

Report for: The Elastomers Pty Ltd trading as Belaire Flooring Systems
50-56 Nissan Drive, Dandenong South, Vic 3175

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: Belaire ECCR AcousTEC 5 rubber underlay, with 5 mm LVT flooring, resting (floating) on a 150 mm thick concrete slab floor.

Materials:

- a) Belaire ECCR AcousTEC 5 underlay (black), recycled crumb rubber with polyurethane binder, 5 mm thick (± 0.5 mm), density 900 kg/m³, corresponding to 4.5 kg/m² (± 5 %) at nominal thickness.
- b) Serfloor 5 mm thick LVT loose lay flooring planks, multilayer vinyl flooring planks with a 700 micron thick textured clear wear layer over a decorative film giving the planks their characteristic timber appearance, over a two layer vinyl substrate, with a textured slightly resilient backing. Plank size 1219.2 x 177.8 x 5 mm, mass per unit area 8.3 kg/m².
- c) 150 mm thick concrete test floor of laboratory (estimated 360 kg/m²); no ceiling below.

Installation details:

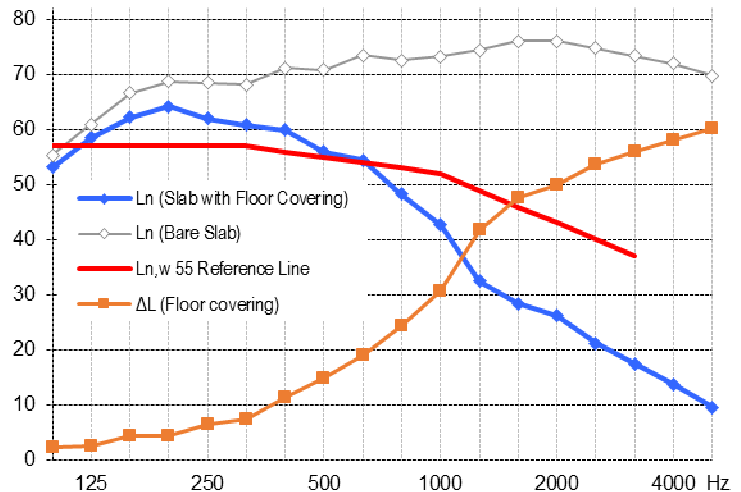
- The concrete test floor was swept to remove dust and other foreign matter.
- Underlay, item a), was laid directly on the concrete floor; the 3.0 m dimension of the test floor being neatly covered by 3 abutted 1 m widths.
- LVT planks, item b) were laid on top of the underlay and carefully slid together to avoid gaps. Planks were cut in half as required to enable joints to be staggered between adjacent rows.
- No adhesive materials were used in installation.
- Installation was carried out jointly by the client and laboratory staff.



Test specimen laid on concrete test-floor

Measurement Details & Results

Freq (Hz)	Specimen Floor L _n (dB)	Bare Concrete Floor L _{n,0} (dB)	Improvement ΔL (dB)
100	53.2	55.4	2.2
125	58.5	61.0	2.5
160	62.2	66.6	4.4
200	64.2	68.7	4.5
250	62.0	68.5	6.5
315	60.8	68.2	7.4
400	59.9	71.2	11.3
500	55.9	70.8	14.9
630	54.4	73.5	19.1
800	48.3	72.6	24.3
1000	42.7	73.3	30.6
1250	32.5	74.4	41.9
1600	28.4	76.1	47.7
2000	26.2	76.1	49.9
2500	21.2	74.8	53.6
3150	17.5	73.4	55.9
4000	13.8	72.0	58.2
5000	≤ 9.6	69.8	≥ 60.2



Performance Index Numbers (laboratory method)

L_{n,w} (C_i) = 55 (0) ie L_{n,w} = 55
IIC = 55
ΔL_w = 21
ΔL_{lin} = 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: 26 August 2016
On top of floor: 12 °C, 58 % R.H.
Chamber underneath floor: 11 °C, 77 % R.H.
Atmospheric pressure: 1009 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: 5 September 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)
• Pistonphone was used to set overall sensitivity of measurement system 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; the perimeter gap filled with sand, with backing rod on top.