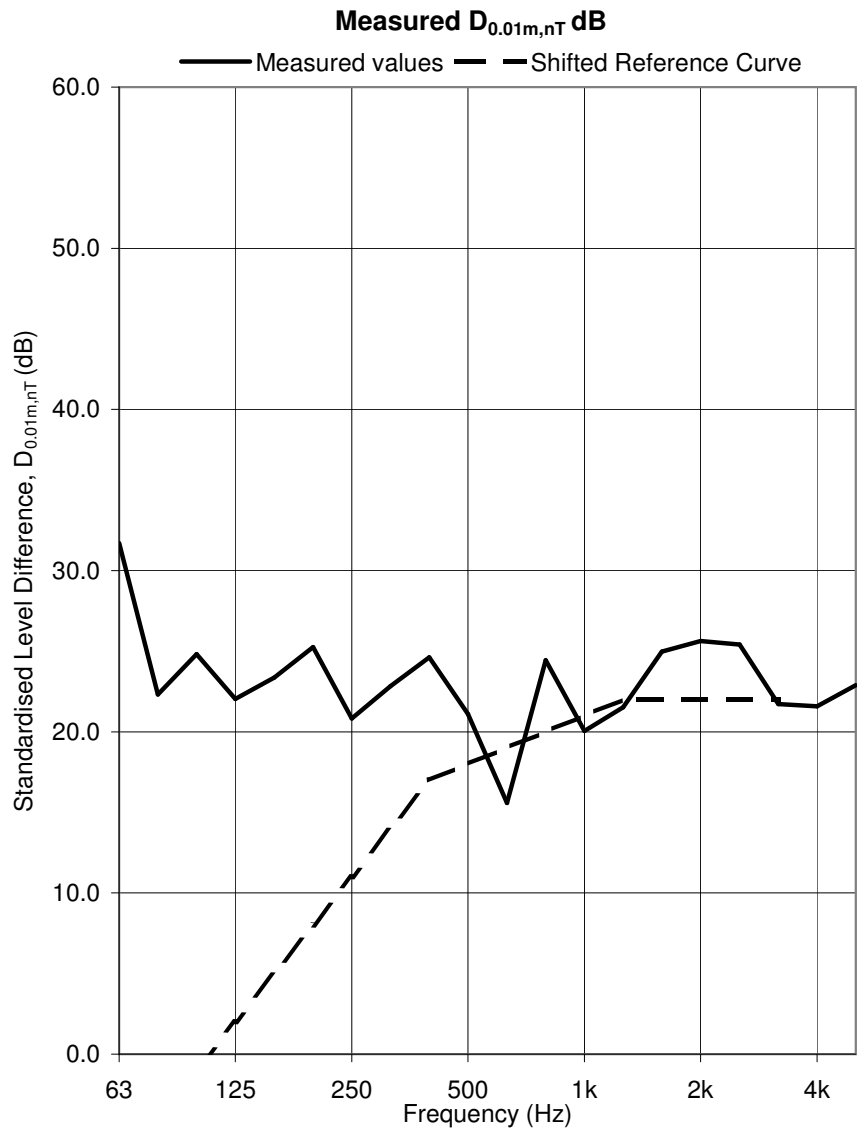
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713050

Test Sample: Window D-3 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	21.0
63	31.7
80	22.3
100	24.8
125	22.0
160	23.4
200	25.3
250	20.8
315	22.8
400	24.6
500	21.1
630	15.6
800	24.4
1k	20.1
1.25k	21.5
1.6k	25.0
2k	25.6
2.5k	25.4
3.15k	21.7
4k	21.6
5k	22.9



D_{0.01m,nT,w(C;C_{tr}) 22 (0; -1) dB}

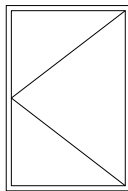
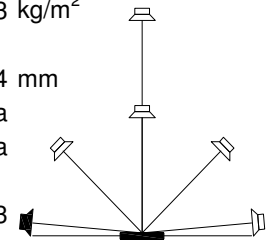
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

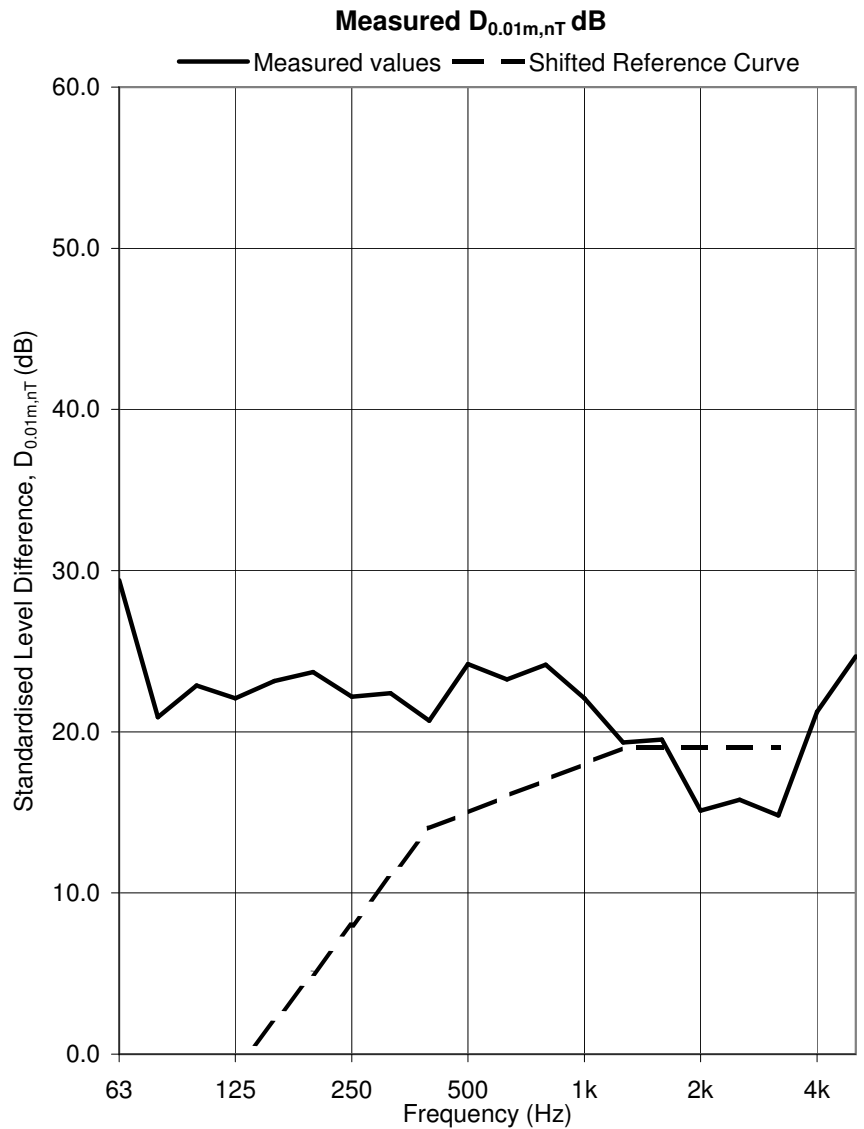
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720037

Test Sample: Window G Open 0.10 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	18.9
63	29.4
80	20.9
100	22.9
125	22.1
160	23.2
200	23.7
250	22.2
315	22.4
400	20.7
500	24.2
630	23.2
800	24.2
1k	22.1
1.25k	19.3
1.6k	19.5
2k	15.1
2.5k	15.8
3.15k	14.8
4k	21.2
5k	24.7



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; 1) dB}

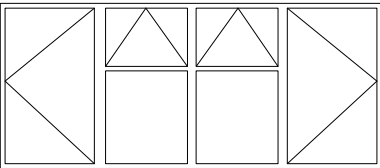
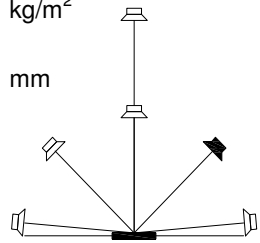
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

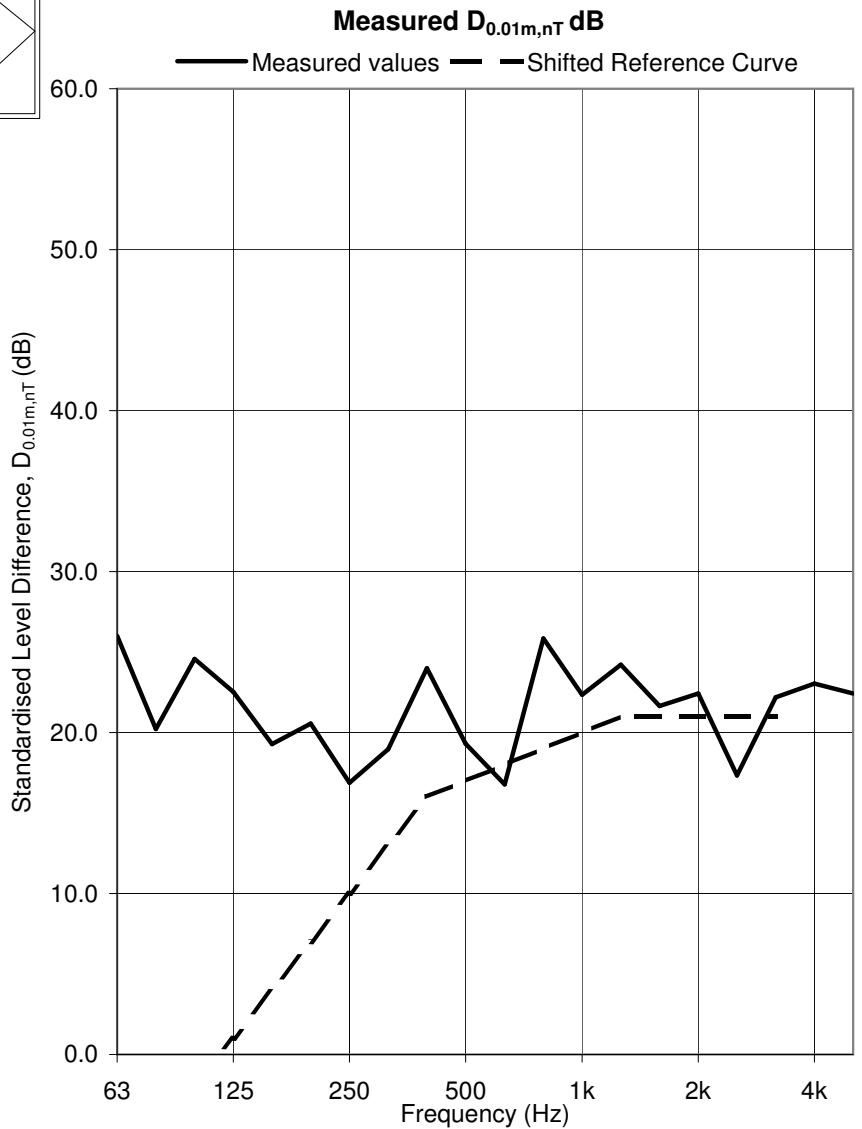
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628079

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	18.0
63	26.0
80	20.2
100	24.6
125	22.5
160	19.3
200	20.6
250	16.9
315	19.0
400	24.0
500	19.3
630	16.8
800	25.8
1k	22.3
1.25k	24.2
1.6k	21.7
2k	22.4
2.5k	17.3
3.15k	22.2
4k	23.0
5k	22.4



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

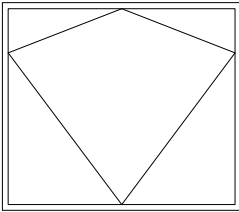
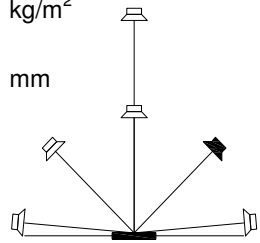
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

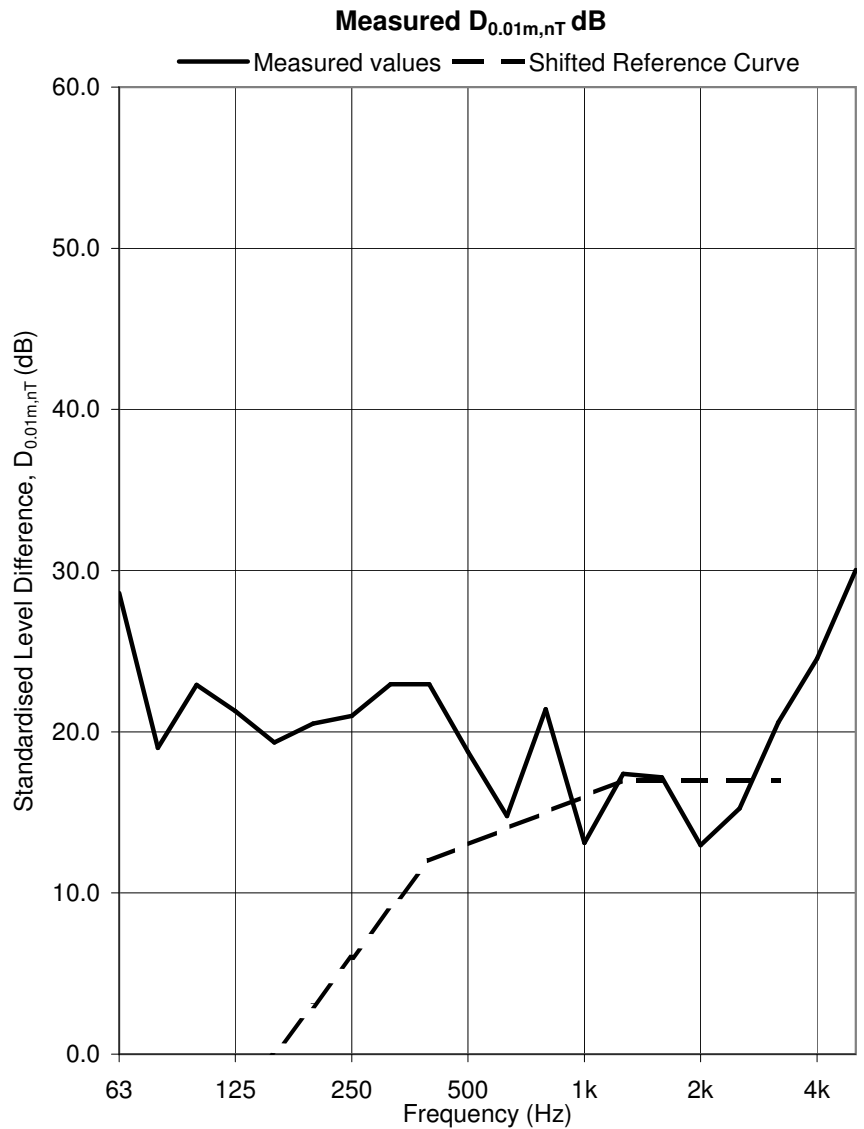
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705019

Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	22.2
63	28.6
80	19.0
100	22.9
125	21.3
160	19.3
200	20.5
250	21.0
315	22.9
400	23.0
500	18.8
630	14.8
800	21.4
1k	13.1
1.25k	17.4
1.6k	17.2
2k	13.0
2.5k	15.3
3.15k	20.6
4k	24.5
5k	30.0



D_{0.01m,nT,w(C;C_{tr}) 17 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

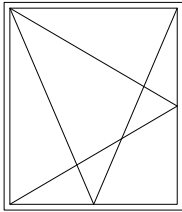
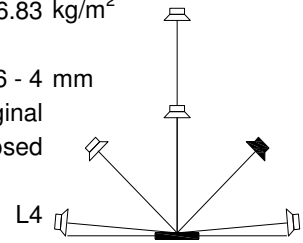
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

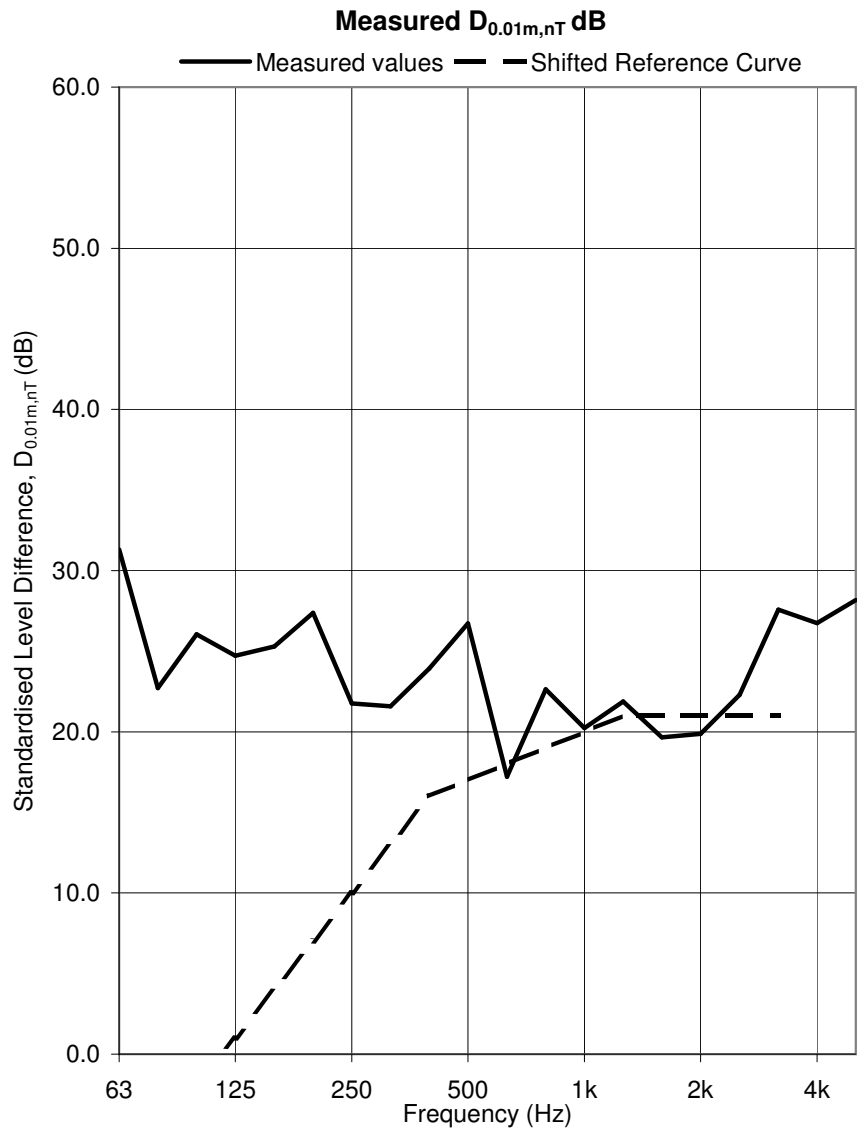
Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711062

Loudspeaker Configuration:



Frequency Hz	D _{0.01m,nT} dB
50	23.0
63	31.3
80	22.7
100	26.1
125	24.7
160	25.3
200	27.4
250	21.8
315	21.6
400	23.9
500	26.7
630	17.2
800	22.6
1k	20.2
1.25k	21.9
1.6k	19.7
2k	19.9
2.5k	22.3
3.15k	27.6
4k	26.8
5k	28.2



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

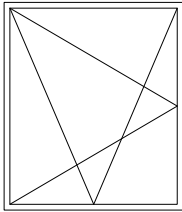
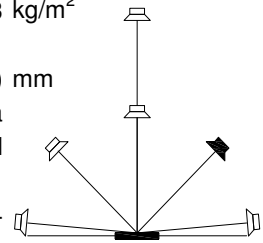
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

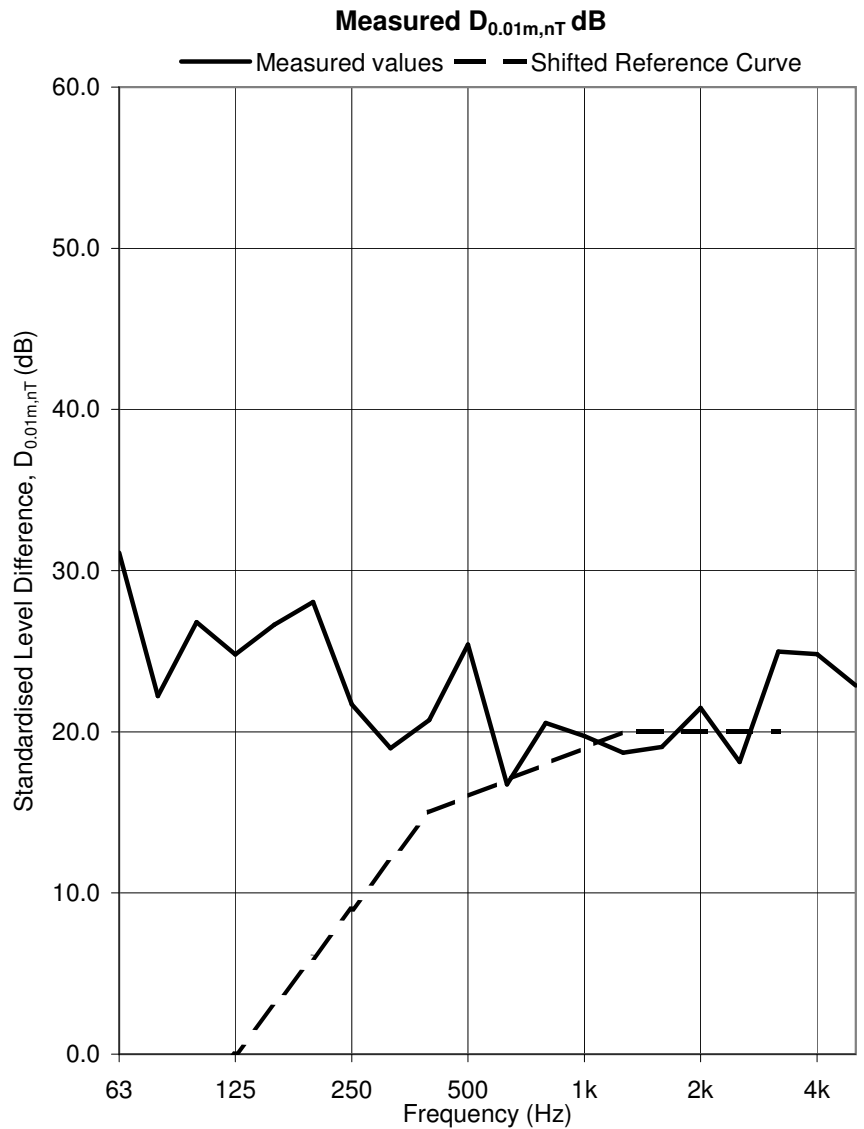
Test Sample: Window C-3 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712059

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	23.2
63	31.1
80	22.2
100	26.8
125	24.8
160	26.6
200	28.1
250	21.7
315	19.0
400	20.7
500	25.4
630	16.7
800	20.5
1k	19.7
1.25k	18.7
1.6k	19.1
2k	21.5
2.5k	18.1
3.15k	25.0
4k	24.8
5k	22.9



D_{0.01m,nT,w(C;C_{tr}) 20 (0; 0) dB}

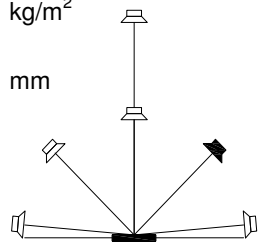
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

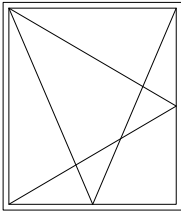
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

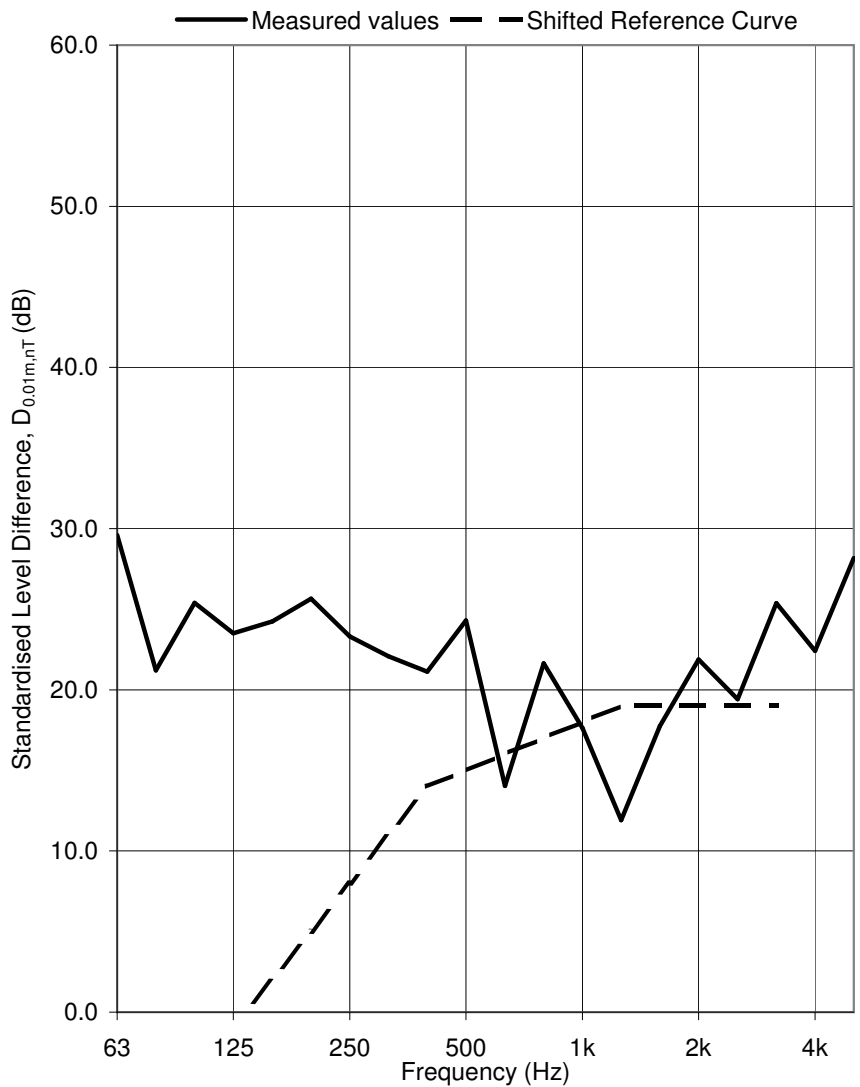


Test ID: 712063

Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.7
63	29.6
80	21.2
100	25.4
125	23.5
160	24.2
200	25.7
250	23.3
315	22.1
400	21.1
500	24.3
630	14.0
800	21.6
1k	17.6
1.25k	11.9
1.6k	17.8
2k	21.9
2.5k	19.4
3.15k	25.4
4k	22.4
5k	28.2

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-2; -2) dB

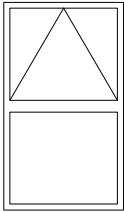
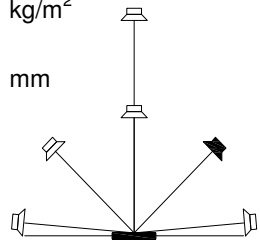
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

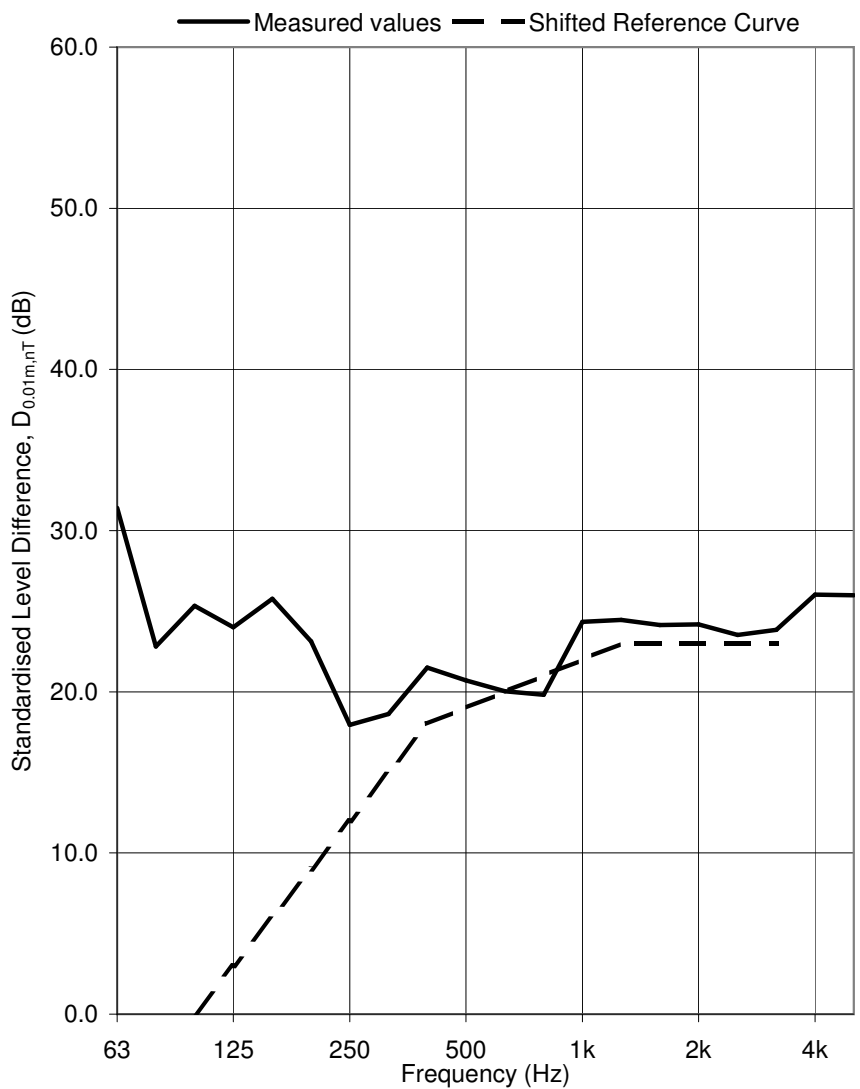
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718010

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	24.3
63	31.4
80	22.8
100	25.3
125	24.0
160	25.8
200	23.1
250	17.9
315	18.6
400	21.5
500	20.7
630	20.0
800	19.8
1k	24.3
1.25k	24.5
1.6k	24.1
2k	24.2
2.5k	23.5
3.15k	23.8
4k	26.0
5k	26.0

D_{0.01m,nT,w(C;C_{tr}) 23 (0; -1) dB}

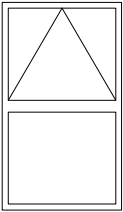
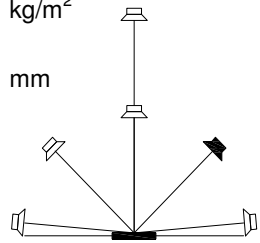
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

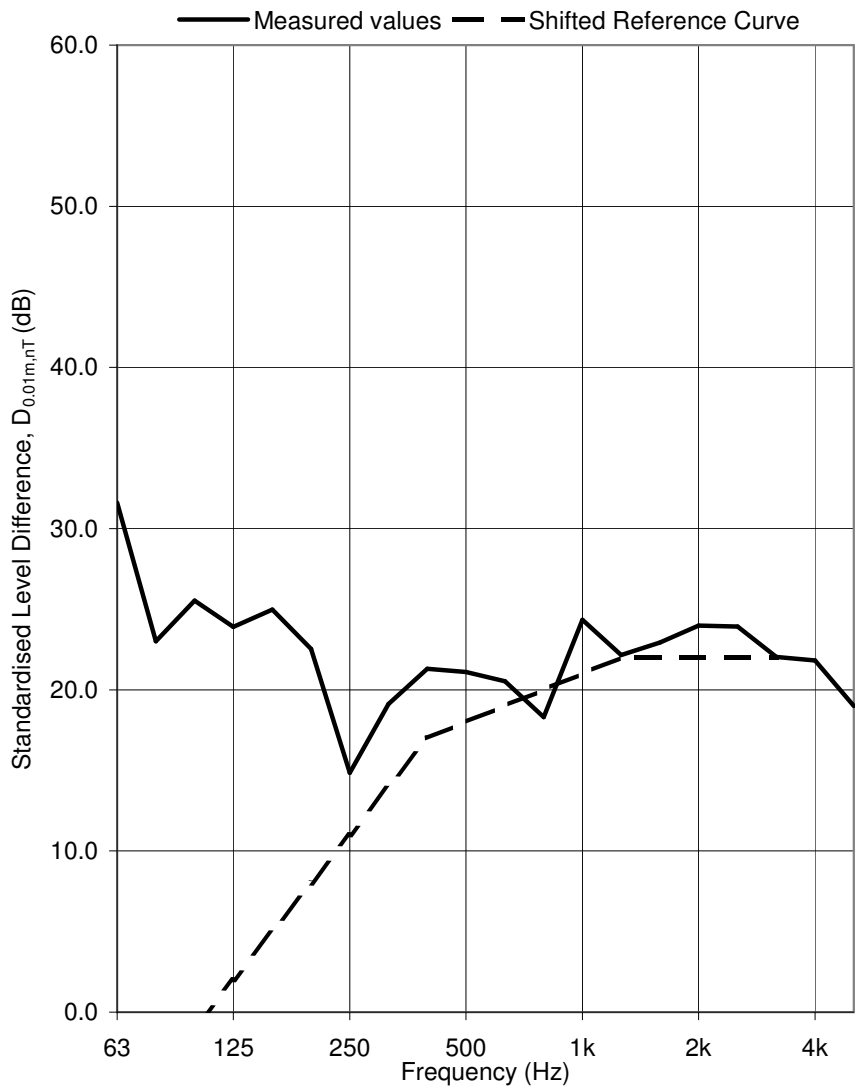
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719024

Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.9
63	31.6
80	23.0
100	25.5
125	23.9
160	25.0
200	22.5
250	14.8
315	19.1
400	21.3
500	21.1
630	20.5
800	18.3
1k	24.3
1.25k	22.2
1.6k	22.9
2k	24.0
2.5k	23.9
3.15k	22.0
4k	21.8
5k	19.0

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

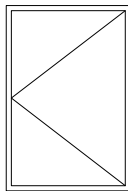
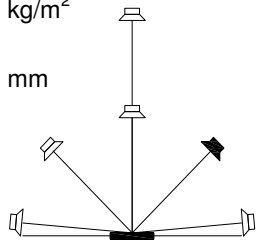
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

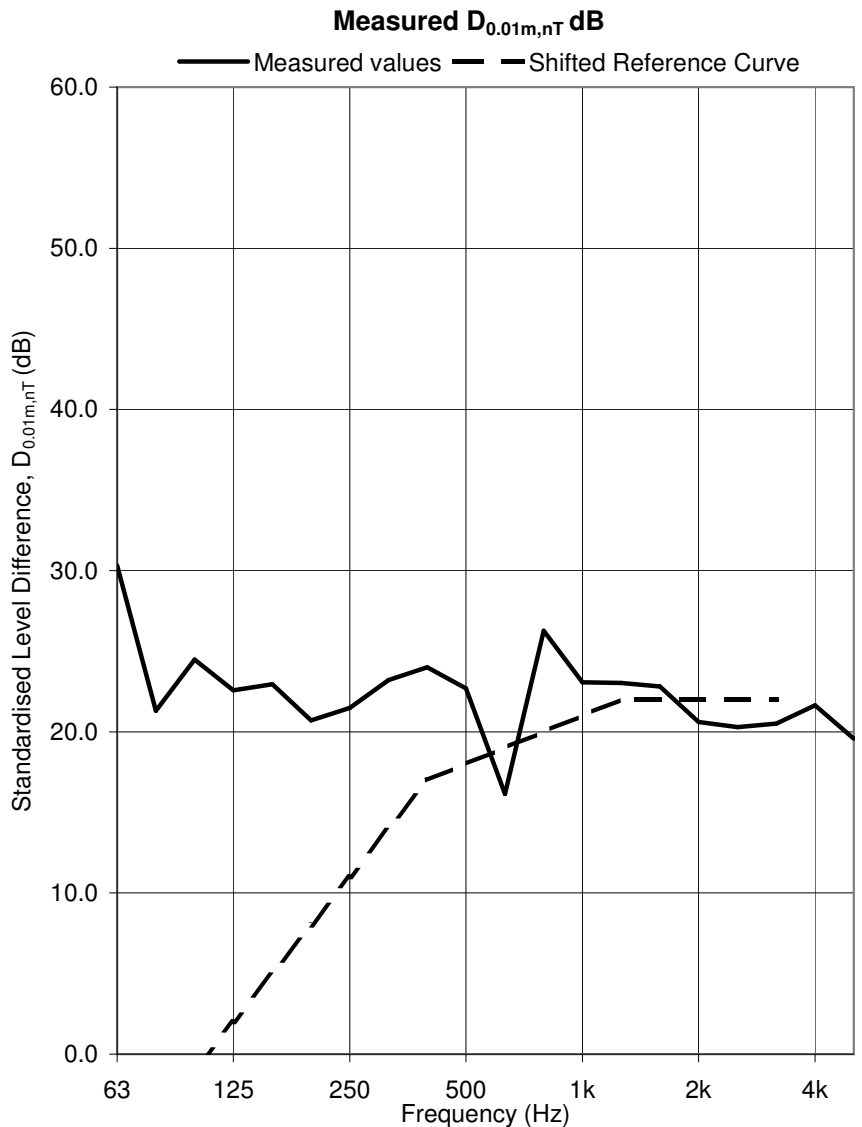
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720032

Test Sample: Window G Open 0.10 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	24.1
63	30.3
80	21.3
100	24.5
125	22.6
160	23.0
200	20.7
250	21.5
315	23.2
400	24.0
500	22.7
630	16.1
800	26.3
1k	23.1
1.25k	23.0
1.6k	22.8
2k	20.6
2.5k	20.3
3.15k	20.5
4k	21.6
5k	19.6



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; 0) dB}

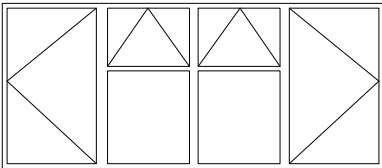
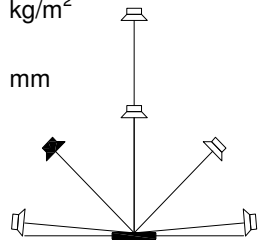
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

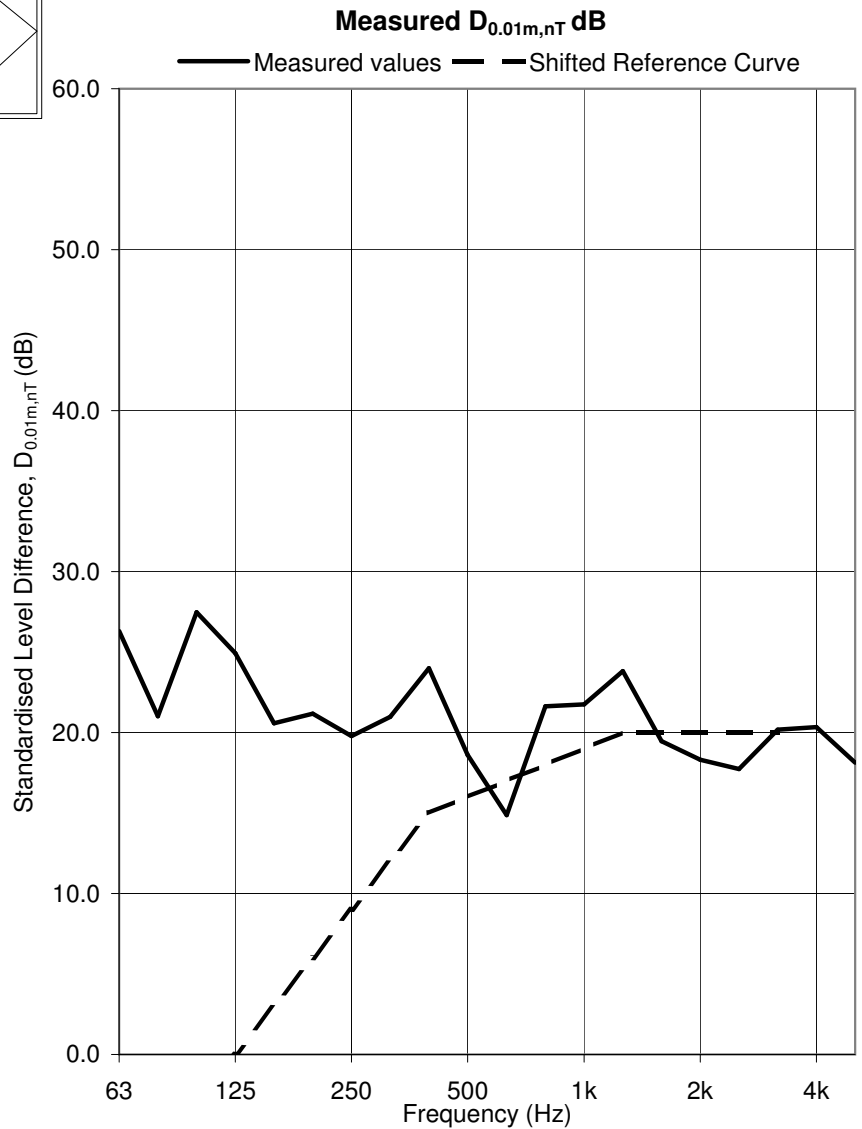
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628095

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	20.0
63	26.3
80	21.0
100	27.5
125	24.9
160	20.6
200	21.2
250	19.8
315	21.0
400	24.0
500	18.6
630	14.9
800	21.6
1k	21.7
1.25k	23.8
1.6k	19.5
2k	18.3
2.5k	17.7
3.15k	20.2
4k	20.3
5k	18.1



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

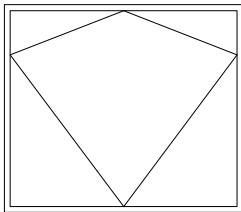
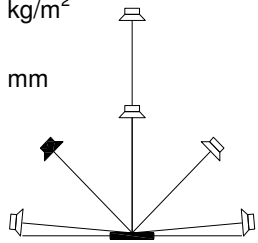
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

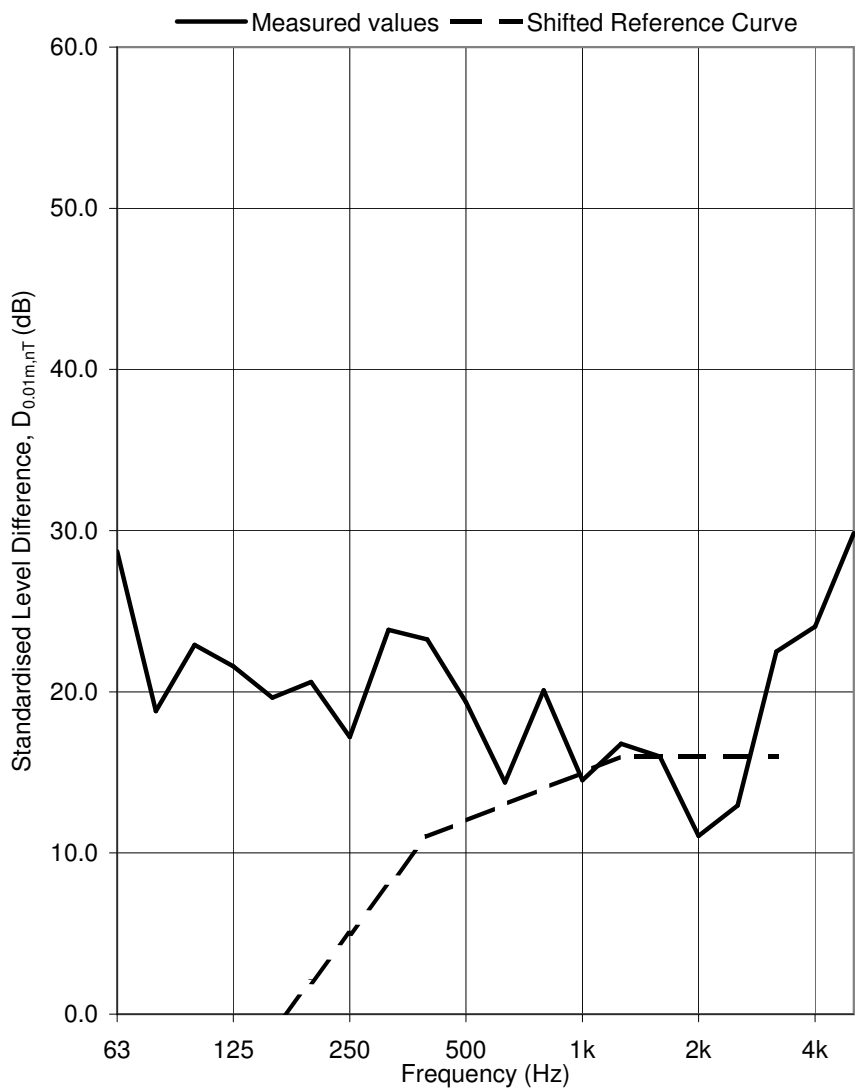
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705024

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.0
63	28.7
80	18.8
100	22.9
125	21.6
160	19.6
200	20.6
250	17.2
315	23.8
400	23.3
500	19.4
630	14.4
800	20.1
1k	14.5
1.25k	16.8
1.6k	16.0
2k	11.1
2.5k	13.0
3.15k	22.5
4k	24.0
5k	29.8

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (-1; 0) dB

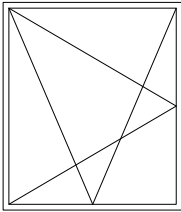
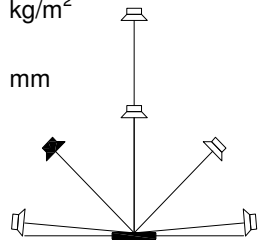
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

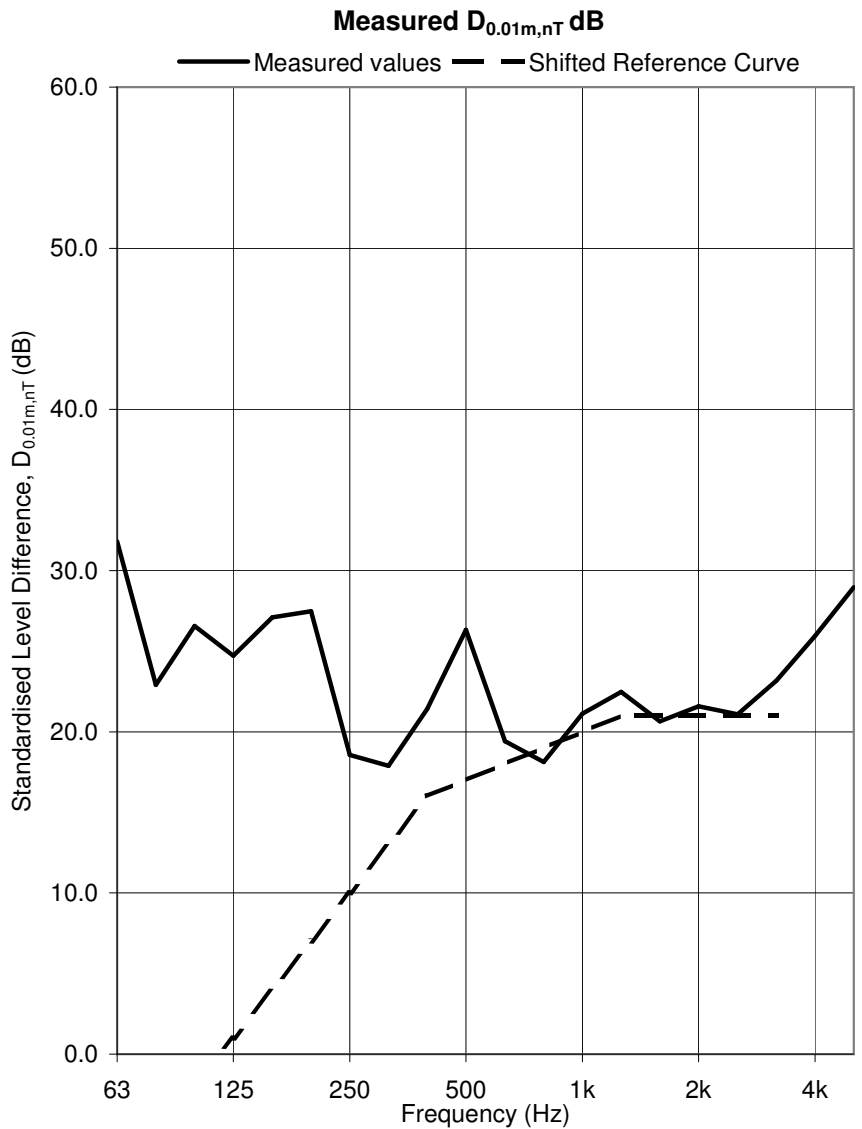
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711057

Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	23.8
63	31.8
80	22.9
100	26.6
125	24.7
160	27.1
200	27.5
250	18.6
315	17.9
400	21.4
500	26.3
630	19.4
800	18.1
1k	21.1
1.25k	22.5
1.6k	20.7
2k	21.6
2.5k	21.1
3.15k	23.2
4k	26.0
5k	29.0



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

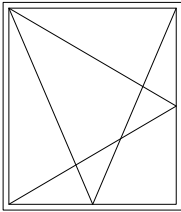
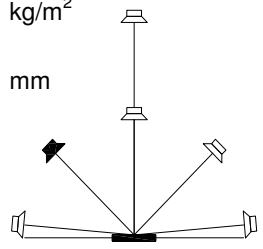
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711052

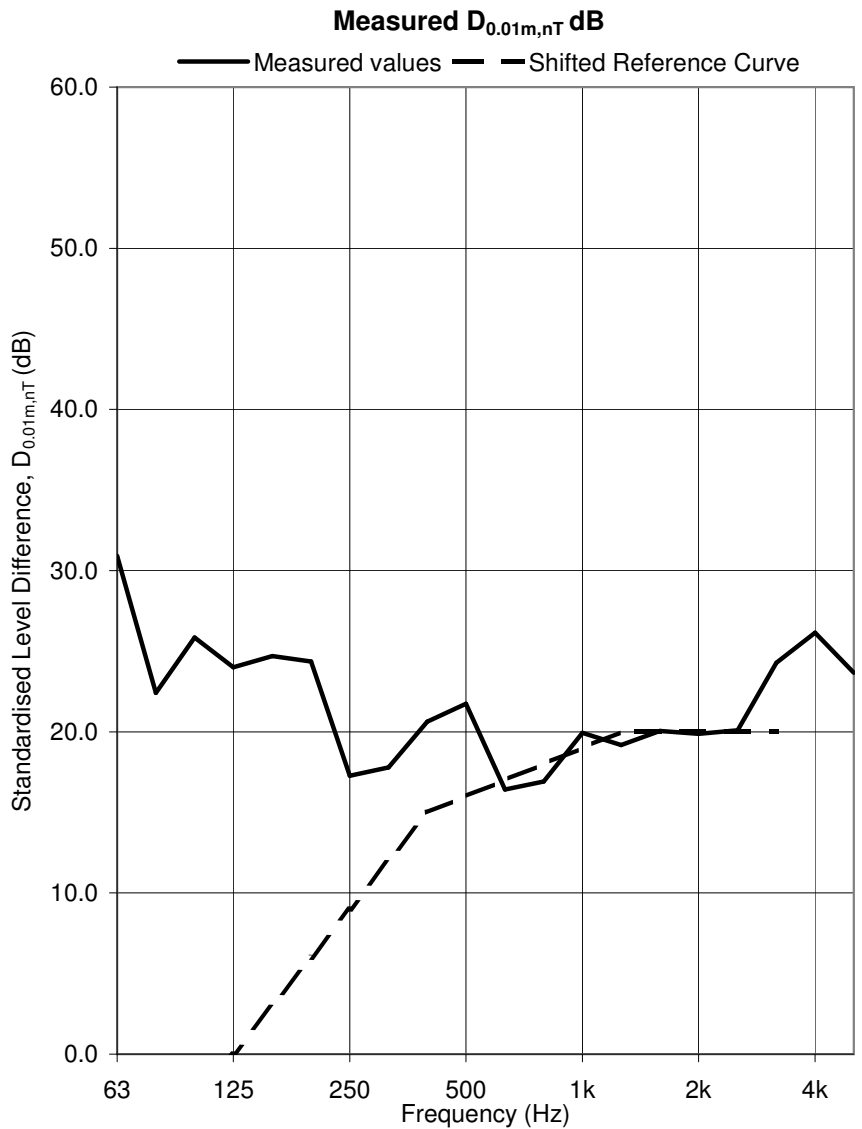
Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	22.8
63	30.9
80	22.4
100	25.9
125	24.0
160	24.7
200	24.4
250	17.3
315	17.8
400	20.6
500	21.7
630	16.4
800	16.9
1k	19.9
1.25k	19.2
1.6k	20.1
2k	19.9
2.5k	20.1
3.15k	24.3
4k	26.2
5k	23.7



D_{0.01m,nT,w(C;C_{tr}) 20 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

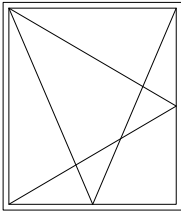
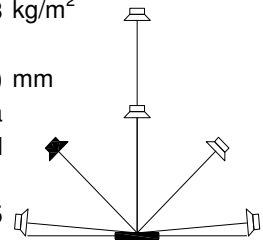
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

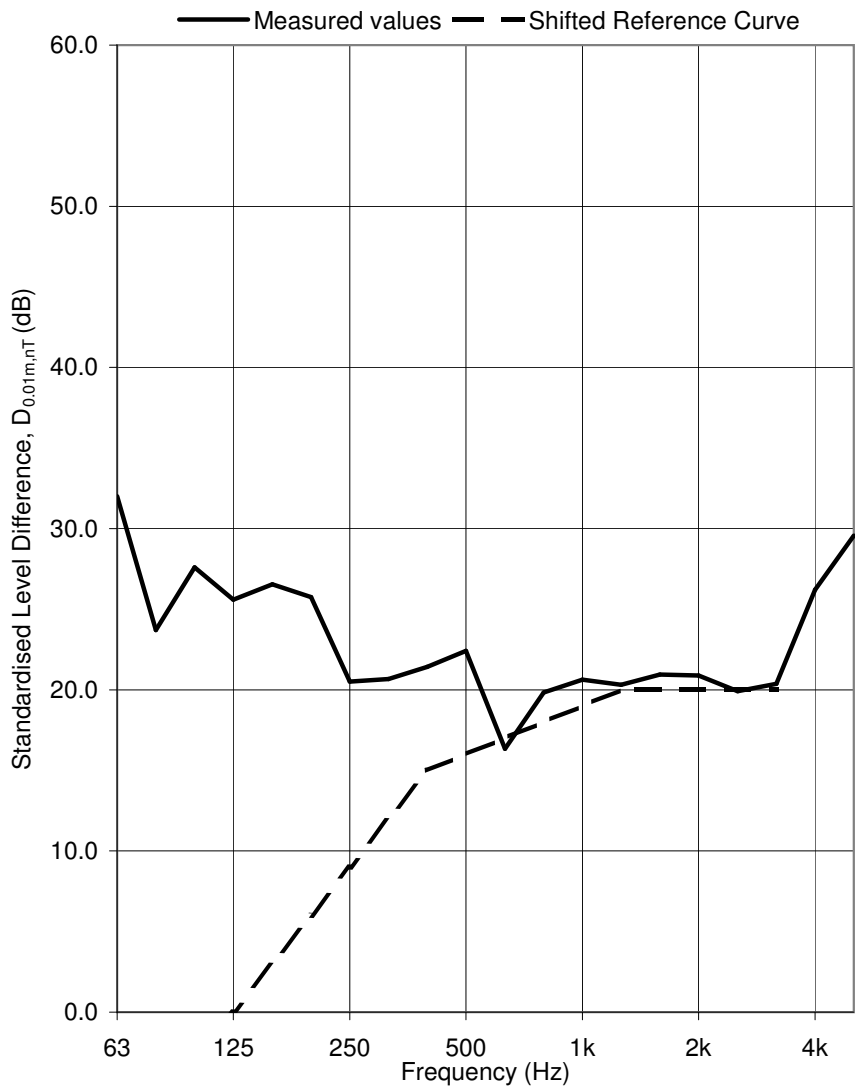
Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712068

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.4
63	32.0
80	23.7
100	27.6
125	25.6
160	26.5
200	25.8
250	20.5
315	20.7
400	21.4
500	22.4
630	16.3
800	19.8
1k	20.6
1.25k	20.3
1.6k	21.0
2k	20.9
2.5k	19.9
3.15k	20.4
4k	26.2
5k	29.6

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

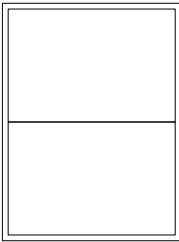
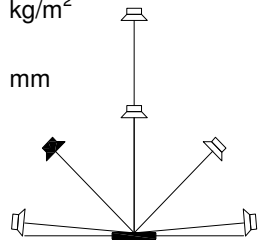
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

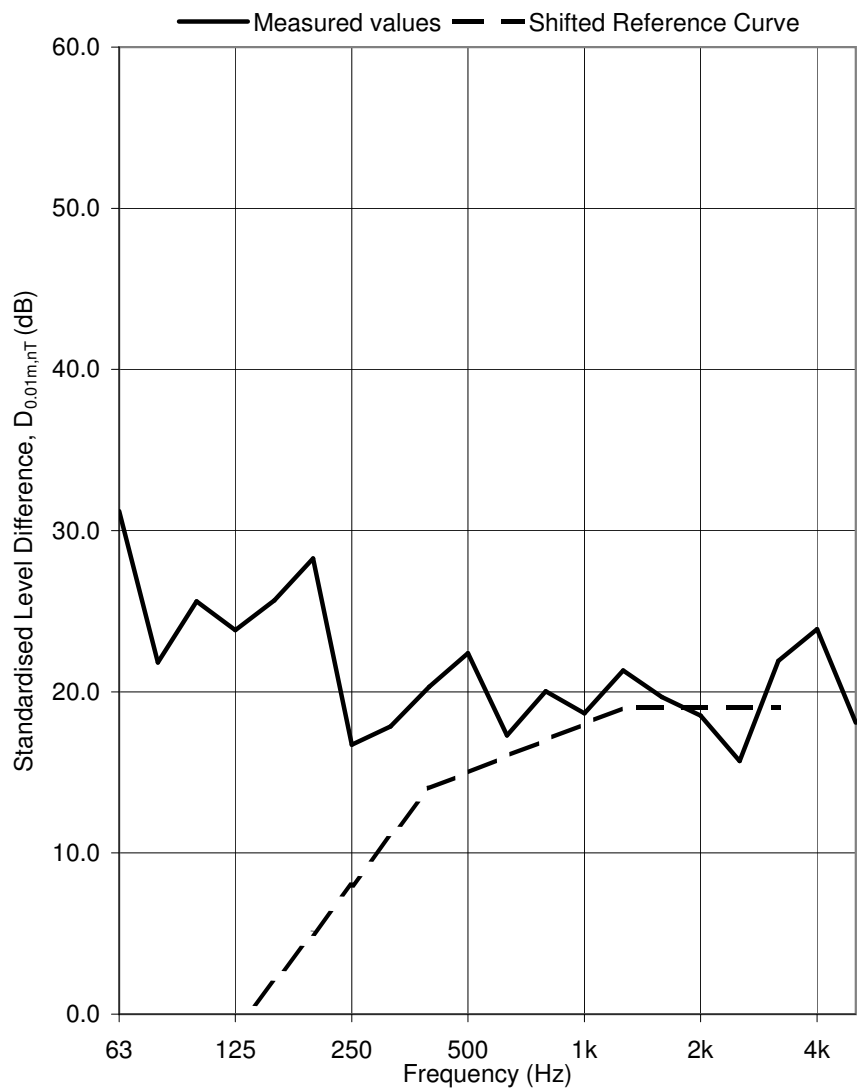
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713040

Test Sample: Window D-1 Open 0.10 m²

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.6
63	31.2
80	21.8
100	25.6
125	23.8
160	25.7
200	28.3
250	16.7
315	17.8
400	20.3
500	22.4
630	17.3
800	20.0
1k	18.7
1.25k	21.3
1.6k	19.7
2k	18.5
2.5k	15.7
3.15k	21.9
4k	23.9
5k	18.1

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (0; 0) dB

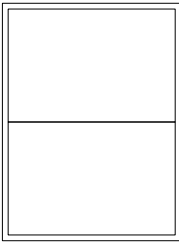
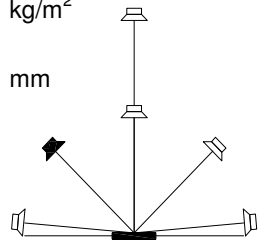
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

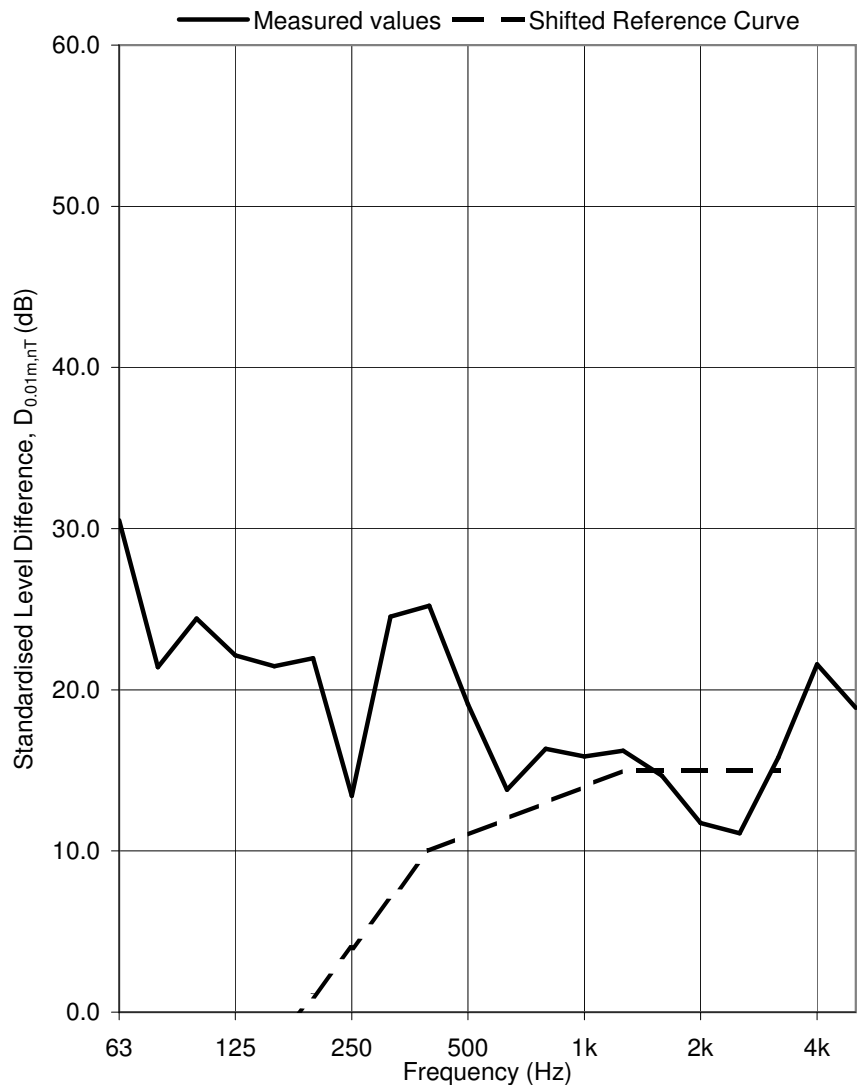
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713032

Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.3
63	30.5
80	21.4
100	24.4
125	22.1
160	21.5
200	22.0
250	13.4
315	24.5
400	25.2
500	19.1
630	13.8
800	16.3
1k	15.9
1.25k	16.2
1.6k	14.7
2k	11.7
2.5k	11.1
3.15k	15.8
4k	21.6
5k	18.9

$D_{0.01m,nT,w}(C;C_{tr})$ 15 (-1; 0) dB

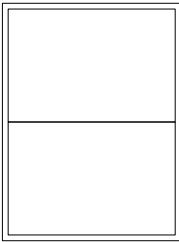
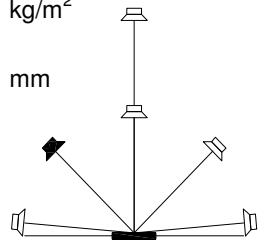
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

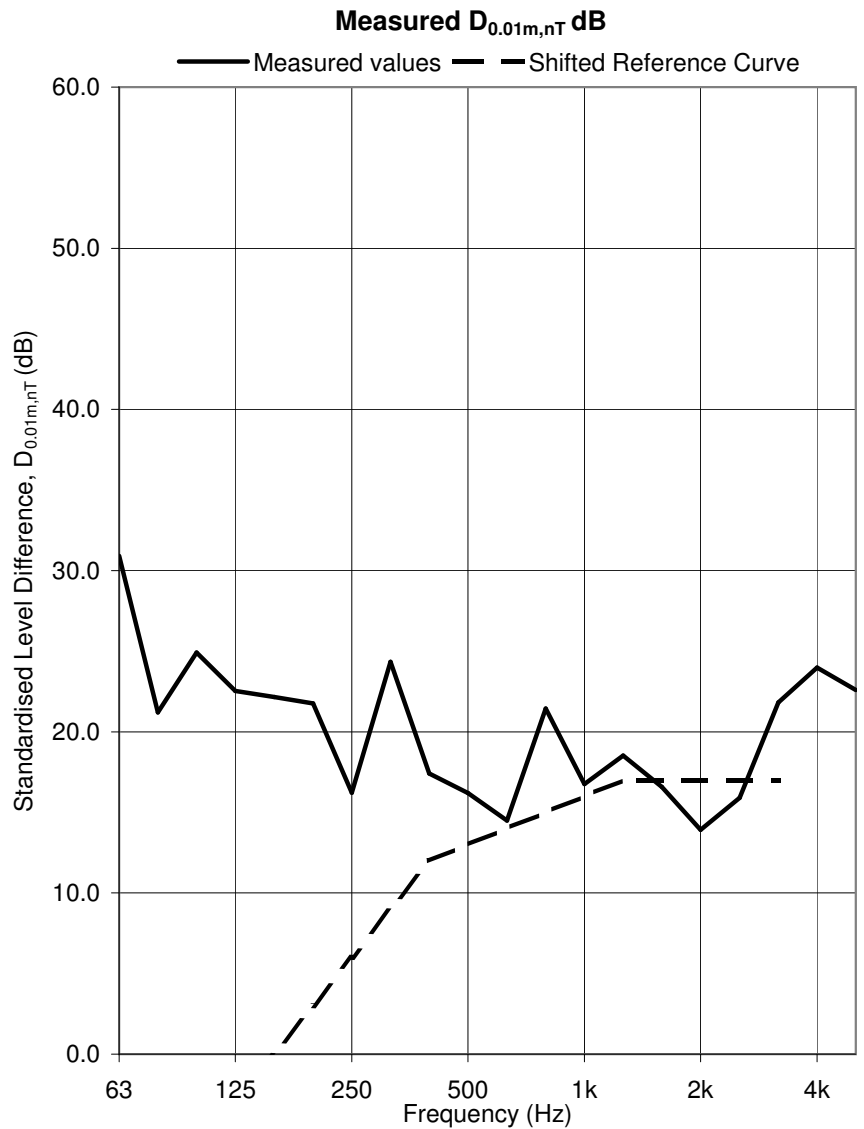
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713036

Test Sample: Window D-3 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	25.7
63	30.9
80	21.2
100	24.9
125	22.5
160	22.2
200	21.8
250	16.2
315	24.3
400	17.4
500	16.2
630	14.5
800	21.4
1k	16.8
1.25k	18.5
1.6k	16.6
2k	13.9
2.5k	15.9
3.15k	21.8
4k	24.0
5k	22.6

b



D_{0.01m,nT,w(C;C_{tr}) 17 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

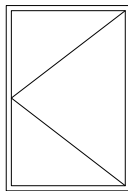
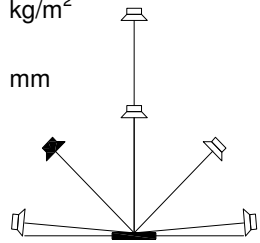
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

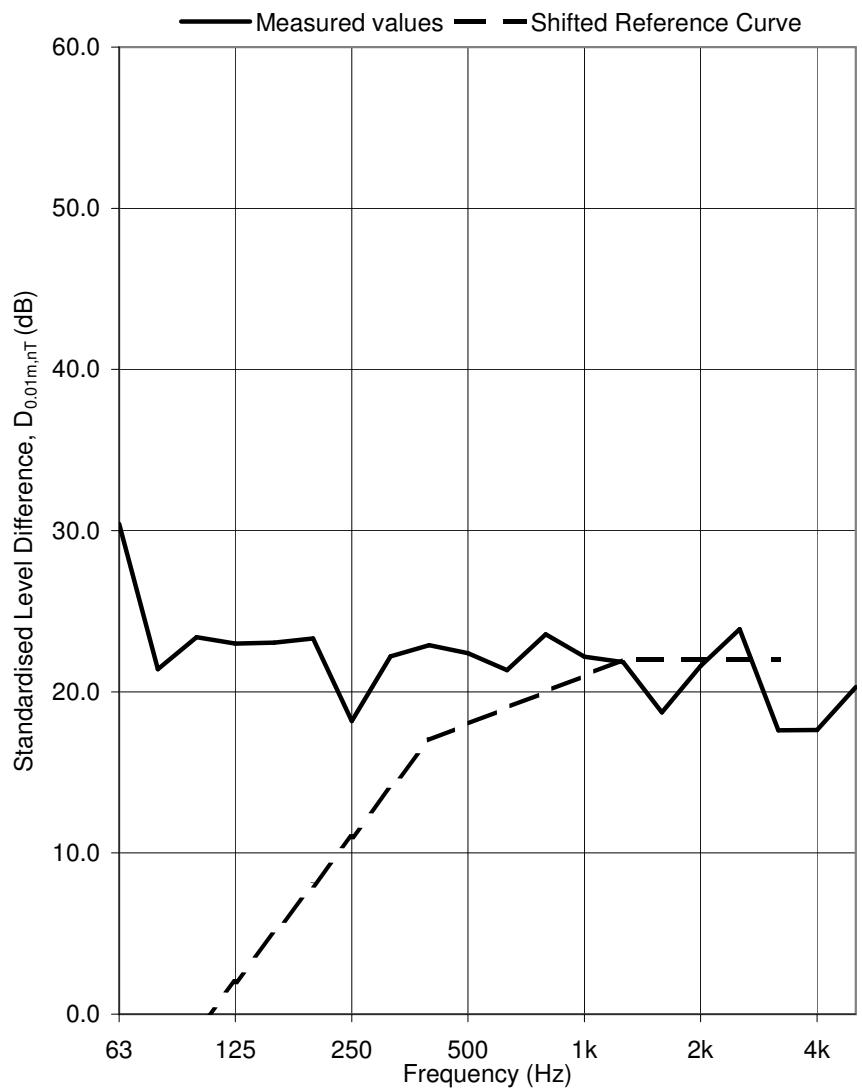
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720023

Test Sample: Window G Open 0.10 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.3
63	30.4
80	21.4
100	23.4
125	23.0
160	23.1
200	23.3
250	18.2
315	22.2
400	22.9
500	22.4
630	21.3
800	23.6
1k	22.2
1.25k	21.8
1.6k	18.7
2k	21.6
2.5k	23.9
3.15k	17.6
4k	17.6
5k	20.3

$D_{0.01m,nT,w}(C;C_{tr})$ 22 (-1; -1) dB

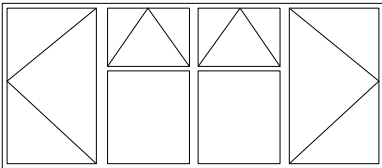
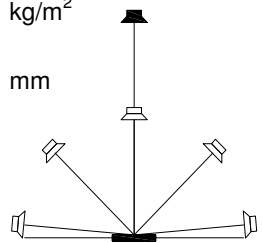
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

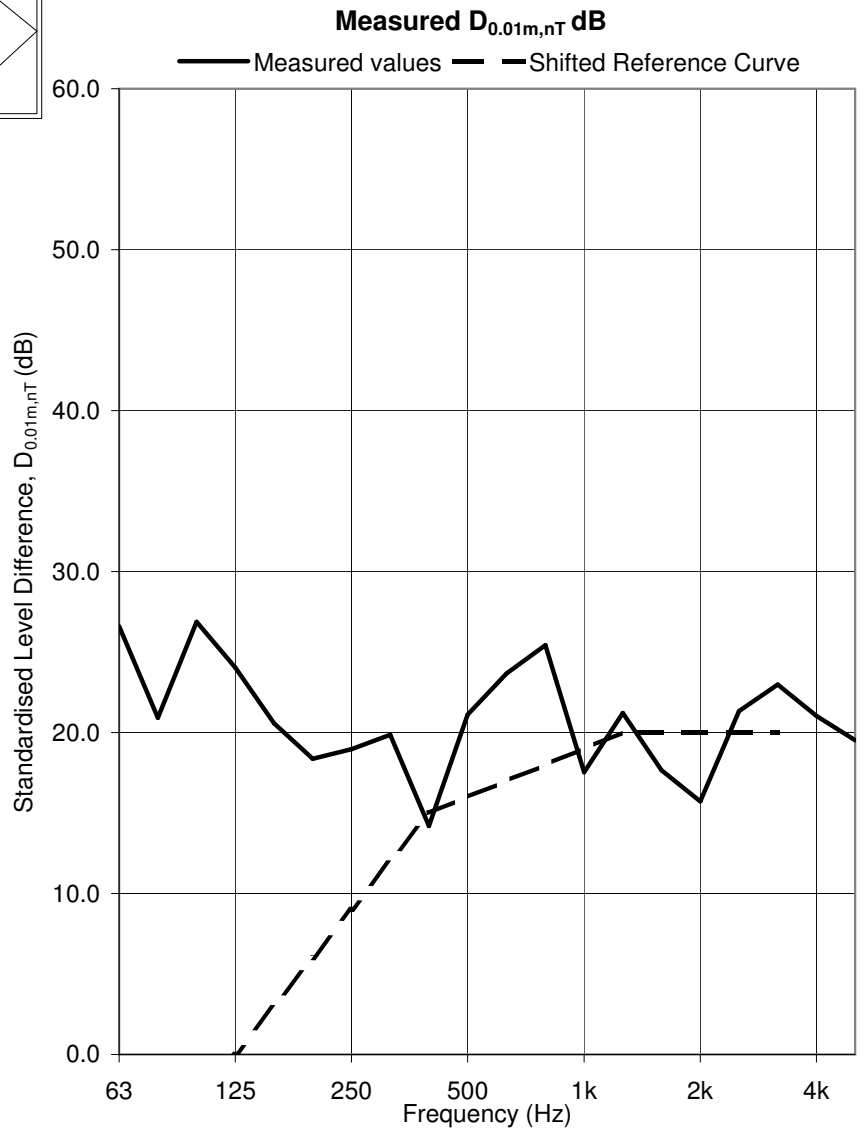
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628031

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	20.0
63	26.6
80	20.9
100	26.9
125	24.0
160	20.6
200	18.4
250	19.0
315	19.9
400	14.2
500	21.1
630	23.7
800	25.4
1k	17.5
1.25k	21.2
1.6k	17.7
2k	15.7
2.5k	21.3
3.15k	23.0
4k	21.0
5k	19.5



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

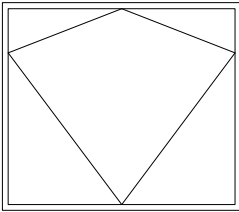
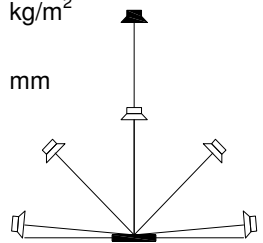
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

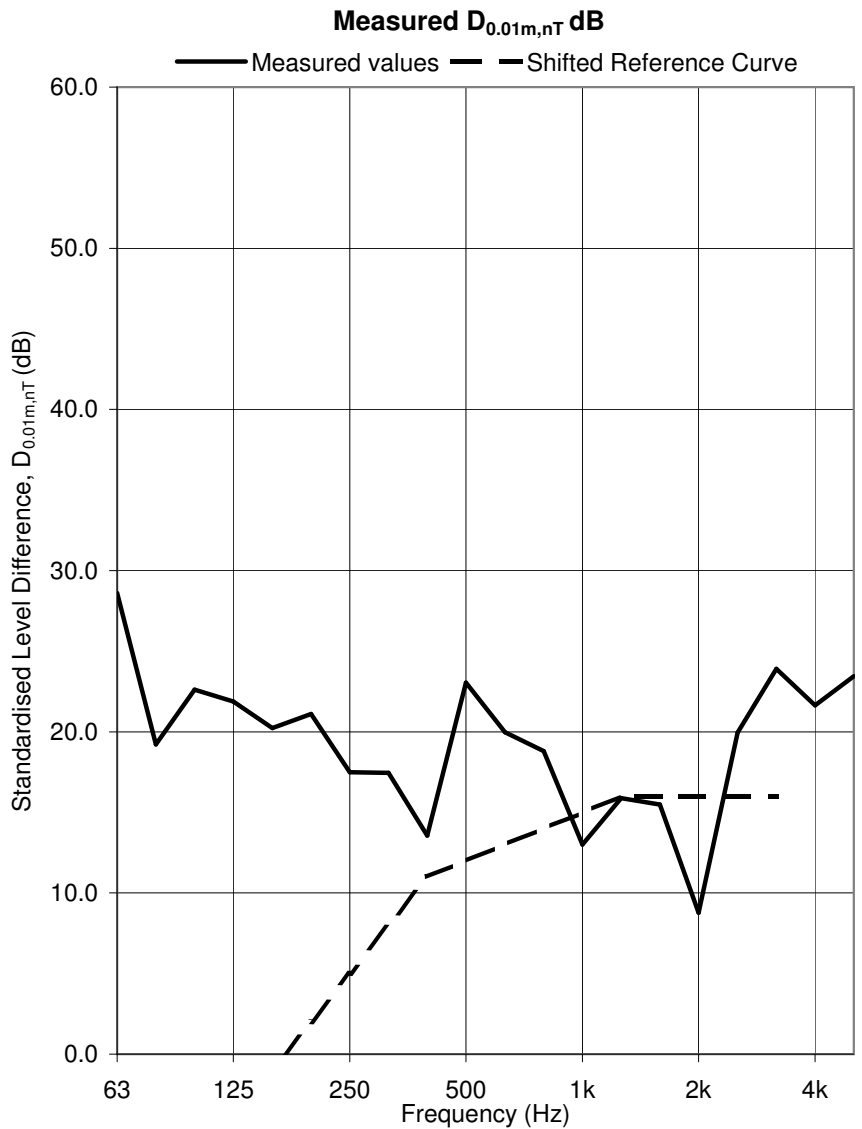
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 705029

Test Sample: Window B Open 0.10 m²

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	23.9
63	28.6
80	19.2
100	22.6
125	21.9
160	20.2
200	21.1
250	17.5
315	17.4
400	13.6
500	23.1
630	20.0
800	18.8
1k	13.0
1.25k	15.9
1.6k	15.5
2k	8.8
2.5k	20.0
3.15k	23.9
4k	21.6
5k	23.4



D_{0.01m,nT,w(C;C_{tr}) 16 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

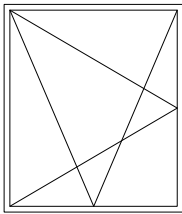
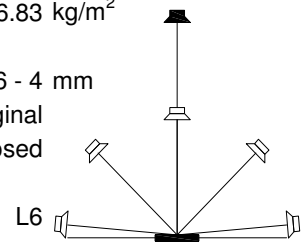
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0279 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

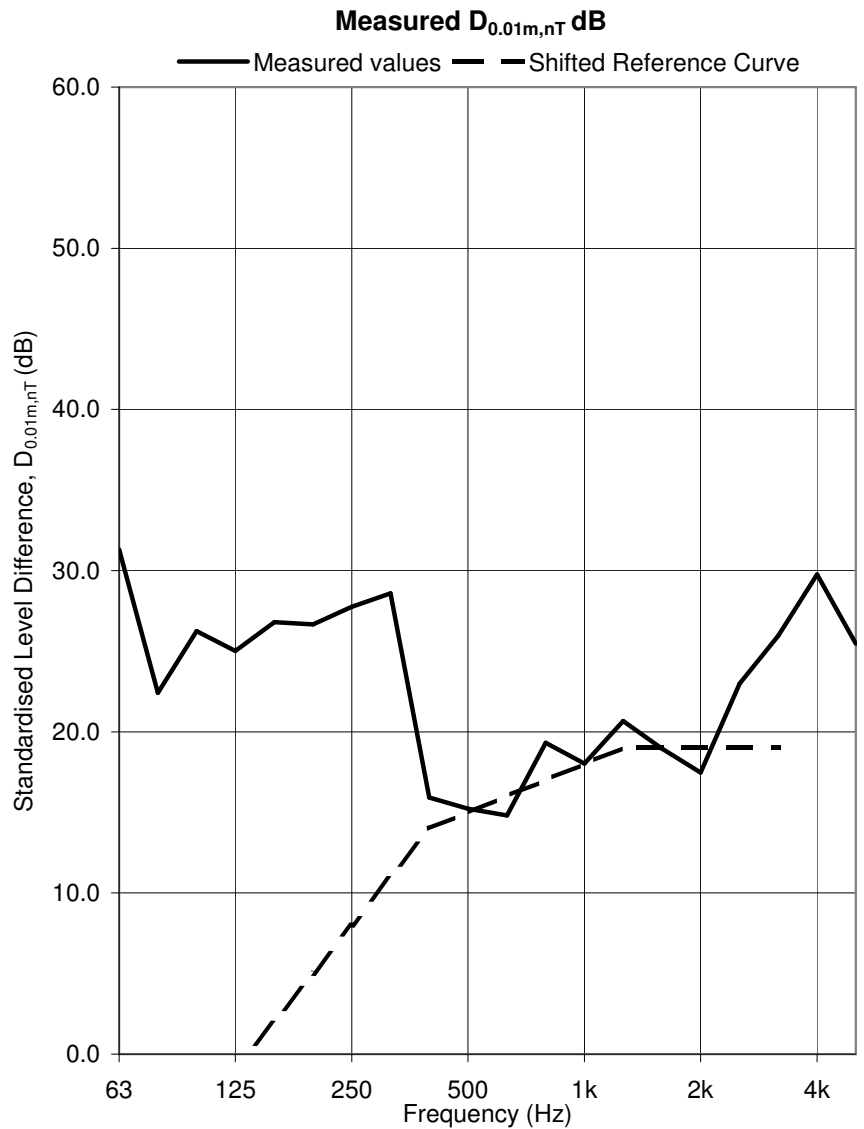
Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.4
63	31.3
80	22.4
100	26.3
125	25.0
160	26.8
200	26.7
250	27.8
315	28.6
400	15.9
500	15.2
630	14.8
800	19.3
1k	18.0
1.25k	20.7
1.6k	19.0
2k	17.5
2.5k	23.0
3.15k	26.0
4k	29.8
5k	25.5

b



D_{0.01m,nT,w(C;C_{tr}) 19 (0; -1) dB}

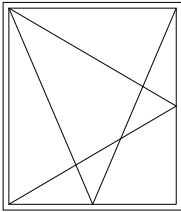
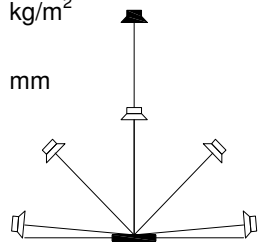
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

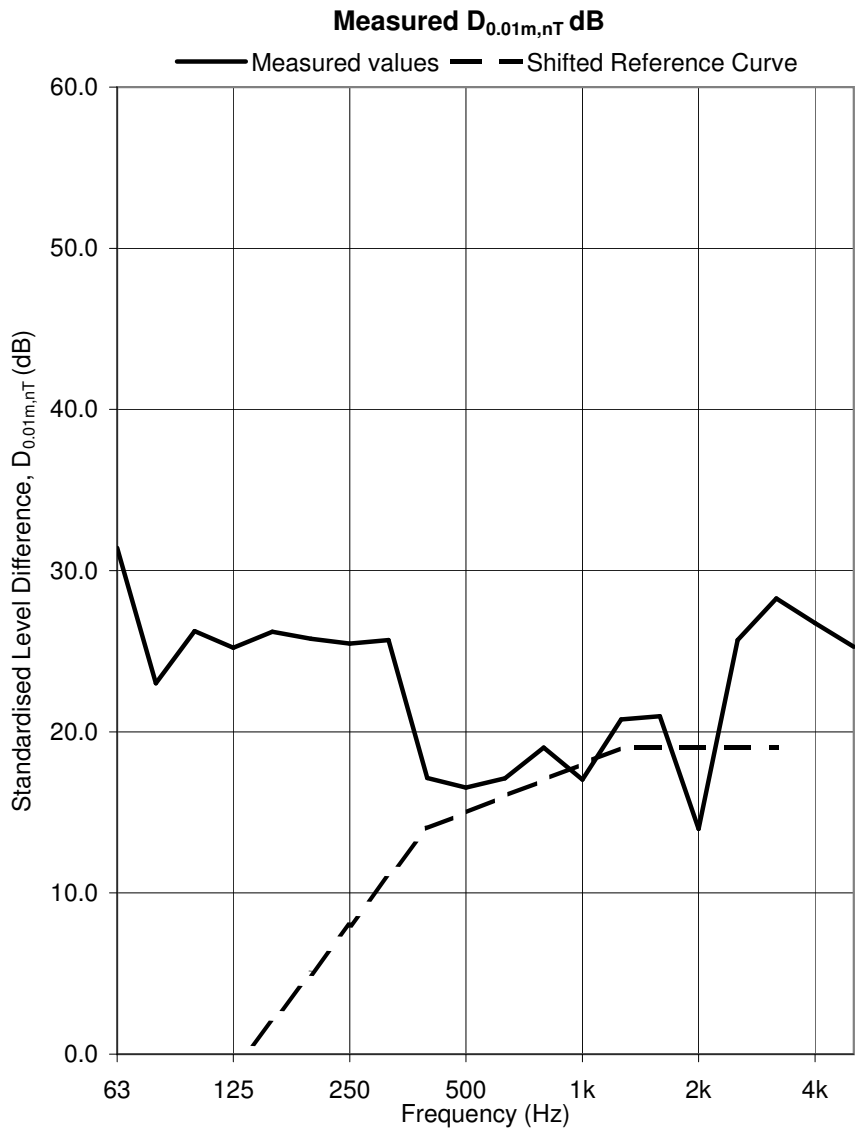
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 711024

Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.7
63	31.4
80	23.0
100	26.3
125	25.2
160	26.2
200	25.8
250	25.5
315	25.7
400	17.1
500	16.5
630	17.1
800	19.0
1k	17.0
1.25k	20.8
1.6k	21.0
2k	14.0
2.5k	25.7
3.15k	28.3
4k	26.8
5k	25.3

B



D_{0.01m,nT,w(C;C_{tr}) 19 (0; -1) dB}

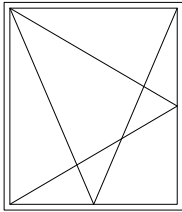
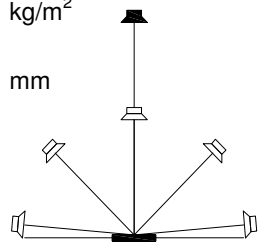
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

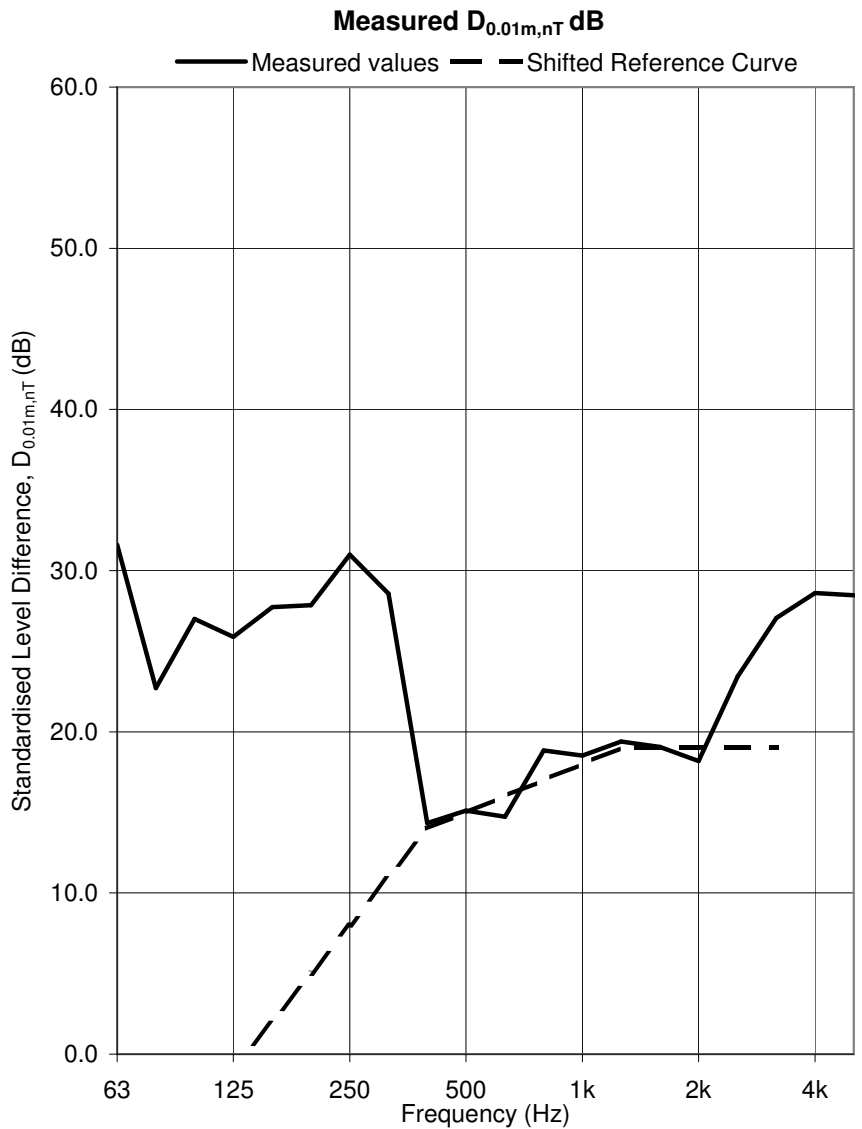
Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712020

Test Sample: Window C-3 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.7
63	31.6
80	22.7
100	27.0
125	25.9
160	27.7
200	27.9
250	31.0
315	28.6
400	14.3
500	15.1
630	14.7
800	18.8
1k	18.5
1.25k	19.4
1.6k	19.1
2k	18.2
2.5k	23.4
3.15k	27.1
4k	28.6
5k	28.5

B



D_{0.01m,nT,w(C;C_{tr}) 19 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

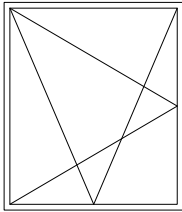
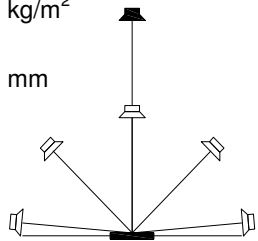
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

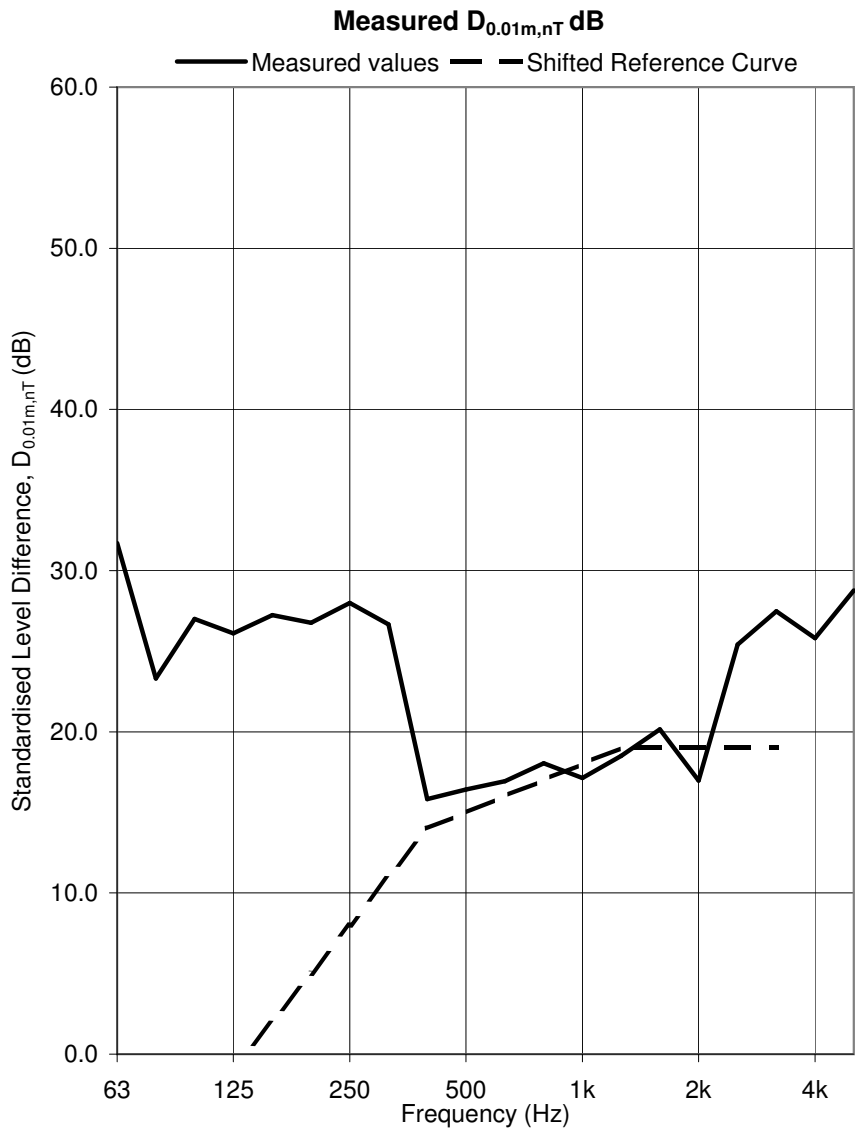
Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	25.5
63	31.7
80	23.3
100	27.0
125	26.1
160	27.2
200	26.8
250	28.0
315	26.7
400	15.8
500	16.4
630	16.9
800	18.0
1k	17.1
1.25k	18.5
1.6k	20.2
2k	17.0
2.5k	25.4
3.15k	27.5
4k	25.8
5k	28.8

b



D_{0.01m,nT,w(C;C_{tr}) 19 (0; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

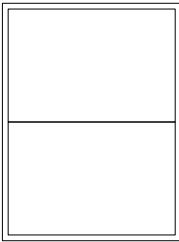
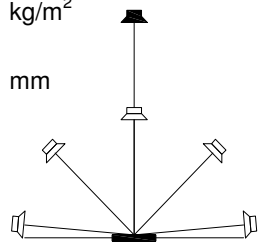
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

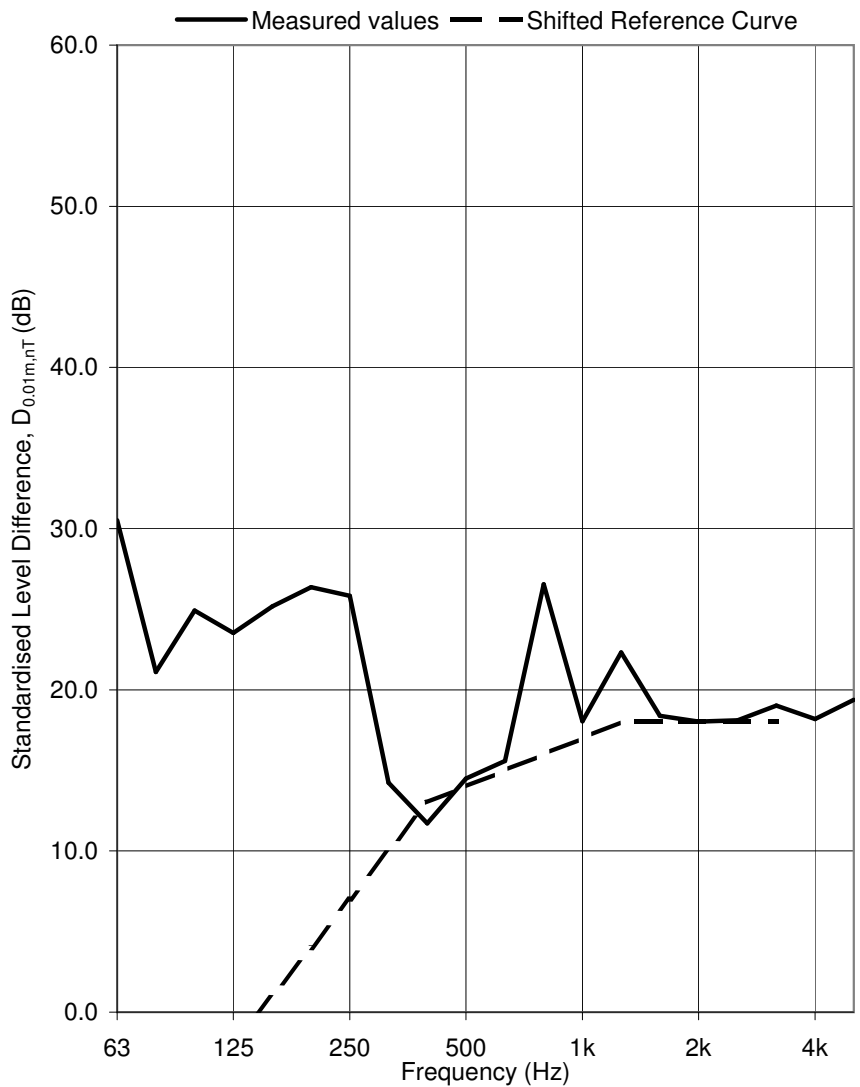
Test Sample: Window D-1 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713026

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.2
63	30.5
80	21.1
100	24.9
125	23.5
160	25.2
200	26.4
250	25.8
315	14.2
400	11.7
500	14.5
630	15.6
800	26.5
1k	18.1
1.25k	22.3
1.6k	18.4
2k	18.0
2.5k	18.1
3.15k	19.0
4k	18.2
5k	19.4

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

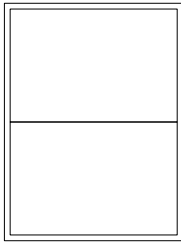
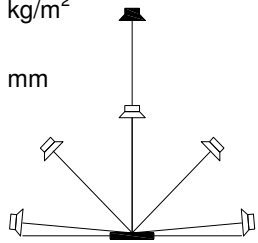
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

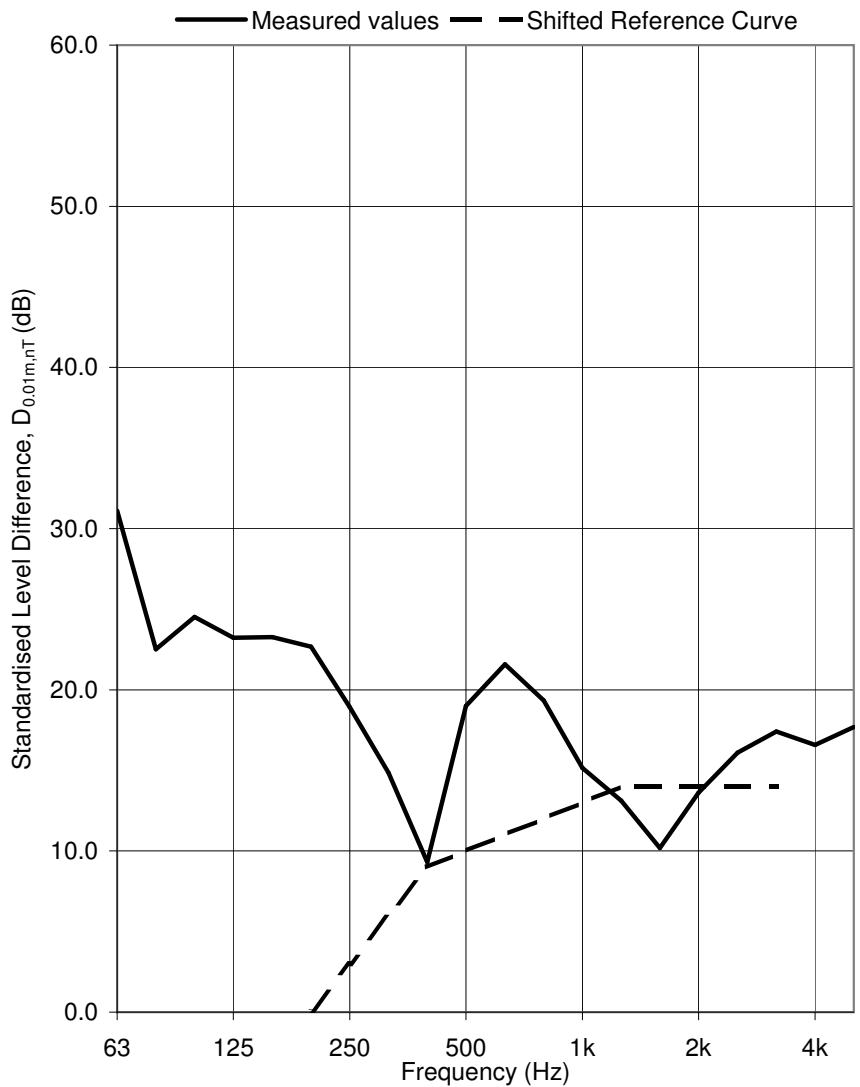
Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713018

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.7
63	31.1
80	22.5
100	24.5
125	23.2
160	23.3
200	22.7
250	18.9
315	14.8
400	9.3
500	19.0
630	21.6
800	19.3
1k	15.2
1.25k	13.1
1.6k	10.2
2k	13.6
2.5k	16.1
3.15k	17.4
4k	16.6
5k	17.7

$D_{0.01m,nT,w}(C;C_{tr})$ 14 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

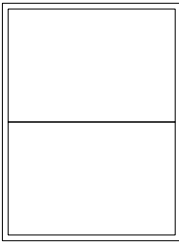
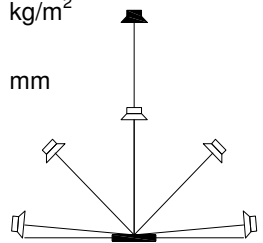
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

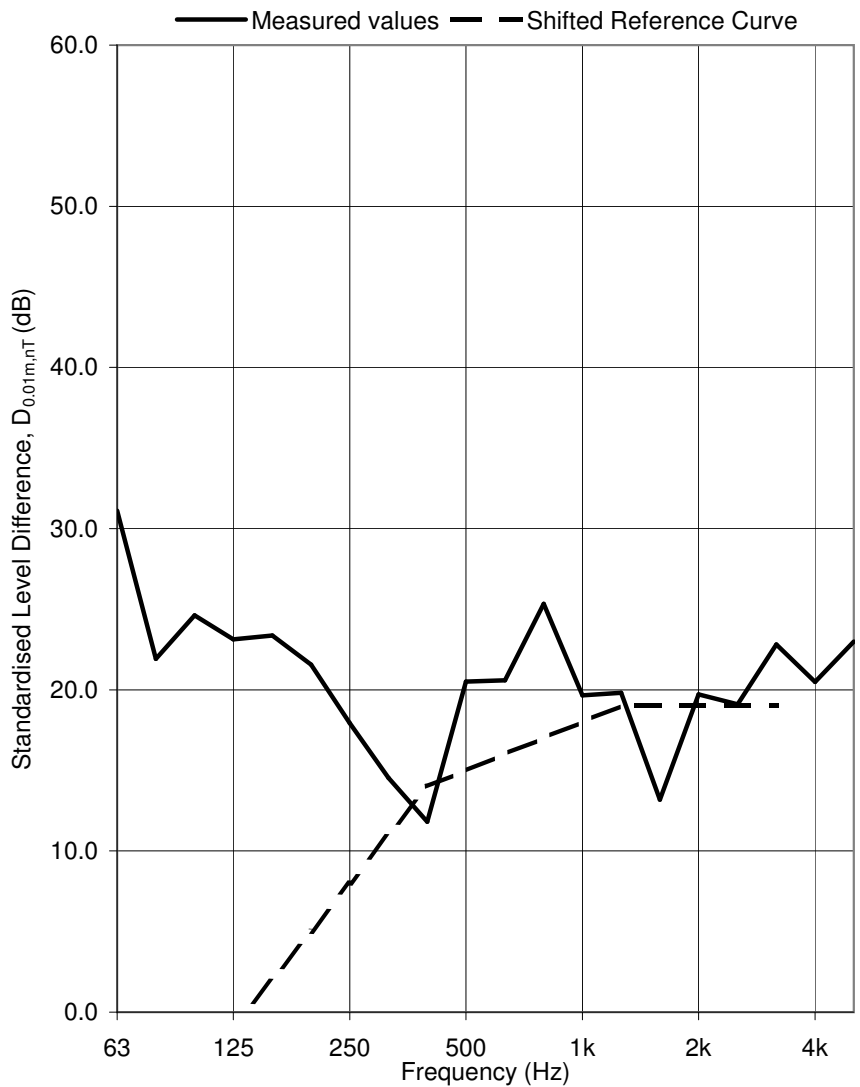
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713022

Test Sample: Window D-3 Open 0.10 m²

Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	26.3
63	31.1
80	21.9
100	24.6
125	23.1
160	23.4
200	21.6
250	17.9
315	14.5
400	11.8
500	20.5
630	20.6
800	25.3
1k	19.7
1.25k	19.8
1.6k	13.2
2k	19.7
2.5k	19.1
3.15k	22.8
4k	20.5
5k	23.0

$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-1; -1) dB

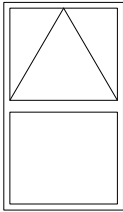
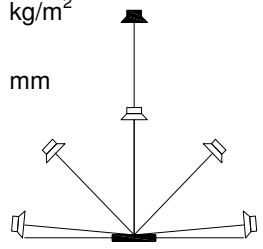
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

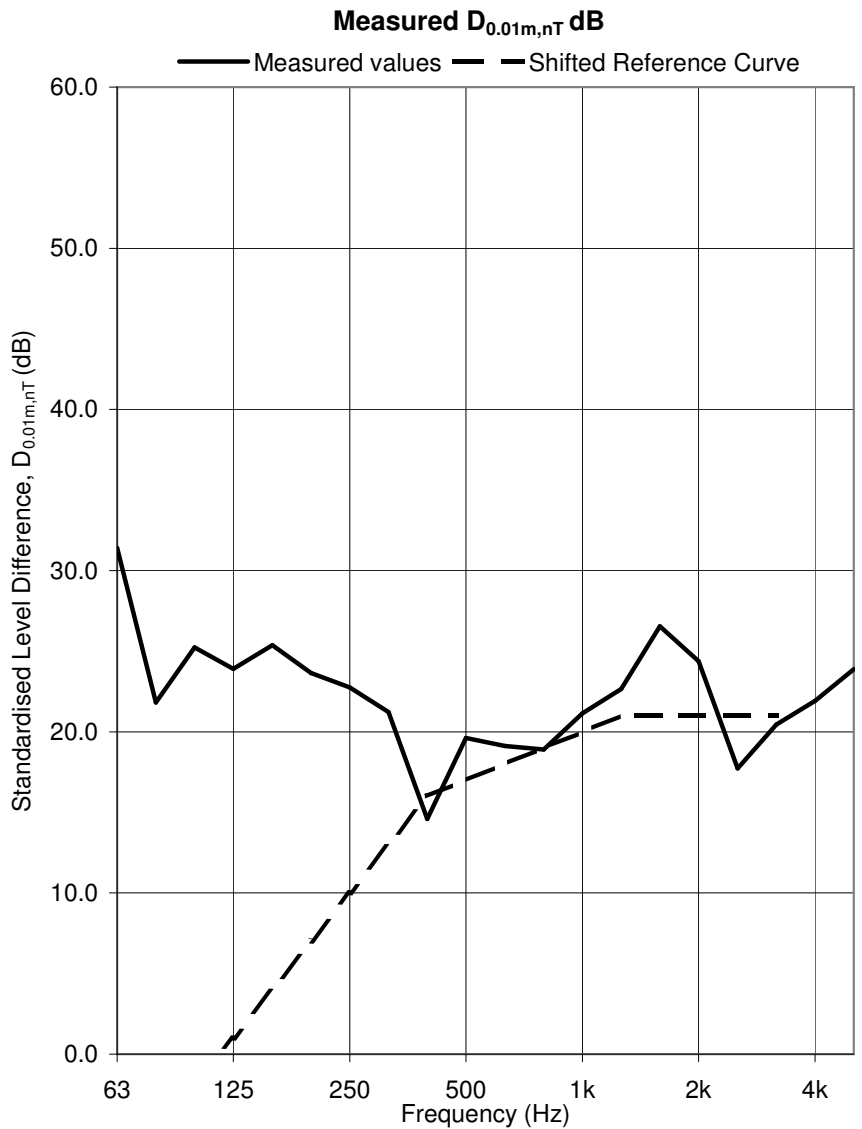
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718024

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	23.7
63	31.4
80	21.8
100	25.2
125	23.9
160	25.4
200	23.6
250	22.7
315	21.2
400	14.6
500	19.6
630	19.1
800	18.9
1k	21.1
1.25k	22.7
1.6k	26.5
2k	24.4
2.5k	17.7
3.15k	20.4
4k	21.9
5k	23.9



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; -1) dB}

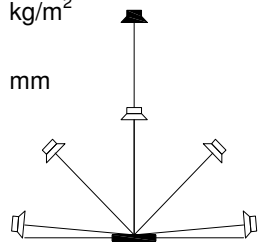
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

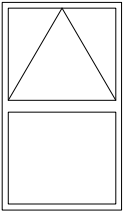
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

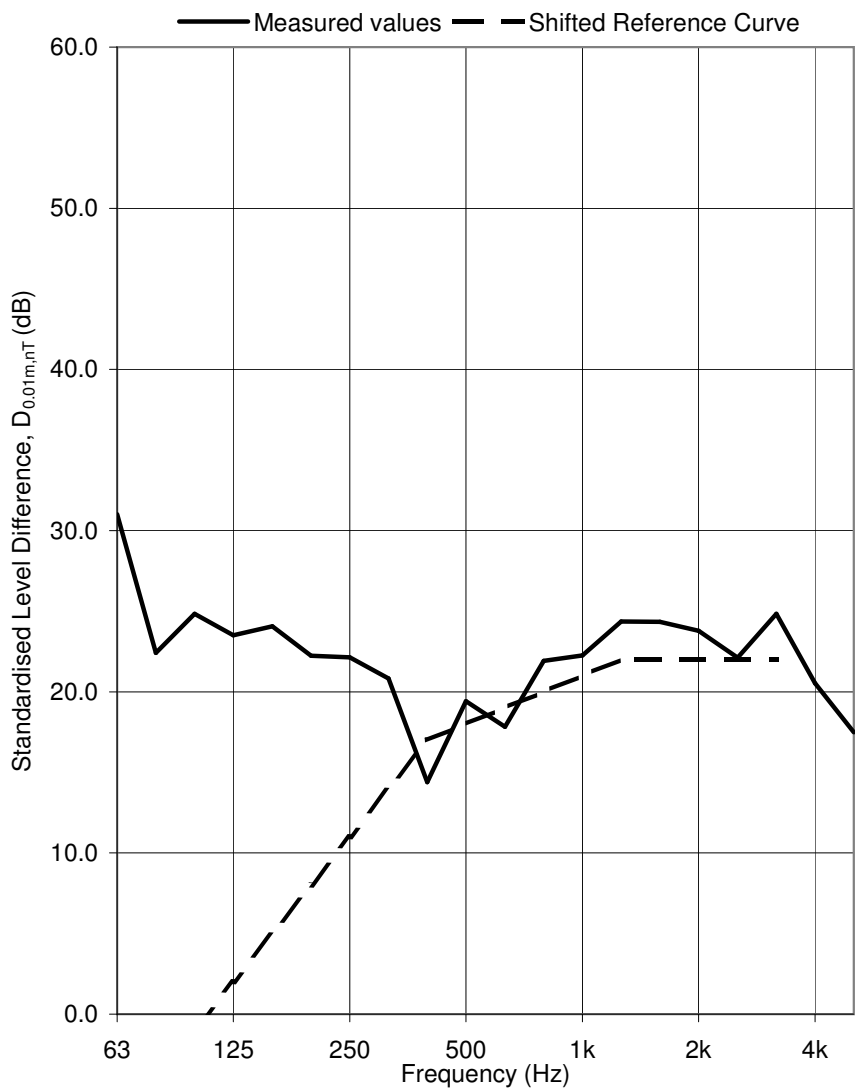


Test ID: 719005

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.1
63	31.0
80	22.4
100	24.8
125	23.5
160	24.1
200	22.2
250	22.1
315	20.8
400	14.4
500	19.4
630	17.8
800	21.9
1k	22.2
1.25k	24.4
1.6k	24.3
2k	23.8
2.5k	22.1
3.15k	24.8
4k	20.5
5k	17.5



$D_{0.01m,nT,w}(C;C_{tr})$ 22 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

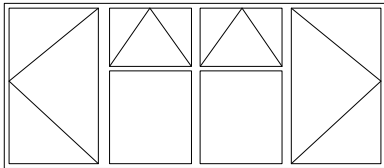
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

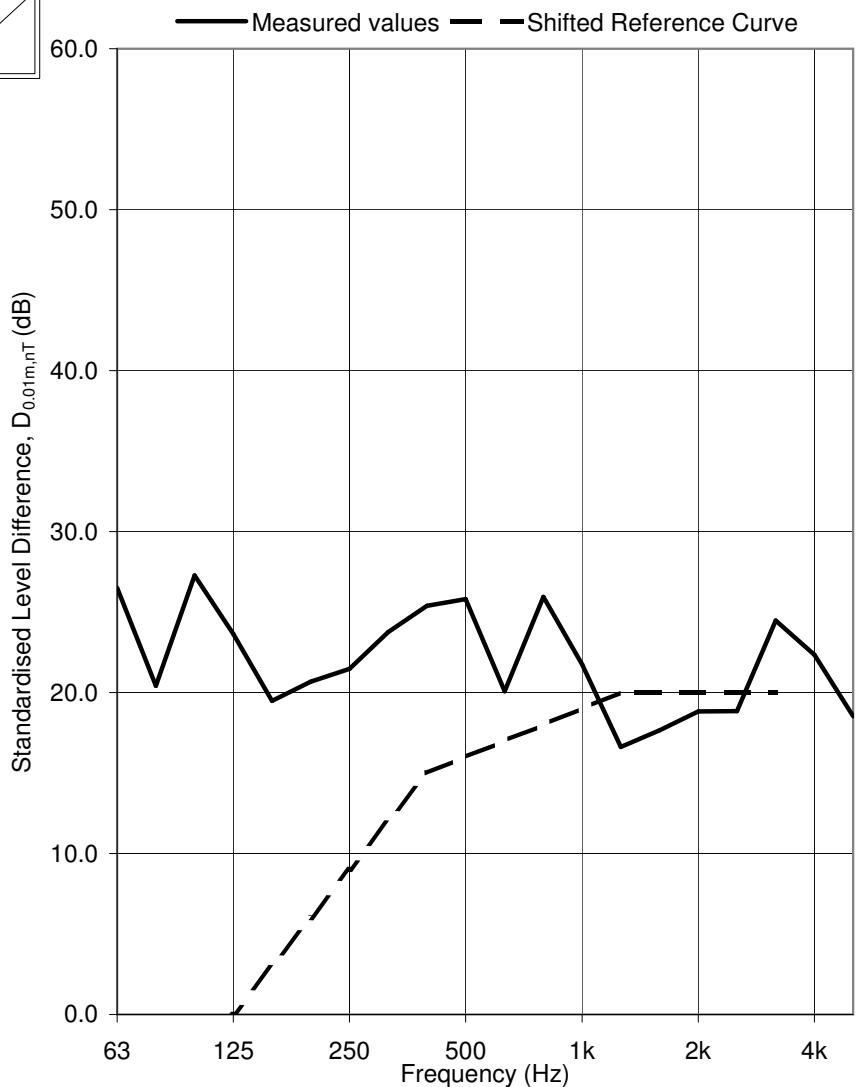
Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window A-1 Open 0.10 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 628111



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	19.5
63	26.5
80	20.4
100	27.3
125	23.6
160	19.5
200	20.7
250	21.5
315	23.8
400	25.4
500	25.8
630	20.1
800	25.9
1k	21.7
1.25k	16.6
1.6k	17.7
2k	18.8
2.5k	18.8
3.15k	24.5
4k	22.3
5k	18.5

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.



Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

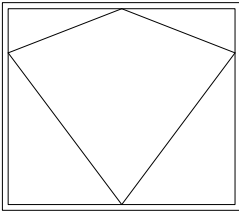
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

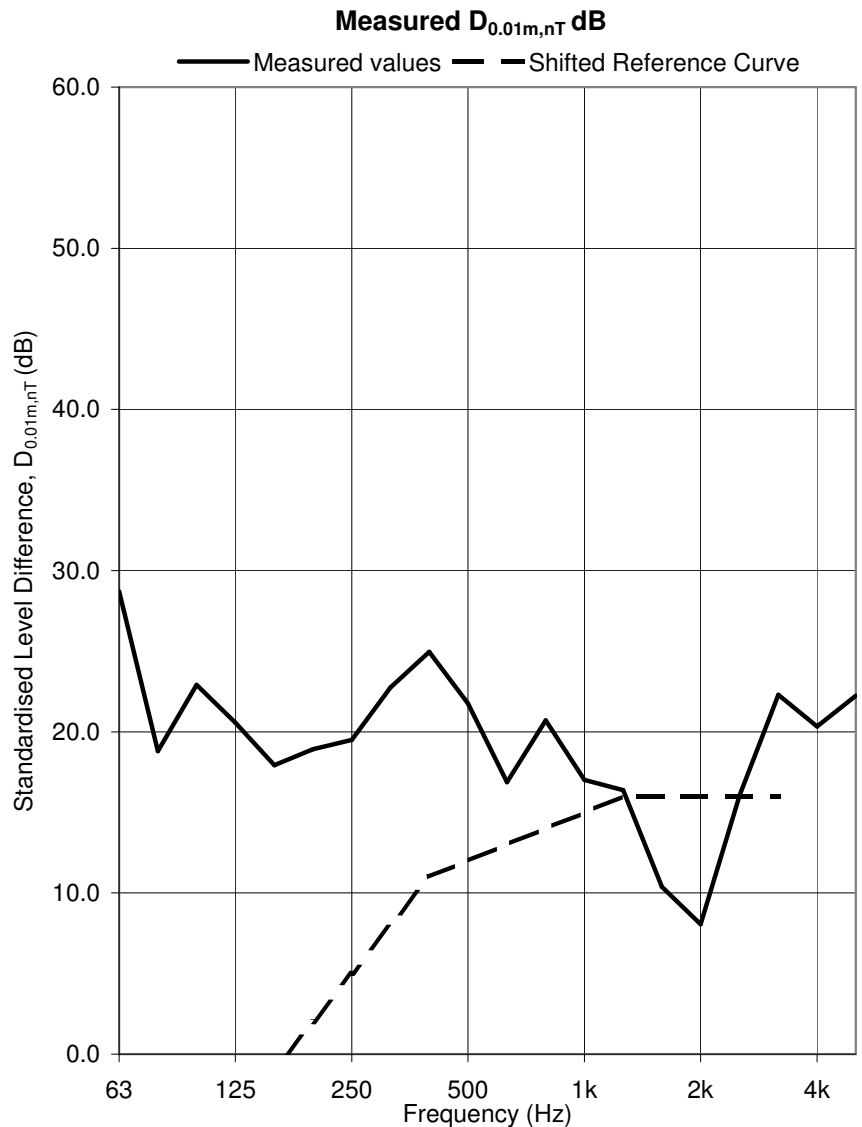
Test ID: 705034

Test Sample: Window B Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	22.8
63	28.7
80	18.8
100	22.9
125	20.6
160	17.9
200	18.9
250	19.5
315	22.7
400	25.0
500	21.8
630	16.9
800	20.7
1k	17.0
1.25k	16.4
1.6k	10.4
2k	8.1
2.5k	16.1
3.15k	22.3
4k	20.3
5k	22.2




D_{0.01m,nT,w(C;C_{tr}) 16 (-2; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

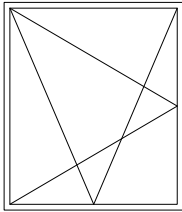
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

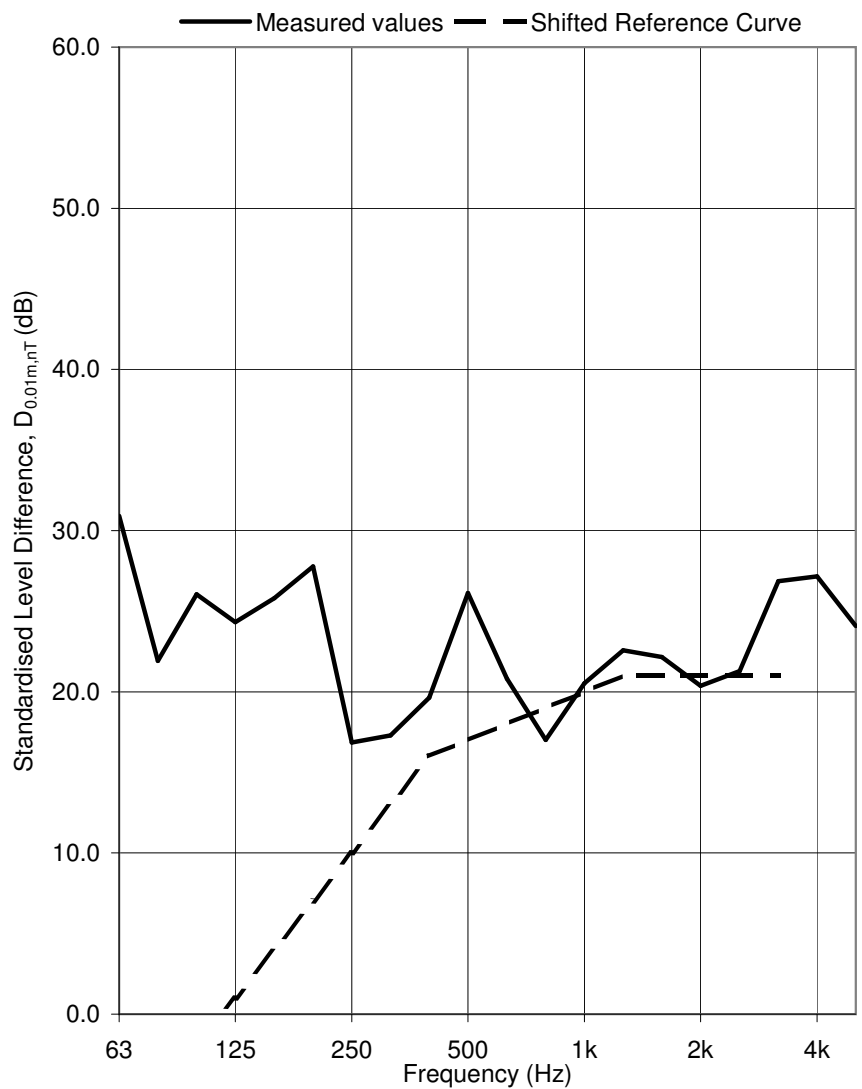
Test Sample: Window C-1 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711071

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.3
63	30.9
80	21.9
100	26.1
125	24.3
160	25.8
200	27.8
250	16.9
315	17.3
400	19.6
500	26.1
630	20.8
800	17.0
1k	20.5
1.25k	22.6
1.6k	22.2
2k	20.4
2.5k	21.3
3.15k	26.9
4k	27.2
5k	24.1


$D_{0.01m,nT,w}(C;C_{tr})$ 21 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

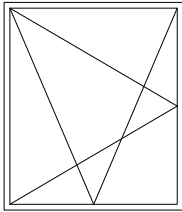
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

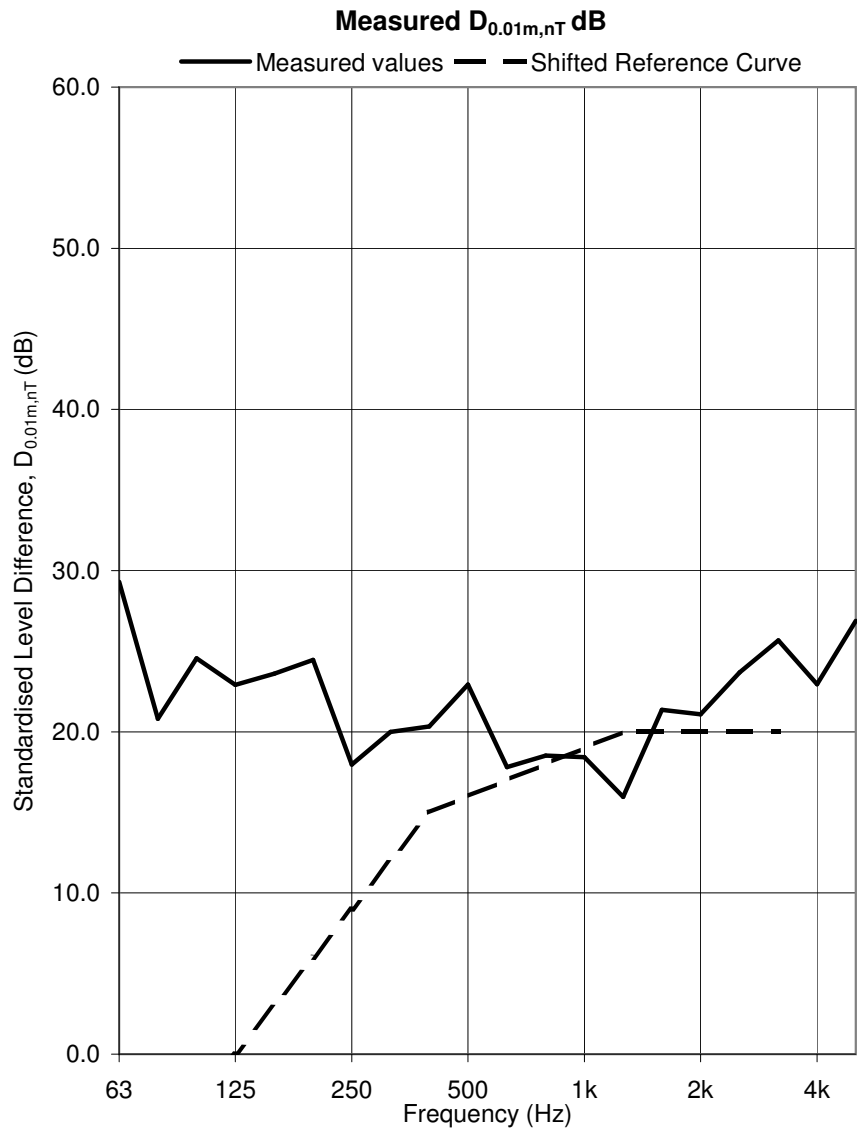
Test Sample: Window C-2 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711075

Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	21.5
63	29.3
80	20.8
100	24.6
125	22.9
160	23.6
200	24.5
250	18.0
315	20.0
400	20.3
500	22.9
630	17.8
800	18.5
1k	18.4
1.25k	16.0
1.6k	21.4
2k	21.1
2.5k	23.7
3.15k	25.7
4k	23.0
5k	26.9





D_{0.01m,nT,w(C;C_{tr}) 20 (0; -1) dB}

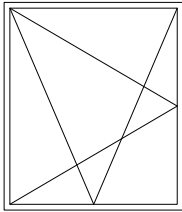
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

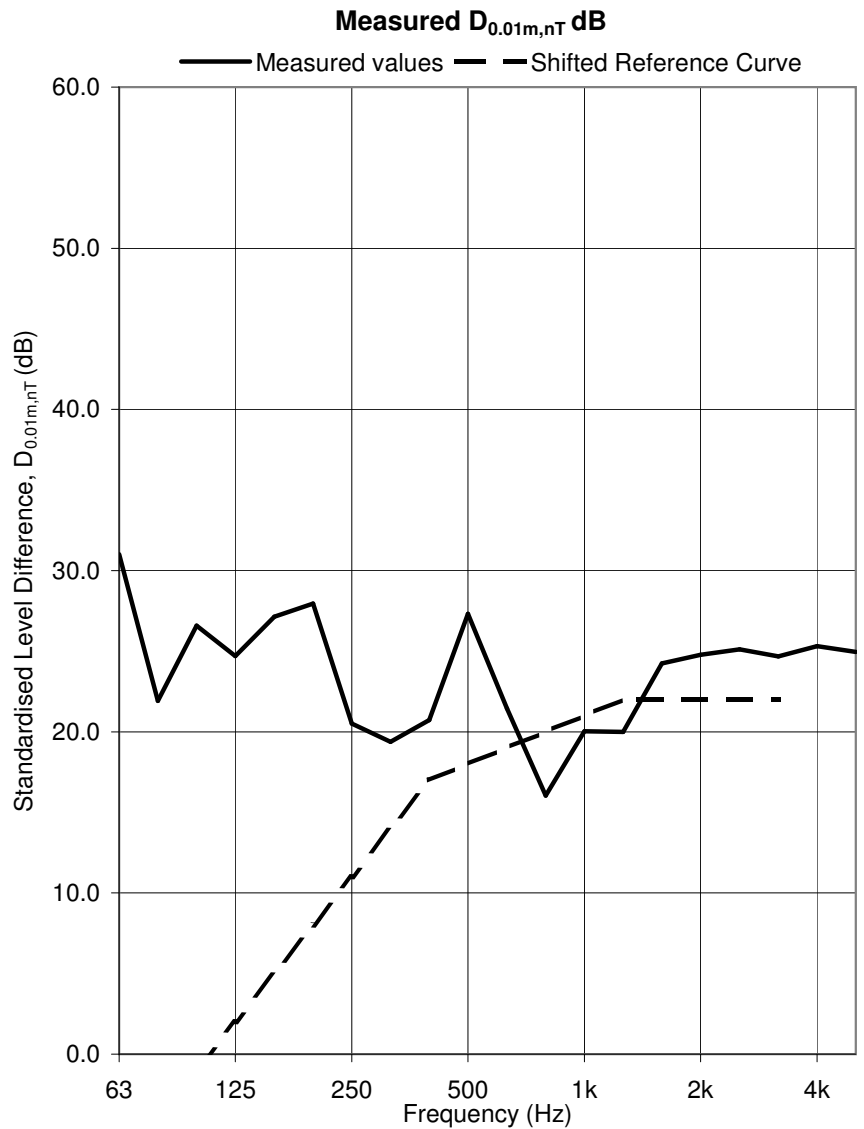
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 712007

Test Sample: Window C-3 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	24.0
63	31.0
80	21.9
100	26.6
125	24.7
160	27.1
200	28.0
250	20.5
315	19.4
400	20.7
500	27.3
630	21.4
800	16.0
1k	20.0
1.25k	20.0
1.6k	24.3
2k	24.8
2.5k	25.1
3.15k	24.7
4k	25.3
5k	25.0



D_{0.01m,nT,w(C;C_{tr}) 22 (-1; -1) dB}


Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

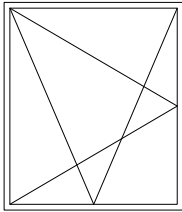
Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.10 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

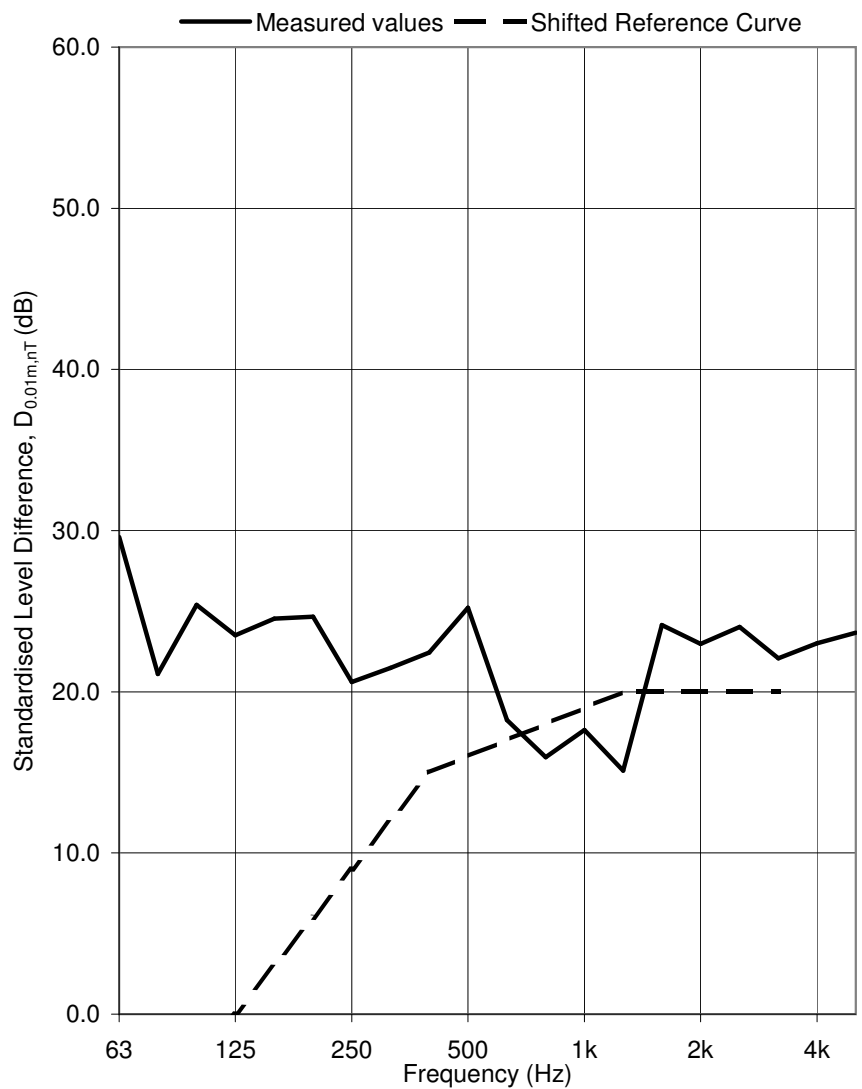
Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712011

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.7
63	29.6
80	21.1
100	25.4
125	23.5
160	24.5
200	24.7
250	20.6
315	21.5
400	22.4
500	25.2
630	18.2
800	15.9
1k	17.6
1.25k	15.1
1.6k	24.2
2k	23.0
2.5k	24.0
3.15k	22.1
4k	23.0
5k	23.7


$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

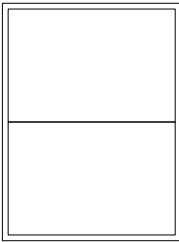
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

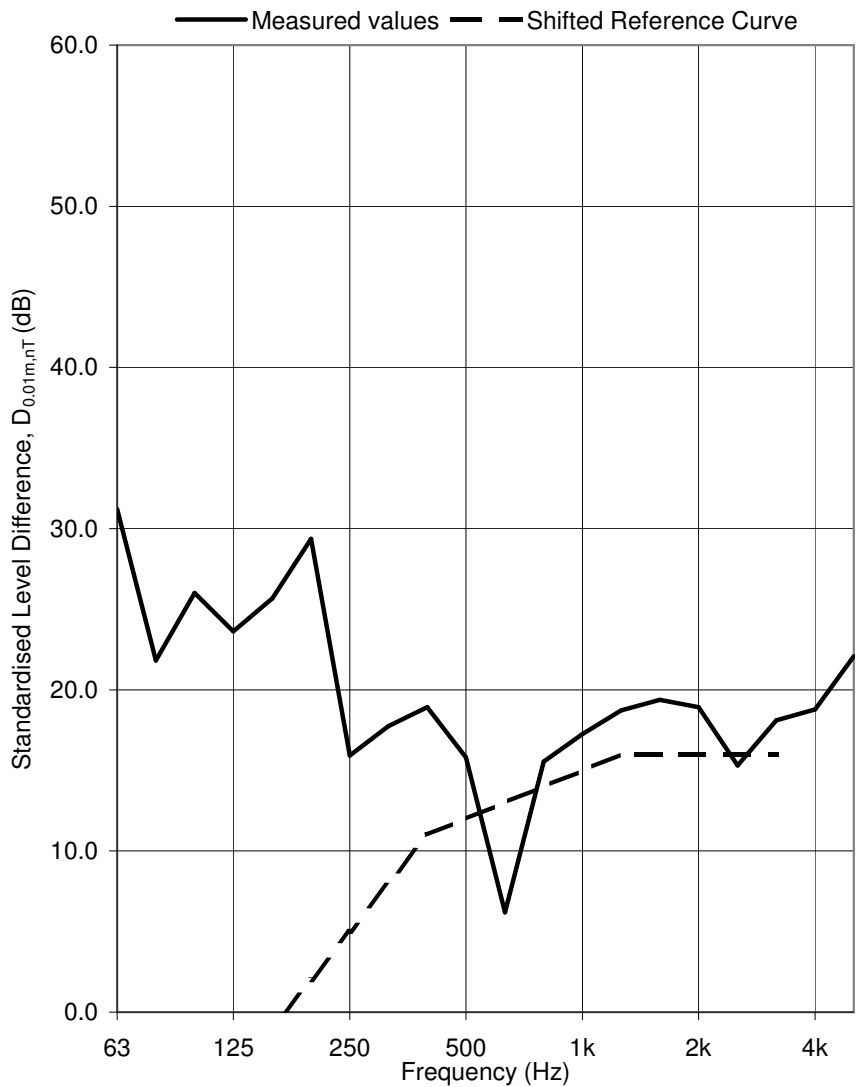
Test Sample: Window D-1 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 713068

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	24.5
63	31.2
80	21.8
100	26.0
125	23.6
160	25.7
200	29.4
250	15.9
315	17.7
400	18.9
500	15.8
630	6.2
800	15.5
1k	17.3
1.25k	18.7
1.6k	19.4
2k	18.9
2.5k	15.3
3.15k	18.1
4k	18.8
5k	22.1



D_{0.01m,nT,w(C;C_{tr}) 16 (-1; -1) dB}

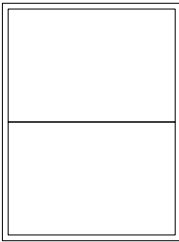
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

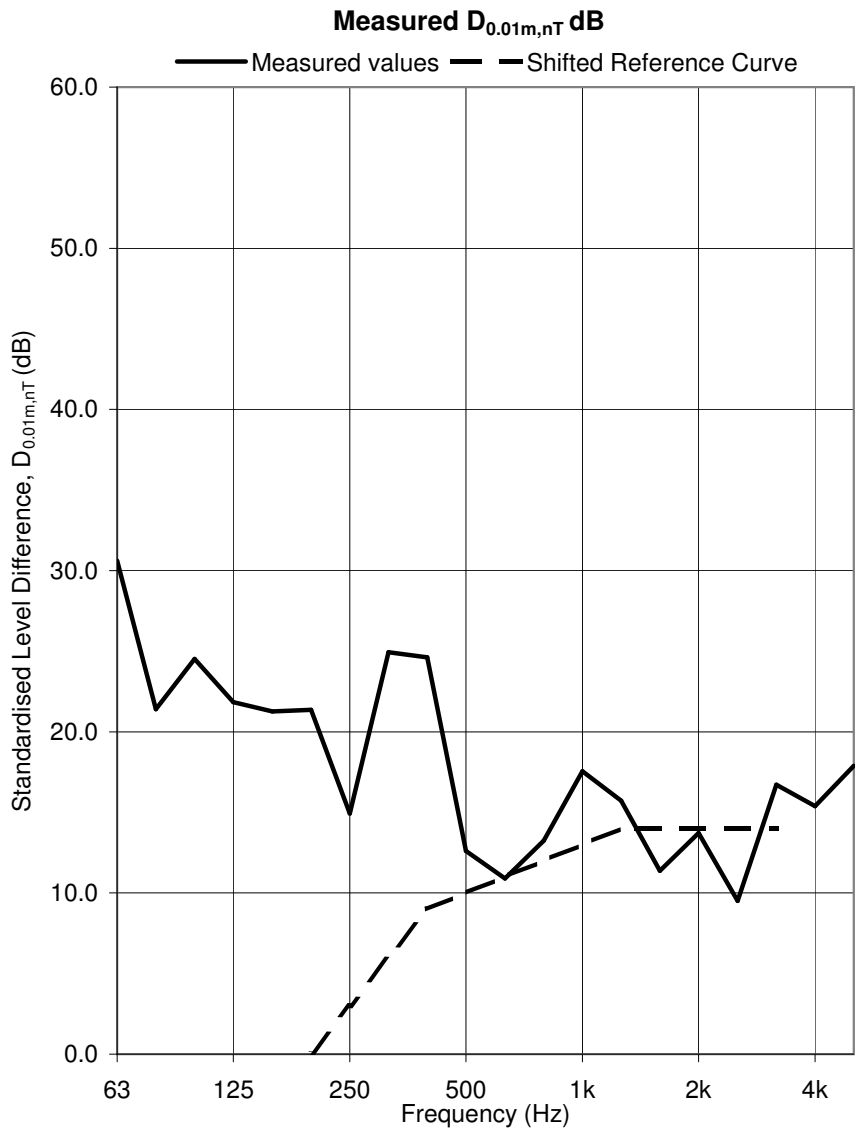
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713060

Test Sample: Window D-2 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	24.9
63	30.6
80	21.4
100	24.5
125	21.8
160	21.3
200	21.4
250	14.9
315	24.9
400	24.6
500	12.6
630	10.9
800	13.2
1k	17.6
1.25k	15.7
1.6k	11.4
2k	13.7
2.5k	9.5
3.15k	16.7
4k	15.4
5k	17.9




D_{0.01m,nT,w(C;C_{tr}) 14 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

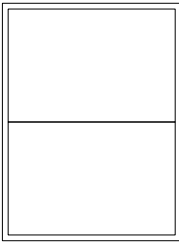
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

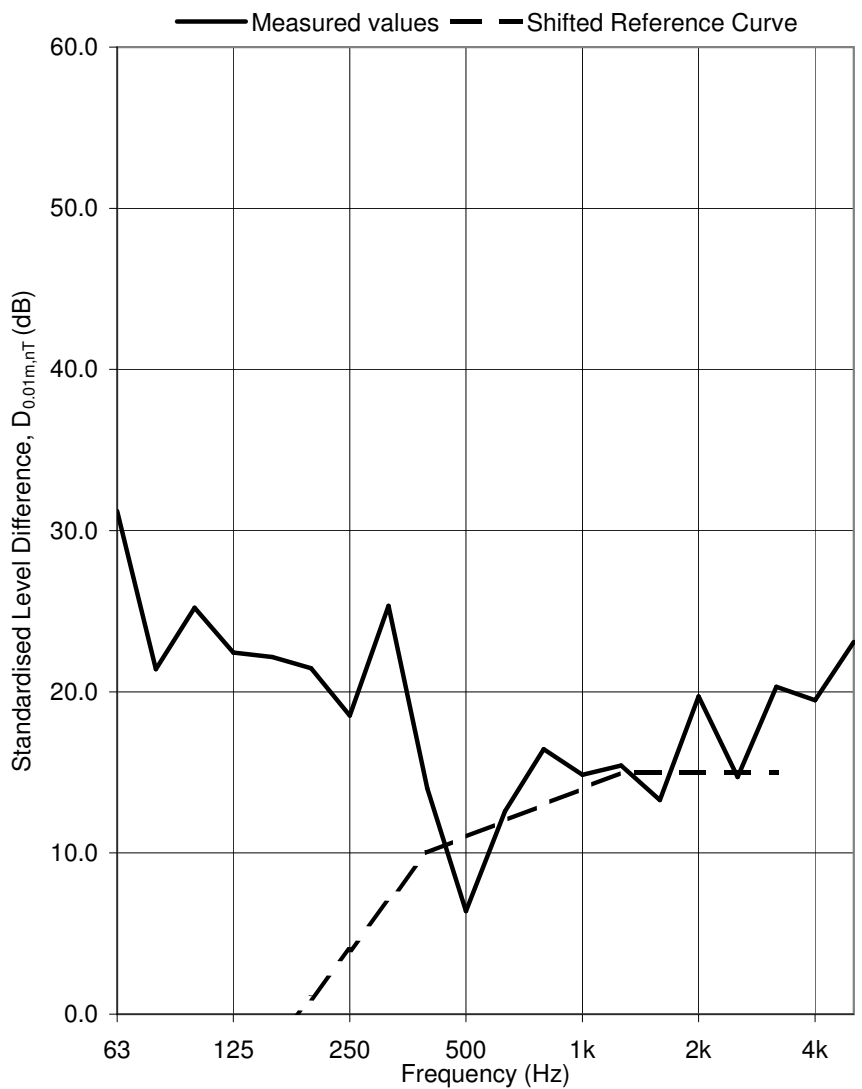
Test Sample: Window D-3 Open 0.10 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 713064

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	26.2
63	31.2
80	21.4
100	25.2
125	22.4
160	22.2
200	21.5
250	18.5
315	25.3
400	14.0
500	6.4
630	12.6
800	16.4
1k	14.9
1.25k	15.4
1.6k	13.3
2k	19.7
2.5k	14.7
3.15k	20.3
4k	19.5
5k	23.1



D_{0.01m,nT,w(C;C_{tr}) 15 (-1; -1) dB}

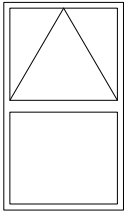
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

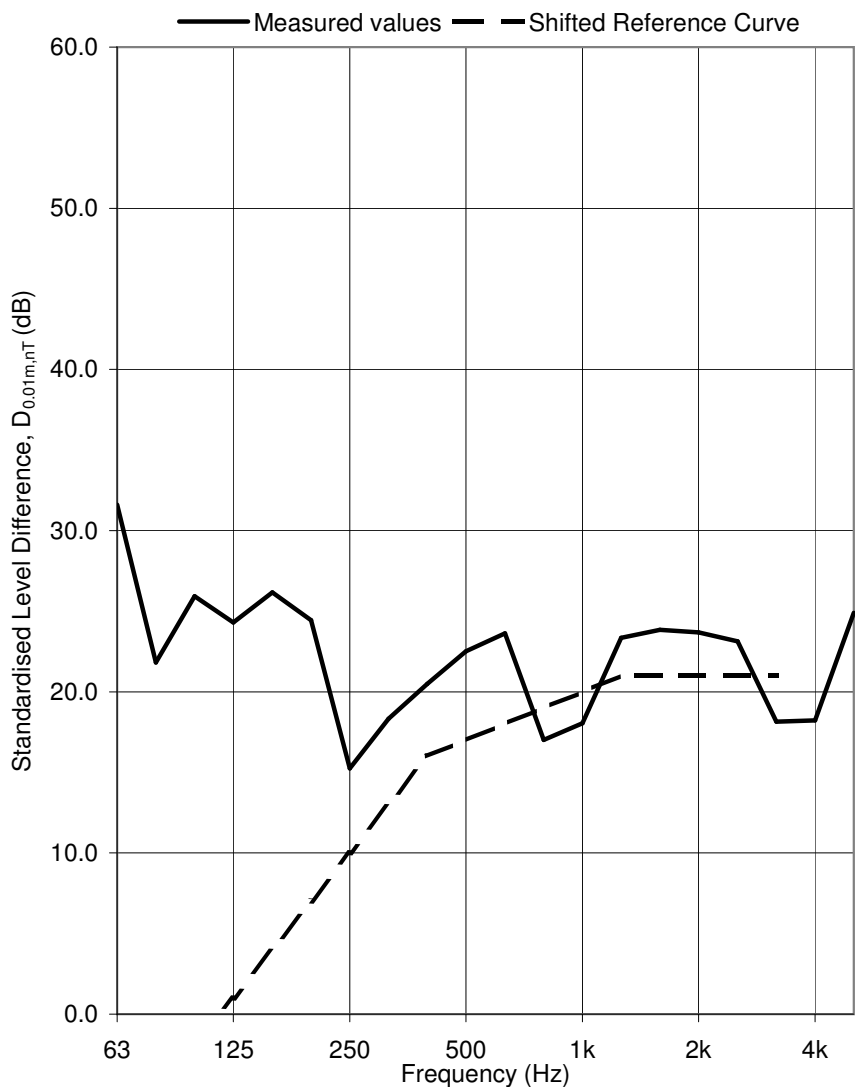
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718033

Test Sample: Window E Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	25.7
63	31.6
80	21.8
100	25.9
125	24.3
160	26.2
200	24.4
250	15.2
315	18.3
400	20.5
500	22.5
630	23.6
800	17.0
1k	18.0
1.25k	23.4
1.6k	23.8
2k	23.7
2.5k	23.1
3.15k	18.1
4k	18.2
5k	24.9


$D_{0.01m,nT,w}(C;C_{tr})$ 21 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

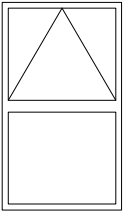
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

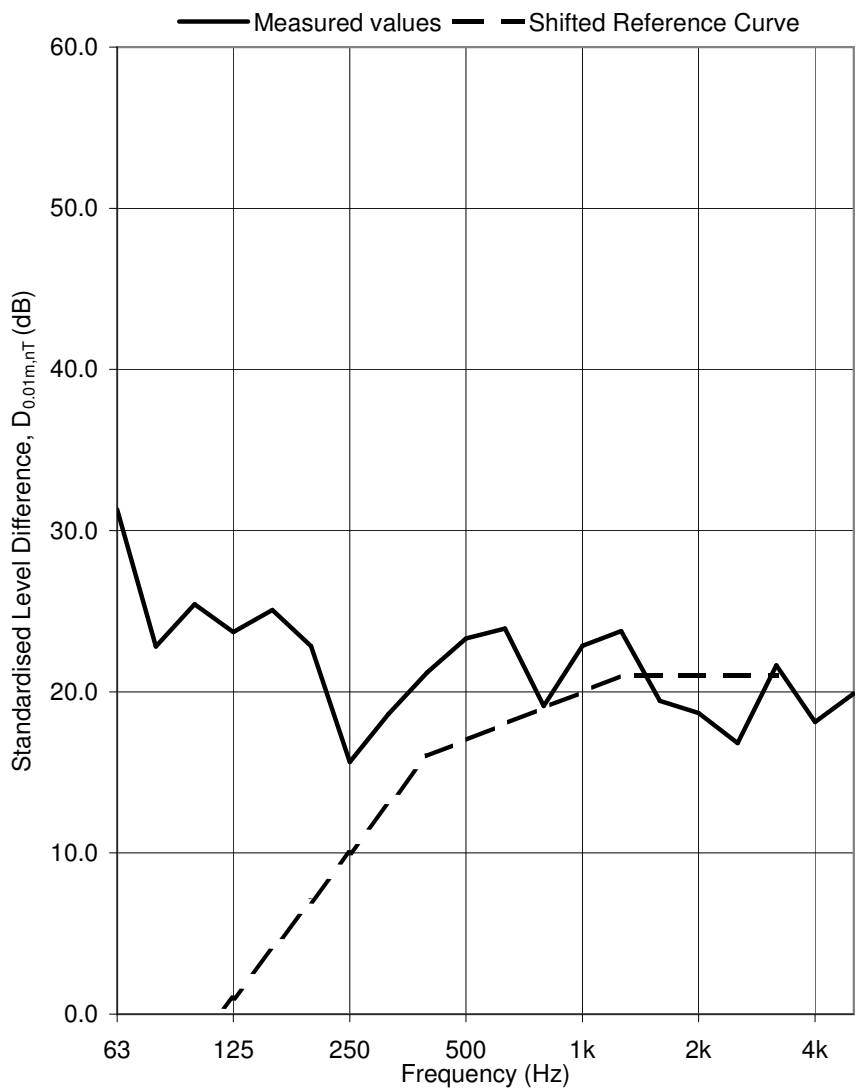
Test Sample: Window F Open 0.10 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 719010

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	24.9
63	31.3
80	22.8
100	25.4
125	23.7
160	25.1
200	22.8
250	15.6
315	18.6
400	21.2
500	23.3
630	23.9
800	19.1
1k	22.8
1.25k	23.8
1.6k	19.4
2k	18.7
2.5k	16.8
3.15k	21.6
4k	18.1
5k	19.9



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; -1) dB}

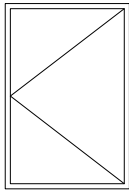
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

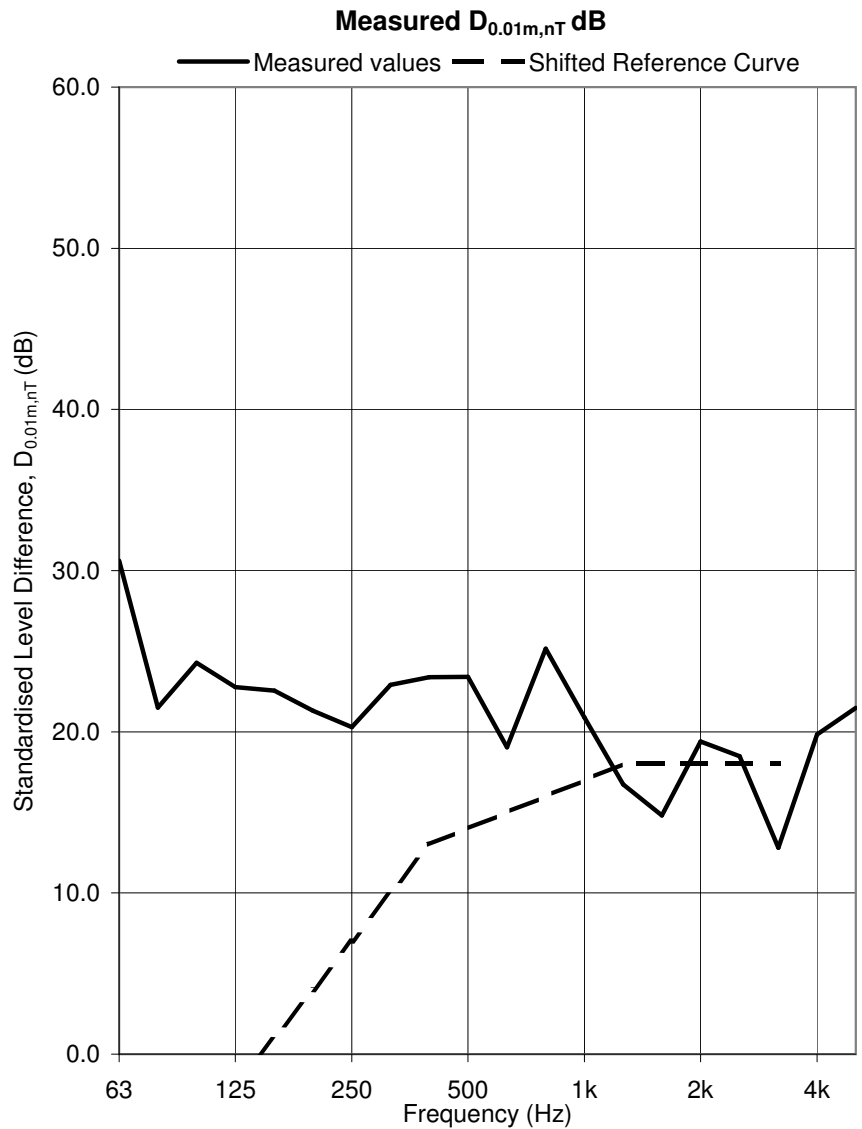
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720010

Test Sample: Window G Open 0.10 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	24.5
63	30.6
80	21.5
100	24.3
125	22.8
160	22.6
200	21.3
250	20.3
315	22.9
400	23.4
500	23.4
630	19.0
800	25.2
1k	20.9
1.25k	16.7
1.6k	14.8
2k	19.4
2.5k	18.5
3.15k	12.8
4k	19.8
5k	21.5



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; 1) dB}

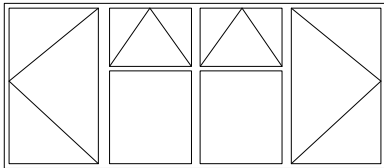
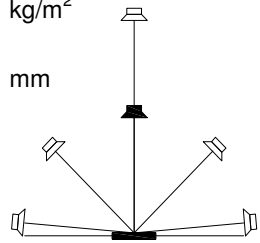
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

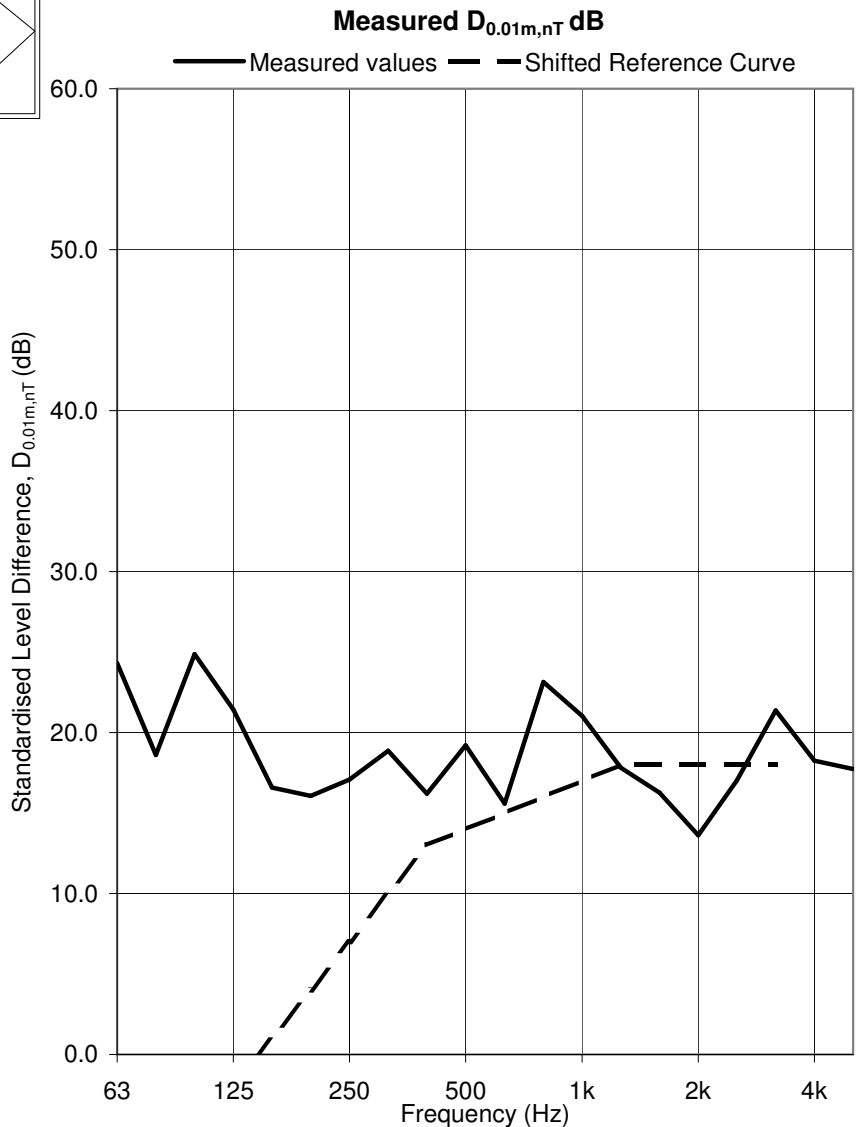
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628016

Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	17.4
63	24.3
80	18.6
100	24.9
125	21.4
160	16.6
200	16.1
250	17.1
315	18.9
400	16.2
500	19.2
630	15.6
800	23.1
1k	21.0
1.25k	17.8
1.6k	16.3
2k	13.6
2.5k	17.0
3.15k	21.4
4k	18.2
5k	17.7



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

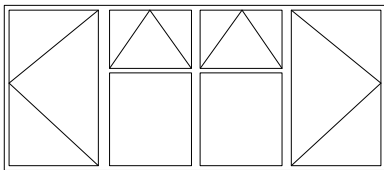
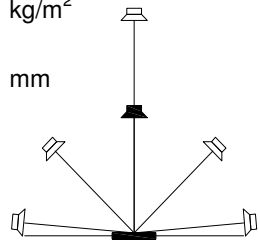
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

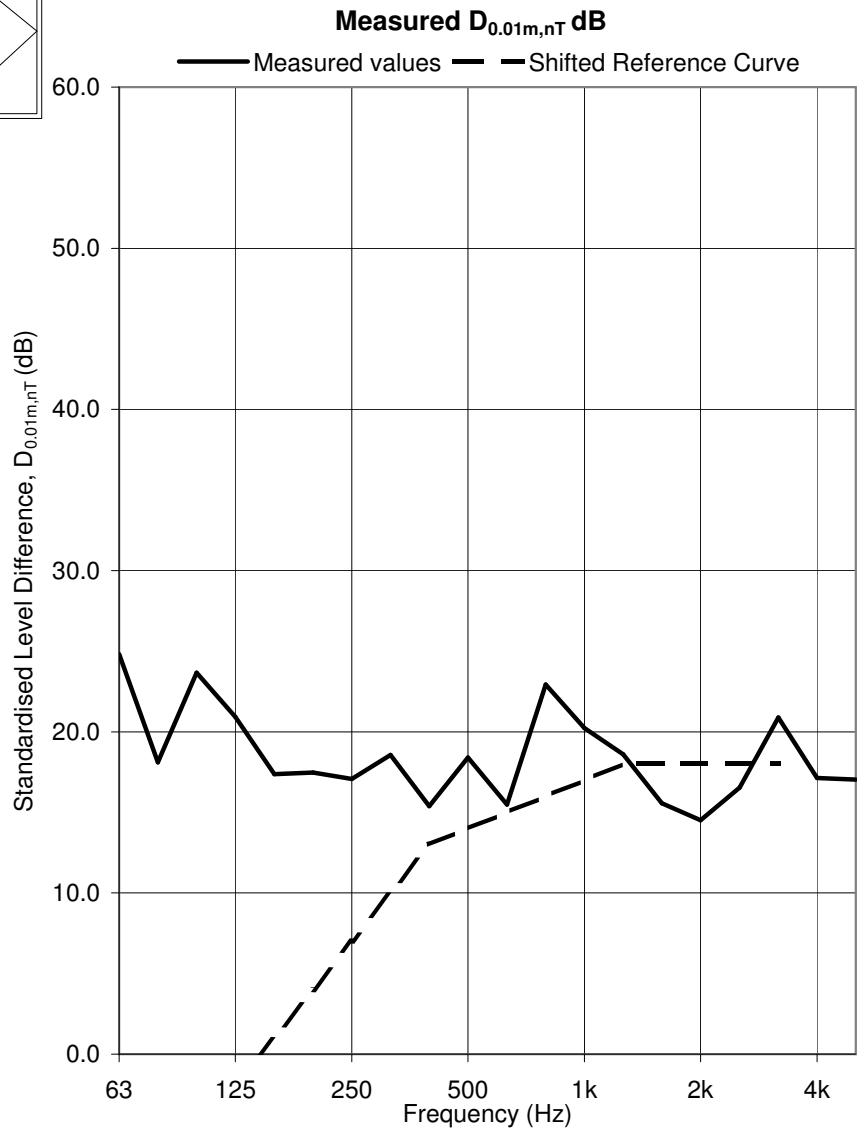
Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0109 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window A-2 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	17.6
63	24.8
80	18.1
100	23.7
125	20.9
160	17.4
200	17.5
250	17.1
315	18.6
400	15.4
500	18.4
630	15.5
800	22.9
1k	20.2
1.25k	18.6
1.6k	15.6
2k	14.5
2.5k	16.5
3.15k	20.9
4k	17.1
5k	17.0



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

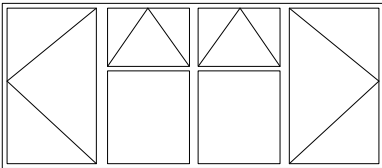
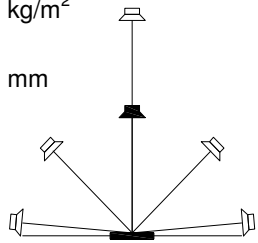
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0112 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

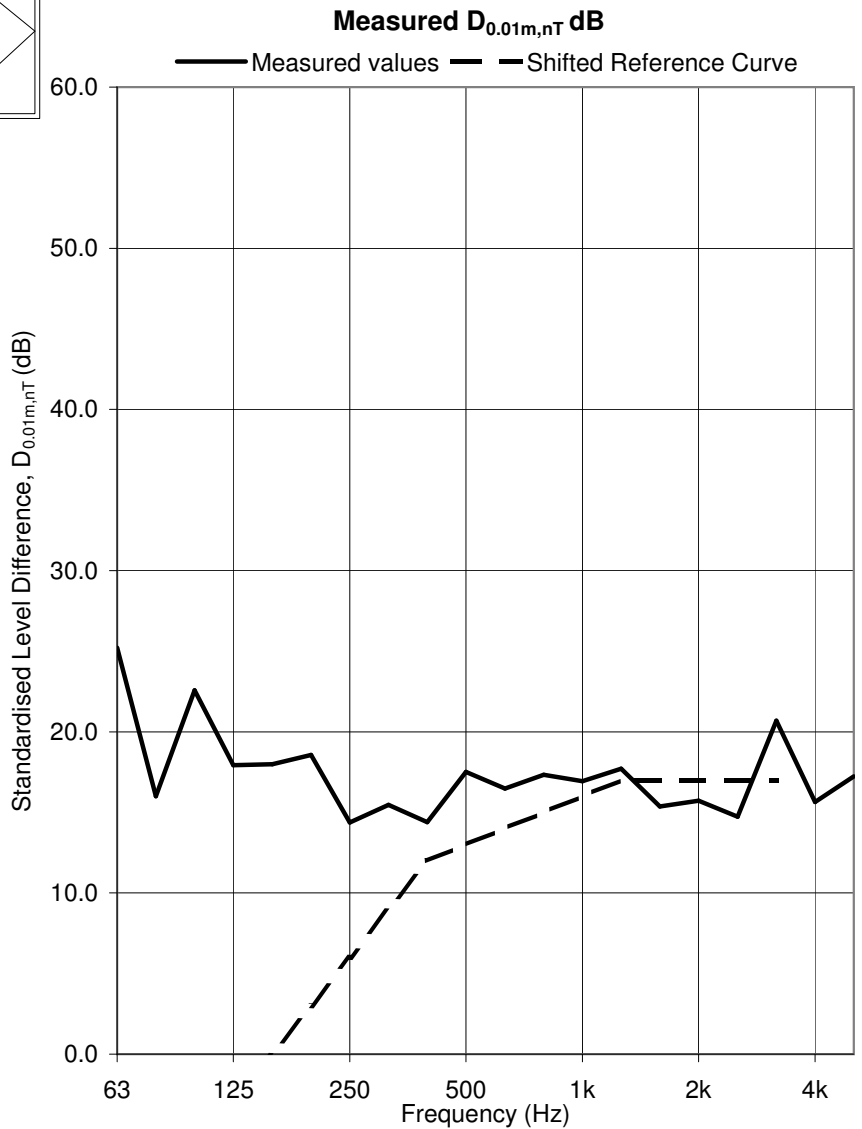
Test Sample: Window A-3 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628006

Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	18.3
63	25.2
80	16.0
100	22.6
125	17.9
160	18.0
200	18.6
250	14.4
315	15.5
400	14.4
500	17.5
630	16.5
800	17.3
1k	16.9
1.25k	17.7
1.6k	15.4
2k	15.7
2.5k	14.7
3.15k	20.7
4k	15.6
5k	17.2



D_{0.01m,nT,w(C;C_{tr}) 17 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

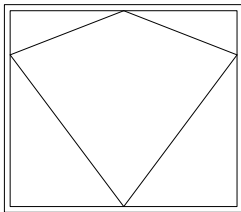
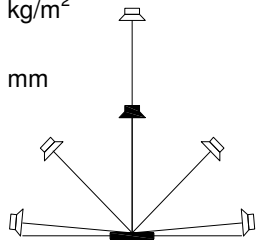
Date: 5/7/05
 Air temperature: 18.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

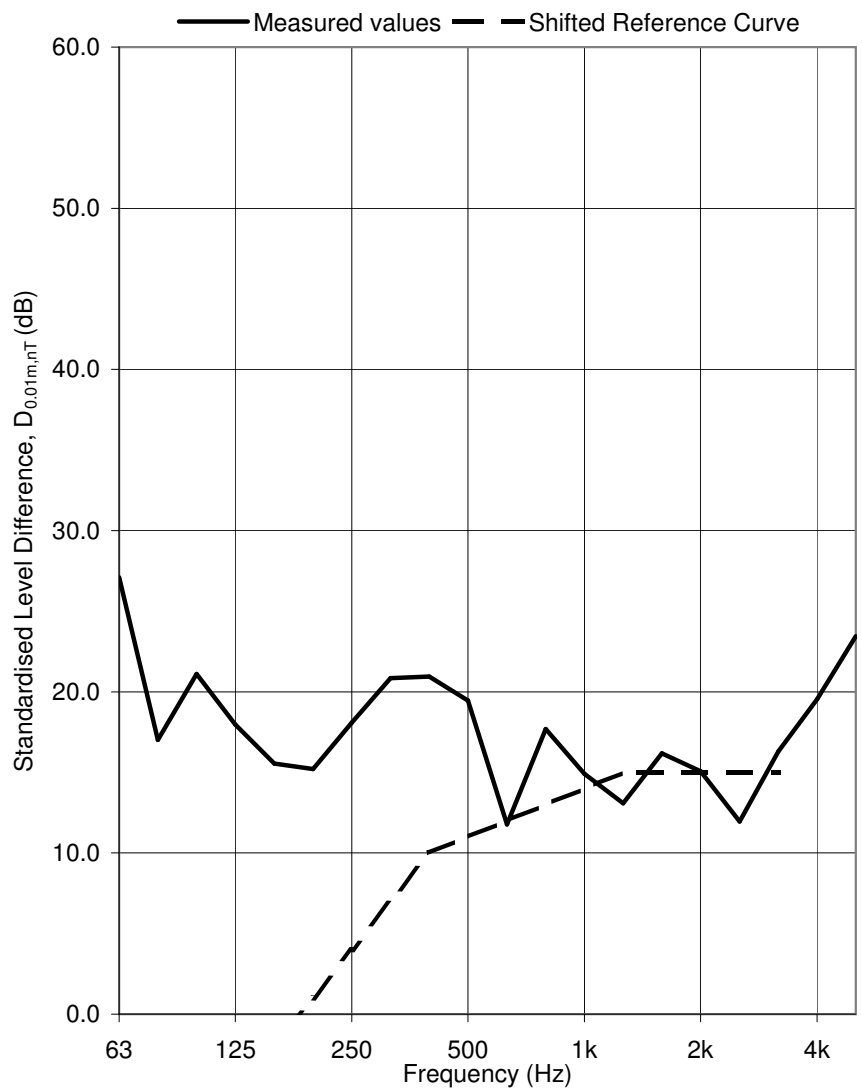
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705005

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.3
63	27.1
80	17.0
100	21.1
125	18.0
160	15.5
200	15.2
250	18.1
315	20.8
400	21.0
500	19.5
630	11.8
800	17.7
1k	14.9
1.25k	13.1
1.6k	16.2
2k	15.1
2.5k	12.0
3.15k	16.3
4k	19.5
5k	23.4

$D_{0.01m,nT,w}(C;C_{tr})$ 15 (0; 0) dB

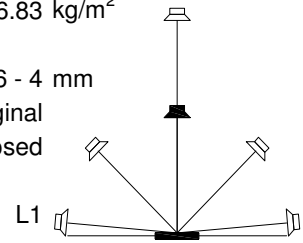
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

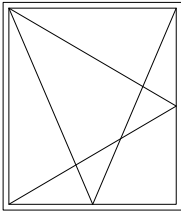
Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

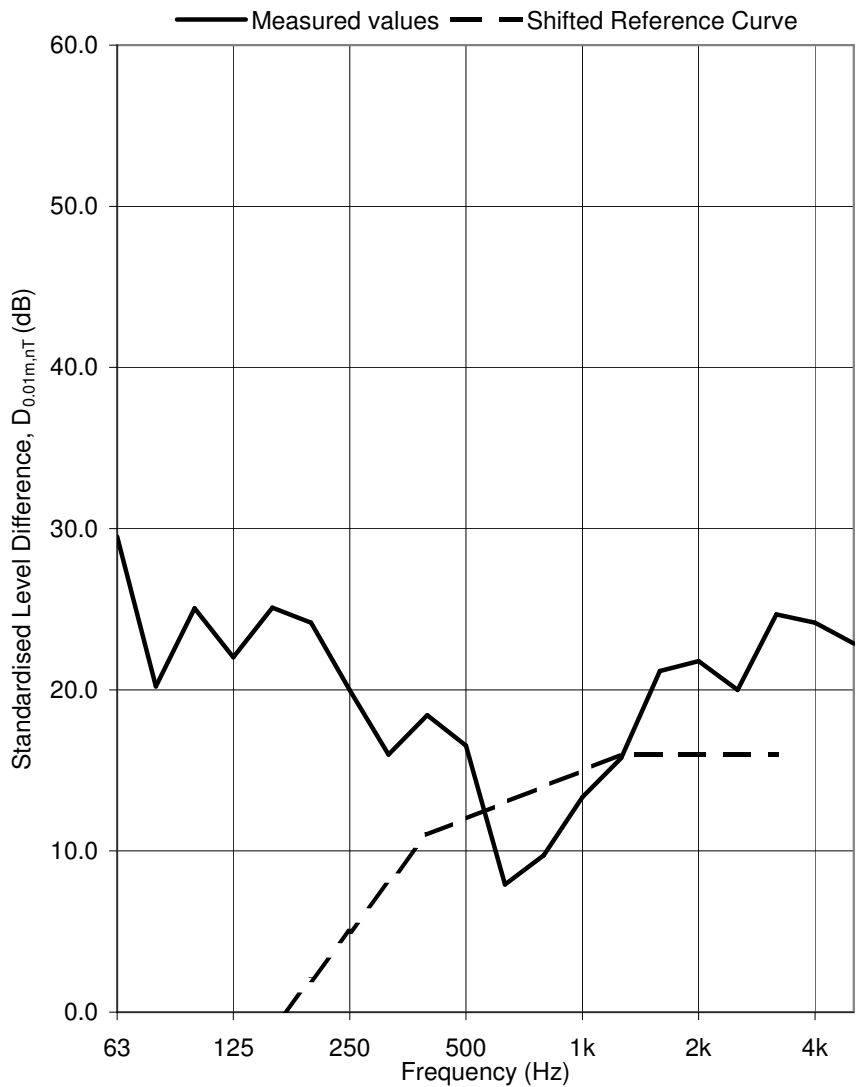


Test ID: 711008

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.5
63	29.5
80	20.2
100	25.1
125	22.0
160	25.1
200	24.2
250	20.0
315	16.0
400	18.4
500	16.5
630	7.9
800	9.7
1k	13.3
1.25k	15.8
1.6k	21.2
2k	21.8
2.5k	20.0
3.15k	24.7
4k	24.2
5k	22.9

$D_{0.01m,nT,w(C;C_{tr})}$ 16 (-1; -2) dB

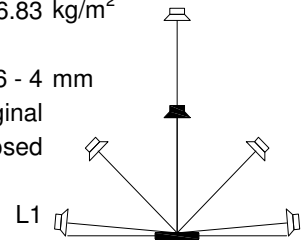
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

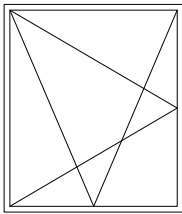
Date: 11/7/05
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0281 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

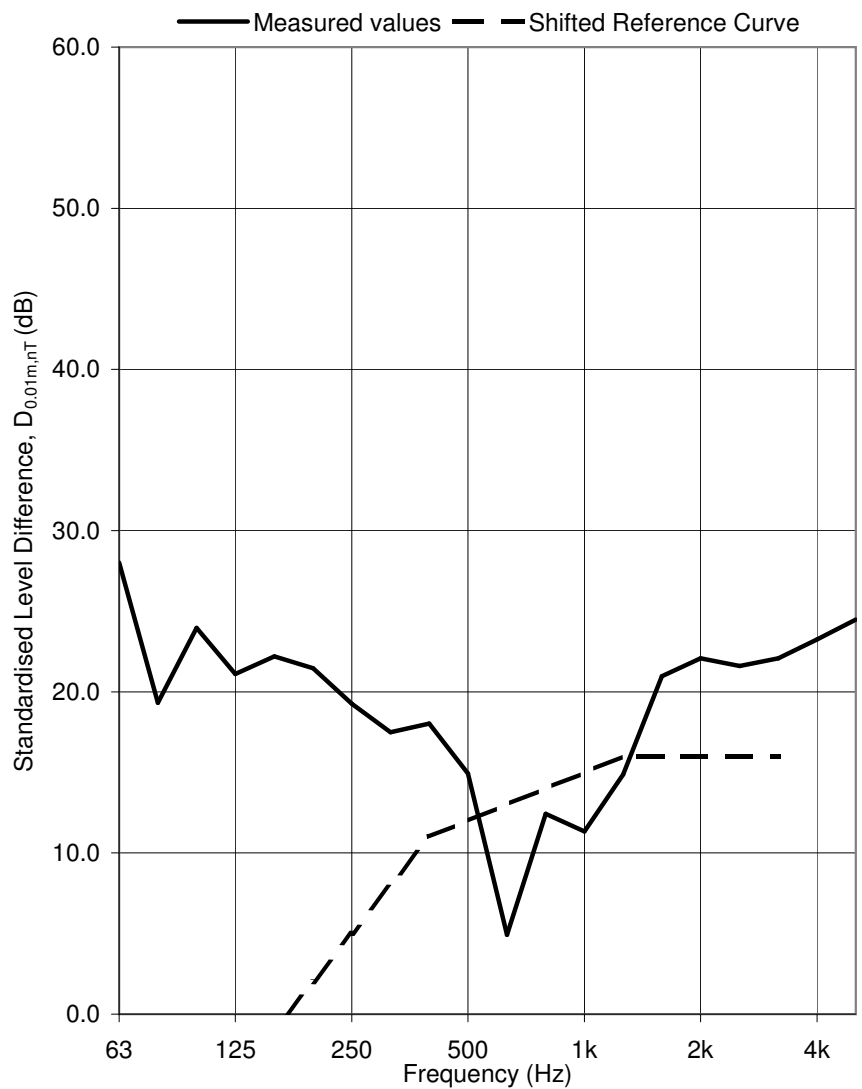


Test ID: 711012

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	20.9
63	28.0
80	19.3
100	24.0
125	21.1
160	22.2
200	21.5
250	19.3
315	17.5
400	18.0
500	14.9
630	4.9
800	12.4
1k	11.3
1.25k	14.9
1.6k	21.0
2k	22.1
2.5k	21.6
3.15k	22.1
4k	23.3
5k	24.5

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (-2; -3) dB

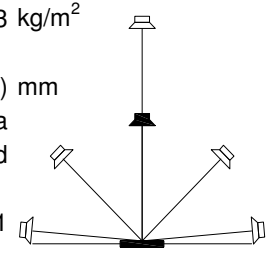
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

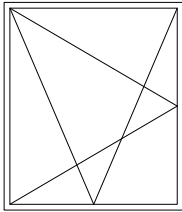
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

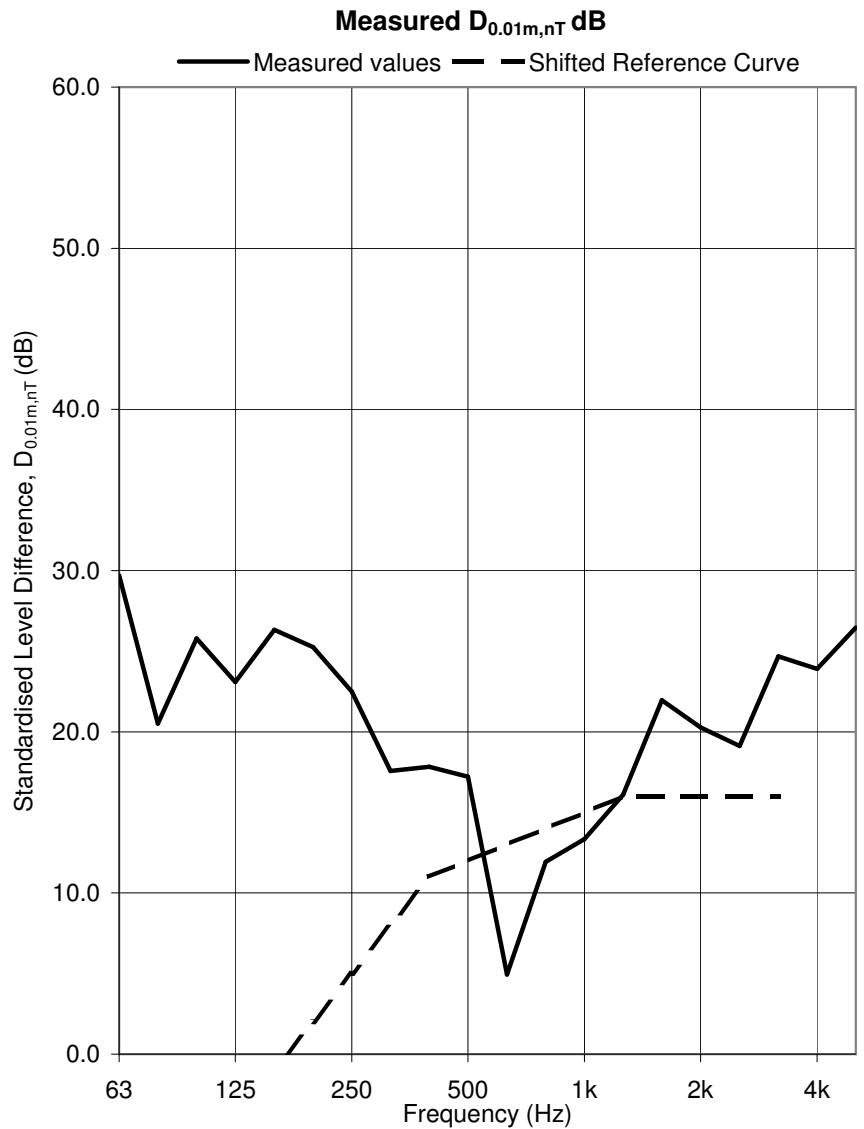


Test ID: 712034

Loudspeaker Configuration:



Frequency Hz	D _{0.01m,nT} dB
50	22.5
63	29.7
80	20.5
100	25.8
125	23.1
160	26.3
200	25.3
250	22.5
315	17.6
400	17.8
500	17.2
630	4.9
800	11.9
1k	13.3
1.25k	16.1
1.6k	22.0
2k	20.3
2.5k	19.1
3.15k	24.7
4k	23.9
5k	26.5



D_{0.01m,nT,w(C;C_{tr}) 16 (-2; -3) dB}

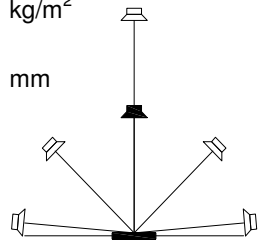
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

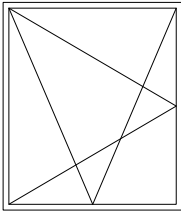
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.025 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

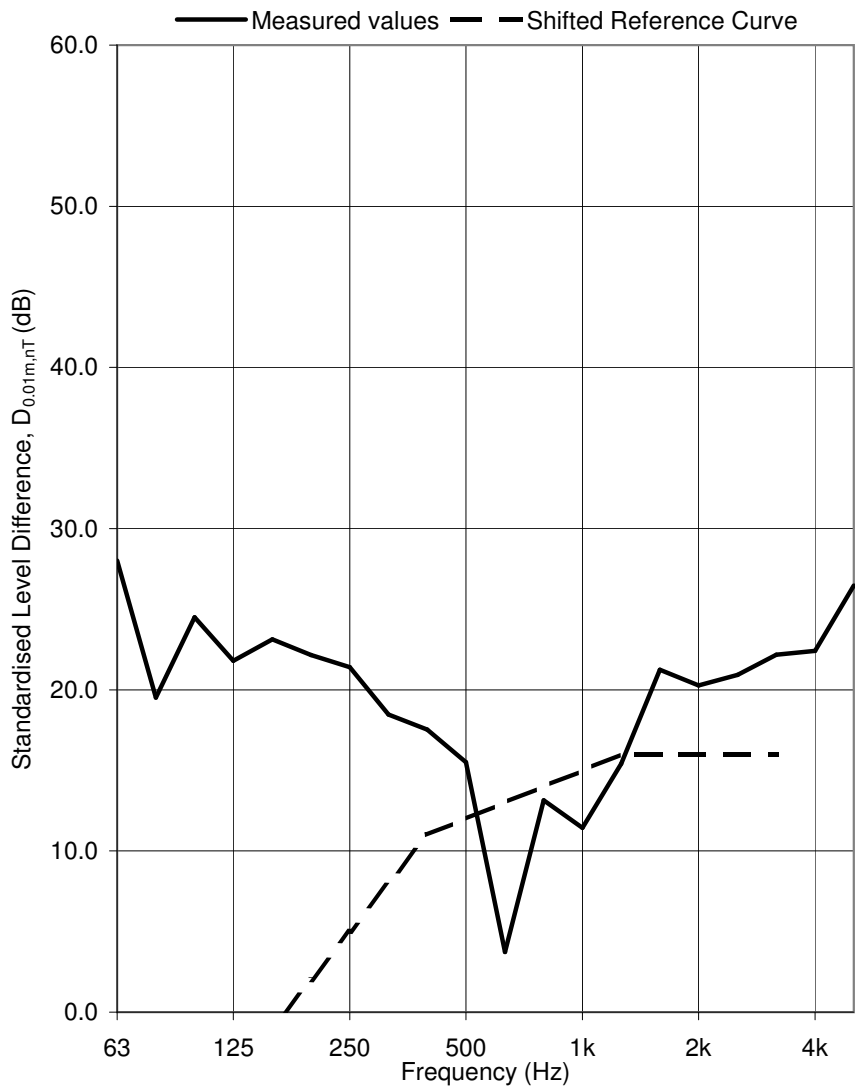


Test ID: 712038

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	20.8
63	28.0
80	19.5
100	24.5
125	21.8
160	23.1
200	22.2
250	21.4
315	18.5
400	17.5
500	15.5
630	3.7
800	13.1
1k	11.4
1.25k	15.4
1.6k	21.3
2k	20.3
2.5k	20.9
3.15k	22.2
4k	22.4
5k	26.5

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (-3; -4) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

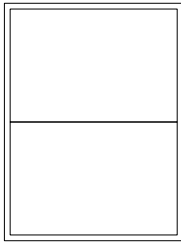
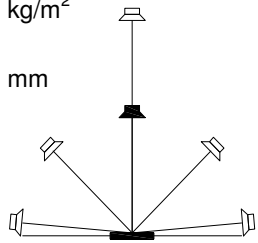
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

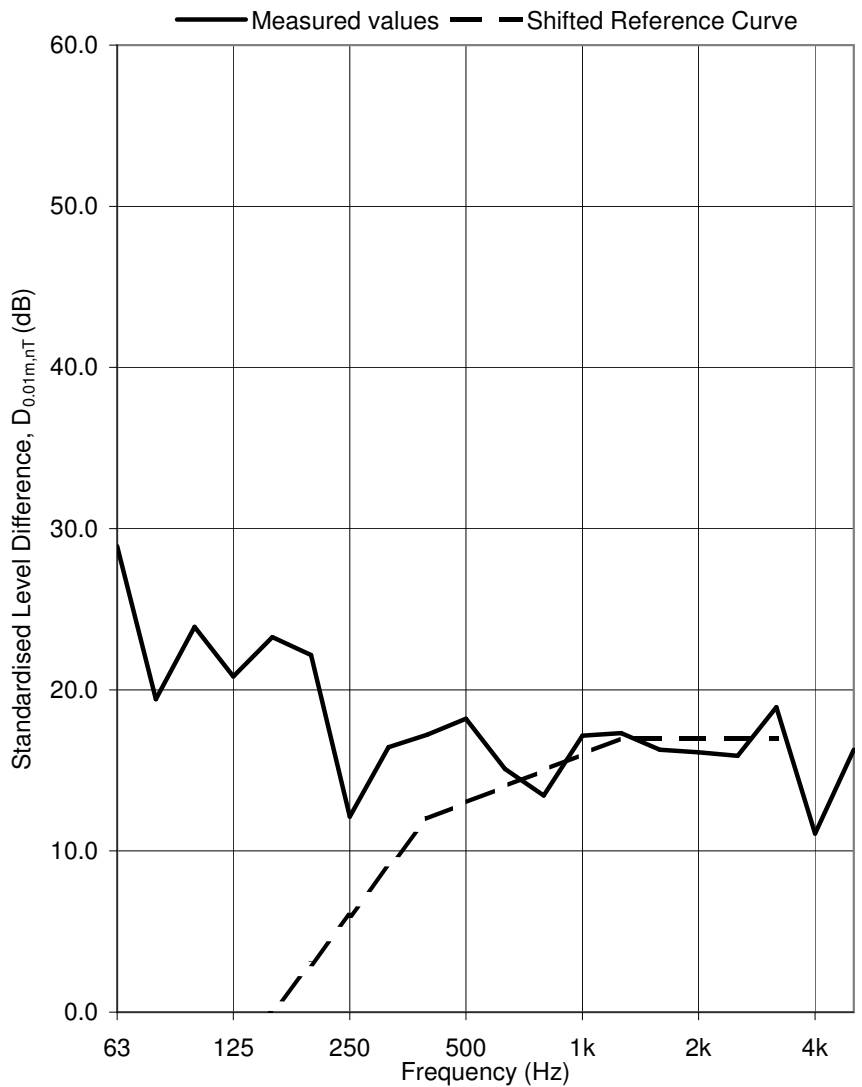
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713013

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.3
63	28.9
80	19.4
100	23.9
125	20.8
160	23.3
200	22.2
250	12.1
315	16.4
400	17.2
500	18.2
630	15.1
800	13.4
1k	17.2
1.25k	17.3
1.6k	16.3
2k	16.1
2.5k	15.9
3.15k	18.9
4k	11.1
5k	16.3

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (-1; -1) dB

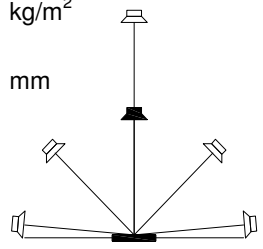
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

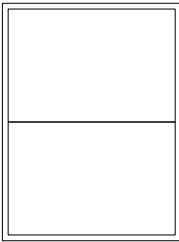
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

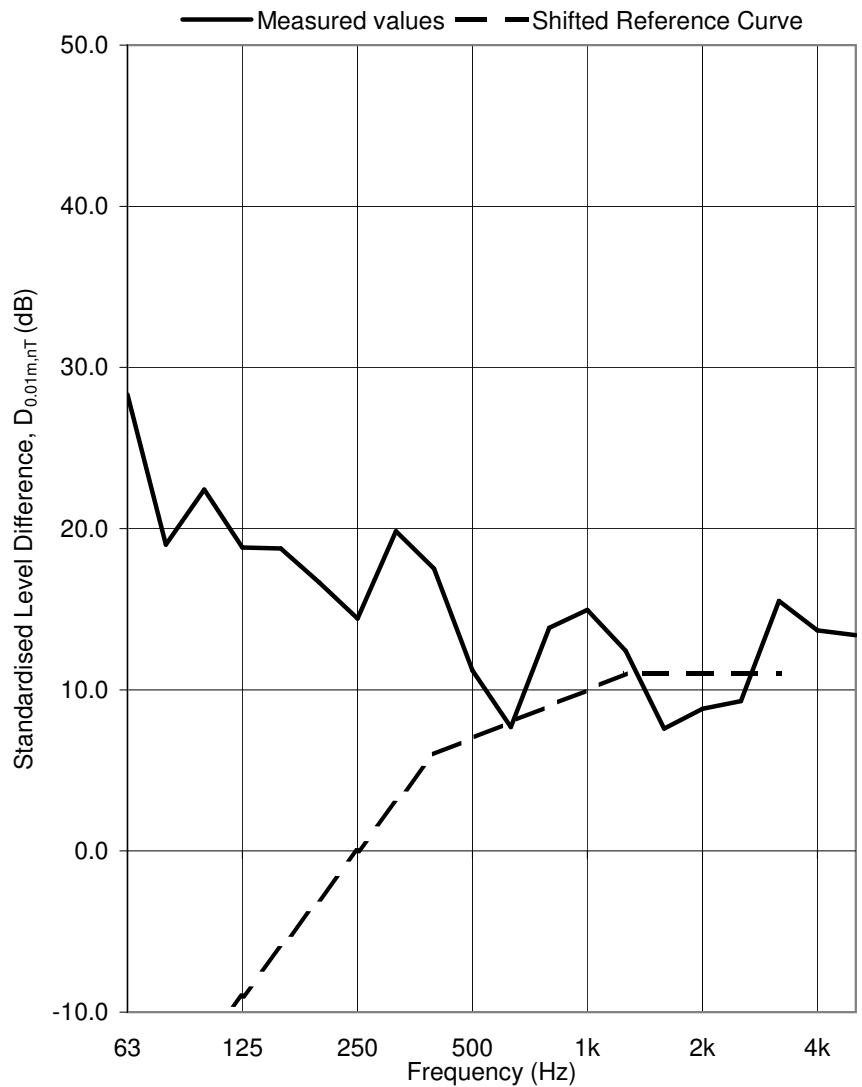


Test ID: 713005

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.5
63	28.3
80	19.0
100	22.4
125	18.8
160	18.8
200	16.7
250	14.4
315	19.8
400	17.5
500	11.2
630	7.7
800	13.8
1k	15.0
1.25k	12.4
1.6k	7.6
2k	8.8
2.5k	9.3
3.15k	15.5
4k	13.7
5k	13.4

$D_{0.01m,nT,w}(C;C_{tr})$ 11 (0; 0) dB

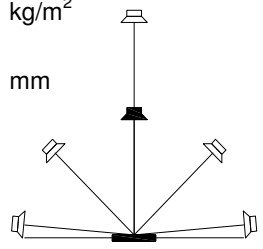
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

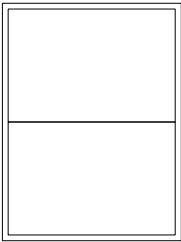
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0185 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

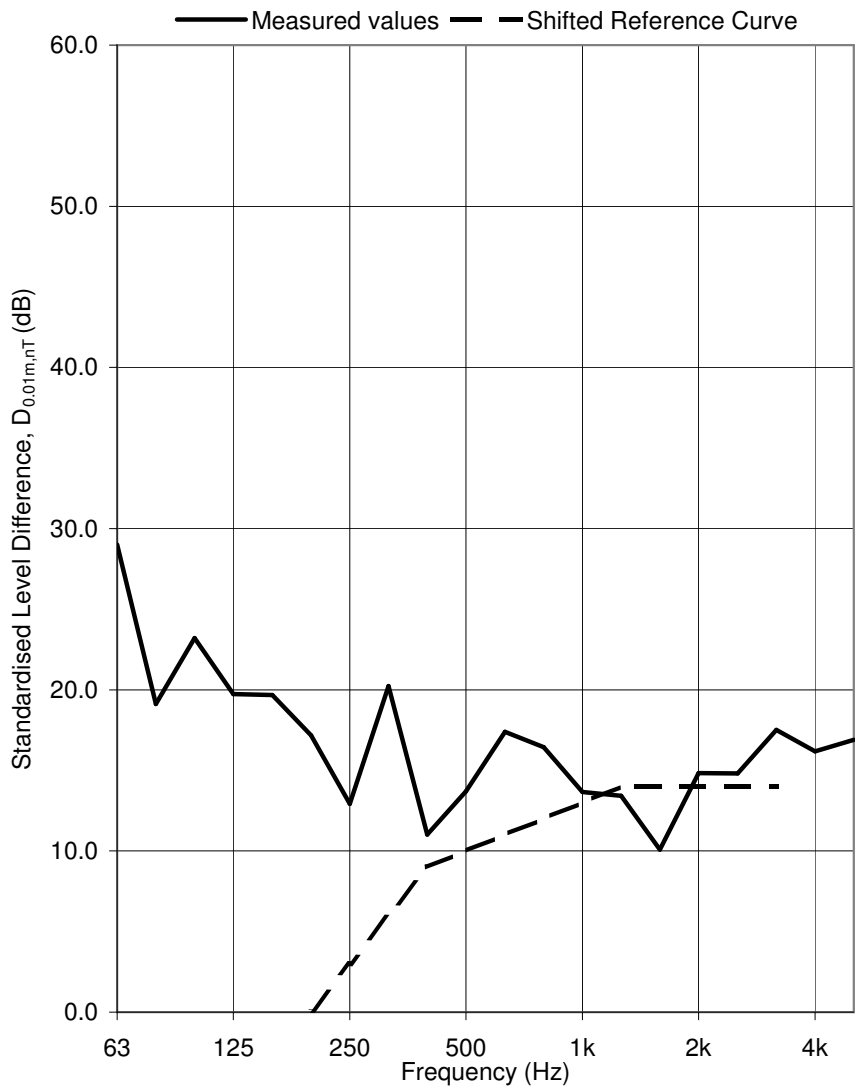


Test ID: 713009

Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.1
63	29.0
80	19.1
100	23.2
125	19.7
160	19.7
200	17.2
250	12.9
315	20.2
400	11.0
500	13.7
630	17.4
800	16.4
1k	13.7
1.25k	13.4
1.6k	10.1
2k	14.8
2.5k	14.8
3.15k	17.5
4k	16.2
5k	16.9

$D_{0.01m,nT,w}(C;C_{tr})$ 14 (0; 0) dB

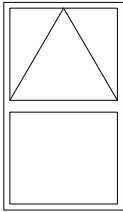
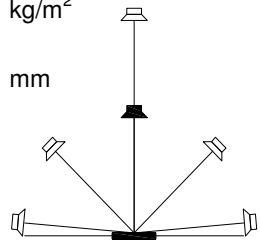
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

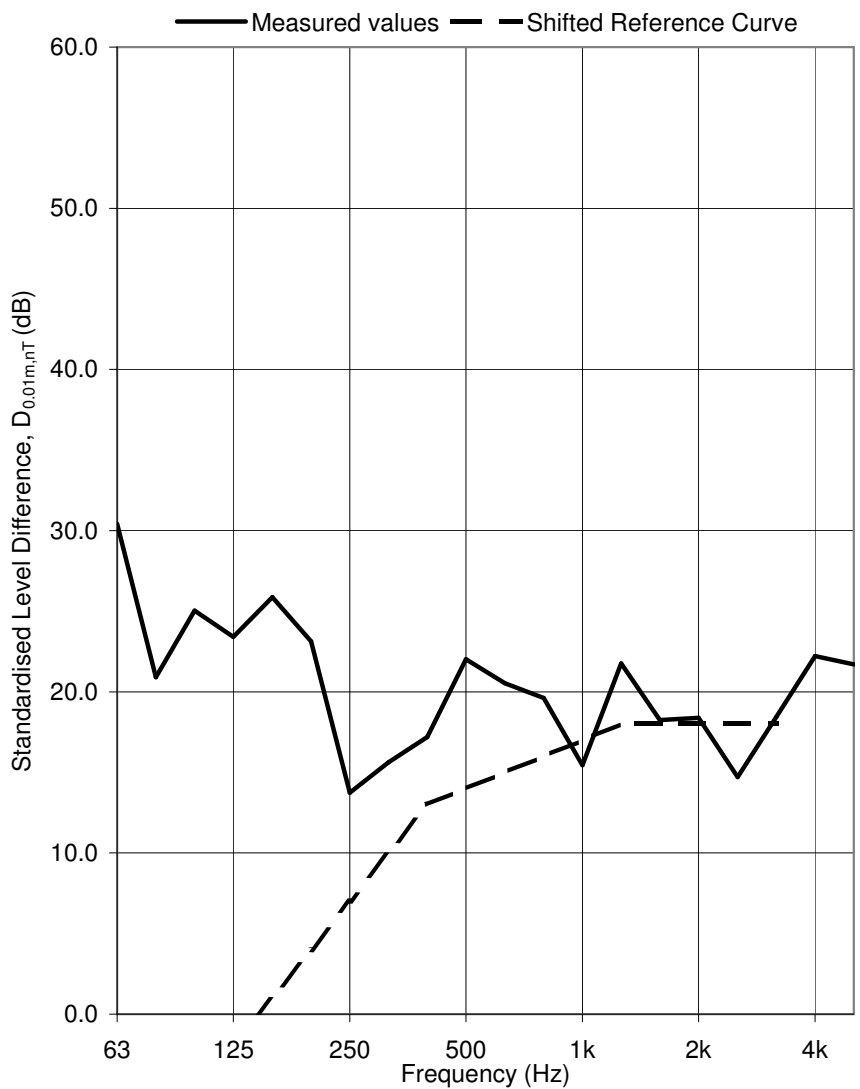
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718006

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.0
63	30.4
80	20.9
100	25.0
125	23.4
160	25.9
200	23.1
250	13.7
315	15.6
400	17.2
500	22.0
630	20.5
800	19.6
1k	15.4
1.25k	21.8
1.6k	18.2
2k	18.4
2.5k	14.7
3.15k	18.4
4k	22.2
5k	21.7

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

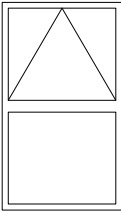
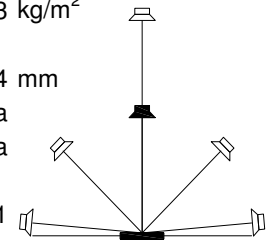
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

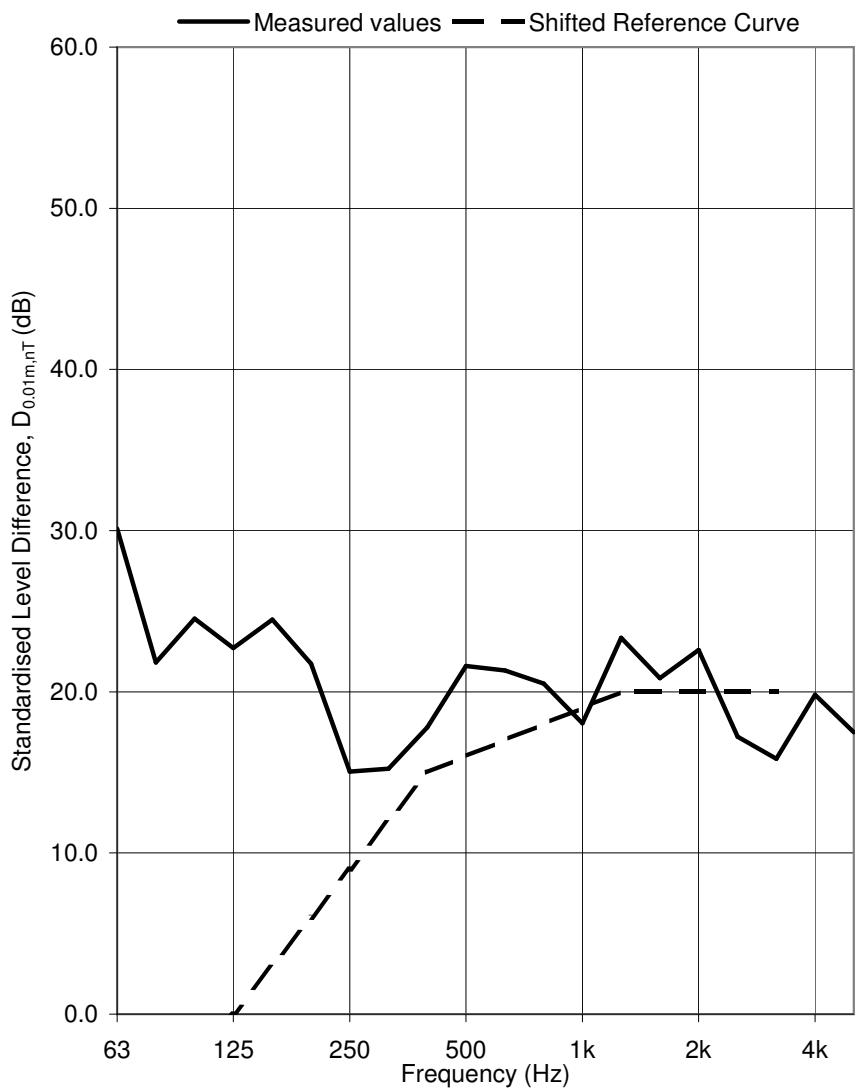
Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 719020

Loudspeaker Configuration: L1



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	23.3
63	30.1
80	21.8
100	24.5
125	22.7
160	24.5
200	21.7
250	15.0
315	15.2
400	17.8
500	21.6
630	21.3
800	20.5
1k	18.0
1.25k	23.4
1.6k	20.8
2k	22.6
2.5k	17.2
3.15k	15.8
4k	19.8
5k	17.5

D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

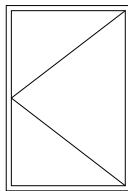
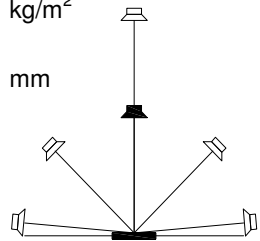
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

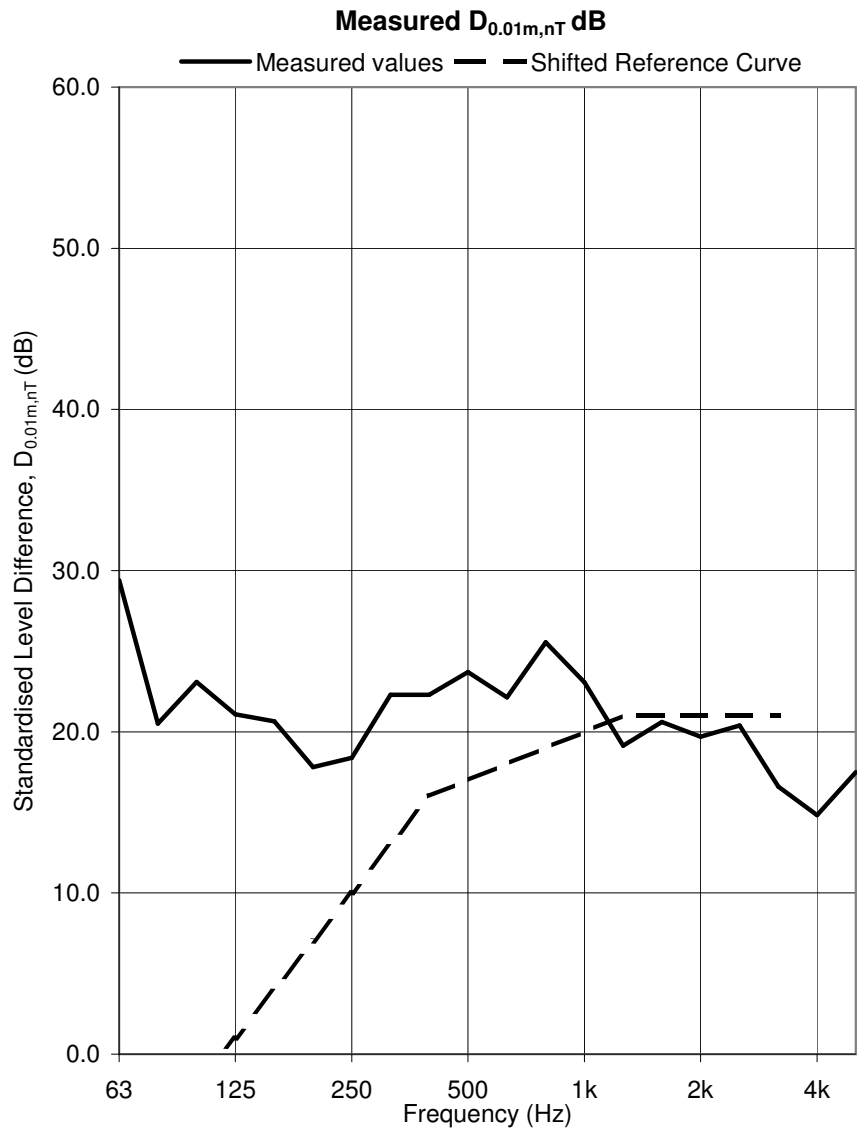
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720019

Test Sample: Window G Open 0.20 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L1



Frequency Hz	D _{0.01m,nT} dB
50	22.9
63	29.4
80	20.5
100	23.1
125	21.1
160	20.7
200	17.8
250	18.4
315	22.3
400	22.3
500	23.7
630	22.1
800	25.6
1k	23.1
1.25k	19.1
1.6k	20.6
2k	19.7
2.5k	20.4
3.15k	16.6
4k	14.8
5k	17.5



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

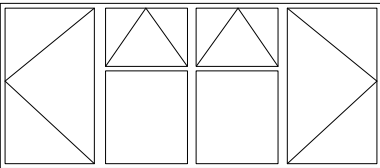
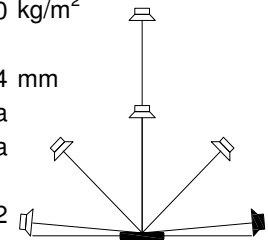
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0102 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

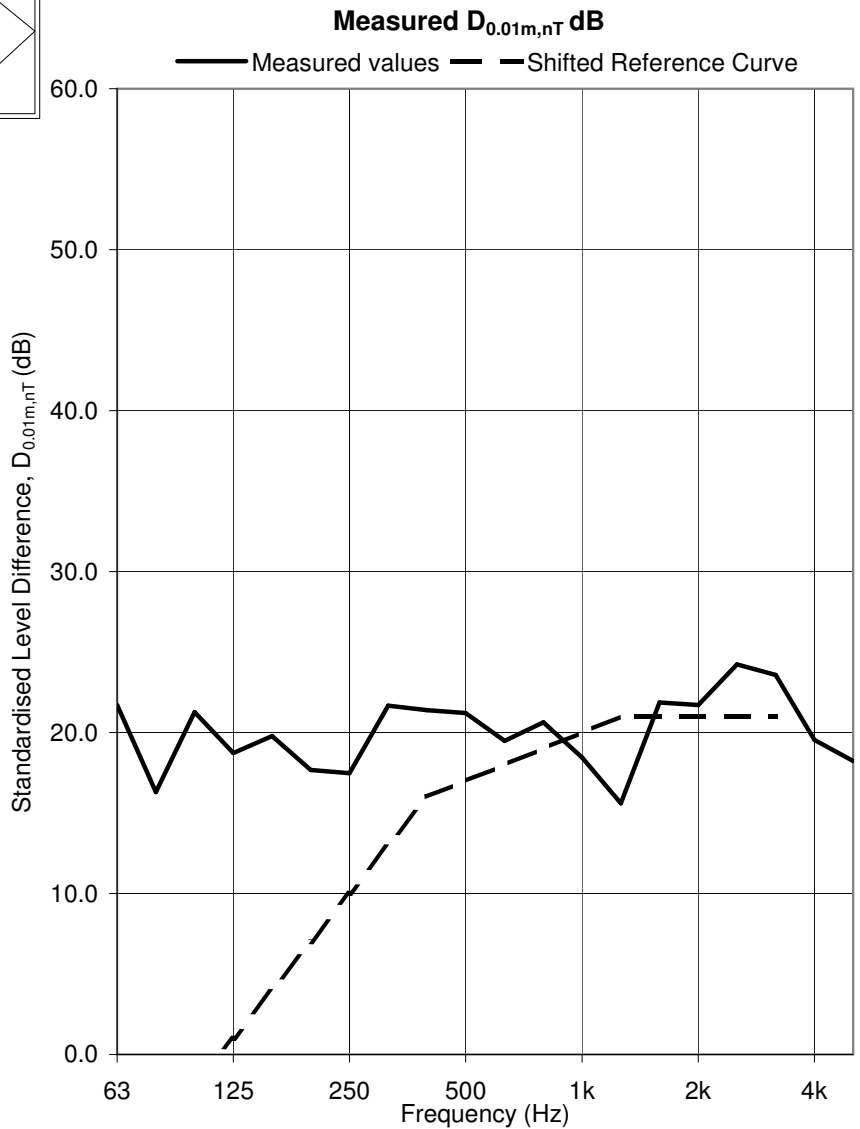
Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628048

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	12.2
63	21.7
80	16.3
100	21.3
125	18.7
160	19.8
200	17.7
250	17.5
315	21.7
400	21.4
500	21.2
630	19.5
800	20.6
1k	18.4
1.25k	15.6
1.6k	21.9
2k	21.7
2.5k	24.2
3.15k	23.6
4k	19.5
5k	18.2



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; -2) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

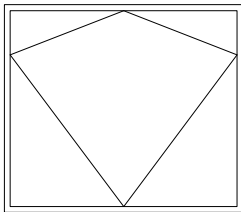
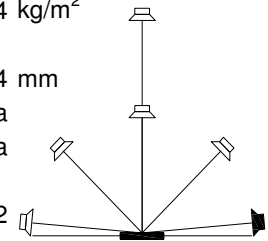
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

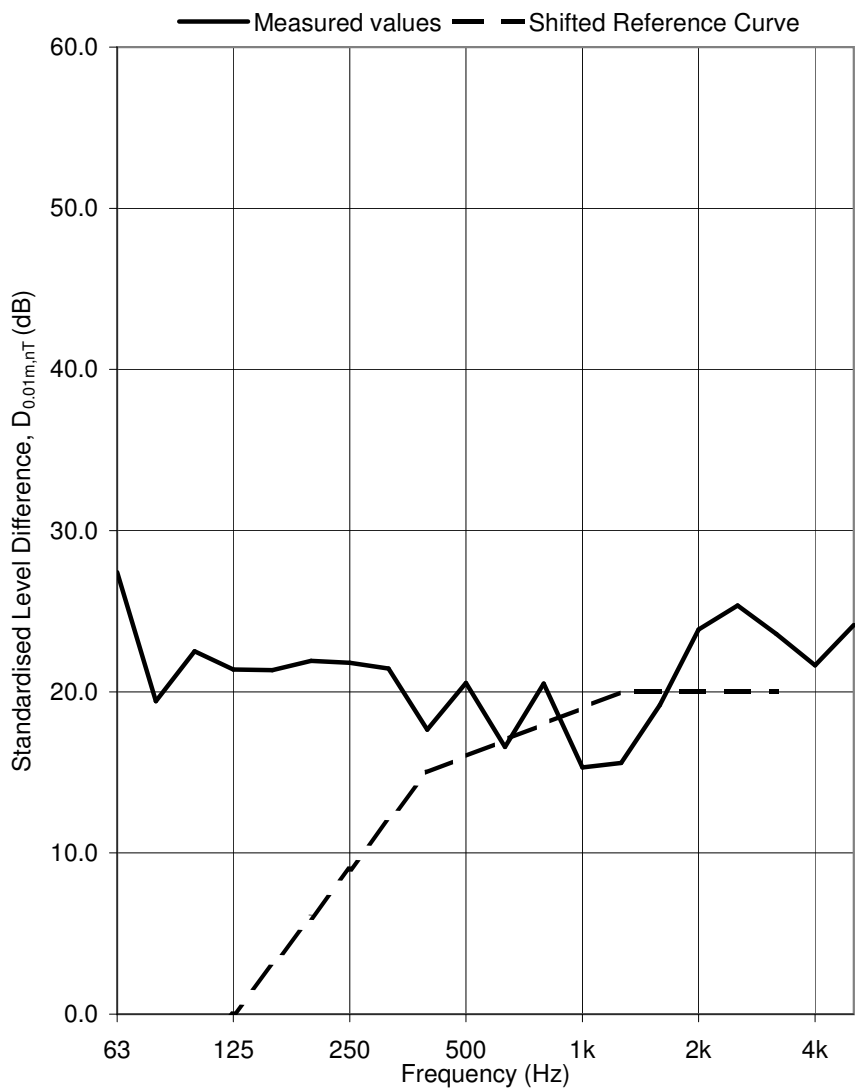
Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705010

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	15.8
63	27.4
80	19.4
100	22.5
125	21.4
160	21.3
200	21.9
250	21.8
315	21.4
400	17.7
500	20.6
630	16.6
800	20.5
1k	15.3
1.25k	15.6
1.6k	19.2
2k	23.9
2.5k	25.4
3.15k	23.6
4k	21.6
5k	24.1

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

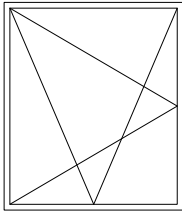
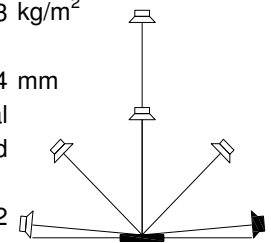
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711034

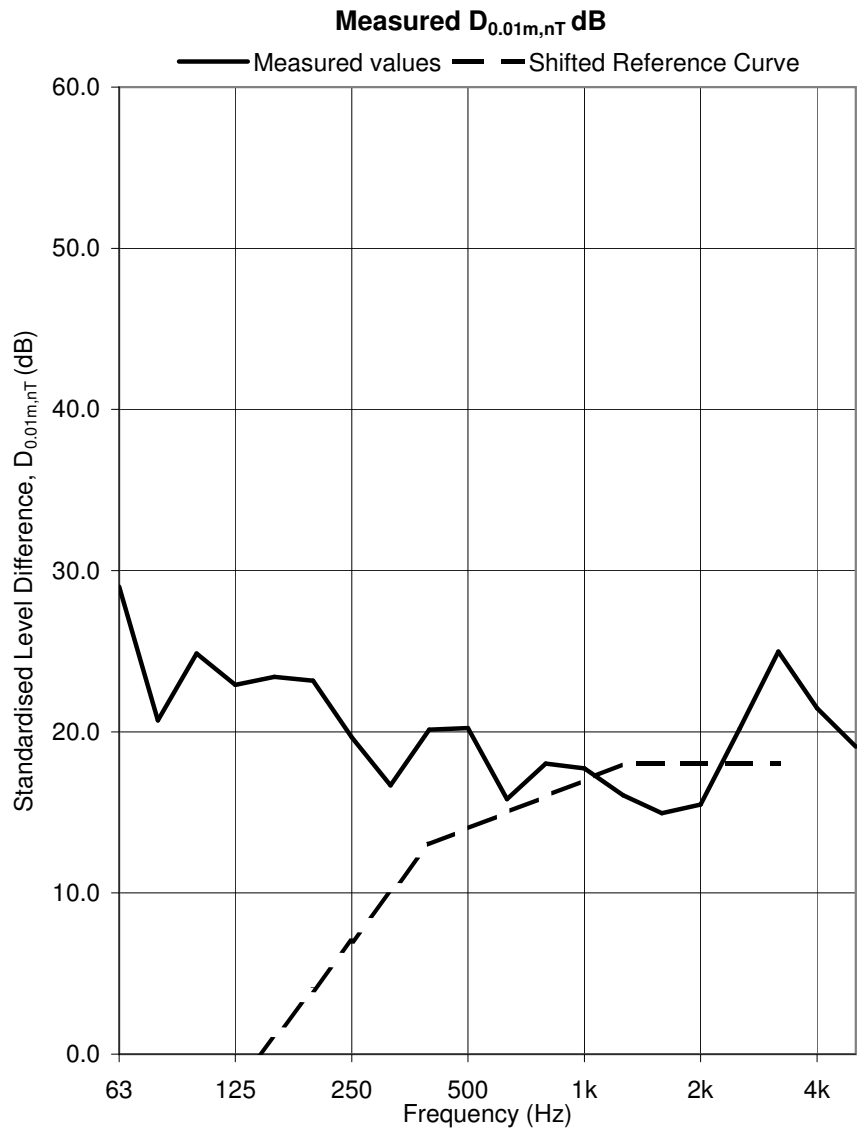
Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	16.7
63	29.0
80	20.7
100	24.9
125	22.9
160	23.4
200	23.2
250	19.7
315	16.7
400	20.1
500	20.2
630	15.8
800	18.0
1k	17.7
1.25k	16.1
1.6k	15.0
2k	15.5
2.5k	20.2
3.15k	25.0
4k	21.5
5k	19.1



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

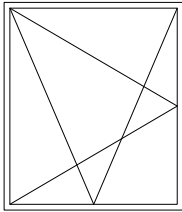
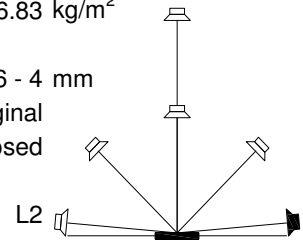
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

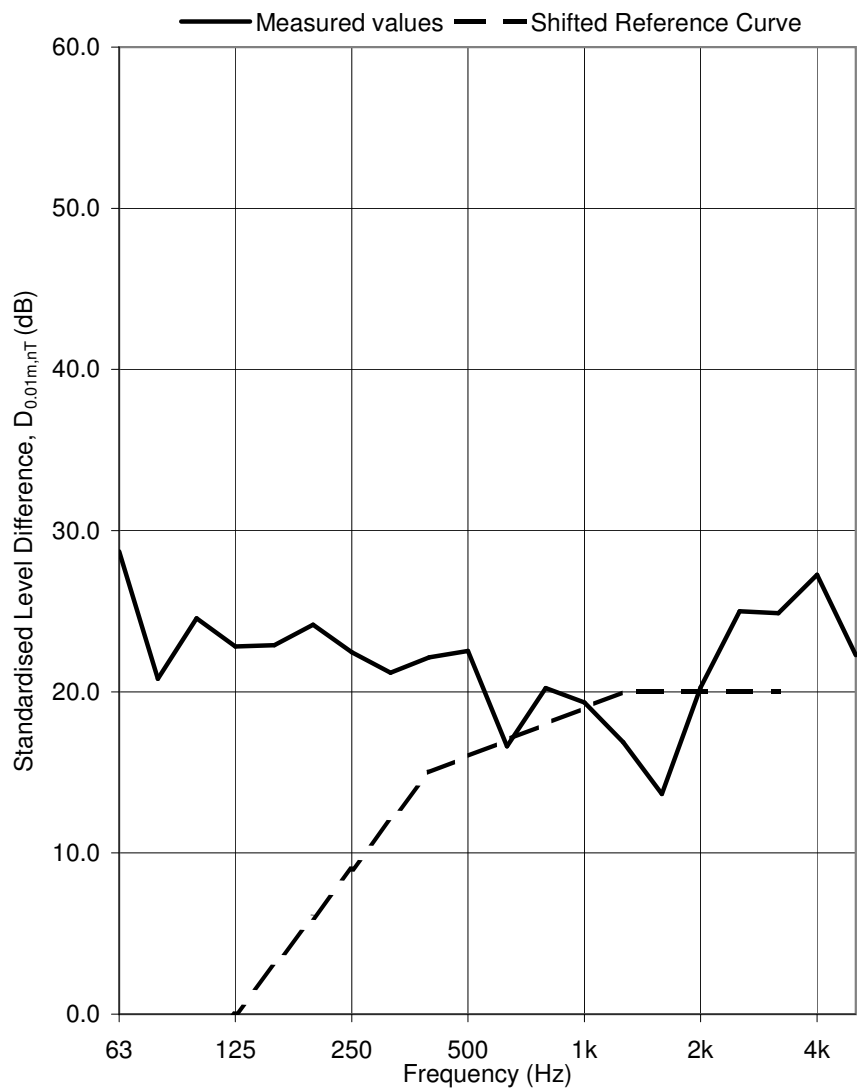
Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711038

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	16.7
63	28.7
80	20.8
100	24.6
125	22.8
160	22.9
200	24.2
250	22.5
315	21.2
400	22.1
500	22.5
630	16.6
800	20.2
1k	19.3
1.25k	16.9
1.6k	13.7
2k	20.3
2.5k	25.0
3.15k	24.9
4k	27.3
5k	22.3

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -1) dB

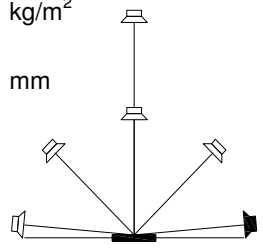
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

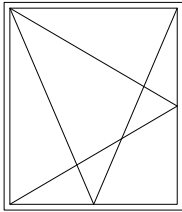
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

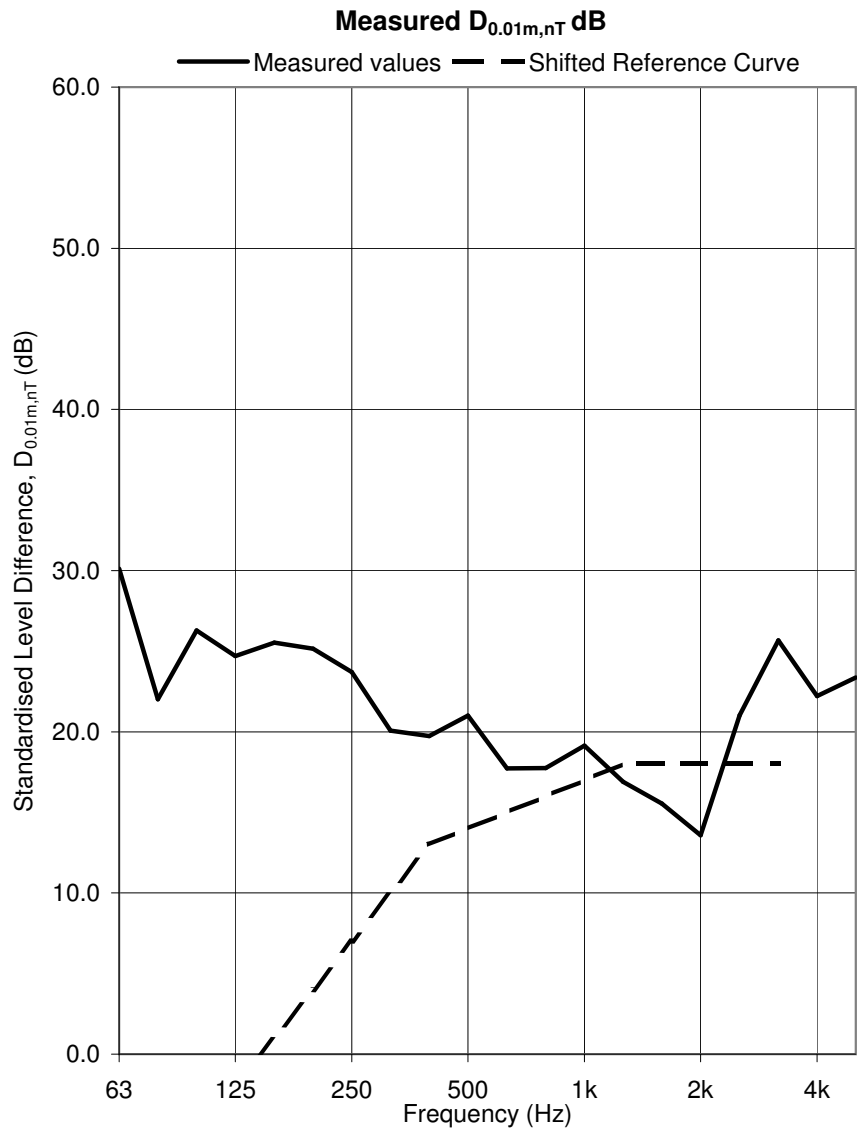


Test ID: 712047

Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	17.8
63	30.1
80	22.0
100	26.3
125	24.7
160	25.5
200	25.2
250	23.7
315	20.1
400	19.7
500	21.0
630	17.7
800	17.7
1k	19.1
1.25k	16.9
1.6k	15.6
2k	13.6
2.5k	21.0
3.15k	25.7
4k	22.2
5k	23.4



D_{0.01m,nT,w(C;C_{tr}) 18 (0; 0) dB}

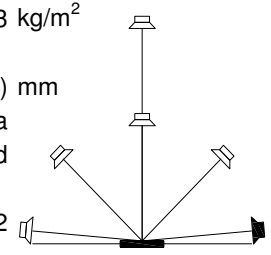
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

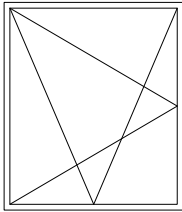
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0247 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

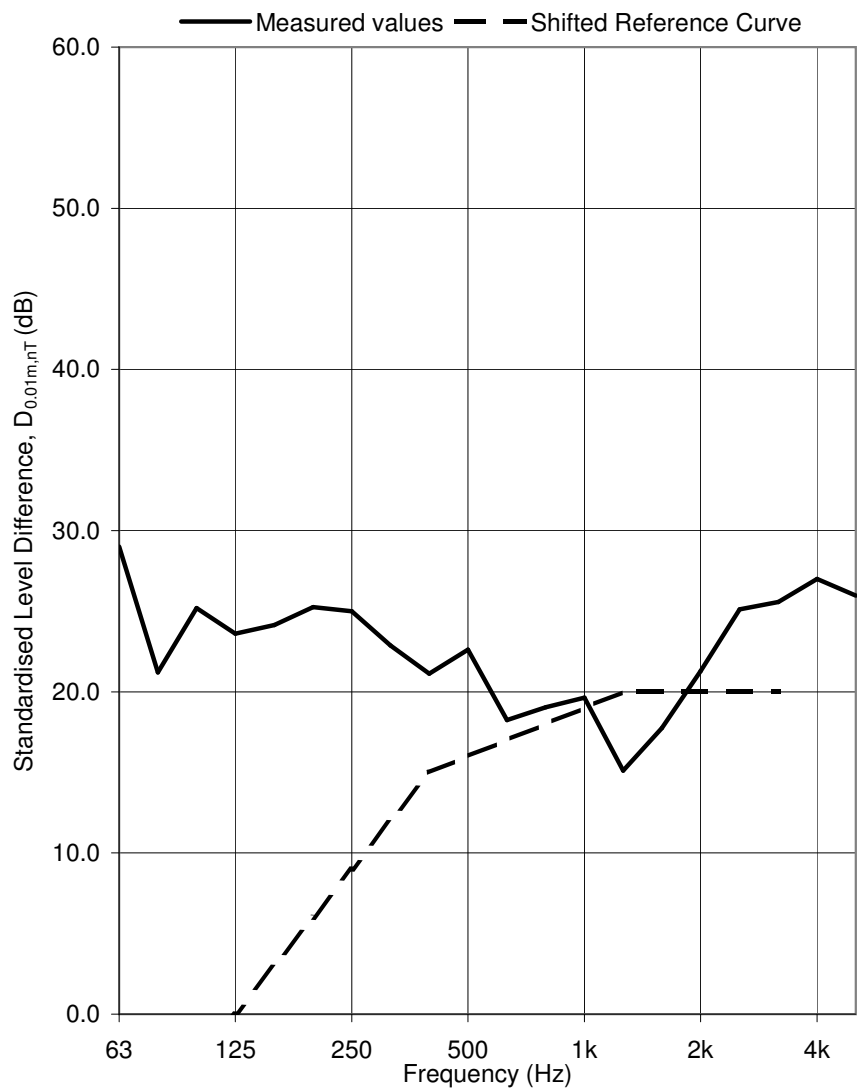


Test ID: 712051

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	16.8
63	29.0
80	21.2
100	25.2
125	23.6
160	24.1
200	25.3
250	25.0
315	22.9
400	21.1
500	22.6
630	18.2
800	19.0
1k	19.6
1.25k	15.1
1.6k	17.8
2k	21.3
2.5k	25.1
3.15k	25.6
4k	27.0
5k	26.0

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-1; -1) dB

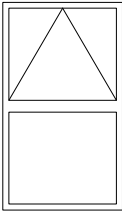
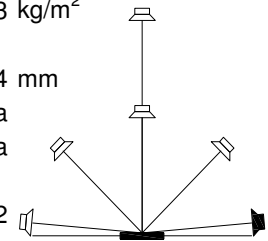
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

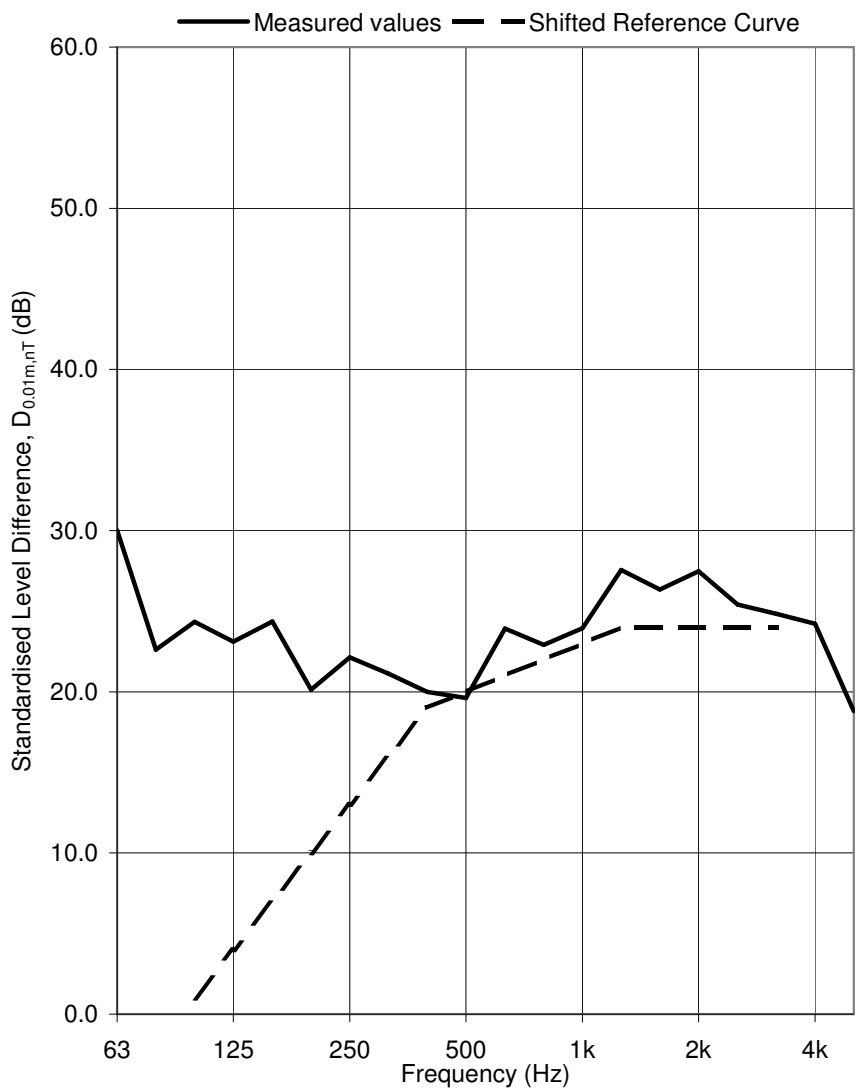
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718020

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	18.8
63	30.0
80	22.6
100	24.3
125	23.1
160	24.4
200	20.1
250	22.1
315	21.1
400	20.0
500	19.6
630	23.9
800	22.9
1k	23.9
1.25k	27.6
1.6k	26.3
2k	27.5
2.5k	25.4
3.15k	24.8
4k	24.2
5k	18.8

$D_{0.01m,nT,w}(C;C_{tr})$ 24 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

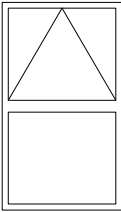
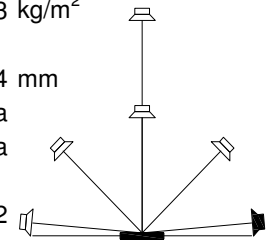
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0024 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

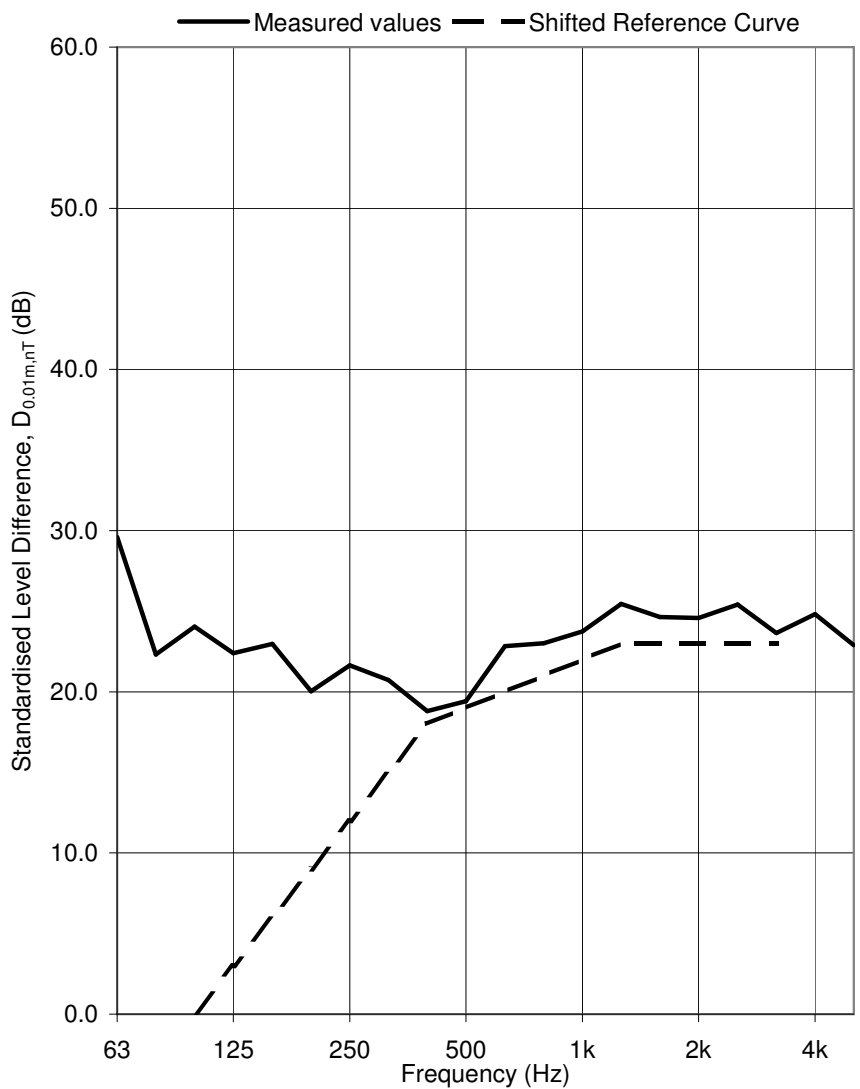
Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 719034

Loudspeaker Configuration: L2



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	18.3
63	29.6
80	22.3
100	24.0
125	22.4
160	23.0
200	20.0
250	21.6
315	20.7
400	18.8
500	19.4
630	22.8
800	23.0
1k	23.7
1.25k	25.5
1.6k	24.6
2k	24.6
2.5k	25.4
3.15k	23.6
4k	24.8
5k	22.9

$D_{0.01m,nT,w}(C;C_{tr})$ 23 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

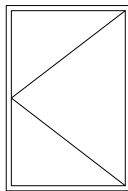
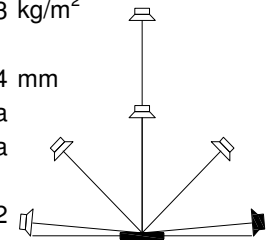
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

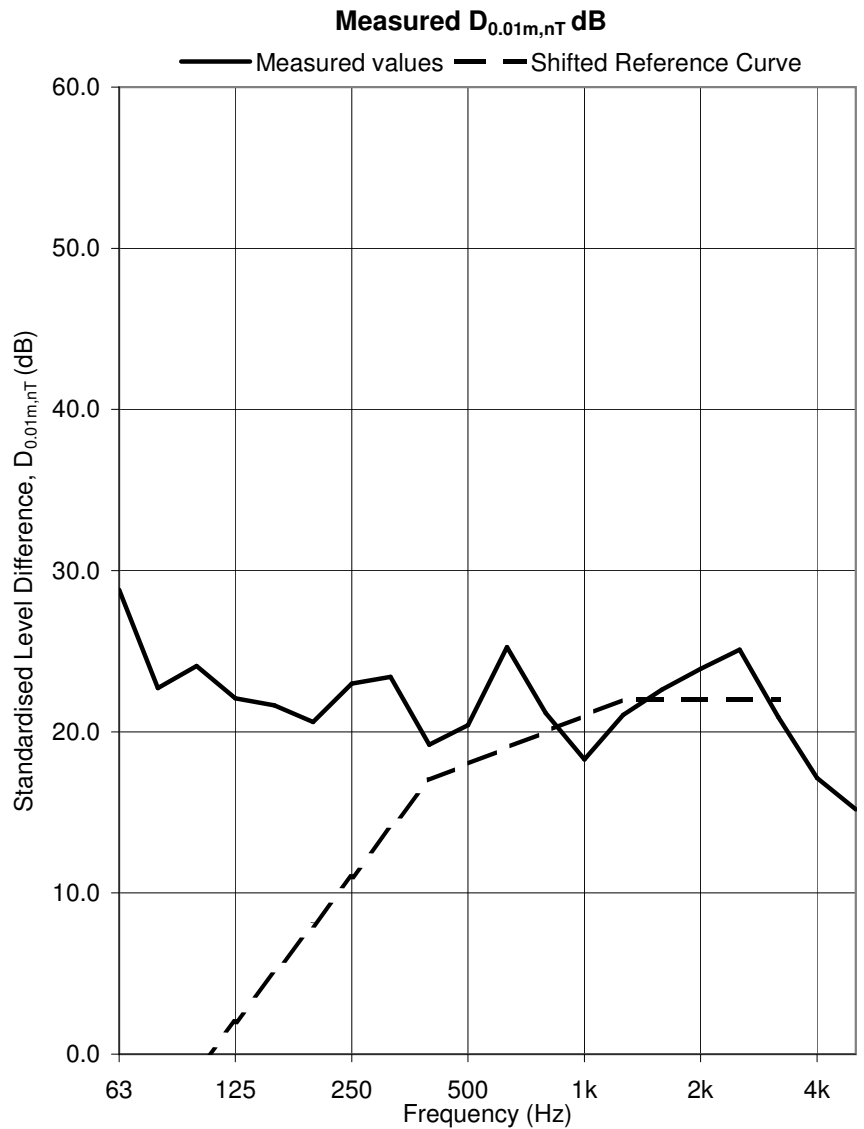
Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720047

Test Sample: Window G Open 0.20 m²

Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L2



Frequency Hz	D _{0.01m,nT} dB
50	18.9
63	28.8
80	22.7
100	24.1
125	22.1
160	21.7
200	20.6
250	23.0
315	23.4
400	19.2
500	20.4
630	25.2
800	21.2
1k	18.3
1.25k	21.0
1.6k	22.6
2k	23.9
2.5k	25.1
3.15k	20.9
4k	17.1
5k	15.2



D_{0.01m,nT,w(C;C_{tr}) 22 (0; -1) dB}

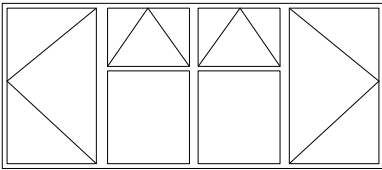
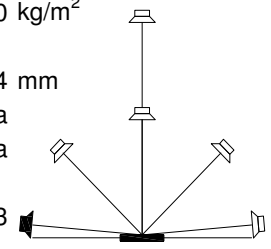
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

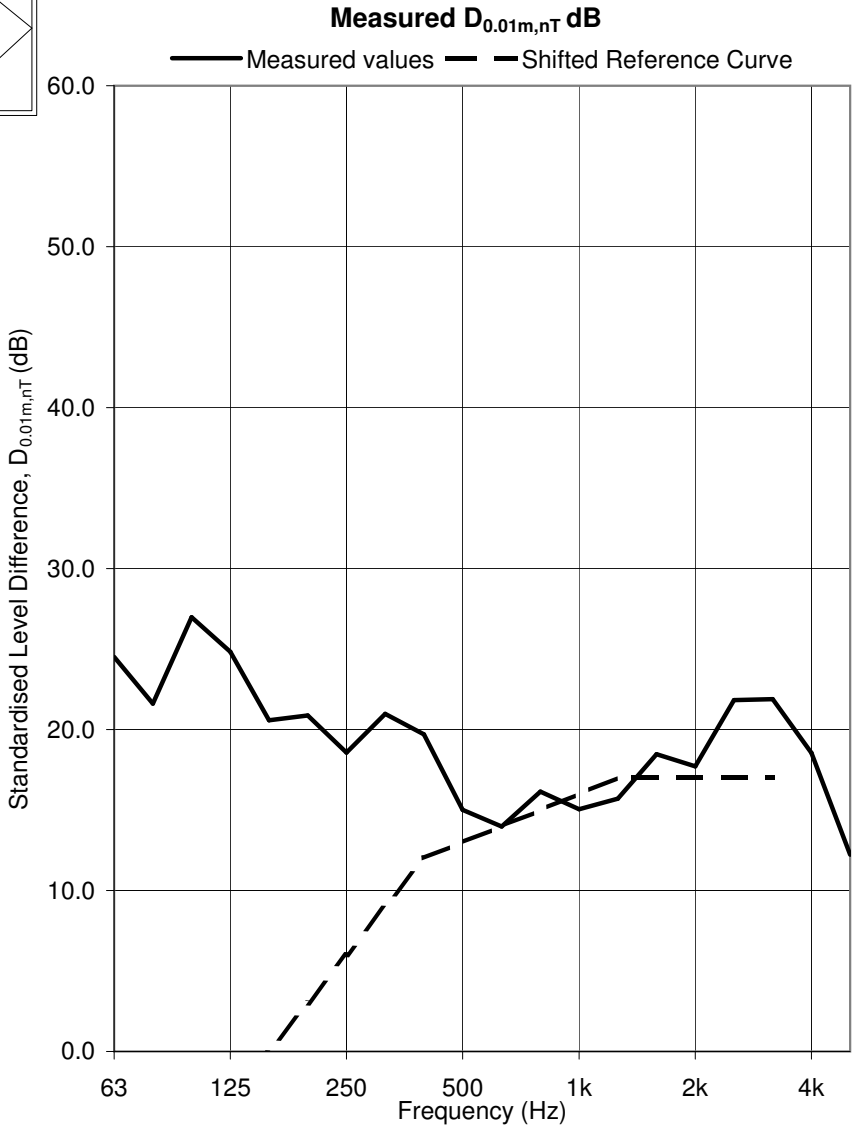
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0095 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628064

Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	16.2
63	24.5
80	21.6
100	27.0
125	24.8
160	20.6
200	20.9
250	18.6
315	21.0
400	19.7
500	15.0
630	14.0
800	16.1
1k	15.0
1.25k	15.7
1.6k	18.5
2k	17.7
2.5k	21.8
3.15k	21.9
4k	18.5
5k	12.2



D_{0.01m,nT,w(C;C_{tr}) 17 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

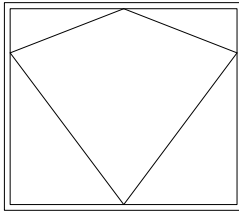
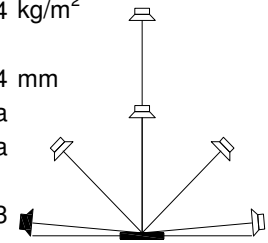
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9975 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

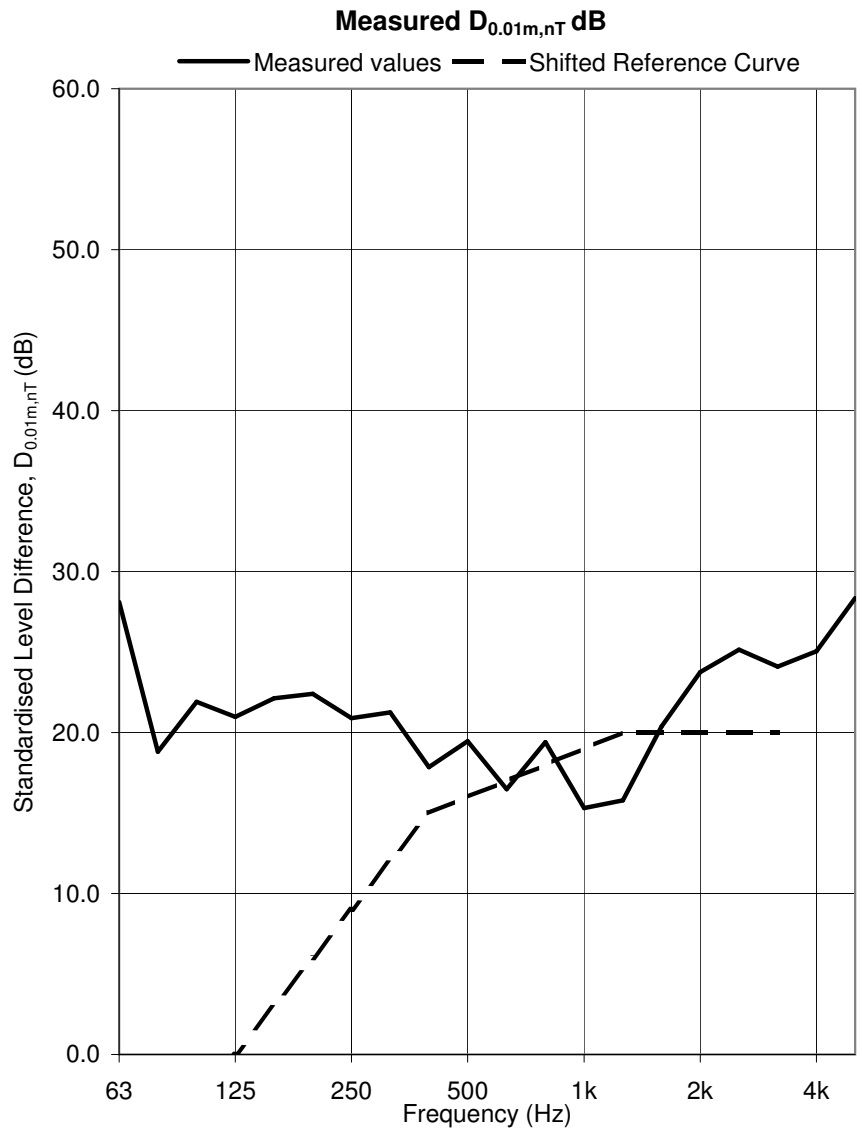
Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705015

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	16.1
63	28.1
80	18.8
100	21.9
125	21.0
160	22.1
200	22.4
250	20.9
315	21.2
400	17.9
500	19.5
630	16.5
800	19.4
1k	15.3
1.25k	15.8
1.6k	20.4
2k	23.8
2.5k	25.2
3.15k	24.1
4k	25.0
5k	28.3



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -2) dB}

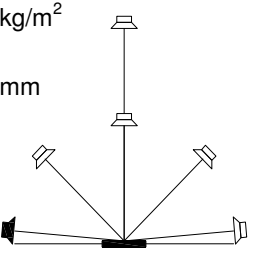
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

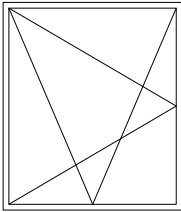
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0276 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

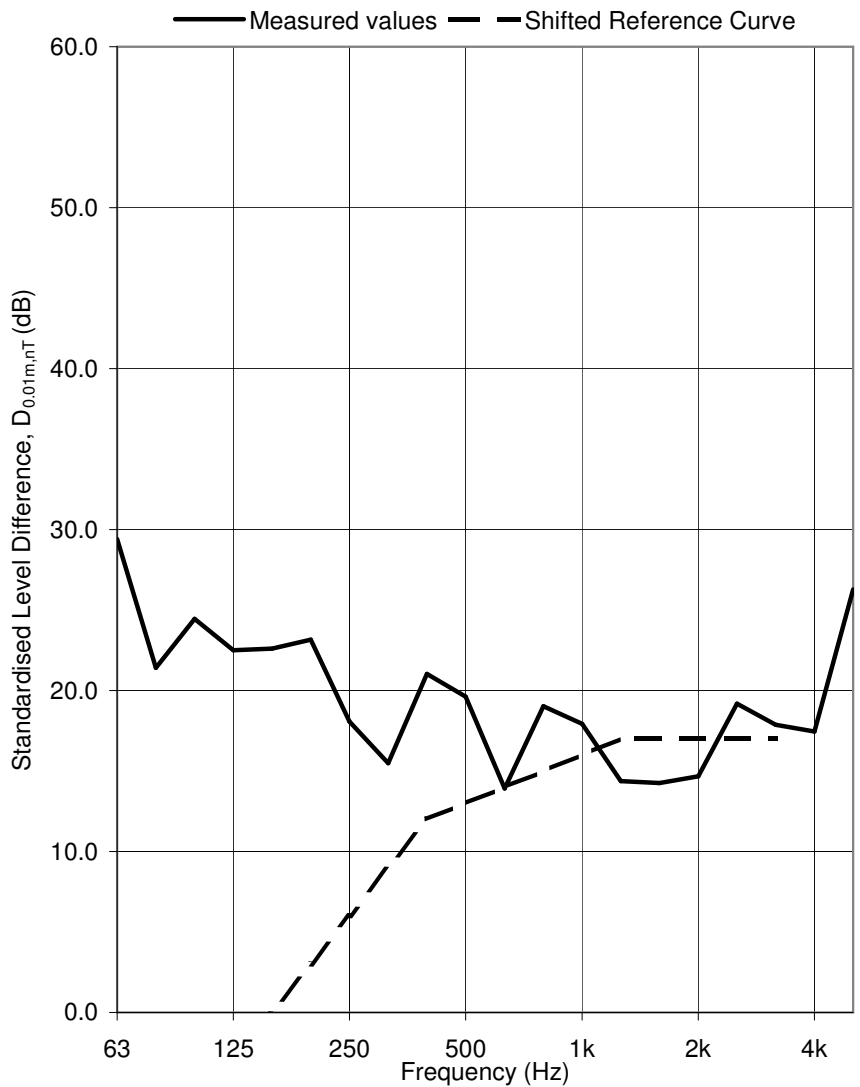


Test ID: 711044

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	17.8
63	29.4
80	21.4
100	24.5
125	22.5
160	22.6
200	23.2
250	18.1
315	15.5
400	21.0
500	19.6
630	13.9
800	19.0
1k	17.9
1.25k	14.4
1.6k	14.3
2k	14.7
2.5k	19.2
3.15k	17.9
4k	17.5
5k	26.3

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

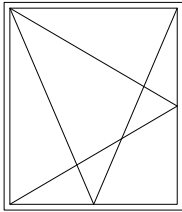
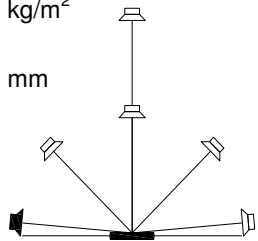
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.2 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0243 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

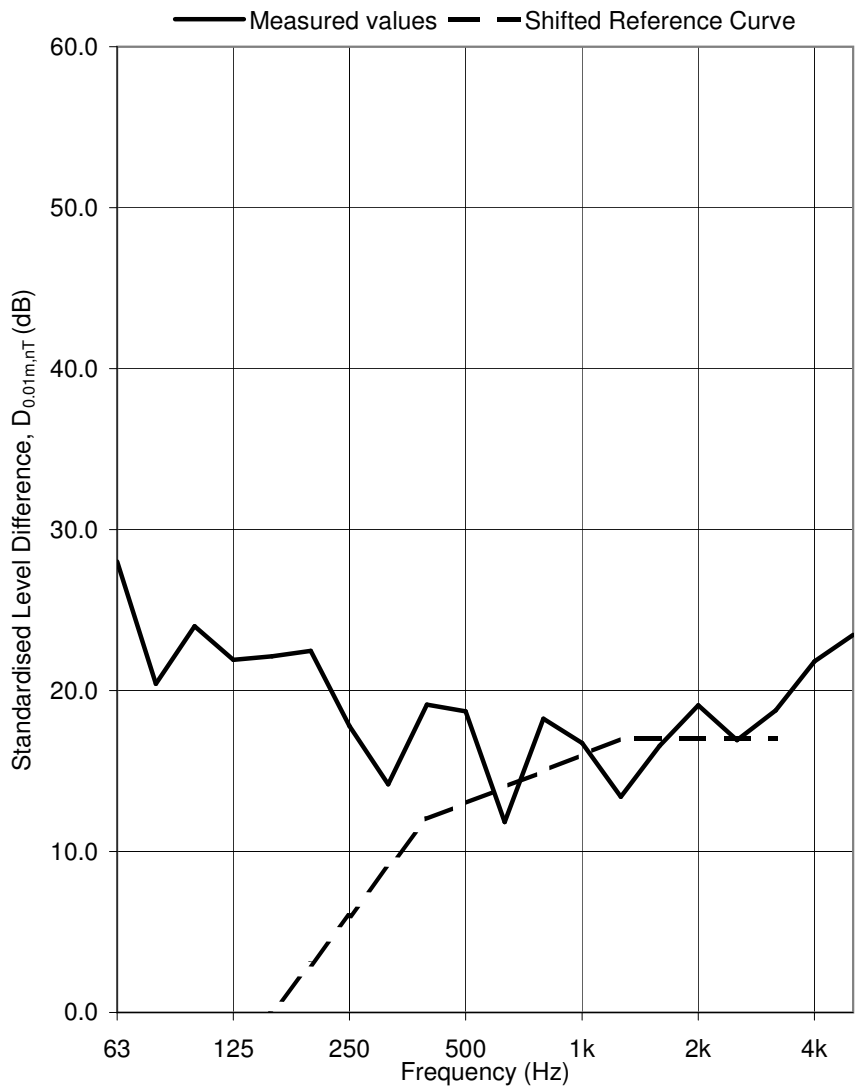
Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712074

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	15.8
63	28.0
80	20.4
100	24.0
125	21.9
160	22.1
200	22.5
250	17.8
315	14.2
400	19.1
500	18.7
630	11.8
800	18.2
1k	16.7
1.25k	13.4
1.6k	16.6
2k	19.1
2.5k	16.9
3.15k	18.8
4k	21.8
5k	23.5

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

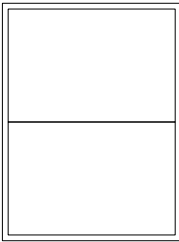
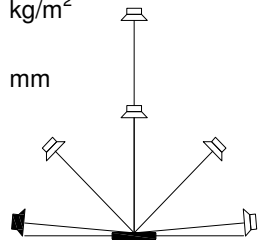
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

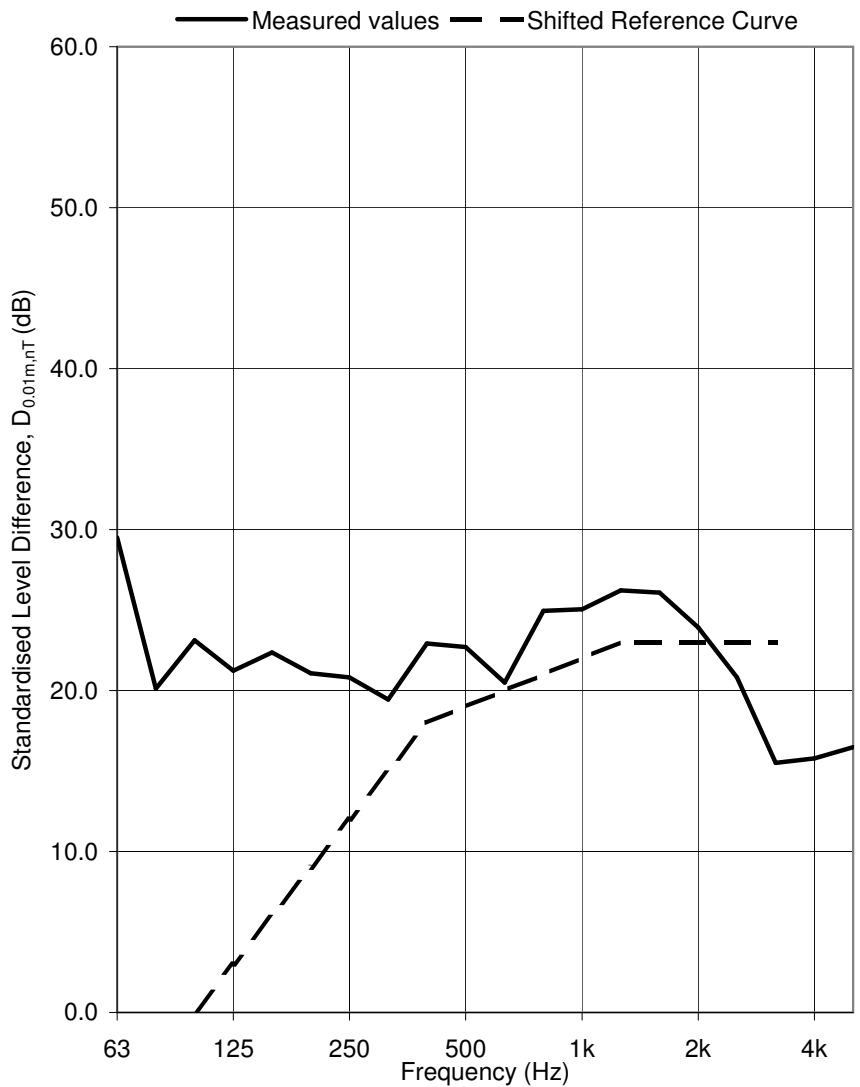
Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713055

Loudspeaker Configuration: L3



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	16.8
63	29.5
80	20.1
100	23.1
125	21.2
160	22.4
200	21.1
250	20.8
315	19.4
400	22.9
500	22.7
630	20.5
800	24.9
1k	25.1
1.25k	26.2
1.6k	26.1
2k	23.9
2.5k	20.8
3.15k	15.5
4k	15.8
5k	16.5

$D_{0.01m,nT,w}(C;C_{tr})$ 23 (-2; 0) dB

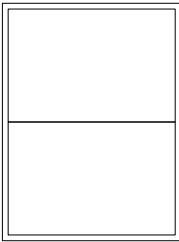
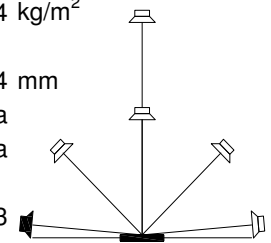
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

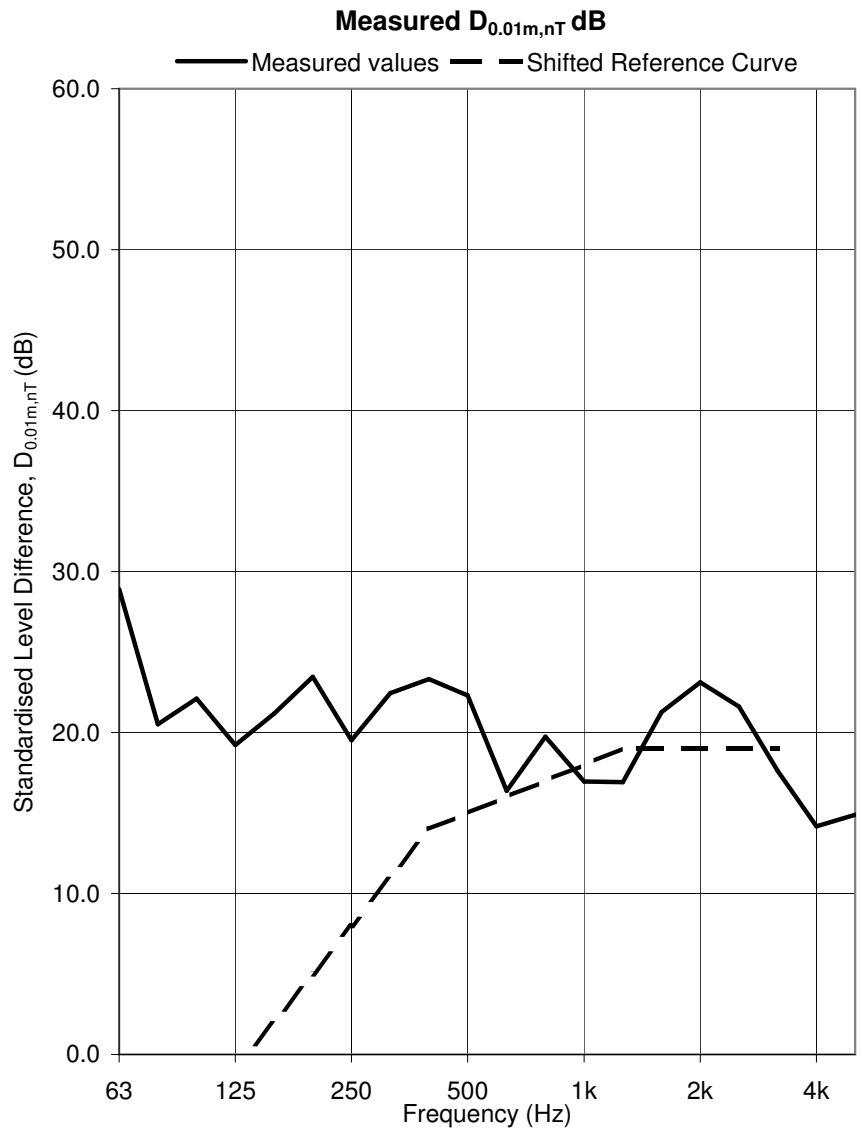
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713047

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	17.4
63	28.9
80	20.5
100	22.1
125	19.2
160	21.2
200	23.5
250	19.5
315	22.4
400	23.3
500	22.3
630	16.4
800	19.7
1k	17.0
1.25k	16.9
1.6k	21.3
2k	23.1
2.5k	21.6
3.15k	17.6
4k	14.2
5k	14.9



D_{0.01m,nT,w(C;C_{tr}) 19 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

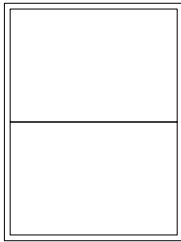
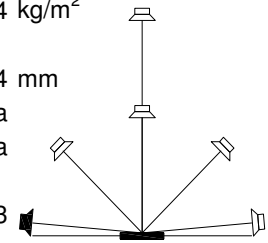
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

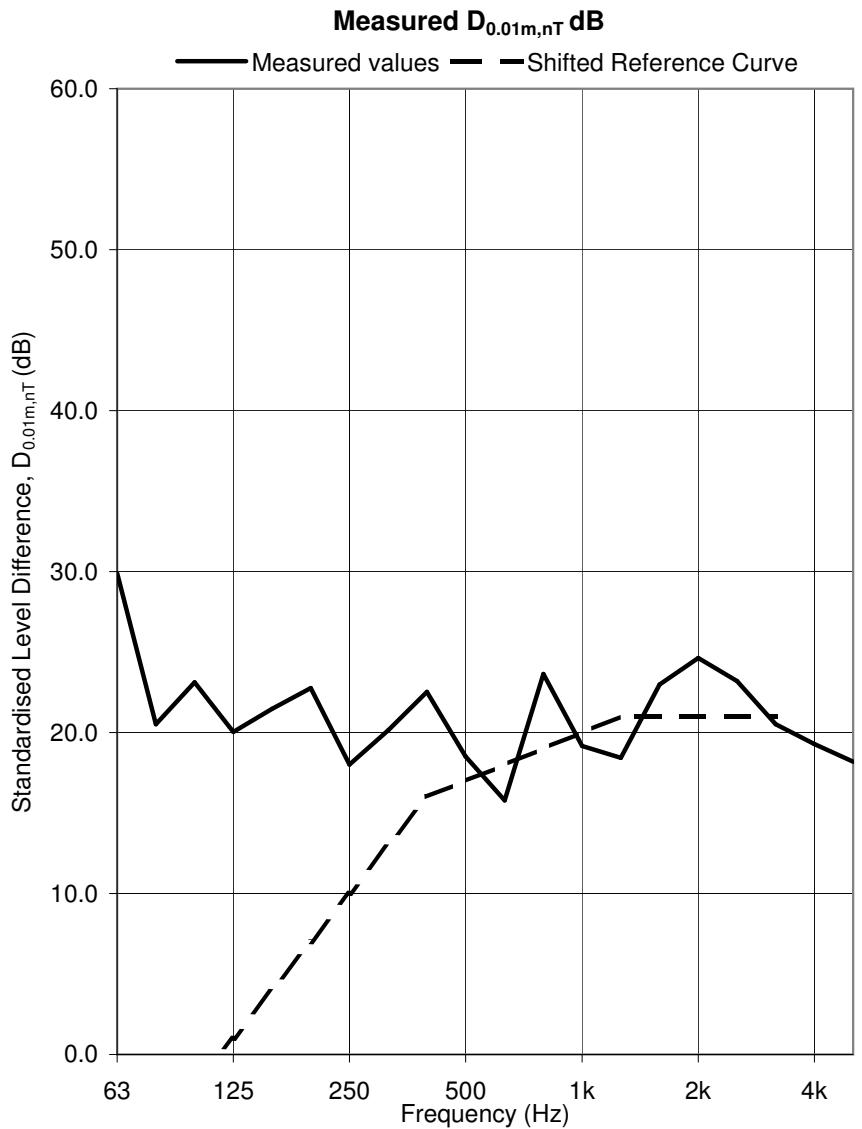
Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713051

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	18.8
63	29.9
80	20.5
100	23.1
125	20.0
160	21.5
200	22.8
250	18.0
315	20.1
400	22.5
500	18.5
630	15.8
800	23.6
1k	19.2
1.25k	18.4
1.6k	23.0
2k	24.6
2.5k	23.2
3.15k	20.5
4k	19.3
5k	18.2



D_{0.01m,nT,w(C;C_{tr}) 21 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

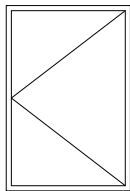
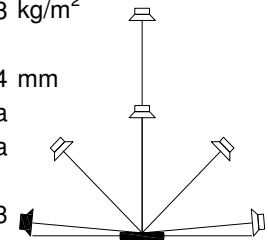
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

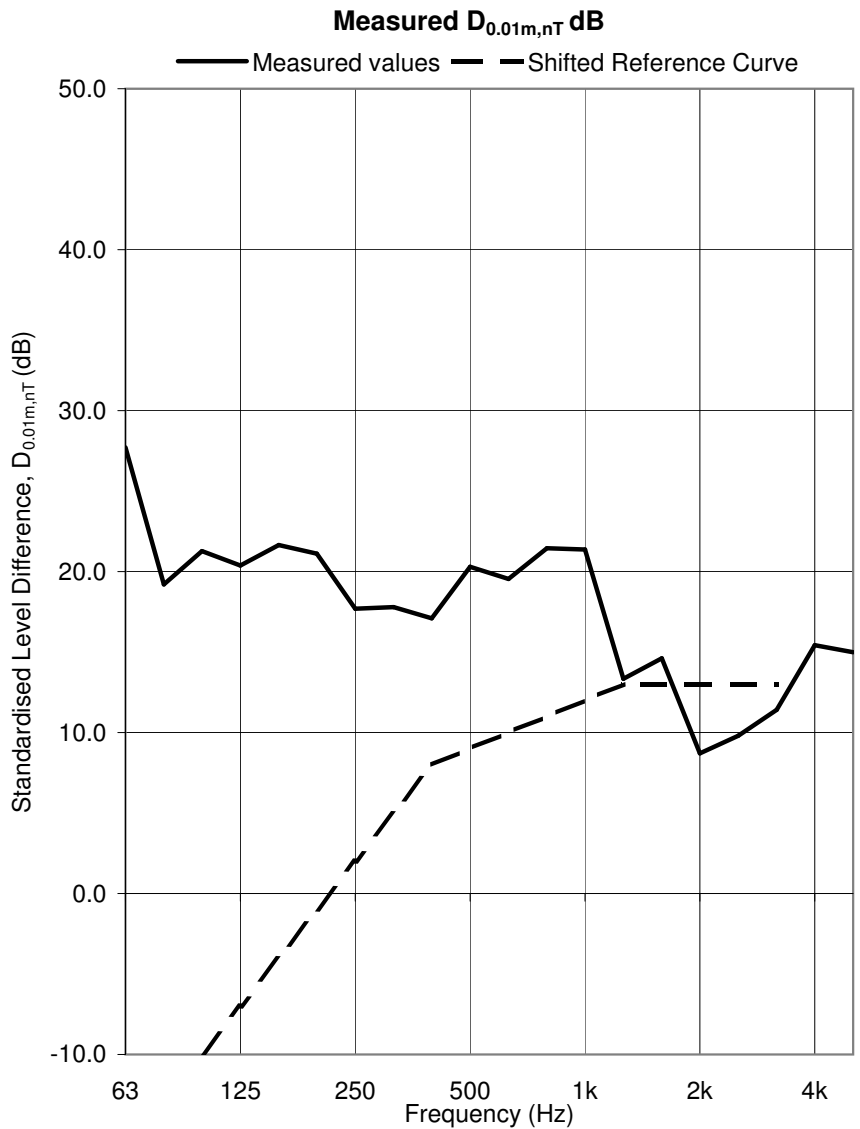
Test Sample: Window G Open 0.20 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 720036

Loudspeaker Configuration: L3



Frequency Hz	D _{0.01m,nT} dB
50	16.8
63	27.7
80	19.2
100	21.3
125	20.4
160	21.7
200	21.1
250	17.7
315	17.8
400	17.1
500	20.3
630	19.5
800	21.5
1k	21.4
1.25k	13.3
1.6k	14.6
2k	8.7
2.5k	9.8
3.15k	11.4
4k	15.4
5k	15.0



D_{0.01m,nT,w(C;C_{tr}) 13 (0; 2) dB}

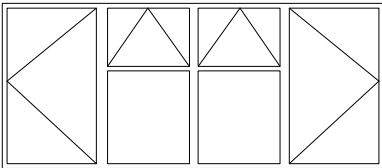
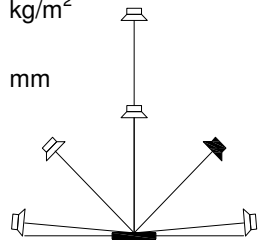
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

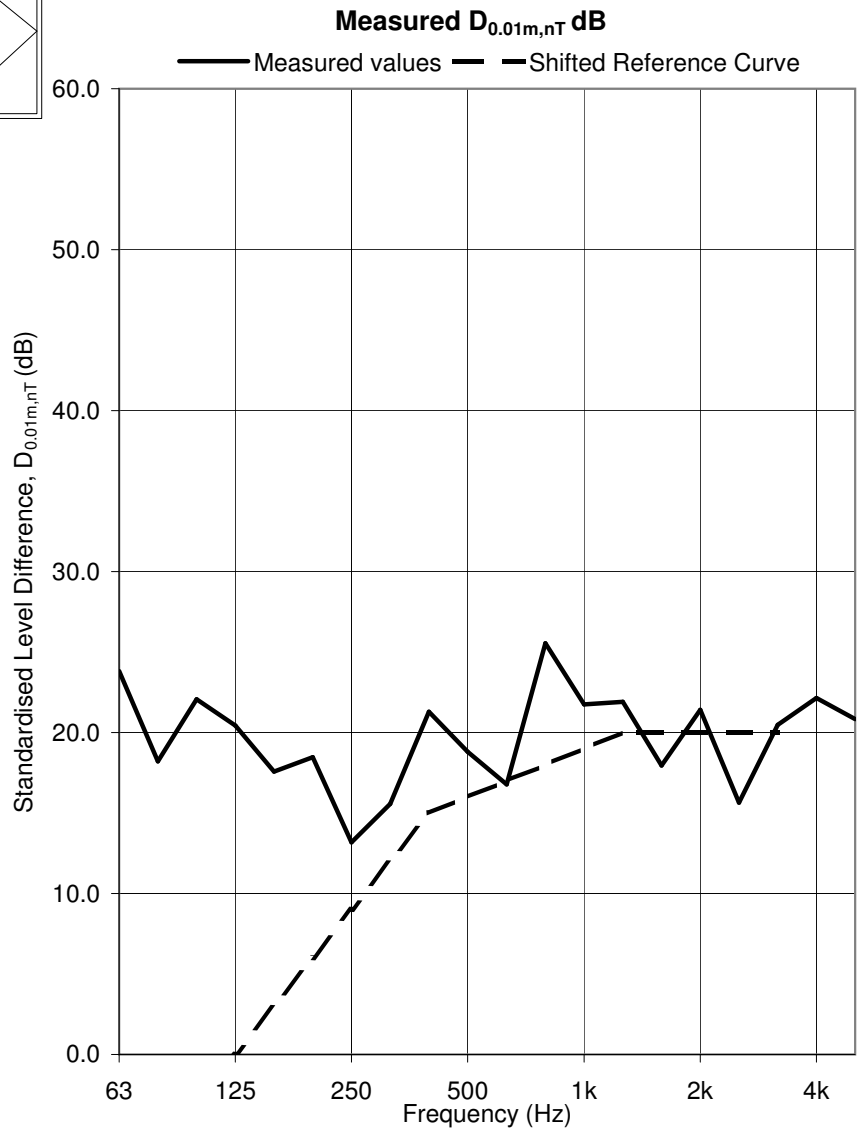
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 628080

Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	15.6
63	23.8
80	18.2
100	22.1
125	20.4
160	17.6
200	18.5
250	13.2
315	15.6
400	21.3
500	18.8
630	16.8
800	25.5
1k	21.7
1.25k	21.9
1.6k	18.0
2k	21.4
2.5k	15.6
3.15k	20.5
4k	22.1
5k	20.8



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

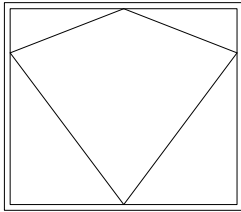
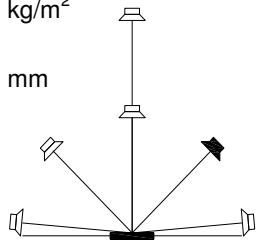
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

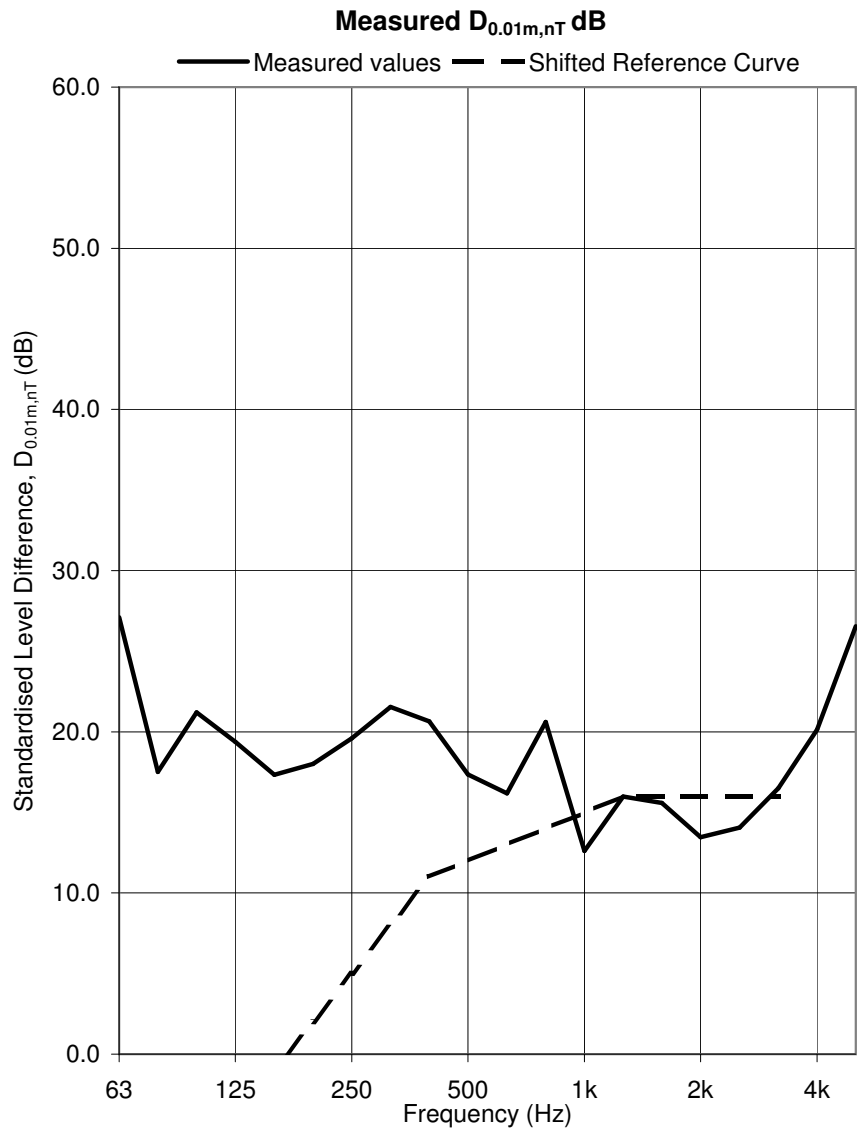
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705020

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	20.5
63	27.1
80	17.5
100	21.2
125	19.4
160	17.3
200	18.0
250	19.6
315	21.5
400	20.7
500	17.4
630	16.2
800	20.6
1k	12.6
1.25k	16.0
1.6k	15.6
2k	13.5
2.5k	14.1
3.15k	16.5
4k	20.1
5k	26.5



D_{0.01m,nT,w(C;C_{tr}) 16 (-1; 0) dB}

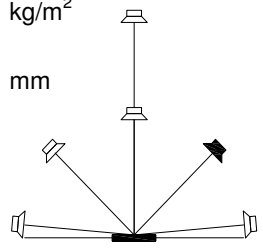
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

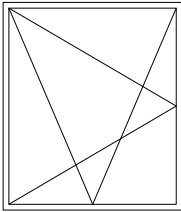
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0273 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

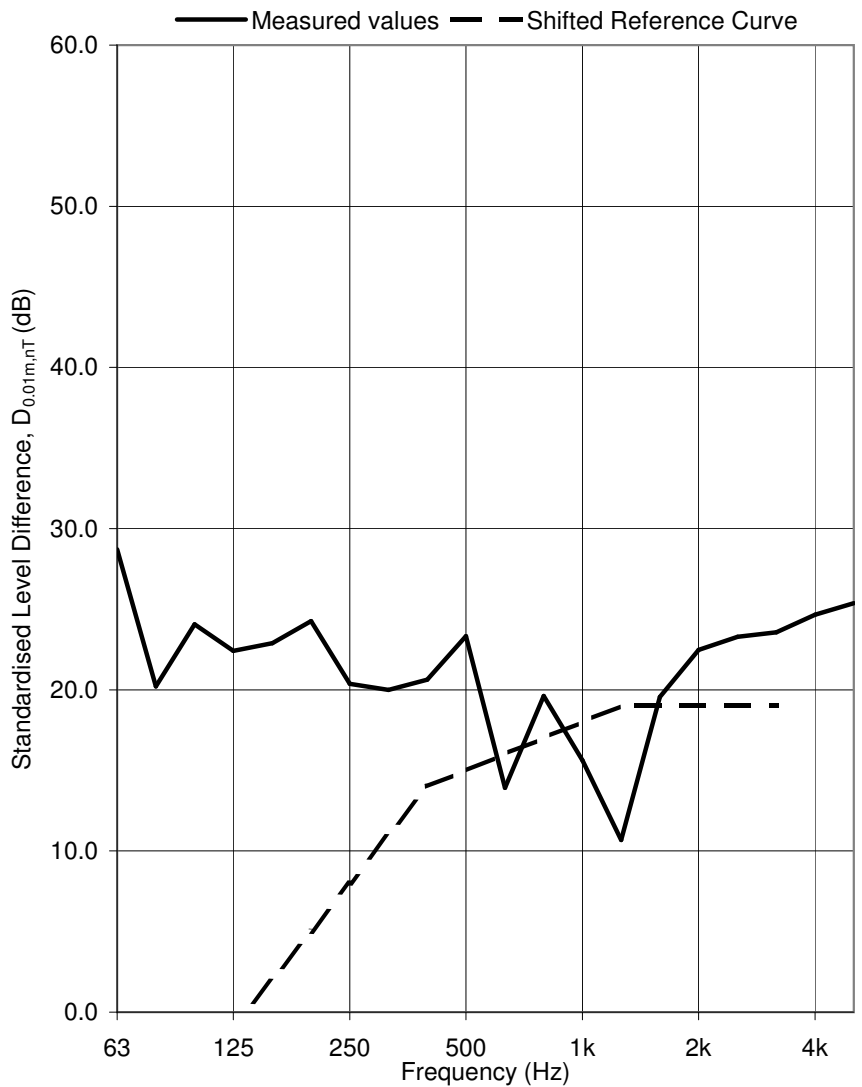


Test ID: 711063

Loudspeaker Configuration: L4



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	20.3
63	28.7
80	20.2
100	24.1
125	22.4
160	22.9
200	24.3
250	20.4
315	20.0
400	20.6
500	23.3
630	13.9
800	19.6
1k	15.6
1.25k	10.7
1.6k	19.6
2k	22.5
2.5k	23.3
3.15k	23.6
4k	24.7
5k	25.4

D_{0.01m,nT,w(C;C_{tr}) 19 (-2; -3) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

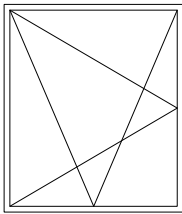
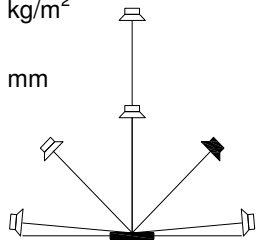
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

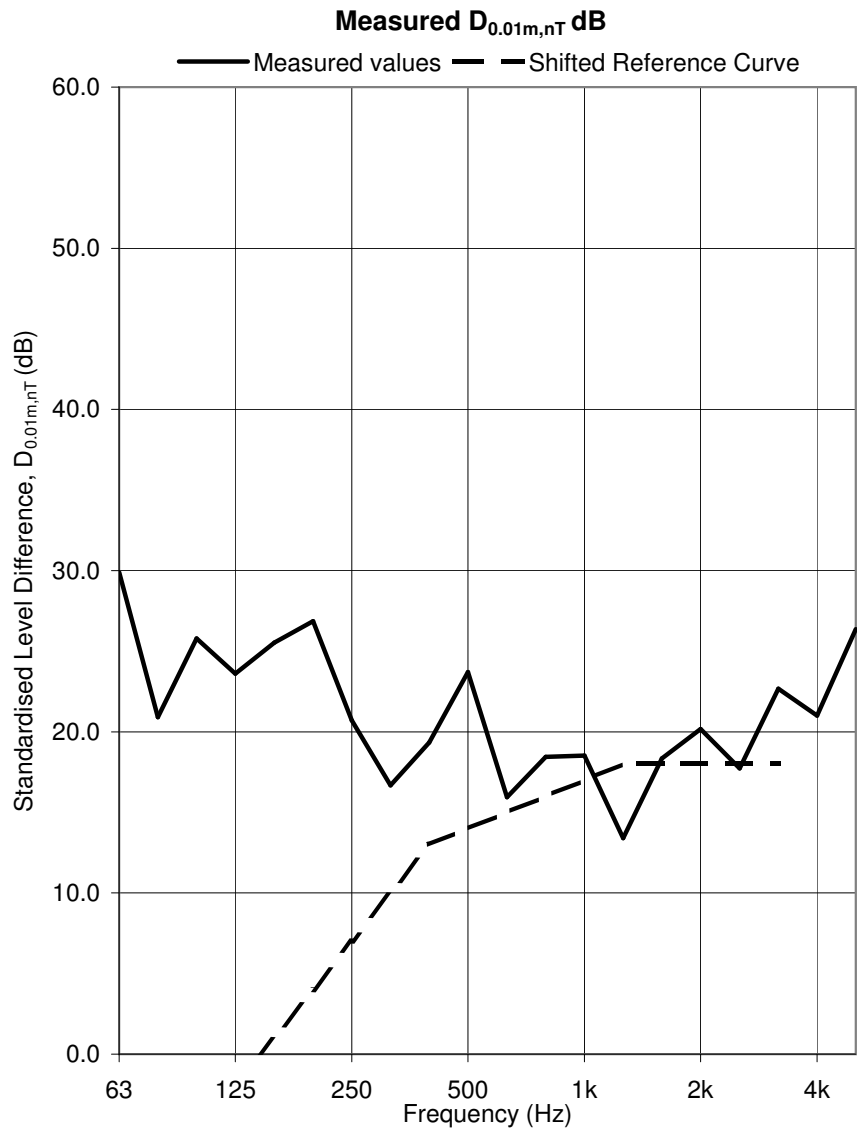
Test Sample: Window C-3 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712060

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	21.7
63	29.9
80	20.9
100	25.8
125	23.6
160	25.5
200	26.9
250	20.7
315	16.7
400	19.3
500	23.7
630	15.9
800	18.4
1k	18.5
1.25k	13.4
1.6k	18.4
2k	20.2
2.5k	17.7
3.15k	22.7
4k	21.0
5k	26.4



D_{0.01m,nT,w(C;C_{tr}) 18 (0; 0) dB}

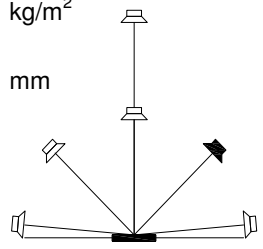
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

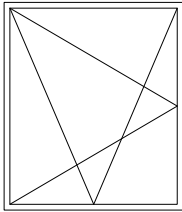
Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

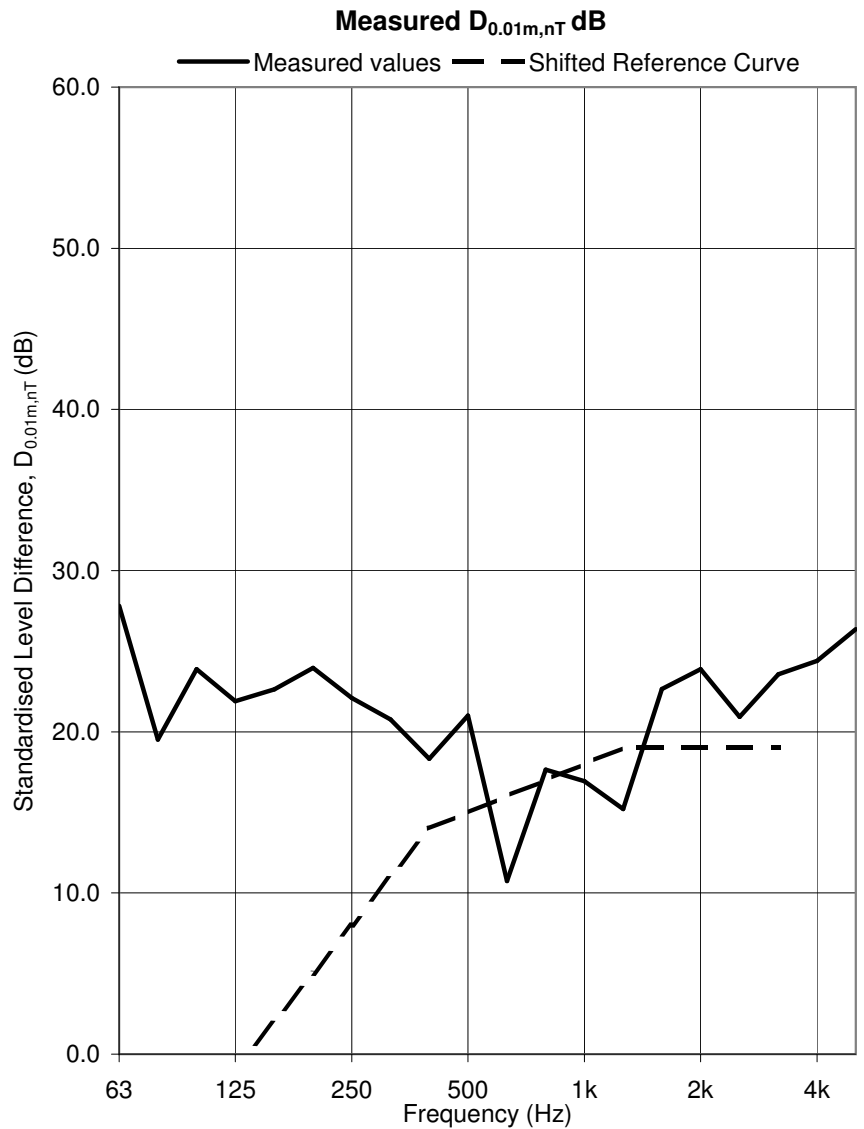


Test ID: 712064

Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	19.6
63	27.8
80	19.5
100	23.9
125	21.9
160	22.6
200	24.0
250	22.1
315	20.8
400	18.3
500	21.0
630	10.7
800	17.6
1k	16.9
1.25k	15.2
1.6k	22.7
2k	23.9
2.5k	20.9
3.15k	23.6
4k	24.4
5k	26.4



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -2) dB}

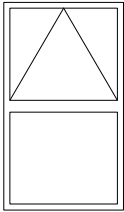
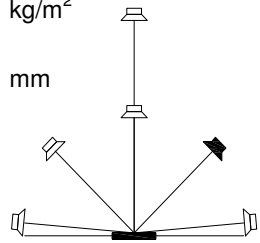
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

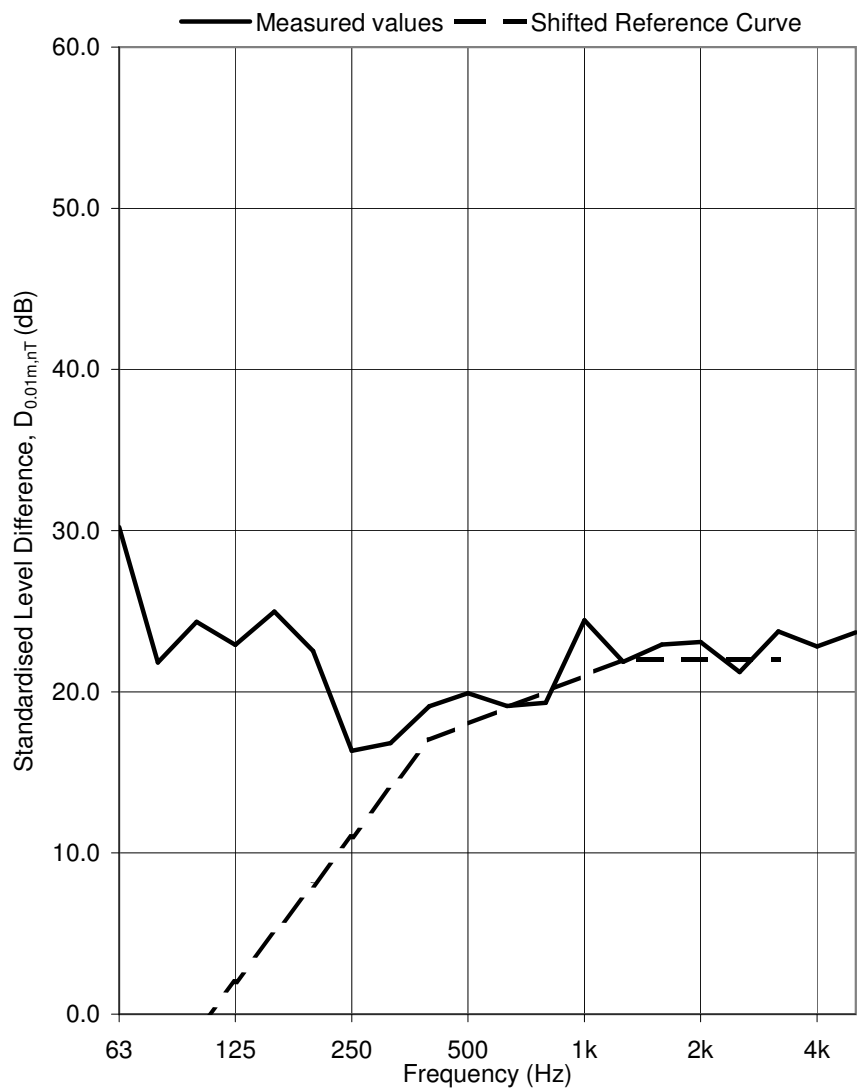
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718009

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.3
63	30.2
80	21.8
100	24.3
125	22.9
160	25.0
200	22.5
250	16.3
315	16.8
400	19.1
500	19.9
630	19.1
800	19.3
1k	24.4
1.25k	21.9
1.6k	22.9
2k	23.1
2.5k	21.2
3.15k	23.7
4k	22.8
5k	23.7

$D_{0.01m,nT,w(C;C_{tr})}$ 22 (-1; -1) dB

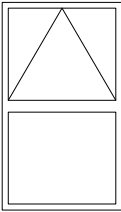
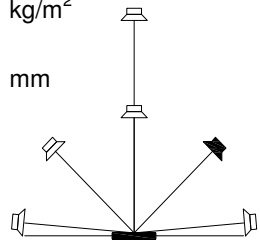
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

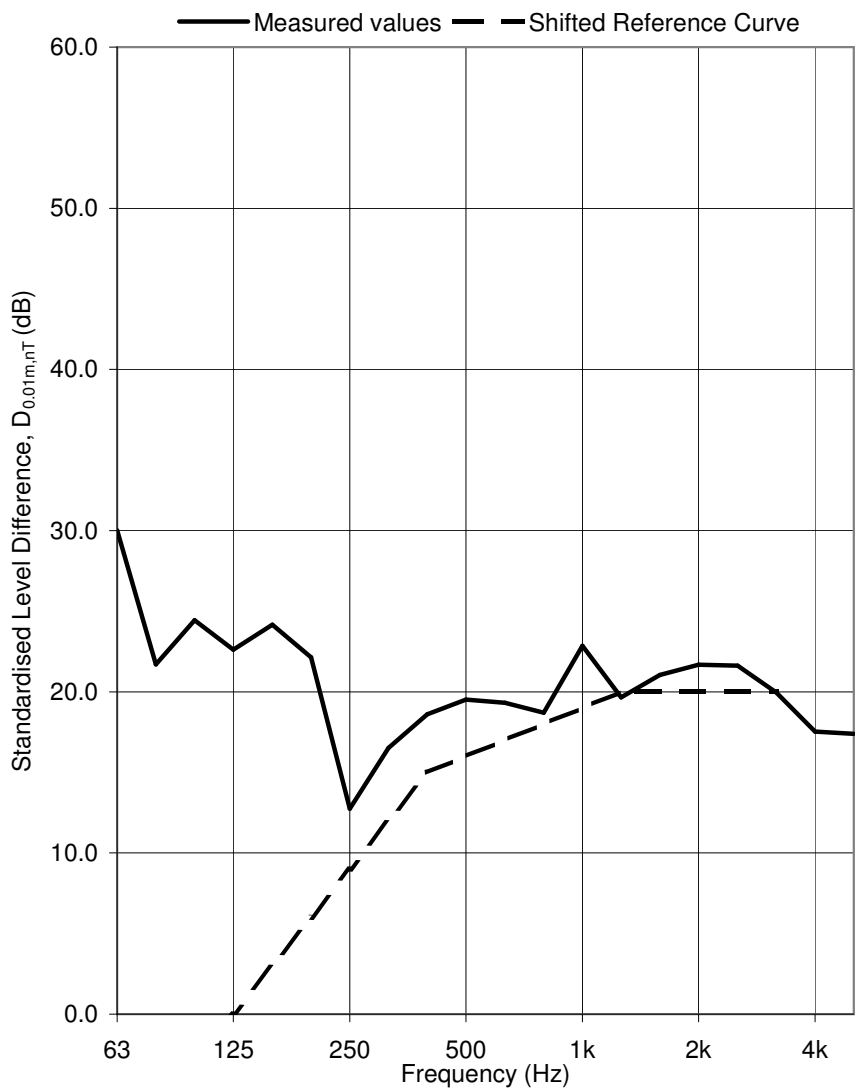
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 719023

Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.1
63	30.0
80	21.7
100	24.4
125	22.6
160	24.2
200	22.1
250	12.7
315	16.5
400	18.6
500	19.5
630	19.3
800	18.7
1k	22.8
1.25k	19.7
1.6k	21.0
2k	21.7
2.5k	21.6
3.15k	19.9
4k	17.5
5k	17.4

$D_{0.01m,nT,w}(C;C_{tr})$ 20 (0; 0) dB

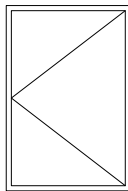
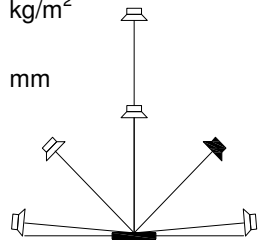
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

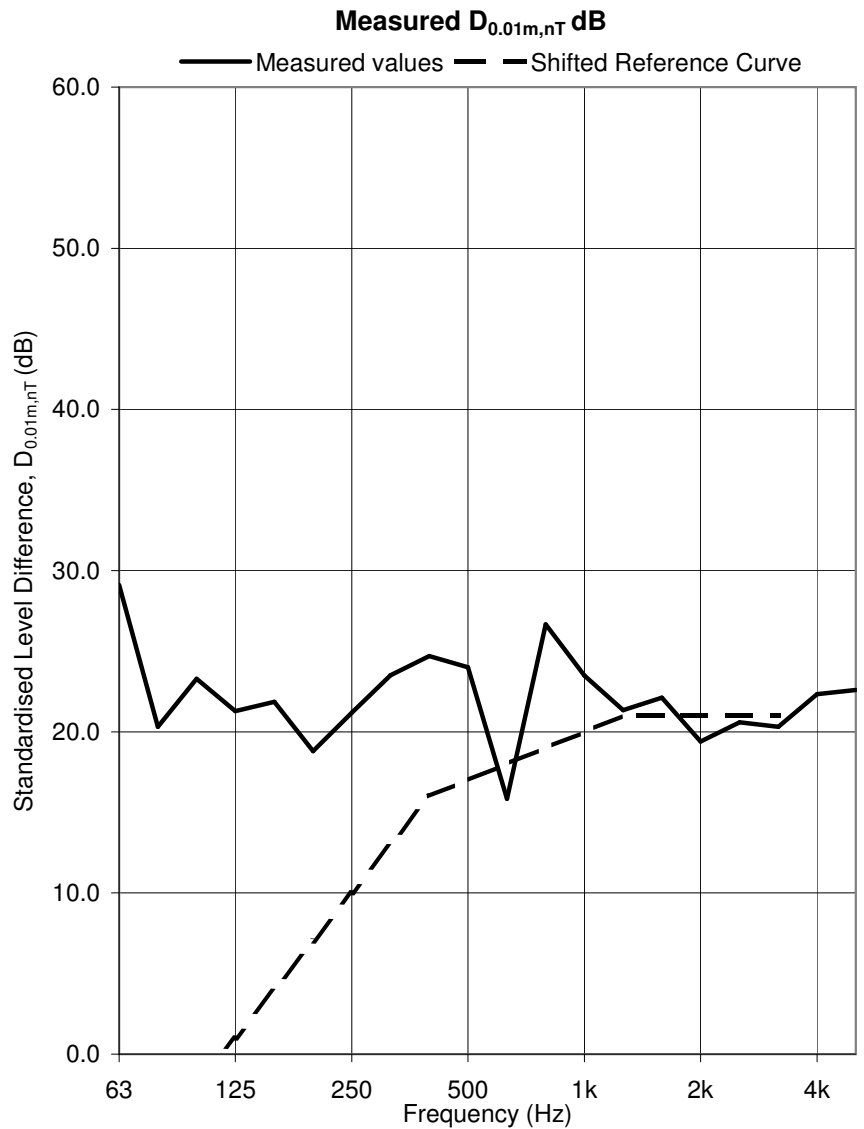
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720033

Test Sample: Window G Open 0.20 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L4



Frequency Hz	D _{0.01m,nT} dB
50	22.6
63	29.1
80	20.3
100	23.3
125	21.3
160	21.9
200	18.8
250	21.2
315	23.5
400	24.7
500	24.0
630	15.8
800	26.7
1k	23.5
1.25k	21.3
1.6k	22.1
2k	19.4
2.5k	20.6
3.15k	20.3
4k	22.3
5k	22.6



D_{0.01m,nT,w(C;C_{tr}) 21 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

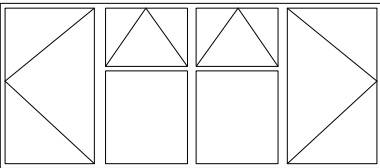
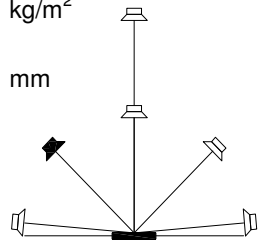
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0091 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

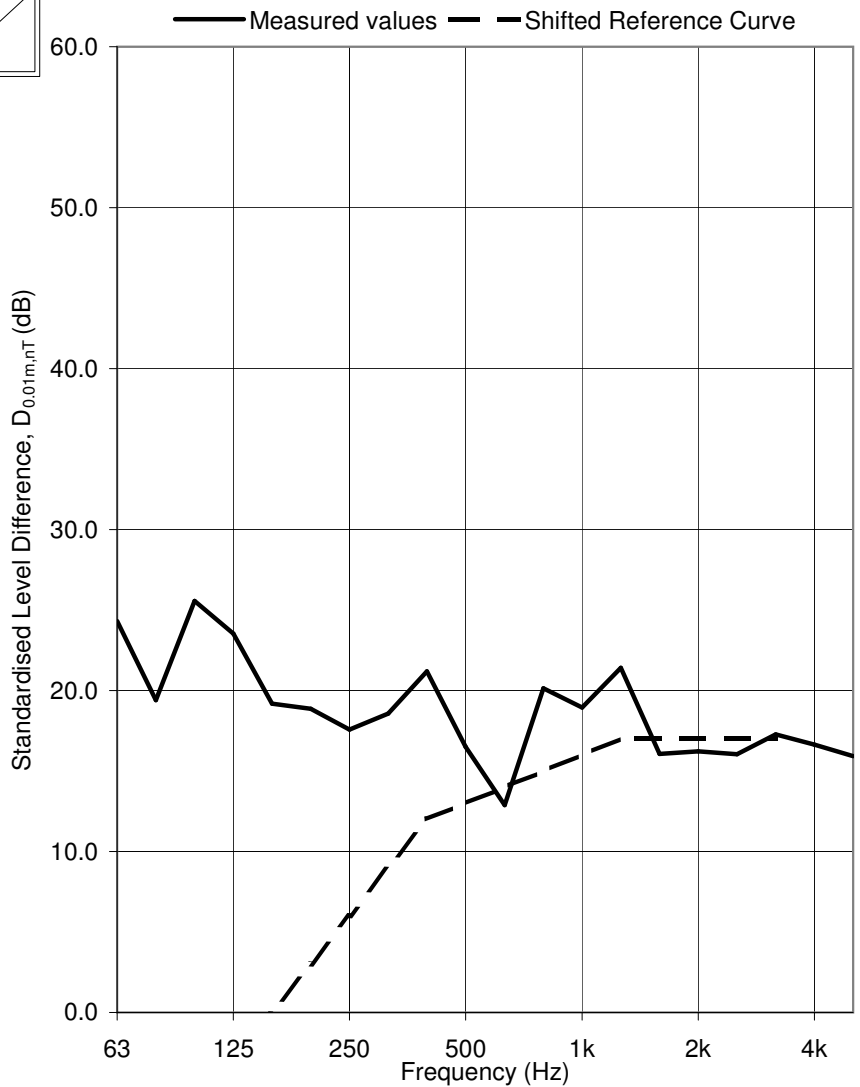
Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628096

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	17.9
63	24.3
80	19.4
100	25.6
125	23.5
160	19.2
200	18.9
250	17.6
315	18.6
400	21.2
500	16.5
630	12.9
800	20.1
1k	18.9
1.25k	21.4
1.6k	16.1
2k	16.2
2.5k	16.0
3.15k	17.3
4k	16.6
5k	15.9

$D_{0.01m,nT,w(C;C_{tr})}$ 17 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

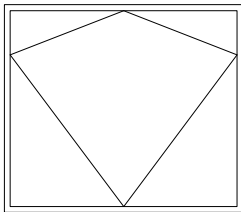
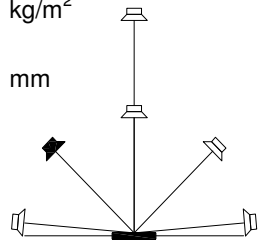
Standardised Level Difference. Simulated residential receiver environment

Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.998 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

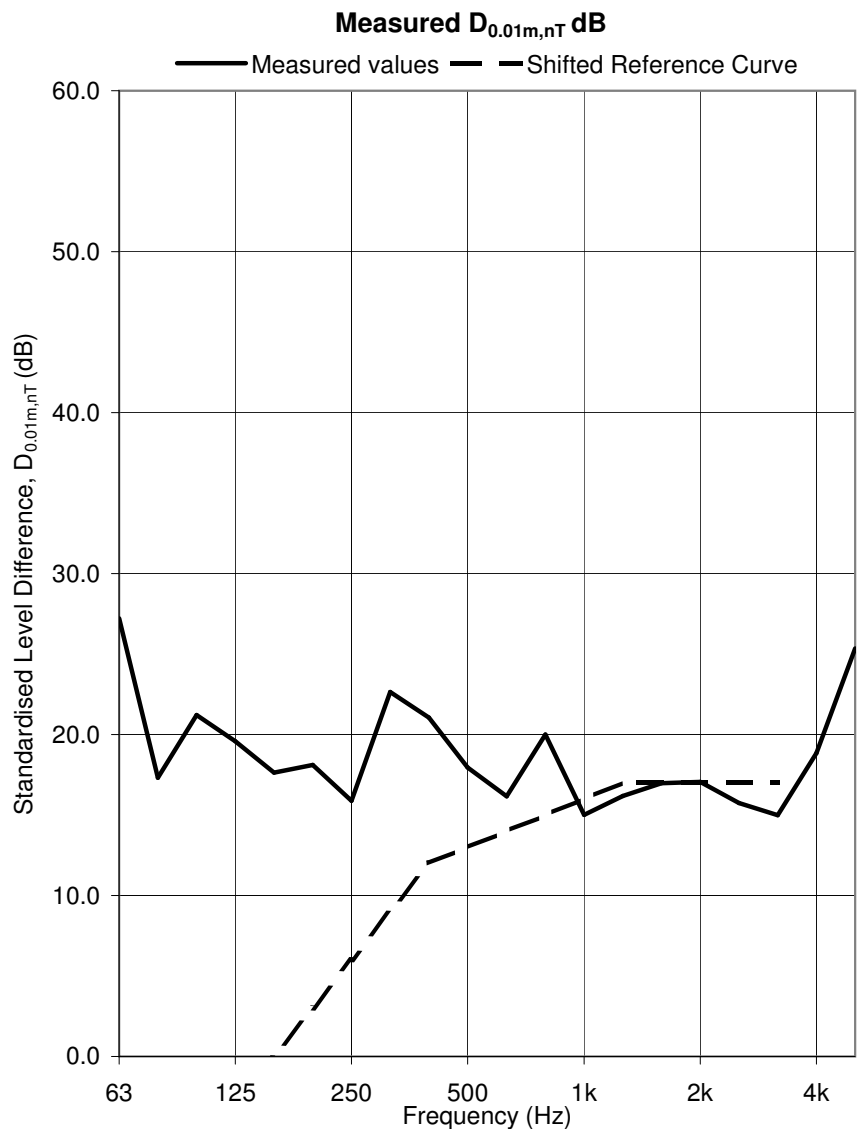
Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 705025

Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	20.4
63	27.2
80	17.3
100	21.2
125	19.6
160	17.6
200	18.1
250	15.9
315	22.6
400	21.1
500	18.0
630	16.2
800	20.0
1k	15.0
1.25k	16.2
1.6k	17.0
2k	17.1
2.5k	15.8
3.15k	15.0
4k	18.8
5k	25.3



D_{0.01m,nT,w(C;C_{tr}) 17 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

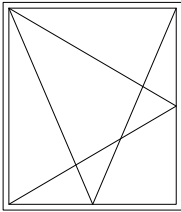
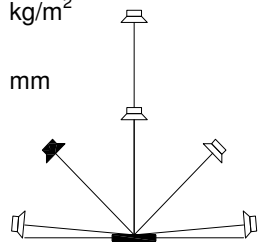
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test ID: 711058

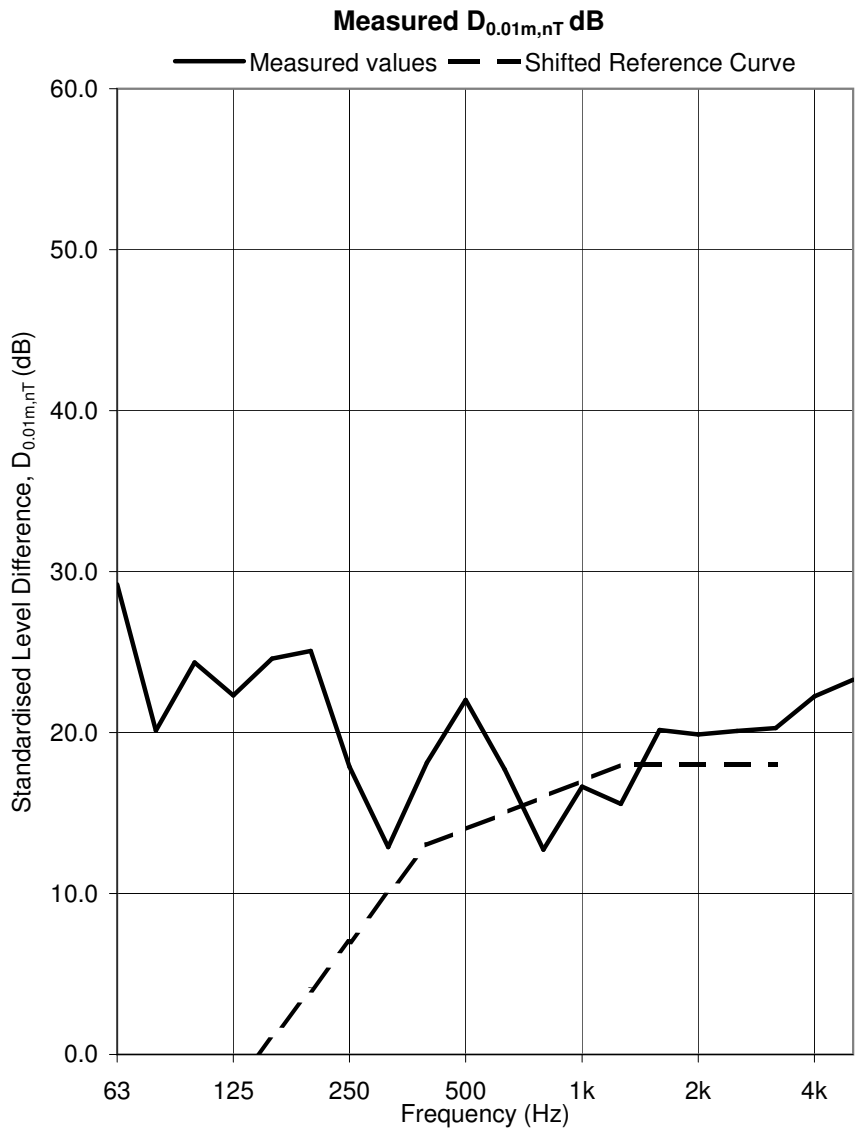
Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	20.8
63	29.2
80	20.1
100	24.4
125	22.3
160	24.6
200	25.1
250	17.9
315	12.9
400	18.1
500	22.0
630	17.7
800	12.7
1k	16.6
1.25k	15.6
1.6k	20.2
2k	19.9
2.5k	20.1
3.15k	20.3
4k	22.3
5k	23.3



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; -1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

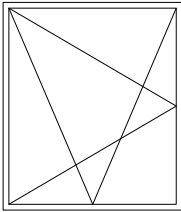
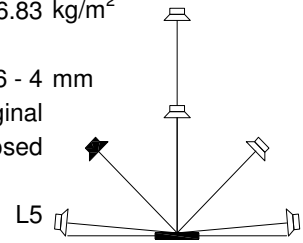
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0274 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

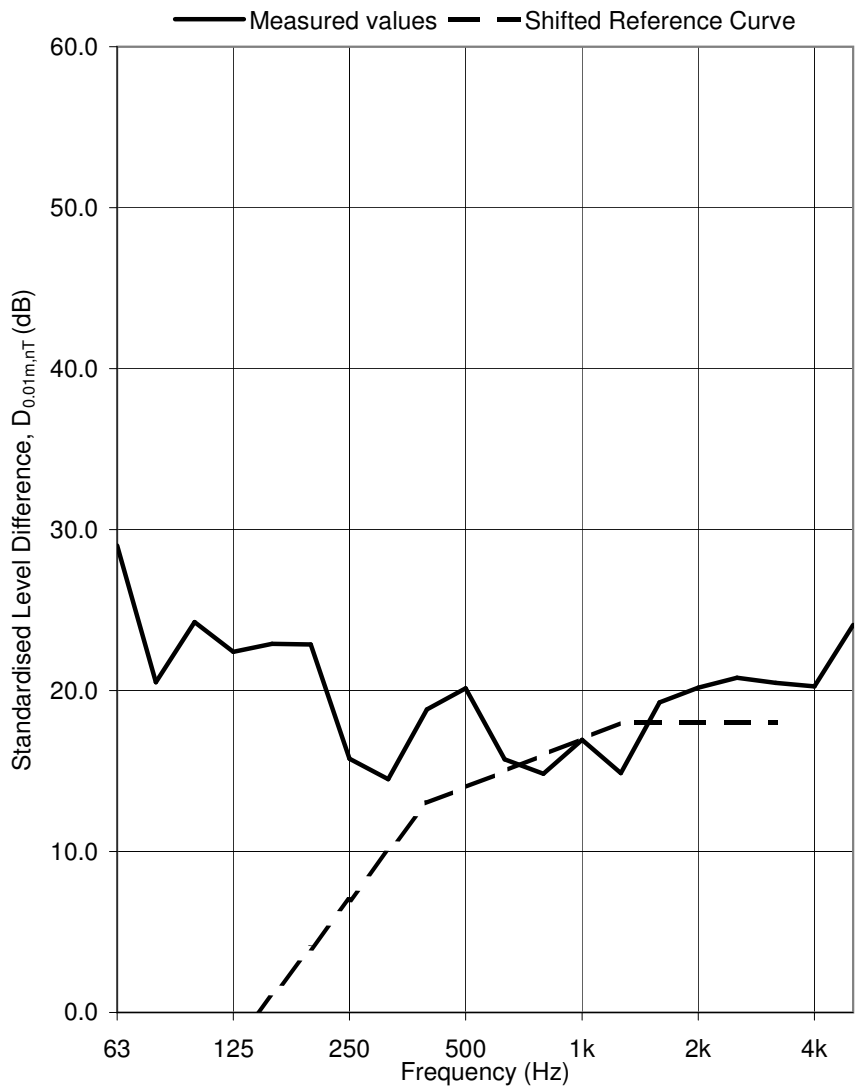
Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

Test ID: 711053

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	20.7
63	29.0
80	20.5
100	24.3
125	22.4
160	22.9
200	22.9
250	15.8
315	14.5
400	18.8
500	20.1
630	15.7
800	14.8
1k	16.9
1.25k	14.9
1.6k	19.3
2k	20.2
2.5k	20.8
3.15k	20.5
4k	20.3
5k	24.1

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

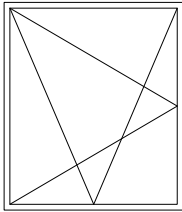
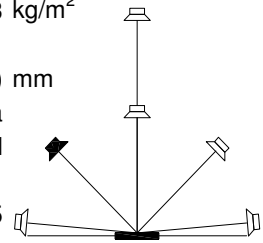
Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0246 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

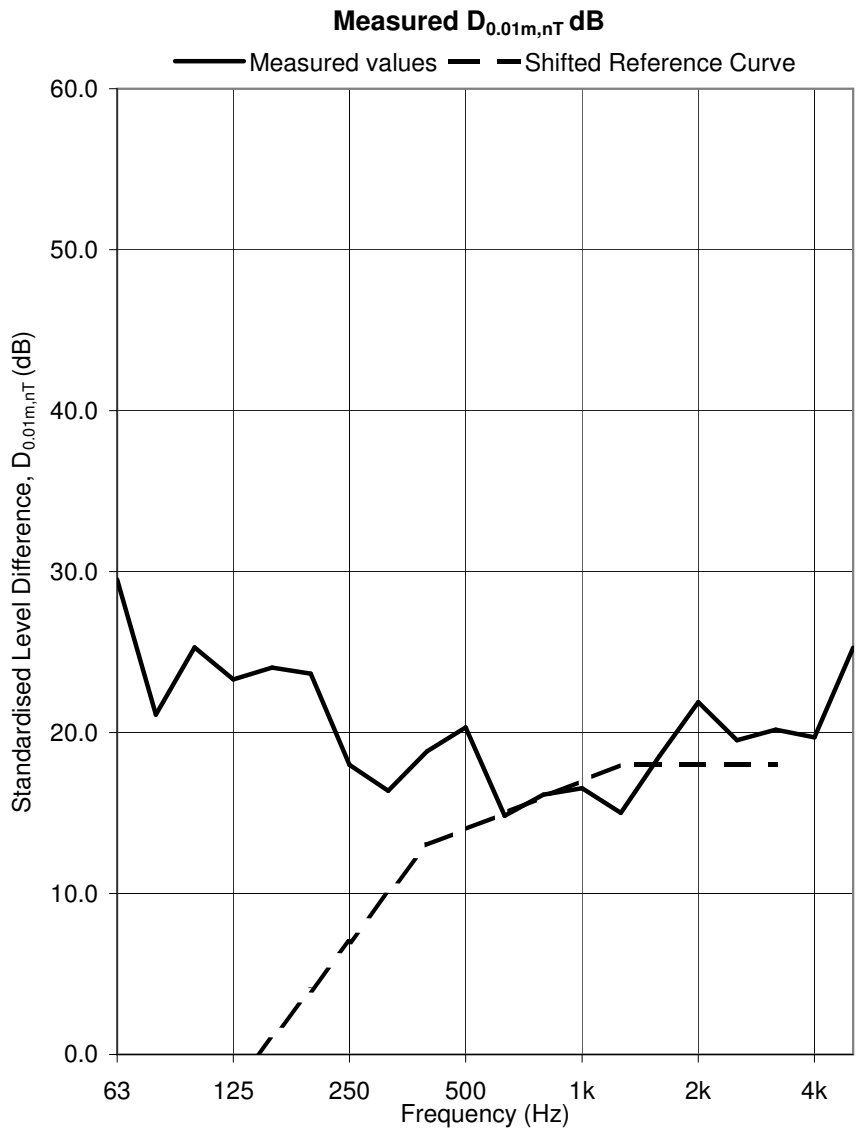
Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Test ID: 712069

Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	21.6
63	29.5
80	21.1
100	25.3
125	23.3
160	24.0
200	23.7
250	18.0
315	16.4
400	18.8
500	20.3
630	14.8
800	16.1
1k	16.5
1.25k	15.0
1.6k	18.6
2k	21.9
2.5k	19.5
3.15k	20.2
4k	19.7
5k	25.3



D_{0.01m,nT,w(C;C_{tr}) 18 (0; -1) dB}

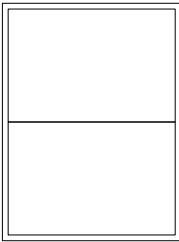
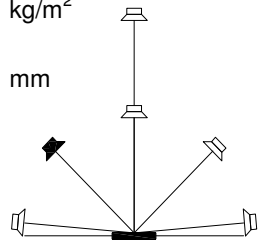
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

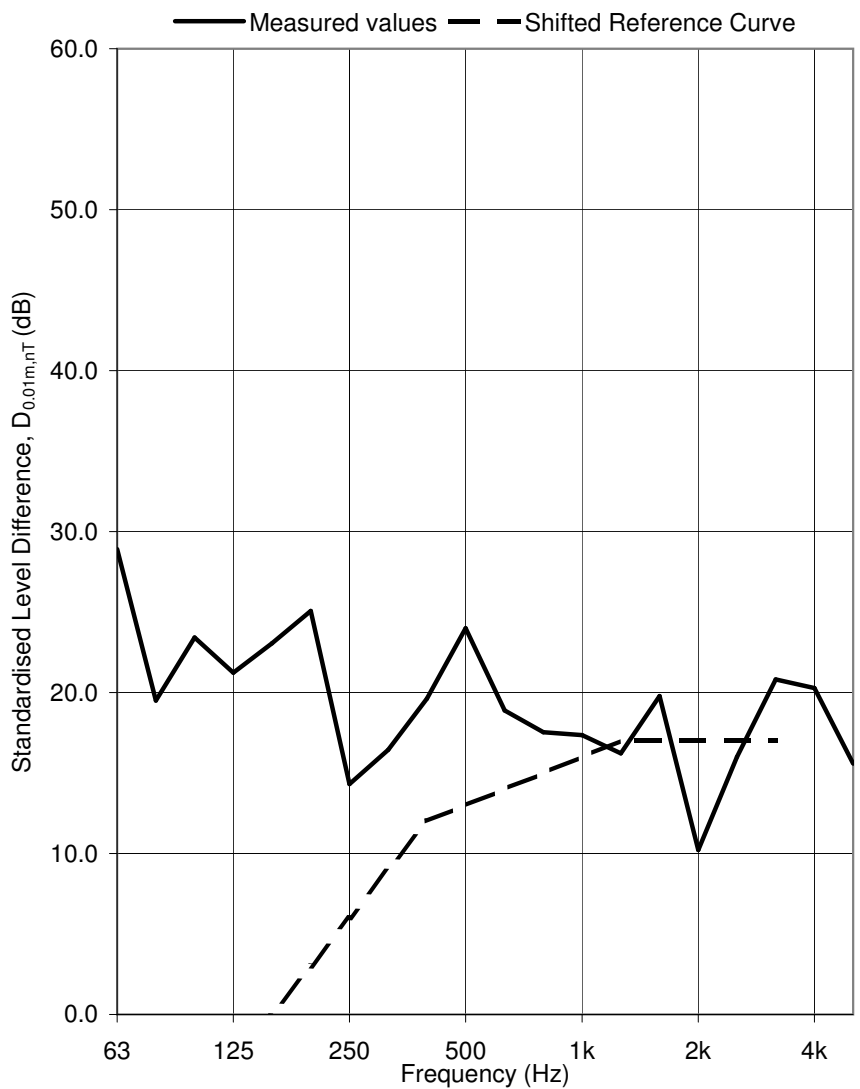
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0176 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713041

Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.4
63	28.9
80	19.5
100	23.4
125	21.2
160	23.1
200	25.1
250	14.3
315	16.4
400	19.6
500	24.0
630	18.9
800	17.5
1k	17.4
1.25k	16.2
1.6k	19.8
2k	10.2
2.5k	16.0
3.15k	20.8
4k	20.3
5k	15.6

$D_{0.01m,nT,w(C;C_{tr})}$ 17 (-1; -1) dB

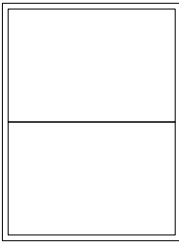
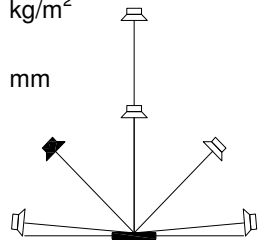
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

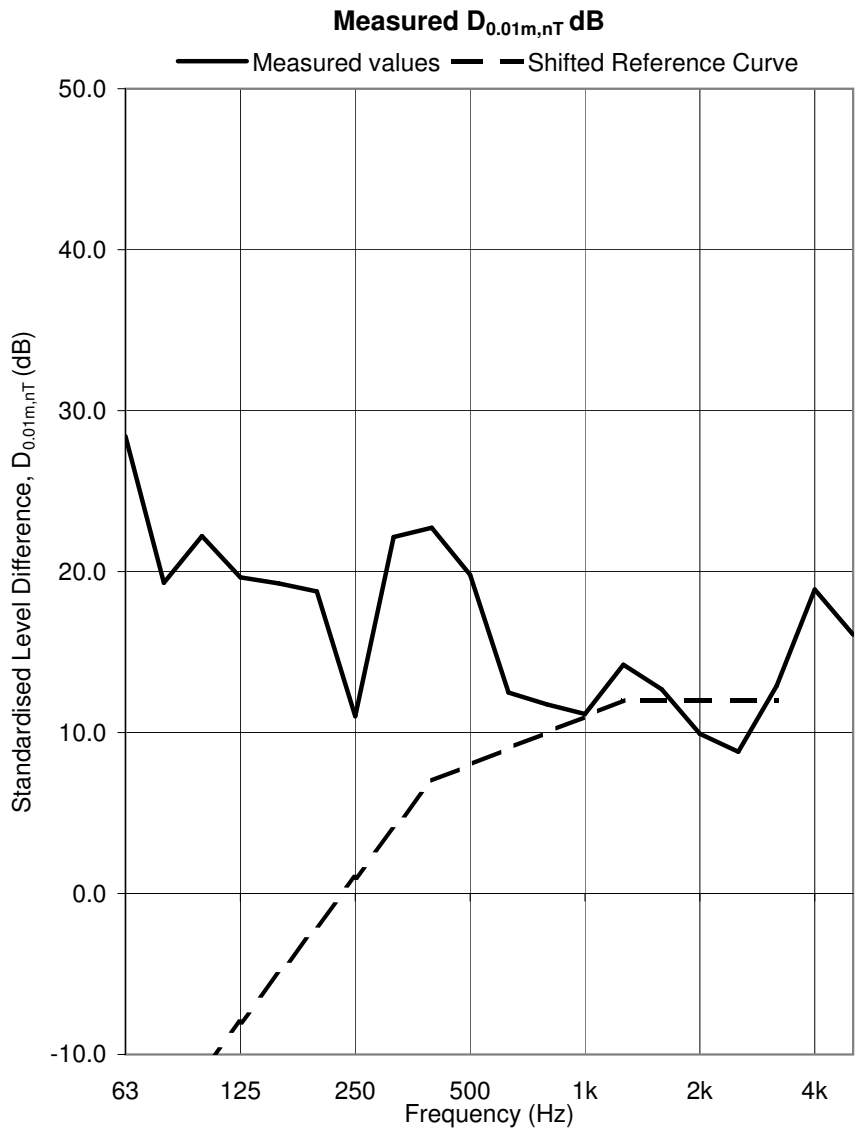
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713033

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	22.0
63	28.4
80	19.3
100	22.2
125	19.6
160	19.3
200	18.8
250	11.0
315	22.1
400	22.7
500	19.8
630	12.5
800	11.7
1k	11.2
1.25k	14.2
1.6k	12.7
2k	9.9
2.5k	8.8
3.15k	12.9
4k	18.9
5k	16.1

b



D_{0.01m,nT,w(C;C_{tr}) 12 (0; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

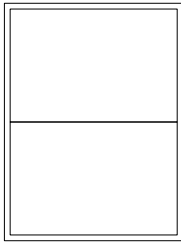
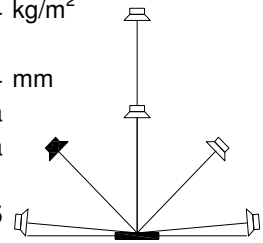
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.018 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²

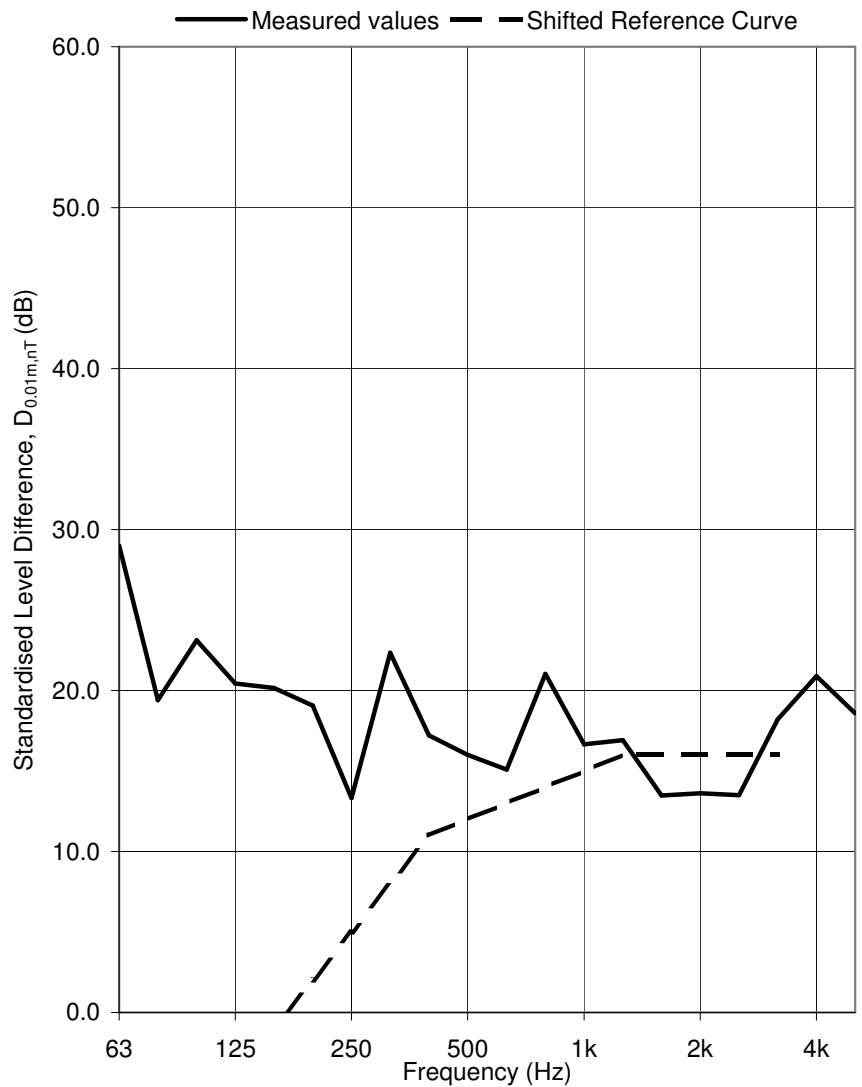
Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713037

Loudspeaker Configuration: L5



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.5
63	29.0
80	19.4
100	23.1
125	20.4
160	20.2
200	19.1
250	13.3
315	22.3
400	17.2
500	16.0
630	15.1
800	21.0
1k	16.7
1.25k	16.9
1.6k	13.5
2k	13.6
2.5k	13.5
3.15k	18.2
4k	20.9
5k	18.6

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (-1; 0) dB

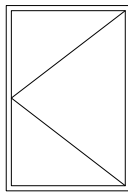
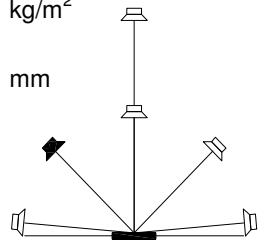
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

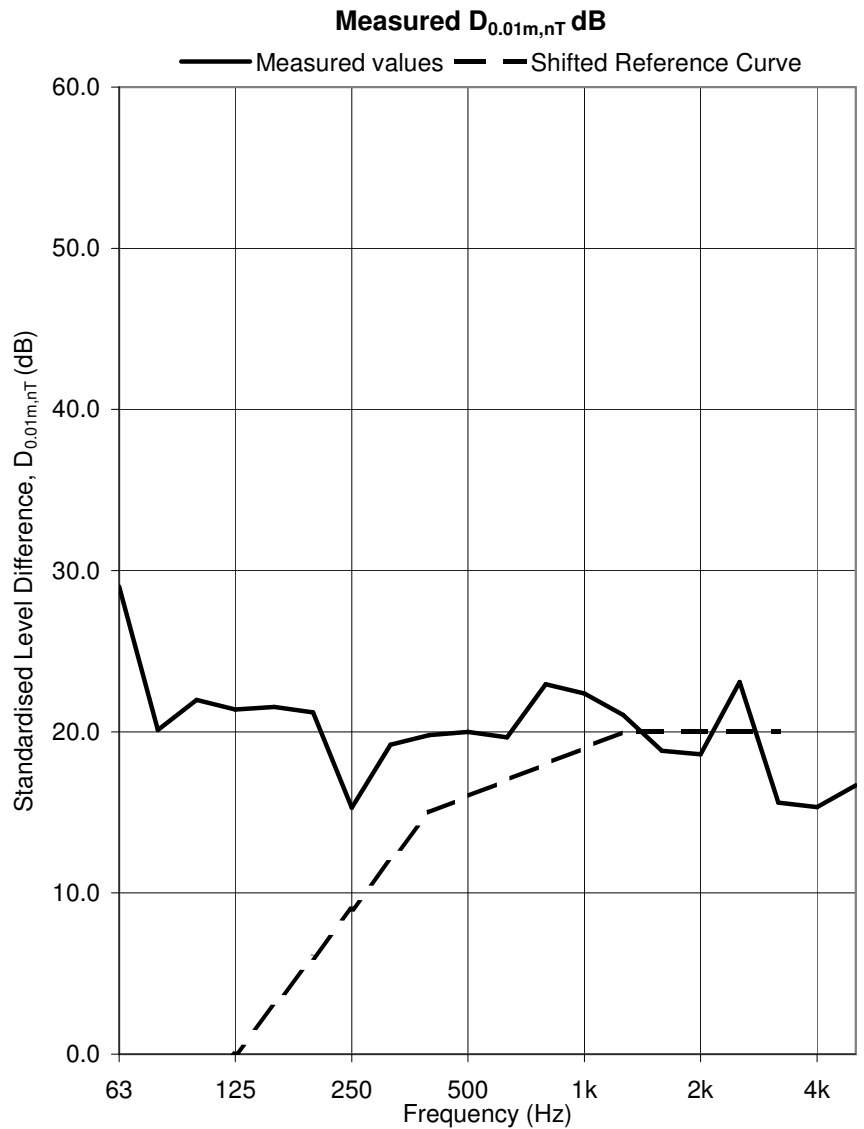
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720022

Test Sample: Window G Open 0.20 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L5



Frequency Hz	D _{0.01m,nT} dB
50	21.6
63	29.0
80	20.1
100	22.0
125	21.4
160	21.6
200	21.2
250	15.3
315	19.2
400	19.8
500	20.0
630	19.6
800	23.0
1k	22.4
1.25k	21.0
1.6k	18.8
2k	18.6
2.5k	23.1
3.15k	15.6
4k	15.3
5k	16.7



D_{0.01m,nT,w(C;C_{tr}) 20 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

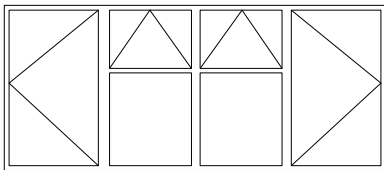
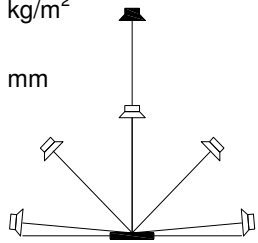
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0106 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

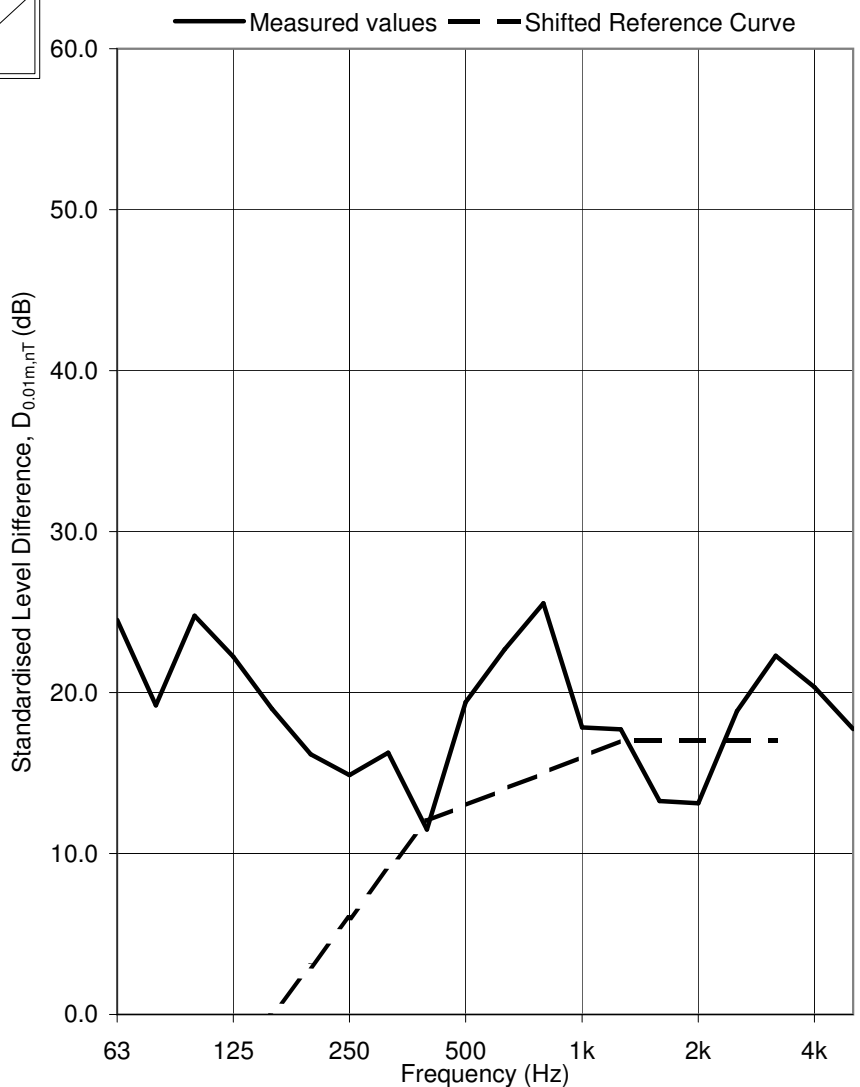
Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 628032

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	17.8
63	24.5
80	19.2
100	24.8
125	22.2
160	19.0
200	16.2
250	14.9
315	16.3
400	11.5
500	19.4
630	22.7
800	25.5
1k	17.8
1.25k	17.7
1.6k	13.3
2k	13.1
2.5k	18.8
3.15k	22.3
4k	20.3
5k	17.7

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (-1; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

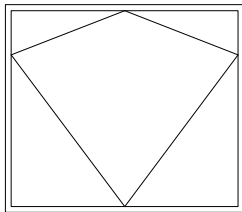
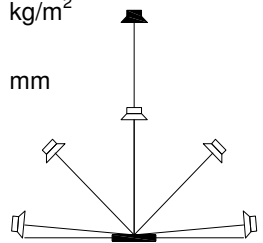
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

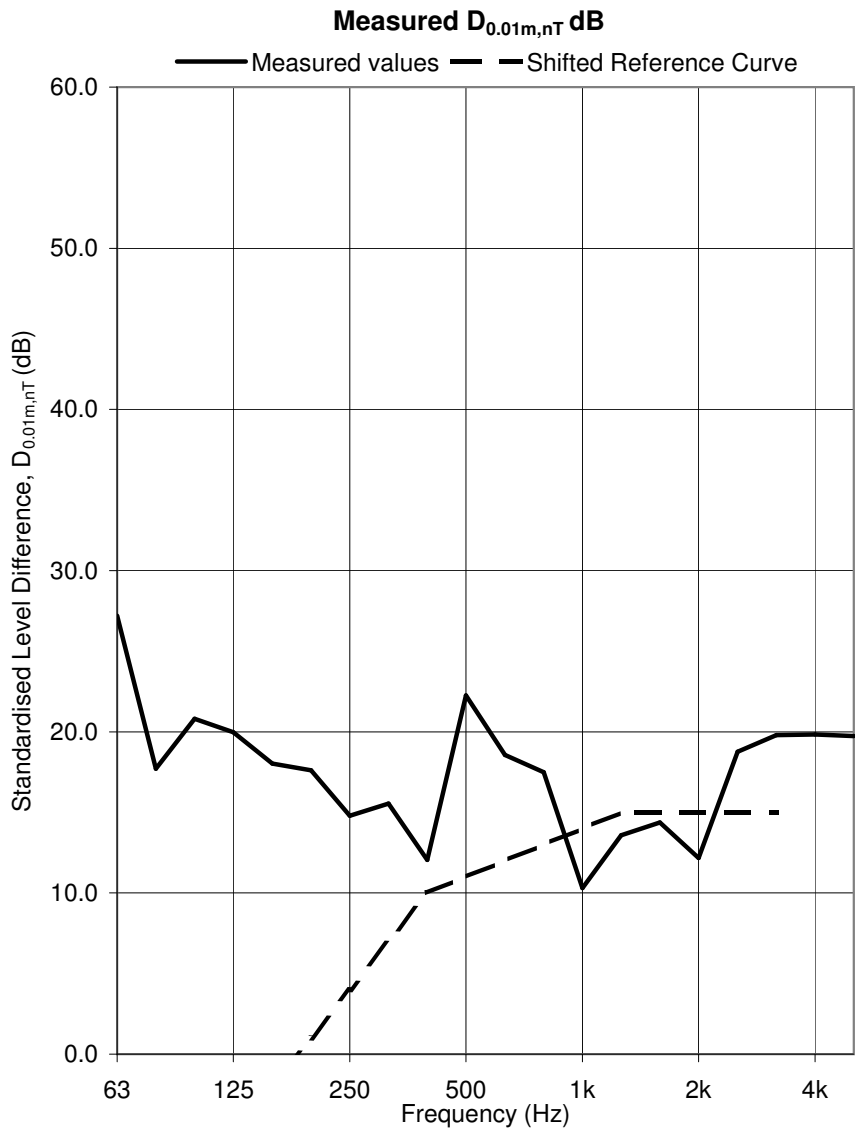
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9981 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	22.6
63	27.2
80	17.7
100	20.8
125	20.0
160	18.0
200	17.6
250	14.8
315	15.5
400	12.1
500	22.3
630	18.6
800	17.5
1k	10.3
1.25k	13.6
1.6k	14.4
2k	12.2
2.5k	18.8
3.15k	19.8
4k	19.8
5k	19.7



D_{0.01m,nT,w(C;C_{tr}) 15 (-1; -1) dB}

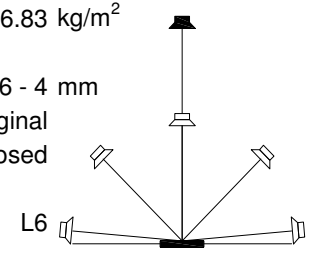
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

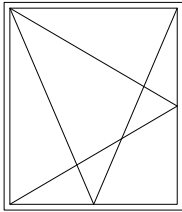
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

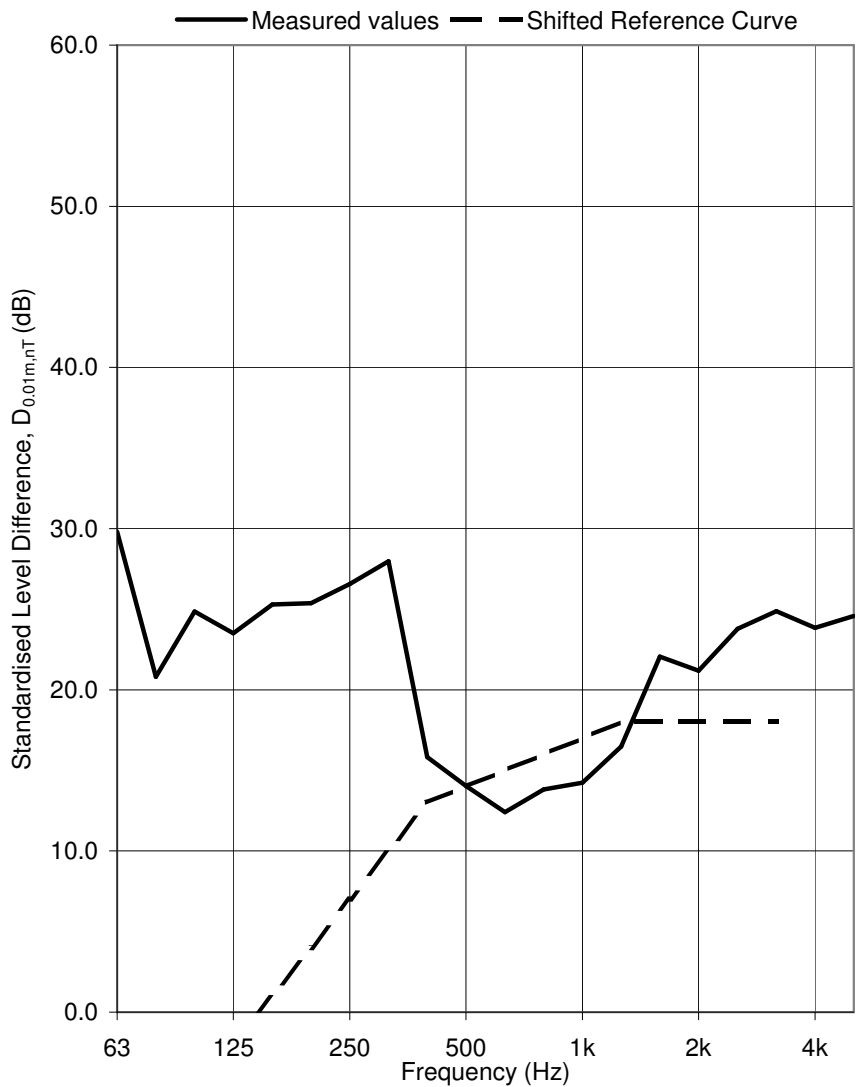


Test ID: 711021

Loudspeaker Configuration:



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.3
63	29.8
80	20.8
100	24.9
125	23.5
160	25.3
200	25.4
250	26.6
315	28.0
400	15.8
500	14.0
630	12.4
800	13.8
1k	14.2
1.25k	16.5
1.6k	22.1
2k	21.2
2.5k	23.8
3.15k	24.9
4k	23.9
5k	24.6

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (-1; -2) dB

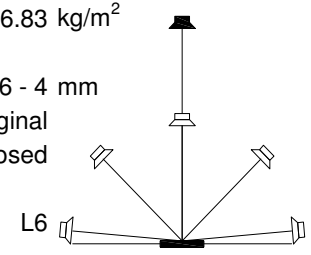
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

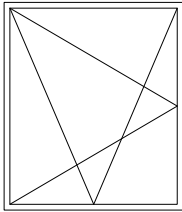
Date: 11/7/05
 Air temperature: 20.6 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0278 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original
 Vent: Closed

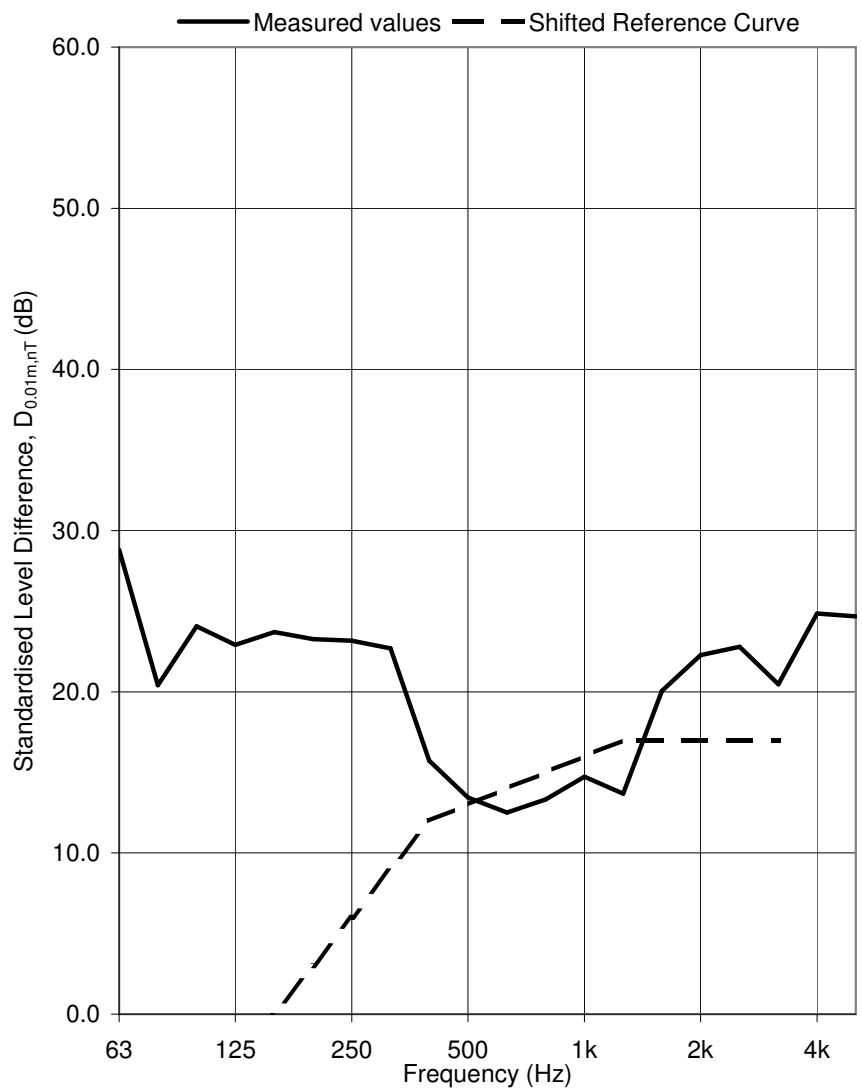


Test ID: 711025

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.7
63	28.8
80	20.4
100	24.1
125	22.9
160	23.7
200	23.3
250	23.2
315	22.7
400	15.7
500	13.4
630	12.5
800	13.3
1k	14.7
1.25k	13.7
1.6k	20.1
2k	22.3
2.5k	22.8
3.15k	20.5
4k	24.9
5k	24.7

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (-1; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

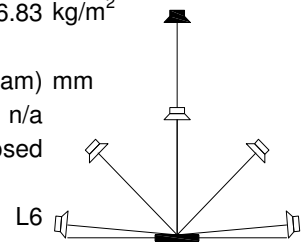
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

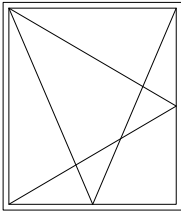
Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

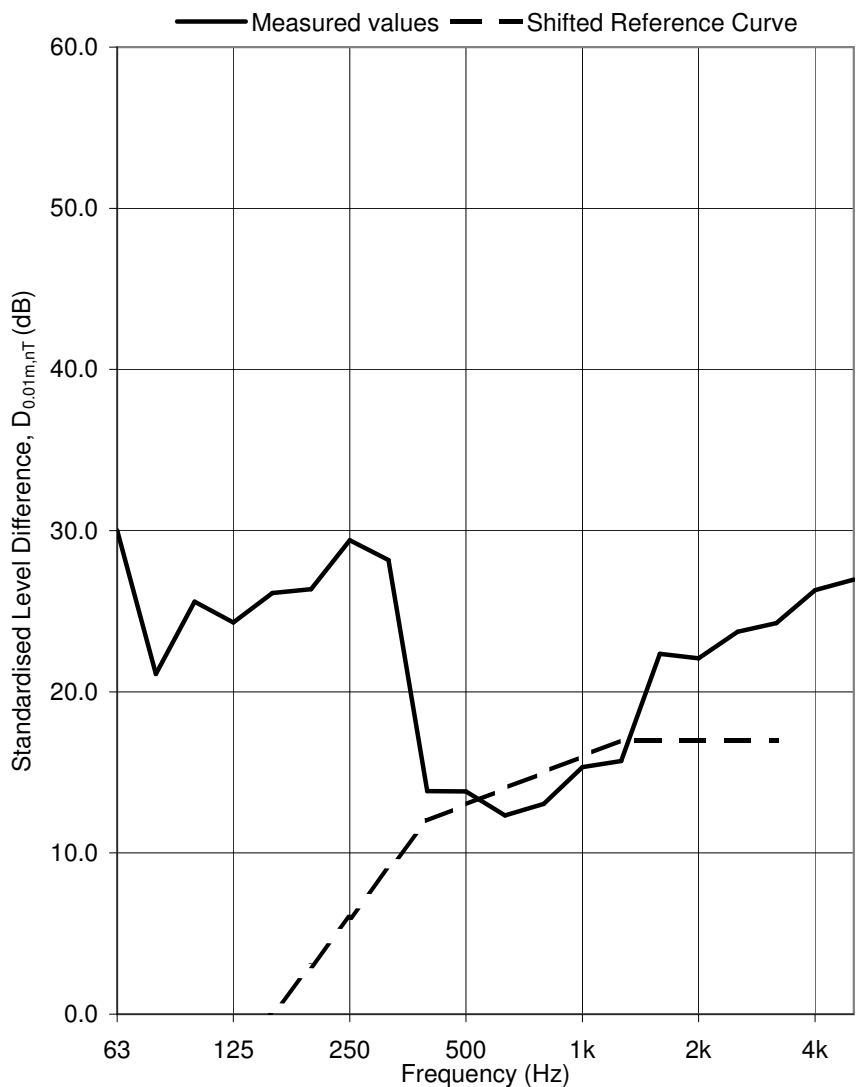
Loudspeaker Configuration:



Test ID: 712021



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.5
63	30.0
80	21.1
100	25.6
125	24.3
160	26.1
200	26.4
250	29.4
315	28.2
400	13.8
500	13.8
630	12.3
800	13.0
1k	15.3
1.25k	15.7
1.6k	22.4
2k	22.1
2.5k	23.7
3.15k	24.3
4k	26.3
5k	27.0

$D_{0.01m,nT,w}(C;C_{tr})$ 17 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

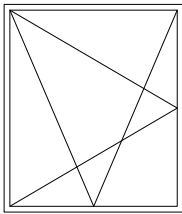
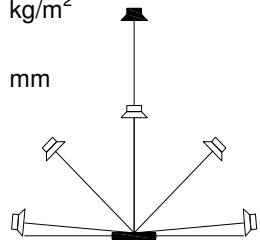
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

Date: 12/7/05
 Air temperature: 21 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0252 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

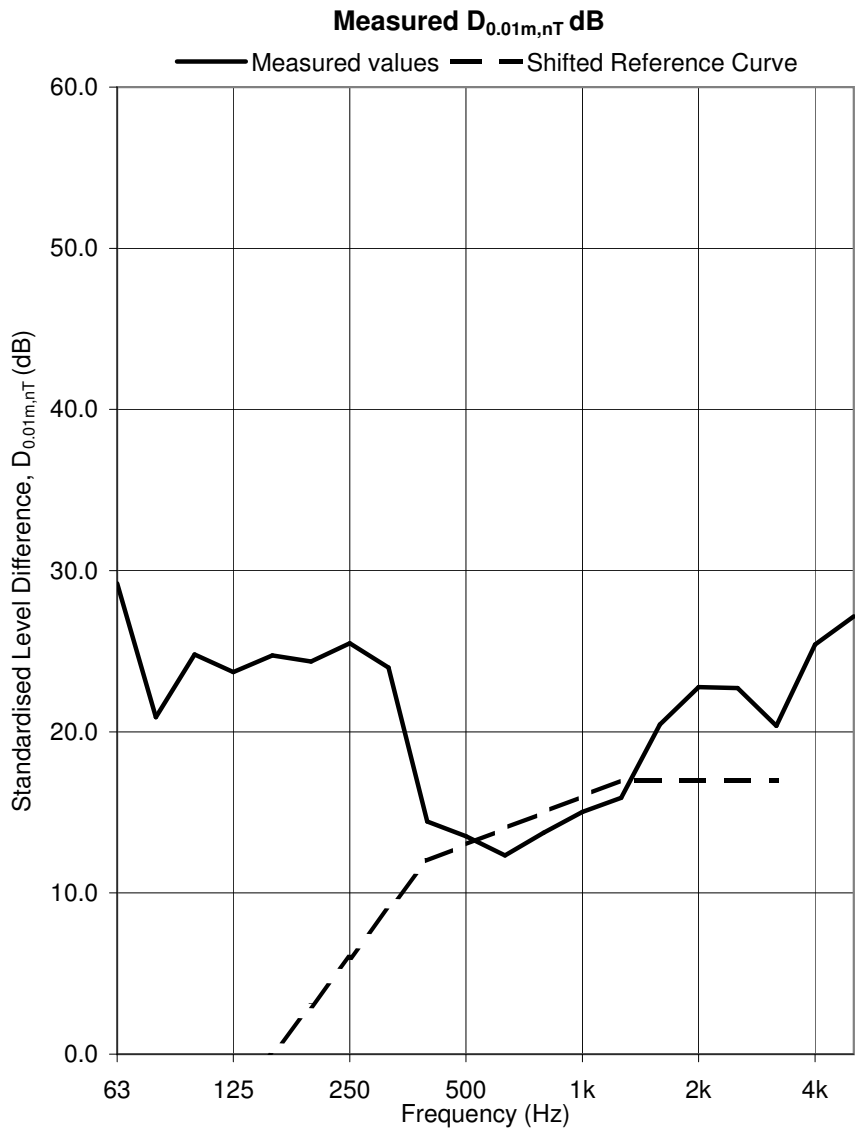
Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a
 Vent: Vent 1 closed

Loudspeaker Configuration: L6



Frequency Hz	D _{0.01m,nT} dB
50	23.0
63	29.2
80	20.9
100	24.8
125	23.7
160	24.7
200	24.4
250	25.5
315	24.0
400	14.4
500	13.5
630	12.3
800	13.7
1k	15.0
1.25k	15.9
1.6k	20.5
2k	22.8
2.5k	22.7
3.15k	20.4
4k	25.4
5k	27.2

b



D_{0.01m,nT,w(C;C_{tr}) 17 (0; -1) dB}

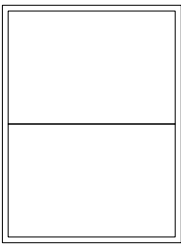
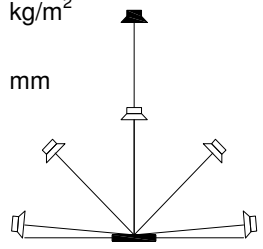
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

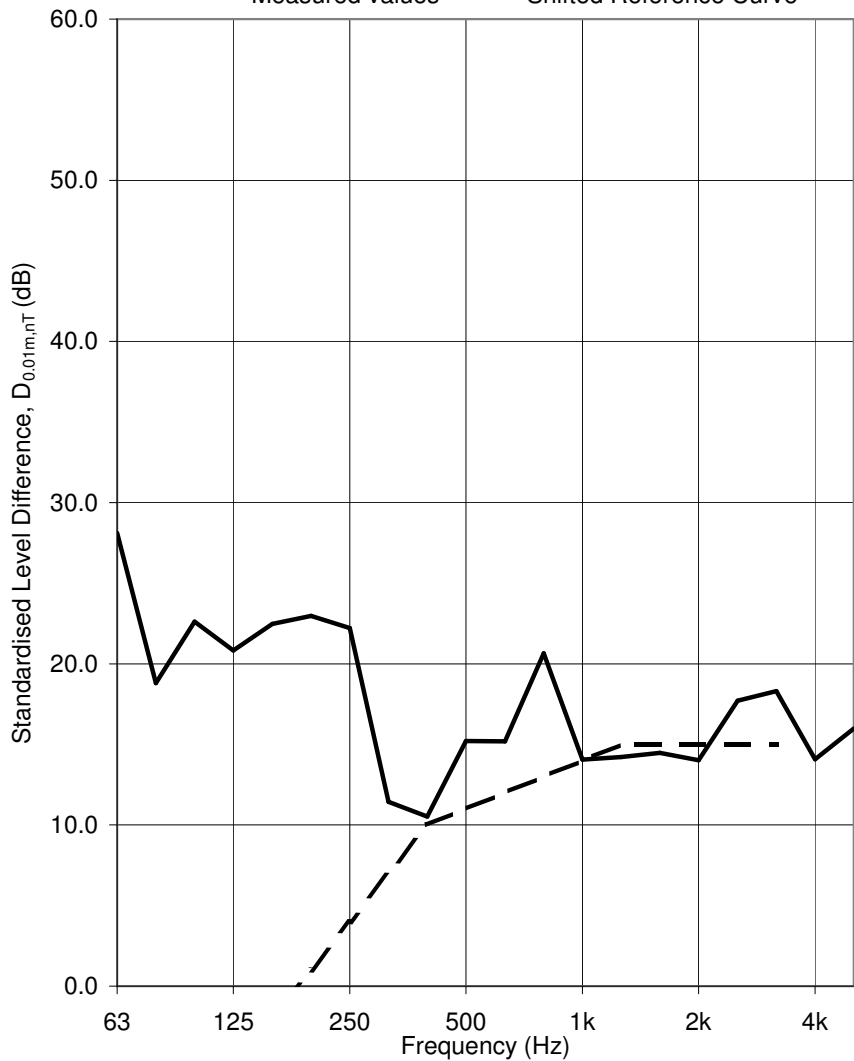
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713027

Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB

— Measured values — Shifted Reference Curve



Frequency Hz	$D_{0.01m,nT}$ dB
50	23.0
63	28.1
80	18.8
100	22.6
125	20.8
160	22.5
200	23.0
250	22.2
315	11.4
400	10.5
500	15.2
630	15.2
800	20.6
1k	14.1
1.25k	14.2
1.6k	14.5
2k	14.0
2.5k	17.7
3.15k	18.3
4k	14.1
5k	16.0

$D_{0.01m,nT,w}(C;C_{tr})$ 15 (0; 0) dB

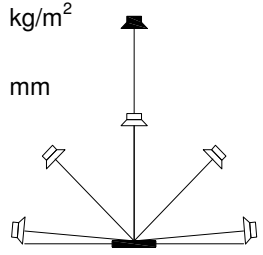
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

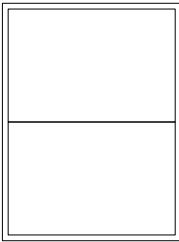
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

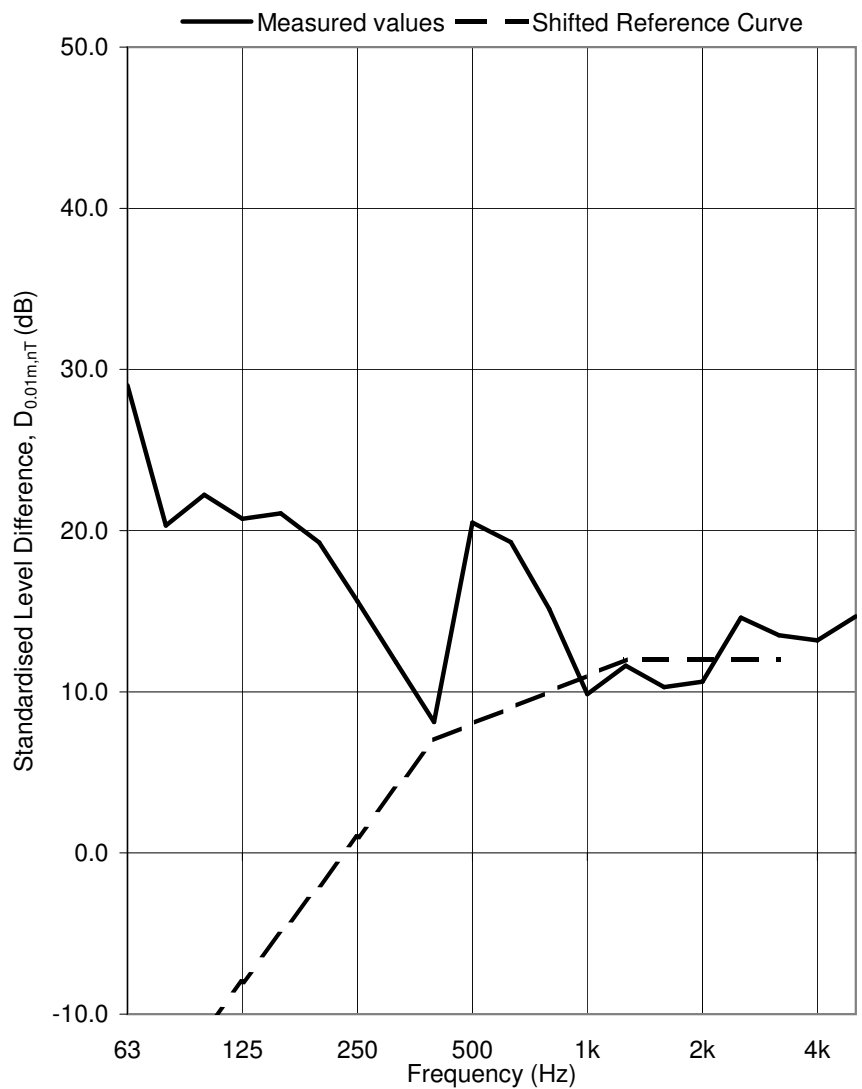


Test ID: 713019

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.1
63	29.0
80	20.3
100	22.2
125	20.7
160	21.1
200	19.3
250	15.6
315	11.8
400	8.1
500	20.5
630	19.3
800	15.1
1k	9.9
1.25k	11.6
1.6k	10.3
2k	10.6
2.5k	14.6
3.15k	13.5
4k	13.2
5k	14.7

$D_{0.01m,nT,w}(C;C_{tr})$ 12 (0; 0) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

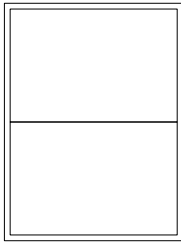
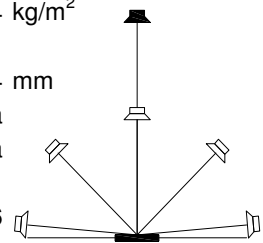
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0183 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

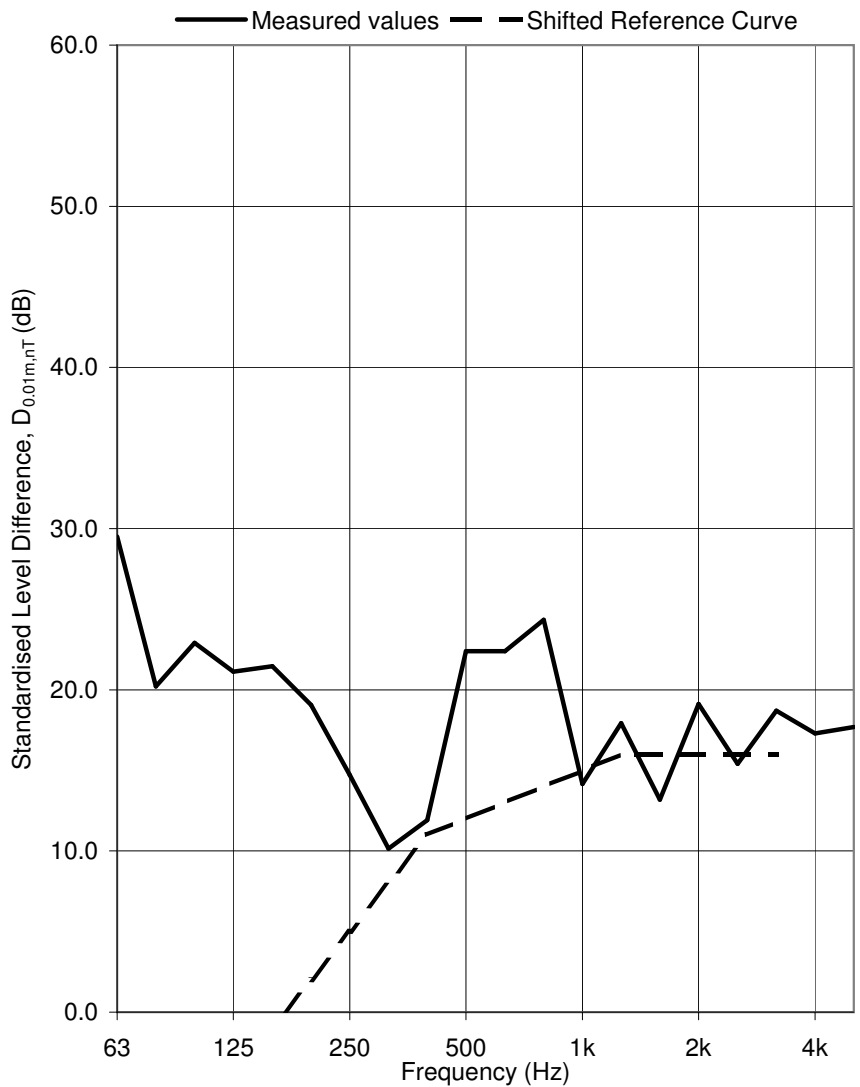
Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

Test ID: 713023

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.6
63	29.5
80	20.2
100	22.9
125	21.1
160	21.5
200	19.1
250	14.7
315	10.1
400	11.9
500	22.4
630	22.4
800	24.3
1k	14.2
1.25k	17.9
1.6k	13.2
2k	19.1
2.5k	15.4
3.15k	18.7
4k	17.3
5k	17.7

$D_{0.01m,nT,w}(C;C_{tr})$ 16 (0; 0) dB

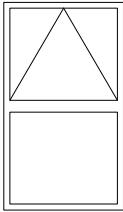
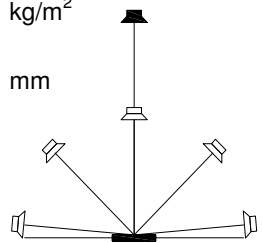
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

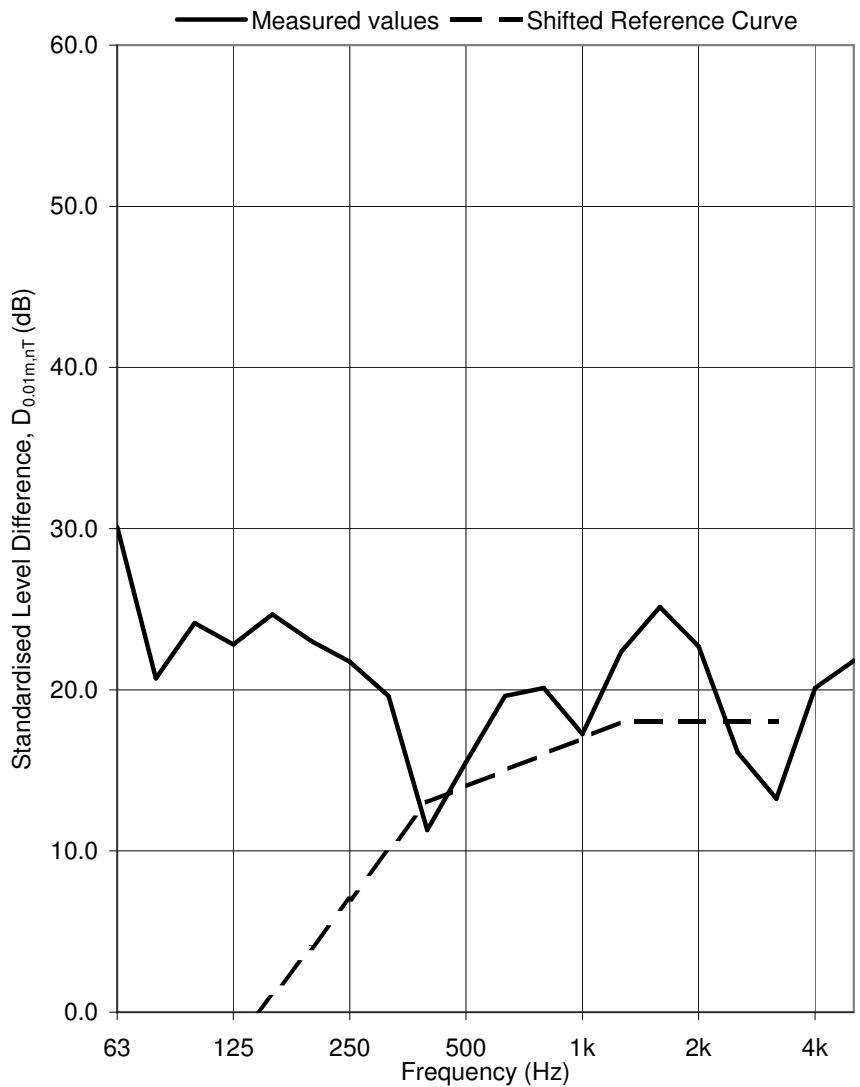
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.4 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9956 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718023

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a
 Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	22.2
63	30.1
80	20.7
100	24.1
125	22.8
160	24.7
200	23.0
250	21.7
315	19.6
400	11.3
500	15.5
630	19.6
800	20.1
1k	17.2
1.25k	22.4
1.6k	25.1
2k	22.7
2.5k	16.1
3.15k	13.2
4k	20.1
5k	21.8

$D_{0.01m,nT,w}(C;C_{tr})$ 18 (-1; 0) dB

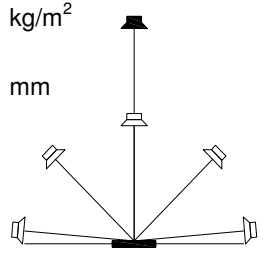
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

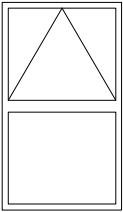
Date: 19/7/2005
 Air temperature: 19.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0019 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a
 Vent: n/a

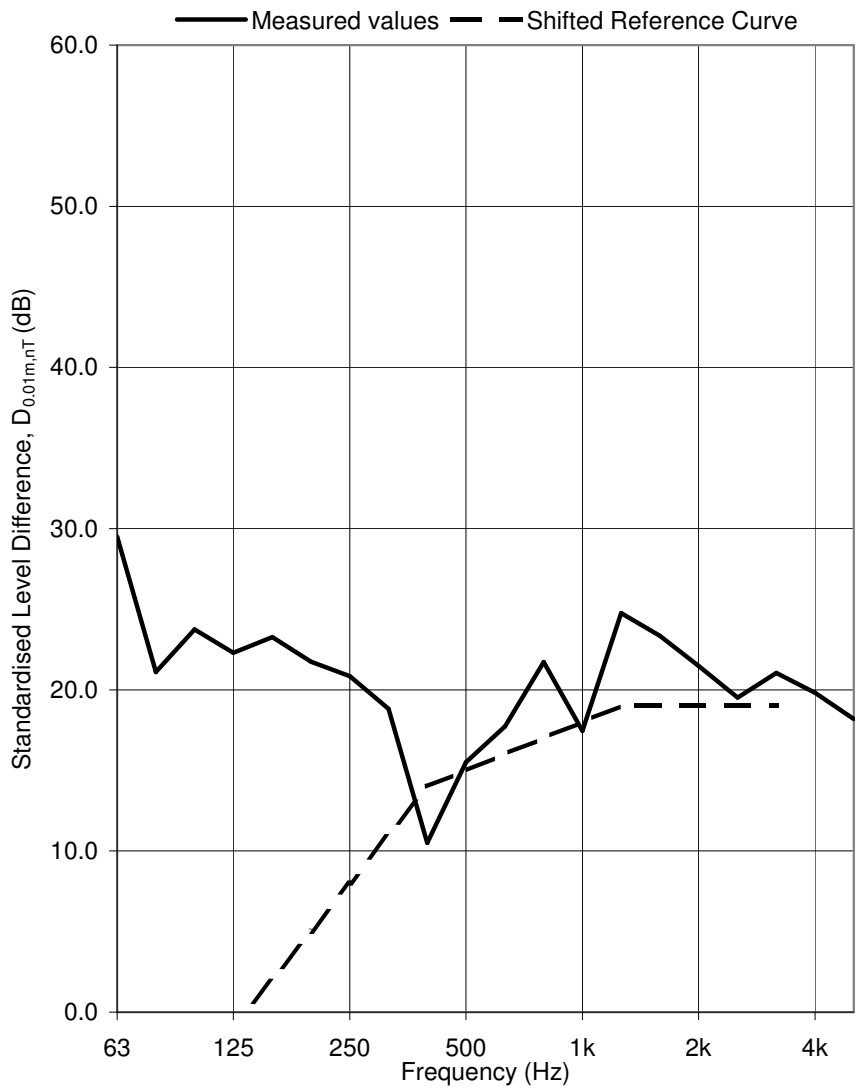


Test ID: 719006

Loudspeaker Configuration: L6



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.4
63	29.5
80	21.1
100	23.7
125	22.3
160	23.3
200	21.7
250	20.8
315	18.8
400	10.5
500	15.5
630	17.7
800	21.7
1k	17.4
1.25k	24.8
1.6k	23.3
2k	21.5
2.5k	19.5
3.15k	21.0
4k	19.8
5k	18.2


$D_{0.01m,nT,w(C;C_{tr})}$ 19 (0; -1) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

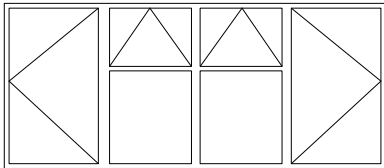
Standardised Level Difference. Simulated residential receiver environment

Date: 28/6/2005
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.009 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

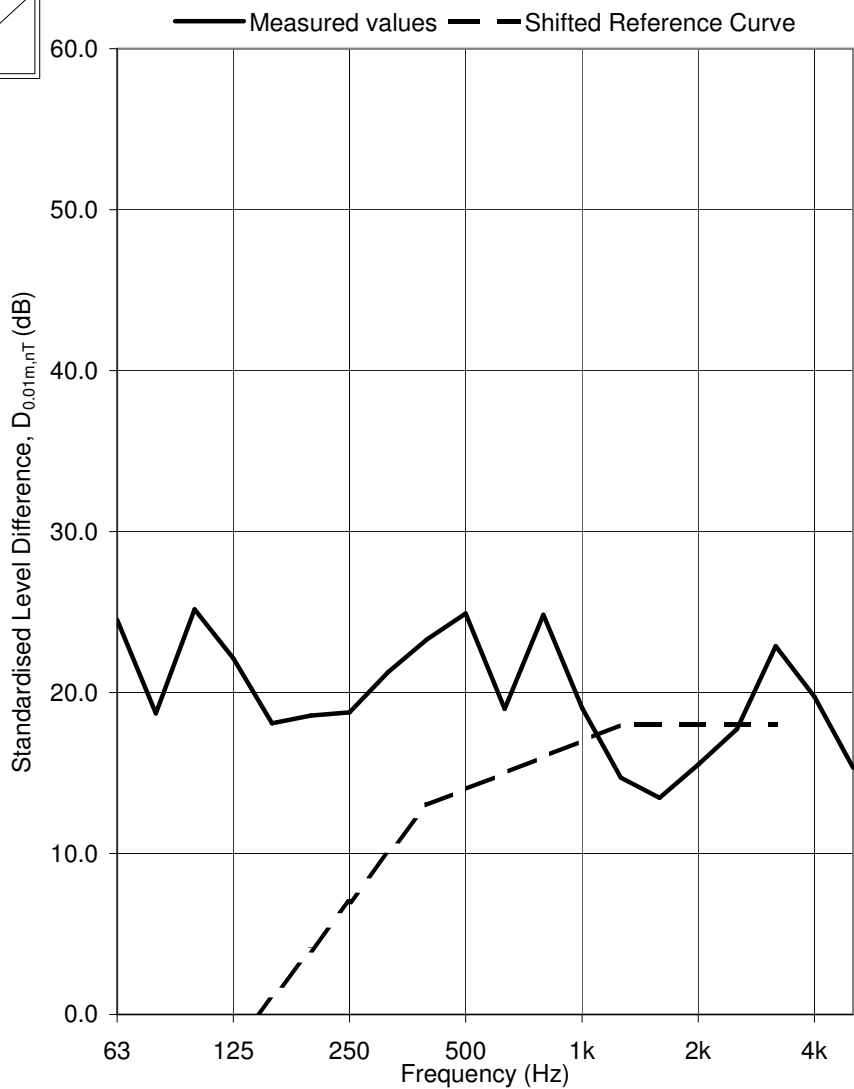
Test Sample: Window A-1 Open 0.20 m²
 Area of window unit, S: 2.52 m²
 Window mass per unit area: 30.00 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 628112

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	17.4
63	24.5
80	18.7
100	25.2
125	22.1
160	18.1
200	18.6
250	18.8
315	21.3
400	23.3
500	24.9
630	19.0
800	24.8
1k	19.0
1.25k	14.7
1.6k	13.5
2k	15.5
2.5k	17.7
3.15k	22.9
4k	19.7
5k	15.3



D_{0.01m,nT,w(C;C_{tr}) 18 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

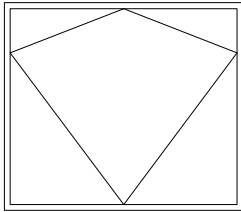
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

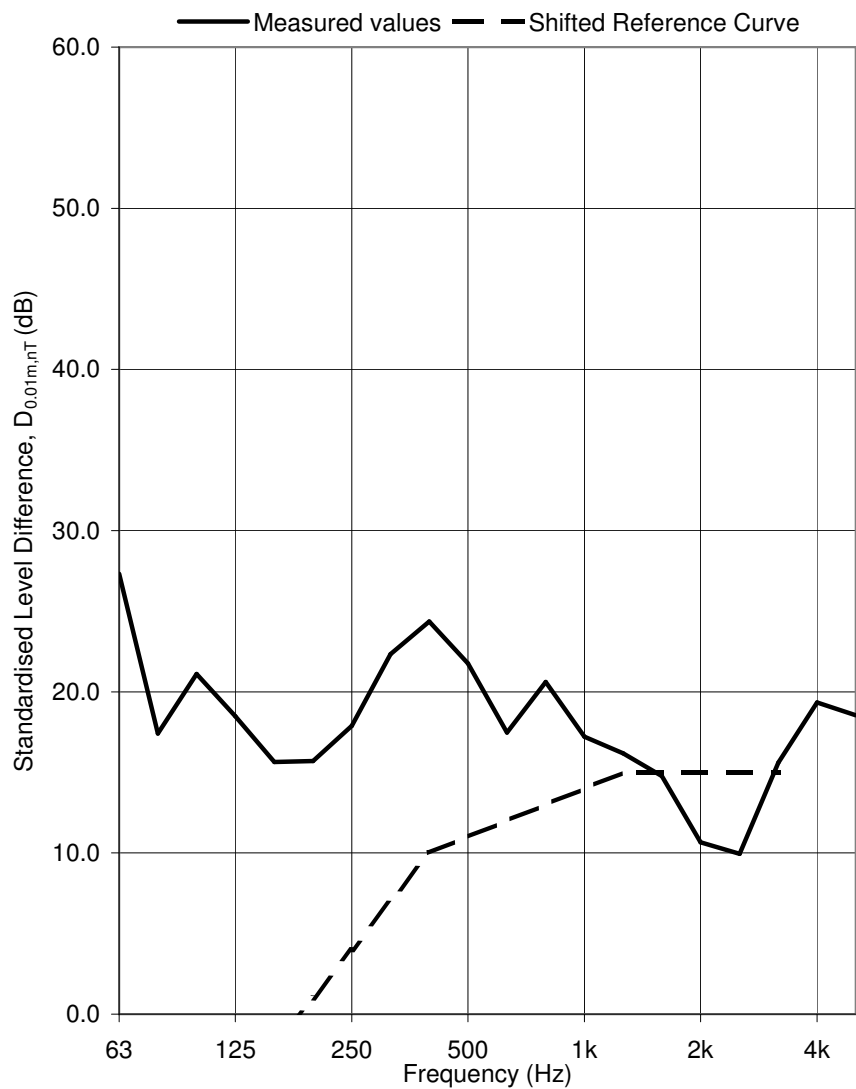
Date: 5/7/05
 Air temperature: 19.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9982 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window B Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 705035



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	20.7
63	27.3
80	17.4
100	21.1
125	18.5
160	15.6
200	15.7
250	17.9
315	22.3
400	24.4
500	21.8
630	17.5
800	20.6
1k	17.2
1.25k	16.2
1.6k	14.8
2k	10.7
2.5k	10.0
3.15k	15.6
4k	19.3
5k	18.5


D_{0.01m,nT,w(C;C_{tr}) 15 (-1; 1) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

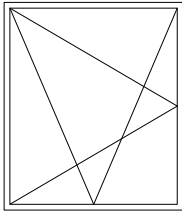
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

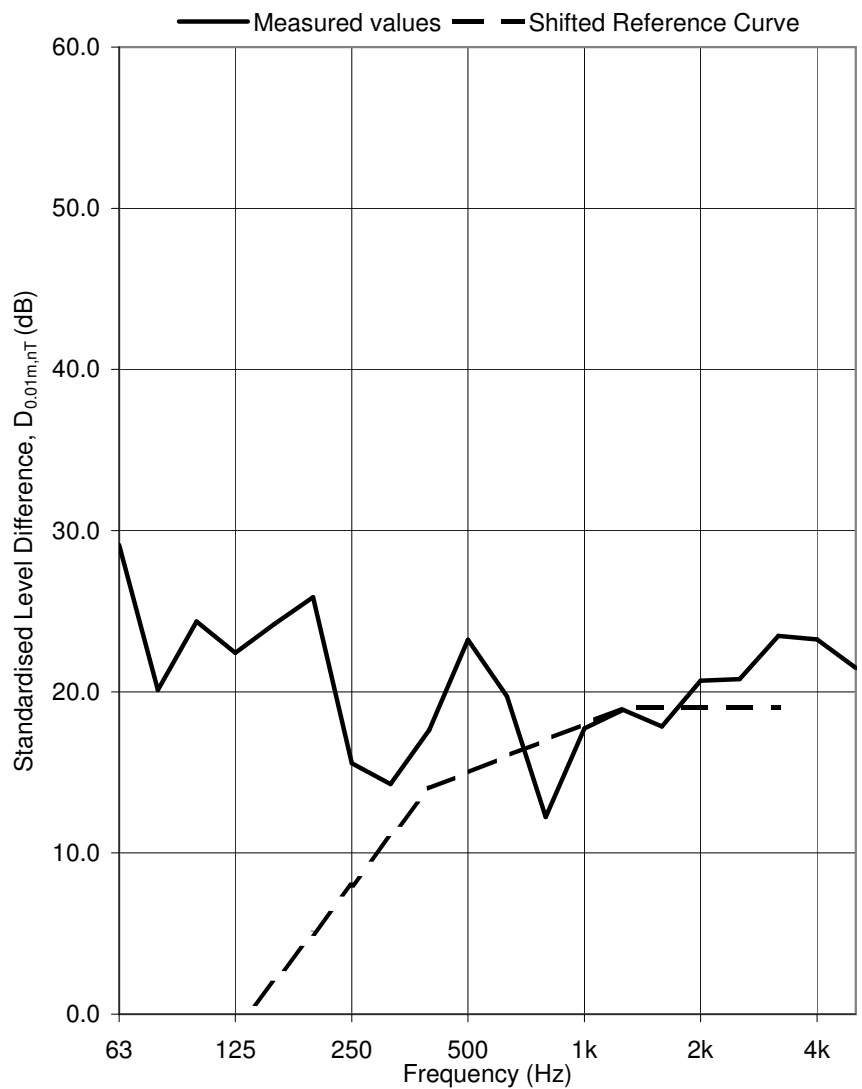
Test Sample: Window C-1 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711072

Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	21.2
63	29.1
80	20.1
100	24.4
125	22.4
160	24.2
200	25.9
250	15.6
315	14.3
400	17.6
500	23.2
630	19.7
800	12.2
1k	17.7
1.25k	18.9
1.6k	17.9
2k	20.7
2.5k	20.8
3.15k	23.5
4k	23.3
5k	21.5


$D_{0.01m,nT,w}(C;C_{tr})$ 19 (-1; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

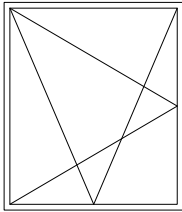
Standardised Level Difference. Simulated residential receiver environment

Date: 11/7/05
 Air temperature: 20.7 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0272 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

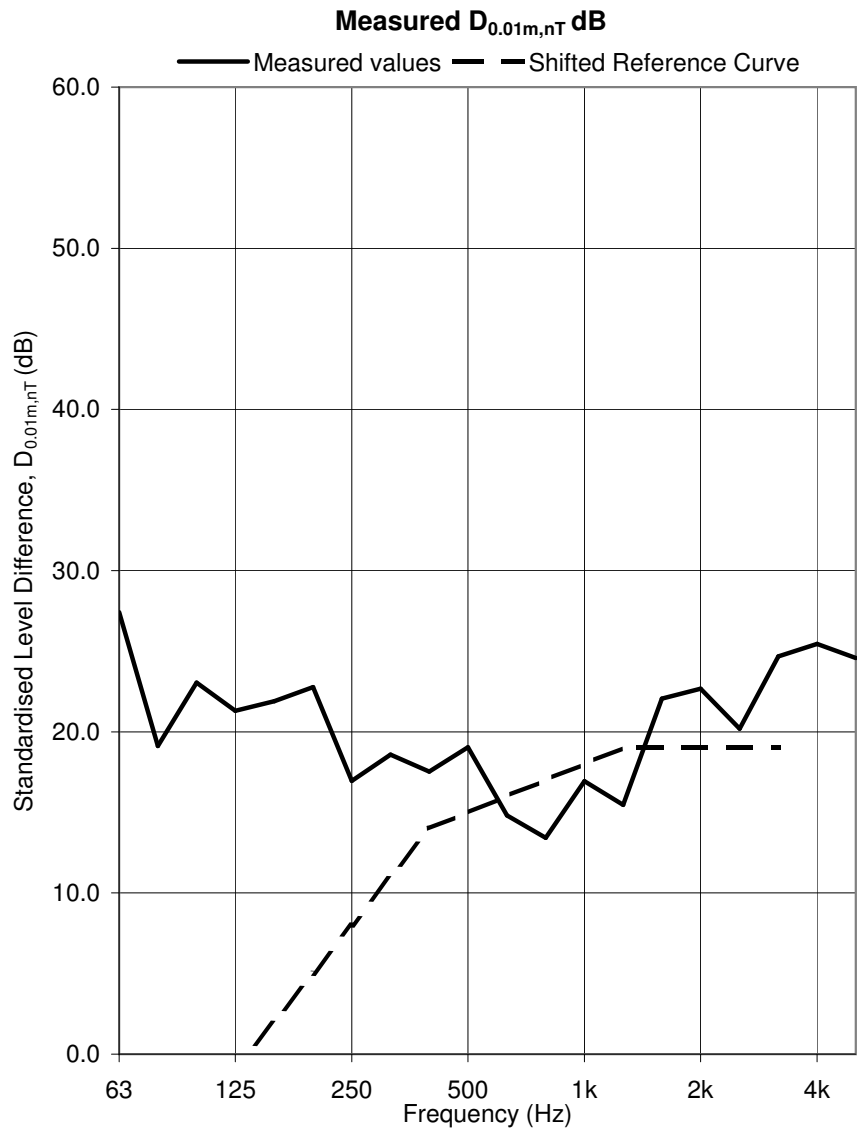
Test Sample: Window C-2 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: Original 
 Vent: Closed

Test ID: 711076

Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	19.4
63	27.4
80	19.1
100	23.1
125	21.3
160	21.9
200	22.8
250	17.0
315	18.6
400	17.5
500	19.0
630	14.8
800	13.4
1k	16.9
1.25k	15.5
1.6k	22.1
2k	22.7
2.5k	20.2
3.15k	24.7
4k	25.5
5k	24.6



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -2) dB}


Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

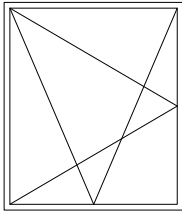
Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-3 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

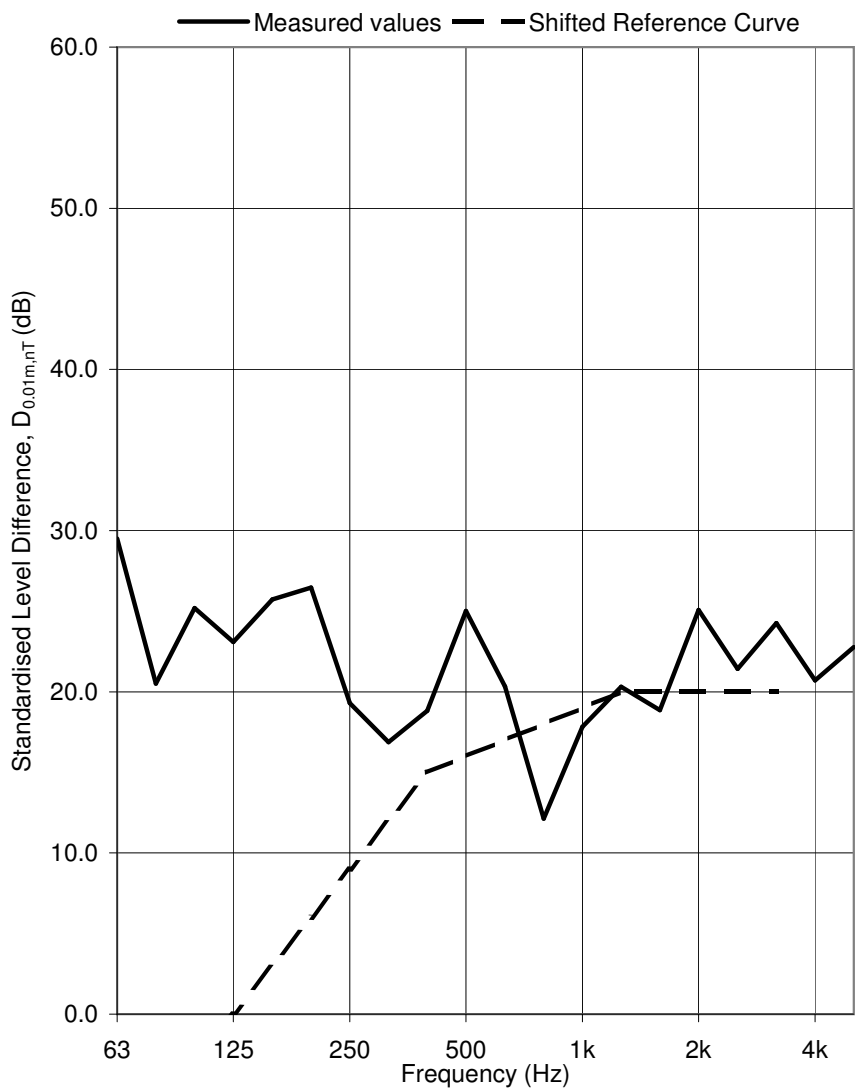
Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712008

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	22.1
63	29.5
80	20.5
100	25.2
125	23.1
160	25.7
200	26.5
250	19.3
315	16.9
400	18.8
500	25.0
630	20.3
800	12.1
1k	17.8
1.25k	20.3
1.6k	18.9
2k	25.1
2.5k	21.4
3.15k	24.3
4k	20.7
5k	22.8

D_{0.01m,nT,w(C;C_{tr}) 20 (-1; -2) dB}


Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

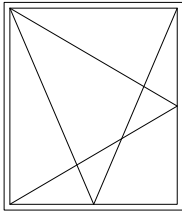
Date: 12/7/05
 Air temperature: 20.9 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0254 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window C-4 Open 0.20 m²
 Area of window unit, S: 0.945 m²
 Window mass per unit area: 36.83 kg/m²

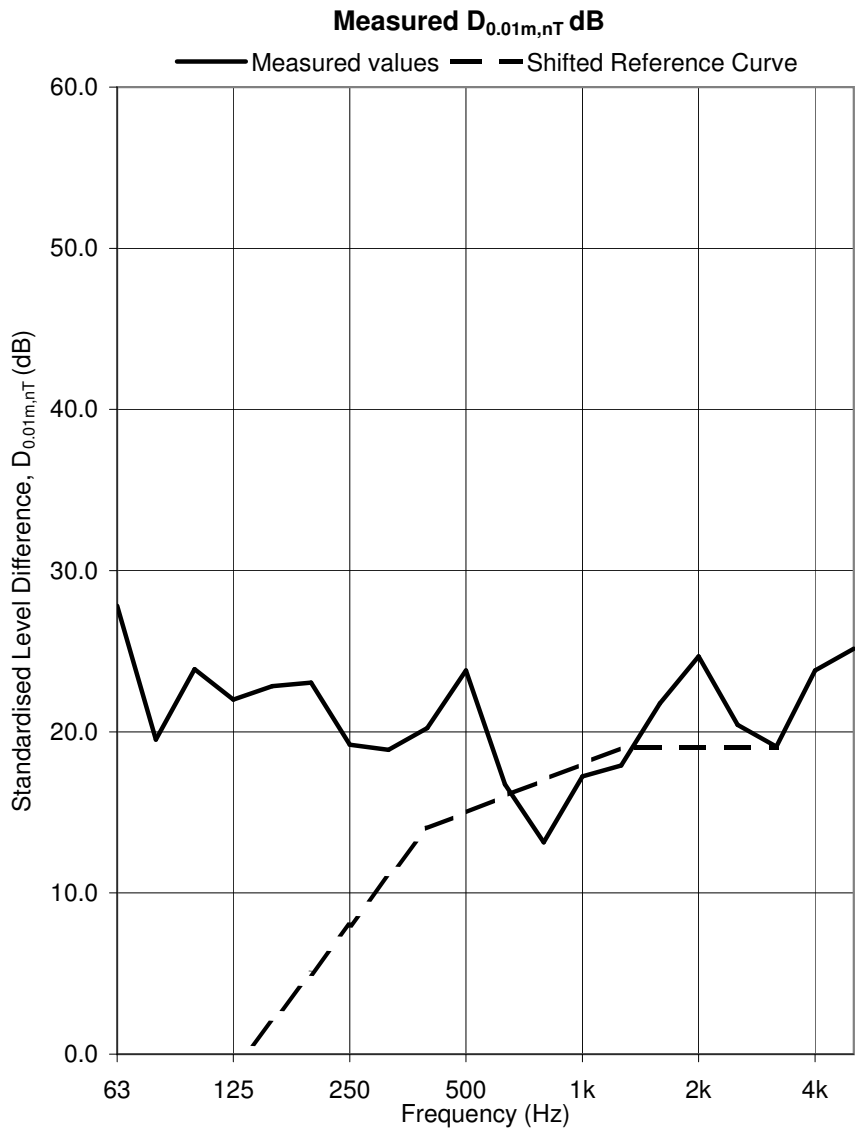
Glass Specification: 4 - 18 - 6.4(lam) mm
 Canopy: n/a 
 Vent: Vent 1 closed

Test ID: 712012

Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	20.4
63	27.8
80	19.5
100	23.9
125	22.0
160	22.8
200	23.1
250	19.2
315	18.9
400	20.2
500	23.8
630	16.7
800	13.1
1k	17.2
1.25k	17.9
1.6k	21.8
2k	24.7
2.5k	20.4
3.15k	19.1
4k	23.8
5k	25.2





D_{0.01m,nT,w(C;C_{tr}) 19 (-1; -1) dB}

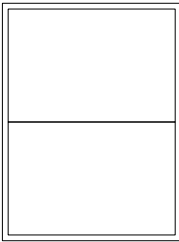
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

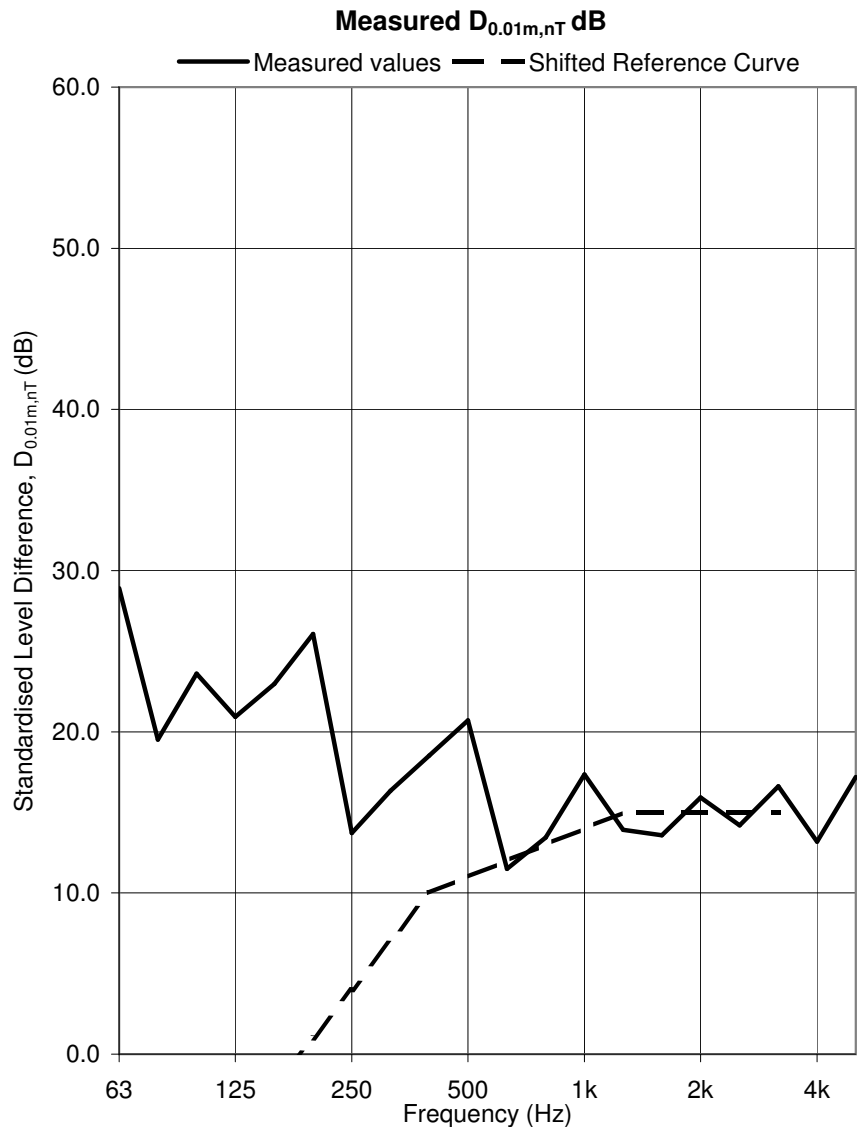
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 713069

Test Sample: Window D-1 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Frequency Hz	D _{0.01m,nT} dB
50	21.9
63	28.9
80	19.5
100	23.6
125	20.9
160	23.0
200	26.1
250	13.7
315	16.3
400	18.5
500	20.7
630	11.5
800	13.4
1k	17.4
1.25k	13.9
1.6k	13.6
2k	15.9
2.5k	14.2
3.15k	16.6
4k	13.2
5k	17.2





D_{0.01m,nT,w(C;C_{tr}) 15 (0; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

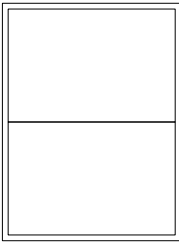
Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

Standardised Level Difference. Simulated residential receiver environment

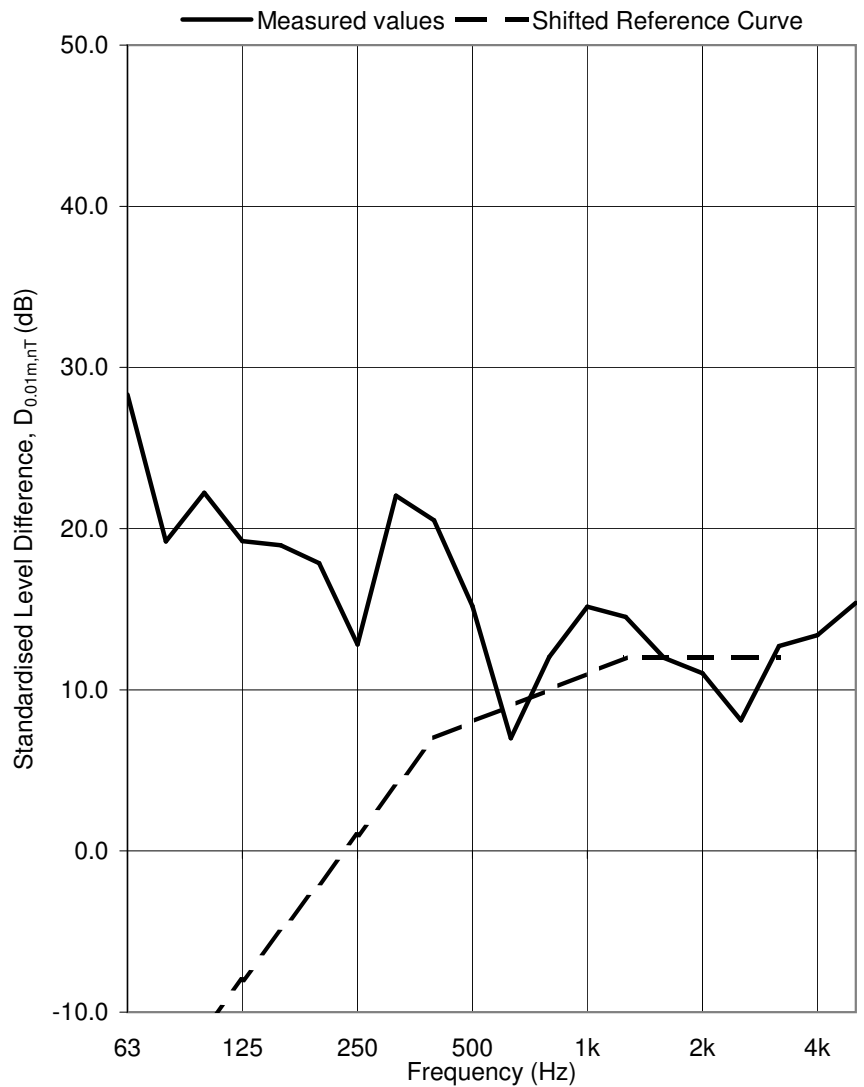
Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0175 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

Test Sample: Window D-2 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 

Test ID: 713061



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	22.4
63	28.3
80	19.2
100	22.2
125	19.2
160	19.0
200	17.9
250	12.8
315	22.0
400	20.5
500	15.2
630	7.0
800	12.0
1k	15.2
1.25k	14.5
1.6k	12.0
2k	11.0
2.5k	8.1
3.15k	12.7
4k	13.4
5k	15.4


D_{0.01m,nT,w(C;C_{tr}) 12 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

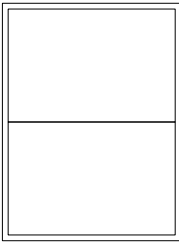
Standardised Level Difference. Simulated residential receiver environment

Date: 13/7/2005
 Air temperature: 21.8 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0174 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

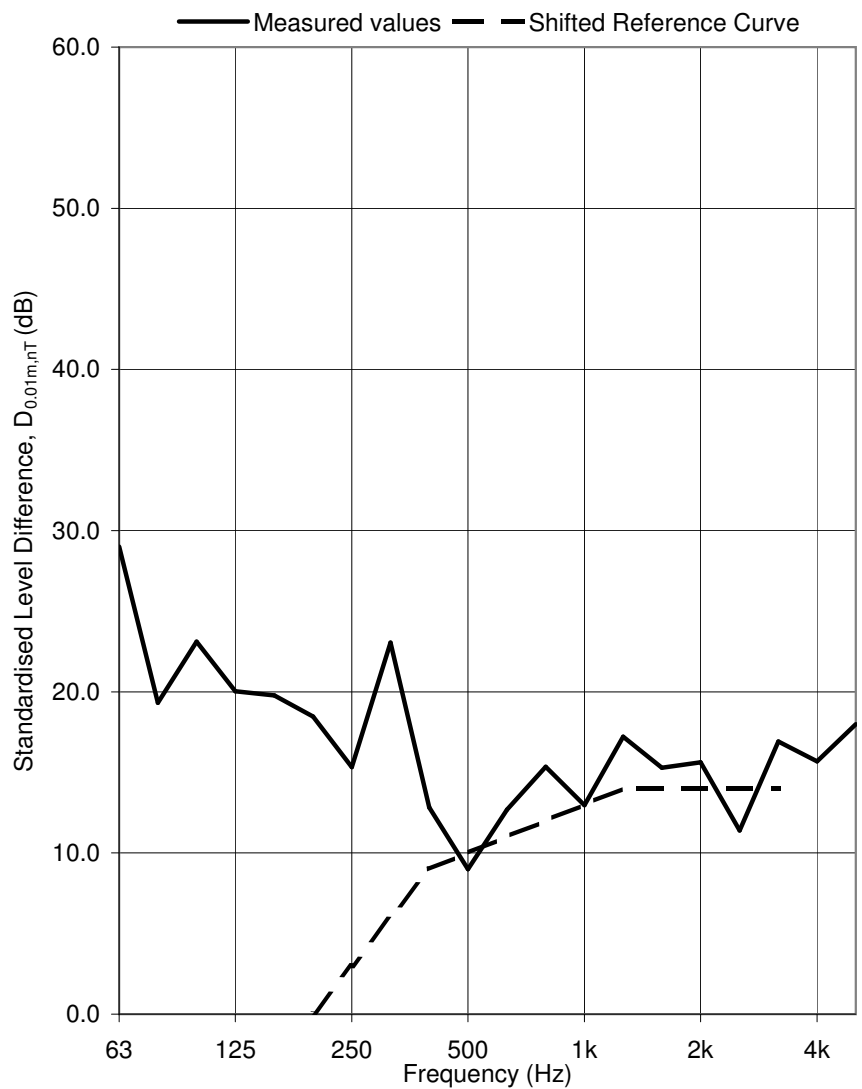
Test Sample: Window D-3 Open 0.20 m²
 Area of window unit, S: 1.26 m²
 Window mass per unit area: 27.94 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 713065

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	23.7
63	29.0
80	19.3
100	23.1
125	20.0
160	19.8
200	18.5
250	15.3
315	23.0
400	12.8
500	9.0
630	12.7
800	15.3
1k	13.0
1.25k	17.2
1.6k	15.3
2k	15.6
2.5k	11.4
3.15k	16.9
4k	15.7
5k	18.0



D_{0.01m,nT,w(C;C_{tr}) 14 (0; 0) dB}

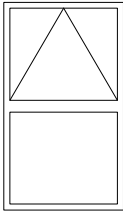
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

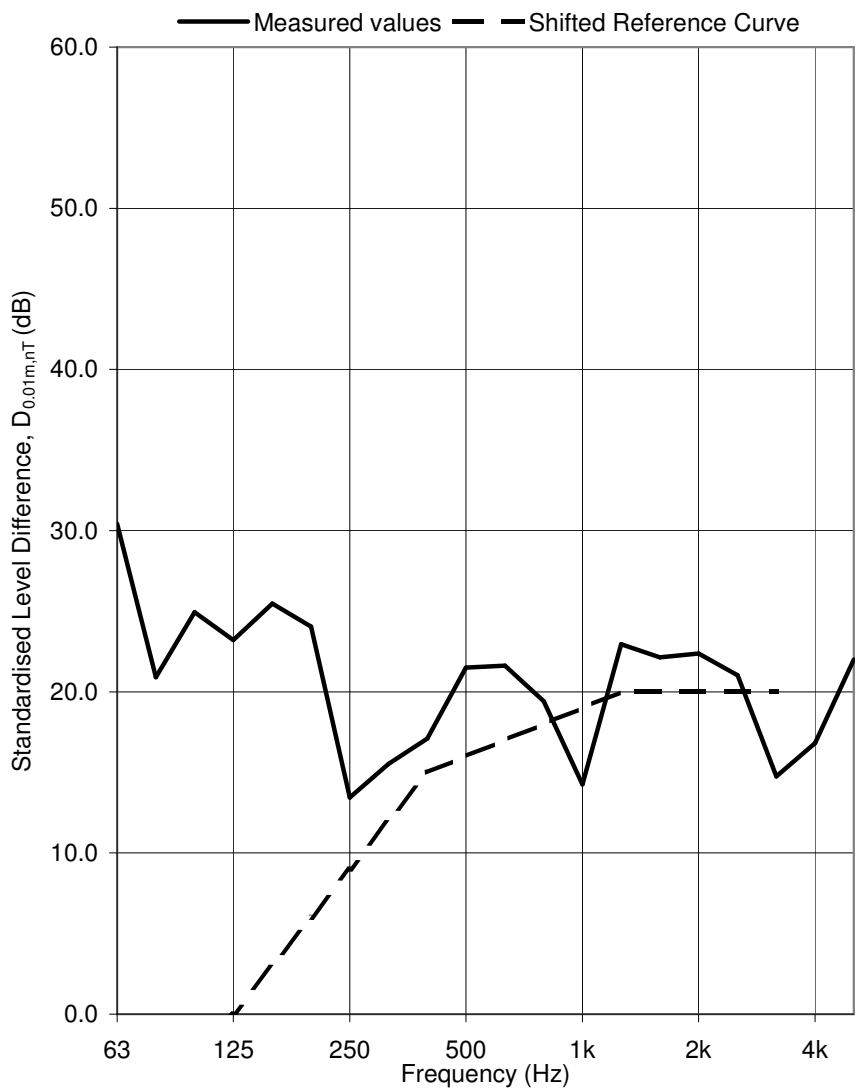
Standardised Level Difference. Simulated residential receiver environment

Date: 18/7/2005
 Air temperature: 20.5 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 0.9959 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 718034

Test Sample: Window E Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured $D_{0.01m,nT}$ dB



Frequency Hz	$D_{0.01m,nT}$ dB
50	24.2
63	30.4
80	20.9
100	24.9
125	23.2
160	25.5
200	24.0
250	13.4
315	15.5
400	17.1
500	21.5
630	21.6
800	19.4
1k	14.2
1.25k	23.0
1.6k	22.1
2k	22.4
2.5k	21.0
3.15k	14.7
4k	16.8
5k	22.0


$D_{0.01m,nT,w}(C;C_{tr})$ 20 (-2; -2) dB

Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

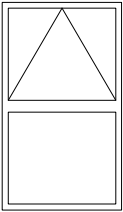
Standardised Level Difference. Simulated residential receiver environment

Date: 19/7/2005
 Air temperature: 20.1 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0023 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³

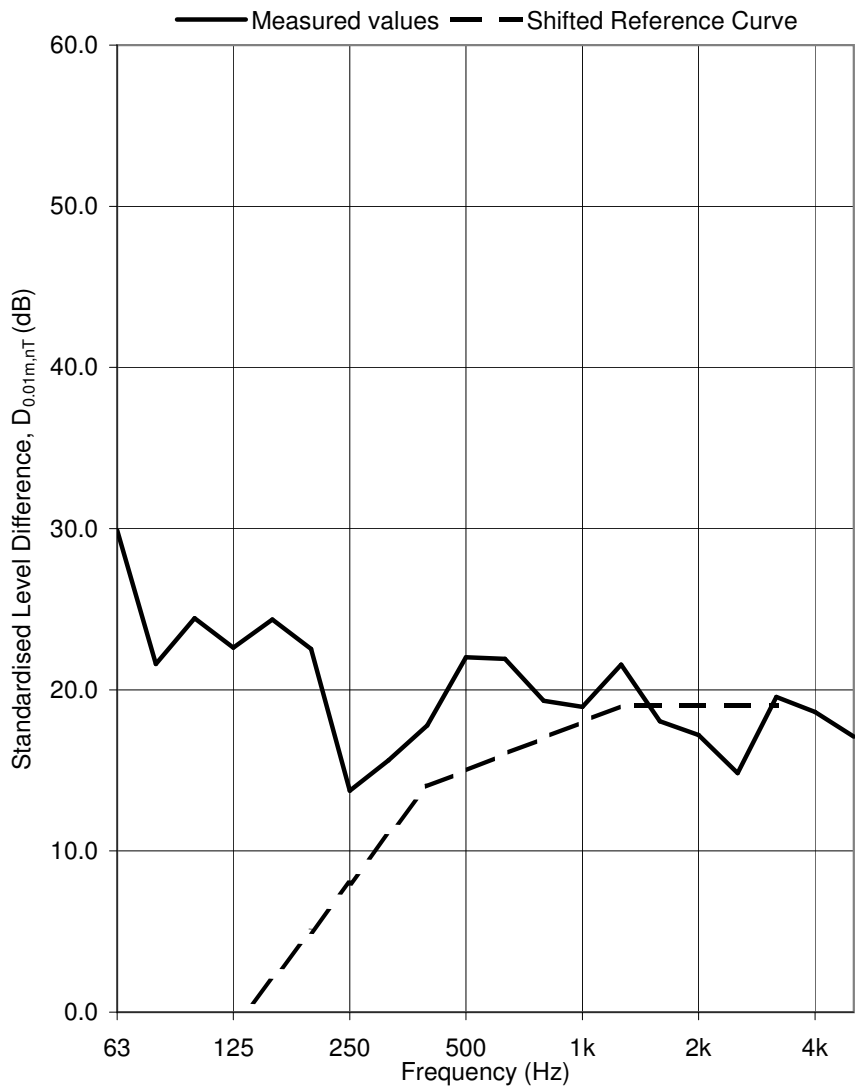
Test Sample: Window F Open 0.20 m²
 Area of window unit, S: 0.63 m²
 Window mass per unit area: 26.83 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a

Test ID: 719009

Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	23.2
63	29.9
80	21.6
100	24.4
125	22.6
160	24.4
200	22.5
250	13.7
315	15.6
400	17.8
500	22.0
630	21.9
800	19.3
1k	18.9
1.25k	21.6
1.6k	18.0
2k	17.2
2.5k	14.8
3.15k	19.5
4k	18.6
5k	17.1



D_{0.01m,nT,w(C;C_{tr}) 19 (-1; 0) dB}

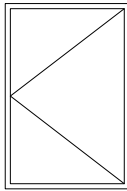
Tested by Building Performance Centre, Napier University, Edinburgh.

Airborne Sound Insulation. Laboratory measurements with non-diffuse source conditions

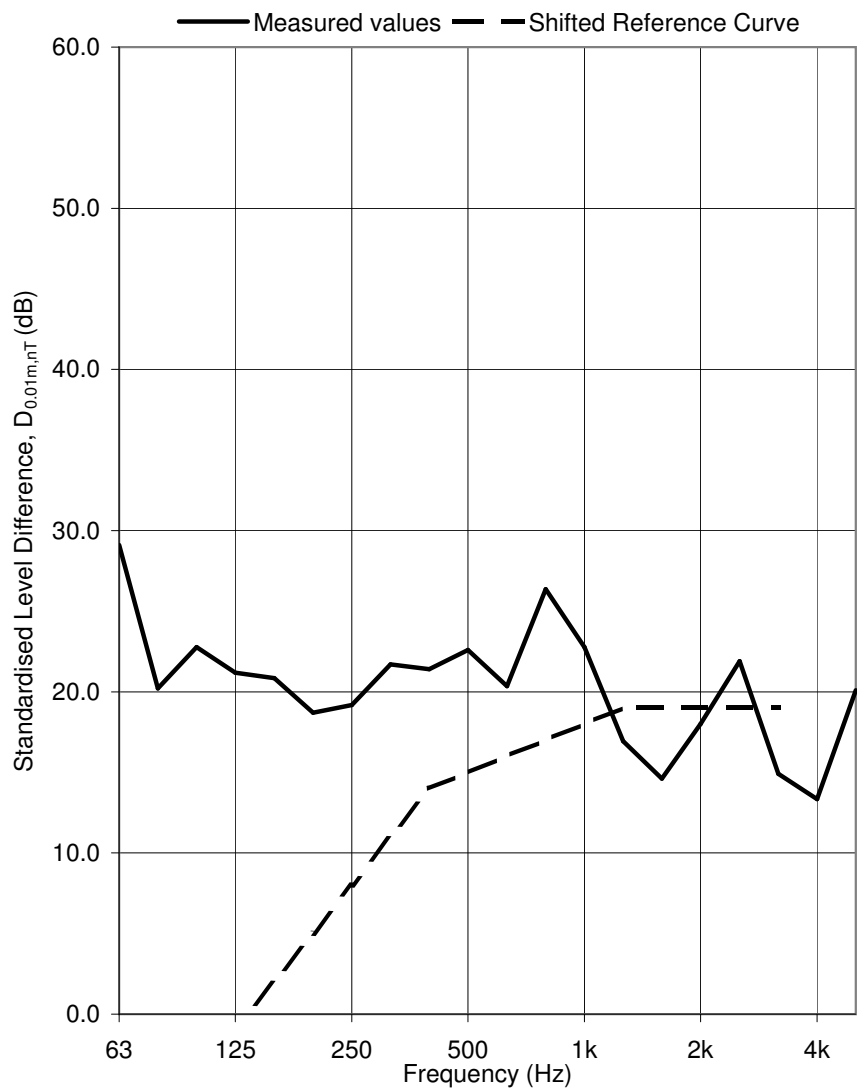
Standardised Level Difference. Simulated residential receiver environment

Date: 20/7/2005
 Air temperature: 20.3 °C
 Air humidity: 31.2 %
 Atmospheric pressure: 1.0032 Bar
 Receiving room volume: 31.2 m³
 Source room volume: 343.1 m³
 Test ID: 720009

Test Sample: Window G Open 0.20 m²
 Area of window unit, S: 0.54 m²
 Window mass per unit area: 33.33 kg/m²
 Glass Specification: 4 -16 - 4 mm
 Canopy: n/a 
 Vent: n/a
 Loudspeaker Configuration: Line 



Measured D_{0.01m,nT} dB



Frequency Hz	D _{0.01m,nT} dB
50	22.6
63	29.1
80	20.2
100	22.8
125	21.2
160	20.9
200	18.7
250	19.2
315	21.7
400	21.4
500	22.6
630	20.3
800	26.4
1k	22.8
1.25k	16.9
1.6k	14.6
2k	18.0
2.5k	21.9
3.15k	14.9
4k	13.3
5k	20.1

D_{0.01m,nT,w(C;C_{tr}) 19 (-1; 0) dB}

Tested by Building Performance Centre, Napier University, Edinburgh.