Acoustics – Impact Isolation Class (IIC)

Impact Isolation Class (IIC) is, in basic terms, a measure of sound heard in one room from an impact made on a floor in the space directly above. This issue is commonly raised when installing floor coverings in multi-storey residential apartments. Both the Strata Titles Act and the Building Code of Australia now raise this issue, setting requirements that need to be followed when installing floor coverings in multi-storey apartments.

A Complex Issue

The Impact Isolation Class of a floor is tested using highly technical tapping machines (used in the testing room) and listening devices (used in the receiving room below). This work is carried out by specialised acoustic engineers. Results of testing are then entered into complex mathematical equations to determine an Impact Isolation Class or the new acoustic results of Ln,w + C1.

Variables that Influence Test Results

Many variables can influence the IIC or acoustic performance of a floor or floorcovering. Subfloor type (timber or concrete), subfloor thickness, subfloor density, subfloor construction method, frequency of subfloor supports or beams, the presence of a suspended ceiling, the floorcovering itself and underlay used in the testing room and background noises can all have a bearing on the acoustic rating achieved. Whether a receiving room is furnished can also have a bearing on the result. In most cases however, three main factors are looked at to draw broad comparisons. The thickness of the subfloor, the floorcovering used and the underlay used seem to have the most significant bearing on results achieved. To this end, Readyflor has been tested using different underlays on concrete subfloors of varying thicknesses.

How ReadyFlor Performs

As discussed earlier, many FIIC tests have been carried out on Readyflor over the years. The fact that Readyflor is the most commonly used floating floor in apartment living across Australia stands as testament to the outstanding results achieved in terms of Field Impact Isolation Class. Our test results follow:

- Readyflor Installed on Standard 2mm Foam Underlay
  - Tested on 180mm Concrete Subfloor Result = FIIC 56
  - Tested on 180mm Concrete Subfloor Result = Ln,w+C1=55
  - Tested on 250mm Concrete Subfloor Result = Ln,w+C1 = 51

- Readyflor Installed on 2mm Quiet Step Underlay
  - Tested on 180mm Concrete Subfloor Result = FIIC 57
  - Tested on 280mm Concrete Subfloor Result = Ln,w+C1 = 49
  - Tested on 280mm Concrete Subfloor Result = FIIC 60
In summary, the field of Impact Isolation Class is incredibly complex. The combination of so many variables and the subjective nature of the governing legislation has been the cause of many disputes in recent years. Premium Floors have tended to rely on our own experience, the advice of acoustic engineers commissioned to undertake our testing and the acoustic engineers contracted by the largest apartment builders in Australia for information, testing and guidelines regarding an acceptable Impact Isolation Class. In short, Readyflor has been installed in many multi-storey apartments across Australia with very few complaints at all! Please feel free to contact your local Premium Floors office should you require more information on this complex subject.

**How the Testing is Carried Out**

By measuring the sound transferred by the tapping machine through a floor across a wide range of frequencies, a series of data is collected. This data is then inserted into complicated mathematical formulas to determine the Impact Isolation Class (IIC) and the Ln,w+C1. While an Impact Isolation Class can only really be determined in a laboratory, field tests are carried out on various installations in service. These tests are recorded as Field Impact Isolation Class (FIIC) tests.

**Complying with Standards**

The Strata Titles Act does not ask that a specific Impact Isolation Class be achieved. It simply states that “peaceful enjoyment” be afforded to the occupant below. This subjective terminology has created the need for acoustic engineers across Australia to apportion an IIC that affords “peaceful enjoyment”. In terms of Readyflor, we tend to follow the requirements of the largest apartment developers in Australia, whose acoustic engineers require a product to meet an FIIC55. Early in 2004, the Building Code of Australia introduced acoustic requirements stating that multi-storey apartments achieve a rating no greater than Ln,w+C1 62. It is important to understand that with Field Impact Isolation Class (FIIC) results, the higher the figure, the better the result. Conversely, with Ln,w+C1 testing, the lower the result, the better the acoustic rating.