



**Setsco Services Pte Ltd**

**Airborne Sound Transmission Loss Testing of  
Sound Insulation Test Cabinet**

**SG ALUMINIUM PTE LTD**

**10 April 2026**

## Document Control Sheet

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Remarks

Date 10 April 2026

Submitted to

Client address

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# 1 INTRODUCTION

- 1.1 This report presents the results of noise measurements carried out for a sound insulation test cabinet as shown in Figure 1.1.



**Figure 1.1:** Sound insulation test cabinet.

- 1.2 The cabinet is intended for evaluating the sound transmission loss performance of a window.
- 1.3 This report presents the results of the acoustic measurements carried out at 7 Mandai Link – Mandai Connection on 7 April 2026 between 1100 and 1400 to establish the transmission loss of the window installed on the test cabinet.

# 2 MEASUREMENT

- 2.1 The test cabinet is located at #4-32, 7 Mandai Link, Mandai Connection.
- 2.2 Figure 2.1 presents the setup of the cabinet at site for the measurement.



**Figure 2.1:** Test cabinet setup at site for the measurement

- 2.3 The present measurement is to establish the sound transmission loss of the window presently installed on the test cabinet.
- 2.4 Figure 2.2 presents details of the window considered for the present testing.

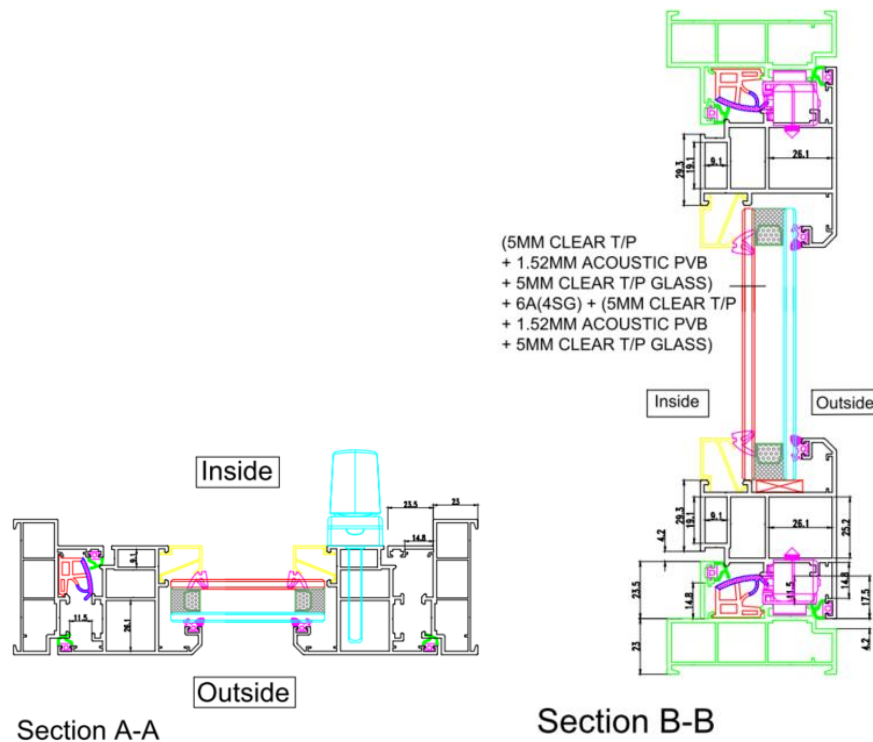


**Figure 2.2:** Window setup.

- 2.5 The sound insulation testing was carried out referencing to the methodology set forward in ASTM E336-19 "Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings" and ASTM E413-16 "Classification for Rating Sound Insulation".

- 2.6 A pink noise was used as the testing signal for the sound insulation test at 3 configurations.
- 2.7 The external of the cabinet is identified as the source position and the internal of the cabinet is the receiver position.
- 2.8 Source noise levels were measured around the external of the cabinet at approximately 1.5-metre away and at 1.5-metre above the ground – see Figure 2.2.



**Figure 2.2:** Sound noise measurement.

- 2.9 Receiver noise levels were measured inside the cabinet chamber.
- 2.10 The RT measurements were carried out inside the cabinet chamber as shown in Figure 2.3.





**Figure 2.3:** RT measurement setup.

- 2.11 Table 2.2 below summarises the dimensions of the exposure surface areas of the window to the noise.

**Table 2.2:** Room dimension details.

| No | Room            | Space Volume – m <sup>3</sup> | Surface Area – m <sup>2</sup><br>exposed to the noise |
|----|-----------------|-------------------------------|-------------------------------------------------------|
| 1  | Cabinet Chamber | 0.8m x 0.8m x 0.3m            | 0.8m x 0.8m                                           |

- 2.12 No noisy human activity and construction work on-going around the test site to affect the noise measurement results during the attended testing.
- 2.13 The external weather condition was dry with low wind speed i.e. less than 4 m/s.



### 3 Measurement Equipment

- 3.1 The measurements were carried out using a Class 1 sound level meter and the microphone was fitted with a wind shield through the measurements.
- 3.2 Field calibration was carried out before and after the measurement with noise level drift less than 0.5 dB recorded.
- 3.3 Details of the measuring equipment deployed for the measurement are presented in Table 3.1. All instrumentations are accredited by certified laboratory and calibration certificate are within 1 year of valid date.

**Table 3.1:** Instrumental details.

| No. | Manufacturer       | Model | Description       | Serial No.   |
|-----|--------------------|-------|-------------------|--------------|
| 1   | NTI XL2 with M2230 | -     | Sound Level Meter | A3A-07540-D1 |

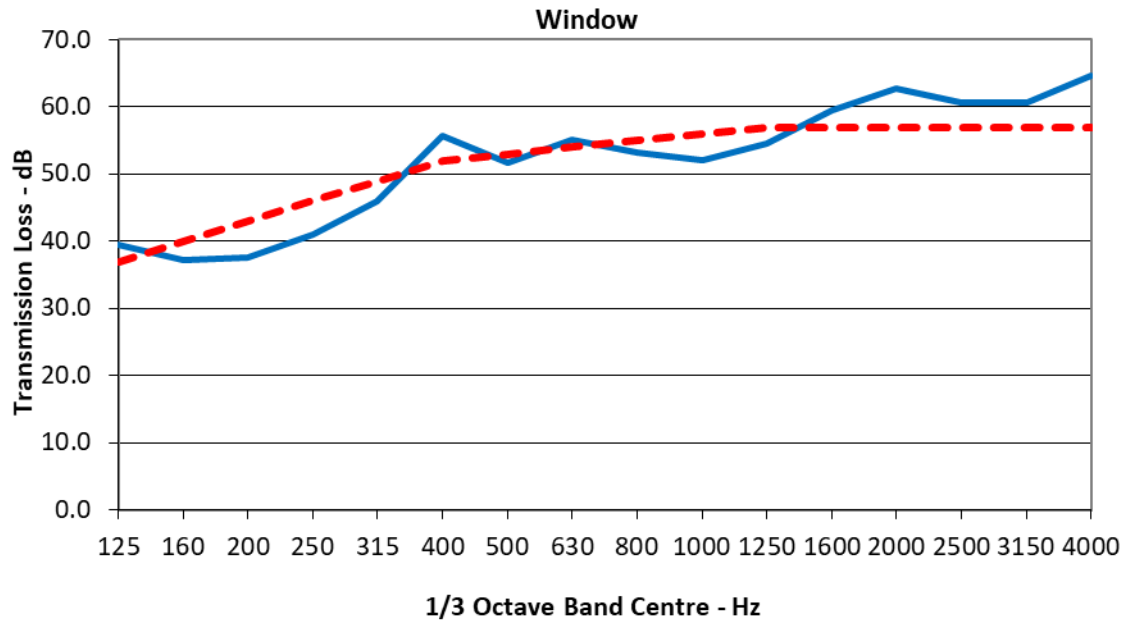


## **4 Results and Discussion**

- 4.1 This section presents the results of the sound insulation test carried out for the window on the test cabinet.
- 4.2 Three sets of measurements corresponded to 3 source positions were carried out for the airborne noise test.
- 4.3 The insertion loss of the window is established by the noise level differences between external and internal of the cabinet chamber and with and without the consideration of the noise absorption in the cabinet chamber.

- 4.4 Figure 4.1 below presents noise reduction levels over the 1/3 octave band frequency (between 125 and 4000Hz) with the consideration of sound absorption in the cabinet chamber.

#### Consideration of sound absorption in the cabinet chamber



— Transmission Loss    - - - Reference Curve

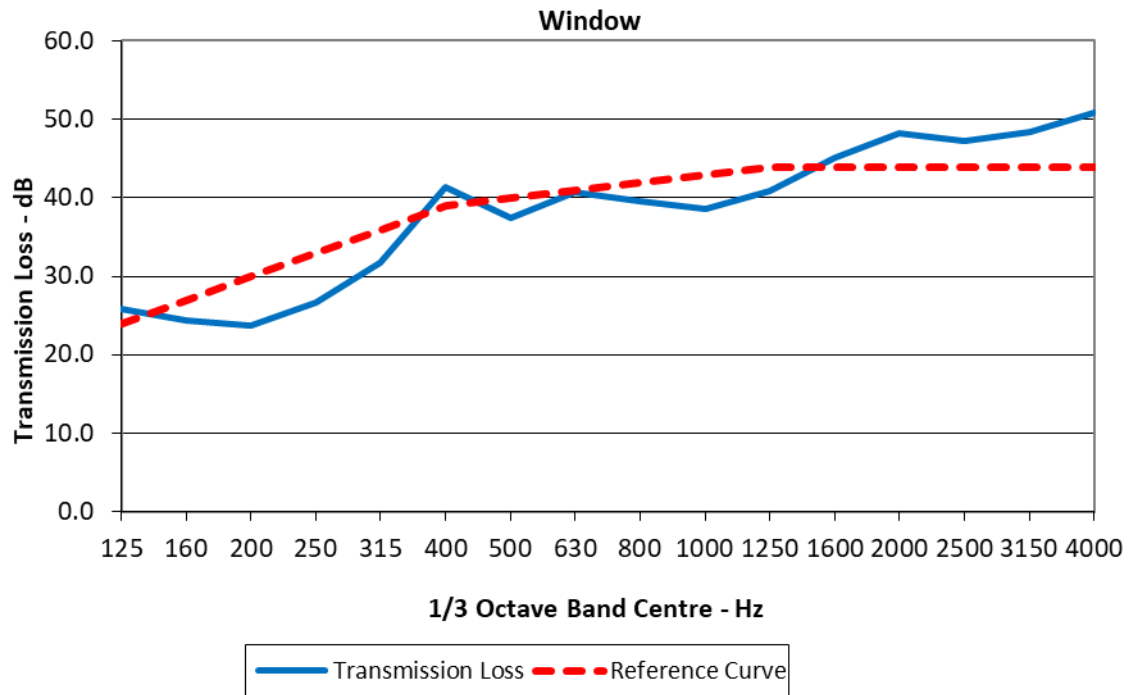
| f (Hz) | Transmission Loss (dB) |
|--------|------------------------|
| 125    | 39.5                   |
| 160    | 37.2                   |
| 200    | 37.5                   |
| 250    | 40.9                   |
| 315    | 45.9                   |
| 400    | 55.7                   |
| 500    | 51.6                   |
| 630    | 55.2                   |
| 800    | 53.2                   |
| 1000   | 52.0                   |
| 1250   | 54.6                   |
| 1600   | 59.5                   |
| 2000   | 62.7                   |
| 2500   | 60.6                   |
| 3150   | 60.6                   |
| 4000   | 64.7                   |

| Partition Area Size | Recommended STC | FSTC - dB |
|---------------------|-----------------|-----------|
| 0.64 m <sup>2</sup> | 42              | 53        |

**Figure 4.1:** Transmission loss curves.

- 4.5 Figure 4.2 below presents noise reduction levels over the 1/3 octave band frequency (between 125 and 4000Hz) without the consideration of sound absorption in the cabinet chamber.

**Without consideration of sound absorption in the cabinet chamber**

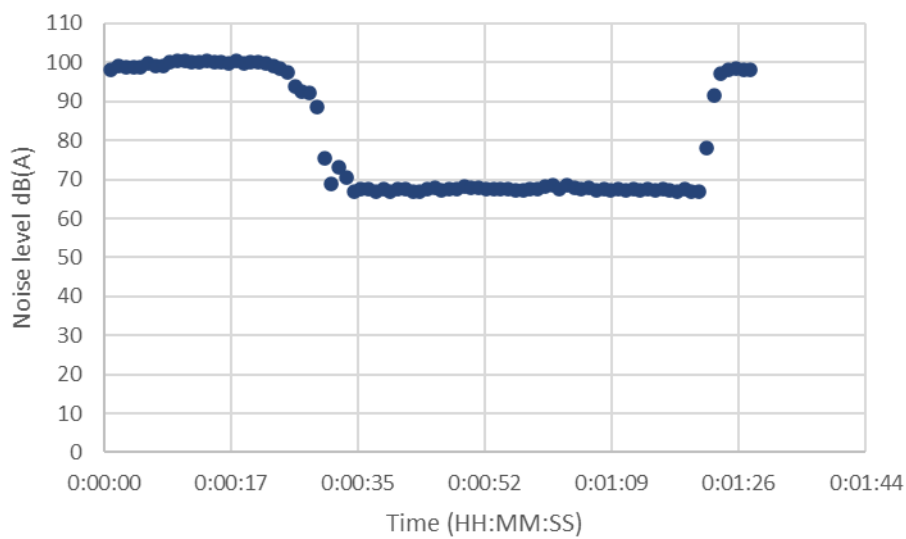


| f (Hz) | Transmission Loss (dB) |
|--------|------------------------|
| 125    | 25.8                   |
| 160    | 24.4                   |
| 200    | 23.7                   |
| 250    | 26.7                   |
| 315    | 31.7                   |
| 400    | 41.3                   |
| 500    | 37.4                   |
| 630    | 40.7                   |
| 800    | 39.6                   |
| 1000   | 38.6                   |
| 1250   | 40.8                   |
| 1600   | 45.1                   |
| 2000   | 48.2                   |
| 2500   | 47.2                   |
| 3150   | 48.4                   |
| 4000   | 50.8                   |

| Partition Area Size | Recommended STC | FSTC - dB |
|---------------------|-----------------|-----------|
| 0.64 m <sup>2</sup> | 42              | 39        |

**Figure 4.2:** Transmission loss curves.

- 4.6 Airborne noise test results presented in Figures 4.1 and 4.2 show FSTC of 39-53 dB was measured for the window installed on the test cabinet.
- 4.7 Figure 4.3 below presents a time history plot of the noise variation with the closing the window on the test cabinet. Noise level insertion loss of 32-33 dB are established by the window.





## Reference

1. ASTM E336-19 "Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings"
2. ASTM E413-16 "Classification for Rating Sound Insulation"



## **Appendix A**

### Calibration Certificate



### Calibration Certificate

Calibration Number: 250803442907

|                           |                                                                            |                                |            |
|---------------------------|----------------------------------------------------------------------------|--------------------------------|------------|
| <b>Customer Name</b>      | : Affinity Engineering Consultancy Pte. Ltd.                               | <b>Job Reference No:</b>       | 25080344   |
| <b>Customer Address</b>   | : 61 Bukit Batok Crescent<br>#07-03 Heng Long Building<br>Singapore 658078 | <b>Certificate Issue Date:</b> | 02/09/2025 |
| <b>Manufacturer</b>       | : NTI Audio                                                                | <b>Calibration Date:</b>       | 28/08/2025 |
| <b>Item Description</b>   | : Sound Level Meter                                                        | <b>Test Conditions:</b>        |            |
| <b>Model Number</b>       | : XL2                                                                      | Ambient Temperature:           | 22.6 °C    |
| <b>Serial Number</b>      | : A2A-07540-E0                                                             | Relative Humidity:             | 52.9 %R.H. |
| <b>Sub-Assemblies S/N</b> | : MC230 7306                                                               | Pressure:                      | 101 kPa    |

This certificate provides traceability of measurement to the International System of Units (SI).

Absolute Laboratories Pte. Ltd. certifies that the above product listed was calibrated in compliance with a quality management system using the applicable and approved Absolute Laboratories Pte. Ltd. calibration procedures as specified.

The reported expanded uncertainty is based on the standard uncertainty multiplied by a factor  $k = 2$  (effective degrees of freedom =  $\infty$ ) or as specified in the calibration report, which corresponds to a level of confidence of approximately 95%.

This is not a type approval test. The sound level meter submitted for testing has successfully completed part of the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

#### Calibration Method:

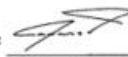
The instrument was calibrated following AL calibration procedure WI-47-Rev-7

| Calibration Equipment(s) Used     |               |              |                    |
|-----------------------------------|---------------|--------------|--------------------|
| Apparatus                         | Serial Number | Cal Due Date | Certificate Number |
| Multifunction Acoustic Calibrator | 3094457       | 13/11/2025   | NMC PT2024-7       |
| Digital Multimeter                | MY57230283    | 25/10/2025   | WO-00934895        |
| Arbitrary Function Generator      | C015037       | 07/10/2025   | SST/SA/R/2024/788  |

Ambient Condition Range:

Temperature: (20-26)°C, Humidity: (25-70)%RH, Pressure: (80-105)kPa

Calibration By :   
Han Chun Keong  
Calibration Officer

Reviewed/Approved By :   
Rodrigo Manansala  
Approving Officer

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