

Understanding sound diffusion

Diffusion is described as the process of spreading or dispersing radiated energy so that it is less direct or coherent. For instance, the plastic cover over a fluorescent light acts as a diffuser. These covers make the light spread out in a more randomized way so it is less harsh.

In audio, diffusion is caused by sound waves reflecting off many complex surfaces. A flat concrete wall with a flat smooth surface produces a pretty distinct echo when sound reflects off from it. However, a brick wall while still reflective, tends to diffuse the sound reflections and produces a much less distinct echo. This is due to both the surfaces of the brick itself and the mortar between the bricks (more specifically the edge diffraction of the joint between the two). Sound diffusion is a very important consideration in acoustics because it minimizes the coherent reflections that cause problems. It also tends to make an enclosed space sound larger than it is. Diffusion is an excellent alternative or complement to sound absorption in acoustic treatment because it doesn't really remove much energy, which means it can be used to effectively reduce reflections while still leaving an ambient or live sounding space.

Acoustical Solutions, Inc. offers a number of different sound diffusers to fit every design and every budget. Along with the full line of RPG™ diffusers, we offer the barrel and pyramid diffusers (the standards in the recording industry) and a more economical line of thermoplastic molded diffusers – the AlphaContours™ and AlphaWave™ diffusers.