

Title : **Do I Need an Acoustic Treatment For My Home Video Studio?**
Written by : **Zailinah Safiee**
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If you are thinking about setting up a home video studio, you would likely be using a spare room in your home. While creating a studio within your home is praiseworthy, recording in any room in a house would most certainly be plagued with unwelcomed acoustics effects simply because a house is not built for the purpose of recording.

Everything that takes place in a room revolves around sound waves. Attributes of the room such as its size, shape, materials used in its construction, the presence of windows, type of doors and furniture have a direct impact on the movement of these waves. The objective of acoustic treatment is to manage the reflection of these sound waves on the room surfaces, ultimately eliminating issues such as unwanted reverberation, flutter echo and inadequate frequency response which affects what you can hear from the recording.

A home video studio that has been given effective acoustic treatment will become a conducive space for recording and producing enhanced quality videos, characterized by crisp, clear sounds.

Why Is Acoustic Treatment Necessary?

When a sound is projected in a room, it either travels in a straight line or in a random fashion. This is due to sound reflection, a process when sound travels and bounces off surfaces such as parallel walls, hardwood or tiled floors, ceilings, and countertops.

Most home video studios are surrounded by parallel flat walls. A pattern of sound reflection known as flutter echo is produced as sound waves travel back and forth between surfaces of these walls. An example of flutter echo is when you clap your hands while standing in the middle of an empty room and hear faint echoey sounds after.

In a room where there is no acoustic treatment, only part of a subject's speech goes directly straight into the microphone. The rest of the sound will be reflected between the parallel walls and may only reach the microphone moments later.

As the sound that directly reaches the microphone does not have any contact or interaction with any part of the room such as ceiling or walls, the result will be a relatively pure tone with balanced frequency.

However, the portion of the sound that gets reflected within the room walls, ceilings or floors will alter the quality of the original sound.

Home video studio without acoustic treatment would lead to interference, resulting in recording with 'colored' or distorted sounds as mentioned above. This is why acoustic treatment is deemed necessary to achieve high-quality video production.

Frequency of Sounds

Managing acoustics of a home video studio requires an understanding of the frequency of

sounds. This is because the application of acoustics treatment hinges on the type of frequency emanating from the source.

Low Frequency

This ranges approximately from 20 to 200 Hz. Examples of low-frequency sounds, also known as bass, are a lion's roar or the banging of a drum.

Mid Range Frequency

Ranging from 200 to 5000 Hz, this is the region where most sounds fall under. Examples include sounds from musical instruments or human voices.

High Frequency

This ranges from 5000 to 15000 Hz. An example would be a high-pitched human voice.

The kind of acoustics treatment applied would depend on the type of sound frequencies present in the room.

Treatment Approaches

Not all home video studios are made equal. The approach in applying acoustic treatment to any room is therefore unique, depending on its surrounding environment.

An important step to take before embarking on any acoustic treatment is to determine any possible problem areas in the room. You can certainly outsource this task to professionals who can identify problem areas and offer recommendations on what to do with the room. However, to limit your expenditure on your home video studio, you might want to undertake this task yourself.

An example of a problem area is polished work surfaces as these are good media for sound reflection. As such, a room with rugs on its floor would offer better acoustics than laminate or hardwood floors.

The presence of windows would also pose a challenge, particularly if they are large. This can be overcome with the installation of curtains or blinds. They might not totally eliminate sounds coming through those windows but the curtains or blinds would definitely reduce unwanted audio effects from being part of your recording.

Acoustic treatment in a home video studio can be carried out in two ways, absorption and diffusion.

1. Absorption

Absorption is most suitable in reducing flutter echos or managing rooms with inherent ringing sound. This approach is usually taken for to manage sounds of various frequencies.

This method involves installing the walls with acoustic panels to soak up sound energy which potentially causes interferences in your video recording. Materials used in these acoustic panels include foam, rock wool, and fiberglass.

These materials are packed very densely within the panels for maximum absorption of sound. As sound passes through these panels, its energy is transferred to the absorptive materials, causing the energy to weaken. The weakening of this energy will then reduce the sound.

As these panels are able to absorb sounds in a wide range of frequencies, they are also known as broadband absorbers. Generally, the thicker a panel is the better it is at absorbing low-frequency sounds.

One of the easiest and cheapest means to treat areas where sound reflections are likely to occur is to use foam panels.

Size and Quantity

Acoustic panels typically come in a thickness of 2 inches and 4 inches, with the following sizes :

- 1 square foot
- 2 square feet
- 8 square feet

Standard bundles usually come in packs of 6, 12 or 24. But how many panels would you need for optimum coverage?

While each home video studio has different requirements, a good starting point would be to buy a number of panels that can cover 48 square feet of walls.

Panel Placement

Once you have your panels, you need to know where to place them. Two important positions in the room should be covered :

- The area behind your monitors
- The open trihedral corners (wall-wall-ceiling and wall-wall-floor intersections)

It is advisable that you test the acoustics of the room each time a panel is installed in order to assess if a panel placement improves the sound quality you want to achieve.

2. Diffusion

Diffusion in acoustic treatment involves deflecting sound with multi-faceted surfaces. These are commonly made of wood, plastic or polystyrene. They help to break up sound waves and scatter them to various directions, making interferences less intense.

This method works well to manage and control sounds in mid to high range frequencies.

Unlike absorption where the treated sound 'disappears', diffusion retains some of the sounds, giving the room an 'airy' feel or spaciousness.

Use of softwood material like cherry as diffusers is an excellent way of getting a smooth and balanced tone when sound is deflected.

Best Practice

There is no hard and fast rule on how acoustics treatment should be undertaken in a room.

To get the best out of your home video studio, however, you can look at combining both absorption and diffusion.

As a guide, you can start by covering 20 percent of the studio's wall and ceiling with broadband absorption materials. To create an airy, spacious effect, you can cover a further 20 percent of the room's wall and ceiling with diffuser materials.

Acoustics Treatment As Opposed to Soundproofing

While the goal of acoustic treatment is to *manage* sound reflections in a bid to achieve better sound quality, soundproofing aims to *isolate* a room, preventing sounds from going in and out of the room. The goal of soundproofing is, therefore, acoustic isolation.

Acoustics treatment is undertaken in an existing studio, the process of which can be modified along the way.

Unlike acoustics treatment, soundproofing is usually planned before a studio is built as dense materials need to be incorporated into the building of the studio.

In other words, soundproofing is akin to prevention rather than cure.

Treatment Within Your Means

Acoustic treatment will not isolate your home video studio from the external environment. Its goal is to effectively manage unwanted interferences in your recording by manipulating sound reflections towards better quality.

Some people who set up their studios become overzealous with purchasing state-of-the-art equipment for their video production but choose to skimp on acoustics treatment.

What they may not realize is that the lackluster quality of sound produced in the studio is the result of something unseen.

Despite its invisibility, sound waves, the bane of achieving pristine sound quality can be reduced, if not eradicated, simply by applying affordable acoustics treatment to the room.

If budget is a concern, you can always start with broadband absorption using foam panels, and work your way up combining this with diffusion materials to improve the sound quality in the studio.

As a first step, you can place panels on the reflection points or open trihedral corners (wall-wall-ceiling and wall-wall-floor intersections) in the room. These are places that should be treated at the start because if neglected, sound reflections that occur at these spots will combine with sound from your speakers, leading to comb filtering.

Comb filtering is a type of acoustic distortion that masks details in your media.

A well-treated room with a decent mix of equipment will certainly produce a better sound quality of your recording as compared to an untreated room with an array of high-end, sophisticated equipment.