I’m a contractor on a design-build project. The architectural specifications for the project require that the partitions and ceilings I build achieve a specific minimum STC rating. In addition, they also require a minimum NRC rating. I’m familiar with the first term, but have never heard of the second. Can you explain?

STC stands for Sound Transmission Class, a numerical rating that defines the effectiveness of a product or assembly in isolating airborne sound transmission. It is typically expressed as a two-digit number. The higher the number, the better the assembly’s ability to withstand the passage of airborne noise.

In simple terms, an STC rating defines how much sound will pass through a properly constructed assembly into an adjacent area. A partition assembly with an STC rating of 30, for example, will allow more noise to pass through it than a ceiling assembly with a rating of 50.

While a room with a high STC rating will not allow much sound to escape from it, reverberating noise may be occurring everywhere within it. To visualize this concept, think of an elementary school classroom. While you may be able to walk down the hall of the school without hearing any noise, the minute you open the door to the kindergarten classroom, you are overwhelmed by the racket; noise is everywhere. The walls and ceilings reflect rather than absorb the sound, and the instructor’s voice can be heard loudly in any part of the room.

NRC, or Noise Reduction Coefficient, is a measure of a product’s ability to absorb noise and reverberation. It is represented as a quantified value between zero and one. A highly absorptive material, with a coefficient value approaching one, will soak up a considerable amount of the noise that emanates from within a room before it can be reflected back to the occupants.

A high NRC area sounds “dead.” You may be able to hear every conversational whisper as you walk outside of the room, but within its confines there is no echo. Speech or music from a single source is very clear and easy to hear. A radio or TV studio has this characteristic. The announcers don’t want their orations bouncing off the wall and coming back through the microphone to distort the broadcast.

The construction of an assembly generally determines its STC rating. The finish material, whether it is part of the basic assembly construction or surface applied, determines the NRC. In addition, many manufacturers of ceiling products may refer to two other methods, the Ceiling Sound Transmission Class or the Ceiling Attenuation Class, to determine the sound-barrier ability of their products.

Like its fire-rated counterpart, acoustically tested construction must be installed so that it replicates the lab-designed assembly. Substitutions or failure to include specific parts of the assembly can compromise its acoustical ability. Sound, like water, will seek the path of least resistance, and an unintended gap in an assembly can negate the best intentions.

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