



CSIRO ACOUSTIC MEASUREMENT REPORT

Commonwealth Scientific and Industrial Research Organisation, Infrastructure Technologies
Acoustics Testing Laboratory, Gate 5, 2 Normanby Road, Clayton, Vic 3168 Australia

Report No:
INR209-03-1

Client: Belgotex Floorcoverings (Australia) Pty Ltd
13-15 Fishermans Road, Kuluin, Qld 4558

Measurement Type: Impact Sound Insulation (Floor)

AS ISO 140.6-2006 "Laboratory measurement of impact sound insulation of floors"

AS ISO 140.8-2006 "Laboratory measurement of reduction of transmitted impact noise by floor coverings on a heavyweight standard floor"

AS ISO 717-2-2004 "Acoustics – Rating of sound insulation in buildings and of building elements. Part 2: Impact sound insulation"

Test Specimen (3.6 x 3.0 m test floor area)

Description: Belgotex Flooring "Kensington Sonic+" loose lay LVT planks laid directly on a 150 mm thick concrete floor.

Materials:

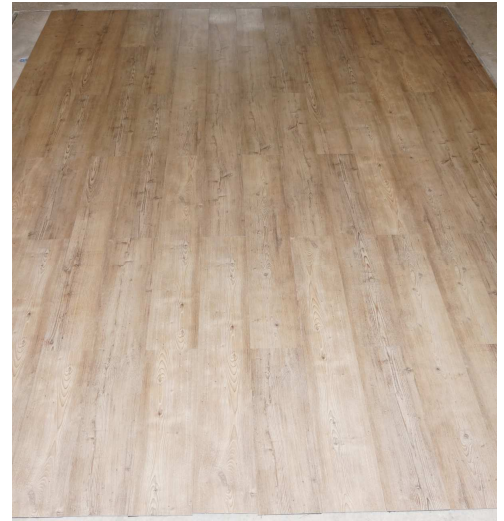
- a) Belgotex Flooring "Kensington Sonic+" luxury vinyl planks, 1219.2 mm (l) x 184.2 mm (w) x 5 mm (t), approx. 6.8 kg/m². Constructed with a textured clear wear layer, over a decorative film giving the plank its timber appearance, over a vinyl core, backed with a soft closed-cell foam resilient backing.
- b) 150 mm thick concrete test floor of laboratory (estimated 360 kg/m²); no ceiling below.

Installation details:

- The concrete test floor was swept to remove all dust and other foreign matter.
- LVT Planks, item a), were laid loose on the floor and butted tightly against each other.
- One plank of every second row was cut in half, and planks arranged with joints staggered.
- No adhesive or underlay materials were used.
- The covered floor was swept again following installation, immediately prior to testing.
- Installation was carried out by laboratory staff.



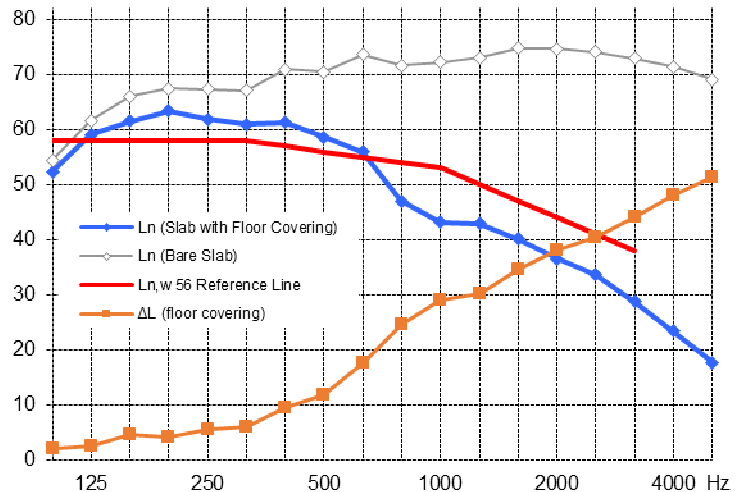
Specimen plank, face and edge



Test specimen laid on test floor in laboratory

Measurement Details & Results

Freq (Hz)	Specimen Floor	Bare Concrete	Improvement
	L _n (dB)	Floor L _{n,0} (dB)	
100	52.4	54.5	2.1
125	59.1	61.7	2.6
160	61.5	66.1	4.6
200	63.4	67.5	4.1
250	61.9	67.4	5.5
315	61.0	67.1	6.1
400	61.3	70.9	9.6
500	58.6	70.5	11.9
630	55.9	73.6	17.7
800	47.0	71.6	24.6
1000	43.2	72.2	29.0
1250	42.9	73.1	30.2
1600	40.1	74.8	34.7
2000	36.6	74.7	38.1
2500	33.6	74.1	40.5
3150	28.7	72.9	44.2
4000	23.4	71.4	48.0
5000	17.7	69.1	51.4



Performance Index Numbers (laboratory method)

L_{n,w} (C) = 56 (-1) ie L_{n,w} = 56

IIC = 54

ΔL_w = 20

ΔL_{in} = 10

The tapping machine was placed diagonally in eight different locations across the test floor area; sound levels in the room below were measured over a whole microphone rotation (33 sec) at each location, and the results averaged.

Measurement Conditions

Date of measurement: 4 August 2016

On top of floor: 12 °C, 62 % R.H.


Chamber underneath floor: 12 °C, 82 % R.H.

Atmospheric pressure: 1018 mBar

Notes, Deviations etc

1. ≤ and ≥ signify results, if any, where measurement was limited by proximity to background level.
2. L_n = dB re 20μPa, corrected to mean sea level pressure; ΔL = dB re bare/reference floor.
3. L_n results represent noise levels; i.e. lower = quieter. For ΔL and IIC results, higher = quieter.
4. IIC has been calculated according to ASTM E989-89; laboratory requirements for which may differ from those of the AS ISO 140.6 and AS ISO 140.8 standards.
5. Testing was carried out unloaded; the weight of the tapping machine being the only load on top of the floor.
6. Physical characteristics given for materials may be as per supplier's advice; not necessarily verified by CSIRO.
7. The test specimen material suffered no visible damage during the course of the test.

Issuing Authority

Signed: 

David Truett

Date: 10 August 2016

Acoustic Instrumentation

- Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
- Microphone/preamp: • Brüel & Kjær type 4166 microphone on type 2669 preamp, rotating continuously with 33 sec period about 1.31 m radius.
- Noise source: • Brüel & Kjær type 3204 tapping machine (complies with ISO 140)
- Calibration: • Brüel & Kjær type 4228 Pistonphone: Feb 2016 (NATA cal)
- Analyser: Feb 2016 (NATA cal)
- Sensitivity of measurement system was calibrated against the pistonphone at the time of measurement.

Laboratory Construction

- Chambers: • 300 mm thick concrete • parallelepiped with dimensional proportions 1:1.3:1.6 for uniform distribution of room modes
- source room (upper): 200 m³ vol, 212 m² surface area (approx.)
- receiving room (lower): 105 m³ vol, 135 m² surface area (approx.)
- Diffusers: • 200 m³ room: 20 diffusers (approx 40 m²) • 100 m³ room: none.
- Test floor: • Homogeneous heavyweight concrete slab, 150 mm thick, 3.58 x 2.98 m, resting on a 10 mm thick rubber seal on a full perimeter support ledge in the upper chamber; perimeter gap filled with sand.