

# SOUND ISOLATION

## In the Home Theater

**ASC** ACOUSTIC  
SCIENCES  
CORPORATION

### HISTORICAL PERSPECTIVE

Typical residential construction is adequate at keeping low-volume, high frequency sounds (such as speech) from traveling through the rest of the household-although still not great. People talking in one room can often be heard in an adjoining room, and low muffled sounds can sometimes be heard between floors. When “frame” construction with drywall became popular in the 1950’s, large sound systems and home theaters were only a futuristic dream.

Today, however, we find ourselves with an ever-increasing problem-Structure-borne Sound Transmission of low frequencies. That “Thump! Thump! Thump!” of a subwoofer going through the structure of the house and annoying everyone who’s not in the listening room.

### WHY ISOLATE THE ROOM

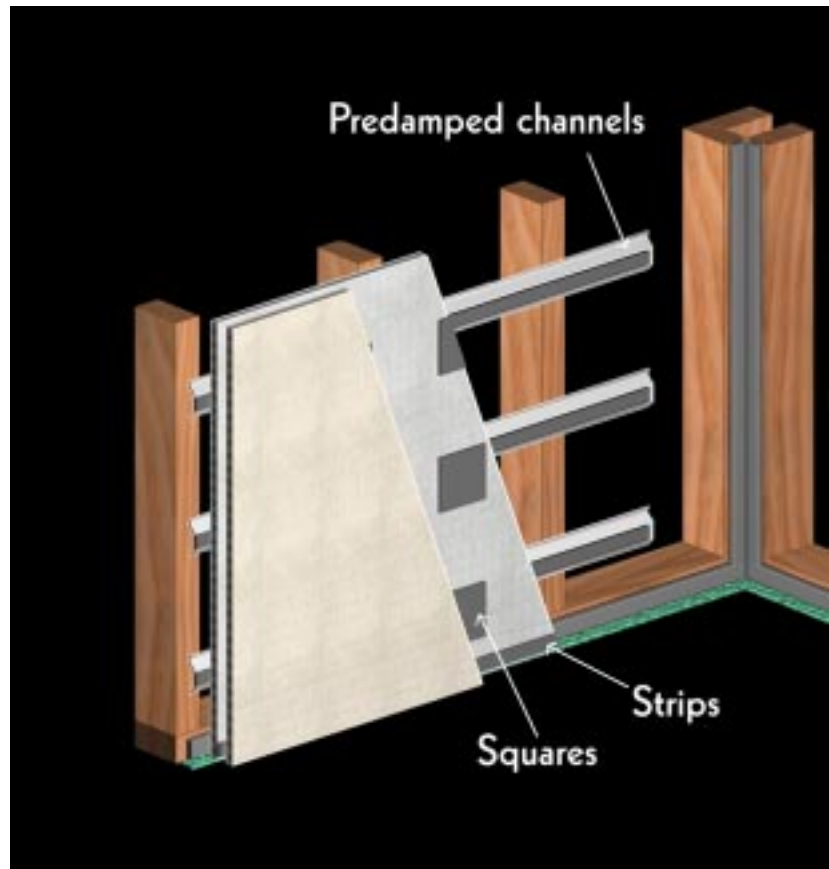
Being an acoustical design and engineering firm, we began receiving many calls for help from disenchanted homeowners. These people had recently invested in a dedicated home theater system, only later to find they had inherited an unforeseen problem-excessive bass that could be heard throughout the house.

What was expected to bring an added degree of enjoyment to the family, was now a source of discontent. Those watching the movie wanted BIG sound with earth shaking bass. However, the rest of the family in other parts of the house couldn’t stand the constant thumping and vibrations they were being forced to deal with. One party was constantly

yelling “turn that thing down!”, while the other party tried to inch the volume up in an effort to get that Large Cinema feel. Nobody was happy in the end.

**“What was expected to bring an added degree of enjoyment to the family, was now a source of discontent!”**

We would hear tales of people trying everything, from pillows under speakers, egg cartons on the walls, to ropes suspending equipment off the floor. Nothing seemed to work.



In a futile search for a solution, people would call us at ASC asking about our bass traps. “Would they work?” “They do absorb bass.. right?”, many would ask. Regrettably, bass traps are not the answer. Yes, they do work great at absorbing excess bass reverberation and controlling room modes, but do little in the effort to reduce structure-borne sound-which was the problem they now were facing.

So, what could be done? Unfortunately for them, very little-unless they were willing to undertake a major remodeling project of their home theater room. This would require a rebuild of all the walls and ceilings, an option not too popular with most.

## THE ROOT OF THE PROBLEM

The real problem is, the room was not designed or constructed to withstand such severe sonic impacts.

When a subwoofer produces powerful low-frequency acoustic energy, that wave front travels through the room and then collides with the wall & ceiling surfaces. Upon collision, much of that kinetic energy of the wavefront is converted into mech-anical (vibrational) energy, which sets the thin, flexible wall surface into vibration. This vibration is easily conducted through solid surfaces it is in contact with—such as the studs, joists and flooring. The vibration travels up and through the framing of the house—vibrating the walls, floors and ceilings as it passes them. What you get is a quaking house full of noise. This is what is known as Structure-borne Sound Transmission.

The fact of the matter is, conventional wall & ceiling construction methods easily conduct low-frequency sound, and are poor at blocking them out.

## THE SOLUTION

We have identified three ways to keep sound from traveling through a structure:

1. Block the sound by increasing the mass (thickness & density) of the walls.
2. Minimize the transmission paths for vibrations and sound to travel through.
3. Absorb & Dampen the vibrational energy.

Only Acoustic Sciences' proprietary WallDamp™ Iso-Wall System™ incorporates all three of these methods.

☑ Our system uses a double layer of gypsum to achieve twice the mass of an ordinary wall. At the same time, we minimize resonant coupling by using materials of differing density.

☑ Path sources are reduced by “floating” the walls & ceiling off the studs, while also giving the room a tight acoustic seal at all potential openings.

☑ Vibrations are quickly damped and the energy absorbed, by utilizing our special WallDamp material. Configured in a constrained layer method, three separate interface points are addressed to insure maximum benefit—at the stud, on the channel surface, and between the layers of drywall.

## THE RESULT

You get walls & ceilings that reduce perceptible sound volume levels SIX times† greater than standard interior walls.

With a calculated STC=60 (Sound Transmission Class), it makes our wall system the highest available using standard single-stud construction.

But, what truly puts the ASC Iso-Wall System in a class by itself is the remarkable ability to improve the playback performance of the audio system. Undesirable excess bass reverb is controlled, resulting in a high-impact, tight bottom end.

Having been developed and used in the construction of music recording studios for the past 12 years, this high-performance system is now available to the discerning homeowner.

## HOW TO ORDER

The Iso-Wall System is sold as a complete kit, ready to be installed by your local contractor or as a do-it-yourself project. All you need to provide is the drywall and screws. Simply call us with the dimensions of your room, and we will send a complete kit with all necessary materials and step-by-step installation instructions to complete your dedicated listening space. Of course, you may call one of our technical representatives at any time with questions or for assistance. Pricing for the kit materials is typically less than \$3 per sq/ft of wall & ceiling surfaces.

It's also great for sound-proofing shops, equipment rooms, laundries, studios and bedrooms.

Speak to your local ASC Distributor, or call Acoustic Sciences directly at (800) 272-8823.

†As measured in sones, a unit of subjective loudness as perceived by human beings

### *Company History*

*Acoustic Sciences Corporation (ASC) was founded by acoustical engineer, Arthur M. Noxon, PE in 1984. A pioneer in the control of low-frequency sound, ASC has grown into a world-class leader in the development of small, critical listening environments. With projects spanning the entire globe, our expertise is recognized worldwide.*

