

## General Description

The Huntair Coplanar Silencer is a revolutionary design that provides up to 20 dB reduction in fan sound power while maintaining full fan efficiency and air performance. In contrast to traditional systems based on flow-through silencers, the silencer elements are arranged in an array in the same plane as the fan wheel. The silencer elements are designed to achieve full air delivery at any operating point and will not cause unwanted noise or any adverse system effect or pressure drop.



## Theory

Air handlers are typically designed with an inlet plenum and a discharge plenum. Noise radiates from the inlet side of the fan to the return opening of the occupied space and from the discharge of the fan to the building supply ductwork. Sound also propagates through cabinet walls and is known as casing radiated noise.

Inlet, discharge and casing radiated noise levels are estimated based on subtracting plenum losses from bare fan sound power levels. Bare fan sound levels are usually determined in accordance with AMCA 300 procedures and provided by most fan manufacturers. It should be noted that fans, once incorporated into air handlers do not bear the AMCA seal for sound rating.



In a traditional air handling system, the maximum noise control that can be achieved within the air handler plenum is determined by the efficiency of the sound absorbing lining and size and location of the intake or discharge openings. In all cases, sound generated by the fan radiates outward and impacts the sidewalls of the plenum. In the case of a traditional design, a sound wave will pass through one layer of absorbing material before impacting the side of the cabinet. A portion of the sound energy will be absorbed and a portion reflected. Most of the energy is transmitted to the inlet or discharge openings.

In a Huntair Fan Wall with Coplanar technology, noise reduction is achieved by directing the sound wave through multiple layers of absorbing material before contacting the first reflective surface. The process of aligning acoustical material in the radial plane of the fan reduces the radiated sound power of the individual fans and thus the array as a whole. Reductions are significant, especially at low frequencies where sound is difficult to attenuate. Fan Wall systems employing Coplanar Technology are characteristically free of turbulence and low frequency rumble.

The following graph shows how fan noise is attenuated at the source through primary and secondary absorption in layered media. As shown the transmitted sound power through supply and discharge paths are greatly reduced. Typical reductions are 15 to 18 dB at low frequencies and 18 to 20 dB at high frequencies. Inlet levels are attenuated 4 to 8 dB at low frequencies.

