

Client: National Flooring Distributors Pty Ltd (NFD)
58 Blanck Street, Ormeau, Qld 4208

Measurement Type: Impact Sound Insulation (Floor)

AS ISO 140.6:2006 and ISO 10140 Part 3 (2010): *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 concrete test floor: 10.8 m² [3.6 x 3.0 m])

Description: NFD 'Eternity 14' engineered timber flooring, on MJS SB250 underlay, on a 200 mm thick concrete subfloor.

Materials:

- a) Flooring planks:-
- Product designation: NFD 'Eternity 14' Oak Engineered Timber flooring (Code 4725).
 - Form: Planks, 190 mm width, supplied as a mix of full length (1900 mm) and shorter planks, with mating interlocking edge profiles. Weight: 7.5 kg/m².
 - Construction: engineered timber, 14 mm thick with 3 mm oak veneer over a multi-ply substrate.
- b) Underlay:-
- Product designation: MJS SB250 Floating Floor Underlay (Sound Block Orange).
 - Form: continuous roll, 1.0 m width (+ 100 mm overlap of moisture barrier) x 2.0 m thick.
 - Construction: closed cell IXPE polyolefin foam with a 60 micron PE moisture barrier (barrier with pre-applied tape seal and 100 mm overlap), 190 gsm.
- c) Concrete slab subfloor (of the laboratory), 200 mm thick, 480 kg/m² approx.

Installation details:

- The concrete subfloor [item c] was swept in preparation for flooring installation.
- Underlay [item b] was laid directly on the concrete floor; the roll width of 1.0 m enabling the 3.0 m wide test floor to be covered using three pieces which were joined together with the pre-applied tape and flap system ensuring no overlap of the foam but minimal gap at the joins in the underlay.
- Timber flooring was laid directly on top of the underlay; planks secured together using their mating click-locking edge profiles. 2 full plank-lengths were used to span the 3.6 m dimension of the concrete subfloor, and 16 plank-widths used to span the 3.0 m dimension, with the excess overhanging onto the surrounding floor. Joins from row-to-row were staggered 200 mm minimum, utilizing the range of plank-lengths where possible.
- Installation was carried out by laboratory staff.



Close up of flooring planks, showing face, mating edge profile, and underlay.

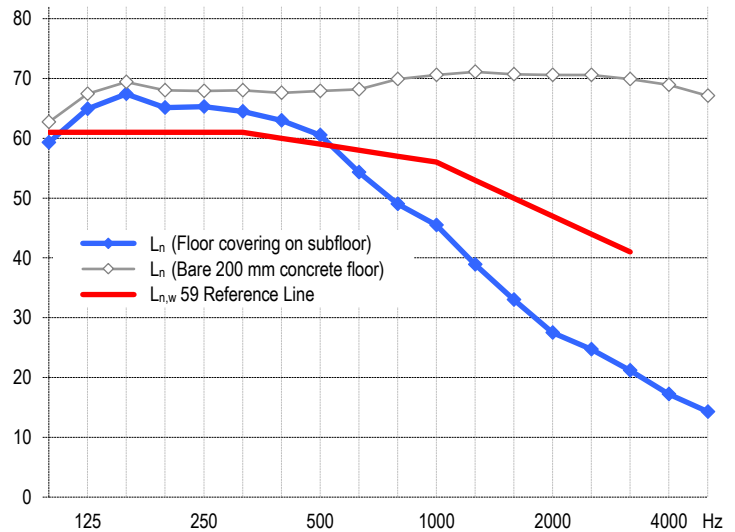


Test specimen installed in laboratory for test.

Measurement Details & Results^{1,2,4}

Freq. (Hz)	Specimen Floor	Bare Concrete ³
	L _n (dB)	Floor L _{n,0} (dB)
100	59.3	62.7
125	64.9	67.4
160	67.4	69.4
200	65.1	68.0
250	65.3	67.9
315	64.5	68.0
400	63.0	67.6
500	60.5	67.9
630	54.3	68.2
800	49.0	69.9
1000	45.5	70.6
1250	38.9	71.1
1600	33.0	70.7
2000	27.5	70.6
2500	24.7	70.6
3150	21.2	69.9
4000	17.2	68.9
5000	14.3	67.1

The concrete test floor, being 200 mm thick, is not suitable for testing in accordance with AS ISO 140.8; hence ΔL values are not reported. Impact noise figures for the bare concrete floor are included for information only.



Performance Index Numbers (laboratory method)

L_{n,w} (C_i) = 59 (-0) dB ie L_{n,w} = 59 dB
IIC⁵ = 51 dB

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 Concrete Floor
Date of measurement:	5 December 2019	5 December 2019
On top of floor:	22 °C, 48 % R.H.	20 °C, 52 % R.H.
Chamber underneath floor:	17 °C, 59 % R.H.	17 °C, 58 % R.H.
Atmospheric pressure:	996 mBar	996 mBar

Notes, Deviations etc

- ≤ signifies results, if any, where measurement was limited by proximity to background level.
- L_n = dB re 20 μPa.
- Bare slab indices: L_{n,w} (C_i) = 77 (-11) dB, IIC = 30 dB.
- L_n results represent noise levels; i.e. lower = quieter. For IIC results, higher = quieter.
- IIC is calculated as per ASTM E989-89 but from measurements as per AS ISO 140.6 & ISO 10140 part 3.
- Testing was carried out unloaded; the weight of the

- tapping machine being the only load on top of the floor.
- Physical characteristics given for materials may be as per supplier's advice; not necessarily verified by CSIRO.
- The test specimen material suffered no visible damage during the course of the test.

Issuing Authority

Signed:
Date: 13 December 2019

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 1.32 m radius.
- Noise source: • Norsonic Nor277 tapping machine (complies with ISO 140)
- Calibration: • Brüel & Kjær type 4231 Calibrator: September 2019 (NATA cal)
- Analyser: July 2018 (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
- room volume approx 200 m³ • room surface area approx 212 m².
- Diffusers: • 20 stationary diffusers (approx 40 m²).
- Test floor: • The roof area of the reverberation chamber was constructed with a 200 mm thick area (3.60 x 3.00 m) for use as a floor test area. The test floor and the surrounding concrete roof of the chamber form a single monolithic structure.