



CSIRO ACOUSTIC MEASUREMENT REPORT

Acoustics Testing Laboratory, Infrastructure Technologies, Division of Materials Science and Engineering
Commonwealth Scientific and Industrial Research Organisation, 37 Graham Rd, Highett, Vic 3190 Australia

Report No:
INR200-07-1

Client: Interface Australia Pty Limited
34 Airds Road, Minto NSW 2566

Measurement Type: Impact Sound Insulation (Floor)

AS ISO 140.6–2006 "Laboratory measurements of impact sound insulation of floors"
AS ISO 140.8–2006 "Laboratory measurements 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 (3.66 x 3.20 m specimen area)

Description: Interface "CushionBacRE" Carpet Tiles, 730 g/m², resting directly on a 150 mm thick reinforced concrete slab.

The product may be produced in a range of aesthetic variants; of identical manufacture except for colours and decorative patterns.

Details:

- Product name: Equilibrium II
- Carpet face: 100% Solution dyed nylon tufted fibre, 730 g/m²
- Primary backing: 100% polyester with EVA latex precoat
- Carpet backing: "CushionBacRE"
- Tile dimensions: 500 x 500 mm

Installation:

- The concrete test floor was swept of dust and other foreign matter.
- The specimen carpet tiles were laid over the concrete, covering the test slab completely and carefully butted against each other to avoid gaps.
- Installation was carried out by CSIRO.



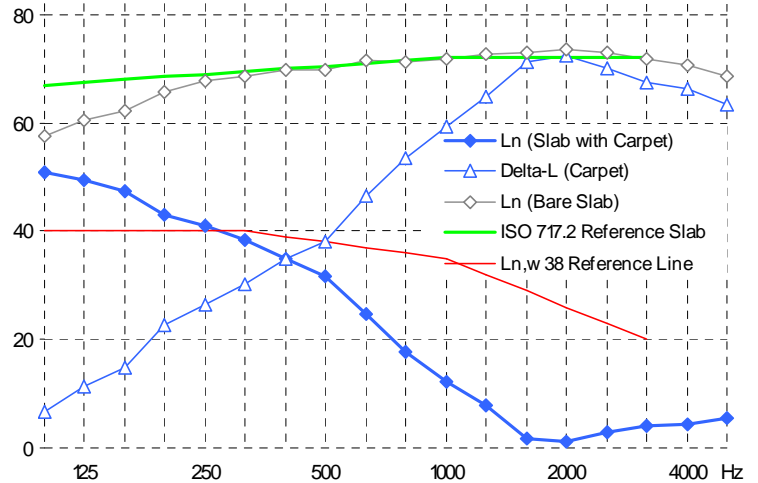
Close-up photo showing top and bottom faces of carpet tile, and edge section



Test specimen materials, arranged as per test

Measurement Details & Results (dB)

Freq (Hz)	AS ISO 140.6		AS ISO 140.8	
	L_n	$L_{n,0}$ (Bare slab)	L_n	ΔL
100	51.0	57.7	57.7	6.7
125	49.4	60.6	60.6	11.2
160	47.4	62.3	62.3	14.9
200	43.1	65.8	65.8	22.7
250	41.1	67.7	67.7	26.6
315	38.5	68.7	68.7	30.2
400	34.8	69.8	69.8	35.0
500	31.6	69.8	69.8	38.2
630	24.8	71.4	71.4	46.6
800	17.7	71.2	71.2	53.5
1000	12.3	71.7	71.7	59.4
1250	7.9	72.7	72.7	64.8
1600	1.8	73.1	73.1	71.3
2000	1.2	73.7	73.7	72.5
2500	≤ 2.8	73.0	73.0	≥ 70.2
3150	≤ 4.2	71.7	71.7	≥ 67.5
4000	≤ 4.4	70.6	70.6	≥ 66.2
5000	≤ 5.4	68.7	68.7	≥ 63.3



Performance Index Numbers (laboratory method)

$L_{n,w}(C_i) = 38$ (2)
IIC = 69
 $\Delta L_w = 34$
 $\Delta L_{lin} = 20$

Tapping machine placed in eight different locations across the test floor area; sound levels measured over a whole microphone rotation (35 sec) at each location, and results averaged.

Measurement Conditions

Upper (source) room: 10 °C, 76 % R.H.
Lower (receiving) room: 12 °C, 66 % R.H.
Atmospheric pressure: 1023 mBar
Date of measurement: 27 July 2015

Notes, Deviations etc

1. Test specimen material suffered no visible damage during the test.
2. Physical characteristics of materials may be suppliers' nominal figures; not necessarily verified by CSIRO.
3. Symbols \leq and \geq denote values, if any, where measurability was limited by proximity to background level.
4. IIC has been calculated according to ASTM E989-89; laboratory requirements for which may differ from those of the AS ISO 140 standards.

Issuing Authority

Signed on behalf of
CSIRO:

David Truett

Date report issued:

12 August 2015

Instrumentation

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2
Microphone/preamp: • Brüel & Kjær type 4166 microphone on type 2619 preamp, continuously rotating at 1.67 m radius with 35 sec period
Noise source: • Brüel & Kjær type 3204 tapping machine (complies with ISO 140)
Calibration: • Brüel & Kjær type 4228 pistonphone: Apr 2014 (NATA cal)
• Analyser: Feb 2013 (NATA cal)
• Overall sensitivity calibrated to pistonphone before use

Laboratory Construction

General: • 300 mm thick concrete • no parallel faces (irregular pentagon, source room with sloping ceiling, receiving room with sloping floor)
Source room: • approx 203 m³ volume • 12 randomly oriented stationary diffuser boards
Receiving room: • approx 105 m³ volume • 3 randomly oriented stationary diffuser boards
Floor slab: • 3.66 x 3.20 m (11.7 m²) reinforced concrete, 150 mm thick • resting on rubber faced steel lip in aperture in surrounding floor • top surface level with surrounding floor