

Sound Rated Luminaires

Why is a sound rated luminaire important?

We have all stayed in hotels or apartments where the people in the room above are making noise when we are trying to sleep. You can hear the constant tap of footsteps or the television blaring, and it is really annoying. That's why sound rated luminaires are an important component in the design of any building: to minimize sound transmission from one room to the next. Minimizing the transmission of noise from one room to the next requires the judicious choice of many building components such as floor topping, floor underlayment, subfloor topping, subfloor underlayment, ceiling insulation, joist size, resilient channel, ceiling finish, construction quality, and a sound rated luminaire.

DMF Lighting provides luminaires, such as the DRDHNJD/DRD2M/DRD2T which have been tested to international standards and have excellent sound rating characteristics: STC of 60 and IIC of 58. These ratings exceed the IBC[®] requirements of 50 STC and 50 IIC and ensure that in buildings constructed with this rating, that loud speech between rooms and footsteps from above will be inaudible.

What are STC and IIC?

The 2015¹ IBC[®] (International Building Code), in chapter 12 Interior Environment, section 1207 Sound Transmission, states,

This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units and sleeping units or between dwelling units and sleeping units and adjacent public areas such as halls, corridors, stairways or service areas.

The IBC[®] identifies two types of tests, that must be passed, that measure the amount of sound travelling from one living area to another: air-borne sound, with a STC (sound transmission class) value of at least 50, when tested in accordance with ASTM E 90; and structure-borne sound, with a IIC (impact insulation class) value of at least 50, when tested in accordance with ASTM E 492.

¹ Previous versions of the IBC have the same requirements and were originally specified in the Uniform Building Code. Free access to IBC 2015: [http://codes.iccsafe.org/app/book/toc/2015/I-Codes/2015 IBC HTML/index.html](http://codes.iccsafe.org/app/book/toc/2015/I-Codes/2015%20IBC%20HTML/index.html)

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These requirements apply to multi-family and single-family homes around the country. The types of buildings that should meet the minimum requirements include hotels, motels, apartments, and condominiums.

The IBC[®] is in use or has been adopted in 50 states, the District of Columbia, the U.S. Virgin Islands, Guam and the Northern Marianas Islands². For example, the California Building Code 2013 is based on the 2012 IBC[®]. Local municipalities often adopt their state building code with local additions and amendments. Note, most municipalities adopt the IBC[®] sound transmission requirements unaltered.

STC is a single number rating for evaluating efficiency of construction in isolating airborne sound transmission. The higher the STC rating, the more efficient the construction. The following table illustrates the effectiveness of the rating³:

STC	Speech Audibility*	Noise Control Rating
15 to 25	Normal speech easily understood.	Poor
25 to 35	Loud speech easily understood. Normal speech 50% understood.	Marginal
35 to 45	Loud speech 50% understood. Normal speech faintly heard, but not understood.	Good
45 to 55	Loud speech faintly heard, but not understood. Normal speech usually inaudible.	Very Good
55 and up	Loud speech usually inaudible.	Excellent

*Given a typical background noise level of 30 dB on the “listening” side

Impact Insulation Class (IIC) is a single number rating developed to estimate the impact sound isolation performance of floor/ceiling systems. This test helps evaluate the impact of footfall, or a chair dragging on the floor, or other impact sounds.

² See IBC Adoption map: <http://www.iccsafe.org/about-icc/overview/international-code-adoptions/>

³ Taken from NAIMA primer called “Sound Control for Commercial and Residential Buildings” available at: <http://www.icsinsulation.com/specifications/general/Sound Control.pdf>