

May 2003  
Achieving Effective Acoustics  
Increasing Privacy, Concentration, and Productivity

While several environmental factors, including temperature, lighting, and air quality, are generally recognized to affect workplace performance, research indicates that proper acoustics must also be a top design priority. The workplace should provide occupants with speech privacy, comfort, and freedom from distracting noises, and enable them to work without disrupting others.

The formula many professionals use to achieve these results is the ABC Rule, meaning Absorb, Block, and Cover up.

### **Absorb Noise**

Adding absorptive ceiling tiles, wall materials, and flooring reduces the energy and, therefore, the volume of sounds reflected off their surfaces back into the office space. Invest in a ceiling tile with a high Noise Reduction Coefficient (NRC) rating and ensure consistent coverage throughout the facility.

In order to limit the lighting system's impact on the absorptive performance of the ceiling, select a system that incorporates a minimum number of ceiling fixtures while still meeting the specified lighting requirements. When it is not possible to install an indirect system, use a deep parabolic lens instead of a solid plastic lens.

Minimize the size and number of reflective materials, such as glass and metal, used in the space because these will reflect noise and conversation, causing them to be heard over greater distances.

### **Block Noise**

Another method of controlling noise is to block sound transmission. Closed plan designs use walls and plenum barriers to block sound, but blocking is also a relevant technique for open concept offices.

Locate noisy office machines and high-activity areas, such as call centers, in remote or isolated areas. Maximize the distance between employees and minimize direct paths of sound transmission from one person to another by seating employees facing away from each other on either side of partitions. Partitions that are 64 inches (1.60 meters) are effective because they extend beyond seated head height, though using taller partitions in high-traffic areas can be beneficial.

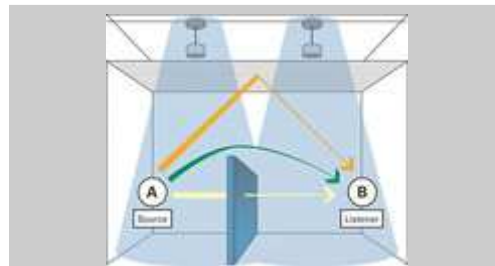


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### **The Quest for Silence**

Most evaluations of the acoustic environment focus only on the quantity, or volume, of sound. In so doing, noise control strategies have been pursued in the "Quest for Silence" – the notion that good acoustics are achieved when the sound levels in a space are as low as possible, with zero being the best. This is a flawed assumption. Just as with ergonomic factors, such as temperature, light, and humidity, there is a comfort zone for the volume of sound. The background sound level should be high enough to provide noise control and speech privacy, yet low enough to be comfortable.

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### **Cover Noise**

Since offices exist for active purposes, silent environments are not an option. Yet the typical response to acoustic problems is to try to achieve silence by using these first three methods of noise control. While these steps are necessary, the exclusion of the fourth, the masking of sound, can often prevent facilities from achieving the desired results.

A sound masking system typically consists of speakers installed in a grid-like pattern above the suspended ceiling. The system introduces a specific background sound at controlled levels across the facility, rendering speech unintelligible to individuals outside of the immediate area of an office or workstation, reducing distracting office sounds and minimizing acoustic variations within the space. Masking can reduce the requirements for other acoustic treatments.

### **Reduce Noise**

The ABC Rule overlooks one valid and frequently used method of addressing office noise: reducing noise at the source. This task can be accomplished by modifying employees' noise-producing behaviors and replacing noisy office equipment with quieter technologies.

An environment conducive to speech privacy, concentration, and productivity can only be created through the balanced application of all four methods of noise control.

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