

Special Series: Acoustic Solutions for the Workplace Part II

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CPM One Source has partnered with Snowsound, an Italian acoustic panel manufacturer with USA HQ in Santa Fe Springs. CPM has installed Snowsound's 100% sound absorbing surface products in our CPM Studio at The CalEdison Building located at One Bunker Hill in Downtown LA. In this special series we'll be exploring ways to correct office acoustics with Snowsound. You can read [Part I of this series here](#).

All Snowsound products leverage the exclusive patented Snowsound technology, based on sound absorbing material with variable densities, which enables selective absorption at various frequencies for optimal room acoustics. The Snowsound Lab's newest project, currently in the final stages of development, is Snowsound-Fiber: a patented textile fiber with acoustic sound absorbing properties. If you want to learn more go to: snowsoundusa.com.

Part 2: Workplace Acoustics – Knowing your Foe

Getting rid of noise in an increasingly open workspace with sleek offices, meeting areas and conference rooms is becoming critically important. As with any challenge, the key to success is understanding your foe. Here's the problem: Unwanted sound is formed by waves that are reflected from solid surfaces that have limited absorption, such as concrete or tile floors, glass walls, hard-lid, and exposed ceilings. Ideally, sound travels in one direction from the speaker to the listener. But today in many spaces, sound reflects off hard surfaces creating echoes. These reflections diminish voice intelligibility, making words hard to understand.

We have all experienced this acoustic “reverberation”, but why has it been such a significant obstacle to overcome?

For starters, sound moves at over 1,000 feet per second in a space. It's usually not the first reflections that we perceive as noise, but rather the secondary sound paths that make us feel like we're speaking with our head in a bucket. Secondly, it's difficult to find aesthetically pleasing acoustic solutions with high NRCs (although [Snowsound](#) has found this balance quite nicely).

What does NRC mean and how is it determined?

NRC = Noise Reduction Coefficient, and it's a scalar representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1.0 indicates perfect absorption. For example, drywall has an NRC of 0.05, while [Snowsound Flap](#) panels have an NRC of 1.0.

When comparing the NRCs of various products, these are a few things to consider:

- Ensure acoustic reports and NRC values are third-party lab tested
- Ensure you're comparing apples to apples (so NOT a 1.5" thick panel from Company A vs. a 2.5" thick panel from Company B)
- Understand that NRC is the average of *only four* sound absorption coefficients of the particular surface at frequencies of 250 Hz, 500 Hz, 1,000 Hz, and 2,000 Hz, and as such, may not offer a transparent view into how well a product works to absorb a certain type of sound frequency.

For example, in the chart below, you have two products:

Figure 1

Frequency	PRODUCT A	PRODUCT B
250 Hz	0.16	0.60
500 Hz	0.26	0.60
1000 Hz	0.96	0.60
2000 Hz	0.98	0.60
NRC	<u>0.60</u>	<u>0.60</u>

Figure 1

In Figure 1 to the left, the NRC for product A and product B are equal, but these two products perform very differently at different frequencies. Even though they have identical NRCs, product B is a more balanced absorber and much more effective in absorbing the lower end frequencies that are most difficult to diminish. The lesson here is that NRC isn't the end-all-be-all, but one should look into a product's performance across the entire frequency spectrum to determine if it's the best solution for the space.

The Issue of “Leaky Rooms”

Just as we have all experienced a room with lots of echoes, we’ve also all experienced what I like to call “a leaky room” – where one can clearly hear conversations in the adjacent room or office. The remedy for these different cases should not be confused with one another. High NRC materials like Snowsound panels are sound-absorbing products designed to improve the acoustic comfort within a space. Sound absorption is a solution that reduces the reverberation time of the sound in these closed areas. It should not be confused with sound insulation, which is the limitation of sound transmission or transference from the room in which the sound is generated to another one.

These cases of sound transmission are not caused by reflective materials, but rather are due to airgaps in the building partitions (walls or ceilings) through which the sound is escaping. This is where NRC is different than STC (Sound Transmission Class). While reverberation issues are easy to retrofit after the building has been constructed, transmission issues are a construction concern that may require reconstruction of some spaces in order to insulate the sound better.



Preventing Transmission Issues

To avoid transmission issues, one should specify insulated walls, or partitions with very high STC ratings, to work as effective noise blockers. There have been cases, however, where sound absorbing materials do help a “leaky room”. Although it won’t block the sound from passing through the walls, adding sound absorbing material in the “leaky room” will help absorb many of the reflections that are transferring through.

Another popular acoustic solution that is not sound absorbing is sound masking. Sound masking, or “white noise”, is used for speech privacy in open plans.

““ When reviewing the ABC’s of Acoustics, sound absorbing materials = **A** (for Absorb), proper sound insulation = **B** (for Block) and sound masking = **C** (for Cover).

White noise is important when trying to limit speech intelligibility in an open workspace. White noise creates a “cover” over the chatter and masks the intelligibility of conversations. Areas where sound masking does *not* help however, are within closed rooms.

These closed rooms require speech clarity, and so using sound masking is simply adding more noise into the space where you want quiet. Even in the open floor plan, if the space has reflective materials (exposed ceiling, hard floors, windows etc.), sound masking alone is not the appropriate solution. While covering speech to ensure privacy is important, the noise in the space will be elevated if only white noise is added without absorption. Therefore, absorptive materials should be considered in conjunction with sound masking for open areas, and in conjunction with high rated STC products for smaller closed spaces.

If you are experiencing noise issues in your office and would like to discuss acoustic solutions, [call or email CPM](#) to arrange a consultation with Snowsound.