

# FACILITY CARE™

## SpeakingWith

Recently, FacilityCare spoke with Kenneth P. Roy, senior principal research scientist at Armstrong World Industries, about how an acoustical ceiling can help healthcare facility managers comply with the privacy regulations included in the new Healthcare Insurance Portability and Accountability Act (HIPAA), how speech privacy is measured and the difference in ceiling requirements between open spaces and closed spaces.

Roy is responsible for acoustic technologies worldwide at Armstrong's Innovation Center, which includes extensive teaching programs and international standards participation. His current focus is on architectural building products with research involving the interactions between electronic sound systems and architectural design as it relates to speech privacy and speech intelligibility in building spaces.

Roy has been an elected Fellow of the Acoustical Society of America since 1999 and is a member of numerous professional affiliations, including the Audio Engineering Society (AES), the American Standards for Testing and Materials (ASTM), the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO).

**FACILITYCARE:** How can installing an acoustical ceiling help healthcare facility managers comply with the privacy regulations included in the new HIPAA legislation that goes into effect on April 14, 2003?

**KENNETH ROY:** The new regulations mandate that all individually identifiable health information — whether it is in electronic form, on paper or oral — must be kept private. Failure to apply “reasonable measures” to safeguard this information is in violation of the act.

As a result of the oral section of the regulations, healthcare facility managers must give more attention to the creation of speech privacy. Telephone conversations now must be conducted in a secure environment; patients must be able to confer in confidentiality with their physician; and they must be able to register for procedures discreetly and confer on payment matters without being overheard.

The attainment of confidential speech privacy is very dependent on the architectural design and materials used in a healthcare facility. In this regard, the proper ceiling choice will serve to both limit the sound intrusion between spaces and affect the quality of sound within the space. Acoustical ceilings are a key element in creating an acoustical environment that maintains speech privacy.

**FC:** Can speech privacy be measured?

**KR:** Yes, it can, especially with the help of an acoustical consultant. Speech intelligibility and privacy test methods are available from the national standards writing bodies, the American National Standards Institute (ANSI) and the American Society for Testing and Materials (ASTM).

The measure of speech privacy is called the privacy index, or PI. It is a rating that



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indicates the degree of speech privacy attained between a talker and a listener.

There are three recognized levels of speech privacy: confidential, normal and minimal. Confidential represents a PI rating of 100 percent to 95 percent. In this case, occasional words can be heard but not

understood, and no phrase or complete sentence can be understood. Normal, or non-intrusive, represents a PI rating between 95 percent and 80 percent. At this level, some phrase and sentence intelligibility is possible but only with active listening. In general, overheard sound is not distracting. Minimal, or transitional, has a PI rating of 80 percent to 60 percent. In this case, most words can be heard and sentence intelligibility is expected.

It is important to note that normal privacy is the most common design target in commercial environments for productivity goals. However, because of the new HIPAA regulations, it is not an adequate design goal in today's healthcare environments. Confidential privacy levels are now required.

**FC:** Can the same acoustical ceiling be used throughout the entire facility, or do different areas require different ceilings?

**KR:** In terms of speech privacy, there is a significant difference in the ceiling requirements between closed spaces, such as treatment rooms or doctors' offices, and within an open space, such as a reception area or open office plan with cubicles. As a result, different areas do require different ceilings.

With that in mind, it is important to be familiar with the three measures of ceiling acoustical performance, all of which are usually printed on a ceiling product data sheet. Noise reduction coefficient, or NRC, is expressed as a number between 0.00 and 1.00, and indicates the average percentage of sound incident from all angles that a ceiling absorbs. For example, an NRC of 0.60 indicates that the ceiling absorbs 60 percent of the sound that strikes it. Ceiling attenuation class, or CAC, indicates a ceiling's ability to block sound transmission between two closed rooms. The higher the number, the better the ceiling performs as a barrier to airborne sound intrusion. Articulation class, or AC, indicates a ceiling's ability to absorb sound reflected at a single angle off the ceiling in open areas. The higher the number, the better the ceiling performs as a sound absorber.

In closed spaces, the main function of the ceiling is to limit the transmission of sound between adjacent rooms, especially when these spaces share a common plenum. In this case, a standard mineral fiber ceiling with an NRC of 0.55 to 0.65 and a CAC of 35 or higher is usually the best choice. In open spaces, the ceiling's main function is to absorb sound that would normally bounce off the ceiling into an adjacent space or cubicle. Here, a high performance fiberglass ceiling with an AC of 180 or higher is the best choice.

**FC:** What is sound masking, and is it appropriate in healthcare environments?

**KR:** Speech privacy is dependent on both the level of intruding sound, which is the speech level of a nearby conversation, and the level of background sound, which in many cases comes from the air delivery system. To attain speech privacy, the background sound must be higher

than that of the intruding sound.

The proper choice of an acoustical ceiling will help lower the level of the intruding sound. In the past, background sound contributed by heating, ventilation and air conditioning equipment was generally sufficient to assure privacy. Today, however, that is no longer the case. As a result, a new controlled background sound is needed to override the sound of speech and preserve the privacy of a conversation without being obtrusive itself. This is called sound masking. When this electronically generated sound is used correctly, unwanted sound, such as an intruding conversation, generally goes unnoticed.

Sound masking should thus be a vital part of all open areas in a healthcare facility because it covers up the residual speech that cannot be controlled by other sound control elements. The full privacy potential of a private office also often requires that sound masking be provided in order to elevate the background.

Sound systems are available today that look just like a standard acoustical ceiling but provide sound masking, paging and background music all from the same speaker. Remember, however, that music alone is not a good masking sound because it is variable in both loudness and frequency content.

**FC:** Must aesthetics be compromised with a high performance acoustical ceiling?

**KR:** Absolutely not. In fact, many of the highest performing acoustical ceiling panels feature the smooth, fine textured surface visual that is popular now in healthcare design.

The panels are also available with a tegular or reveal edge to create a shadow line that helps camouflage the grid or suspension system. In addition to their aesthetic appeal, these panels provide better acoustical performance than

square lay-in panels because there is less leakage at the interface between the panel and the grid. **FC**

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