Test Report No. S08MEC04781/A1/EMK
dated 18 Aug 2008

PSB Singapore

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SUBJECT:

Laboratory measurement of airborne sound insulation of "Besta" composite mineral board system submitted by Best Rock Building Systems Pte Ltd on 4 Aug 2008.

TESTED FOR:

Best Rock Building Systems Pte Ltd
14 Zion Road
Singapore 247732

Attn : Mr Daniel Wong

DATE OF TEST:

8 Aug 2008

DESCRIPTION OF SAMPLES:

The "Besta" composite mineral board system of 3.20m (width) x 3.15m (length) x 100mm (thick) was installed onto the sample carrier by Best Rock Building Systems Pte Ltd.

The dimension of each composite mineral board was 3145mm (length) x 600mm (width) x 100mm (thick). Each composite mineral board consisted of Perlite materials enclosed by 10mm thick "Besta" board. The mass of each composite mineral board measured to be 93kg.

The joining of panel-to-panel and the perimeter seal of the composite mineral board system was used by silicone sealant.

The drawing description of the composite mineral board system was shown in Figure 4.

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METHOD OF TEST:

The test was conducted in accordance with ISO 140 – 3 : 1995 "Laboratory measurements of airborne sound insulation of building elements".

Measured area of panel opening: 3.20m (width) x 3.15m (height) = 10.06m^2
Air temperature in both source room and receiving room : 26°C
Relative air humidity in both source room and receiving room : 65%
Source room volume : 74m^3
Receiving room volume : 84m^3
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) Two units of loudspeaker (JBL MPro MP415)
3) Two sets of ½" condenser microphones (B&K Type 4190)
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)

TEST PROCEDURES:

1) Instrumentation was set up according to ISO 140 - 3.

2) Measurement system was calibrated using a sound level calibrator Norsonic Type 1251.

3) Background noise level for both source room and receiving room were measured.

4) Sound source system was switched on and maintained at constant level. The sound pressure level in the receiving room was ensured to be 15dB higher than the background noise level.

5) Recording time for both rotating microphone booms was set to 64s which equals to the time taken by the booms to complete two revolutions.

6) Sound pressure level difference between the source room and the receiving room was measured with a dual – channel acoustic analyser (B&K 2133), and the measurement was repeated 3 times.

7) Step 6 was repeated after the loudspeaker was moved to new position.

8) Reverberation time (RT) of the receiving room was measured from two different loudspeaker positions. Each loudspeaker position was measured 2 times.

9) The mean values of the six readings for sound pressure level difference and four readings for RT values were calculated.

10) Values of sound reduction index were determined for each 1/3 octave frequency band from 100Hz to 5kHz based on the mean values of step 9.

11) Weighted sound reduction index (R_w) (single number for rating sound insulation of the sample) and its adaptation terms (C, C_{tr}) according to ISO 717-1 was determined at the frequency of 500Hz of the shifted reference curve (see figure 1)

RESULTS:

Values of sound reduction index (R) of the tested sample were tabulated in Table 1. Sound Insulation Rating is computed according to ISO 717 - 1 : 1996 "Acoustics - Rating of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation".

Table 1 : Measured values of the test sample and values of the shifted reference curve for R_w = 36

1/3 Octave Band Frequency (Hz)	Measured Sound Reduction Index, R (dB)		Shifted Reference Curve R_w = 36 (dB)	Deficiency
100	30.0	29	17.0	0.0
125	27.9		20.0	0.0
160	30.2		23.0	0.0
200	29.8	30	26.0	0.0
250	29.3		29.0	0.0
315	30.1		32.0	1.9
400	31.7	34	35.0	3.3
500	34.2		36.0	1.8
630	35.6		37.0	1.4
800	36.3	37	38.0	1.7
1000	36.6		39.0	2.4
1250	36.8		40.0	3.2
1600	37.3	37	40.0	2.7
2000	37.6		40.0	2.4
2500	37.4		40.0	2.6
3150	38.7	41	40.0	1.3
4000	41.4		40.0	0.0
5000	44.9		40.0	0.0
Total deficiency (100Hz – 3150Hz) :				**25**

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

Remark:

The tested "Besta" composite mineral board system achieved a weighted sound reduction index, $R_w (C, C_{tr})$ = 36 (0, -2).

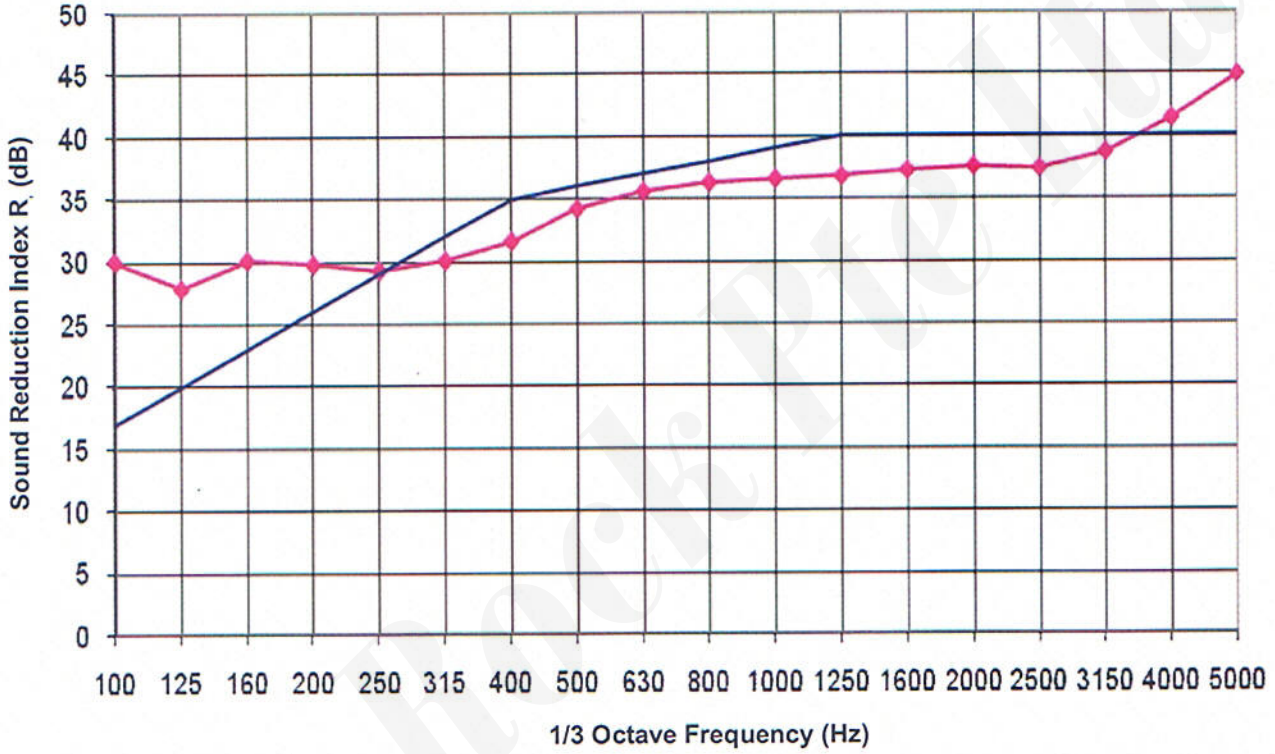
Francis Ee Min Kuen
Testing Officer

Dr Sun Qiqing
Assistant Vice President
Acoustics & Vibration
Testing Services

PSB Singapore

RESULTS: (cont'd)

Figure 1 : Sound insulation performance of "Besta" composite mineral board system



Measured Sound Reduction Index, R

Shifted reference curve, R_w = 36

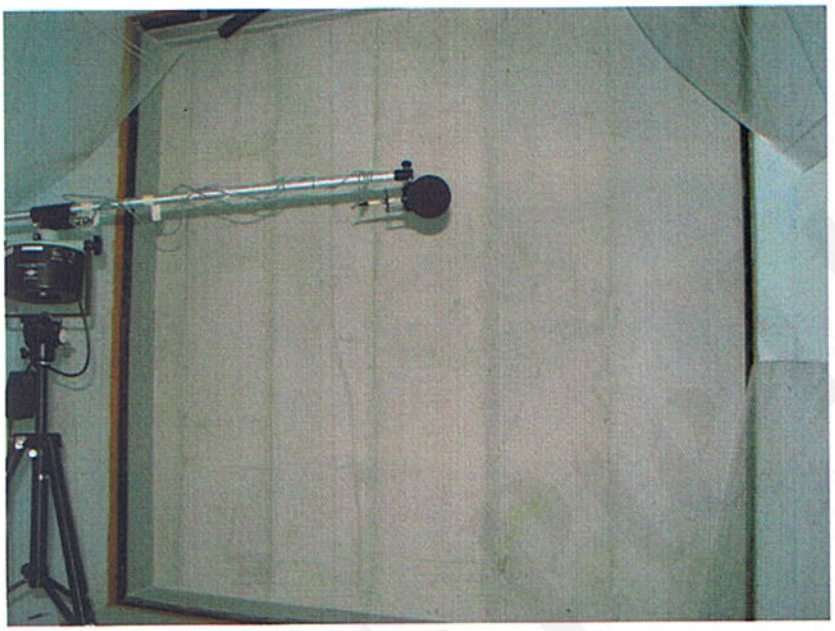


Figure 2 : "Besta" composite mineral board system facing the source room

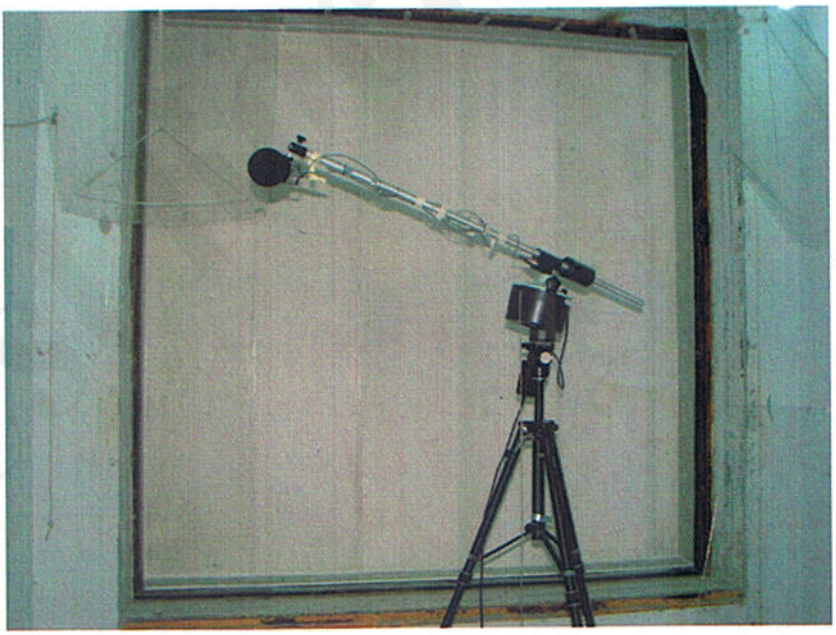


Figure 3 : "Besta" composite mineral board system facing the receiving room

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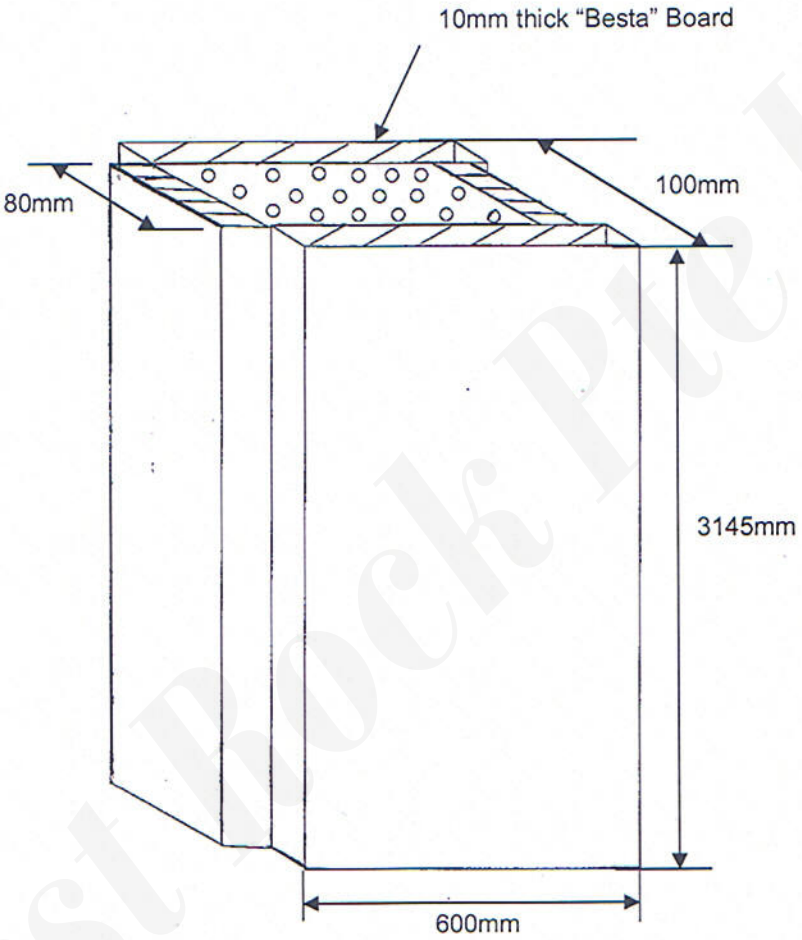

Figure 4 : "Besta" composite mineral board panel

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January 2008