SOUND CONTROL

YOU WON'T HAVE TO HEAR IT TO BELIEVE IT

by Dave Hanna

The number one complaint to homeowner associations and condominium management is the floor/ceiling noise issue. OK, but this is *Private University Products and News*—what does this point have to do with universities? The noise issue is not unique to the multi-family housing market. In fact, sound transmission between floors happens in all multi-level buildings, passing through a wide array of avenues between floors.

Multi-level classrooms, student dorms, laboratories, and administration buildings all must deal with sound transmission between floors. Whether the substrate is concrete or wood, the installation of tile, stone, marble, LVT, and other hard surface flooring occurs in many of these installations. The installation of a sound control membrane prior to the finished flooring can have a dramatic effect on the reduction of sound transmission between floors.

NAC Products has been providing sound control, crack isolation, and waterproofing membrane solutions to the flooring industry for nearly 40 years. Our products have been recognized and recommended by industry consultants as best in class for years, and independent testing supports the outstanding performance of our membrane systems.

Last fall, NAC sheet membranes joined an elite line of building solutions achieving the esteemed Clean Air GOLD certification. These products contain little to no VOCs and comply with the California Department of Public Health (CDPH) Standard Method v1.2 for Private Office, School Classroom, and Single-Family Residence.

A typical multi-level building envelope contains a six-inch or eight-inch concrete slab between floors. Hard surface flooring installed without a membrane system may be subject to a variety of potential issues including cracked tile from expansion and contraction of the substrate, moisture, or water issues, and of course, the transmission of sound from one floor to the next.

Industry Guidelines

The flooring industry has developed standards that define the installation of hard surface flooring, the test methods, and physical properties for installation as recognized by industry professionals. The Tile Council of North America (TCNA), the American Society for Testing and Materials (ASTM), the American National Standards Institute (ANSI), and the National Tile Contractors Association (NTCA) are the primary organizations responsible for developing these standards.

But let us start with how sound is measured. Three types of laboratory tests measure sound vibrations: Impact Insulation Class, (IIC), Sound Transmission Class, (STC), and Delta Impact Insulation Class (Δ IIC).

According to the TCNA Handbook, IIC refers to the measurement used to quantify the transmission of impact sounds through the floor/ceiling assembly system, such as foot traffic, dropped articles or furniture dragged across the floor.

STC refers to airborne noises such as traffic, voices, television, music, etc., that penetrate through walls, doors, and other structural elements. Open windows, cracks around doors, HVAC ducts and other imperfectly sealed openings may also "leak" airborne noise.

The Delta IIC is a method that measures the bare concrete slab first. A sound underlayment system is then installed on the concrete slab and retested. The Delta IIC rating is the performance gain between the first and second tests.

Sound testing may be done in an accredited laboratory or in a field setting at the location; however, there are significant differences between the tests. A field test is generally recognized to only be valid in the exact building where the testing took place because of the many variables that can impact the outcome of the test. A lab test is considered more reliable because it is

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Multi-level classrooms, student dorms, laboratories, and administration buildings all must deal with sound transmission between floors. Whether the substrate is concrete or wood, the installation of tile, stone, marble, LVT, and other hard surface flooring occurs in many of these installations. The installation of a sound control membrane prior to the finished flooring can have a dramatic effect on the reduction of sound transmission between floors.

conducted in a controlled environment and it provides a more accurate model since a wide range of construction situations can be created while comparing the performance of the materials being tested.

The testing establishes a specific value for the membrane system producing an IIC and an STC number. In most jurisdictions, there are minimum IIC and STC values that the floor/ceiling assembly must achieve to meet the building code standards. The most common is the Uniform Building Code (UBC) and the International Building Code (IBC) which call for a minimum of 50 IIC and 50 STC value. The higher the IIC or STC value, the better sound attenuation.

Some building envelopes utilize a Sound Rated Ceiling Assembly (SRCA), which is an elaborate system typically between the floor and ceiling that uses a spring hanger with insulation in the cavity and two layers of wallboard to help reduce the sound between floors. This installation will produce very high IIC and STC values.

Sound Control Solution

Over the years, a variety of products have appeared on the market to reduce the transmission of sound, like Styrofoam, cork, recycled rubber, and others.

These products worked for a while; however, as hard surface flooring has evolved, the additional need to protect the finished floor from moisture vapor transmission and cracking of the tile and grout due to lateral substrate movement has become an issue.

These issues led to the development of sound control solutions provided by NAC, Super SAM 125, and SAM 3 peel-and-stick membranes.

Super SAM® 125 is an approximately 1/8" thick sound deadening sheet membrane designed to reduce airborne (STC) and impact (IIC) sound transmission in applications without a sound-rated ceiling assembly (SRCA). Super SAM 125 has been rigorously tested in independent laboratory settings and achieved:

IIC: 51, STC: 54, ΔIIC: 22 over bare 6" concrete with tile finished floor.

IIC: 51, STC: 52, ΔIIC: 23 over bare 6" concrete with engineered hardwood finished floor.

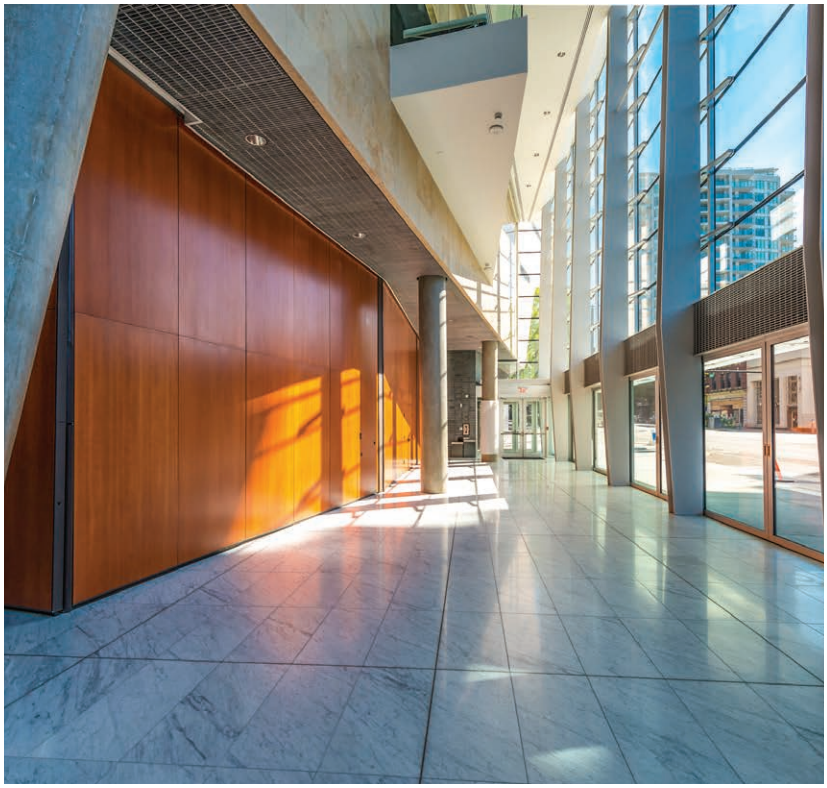
IIC: 56, STC: 61 over a wood-framed assembly with ceramic tile floor.

Super SAM 125 has also achieved a "residential" rating with 5.6 mm thin tile, in the ASTM C627 test using the Robinson-Type floor tester.

The versatility of Super SAM 125 offers additional advantages. It performs as a moisture barrier and provides crack isolation up to 3/8" of lateral substrate movement. It can also function as a waterproof membrane when the joints and end seams are treated with a urethane sealant or NAC SubSeal® liquid applied waterproofing.

As a peel-and-stick membrane, Super SAM is easily installed with a NAC primer and does not require any cure time. Once the membrane is installed, any flooring finish may be applied immediately, reducing labor wait times.

SAM 3 is a thinner alternative to Super SAM, less than 1/8" thick, and designed to reduce airborne (STC) and impact (IIC) sound transmission in applications with OR without a sound rated ceiling assembly (SRCA).



IIC: 70, STC: 67 over bare 8" concrete with a sound-rated ceiling assembly and tile finished floor.

SAM® 3, also a peel-and-stick membrane that is applied with an NAC primer, shares some of the same capabilities as Super SAM, like crack protection for up to 3/8" of lateral substrate movement. SAM 3 will also work as a waterproof membrane when the joints and end seams are treated with a urethane sealant or NAC SubSeal® liquid applied waterproofing.

Whether you chose a sound control membrane from NAC or from a different company, the use of a sound reduction system should be implemented to help reduce the sound transmission between floors. For applications requiring integrated sound abatements such as classrooms, dormitories, labs, administrative buildings, and more, choose NAC's Super SAM 125 and SAM 3 Sound Abatement Membrane systems. For more information about NAC Products and our floor protection systems designed for crack isolation, sound control, and waterproofing, visit www.nacproducts.com.

ABOUT THE AUTHOR: Dave Hanna is the Director of Marketing for NAC Products, Inc., the innovator of ECB, the original Crack Isolation membrane. Learn about all of the NAC flooring solutions at www.NACproducts.com.

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