Acoustics 101 from acoustics.com

Four acoustic terms you need to be familiar with: **Reverberation, Reflections, Absorption - Noise Reduction Coefficient (NRC), Isolation - Sound Transmission Class (STC)**

Reverberation:

In an enclosed space, when a sound source stops emitting energy, it takes some time for the sound to become inaudible. This prolongation of the sound in the room caused by continued multiple reflections is called reverberation.

Reverberation time plays a crucial role in the quality of music and the ability to understand speech in a given space. When room surfaces are highly reflective, sound continues to reflect or reverberate. The effect of this condition is described as a live space with a long reverberation time. A high reverberation time will cause a build-up of the noise level in a space. The effects of reverberation time on a given space are crucial to musical conditions and understanding speech. It is difficult to choose an optimum reverberation time in a multi-function space, as different uses require different reverberation times. A reverberation time that is optimum for a music program could be disastrous to the intelligibility of the spoken word. Conversely, a reverberation time that is excellent for speech can cause music to sound dry and flat.

Reflections:

Reflected sound strikes a surface or several surfaces before reaching the receiver. These reflections can have unwanted or even disastrous consequences. Although reverberation is due to continued multiple reflections, controlling the Reverberation Time in a space does not ensure the space will be free from problems from reflections.

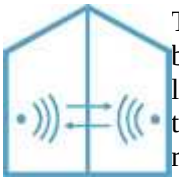
Reflective corners or peaked ceilings can create a “megaphone” effect potentially causing annoying reflections and loud spaces. Reflective parallel surfaces lend themselves to a unique acoustical problem called standing waves, creating a “fluttering” of sound between the two surfaces.

Reflections can be attributed to the shape of the space as well as the material on the surfaces. Domes and concave surfaces cause reflections to be focused rather than dispersed which can cause annoying sound reflections. Absorptive surface treatments can help to eliminate both reverberation and reflection problems.

Noise Reduction Coefficient (NRC):

The Noise Reduction Coefficient (NRC) is a single-number index for rating how absorptive a particular material is. Although the standard is often abused, it is simply the average of the mid-frequency sound absorption coefficients (250, 500, 1000 and 2000 Hertz rounded to the nearest 5%). The NRC gives no information as to how absorptive a material is in the low and high frequencies, nor does it have anything to do with the material’s barrier effect (STC).

Sound Transmission Class (STC):



The Sound Transmission Class (STC) is a single-number rating of a material’s or assembly’s barrier effect. Higher STC values are more efficient for reducing sound transmission. For example, loud speech can be understood fairly well through an STC 30 wall but should not be audible through an STC 60 wall. The rating assesses the airborne sound transmission performance at a range of frequencies from 125 Hertz to 4000 Hertz. This range is consistent with the frequency range of speech. The STC rating does not assess the low frequency sound transfer. Special consideration must be given to spaces where the noise transfer concern is other than speech, such as mechanical equipment or music.

Even with a high STC rating, any penetration, air-gap, or “flanking” path can seriously degrade the isolation quality of a wall. Flanking paths are the means for sound to transfer from one space to another other than through the wall. Sound can flank over, under, or around a wall. Sound can also travel through common ductwork, plumbing or corridors.

For more information on Sound Transmission Class, visit STCratings.com.