

Peace and Quiet for your home

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Do you miss having peace and quiet in your home? Are you tired of hearing the video games, loud music or noisy vehicles? Research has discovered that there is a direct correlation between noise and stress. A noisy environment can also affect your sleep patterns, leaving you tired and irritable. Soundproofing your home is not difficult but you must understand a few things about sound to effectively do it. Household noises fall into one of three categories:

- Airborne (Traffic, stereo, voices, music)
- Impact (foot-falls, machinery vibration)
- Reflective (reverberation in baths, basements, garages)

Understanding the difference is key to determining which solution will be best. Sound waves will pass through the air until they hit an object. If the sound wave is strong enough it will pass the energy onto the object, which will vibrate in return. If the vibration is strong enough it will create its own sound wave. This would be impact sound. A good example, is a stereo playing in a bedroom with the door closed. The sound will pass through the wall into the next room. What is being heard is not the direct sound waves but the wall making its own vibrations. A good example of reflective sound would be sound in an all tile bathroom. The sound bounces around the room, like a super ball, until it runs out of energy. The solution to quieting the sounds is to absorb the energy, which in some cases can be difficult. Solutions normally come in three forms: absorption, barriers, and isolators.

When sound passes through an acoustically absorptive material like mineral wool insulation or acoustic foam, the sound waves are forced to change directions many times and travel great distances before the sound passes completely through the absorptive material. Each time a sound wave changes direction, a portion of the energy is absorbed by conversion to heat. When there is a reflective surface behind the absorber, (such as a wall) the sound, which passes through the absorber, will be reflected back and through the absorber once again. Absorbers work best when there is some sort of a reflective surface behind them. For some sounds (low frequency) an air gap is ideal between the absorber and the reflective surface or wall.

A noise barrier can be constructed from almost any non-porous material. Since sound is energy, an effective barrier must have enough mass (weight and density) and a low resonant frequency to stop (or reflect) this energy. As sound pressure levels increase so does the sound power (energy). High sound power levels will excite any surface they encounter causing the surface to vibrate at its resonant frequency, which inevitably makes the walls shake. Low frequency sound contains more energy, because a larger volume of air is being displaced to produce the long wavelengths associated with bass and sub bass frequencies.

Isolators are devices that are typically used for absorbing impact type noises. An example of this is heavy equipment that will have springs, donuts or spacers made to absorb vibrations.

There are a variety of solutions to everyday home noises. The most common complaint is noise from outside. The first step would be to look at your windows. Double panes are very effective at reducing noise and are available from all manufacturers. If you already have double pane windows, several companies offer an inner window that will go over your existing window. Another alternative is to add heavy drapes to the window.

To reduce noise within your home most people will turn to sound absorption or isolation products. Owens Corning offers a series of products - called QuietZone - that manage sound and reduce noise from laundry

rooms, entertainment rooms, family rooms, and other noisy areas of the house. They can also be used for home offices, bedrooms, or other parts of the house where you prefer it be quiet when you work or sleep.

A company called Icynene offers an insulation, spray-in-place soft foam system that it says serves as a barrier to airborne sounds. And Maxxon has a product called Acousti-Mat made especially for floors.

And when it comes to appliances, many newer dishwashers offer improved sound insulation and quieter motors than older versions. For example, Whirlpool offers a line of Quiet Partner dishwashers, which the company says are quieter than the sound of popcorn popping in the microwave, bacon frying, and an electric razor. Jenn-Air offers a Quiet Series dishwasher line.

The laundry room is a major source of noise with running water, dryer rumbles and spins cycles. Owens Corning says you can minimize noise from plumbing pipes and washing machines by isolating noise sources from areas requiring privacy. Reducing noise also requires the proper selection and installation of piping and other laundry room fixtures. Install vibration isolators to washers and dryers and caulk around fixtures. Consider adding acoustic material to the laundry walls and ceilings.

Heavier carpet with thicker padding is the perfect solution for today's homes, which are typically filled with noisy computers, speaker phones, big screen TVs, video games, and home entertainment centers. Carpet provides sound absorption and to a some isolation. With an increasing number of new homes being built with open floor plans for primary living spaces, the use of carpet allows the family noise to be absorbed rather than bounced off the floor and back onto the walls and furniture. Adding acoustic absorbing tapestries to walls will also minimize the reflective noise in an open floor plan.

Another way to cut down on household noise, says the U.S. Environmental Protection Agency, is to make sure your "home envelope" is efficient. Your home envelope includes walls, floors, ceilings, roof, windows, and doors. By making sure your insulation is up to par, your air sealing is thorough, and your windows are appropriate for your climate (look for the Energy Star label), you can reduce noise transmission in your house - not to mention reduce drafts, save on energy bills, and control moisture.

A good resource for those who want to learn more is the Noise Pollution Clearinghouse. The NPC is a national non-profit organization with extensive online noise related resources. Its website is <http://www.nonoise.org/>

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