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LABORATTORY REPORT

THE AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENTS

OF

SmartBoard

FOR

THE SIAM FIBRE - CEMENT CO., LTD.

20th

Chula Unisearch
ศูนย์บริการวิชาการแห่งจุฬาฯ

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LABORATORY REPORT

ON

THE AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENTS

OF

"SmartBoard"

FOR

THE SIAM FIBRE - CEMENT CO., LTD.

LABORATORY REPORT ON
THE AIRBORNE SOUND TRANSMISSION-LOSS MEASUREMENTS

1. Subject:

Laboratory measurement of the airborne sound transmission loss (TL) of the reinforced cement sheet, called "**SmartBoard**", submitted by THE SIAM FIBRE - CEMENT Company Limited on 25 Oct 2006.. The dimensions of each board were 1200 mm. x 3000 mm. x 8 mm.

2. Description of the Specimens:

The test wall was constructed by using the SmartBoard with steel stud in order to be the backbone of the wall, and filled the gap between two sides of wall with "Cylence S060" fiberglass.

The test wall was installed between two reverberation chambers, as illustrated in Figure 1 with the size of 3.05 meters x 2.45 meters.

3. Client:

THE SIAM FIBRE - CEMENT CO.,LTD. Thailand.

4. Test Period:

December 2006.

5. Measurement Facilities:

The transmission-loss measurements were 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) Brüel & Kjær Free-field Condenser Microphones (model 4165).
b) Brüel & Kjær Microphone Pre-amplifier (model 2619).
c) 01dB Symphonies computer-based Acoustics Analyzer.
d) 01dB dBBATI building Acoustics Software.
e) Brüel & Kjær Loudspeaker Unit (model 4224).
f) 01dB Cal21 -- Sound level calibrator.
g) Pentium 4-based notebook computer.

6. Measurement conducted in association with:

Mr. Wisit Leelasiriwong	Project leader
Dr. Sukkaneste Tungasmita	Researcher
Dr. Natthakorn Tabthong	Researcher

7. The Airborne Sound Transmission-loss Measurements Procedure :

Before the transmission-loss measurement, the microphones calibration were 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 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.

8. Measurement Results:

The airborne sound Transmission Loss (TL) values at different frequencies and the STC rating are calculated for each speciment. **Table 1** show the STC rating and the airborne sound transmission-loss values at different frequencies of each speciment .

The graphical representation of the values in the table 1 was shown in **figure 2**.

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

8. Measurement Results:(cont'd)

Table 1. The STC rating and the airborne sound transmission-loss (TL) values at different frequencies of the **SmartBoard** wall with Cylence fiberglass.

Frequency (Hz)	TL (dB)
125	32
160	32
200	33
250	42
315	46
400	48
500	52
630	54
800	56
1 k	57
1.25 k	57
1.6 k	55
2 k	57
2.5 k	55
3.15 k	48
4 k	48

STC	50
Max. Deficiency	7 dB
Sum. Deficiency	29 dB

8. Measurement Results:(cont'd)

Figure 2. The STC rating and the airborne sound transmission-loss (TL) of the **SmartBoard** wall with Cylence fiberglass.

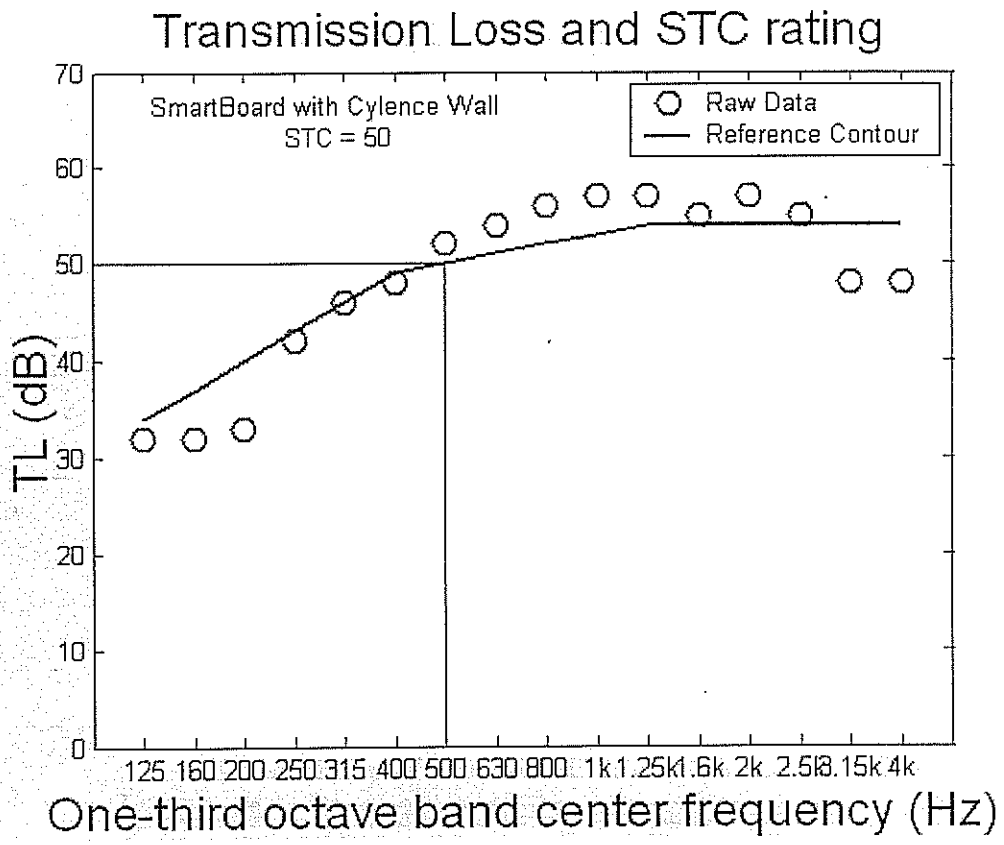

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Figure 1. A schematic drawing of the measurement set-up in a double-reverberation chamber