

IMPACT SOUND INSULATION

INTRODUCTION

This TECHnote addresses the use of impact sound insulation in floor systems. Impact sound transmission is commonly the sound of footsteps, moving furniture and dropped objects from a room, being heard in a room below. By absorbing some of the energy caused by the falling object, impact sound insulation helps reduce the intensity of the sound heard in the receiving room.

SOUND INSULATION PROPERTIES

AS ISO 717.2 and other standards deal with the single number rating – that is, the method by which frequency dependent values of sound insulation tests can be converted into a single number characterising performance. The single number rating is relevant to specifications of all but the most specialised applications.

In residential situations single number rating methods may be used with spectrum adaption terms recognising that impact sound (e.g. heeled shoes on a wooden floor) are more readily transmitted through some insulating materials than through others. However, the NCC no longer includes a requirement for a spectrum adaption term for impact sound. This amendment to the NCC is for alignment with international building codes.

NCC CONFORMANCE AND ACOUSTIC UNDERLAYS

BCA Specification 28 includes a limited number of floor systems. All have an isolated suspended ceiling, except the examples of a 100 mm thick concrete slab, and a 200 mm thick concrete slab with carpet and underlay. Floor systems incorporating acoustic underlays are not included. Systems including underlays may be required for hard floor finishes if an isolated ceiling is not installed under the slab.

NCC PRESCRIPTIVE AND PERFORMANCE APPROACHES

The options for NCC conformance are the prescriptive approach (Deemed-to-Satisfy) or the performance approach (Verification Method).

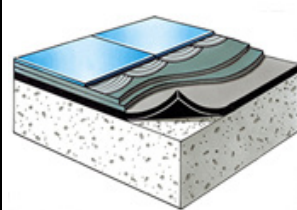
In the prescriptive approach, the designer selects a complete floor system from a laboratory tested range. To conform to NCC requirements, the weighted normalised impact sound pressure level, $L_{n,w}$ of the floor system must not exceed 62 dB.

The performance approach involves the selection of a floor system that can be field tested on completion. The selection process for this approach requires input from an acoustic consultant. When measured in situ, the weighted standardised impact sound pressure level, $L'_{nT,w}$ of the floor system must not exceed 62 dB.

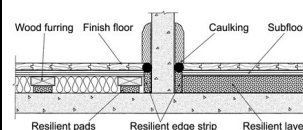
MANUFACTURER'S TESTING DATA

Some acoustic underlay manufacturers have published laboratory test results for a range of flooring systems incorporating their products. Close liaison with all suppliers involved in the floor system is essential to make sure of the compatibility of all the products. Verification of the value achieved for the weighted normalised impact sound pressure level with the spectrum adaption term can be obtained from an AS/NZS ISO 9001 certified supplier.

If the performance approach is used there is no guarantee that the manufacturer's stated impact sound insulation values will be achieved, simply because the work of a number of contractors, unrelated to the supplier, is required to install the entire floor system. Some manufacturers have responded to this problem and have jointly developed flooring systems that are claimed to conform to the NCC requirements.



For acoustic underlay below ceramic tile flooring, seek advice from tile suppliers about a compatible system of tiles, adhesives and acoustic underlays.



Acoustic underlay below timber flooring may vary depending on the selected fixing system. If the flooring is fixed to a substructure like timber battens, the underlay need only be positioned under the battens that have direct contact with the slab, while the cavity can be filled in with sound absorptive material like mineral wool. In a floating floor, acoustic underlay is placed below the timber flooring.

Relevant standards

AS ISO 717.2 *Acoustics - Rating of sound insulation in buildings and of building elements - Impact sound insulation*.

AS/NZS ISO 9001 *Quality management systems - Requirements*.

National Construction Code Series

NCC Volume One *Building Code of Australia Class 2 to 9 Buildings*.

BCA Specification 28 *Sound insulation for building elements*.

NCC Volume Two *Building Code of Australia Class 1 and Class 10 Buildings*.

Relevant worksections

0472 *Acoustic insulation*

0531 *Suspended ceilings - combined*

0631 *Ceramic tiling*

0632 *Stone and terrazzo tiling*

0651 *Resilient finishes*

0652 *Carpets*

0654 *Multilayered board flooring*

0655 *Timber flooring*