**Note:** This report is issued subject to the Testing and Certification Regulations of the TÜV SÜD Group and the General Terms and Conditions of Business of TÜV SÜD PSB Pte Ltd. In addition, this report is governed by the terms set out within this report.



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#### **SUBJECT:**

Laboratory measurement of airborne sound insulation of wall panels system submitted by GE Tech Industry Sdn Bhd on 14 May 2019.

#### **TESTED FOR:**

GE Tech Industry Sdn Bhd Wisma HCK, No. 6 Jalan 19/1B Seksyen 19, 46300 Petaling Jaya, Selangor Malaysia

Attn: Mr. Tey CK

#### **DATE OF TEST:**

23 May 2019

## **DESCRIPTION OF SAMPLES:**

The following wall panels system was installed onto the sample carrier for sound insulation test.

Product name : GEG ECO lightweight wall panels

Nominal size of wall system : 3180mm (length) x 3140mm (height) x 105mm (thick)

Composition of material : Cement, water, foaming agent, fibreglass and 20% volume air

Measured density of panel : 1036kg/m<sup>3</sup>

The boundary perimeters of the entire wall panels system were sealed with silicon sealant.

The technical drawing of wall panels system submitted by the company was shown in Appendix.









LA-2007-0380-A LA-2007-0385-E LA-2007-0381-F LA-2007-0386-C LA-2007-0382-B LA-2010-0464-D LA-2007-0383-G LA-2018-0702-B LA-2007-0384-G LA-2018-0703-G

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection bodylaboratory.



### **METHOD OF TEST:**

The test was conducted in accordance with the following test standards.

a) ISO 10140 - 2 : 2010 "Laboratory measurement of sound insulation of building elements" Part 2 : Measurement of airborne sound insulation.

b) ISO 717 - 1 : 2003 "Acoustics - Rating of sound insulation in buildings and of building elements" Part 1 : Airborne sound insulation

Measured area of wall panel system: 9.80m<sup>2</sup>

Air temperature in both source room and receiving room : 26°C Relative air humidity in both source room and receiving room : 54%

Source room volume: 74m<sup>3</sup> Receiving room volume: 85m<sup>3</sup>

Location of the test: Acoustics Lab of TÜV SÜD PSB Pte Ltd

### **TEST EQUIPMENT:**

The following instruments were used for the test.

- 1) A dual-channel real-time frequency analyser (B&K Type 2133)
- 2) One units of loudspeaker (JBL MPro MP415)
- 3) Two sets of ½" diffuse field microphones (G.R.A.S Type 4OAR)
- 4) Two sets of microphone preamplifers (B&K Type 2669)
- 5) A sound pressure level calibrator (Norsonic Type 1251)
- 6) A sound source amplifier (Crown model CE 1000)
- 7) Two sets of rotating microphone booms (B&K Type 3923)

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### **TEST PROCEDURES:**

- 1) Instrumentation was set up according to ISO 10140 2.
- Measurement system was calibrated using a sound level calibrator.
- 3) Background noise level of both source and receiving room were measured.
- 4) One loudspeaker was placed at one corner in the source room.
- 5) Sound source system was switched on to generate "White" noise and maintained at constant level. The measured sound pressure level in the receiving room was ensured to be 15dB higher than the background noise level.
- 6) Recording time for both rotating microphone booms was set to 64s which equals to the time taken by the booms to complete two revolutions.
- 7) Sound pressure level in the source room and the receiving room were measured simultaneously and the measurement was repeated for another 2 more times.
- 8) Step 6 and 7 were then repeated after the loudspeaker was moved to another corner in the source room.
- 9) One loudspeaker was placed at one corner of the receiving room to generate the "Pink" noise for reverberation time measurement.
- 10) The average of 2 measurements of reverberation time in the receiving room was conducted and the measurement was repeated for another 1 more time.
- 11) Step 9 and 10 were then repeated after the loudspeaker was moved to another corner in the receiving room.
- 12) The mean values of 6 readings of sound pressure level difference and 4 readings of RT values were calculated.
- 13) Values of sound reduction index (R) were determined for each 1/3 octave frequency band from 100Hz to 5kHz based on the mean values of step 12.
- 14) Weighted sound reduction index (R<sub>w</sub>) and its adaptation terms (C; C<sub>tr</sub>) according to ISO 717-1 was determined at 500Hz frequency of the shifted reference curve

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### **RESULTS: (cont'd)**

Values of sound reduction index (R) of the tested wall panels system were tabulated in Table 1. Sound Insulation Rating is computed according to ISO 717 – 1.

<u>Table 1 : Measured Sound Reduction Index, R, and values of the shifted reference curve</u> <u>for  $R_w = 44$ </u>

1/3 Octave Band Frequency (Hz)	Sound Reduction Index, R (dB)	Shifted Reference Curve R <sub>w</sub> = 44 dB	Deficiency
100	32.2	25	0.0
125	29.4	28	0.0
160	30.8	31	0.2
200	32.5	34	1.5
250	34.0	37	3.0
315	33.9	40	6.1
400	36.2	43	6.8
500	39.4	44	4.6
630	42.6	45	2.4
800	45.4	46	0.6
1000	46.8	47	0.2
1250	48.4	48	0.0
1600	50.7	48	0.0
2000	52.0	48	0.0
2500	53.5	48	0.0
3150	54.7	48	0.0
4000	55.7	48	0.0
5000	56.5	48	0.0
Total deficiency (100Hz – 3150Hz)			26

The values in Table 1 were plotted as shown in Figure 1.

### Remark:

The tested 105mm thick "GEG ECO" lightweight wall panels system achieved a weighted sound reduction index,  $R_w(C; C_{tr}) = 44$  (-1; -4).

Francis Ee Min Kuen Testing Officer Lem Chee Meng Product Manager

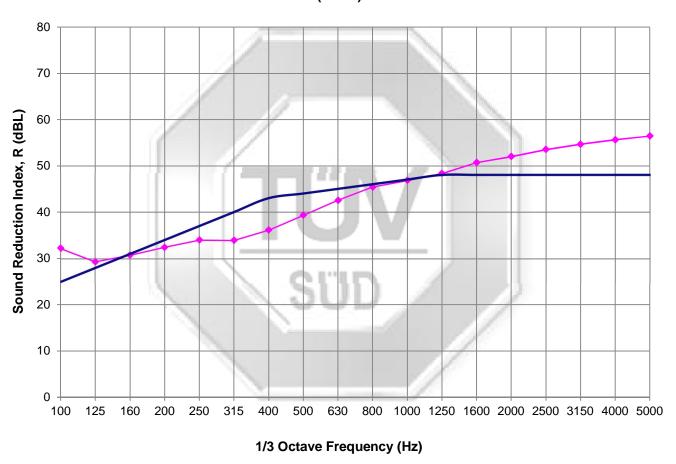
Acoustics

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RESULTS: (cont'd)

Figure 1 : Sound insulation performance of 105mm thick "GEG ECO" lightweight wall panels system (Rw 44)



Measured Sound Reduction Index, RShifted reference curve, Rw = 44

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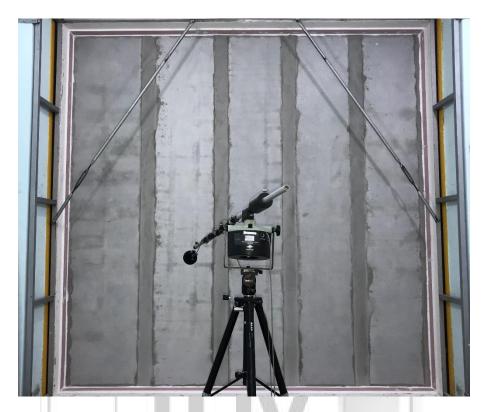


Figure 2: "GEG ECO" lightweight wall panels system facing source room

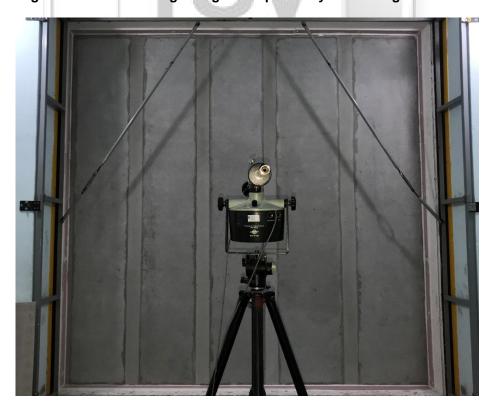
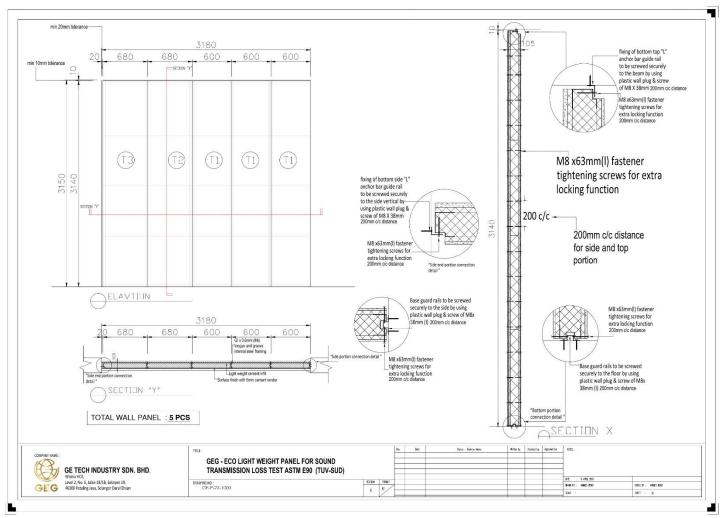


Figure 3: "GEG ECO" lightweight wall panels system facing the receiving room

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Appendix: Technical drawing of the installed "GEG ECO" lightweight wall panels system

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