In Australia, the NCC Part F5.5 deemed-to-satisfy provisions states that Class 2 buildings; typically apartments and multi-residential, and class 3 buildings; hotels and motels, have entry doors with a minimum sound insulation rating of R_W30. The UK Building Approved Document E states a minimum R_W29 is required.

Raven acoustic seals are used in airports, hotels, offices, hospitals, homes and anywhere noise infiltration occurs through doors. Their effectiveness is best illustrated by the repeated use of Raven seals by architects, acoustic engineers, door fabricators, and project builders.

Raven, the industry leader in door sealing systems, pioneered baseline acoustic testing, utilising "off the shelf" doors and ironmongery to give specifiers proven, cost effective solutions to the growing problem of noise in living and workplace environments.

Acoustic door manufacturers increasingly incorporate Raven door sealing systems with acoustically engineered doors to achieve and maintain the highest R_W ratings up to R_W52.

Improving R_W Ratings

It should be considered that the R_W rating of a door set is only as good as the sum of its parts, i.e. the R_W value of the door set, fitted with Raven acoustic seals and the wall in which the door assembly is fitted. The use of soft absorbent furnishings within a room will also help absorb unwanted noise. All these measures will improve the acoustic attenuation of the room.

Typically, when Raven acoustic seals are fitted to timber solid core doors the R_W rating of the door assembly is increased from around R_W16 up to R_W32. When the assembly is placed into an R_W55 wall, the overall rating of the door assembly and wall combination drops as a ratio to area. The larger the wall area the less the combined R_W rating will drop.

AUS National Construction Code (NCC) Part F5

Class 2 - Class 9 buildings

F5.5 Sound insulation rating of walls

(a) A wall in a Class 2 or 3 building must—
(i) have an $R_w + C_{tr}$ (airborne) not less than 50, if it separates *sole-occupancy units*; and
(ii) have an R_w (airborne) not less than 50, if it separates a *sole-occupancy unit* from a plant room, lift *shaft*, stairway, *public corridor*, public lobby or the like, or parts of a different classification; and
(iii) comply with **F5.3(b)** if it separates—
(A) a bathroom, *sanitary compartment*, laundry or kitchen in one *sole-occupancy unit* from a *habitable room* (other than a kitchen) in an adjoining unit; or
(B) a *sole-occupancy unit* from a plant room or lift *shaft*.

(b) A door may be incorporated in a wall in a Class 2 or 3 building that separates a sole-occupancy unit from a stairway, public corridor, public lobby or the like, provided the door assembly has an R_w not less than 30.

Acoustic Standards, Test Methods and Ratings

The test methods used to establish the sound attenuation ability of a door set is AS 1191, ISO 140 series and recently EN ISO 10140 series standards. Test data from any one of these test methods can be used in EN ISO 717-1 which provides a single number rating across a spectrum of frequencies for the sound attenuation performance of the building element. Typically Rw is used for door sets that cover frequencies from 100Hz to 3150Hz.

Related Building Codes

There are several standards, which refer to seal properties and testing for noise - acoustic:

AUS / NZ
Requirements are noted in the Australian National Construction Code (NCC) and New Zealand NZ BC Compliance Doc. G.

UK / EU
Requirements are noted in the British Building Regulations Approved Document E.

USA
Requirements are noted in the Building Code and the Residential Code IBC 2000.

For further details, refer to Standards / Authorities on page 118.