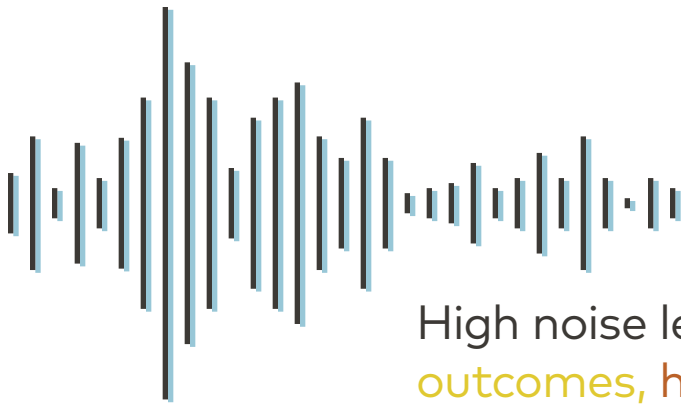


Carpet Has Superior Acoustical Properties. Noise is typically defined as unpleasant and unwanted sound. High noise levels worsen patient and staff outcomes in hospitals, hinder teaching and learning in schools, and negatively impact productivity in offices.

As one of the most abundant finishes in the built environment, flooring's ability to impact acoustical performance is significant. Hard surface flooring absorbs little or no sound and has greater potential to transmit sound, contributing to a noisier environment. Carpet and textile composite flooring absorb significantly more sound and transmit less sound, contributing to a quieter environment.

Insights on Wellness & Flooring: Noise Control

inform.



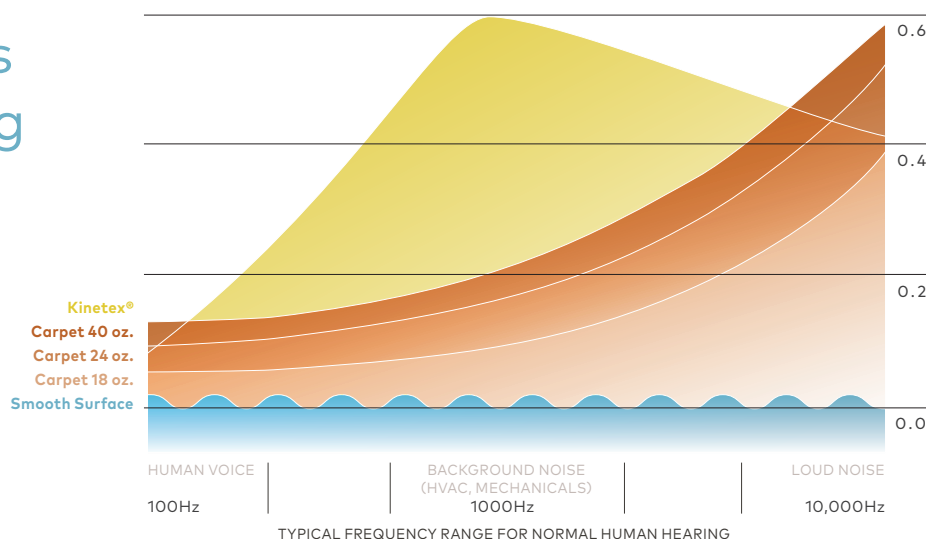
High noise levels worsen patient outcomes, hinder teaching and learning, and negatively impact productivity.

How big is the problem? Noise is a top complaint among patients in hospitals, as evidenced by HCAHPS surveys. According to a survey done by the U.S. General Services Administration, it is also a leading source of employee dissatisfaction in offices. In addition, speech is involved in as much as 60 percent of classroom activities. High noise and reverberation levels hinder speech intelligibility, causing reduced understanding and reduced learning. In many U.S. classrooms, the speech intelligibility rating is 75 percent or less. This is significantly lower than the 95% rating that the Acoustical Society of America recommends for effective learning.

How effective are different types of flooring in absorbing airborne sound? Flooring's measure of effectiveness in absorbing airborne sound is expressed as a Noise Reduction Coefficient (NRC). The greater the absorption the higher the NRC number. A surface that completely eliminates sound has an NRC of 1.0. Hard surface flooring typically has NRCs of about 0.0-0.015, meaning it absorbs little to no airborne sound. Commercial carpet typically has NRCs ranging between .15 and .2, meaning it absorbs about 15-20 percent of airborne sound. The NRC for Kinetex® is about .30, meaning 30 percent sound absorption.

Acoustic Properties of Flooring

Absorption Coefficient

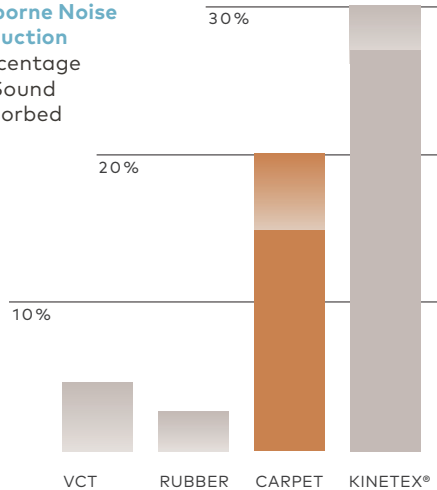


What about reverberation time? Reverberations are continuing effects of a sound. Like echoes, they occur when sound waves strike a surface and are reflected back into the space. Reverberation time is a measurement based on physical volume, areas of different surface materials, and the absorption coefficient of those materials. Reverberation time influences a floor covering's NRC. Shorter reverberation times aid speech recognition. For example, the recommended reverberation times for offices and classrooms are 0.75 seconds and 0.6-0.7 seconds, respectively. Test results show that soft surface flooring mutes reverberation.

How does flooring affect structure-borne noise reduction? ASTM International uses a structure-borne noise reduction test for flooring, which studies the material's ability to reduce impact sound transmission into the space below. Footsteps and objects dropping on the floor are examples of impact noises. The measure is expressed as a whole number, Impact Insulation Class (IIC). The higher the numerical rating, the greater the sound insulation. ICC ratings vary, depending on materials and construction. IICs for VCT typically range from approximately 15dB to 25dB. The results for rubber range from approximately 15dB to 30dB. Carpet IICs range from approximately 35dB to 50dB. The IIC for Kinetex is 64dB.

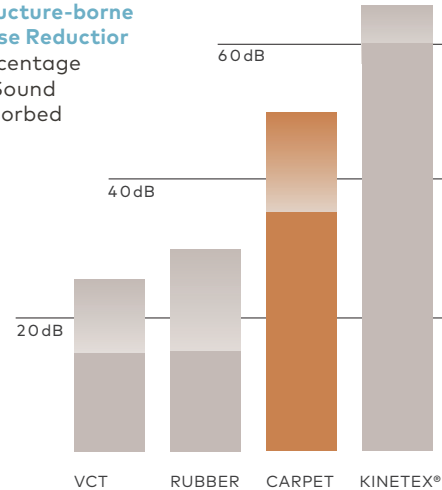
Airborne Noise Reduction

Percentage of Sound Absorbed



Structure-borne Noise Reduction

Percentage of Sound Absorbed



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