

Client: Karndean International Pty Ltd
838 Stud Road, Knoxfield, Vic 3180

Measurement Type: Impact Sound Insulation (Floor)

AS ISO 140.6-2006 "Laboratory measurement of impact sound insulation of floors"
AS ISO 717-2-2004 "Acoustics – Rating of sound insulation in buildings and of building elements. Part 2: Impact sound insulation"

Test Specimen (Area of test floor: 10.8 m² [3.6 x 3.0 m])

Description:

Karndean Looselay LVT flooring planks, on Regupol 4515 (4.5 mm) underlay, laid on a 19 mm particleboard floor with resiliently-hung double layer 13 mm fire-rated plasterboard ceiling and 90 mm R2.5 glasswool batts in a 235 mm cavity.

Materials:

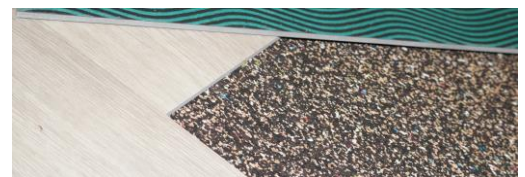
- a) Karndean Looselay LVT flooring planks (LLP-153); multilayer vinyl flooring planks with a PVC friction pad backing layer under a vinyl core, under a decorative film printed with a timber appearance, under a clear wear layer (PU) with woodgrain texture.
Plank size: 1050 x 250 mm, 4.5 mm thick, 7.3 kg/m², with square cut edge profile.
Product is available in a range of aesthetic designs/colours, all of identical construction except for the printing on the decorative film behind the clear wear layer on top.
- b) Regupol 4515 (4.5 mm) impact acoustic underlay, consisting of PUR foam granulates and cork, bound with polyurethane, 1.9 kg/m², 1 m roll width.
- c) Lightweight particleboard floor⁷ - 19 mm yellow-tongue particleboard on 190 mm timber joists, with resilient clips and furring channel (total cavity approx 235 mm), 90 mm R2.5 glasswool batts and 2 layers of 13 mm fire-rated plasterboard.

Installation details:

- The underlying floor/ceiling system [item c] was constructed and installed in the laboratory.
- Underlay [item b] was laid on the floor. Only 6 m² of the underlay was available; insufficient to cover the entire floor, but enough to cover all of the area to within 0.5 m of the edges of the floor (all of the area on which the tapping machine was placed). The remaining area was covered with a rubber underlay of identical thickness⁸.
- Flooring planks [item a] were laid directly on top of the underlay; cut to length as required and pushed hard against each other to avoid gaps. Joins were staggered between adjacent rows.
- The finished floor was swept prior to testing.
- Installation was carried out by the client in conjunction with contractors employed by the client.



Test specimen installed in laboratory for test.

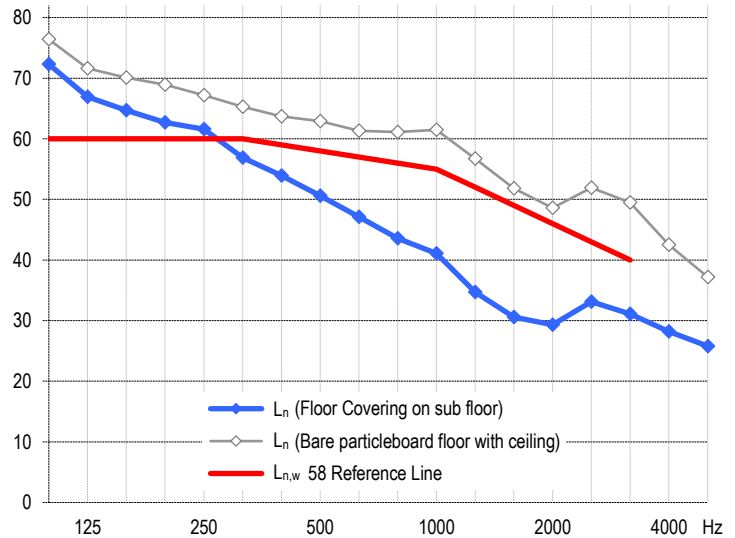


Close up view, showing face, backing, edge profile and underlay.

Measurement Details & Results

Freq (Hz)	Specimen Floor	Bare Particleboard
	L _n (dB)	Floor L _n (dB)
100	72.3	76.4
125	66.9	71.6
160	64.7	70.1
200	62.7	68.9
250	61.6	67.2
315	56.9	65.3
400	53.9	63.7
500	50.6	62.9
630	47.1	61.3
800	43.6	61.1
1000	41.1	61.5
1250	34.7	56.7
1600	30.6	51.8
2000	29.3	48.6
2500	33.1	51.9
3150	31.1	49.5
4000	28.2	42.5
5000	25.8	37.2

The timber floor with ceiling is not suitable for testing in accordance with AS ISO 140.8; hence ΔL values are not reported. Impact noise figures for the bare floor are included for information only.



Performance Index Numbers (laboratory method)

L_{n,w} (C_i) = 58 (2) ie L_{n,w} = 58
IIC = 48

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	with Floor Covering	Bare Floor
Date of measurement:	15 November 2017	14 November 2017
On top of floor:	26 °C, 34 % R.H.	25 °C, 37 % R.H.
Chamber underneath floor:	18 °C, 71 % R.H.	18 °C, 61 % R.H.
Atmospheric pressure:	1000 mBar	1000 mBar

Notes, Deviations etc

1. ≤ signifies results, if any, where measurement was limited by proximity to background level.
2. L_n = dB re 20µPa.
3. Bare floor indices: L_{n,w} (C_i) = 64 (1), IIC = 44.
4. For L_n results, lower = quieter; for IIC, higher = quieter.
5. IIC is as per ASTM E989-89; laboratory requirements for which may differ from those of AS ISO 140.6.
6. Physical characteristics given for materials may be as per supplier's advice; not necessarily verified by CSIRO.

7. The sub floor and ceiling construction is described in detail and reported upon in test report INR241-00-1.
8. The specimen underlay material covered the full active test area of the floor, but not the entire floor area; the remainder being covered by a rubber underlay of the same thickness. This is a deviation from AS ISO 140.6.
9. The test specimen material suffered no visible damage during the course of the test.

Issuing Authority

Signed: David Truett
Date: 15 February 2018

Acoustic Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphone/preamp: • GRAS 40AP microphone on Brüel & Kjær 2669 preamp, rotating continuously with 33 sec period about 1.65 m radius.
Noise source: • Norsonic Nor277 tapping machine (complies with ISO 140)
Calibration: • Brüel & Kjær type 4231 Calibrator: Jun 2017 (NATA cal)
• Analyser: Feb 2016 (NATA cal)
• Sensitivity of measurement system was calibrated against the calibrator 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): two adjoining rooms, combined vol 310 m³, 326 m² surface area (approx.)
• receiving room (lower): 104 m³ vol, 132 m² surface area (approx.)
Diffusers: • none.
Test floor: • Timber particleboard floor with 235 mm cavity, 90 mm R2.5 glasswool, and 2 layers of 13 mm fire-rated plasterboard, as detailed in report INR241-00-1.