

Cork Underlayment Sound Control

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Thermal Insulating & Sound Control Underlayment

Sound Control for Hard Surface Flooring applications in multi-family construction can be a confusing and controversial topic. With the large number of multi-family and condo projects built over the last few years and the increased interest in 'downtown living?', even in smaller urban markets and in suburban areas, and with those clients demanding more hard surface flooring materials, there has been increased attention focused on this issue. This growth in the potential market for Sound Control Underlayments has brought many new manufacturers and technologies into the category.

With all the different manufacturers and products and the plethora of marketing materials and data sheets making claims about the performance of those products, it is difficult to separate fact from marketing hype, when it comes to how a specific product will perform in a given application. To make an intelligent decision about what type of product to specify or install, it is important to understand what is required by the Building Code, in any given jurisdiction, and what the performance standards of STC and ICC ratings actually relate to.

In multi-family construction, in most jurisdictions, there are minimum IIC and STC values that the floor/ceiling assembly, in a living space over living space configuration, must achieve in order to meet the code standard. The most common are the U.B.C. (Uniform Building Code) and (I.B.C. International Building Code), which call for a minimum 50 IIC and 50 STC value. The higher the IIC or STC number, the better the sound attenuation performance, with 50 considered the minimum for most multi-family applications. Some areas and municipalities may have different building code standards, but the U.B.C. and I.B.C. codes are by far the most common. Consult your local Building Department or the Homeowners Association of the development for the exact standards applicable for your potential installation.

The term STC refers to the evaluation method used to quantify the transmission of airborne sound through building elements, such as walls, windows, doors or floor systems. This type of noise would be the equivalent of voices, music, or television in the context of a multi-family building. The term STC actually translates to Sound Transmission Class and it is measured and stated in accordance with ASTM Standard number C634 and tested via the test methodology of ASTM Test Methods E90, E336, and E596.

In reality, Sound Control Underlayments contribute little or nothing to the STC rating of an assembly. Since the building code requires the information, the vendors of Sound Control Underlayments usually provide test data showing STC ratings. In a typical multi-family assembly, the mass of the structure is what contributes the STC value of an assembly. A 6" solid concrete slab, a very typical multi-family construction detail, has an STC rating of about 52, without any underlayment or flooring materials installed. If you see STC ratings in the high 60's or low 70's in Sound Control Underlayment marketing materials and data sheets, or claims of 'highest STC performance?', this would indicate that an elaborate sound rated ceiling (suspended) assembly being used in the test data and that the STC, as well as the IIC ratings, claimed in the test data or marketing materials should be viewed with a great deal of skepticism.

The term IIC refers to the evaluation method used to quantify the transmission of Impact Sound through a floor/ceiling assembly system. This type of sound would be the equivalent of foot steps, dropped articles, or furniture being dragged across the floor in the context of a multi-family building. The term IIC actually translates to Impact Isolation Class and it is measured and stated in accordance with ASTM Standard numbers C634 and E989 and tested via the test methodology of ASTM Test Method E492. In

In addition, a new test protocol for concrete subfloors has been introduced under ASTM E2179-03e. The ASTM E-2179 standard states the IIC rating as a ? , or ?contributed value? for the underlayment and flooring assembly. While there has been a lot of promotion of ?? IIC values? recently, in reality, very few products have actually been tested to the E-2179 standard. Also, if you are looking at ? IIC data in regard to your application, bear in mind that in most cases a ? IIC value in excess of 20 will be required to produce a code compliant flooring assembly.

In addition to the laboratory testing for IIC referenced above, there is an ASTM Field Test method for IIC testing (E1007). In the reports for these tests, the values are designated by the initials FIIC to the left of the numeric value. Products that have only ?Field IIC? (FIIC) data and no laboratory testing should be considered with caution. Field tests can be valuable, but are very location specific, because of the wide variety of variables that can be encountered. Manufacturers can, and have, found ?favorable? locations and acoustical engineers to perform FIIC testing. For this reason, comparing the Field IIC test data of one product to the lab IIC testing of another product is not an accurate way to make an assessment of relative performance.

IIC values are not heavily influenced by the presence of solid mass in the structure. A 6? solid concrete slab, a very typical multi-family construction detail, has an IIC rating of about 28, without any underlayment or flooring materials installed. 28 IIC is a long way from the code standard of 50 IIC and the addition of a hardwood, tile or laminate floor, without a sound attenuation system is not going to markedly improve the IIC rating of the assembly. Improvement in IIC values is dependent on the presence of a resilient material somewhere in the assembly to isolate and absorb the sound energy created by impacts. To put all this in a more understandable perspective, table below shows the theoretical IIC for the 6? concrete slab at various levels of IIC improvement and what the approximate reduction in audible sound would be.

IIC Point Improvement	+5 IIC Points (IIC31)	+10 Points (IIC38)	+20 Points (IIC48)	+30 Points (IIC58)
Approx. % Reduction in Audible Sound	15% Reduction	50% Reduction	75% Reduction	88% Reduction

Tremendous IIC improvement can be provided by the presence of a Sound Rated (suspended) Ceiling Assembly. These rarely exist in real world construction details, however most of the test data for the IIC ratings of Sound Control Underlayments relates to assemblies with Sound Rated Ceiling Assemblies. If you see marketing materials that claims laboratory IIC testing with an IIC rating of 60 or more, you can be almost certain that a Ceiling Assembly was present. There is not a ?standard? ceiling assembly, so consequently in a race to provide the best marketing ?number?, there now some pretty robust ceiling assemblies being used for test reports. If you see STC an IIC ratings in the 70's for any sound control underlayment, you can be assured that a pretty elaborate ceiling assembly was employed to achieve the biggest number possible. You can also be relatively certain that the product if used in an assembly without a similar ceiling assembly, would not produce a code complain installation.

To provide the resilient material in the floor assembly to attenuate IIC (Impact) noise, a Sound Control Underlayment is what is commonly required. The correct Sound Control Underlayment will provide the resilience required for code complaint IIC noise reduction, as well as the structural stability required for a responsible installation of the finished flooring. Bonding characteristics can also be a concern, for applications where the flooring will be adhered to the underlayment. Floating hardwood or laminate flooring are typically the least challenging application and bonded ceramic tile or natural stone assemblies are the most challenging application for sound attenuation performance in multi-family settings.

Different types of assemblies, flooring choices and attachment methods have different types of needs; and there is no single product that is appropriate for all types of assemblies or flooring products. That is why we offer six completely different products as part of the MantonCORK ? program. For the best results, look for a manufacturer who can supply acoustical testing data that most closely matches the type of floor covering you will be installing and the construction detail of the building they will be installed in. Many suppliers have only one product and one tested assembly which may not correlate well with your actual installation.

If a Sound Rated Ceiling Assembly is used in the test assembly, it should be disclosed and described in detail in the test report. For the MantonCORK ? program, we currently publish test data for 19 different assemblies, using various flooring materials and a variety of different construction details. We fully describe the subfloor, flooring material, attachment of the underlay and flooring. If a ceiling assembly is present, we disclose it and fully describe it in the test reports. We feel that all suppliers should do the same, but

unfortunately the vast majority do not. If a potential supplier does not have a tested assembly that closely approximates your conditions, you may be better served finding a supplier who does.

The 2007 TCNA Handbook has an advisory on Sound Rated Floors (pages 77 & 78). As one of the primary authors of this industry consensus document, I can attest to the quality of information that it provides. Many of the points covered in that document, are referenced in this article. In addition, if you would like more information on the topic of Sound Rated Floors, I would suggest checking out the AIA-CEU course that our company provides on the topic, which can be accessed from the website www.acousticorkusa.com . It is an objective look at the topic, the code issues, the challenges in meeting the code requirements in different construction details and the range of solutions available, with their relative strengths and weaknesses. The course meets the AIA guidelines and is not an ?infomercial? for our products.

Multi-family housing and Condominiums can be a litigious environment. If you are going to recommend, specify or install Sound Control products with hard surface flooring materials in these types of applications, you should make sure you are making an informed decision about the products you intend to use. A little research and education can go a long way toward minimizing the risk and providing a satisfactory installation for the end user, and his downstairs neighbor.