

HVAC Considerations for High-Performance Acoustical Panels

It's important to design effective airflow to minimize potential soiling

The noise absorption of most high-performance acoustical ceilings requires a certain amount of airflow through the tiles. The panels' semi-porous nature allows them to achieve Noise Reduction Coefficient (NRC) values between 0.80 and 1.00. They also make it important to employ a suitable strategy for supply and return air paths in order to avoid accelerated soiling of the ceiling tiles.

If air-handling in HVAC systems is not well designed, and pressure equalization does not occur properly through the exchanges and returns, then air will seek to move through the acoustical treatment, making it act like an additional dust filter. Over time, this filtering action will cause the acoustical treatment to become dirty.

By following a few basic guidelines, this potential issue can be avoided by ensuring minimal pressure differences between the room and the ceiling plenum:

- Design sufficient air return openings in the ceiling plane and/or utilize a ducted return system. Because they draw air directly from the room instead of from the ceiling plenum, ducted returns offer an advantage over plenum returns, not only by further minimizing soiling, but also improving indoor air quality.
- To avoid pressurization of the room, return grilles should be sized for the same or greater total air volume as is being supplied to the room.
- Pressure can also be balanced by opting for floating acoustical treatments – which are often more effective acoustically in any case – rather than wall-to-wall installations.
- Maintenance of air-handling systems and cleaning of system filters as recommended by manufacturers will further reduce the chance of soiling and will add to overall performance and energy efficiency of the HVAC system.
- To further optimize panel appearance and cleanliness, avoid unequal pressures and risk of soiling during construction by scheduling panel installation as late as possible in the project, so that all dust producing activities are completed and the space is cleaned of loose dust and dirt
- Careful handling of the tiles is also recommended during installation and when the plenum needs to be accessed. Use of clean cotton gloves is an effective way to ensure good panel appearance.