

Sound attenuation for floor/ceiling assemblies may be required to attain code ratings or desired by a client to mitigate sound transfer. The best practice in residential, multi-family and light commercial applications is to have the assembly evaluated by one of several testing methods. The common methods used are: field testing, lab testing, software modeling and estimating. Each method offers a different level of accuracy and cost. Usually these services are performed by an “Acoustical Consultant” to provide STC and IIC ratings. The higher the number, the quieter the floor/ceiling assembly.

Sound Transmission Class (STC) is a rating of how well a building floor/ceiling assembly attenuates airborne sound. For example, noise created from stereos, televisions and human conversations are classified as STC’s. Common ratings for standard residential floor/ceiling assemblies are 35-40 STC.

Impact Insulation Class (IIC) is a rating of how well a building floor/ceiling assembly attenuates structure borne sound. For example, noise created from children running across the floor or adults participating in a dance class are classified as IIC’s. Common ratings for standard residential floor/ceiling assemblies are 35-45 IIC.

In 2006 the IBC Section 1207 mandated that all floor/ceiling assemblies in multi-residential buildings meet or exceed a minimum rating of 50 for both airborne (STC) and structure borne (IIC).

Currently the industry is flooded with thousands of building products that promote a quieter living space. A few of the most popular are specialized sheetrock, plywood, adhesives, rubber sound mats, resilient channels and light weight concrete. When specifying these products it is crucial to always evaluate the entire floor/ceiling assembly and not the product by itself.

For Warmboard applications we have several relatively affordable recommendations that will help increase STC and IIC numbers.

The first type of product we suggest are rubber sound mats; they interface easily with Warmboard. The mats are installed on top of the Warmboard, followed by the finish floor. The mats should not be penetrated by any type of fasteners. Carpet, tile, and floated engineered hardwood are easy to install. For nail down hardwoods, a 3/4" floating plywood underlayment is needed. These mats have very low R-values, and common thicknesses available are 1/4", 3/8" and 1/2". Common reputable products are:

- Sound shark by Sound Seal www.soundseal.com
- QTSCU by QT Sound Control www.qtsoundcontrol.com
- Privacy Ultimate Underlayment by Sound Isolation Company www.soundisolationcompany.com

The Homasote 440 Sound Board Barrier will interface nicely with a Warmboard assembly. These 4'x 8' sound panels are available in 1/2", 5/8" and 3/4" thicknesses. They are installed on the top side of the Warmboard panel and then completed with the finish floor. Also the 440 Sound Board Barrier can be used in a ceiling application, then followed by gypsum board.

- Homasote 440 Sound Board Barrier www.homasote.com/products/440-Soundbarrier.aspx

Another option to improve IIC and STC ratings is the use of a resilient clip and a resilient channel. This technology uses the concept of decoupling the finish ceiling from the framing members. The clips are attached to the bottom of the ceiling joists, then a metal dry wall furring channel is installed followed by two layers of sheet rock. Common reputable products are:

- Iso Max by Kinetics www.kineticsnoise.com
- Quiet Clips by Sound Isolation Company www.soundisolationcompany.com
- Genie Clips by Acoustigard www.acoustigard.com



Over the years some design professionals have specified light weight concrete to help create a quieter living space. Many times lab testing results can help discover a performance misconception.

For example, the APA (Engineered Wood Association) conducted a lab test with 1-5/8" lightweight concrete installed over plywood and then compared the same assembly without the lightweight concrete. The results were surprisingly close in performance, when comparing plywood with and without the lightweight concrete (APA document available by request).

Assembly rating with concrete: STC 53 IIC 74

- 1-5/8" light weight concrete
- Pad and carpet
- 5/8" plywood
- Wood joists/ 3" insulation Resilient channel
- 5/8" gypsum wall board

Assembly rating without concrete: STC 48 IIC 69

- Pad and carpet
- 5/8" plywood
- Wood joist/ 3" insulation
- Resilient channel
- 5/8" gypsum wall board

In closure, sound attenuation is a complex science that sometimes requires a qualified consultant to help guide a project towards realistic goals. The products and methods we recommend are all practical solutions to help achieve a quieter living space. It is important to understand the sound industry as its products can be controversial.

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