

Client: Amtico International Pty. Limited
Level 1, 12 Waters Road, Neutral Bay, N.S.W. 2089 Australia

Measurement Type: Impact Sound Insulation (Floor)

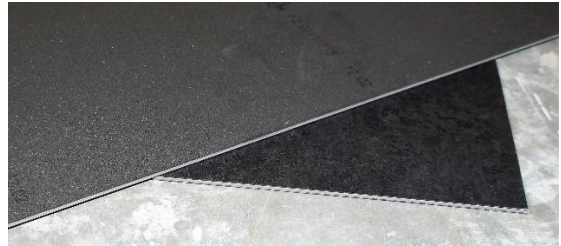
AS ISO 140.6-2006 "Laboratory measurement of impact sound insulation of floors"
AS ISO 140.8-2006 "Laboratory measurement of reduction of transmitted impact noise by floor coverings on a heavyweight standard floor"
AS ISO 117.2-2004 "Acoustics – Rating of sound insulation in buildings and of building elements. Part 2: Impact sound insulation"

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

Description: Amtico Spacia Acoustic 'Ceramic Coal' flooring tile laid without adhesives, directly on:
• 150 mm thick concrete slab floor (approx. 360 kg/m²; no ceiling below).

Amtico Spacia 'Ceramic Coal' flooring tile⁷:

- Amtico Spacia Acoustic 'Ceramic Coal' flooring tile is a waterproof vinyl flooring tile comprised of a urethane surface treatment, a high-density wear layer, an aesthetic layer, a backing layer for supporting the aesthetic layer and a visco-elastic polymer based closed-cell acoustic backing layer.
- Individual Tile size: 457.2 x 457.2 mm (18 x 18 in)
- Total tile thickness: 3.5 mm
- Total wear layer: 0.55 mm incl. urethane surface treatment
- Surface density: 3600 g/m²
- Surface Texture: Anti-slip (R10)
- Amtico Spacia Acoustic Technical Specifications reference: ASPA-TS-20171031-03-GB



Close up of flooring tile: top (on right) and bottom faces (on left), and edge profile.

Installation details:

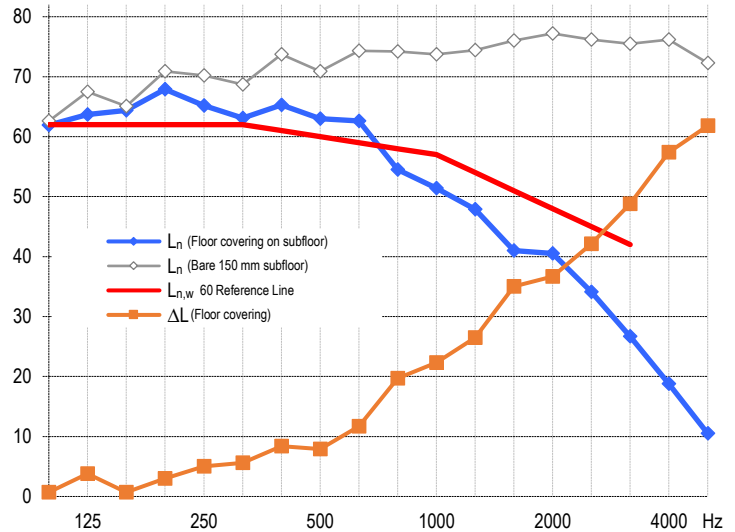
- The concrete test floor of the laboratory was scraped, swept and vacuumed prior to testing.
- The test specimen was a 7 x 8 tile array totalling 56 tiles.
- The specimen flooring tiles were laid directly on the concrete test floor and carefully placed together minimising gaps between neighbouring tiles.
- The specimen flooring tiles covered the entire concrete test floor area.
- Tapping machine locations were kept at least 0.5 m from the edges of the 150 mm thick concrete floor, and not in the immediate vicinity of the edges of the floor covering.
- Installation was carried out by laboratory staff.



Test specimen installed in laboratory for test.

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

Freq. (Hz)	Specimen Floor	Bare Concrete ³	Improvement
	L _n (dB)	Floor L _{n,0} (dB)	ΔL (dB)
100	61.9	62.6	0.7
125	63.7	67.5	3.8
160	64.4	65.1	0.7
200	67.9	70.9	3.0
250	65.2	70.2	5.0
315	63.1	68.7	5.6
400	65.3	73.7	8.4
500	63.0	70.9	7.9
630	62.6	74.3	11.7
800	54.5	74.2	19.7
1000	51.4	73.7	22.3
1250	47.9	74.4	26.5
1600	41.0	76.0	35.0
2000	40.5	77.2	36.7
2500	34.1	76.2	42.1
3150	26.7	75.5	48.8
4000	18.8	76.2	57.4
5000	10.5	72.3	61.8



Performance Index Numbers (laboratory method)

L_{n,w} (C_i) = 60 (-1) ie L_{n,w} = 60
IIC⁵ = 50
ΔL_w = 19
ΔL_{lin} = 8

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:	1 May 2019	1 May 2019
On top of floor:	18 °C, 61 % R.H.	18 °C, 64 % R.H.
Chamber underneath floor:	17 °C, 65 % R.H.	17 °C, 66 % R.H.
Atmospheric pressure:	1001 mBar	1001 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, ΔL = dB re bare floor.
3. Bare slab indices: L_{n,w} (C_i) = 82(-12), IIC = 24.
4. L_n results represent noise levels; i.e. lower = quieter. For ΔL and IIC results, higher = quieter.
5. IIC is as per ASTM E989-89; laboratory requirements for which may differ from those of AS ISO 140.6.
6. Testing was carried out unloaded; the weight of the tapping machine being the only load on top of the floor.
7. Physical characteristics given for materials may be as per supplier's advice; not necessarily verified by CSIRO.
8. The test specimen material suffered no visible damage during the course of the test.

Issuing Authority

Signed: John Watson
Date: 17 June 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: July 2018 (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
- 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.