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Acoustics
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MD799-01F01 Acoustic Opinion (r1)

# Acoustic Opinion: Aqua Stone V7 SPC Flooring

Renzo Tonin & Associates have been engaged by UB TRADING PTY LTD to provide an acoustic opinion on the predicted weighted normalised impact sound pressure level ($L_{n,w}$) performance of the Aqua Stone V7 SPC Flooring (the Subject Product). The Subject Product is understood to comprise:

- 5mm SPC layer
- 2mm foam underlay layer

The predictions were conducted with reference to Renzo Tonin & Associates' archive of laboratory and field tests of similar products, and sound insulation prediction software (INSUL).

*Deemed-to-Satisfy* Provision F5.4 (a) of the National Construction Code (NCC) states:

> ***F5.4 Sound insulation rating of floors***
>
> *(a) A floor in a Class 2 or 3 building must have an $R_W + C_{tr}$ (airborne) not less than 50 and an $L_{n,w}$ (impact) not more than 62 if it separates–*
>
> *(i) sole-occupancy units; or*
>
> *(ii) a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification.*

The Association of Australian Acoustic Consultants (AAAC) has developed a star rating system for residential developments and is presented in a document entitled *"Guideline for Apartment and Townhouse Acoustic Rating (Version 1.0)"*. The star rating system provides a framework for design of dwellings. Table 1 presents details of the respective AAAC star rating levels applicable to floors.

**Table 1: AAAC star rating requirements for inter-tenancy sound insulation**

| Occupancy | Requirement | 2 star | 3 star | 4 star | 5 star | 6 star |
|---|---|---|---|---|---|---|
| **Airborne sound insulation for walls and floors[1]** | | | | | | |
| Between separate tenancies | $R_W + Ctr \geq$ | 40 | 45 | 50 | 55 | 60 |
| **Impact isolation of floors** | | | | | | |
| Between tenancies | $L_{nT,w} \leq$ | 65 | 55 | 50 | 45 | 40 |

Notes: 1. Presented in terms of $D_{nTw} + C_{tr}$ in the AAAC star rating document, however this has been converted to $R_W + C_{tr}$ in this document for simplicity. It is commonly accepted that $D_{nTw} + C_{tr}$ is 5dB less than $R_W + C_{tr}$.

**Table 2: Understood floor-ceiling construction and expected performance**

| ID | Description | Expected sound insulation performance | Expected compliance with NCC criterion? |
|---|---|---|---|
| 1 | • Aqua Stone V7 SPC Flooring in floating configuration<br>• 150mm thick concrete slab<br>• 13mm standard plasterboard suspended on a light ceiling grid with minimum 150mm cavity (no insulation) | **Airborne:**<br>$R_W+C_{tr} \geq 50$ | **Airborne $R_W+C_{tr} \geq 50$:**<br>✓ |
| | | **Impact:**<br>$L_{n,w} \leq 56$ | **Impact $L_{n,w} \leq 62$:**<br>✓ |
| 2 | • Aqua Stone V7 SPC Flooring in floating configuration<br>• 150mm thick concrete slab<br>• 13mm standard plasterboard suspended on a light ceiling grid with minimum 150mm cavity and 50mm thick 11kg/m$^3$ glasswool insulation | **Airborne:**<br>$R_W+C_{tr} \geq 55$ | **Airborne $R_W+C_{tr} \geq 50$:**<br>✓ |
| | | **Impact:**<br>$L_{n,w} \leq 52$ | **Impact $L_{n,w} \leq 62$:**<br>✓ |
| 3 | • Aqua Stone V7 SPC Flooring in floating configuration<br>• 200mm thick concrete slab<br>• 13mm standard plasterboard suspended on a light ceiling grid with minimum 150mm cavity (no insulation) | **Airborne:**<br>$R_W+C_{tr} \geq 55$ | **Airborne $R_W+C_{tr} \geq 50$:**<br>✓ |
| | | **Impact:**<br>$L_{n,w} \leq 53$ | **Impact $L_{n,w} \leq 62$:**<br>✓ |
| 4 | • Aqua Stone V7 SPC Flooring in floating configuration<br>• 200mm thick concrete slab<br>• 13mm standard plasterboard suspended on a light ceiling grid with minimum 150mm cavity and 50mm thick 11kg/m$^3$ glasswool insulation | **Airborne:**<br>$R_W+C_{tr} \geq 60$ | **Airborne $R_W+C_{tr} \geq 50$:**<br>✓ |
| | | **Impact:**<br>$L_{n,w} \leq$ **49** | **Impact $L_{n,w} \leq 62$:**<br>✓ |
| 5 | • Aqua Stone V7 SPC Flooring in floating configuration<br>• 200mm thick concrete slab<br>• Two (2) layers of 13mm standard plasterboard suspended on a light ceiling grid incorporating resilient ceiling hangers with minimum 150mm cavity and 100mm thick 11kg/m$^3$ glasswool insulation | **Airborne:**<br>$R_W+C_{tr} \geq 65$ | **Airborne $R_W+C_{tr} \geq 50$:**<br>✓ |
| | | **Impact:**<br>$L_{n,w} \leq 45$ | **Impact $L_{n,w} \leq 62$:**<br>✓ |

Notes:
- The expected performances have regard to the assumptions that the consultant can be reasonably expected to make in accordance with professional industry practice and on the assumption that the consultant is exercising the level of skill, care and attention required of a consultant practicing in his professional industry
- It is generally recommended that the additional recommendations in Appendix B be adhered to in the construction of the floor-ceiling system

To obtain a more accurate indication of weighted sound reduction index performance, we recommend that the systems are laboratory tested.