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**PT INDOAKUSTIK REKAYASA UTAMA**

FOR  
**CPL Global Group LTD**

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# Technical Report

Sound Transmission Loss Measurement

Hushtec Performance Series

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## INTRODUCTION

In this report, the sound transmission loss and sound insulation rating the product sample provided by CPL Global Group LTD are delivered. The measurements were based on the following standards:

- ASTM E2249-02 Standard test method for laboratory measurement of airborne transmission loss of building partitions and elements using sound intensity.
- ASTM E413 -16: Classification for rating sound insulation. In this evaluation, the result is the sound transmission class (STC).
- ISO 717-1: Rating of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation.

The measurements were conducted at Adhiwijogo Acoustics laboratory, Institut Teknologi Bandung Bandung, Indonesia between 27 May – 18 June 2025

## EQUIPMENT

In each measurement, the following equipment were used:

- G.R.A.S. 46AE ½ inch microphones: 5 units.
- G.R.A.S. 50GI CCP Intensity Probe with 25mm spacing.
- Norsonic Dodecahedron loudspeaker Nor276.
- Norsonic Power Amplifier Nor280.
- Microphone Calibrator Nor1251.
- CATEC software/measuring and analyzing systems with RION data acquisition system.

## TEST CHAMBERS

The measurement was conducted using two rooms (Figure 1) as follows:

- Reverberation chamber with several stationary diffusers installed at the ceiling and a volume of 278 m<sup>3</sup> (Figure 2).
- Anechoic chamber with dimensions of 7.65 m x 9.63 m x 4.57 m. This room has a cut-off frequency of 100 Hz (Figure 3).





**Figure 3. The reverberation chamber used for transmission loss measurements.**

## **SAMPLE INSTALLATION**

The product sample measures 1.4 m x 1.2 m and was installed on the aperture the two chambers, as shown in Figures 2, 3, and 4 (including the filler). The perimeter of the sample surface was sealed on the front and back with Smartflex PU sealant and metal brackets (with filler) were used to support the specimen (see Figure 4). The sealant was allowed to cure for at least 12 hours prior to testing.



**Figure 4. Installation of the product sample to the aperture during measurement.**

## TEST PROCEDURE

1. Each microphone and the intensity probes were calibrated by adjusting their sensitivity.
2. Five microphones were distributed over the reverberation chamber with a height of 1.5 meters, as shown in Figure 5. The minimum distances between microphones to the source and the nearest wall are 1.5 meters.
3. The sound source was turned on by generating white noise.
4. Sound pressure levels were measured to know the sound power in the reverberation chamber.



**Figure 5. Microphone distribution during measurement.**

5. In the anechoic chamber, the sound intensity was measured using discrete point methods to know the sound power transmitted through the specimen. The area of the specimen is divided into 16 discrete areas.
6. Each point was measured for 15 seconds using automatic arm system shown in Figure 6.



**Figure 6. An automatic arm controls the intensity probe during measurement.**

7. The air temperature and humidity were recorded at the start of the measurement (presented in the report).
8. Measurement was repeated for three source locations to take the average sound transmission losses.
9. The measurement results were processed and analyzed using the CATEC software, and the STC value was calculated afterwards by Indoakustik personnel.

## **DELIVERABLES**

This report contains the room conditions, sound transmission loss values, photographs during measurement, Sound Transmission Class (STC) curves and values, Weighted Sound Reduction Index ( $R_w$ ) and Spectrum adaptation values ( $C$ ,  $C_{tr}$ ). In the following tables, the summary of the measurement results is given.

<b>Product Name</b>	<b>STC (dB)</b>	<b><math>R_w</math> (C; <math>C_{tr}</math>) (dB)</b>
Hushtec Performance Series	26	26 (-2; -5)



### Airborne Sound Insulation Laboratory Measurement Results

**Reference Number** : 017g/Aks/VI/2025  
**Client** : CPL Global Group LTD  
**Test Specimen** : Hushtec Performance Series  
**Date of Test** : 10 June 2025  
**Standard** : ASTM E2249-02 (Test Method), ASTM E413-16 & ISO 717 (Rating Method)

**Test Site:** Coupled Anechoic-Reverberation Chamber Adhiwijogo Acoustics Laboratory

**Receiving room volume:** 346 m<sup>3</sup>

**Source room volume:** 278 m<sup>3</sup>

**Measurement surface (S<sub>m</sub>):**

1.4m x 1.2m (1.68 m<sup>2</sup>)

**Mass per unit area estimated:**

2.5 kg/m<sup>2</sup>

**Sample total thickness:** 45 mm

**Measurement shape (segments):**

Rectangular (discrete method)

**Measurement segments:**

16 segments each 0.35m x 0.3m (0.105 m<sup>2</sup>)

**Pressure microphone:**

5 microphones G.R.A.S. 46AE ½ inch, 3

Sources locations (15 points-averaging)

**Intensity probe:**

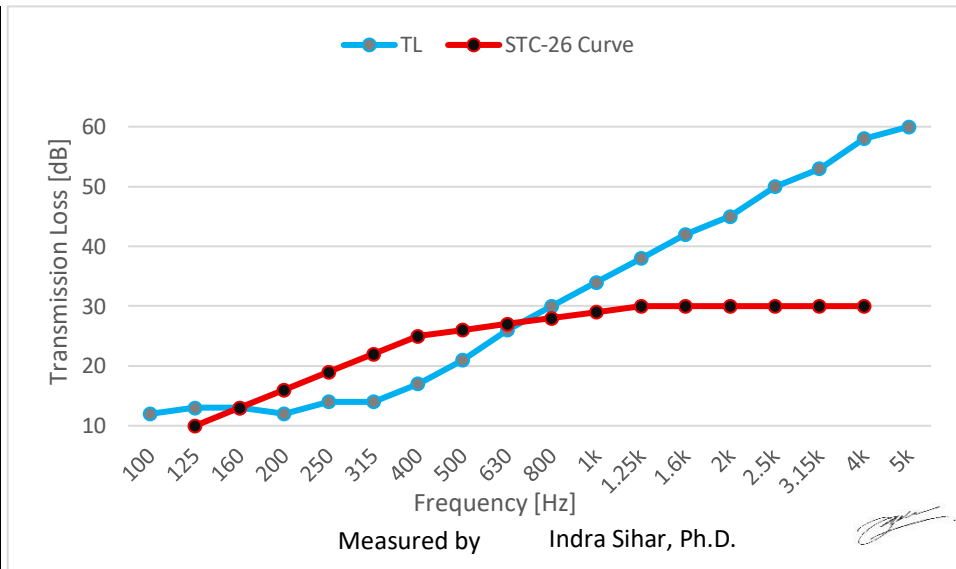
G.R.A.S. 50GI CCP with 25mm spacing.

**Measurement distance:** 25cm

**Air temperature:** 24°C

**Air humidity:** 70%

f (Hz)	TL (dB)
100	12
125	13
160	13
200	12
250	14
315	14
400	17
500	21
630	26
800	30
1000	34
1250	38
1600	42
2000	45
2500	50
3150	53
4000	58
5000	60



Bandung, 10 June 2025

Head of Building Physics Laboratory

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**STC: 26 dB**

**Rw (C;Ctr): 26 (-2;-5) dB**



APPENDIX





