



**LABORATORY REPORT  
ON  
AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENT  
OF  
THE SANDWICH PANEL AND FIRE RESISTANCE GYPSUM  
BOARD WITH C-LINE  
FOR  
SUPA RICH CO., LTD.  
THAILAND.**

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## 1. Subject:

Laboratory measurement of the airborne sound transmission loss (TL) of the sandwich panel and fire resistance Gypsum board submitted by SUPA RICH Co., Ltd. on 21 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). And the **FireBloc** fire resistance gypsum board (15 mm. of thickness) is screwed to the C-line (W35 x H10 T 0.4 mm.) fixed either side of the sandwich panel.

The **RICCO** sandwich panel surface is 0.65 mm thick electro galvanized steel, the panel core is Rockwool with density of 125 kg/m<sup>3</sup>. The specimen detail is illustrated in Figure 2.

The specimens were installed between two reverberation chambers, as illustrated in Figure 3.

## 4. Test Date:

21 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:

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

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

**Client:** SUPA RICH Co., Ltd.

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

**Date of test:** 21 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	40
Maximum Deficiency	6 dB
Sum of Deficiency	27 dB

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

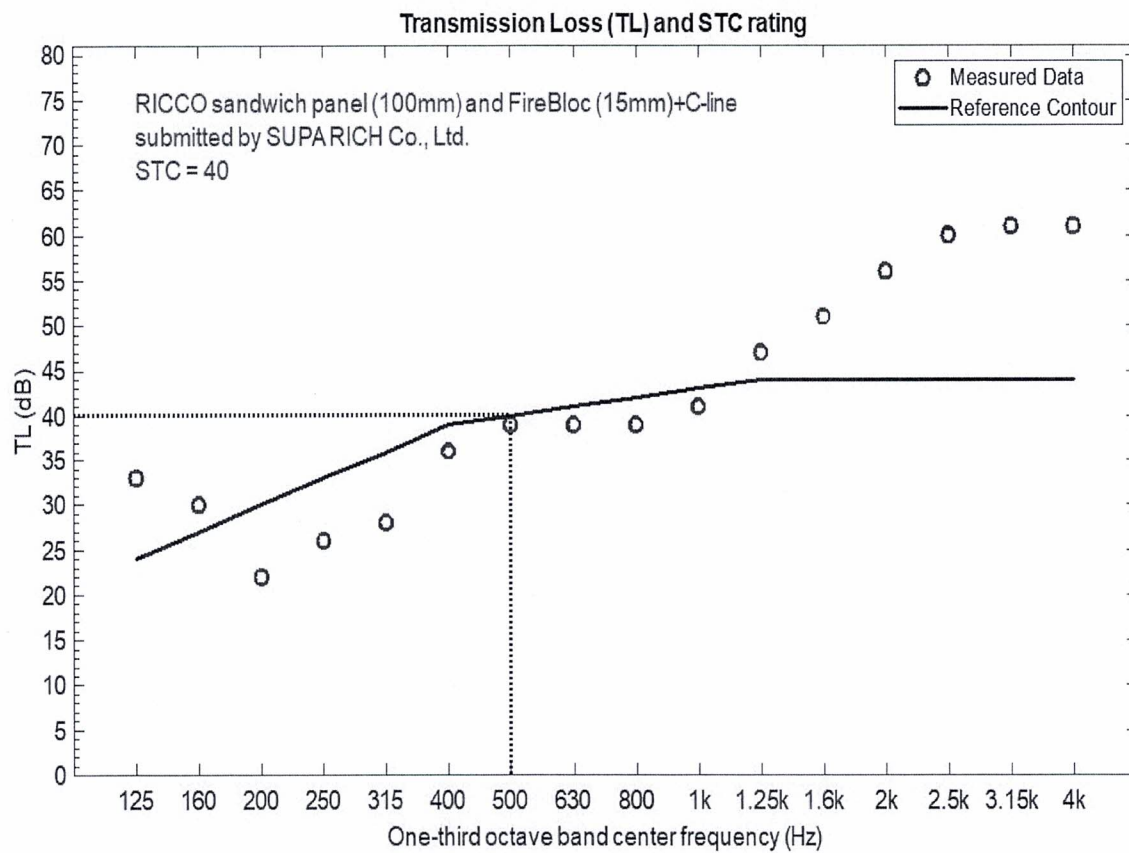
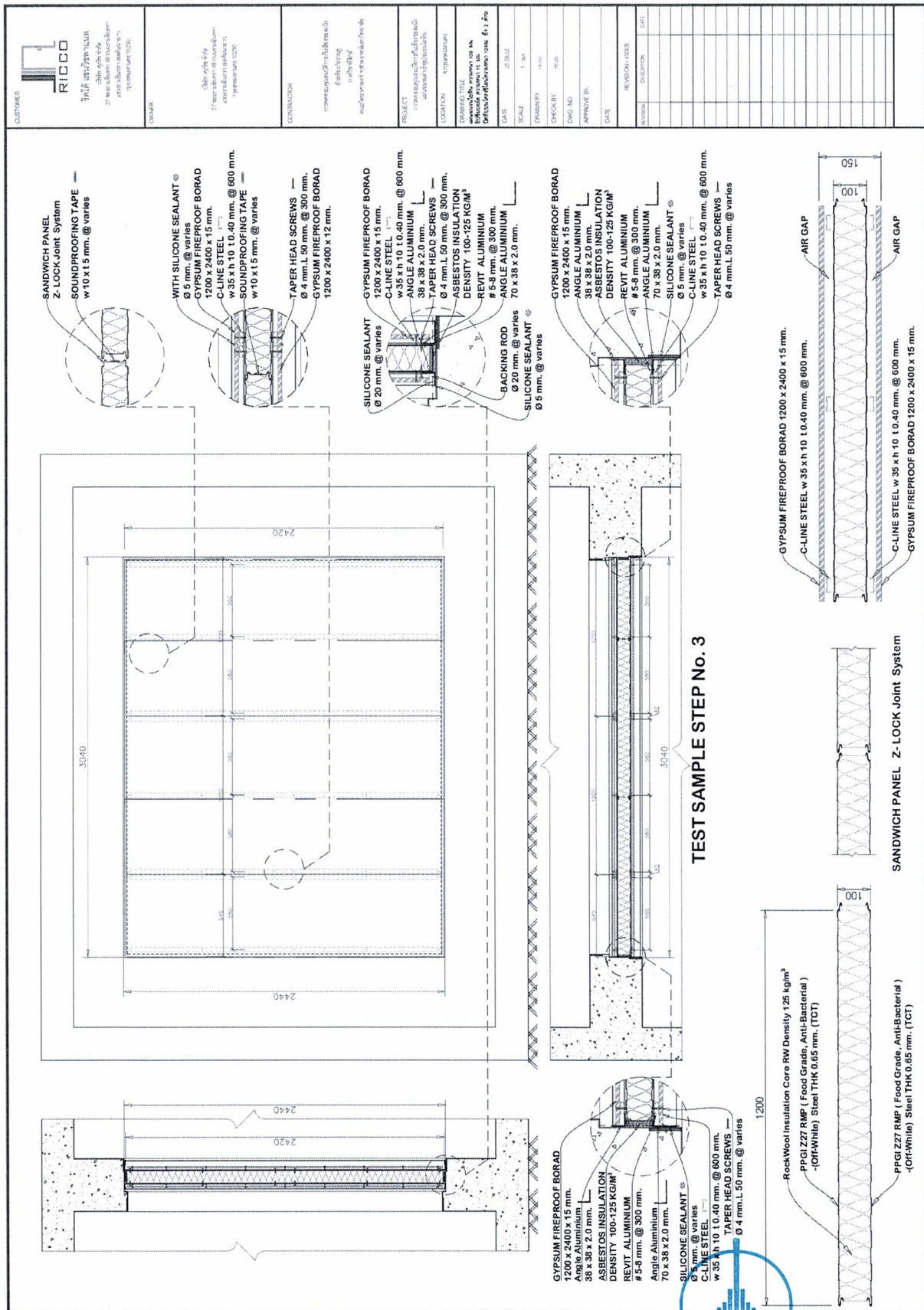




Figure 2. Specification of the test sample.



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

