



ACOUSTICAL | SURFACES, INC.

**Acoustics Demystified: Creating
Better-Sounding Rooms Is Easier Than You Think**

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“Acoustics” is a term most people associate with complex concepts and deep science. And while there IS a lot of science in acoustics, understanding the basics – enough to help you make good decisions about improving the sound of your room – is much easier than you think.

First, for our purposes, “Acoustics” means improving sound in rooms. There are two categories of techniques professionals use to help improve room sound - “soundproofing” and “treatment”, and they are distinctly different. Soundproofing means “less noise”, and treatment means “better sound”.



You may want less noise – the sound of traffic, neighbors, and construction can be annoying, and a quiet space can be very healthy. Or you may want your sound system or musical instrument to sound better in a room. You may also want both, to varying degrees.

Let’s look at soundproofing. The products utilized to lessen noise work by increasing structural mass and isolation – a room’s walls, ceiling, and floor must be dense and isolated from the rest of the structure, and the air gaps must be sealed – such as doors and windows, heating and cooling vents, and electrical sockets.

Think of soundproofing like weatherproofing – you want the structure to be as solid as possible, and you want all the holes sealed, so the weather stays outside and comfort stays inside. For soundproofing, the amount of mass and isolation needed depends on how much noise there is outside – and inside – your room, and how much you want it reduced. A recording studio in a big city needs much more soundproofing than a stereo listening room in a house out in the countryside. It all depends on your situation and your goals.



For example, sheetrock walls and ceilings can be improved by adding more (and isolated) layers of sheetrock, by using an isolation clip system like [“RSIC-1 Clips”](#), or by using damping compounds like [“Green Glue”](#) between two layers of drywall. Acoustical sealant is then used to seal all gaps in the walls and ceilings. Doors can be effectively sealed with a [“Door Seal Kit”](#), which places gaskets around the side and top edges and an automatic bottom seal which lowers when the door is closed. Floors can be isolated with underlayments such as 3/8” thick [“Acoustik”](#), and windows can be sealed with [“Climate Seal”](#) clear removable covers. There are many products to improve soundproofing in a room, or a house, or large building, and most are relatively easy to install.



Once a room has less noise, you may want the room itself to sound better. To accomplish this, there are two acoustical treatment methods available – sound absorption and sound diffusion. Absorption is a bit like a hole in the wall – some of the sound energy goes out of the room, and that reduces reflections back into the room. Diffusion smoothly spreads out the sound energy in a room, also reducing the harmful effects of strong reflections. The best room-treatment strategies combine absorption and diffusion to improve sound in rooms.

Absorbers are usually made of fibrous materials like fiberglass or recycled cotton, with a fabric wrap or cover, and are often in flat-panel form, which makes wall and ceiling placement easy. Determining how much absorption a room needs depends on the geometry of the space – a small cube shape needs more treatment, and a large irregular non-parallel shape needs less. However, too much absorption in a room will make the space sound and feel unnatural.

Diffusors are usually fabric-covered curve-shaped panels which can also be easily placed on walls and ceilings. These types of panels have the advantage of evenly spreading out flat-wall reflections that would otherwise combine with original sound waves and create destructive interference. A mix of diffusors and absorbers greatly improves sound in rooms by reducing harmful echoes while retaining the room’s natural ambience.



Something to also keep in mind as you search for solutions to your room-sound issues is that science, as mentioned earlier, is always a big part of acoustical problem-solving. For example, the latest research into sound control has already yielded exceptional products that not only control sound with broadband absorption, they have the added advantage of “stealth” – they don’t look like acoustic panels, and for some rooms, that’s a great solution. Both [“Acousticore”](#) and [“Silk Metal”](#) panels are based on micro-perforated surfaces, which is new cutting-edge absorption technology. Acousticore offers several wood-veneer surface options, and Silk Metal offers various smooth metal and paint finishes, and both product groups are beautiful noise-control choices when used as wall or ceiling coverings.



All situations are different, and your goals may vary: adding a few absorbers to reduce echo in a hallway; building an amazing entertainment space for your family; increasing speech intelligibility in a corporate meeting room; quieting too-loud ambience in a bar-restaurant; soundproofing a music venue built into an apartment building – each of these projects will take advantage of the basic acoustic principles outlined above. The common elements for improving the sound of any space are these: define the problems, clearly state the goals, and choose a balance of solutions to accomplish the goals effectively (for both performance and price). There is now a very wide range of acoustical products available to business managers, home owners, audio professionals, contractors, builders, architects, and everyone else seeking less noise and better sound. It all starts with demystifying the basics.



About Acoustical Surfaces, Inc.

Acoustical Surfaces, Inc. (ASI) takes sound control to the next level with its state-of-the-art soundproofing, acoustics, and noise and vibration control solutions. ASI serves the commercial, industrial, educational, house of worship, OEM, home theater and residential markets. ASI's expert staff offers both onsite and/or remote assistance to ensure that each project's specific acoustical goals are achieved.

ASI is a pioneer in the business of controlling sound. The company offers a wide range of product lines under its various brands. For more information, please visit www.acousticalsurfaces.com.

