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CANTERBURY
ACOUSTIC TESTING SERVICES

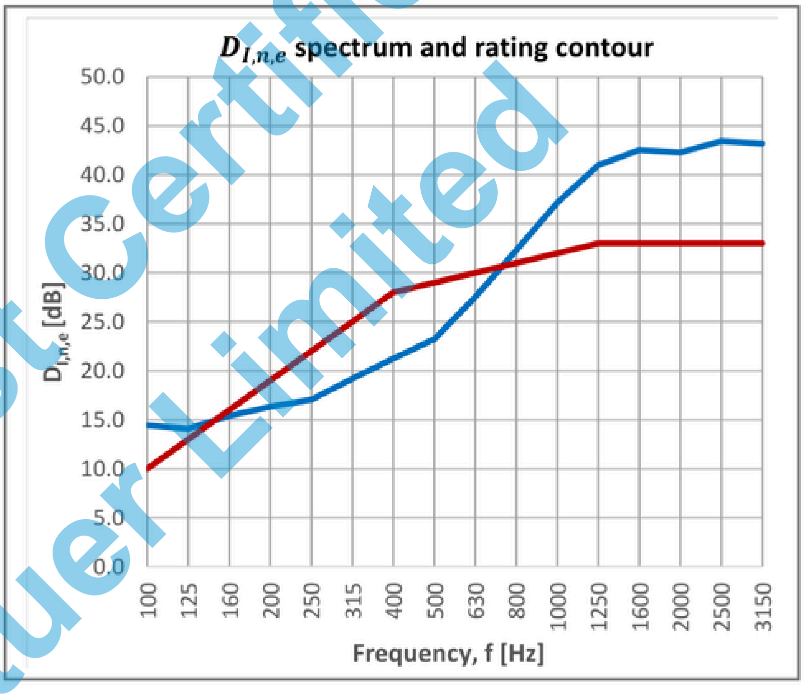
Measurement Results:

Report number: 2026-335

Client:	Venteur
Manufacturer	Venteur
Sample mounted by:	Venteur
Sample trade name:	AL-450
Name of test institute:	Canterbury Acoustic Testing Services
Test room identification:	Semi anechoic room (sound intensity)
Test date:	19/05/26

Sample Description:
450mm deep aluminium acoustic louvre system with extruded rain defence nosing profile to one side, incorporating high-density mineral wool absorption with stainless steel mesh facing. Refer to Appendix 5, Engineering Drawings.

Frequency (Hz)	PI index	Sound Intensity Level (dB)	$D_{I,n,e}$ one-third octave (dB)
100	0.5	86.7	14.4
125	1.5	92.4	14.1
160	1.5	94.9	15.4
200	1.2	96.5	16.3
250	0.9	97.7	17.0
315	1.6	94.3	19.2
400	1.8	88.5	21.2
500	1.6	84.2	23.2
630	1.7	77.9	27.5
800	1.5	71.6	32.3
1000	1.6	66.4	37.2
1250	1.7	59.9	41.0
1600	1.9	57.6	42.5
2000	2.0	56.4	42.3
2500	2.3	52.6	43.4
3150	2.0	50.9	43.2
4000	1.8	54.2	40.6
5000	1.7	54.6	39.4
Refer to Appendix 2 for insertion loss values			



Key
$D_{I,n,e}$: Intensity element normalised level difference.
f : Frequency (Hz)
*: See appendix 1 for interpretation of the STC and R_w ratings derived from $D_{I,n,e}$ for this test method
The measured $D_{I,n,e}$ data satisfy the frequency-band requirements of ISO 15186-1, and the indicative R_w rating has been calculated using the ISO 717-1 reference-curve procedure, using only the one-third-octave frequency bands specified for rating.

Sample mass:	N/A kg	**Sample size:**	1047 mm x 957 mm	**Air Temperature:**	17 °C
Sample surface density:	88 kg/m^2	**Sample area S:**	1.0 m^2	**Relative Humidity (R/H):**	45 %
		Receiving room volume:	32.6 m^3	**Barometric Pressure:**	101.5 kPa

Indicative ratings derived using ISO 717-1

$*R_w$	29
$(C; C_{tr})$	(-1; -5)
$(R_w + C_{tr})$	24

Indicative rating derived using ASTM E413-16

Sound Transmission Class (*STC)	29

Created by:
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Technical Lead
Canterbury Acoustic Testing Services Ltd
Date: 04/06/26

Checked by:
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Canterbury Acoustic Testing Services Ltd
Date: 04/06/26

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Appendix 1: Methodology

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Facility:	**The source room:** Is a reverberation room at the Canterbury Acoustic Testing Lab facility, 180 Hazeldean Road, Christchurch, New Zealand. It is a cuboid shape chamber. Constructed in accordance with *AS ISO 354 - 2006. Subsections 6.1.1 Volume of reverberation room, and 6.1.2 Shape of reverberation room*, of the following dimensions, 7.7 L x 6.1 W x 4.7 H m. The room has a cubic volume of ~220 m^3 and internal surface area of ~223.66 m^2, as shown in Appendix 2, Figure 1. **The receiving room:** A semi-anechoic room is connected to the front end of the reverberation room, with an opening of 2.4 H x 4.8 L m. The room is 5.246 L x 2.000 W x 3.110 H m. The room has a volume of ~32.63 m^3 and an internal surface area of ~66.06 m^2. The internal surfaces of the room are covered with 100 mm sound absorption material. The sample is mounted into a steel test collar filled with concrete, located between the reverberation room and semi-anechoic room, as shown in Appendix 2, Figure 2.
Sample Mounting:	**Filler wall construction:** • A double stud filler wall of STC 55 (calculated) was constructed in half of the opening of the reverberation room TL test aperture. Filler wall constructed as follows: • Framing construction from 90 x 45 mm framing timber, with R3.6 insulation between the frames, lined with two layers of 10 mm standard GiB board either side of the frames. • A ~ 1-meter square opening was created in the filler wall, where the test elements were mounted. • The front of the element was screw fixed to a 3 mm thick aluminium angle, affixed to the aperture. The rear of the test element had a 10 mm gap around the perimeter of the sample; this gap was covered with a 3mm thick aluminium angle with foam seal tape. This mounting method isolated the sample from the filler wall source side and receiving side linings. • The installed samples ready for testing are shown in Appendix 4: Sample mounting. • Refer to Appendix 4: Sample Mounting.
Comments:	• The test results presented refer only to the test specimens and prevailing conditions on the day of the measurements and may or may not be representative of a different batch of material. • Measurements were carried out using the sound intensity method described in ISO 15186-1, with supporting procedures referenced where applicable. • The sound transmission class (STC) has been calculated to *ASTM E413-16*, although not part of the ISO group of standards. • Standards used and referred to in this report is as follows: *ISO 15186-1: 2003* *ISO 9614-1: 1993* *ISO 10140-1: 2016* *ISO 10140-2: 2010* *ISO 10140-4: 2010* *ISO 10140-5: 2010* *ISO 717-1:2021* *ASTM E413-16* *ISO 7235:2003 (referenced for the insertion-loss substitution principle only)*

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Appendix 1: Methodology

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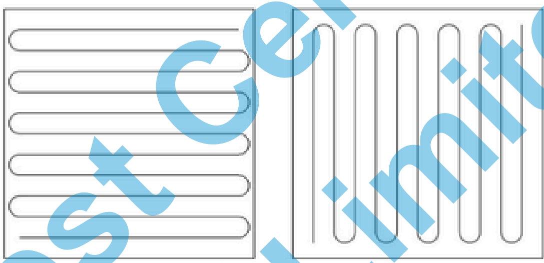
<table>
<tr><td>Measurement Method:</td><td>Generation of sound field:
• The test signal used was random pink noise, generated by a SINUS multi-channel analyser system.
• The signal was sent to an amplifier to two omnidirectional speakers, placed in opposite corners of the source room, to excite the sound field in the room.
Receipt of Signal:
• The direct sound intensity method was used in accordance with ISO 15186-1 Acoustics — Measurement of sound insulation in buildings and of building elements using sound intensity — Part 1: Laboratory measurements.
• The test sample was measured using the scanning procedure in a horizontal and vertical pattern. This was measured, using a two channel SINUS Apollo Analyser, attached to a Sinus intensity probe, running Samurai sound intensity software.
• The measurement data was exported to a PC in the form of pressure and intensity levels for further analysis and calculation of the $D_{I,n,e}$ values.
• The scan included the total face of each installed louvre as shown in figures in Appendix 4: Sample mounting.

Scan Pattern
Source room receipt of signal:
• The sound pressure levels in the source (reverberation room) were measured according to ISO 10140-4 using 6 microphones at 6 locations, connected to the SINUS multi-channel analyser, in the control room.</td></tr>
<tr><td>Measurement Calculation: Adaption term K_c</td><td>Adaption term K_c:
It is generally recognised that there is a difference between the sound reduction index determined by the sound intensity method ISO 15186 (all parts) and that measured by traditional methods (ISO 140-3, ISO 140-4, and ISO 140-10) at low frequencies. ISO 140 has now been superseded by the ISO 10140 series. Measurements for this set of samples was carried out in accordance with the new standard.
If the intensity results are to be compared to results measured using the traditional method, then the intensity results should be adjusted, giving the modified apparent intensity sound reduction index, refer to Appendix 4: Measurement calculation.</td></tr>
<tr><td>STC and R_w calculation from $D_{I,n,e}$</td><td>The frequency-dependent quantity determined form the sound intensity measurements is the intensity element normalised level difference, $D_{I,n,e}$.

For this report, the asterisked STC and R_w values have been derived by applying the relevant single-number reference-contour procedures to the measured one-third octave-band $D_{I,n,e}$ spectrum. The STC value was derived using the ASTM E413 reference contour procedure, and the R_w value was derived using the ISO 717-1 reference curve procedure. Where applicable, K_c corrections were applied to the individual one-third octave-band values before deriving the single-number ratings.

These values should therefore be interpreted as indicative single-number ratings derived from $D_{I,n,e}$ rather than conventional laboratory STC or R_w ratings derived from a sound reduction index spectrum. For louvre design and acoustic consultant use, the octave-band static insertion loss values in Appendix 2 should be used as the primary acoustic performance data.

Where quoted outside this report, the asterisked STC and R_w values should be qualified as indicative ratings derived from the measured $D_{I,n,e}$ spectrum, not conventional laboratory ratings derived from a sound reduction index spectrum. The octave-band static insertion loss values in Appendix 2 should be used as the primary acoustic performance data for design and specification.</td></tr>
</table>

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Appendix 1: Methodology

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Instrumentation:

Description	Manufacture	Model	Calibration	Serial number
Analyser (intensity)	Sinus	Apollo Box 2 channel	26/03/2025	7568
Analysers (source room)	Sinus	Apollo Box 2 and 4 channel	26/03/2025	7591, 7569
Intensity probe	Sinus	Microtech Gefell SIS190 Intensity Probe, Microtech Gefell HG90 probe handle	26/03/2025	Nr 0203
Calibrator	Larson Davis	CAL200	26/03/2025	9063
Noise source	Norsonic Bruel & Kjaer	NOR276 OmniPower 4296		2766177 2071500
Amplifier	BETA 3	UA330		
Microphones	Microtech Gefell	MK290E K1, K2 (intensity probe) MK255	26/03/2025 26/03/2025	18114, 18119 10007, 10014
	G.R.A.S	46AE	26/03/2025	196169, 184222, 183512, 183079

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Appendix 2: Test results summary

Report number: 2026-335

Test specimen name	STC	R_w
AL-300	26	26
AL-450V	30	30
AL-450	29	29
VL-300V	27	27
AL-600	31	31
AL-600V	32	32
AL-500GB	28	28
AL-150	21	22
VL-3SD	14	14
VL-3SD + BF150	21	21
BF150	20	19
AL-300 + BF150	29	29

Octave-band static insertion loss								
Octave-band centre frequency (Hz)	63	125	250	500	1000	2000	4000	*8000
T1 AL-300								
IL_{static} (dB)	1.4	0.9	3.4	8.6	17.4	35.7	34.3	24.6
$D_{I,n,e}$ (dB)	18.6	15.8	15.3	20.8	29.3	36.1	36.5	30.8
T2 AL-450V								
IL_{static} (dB)	0.9	2.6	6.3	12.2	25.2	44.1	39.5	32.0
$D_{I,n,e}$ (dB)	19.0	16.3	18.9	24.8	37.4	44.2	42.1	39.0
T3 AL-450								
IL_{static} (dB)	0.3	1.5	4.9	11.0	23.3	42.6	38.3	28.7
$D_{I,n,e}$ (dB)	18.3	14.6	17.4	23.3	35.4	42.7	40.8	35.6
T4 VL-300V								
IL_{static} (dB)	0.8	1.9	3.1	9.5	17.7	36.3	33.1	25.8
$D_{I,n,e}$ (dB)	18.6	16.6	15.7	21.7	29.9	36.7	35.8	32.8
T5 AL-600								
IL_{static} (dB)	0.7	3.3	5.8	13.5	28.4	49.0	41.3	31.9
$D_{I,n,e}$ (dB)	17.9	15.7	17.9	26.0	40.4	49.1	43.7	38.4
T6 AL-600V								
IL_{static} (dB)	0.7	4.4	6.9	14.6	29.6	46.0	41.3	36.7
$D_{I,n,e}$ (dB)	17.7	16.6	19.3	27.2	41.7	46.1	43.9	43.6
T7 AL-500GB								
IL_{static} (dB)	-0.5	4.3	5.4	10.0	18.2	32.9	29.4	24.3
$D_{I,n,e}$ (dB)	17.3	16.6	17.8	22.5	30.1	33.2	31.9	31.2
T8 AL-150								
IL_{static}(dB)	0.1	0.0	0.9	5.5	9.9	25.5	21.9	16.3
$D_{I,n,e}$ (dB)	17.7	15.0	13.3	17.4	21.8	25.7	24.2	22.7
T9 VL-3SD								
IL_{static} (dB)	-1.7	-0.9	-1.1	0.4	1.6	14.7	17.1	13.2
$D_{I,n,e}$ (dB)	16.0	14.2	11.4	12.1	13.2	15.2	19.3	19.7
T10 VL-3SD + BF150								
IL_{static} (dB)	-0.3	-0.4	0.8	4.5	9.6	27.6	33.6	24.8
$D_{I,n,e}$ (dB)	17.6	14.9	13.0	16.3	21.4	28.5	35.7	31.3
T11 BF 150								
IL_{static} (dB)	-2.7	-1.6	-0.6	2.3	7.6	24.9	24.1	17.2
$D_{I,n,e}$ (dB)	15.0	13.2	11.7	14.2	19.4	25.3	26.5	23.5
T12 AL-300 + BF150								
IL_{static} (dB)	0.0	1.7	5.0	10.8	23.6	44.5	43.3	38.8
$D_{I,n,e}$ (dB)	17.7	15.4	17.1	23.1	35.6	44.6	45.7	45.5

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Appendix 2: Test results summary

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- *Octave-band values have been calculated from the corresponding one-third octave-band data.*
- *Static insertion loss IL_{static} was calculated as the difference between the octave-band transmitted sound intensity level measured for the empty aperture reference condition and the corresponding octave-band transmitted sound intensity level measured with the louvre installed $IL_{static} = L_{I,empty\ aperture} - L_{I,louvred\ aperture}$*
- *Sound intensity measurements were carried out using the ISO 15186-1 method. The insertion loss calculation follows the substitution/reference-condition principle used for attenuating elements in ISO 7235; however, the test arrangement was not a full ISO 7235 ducted-silencer test*
- ** The 8 kHz octave-band values include extrapolated 8 kHz and 10 kHz one-third octave-band data and should be treated as indicative values rather than directly measured values.*