



**LABORATORY REPORT
ON
AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENT
OF
THE DOUBLE LAYER GYPSUM BOARD AND
SANDWICH PANEL
FOR
SUPA RICH CO., LTD.
THAILAND.**

**LABORATORY REPORT
ON
AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENT
OF
THE DOUBLE LAYER GYPSUM BOARD AND
SANDWICH PANEL
FOR
SUPA RICH CO., LTD.
THAILAND.**



1. Subject:

Laboratory measurement of the airborne sound transmission loss (TL) of the double layer Gypsum board and sandwich panel submitted by SUPA RICH Co., Ltd. on 15 November 2022.

2. Client:

SUPA RICH Co., Ltd.
27 Ramintra Soi 48, Ramintra Road,
Ramintra, Khannayao,
Bangkok 10230
Thailand.

3. Description of the Specimen:

The specimen is constructed from the **RICCO** sandwich panel (100 mm. of thickness). The **FireBloc** fire resistance gypsum board (15 mm. of thickness) is screwed to fixed either side of the sandwich panel, and the standard gypsum board (9 mm. of thickness) is screwed on the fire resistance gypsum board. The specimen detail is illustrated in Figure 2.

The specimen was installed between two reverberation chambers, as illustrated in Figure 3.

4. Test Date:

15 November 2022.

5. Test Method:

To determine the airborne sound transmission loss (TL), the specimen was installed between two reverberation chambers (see Figure 3). The space- and time-averaged sound pressure levels in the two rooms are determined. In addition, with the test specimen in place, the sound absorption in the receiving room is determined. The sound pressure levels in the two rooms, the sound absorption in the receiving room and the area of the specimen are used to calculate transmission loss (TL) value. And the Sound transmission class (STC) is determined.

6. Measurement Facilities:

The measurement was performed in a double-reverberation chamber, with a background noise less than 30 dBA, at the Acoustics Laboratory, Department of Physics, Faculty of Science, Chulalongkorn University, Bangkok, Thailand.

The instruments used for the measurements are as follow:

- a) Random-field Condenser Microphones (G.R.A.S. model 40AR).
- b) Microphone Pre-amplifier (01dB model Pre 21).
- c) Computer-based Acoustics Analyzer (01dB model Symphonies).
- d) Building Acoustics Software (01dB Model dBBATI).
- e) Sound level calibrator (01dB Cal21).
- f) Power amplifier (QSC model PLX1804).
- g) Loudspeaker Unit (Brüel & Kjær model 4224).



7. Measurement Procedures:

Before the transmission-loss measurement, the microphone calibration was done and the background noise was measured. Then, the pink noise was sent to the loudspeaker unit, which placed in the source room. There are two microphones used in this measurement. One was installed in the source room to record the incident sound pressure level on the specimen before transmit through the material. Another microphone was placed in the receiving room to measure the transmitted sound pressure level and the reverberation time of the receiving room.

All spectra were recorded and by cause 7.3.1 of the ASTM E 90-02 the transmission loss (TL) values were calculated at each frequency in the 1/3-octave band. The center frequencies in this measurement are at 125Hz, 160Hz, 200Hz, 250Hz, 315Hz, 400Hz, 500Hz, 630Hz, 800Hz, 1kHz, 1.25kHz, 1.6kHz, 2kHz, 2.5kHz, 3.15kHz and 4kHz respectively.

Finally, the single value rating, Sound Transmission Class (STC) according to ASTM E 413 was calculated from the sound transmission loss.

8. Result:

The airborne sound transmission-loss (TL) of the test sample for each individual 1/3 octave band center frequency and the STC rating number of the test wall were tabulated in **Table 1**. The graphical representation of the values in the table 1 was shown in **figure 1**.

However, these TL-values and the STC rating in this measurement are valid only in this test condition. Thus, the internal structure of the wall, the installation and the size of the specimen can give the influences to the transmission-loss measurements.

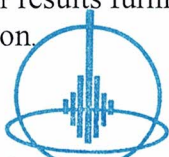
9. This report is issued under the following conditions:

This report applies to the sample of the specific product given at the time of its testing. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that Chulalongkorn University approves, recommends or endorses the manufacturer, supplier or user of such product, or that Chulalongkorn University in any way “guarantees” the later performance of the product.

The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. Chulalongkorn University therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

Nothing in this report shall be interpreted to mean that Chulalongkorn University has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.

This report shall not be reproduced wholly or in parts and no reference shall be made by the Client to Chulalongkorn University or to the report or results furnished by Chulalongkorn University in any advertisements or sales promotion.



ศูนย์บริการวิชาการ
มหาวิทยาลัยจุฬาลงกรณ์
Chulalongkorn



Table 1. The airborne sound transmission-loss (TL) for each individual 1/3 octave band center frequency and STC rating of the **SAC 01 C35** test sample.

Test panel: **RICCO** sandwich panel (100 mm. of thickness) and **FireBloc** Gypsum board (15 mm. of thickness) + standard Gypsum board (9 mm. of thickness).

Client: SUPA RICH Co., Ltd.

Test sample size: 3040mm. x 2440mm. x mm.

Date of test: 15 November 2022.

Temperature: 27°C

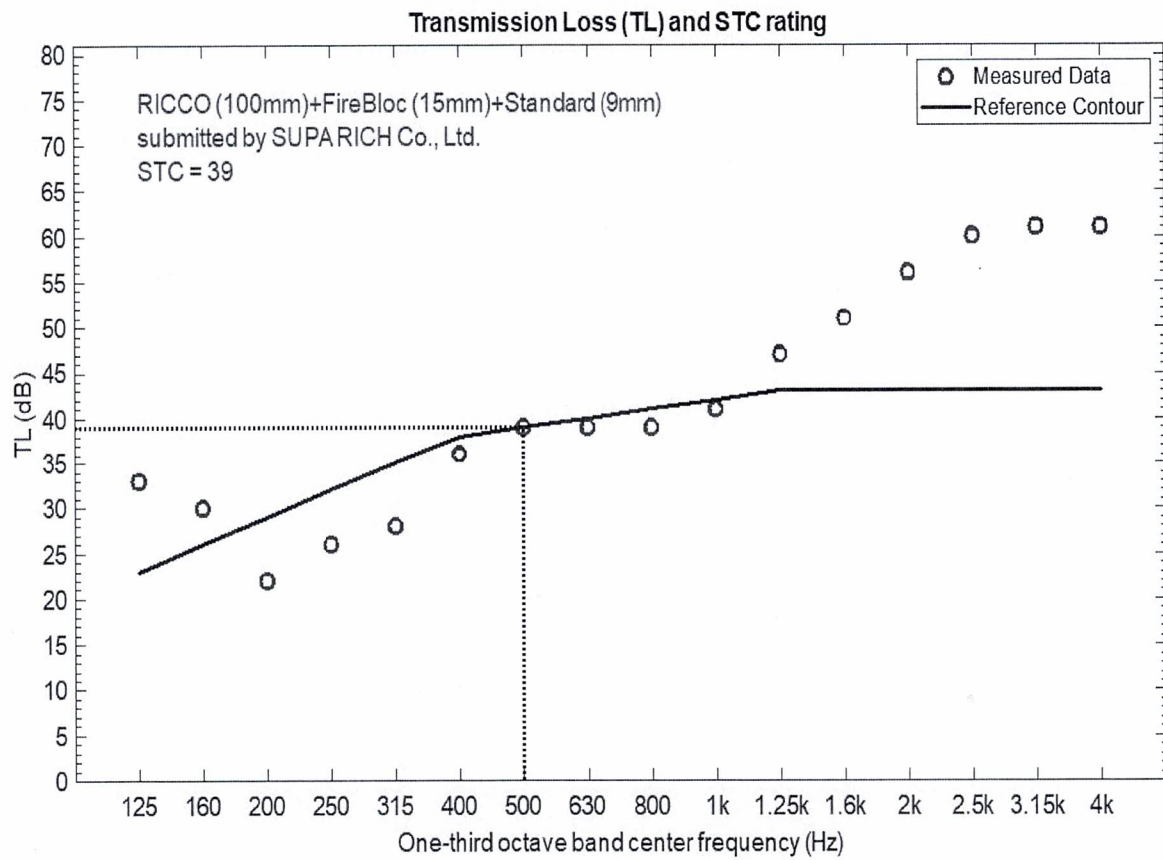
Relative humidity: 50%

Frequency (Hz)	TL (dB)
125	33
160	30
200	22
250	26
315	28
400	36
500	39
630	39
800	39
1000	41
1250	47
1600	51
2000	56
2500	60
3150	61
4000	61

STC	39
Maximum Deficiency	7 dB
Sum of Deficiency	26 dB



Figure 1. The airborne sound transmission-loss (TL) and the STC rating of the test sample.




 ศูนย์บริการวิชาการ
 ภาควิชาสถาปัตยกรรมศาสตร์
 จุฬาลงกรณ์มหาวิทยาลัย
Chulanwong



Figure 2. Specification of the test sample.

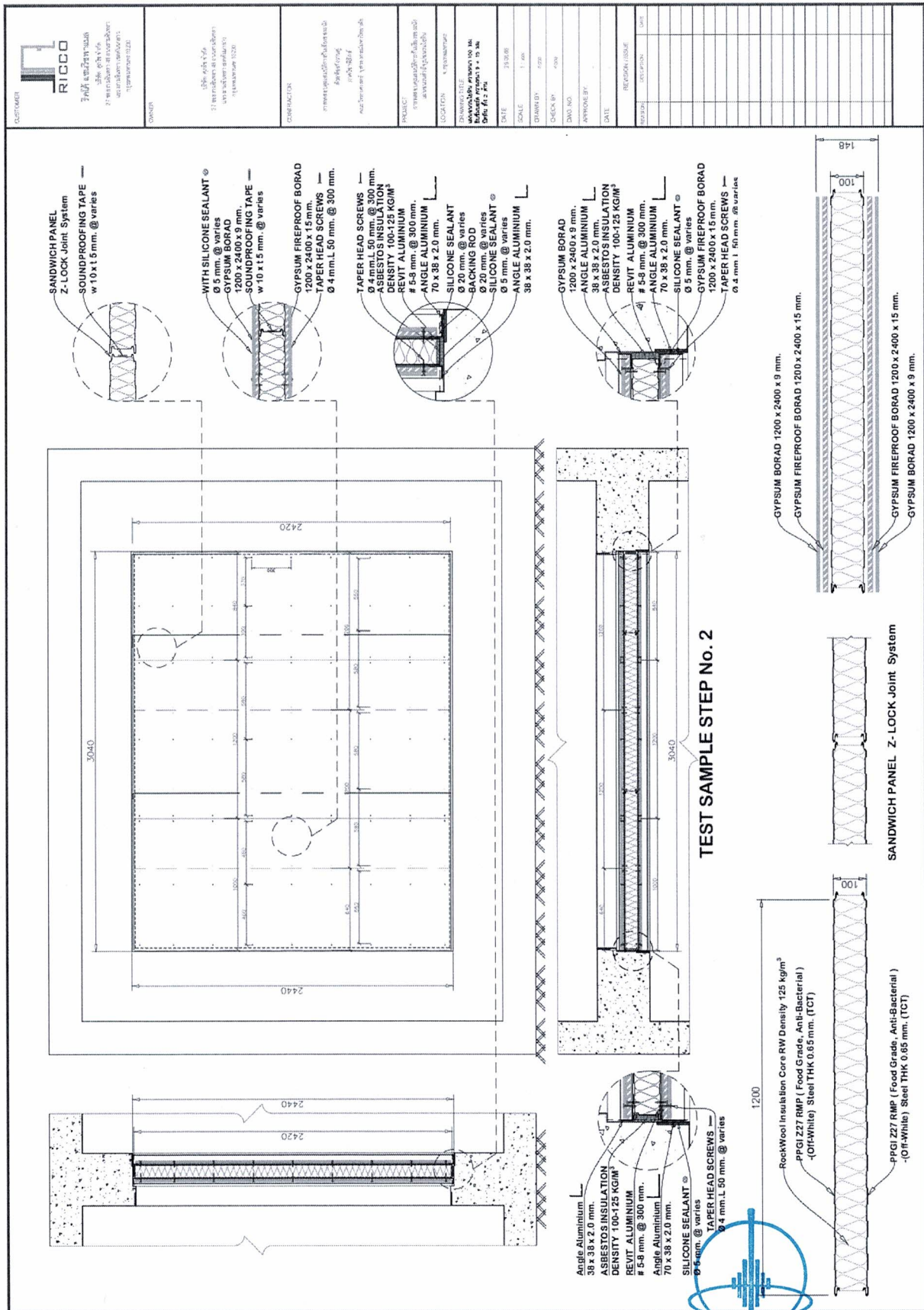


Figure 3. Schematic drawing of the measurement set-up in a double-reverberation chamber.

